



The Quality Assessment and Assurance Division

Self-Evaluation

School of Pharmacy

The Hebrew University of Jerusalem

September 2019

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1. Executive Summary (max 2 pages):

1.1. A short summary of the main strengths and weaknesses that were pointed out in the self- evaluation process.

The School of Pharmacy and its research institute, “Institute for Drug Research (IDR)”, have a long record of both high-levels of teaching and research. Graduates of the School of Pharmacy hold prominent positions in private and public pharmaceutical services, the pharmaceutical industry, and the health system. The school faculty members perform high quality research in various aspects of drugs and medications. Following is a summary of their strengths and weaknesses.

Strengths:

1. Curriculum: Undergraduate and Graduate Study programs are of a high standard. The employment rate of our graduates has always been very high with many holding senior rank positions in the private and public sectors.
2. Faculty staff: Within 2-3 years the IDR faculty members will be comprised mostly of young and vibrant faculty members, most recruited within the past decade. The School has an excellent record integrating emeriti faculty in the research and teaching activities. Some emeriti contribute significantly to the research volume and grant awards, graduate student supervision, and teaching elective courses. Harmony and friendship among all members contribute to collaborations and expansion of effective research and publications. The new recruitments of the past 5 years are generally very successful in winning grants (3 ERC awards), teaching, and supervising graduate students. The three newly hired faculty members starting in 2019-2020 are outstanding in all academic aspects.
3. Collaboration with Hadassah physicians: Strong collaboration with Hadassah Hospital physicians and the Faculty of Medicine research groups as well as national and international collaborations across disciplines exists with success in attracting funding and producing high profile publications.
4. Innovation and applied research: The School of Pharmacy and IDR are extensively reputed for innovation and marketed products. IDR research teams are attuned to innovation and applied research, reflected by the number of patent filings, agreements with industry, grant awards for product development (Kamin, Nofar), and the number of products resulted from research initiated at IDR.

Weaknesses:

1. Pharmacy graduates (pharmacists): Being the main School of Pharmacy in Israel, we are expected to have about 120 graduate pharmacists each year to accommodate public needs. However, the number of graduates in recent years has dropped to about 80. The main reasons for the reduction in the number of graduates are the influx of pharmacists graduated from Jordanian universities that obtain licenses to work in Israel as pharmacists. This influx (a few hundred per year) has reduced the salary and the demand of the profession. The enrolment of students to study pharmacy has declined from about 10 candidates per student to one candidate. Thus, the quality of students has dropped along with disproportionately exceeding the number of minorities in the program to nearly 60% in recent classes. Due to this change in the academic level of students, the dropout rate has increased to about 30% after the first year, which is the current situation. Due to a change in Jordanian university policy two years ago, the number of Jordanian pharmacy graduates was significantly reduced. This generated a significant shortage in pharmacists in the country, estimated at 1,000 for all sectors. This increases the pressure on the Ministry of Health to open more schools or to introduce another profession, pharmacy-

technician. The reduction in the number and quality of pharmacy graduates has also significantly impacted the graduate programs in which fewer pharmacy students proceed to graduate research studies.

2. Graduate students: There has been a general decline in the number of M.Sc. and Ph.D. students, making it harder to either keep or attract students to the graduate programs. The IDR has increased its international activities to attract foreign Ph.D. students.

3. Faculty staff: The number of faculty has been below (22) the norm (27) for the School with an insufficient long term planning to accommodate coming retirements. This affects the quality and quantity of teaching, research capacity, and general academic activities of the School.

4. Administrative staff: The School administrative staff was rated low by students. This may reflect a shortage in the number and quality of administrative and technical staff.

5. Facilities: The Pharmacy building needs major renovations, primarily in its air flow and air conditioning systems, research lab space, and general appearance.

6. Pharmacy studies for all: It is necessary to induce diversity into the pharmacy profession, to allow communities an access to pharmacy studies, including the ultra-orthodox community.

7. Internationalization: Current undergraduate pharmacy studies are not appropriate for international students. Since most of our graduates become dispensing pharmacists, the knowledge of the Hebrew language is mandatory. However, as part of the general international program of the Hebrew University, we are attuned towards graduate studies in English and fortify the number of courses given in English. We have also built exchange student programs with foreign Schools of Pharmacy.

1.2. A short description of the actions the Institution, the Parent Unit, and the Department will undertake to rectify the shortcomings that were found.

Addressing the weaknesses:

1. Pharmacy graduates: To accommodate the shortage in community pharmacists, the School has initiated actions to increase the number of graduates, including: intensive activities to reduce the dropout rate; initiate new programs including: day/evening pharmacy studies for chemists and biologists, chemistry-pharmacy double degrees, collaboration with the Lev Academic Center and other institutions for joint pharmacy studies for the ultra-orthodox community.

2. Graduate Students: The Department has taken several measures to increase M.Sc. enrollment: (i) provide fellowships and support, (ii) encourage undergraduate research projects to get their attention to undertake research, and (iii) offer expedited M.Sc. and Ph.D. programs to outstanding students.

3. Hiring of Faculty members: A plan was agreed with the Rector to expedite recruitment to hire faculty to full capacity, keeping the balance among the four disciplines, Pharmaceutical Sciences, Medicinal Chemistry, Clinical pharmacy and Pharmacology.

4. Administrative staff: We have negotiated with university authorities to increase the number of research support staff, so that each research team will be supported by 50% administrative staff.

5. Facilities: Two main actions were taken to improve the School facilities: Renovation of the 5th floor, that was re-assigned to the School and will be dedicated to building labs for the new faculty members. There is an understanding with university authorities to update the air-conditioning and air exchange in the building. In addition, the School is now renovating several halls and labs to allow more teaching and lab space.

6. Pharmacy studies for all: We have setup a joint program with the Lev Academic Center to initiate a joint program for pharmacy studies through the “transfer route” where the student

girls study two years at Lev and the 3rd and 4th years at the School of Pharmacy. This may generate 20-40 pharmacists.

7. Internationalization: Our focus is on building student exchange programs with prominent Schools of Pharmacy in North America. This will allow exchange students to become acquainted with the Pharmacy profession in other countries. The School promotes acceptance of Ph.D. students from abroad as well as post-doctoral fellows. These programs do not require knowledge of the Hebrew language.

2. The Institution (max 1 page)

About the University: The Hebrew University of Jerusalem is Israel's premier university as well as its leading research institution. It was founded in 1918 and opened officially in 1925. The Hebrew University is ranked internationally among the 100 leading universities in the world and first among Israeli universities. It stresses excellence and offers a wide array of study opportunities in the humanities, social sciences, exact sciences, and medicine. The University encourages multi-disciplinary activities in Israel and overseas and serves as a bridge between academic research and its social and industrial applications. The Hebrew University strives for excellence. It is among the top winners of the European Research Council's competitive grants for young researchers. Hebrew University scholars are awarded one-third of all competitive research grants in Israel.

The University maintains three campuses in Jerusalem: the Mount Scopus campus for the humanities and social sciences (the Faculty of Humanities and the School of Education, the Faculty of Social Sciences, the School of Business Administration, the Faculty of Law and the Institute of Criminology, the School of Occupational Therapy, the Paul Baerwald School of Social Work and Social Welfare, the Truman Institute for the Advancement of Peace, the Center for Pre-Academic Studies, the Rothberg International School, and the Buber Center for Adult Education); the Edmond J. Safra Campus at Givat Ram for exact sciences (the Faculty of Mathematics and Natural Sciences, the Rachel and Selim Benin School of Engineering and Computer Sciences, the Center for the Study of Rationality, the Institute for Advanced Studies, and the Edmond and Lily Safra Center for Brain Sciences); and the Ein Karem Campus, for medical sciences (the Hebrew University–Hadassah Medical School, Braun School of Public Health and Community Medicine, School of Pharmacy, the School of Nursing, and the Faculty of Dental Medicine). It also maintains a campus in Rehovot for the Robert H. Smith Faculty of Agriculture, Food and Environment, and the School of Nutritional Sciences; a campus in Beit Dagan for the veterinary hospital (The Koret School of Veterinary Medicine); and one in Eilat, for the Interuniversity Institute for Marine Sciences. The University also operates 3 sports facilities, 11 libraries, 5 computer centers, and about 6,000 dormitory beds.

The Hebrew University consists of close to 1,000 faculty members, about 2,000 administrative staff, and 23,000 students from Israel and 65 other countries. The university is actively engaged in international cooperation for research and teaching. It has signed 300 agreements for joint projects with other universities and 120 agreements for student exchanges with institutions from 25 countries, in addition to numerous faculty-based exchange programs. The HU faculty has registered more than 10,000 patents, and faculty members and alumni have won 8 Nobel prizes, 1 Fields Medal for Mathematics, 287 Israel Prizes, 13 Wolf Prizes, 48 EMET Prizes, and 96 Rothschild Prizes.

The University emphasizes excellence in research and teaching. The Office of Academic Assessment & Evaluation, which reports to the University's Academic Policy Committee (headed by the rector), monitors the implementation of recommendations provided by internal review committees and those appointed by the Council for Higher Education. The Office for Teaching and Studying aims to improve teaching practices through workshops, development of evaluation tools of effective teaching, etc.

2.1. Mission statement, aims and goals of the institution:

The Hebrew University has set as its goals the training of public, scientific, educational and professional leadership; the preservation of and research into Jewish, cultural, spiritual and intellectual traditions; and the expansion of the boundaries of knowledge for the benefit of all humanity.

The Hebrew University's mission is to develop cutting edge research and to educate future generations of leading scientists and scholars in all fields of learning. The Hebrew University is part of the international scientific and scholarly network. It measures itself by international standards and strives to be counted among the best research universities worldwide.

The Hebrew University is a pluralistic institution where science and knowledge are developed for the benefit of humankind. At the same time, the study of Jewish culture and heritage are a foremost legacy of the Hebrew University.

The goal of the Hebrew University is to be a vibrant academic community, committed to rigorous scientific approach and characterized by its intellectual effervescence. These will both radiate and enlighten the University's surrounding society.

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Supporting documents:

A chart of the institution's organizational structure, and the names of holders of senior academic and administrative positions.

Chart 1 – Institute's Organizational Structure



Names of holders of Senior Academic and Administrative Positions (2018)

Chairman of the Board of Governors: Mr. Daniel I. Schlessinger
 President: Prof. Asher Cohen
 Rector: Prof. Barak Medina
 Vice-President and Director-General: Mr. Yishai Fraenkel
 Vice-President and Chairman of the Authority for Research and Development: Prof. Reem Sari
 Vice-President for Advancement and External Relations: Mr. Yossi Gal
 Chancellor: Prof. Menahem Ben-Sasson
 Vice-President for International Affairs: Prof. Oron Shagrir
 Vice-Rector: Prof. Assaf Friedler
 Vice-Rector: Prof. Berta Levavi-Sivan
 Comptroller: Mr. Zvi Aizenstein

Deans:

Prof. Michael Segal, Faculty of Humanities
Prof. Tamir Sheafer, Faculty of Social Sciences
Prof. Michael Karayanni, Faculty of Law
Prof. Jay Fineberg, Faculty of Mathematics and Natural Science
Prof. Benny Chefetz, The Robert H. Smith Faculty of Agriculture, Food and Environment
Prof. Dina Ben-Yehuda, Faculty of Medicine
Prof. Aharon Palmon, Faculty of Dental Medicine
Prof. Guy Harpaz, Dean of Students
Prof. Zvi Wiener, Jerusalem School of Business Administration
Prof. Mona Khoury-Kassabri, The Paul Baerwald School of Social Work and Social Welfare

Members of the Executive Committee of the Board of Governors

Board of Managers

Table 1 (Excel appendix).

| Table 1 - Number of students and faculty members in the Institution | | | | | | | |
|---|--------------------|---------|---------|---------|---------|---------|---------------------------|
| Faculty | Number of Students | | | | | | Number of faculty members |
| | BA | | MA | | Ph.D. | | |
| | 2017/18 | 2018/19 | 2017/18 | 2018/19 | 2017/18 | 2018/19 | |
| Faculty of Humanities | 1400 | 1357 | 668 | 671 | 419 | 429 | 186 |
| Faculty of Social Sciences | 1841 | 1807 | 1006 | 982 | 328 | 350 | 167 |
| Faculty of Law | 856 | 883 | 363 | 356 | 70 | 68 | 41 |
| Faculty Mathematics and | 1377 | 1389 | 381 | 427 | 441 | 498 | 203 |
| Faculty of Medicine | 1481 | 1757 | 971 | 990 | 339 | 384 | 113 |
| Faculty of Dental Medicin | 225 | 222 | 248 | 250 | 35 | 49 | 13 |
| Faculty of Agriculture, Foo | 1360 | 1307 | 397 | 386 | 303 | 308 | 91 |
| School of Engineering and | 1259 | 1376 | 210 | 178 | 111 | 91 | 44 |
| School of Pharmacy | 325 | 340 | 115 | 103 | 80 | 81 | 22 |
| School of Education | 219 | 230 | 544 | 568 | 60 | 72 | 34 |
| School of Social Work and | 257 | 257 | 595 | 644 | 66 | 68 | 28 |
| School of Business Admini | 368 | 347 | 460 | 464 | 37 | 37 | 29 |
| Total | 10968 | 11272 | 5958 | 6019 | 2289 | 2435 | 945 |

3. Internal Quality Assurance (max 3 pages):

3.1. A description of the institution's Quality Assurance policy and system, including its mechanisms, processes, and the responsible bodies for its implementation:

The Hebrew University developed an internal quality assessment mechanism. The Office of Assessment & Evaluation, which is part of the Rector's Office and headed by a full professor (currently, Prof. Berta Levavi Sivan, the vice rector), is responsible for internal quality assessment.

The School of Pharmacy monitors its curriculum every 2-3 years. The head of each discipline, Chemistry, Pharmacology, Pharmaceutics, and Clinical Pharmacy, is responsible for monitoring all courses of the discipline. Proposed modifications and suggested improvements are presented to the School management and the Development Committee that approve/modify the proposed changes. The final approval is by the School Teacher Council.

This year, as part of the new management, all teaching and research activities were closely evaluated. This self-evaluation resulted in major changes in the School's activities, including: update of the chemistry, pharmacy and pharmacology undergraduate studies; cancelation of two M.Sc. programs due to low student registration, and the establishment of several programs to increase the number of graduate pharmacists.

3.2. Describe the current Self-Evaluation process, including methods used by the Institution, parent unit, and the Department in its Self-Evaluation process; direct and indirect participants in the process, etc. Specify your conclusions regarding the process and its results

This report was compiled by the School of Pharmacy. Parts of these reports were written by the office of the Rector (general information about the university), office of the Dean (information pertaining to the Faculty of Medicine), and members of the School of Pharmacy. Prof. Shlomo Sasson coordinated the composition of the report and wrote parts of it. Our Academic Staff provided most of the information. Additional data were collected by the School Administrative Director (Ms. Tirza Lavi), as well as by the secretaries of study programs at the School. Information was also collected and written by the Heads of academic committees of the School, the central University unit for student registration and selection. The University's Authority for research and Development and Yisum, the transfer company of the University also shared information on the relevant topics.

Collecting the data was extremely tedious (see below). However, given the significant assistance from the academic and administrative staff of the School of Pharmacy, it was better than expected.

3.3. Describe the consolidation process of the Self-Evaluation Report, including its preparation, final approval, and a description of the contributions of staff members to the process.

To simplify the process, we distributed among our faculty members a structured form with a template for reporting their CVs as well as their activities including all other information needed for fulfilling the self-evaluation report. Basically, our report is based on the information collected from the academic staff of the School of Pharmacy, as well as other sources from the University.

3.4. Describe the mechanism used to follow-up and address the weaknesses that were highlighted by the Self-Evaluation process. Which bodies

within the institution/parent unit/department are responsible for this activity?

General: The Office of Assessment & Evaluation initiates timely international reviews of the academic units, and it assists the units in preparing the self-evaluation reports. Once a review is received, the relevant unit is asked to respond to it. The report and the response are then discussed at the University's Academic Policy Committee. This committee consists of the President, the Rector and Vice Rectors, as well as faculty members and independent, non-faculty members. The head of the Office of Assessment & Evaluation leads the discussion, which includes presentation and Q&A with the heads of the relevant academic unit. The discussion is concluded with a set of recommendations for implementation. The head of the Office of Assessment & Evaluation is then responsible to work in cooperation with the academic unit on implementing the recommendations, including required changes in policies of the School/faculty or the university in general.

School of Pharmacy: The weaknesses recognized by the School management were evaluated with respect to the objectives of the School of Pharmacy, its budget allocation, and yield. The issues are first discussed within the School Development Committee followed by approval by the Teachers Council. The issues-weaknesses are raised to the Dean of the Faculty, and together the issues were discussed with the Rector and his team along with proposed solutions. An action plan is put into place for execution in the coming year. This is a common process for actions within the School of Pharmacy.

3.5. Is the full Self-Evaluation Report accessible? If so, to whom is it accessible and to what extent?

The Self-Evaluation reports are available on the Rector's website. For example, the previous decadal review can be found at: <https://rector.huji.ac.il/book/2007-פיסיקה>

The self-evaluation report will be accessible to all faculty members of the School of Pharmacy and to anyone who will request the report and is eligible to receive it.

3.6. Second cycle of evaluation: in a format of a table, address the recommendations of the previous evaluation committee and describe the implementation and follow-up process (address each recommendation separately).

This is the first time the School of Pharmacy of the Hebrew University has undergone the self-evaluation process by the Council for Higher Education.

4. The Parent Unit1 (max 2 pages)

4.1. The name of the parent unit, its mission statement, aims, and goals.

The Hebrew University's Faculty of Medicine was initially instituted as a Department of Parasitology in 1924. Since then it has developed into a major international clinical and research medical center. There are five schools in the Faculty: School of Medicine, School of Pharmacy, School of Public Health, School of Occupational Therapy, and School of Nursing. In addition, there are undergraduate and graduate study programs in biomedicine. The number of students enrolled in this program is about 3,000.

The Mission of the Faculty of Medicine of the Hebrew University in Jerusalem is to preserve its cutting edge in biomedicine through education, research, and community service, while maintaining scientific excellence at the highest international standards. This endeavor is carried out by emphasizing basic human and ethical values together with local community and environmental activism; by exploiting translational research in basic sciences and clinical

medicine; and by ensuring that our graduates play a pivotal role in the Israeli health care system, as well as global medical and clinical research.

The *raison d'être* of the Faculty of Medicine of the Hebrew University of Jerusalem is three-fold: excellence in bio-medical research, medical education, and community service. The Faculty of Medicine impacts nationally on science and research as the leading medical research institution in Israel; on Jerusalem as the leading health provider; on Israel where Faculty graduates are heads of departments in hospitals, pharmacy service, and research centers around the country; on the Jewish People due to its research on diseases specific to Jews; and on regional collaborations with bi- and tri-lateral research programs in the Middle East and elsewhere.

4.2. What is the decision-making process for the rationale, mission, and goals of the parent unit? How are they reviewed and monitored?

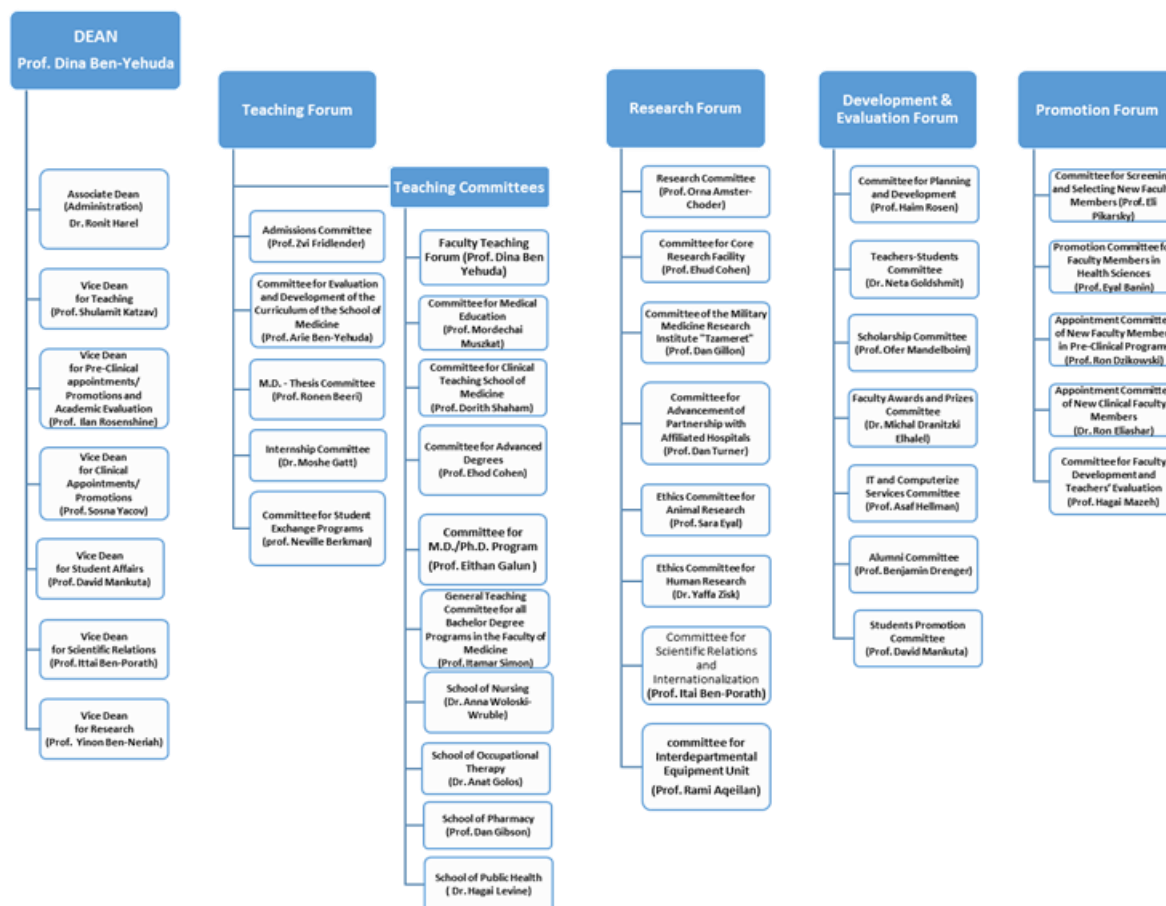
The body that is academically responsible for the teaching programs is the Teaching Committee of the Faculty of Medicine. It is headed by the Vice Dean for Teaching, and it comprises the heads of all the Faculty's teaching programs, including the School of Pharmacy, students' representatives and ex-officio the Dean, Prof. Dina Ben Yehuda. The major responsibilities of this Teaching Committee are to propose, discuss, approve, and monitor all the Faculty's teaching programs, including interfaculty and interuniversity programs. New programs, which are approved by the committee are submitted for approval by the University's Standing Committee and when required, also by the Council for Higher Education. Changes in teaching programs, goals and missions are delegated to the Faculty and students, via the corresponding members of the Faculty's Teaching Committee. Such new programs are presented to the faculty in the tri-annual School Council, which is composed of all faculty members. (Haim Avital).

4.3. List of the committees operating within the parent unit, and their composition (representatives of which departments/bodies are members).

The Faculty of Medicine is one of seven faculties comprising the Hebrew University of Jerusalem. It is subject to University authority. At the head of the Faculty of Medicine is the Dean, who is elected by the Faculty Council comprised of full and associate professors of the faculty. According to tradition, there is a rotation between pre-clinical and clinical faculty with regard to the appointment of the dean. Vice Deans are nominated by the Dean, pending approval of the University President, Rector, and the Standing Committee. The relationship between the Faculty of Medicine and the University administration and its committees allows for a great degree of freedom of action and for the development of initiatives and changes. The Faculty of Medicine, as with all faculties within the Hebrew University, is under the control of the President, the Rector, and the Board of Governors of the Hebrew University.

The Dean is elected by the entire (pre-clinical and clinical) faculty in all Schools and academic bodies of the Faculty of Medicine for a four-year term. The Dean is responsible for all academic functions of the Faculty of Medicine and reports to the Rector of the University and its governing bodies.

The following charts describe the general structure of the Faculty of Medicine including Vice-Deans, Committees and forums.



Vice Deans are appointed by the Dean, pending approval of the University President, Rector, and the Standing Committee. The Associate Dean for Administration is selected and appointed by the University Management and is responsible for the administrative issues of the Faculty and contacts with the University administrative departments and regulatory bodies. All other Vice-Deans and Assistant Deans were nominated by Dean Ben Yehuda and approved by the Faculty Council when convened in October 2017.

- Associate Dean (Dr. Ronit Harel)
- Vice Dean for Teaching (Prof. Shula Katsav)
- Vice Dean for Pre-Clinical Appointments/Promotions and Academic Evaluation (Prof. Ilan Rosenshine)
- Vice Dean for Clinical Appointments/Promotions (Prof. Yacov Sosna)
- Vice Dean for Student Affairs (Prof. David Mankuta)
- Vice Dean for Research (Prof. Yinon Ben-Neriah)
- Vice Dean for Scientific Relations (Prof. Ittai Ben-Porath)
- Assistant Dean for Admission (Prof. Zvi Fridlender)

The following Faculty Committees and their Chairs were appointed by Dean Ben Yehuda. These appointments were approved by the Faculty Council during its assembly on ?? October 2017

- Faculty Teaching Forum (Prof. Dina Ben Yehuda)
- Committee for Planning and Development (Prof. Haim Rosen)
- Admissions Committee (Prof. Zvi Fridlender)
- Committee for Screening and Selecting New Faculty Members (Prof. Eli Pikarsky)

- Appointment Committee of New Faculty Members in Pre-Clinical Programs (Prof. Ron Dzikowski)
- Appointment Committee of New Clinical Faculty Members (Prof. Ron Eliashar)
- Promotion Committee for Faculty Members in Health Sciences (Prof. Eyal Banin)
- Committee for Medical Education (Prof. Motti Mushkat)
- Committee for Clinical Teaching School of Medicine (Prof. Dorit Shaham)
- Teaching Committee for Advanced Degrees (Prof. Ehud Cohen)
- Teaching Committee – School of Nursing (Dr. Yaffa Zisk Rony)
- Teaching Committee – School of Occupational Therapy (Dr. Anat Golos)
- Teaching Committee – School of Pharmacy (Prof. Boaz Tirosh)
- Teaching Committee – School of Pharmacy (Prof. Eylon Yavin)
- Teaching Committee – School of Public Health (Dr. Hagai Levine)
- General Teaching Committee for all Bachelor Degree Programs in the Faculty of Medicine (Prof. Itamar Simon)
- Committee for Teachers' Evaluation (Prof. Hagai Mazeh)
- Committee for Evaluation and Development of the Curriculum of the School of Medicine (Prof. Arie Ben Yehuda)
- Committee for M.D./Ph.D. Program (Prof. Eithan Galun)
- M.D. - Thesis Committee (Prof. Ron Be'eri)
- Committee for Scientific Relations and Internationalization (Prof. Ittai Ben-Porath)
- Steering Committee of the "Tzamaret" (Military Medicine) Program (Prof. Dan Gilon)
- Research Committee (Prof. Orna Amster Choder)
- IT, Computer, and Bio-information Committee (Prof. Asaf Hellman)
- Teachers-Students Committee (Dr. Neta Goldschmidt)
- Ethics Committee for Animal Research (Prof. Sara Eyal)
- Ethics Committee for Human Research (Prof. Yaffa Zisk Rony)
- Faculty Awards and Prizes Committee (Prof. Michal Elhalal)
- Internship Committee (Dr. Moshe Gatt)
- Committee for Student Exchange Programs (Prof. Neville Berkman)
- Scholarship Committee (Prof. Ofer Mandelboim)
- Committee for Advancement of Partnership with Affiliated Hospitals (Prof. Dan Turner)
- Committee for Interdepartmental Equipment Unit (Prof. Rami Aqeilan)
- Alumni Committee (Prof. Benjamin Drenger)

Members of the curriculum committees are the heads of the different teaching divisions in the School of Medicine. To properly coordinate between the Pre-Clinical and Clinical curricula, the members of the general Teaching Committee, chaired by Prof. Shula Katsav, represent all the disciplines and departments involved in the teaching programs. The Dean, Vice Dean for Student Affairs, Chairperson of the Teacher-Student Committee, Chairperson of the Center for Medical Education, Associate Dean, representatives of the affiliated hospitals, a representative of the Hadassah administration, a representative of the School of Dentistry, and the Head of the Teaching Services Unit in the Faculty of Medicine are also members of the Committee. Additional members of this Committee are six students representing the pre-clinical and clinical years of MD study. (Haim Avital)

Supporting documents:

A chart of the unit's academic and administrative organizational structure (including relevant committees), names of holders of senior academic and administrative positions, and a list of departments/study programs operating within its framework. See above chart

Table 2 (Excel appendix).

| Table 2 - Number of students and faculty members in the Parent Unit | | | | | | | | | |
|---|--------------------|---------|---------|---------|---------|---------|---------|---------|---------------------------|
| Department/Divisions | Number of Students | | | | | | | | Number of faculty members |
| | BSc | | MSc | | PhD | | Pharm.D | | |
| | 2017/18 | 2018/19 | 2017/18 | 2018/19 | 2017/18 | 2018/19 | 2017/18 | 2018/19 | |
| School of Medicine | 538 | 543 | 524 | 543 | | | N/A | N/A | 113+12 Emiriti |
| School of Nursing | 730 | 726 | 44 | 49 | 6 | 7 | N/A | N/A | |
| School of Occupational Therapy | 254 | 256 | 59 | 67 | 16 | 18 | N/A | N/A | |
| School of Biomedical Sciences | 213 | 232 | 140 | 147 | 282 | 325 | N/A | N/A | |
| School of Public Health | | - | 148 | 133 | 35 | 34 | N/A | N/A | |
| School of Pharmacy | 326 | 340 | 59 | 52 | 80 | 81 | 56 | 51 | 22+13Emiriti |
| Total | 1807 | 2097 | 974 | 991 | 419 | 465 | 56 | 51 | 135+25 Emiriti |

5. The Department/Study Program

5.1. Study Programs (max. 8 pages*)

*if the department/program offers more than one-degree level, 2 additional pages may be added to this chapter

5.1.1. Overview, addressing the following:

5.1.1.1. The name of the Department/study programs, and a brief summary describing its development since its establishment:

History and General structure: The Hebrew University's School of Pharmacy was founded in 1953. It was originally located in the Russian Compound and was moved in 1972 to its current School of Pharmacy building at the Hadassah Ein Kerem Medical Center. The School of Pharmacy originally had 10 faculty members teaching 8-10 pharmacy students per year. Today, the School of Pharmacy consists of 25 faculty members and 13 active emeriti professors. All are involved in undergraduate teaching, supervising graduate students, and performing research in the following four disciplines: Pharmaceutical Sciences, Medicinal Chemistry, Pharmacology and Clinical Pharmacy. Currently, 70-80 licensed pharmacists are graduated yearly in the B.Pharm. program. However, the School has a capacity of graduating 120 pharmacists per year. In 2009 the Institute for Drug Research (IDR) was founded to replace the previous three-department structure of the School. This structural change allowed management to allocate resources, reduce, departmental segregation and support inter-discipline research. However, the three teaching disciplines were kept independent. During the past decade, a new discipline of Clinical Pharmacy emerged as the fourth discipline, both for teaching and research.

Leadership: The School of Pharmacy is directed by its Head (Presently Prof. Avi Domb), elected by the School faculty for a four-year term. The School head, along with the administrative manager, Tirza Lavi, and the Deputy-School head, Prof. Boaz Tirosh, are responsible for the academic and administrative school management as well as future planning and execution. The School management is responsible for: budget preparation (and its approval by the university authorities); and its allocation for school activities; the recruitment and promotion of faculty members, and administrative personnel; providing suitable infrastructure for teaching and research.

Permanent committees in the School:

Planning and Development (headed by the Head of School) is responsible for long and short term developmental goals, budget allocations and overall school activities. The committee is comprised of the School management (head, deputy head, and administrative manager), the heads of all school committees, the heads of the School disciplines, representative of the school emeritus faculty, the Faculty Dean and Deputy-Dean.

Teaching/curriculum (headed by the Deputy of the School head) is responsible for the undergraduate and graduate curriculum, quality of courses and teaching, and placement of the

teaching staff. the committee also handles the academic individual issues of the undergraduate students.

Advanced Studies Committee (headed by Prof. Rami Yaka), is in-charge for the M.S. program, including approval of courses in conjunction with the faculty teaching committee, and dealing with students' matters. It should be noted that Ph.D. students' matters and regulations are handled directly by the graduate student's authority of the University and not by the School. Additional committees include: Research equipment and infrastructure (headed by Dr. Yossi Tam), Student/faculty committee (Prof. Avital Shurki) and the Awards and Prizes Committee. The following are the current study programs in the School of Pharmacy:

B.Pharm.Sci. including the Ministry of Health license to serve as a pharmacist. The program consists of 7 semesters (3.5 years) of courses, total 180 credits, followed by mandatory internship in a pharmacy. The first three semesters are devoted to basic studies in mathematics, physics, biology, chemistry, and medical sciences (anatomy, physiology, pathology, etc.). The last four semesters are devoted to courses in the pharmacy profession in the three disciplines: pharmaceutics, medicinal chemistry, and pharmacology.

The excellence program for a direct M.Sc. within 5 years is offered for outstanding pre-selected students. This program is fortified with courses in chemistry and extensive laboratory work. The students after the internship join labs for a one year M.Sc. research project (total 5 years) or direct Ph.D. program (total 8 years).

Masters studies in science focusing on pharmaceutics, pharmacology, medicinal chemistry, and forensic science are open to any candidate with a science degree. The studies are for 4 semesters composed of 28 course credits and an extensive research thesis.

Ph.D. studies offer Ph.D. degree with specialty in Pharmaceutical Sciences, Medicinal Chemistry, Clinical Pharmacy, or Pharmacology. The program is for 4.5 years with focus on an original research thesis.

Pharm.D. is a three year program awarding Pharm. Doctor degree. The first two years are mainly courses in topics related to clinical pharmacy followed by one year in clinics supervised by clinical pharmacists. All students submit a research thesis that is mentored by the members of the clinical pharmacology section of the School of Pharmacy.

| Chart of Study Programs - School of Pharmacy | |
|--|---|
| Standard (B.Pharm.Sc.) | Pharmacy |
| Excellence program (B.Pharm.Sc./M.Sc.) | A 5 year program of Pharmacy studies with accelerated M.Sc. |
| Pharmacy retraining studies (B.Pharm.Sc.) | Pharmacy for students that hold a B.Sc. Degree in sciences |
| Master of Science (M.Sc.) | Masters in sciences specializing in Pharmaceutical Sciences |
| | Masters in sciences specializing in Pharmacology |
| | Masters in sciences specializing in Medicinal Chemistry |
| | Masters in sciences specializing Forensic Sciences |
| Ph.D. | Ph.D. in Sciences |
| Pharm.D. | Doctor in Clinical Pharmacy |

5.1.1.2. The study program mission statement, aims, and goals of the department. What is the strategic plan of the Department and its study programs? (Address the decision-making process, revision, and monitoring.)

The main mission of the School of Pharmacy is to teach and train professional pharmacists required to operate community, hospital pharmacies, health institutions and industry (about 120 per year). It should be noted that there is a second School of Pharmacy at Ben Gurion University that trains 40-60 new pharmacists per year.

As an academic institute we also operate graduate research programs (M.Sc. and Ph.D.) that fulfill the need for pharmaceutical experts in the pharmaceutical industry, research institutions, and academia. The school runs a unique Pharm. Doctor program that serves in hospital departments, HMOs as medication experts. The Institute of Drug Research is the only

integrated research institute in Israel staffed under one roof by medicinal chemists, pharmacologists, pharmaceutical scientists and clinical pharmacists who are capable of developing and evaluating new chemical entities all the way to clinical trials.

The curriculum for all programs is challenged annually to educate our students with the most up-to-date professional developments and prepare them for the day after completion of their studies. The studies are constantly monitored to ensure high quality teaching and graduate research. This is initiated by the heads of the school disciplines, the teaching committees, and school management.

Special attention is given to monitor the 6 months pharmacy training, mandatory for qualifying for a pharmacist's license. The School of Pharmacy has built a mechanism to monitor and supervise a student's internship and guarantee the quality of his training outside of the School. Only following approval of the internship after successful completion of all courses, can a license can be issued. This is monitored and followed by a dedicated internship committee (headed by Prof. Amnon Hoffman).

The Ph.D. program is fully controlled and managed by the central Authority for the Advanced Studies in Experimental Sciences of the Hebrew University.

5.1.1.3. List the bodies responsible for planning and managing the study program. Describe the mechanisms responsible for introducing changes and updating the study program and how they operate. Specify any fundamental changes in the study program during the last five years, as well as recent and planned (upcoming year) changes in the study program.

The undergraduate teaching program is coordinated and monitored by the Teaching Committee. The committee discusses all suggestions to changes and updating of the curriculum. Upon recommendation, the committee decides on the implementation and monitoring of new modules and courses. All changes in curriculum and course content are controlled and require approval of the School management.

The new management, started in October 2018, called for intensive review of all programs offered by the School of Pharmacy with objectives stressing focus, reduction of redundancy, balancing course contents, and updating and reducing pressure on students by reducing the course load. The outcome of this initiative is summarized as follows: the total required credits was fixed as 180, and pharmacology courses were reorganized into three courses that provide the full spectrum of pharmacology with no redundancy. The chemistry course sequence was rearranged to allow a better distribution during the first 3 semesters. Pharmacy frontal courses and laboratories were updated.

For example, the organic chemistry courses were divided into three courses of 3-4 credits (instead of two courses of 8 and 5 credits), and the content was updates to include 2 additional credits devoted for analytical chemistry and instrumentation familiarity. Overlaps in the pharmacology training were observed and the curriculum was updated accordingly. Specifically, we updated the course in drug toxicology which contained information that overlapped with advanced pharmacology. We also made an effort to minimize the number of teachers per course to avoid duplications in lectures and contradictions in the exams.

5.1.1.4. Describe the mechanism for coordinating and examining the contents that are, in fact, being taught, if such a mechanism exists.

The Teaching Committee is the academic body in the School of Pharmacy that coordinates all the undergraduate, elective and graduate courses and ascertains that the courses are given in a logical sequel. Students are represented in this committee.

At the end of each course, students are asked to fill out an evaluation/feedback survey. These surveys are analyzed by an independent institution. At the end of every semester each discipline

conducts a meeting in which the student feedbacks are discussed, and ideas for improvements are raised. All recommendations are then presented to the curriculum/teaching committee for practical discussion and implementation. Based on the decisions, the head of each discipline is in charge of implementation. The heads also plan faculty teaching assignments for the next academic year, taking into consideration sabbatical leaves and retirements.

New courses for M.Sc. students are approved first by the School of Pharmacy Teaching Committee, followed by approval by the Faculty of Medicine Graduate Teaching Committee.

5.1.1.5. 5.1.1.5. List the courses provided by the Department to other units, if such courses exist.

The School of Pharmacy is in charge of teaching pharmacology at the School of Medicine, School of Dentistry and the School of Nursing. As such, the pharmacology sections in the curriculum for medical, dental and nursing students are given by the faculty of the School of Pharmacy and its research assistants.

The list of service courses is given in the following table:

| Service Courses | | | |
|------------------------|--|-----------------|---------------|
| No. of Course | Name of Course | Semester | Credit |
| 96211 | Pharmacology - general | B | 3 |
| 96307 | The nervous system of the sick person | B | 3.5 |
| 96301 | Heart and blood vessels of the sick person | A | 4.5 |
| 96305 | Female sex system and fertility and venereal diseases | A | 3.5 |
| 97345 | Pharmacology for Dental Students | A | 4.5 |
| 91117 | Pharmacology A | A | 4 |
| 91120 | Pharmacology B | B | 2 |
| 91146 | CHEMISTRY (INTRO. TO BIOCHEMISTRY) | A | 5 |
| 94682 | Principles in Pharmacology | A | 2 |
| 64200 | The chemical basis for rational drug design and discovery | A | 2 |
| 64126 | History of Science: From the Closed World to the Infinite Universe | A | 2 |

In addition, the School of Pharmacy is engaged in programs with the Faculty of Law for forensic sciences. In this respect, courses are provided for lawyers who also aim to become also forensic specialists:

Courses in forensic sciences include:

| Forensic Courses | | | |
|-------------------------|---|-----------------|---------------|
| No. of Course | Name of Course | Semester | Credit |
| 64873 | An introduction to forensic science and law | A | 2 |
| 61914 | Forensic Medicine and Biology | C | 2 |
| 61915 | Concepts of Forensic Science | B | 2 |
| 61800 | Criminological Theory | A | 2 |
| 64853 | Forensic Anthropology | A | 2 |
| 61805 | Criminal Law | A | 2 |

In an effort to expand the general knowledge of students at the Hebrew University, each faculty offers other faculties basic courses in a variety of topics.

The School of Pharmacy offers one course in drug design for non-science students (Corner-Stone course): The Chemical Basis for Rational Drug Design and Discovery, Prof. Amiram Goldblum, 2 credit points.

5.1.1.6. List the non-academic bodies involved in the running and the activities of the parent unit and study program, if such bodies exist.

The School of Pharmacy includes a Continuing Education Unit. The objective of this unit is to create a bridge between the professional public and the community at large by:

- organizing courses in the fields of pharmacy and medicine for a specified audience (see below)
- presenting innovative courses to professional members of the community at large
- organizing courses for new immigrants, who have a degree equivalent to a degree in pharmacy, which will allow them easy assimilation into Pharmacy in Israel

The Target Audience includes: Pharmacists (in the public and private sectors, the pharmaceutical industry, drug development companies, hospitals, health organizations, clinics, research institutions, new pharmacist immigrants that need to pass an exam to get license, physicians and dentists, veterinarians, nurses, dieticians, agriculture graduates (involved in animal care), drug sponsors, toxicologists (in the Departments of Health, Environment, Commerce and Industry, and Science), biology teachers, patent holders, IDF, and more.

The Community at Large: Adult instructors, elementary to high school institutions, and a multitude of instructors in relevant fields.

All courses are given in Hebrew.

The management of the department examines possibilities of offering courses in specific fields of potential interest to the participating community.

5.1.1.7. Research of undergraduate students:

5.1.1.7.1. To what extent are undergraduate students involved in research projects of the faculty? Is there a structured mechanism (e.g., courses; credits for participating)?

To increase the number of M.Sc. students and also help principal investigators to obtain help in performing basic tasks in their labs, two courses have been constructed to encourage undergraduate students to become active in lab work. One course, Exposure to Drug Research, is an elective for all the students and involves the performance of a small research project in one of the School's labs (3 credits). The students are assigned to a graduate student in the lab for a semester and need to design and perform an experiment in the lab.

A second course, Research Experience, is offered to the students in the excellence program. This mandatory course is spread over two years (second and third). In this 10 credit course, students are obliged to participate in active research in three different laboratories, each belonging to a different discipline. At the end of the course, the students submit extensive reports and present posters on their achievements.

In addition to this mechanism, we give fourth year students, before the beginning of the exam period, a day of lectures in which all interested faculty members present their research projects to interest students in graduate studies in the School of Pharmacy. From our experience, this endeavor has proven successful.

Undergraduate students may work in research labs and be paid by the hour. Some may remain in the lab for the B.Sc. period and continue to study for M.Sc. and even Ph.D. in the same lab.

5.1.1.7.2. Is there a procedure for encouraging students to carry out independent research?

For safety reasons we do not encourage independent research at the undergraduate level. The mechanism is to assign an undergraduate student to a research student for hand-in-hand work. However, hourly paid undergraduate students do work in certain labs for periods of months or years and may be advanced to perform independent research within the scope of the research group.

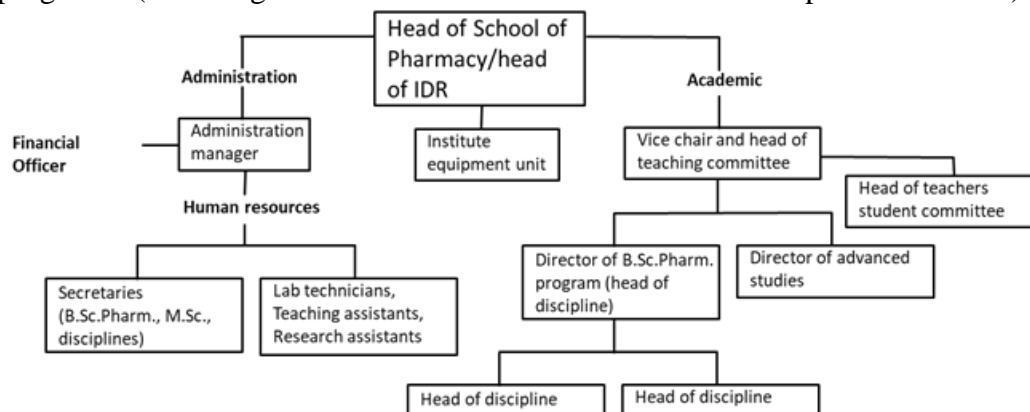
In summary, to what extent has the program achieved its mission and goals? What are its strengths and weaknesses?

The objective of introducing research to undergraduate students has been partly achieved, since not all students elect these courses. Some students engage with a lab and are paid by the hour.

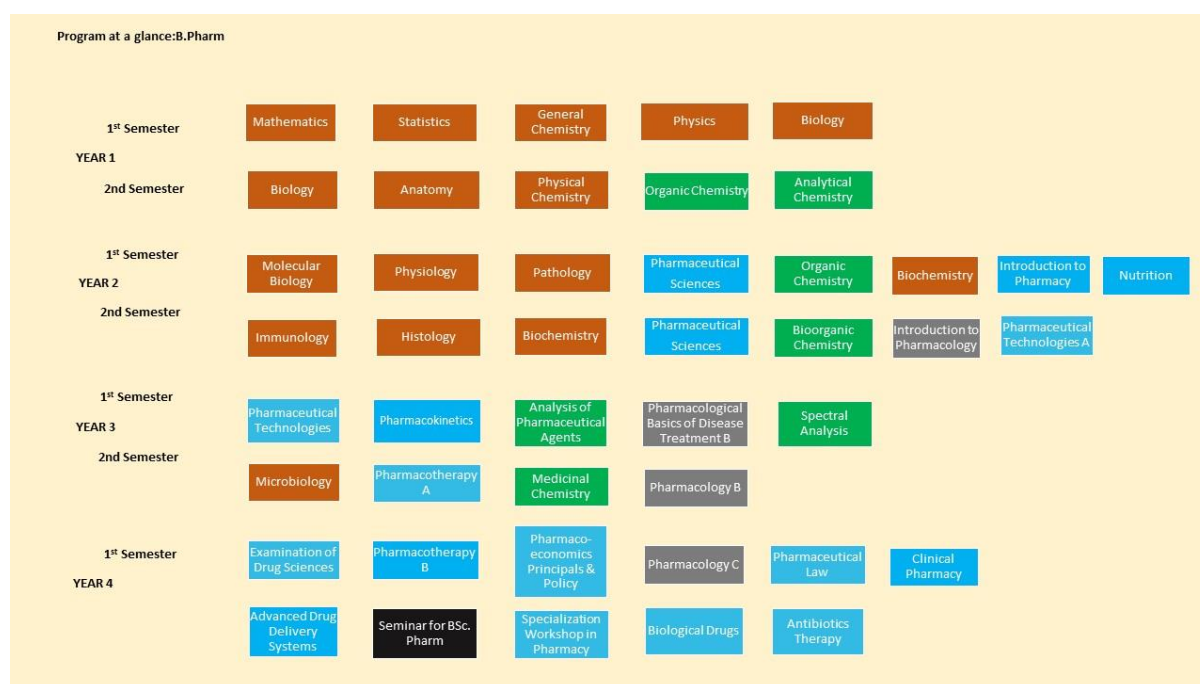
The only lab experience that the majority of the students experience is lab courses in chemistry and pharmacy.

5.1.1.8. Supporting Documents:

A chart of the academic and administrative organizational structure of the department and its study program/s (including relevant committees and names of senior position holders).



A flow chart of the program presenting the process of completing the degree fully. The chart should present the "program at a glance" at all degree levels.



Program at a glance: M.Sc.

YEARS 1+2

Semester 1

| | | | | |
|---|---------------------------|--------------------------------------|---|---|
| Drug Delivery Systems | Advanced Pharmacokinetics | The Epidemic of Fatty Liver Diseases | Drug Therapy for Diabetes | Selected Metabolic Pathways and their Link to Cell Identity |
| Oligonucleotides: Chemical Synthesis and Medical Applications | Molecular Pharmacology | Forensic Anthropology | An Introduction to Forensic Science and Law | From an Idea to a Drug |

Semester 2

| | | | | | |
|---|--|----------------------------------|---|--|---------------|
| Chemical Basis for Rational Drug Discovery | Regulation of the Pharmaceutical Industry | Basic Principles in Pharmacology | Drugs Intellectual property | Pharmacological Principles in Drug Development | Drug Delivery |
| Medicinal Natural Products | Preclinical Imaging | From an Idea to a Drug | Patents in the Pharmaceutical Industry: Differing Views | New Developments in Sterilization | |
| Seminar | Biostatistics in Pharmaceutics and Clinical Pharmacy | Diseases of Misfolded Proteins | Introduction to Nuclear Medicine | | |
| The Involvement of the Endocannabinoid System in Health and Disease | | | | | |

Program at a glance: Pharm D

Semester 1

| | | | | |
|-----------------------------------|---|--|--------------------------------|----------------------------|
| Basic Skills in Clinical Pharmacy | Introduction to Medicine for Clinical Pharmacists | The hematology of the healthy and unhealthy person | Clerkship in Clinical Pharmacy | Clinical Seminar 2019-2020 |
|-----------------------------------|---|--|--------------------------------|----------------------------|

Year 1

Semester 2

| | | | | |
|----------------------------|---|---------------------|-----------------------------|--|
| Drug Literature Evaluation | Communication Skills in Pharmacy - Practice | Clinical Teratology | Pharmacotherapy -Advanced 2 | |
|----------------------------|---|---------------------|-----------------------------|--|

Semester 1

| | | | | | |
|--|---------------------------------------|----------------------------|--|--|---------------------------------------|
| Basic skills in pharmacotherapy consulting 1 | Statistical Methods for Public Health | Clinical Seminar 2019-2020 | Preparation for Residency in Clinical Pharmacy | Kinetics of drug action in disease state | Advanced Research Seminar for Pharm D |
|--|---------------------------------------|----------------------------|--|--|---------------------------------------|

Year 2

Semester 2

| | | | | |
|------------------------------|------------------------------------|--|-----------------|------------------|
| Advanced Toxicology of Drugs | Introduction to Clinical Neurology | Economic considerations in prioritizing therapeutics-2 | Clinical Trials | Elective courses |
|------------------------------|------------------------------------|--|-----------------|------------------|

Semester 1

| | | | |
|--------------------------------|--------------------------|---------------------------------------|------------------|
| Residency in Clinical Pharmacy | Pharmacotherapy Skills 2 | Advanced Research Seminar for Pharm D | Elective courses |
|--------------------------------|--------------------------|---------------------------------------|------------------|

Year 3

Semester 2

| | | |
|----------------------------|----------------|------------|
| Clinical Seminar 2019-2020 | Masters Thesis | Final Exam |
|----------------------------|----------------|------------|

Table 3 (Excel appendix)

| Table 3 - The Study Program | | | | | | | | | | |
|-----------------------------|---|-----|---------|-----------------------|----------|--------|-----|---------|--------------------|-----------------------|
| BSc | | | | | | | | | | |
| Year 1- Mandatory Courses | | | | | | | | | | |
| Track/Specialization | Course Title | Sem | Credits | Weekly Teaching Hours | | | | | Number of Students | Name+Rank of Lecturer |
| | | | | Frontal | Exercise | Online | Lab | Seminar | | |
| Mathematics | Mathematics for Science Students 1 (80125) | A | 4 | 3 | 1 | | | | 259 | Mr. Shmuel Berger |
| Chemistry | Introduction to Chemistry for Pharmacy & Earth Sciences (69135) | A | 6 | 4 | 2 | | | | 130 | Prof. Daniel Mandler |
| Statistics | Statistics for Pharmacologists (52024) | A | 3 | 2 | 1 | | | | 94 | Ms. Orit Moradov |

| | | | | | | | | | | |
|-----------------------------------|--|-----|---|---|---|--|---|--|-----|----------------------------|
| Physics | General Physics (1) for Pharmacy Students (77116) | A | 7 | 5 | 2 | | | | 92 | Dr. Hadar Steinberg |
| Biology | Introduction to Cell Biology (64104) | A | 4 | 4 | | | | | | Dr. Zvika Granot |
| Physics | General Physics (2) for Pharmacy Students (77104) | B | 5 | 3 | 2 | | | | 102 | Prof. Amir Saar |
| Chemistry | Physical Chemistry for Pharmacy & Earth Sciences (69167) | B | 6 | 4 | 2 | | | | 121 | Dr. Elad Gross |
| Chemistry | Organic Chemistry A (64106) | B | 4 | 3 | 1 | | | | 98 | Prof. Avital Shurki |
| Pharmacy | Human Anatomy - Pharmacy Students (64305) | B | 6 | 4 | 1 | | 1 | | 97 | Dr. Anna Nachshon |
| Chemistry | Fundamentals of Analytical Chemistry (64101) | B | 2 | 2 | | | | | 91 | Dr. Rachel Ta-Shma |
| Year 2 - Mandatory Courses | | | | | | | | | | |
| Biology | Molecular Biology (64644) | A | 2 | 2 | | | | | 81 | Dr. Reuven Wiener |
| Physiology | Human Physiology (64310) | A | 6 | 6 | | | | | 87 | Prof. Millet Treinin |
| Chemistry | Organic Chemistry B (64311) | A | 4 | 3 | 1 | | | | 82 | Prof. Dmitry Tsvetikhovsky |
| General studies | Biochemistry, Metabolism & Bioenergetics (64635) | A | 4 | 4 | | | | | 84 | Prof. Ronit Sharon |
| General studies | Human Nutrition in Health & Disease (64602) | A | 3 | 3 | | | | | 85 | Prof. Yosefa Avraham |
| General studies | General Pathology (64646) | A | 3 | 3 | | | | | 85 | Dr. Tzahi Neuman |
| Pharmacy | Pharmaceutical Sciences (64317) | A+B | 6 | 5 | 1 | | | | 83 | Dr. Ofra Benny |
| Chemistry | Bio-Organic Chemistry Laboratory (64320) | B | 3 | | | | 3 | | 79 | Prof. Abraham (Avi) Domb |
| Chemistry | Bio-Organic Chemistry & Spectral Analysis (64327) | B | 3 | 3 | | | | | 81 | Prof. Eylon Yavin |
| General studies | Immunology (64325) | B | 3 | 3 | | | | | 80 | Dr. Michael Berger |
| General studies | Physiological Biochemistry (64636) | B | 4 | 4 | | | | | 83 | Dr. Offer Gerlitz |
| Pharmacology | Introduction to Pharmacology (64333) | B | 5 | 4 | 1 | | | | 88 | Prof. Boaz Tirosh |
| Pharmacy | Pharmaceutical Technologies A (64610) | B | 2 | | | | 2 | | 84 | Mr. Ben Zion Amoyav |
| Year 3 -Mandatory Courses | | | | | | | | | | |

| | | | | | | | | | | |
|----------------------------------|--|-----|---|---|---|--|---|---|----|--|
| Pharmacy | Biopharmaceutics- Pharmacokinetics (64614) | A | 5 | 4 | 1 | | | | 74 | Prof. Meir Bialer |
| Pharmacology | Pharmacological Basis of Disease Treatment (64715) | A | 8 | 7 | 1 | | | | 69 | Prof. Avi Priel |
| Pharmacy | Pharmaceutical Technologies B (64616) | A | 2 | | | | 2 | | 63 | Dr. Arie Moussaieff |
| Pharmacy | Pharmaceutical Technologies C (64611) | A | 2 | | | | 2 | | 63 | Dr. Ofra Benny |
| Chemistry | Analysis of Pharmaceutical Agents - Laboratory (64640) | A | 5 | 2 | | | 3 | | 53 | Prof. Dan Gibson |
| General Studies | Microbiology (64608) | B | 4 | 3 | | | 1 | | 62 | Prof. Albert Taraboulos |
| Chemistry | Medicinal Chemistry- Drugs & Drug Action (64621) | B | 5 | 5 | | | | | 61 | Prof. Gali a Blum |
| Pharmacology | Disease Etiology (64861) | B | 4 | 4 | | | | | 67 | Dr. Hadar Arien- Zakay |
| Clinical Pharmacy | Pharmacotherapy - Part A (64722) | B | 8 | 4 | | | | 4 | 63 | Prof. Amnon Hoffman |
| Year 4 -Mandatory Courses | | | | | | | | | | |
| Pharmacy | Pharmacotherapy - Part B (64724) | A | 8 | 4 | | | | 4 | 76 | Prof. Sara Eyal |
| Pharmacology | Fundamentals of Toxicology (64749) | A | 3 | 3 | | | | | 80 | Prof. Uri Wormser |
| Clinical Pharmacy | Drug Literature and Biostatistics (64723) | A | 3 | 2 | 1 | | | | 82 | Prof. Ilan Matok |
| Pharmacy | Advanced Drug Delivery Systems (64643) | A | 3 | 3 | | | | | 83 | Dr. Ofra Benny |
| Clinical Pharmacy | Pharmacoeconomics Principals & Policy (64319) | A | 2 | 2 | | | | | 84 | Dr. Oren Shavit |
| Clinical Pharmacy | Specialization Workshop in Pharmacy (64725) | A+B | 4 | 4 | | | | | 78 | Prof. Amnon Hoffman |
| Clinical Pharmacy | Pharmaceutical Law (64704) | A | 1 | 1 | | | | | 83 | Dr. Miri Trainin |
| Pharmacology | Biological Drugs (64121) | A | 2 | 2 | | | | | 82 | Dr. Hadar Arien- Zakay |
| Clinical Pharmacy | Antibiotics Therapy (64729) | A | 2 | 2 | | | | | 83 | Dr. Ehud Horwitz |
| Clinical Pharmacy | Community Pharmacy at Med. Inst (64759) | A | 2 | 2 | | | | | 82 | Dr. Shmuel Klang |
| Clinical Pharmacy | Clinical Pharmacy Workshop (64727) | B | 1 | 1 | | | | | | Prof. Shimona Yosselson- Superstine |
| Chemistry | Seminar for B.Sc.Pharm: Theoretical Approaches in Medicinal Chemistry (64736) | A | 2 | | | | | 2 | 5 | Prof. Avital Shurki |

| Chemistry | Seminar for B.Sc.Pharm: The Art and Science of Natural Products (64743) | A | 2 | | | | | 2 | 7 | Prof. Dmitry Tsvetikhovsky |
|---|--|-----|---------|-----------------------|----------|--------|------------|---------|--------------------|-----------------------------|
| Pharmacology | Seminar for B.Sc.Pharm: Cellular and Molecular Event in Malignant Progression (64744) | A | 2 | | | | | 2 | 7 | Prof. Reuven Reich |
| Pharmacology | Seminar for B.Sc.Pharm: The Virtues of Cannabis Treatment: Truth or Legend? (64748) | A | 2 | | | | | 2 | 6 | Dr. Yossi Tam |
| Chemistry | Seminar for B.Sc.Pharm:Oligo nucleotides in Therapeutics and Diagnostics (64750) | A | 2 | | | | | 2 | 6 | Prof. Eylon Yavin |
| Clinical Pharmacy | Seminar for B.Sc.Pharm:Pharmacotherapy of CNS Disorders: The Good , the Bad and the Ugly (64756) | A | 2 | | | | | 2 | 6 | Prof. Sara Eyal |
| Clinical Pharmacy | Seminar for B.Sc.Pharm: Selected topics in pharmacopidemiology (64758) | A | 2 | | | | | 2 | 6 | Prof. Ilan Matok |
| Pharmacy | Metabolic Changes During Development and Pathological Processes (64763) | A | 2 | | | | | 2 | 6 | Dr. Arie Moussaieff |
| Pharmacology | Seminar for B.Sc.Pharm:Exposure to a Combination of Toxic Agents (64768) | A | 2 | | | | | 2 | 6 | Prof. Uri Wormser |
| Pharmacology | Seminar for B.Sc. Pharm:Cell Therapy Using Stem Cells (64769) | A | 2 | | | | | 2 | 6 | Prof. Philip Lazarovici |
| Chemistry | Seminar for B.Sc.Pharm:Platinum Anticancer Agents (64770) | A | 2 | | | | | 2 | 6 | Prof. Dan Gibson |
| Chemistry | Seminar for B.Sc.Pharm: Molecular Imaging of Diseases (64757) | A | 2 | | | | | 2 | 6 | Prof. Galia Blum |
| Year 2/3/4 - Elective Courses-The student is required to take 8 points of elective courses | | | | | | | | | | |
| Track/Specialization | Course Title | Sem | Credits | Weekly Teaching Hours | | | | | Number of Students | Name+Rank of Lecturer |
| | | | | Frontal | Exercise | Online | Laboratory | Seminar | | |
| Pharmacy | Medical Plants in Modern Medicine (64752) | A | 3 | 3 | | | | | 81 | Prof. Zohara Yaniv Bachrach |

| | | | | | | | | | | |
|----------|--|---|---|---|--|--|--|--|----|-----------------------|
| Pharmacy | Pharmacy Management and Marketing (64701) | A | 3 | 3 | | | | | 55 | Ms. Ahuva Lev |
| Pharmacy | Introduction to Human Genetics (64648) | A | 2 | 2 | | | | | 7 | Prof. Dror Sharon |
| Pharmacy | Molecular Modeling for Drug Design (64751) | B | 2 | 2 | | | | | 31 | Prof. Amiram Goldblum |

The student is allowed to take elective courses from the M.A list, with the approval of the lecturer

| Track/Specialization | Course Title | Sem | Credits | Weekly Teaching Hours | | | | | Number of Students | Name+Rank of Lecturer |
|----------------------|---|-----|---------|-----------------------|----------|--------|------------|---------|--------------------|---------------------------|
| | | | | Frontal | Exercise | Online | Laboratory | Seminar | | |
| Chemistry | Medicinal Natural Products: A Biosynthetic Approach (64304) | B | 2 | 2 | | | | | 19 | Prof. Dmitry Tselikhovsky |
| Chemistry | Preclinical Imaging (64316) | B | 2 | 2 | | | | | 14 | Prof. Galia Blum |
| Pharmacy | Introduction to Drug Delivery Systems (64761) | A | 2 | 2 | | | | | 27 | Dr. Ofra Benny |
| Pharmacy | Advanced Pharmacokinetics (64801) | A | 3 | 3 | | | | | 4 | Prof. Meir Bialer |
| Pharmacology | The Epidemic of Fatty Liver Diseases: Risk Factors of Treatment and Extrahepatic Consequences (64818) | A | 0.5 | 0.5 | | | | | 8 | Prof. Boaz Tirosh |
| Chemistry | From an Idea to a Drug (64806) | | 2 | 2 | | | | | 6 | Prof. Abraham (Avi) Domb |
| Pharmacology | Challenges and Developments in the Pharmacotherapy of Type 2 Diabetes (64830) | A | 2 | 2 | | | | | 6 | Prof. Shlomo Sasson |
| Pharmacy | Selected Metabolic Pathways and their Link to Cell Identity (64846) | A | 2 | 2 | | | | | 28 | Dr. Arie Moussaieff |
| Pharmacy | New Developments in Sterilization (64809) | B | 2 | 2 | | | | | 16 | Dr. Yeshaya Yaakovi |
| Chemistry | Oligonucleotides: Chemical Synthesis and Medical Applications (64847) | A | 2 | 2 | | | | | 11 | Prof. Eylon Yavin |
| Pharmacology | Laboratory Methods in Molecular Pharmacology (64848) | A | 3 | 3 | | | | | 31 | Prof. Avi Priel |
| Chemistry | Forensic Anthropology (64853) | A | 2 | 2 | | | | | 24 | Prof. Tzipi Kahana |
| Pharmacology | Biostatistics in Pharmaceutics and Clinical Pharmacy (64860) | B | 3 | 1.5 | | | | 1.5 | 15 | Prof. Meir Bialer |

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|--------------|---|---|---|---|--|--|--|--|----|--------------------------|
| Pharmacy | Diseases of Misfolded Proteins (64872) | B | 2 | 2 | | | | | 6 | Prof. Boaz Tirosh |
| Chemistry | An Introduction to Forensic Science and Law (64873) | A | 2 | 2 | | | | | 53 | Prof. Abraham (Avi) Domb |
| Pharmacy | Introduction to Nuclear Medicine (64890) | B | 2 | 2 | | | | | 30 | Prof. Eyal Mishani |
| Pharmacology | The Involvement of the Endocannabinoid System in Health and Disease (64891) | B | 2 | 2 | | | | | 13 | Dr. Yossi Tam |
| Chemistry | Chemical Basis for Rational Drug Discovery (64900+64200) | A | 2 | 2 | | | | | 30 | Prof. Amiram Goldblum |

Drug Sciences-Excellence Program

| Year 1- Mandatory courses | | | | | | | | | | |
|----------------------------|--|-----|---------|-----------------------|----------|--------|------------|---------|--------------------|--|
| Track/Specialization | Course Title | Sem | Credits | Weekly Teaching Hours | | | | | Number of Students | Name+Rank of Lecturer |
| | | | | Frontal | Exercise | Online | Laboratory | Seminar | | |
| Statistics | Statistics for Pharmacologists (52024) | A | 3 | 2 | 1 | | | | 94 | Ms. Orit Moradov |
| Physics | General Physics (1) for Pharmacy Students (77116) | A | 7 | 5 | 2 | | | | 92 | Dr. Hadar Steinberg |
| Biology | Introduction to Cell Biology (64104) | A | 4 | 4 | | | | | | Dr. Zvika Granot |
| Physics | General Physics (2) for Pharmacy Students (77104) | B | 5 | 3 | 2 | | | | 102 | Prof. Amir Saar |
| Chemistry | Physical Chemistry for Pharmacy & Earth Sciences (69167) | B | 6 | 4 | 2 | | | | 121 | Dr. Elad Gross |
| Chemistry | Organic Chemistry A (64106) | B | 4 | 3 | 1 | | | | 98 | Prof. Avital Shurki |
| Pharmacy | Human Anatomy - Pharmacy Students (64305) | B | 6 | 4 | 1 | | 1 | | 97 | Dr. Anna Nachshon |
| Pharmacy | Time for Drug Science 2018-2019 (64631) | A+B | 0 | | | | | | 29 | Prof. Avi Priel, Dr. Hadar Arien-Zakay |
| Chemistry | General Chemistry Lab (69115) | B | 3 | | | | 3 | | 105 | Prof. Shlomo Magdassi |
| Chemistry | Fundamentals of Analytical Chemistry (64101) | B | 2 | 2 | | | | | 91 | Dr. Rachel Ta-Shma |
| Year 2 - Mandatory Courses | | | | | | | | | | |
| Biology | Molecular Biology (64644) | A | 2 | 2 | | | | | 81 | Dr. Reuven Wiener |
| Physiology | Human Physiology (64310) | A | 6 | 6 | | | | | 87 | Prof. Millet Treinin |
| Chemistry | Organic Chemistry B (64311) | A | 4 | 3 | 1 | | | | 82 | Prof. Dmitry Tsvetikhovsky |

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|----------------------------------|--|-----|-----|---|---|--|-----|---|-----|--|
| General studies | Biochemistry, Metabolism and Bioenergetics (64635) | A | 4 | 4 | | | | | 84 | Prof. Ronit Sharon |
| General studies | Human Nutrition in Health & Disease (64602) | A | 3 | 3 | | | | | 85 | Prof. Yosefa Avraham |
| General studies | General Pathology (64646) | A | 3 | 3 | | | | | 85 | Dr. Tzahi Neuman |
| Pharmacy | Pharmaceutical Sciences (64317) | A+B | 6 | 5 | 1 | | | | 83 | Dr. Ofra Benny |
| Chemistry | Bioorganic Chemistry Laboratory (64320) | B | 3 | | | | 3 | | 79 | Prof. Abraham (Avi) Domb |
| Chemistry | Bio-Organic Chemistry and Spectral Analysis (64327) | B | 3 | 3 | | | | | 81 | Prof. Eylon Yavin |
| General studies | Immunology (64325) | B | 3 | 3 | | | | | 80 | Dr. Michael Berger |
| General studies | Physiological Biochemistry (64636) | B | 4 | 4 | | | | | 83 | Dr. Offer Gerlitz |
| Pharmacy | Time for Drug Science 2018-2019 (64631) | A+B | 0 | | | | | | 29 | Prof. Avi Priel, Dr. Hadar Arien-Zakay |
| Chemistry | Inorganic Chemistry (69303) | A | 6 | 4 | | | | 2 | 100 | Prof. Avi Bino |
| Chemistry | Experimental Methods in Organic Chemistry (64321) | B | 2 | | | | 2 | | 11 | Prof. Dan Gibson |
| Pharmacology | Introduction to Pharmacology (64333) | B | 5 | 4 | 1 | | | | 88 | Prof. Boaz Tirosch |
| Pharmacy | Pharmaceutical Technologies A (64610) | B | 2 | | | | 2 | | 84 | Mr. Benzion Amoyav |
| Year 3 -Mandatory Courses | | | | | | | | | | |
| Pharmacy | Biopharmaceutics- Pharmacokinetics (64614) | A | 5 | 4 | 1 | | | | 74 | Prof. Meir Bialer |
| Pharmacology | Pharmacological Basics of Disease Treatment (64715) | A | 8 | 7 | 1 | | | | 69 | Prof. Avi Priel |
| Pharmacy | Pharmaceutical Technologies B (64616) | A | 2 | | | | 2 | | 63 | Dr. Arie Moussaieff |
| Pharmacy | Pharmaceutical Technologies C (64611) | A | 2 | | | | 2 | | 63 | Dr. Ofra Benny |
| Chemistry | Analysis of Pharmaceutical Agents - Laboratory (64124) | A | 5.5 | 2 | | | 3.5 | | 53 | Prof. Dan Gibson |
| General studies | Microbiology (64608) | B | 4 | 3 | | | 1 | | 62 | Prof. Albert Taraboulos |
| Chemistry | Medicinal Chemistry- Drugs & Drug Action (64621) | B | 5 | 5 | | | | | 61 | Prof. Galia Blum |
| Pharmacology | Disease Etiology (64861) | B | 4 | 4 | | | | | 67 | Dr. Hadar |

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|----------------------------------|--|-----|----|---|---|--|--|---|----|---|
| | | | | | | | | | | Arien-Zakay |
| Pharmacy | Workshop in Drug Design and Development (64123) | A | 7 | | | | | 7 | 10 | Dr. Hadar Arien-Zakay, Prof. Dmitry Tsvetikhovsky |
| Clinical Pharmacy | Principles of Advanced Pharmacotherapy (64803) | A | 10 | 4 | | | | 6 | 5 | Prof. Sara Eyal |
| Clinical Pharmacy | Pharmacotherapy - Part A (64722) | B | 8 | 4 | | | | 4 | 63 | Prof. Amnon Hoffman |
| Year 4 -Mandatory Courses | | | | | | | | | | |
| Pharmacy | Pharmacotherapy - Part B (64724) | A | 8 | 4 | | | | 4 | 76 | Prof. Sara Eyal |
| Pharmacology | Fundamentals of Toxicology (64749) | A | 3 | 3 | | | | | 80 | Prof. Uri Wormser |
| Clinical Pharmacy | Drug Literature and Biostatistics (64723) | A | 3 | 2 | 1 | | | | 82 | Prof. Ilan Matok |
| Pharmacy | Advanced Drug Delivery Systems (64643) | A | 3 | 3 | | | | | 83 | Dr. Ofra Benny |
| Clinical Pharmacy | Pharmacoeconomics Principles & Policy (64319) | A | 2 | 2 | | | | | 84 | Dr. Oren Shavit |
| Clinical Pharmacy | Specialization Workshop in Pharmacy (64725) | A+B | 4 | 4 | | | | | 78 | Prof. Amnon Hoffman |
| Clinical Pharmacy | Pharmaceutical Law (64704) | A | 1 | 1 | | | | | 83 | Dr. Miri Trainin |
| Pharmacology | Biological Drugs (64121) | A | 2 | 2 | | | | | 82 | Dr. Hadar Arien-Zakay |
| Clinical Pharmacy | Antibiotics Therapy (64729) | A | 2 | 2 | | | | | 83 | Dr. Ehud Horwitz |
| Clinical Pharmacy | Community Pharmacy at Medical Institute (64759) | A | 2 | 2 | | | | | 82 | Dr. Shmuel Klang |
| Clinical Pharmacy | Clinical Pharmacy Workshop (64727) | B | 1 | 1 | | | | | | Prof. Shimona Yosselson-Superstine |
| Chemistry | Seminar for B.Sc.Pharm: Theoretical Approaches to Medicinal Chemistry (64736) | A | 2 | | | | | 2 | 5 | Prof. Avital Shurki |
| Chemistry | Seminar for B.Sc.Pharm: The Art and Science of Natural Products (64743) | A | 2 | | | | | 2 | 7 | Prof. Dmitry Tsvetikhovsky |
| Pharmacology | Seminar for B.Sc.Pharm: Cellular and Molecular Events in Malignant Progression (64744) | A | 2 | | | | | 2 | 7 | Prof. Reuven Reich |
| Pharmacology | Seminar for B.Sc.Pharm: The | A | 2 | | | | | 2 | 6 | Dr. Yossi Tam |

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|-------------------|--|---|---|--|--|--|--|---|---|-------------------------|
| | Virtues of Cannabis Treatment: Truth or Legend? (64748) | | | | | | | | | |
| Chemistry | Seminar for B.Sc.Pharm:Oligo nucleotides in Therapeutics and Diagnostics (64750) | A | 2 | | | | | 2 | 6 | Prof. Eylon Yavin |
| Clinical Pharmacy | Seminar for B.Sc.Pharm:Pharmacotherapy of CNS Disorders: The Good , the Bad and the Ugly (64756) | A | 2 | | | | | 2 | 6 | Prof. Sara Eyal |
| Clinical Pharmacy | Seminar for B.Sc.Pharm: Molecular Imaging of Diseases (64758) | A | 2 | | | | | 2 | 6 | Prof. Ilan Matok |
| Pharmacy | Metabolic Changes During Development and Pathological Processes (64763) | A | 2 | | | | | 2 | 6 | Dr. Arie Moussaieff |
| Pharmacology | Seminar for B.Sc.Pharm:Exposure to Combination of Toxic Agents (64768) | A | 2 | | | | | 2 | 6 | Prof. Uri Wormser |
| Pharmacology | Seminar for B.Sc.Pharm:Cell Therapy using Stem Cells (64769) | A | 2 | | | | | 2 | 6 | Prof. Philip Lazarovici |
| Chemistry | Seminar for B.Sc.Pharm:Platinum Anticancer Agents (64770) | A | 2 | | | | | 2 | 6 | Prof. Dan Gibson |
| Chemistry | Seminar for B.Sc.Pharm: Molecular Imaging of Diseases (64757) | A | 2 | | | | | 2 | 6 | Prof. Galia Blum |

Year 2/3/4 - Elective Courses-The student is required to take 8 points of elective courses

| Track/Specialization | Course Title | Sem | Credits | Weekly Teaching Hours | | | | | Number of Students | Name+Rank of Lecturer |
|----------------------|---|-----|---------|-----------------------|----------|--------|------------|---------|--------------------|-----------------------------|
| | | | | Frontal | Exercise | Online | Laboratory | Seminar | | |
| Pharmacy | Medicinal Plants in Modern Medicine (64752) | A | 3 | 3 | | | | | 81 | Prof. Zohara Yaniv Bachrach |
| Pharmacy | Pharmacy Management and Marketing (64701) | A | 3 | 3 | | | | | 55 | Ms. Ahuva Lev |
| Pharmacy | Introduction to Human Genetics (64648) | A | 2 | 2 | | | | | 7 | Prof. Dror Sharon |
| Pharmacy | Molecular Modeling for Drug Design (64751) | B | 2 | 2 | | | | | 31 | Prof. Amiram Goldblum |

The student is allowed to take elective courses and accumulate points for the 4 -5 year of the program

| Track/Specialization | Course Title | Sem | Credits | Weekly Teaching Hours | | | | | Number of Students | Name+Rank of Lecturer |
|----------------------|--------------|-----|---------|-----------------------|----------|--------|------------|---------|--------------------|-----------------------|
| | | | | Frontal | Exercise | Online | Laboratory | Seminar | | |

| | | | | | | | | | | |
|--------------|---|---|-----|-----|--|--|--|-----|----|----------------------------|
| Chemistry | Medicinal Natural Products: a Biosynthetic Approach (64304) | B | 2 | 2 | | | | | 19 | Prof. Dmitry Tsvetikhovsky |
| Chemistry | Preclinical Imaging (64316) | B | 2 | 2 | | | | | 14 | Prof. Galia Blum |
| Pharmacy | Introduction to Drug Delivery Systems (64761) | A | 2 | 2 | | | | | 27 | Dr. Ofra Benny |
| Pharmacy | Advanced Pharmacokinetics (64801) | A | 3 | 3 | | | | | 4 | Prof. Meir Bialer |
| Pharmacology | The Epidemic of Fatty Liver Diseases: Risk Factors of Treatment and Extrahepatic Consequences (64818) | A | 0.5 | 0.5 | | | | | 8 | Prof. Boaz Tirosh |
| Chemistry | From an Idea to a Drug (64806) | | 2 | 2 | | | | | 6 | Prof. Abraham (Avi) Domb |
| Pharmacology | Challenges & Developments in the Pharmacotherapy of Type 2 Diabetes (64830) | A | 2 | 2 | | | | | 6 | Prof. Shlomo Sasson |
| Pharmacy | Selected Metabolic Pathways and Their Link to Cell Identity (64846) | A | 2 | 2 | | | | | 28 | Dr. Arie Moussaieff |
| Pharmacy | New Developments in Sterilization (64809) | B | 2 | 2 | | | | | 16 | Dr. Yeshaya Yaakovi |
| Chemistry | Oligonucleotides: Chemical Synthesis and Medical Applications (64847) | A | 2 | 2 | | | | | 11 | Prof. Eylon Yavin |
| Pharmacology | Laboratory Methods in Molecular Pharmacology (64848) | A | 3 | 3 | | | | | 31 | Prof. Avi Priel |
| Chemistry | Forensic Anthropology (64853) | A | 2 | 2 | | | | | 24 | Prof. Tzipi Kahana |
| Pharmacology | Biostatistics in Pharmaceutics and Clinical Pharmacy (64860) | B | 3 | 1.5 | | | | 1.5 | 15 | Prof. Meir Bialer |
| Pharmacy | Diseases of Misfolded Proteins (64872) | B | 2 | 2 | | | | | 6 | Prof. Boaz Tirosh |
| Chemistry | An Introduction to Forensic Science and Law (64873) | A | 2 | 2 | | | | | 53 | Prof. Abraham (Avi) Domb |
| Pharmacy | Introduction to Nuclear Medicine (64890) | B | 2 | 2 | | | | | 30 | Prof. Eyal Mishani |
| Pharmacology | The Involvement of the Endocannabinoid System in Health and Disease (64891) | B | 2 | 2 | | | | | 13 | Dr. Yossi Tam |

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|--------------|---|---|---|-----|--|--|--|-----|----|--------------------------|
| Chemistry | Chemical Basis for Rational Drug Discovery (64900+64200) | A | 2 | 2 | | | | | 30 | Prof. Amiram Goldblum |
| Chemistry | Oligonucleotides: Chemical Synthesis and Medical Applications (64847) | A | 2 | 2 | | | | | 11 | Prof. Eylon Yavin |
| Pharmacology | Laboratory Methods in Molecular Pharmacology (64848) | A | 3 | 3 | | | | | 31 | Prof. Avi Priel |
| Chemistry | Forensic Anthropology (64853) | A | 2 | 2 | | | | | 24 | Prof. Tzipi Kahana |
| Pharmacy | Biostatistics in Pharmaceutics and Clinical Pharmacy (64860) | B | 3 | 1.5 | | | | 1.5 | 15 | Prof. Meir Bialer |
| Pharmacy | Advanced Pharmacokinetics (64801) | A | 3 | 3 | | | | | | Prof. Meir Bialer |
| Pharmacology | Diseases of Misfolded Proteins (64872) | B | 2 | 2 | | | | | 6 | Prof. Boaz Tirosh |
| Chemistry | An Introduction to Forensic Science and Law (64873) | A | 2 | 2 | | | | | 53 | Prof. Abraham (Avi) Domb |
| Pharmacy | Introduction to Nuclear Medicine (64890) | B | 2 | 2 | | | | | 30 | Prof. Eyal Mishani |
| Pharmacology | The Involvement of the Endocannabinoid System in Health and Disease (64891) | B | 2 | 2 | | | | | 13 | Dr. Yossi Tam |
| Chemistry | Chemical Basis for Rational Drug Discovery (64900+64200) | A | 2 | 2 | | | | | 30 | Prof. Amiram Goldblum |

| PHARM D | | | | | | | | | | |
|---------------------------|---|-----|---------|-----------------------|----------|--------|------------|---------|--------------------|---|
| Year 1- Mandatory Courses | | | | | | | | | | |
| Track/Specialization | Course Title | Sem | Credits | Weekly Teaching Hours | | | | | Number of Students | Name+Rank of Lecturer |
| | | | | Frontal | Exercise | Online | Laboratory | Seminar | | |
| Clinical Pharmacy | Basic Skills in Clinical Pharmacy (64859) | A | 2 | 1 | | | | 1 | 15 | Prof. Shimona Yosselson-Superstine |
| Clinical Pharmacy | Introduction to Medicine for Clinical Pharmacists (64112) | A | 5 | | | | | 5 | 15 | Dr. Iddo Ben-Dov |
| Medicine | Hematology (96706) | A | 5 | | | | | 5 | 273 (15) | Dr. Batia Avni |
| Clinical Pharmacy | Clerkship in Clinical Pharmacy (64862) | A+B | 15 | | | | | 15 | 15 | Prof. Shimona Yosselson-Superstine, other clinical teachers |

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|----------------------------------|--|-----|---|---|--|--|--|---|----|---|
| Clinical Pharmacy | Clinical Seminar 2018-2019 (64878) | A+B | 6 | | | | | 6 | 48 | Prof. Yoseph Caraco, Prof. Amnon Hoffman |
| Clinical Pharmacy | Drug Literature Evaluation (64910) | B | 3 | 3 | | | | | 13 | Prof. Ilan Matok |
| Clinical Pharmacy | Communication Skills in Pharmacy Practice (64867) | B | 2 | 1 | | | | 1 | 16 | Prof. Amnon Hoffman, Dr. Adaya Meirovitch |
| Clinical Pharmacy | Clinical Teratology (64838) | B | 2 | 1 | | | | 1 | 15 | Prof. Asher Ornoy, Prof. Orna Diav-Citrin |
| Clinical Pharmacy | Pharmacotherapy - Advanced 2 (64108) | B | 3 | | | | | 3 | 16 | Prof. Shimona Yosselson-Superstine |
| | Introduction to Clinical Toxicology (64728) | B | 2 | | | | | 2 | 21 | Prof. G. Koren |
| Year 2- Mandatory Courses | | | | | | | | | | |
| Clinical Pharmacy | Basic Skills in Pharmacotherapy Consulting 1 (64863) | A+B | 8 | 4 | | | | 4 | 15 | Prof. Amnon Hoffman, Prof. Sara Eyal |
| Clinical Pharmacy | Clinical Seminar 2018-2019 (64878) | A+B | 6 | | | | | 6 | 48 | Prof. Yoseph Caraco, Prof. Amnon Hoffman |
| Clinical Pharmacy | Advanced Toxicology of Drugs (64833) | A | 2 | 2 | | | | | 16 | Prof. Uri Wormser |
| Clinical Pharmacy | Preparation for Residency in Clinical Pharmacy (64116) | A+B | 1 | | | | | 1 | 16 | Prof. Shimona Yosselson-Superstine |
| Clinical Pharmacy | Kinetics of Drug Action in Disease State (64854) | A | 3 | 2 | | | | 1 | 17 | Prof. Amnon Hoffman, Prof. Sara Eyal |
| Clinical Pharmacy | Advanced Research Seminar for Pharm D (64152) | A+B | 1 | | | | | 1 | 17 | Prof. Ilan Matok, Prof. Sara Eyal |
| Clinical Pharmacy | Economic Considerations in Prioritizing Therapeutics-2 (64119) | B | 3 | 2 | | | | 1 | 17 | Dr. Oren Shavit |
| Clinical Pharmacy | Clinical Trials (98481) | B | 2 | 1 | | | | 1 | 40 | Prof. Orly Manor, |

| | | | | | | | | | | Dr. Mosenzon Ofri, Mr. Wiessam Abuahmad, Dr. Yiska Weisband |
|--|--|-----|---------|-----------------------|----------|--------|------------|---------|--------------------|---|
| Mandatory Elective Courses | | | | | | | | | | |
| | Statistical Methods for Public Health (98424) | A | 4 | 3 | | | | 1 | 68 (15) | Prof. Orly Manor |
| | Biostatistics in Pharmaceutics and Clinical Pharmacy (64860) | B | 3 | | | | | 3 | 15 | Prof. Meir Bialer |
| Year 3- Mandatory Courses | | | | | | | | | | |
| Clinical Pharmacy | Clinical Seminar 2018-2019 (64878) | A+B | 6 | | | | | 6 | 48 | Prof. Yoseph Caraco, Prof. Amnon Hoffman |
| Clinical Pharmacy | Residency in Clinical Pharmacy (64105) | A+B | 28 | 28 | | | | | 16 | Prof. Shimona Yosselson-Superstine, Prof. Ilan Matok, Prof. Amnon Hoffman |
| Clinical Pharmacy | Pharmacotherapy Skills 2 (64110) | A+B | 3 | | | | | 3 | 10 | Prof. Sara Eyal |
| Clinical Pharmacy | Advanced Research Seminar for Pharm D (64153) | A+B | 1 | 1 | | | | | 15 | Prof. Ilan Matok, Prof. Sara Eyal |
| Year 2/3 - Elective Courses one of the two | | | | | | | | | | |
| Track/Specialization | Course Title | Sem | Credits | Weekly Teaching Hours | | | | | Number of Students | Name+Rank of Lecturer |
| | | | | Frontal | Exercise | Online | Laboratory | Seminar | | |
| Clinical Pharmacy | Clinical Pharmacy Residency in Hospital (64150) | B | 2 | 2 | | | | | 16 | Prof. Shimona Yosselson-Superstine, Prof. Amnon Hoffman |
| Clinical Pharmacy | Specialization in Community Clinical Pharmacy (64113) | B | 2 | 2 | | | | | 16 | Prof. Shimona Yosselson-Superstine, Prof. Amnon Hoffman |
| Pharm D Excellence Program (6-year program) | | | | | | | | | | |
| Year 1- Mandatory courses | | | | | | | | | | |
| Track/Specialization | Course Title | Sem | Credits | Weekly Teaching Hours | | | | | Number of Students | Name+Rank of Lecturer |
| | | | | Frontal | Exercise | Online | Laboratory | Seminar | | |

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|----------------------------------|---|-----|---|---|---|--|---|--|-----|----------------------------|
| Mathematics | Mathematics for Science Students 1(80125) | A | 4 | 3 | 1 | | | | 259 | Mr. Shmuel Berger |
| Chemistry | Introduction to Chemistry for Pharmacy & Earth Sciences (69135) | A | 6 | 4 | 2 | | | | 130 | Prof. Daniel Mandler |
| Statistics | Statistics for Pharmacologists (52024) | A | 3 | 2 | 1 | | | | 94 | Ms. Orit Moradov |
| Physics | General Physics (1) for Pharmacy Students (77116) | A | 7 | 5 | 2 | | | | 92 | Dr. Hadar Steinberg |
| Biology | Introduction to Cell Biology (64104) | A | 4 | 4 | | | | | | Dr. Zvika Granot |
| Physics | General Physics (2) for Pharmacy Students (77104) | B | 5 | 3 | 2 | | | | 102 | Prof. Amir Saar |
| Chemistry | Physical Chemistry for Pharmacy & Earth Sciences (69167) | B | 6 | 4 | 2 | | | | 121 | Dr. Elad Gross |
| Chemistry | Organic Chemistry A (64106) | B | 4 | 3 | 1 | | | | 98 | Prof. Avital Shurki |
| Pharmacy | Human Anatomy - Pharmacy Students (64305) | B | 6 | 4 | 1 | | 1 | | 97 | Dr. Anna Nachshon |
| Chemistry | Fundamentals of Analytical Chemistry (64101) | B | 2 | 2 | | | | | 91 | Dr. Rachel Ta-Shma |
| Year 2- Mandatory Courses | | | | | | | | | | |
| Biology | Molecular Biology (64644) | A | 2 | 2 | | | | | 81 | Dr. Reuven Wiener |
| Physiology | Human Physiology (64310) | A | 6 | 6 | | | | | 87 | Prof. Millet Treinin |
| Chemistry | Organic Chemistry B (64311) | A | 4 | 3 | 1 | | | | 82 | Prof. Dmitry Tsvelikhovsky |
| General studies | Biochemistry, Metabolism and Bioenergetics (64635) | A | 4 | 4 | | | | | 84 | Prof. Ronit Sharon |
| General studies | Human Nutrition in Health & Disease (64602) | A | 3 | 3 | | | | | 85 | Prof. Yosefa Avraham |
| General studies | General Pathology (64646) | A | 3 | 3 | | | | | 85 | Dr. Tzahi Neuman |
| Pharmacy | Pharmaceutical Sciences (64317) | A+B | 6 | 5 | 1 | | | | 83 | Dr. Ofra Benny |
| Chemistry | Bioorganic Chemistry Laboratory (64320) | B | 3 | | | | 3 | | 79 | Prof. Abraham (Avi) Domb |
| Chemistry | Bioorganic Chemistry and Spectral Analysis (64327) | B | 3 | 3 | | | | | 81 | Prof. Eylon Yavin |
| General studies | Immunology (64325) | B | 3 | 3 | | | | | 80 | Dr. Michael Berger |
| General studies | Physiological Biochemistry (64636) | B | 4 | 4 | | | | | 83 | Dr. Offer Gerlitz |
| Pharmacology | Introduction to Pharmacology (64333) | B | 5 | 4 | 1 | | | | 88 | Prof. Boaz Tirosh |

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|-----------------------------------|---|-----|---|---|---|--|---|---|----|------------------------------------|
| Pharmacy | Pharmaceutical Technologies A (64610) | B | 2 | | | | 2 | | 84 | Mr. Benzion Amoyav |
| Year 3- Mandatory Courses | | | | | | | | | | |
| Pharmacy | Biopharmaceutics- Pharmacokinetics (64614) | A | 5 | 4 | 1 | | | | 74 | Prof. Meir Bialer |
| Pharmacology | Pharmacological Basics of Disease Treatment (64715) | A | 8 | 7 | 1 | | | | 69 | Prof. Avi Priel |
| Pharmacy | Pharmaceutical Technologies B (64616) | A | 2 | | | | 2 | | 63 | Dr. Arie Mousaieff |
| Pharmacy | Pharmaceutical Technologies C (64611) | A | 2 | | | | 2 | | 63 | Dr. Ofra Benny |
| Chemistry | Analysis of Pharmaceutical Agents - Laboratory | A | 5 | 2 | | | 4 | | 53 | Prof. Dan Gibson |
| General studies | Microbiology (64608) | B | 4 | 3 | | | 1 | | 62 | Prof. Albert Taraboulos |
| Chemistry | Medicinal Chemistry- Drugs & Drug Action (64621) | B | 5 | 5 | | | | | 61 | Prof. Gali Blum |
| Pharmacology | Disease Ethiology (64861) | B | 4 | 4 | | | | | 67 | Dr. Hadar Arien-Zakay |
| Clinical Pharmacy | Pharmacotherapy - Part A (64722) | B | 8 | 4 | | | | 4 | 63 | Prof. Amnon Hoffman |
| Year 4 - Mandatory courses | | | | | | | | | | |
| Pharmacy | Pharmacotherapy - Part B (64724) | A | 8 | 4 | | | | 4 | 76 | Prof. Sara Eyal |
| Pharmacology | Fundamentals of Toxicology (64749) | A | 3 | 3 | | | | | 80 | Prof. Uri Wormser |
| Clinical Pharmacy | Drug Literature and Biostatistics (64723) | A | 3 | 2 | 1 | | | | 82 | Prof. Ilan Matok |
| Pharmacy | Advanced Drug Delivery Systems (64643) | A | 3 | 3 | | | | | 83 | Dr. Ofra Benny |
| Clinical Pharmacy | Pharmacoeconomics Principals & Policy (64319) | A | 2 | 2 | | | | | 84 | Dr. Oren Shavit |
| Clinical Pharmacy | Specialization Workshop in Pharmacy (64725) | A+B | 4 | 4 | | | | | 78 | Prof. Amnon Hoffman |
| Clinical Pharmacy | Pharmaceutical Law (64704) | A | 1 | 1 | | | | | 83 | Dr. Miri Trainin |
| Pharmacology | Biological Drugs (64121) | A | 2 | 2 | | | | | 82 | Dr. Hadar Arien-Zakay |
| Clinical Pharmacy | Antibiotics Therapy (64729) | A | 2 | 2 | | | | | 83 | Dr. Ehud Horwitz |
| Clinical Pharmacy | Community Pharmacy at Medical Institution (64759) | A | 2 | 2 | | | | | 82 | Dr. Shmuel Klang |
| Clinical Pharmacy | Clinical Pharmacy Workshop (64727) | B | 1 | 1 | | | | | | Prof. Shimona Yosselson-Superstine |

| | | | | | | | | | | |
|----------------------------------|--|-----|---|---|--|--|--|---|----|--------------------------------------|
| Chemistry | Seminar for B.Sc.Pharm: Theoretical Approaches in Medicinal Chemistry (64736) | A | 2 | | | | | 2 | 5 | Prof. Avital Shurki |
| Chemistry | Seminar for B.Sc.Pharm: The Art and Science of Natural Products (64743) | A | 2 | | | | | 2 | 7 | Prof. Dmitry Tsvetikhovsky |
| Pharmacology | Seminar for B.Sc.Pharm: Cellular and Molecular Event in Malignant Progression (64744) | A | 2 | | | | | 2 | 7 | Prof. Reuven Reich |
| Pharmacology | Seminar for B.Sc.Pharm: The Virtues of Cannabis Treatment: Truth or Legend? (64748) | A | 2 | | | | | 2 | 6 | Dr. Yossi Tam |
| Chemistry | Seminar for B.Sc.Pharm: Oligonucleotides in Therapeutics and Diagnostics (64750) | A | 2 | | | | | 2 | 6 | Prof. Eylon Yavin |
| Clinical Pharmacy | Seminar for B.Sc.Pharm: Pharmacotherapy of CNS Disorders: The Good, the Bad and the Ugly (64756) | A | 2 | | | | | 2 | 6 | Prof. Sara Eyal |
| Clinical Pharmacy | Seminar for B.Sc.Pharm: Molecular Imaging of Disease (64758) | A | 2 | | | | | 2 | 6 | Prof. Ilan Matok |
| Pharmacy | Metabolic Changes During Development and Pathological Processes (64763) | A | 2 | | | | | 2 | 6 | Dr. Arie Moussaieff |
| Pharmacology | Seminar for B.Sc.Pharm: Exposure to Combination of Toxic Agents (64768) | A | 2 | | | | | 2 | 6 | Prof. Uri Wormser |
| Pharmacology | Seminar for B.Sc. Pharm: Cell therapy using stem cells (64769) | A | 2 | | | | | 2 | 6 | Prof. Philip Lazarovici |
| Chemistry | Seminar for B.Sc.Pharm: Platinum Anticancer Agents (64770) | A | 2 | | | | | 2 | 6 | Prof. Dan Gibson |
| Chemistry | Seminar for B.Sc.Pharm: Molecular Imaging of Disease (64757) | A | 2 | | | | | 2 | 6 | Prof. Galia Blum |
| Year 5- Mandatory Courses | | | | | | | | | | |
| Clinical Pharmacy | Basic Skills in Pharmacotherapy Consulting 1 (64863) | A+B | 8 | 4 | | | | 4 | 15 | Prof. Amnon Hoffman, Prof. Sara Eyal |

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|--|--|-----|----|----|--|--|--|---|---------|---|
| Clinical Pharmacy | Clinical Seminar 2018-2019 (64878) | A+B | 6 | | | | | 6 | 48 | Prof. Yoseph Caraco, Prof. Amnon Hoffman |
| Clinical Pharmacy | Advanced Toxicology of Drugs (64833) | A | 2 | 2 | | | | | 16 | Prof. Uri Wormser |
| Clinical Pharmacy | Preparation for Residency in Clinical Pharmacy (64116) | A+B | 1 | | | | | 1 | 16 | Prof. Shimona Yosselson-Superstine |
| Clinical Pharmacy | Kinetics of Drug Action in Disease State (64854) | A | 3 | 2 | | | | 1 | 17 | Prof. Amnon Hoffman, Prof. Sara Eyal |
| Clinical Pharmacy | Advanced Research Seminar for Pharm D (64152) | A+B | 1 | | | | | 1 | 17 | Prof. Ilan Matok, Prof. Sara Eyal |
| Clinical Pharmacy | Economic Considerations in Prioritizing Therapeutics-2 (64119) | B | 3 | 2 | | | | 1 | 17 | Dr. Oren Shavit |
| Clinical Pharmacy | Clinical Trials (98481) | B | 2 | 1 | | | | 1 | 40 | Prof. Orly Manor, Dr. Mosenson Ofri, Mr. Wiessam Abuahmad, Dr. Yiska Weisband |
| Mandatory Elective Courses (one of the two) | | | | | | | | | | |
| | Statistical Methods for Public Health - (98424) | A | 4 | 3 | | | | 1 | 68 (15) | Prof. Orly Manor |
| | Biostatistics in Pharmaceutics and Clinical Pharmacy (64860) | B | 3 | | | | | 3 | 15 | Prof. Meir Bialer |
| Year 6- Mandatory courses | | | | | | | | | | |
| Clinical Pharmacy | Clinical Seminar 2018-2019 (64878) | A+B | 6 | | | | | 6 | 48 | Prof. Yoseph Caraco, Prof. Amnon Hoffman |
| Clinical Pharmacy | Residency in Clinical Pharmacy (64105) | A+B | 28 | 28 | | | | | 16 | Prof. Shimona Yosselson-Superstine, Prof. Ilan Matok, Prof. Amnon Hoffman |
| Clinical Pharmacy | Pharmacotherapy Skills 2 (64110) | A+B | 3 | | | | | 3 | 10 | Prof. Sara Eyal |

| | | | | | | | | | | |
|-------------------|---|-----|---|---|--|--|--|--|----|-----------------------------------|
| Clinical Pharmacy | Advanced Research Seminar for Pharm D (64153) | A+B | 1 | 1 | | | | | 15 | Prof. Ilan Matok, Prof. Sara Eyal |
|-------------------|---|-----|---|---|--|--|--|--|----|-----------------------------------|

Year 2/3/4 - Elective Courses (the student is required to take 8 points of elective courses)

| Track/Specialization | Course Title | Sem | Credits | Weekly Teaching Hours | | | | | Number of Students | Name+Rank of Lecturer |
|----------------------|---|-----|---------|-----------------------|----------|--------|------------|---------|--------------------|---|
| | | | | Frontal | Exercise | Online | Laboratory | Seminar | | |
| | Medicinal Plants in Modern Medicine (64752) | A | 3 | 3 | | | | | 81 | Prof. Zohara Yaniv Bachrach |
| | Pharmacy Management and Marketing (64701) | A | 3 | 3 | | | | | 55 | Ms. Ahuva Lev |
| | Introduction to Human Genetics (64648) | A | 2 | 2 | | | | | 7 | Prof. Dror Sharon |
| | Molecular Modeling for Drug Design (64751) | B | 2 | 2 | | | | | 31 | Prof. Amiram Goldblum |
| Clinical Pharmacy | Clinical Pharmacy Residency in Hospital (64150) | B | 2 | 2 | | | | | 16 | Prof. Shimona Yosselson-Superstine, Prof. Amnon Hoffman |
| Clinical Pharmacy | Specialization in Community Clinical Pharmacy (64113) | B | 2 | 2 | | | | | 16 | Prof. Shimona Yosselson-Superstine, Prof. Amnon Hoffman |

The students are allowed to take elective courses from the M.A. list only with of the lecturer's approval

| Track/Specialization | Course Title | Sem | Credits | Weekly Teaching Hours | | | | | Number of Students | Name+Rank of Lecturer |
|----------------------|---|-----|---------|-----------------------|----------|--------|------------|---------|--------------------|----------------------------|
| | | | | Frontal | Exercise | Online | Laboratory | Seminar | | |
| Chemistry | Medicinal Natural Products: a Biosynthetic Approach (64304) | B | 2 | 2 | | | | | 19 | Prof. Dmitry Tsvetikhovsky |
| Chemistry | Preclinical Imaging (64316) | B | 2 | 2 | | | | | 14 | Prof. Galia Blum |
| Pharmacy | Introduction to Drug Delivery Systems (64761) | A | 2 | 2 | | | | | 27 | Dr. Ofra Benny |
| Pharmacy | Advanced Pharmacokinetics (64801) | A | 3 | 3 | | | | | 4 | Prof. Meir Bialer |
| Pharmacology | The Epidemic of Fatty Liver Diseases: Risk Factors, Treatment and Extrahepatic Consequences (64818) | A | 0.5 | 0.5 | | | | | 8 | Prof. Boaz Tirosh |
| Chemistry | From an Idea to a Drug (64806) | | 2 | 2 | | | | | 6 | Prof. Abraham (Avi) Domb |
| Pharmacology | Challenges and Developments in the Pharmacotherapy | A | 2 | 2 | | | | | 6 | Prof. Shlomo Sasson |

| | | | | | | | | | | |
|--------------|---|---|---|-----|--|--|--|-----|----|--------------------------|
| | of Type 2 Diabetes (64830) | | | | | | | | | |
| Pharmacy | Selected Metabolic Pathways and Their Link to Cell Identity (64846) | A | 2 | 2 | | | | | 28 | Dr. Arie Mousaieff |
| Pharmacy | New Developments in Sterilization (64809) | B | 2 | 2 | | | | | 16 | Dr. Yeshaya Yaakovi |
| Chemistry | Oligonucleotides: Chemical Synthesis and Medical Applications (64847) | A | 2 | 2 | | | | | 11 | Prof. Eylon Yavin |
| Pharmacology | Laboratory Methods in Molecular Pharmacology (64848) | A | 3 | 3 | | | | | 31 | Prof. Avi Priel |
| Chemistry | Forensic Anthropology (64853) | A | 2 | 2 | | | | | 24 | Prof. Tzipi Kahana |
| Pharmacy | Biostatistics in Pharmaceutics and Clinical Pharmacy (64860) | B | 3 | 1.5 | | | | 1.5 | 15 | Prof. Meir Bialer |
| Pharmacology | Diseases of Misfolded Proteins (64872) | B | 2 | 2 | | | | | 6 | Prof. Boaz Tirosh |
| Chemistry | An Introduction to Forensic Science and Law (64873) | A | 2 | 2 | | | | | 53 | Prof. Abraham (Avi) Domb |
| Pharmacy | Introduction to Nuclear Medicine (64890) | B | 2 | 2 | | | | | 30 | Prof. Eyal Mishani |
| Pharmacology | The Involvement of the Endocannabinoid System in Health and Disease (64891) | B | 2 | 2 | | | | | 13 | Dr. Yossi Tam |
| Chemistry | Chemical Basis for Rational Drug Discovery (64900+64200) | A | 2 | 2 | | | | | 30 | Prof. Amiram Goldblum |

MSc Pharmacy, Chemistry, Pharmacology

| Year 2- Mandatory Courses | | | | | | | | | | |
|---------------------------|------------------------|-----|---------|-----------------------|----------|--------|------------|---------|----------------------|-----------------------|
| Track/Specialization | Course Title | Sem | Credits | Weekly Teaching Hours | | | | | Number of Students | Name+Rank of Lecturer |
| | | | | Frontal | Exercise | Online | Laboratory | Seminar | | |
| Pharmacy | Seminar (64850) | B | 3 | | | | | 3 | 29 | Prof. Rami Yaka |
| Pharmacy | Final Exam (74444) | B | | | | | | | Second year students | |
| Pharmacy | Masters Thesis (74445) | B | | | | | | | Second year students | |

The student is required to take 25 points of the elective courses of the School of Pharmacy or other courses from the faculty that have been approved by their advisor

| Year 1/2 - Elective Courses- The student is required to take 25 points of the elective courses of the School of Pharmacy or other courses from the faculty that have been approved by their advisor | | | | | | | | | | |
|---|-------------------------------|-----|---------|-----------------------|----------|--------|------------|---------|--------------------|-----------------------|
| Track/Specialization | Course Title | Sem | Credits | Weekly Teaching Hours | | | | | Number of Students | Name+Rank of Lecturer |
| | | | | Frontal | Exercise | Online | Laboratory | Seminar | | |
| Chemistry | Medicinal Natural Products: a | B | 2 | 2 | | | | | 19 | Prof. Dmitry |

| | | | | | | | | | | |
|--------------|---|---|-----|-----|--|--|--|-----|----|--------------------------|
| | Biosynthetic Approach (64304) | | | | | | | | | Tsvelikhovsky |
| Chemistry | Preclinical Imaging (64316) | B | 2 | 2 | | | | | 14 | Prof. Galia Blum |
| Pharmacy | Introduction to Drug Delivery Systems (64761) | A | 2 | 2 | | | | | 27 | Dr. Ofra Benny |
| Pharmacy | Advanced Pharmacokinetics (64801) | A | 3 | 3 | | | | | 4 | Prof. Meir Bialer |
| Pharmacology | The Epidemic of Fatty Liver Diseases: Risk Factors, Treatment and Extrahepatic Consequences (64818) | A | 0.5 | 0.5 | | | | | 8 | Prof. Boaz Tirosh |
| Chemistry | From an Idea to a Drug (64806) | | 2 | 2 | | | | | 6 | Prof. Abraham (Avi) Domb |
| Pharmacology | Challenges and Developments in the Pharmacotherapy of Type 2 Diabetes (64830) | A | 2 | 2 | | | | | 6 | Prof. Shlomo Sasson |
| Pharmacy | Selected Metabolic Pathways and Their Link to Cell Identity (64846) | A | 2 | 2 | | | | | 28 | Dr. Arie Moussaieff |
| Pharmacy | New Developments in Sterilization (64809) | B | 2 | 2 | | | | | 16 | Dr. Yeshayahu Yaakovi |
| Chemistry | Oligonucleotides: Chemical Synthesis and Medical Applications (64847) | A | 2 | 2 | | | | | 11 | Prof. Eylon Yavin |
| Pharmacology | Laboratory Methods in Molecular Pharmacology (64848) | A | 3 | 3 | | | | | 31 | Prof. Avi Priel |
| Chemistry | Forensic Anthropology (64853) | A | 2 | 2 | | | | | 24 | Prof. Tzipi Kahana |
| Pharmacy | Biostatistics in Pharmaceutics and Clinical Pharmacy (64860) | B | 3 | 1.5 | | | | 1.5 | 15 | Prof. Meir Bialer |
| Pharmacology | Diseases of Misfolded Proteins (64872) | B | 2 | 2 | | | | | 6 | Prof. Boaz Tirosh |
| Chemistry | An Introduction to Forensic Science and Law (64873) | A | 2 | 2 | | | | | 53 | Prof. Abraham (Avi) Domb |
| Pharmacy | Introduction to Nuclear Medicine (64890) | B | 2 | 2 | | | | | 30 | Prof. Eyal Mishani |
| Pharmacology | The Involvement of the Endocannabinoid System in Health and Disease (64891) | B | 2 | 2 | | | | | 13 | Dr. Yossi Tam |
| Chemistry | Chemical Basis for Rational Drug | A | 2 | 2 | | | | | 30 | Prof. Amiram |

| | Discovery (64900+64200) | | | | | | | | | Goldblum |
|------------------------------------|---|-----|---------|-----------------------|----------|--------|------------|---------|----------------------|-----------------------|
| MSc Nanomedicine | | | | | | | | | | |
| Year 1,2- Mandatory Courses | | | | | | | | | | |
| Track/Specialization | Course Title | Sem | Credits | Weekly Teaching Hours | | | | | Number of Students | Name+Rank of Lecturer |
| | | | | Frontal | Exercise | Online | Laboratory | Seminar | | |
| | Seminar (64850) | B | 3 | | | | | 3 | 29 | Prof. Rami Yaka |
| | Final Exam (74444) | B | | | | | | | Second year students | |
| | Masters Thesis (74445) | B | | | | | | | Second year students | |
| Physics | Material Characterization (83517) | B | 3 | 3 | | | | | | Dr. Yossi Paltiel |
| Pharmacy | Introduction to Drug Delivery Systems (64761) | A | 2 | 2 | | | | | | Dr. Ofra Benny |

**Mandatory Elective Course 6 points
(69674 or 69993)**

| | | | | | | | | | | |
|-----------|---|---|---|---|--|--|--|--|----|-----------------------|
| Pharmacy | Biological Drugs (64121) | A | 2 | 2 | | | | | 82 | Dr. Hadar Arien-Zakay |
| | Preclinical Imaging (64316) | B | 2 | 2 | | | | | 14 | Prof. Galia Blum |
| | Oligonucleotides: Chemical Synthesis and Medical Applications (64847) | A | 2 | 2 | | | | | 11 | Prof. Eylon Yavin |
| Chemistry | Physical Chemistry of Nano Materials (69674) | A | 4 | 3 | | | | | | Prof. Uri Banin |
| Chemistry | Selected Topics in Chemistry of Materials (69993) | B | 4 | 4 | | | | | | Prof. Meital Rechtes |

Year 1/2 - Elective Courses 19 points. The student is allowed to take courses from the Faculty of Chemistry and Physics

| Track/Specialization | Course Title | Sem | Credits | Weekly Teaching Hours | | | | | Number of Students | Name+Rank of Lecturer |
|----------------------|---|-----|---------|-----------------------|----------|--------|------------|---------|--------------------|----------------------------|
| | | | | Frontal | Exercise | Online | Laboratory | Seminar | | |
| Pharmacy | Introduction to Nuclear Medicine (64890) | B | 2 | 2 | | | | | 30 | Prof. Eyal Mishani |
| Pharmacy | Biostatistics in Pharmaceutics and Clinical Pharmacy (64860) | B | 3 | 1.5 | | | | 1.5 | 15 | Prof. Meir Bialer |
| Chemistry | Forensic Anthropology (64853) | A | 2 | 2 | | | | | 24 | Prof. Tzipi Kahana |
| Chemistry | Medicinal Natural Products: a Biosynthetic Approach (64304) | B | 2 | 2 | | | | | 19 | Prof. Dmitry Tsvetikhovsky |
| Pharmacology | The Involvement of the Endocannabinoid System in Health and Disease (64891) | B | 2 | 2 | | | | | 13 | Dr. Yossi Tam |
| Chemistry | An Introduction to Forensic Science and Law (64873) | A | 2 | 2 | | | | | 53 | Prof. Abraham (Avi) Domb |

| Pharmacy | Advanced Pharmacokinetics (64801) | A | 3 | 3 | | | | | | Prof. Meir Bialer |
|---|--|-----|---------|-----------------------|----------|--------|------------|---------|--------------------|----------------------------|
| MA Intellectual Property in the Pharmaceutical Field - Total of 36 points non-research program | | | | | | | | | | |
| Year 1,2- Mandatory Courses | | | | | | | | | | |
| Track/Specialization | Course Title | Sem | Credits | Weekly Teaching Hours | | | | | Number of Students | Name+Rank of Lecturer |
| | | | | Frontal | Exercise | Online | Laboratory | Seminar | | |
| | Basic Principles in Pharmacology (64902) | A | 2 | 2 | | | | | 2 | Dr. Hadar Arien-Zakay |
| | Drugs, Intellectual Property (64905) | A | 4 | | | | | 4 | 2 | Prof. Philip Lazarovici |
| | Pharmacological Principles in Drug Development (64906) | A | 2 | 2 | | | | | 8 | Prof. Philip Lazarovici |
| | Insights in Drug Delivery Systems (64907) | A | 2 | 2 | | | | | 8 | Prof. Gershon Golomb |
| | Chemical Basis for Rational Drug Discovery (64900+64200) | A | 2 | 2 | | | | | 30 | Prof. Amiram Goldblum |
| | Regulations of the Pharmaceutical Industry (64901) | A | 2 | 2 | | | | | 2 | Zohar Yahalom, Adv. |
| | Introduction to Intellectual Property (62991) | A | 2 | 2 | | | | | 19 | Jacqueline Bracha, Adv. |
| | Patents in the Pharmaceutical Industry: Differing Views (62998) | B | 2 | 2 | | | | | 5 | Eran Barkat, Adv. |
| | Patent Law (62828) | B | 2 | 2 | | | | | 26 | Asa Kling, Adv. |
| | Introduction to Israeli Law (62147) | A | 2 | 2 | | | | | 22 | Dr. Osnat Grady Schwartz |
| | Examination of Patent Applications in the Pharmaceutical Field (62993) | B | 2 | 2 | | | | | 10 | Mr. Yoav Sin-Malia |
| Year 1/2 - Elective Courses (8 points from School of Pharmacy, 4 points from the Faculty of Law) | | | | | | | | | | |
| Track/Specialization | Course Title | Sem | Credits | Weekly Teaching Hours | | | | | Number of Students | Name+Rank of Lecturer |
| | | | | Frontal | Exercise | Online | Laboratory | Seminar | | |
| Chemistry | Medicinal Natural Products: a Biosynthetic Approach (64304) | B | 2 | 2 | | | | | 19 | Prof. Dmitry Tsvetikhovsky |
| Chemistry | Preclinical Imaging (64316) | B | 2 | 2 | | | | | 14 | Prof. Galia Blum |
| Pharmacy | Introduction to Drug Delivery Systems (64761) | A | 2 | 2 | | | | | 27 | Dr. Ofra Benny |
| Pharmacy | Advanced Pharmacokinetics (64801) | A | 3 | 3 | | | | | 4 | Prof. Meir Bialer |
| Pharmacology | The Epidemic of Fatty Liver Diseases: Risk Factors, Treatment and Extrahepatic | A | 0.5 | 0.5 | | | | | 8 | Prof. Boaz Tirosh |

| | Consequences (64818) | | | | | | | | | |
|---|---|-----|---------|-----------------------|----------|--------|------------|---------|--------------------|--------------------------|
| Chemistry | From an Idea to a Drug (64806) | | 2 | 2 | | | | | 6 | Prof. Abraham (Avi) Domb |
| Pharmacology | Challenges and Developments in the Pharmacotherapy of Type 2 Diabetes (64830) | A | 2 | 2 | | | | | 6 | Prof. Shlomo Sasson |
| Pharmacy | Selected Metabolic Pathways and Their Link to Cell Identity (64846) | A | 2 | 2 | | | | | 28 | Dr. Arie Moussaieff |
| Pharmacy | New Developments in Sterilization (64809) | B | 2 | 2 | | | | | 16 | Dr. Yeshaya Yaakovi |
| Chemistry | Oligonucleotides: Chemical Synthesis and Medical Applications (64847) | A | 2 | 2 | | | | | 11 | Prof. Eylon Yavin |
| Pharmacology | Laboratory Methods in Molecular Pharmacology (64848) | A | 3 | 3 | | | | | 31 | Prof. Avi Priel |
| Chemistry | Forensic Anthropology (64853) | A | 2 | 2 | | | | | 24 | Prof. Tzipi Kahana |
| Pharmacy | Biostatistics in Pharmaceutics and Clinical Pharmacy (64860) | B | 3 | 1.5 | | | | 1.5 | 15 | Prof. Meir Bialer |
| Pharmacy | Advanced Pharmacokinetics (64801) | A | 3 | 3 | | | | | | Prof. Meir Bialer |
| Pharmacology | Diseases of Misfolded Proteins (64872) | B | 2 | 2 | | | | | 6 | Prof. Boaz Tirosh |
| Chemistry | An Introduction to Forensic Science and Law (64873) | A | 2 | 2 | | | | | 53 | Prof. Abraham (Avi) Domb |
| Pharmacy | Introduction to Nuclear Medicine (64890) | B | 2 | 2 | | | | | 30 | Prof. Eyal Mishani |
| Pharmacology | The Involvement of the Endocannabinoid System in Health and Disease (64891) | B | 2 | 2 | | | | | 13 | Dr. Yossi Tam |
| Chemistry | Chemical Basis for Rational Drug Discovery (64900+64200) | A | 2 | 2 | | | | | 30 | Prof. Amiram Goldblum |
| | | | | | | | | | | |
| MA Forensic and Analytical Science | | | | | | | | | | |
| Year 2- Mandatory Courses | | | | | | | | | | |
| Track/Specialization | Course Title | Sem | Credits | Weekly Teaching Hours | | | | | Number of Students | Name+Rank of Lecturer |
| | | | | Frontal | Exercise | Online | Laboratory | Seminar | | |
| Pharmacy | Seminar (64850) | B | 3 | | | | | 3 | 29 | Prof. Rami Yaka |

| | | | | | | | | | | |
|-------------|---|-----|---|---|--|--|--|--|----------------------|--------------------------|
| Pharmacy | Final Exam (74444) | B | 0 | | | | | | Second year students | |
| Pharmacy | Masters Thesis (74445) | B | 0 | | | | | | Second year students | |
| Physics | Material Characterization (83517) | B | 3 | 3 | | | | | 28 | Prof. Yossi Paltiel |
| Pharmacy | An Introduction to Forensic Science and Law 64873 | A | 2 | 2 | | | | | 53 | Prof. Abraham (Avi) Domb |
| Criminology | Forensic Medicine and Biology (64914) | sum | 2 | 2 | | | | | 19 | Prof. Tzipi Kahana |
| Criminology | Concepts of Forensic Science (61915) | B | 2 | 2 | | | | | 36 | Prof. Abraham (Avi) Domb |
| Pharmacy | Forensic Anthropology (64853) | A | 2 | 2 | | | | | 24 | Prof. Tzipi Kahana |
| Criminology | Criminal Law (61805) | a | 2 | 2 | | | | | 55 | Dr. Daniel Ohana |
| Criminology | Law of Criminal Procedure and Evidence (61855) | A | 2 | 2 | | | | | 56 | Dr. Daniel Ohana |

Year 1/2 - Elective Courses- The student is required to take 7 points of the elective courses from the School of Pharmacy or other courses from the Faculty which are approved by their advisor

| Track/Specialization | Course Title | Sem | Credits | Weekly Teaching Hours | | | | | Number of Students | Name+Rank of Lecturer |
|----------------------|---|-----|---------|-----------------------|----------|--------|------------|---------|--------------------|-----------------------------|
| | | | | Frontal | Exercise | Online | Laboratory | Seminar | | |
| Chemistry | Medicinal Natural Products: a Biosynthetic Approach (64304) | B | 2 | 2 | | | | | 19 | Prof. Dmitry Tsvetikhovskiy |
| Chemistry | Preclinical Imaging (64316) | B | 2 | 2 | | | | | 14 | Prof. Galia Blum |
| Pharmacy | Introduction to Drug Delivery System (64761) | A | 2 | 2 | | | | | 27 | Dr. Ofra Benny |
| Pharmacy | Advanced Pharmacokinetics (64801) | A | 3 | 3 | | | | | 4 | Prof. Meir Bialer |
| Pharmacology | The Epidemic of Fatty Liver Diseases: Risk Factors, Treatment and Extrahepatic Consequences (64818) | A | 0.5 | 0.5 | | | | | 8 | Prof. Boaz Tirosh |
| Chemistry | From an Idea to a Drug (64806) | | 2 | 2 | | | | | 6 | Prof. Abraham (Avi) Domb |
| Pharmacology | Challenges and Developments in the Pharmacotherapy of Type 2 Diabetes (64830) | A | 2 | 2 | | | | | 6 | Prof. Shlomo Sasson |
| Pharmacy | Selected Metabolic Pathways and Their Link to Cell Identity (64846) | A | 2 | 2 | | | | | 28 | Dr. Arie Moussaieff |
| Pharmacy | New Developments in Sterilization (64809) | B | 2 | 2 | | | | | 16 | Dr. Yeshayahu Yaakovi |

| | | | | | | | | | | |
|--------------|---|---|---|-----|--|--|--|-----|----|--------------------------|
| Chemistry | Oligonucleotides: Chemical Synthesis and Medical Applications (64847) | A | 2 | 2 | | | | | 11 | Prof. Eylon Yavin |
| Pharmacology | Laboratory Methods in Molecular Pharmacology (64848) | A | 3 | 3 | | | | | 31 | Prof. Avi Priel |
| Chemistry | Forensic Anthropology (64853) | A | 2 | 2 | | | | | 24 | Prof. Tzipi Kahana |
| Pharmacy | Biostatistics in Pharmaceutics and Clinical Pharmacy (64860) | B | 3 | 1.5 | | | | 1.5 | 15 | Prof. Meir Bialer |
| Pharmacology | Diseases of Misfolded Proteins (64872) | B | 2 | 2 | | | | | 6 | Prof. Boaz Tirosh |
| Chemistry | An Introduction to Forensic Science and Law (64873) | A | 2 | 2 | | | | | 53 | Prof. Abraham (Avi) Domb |
| Pharmacy | Introduction to Nuclear Medicine (64890) | B | 2 | 2 | | | | | 30 | Prof. Eyal Mishani |
| Pharmacology | The Involvement of the Endocannabinoid System in Health and Disease (64891) | B | 2 | 2 | | | | | 13 | Dr. Yossi Tam |
| Chemistry | Chemical Basis for Rational Drug Discovery (64900+64200) | A | 2 | 2 | | | | | 30 | Prof. Amiram Goldblum |

Table/list: research projects and number of undergraduate students involved. N/A

5.1.2. Training and field work

5.1.2.1. Describe the training/field work required in the program, including its contents and scope.

Options for internship are in supervised community pharmacies (private or HMO, Kupat cholim)), industry, and medical centers. The intern is considered as an "Assistant Pharmacist" (עוזר רוקח) according to the "Pkodat Harokhim" (The relevant law of the MOH). Under this arrangement the trainee can carry out most common practices in the pharmacy under the responsibility and supervision of the chief pharmacist. The internship is conducted for a period of six months, forty hours per week.

5.1.2.2. Describe the process for choosing places for training, including responsible bodies in the institution/faculty/department, as well as the processes to ensure the quality of the training provided (such as staff and facilities).

Choosing places for an internship is done independently by the students, according to personal and professional considerations. In general, there are more potential internship sites than students. Counseling and guidance are provided to the students during the process of selecting places for an internship, or during the internship, if needed. We (the academic staff in charge of the internship) offer consultation to the student in case of doubts.

During the internship, the student participates in professional workshops at the School of Pharmacy (about one meeting each month). These meetings enable network communication (group-dynamics) between the students. The meetings also allow students to share problems and difficulties in their internships with peers and members of the internship committee.

5.1.2.3. Describe the methods applied to evaluate training/field work. What kind of feedback is given to the students?

The activity of the intern at the internship site is evaluated after three months. The evaluation includes a letter detailing the activity performed during this period signed by the chief pharmacist.

During the internship the intern manages a log book in which his/her various professional activities are recorded. At the end of the internship, the student must submit to the internship committee the log book and a report summarizing the internship period and signed by the chief pharmacist. The committee evaluates the student's performance during the internship and confirms the completion of his studies.

Supporting Documents:

List of places of training (including the number of students in each).

| List of Places of Training | | |
|----------------------------|--------------------|------------|
| Sites of Training | Number of Students | Percentage |
| HMO Clalit | 16 | 21 |
| HMO Maccabi | 9 | 12 |
| HMO Meuchedet | 1 | 1 |
| Ministry of Health | 9 | 12 |
| Private Pharmacy | 10 | 13 |
| Superpharm | 32 | 42 |
| Total | 77 | |

5.1.3. Internationalization

5.1.3.1. What is the international strategy of the institution? How is it reflected in the mission and goals of the department/study program?

Hebrew University has set internationalization as a strategic institutional priority.

The Hebrew University is a leader in bringing about change in the global community in many fields, including science, economics, agriculture, environmental quality, and public health. Students carry out advanced studies at the Hebrew University and return to their home countries where they apply the knowledge they gained to improve the lives of their local communities.

We create and support cooperation with academic institutions abroad, proactively driving internationalization with a futuristic, multi-dimensional, and interdisciplinary vision.

On campus we encourage faculties and departments to increase the number of courses and full degree programs offered in English, and we promote the creation of joint and double degrees. As part of the Hebrew University's ongoing efforts to internationalize, the Hebrew University is developing a portfolio of joint degree programs designed to offer students a joint degree with our international partner universities worldwide.

The Hebrew University is striving continuously to offer our students a variety of exciting international special initiatives and opportunities with the aim to gain global perspectives.

Our belief is that an internationalization strategy will have impact only if we align our efforts and resources with a limited set of priority actions, while leaving innovative space for individual initiatives.

The Committee for the Development of an International Strategy has just released its **5 key recommendations**:

1. Increase the number of outgoing HUJI students for international study experiences during their studies.
2. Increase and expand international degree programs at HUJI for international students, especially at the graduate level.
3. Increase the number of international doctoral and post-doctoral students
4. Expand short term summer and winter programs for international students
5. Build strategic partnerships with leading universities worldwide, in North America, Europe and the Far East

5.1.3.2. List the international features of the department/study program, if such features exist.

The internationalization efforts at the School of Pharmacy focus on acceptance of graduate students, mainly for Ph.D., postdoctoral fellows, short term internship of undergraduate students Ph.D. and postdoctoral fellows are individually selected by faculty members who are responsible for full their full support, including: round-trip flights, stipend and health insurance. Postdoctoral fellows are invited through the Dean's Office that guaranties that the fellows be treated well while in Israel. Jewish undergraduate students come each summer through several organizations that arrange the internship directly with the group leader. The organization is responsible to support their stay, so they come to the lab and do lab work along with graduate students and postdocs in the lab. Masters students are rarely accepted, as the stipends and tuition that a mentor can provide is limited, and there is no assistance from the university.

Supporting Documents:

Table 4 - Student Mobility *Based on the responses of 16 researchers.

| Table 4 - Student Mobility - 2018-19 | | | |
|---|--------------------------------------|----------------|-----------------|
| Degree Level | Country of Origin/Destination | Inbound | Outbound |
| Postdoc | India | 24 | 2 |
| | Italy | 4 | 4 |
| | Germany | 1 | 2 |
| | Romania | 1 | |
| | USA | | 6 |

| | | | |
|------------------------------------|-----------------------|-----|-----|
| | England | 1 | |
| | Brazil | 1 | |
| | Lithuania | 1 | |
| | Iran | 1 | |
| | | | |
| BSc | USA | 13 | |
| | Czech Republic | 1 | |
| | England | 2 | |
| | Brazil | 1 | |
| | Canada | 6 | |
| | | | |
| MSc | Czech Republic | | 1 |
| | | | |
| PhD | Italy | 2 | |
| | Germany | 2 | 1 |
| | USA | | 2 |
| | Czech Republic | 1 | |
| | Palestine Authirities | 1 | |
| | Australia | 1 | |
| Total (Number + Percentage) | | 78% | 22% |
| | | 64 | 18 |

5.2. Teaching and Learning Outcomes (max. 5 pages*) -

*if the department/program offers more than one degree level, 1 additional page may be added to this chapter

5.2.1. Teaching

List the institutional Quality Teaching activities offered: training of new and existing faculty (including adjunct faculty), support for teaching technologies, etc.

The Unit for Teaching and Learning at the university offers a wealth of teaching skill improvement courses and workshops. These include general teaching skills, teaching with presentations, discipline in teaching, teaching large classes, the challenge of activity-based teaching, etc. All new faculty members have to take the basic teaching workshop before their tenure procedure is opened. Faculty who receive relatively low grades in the teaching survey are generally asked to take a personal mentoring program given by the Unit for Teaching and Learning. In the program professional staff of the Unit visit and record several lectures, and then sit with the lecturer to pin point where he can improve his teaching.

On the technical side, the Faculty of Medicine keeps technical teaching staff who help introduce new teaching technologies. Today, for example, some courses are video recorded and uploaded to the course website, where students can watch again to better understand hard topics or listen to missed lectures. Most courses have organized websites on the university Moodle system. The faculty keeps technical staff to run the teaching laboratories.

Each new recruit is provided with a senior mentor who directs and gives suggestions. This support helps the new recruit in decisions to choose research students, selecting the right projects, writing grant proposals, and improving teaching skills.

The head of the discipline monitors the quality of teaching in his discipline to assure that the teacher is aware of the monitoring. This is also relevant to issues pertain to the exams. Special attention is given to laboratories and teaching in small groups, particularly courses in years 3 and 4 in the undergraduate program. Efforts are made to shift courses to web courses that are studied individually by the students, supported by the course teacher. Such courses exist in pharmacology, organic chemistry, and pharmacy law. Exams are either open questions (essay) or multiple choice for which multiple choice exams are computerized so several versions are prepared.

5.2.1.1. Teaching regulations and information: list the regulations that address student-faculty relations in terms of teaching obligations (deadlines and schedules, availability, etc.), regulations regarding content and publication of syllabi (including the coursework and grading structure), and the mechanism for publishing and disseminating the information to students.

The university has adopted bylaws governing the faculty-student relations in general, and bylaws pertaining to teaching. These include, for example, the right for a 2nd exam (Moed Beit) in any course and a 3rd exam upon justification, the requirement to submit exam grades no later than 10 days after the exam, and the publication of updated course syllabi and grade structure at the beginning of the course. The rights are summarized here (in Hebrew):

<https://studean.huji.ac.il/book/זכויות>.

Course information is generally sent via email (e.g., through Moodle messaging) to university e-mail accounts that each student has. WhatsApp is also a network that students apply for communication with other students. To help students keep track of large courses, intermediate exams apply and the marks are considered in the final course mark. The undergraduate and graduate course number, content and schedule or any issue related to teaching, teachers and students are monitored by the Teaching Committee and the Advanced Studies Committee.

5.2.1.2. Teaching surveys: describe the institutional system (frequency, percentage of courses addressed, the process of evaluation, responsible bodies for feedback and follow-up, etc.).

The School adheres to the policy mandated by the University that all courses and teachers be evaluated by students. The information obtained from questionnaires is both quantitative and qualitative. Information derived from student evaluations serves two major functions: (1) improving the quality of teaching and courses given in the study programs, and (2) a summative evaluation used for the purpose of promotion.

The primary means for evaluating the courses and the individual teaching performance is by student surveys. In 2008, a centralized web-based platform for all courses was introduced into the Hebrew University. All pre-clinical courses in the School are evaluated by this system. The computerized online survey is open to registered students only. It is anonymous and managed by a third party under strict conditions to maintain anonymity and adherence to the rules set for compilation and analysis of the data. Since 2011 the survey has been conducted by an independent institution in collaboration with the University Information Center. The statistical analysis is based on a trim average (discarding the lowest and highest 5% of scores) using a 1-10 range. These reports are used as feedback both for the teachers, students and for the university administration. When the data processing ends, the results, including the statistical evaluation (averages, number of registered students, and number of responders) are provided individually to teachers and program directors.

Every semester, all students are asked (but not forced) to fill-in online teaching surveys for each course that they attended during the semester. These surveys are run by the Unit for Teaching and Learning.

Course and teacher grades are then generated for the courses for which there were at least 30% response or fewer than 5 answers. Lab courses and workshops are not included in the survey. The results are then sent to the relevant teacher and the head of the discipline. All surveys are compiled and presented to the head of the curriculum committee. If there are issues about the teaching quality, decisions are made whether to modify the course or change teachers. If a course/teacher is getting low scores for a number of years, actions are undertaken, including bringing the issue to the vice-dean of teaching for continuation.

In addition to these surveys, the disciplines conduct internal surveys to gauge and monitor quality of teaching. These surveys are brought to the attention of the faculty in charge of the particular course.

5.2.2. Learning Outcomes

Learning outcomes are what students are expected to know, understand, or be able to do as a result of their learning experience²:

Pharmacy students study academic courses as well as technical pharmacy courses that prepare them to be pharmacists. The courses in the program are sequential and rely on prerequisite studies and courses. Students who graduate from the B.Pharm.Sc. degree, should possess a high level of basic sciences (Chemistry, Math, Biology, Physics, Pharmacology and Pharmaceutics) as well as professional knowledge as pharmacists. The knowledge absorbed during pharmacy studies is reflected during the pharmacy practicing period in which our graduates integrate fast into jobs as professionals and serve the public. On the other hand, our students are accepted warmly for M.Sc. and Ph.D. graduate studies at any institute in Israel and abroad. Our B. Pharm graduates are exempt from the national exam for pharmacy qualifications due to the quality of curriculum and knowledge obtained during studies.

Our graduate students are accepted to all institutes for Ph.D. or postdoctoral fellowships, including MIT and Harvard. Pharm D, graduates are considered top pharmacists with extensive knowledge in pharmaceutics, pharmacology, and the use of medications.

5.2.2.1. List the program's Intended Learning Outcomes (ILO). How were they set and where are they stated? Please refer to each track and each degree level separately. In framing your response, consider the following:

5.2.2.1.1. Specify what the ILOs of your program are.

5.2.2.1.2. Emphasize desired competences, skills, and impact of the program.

5.2.2.1.3. Clearly describe skills and competencies, rather than just content knowledge. An example could include the following description: 'at the end of the degree...the student should be able to...'

The following programs and their ILO are given below:

B.Pharm.Sc. and license to serve as a pharmacist in community, hospitals, institutions and industry. The ILO for this program is to be knowledgeable in pharmaceutics, pharmacology, drug mechanism of action, drug interactions, and general knowledge in science, so they can serve the public and provide professional service to individuals.

Pharm D. The IOL is broad knowledge in drug activities, limitations interactions etc. to be able to consult to expert physicians on their daily treatment of hospitalized patients with complications.

Specifically, by graduation from the School of Pharmacy, they will have the following skills and competencies:

- Biomedical sciences. Entry knowledge to M.Sc. in the fields of cell biology, biochemistry, physiology and pathology. Understand and be able to critically read scientific literature in the field, including mechanics, analytical methods, and statistical analyses.
- Clinical pharmacology. They will have knowledge in pharmacokinetics and pharmacodynamics of drugs. Know mechanisms of drug/drug interactions and understand pharmacovigilance.
- They will have laboratory skills in organic chemistry and pharmaceutical sciences that will allow them to perform M.Sc. work in these fields.
- They should be able to be independent in the design and execution of experiments in their designated laboratories.

M.Sc. in science (medicinal chemistry, pharmaceuticals and pharmacology). The ILO is to be able to conduct independent lab research in the selected field and be knowledgeable of basic science in the field. M.Sc. graduates are expected to be able to join a research team or a Ph.D. program in their field.

M.Sc. in Forensic Science. The ILO is to have basic knowledge in forensic science and be knowledgeable in the specific field of research (i.e., fingerprint development, DNA forensics etc.) The graduate should be able to perform independent research in forensics.

Ph.D. The ILO is to be professional in both experimental and theoretical research, and serve as a knowledge focal point in the field. Due to the orientation of the School towards drug development, our graduates are expected to be conversant in drug development and medications.

5.2.2.2. Who writes and grades the examinations and exercises? How is their validity assessed?

The course teacher(s) determines the curriculum, the requirements/assignments for the course, minimum attendance required, interim and the final exams, checking the exams, and awarding the final mark. Each exam must be checked by a second teacher, and the exam technical requirements are overseen by a secretary. In courses that have exercises, the exercise content is coordinated with the teaching assistant assigned to the course. Multiple choice exams are coordinated and controlled by the faculty center for this type of exams. The validity of Q&A is determined statistically based on the students' answers. This may result in full or partial cancellation of a question.

Laboratory courses are managed by a team of instructors and a course coordinator. Each laboratory session starts with a short test to confirm that the student is prepared for the lab. The instructor is responsible for all student activities during the lab and for checking the tests and lab reports. The final mark consists of the test, evaluation of lab work, and quality of the reports. There is no final exam for laboratory courses.

5.2.2.3. Who grades the written assignments? Describe the methods applied for the evaluation of written assignments and projects. What kind of feedback, apart from the grade, is given to the students?

The course teacher should check and grade written assignments. In courses of 100 students or more, the teaching assistant may participate in the checking of semi-final or final exams of written assignments. In general, in undergraduate courses interim and final exams are the standard, with no exchange of an exam by a study work. M.Sc. theses are examined by two faculty members, preferably one not from the school. These teachers rate the thesis as well as the oral exam. The final mark is an average of the average marks of the courses (40%), the thesis (40%) and the final exam (20%). A Ph.D. thesis is evaluated by internal and external reviewers and is controlled by the university authority for advanced studies. There is no final mark for Ph.D. studies. The top outstanding theses are awarded a “with distinction” mark.

5.2.2.4. Any other methods applied to measure the achievements of the students.

As indicated above, most courses are evaluated by interim tests and final exams. For M.Sc. courses, some short theses are allowed.

5.2.2.5. In summary, to what extent have the methods applied to measure the teaching and learning outcomes achieved their goals? Are the ILOs achieved by the students?

Overall, the systems seem to work when students keep consistent marks. Outstanding students are successful in most/all courses, while others keep an average mark, and some fail in several courses. All successful graduates of the different programs are professionals and have good knowledge in their field of study.

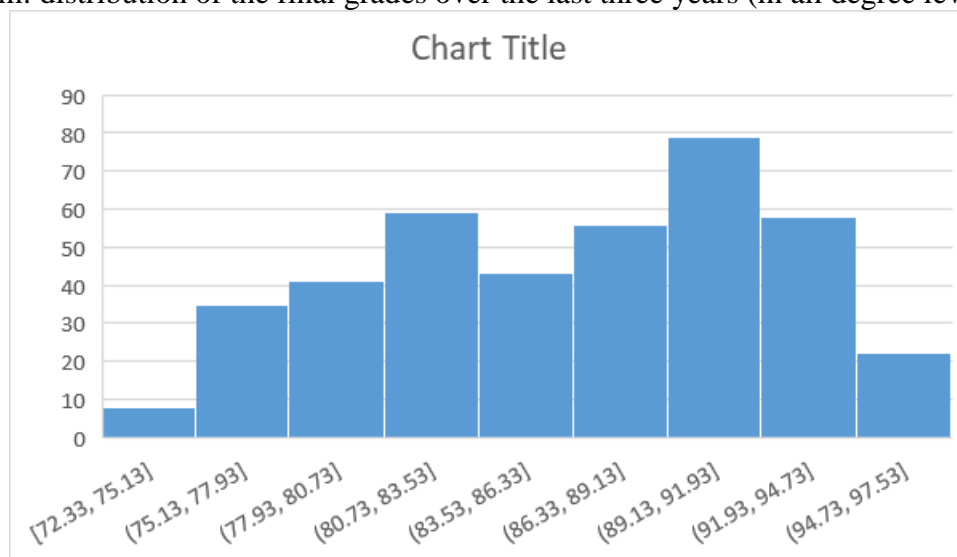
Supporting Documentation:

Table: method of examination and the percentage of its use in the program.

The students in most courses are graded by a final exam. Laboratory courses are graded by an average of the grades of the weekly test, lab work and lab report.

| Method of Exams and percentage of its use in the program | | |
|--|---------|---------|
| | B.Pharm | Pharm D |
| Open Exams | 36 | |
| Multiple Choice Exams | 62 | 23 |
| Computerized exams | 2 | |
| Oral | | 9 |
| Papers/Reports | | 68 |
| *M.Sc. and Ph.D - Mainly elective courses | | |

Histogram: distribution of the final grades over the last three years (in all degree levels).



5.3. Students (max. 4 pages)

5.3.1. Admission and Graduation

5.3.1.1. How are the admission criteria to the program decided upon?

Criteria for admission for the first year of undergraduate studies at the School of Pharmacy

Admission Requirements

- Matriculation certificate
- Psychometric entrance test (quantitative skills)
- Knowledge of English - Meeting the level of "Advanced A".
- Hebrew knowledge - meeting the minimum required knowledge of the language for students whose language of instruction in high school was not Hebrew.
These requirements are mandatory for first-year applicants in all fields of university studies, and were selected to identify and admit candidates with the best chances of succeeding in their studies.
- Personal interview – for the excellence in drug sciences students.

Admission Procedures

- a. A final weighted score is calculated on the average scores of the matriculation certificate and the psychometric exam. Admission is offered to candidates with the highest scores, according to the number of places available.
- b. Previous Education - Previous academic achievements (pre-academic preparatory courses at the Hebrew University or Tel-Aviv University, in natural sciences tracks) may replace the average of the matriculation certificate in the calculation of the final score. Candidates with a number of learning achievements, i.e. extended mathematics or physics in the matriculation are credited in the scoring for acceptance.
- c. Students from abroad should present high school diplomas, matriculation certificates that are equivalent to Israeli matriculation certificates, or Hebrew University grades in academic preparatory studies. These grades replacing matriculation grades are weighted with the psychometric results.
- d. A candidate may register in up to five different teaching program schools of their choice. The sorting procedure is done according to the order of preference. If a candidate has given first priority to pharmacy and has been accepted, other requests will not be reviewed. If the candidate has not been accepted to a field of his/her first preference, the second preference will be examined, and so on. If the candidate is accepted into his/her second preference, and after a period of time is admitted to the first-preference group, his/her admission to the second preference will be cancelled.
- e. A candidate whose score does not grant admission according to the normal admission conditions and who has additional relevant data may apply for a re-examination in the central appeal committee.

5.3.1.2. Describe the policy of affirmative action within the program.

Affirmative action

- a. Since 2001/2002 the University has been conducting a program of affirmative action for all classes of study, including the School of Pharmacy.
- b. Applicants who are recognized as eligible for promotion based on the criteria of the Association for the Advancement of Education may be accepted if their calculated score is slightly lower than the admission threshold for the department, according to the number of places allotted to this population. A typical undergraduate class may consist of >50% Arabs, students who come from any place in Israel with attention given to certain communities.

5.3.1.3. Describe the selection and admission process, the criteria of advancement from year to year and for completion of studies, including the requirements for being entitled to receive an academic degree.

The requirement for passing a course is a minimum grade of 60, while the average score for all courses of a school year should average 70 or above. A student may pass to the subsequent year even if he did not pass two courses but his average is at least 70, not counting the courses he/she failed. The student will be required to carry the courses that he failed to the subsequent school year and must pass them to continue for the third year. The student may continue to attend all courses, even a prerequisite that he failed, assuming that he has studied the course but failed the exam. The student may reduce the number of courses at a certain year to be able to pass the failed course(s). A student who successfully completed all courses, 180 credit points (each credit is a weekly hour for a semester), is eligible to proceed with the pharmacy internship period of 6 months, after which he/she is eligible for the B.Pharm.Sc. degree and the Ministry of Health pharmacist permit.

²For further information on Learning Outcomes, please see: <https://www.nvao.net/system/files/pdf/Report%20Achieved%20Learning%20Outcomes%20Recommendations%20and%20Good%20Practices%202016-0.pdf>, p. 16.

5.3.1.4. Describe the department's policy regarding dropping out.

The School's policy in general is to help students as much as possible not to drop out and at the same time not to compromise on the level of studies.

The official bylaws up to this academic year (2018-2019) were that students cannot continue if they failed in any course. In practice a student that failed in only one course was usually given the opportunity to repeat that course. This year the official bylaws have been changed. Now the School terminates the studies of students in the following two cases: a) student that did not pass 3 or more mandatory courses or, b) students who failed in two courses and their overall average grade (excluding the courses they failed) is lower than 70. However, in these two cases, the Studies Committee may let the student continue under certain conditions.

Otherwise, the School is trying to help students with problematic academic standing. Most of the students dropping out are first year students. Therefore, this year for example, several workshops aiming to assist students with learning disabilities (e.g., including time management and preparation for exams) were given to first year students who failed at least one course. In addition, we are planning an online course of basic chemistry that will be given to the students before they begin their studies. The goal of this course is to give the students some initial basic knowledge in chemistry that is expected to assist them with their studies in the first year. Other programs to minimize dropouts are offered with the assistance of the Students Dean office.

Supporting documents:

Admission Requirements --- Undergraduate Pharmacy Studies:

- Matriculation certificate
- Psychometric entrance test (quantitative emphasis)
- Knowledge of English - Meeting the level of set by the university;
- Hebrew knowledge - meeting the minimum required knowledge of the language for students whose language of instruction in high school was not Hebrew.

These requirements are required for first-year applicants in all fields of the university, and were selected to identify and accept the candidates with the best chances of succeeding in their studies.

Personal interview – for excellence in the drug sciences program.

Admission Requirements- Pharm D:

- B. Pharm and licensed pharmacists with an average mark of 85 and above.
- Interview
- Acceptance is limited to 16 students per year

Students will earn Pharm Doctor after fulfilling all requirements of the three years of study.

Supporting Documents:

Table: entry requirements/criteria for the program (first degree and advanced degrees including "on probation" status).

| 3a. Registration, acceptance and realization statistics by degree and year - Pharmacy | | | | | | |
|---|-----------------|---------|-----------|-----------|-----------|-----------|
| Degree | Group | Year | | | | |
| | | 15/2014 | 2016/2015 | 2017/2016 | 2018/2017 | 2019/2018 |
| Graduate | applicants | 417 | 382 | 337 | 324 | 335 |
| | *accepted | 159 | 198 | 163 | 157 | 158 |
| | actual students | 66 | 92 | 65 | 80 | 85 |
| Masters | applicants | 41 | 23 | 18 | 32 | 36 |

| | | | | | | |
|--|------------------------|----|----|----|----|----|
| | *accepted | 30 | 13 | 17 | 20 | 23 |
| | actual students | 28 | 12 | 15 | 19 | 17 |

3b. Registration, acceptance and actual student statistics for undergraduate program and year - Drug Sciences and Pharmacy Retraining Programs

| Course | Group | Academic Year | | | | |
|--------------------|-----------------|---------------|-----------|-----------|-----------|-----------|
| | | 15/2014 | 2016/2015 | 2017/2016 | 2018/2017 | 2019/2018 |
| Drug Sciences | applicants | 120 | 116 | 108 | 105 | 84 |
| | *accepted | 8 | 21 | 16 | 18 | 8 |
| | actual students | 7 | 9 | 14 | 13 | 6 |
| Retraining Program | applicants | 29 | 35 | 14 | 18 | 13 |
| | *accepted | 14 | 14 | 8 | 8 | 4 |
| | actual students | 10 | 11 | 6 | 5 | 4 |

3c. Average results of applicants and first year students of Pharmacy, according to year

| Group | Acceptance Requirements | | Year | | | | |
|-----------------|-------------------------|--------------------|---------|-----------|-----------|-----------|-----------|
| | | Statistic | 15/2014 | 2016/2015 | 2017/2016 | 2018/2017 | 2019/2018 |
| Accepted | Matriculation | Average | 11.07 | 11.11 | 11.36 | 11.15 | 11.22 |
| | | Standard Deviation | 0.4 | 0.42 | 0.47 | 0.63 | 0.52 |
| | | Number | 158 | 175 | 148 | 146 | 144 |
| | Psychometric exams | Average | 687.3 | 676.3 | 677.8 | 673.6 | 670.3 |
| | | Standard Deviation | 37.5 | 42 | 48.4 | 48 | 45.8 |
| | | Number | 169 | 197 | 160 | 153 | 154 |
| Actual Students | Matriculation | Average | 11.05 | 11.04 | 11.24 | 11.02 | 11.06 |
| | | Standard Deviation | 0.407 | 0.39 | 0.49 | 0.68 | 0.52 |
| | | Number | 63 | 81 | 53 | 73 | 77 |
| | Psychometric exams | Average | 674.3 | 658.3 | 656.8 | 659.9 | 650.3 |
| | | Standard Deviation | 32.4 | 36.9 | 47.4 | 48.7 | 43.2 |
| | | Number | 66 | 90 | 63 | 79 | 85 |

3d. Statistics of acceptance data of admissions and first year studies in medicine sciences, according to year

| Group | Acceptance Requirements | | Year | | | | |
|-----------------|-------------------------|--------------------|-------------|---------------|---------------|---------------|---------------|
| | | Statistic | 1/2014 5 | 201/2015 6 | 201/2016 7 | 201/2017 8 | 201/2018 9 |
| Accepted | Matriculation | Average | 11.34 | 11.18 | 11.48 | 11.36 | 11.6 |
| | | Standard Deviation | 0.25 | 0.35 | 0.35 | 0.58 | 0.46 |
| | | Number | 8 | 16 | 14 | 18 | 8 |
| | Psychometric exams | Average | 712.8 | 711 | 689.8 | 700.9 | 713.3 |
| | | Standard Deviation | 23.9 | 37.4 | 45.01 | 38.3 | 41.8 |
| | | Number | 8 | 21 | 16 | 18 | 8 |
| Actual students | Matriculation | Average | 11.38 | 11.1 | 11.48 | 0.49 | 11.49 |
| | | Standard Deviation | 0.24 | 0.39 | 0.38 | 0.66 | 11.21 |
| | | Number | 7 | 6 | 12 | 12 | 6 |
| | Psychometric exams | Average | 717.3 | 702.8 | 686.4 | 690.8 | 703.8 |
| | | Standard Deviation | 21.8 | 33.1 | 46.7 | 36.5 | 41.4 |
| | | Number | 7 | 9 | 14 | 12 | 6 |

Table 5-6

| Table 5 - Student Registration* | | | | |
|--|---|---------|---------|---------|
| | | 2016/17 | 2017/18 | 2018/19 |
| BA/B.Sc | Applicants | 337 | 324 | 335 |
| | Admitted | 163 | 157 | 158 |
| | Admitted on probation | 0 | 0 | 0 |
| | Enrolled | 79 | 93 | 91 |
| | Total number of students in the program (all years) | 334 | 326 | 340 |
| Pharm D | Applicants | 20 | 24 | 25 |
| | Admitted | 17 | 17 | 17 |
| | Admitted on probation | | | |
| | Enrolled | 17 | 17 | 17 |
| | Total number of students in the program (all years) | 60 | 56 | 51 |
| MA/M.Sc (with thesis) | Applicants | 18 | 32 | 36 |
| | Admitted | 17 | 20 | 23 |
| | Admitted on probation | 0 | 0 | 0 |
| | Enrolled | 15 | 19 | 17 |
| | Total number of students in the program (all years) | 53 | 59 | 52 |
| PhD | Applicants | 19 | 12 | 18 |
| | Admitted | 17 | 9 | 17 |
| | Admitted on probation | 0 | 0 | 0 |
| | Enrolled | 17 | 9 | 17 |
| | Total number of students in the program (all years) | 74 | 80 | 81 |
| *1. Admitted - includes also those who preferred other discipline and did not continue in this program | | | | |
| 2. Admitted on probation - not applicable. Everyone has to pass the admission criteria | | | | |
| 3. Data based on reports of the Students Admission Office of the HUJI. | | | | |

| Table 6 - Student Dropout Rate - B.Pharm | | | | | |
|--|---|---|---|---|--|
| Cohort (שנת תחילת הלימודים) | Number of students who started in the program | Number of students graduated after 4 years or more* | Number of students who graduated within 5 years** | Number of students who graduated in more than 5 years | Number of students who did not graduate/drop out |
| 2010-11 | 131 | 104 | Not Available | Not Available | 27 |
| 2011-12 | 111 | 82 | Not Available | Not Available | 29 |
| 2012-13 | 126 | 96 | Not Available | Not Available | 30 |
| 2013-14 | 118 | 84 | Not Available | Not Available | 34 |
| 2014-15 | 89 | 66 | Not Available | Not Available | 23 |
| Table 6 - Student Dropout Rate - M.Sc | | | | | |
| Cohort (שנת תחילת הלימודים) | Number of students who started in the program | Number of students graduated after 2 years* | Number of students who graduated within 3 years** | Number of students who graduated in more than 3 years | Number of students who did not graduate/drop out |
| 2010-11 | 17 | 18 | Not Available | Not Available | Not Available |
| 2011-12 | 23 | 27 | Not Available | Not Available | Not Available |
| 2012-13 | 23 | 21 | Not Available | Not Available | Not Available |
| 2013-14 | 16 | 20 | Not Available | Not Available | Not Available |
| 2014-15 | 33 | 32 | Not Available | Not Available | Not Available |
| 2015-16 | 14 | 16 | Not Available | Not Available | Not Available |

| Table 6 - Student Dropout Rate - Pharm D | | | | | |
|---|---|---|---|---|--|
| Cohort (שנה תחילת הלימודים) | Number of students who started in the program | Number of students graduated after 3 years* | Number of students who graduated within 4 years** | Number of students who graduated in more than 4 years | Number of students who did not graduate/drop out |
| 2010-11 | 13 | 18 | Not Available | Not Available | Not Available |
| 2011-12 | 14 | 12 | Not Available | Not Available | Not Available |
| 2012-13 | 14 | 12 | Not Available | Not Available | Not Available |
| 2013-14 | 16 | 19 | Not Available | Not Available | Not Available |
| 2014-15 | 17 | 18 | Not Available | Not Available | Not Available |
| Table 6 - Student Dropout Rate Ph.D | | | | | |
| Cohort (שנה תחילת הלימודים) | Number of students who started in the program | Number of students graduated after 5 years* | Number of students who graduated within 6 years** | Number of students who graduated in more than 6 years | Number of students who did not graduate/drop out |
| 2010-11 | 13 | 12 | Not Available | Not Available | Not Available |
| 2011-12 | 17 | 9 | Not Available | Not Available | Not Available |
| 2012-13 | 15 | 11 | Not Available | Not Available | Not Available |
| 2013-14 | 22 | N/A | Not Available | Not Available | Not Available |
| 2014-15 | 10 | N/A | | | N/A |
| The Data available from the University's database do not provide accurate information for dropouts statistics | | | | | |

5.3.2. Graduate Studies

5.3.2.1. Specify the structure of the graduate program (M.Sc. and Ph.D.), including official and *de facto* period for completion, and the mechanism for monitoring students' progress.

Admittance criteria for the graduate programs is described below.

M.Sc. students who fulfilled all requirements for earning a research M.Sc. will receive the degree. The requirements include: study for 4 semesters; pass 25 credits with a mark of not less than 60 and average 70 for all courses; deliver a public seminar on the thesis work (3 credits); submission of an M.Sc. thesis that was evaluated and received the mark of 60 or more; pass the M.Sc. exam that includes a thesis and understanding two articles.

The **M.Sc.** program is 4 semesters for a full time student, though occasionally it lasts longer (typically another semester). Students without a fellowship and working elsewhere (or serving in the army) can and do extend the program longer for obvious reasons.

The **Ph.D.** Program includes study courses of 12 credit points and carrying out extensive and original research. In the first stage of the Ph.D., the student commences his study and research of an advanced topic.

Towards passing to the 2nd stage, during the 4th semester the student has to submit a research proposal and an "accompanying" committee (Va'ada Melava) is established (which includes

the advisor and at least 2 more researchers, of which at least one has to be from outside the institute). The committee convenes, grills the student, and decides if the student is ready to pass to the 2nd stage. The committee can also decide if additional courses have to be taken. Towards the end of the 4th year of research the committee should begin to discuss the research quality and quantity and decide if the student can progress and deliver a lecture and is ready to write and submit the thesis.

Once the thesis is submitted, it is sent to reviewers outside the university (including reviewers from abroad), for evaluation and comment. The evaluators may reject the thesis, ask for adding more data or ask for revisions of the thesis text and require resubmission of the thesis. The Ph.D. nominally lasts 4 years, but occasionally extends to the 5th year.

M.Sc. studies

Admission requirements:

1. Candidates holding B.Sc. in natural or medical sciences, including: chemistry, biology, earth sciences, statistics, computer sciences, pharmacy, nursing, medical sciences and medical laboratory from a certified higher education institute in Israel or abroad with a grade score of at least 80, will be considered by the Graduate Studies Committee. If necessary, the committee may require supplementary courses in addition to the M.Sc. program.
2. Candidates should meet the English language university level.
3. To register for M.Sc. studies, the candidate must obtain the consent of one of the School's faculty to serve as his/her research supervisor. A candidate may have up to two supervisors from the university or from a research institute, conditional upon the approval of the Chairman of the Graduate Studies Committee.
4. Registration for the M.Sc. program is open throughout the year, however, studies may start in either the first or second semester.
5. Candidates who hold a B.Sc. from abroad are required to certify their foreign degree at the office of Overseas Students at Mount Scopus.
6. The School Graduate Studies Committee is authorized to decide on admission of candidates.

Registration procedures

1. Candidates who meet the admission criteria will register at the Secretariat for Advanced Studies at the School of Pharmacy. Candidates must have a supervisor prior to registration and should submit the following documents:
 - a. An updated registration form (can be downloaded from the School website) and a form signed by the supervisor.
 - b. Certification of B.Sc. with a list of courses and grades.
 - c. Applications can be submitted via the Graduate Studies website
2. Master's degree framework

Studies towards the M.Sc. degree include subjects of specialization in pharmaceutical sciences and complementary studies in other subjects, as required and based on the background of the candidate, in total requiring 28 credits. 25 credits will be selected from the School of Pharmacy and / or the Faculty of Medicine and / or the Faculty of Natural Sciences, while ensuring that 10 credits will be selected from the list of courses of the School of Pharmacy. All M.Sc. students must deliver a seminar, presenting their research topic, entitling them to 3 credit points.

"Accumulated" courses for the graduate degree are advanced courses taught beyond the prerequisite B.Sc. degree. These courses may be counted in the Master's degree program with the approval of the Chair of the Graduate Studies Committee, and their grades will

form part of the general grade for a Master's degree. The number of credits of accumulated courses will not exceed one-third of the scope of the Master's Program.

The Master's degree research topic must be submitted to the committee during the first year of studies before the end of the second semester. Guidelines for writing the research topic are available at the Graduate Studies Office. The required grade for each course is at least 60. M.Sc. studies are planned for 4 semesters. Exceptions will be discussed with the Graduate Studies Committee.

3. Thesis

The thesis is obligatory to receive a M.Sc. degree and will be submitted at least 4 weeks prior to the date of the final examination. The thesis confirms the student's ability to perform quality research and write a scientific document. The thesis will be evaluated by the advisor and two judges. The judges will be appointed by the Committee for Advanced Studies in consultation with the advisor.

The examination of the thesis will be submitted to the Secretariat of Advanced Studies no later than three weeks after receiving the thesis. The final grade of the thesis will be determined as the average of the grades to be passed by the two judges and the calculated average score of the instructors.

4. M.Sc. Exam

The purpose of the final exam is to determine the general knowledge of the student, his understanding of the field, his specialization, and his ability to deal with a scientific subject.

The final exam takes place only after completion of all credit points and submission of the thesis. The exam will take about an hour and will be attended by up to three examiners, one of whom will serve as chair of the exam. The student will present the research project (15-20 minutes) followed a question and answer session.

In the second part of the exam, the student will be tested for his/her ability to understand two scientific articles provided by the examiners. At the end of the examination, the final grade will be decided by the members of the committee. They will sign a final exam page together with a final exam score (required grade of at least 60 to pass).

5. Final Grade for M.Sc. degree

The general grade for a master's degree will be calculated according to the following criteria:

- a. Average course scores 40%
- b. Grade of thesis 30%
- c. Final exam score 30%

A grade of distinction (excellence) can be awarded only to students who have completed their studies in 4 semesters.

5.3.2.2. Describe the policy regarding advising graduate students.

M.Sc. Students are expected to find a thesis supervisor prior to being accepted to the M.Sc. program. The supervisor will instruct the student on the selection of courses and thesis topic. The student is expected to follow the university's general regulations.

Ph.D. and M.Sc. students consult with their supervisors as well as the school staff, faculty, committee members, and school head. Ph.D. students can consult with the Central Office of Graduate Students in exact sciences.

5.3.2.3. List the mandatory/elective courses that provide and teach research skills/soft skills.

At the bachelor degree level, most of the courses provide "hard" skills. Out of 180 credits, 8 are devoted to electives selected from the school or faculty elective course list. 6 credits are

devoted to non-science courses (“Avnei Pina”). In addition, there are several courses that are more flexible such as the “Exposure to Research” course: Through this course students have the opportunity to experience and learn by carrying out advanced research.

At the graduate level, the research projects require the acquisition of relevant soft skills. The main difference between the Ph.D. and M.Sc. projects is that Ph.D. requires independent work on an original, innovative, and publishable research project. Most Ph.D. theses are a collection of research papers (4-6 papers on different aspects of the topic) published on the work in which the student is the first author. M.Sc. thesis is limited to a specific topic, and its purpose is to familiarize and train the student to perform independent research, study methodologies, and be acquainted with day to day research, reporting in a formal notebook with critical data analysis, design of studies, etc. It is not essential that the work be fully original and innovative.

5.3.2.4. Is there a departmental seminar? Do graduate students participate in it?

There is a weekly colloquium during the semester taking place on Thursday noon. The presenters are invited scientists from other universities and from abroad. In addition, there are special seminars of guests that can take place any time during the week. M.Sc. students are required (obligatory) to attend these seminars. In addition, each graduate student is required to deliver a seminar once during his studies. These seminars take place on random days based on the availability of examiners. There are many seminars that take place throughout the faculty and the Hadassah Hospital; these are announced throughout the campus to attract student and faculty attendance

5.3.2.5. Describe the financial support system available for graduate students.

M.Sc. and Ph.D. student receive monthly stipends for the time of their studies, in the range of NIS 3000 and NIS 6000, respectively. All M.Sc. students are exempt from tuition payments (arranged by the university and the supervisor). In addition, Ph.D. students may have a teaching assistant position that may add another NIS 3000. The stipend is paid mostly by the supervisor from his grant sources. Students can apply for certain grants and prizes for certain achievements, help in the community, minorities, or immigrants.

5.3.3. Student Support Services - institutional and departmental

5.3.3.1. Describe the system of academic counselling for students before and during the period of study (including reference to the structuring and approval of the study curriculum).

Undergraduate students receive academic counseling by several means:

- An office with two secretaries dedicated for assisting undergraduate students with technical issues such as exams, marks, applications to committees, personal issues, etc.
- Each class year of students has a faculty member as an academic consultant to whom they can apply anytime. Special attention is given to the first year students due to the high rate of dropout. The consultant is responsible for meeting the class a few times a year to discuss general as well as personal issues.
- A mentoring program is in effect in which 5-6 students are assigned to each faculty member. He is expected to meet with the students and be a contact point for them. Students meet the faculty in person, interact, and receive advice.
- The School administrative and academic heads are available to help students.
- The School has developed a special program to reduce dropouts and has appointed a faculty member who has arranged several programs, along with the Dean of Students and other inner agencies, to provide mentoring and teaching assistance to specific students who are vulnerable to dropping out.

5.3.3.2. Do students with special needs receive special support? If so, please specify.

Students with special needs can turn to the Office of the Dean of Student. Their special needs are examined, and various adjustments are offered. The School is always attuned to provide help and make adjustments to meet student needs. This includes adjustments for students with learning disabilities and students with various handicaps (e.g., vision or hearing impairments, other physical handicaps, or certain diseases). Adjustments include, for example, extension of the exam time, a quiet room for students during the exam, consideration of course requirements in certain special cases, etc. Accessible and/or front seats are reserved for students with special needs. Faculty members are instructed to accommodate the needs of all students.

5.3.3.3. Describe the types of financial assistance available for students (outstanding and with financial difficulties).

The School provides several scholarships to outstanding students. A limited number of scholarships are available through endowments and donations from Superpharm and others. There are university programs that students can join and be given scholarships. The School does not have a budget for financial support of students; this is done through the Office of the Dean of Students.

5.3.3.4. Describe the institutional mechanism to address student complaints regarding teaching (its activity, accessibility, and how its activity is publicized to students).

Students can complain in person or as a class through the class representatives in various manners:

- They turn directly to the teacher.
- If the problem is personal, they can turn to their personal mentors.
- They turn to the consultant of that year and complain. The consultant then talks directly to the relevant teacher.
- They turn to the head of the study committee and the school manager, who also intervene if they find the problem justified and can resolve it.
- In extreme cases they also turn to the Dean of the Faculty of Medicine, who usually asks the School head to interfere if found justified.
- There is also a student-teachers committee, which includes the consultants of all the years as well as student representatives of all the years. This committee meets twice a year, when problems in teaching are raised and solutions are discussed.
- Starting next year there will be a course for first-year students that will introduce students to the university's infrastructure and the various available assistance possibilities.
- If the problem includes some administrative/technical issues, students can turn to the students-secretary who can also assist.
- Students have the opportunity once in a semester to rate the course and the teacher. This includes specific comments for improvements. These comments are considered seriously by the school head and the university. The issue is discussed with the teacher including a request to improve or take a course for teaching improvement.

5.3.3.5. Describe the counselling and assistance provided to students regarding job placement (including collaboration with employers and the employment market).

Each year our students are invited to participate in a conference conducted by a large network of pharmacies. This conference provides the students with information regarding employment options, conditions, wages, and even enables their recruitment. Also, representatives from HMOs come to talk with the students.

At the end of the internship period the students provide feedback on the quality of their internship. Over the years the Internship Committee has accumulated information on most of the places of internship, which allows the provision of objective information to students as necessary.

Overall, about 70% of the students do internships in community pharmacies (HMO or private), an additional 25% in hospitals, and approximately 5% in the pharmaceutical industry. During the internship they select the place to work or continue studies. For the coming years we are not expecting a problem of employment, as there is a clear shortage of pharmacists.

5.3.4. Alumni

5.3.4.1. How does the institution and/or the department maintain contact with their alumni?

The Hebrew University's alumni, comprising over 280,000 graduates, work to maintain strong ties between alumni and the University, ensuring that they are active and engaged members of the University community.

The Alumni Association works to promote close relationships between alumni and the University as well as amongst alumni.

The School of Pharmacy maintains contacts with alumni and arranges every few years (every 10th year anniversary) a special event to which all graduates are invited. There are no regular year-round activities that involve school graduates. An initiative to issue a periodical newsletter and convene conference once in a few years is being considered to keep contact with our alumni. It should be noted that the School alumni are the candidates for our continued studies program.

Supporting Documents:

Table/Chart. Integration of alumni into the labor market: where they have found employment, what positions they hold, time elapsed between graduation and employment.

The information we have received is partial. The table is based on the data received from the Unit for HUJI Alumni

| Alumni | |
|--------------------|------------|
| Current Occupation | Percentage |
| HUJI | 8 |
| Pharma company | 40 |
| HMO | 51 |
| Police | 2 |

5.3.5. In summary, what are the strengths and weaknesses of the issues specified in this chapter?

This chapter focusses on the students learning in the various programs at the School of Pharmacy. The teaching programs are up-to-date with a good balance of the subjects studied. The financial support for students is limited and is not part of the annual budget. Management of the issues discussed in this section is reasonable, although there is room for improvements in fund raising to allow more stipends and support for needy students. Better alumni activities are required. With regard to alumni, the communication data available are limited due to frequent changes in addresses. However, communication through Facebook, Instagram or other means should be considered. These actions require at least 50% time of a dedicated personnel and will keep communication with alumni.

5.4. Human Resources (max. 3 pages)

5.4.1. Specify the rules, criteria, and procedures for recruiting, appointing, and renewing appointments and dismissals of academic staff (tenured and adjunct), including rules regarding tenure and promotion; specify the standard duration of service at each position. What are the plans for future recruitment to the study program? How are these plans made and by whom?

Recruitment at the Lecturer and Senior Lecturer Level:

The usual hiring process is as follows:

The dean together with the head of the Institute for Drug Research discuss faculty needs and negotiate the number of new recruit positions for the coming year. Calls are usually open to all fields of biomedical and pharmaceutical research. In specific cases, following an internal committee discussion, they may request permission to issue a specific call. For example, this year in addition to the general call we are issuing a specific call for pharmaceutical chemists. The call for applications is advertised in the summer, soliciting applications in all disciplines of pharmaceuticals, with a deadline in the fall. These positions are published as part of the faculty of Medicine recruitment effort where all open positions in all schools of the faculty are listed. The Faculty of Medicine is strongly committed to recruiting and retaining an excellent and diverse faculty.

Applications are evaluated by the Faculty Search Committee (standing committee) based on the candidates' academic merit. Typically, the Faculty of Medicine receives around 60 applications a year. Candidates who meet the faculty's high standards (15-20 candidates), are invited for a faculty visit that includes a job talk, a chalk talk, multiple interviews by faculty members, a meeting with exemplary graduate students, and a visit to the campus facilities. The Faculty Search Committee receives feedback from each of these meetings and eventually produces a shortlist of candidates (usually around 10 candidates) ranked according to their perceived academic merit. The shortlisted candidates are then evaluated by the Faculty Appointment Committee, that in addition to scientific merit takes into account the faculty needs, space availability, and the faculty's research vision as outlined by the dean together with the vice dean for research. The Appointment Committee will also decide on the academic rank of each potential candidate. This will usually be at the senior lecturer level.

Once the relevant candidates are decided upon, the Dean / Head of the School of Pharmacy requests two additional letters of evaluation by independent high-profile researchers in the field. Together with these letters the list is presented to the Rector who must approve each candidate before we can proceed with a job offer. In parallel to the approval by the Rector, the head of the Planning and Development Committee of the Faculty will negotiate the candidates' needs with the Vice President for Research and Development to formulate the assimilation packages to be offered to each candidate. These are based on the candidates' requests. Job offers are issued according to a priority set by the dean based on the ranked list provided by the Appointments Committee.

Tenure has to be discussed in the 4th year at the latest, at which point a professional committee has to be established. The dean can then decide to open the procedure for promotion, or extend the tenure track position by 2 years. After these 2 years a new professional committee is established, and the tenure procedure has to begin with the dean requesting review letters (using a list of suggestions by the professional committee). Once letters arrive, the file is brought to the university's tenure committee. If the candidate does not pass the process, then a termination of employment process is followed.

Promotion to Associate Professor is discussed in the majority of cases together with the tenure, passing through the same committees. The minority of cases in which tenure is given without promotion are usually experimentalists that took a longer than average time to establish a lab and get their scientific production out. Thus, promotion to associate professor is typically after 6 years.

Promotion to Full Professor requires passing a professional university committee, which should recommend promotion. If the dean accepts the recommendation, he or she solicits review letters from high profile researchers from abroad. The file is then brought to the university promotion committee which has to discuss and approve the promotion. Typical promotion to full professor at the RI is 6 years after promotion to associate professor. However, in rare cases it can be a bit shorter, while in a non-negligible number, it is longer, depending on the impact and international stature of the faculty members.

All professional committees require that at least one member be from outside the department (and are typically from outside the university).

5.4.2. Describe how faculty members are informed of these policies and procedures.

Each new faculty member is mentored by a senior faculty member officially appointed for the task. The senior faculty member regularly advises the new person about what to expect and when. In particular, the senior faculty member is expected to advise about the requirements for tenure (in terms of publications, grants, teaching, etc.).

The Head of the School regularly consults with the Head of the Faculty Promotion Committee and on School faculty as to who can be considered for promotion or should be considered for tenure. The chairman can then discuss the progress of the faculty with them and inform them of the tenure and promotion procedures.

5.4.3. Specify the policy regarding emeritus faculty activity at the institutional/parent unit/study program level.

Emeritus faculty are very welcome in the School of Pharmacy. Currently there are 13 active emeriti who have laboratories, offices, and graduate students, supported by academic as well as industrial and institutional grants. Recently retirees (usually until the age of 75) have been fully active in research and remain in their original labs, participate in seminars and conferences, as well as serve as examiners for graduate students. However, according to the university regulations they do not serve on formal committees. They can serve as single supervisors for graduate students and hire postdoctoral fellows, and they participate in all school activities. Due to limited resources, emeriti are not eligible to receive internal grants, and graduate students supervised by emeriti are not eligible for school stipends. Emeritus faculty are invited to continue to teach in undergraduate and graduate courses. Emeriti who teach a 4 credit course for undergraduate students are eligible for a stipend to support one graduate student. Most emeriti, however, are less involved in teaching. As research activity reduces with age, lab space is reduced to accommodate new faculty members. All activities with the emeriti are done in a polite way and with full respect.

5.4.4. Specify the steps that are taken to ensure that staff members are academically and professionally updated, with regard to the program, as well as the professional development plan for faculty.

Faculty members are regularly updated by e-mail messages. Important updates and issues requiring discussion are raised during the bi-annual teacher's council meeting of the School of

Pharmacy. Issues regarding the entire Faculty of Medicine are presented and discussed in the bi-annual council meeting of the Faculty. Also, all faculty members of the university are regularly invited to Hebrew University Senate meetings (but only formal Senate members can vote). Any faculty member is invited to discuss any issue with the School management or committee members. If a certain issue requires special attention, an ad hoc meeting is organized. The School management meets twice a year with the emeritus faculty to discuss their special needs or issues.

5.4.5. Describe the position of the head of the study program, including the appointment process, term duration, and required credentials (experience and education).

A selection committee, appointed by the Dean issues a Call for Candidates and then interviews and selects one or two potential candidates for the position of the Head of the School. The Head of the School of Pharmacy is then elected by the academic faculty members of the School (excluding emeriti professors) in a secret ballot. The term for each position is four years. A second term for a serving as Head is possible, pending approval and election by the faculty of the School. No extension beyond two terms is allowed. The heads of each discipline (pharmacy, chemistry, pharmacology and clinical pharmacy) are elected by members of each discipline. The committee heads are proposed by the School head and approved by all faculty members.

5.4.6. List the technical and administrative staff, including the number of staff members and their job descriptions. What kind of support does the technical and administrative staff provide for the academic activity?

The scientific technical staff at the School of Pharmacy serves in three categories: (1) As experts who operate the Institute's shared laboratory (4); (2) Operate the pharmacy and chemistry student laboratories (2); (3) Laboratory assistants who join the laboratory of a young faculty member (at 50% time sharing) for his first years as faculty member, until tenured. There are a few tenured faculty members who have technical assistance at 50% time sharing, however most tenured faculty members do not have and never had any assistance. Most of the technical staff are Ph.D. level, thus significantly contributing to the quality of research and teaching. The administrative staff, consisting several secretaries, run the day-to-day School administration. Their contribution to the academic programs, teaching and research, is insignificant. It should be noted that the pharmacy students rate the school services as the lowest in the entire university!

Administration

| Last Name | First Name | Job Description |
|------------|------------|--|
| Aharon | Sagit | Secretary of Dept. of Drug Sciences and Advanced Degrees |
| Avi-Tsedek | Tali | Secretary of Undergraduate Studies |
| Buzaglo | Yehudit | Lab dish washer |
| Lavi | Tirza | Administrative Secretary |
| Mizrachi | Keren | Secretary of Human Resources |
| Shefer | Ruth | Secretary of Clinical Pharmacy |
| Dotan | Christine | Secretary of the School of Pharmacy |
| Lasri | Michal | Secretary of Scholarships |
| Meron | Esther | Coordinator of Teaching and Undergraduate Students |

* worked until end Decemeber 2018 in fulltime position and has since reduced to halftime

** Paid from 046 and not included in employee data of the quantitive data appendices

Lab Technicians

| Last Name | First Name | Position |
|-----------|------------|----------|
|-----------|------------|----------|

| | | |
|-------------------|------------|--|
| Agranat | Ahuva | Manager of student teaching lab-Chemistry |
| Barasch | Dinorah | Research assistant, lab assistant, and operator of MS Instrumentation Unit |
| Hadar | Rivka | Research assistant and assistant in teaching labs |
| Moshel | Ofra | Manager of Core Instrumentation Unit |
| Merquoil | Emmanuelle | Research assistant |
| Nemirovs kai | Alina | Research assistant, lab assistant, and operator of MS Instrumentation Unit |
| Friedman- Ezra | Aviva | Research assistant, lab assistant in teaching laboratories, and operator of NMR instrumentation unit |
| Shmuel | Miriam | Research assistant and teaching lab assistant |
| Tam | Avshalom | Manager of student teaching lab-Pharmacy |
| Grad | Etty | Research assistant and assistant in teaching labs |
| Schwob | Ouri | Research assistant |

Tables 7-12 (Excel appendix).

| Table 7 - Full Employment | |
|----------------------------------|-----------------------|
| Rank | Teaching Hours |
| Lecturer | 168 |
| Senior Lecturer | 168 |
| Senior Adjunct Lecturer | 448 |
| Associate Professor | 168 |
| Full Professor | 168 |

Table 8 - Faculty (Academic Staff) - Senior Faculty Employed (the following ranks: Lecturer, Senior Lecturer, Associate Professor, Full Professor)

| Faculty Member | | | | | Part of Position in the Institution* | | Part of Position in the Program | | Total weekly teaching hours per semester | Additional Tasks in Institution | Additional Employment (external to the institution) | | | Number of Graduate Students Supervised ** | |
|----------------|------------|-----------------|-----------------|---|--------------------------------------|---------------------|---------------------------------|---------------------|--|---|---|--------------|---------------------|---|--------------|
| Family name | First name | Academic Degree | Employment Rank | Area of Specialization | Weekly hours | Position percentage | Weekly hours | Position percentage | | | Name of Employer | Weekly hours | Position percentage | Master students | PhD students |
| Arien-Zakay | Hadar | PhD | Senior Teacher | Pharmacy / Pharmacology Education | | 100 | 17.18 | 100 | 17.18 | Instructing small groups teaching in Pharmacology courses for second-and third- year pharmacy, medical, military medicine, dental medicine and nursing students. Academic leader, founder and lecturer- Pharmacy program for high school students in the Israel periphery; a joint project of the Hebrew University School of Pharmacy with Dexcel pharmaceutical company. Program coordinator- The Excellence Program for bachelor and graduate students in Drug Sciences, School of Pharmacy, Faculty of Medicine, HUJI, Jerusalem, Israel. Evaluator, MIRKAM Assessments for medical students, Faculty of Medicine, HUJI, Jerusalem, Israel.Member, monitoring committee for pharmacology undergraduate teaching during B. Pharm. degree on pharmacy, School of Pharmacy, Faculty of Medicine, HUJI, Jerusalem, Israel.Member, monitoring committee for pharmacology teaching to bachelor's degree in nursing, School of Pharmacy, Faculty of Medicine, HUJI, Jerusalem, Israel.Member, the School of Pharmacy teaching committee on measures preventing first-year students dropping. | | | | | |
| Benny | Ofra | PhD | Senior Lecturer | Nanomedicine for cancer therapy and diagnostics | | 100 | 6.75 | 100 | 6.75 | Head, Pharmacy Division Member, Planning and Development Committee Member, Teaching Committee Member, Advanced Studies Committee Member, Fellowships and Prizes Committee | | | | 4 | 7 |

| | | | | | | | | | | | | | | | |
|------|---------------|-----|---------------------|--|--|-----|------|-----|------|---|--|--|--|---|---|
| | | | | | | | | | | Member, Ground/Area Committee Member, PhD Acceptance Committee | | | | | |
| Blum | Galia | PhD | Associate Professor | Research focus - investigation of protease activity. Development of novel imaging reagents and inhibitors of cysteine protease activities. My research is interdisciplinary with the unique ability to combine organic chemistry methods with biochemical methodologies. One of my major goals is to apply our novel home-made compounds in various systems to investigate the protease function in various pathologies. My research involves the application of our chemical tools to study cancer, atherosclerosis and arthritis in cell cultures, mouse models and human samples. | | 100 | 5.75 | 100 | 5.75 | Member, Teacher Student Committee Supervisor, Second-year students Member, Faculty Filtering Committee for Academic Candidates | | | | 3 | 3 |
| Domb | Abraham (Avi) | PhD | Full Professor | Synthesis, characterization and applications of biopolymers: Medicinal and organic chemistry; Anticancer drugs, Controlled drug delivery; Drug targeting; Prodrugs; Drug-polymer conjugates; Nanoparticles and nanoformulations; Hydrogels; Surface modification and coatings; Water purification systems, Bioactive polymers; Scaffolds for tissue engineering; Nucleic acid transfection agents; Forensic Sciences, Crystallization, Iontophoresis to the eye. | | 100 | | 100 | | Head, the School of Pharmacy Director, the Institute for Drug Research Chair, Planning and Development Committee Member, Teaching Committee Chair, Advanced Studies Committee Chair, Fellowships and Prizes Committee Chair, Mechanical Equipment Committee Chair, Teacher Student Committee Chair, Ground/Area Committee Member, Mechanical Equipment Committee Member, Internship Committee Member, PhD Acceptance Committee | | | | 9 | 6 |
| Eyal | Sara | PhD | Associate Professor | Epilepsy is a neurological disease affecting sixty five million individuals in the world, a third of whom are resistant to antiepileptic drugs (AEDs). Patients with drug | | 100 | 8.2 | 100 | 8.2 | | | | | 2 | 5 |

| | | | | | | | | | | | | | | | | |
|---------|---------|-----|----------------|---|--|-----|------|-----|------|--|--|--|--|--|---|---|
| | | | | resistant epilepsy suffer from impaired quality of life and are prone to premature death. For those who do respond to AEDs, treatment can be complicated by non-linear pharmacokinetics, adverse drug reactions, and drug-drug interactions. With this in mind, our objective is to identify novel mechanisms for therapeutic and adverse effects of AEDs.. | | | | | | | | | | | | |
| Gibson | Dan | PhD | Full Professor | We are fucosed on the design synthesis and anticancer activity of platinum complexes. Specifically we are working now on multi-action Pt(IV) prdrugs that can release two, three or four different bioactive moities inside the cancer cells. | | 100 | 6.75 | 100 | 6.75 | | | | | | 2 | 1 |
| Golomb | Gershon | PhD | Full Professor | Developing advanced drug delivery systems and therapy in inflammatory-related disorders.Controlled release, implantable, and targeted injectable drug and gene delivery systems; from hypothesis to in vivo studies. Targeted nanoparticles (polymeric-based and liposomes) for drugs/genes/imaging agents. Developing nanoparticles, encapsulating them in drugs/genes, for modulating the innate immunity in inflammatory-associated disorders, blood-brain barrier delivery, and for the treatment and diagnosis of cancer and cradiovascular disorders. | | 100 | 0 | 100 | 0 | | | | | | 1 | 5 |
| Hoffman | Amnon | PhD | Full Professor | <ul style="list-style-type: none">• Study of structure (conformation) – oral bioavailability relationship of peptides.• Biopharmaceutical aspects | | 100 | 10.2 | 100 | 10.2 | Head, Clinical Pharmacy Division Member, Planning and Development Committee Member, Teaching Committee Member, Advanced Studies Committee | | | | | 1 | 5 |

| | | | | | | | | | | | | | | | |
|---------------|-----------|-----|---------------------|---|--|-----|------|-----|------|---|--|--|--|---|---|
| | | | | of drug delivery systems and drug development. | | | | | | Member, Fellowships and Prizes Committee Member, Internship Committee | | | | | |
| Kohen | Ron | PhD | Full Professor | Reactive oxygen species, skin as window for interanal disease, antioxidants in vivo | | 100 | | 100 | 0 | Head, Bloom Center | | | | 1 | 2 |
| Lazarovici | Philip | PhD | Full Professor | Pharmacology and Toxicology, Neuroscience, Neuro-oncology, Biomedical Engineering | | 100 | 7.6 | 100 | 7.6 | | | | | 2 | 4 |
| Levi-Schaffer | Francesca | PhD | Full Professor | allergy, asthma, mast cells, eosinophils, immunopharmacology, COPD, cancer | | 100 | 0 | 100 | 0 | | | | | 1 | 5 |
| Matok | Ilan | PhD | Associate Professor | <ul style="list-style-type: none"> • The association between cardiovascular medication use and motor & cognitive decline in the elderly • The safety and efficacy of new oral anticoagulants. • The safety and effectiveness of medication use in pregnant women and children. • The cardiac toxicity of drugs. | | 100 | 7.6 | 100 | 7.6 | Supervisor, Third-year students Member, Teacher Student Committee Member, Internship Committee | | | | | 9 |
| Moussaieff | Arieh | PhD | Senior Lecturer | metabolism; lipid metabolism; metabolomics; lipidomics; metabolism during early development; cancer metabolism | | 100 | 6.25 | 100 | 6.25 | | | | | 2 | 1 |
| Priel | Avi | PhD | Associate Professor | Ion channels Pharmacology and Biophysics with emphasis on pain receptors | | 100 | 6.5 | 100 | 6.5 | Head, Pharmacology Division Member, Planning and Development Committee Member, Teaching Committee Member, Advanced Studies Committee Member, Fellowships and Prizes Committee Member, Teacher Student Committee Member, Ground/Area Committee | | | | 2 | 4 |
| Reich | Reuven | PhD | Full Professor | Tumor Biology and Embryo Implantation | | 100 | 6 | 100 | 6 | Member, Mechanical Equipment Committee Head, Brettler Center Coordinator, Institute Seminars | | | | 0 | 5 |
| Shurki | Avital | PhD | Associate Professor | Enzyme Design, binding and affinity studies of cannabinoids and endocannabinoids, method development | | 100 | 6 | 100 | 6.6 | Head, Teacher Students Committee Head, Grass Center | | | | 0 | 1 |

| | | | | | | | | | | | | | | | |
|---------------|--------|-----|---------------------|--|--|-----|------|-----|------|---|--|--|--|---|---|
| Tam | Joseph | PhD | Senior Lecturer | The peripheral cannabinoid-1 receptor's (CB1R) role in treating the metabolic syndrome. Researching the molecular mechanisms potentially involved in the development of different aspects of the metabolic syndrome (obesity, fatty liver disease, nephropathy, osteoporosis, and mitochondrial dysfunction), with therapeutic prospects for the development of an effective drug therapy. | | 100 | 7.15 | 100 | 7.15 | Member and Teachers' Representative, Teaching Committee Head, Cannabinoid Center Member, PhD Acceptance Committee | | | | 5 | 5 |
| Tirosh | Boaz | PhD | Associate Professor | Pharmacology, Biochemistry, Immunology | | 100 | 6.6 | 100 | 6.6 | Vice Head, the School of Pharmacy Vice Director of the Institute for Drug Research Member, Planning and Development Committee Chair, Teaching Committee Member, Fellowships and Prizes Committee Member, Ground/Area Committee Member, Internship Committee | | | | 1 | 5 |
| Tsvelikhovsky | Dmitry | PhD | Associate Professor | Synthetic Medicinal Chemistry | | 100 | 9.05 | 100 | 9.05 | Supervisor, Excellence Program Supervisor, First-year students Member, Teacher Student Committee | | | | 3 | 1 |
| Wormser | Uri | PhD | Associate Professor | <ul style="list-style-type: none"> • Development of antidotes against chemical and heat-induced skin lesions. • Development of drugs for multiple sclerosis. • Development of drugs for systemic lupus erythematosus. • Development of drugs for autoimmune diseases. • The mechanism of action of T regulatory cells and their role in autoimmune disease. | | 100 | 3.5 | 100 | 3.5 | | | | | 0 | 0 |
| Yaka | Rami | PhD | Associate Professor | <ul style="list-style-type: none"> • Role of the glutamatergic system in relapse to cocaine. • Role of the NMDA receptor in cocaine-induced synaptic plasticity. • Role of GABA receptor in the acute effects of cocaine. • Molecular mechanism of | | 100 | 7.35 | 100 | 7.35 | Head, Advanced Studies Committee. Member, Teaching Committee Member, Fellowships and Prizes Committee Member, Internship Committee Member, PhD Acceptance Committee | | | | 4 | 5 |

| | | | | | | | | | | | | | | | |
|----------|---------|-----|---------------------------|---|----------|-----|-----|----------|-----|--|--|--|--|---|---|
| | | | | incubation of cocaine craving. • Role of the insula in cocaine addiction. • Antioxidants as a potential treatment for cocaine addiction. | | | | | | | | | | | |
| Yavin | Eylon | PhD | Associate Professor | • PNA • splice switching oligonucleotides • FIT-(Forced Intercalation)-PNA • cancer diagnosis • SNP detection • PNA-peptide conjugates | | 100 | 7.6 | 100 | 7.6 | Head, Drug Sciences and Chemistry Divisions Member, Planning and Development Committee Member, Teaching Committee Member, Advanced Studies Committee Member, Fellowships and Prizes Committee Member, Ground/Area Committee Member, PhD Acceptance Committee | | | | 2 | 2 |
| Benita | Simon | PhD | Full Professor (emeritus) | My research is focused on polymeric Nano and Microparticulate and lipid-based drug delivery systems aimed at improving ocular bioavailability, dermal penetration and drug targeting. Innovative original nano particulate carriers for enhanced oral bioavailability of poorly absorbed and highly lipophilic drugs which can be subjected to massive pre-systemic metabolism and P-gp efflux pump effect are currently under investigation. | Emeritus | | | Emeritus | 0 | | | | | 0 | 1 |
| Bialer | Meir | PhD | Full Professor | Pharmacokinetics of new antiepileptic drugs (AEDs) and pharmacokinetic-based design of new antiepileptics and CNS drugs | Emeritus | | 5.5 | Emeritus | 5.5 | | | | | 2 | 3 |
| Deutsch | Joseph | PhD | Full Professor (emeritus) | Chemical Synthesis and Pharmacological Characterization of New Steroidal Compounds | Emeritus | | 0 | Emeritus | 0 | | | | | 0 | 0 |
| Friedman | Michael | PhD | Full Professor (emeritus) | • Stem cell and symvastatin delivery systems for guided bone regeneration. • Novel sustained release delivery systems for local treatment of dental | Emeritus | | | Emeritus | | Representative for Pensioners. Member of ground/are committee | | | | 1 | 2 |

| | | | | | | | | | | | | | | | |
|------------|---------|-----|--------------------------------|--|----------|--|---|----------|---|--|--|--|--|---|---|
| | | | | <ul style="list-style-type: none"> pathologies • Stomach-retentive delivery system of polyphenols • Development of a novel oral delivery system for controlled release of neuroprotective natural alkaloid for treatment of alzheimer's disease and dementia • Prevention and treatment of oral squamos cell carcinomas using a novel sirolimus sustained release topical oral delivery system. • Single-dose administration of a novel subcutaneously-implanted controlled-release antimicrobial veterinary dosage form. | | | | | | | | | | | |
| Goldblum | Amiram | PhD | Full Professor (Emeritus) | <p>The discovery of novel and more effective drugs in the fields of – antibiotics, obesity, Immunotherapy, fertilization, Glycogen storage diseases, Physical Endurance, Cancer, Diabetis, NASH, High energy compounds, fragrances, sugar substitutes and more.</p> | Emeritus | | 3 | Emeritus | 3 | | | | | 3 | 4 |
| Gorinstein | Shela | PhD | Senior Scientist A+ (Emeritus) | <ul style="list-style-type: none"> • Dietary antioxidants and various radical scavenging methods for their determination • Coronary artery disease and moderate consumption of fruits and vegetables • Structure and functional properties of some plant proteins • Study of binding reactions between plant flavonoids and human serum albumin. | Emeritus | | 0 | Emeritus | 0 | | | | | 0 | 0 |
| Mechoulam | Raphael | PhD | Full Professor (Emeritus) | <ul style="list-style-type: none"> • Isolation and structure elucidation of plant cannabinoids • Isolation and structure elucidation of mammalian cannabinoids (anandamide | Emeritus | | 0 | Emeritus | 0 | | | | | 1 | 0 |

| | | | | | | | | | | | | | | | |
|------------|---------|-----|--------------------------------|---|----------|--|---|----------|---|--|--|--|--|---|---|
| | | | | and 2-AG). • Isolation and structure elucidation of novel endogenous molecules that act on brain damage; bone formation; addictions. | | | | | | | | | | | |
| Ringel | Israel | PhD | Associate Professor (Emeritus) | <ul style="list-style-type: none"> • The mechanism of action of anti-cancer, anti-microtubule, drugs • The application of NMR methods for the study of drug-protein and drug-cell interaction • Changes in cancer cell metabolism as a predictive tool for chemotherapy success using MRS. | Emeritus | | 0 | Emeritus | 0 | | | | | 1 | |
| Rubinstein | Abraham | PhD | Full Professor (Emeritus) | <ul style="list-style-type: none"> • Novel targeted platforms for the targeted treatment of IBD • Apical, combination treatment of colorectal cancer • Biomedical photonic approaches for early detection of IG malignancy. • Mucoadhesion • Colon-specific drug delivery. | Emeritus | | 0 | Emeritus | 0 | | | | | 1 | 1 |
| Sasson | Shlomo | PhD | Full Professor (Emeritus) | Diebetes research. | Emeritus | | 1 | Emeritus | 1 | | | | | 1 | 1 |
| Shohami | Esther | PhD | Full Professor (Emeritus) | <ul style="list-style-type: none"> • The pathophysiology of traumatic brain injury (TBI): mechanisms of damage and repair of motor and cognitive deficits. The role of neuroinflammation in the post-injury secondary damage. The role of the NMDA receptors in the cognitive decline after TBI • Mechanisms for the repair of learning and memory deficits after TBI • The role of cannabinoids in the recovery of motor and cognitive functions after TBI. Effect of cannabinoids | Emeritus | | | Emeritus | | | | | | 0 | 0 |

| | | | | | | | | | | | | | | | |
|--|-------|-----|---------------------------|--|----------|--|---|----------|---|--|--|--|--|----|----|
| | | | | (synthetic, plant-driven, endocannabinoids) on the recovery after TBI. Mechanism of action of endocannabinoids as neuroprotective and neuro-regenerative molecules. | | | | | | | | | | | |
| Touitou | Elka | PhD | Full Professor (Emeritus) | <ul style="list-style-type: none"> • Novel approach for enhanced and modulated dermal and transdermal drug delivery of peptides and small molecules • Nanocarriers for dermal treatments: atopic dermatitis, psoriasis, dermatoses. • Ethosomes: nano-vesicular carriers for efficient topical and transdermal delivery • Composition for treatment of burn • Nanocarrier for system and CNS delivery by nasal administration; novel therapy approaches for MS, Parkinson's disease, pain, emesis, insomnia, anxiety • New technologies for cosmetic products: skin care, nail mycoses and sunscreens. | Emeritus | | | Emeritus | | | | | | | 1 |
| Weinstock-Rosin | Marta | PhD | Full Professor (Emeritus) | <ul style="list-style-type: none"> • Neurochemical, behavioral and genetic effects of prenatal stress. • Development of novel drugs for inflammatory and neurodegenerative diseases. | Emeritus | | 0 | Emeritus | 0 | | | | | 0 | 0 |
| | | | | | | | | | | | | | | 55 | 94 |
| * In case the employment status in the institution and in the program are identical, this data can appear only once (please specify that this data is identical) | | | | | | | | | | | | | | | |
| **These columns are relevant only if the program has masters and doctoral degrees | | | | | | | | | | | | | | | |
| * In case the employment status in the institution and in the program are identical, this data can appear only once (please specify that this data is identical) | | | | | | | | | | | | | | | |
| **These columns are relevant only if the program has masters and doctoral degrees | | | | | | | | | | | | | | | |
| * In case the employment status in the institution and in the program are identical, this data can appear only once (please specify that this data is identical) | | | | | | | | | | | | | | | |

| Table 9 - Faculty (Academic Staff) - Junior Faculty Employed (such as: TAs; RAs) | | | | | | | | | | | |
|--|-----------|-----------------|-----------------|------------------------|--------------------------------------|---------------------|---------------------------------|---------------------|--|--------------|--|
| Faculty Member | | | | | Part of Position in the Institution* | | Part of Position in the Program | | Courses taught by the faculty member | | |
| First Name | Last Name | Academic Degree | Employment Rank | Area of Specialization | Weekly hours | Position percentage | Weekly hours | Position percentage | Name of Course | Weekly Hours | |
| Abdalhay | Nour | Ph.D. | RA | Pharmacology | 5.5 hrs | 0.25 | same | same | Pharmacology | same | |
| Agabaria | Majd | Ph.D. | RA | Pharmacy | 5.5 hrs | 0.25 | same | same | Pharmacy A | same | |
| Amayev | Ben Tsion | Ph.D. | RA | Pharmacy | 5.5 hrs | 0.25 | same | same | Pharmacy A | same | |
| Arshaiyad | Tujan | Pharm D | TA | Clinical Pharmacy | 3 hrs | 0.15 | same | same | Pharmacotherapy | same | |
| Azar | Shahar | Ph.D. | RA | Pharmacology | 5.5 hrs | 0.25 | same | same | Pharmacology | same | |
| Babu | Tomer | Ph.D. | RA | Clinical Medicine | 5.5 hrs | 0.25 | same | same | Analysis of Medical Substances | same | |
| Bengor | Alexey | Ph.D. | RA | Pharmacology | 5.5 hrs | 0.25 | same | same | Pharmacology | same | |
| Bibi | David | Ph.D. | RA | Clinical Pharmacy | 5.5 hrs | 0.25 | same | same | Pharmacokinetics | same | |
| Biton | Reut | Ph.D. | RA | Pharmacy | 5.5 hrs | 0.25 | same | same | Pharmacy | same | |
| Biton | Bar | Pharm D | TA | Clinical Pharmacy | 5.5 hrs | 0.15 | same | same | Clinical Pharmacy | same | |
| Bruck | Reut | Ph.D. | RA | Pharmacy | 5.5 hrs | 14 +11% | same | same | Pharmaceutical Sciences | same | |
| Cohen | Hagar | Pharm D | TA | Clinical Pharmacy | 5.5 hrs | 0.15 | same | same | Clinical Pharmacy | same | |
| Cohen | Rachel | Pharm D | TA | Clinical Pharmacy | 3 hrs | 0.15 | same | same | Pharmacotherapy | same | |
| Corem | Yaara | Ph.D. | RA | Pharmacy | 5.5 hrs | 0.25 | same | same | Pharmacy B | same | |
| Darawashi | Odai | M.Sc. | TA | Pharmacology | 5.5 hrs | 0.25 | same | same | Pharmacology | same | |
| Dayef | Maharan | Ph.D. | RA | Chemistry | 5.5 hrs | 0.25 | same | same | Bioorganic Chemistry-Laboratory | same | |
| El-Atawneh | Shayma | Ph.D. | RA | Pharmacy | 5.5 hrs | 0.25 | same | same | Pharmacy B | same | |
| Filoppov | Natalie | Ph.D. | RA | Pharmacology | 5.5 hrs | 0.25 | same | same | Pharmacology | same | |
| Fluchsmann | Arnon | Ph.D. | RA | Pharmacy | 5.5 hrs | 0.25 | same | same | Pharmaceutical Technologies C | same | |
| Forman | Tobi | Ph.D. | RA | Clinical Medicine | 5.5 hrs | 0.25 | same | same | Analysis of Pharmaceutical Agents - Laboratory | same | |
| Friedman | Natanel | Ph.D. | RA | Pharmacy | 5.5 hrs | 0.25 | same | same | Pharmacy B | same | |
| Gabaly | Siham | Pharm D | TA | Clinical Pharmacy | 3 hrs | 0.15 | same | same | Clinical Pharmacy | same | |
| Geron | Matan | Ph.D. | RA | Pharmacology | 5.5 hrs | 0.25 | same | same | Pharmacology | same | |
| Goldman | Amalia | M.Sc. | TA | Clinical Pharmacy | 5.5 hrs | 0.25 | same | same | Bioorganic Chemistry-Laboratory | same | |
| Goldstein | Yoel | Ph.D. | RA | Pharmacy | 5.5 hrs | 0.25 | same | same | Pharmacy | same | |
| Haim-Zadah | Moran | Ph.D. | RA | Chemistry | 5.5 hrs | 0.25 | same | same | Analysis of Pharmaceutical Agents - Laboratory | same | |
| Hajyahia | Sahar | Pharm D | TA | Clinical Pharmacy | 3 hrs | 0.15 | same | same | Clinical Pharmacy | same | |
| Hamou | Yael | Pharm D | TA | Clinical Pharmacy | 3 hrs | 0.15 | same | same | Clinical Pharmacy | same | |

| | | | | | | | | | | |
|-------------|------------|---------|----|---------------------|---------|------|------|------|--|------|
| Itin | Konstantin | Ph.D. | RA | Pharmacy | 5.5 hrs | 0.25 | same | same | Pharmacy | same |
| Izgelov | Dvora | Ph.D. | RA | Pharmacy | 5.5 hrs | 0.25 | same | same | Pharmacy A | same |
| Jabara | Douaa | Ph.D. | | Pharmacy | 5.5 hrs | 0.25 | same | same | Pharmaceutical Technologies C | same |
| Karsch | Adi | Ph.D. | RA | Pharmacy | 5.5 hrs | 0.25 | same | same | Pharmaceutical Technologies C | same |
| Katan | Liora | Ph.D. | RA | Pharmacology | 5.5 hrs | 0.25 | same | same | Pharmacology | same |
| Khayat | Alaa | Ph.D. | RA | Pharmacology | 5.5 hrs | 0.25 | same | same | Pharmacology | same |
| Klinger | Adi | Ph.D. | RA | Pharmacy | 5.5 hrs | 0.25 | same | same | Pharmacy A | same |
| Lankri | David | Ph.D. | RA | Pharmacology | 5.5 hrs | 0.25 | same | same | Bioorganic Chemistry-Laboratory | same |
| Leshem | Ragina | Ph.D. | RA | Clinical Pharmacy | 5.5 hrs | 0.25 | same | same | Pharmacotherapy | same |
| Levin | Nimrod | Ph.D. | RA | History of Sciences | 3 hrs | 0.13 | same | same | History of Science | same |
| Livne | Ariela | Ph.D. | RA | Chemistry? | 5.5 hrs | 0.25 | same | same | Analysis of Pharmaceutical Agents - Laboratory | same |
| Martouf | Yosef | Ph.D. | RA | Pharmacology | 5.5 hrs | 0.25 | same | same | Pharmacology | same |
| Martsbach | Shira | Ph.D. | RA | Pharmacy | 5.5 hrs | 0.25 | same | same | Pharmacy | same |
| Minkowicz | Lior | Ph.D. | RA | Pharmacy | 5.5 hrs | 0.25 | same | same | Pharmaceutical Technologies C | same |
| Muhameed | Mohamed | Ph.D. | RA | Pharmacology | 5.5 hrs | 0.25 | same | same | Organic Chemistry A | same |
| Nmarneh | Alaa | Ph.D. | RA | Pharmacology | 5.5 hrs | 0.25 | same | same | Pharmacology | same |
| Noy | Gilad | Ph.D. | RA | Pharmacology | 5.5 hrs | 0.25 | same | same | Pharmacology | same |
| Obiedat | Akraam | Ph.D. | RA | Pharmacology | 5.5 hrs | 0.25 | same | same | Pharmacology | same |
| Onallah | Hadil | Ph.D. | RA | Pharmacology | 5.5 hrs | 0.25 | same | same | Pharmacology | same |
| Rebibo | Leslie | Ph.D. | RA | Pharmacy | 5.5 hrs | 0.25 | same | same | Pharmacy B | same |
| Rekach | Bruriah | Ph.D. | RA | Clinical Pharmacy | 5.5 hrs | 0.25 | same | same | Pharmacotherapy | same |
| Ron | Sapir | Ph.D. | RA | Pharmacy | 5.5 hrs | 0.25 | same | same | Pharmaceutical Technologies C | same |
| Sayef | Mansour | Ph.D. | RA | Pharmacy | 5.5 hrs | 0.25 | same | same | Pharmaceutical Technologies C | same |
| Shakarov | Avi | Pharm D | TA | Clinical Pharmacy | 3 hrs | 0.15 | same | same | Pharmacotherapy | same |
| Shmueli | Ariela | Pharm D | TA | Clinical Pharmacy | 3 hrs | 0.15 | same | same | Pharmacotherapy | same |
| Shusterman | Bella | M.Sc. | TA | Pharmacy | 5.5 hrs | 0.25 | same | same | Pharmacokinetics | same |
| Shvindelman | Osnat | Ph.D. | RA | Pharmacy | 5.5 hrs | 0.25 | same | same | Pharmacy A | same |
| Slatina | Yael | Pharm D | TA | Clinical Pharmacy | 3 hrs | 0.15 | same | same | Pharmacotherapy | same |
| Solomon | Rotem | Pharm D | TA | Clinical Pharmacy | 3 hrs | 0.15 | same | same | Pharmacotherapy | same |
| Soudah | Terese | Ph.D. | RA | Chemistry | 5.5 hrs | 0.25 | same | same | Bioorganic Chemistry-Laboratory | same |
| Stein | Noga | Ph.D. | RA | Pharmacology | 5.5 hrs | 0.25 | same | same | Pharmacology | same |
| Steinman | Noam | Ph.D. | RA | Chemistry | 5.5 hrs | 0.25 | same | same | Chemistry (Introduction to Biochemistry) | same |
| Suliman | Jessica | Pharm D | TA | Clinical Pharmacy | 3 hrs | 0.15 | same | same | Pharmacotherapy | same |
| Tetro | Nino | Ph.D. | RA | Clinical Pharmacy | 5.5 hrs | 0.25 | same | same | Pharmacy A | same |

| | | | | | | | | | | |
|------------|--------|---------|----|-------------------|---------|------|------|------|--|------|
| Treves | Nir | Ph.D. | RA | Clinical Pharmacy | 5 hrs | 0.2 | same | same | Drug literature and biostatistics | same |
| Weitz | Moriah | Ph.D. | RA | Pharmacology | 5.5 hrs | 0.25 | same | same | Pharmacology | same |
| Wolk | Omri | Ph.D. | RA | Chemistry | 5.5 hrs | 0.25 | same | same | Chemistry (Introduction to Biochemistry) | same |
| Zafran | Ilan | Ph.D. | RA | Pharmacology | 5.5 hrs | 0.25 | same | same | Pharmacology | same |
| Zaikin | Igor | Pharm D | TA | Clinical Pharmacy | 3 hrs | 0.15 | same | same | Clinical Pharmacy | same |
| Zaks | Eliahu | Pharm D | TA | Clinical Pharmacy | 3 hrs | 0.15 | same | same | Clinical Pharmacy | same |
| Zaydenberg | Chen | Pharm D | TA | Clinical Pharmacy | 3 hrs | 0.15 | same | same | Clinical Pharmacy | same |
| Zlotber | Ivan | M.Sc. | TA | Chemistry | 5.5 hrs | 0.25 | same | same | Bioorganic Chemistry - Laboratory | same |
| Zmiro | Yara | Pharm D | TA | Clinical Pharmacy | 3 hrs | 0.15 | same | same | Clinical Pharmacy | same |
| | | | | | | | | | | |

Table 10 - Adjunct Faculty

| Faculty Member | | | | | Employment in the Institution | | | |
|------------------------|------------|-----------------|-------------------------|------------------------|-------------------------------|--|--|---|
| Last name | First Name | Academic Degree | Employment Rank | Area of Specialization | Weekly Teaching Hours | Courses taught by lecturer | | Additional tasks in the institution |
| Arien-Zakay | Hadar | Ph.D. | Senior Adjunct Lecturer | Pharmacology | Average of 17 hours | <ul style="list-style-type: none"> •The sick patient: diseases of the gastrointestinal tract and the liver •Endocrinology disease states •Pharmacology - general •Heart and blood vessels of the sick person •The respiratory system of the sick person •The nervous system of the sick person •Pharmacology A •Pharmacology B •Biological drugs •Advanced Pharmacology •Disease Etiology •Basic Principles in Pharmacology •Pharmacological Basis of Disease Treatment •Introduction to Pharmacology •Time for drug science 2018-2019 •Workshop in drugs design and development | | Project "Excellence in Pharmacy" a unique novel program in high schools. Development in an integrative computer lab in pharmacology |
| Ta-Shma | Rachel | Ph.D. | Senior Teacher | | Average of 7 Hours | Fundamentals of Analytical Chemistry; Analysis of Pharmaceutical Agents - Laboratory | | |
| Yosselson - Superstine | Shimona | Ph.D. | Full Professor | Clinical Pharmacy | Average of 12.9 hours | <ul style="list-style-type: none"> •Clinical pharmacy Residency in Hospital •Specialization in community clinical pharmacy •Residency in Clinical Pharmacy •Basic Skills in Clinical Pharmacy •Clerkship In Clinical Pharmacy •Clinical Pharmacy Workshop •Preparation for Residency in Clinical Pharmacy •Pharmacotherapy - Advanced 2 | | Director of Continuing Studies |

Table 11 - Recruitments and Retirements - previous 5 years

| Year | Recruited/Retired | Name | Rank | Specialization |
|---------|-------------------|------------------------------|----------------|--|
| 2018-19 | Retired | Lazarovici Philip | Full Professor | Neuropharmacology, neuro-oncology and neural engineering |
| | Retired | Yosselson-Superstine Shimona | Adjunct Prof. | Clinical Pharmacy |
| | | | | |
| | Retired | Sasson Shlomo | Full Professor | Diabetes |

| | | | | |
|---------|-----------|--------------------|-----------------|--|
| 2017-18 | | | | |
| 2016-17 | Retired | Bialer Meir | Full Professor | Pharmacokinetic drugs & PK-based drug design |
| 2015-16 | Retired | Benita Simon | Full Professor | Nano drug delivery |
| 2014-15 | Recruited | Moussaieff Arie | Senior Lecturer | |
| | Retired | Goldblum Amiram | Full Professor | Molecular modeling and drug design |
| | Retired | Rubinstein Abraham | Full Professor | Drug Delivery |

| Table 12 - Recruitments and Retirements - upcoming 3 years | | | | |
|--|----------------|----------------------|-------------------------|---|
| Year | Recruit/Retire | Name | Rank | Specialization |
| 2019-20 | Recruit | Amal Haitham | Senior Lecturer | Biology and Pharmacology of Autism |
| | Recruit | Margulis Katy | Senior Lecturer | Applying and developing methods for ambient mass spectrometry imaging to address fundamental questions in medicine and to guide therapeutic intervention and drug delivery |
| | Recruit | Sheih-Ahmad Tawfeeq | Senior Lecturer | Induced neuronal damage through reactive oxygen species and mitochondria. · Mechanisms underlying epileptogenesis. · Gene therapy strategies for the treatment of epilepsy. · Identify and delivery of antioxidant treatments to the brain to combat oxidative stress and related neurodegenerative diseases. · Pharmacokinetics-based design of new antiepileptics and CNS drugs. · Structure – pharmacokinetic-pharmacodynamic relationship (SPPR). · Stereospecific pharmacokinetic and pharmacodynamic analysis of chiral drugs |
| | Recruit | Hirsch-Rokach Bruria | Adjunct Senior Lecturer | Clinical Pharmacy |
| | Recruit | Rostchild Victoria | Adjunct Lecturer | Clinical Pharmacy |
| | Retire | Gibson Dan | Full Professor | Platinum Anticancer Agents |
| | Retire | Golomb Gershon | Full Professor | Drug delivery and therapy |
| | Retire | | | |
| 2020-21 | Recruit | Komagorsky Rina | Adjunct Lecturer | Clinical Pharmacy |
| | Retire | Domb Abraham | Full Professor | Biopolymers |
| | Retire | Hoffman Amnon | Full Professor | Biopharmaceutics of Drug development |
| | Retire | Reich Reuven | Full Professor | Cancer Research |
| | Retire | Wormser Uri | Full Professor | Autoimmunity and dermal toxicology |
| 2021-22 | Retire | Kohen Ron | Full Professor | Oxidative Stress, Antioxidants and Polyphenols |

Table: Emeritus faculty involvement in the program (teaching courses/research/advising graduate students).

| Emiriti Researchers | | | | | |
|---------------------|------------|------------|------------------|----------|-------------------|
| Family Name | First Name | Discipline | Teaching courses | Research | Advising students |
| Benita | Simon | Pharmacy | No | Yes | Yes |
| Bialer | Meir | Pharmacy | Yes | Yes | Yes |

| | | | | | |
|-----------------|---------|--------------|-----|-----|-----|
| Deutsch | Joseph | Chemistry | No | Yes | No |
| Friedman | Michael | Pharmacy | No | Yes | Yes |
| Goldblum | Amiram | Chemistry | Yes | Yes | Yes |
| Mechoulam | Raphael | Chemistry | No | Yes | Yes |
| Ringel | Israel | Pharmacology | No | Yes | Yes |
| Rubinstein | Abraham | Pharmacy | No | Yes | Yes |
| Sasson | Shlomo | Pharmacology | Yes | Yes | Yes |
| Shohami | Esther | Pharmacology | No | Yes | No |
| Touitou | Elka | Pharmacy | No | Yes | No |
| Weinstock-Rosin | Marta | Pharmacology | No | Yes | No |

Table: The division of faculty members into areas of specialty in the discipline.

| Division of Faculty Members into Areas of Specialty in Discipline | | |
|---|---------------|-------------------|
| Family name | First name | Discipline |
| Arien-Zakay | Hadar | Pharmacology |
| Benny | Ofra | Pharmacy |
| Blum | Galia | Chemistry |
| Domb | Abraham (Avi) | Chemistry |
| Eyal | Sara | Clinical Pharmacy |
| Gibson | Dan | Chemistry |
| Golomb | Gershon | Pharmacy |
| Hoffman | Amnon | Clinical Pharmacy |
| Kohen | Ron | Pharmacy |
| Lazarovici | Philip | Pharmacology |
| Levi-Schaffer | Francesca | Pharmacology |
| Matok | Ilan | Clinical Pharmacy |
| Moussaieff | Arieh | Pharmacy |
| Priel | Avi | Pharmacology |
| Reich | Reuven | Pharmacology |
| Shurki | Avital | Chemistry |
| Tam | Joseph | Pharmacology |
| Tirosh | Boaz | Pharmacology |
| Tsvetkikhovsky | Dmitry | Chemistry |
| Wormser | Uri | Pharmacology |
| Yaka | Rami | Pharmacology |
| Yavin | Eylon | Chemistry |

| Emiriti Researchers | | |
|---------------------|---------|--------------|
| Benita | Simon | Pharmacy |
| Bialer | Meir | Pharmacy |
| Deutsch | Joseph | Chemistry |
| Friedman | Michael | Pharmacy |
| Goldblum | Amiram | Chemistry |
| Gorinstein | Shela | Chemistry |
| Mechoulam | Raphael | Chemistry |
| Ringel | Israel | Pharmacology |
| Rubinstein | Abraham | Pharmacy |
| Sasson | Shlomo | Pharmacology |
| Shohami | Esther | Pharmacology |
| Ta-Shma | Rachel | Chemistry |
| Touitou | Elka | Pharmacy |
| Weinstock-Rosin | Marta | Pharmacology |

5.5. Diversity (max. 1 page)

5.5.1. Specify the institutional and departmental policy and goals regarding diversity of faculty and students (gender and minorities equality).

The School is interested to promote diversity, both among students and faculty. It actively tries to reduce gender asymmetry and increase the number of minorities, residents of developing areas, and followers of certain religious sectors without any compromise on the academic level. It should be noted that over 50% of the pharmacy undergraduate students are Arabs, since attention must be given to open the pharmacy profession to all communities in Israel. The School is involved in various special programs aimed at reaching these goals. Examples include a) the involvement of the school in teaching at various high schools in developing cities, b) the involvement of the School in designing the program, "A Step Ahead Everyone," for Arab students, and c) plans for a new program aimed at opening pharmacy

studies to the Jewish ultra-orthodox community. In the graduate programs students are accepted based on their merit and qualifications. The school is not involved in the recruiting process of graduate students; this is done individually by each faculty member based on the fitness of the candidate to the opening position. Minority graduate students as well as Olim Hadashim and graduate students from the Ethiopian community have designated competitive stipend grants that assist them during their studies. Most postdoctoral fellows accepted for training at the school research laboratories are Indian, and about 20 postdoctoral fellows perform research at the school at any point in time.

The School's active faculty members consist of 23 XX full time faculty of which XX are men and YY are women. This year we hired three full time faculty members and three 50% pharmacy teachers who will start their academic position in the coming 2019-2020 school year. Two of the hired faculty are Arabs and the third is a woman. All three pharmacy teachers are women. It should be noted that these new faculty staff were selected based on academic excellence only, which has been always the policy.

5.5.2. Specify the mechanisms and activities supporting the implementation of the policy.

Students and faculty members are accepted based on their qualifications and merits without quota or other considerations.

In our view the disproportion in the undergraduate student diversity and registration is related to the low prestige of the pharmacy profession. Changing this image will increase the number of candidates registered for pharmacy studies as well as their diversity.

With regard to the ultra-orthodox community, we are in the process of opening a unique joint program with the Lev Academic Center so that students will start their first two years of pharmacy studies at the Lev Academic Center (separate classes for women). After two years the students will register at the Hebrew University and join the regular third year class in pharmacy studies.

5.5.3. In summary, what are the points of strength and weakness of the issues specified in this chapter?

Strength: The school policy with regard to gender and diversity of students and faculty has always conformed to the university's general policy to avoid discrimination. The School never had direct policies to promote minorities or women. This happened naturally. Academic merit and excellence have been and should be the main criteria for acceptance of students and faculty members. The School should open opportunities to the ultra-orthodox community to study pharmacy as well as encourage registration to study pharmacy for all communities living in Israel.

Supporting Documents:

Tables 13-14 (Excel appendix).

| Table 13 - Gender Equality | | | | | | |
|-----------------------------------|---|-----------------|---------------------|----------------|--|-------------------|
| | Percentage of faculty members in program/department | | | | Percentage of students in the program/department | |
| Rank | Adjunct Lecturer | Senior Lecturer | Associate Professor | Full Professor | | |
| Female Faculty | 100% | 33.33% | 33.33% | 23.81% | 79 | BA |
| 11=30.55% | | | | | 58 | MASTER |
| | | | | | 85 | Clinical Pharmacy |
| | | | | | 55 | Ph.D |

| | | | | | | |
|---------------------|----|--------|--------|--------|----|-------------------|
| | | | | | 73 | Total Average |
| | | | | | | |
| Male Faculty | 0% | 66.67% | 66.67% | 76.19% | 21 | BA |
| 25=69.447% | | | | | 42 | MASTER |
| | | | | | 15 | Clinical Pharmacy |
| | | | | | 45 | PhD |
| | | | | | 27 | Total Average |

| Table 14 - Equality of Minorities | | | | | |
|-----------------------------------|---|-----------------|---------------------|----------------|--|
| | Percentage of faculty members in program/department | | | | Percentage of students in the program/department |
| Rank | Lecturer | Senior Lecturer | Associate Professor | Full Professor | |
| Minorities | N/A | N/A | N/A | N/A | Non-Jewish 43% |

5.6. Research (max. 15 pages)

5.6.1. Describe how the department's research activities correspond with the institution's overall mission and goals.

The Hebrew University's mission is to develop cutting edge research, and to educate future generations of leading scientists and scholars in all fields of learning. The Hebrew University is part of the international scientific and scholarly network. It measures itself by international standards and strives to be counted among the best research universities worldwide.

IDR Mission: The Institute for Drug Research (IDR) is unique. It includes scientists and research groups from various fields of drug-related research (chemistry, classical and cellular pharmacology, pharmaceutical sciences, and clinical pharmacy). They are performing interdisciplinary medical research, from basic computerized drug design through synthesis of novel molecules as well as their biological and therapeutic investigation to the development of sophisticated targeted drug delivery systems.

The IDR is uniquely designed to operate in the interface of basic and applied research. It works alongside the pharmaceutical industry in new initiatives hand in hand with leading physicians from the Hadassah Medical Center, contributing its exceptional and invaluable experience and knowledge. This unique position and multidisciplinary approach provide optimal conditions to generate cutting-edge research and promising therapeutic solutions.

Academic promotion is based on research achievements determined by international standards for excellence. This includes the quality and number of published articles and patent filing, grant winning, international visibility, etc.

Research Summary –

Pharmaceutical Science research focuses on identifying and developing bioactive agents that potentially may result in a drug, formulations, and drug delivery systems. This includes studying physio-chemical properties, mechanisms of activity, toxicity, elimination, and pharmacokinetics and pharmacodynamics. Pharmaceutical research has been the main field of research in IDR since the beginning of the School of Pharmacy in 1953, with a clear mission of providing basic training for pharmacists and a solid core of research in this field. Until 2000 the Hebrew University-School of Pharmacy held an exclusive status as the academic institute with the only Pharmacy School in Israel, partially explaining its dominance at the national level and its status as the leading and most experienced pharmacy research division up to date.

The emerging field of polymer sciences and controlled drug delivery that started in the 1980s has had an immediate impact on the research done in the Pharmaceuticals sciences division.

Each faculty member has been able to develop a distinct research niche that is identified with him. For example, liposomal drug delivery, and oligonucleotide delivery in cardiovascular diseases (Prof. Golomb), targeted oral delivery (Prof. Rubinstein), solution and particulate systems for ocular diseases (Prof. Benita), topical delivery for skin pathologies and systemic disease (Prof. Touitou), and oxidative stress, dermal delivery, and diagnostics (Prof. Kohen). Possibly the most **exceptional and outstanding achievement** of the Pharmaceuticals Science research in the IDR is related to the high level translational and applicative research that attract industry interest due to the potential for commercialization. Indeed, the discipline possesses a special status as one of the leading units in the Hebrew University in regard to innovations (including 10 Kaye Innovation Awards) for innovative research), papers (> 900 amongst 8 PIs), patents (> 200) and commercialization. About 20 drug products were developed by IDR members, integrating medicinal chemistry, pharmaceutical sciences, and pharmacology. Many other technologies are currently in various stages of clinical development. Selected examples of such commercialized products are Periochip, Excelon, Theotrim, Dilatam, Deximune, Canker Cover, and OraMoist. To be able to keep up-to-date with the future demands of the profession and to remain being relevant and current, in the recent years the research activity in Pharmaceutical Science was expanded to include big data oriented formulation design, nanomedicine, and personalized medicine.

Two of the younger faculty members cover some of the expertise in nanomedicine and big data: Dr. Ofra Benny who was recruited in 2013 started a lab on nanomedicine that includes advanced technologies of microfluidics and 3D printing of drug related devices and slow release system, and computational approaches for personalized nanomedicine. Dr. Benny won an ERC-starting grant in 2018 in addition to the ISF, Marie Curie, and M-Era NET consortia. Dr. Mussaioff that was recruited in 2014 and established a lab for large-scale metabolomics using mass spectrometer aimed in drug identification and studying basic drug mechanisms related to fertilization and embryo development. In 2019 two new investigators, Dr. Kathia Margulis and Dr. Tawfeeq Sheikh-Ahmad will join Pharmaceutical Science and are expected to strengthen the research in nanomedicine, large data, and pharmacokinetics in possessing the core knowledge of traditional pharmacy, e.g., galenic preparation and principles in neuronal diseases and cancer.

The on-going challenge in the Pharmaceutical Science remains finding the right balance between pharmacokinetics versus expanding research in innovative technologies (such as nanomaterials, 3D printing external triggered drug delivery, etc.). This may attract students and funding but on the other hand might increase the gap for translation and drug discovery, possibly reducing basic pharmacy knowledge.

The overall mission of the Institute for Drug Research (IDR) at the School of Pharmacy is to improve human health by conceiving novel approaches to treat a plethora of diseases. The IDR goals include:

- (1) Design and synthesis of novel therapeutics.
- (2) Elucidation of drug mechanisms of action at the molecular level.
- (3) Studying the overall fate of a drug in the human body.
- (4) Designing novel drug carriers for improved potency and safety.

The Medicinal Chemistry research activities are focused primarily on several goals (1). These include computational drug design, synthesis of novel biologically active compounds, synthesis of improved derivatives of known drugs, new methodologies for the synthesis of natural compounds and their derivatives, synthesis of new imaging agents for disease diagnosis, development of bio-degradable biopolymers for drug delivery, synthesis of gene silencing molecules, synthesis of molecules for the detection of biomarkers associated with

diseases, and the development of theoretical models for the prediction and deciphering of binding/action modes of drugs.

The main goals of the pharmacology section are to lead pharmacology research and education. Typical research includes: determine the mechanism of reduction of back pain with CBD and other agents, study the development of addiction to various agents, obesity mechanism and drug therapies, optimization of multidrug treatment of cancer, autism, and cannabis drugs. These research activities are in line with our overriding objectives – to hire the best possible faculty and to carry out the best possible research with the help of the best possible graduate students. High-quality research goes hand in hand with the best possible graduate and undergraduate studies.

5.6.2. Provide an overview of the department's research activities:

IDR consists of four research disciplines: Medicinal chemistry, Pharmaceuticals, Clinical Pharmacy and Pharmacology. The researchers within these disciplines perform independent research as well as collaborative research with colleagues within IDR or with colleagues from the Hadassah Hospital, faculty members and colleagues from Hebrew University and other universities that complement their research. The research topics represent the four disciplines, typical research projects are described below:

Prominent research fields and activities:

Molecular diagnostics: In this field activities include:

- (1) development of protease activity probes for the detection (and therapy) of human pathologies such as cancer and atherosclerosis.
- (2) development of FIT-PNA probes for the detection of RNA biomarkers associated with human disease such as cancer and malaria.
- (3) contrast agents for marking tumor suspicious sites in breast during mammography.

Novel Therapeutics: In this field activities include:

- (1) development of novel molecules as drug candidates for treating a variety of diseases such as epilepsy, cancer, Alzheimer disease, chronic pain and inflammation, therapeutic cannabinoids and derivatives, iron chelators for treating cancer, anti-prolactin agents, etc.

Drug Modeling: In this field activities include:

- (1) modeling enzymatic reactions and designing novel enzymes.
- (2) molecular modeling and drug design.

Drug delivery: In this field activities include various methods for the delivery of drugs from IV injections to skin formulation, nanoparticles, and targeted delivery carriers. Delivery of small molecules, peptides and proteins, oligo and polynucleotides, gene therapy, cell therapy, and tissue engineering using various delivery technologies have been developed with several reaching the market.

The Pharmacology discipline focusses on neuroscience and brain disorder diseases, metabolic diseases, fertility, cancer, infections, and cellular and molecular immunological research.

In the past three years, pharmacology discipline members were awarded more than 8.5 million USD in competitive grants and mentored more than 30 graduate students. Several members of the department were honored with both national and international awards throughout the years, including the Distinguished Israel Award to Prof. Weinstock-Rosin. Thus, taking into account that

the Pharmacology Department is quite small compared to other international pharmacology departments, the research done in this department is impressive.

Past and present research impact and most significant research contributions.

Past research impact in the Medicinal Chemistry Department relates to 3 researchers.

Prof. Raphael Mechoulam Prof. Raphael Mechoulam (Israel Prize recipient; member Israel Academy of Science) isolated and elucidated the structures of Δ^9 -THC, the psychoactive Constituent in cannabis, as well as numerous other natural cannabinoids, including cannabidiol (CBD), which is widely used as a drug. Dr. Zeev Ta-Shma in collaboration with Prof. Marta Weinstock-Rosin (Israel Prize laureate, IDR) developed a drug for the treatment of Alzheimer's disease (Exelon). The biopolymers team developed implantable biodegradable balloons, InSpace, and Bioprotect; Maze water purification system; Deximmun cyclosporine capsule and mucoadhesive tablets (Canker Cover and Oramoist). Present research impact and most significant research contributions includes: The Tsvelikhovsky Lab has developed methodologies for the synthesis of multiple targets via sequence of controlled, simple and atom economy reactions from a single common molecular unit. This has led to simplified access to a wide variety of important classes of biologically active and structurally interesting molecules. Galia Blum is developing novel imaging molecules and nanoparticles that allow better detection of diseases like cancer. The Yavin Lab has recently developed FIT-PNAs that detect RNA biomarkers in fresh cancerous tissues taken directly from the operating room. The Goldblum Lab focuses on the computational discovery of novel bioactive molecules. They use in-house developed algorithms for the discovery of CB1R peripheral antagonists to combat obesity, Toll-Like Receptor agonists and antagonists for modulation of the immune system, iron chelators to block ribonucleotide reductase in cancer, candidates for treating glycogen disorder diseases, and PPAR-delta agonists for several indications including NASH.

Possible challenges and opportunities: There is extensive collaboration among research teams within the School of Pharmacy and partners from the faculty and other universities in Israel and abroad. For example, the Domb team is collaborating with Hoffman's team on PNL oral formulations and on mucoadhesives, Domb has a joint Ph.D. student with Goldblum on the computation of high energy compounds. He has joint students in the Faculty of Law, the Parasitology Department, and collaboration with Hadassah physicians to develop novel drug delivery, therapeutics, and diagnostics.

5.6.3. Specify the journal ranking the department relates to when evaluating faculty publications. If the department or institution has its own scale (not international) or another method for evaluating (e.g. peer review), provide a brief description and the ranking list.

There is no internal ranking of journals as the school members publish in diverse fields that do not allow internal scale of ranking. We use the standard of the Web of Science Journal Ranking or Google Scholar.

5.6.4. Specify the intellectual property policy of the institution in relation to the department.

The university has clear guidelines regarding inventions and commercialization of IP. Any IP developed as part of university research belongs, by default, to Yisum, a Hebrew University-owned company that deals with technology transfer and IP issues developed at the university. All inventions are assigned to Yisum, whose management decides on the IP and patent filing and maintaining of each invention. All non-IP service agreements between

companies/organizations and Hebrew University personnel (academic or administrative) are done through Yisum. The net revenues from inventions commercialized through Yisum are divided as 40:40:20 to the inventors, university (including Yisum), and the research team. Thus, researchers have an incentive to develop IP, as does the university. Yisum is responsible for patent filing and maintenance, licensing of patents and knowhow, and undertaking actions towards commercialization. Typically, a researcher who produces an invention fills out a form that summarizes the invention, the agencies that supported the research, the researchers involved, and their percentage in the invention. This document is signed by the School head and dean and passed to Yisum that evaluates the invention. If approved by the appropriate committee to proceed, the invention is written and filed in a provisional application. A one page description of the invention is filed in Yisum website to enable companies to approach Yisum for possible licensing. After one year, if no interested party is found, the provisional application may be filed again or proceed to PCT, usually when there is already a licensee. Commercialization is a joint effort of the inventor and Yisum.

5.6.5. Describe the commercialization unit of the institution, its function, number of patents registered, and where have they been registered.

School of Pharmacy faculty members are attuned to commercialization of technologies developed in their laboratories. Faculty members consult with Yisum on patent filing, preparing white papers, and meeting with companies and organizations for technology transfer. Faculty members file applications to the innovation authorities (Nofar and Kamin programs) and open new companies through incubators. The industry is a major contributor to the support of research performed at the School of Pharmacy.

In summary, what are the points of strength and weakness of the issues specified in this chapter?

Strength: Research at the School of Pharmacy is intensive. Some contribute more, others contribute less. Our objective is to further increase the capacity of research, so that more faculty members publish high impact articles.

Weaknesses: Faculty members as well as the school management should make more efforts to gain support for graduate students and improve research facilities. Motivation to initiate more research is dependent on the faculty member, each and every one of whom should make every effort to gain more funding to allow hiring more graduate students and postdoctoral fellows as well as perform expensive high risk studies that may result in high impact articles. Our international ranking is below the general ranking of the Hebrew University.

Supporting Documents:

Tables 15-16 (Excel appendix).

List: cooperation activities by department members both in Israel and abroad (last 5 years).

| Table 15 - Research Resources - last 3 years | | | | | |
|---|--|---------|--|-----------|--------|
| Arien-Zakay Hadar | Pharmacology education | 56,000 | HUJI- Online Teaching Unit, the Rector's office, and matching with Faculty of Medicine Dean's office | 2018-19 | 56,000 |
| Benny Ofra | Experimental Tumor 3d organoids for brain tumors | 40,000 | Faculty of Medicine, HUJI, grants for personalized medicine (Internal) | 7/2018-19 | 40,000 |
| | Treating Skin toxicity originated from oncological therapies, | 166,667 | Kamin Fund, Israel Innovation Authority | 9/2018-20 | 83,333 |
| | Topical therapy for skin toxicity of biological drugs | 25,000 | Yisum – Technology Office Hebrew University | 10/17-18 | 25,000 |
| | Methionine Aminopeptidase-2 as a Key Pathway Target in AM | 5,000 | The Alex Grass Center for Drug Design and Novel Therapy (Internal) | 9/17-18 | 5,000 |
| | A Mechano-Activated Nano-therapeutic for Thrombolytic Treatment of Central Retinal Artery Occlusion (CRAO) | 158,361 | Ministry of Science and Technology (MOST) | 12/17-20 | 52,787 |

| | | | | | |
|--------------------|--|-----------|--|------------------------------|---------|
| | Studying the anti-angiogenic and anti-cancer activity of cannabinoid receptor 2 agonists, | 8,000 | Multidisciplinary Center on Cannabinoid Research | 2/2017-18 | 8,000 |
| | Construction of a detailed data matrix for rational design of nanoparticles with minimized toxicity | 138,666 | Ministry of Science and Technology (MOST) | 12/2016- 19 | 46,222 |
| | Donation for research in personalized medicine in cancer, | 90,000 | The American Friends of HUJI (David Hummer) | Nov-16 | 90,000 |
| | 'Magnetically and photochemically actuated bioactive nanowires for remotely controlled drug delivery (PAIRED) | 112,000 | M-ERA.NET – Consortium, Horizons 2020 | 7/2016-19 | 37,333 |
| | Transcytosis as a mechanism for nanoparticles delivery in poorly vascular tumors | 180,868 | ISF - Israel Science Foundation | 10/2016-19 | 60,289 |
| | On demand" biodegradable Intra-Vascular Device | 72,222 | Kamin Fund, Israel Innovation Authority | 7/2016-18 | 36,111 |
| | Ocular research | 30,000 | The European Friends of the Hebrew University (Elie, Gilly Zilkha, Francois, Helene Meyer, Nilly Sikorsky and Winni Fejne) | 01/06/2016 (single donation) | |
| | Mechanical Targeting as an Integrative Approach for Personalized Nanomedicine | 1,710,718 | ERC (European Research Council) - Starting Grant | 10/2017-22 | 342,143 |
| Blum Galia | Nonmedicines for personalized theranostics | 245,000 | Israel Planning & Budgeting Committee | 2012-2017 | 49,000 |
| | Detection and stabilization of vulnerable atherosclerotic plaques using small molecule probes that target the lysosomal cysteine cathepsins | 100,000 | United States- Israel Binational Science Foundation (BSF), | 2012-2016 | 25,000 |
| | Protease activated X Ray contrast agents for molecular imaging of vulnerable atherosclerotic plaques and cancer development using spectral CT | 1,710,467 | European Research Council (ERC)– Starting grant | 2013-2018 | 324,093 |
| | Characterization and therapeutic targeting of cathepsin activity in tumor-associated macrophages during pancreatic cancer development and progression | 330,000 | German Research Foundation (DFG) | 2015-2018 | 82,500 |
| | Developing In Vivo stable Caspases-3 Quenched Fluorescent Activity Probes for Real Time Imaging of Apoptosis, Chemotherapy Resistance and Studying ER Caspase Activity | 200,000 | ISF - Israel Science Foundation | 2016-2019 | 66,667 |
| | Cathepsin activity-based probes for diagnosing and treating epilepsy, | 73,611 | Ministry of Economy and Industry | 2017-2018 | 73,611 |
| | Novel Combination Immunotherapies and Probes for Assessing its Efficiency Based on Cathepsin Protease Activity | 300,000 | The Center for Transformative Nanomedicine | 2019-2021 | 150,000 |
| | Cathepsin K probes | 5,000 | Grass Foundation (Internal) | 2017 | 5,000 |
| | | | | | |
| Domb Abraham (Avi) | Sweat-pore fingerprint Biometry | 100,000 | Biometry National Authority | 2017-2019 | 50,000 |
| | High energy compounds and formulations | 75,000 | National Research Fund | 2017-2019 | 37,500 |
| | Hydrogels for treating bladder cancer | 60,000 | Israel Cancer Research Fund (ICRF) | 2018-2019 | 60,000 |
| | Biomaterials via Strecker synthesis | 230,000 | ISF - Israel Science Foundation | 2017-2021 | 57,500 |
| | Non-surgical cancer therapy | 60,000 | Ministry, Science | 2016-2019 | 20,000 |
| | Mucoadhesive tablet | 100,000 | Nofar | 2017-2018 | 100,000 |
| | Apomorphine delivery | 100,000 | Kamin Fund, Israel Innovation Authority | 2017-2018 | 100,000 |
| Eyal Sara | Antiepileptic treatments | 24,800 | Ministry of Industry (Kamin) | 2017 2 yrs | 12,400 |
| | Antiepileptic drugs, maternal fetal pharmacology | 2,500 | Grass Foundation | 2019 1 yr | 2,500 |
| | First seizures in soldiers | 25,000 | Milgrom Foundation | 2016 2 yrs | 12,500 |
| | Imaging in cancer | 12,400 | Israel Cancer Association | 2019 1 yr | 12,400 |

| | | | | | |
|-------------------------|---|---------|---|-------------------|---------|
| | Antiepileptic drugs, maternal fetal pharmacology | 5,000 | Bloom Foundation (Internal) | 2018 1 year | 5,000 |
| | Antiepileptic drugs, maternal-fetal pharmacology | 330,758 | The Israeli Science Foundation (ISF) | 2018 5 yrs | 66,152 |
| Gibson Dan | Multi-action platinum anticancer agents | 450,000 | ISF - Israel Science Foundation | 2018-2022 | 112,500 |
| | Multi level targeting of platinum anticancer drugs | 354,000 | ISF - Israel Science Foundation | 2014-2018 | 88,500 |
| | Quadruple action Pt(IV) drugs | 50,000 | Applied research –Hebrew University | 2017-2018 | 50,000 |
| | Novel approaches to studying the mechanisms of action of multinuclear platinum anticancer drugs | 453,000 | ISF - Israel Science Foundation | 2013-2017 | 113,250 |
| | International workshop - Metals in medicine - novel approaches and insights | 17,000 | ISF - Israel Science Foundation | 2017 | 17,000 |
| Golomb Gershon | Targeting VAV1 in Pancreatic Cancer: Mechanism and a Therapeutic Approach | 365,000 | Israel Science Foundation (ISF) & National Science Foundation of China (NSFC) | 10/2016-09/2019 | 121,667 |
| | Targeted drug delivery: Proof-of-concept in Herpes Simplex 1 Infection | 230,000 | ISF - Israel Science Foundation | 10/2016-09/2019 | 76,667 |
| | Novel nanoparticles for attenuating the innate-immunity system | 80,000 | Fraunhofer Institute (Germany) & Yisum Research and Development (HUJI) | 10/2018-09/2020 | 40,000 |
| | Implantable drug eluting IUD | 130,000 | Ocon Medical Ltd | 2016-2018 | 65,000 |
| | iHSV nanoparticles | 50,000 | Yisum Research and Development (HUJI) | 2015-2018 | 16,667 |
| | Targeted drug delivery: Proof-of-Principle | 50,000 | Yisum Research and Development (HUJI) | 2016-2017 | 50,000 |
| Hoffman Amnon | A novel cyclic peptide drug to inhibit MyD88 | 200,000 | Kamin Chief Scientist Ministry of Commerce | 2016-17 | 50,000 |
| | Injectable controlled release system single dose antibiotic for pigs | 150,000 | Yisum Research and Development (HUJI) and Investors "Agrinovation" | 2016 – 18 | 75,000 |
| | Improving bioavailability of cannabinoids | 50,000 | Phytotech Ltd. | 2017 | 50,000 |
| | Development of orally available octreotide derivative | 50,000 | MET. Syn Lysine Ltd. Israel Advanced Technology Studies | 2018-19 | 50,000 |
| | MyR-c(MyD 4-4), a novel cyclic peptide drug lead for autoimmune disease and cancer therapy. | 30,000 | Integra Holdings | 2018-19 | 30,000 |
| Kohen Ron | Skin Biochemistry | 15,000 | Myers Lab for Skin Research | 2014-2019 | 3,000 |
| | Skin microbiome | 5,000 | The David R. Bloom Center (Internal) | 2019-2020 | 5,000 |
| | Nano gold particles for psoriasis treatment | 50,468 | Ministry of Health | 2016-2017 | 50,468 |
| | Develop and demonstrate a modular mini lab for skin analysis | 455,578 | EU (European Commission) FP7 | 2014-2017 | 151,859 |
| | The effect of the Dead sea salt on skin | 118,993 | Ahava | 2011-2019 | 14,874 |
| | Overcoming resistance to CIS platinum: the Nrf2 pathway | 5,000 | The Alex Grass Center for Drug Design and Novel Therapeutics (Internal) | 2018-2019 | 5,000 |
| Lazarovici Philip | Pharmacology-Neuro-Oncology; Pilot characterization of glioblastoma tumors microfibillar-associated protein 4 (MFAP-4) as a potential diagnostic and prognostic marker. | 5,000 | Bretler Center of Research (Internal) | 2017 | 5,000 |
| | Neuropharmacology; Brain grafting of cord blood derived stem cells for treatment of traumatic brain injury. | 5,000 | Bloom Center of Research (Internal) | 2018 | 5,000 |
| | Neuropharmacology and Medicinal Chemistry; Synthesis, safety and neurotropic effect of HU-MCA-13. | 5,000 | Grass Center of Research (Internal) | 2019 | 5,000 |
| | Pharmacology-Neurology; Visabron, a N-methylated, cyclic peptide novel antagonist of $\alpha 4\beta 1$ (VLA-4) integrin for multiple sclerosis therapy. | 245,000 | Israel Innovation Authority-Kamin | 2 years 2018-2020 | 122,500 |
| Levi-Schaffer Francesca | Specialized pro-resolving mediators and CD300a engage innate immune cells to promote the resolution of allergic responses | 116,232 | United States - Israel Binational Science Foundation (BSF) | 2016-2020 | 29,058 |

| | | | | | |
|-----------------|--|---------|--|----------------------|---------|
| | CD48 on mast cells and eosinophils: a newly described master regulator of allergic inflammation through its interaction with 2B4 and S. aureus | 312,845 | ISF - Israel Science Foundation | 2015-2019 | 78,211 |
| | Resolution mechanisms in allergy: potential new therapeutic targets | 83,373 | Rosetrees Trust (UK) | 2014-2017, 2018-2020 | 16,648 |
| | Involvement of mast cells and their expressed CD300a cell surface receptor in different stages of lung cancer | 11,731 | Israel Cancer Association | 2014-2016; Annual | 5,865 |
| | Mast cell role in COPD. The aim of this project is study the functional behavior of mast cells in hypoxic conditions and to relate it to pathological changes seen or detected in COPD | 15,000 | Arthur Gutterman Fund (USA) | 2013-2019; Annual | 2,500 |
| | Immunopharmacological Studies on Allergic Inflammation: Mast cells & eosinophils interactions. | 32,000 | Aimwell Charitable Trust (UK) | 2011-2019; Annual | 4,000 |
| Matok Ilan | Calcium Channel Blockers and the Risk for Cancer. Duration | 5,000 | The David R Blum Center for Pharmacy (Internal) | 2016 | 5,000 |
| | Colorectal Cancer Screening Services by Community Pharmacies in Israel. | 50,000 | The Israel National Institute for Health Policy Research | 2016-2017 | 50,000 |
| | Calcium Channel Blockers and the Risk for Lung Cancer. | 22,000 | The Israel Cancer Association | 2016-2017 | 22,000 |
| | Calcium Channel Blockers and the Risk for Lung Cancer. Duration | 30,000 | ISF - Israel Science Foundation | 2018-2019 | 30,000 |
| | The Cardiovascular Safety of Macrolides Antibiotics. | 5,000 | The David R Blum Center for Pharmacy (Internal) | 2018 | 5,000 |
| | Calcium Channel Blocker Use and Prostate Cancer: A Population-Based Nested Case-Control Study | 5,000 | The David R Blum Center for Pharmacy (Internal) | 2019 | 5,000 |
| Moussaieff Arie | Drug loaded liposomal nanoparticles for targeting breast cancer dysbiosis | 200,000 | Global Center for Transformative Nanomedicine | 2017-2018 | 200,000 |
| | Studying the cellular metabolic interactions of the implanted embryo | 50,000 | Yissum Technology Transfer | 2014-2016 | 25,000 |
| | Follicular cells' properties and function in elderly IVF patients | 10,000 | Hadassah-HUJI Inter-Institutional Clinical Studies | 2015-2016 | 10,000 |
| | Exploring the role and regulation of phospholipids in the AD brain | 100,000 | American Federation for Aging Research (AFAR) | 2018-2019 | 100,000 |
| | Widespread Bacterial CORE Complex Executes Intra- and Inter-Kingdom Cytoplasmic Molecular Trade | 285,120 | European Research Council (ERC) | 2019-2021 | 125,000 |
| Priel Avi | Pain Receptors | 183,000 | ISF - Israel Science Foundation | 2012 4 yrs | 45,750 |
| | Cannabinoids | 30,000 | The National Institute for Psychobiology in Israel (NIPI) | 2016 2 yrs | 15,000 |
| | Toxins and pain | 75,000 | US-Israel Binational Science Foundation (BSF) | 2016 3 yrs | 25,000 |
| | Pain receptors | 370,000 | ISF - Israel Science Foundation | 2016 4 yrs | 92,500 |
| | Inflammatory pain and pain receptors | 50,000 | The Prusiner-Abramsky Research Award in Basic Neuroscience | 2016 2 yrs | 25,000 |
| | Developing novel analgesics | 25,000 | Hezrek B Research Grant, Yissum Research & Development (Hebrew University of Jerusalem) | 2016 1 yr | 25,000 |
| | Developing novel analgesics | 63,500 | Chief Scientist of the Ministry of Industry, Trade & Labor – Nofar | 2016 1 yr | 63,500 |
| | Cannabinoids | 40,000 | The Multidisciplinary Center on Cannabinoid Research (MCCR) and Integra holdings grant | 2018 1 yr | 40,000 |
| | Developing novel analgesics | 250,000 | Israel Cancer Research Fund (ICRF), The Brause Family Initiative for Quality of Life Grant | 2018 3 yrs | 83,333 |
| Reich Reuven | Embryo implantation- Internal | 5,500 | Bretler Center (Internal) | 1 year 2019 | 5,500 |
| | Tumor biology- Internal | 5,500 | Bloom Foundation (Internal) | 1 year 2018 | 5,500 |
| | Tumor biology - internal | 5,500 | Bloom Foundation (Internal) | 1 year 2017 | 5,500 |
| | Tumor biology - | 200,000 | Fredrikson Foundation (Internal) | 5 years (from 2014) | 50,000 |
| Shurki Avital | Method development for Structure Bonding and Reactivity Studies | 213,500 | ISF - Israel Science Foundation | 4 years (2013-2016) | 53,375 |

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|---------------------|--|-----------|---|-------------------|---------|
| | Butyrylcholinesterase | 5,000 | Alex Grass Center for Drug Design and Synthesis of Novel Therapeutics | 1 yr (2017) | |
| | Enzyme Design | 247,000 | ISF - Israel Science Foundation | 4 yrs (2017-2020) | 61,750 |
| Tam Yossi (Joseph) | Role of Cannabinoid Type-1 Receptor in the Kidney in the Pathogenesis of Diabetic Nephropathy | 100,000 | Yisum-Baby Seed Research Grant Award | 2014-2016 | 50,000 |
| | Targeting the Peripheral Endocannabinoid System for the Treatment of Diabetes-induced Osteoporosis | 46,300 | Abisch-Frenkel Foundation | 2015-2016 | 46,300 |
| | Modular Phenotyping System for Lab Animals | 120,000 | ISF - Israel Science Foundation | 2014-2018 | 30,000 |
| | Role of the Peripheral Endocannabinoid System in Leptin Resistance and Obesity | 340,000 | ISF - Israel Science Foundation | 2014-2019 | 68,000 |
| | Role of Cannabinoid-like Compounds in Obesity and Osteoporosis | 569,133 | Yisum/Kalytera Therapeutics | 2015-2019 | 142,283 |
| | From Peripheral to Cell- and Organelle-Targeted Medicine: The 3rd Generation of Cannabinoid-1 Receptor Antagonists for the Treatment of Chronic Kidney Disease | 1,700,000 | European Research Council (ERC-StG). | 2016-2021 | 340,000 |
| | Role of the endocannabinoid system in PWS-induced osteoporosis and skeletal growth | 108,000 | Foundation for Prader-Willi Research (FPWR) | 2017-2018 | 108,000 |
| | Discovery and Experimental Confirmation of Novel Peripherally Restricted CB1 Receptor Antagonists | 30,000 | Integra Holdings/MCCR | 2018-2019 | 30,000 |
| | Endocannabinoids as Biomarkers for Stress in Dairy Cows | 12,000 | Israel Dairy Board | 2018-2021 | 4,000 |
| | Deciphering the Crosstalk between CB1 and GLUT2 in the Development of Diabetic Nephropathy | 415,000 | ISF - Israel Science Foundation | 2018-2023 | 83,000 |
| | Testing the Therapeutic Efficacy of CBDA and its Derivatives for the Treatment of Diabetic Kidney Disease | 669,600 | Yisum/Europacific Medical | 2018-2020 | 334,800 |
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| Tirosh Boaz | Golgi stress in plasma cell differentiation (Immunology) | 10,000 | ISF-Israel Science Foundation - Israel Japan program | 2017-2019 | 5,000 |
| | IRE1 in the interphase of cancer and immune system (Cancer) | 100,000 | Ministry of Science and Technology (PHC-Maimonide) | 2017-2019 | 50,000 |
| | Interconnectivity of KIT signaling and the unfolded protein response in normal and neoplastic mast cell function and survival (Immunology) | 130,000 | German Israeli Foundation | 2019-2022 | 43,333 |
| | Exploiting the Achilles heel of hyperactivated mTORC1 for tumor therapy (Cancer) | 140,000 | MOST-DKFZ | 2019-2022 | 46,667 |
| | Metabolic effects of antischizophrenic drugs (Pharmacology) | 550,000 | Marie Curie International Training Network "TREATMENT" | 3 years 2017-2019 | 183,333 |
| Tselikhovsky Dmitry | Stretching the Model of TRPV1 Activation | 304,000 | ISF - Israel Science Foundation | 2018-2022 | 76,000 |
| | Novel Synthetic Scaffold DT100 Promotes Silencing of the Pain Receptor TRPV1. | 68,000 | Nofar (Israel Ministry of Trade and Industry) | 2016-2017 | 68000 |
| | Study for the development of protocols for synthesis of new CBD derivatives. | 200,000 | Scopus Biopharma Israel Ltd. | 2018-2019 | 200000 |
| | Application of novel synthetic tricyclic spirolactones in the pain analgesic model. | 25,000 | Yisum-HUJI Technology Transfer Start-Up Grant | 2016-2017 | 25000 |
| | Collective and regioselective synthesis of gamma-, delta- and macro-lactones from Hydroxyalkenoic acid - a single common precursor. | 5,000 | A. Grass grant for Drug Design and Synthesis of Novel Therapeutics-HUJI | 2016-2017 | 5000 |
| | Structure Pattern Recognition: A Catalyst for Methodology Development in Total Synthesis. | 336,000 | Volkswagen Foundation, Joint Lower Saxony-Israeli Research Grant | 2015-2017 | 168,000 |
| Wormser Uri | 2017 Novel peptides for cancer treatment. | 139,381 | Fund for Cancer Research | 2019 | 139381 |
| | New drug for cancer treatment | 130,226 | Nofar Fund, Israel | 2015-2017 | 65,113 |
| | Mechanism of the protective activity of topical iodine: effect on sulfur mustard-induced skin toxicity | 182,886 | ISF - Israel Science Foundation | 2013-2017 | 45,721 |
| Yaka Rami | GABA and cocaine | 5,000 | Bretler (Internal) | 2017 | 5000 |

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| | GABA and cocaine | 500,000 | ISF - Israel Science Foundation | 2016-2021 | 100,000 |
| | Endocannabinoid and cocaine | 100,000 | Kamin | 2016-2018 | 50,000 |
| | Cannabinoids and TBI | 5,000 | Cannabinoids Research | 2017 | 5000 |
| | Oxidative stress and cocaine | 80,000 | Israel Drug Authority | 2017-2019 | 40,000 |
| | Erasing cocaine memory | 5,000 | Grass (internal) | 2018 | 5000 |
| | Exchange program | 15,000 | Royal Society (UK) | 2018-2019 | 15000 |
| | Endocannabinoid and alcohol | 80,000 | Industry-Planext | 2019 | 80000 |
| | Peptides as memory erasers | 5,000 | Bretler (Internal) | 2019 | 5000 |
| | Oxidative stress | 5,000 | Bloom (internal) | 2016 | 5000 |
| Yavin Eylon | RNA diagnostics | 340,000 | Kamin Program | 2 yrs, 2016-2018 | 170,000 |
| | RNA diagnostics | 340,000 | ISF - Israel Science Foundation | 4 yrs, 2017-2021 | 85,000 |
| | PNA Therapeutics | 5,000 | Grass (internal) | 2017 | 5000 |
| | PNA Therapeutics | 5,000 | Bloom (internal) | 2019 | 5000 |
| | RNA diagnostics | 154,000 | Nofar Program | 15 mths, 2018 | 85,000 |
| Benita Simon (emeritus) | Design and evaluation of tLivin polypeptide conjugated to targeted nanoparticles for improved resistant cancer therapy | 165,000 | Kamin Program, The Office of the Chief Scientist, Ministry of Economy, Israel | 2015-2016 | 165,000 |
| | Nanoencapsulation of Oxaliplatin Palmitate Acetate (OPA) | 820,000 | BioNanoSim Ltd., (BNS) Jerusalem, Israel via the Israel Innovation Authority | 2016-2017 | 820,000 |
| | Oral bioavailability improvement of Cannabinoids | 275,000 | Breath of Life Magnetron project via the Israel Innovation Authority | 2017-2018 | 275,000 |
| | Oral absorption enhancement of CBD using a nanocarrier bypassing pre-systemic cytochrome metabolism | 330,000 | Breath of Life, Pharma Ltd | 2018-2019 | 330,000 |
| Bialer Meir (emeritus) | Pharmacokinetics of new antiepileptic drugs (AEDs) and pharmacokinetic-based design of new antiepileptics and CNS drugs | 405,000 | NIH (National Institute of Health) Grant | 7/2019-6/2022 | 135,000 |
| Deutsch Joseph (emeritus) | Novel Treatment for Traumatic Brain Injury | 30,250 | Milgrom Foundation | July 2017-June 2019 | 15,125 |
| | Novel Treatment for Traumatic Brain Injury | 55,000 | Milgrom Foundation | July 2016-June 2017 | 55,000 |
| Friedman Michael (emeritus) | Injectable sustained-release florfenicol formulation | 167,820 | Agni-nnovation Fund | 2016-2019 | 55,940 |
| | Injectable sustained-release delivery systems for veterinary antibiotics | 70,000 | Agni-nnovation Fund | 2019-2020 | 70,000 |
| | Mastitis prevention | 20,000 | The Dairy Council | 2019-2020 | 20,000 |
| Goldblum Amiram (emeritus) | Immunomodulators of the Toll Like Receptors | 33,615 | EU (European Commission) FP6 Consortium | 2012-2016 | 8,404 |
| | Nano-Mupiroin Injection - Antibiotics | 83,151 | Kamin | 2016 | 83,151 |
| | Novel Modulators of innate Immune response - Immunomodulation | 5,000 | Yissum Research and Development (HUJI) | 2016-2017 | 2,500 |
| | Anti candida - novel therapies | 30,489 | EU (INFECT ERA) | 2017-2019 | 10,163 |
| | Selective and diverse chelators of Iron | 44,347 | ISF - Israel Science Foundation | 2015-2019 | 11,087 |
| | Inhibiting the meeting of sperm with oocyte -Contraceptives | 180,000 | Bill and Melinda Gates Foundation | 2017-2019 | 90,000 |
| | Agonists of PPAR-delta of improving physical several conditions, including Duchenne and NASH | 19,402 | Milgrom Military Medicine | 2018-2019 | 19,402 |
| | Discovery of novel ROR alpha activators (NASH) | 40,000 | Kamin | 2018-2020 | 20,000 |

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| | Glycogen storage diseases | 83,151 | Ministry of Science | 2017-2020 | 27,717 |
| | Multitargeted CB1R + others (Obesity) | 25,000 | INTEGRA Holdings | 2018-2019 | 25,000 |
| Mechoulam Raphael (emeritus) | | 44,000 | Therapix | 07/18-08/20 | 22,000 |
| | | 72,000 | Plant Ext | 08/18-08/19 | 72,000 |
| | | 155,555 | Cau Biorex | 05/18-05/19 | 155,555 |
| | | 43,342 | Israel Innovation Authority | 01/16-12/19 | 14,447 |
| | | 288,816 | Phytecs | 01/16-12/19 | 96,272 |
| | | 518,000 | Europacific | 05/18-08/20 | 259,000 |
| Ringel Israel (emeritus) | Tubulin assemblies | 240,000 | ISF - Israel Science Foundation | Oct 1, 2013 - Sept 30, 2017 | 60,000 |
| Rubinstein Abraham (emeritus) | Intra-operative real-time identification of peritoneal cavity micro-metastases by remote-degrading composite platforms of targeted polymer and fluorescent nanoparticles. Together with Aviram Nissan, Hadassah-HU. | 400,000 | ISF - Israel Science Foundation | 2014-2019 | 80,000 |
| | In situ identification of micro-metastases by peptide nucleic acids (PNAs) embedded in biodegradable mucoadhesive platforms. Together with Eylon Yavin, HU and Aviram Nissan, Sheba Medical Center. | 158,000 | Kamin program of the Ministry of Industry & Commerce | 2015-2016 | 158,000 |
| Sasson Shlomo (emeritus) | Diabetes Research | 1,600,000 | Diab R&D | 9 years (2010-2019) | 177,778 |
| | | 194,482 | Nofar (Israel Ministry of Trade and Industry) | 9 years (2010-2019) | 21,609 |
| | | 333,398 | The Israeli Science Foundation (ISF) | 3 years (2015-2018) | 111,133 |
| | | 5,000 | Bretler Center (Internal) | 1 year (2017) | 5,000 |
| Shohami Esther (emeritus) | Enhancement of learning and memory after traumatic brain injury | 623,500 | Adelson Medical Research Foundation (AMRF) | 2015-17 | 311,750 |
| | Enhancement of learning and memory after traumatic brain injury | 588,000 | Adelson Medical Research Foundation (AMRF) | 2017-19 | 294,000 |
| | Effects of enhanced neuroinflammation on outcome after TBI | 83,349 | Israel Ministry of Health | 2015-2018 | 100,000 |
| Touitou Elka (emeritus) | Cannabinoids, Nasal Delivery, Skin Burns | 200,000 | | Open until exhausted | |

List: research infrastructure of the faculty: research laboratories, research centers, specialized equipment and budget for maintenance (level and sources of funding).

| Table 16 - Research Activities - last 3 years | | | | | | | |
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| Name of Faculty Member, Rank | H-Index (please indicate if Web of Science of Google Scholar) | Fields of Research/ Specialization | Bodies (research facilities / centers/ institutions / labs) the faculty member is active at, in the last 3 years | Other (special positions, honors, prizes, etc) | Number of Research Students | Name of Publication: (שם מאמר מלא) | Published In: (name of journal / publishing house) |
| Benny Ofra | 16 WOS | nanomedicine for cancer therapy and diagnostics | <ul style="list-style-type: none"> • Hebrew University Center for Nanoscience and Nanotechnology (HUJI) • Multidisciplinary Center on Cannabinoid Research (HUJI) • The Alex Grass Center for Drug Design and Novel Therapeutics (HUJI) • ISF, MOST review panels • Israel Controlled Release Society (ICRS) | 2016 M-ERA.NET – Consortium, Horizons 2020 2017 The Faculty of Medicine Prize for Excellent Research Work 2019 ERC-Starting grant | 11 | <ul style="list-style-type: none"> •Microfluidic Based Fabrication and Characterization of Highly Porous Polymeric Microspheres. •Tissue necrosis and its role in cancer progression. •Body on Chip-A Distant Dream or an Emerging Reality? •Matrix metalloproteinase 12 promotes tumor propagation in the lung. •Controlled and tunable polymer particles' production using a single microfluidic device. •Nerve Growth Factor-Induced Angiogenesis: 1. Endothelial Cell Tube Formation Assay. •Evolving multidimensional pharmacological approaches to CNV therapy in AMD. •3D printing of responsive hydrogels for drug-delivery systems. •Tumor cells and their crosstalk with endothelial cells in 3D spheroids. •High mobility group box 1 antagonist limits metastatic seeding in the lungs via reduction of cell-cell adhesion. •Rigidity of polymer micelles affects interactions with tumor cells. •VEGF preconditioning leads to stem cell remodeling and attenuates age-related decay of adult hippocampal neurogenesis. •Murine fundus fluorescein angiography: An alternative approach using a handheld camera. | <ul style="list-style-type: none"> • Polymers. 2019. • Oncogene. 2019. • Drug Des Int Prop Int J 1(4)- 2018. • J Thorac Cardiovasc Surg. 2018. • Applied Nanoscience. 2018. • Methods Mol Biol. 2018. • Curr Eye Res. 2018. • J. 3D Print. Med. 2017. • Sci Rep. 2018. • Oncotarget. 2017. • J Control Release. 2016. • Proc Natl Acad Sci U S A. 2016. • Exp Eye Res.. 2016. |
| Blum Galia | 19 WOS 23 GS | investigation of protease activity- developing novel imaging reagents and inhibitors of cysteine protease activities. My research is interdisciplinary with the unique ability | Nano Center | 2016 The Dean Prize for Outstanding Young Researcher in Memory of Yaacov Matzner, The Hebrew University of Jerusalem 2019 Adolf D. and Horthy Storch Chair in Pharmaceutical Sciences, Cathedra | 6 | <ul style="list-style-type: none"> •Defensins induce a post-translational modification of LDL that promotes atherosclerosis at normal levels of plasma cholesterol. J Biol Chem. 2016. •Characterizing Cathepsin Activity and Macrophage Subtypes in Excised Human Carotid Plaques. Stroke, 2016. •Cathepsin Activity-Based Probes and Inhibitor for Preclinical Atherosclerosis Imaging and Macrophage Depletion. PLoS ONE, 2016. •Macrophage-induced lymphangiogenesis and metastasis following paclitaxel chemotherapy is regulated by VEGFR3. Cell Reports, 2016. •Comparative evaluation of polycyanoacrylates. Acta Biomaterialia, 2017. •Cathepsin Nanofiber Substrates as Potential Agent for Targeted | <ul style="list-style-type: none"> • J Biol Chem. 2016. • Stroke, 2016. • PLoS ONE, 2016. • Cell Reports, 2016. • Acta Biomaterialia, 2017. • Journal of Controlled Release, 2017. • Journal of the American Heart Association. 2017. • Nature Communications 2018. • Nano Letters 2018. • Theranostics, 2018. |

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| | | to combine organic chemistry methods with biochemical methodologies. One of my major goals is to apply our novel home-made compounds in various systems to investigate the protease function in various pathologies. My research involves the application of our chemical tools to study cancer, atherosclerosis and arthritis in cell cultures, mouse models and human samples. | | | | <p>Drug Delivery. Journal of Controlled Release, 2017.</p> <ul style="list-style-type: none"> ● A New Role for Interleukin-13 Receptor $\alpha 1$ in Myocardial Homeostasis and Heart Failure. Journal of the American Heart Association. 2017. ● Amphiphilic nanocarrier-induced modulation of PLK1 and miR-34a leads to improved therapeutic response in pancreatic cancer. Nature Communications 2018. ● Molecular Imaging of Cancer using X-ray Computed Tomography with Protease Targeted Iodinated Activity-Based Probes. Nano Letters 2018. ● Image-Guided Surgery Using Near-Infrared Turn-ON Fluorescent Nanoprobes for Precise Detection of Tumor Margins Theranostics, 2018. ● mTORC1 activation in B cells confers impairment of marginal zone microarchitecture by exaggerating cathepsin activity. Immunology 2018. ● CT Imaging of Enzymatic Activity in Cancer using Covalent Probes Reveal a Size-Dependent Pattern. Journal of the American Chemical Society, 2018. ● Cathepsin L Regulates Metabolic Networks Controlling Rapid Cell Growth and Proliferation. Molecular and cellular Proteomics, 2019. ● Cathepsin Cysteine Proteases in Atherosclerosis. The FEBS Journal 2017. | <ul style="list-style-type: none"> ● Immunology 2018. ● Journal of the American Chemical Society, 2018. ● Molecular and cellular Proteomics, 2019. ● The FEBS Journal 2017. |
| Domb Abraham (Avi) | 90 GS | Synthesis, characterization and applications of biopolymers; Medicinal and organic chemistry; Anticancer drugs, Controlled drug delivery; Drug targeting; Prodrugs; | 2018– present Head of School of Pharmacy and Institute of Drug Research, HUJI 2014– present ERC panel member EP8. 2017– present Member, University Committee for faculty permanency and promotion, HUJI 2016– present Professor, Forensic Sciences and Criminology, Faculty of Law, HUJI 2014-2016 President, Azrieli Jerusalem College of | 2017 Honorable lifetime member of the Israel Bioengineering Association, | 15 | <ul style="list-style-type: none"> ● Alternating Poly(ester-anhydride) by Insertion Polycondensation. ● Nyska, A. Biocompatibility and safety of PLA and its copolymers. ● Biodegradable inflatable balloons for tissue separation. ● Biodegradable polymers for targeted delivery of anti-cancer drugs ● Co-delivery of rapamycin- and piperine-loaded polymeric nanoparticles for breast cancer treatment. ● Discovering Novel and Diverse Iron-Chelators in Silico. ● Glycopeptides derived from glucosaminic acid. ● Injectable formulations of poly(lactic acid) and its copolymers in clinical use. ● N-bromo-hydantoin grafted polystyrene beads: Synthesis and nano-micro beads characteristics for achieving controlled release of active oxidative bromine and extended microbial inactivation efficiency. ● PEG-Biscyanoacrylate Crosslinker for Octyl Cyanoacrylate Bioadhesive. ● Poly(alpha-hydroxy acid)s and poly(alpha-hydroxy acid-co-alpha-amino acid)s derived from amino acid. ● Poly(ester-anhydride) for controlled delivery of | <ul style="list-style-type: none"> ● Biomacromolecules 2016 ● Adv. Drug Deliv. Rev. 2016. ● Expert Opin. Drug Deliv. 2016. ● Drug Deliv. 2016. ● Polym. Chem. 2016. ● Adv. Drug Deliv. Rev. 2016. ● J. Polym. Sci. A Polym. Chem. 2016. ● Macromol. Rapid Commun. 2016. ● Adv. Drug Deliv. Rev. 2016. |

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| | <p>Drug-polymer conjugates; Nanoparticles and nanoformulations; Hydrogels; Surface modification and coatings; Water purification systems, Bioactive polymers; Scaffolds for tissue engineering; Nucleic acid transfection agents; Forensic Sciences, Crystallization, Iontophoresis to the eye.</p> | <p>Engineering 1991– present Professor, Biomaterials and Medicinal Chemistry, Faculty of Medicine, HUJI</p> | | <p>hydrophilic drugs. •Poly(hexamethylene guanidine)-poly(ethylene glycol) solid blend for water microbial deactivation. •Poly(lactic acid) based hydrogels. •Preclinical Safety Evaluation in Rats of a Polymeric Matrix Containing an siRNA Drug Used as a Local and Prolonged Delivery System for Pancreatic Cancer Therapy. •Sustained Release of Antibacterial Lipopeptides from Biodegradable Polymers against Oral Pathogens. •Tacrolimus and curcumin co-loaded liposphere gel: Synergistic combination towards management of psoriasis. •Polymeric sensors containing P-dimethylaminocinnamaldehyde: Colorimetric detection of urea nitrate •Comparative evaluation of polycyanoacrylates. •Unique aggregation of conjugated amphotericin B and its interaction with lipid membranes. •Polymer with pendant diazo-coupling functionality for colorimetric detection of nitrates •Synthesis of Glycopeptides from Glucosaminic Acid. •The effect of Pro NanoLipospheres (PNL) formulation containing natural absorption enhancers on the oral bioavailability of delta-9-tetrahydrocannabinol (THC) and cannabidiol (CBD) in a rat model. •Piperine-pro-nanolipospheres as a novel oral delivery system of cannabinoids: Pharmacokinetic evaluation in healthy volunteers in comparison to buccal spray administration. •Elimination of Schistosoma mansoni in infected mice by slow release of artemisone. •Stable polyanhydride synthesized from sebacic acid and ricinoleic acid. •Cationic antimicrobial copolymer poly(methylmethacrylate-co-PHMG) decontaminates water. •Poly(lactic acid)-based nanocomposites. •Crystalline paclitaxel coated DES with bioactive protective layer development 2018. •Efficacy of paclitaxel/dexamethasone intra-tumoral delivery in treating orthotopic mouse breast cancer. •Recent Advances in Polyanhydride Based Biomaterials. •Synthesis, characterization and antibacterial activity of heterocyclic quaternary ammonium polymers. • Non-polymer drug-eluting coronary stents. •The Effect of Piperine Pro-Nano Lipospheres on Direct Intestinal Phase II Metabolism: The Raloxifene Paradigm of Enhanced Oral Bioavailability. •New Formulation Based on Pro-Nano Dispersion Technology, Improves Oral Cannabinoids Bioavailability in Healthy Volunteers. •Overview on natural hydrophilic polysaccharide polymers in drug delivery. •Crosslinked colloids with cyclopropenium cations. •Polysaccharide Based Nanoparticles. •Therapeutic Macromolecular Iron Chelators. •Cabazitaxel-Loaded Nanocarriers for Cancer Therapy with Reduced Side Effects. Pharmaceutics 2019. •Protein-based bioadhesives and bioglues. •Biodegradable wafers releasing</p> | <p>• J. Bioact. Compat. Polym. 2016. • Polym. Degrad. Stab. 2016. • Adv. Drug Deliv. Rev. 2016. • Toxicol. Pathol. 2016. • PLoS One 2016. • J. Control. Release 2016. • Sens. Actuators B Chem. 2017. • Med. Mycol. 2017. • Sens. Actuators B Chem. 2017. • J. Polym. Sci. A Polym. Chem. 2017. • Eur. J. Pharm. Sci. 2017. • J. Control. Release 2017. • Int. J. Parasitol. Drugs Drug Resist. 2017. • J. Control. Release 2017. • Polym. Adv. Technol. 2017. • Polym. Adv. Technol. 2017. • J. Control. Release 2018. • J. Control. Release 2018. • Adv. Mater. 2018. • New J. Chem. 2018. • Drug Deliv. Transl. Res. 2018. • Mol. Pharm. 2018. • J. Pharm. Sci. 2018. • Polym. Adv. Technol. 2018. • J. Polym. Sci. A Polym. Chem. 2018. • Isr. J. Chem. 2018. • Curr. Med. Chem. 2019. • Pharmaceutics 2019. • Polym. Adv. Technol. 2019. • J. Control. Release 2019. • J. Polym. Sci. A Polym. Chem. 2019. • J. Control. Release 2019. • Macromolecules 2019.</p> |
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| | | | | | | <p>Temozolomide and Carmustine for the treatment of brain cancer.</p> <ul style="list-style-type: none"> ●Effect of PLGA block molecular weight on gelling temperature of PLGA-PEG-PLGA thermoresponsive copolymers ●Dispersible hydrolytically sensitive nanoparticles for nasal delivery of thyrotropin releasing hormone (TRH). ●Cyclopropenium-Based Biodegradable Polymers. | |
| Eyal Sara | 21 WOS | Epilepsy and antiepileptic drugs | The Hebrew University Center for Nanoscience and Nanotechnology The Hebrew University Cannabinoid Center | 2017 Rector's Award for Excellence in Teaching | 7 | <ul style="list-style-type: none"> ●Pharmacokinetics of metoprolol during pregnancy and lactation. ●An evaluation of pharmacist knowledge on treatment with antiepileptic drugs. ●Use of antiepileptic drugs during pregnancy and lactation: Type of information provided by searching Google. ●Indocyanine Green Liposomes for Diagnosis and Therapeutic Monitoring of Cerebral Malaria. ●Tracking inflammation in the epileptic rat brain by bi-functional fluorescent and magnetic nanoparticles. ●Maternal-fetal transfer of indocyanine green across the perfused human placenta ●Effects of valproic acid on the placental barrier in the pregnant mouse: Optical imaging and transporter expression studies. ●Utilization of antiepileptic drugs in Israel. ●Genetic risk factors for antiepileptic drug-induced hypersensitivity reactions in Israeli populations. ●Evaluation of Near Infrared Dyes as Markers of P-Glycoprotein Activity in Tumors. ●Intraoperative Localization of Rectal Tumors Using Liposomal Indocyanine Green. ●Causative Drugs of Stevens-Johnson Syndrome and Toxic Epidermal Necrolysis in Israel. ●Comparing single and combined therapy in young and old mice. ●Optimization of liposomal indocyanine green for imaging of the urinary pathways and a proof of concept in a pig model. ●Trends in utilization of benzodiazepine and Z-drugs in Israel. ●Folate homeostasis in epileptic rats. ●Adverse placental effects of valproic acid: Studies in perfused human placentas. ●Stevens-Johnson syndrome/toxic epidermal necrolysis in Jewish and Arab populations. ●Treatment with antiepileptic drugs in patients with stroke. A change in clinical practice may be required. ●Effects of Valproic Acid on Cerebral Nutrient Carriers' Expression in the Rat. ●Lacosamide at therapeutic concentrations induces histone hyperacetylation in vitro. ●The effects of valproic acid on early pregnancy human placentas: Pilot ex vivo analysis in cultured placental villi. | <ul style="list-style-type: none"> ● J Clin Pharmacol. 2016. ● Seizure. 2016. ● Epilepsy Behav. 2016. ● Theranostics. 2016. ● Nanomedicine. 2016. ● Reprod Toxicol. 2016. ● Epilepsia. 2016. ● Epilepsy Behav. 2016. ● Epilepsia. 2016. ● Front Pharmacol. 2016. ● Surg Innov. 2017. ● J Clin Pharmacol. 2017. ● J Control Release. 2017. ● Surg Endosc. 2018. ● Pharmacoevidentiol Drug Saf. 2017. ● Epilepsy Res. 2018. ● Epilepsia. 2018. ● Epilepsia. 2018. ● J Neurol Sci. 2018. ● Front Pharmacol. 2018. ● Epilepsia Open. 2018. ● Epilepsia. 2019. |

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| Gibson Dan | 21 WOS | platinum anticancer agents | 2013 University of Sydney, Australia 2018 Visiting Professor Ecole Normale Supérieure 2019 Visiting professor | | 3 | <ul style="list-style-type: none"> ●Oxaliplatin Derivative Enhances Antitumor Activity ● Platinum(IV) anticancer prodrugs - hypotheses and facts. ●Derivatives of cisplatin and oxaliplatin with phenylbutyrate axial ligands are potent cytotoxic agents that act by several mechanisms of action. ●Potentiation of mitochondrial dysfunction in tumor cells by conjugates of metabolic modulator dichloroacetate with a Pt(IV) derivative of oxaliplatin. Journal of Inorganic ●Probing the Interactions of Cytotoxic [Pt(1S,2S-DACH)(5,6-dimethyl-1,10-phenanthroline)] and Its Pt-IV Derivatives with Human Serum. ●Synthesis, characterization and in vitro and in vivo anticancer activity of Pt(IV) derivatives of [Pt(1S,2S-DACH)(5,6-dimethyl-1,10-phenanthroline ●Epigenetic and antitumor effects of platinum (IV)-octanoato conjugates. ●Quadruple-Action Platinum(IV) Prodrug with Anticancer Activity Against KRAS Mutated Cancer Cell Lines. ●The timing of caffeic acid treatment with cisplatin determines sensitization or resistance of ovarian carcinoma cell lines. ●Triple action Pt(IV) derivatives of cisplatin: a new class of potent anticancer agents that overcome resistance. ●Dual-Targeting Dual-Action Platinum(IV) Platform for Enhanced Anticancer Activity and Reduced Nephrotoxicity. ●Multi-action Pt(IV) anticancer agents; do we understand how they work? ●An Anticancer Pt(IV) Prodrug That Acts by Mechanisms Involving DNA Damage and Different Epigenetic Effects. ● A Subset of New Platinum Antitumor Agents Kills Cells by a Multimodal Mechanism of Action Also Involving Changes in the Organization of the Microtubule Cytoskeleton. | <ul style="list-style-type: none"> ● J Med Chem 59. 2016 ● Dalton Transactions 45. 2016. ● Chem Sci 7. 2016. ●Journal of Inorganic Biochemistry 2016. ●Chemmedchem 12, 2017. ●Dalton Transactions 2017 ●Sci Rep-Uk 7 2017. ●Angewandte Chemie-International Edition 2017. ●Redox Biol 2017. ●Chem Sci 2018. ● J Inorg Biochem 2018. ●Chemistry 2019. ● J Med Chem 2019. |
| Golomb Gershon | 38 WOS 48 GS | Advanced drug delivery systems and therapy in inflammatory-related disorders. Developing controlled release implantable, and targeted injectable drug and gene delivery systems; from hypothesis to | 2013-2017 Planning & Development Committee, Faculty of Medicine, HUJI. 2015–2018 Head, Division of Pharmaceutical Studies, School of Pharmacy, HUJI. 2015-2016 Visiting Prof., Koch Institute for Integrative Cancer Research (R. Langer), MIT, USA. 2018- Director, Fraunhofer Project Center for Drug Discovery & Delivery | Incumbent, The Woll Sisters & Brothers Chair in Cardiovascular Diseases (Endowed). | 6 | <ul style="list-style-type: none"> ●Reduced cytotoxicity and enhanced bioactivity of cationic antimicrobial peptides liposomes in cell cultures and 3D epidermis model against HSV ●Delivery of liposomal quantum dots via monocytes for imaging of inflamed tissue ● Liposomal temozolomide drug delivery using convection enhanced delivery ●Polymeric nanoparticles of siRNA prepared by a double-emulsion solvent-diffusion technique: Physicochemical properties, toxicity, biodistribution and efficacy in a mammary carcinoma mice model ●The role of monocyte subpopulations in vascular injury following partial and transient depletion ●Lysozyme transport to the brain by Liposomes, Prec. ●Monocyte-mediated drug delivery systems for the treatment of cardiovascular diseases ●Cardiovascular delivery of drugs and biotherapeutics | <ul style="list-style-type: none"> ● J. Control. Release, 2016. ● ACS Nano, 11, 2017. ● J Control. Release, 2017. ● Biomaterials, 2017. ● Drug Deliv. Transl. Res., 2018. ● Nanomed., 2018. ● Drug Deliv. Transl. Res., 2018. ● Drug Deliv. Transl. Res. 2018. ● Cancers, 2019. ● Regen. Eng. Transl. Med. 2019. |

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| | | <i>in vivo</i> studies. Targeting nanoparticles (polymeric-based and liposomes) for drugs/genes/imaging agents. Developing nanoparticles, encapsulating drugs/genes, for modulating the innate immunity in inflammatory-associated disorders, blood-brain barrier delivery, and for the treatment and diagnosis of cancer and cardiovascular disorders. | | | | <ul style="list-style-type: none">●Targeted siRNA nanoparticles for mammary carcinoma therapy.●Monocyte modulation by liposomal alendronate improves cardiac healing in a rat model of myocardial infarction, Regen. | |
| Hoffman Amnon | 48 GS | Study of the structure (conformation) – oral bioavailability relationship of peptides. As well as biopharmaceutical aspects of drug delivery systems (DDS)s and drug development. | 2008-present Head, Pharm.D. Program, School of Pharmacy, Faculty of Medicine, HUJI 2009-present Professor in Clinical Pharmacy and Biopharmaceutics, HUJI. 2009-present Chairman, Division of Clinical Pharmacy, Faculty of Medicine, HUJI | 2016 The Kaye Innovation Award for the development of a novel anti metastasis pharmacotherapy a carbamoylphosphonates derivative. The Hebrew University of Jerusalem. 2017 Distinction for Excellence in Teaching selected by the Rector of The Hebrew University of Jerusalem, 2019 The Kaye Innovation Award for | 6 | <ul style="list-style-type: none">●Insulin Sensitizer Prevents and Ameliorates Experimental Type-1 Diabetes.●The effect of Pro NanoLipospheres (PNL) formulation containing natural absorption enhancers on the oral bioavailability of delta-9-tetrahydrocannabinol (THC) and cannabidiol (CBD) in a rat model.●Piperine-Pro-Nanolipospheres as a Novel Oral Delivery System of Cannabinoids: Pharmacokinetic evaluation in Healthy Volunteers in Comparison to Buccal Spray Administration.●Overcoming the lack of oral availability of cyclic hexapeptides: Design of a new selective and orally available ligand for the integrin $\alpha v \beta 3$.●PTL401, a new formulation based on pro-nano dispersion technology, improves oral cannabinoids bioavailability in healthy volunteers.●PTL401, a new formulation based on pro-nano dispersion technology, improves oral cannabinoids bioavailability in healthy volunteers. | <ul style="list-style-type: none">● Am J Physiol Endocrinol Metab.2016.● Eur J Pharm Sci. (2017).● J Control Release 2017.● Angew Chem Int Ed Engl. 2017.● J Pharm Sci. 2018.● J Pharm Sci. 2018.●Drug Development and Industrial Pharmacy (DRUG DEV IND PHARM) 2018.●Mol. Pharm. 2018.●Scientific Reports 2018.● Mol. Pharm. 2018.● Angew Chem Int Ed Engl.2018.● Am. J Pharmacol |

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| | | | | <p>the development of a novel. The Hebrew University of Jerusalem. MyR-c(MyD 4-4), a novel cyclic peptide drug lead for autoimmune disease and cancer therapy 2016 The Kaye Innovation Award for the development of a novel anti metastasis pharmacotherapy a carbamoylphosphonates derivative. The Hebrew University of Jerusalem. 2017 Distinction for Excellence in Teaching selected by the Rector of The Hebrew University of Jerusalem, 2019 The Kaye Innovation Award for the development of a novel. The Hebrew University of Jerusalem. MyR-c(MyD 4-4), a novel cyclic peptide drug lead for autoimmune disease and cancer therapy</p> | | <ul style="list-style-type: none"> ●Investigation of Intestinal Absorption Enhancers: Individual vs. Blends with the Carbamoylphosphonate ●The effect of piperine pro-nano lipospheres on direct intestinal phase II metabolism: the raloxifene paradigm of enhanced oral bioavailability. ●Development of a Novel Backbone Cyclic Peptide Inhibitor of the Innate Immune TLR/IL1R Signaling Protein MyD88 ●Enhancing oral bioavailability of cyclic RGD hexa-peptides by the Lipophilic Prodrug Charge Masking approach: Redirection of peptide intestinal permeability from paracellular to transcellular pathway. ●Orally Active Peptides: Is There a Magic Bullet? ●Pro-nanoliposphers (PNL) for improved oral bioavailability of insoluble drugs. ●Myristoylation confers oral bioavailability and improves the bioactivity of c(MyD 4-4), a cyclic peptide inhibitor of MyD88. | <p>Pharmacother 2018. ● Mol. Pharm. 2019.</p> |
| Kohen Ron | 49 WOS | Reactive oxygen species, skin as window for internal disease, antioxidants in vivo | Head Bloom Center of Pharmaceutical Sciences. Head School of Pharmacy, Director Institute for Drug Research. All of the School of Pharmacy Committees. Development Committee of the Faculty of Medicine Nomination Committee of | <p>EF-7 EU grants (x2) "Superflex" :SkinTreat; The Israel Science Foundation (X5) (ISF, United State – Israel Binational Foundation (x3) (BSF), BARD and the European Community (EU-7),</p> | 3 | <ul style="list-style-type: none"> ●Chronic treatment with Tempol during acquisition or withdrawal from CPP abolishes the expression of cocaine reward and diminishes oxidative damage. ●Serial evaluation of serum total reduction power potential by cyclic voltammetry in 30 dogs with gastric dilatation and volvulus- a randomised, controlled (lidocaine vs placebo), clinical trial. ●The timing of caffeic acid treatment with cisplatin determines sensitization or resistance of ovarian carcinoma cell lines. ●A novel role of topical iodine in skin: Activation of the Nrf2 | <ul style="list-style-type: none"> ●Scientific Reports 2017. ●Res Vet Sci. 2018. ●Redox Biol. 2017. ●Free Radic Biol Med. 2017. ●Oxid Med Cell Longev. 2017. ●Nanoscale 2016. ●Cosmetics. 2016. |

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| | | | the Faculty of Medicine ("Vaadat Minuim") | Ministry of Health (x3). | | <p>pathway.</p> <ul style="list-style-type: none"> ●Curcumin Protects Skin against UVB-Induced Cytotoxicity via the Keap1-Nrf2 Pathway: The Use of a Microemulsion Delivery System. ●The bright side of plasmonic gold nanoparticles; activation of Nrf2, the cellular protective pathway. ●Skin Redox Balance Maintenance: The Need for an Nrf2-Activator Delivery System Cosmetics. | |
| Lazarovich Philip | 48 GS | <p>Nerve growth factor (NGF) action on cellular and molecular targets. Different selective toxins allowed me to dissect and characterize fundamental pharmacological processes such as signal transduction, exocytosis, site selected neurotoxicity and chimeric toxins, as well as pore forming peptides and protein toxins. Lately, I started to investigate disintegrins from snake venoms which helped me to dissect integrin related pathologies and to develop anti-</p> | <p>2013- 2019 Member of the Center for Nanoscience and Nanotechnology at The Hebrew University.</p> <p>2014-2019 Member in the Brain Disease Research Center (BDRC), Faculty of Medicine, HUJI.</p> <p>2014-2019 Member of The Jerusalem Brain Community (JBC), The Hebrew University.</p> <p>2014-2019 Partnership in ERA chair, FP7 organized by Prof. Rui L. Reis. Headquarters of the European Institute of Excellence in Regenerative Medicine, Guimaraes, Portugal.</p> <p>2017-2019 Visiting Professor at Temple University, Faculty of Engineering, Department of Bioengineering, Philadelphia, PA, USA.</p> <p>2017-2019 Visiting Professor at Faculty of Health Sciences, University of Macau, Taipa, Macau, China</p> | <p>06/2016 Award of appreciation from PCS global cell science and stem cell conferences organization.</p> <p>08/2017 Award of recognition as long standing 25 years member of American Society for Neuroscience.</p> <p>08/2017 Award of contribution to the editorial board of Journals : Clinical Pharmacology and Toxicology and Journal of Molecular Neuroscience.</p> | 6 | <ul style="list-style-type: none"> ●Enhanced Re-Endothelialization of Decellularized Rat Lungs ●Artemisinin conferred ERK mediated neuroprotection to PC12 cells and cortical neurons exposed to sodium nitroprusside-induced oxidative insult. ●Novel Synthetic PEGylated Conjugate of α-Lipoic Acid and Tempol Reduces Cell Death in a Neuronal PC12 Clonal Line Subjected to Ischemia. ●Protein toxins of the Echis coloratus viper venom directly activate TRPV1. ●Methylene-Cycloalkylacetate (MCA) Scaffold-Based Compounds as Novel Neurotropic Agents. ●Human Umbilical Cord Blood CD45+ Pan-Hematopoietic Cells Induced a Neurotherapeutic Effect in Mice with Traumatic Brain Injury: Immunophenotyping, Comparison of Maternal and Neonatal Parameters, and Immunomodulation. ●Elchalal U. Nerve growth factor plays a role in the neurotherapeutic effect of a CD45+ pan-hematopoietic subpopulation derived from human umbilical cord blood in a traumatic brain injury model. Cytotherapy. 2018. ●Nerve Growth Factor-Induced Angiogenesis: 1. Endothelial Cell Tube Formation Assay. ●Nerve Growth Factor-Induced Angiogenesis: 2. The Quail Chorioallantoic Membrane Assay. ●Reverting the molecular fingerprint of tumor dormancy as a therapeutic strategy for glioblastoma. ●Tufelisin is required for NGF-induced differentiation of PC12 cells. ●Measurements of cell death induced by snake and spider's venoms and derived toxins. ●Cell-based adhesion assays for isolation of snake venom's integrin antagonists. | <ul style="list-style-type: none"> ● Tissue Eng Part C Methods. 2016. ● Free Radic Biol Med. 2016. ● ACS Chem Neurosci. 2016. ● Biochim Biophys Acta. 2017. ● ACS Chem Neurosci. 2017. ● J Mol Neurosci. 2018. ● Cytotherapy. 2018. ● Methods Mol Biol. 2018. ● Methods Mol Biol. 2018. ● FASEB J. 2018. ● Journal of Molecular Neuroscience. 2019. ● Methods Mol Biol. In press. 2019. ● Methods Mol Biol. In press. 2019. |

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| | | platelets drugs, angiogenesis inhibitors and lead compounds for therapy of multiple sclerosis. I am in the process of translating my pharmaceutical knowhow to tissue engineering and regenerative medicine topics | | | | | |
| Levi-Schaffer Francesca | 55 GS | Allergy, asthma, mast cells, eosinophils, immunopharmacology, COPD, cancer | 1/2015-4/2015 Visiting Professor (sabbatical), Humanitas Clinical and Research Center, Milano, Italy 9/2018-11/2018 Visiting Professor (sabbatical), Charité Universitätsmedizin Berlin, Berlin, Germany 1/3/2019-30/4/2019 Visiting Professor (sabbatical), Brigham & Women's Hospital, Harvard Medical School, Boston, MA | 2015 Otto Loewi Memorial Lecture, Medical University of Graz, Austria 2018 Academia Europaea 2019 GB West Lecture, 48th European Histamine Research Society Meeting, Krakow, Poland | 6 | <ul style="list-style-type: none">●Immunotherapy of cancer: from monoclonal to oligoclonal cocktails of anti-cancer antibodies: IUPHAR Review.●Biomarkers of the involvement of mast cells, basophils and eosinophils in asthma and allergic diseases.●Manifesto on small airway involvement and management in asthma and chronic obstructive pulmonary disease: an Interasma (Global Asthma Association - GAA) and World Allergy Organization (WAO) document endorsed by Allergic Rhinitis and its Impact on Asthma (ARIA) and Global Allergy and Asthma European Network (GA2LEN).●The human 2B4 and NTB-A receptors bind the influenza viral hemagglutinin and co-stimulate NK cell cytotoxicity.●sCD48 is anti-inflammatory in S. aureus enterotoxin B induced eosinophilic inflammation.●Papain activates human mast cells to release pro-inflammatory mediators via its enzymatic activity.●Human herpesvirus 6B downregulates expression of activating ligands during lytic infection to escape elimination by natural killer cells.●AllergoOncology - The impact of allergy in oncology.●Positive and negative signals in mast cell activation.●Mast cell and eosinophil surface receptors as targets for anti-allergic therapy.●Bidirectional mast cell-eosinophil interactions in inflammatory disorders and cancer●Pyruvate dehydrogenase has a major role in mast cell function and its activity is regulated by mitochondrial MITF.●CD48 on blood leukocytes and in serum of asthma patients | <ul style="list-style-type: none">● IUPHAR Review. 2016.● World Allergy Organ J.2016● World Allergy Organ J. 2016.●Oncotarget. 2016.● Allergy. 2016.● J Invest Dermatol. . 2016.● J Virol.. 2016.●Allergy 2017.● Trends Immunol.. 2017.● Pharmacol Ther. . 2017.● Front Med (Lausanne).. 2017.● J Allergy Clin Immunol 2017.● Allergy 2017.● J Allergy Clin Immunol.. 2017.● Allergy 2018.● Immunol Rev. 2018.● Expert Opin Drug Saf. 2018.● Nucleic Acids Res.. 2018.● Allergy. 2018.● Clin Immunol. . 2018. |

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| | | | | | | <div>varies with severity.</div> <div>●miR-4443 regulates mast cell activation by T cell - derived microvesicles.</div> <div>●AllergoOncology: Opposite outcomes of immune tolerance in allergy and cancer.</div> <div>●Human eosinophils and mast cells: birds of a feather flock together. 2018.</div> <div>●Safety of humanized monoclonal antibodies against IL-5 in asthma: focus on reslizumab</div> <div>●The IUPHAR/BPS Guide to PHARMACOLOGY in 2018: updates and expansion to encompass the new guide to IMMUNOPHARMACOLOGY.</div> <div>●Comparing biologicals and small molecule drug therapies for chronic respiratory diseases: An EAACI Taskforce on Immunopharmacology position paper.</div> <div>●2B4 and CD48 a powerful couple of the immune system.</div> <div>●Dangerous liaisons in anaphylaxis.</div> <div>●Fevipiprant, a DP2 receptor antagonist, inhibits eosinophil migration towards mast cells.. ●Evaluation of soluble CD48 levels in patients with allergic and nonallergic asthma in relation to markers of type 2 and non-type 2 immunity: An observational study.</div> <div>●Modulation of allergic responses by mitochondrial STAT3 inhibitors.</div> <div>●Leukocyte CD300a contributes to the resolution of murine allergic inflammation.</div> <div>●CD300a expression is modulated in atopic dermatitis and could influence the inflammatory responses.</div> <div>●Siglec-7on peripheral blood eosinophils: Surface expression and function.</div> <div>●AllergoOncology: microbiota in allergy and cancer - an EAACI position paper.</div> <div>●The immunoreceptor CD300a controls the intensity of inflammation and dysfunction in a model of antigen-induced arthritis in mice.</div> | <div>● Science.. 2018.</div> <div>● Clin Exp Allergy. 2018.</div> <div>● J Immunol Res.. 2018.</div> <div>● Allergy. 2018.</div> <div>● J Immunol.. 2018.</div> <div>● Allergy. 2019.</div> <div>●Allergy 2019.</div> <div>●Allergy. 2019.</div> <div>● J Leukoc Biol.2019.</div> |
| Matok Ilan | 16 WOS | Pharmacoevid emiology in special populations (namely, pregnant women, children and older adults): The study of drug effects in large | 2013-Present: Member, PharmD Program Student Admission Committee, School of Pharmacy, HUJI 2014-Present: Member, Teaching Committee in The Division of Clinical Pharmacy School of Pharmacy 2014-Present: Member, Pharmacy Internship | 2014: PI, The Israel National Institute for Health Policy Research. Clinical Computerized Decision Support for the Prevention of Medication Errors in the Pediatric Intensive Care Department (Project did not start-technical problems | 9 | <div>●Antihypertensive and Statin Medication Use and Motor Function in Community-Dwelling Older Adults.</div> <div>●Major Bleeding and Hemorrhagic Stroke with Direct Oral Anticoagulants in Patients with Renal Failure: Systematic Review and Meta-Analysis of Randomized Trials.</div> <div>●Association of Acetaminophen and Ibuprofen Use with Wheezing in Children with Acute Febrile Illness.</div> <div>●Demonstration of early efficacy results of the delayed-release combination of doxylamine-pyridoxine for the treatment of nausea and vomiting of pregnancy.</div> <div>●Role of vasopressin and terlipressin in refractory shock compared to conventional therapy in the neonatal and pediatric</div> | <div>● J Am Med Dir Assoc.. 2016.</div> <div>● Chest.. 2016.</div> <div>● Ann Pharmacother.2017.</div> <div>● BMC Pregnancy Childbirth.. 2016.</div> <div>● Crit Care2017.</div> <div>● Drug Saf.. 2017.</div> <div>● Int J Med Inform. 2017.</div> <div>● Nutr Metab Cardiovasc Dis. 2017.</div> <div>● Age Ageing. 2018.</div> |

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| | | populations (drug safety & efficacy, Drug utilization) | <p>("Stage") Committee, School of Pharmacy 2014-Present: Member, Teacher-student committee, School of Pharmacy 2014-Present: Advisor, Fourth-year Pharmacy students, School of Pharmacy 2017-Present: Member, Committee for Ethics in Humans, Faculty of Medicine 2017-Present: Head, Excellence Program for Direct Studies for Doctor in Clinical Pharmacy, School of Pharmacy</p> | <p>with the CDSS software)</p> <p>2016: PI, The Israel National Institute for Health Policy Research. Colorectal Cancer Screening Services by Community Pharmacies in Israel</p> <p>2016-2017: PI, The Israel Cancer Association: Calcium Channel Blockers and the Risk for Lung Cancer</p> <p>2017-2018: PI, Israel Science Foundation (ISF): Calcium Channel Blockers and the Risk for Lung Cancer</p> | | <p>population: a systematic review, meta-analysis, and trial sequential analysis.</p> <ul style="list-style-type: none"> ●The Fetal Safety of Enoxaparin Use During Pregnancy: A Population-Based Retrospective Cohort Study. ●Prescriber response to computerized drug alerts for electronic prescriptions among hospitalized patients. ●Acute renal failure with sodium-glucose-cotransporter-2 inhibitors: Analysis of the FDA adverse event report system database. ●Z-drugs and risk for falls and fractures in older adults-a systematic review and meta-analysis. ●. Pregnancy Outcomes Following Exposure to Quinolone Antibiotics – a Systematic-Review and Meta-Analysis. ●The Risk for Lung Cancer Incidence with Calcium Channel Blockers: A Systematic Review and Meta-Analysis of Observational Studies. ●Prenatal Exposure to Acetaminophen and Risk for Attention Deficit Hyperactivity Disorder and Autistic Spectrum Disorder: A Systematic Review, Meta-Analysis, and Meta-Regression Analysis of Cohort Studies. ●The Cardiovascular safety of Macrolides: A Systematic review, Meta-Analysis and network Meta-Analysis. ●Cognition and Dementia Related Adverse Effects with Sacubitril-Valsartan: Analysis of the FDA Adverse Event Report System Database. ●CT Imaging of Enzymatic Activity in Cancer using Covalent Probes Reveal a Size-Dependent Pattern. ●Interaction as a Predictor of Direct Oral Anticoagulants Drug levels in Atrial Fibrillation Patients. ●Appropriateness of Direct Oral Anticoagulant Dosing and its Relation to Drug Levels in Atrial Fibrillation Patients. ●Calcium Channel Blockers Increase the Risk for Lung Cancer: A Population-Based Nested Case-Control Study. ●Fluoroquinolones and Cardiovascular Risk: A Systematic Review, Meta-analysis and Network Meta-analysis. ●Trial of labor after caesarean delivery in twin gestations: Systematic review and meta-analysis. ●Prenatal Exposure to SSRIs and SNRIs and Risk for Persistent Pulmonary Hypertension of The Newborn: A Systematic Review, Meta-Analysis and Network Meta-Analysis. ●Management strategies of the interaction between direct oral anticoagulant and drug-metabolizing enzyme inducers. | <ul style="list-style-type: none"> ●. Pharm Res. . 2018. ● Drug Saf.. 2018. ●Am J Epidemiol. 2018. ● Antimicrob Agents Chemother.2018. ● J Card Fail. 2018. ● J Am Chem Soc.. 2018. ● J Thromb Thrombolysis.2018. ● J Thromb Thrombolysis.. 2019. ● Ann Pharmacother.. 2018. ● Drug Saf.. 2019. ● Am J Obstet Gynecol.. 2019. ● J Thromb Thrombolysis. 2019. |
| Moussaieff Arieh | 16 GS | We aim to characterize metabolic networks and in particular lipid | | | 3 | <ul style="list-style-type: none"> • Multi-platform NMR Investigation of Pluripotent Stem Cells Unveils New Metabolic Signatures of Epigenetic Shifts towards Neuronal Differentiation. • A shift in follicular fluid from triacylglycerols to membrane lipids is associated with positive pregnancy outcome. | <ul style="list-style-type: none"> • Analytical Chemistry. In revision. • FASEB journal. Accepted for publication. |

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| | | <p>metabolic networks for monitoring and regulating changes in biological systems by metabolic perturbations.</p> <p>Using stem cell technologies and other advanced cellular, multicellular and animal models as well as clinical samples, we study the lipid composition (lipidome) during developmental and pathological processes. We use the lipidome for monitoring or controlling cell fate.</p> | | | | | |
| Priel Avi | 8 WOS 10 GS | <p>Ion channels Pharmacology and Biophysics with emphasis on pain receptors.</p> | <p>2015-present The American Society for Pharmacology and Experimental Therapeutics (ASPET)</p> <p>2015-present Federation of European Neuroscience Societies (FENS)</p> <p>2018-present Society of General Physiologists (SGP)</p> | <p>2015 Excellence in Teaching (Rector list)</p> <p>The Hebrew University of Jerusalem, Israel</p> <p>2016 Faculty Award for Excellent Pre-Clinical Lecturer</p> <p>The Faculty of Medicine of the Hebrew University of Jerusalem, Israel</p> | 6 | <ul style="list-style-type: none"> ●Tyrosine residue in the TRPV1 vanilloid binding pocket regulates deactivation kinetics ●Protein toxins of the Echis coloratus viper venom directly activate TRPV1 ●Controllable ion channel expression through inducible transient transfection ●Activation of TRPV1 by lipoxigenase-metabolites depends on PKC phosphorylation ●Tricyclic Spirolactones as Modular TRPV1 Synthetic Agonists ●Animal toxins providing insights into TRPV1 activation mechanism ●Modulation of Renal GLUT2 by the Cannabinoid-1 Receptor: | <ul style="list-style-type: none"> ● The Journal of Biological Chemistry (JBC). 2016. ● Biochimica et Biophysica Acta (BBA) - General Subjects. 2017. ● Journal of Visualized Experiments (Jove). 2017. ● The FASEB Journal. 2017. ● ACS Chemical Neuroscience. 2017. |

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| | | | | 2016 The Prusiner-Abramsky Research Award in Basic Neuroscience The Hebrew University of Jerusalem, Israel 2016 Excellence in Teaching (Rector list) The Hebrew University of Jerusalem, Israel 2018 Faculty Award, The Dr. A Harvey & Mrs. Beryl Granat Prize for study in Neuro-anesthesia The Faculty of Medicine of the Hebrew University of Jerusalem, Israel 2018 Excellence in Teaching (Rector list) The Hebrew University of Jerusalem, Israel | | Implications for the Treatment of Diabetic Nephropathy ●Pancreatic Pericytes Support β -Cell Function in a Tcf7l2-Dependent Manner ●TRPV1 pore turret dictates distinct DkTx- and capsaicin- gating ●The Role of Toxins in the Pursuit for Novel Analgesics | ●Toxins. 2017. ● Journal of the American Society of Nephrology (JASN). 2018. ● Diabetes. 2018. ● Proceedings of the National Academy of Sciences USA (PNAS). 2018. ● Toxins. 2019. |
| Reich Reuven | 65 GS | Tumor Biology and Embryo Implantation | 2004-2018 Teaching Committee- School of Pharmacy 2010-2018 Scientific committee, Bretlller Center-Head 2014-2018 Committee for Advanced Studies- Head, School of Pharmacy, HUJI 2014-2017 Committee for Advanced Studies-Member, Faculty of Medicine, HUJI 2014-2018 Committee for PhD student's admission, Head, School of Pharmacy, HUJI 2015-2017 Ethics Committee – Faculty of Medicine | 2011 Teaching Prize - Faculty of Medicine, Hebrew University of Jerusalem, Israel 2012- Dame Susan Garth Professor in Cancer Research | 5 | ●Uterine leiomyosarcoma and endometrial stromal sarcoma have unique miRNA signatures. ●HUR mRNA expression in ovarian high-grade serous carcinoma effusions is associated with poor survival. ●Ezrin is associated with disease progression in ovarian carcinoma, ●MiR-29a is a candidate biomarker of better survival in metastatic high-grade serous carcinoma. ●TSAP6 is a novel candidate marker of poor survival in metastatic high-grade serous carcinoma ●TGF β splicing and canonical pathway activation in high-grade serous carcinoma ●Phospholipase D messenger RNA expression and clinical role in high-grade serous carcinoma. ●Activity and clinical relevance of autotaxin and lysophosphatidic acid pathways in high-grade serous carcinoma. 2018. ●Expression and clinical role of long non-coding RNA in high-grade serous carcinoma. | ●Gynecologic Oncology. 2016. ●Hum Pathol. ●PLoS One. 2016. ●Hum Pathol. 2016. ●Hum Pathol. 2016. ●Virchows Arch. 2017. ●Hum Pathol. 2017. ●Virchows Arch. ●Gynecol Oncol. 2018. |

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| | | | 2019- Brettler Center, HUJI- Director | | | | |
| Shurki Avital | 21 GS | Enzyme Design. Binding and affinity studies of cannabinoids and endocannabinoids. Method development. | Member of the Lise Meitner-Minerva Center - Member and Head of the Alex Grass Center for Drug Design and Synthesis - Member of the Multidisciplinary Center for Cannabinoid Research - Member of the Editorial Board of Scientific Reports | 2015 – Rector's list for outstanding teachers 2017 – Rector's list for outstanding teachers | 1 | <ul style="list-style-type: none"> • Derivatives of the non-psychoactive cannabinoid cannabidiol, decrease the activation of encephalitogenic T cells • Empirical Valence Bond Simulations of Biological Systems • Assessing the performance of ab initio classical valence bond methods for hydrogen transfer reactions | <ul style="list-style-type: none"> • Chemical Biology & Drug Design, 2016. • Theory and Applications of the Empirical Valence Bond Approach - From Physical Chemistry to Chemical Biology Eds. Fernanda Duarte, Shina Caroline Lynn Kamerlin, publisher Wiley, Chap. 6 pp. 2017. • Comput. Theor. Chem., 2017. |
| Tam Joseph (Yossi) | 22 GS | Demonstrating that targeting the peripheral cannabinoid-1 receptor (CB ₁ R) has the potential to treat the metabolic syndrome. Studying molecular mechanisms potentially involved in the development of different aspects of the metabolic syndrome (obesity, fatty liver disease, nephropathy, osteoporosis, and mitochondrial dysfunction), with | <p>2014-Present Head, Obesity and Metabolism Laboratory, Institute for Drug Research, School of Pharmacy, Faculty of Medicine, The Hebrew University of Jerusalem</p> <p>2016-Present Member, The Hebrew University Center for Nanoscience & Nanotechnology (HUCNN)</p> <p>2016-Present Director, The Hebrew University's Multidisciplinary Center for Cannabinoid Research (MCCR)</p> | <p>2016-2018 Excellence in Teaching (Rector List). The Hebrew University of Jerusalem.</p> <p>2016 ERC Starting Grant</p> <p>2017 Prof. Jacob Metzner's Young Investigator Award.</p> <p>The Hebrew University of Jerusalem.</p> <p>2018 Prof. Israel Chowers Award. The Israel Endocrine Society</p> <p>2018 NCATS Director's Awards for Scientific/Medical Achievement.</p> <p>National Institutes of Health</p> <p>2019 Sir Zelman Cowen Universities Fund (SZCUF) Prize for Discovery in Medical Research in the field of Metabolism and</p> | 10 | <ul style="list-style-type: none"> • Targeting the Endocannabinoid/CB₁ Receptor System for Treating Obesity in Prader-Willi Syndrome. • The Emerging Role of the Endocannabinoid System in the Pathogenesis and Treatment of Kidney Diseases. • Serum Levels of Endocannabinoids are Independently Associated with Nonalcoholic Fatty Liver Disease.. • miRNA-132 Induces Hepatic Steatosis and Hyperlipidemia by Synergistic Multi-target Suppression. • Peripheral Cannabinoid-1 Receptor Blockade Restores Hypothalamic Leptin Signaling. • Metabolic Circuit Involving Free Fatty Acids, microRNA 122, and Triglyceride Synthesis in Liver and Muscle Tissues. • Metabolic Profiling of CB₁ Neutral Antagonists, CANNABINOIDS AND THEIR RECEPTORS, Methods in Enzymology. • Proximal Tubular Cannabinoid-1 Receptor Regulates Obesity-induced CKD. • Attenuating the Rate of Total Body Fat Accumulation and Alleviating Liver Damage by Oral Administration of Vitamin D-enriched Edible Mushrooms in a Diet-induced Obesity Murine Model is Mediated by an Anti-inflammatory Paradigm Shift. • Modulation of Renal GLUT2 by the Cannabinoid-1 Receptor: Implications for the Treatment of Diabetic Nephropathy. • Age-related Regulation of Bone Formation by the Sympathetic Cannabinoid CB₁ Receptor. • In Vivo Anticancer Activity of a Non-Toxic Inert Phenolato Ti Complex: High Efficacy on Solid Tumors Alone and Combined with Pt Drugs. • Characterization of the Endocannabinoid System in Subcutaneous Adipose Tissue in Periparturient Dairy Cows and | <ul style="list-style-type: none"> • Mol Metab • J Basic Clin Physiol Pharmacol. • Obesity (Silver Spring) • Gut. • Mol. Metab. • Gastroenterology. • Methods Enzymol. • J Am Soc Nephrol. • BMC Gastroenterol • J Am Soc Nephrol • Bone • Chem Med Chem • Plos One • Eur J Intern Med • J Bone Miner Res • Diabetes Obes Metab • Obes Surg • Mol Autism • Mol Metab • Nephron • Toxins (Basel) |

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| | | therapeutic prospects for the development of an effective drug therapy | | Obesity 2019 Excellence in Teaching. Faculty of Medicine. The Hebrew University of Jerusalem | | <p>its Association to Metabolic Profiles.</p> <ul style="list-style-type: none"> ●The Therapeutic Potential of Targeting the Peripheral Endocannabinoid/CB1 Receptor System. 2018. ●Magel2 Modulates Bone Remodeling and Mass in Prader Willi Syndrome by Affecting Oleoyl Serine Levels and Activity. ●Cannabinoid-1 Receptor Regulates Mitochondrial Dynamics and Function in Renal Proximal Tubular Cells. ●Circulating Endocannabinoids Are Reduced Following Bariatric Surgery and Associated with Improved Metabolic Homeostasis in Humans. ●Lower Circulating Endocannabinoid Levels in Children with Autism Spectrum Disorder. ●Aqeilan R. WWOX somatic ablation in skeletal muscles alters glucose metabolism. ●Do Endocannabinoids Regulate Glucose Reabsorption in the Kidney? ●Cannabis: From a Plant That Modulates Feeding Behaviors toward Developing Selective Inhibitors of the Peripheral Endocannabinoid System for the Treatment of Obesity and Metabolic Syndrome. | |
| Tirosh Boaz | 25 WOS | Pharmacology , Biochemistry, Immunology | Director, Inter-Faculty Biotechnology Program at HUJI Head of the Core Equipment Facility of the Institute for Drug Research | Israel-France collaboration award "PHC-Maimonides", 2017 | 6 | <ul style="list-style-type: none"> ●Metabolic Control of Plasma Cell Differentiation- What We Know and What We Don't Know. ●CHO cells knocked out for TSC2 display an improved productivity of antibodies under fed batch conditions. ●Schlafen2 mutation unravels a role for chronic ER stress in the loss of T cell quiescence. ●Engineering CHO cells with an oncogenic KIT improves cells growth, resilience to stress, and productivity. ●Opposing effects of intracellular versus extracellular adenine nucleotides on autophagy: implications for β-cell function. ●Infliction of proteotoxic stresses by impairment of the unfolded protein response or proteasomal inhibition as a therapeutic strategy for mast cell leukemia. ●Hepatic Amiodarone Lipotoxicity Is Ameliorated by Genetic and Pharmacological Inhibition of Endoplasmatic Reticulum Stress. ●Increasing the affinity of cationized polyacrylamide-paclitaxel nanoparticles towards colon cancer cells by a surface recognition peptide. ●SQSTM1/p62-mediated autophagy compensates for loss of proteasome polyubiquitin recruiting capacity. ●mTORC1 activation in B cells confers impairment of marginal zone microarchitecture by exaggerating cathepsin activity. ●Transcription of the NKG2D ligand MICA is suppressed by the IRE1/XBP1 pathway of the unfolded protein response through the regulation of E2F1. ●Low concentrations of cadmium chloride promote protein | <ul style="list-style-type: none"> • J Clin Immunol. 2016. • Biotechnol Bioeng. 2016. • Oncotarget. 2016. • Biotechnol Bioeng 2017. • J Cell Sci. 2018. • Oncotarget. 2017. • Toxicol Sci. 2017 • Int J Pharm.2017 • Autophagy. 2017 • Immunology. 2018 • FASEB J. 2019 • Biotechnol Bioeng. 2019 • Cell Death Dis. 2019 • Mol Cell Proteomics 2019 |

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| | | | | | | translation and improve cell line productivity. ●The unfolded protein response modulators GSK2606414 and KIRA6 are potent KIT inhibitors. ●Cathepsin L Regulates Metabolic Networks Controlling Rapid Cell Growth and Proliferation. | |
| Tsvetikhovsky Dmitry | 8 WOS | Synthetic Medicinal Chemistry | 0 | CIG, GIF, ISF, Nofar, Volkswagen | 4 | <ul style="list-style-type: none"> ●Three phase microemulsion/sol-gel system for aqueous c-c coupling of hydrophobic substrates. ●Stereo- and Regioselective Synthesis of Tricyclic Spiranoind Lactones via Diastereomeric Differentiation of a Collective Key Precursors. ●Cascade Pd-Catalyzed Wacker Lactonization-Heck Reaction: Rapid Assembly of Spiranoind Lactones. ●Pd-Catalyzed Cyclization of Free Hydroxyalkenoic Acids: Regio- and Chemoselective Access to Methylene Lactones. ●A Multifaceted α-Enaminone - Adaptable Building Block for Synthesis of Heterocyclic Scaffolds Through Conceptually Distinct 1,2-, 1,3-, 1,4- and C-O Bond Forming Annulations. ●Tricyclic Spirolactones as Modular TRPV1 Synthetic Agonists. ●Palladium-Catalyzed Cascade Assembly of Tricyclic Spiroethers from Diene-Alcohol Precursors. ●Methylene-Cycloalkylacetate (MCA) Scaffold-Based Compounds as Novel Neurotropic Agents. | <ul style="list-style-type: none"> • Eur. J. Org. Chem. 2008, 2017. • Chem. Eur. J. 2016. • Chem. Commun. 2016. • Adv. Synth. Catal. 2017. • J. Org. Chem. 2017. • ACS Chem. Neurosci. 2017 • J. Org. Chem. 2017. • ACS Chem. Neurosci. 2018. |
| Wormser Uri | 20 WOS | 1. Development of topical iodine as antidote against skin irritation 2. Development of novel peptides for autoimmune diseases 3. Development of novel peptides for treatment of cancer | | | 0 | <ul style="list-style-type: none"> ●Is chronic exposure to organophosphate drift influences the peripheral nervous system? 2016. ●Reduced levels of α-1-antitrypsin in cerebrospinal fluid of amyotrophic lateral sclerosis patients: a novel approach for a potential treatment. 2016. | <ul style="list-style-type: none"> ●In; The high Galil Studies, vol 2- Itai Bahur Publishing, Zichron Ya'akov, Israel ●J Neuroinflammation |
| Yaka Rami | 23 | Neurobiology of Drug Addiction | Head, Department of Pharmacology, School of Pharmacy Head, Teaching program, School of Pharmacy Head, Program for Advanced studies, School | | 9 | <ul style="list-style-type: none"> ●Neuroinflammation-Induced Memory Deficits Are Amenable to Treatment with D-Cycloserine. 2019 ●Chronic treatment with Tempol during acquisition or withdrawal from CPP abolishes the expression of cocaine reward and diminishes oxidative damage. 2017. ●Role of oxidative stress in cocaine addiction | <ul style="list-style-type: none"> ●J Clin Med. ●Sci Rep ●J Neurol and Neuromedicine. 2019. |

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| | | | <p>of Pharmacy Head, Scientific board, David R. Bloom Center for Pharmacological Research, School of Pharmacy Member, Infrastructure committee, School of Pharmacy Member, PhD evaluation committee, School of Pharmacy Member, Teaching committee, School of Pharmacy Member, Award committee, School of Pharmacy Member, Teaching committee, Faculty of Medicine Member, Brain Disease Research Center, Faculty of Medicine Member, Scientific board, Brain Disease Research Center (BDRC), Faculty of Medicine</p> | | | | |
| Yavin Eylon | 18 GS | <p>PNA; splice switching oligonucleotides; FIT- (Forced Intercalation)- PNA; cancer diagnosis; SNP detection; PNA-peptide conjugates</p> | <p>Medicinal Chemistry Section of the Israel Chemical Society (president) David R. Bloom Center for Pharmacy (member) Alex Grass Center for Novel Therapeutics (member)</p> | | 4 | <ul style="list-style-type: none"> ●Single Point Mutation Detection in Living Cancer Cells by Far-red Emitting PNA-FIT Probes, ●Solid Nano-in-Nanoparticles for Potential Delivery of siRNA ●The effect of linker type and recognition peptide conjugation chemistry on tissue affinity and cytotoxicity of charged polyacrylamide. ●CLIP6-PNA-peptide Conjugates: Non-endosomal Delivery of Splice Switching Oligonucleotides (SSO), ●A predictive model for the sequence-dependent fluorogenic response of forced-intercalation Peptide Nucleic Acid (FIT-PNA), ●Protein Regulation by Intrinsically Disordered Regions: A Role for Subdomains in the IDR of the HIV-1 ●Reverting the molecular fingerprint of tumor dormancy as a therapeutic strategy for glioblastoma ●Modulation of MKNK2 alternative splicing by splice-switching oligonucleotides as a novel approach for glioblastoma treatment ●MiR-16-1-3p and miR-16-2-3p possess strong tumor suppressive and anti-metastatic properties in osteosarcoma ●Specific inhibition of splicing factor activity by decoy RNA oligonucleotides | <ul style="list-style-type: none"> ●Chem. Commun. 2016. ●J. Controlled Rel. 2017. ●J. Controlled Rel. 2017. ●Bioconjugate Chem. 2017. ●ACS Omega 2018. ●Rev Protein, ●ChemBioChem, 2018. ●FASEB J., 2018. ●Nucleic Acids Res. 2018. ●Int J. Cancer, 2019. ●Nature Commun. 2019. ●Biosensors Bioelect. 2019. ●ACS Omega 2019. |

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| | | | | | <ul style="list-style-type: none"> ●Red-emitting FIT-PNAs: "On Site" Detection of RNA Biomarkers in Fresh Human Cancer Tissues ●AntimiR-155 Cyclic Peptide–PNA Conjugate: Synthesis, Cellular Uptake, and Biological Activity | |
| Benita Simon (emeritus) | 41 WOS 48 GS | Improving Drug Performance using Nanodelivery Systems - for enhanced oral, topical or ocular bioavailability of hydrophilic macromolecules or poorly absorbed lipophilic drugs which will improve the treatment of severe diseases such as cancers, ophthalmological, metabolic and immunological disorders. Double nano-encapsulated systems are being investigated for prolonged injectable delivery of peptides and proteins. | Member of Editorial Board, Journal of Microencapsulation, Taylor & Francis, London Member of Editorial Board, Journal of Drug Delivery Science and Technology Member of Editorial Board, Annales Pharmaceutiques Francaises Foreign Correspondent of Academie Nationale de Pharmacie, France Members of the Scientific Committee of LabEx NanoSaclay, Laboratory of Excellence in Nanosciences and Nanotechnologies, CEA Saclay, France, supported by the French National Research Agency (ANR) Member of International Advisory Board of Pharmaceutical Technology Conference. Chairman of Nanomedicine and its Role in New Medical Therapeutics. Mixiii-Biomed 2018, May Co-chairman of the Cannabis' Therapeutic Promise: Hope or Hype? Mixiii-Biomed 2019, May. | | 1 <ul style="list-style-type: none"> ●A Lipophilic Pt(IV) Oxaliplatin Derivative Enhances Antitumor Activity. J Med Chem. (2016). ●Solid nano-in-nanoparticles for potential delivery of siRNA. J Control Release, (2017) ● Cyclosporine A delivery to the eye: a comprehensive review of academic and industrial efforts. Eur J Pharm Biopharm., (2017). ●Dermal absorption behavior of fluorescent molecules in nanoparticles on human and porcine skin models. Int J Pharm.,(2017). ● Pharmacodynamical Effects of Orally Administered Exenatide Nanoparticles Embedded in Gastro-resistant Microparticles. Eur. J. Pharm. Biopharm., (2018). ●Nanocapsules embedded in microparticles for enhanced oral bioavailability and efficacy of Lopinavir as an anti-AIDS drug. Journal of Drug Targeting., (2019). | <ul style="list-style-type: none"> ● J Med Chem. (2016). ● J Control Release, (2017) ● Eur J Pharm Biopharm., (2017). ● Int J Pharm.,(2017). ● Eur. J. Pharm. Biopharm., (2018). ● Journal of Drug Targeting., (2019). |
| Bialer Meir (emeritus) | 50 GS | Pharmacokinetics of new antiepileptic drugs (AEDs) and pharmacokinetic-based | 0 | Honorary member and a Special Award of the Georgian League against Epilepsy (2017) | 5 <ul style="list-style-type: none"> ●sec-Butylpropylacetamide (SPD) has antimigraine properties. ●Pharmacokinetic and pharmacodynamic analysis after various routes of administration of sec-butylpropylacetamide (SPD), a new CNS drug possessing a unique activity against status epilepticus. ●Syntheses and Comparative Anticonvulsant Activity Assessment of CNS-Active Imidazole Derivatives. | <ul style="list-style-type: none"> ● Cephalgia. 2016. ● Mol. Pharmaceutic.13. 2016. ● Bioorg. Med.Chem. 24. 2016. ● Mol Diagnos. Ther, 21. 2017. |

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| | | design of new antiepileptics and CNS drugs | | | | <ul style="list-style-type: none"> ●The Impact of CYP2C9 Genetic Polymorphism on the Oral Clearance of S-warfarin. ●sec-Butylpropylacetamide (SPD) a new derivative of valproic acid for the treatment of neuropathic and inflammatory pain. ●White: Progress report on new antiepileptic drugs: A summary of the Thirteen Eilat Conference (EILAT XIII). ●White. Seizure detection and neuromodulation: A summary of the Thirteen Eilat Conference on New antiepileptic and devices (EILAT XIII). ●Mitochondrial liver toxicity of valproic acid and its acid derivatives is related to inhibition of alpha-lipoamide dehydrogenase ●Design and Comparative Evaluation of the Anticonvulsant Profile, Carbonic-Anhydrase Inhibition and Teratogenicity of Novel Carbamate Derivatives of Branched Aliphatic Carboxylic Acids with 4-Aminobenzenesulfonamide . ●A randomized, double-blind, placebo- and risperidone-controlled study on valnoctamide for acute mania. ●White: Progress report on new antiepileptic drugs: A summary of the fourteen Eilat Conference on new antiepileptic drugs and devices (EILAT XIV).I. Drugs in preclinical and early clinical development. ●White: Progress report on new antiepileptic drugs: A summary of the fourteen Eilat Conference on new antiepileptic drugs and devices (EILAT XIV). II. Drugs in more advanced clinical development. ●Wlodarczyk Teratogenicity of valproic acid and its constitutional isomer, amide derivative valnoctamide in mice. ●Comparative efficacy of valnoctamide and sec-butylpropylacetamide (SPD) in terminating nerve Agents-Induced seizures in pediatric rats. ●White. Virtual special issue "Neuromodulation": A summary of the data presented at the XIV conference on new antiepileptic and devices (EILAT XIV). ●Stereoselective pharmacokinetic and pharmacodynamic analysis of a CNS-active sulfamoylphenyl carbamate derivative. | <ul style="list-style-type: none"> ● Pharmacol. Res 17. 2017. ● Epilepsia 58. 2017. ● Epilepsy Res.130. 2017. ● Int. J. Mol. 19. 2017. ● Neurochem. Res. 42. 2017. ● Bipolar Disorder. 19. 2017. ● Epilepsia 59. 2018. ● Epilepsia59. 2018. ● Birth Def. Res.92. 2018. ● Epilepsia, 2019. ● Epilepsy Res. 153. 2019. ● J. Enzyme Inhibit. Med. Chem, in press. 2019. |
| Deutsch Joseph (emeritus) | 4 WOS | Chemical Synthesis and Pharmacological Characterization of New Steroidal Compounds | | NIH Visiting Scientist Case Western Reserve University , Visiting Professor | 0 | <ul style="list-style-type: none"> ●Endogenous cardiac steroids in animal models of mania. | Bipolar Disorders. 2016. |
| Friedman Michael | 31 WOS | | Institute for Drug Research Multidisciplinary Center on Cannabinoids Research | 5. Israeli Pharmacy Organization (ארגון רוקחות בישראל), | 3 | <ul style="list-style-type: none"> ●A Sustained-Release Membrane of Thiazolidinedione-8: Effect on Formation of a Candida/Bacteria Mixed Biofilm on Hydroxyapatite in a Continuous Flow Model | <ul style="list-style-type: none"> ● BioMed Research International. 2017. ● Expert Opin Drug Deliv. |

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| (emeritus) | | | | Distinction sign (אות למופת) 6. The Faculty of Medicine Award, the Hebrew University of Jerusalem, " אות הוקרה " עבור המשך הצטיינות ופעילות ענפה במחקר "בפקולטה ובהוראה" | | <ul style="list-style-type: none"> ●Sustained-release drug delivery of antimicrobials in controlling of supragingival oral biofilms. ●Chlorhexidine sustained-release varnishes for catheter coating – Dissolution kinetics and antibiofilm properties. ●Retrospective Evaluation Of A Novel Sustained-Release Ivermectin Varnish For Treatment Of Wound Myiasis In Zoo-Housed Animals, Journal of Zoo and Wildlife Medicine, 2018. ●Sustained-Release Fillers for Dentin Disinfection: An Ex Vivo Study ●Efficacy and potential use of novel sustained release fillers as intracanal medicaments against Enterococcus faecalis biofilm in vitro | 2017. 2017. <ul style="list-style-type: none"> ● European Journal of Pharmaceutical Sciences, 2018. ● Journal of Zoo and Wildlife Medicine, 2018. ●International Journal of Dentistry 2019. ● BMC Oral Health (in press), 2019. |
| Gorenstein Shela (emiritus) | 59 GS 46 WOS | Metabolomics study based on cultivars and origins of different plants by 1H NMR spectra of polar and non-polar extracts; Two dimensional gas chromatography coupled with time-of-flight mass spectrometry (GC×GC-TOF-MS) was applied to assess the botanical origin of different plants, based on volatile substances. Docking studies in interaction between plant polyphenols and human serum albumin. | Israeli coordinator in Erasmus plus program Editorial board of Food Research International from 2000- present Editorial board of Plant Foods for Human Nutrition from 1999- present | Received the highest award from the President of Poland for scientific cooperation between Israel- Poland in 2018. It is the second award in scientific achievements. | 0 | <ul style="list-style-type: none"> ●. Actinidia arguta supplementation protects aorta and liver in rats with induced hypercholesterolemia. 2016 ● Impact of Cultivation Conditions, Ethylene Treatment, and Postharvest Storage on Selected Quality and Bioactivity Parameters of Kiwifruit "Hayward" Evaluated by Analytical and Chemometric Methods. 2016 ● The effects of treatment on quality parameters of smoothie-type 'Hayward' kiwi fruit beverages. 2016 ● Antioxidant and Anti-proliferative Properties of Bioactive Compounds of Sweet Paprika (Capsicum annum L.) ● Effects of artificial lighting on bioactivity of sweet red pepper (Capsicum annum L.). 2016 ● Analytical Methods Applied to Characterization of Actinidia arguta, Actinidia deliciosa, and Actinidia eriantha Kiwi Fruit Cultivars. 2016 ● Chemistry and biological properties of berry volatiles by two-dimensional chromatography, fluorescence and Fourier transform infrared spectroscopy techniques. 2016 ● Selenium Supplementation of Amaranth Sprouts Influences Betacyanin Content and Improves Anti-Inflammatory Properties via NFkB in Murine RAW 264.7 Macrophages. ● Bioactivity and nutritional properties of hardy kiwi fruit Actinidia arguta sp. in comparison with Actinidia deliciosa "Hayward" and Actinidia eriantha "Bidan". 2016 ● Polychlorinated dibenzo-p-dioxins and dibenzofurans levels in piglet liver with various diseases. 2017 ● Interaction of human serum albumin with volatiles and polyphenols from some berries. 2017 ● Efficient three-dimensional fluorescence measurements for characterization of binding properties in some plants. 2017 ● Codonopsis lanceolata and Nelumbo nucifera Gaertn. root extracts for functional food: metabolic profiling by MS, FTIR and fluorescence and evaluation of cytotoxicity and anti-obesity properties on 3T3-L1 cell line. 2017 ● Identification and Characterization of Diploid and Tetraploid in | <ul style="list-style-type: none"> • Nutrition Research • Journal of AOAC International • Food Control • Plant Foods for Human Nutrition (Dordrecht, Netherlands). 2016 • International Journal of Food Science and Technology • Food Anal. Methods • Food Research International • Biological Trace Element Research • Food Chemistry Food Chemistry Food Chemistry • International Journal of Experimental Pathology • Food Hydrocolloids • Sensors and Actuators B: Chemical • European Food Research and Technology • Plant Foods for Human Nutrition • Journal of Pharmaceutical and Biomedical Analysis • Journal of Food Processing and Preservation • Food Analytical Methods • Food Chemistry • Food Control • Industrial Crops and |

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| | | | | | | <p>Platycodon grandiflorum. 2017</p> <ul style="list-style-type: none"> • Characterization of metabolites in different kiwifruit varieties by NMR and fluorescence spectroscopy. 2017 • Ethylene treated kiwi fruits during storage. Part I: Postharvest bioactive, antioxidant and binding properties. 2017 • Detection of Bioactive Compounds in Organically and Conventionally Grown Asparagus Spears 2018 • Influence of different cultivation systems on bioactivity of asparagus. 2018, • Quality of limes juices based on the aroma and antioxidant properties. 2018. • A novel analytical approach in the assessment of unprocessed Kaffir lime peel and pulp as potential raw materials for cosmetic applications. 2018, • Effects of different binder types and concentrations on physical and antioxidant properties of pelleted sweet corn seeds. 2018, • ¹H NMR and antioxidant profiles of polar and non-polar extracts of persimmon (Diospyros kaki L) - metabolomics study based on cultivars and origins. 2018, • Human serum interactions with phenolic and aroma substances of Kaffir (Citrus hystrix) and Key lime (Citrus aurantifolia) juices. 2018 • Application of hydrophilic interaction liquid chromatography for the quantification of succinylcholine in Active Pharmaceutical Ingredient and medicinal product. Identification of new impurities of succinylcholine chloride. 2018, • In Vitro Screening of Bioactive Compounds in some Gluten-Free Plants. 2018 • Plant Sources, Extraction Methods, and Uses of Squalene. 2018, • Comparative Study of Predominant Phytochemical Compounds and Proapoptotic Potential of Broccoli Sprouts and Florets. 2018 | <p>Products</p> <ul style="list-style-type: none"> • European Food Research and Technology • Talanta • Journal of Luminescence • Heliyon • Applied Biochemistry and Biotechnology • International Journal of Agronomy • Plant Foods for Human Nutrition |
| Goldblum Amiram (emeritus) | 24 GS | Drug discovery and design by Molecular Modelling in Silico and the application of our in house: Computational algorithms to highly diverse fields: | Center for Cannabinoid Research, EU Consortia | 2017 - Kaye prize for Innovation, HUJI 2018 – Bill and Melinda Gates Foundation grant for "on demand contraceptives" | 7 | <ul style="list-style-type: none"> • Nano-mupirocin: enabling the parenteral activity of mupirocin. • Discovering Novel and Diverse Iron-Chelators in Silico • Computational Discovery and Experimental Confirmation of TLR9 Receptor Antagonist Leads • New Drug Candidates for Liposomal Delivery Identified by Computer Modeling of Liposomes' Remote loading • Iterative stochastic elimination for discovering hits and leads. • From finance to molecules modeling algorithms: The risk and return heuristic • Discovering Highly Selective and Diverse PPAR-delta agonists by ligand based machine learning and structural modeling. | <ul style="list-style-type: none"> • Eur. J. Nanomed 2016. • J. Chem. Inf. Model 2016. • J. Chem. Inf. Model 2016. • J. Control. Release 2017. • Chimica Oggi – Chemistry Today 2017. • Current Topics in Pept and Prot. Research 2018. • Scientific Reports .2019. |
| Mechoulam Raphael | 112 GS | Chemistry and Pharmacology | | Doctor Honoris Causa, Maimonides University, Buenos | 1 | <ul style="list-style-type: none"> • A synthetic analogue of cannabidiolic acid that acts like a positive allosteric modulator at 5-HT1A receptors • N-Oleoyl-glycine reduces nicotine reward and withdrawal in mice • | <ul style="list-style-type: none"> • British Journal of Pharmacology 2019 • Neuropharmacology |

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| (emeritus) | | of Natural Products | | <p>Aires, Oct. 2017. American Botanical Council Norman Farnsworth Excellence in Botanical Research Award, Anaheim, California, 2018.</p> <p>Doctor Honoris Causa, Guelph University, Canada, 2018</p> <p>Yisum Research and Development Company award ' for Paving the Way to Advanced Collaboration between Researchers, Academia , and the Medical Cannabis Industry, May, 2019.</p> <p>Doctor Honoris Causa, Weizmann Institute of Science, 2019.</p> | | <p>Peripubertal cannabidiol treatment rescues behavioral and neurochemical abnormalities in the MAM model of schizophrenia</p> <ul style="list-style-type: none"> • Peripubertal treatment with cannabidiol reverses behavioral alterations in Delta 9-THC animal model of schizophrenia • Cannabidiolic acid methyl ester, a stable synthetic analogue of cannabidiolic acid, can produce 5-HT1A receptor-mediated suppression of nausea and anxiety in rats • Antinociceptive effects of HUF-101, a fluorinated cannabidiol derivative • Anti-depressant-like effects of cannabidiol and cannabidiolic acid in genetic rat models of depression • Effect of prior foot shock stress and Delta(9)-tetrahydrocannabinol, cannabidiolic acid, and cannabidiol on anxiety-like responding in the light-dark emergence test in rats 2017 • Early modulation of the endocannabinoid tone prevents molecular and behavioral alterations in MAM model of schizophrenia • Endocannabinoid system genes regulation in schizophrenia • Cannabidiol presents an inverted U-shaped dose-response curve in the simulated public speaking test • Disturbed DISC1 pathway interacts with adolescent cannabis exposure to produce impaired recognition memory restored by BDNF over-expression: a host-environment mouse model of severe mental illness • Early pharmacological modulation of the endogenous cannabinoid signaling counteracts the phenotype in a rodent developmental disruption model of schizophrenia at adulthood • Cannabinoid 2 (CB2) receptor agonism reduces lithium chloride-induced vomiting in Suncus murinus and nausea-induced conditioned gaping in rats • Prospects for Creation of Cardioprotective Drugs Based on Cannabinoid Receptor Agonists | <p>2019</p> <ul style="list-style-type: none"> • Neuropharmacology 2019 • European Neuropsychopharmacology 2019 • British Journal of Pharmacology 2018 • Antinociceptive effects of HUF-101, a fluorinated cannabidiol derivative • Progress in Neuro-Psychopharmacology & Biological Psychiatry 2017 •European Neuropsychopharmacology 2017 • Psychopharmacology (Berl). 2017 • European Neuropsychopharmacology 2017 • European Neuropsychopharmacology 2016 • European Neuropsychopharmacology 2016 • European Neuropsychopharmacology 2016 • European Jjournal of Pharmacology -2016 • Journal of Cardiovascular Pharmacology and Therapeutics 2016 |
| Ringel Israel (emeritus) | 28 GS | | 1. the mechanism of action of anti-cancer, anti-microtubule, drugs. 2.The application of NMR methods for the study of drug-protein and drug-cell | | 1 | <ul style="list-style-type: none"> ●Reciprocal grids: a hierarchical algorithm for computing solution x-ray scattering curves from supramolecular complexes at high resolution. ●Structure of Dynamic, Taxol-Stabilized, and GMPPCP-Stabilized Microtubule. ●Structure, Assembly, and Disassembly of Tubulin Single Rings. | <ul style="list-style-type: none"> • Journal of chemical information and modeling. 2016. • The Journal of Physical |

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| | | | interactions. 3.Changes in cancer cell metabolism as a predictive tool for chemotherapy success using MNR. | | | | Chemistry B 2017. • Biochemistry. 2018. |
| Rubinstein Abraham (emeritus) | 40 GS | 1. Mucosal targeting and local therapy of IBD and colorectal cancer. 2. Colon-specific drug delivery. 3. Biomedical photonics and in situ diagnostics using targetable platforms. 4. Synergistic drug activity at the mucosal level. | N/A | ICRS Award for Outstanding Achievements in Drug Delivery in Recognition for Pioneering Work in the Field of Site-Specific Therapy in the GI Tract: The Israeli Chapter of the Controlled Release Society. 2018 -Excellence in Teaching Award: The Hebrew University, Faculty of Medicine. 2011 -Excellent Pre-Clinical Teacher Award: The Hebrew University, Faculty of Medicine. 2005 -Excellence in Teaching Award: The Hebrew University, Faculty of Medicine. 2001 -Eurand Honorable Mention Award for Innovative Research Accomplishments in Emerging Areas of Oral Drug Delivery: Controlled Release Society. 2000 -Excellence Award for Original Research: The Hebrew University, Faculty of Medicine. 1994 | 2 | <ul style="list-style-type: none"> •Synchronizing the release rates of salicylate and indomethacin from degradable chitosan hydrogel and its optimization by definitive screening 2018. •Increasing the affinity of cationized polyacrylamide-paclitaxel nanoparticles towards colon cancer cells by a surface recognition peptide. •The effect of linker type and recognition peptide conjugation chemistry on tissue affinity and cytotoxicity of charged polyacrylamide. •Single point mutation detection in living cancer cells by far-red emitting PNA-FIT probes. | <ul style="list-style-type: none"> • Eur J Pharm Sci. Eur J Pharm Sci. • Int. J. Pharm.2017. • J. Control. Rel 2017. • Chem. Commun. 2016. |
| Sasson Shlomo | 36 GS | Diabetes research: Regulation of | 2013-2017 Vice Dean for Research and Head of the Faculty Research | 2015 Vigevani Fund Visiting Professorship Prize to the Catholic | 2 | <ul style="list-style-type: none"> •Hormetic and regulatory effects of lipid peroxidation mediators in pancreatic beta cells. •Fatty acid-related modulations of membranes fluidity in cells: | <ul style="list-style-type: none"> • Mol Aspects Med. • Free Radic Res. • Free Radic Biol Med |

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| (emeritus) | | glucose transport, vascular complications in diabetes, Beta cell function and dysfunction in diabetes, intra islet of Langerhand crosstalk between microcapillary endothelial cells and beta cells, development of novel antihyperglycemic drugs | Committee, Faculty of Medicine, HUJI 2013-2017 Member, Curriculum Advisory Committee, Faculty of Medicine, HUJI. 2013-2017 Member, Steering Committee of the Military Medicine (Tzameret) Program, Faculty of Medicine, HUJI. 2014-2016 Member of the Senate of HUJI (elected delegate of the senior Faculty at the Faculty of Medicine). 2014-2016 Member of the Standing Committee, HUJI (Senate representative). 2015-2016 Member of the Committee for Academic Policy, HUJI. 2015-2018 Director, Brettler Center for Research of Molecular Pharmacology and Therapeutics. Institute for Drug Research, HUJI. 2017-2018 Member of the Executive Committee, HUJI . | University of the Sacred Heart in Rome, Italy. 2018 Japan Council Forum on Basic Cardiovascular research Visiting Award. | | <p>detection and implications.</p> <ul style="list-style-type: none"> ●Nutrient overload, lipid peroxidation and pancreatic beta cell function. ●4-Hydroxyalkenal-PPARδ mediates hormetic interactions in diabetes. ●Deleterious effect of n-3 polyunsaturated fatty acids in non-alcoholic steatohepatitis in the fat-1 mouse model; Clinical Nutrition. ●European contribution to the study of ROS: A summary of the findings and prospects for the future, from the COST Action BM1203 (EU-ROS). ●Regulation of GLUT4 activity in myotubes by 3-O-methyl-D-glucose. ●Supportive data on the regulation of GLUT4 activity by 3-O-methyl-D-glucose. ●Viva Europa, a Land of Excellence in Research and Innovation for Health and Wellbeing. ●A novel phenylchromane derivative increases the rate of glucose uptake in L6 myotubes and augments insulin secretion from pancreatic beta-cells by activating AMPK. ●Development of a novel monoclonal antibody against 4-hydroxy-2E,6Z-dodecadienal (4-HDDE)-protein adducts: immunochemical application in quantitative and qualitative analyses of lipid peroxidation in vitro and ex vivo. ●A chromatographic toolbox for comprehensive analysis of phospholipids and their oxidized derivatives for research in lipidomics and the field of food science. ●Impact of apolipoprotein A1- or Lecithin:cholesterol acyltransferase-deficiency on white adipose tissue metabolic activity and glucose homeostasis in mice. ●4D Quantitative analysis of insulin granules in living beta-cells: a preliminary study. ●Catalyzing transcriptomics research in cardiovascular disease: The CardioRNA COST Action CA17129 Noncoding RNA. ●Effects of somatostatin and vitamin C on the fatty acid profile of breast cancer cell membranes. ●Fatty Aldehyde Dehydrogenase (ALDH3A2)-Dependent Neutralization of Advanced Lipid Peroxidation End Products (ALEs) at the Bifurcation of Hormetic and Degenerative Pathways in Pancreatic Beta Cells. | <ul style="list-style-type: none"> • Biochimie • Clinical Nutrition • Redox Biol • Biochim Biophys Acta Biomembr. • Data Brief. • Progress in Preventative Medicine • Pharm Res. • Free Radic Biol Med • Biochim Biophys Acta Mol Basis Dis • Literature Review • Noncoding RNA |
| Shohami Esther (emeritus) | 59 WOS | The pathophysiology of traumatic brain injury (TBI): mechanisms | 2013-2018 Students' ombudsman | | 0 | <ul style="list-style-type: none"> ●Neuroinflammation-Induced Memory Deficits Are Amenable to Treatment with D-Cycloserine. ●Human Umbilical Cord Blood CD45+ Pan-Hematopoietic Cells Induced a Neurotherapeutic Effect in Mice with Traumatic Brain Injury: Immunophenotyping, Comparison of Maternal and Neonatal Parameters, and Immunomodulation. ●Nerve growth factor plays a role in the neurotherapeutic effect | <ul style="list-style-type: none"> • J Mol Neurosci. 2016. • J Mol Neurosci. 2017. • Cytotherapy. 20:245-261, 2018 doi: 10.1016/j.jcyt.2017. • J Neurotrauma 35:1667- |

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| | <p>of damage and repair of motor and cognitive deficits. The role of neuroinflammation in the post-injury secondary damage</p> <p>The role of the NMDA receptors in the cognitive decline after TBI</p> <p>Mechanisms for the repair of learning and memory deficits after TBI</p> <p>The role of cannabinoids in the recovery of motor and cognitive functions after TBI.</p> <p>Effect of cannabinoids (synthetic, plant-driven, endocannabinoids) on the recovery after TBI.</p> <p>Mechanism of action of endocannabinoids as neuroprotective and neuro-regenerative molecules.</p> | | | <p>of a CD45+ pan-hematopoietic subpopulation derived from human umbilical cord blood in a traumatic brain injury model.</p> <ul style="list-style-type: none"> ● Enhancement of brain D-serine mediates recovery of cognitive function after TBI. ● Stimulation of N-methyl-D-aspartate receptors by exogenous and endogenous ligands improves outcome of brain injury. ● The role of CB2 receptor in the recovery of mice after traumatic brain injury. ● Carmichael, S.T. CCR5 is a therapeutic target to stimulate recovery in stroke and traumatic brain injury. | <p>1680. 2018.</p> <ul style="list-style-type: none"> • Curr Opin Neurol. 2018. • J. Neurotrauma, in press 2018. • Cell. 2019. |
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| Touitou Elka (emeritus) | 30WOS 36GS | <ul style="list-style-type: none"> • Nasal drug delivery • Dermal and transdermal drug delivery: enhancers and mechanism of action, enhanced delivery of drugs • Design of new carriers for improved delivery • New technologies for cannabinoid medical products | School of Pharmacy-Institute for Drug Research, The Faculty of Medicine, The Hebrew University of Jerusalem, Israel | <p>2018: Special Recognition, Annual Congress in Medicine, Asia</p> <p>2011: Outstanding Award, The Pharmaceutical Society of Israel</p> <p>2010: Prof. Rakhamimov Outstanding Teacher Award, Faculty of Medicine, Hebrew University of Jerusalem</p> <p>2000: Jorge Heller Outstanding paper, Control Release Society (CRS)</p> <p>2006: Kaye Award, Hebrew University of Jerusalem</p> <p>1999: Outstanding paper award-Drug Delivery to the 3rd Millennium Conference-Italy</p> <p>1998: Honoree Women Pharmacist of the World (FIP)</p> | 1 | | |
| Weinstock-Rosin Marta (emeritus) | 50 WOS | Inflammation and neurodegenerative diseases | | <p>-Awarded Storch Chair of Pharmaceutical Science.</p> <p>-Awarded Leon and Minna Deutsch Chair of Psychopharmacology.</p> <p>-Awarded first prize in Kaye -Awards for development of Exelon, a new drug for the treatment of dementia</p> <p>First Alzheimer Disease Drug Discovery Award from the Institute for</p> | 0 | <ul style="list-style-type: none"> • Perinatal citalopram does not prevent the effect of prenatal stress on anxiety, depressive-like behaviour and serotonergic transmission in adult rat offspring. • Sex-Specific Effects of Prenatal Stress on Memory and Markers of Neuronal Activity in Juvenile Rats. • Prenatal stressors in rodents: Effects on behavior. • Novel indoline derivatives prevent inflammation and ulceration in dinitro-benzene sulfonic acid-induced colitis in rats. • Prenatal stressors in rodents: Effects on behavior. • Cholinergic anti-inflammatory pathway does not contribute to prevention of ulcerative colitis by novel indoline carbamates • Indoline derivatives mitigate liver damage in a mouse model of acute liver injury. • Synthesis and Biological Evaluation of Derivatives of Indoline as Highly Potent Antioxidant and Antiinflammatory Agents. • Age-induced spatial memory deficits in rats are correlated with specific brain region alterations in microglial morphology and gene expression. | <ul style="list-style-type: none"> • Eur J Neurosci 2016. • Dev Neurosci 2016. • Neurobiol Stress 2016. • Pharmacological Reports 2016. • Neurobiol Stress 2017. • J Neuroimmune Pharmacol 2017. • Pharmacological Reports 2017. • J Med Chem 2018. • J Neuroimmune Pharmacology 2018. • Psychoneuroendocrinology 2019. |

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| | | | the Study of Aging, New York, USA. | •Sex differences during emotion processing are dependent on the menstrual cycle phase. | |
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5.7. Infrastructure (max. 5 pages)

5.7.1. List the campuses on which the study program is taught. If the study program is offered on more than one campus, is the study program identical on all campuses? What measures are taken to ensure this?

The School of Pharmacy is located on the Ein-Kerem campus adjacent to the Hadassah Ein-Kerem Hospital. The physical infrastructure at the disposal of the School of Pharmacy, as detailed below, enables the study program to function in accordance with stated aims and objectives. Past problems of limited lab and teaching hall spaces have been recently resolved, when the 5th floor of the School of Pharmacy building, was assigned back to the School of Pharmacy. This floor will soon be renovated, and office and laboratory spaces will be available for the new recruits. In addition to two large lecture halls, teaching laboratories and a few seminar rooms within the School building, our courses are conducted in various lecture halls and seminar rooms in other buildings of the Faculty of Medicine.

During their first year, undergraduate pharmacy students study two days a week at the Edmond Safra campus- Faculty of Natural Sciences, where chemistry and physics courses are taught. The School of Pharmacy is sharing lecture halls with the Faculty of Medicine. All student laboratory courses are given at the School of Pharmacy building. There are no parallel programs at the School of Pharmacy.

5.7.2. Specify the department's physical location in the institution (building/s). List any other departments that share the building/s.

Most courses are taking place in the School of Pharmacy building, located at the Hadassah Medical Center, Ein Kerem. Some course are taught in the Faculty of Medicine teaching halls. First year pharmacy students study basic sciences at the Edmond Safra Campus, Givat Ram. All research laboratories are located in the School of Pharmacy building, including an animal facility, GMP clean room, and the Institute shared instrument room.

5.7.3. List the physical infrastructure that serves the department. Refer to classrooms, computerization, administrative and academic faculty offices; to what extent does this infrastructure enable the department to operate according to the defined aims and goals?

There are two classrooms in the School of Pharmacy building (78 and 50 seats respectively), five seminar rooms, two teaching laboratories, a core facility unit, and administration offices. In addition, each of the Faculty members (regular and Emeriti) has an office adjacent to his laboratory. The seventh floor of the building is occupied by the Animal facilities and is administered by the University Authority for Biological Models.

5.7.4. List the laboratories that serve the department (users, equipment, and number of seats).

The two teaching laboratories are dedicated to practical courses for Chemistry and Pharmacy and can host up to 35 students each. Both laboratories are well equipped with modern glassware, vacuum and heating devices, etc.

The School's sharing instrumentation core facility unit contains a range of instrumentation in use by the faculty members of the School and not available in the Faculty instrumentation room. That room is equipped with two NMR systems, 500 and 300 MHz, FTIR, UV, GPC, DSC, particle size analyzer, three high resolution LCMS systems for pharmacokinetic studies, high resolution GCMS, Karl Fischer for water content determination, particle shape analyzer, Ultra Centrifuge, lyophilizers and various small instruments. The unit is operated by four Ph.D. chemists who provide high quality services. Faculty members and students can access other

instrument rooms in the Faculty or in the Nanocenter located in the Givat Ram Campus. The Faculty of Medicine instrument room is attuned to biology, biochemistry and research. Proteomic analysis is available in the Faculty instrument room.

The School of Pharmacy has its own animal facility located on the 7th floor, which is part of the Faculty's three animal facilities. The animal facility serves mainly School of Pharmacy scientists who have routine animal studies and animal models that need to be maintained over the years. Occasional animal studies are performed at the central animal facility located in the School of Medicine main building.

5.7.5. List special equipment and other relevant materials to this section.

See 5.7.4 above.

A table with a full list of equipment available at the School instrument room is available on the School website. The full list and details of operation is given in the Table below:

| Core Research Facility | | | | |
|-------------------------------|-----------------|---|---|-------------------------------|
| Equipment | Model | Characters | for Used | for Budget maintenance |
| Confocal Microscope | I10 Olympus FV | Objectives: 10x and 60x (oil). | Optical imaging that increases optical resolution and contrast. Ability to control depth of field, elimination or reduction of background information away from the focal plane. Option to collect serial optical sections form thick specimens. Used for live cells and fixed specimens. | |
| Freeze dryer | Epsilon 2-6 D | 3 shelves. Shelf temperature:-50 °C to +60 °C. Shelf dimensions: 225 x 300 mm (W x D). Shelf spacing: 249 mm to 31 mm. | General-purpose, high-performance laboratory and pilot unit for drying solid or liquid products in vials, ampoules, tubes, other glass containers or dishes. Applications include drying of bacteria or cultures, viruses, blood plasma, serum fractions, antibodies, vaccines, medicines such as chloramphenicol or streptomycin, vitamins, biomass and plant extracts for biochemical tests. Enables product development and small-scale production activities. | |
| Rheometer | MCR-101 Physica | High-precision air bearing. Min. torque rotation: 0.1. Min. torque oscillation: 0.1. Max torque: 150. Torque resolution: 0.2. Angular deflection (set value): 1 to ∞. Angular resolution: 0.01. Speed range: 10-6-3000. Angular frequency range: 10-5-628. Normal force range: 0.1-30. Normal force resolution: 0.02. Max. Temperature range: -150-+1000. | Precision instrument that contains the material of interest in a geometric configuration, controls the environment around it, and applies and measures wide ranges of stress, strain, and strain rate. | |
| Material testing machine | LF Plus Lloyd | Crosshead Speed: 0.05 to 1270mm/min, (at full load) | System for force measurement and material testing applications up to 1 kN (225 lbf) capacities. Uses interchangeable XLC Series loadcells as the measurement device. | |

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| | | 0.002 to 50 in/min. Extention Resolution: Better than <1.3 microns (0.0013mm). | | |
| Monolith | 115 Monolith NT | Affinity range: 1 nM to mM. Number of samples per run: 16. | Measures biomolecular interactions via detection of fluorescent dyes or fluorescent fusion proteins. Allows measuring and calculation of binding affinity (KD) of every interaction type. Sensitive to changes in size, charge and hydration shell.rapid optimization of experimental conditions. Contains valuable information on aggregation and sample quality in general. | |
| Reader Plate | 3 Cytation | Magnification range of 2.5x;20x;40x. Flexible sample format: 6-384 plates, microscope slides, cell culture flasks. | Cell imaging multi-mode microplate reader that combines automated digital microscopy and conventional microplate detection. Provides rich phenotypic cellular information with quantitative data. Visualizing cellular responses to understand expressions such as cell proliferation, protein expression and cytotoxicity. Includes automatic cell counting, sub-population analysis and image statistics. | |
| GPC | VISCOTEK Malvern GPCmax | A solvent and sample delivery module. Contains an integrated pump, autosampler and degasser. | Enables comprehensive macromolecular characterizations to be made. | |
| Spectrophotometer UV/VIS | pro 2100 Ultraspec | Wavelength 190-900 nm | Modes of operation include Scanning, Wavelength Program, Timedrive, Rate, Quant, Scanning Quant. best solution for measurement on solids, pastes and powders. Includes double-beam operation. | |
| Centrifuge | R 5810 Eppendorf | Swing-bucket rotors and adapters to accommodate tubes and bottles from 0.2 mL to 50 mL. High centrifugation speed of up to $20,913 \times g$ (14,000 rpm). Temperature range from -9 °C to 40 °C. | For medium through-put applications for cell culture and clinical applications, high-speed for separating cell lysates and a microcentrifuge for nucleic acid purifications. | |
| Zeta and particle size analyzer | nano ZSP Malvern instruments | Size measurement from 0.3nm (diameter) to 10 microns. Molecular weight measurement down to 980Da. Protein size measurement as dilute as 0.1mg/mL. Temperature range extension option to 120°C. | Particle and molecule size, translational diffusion, electrophoretic mobility, zeta potential of particles at high and low concentrations, viscosity and viscoelasticity of protein and polymer solutions, concentration, MW, A2, kD. | about 1000ils/y |
| Lyophilizer | Labconco | Holds 6L of ice. Collector temperature: -84° C, -119° F. | Lyophilizes moderate to large samples loads or numerous small container batches. | |
| Laser scanner | 9500 Typhoon FLA | Scanning area of 40 × 46 cm, | Imaging of both fluorescent gels and of radioisotope-labeled samples. Variable mode laser | |

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| | | <p>simultaneous imaging of up to 20 gels or blots, measuring 10 × 8 cm in size. Excitation wavelengths: 473 nm (blue LD laser), 532 nm (green SHG laser), 635 nm (red LD laser), 685 nm. Emmission filters of IP(Phosphorimaging),LPB (510LP), LPG (575LP), LPR (665LP), LPR-Ch2 (665LP), BPB1(530DF20), and BPG1 (570DF20).</p> | <p>scanner with modular access to the optical components, providing both versatile and flexible imaging for precise quantitation of proteins, nucleic acids, and other biomolecules. Provides several imaging modes at any time, including fluorescence and chemifluorescence, filmless autoradiography, and digitization of colorimetrically-stained samples.</p> | |
| Polarimeter | Jasco FT-6500 | <p>Wavelength range: 200-900 nm for both EX and EM monochromators. is highly sensitive with a signal noise to ratio greater than 200:1 Raman band of water peak-to-peak using SBW 5nm on both EX and EM monochromators, 2 second response at 250 nm excitation wavelength.</p> | <p>Measures parameters of fluorescence intensity and wavelength distribution of emission spectrum after excitation by a certain spectrum of light. Application include identifying presence and amount of specific molecules in a medium. Useful for biochemistry performing kinetics, stopped flow, titration and anisotropy experiments.</p> | |
| FTIR | Nicolet Smart ITR iS10 | <p>Spectral range: 7800-350 cm⁻¹ optimized, mid-infrared KBr beamsplitter 11000-375 cm⁻¹ XT KBr extended range mid-infrared optics. Room temperature, KBr optics, DTGS detector, 4 cm⁻¹ spectral resolution.</p> | <p>Technique used to obtain an infrared spectrum of absorption or emission of a solid, liquid or gas. Simultaneously collects high-spectral-resolution data over a wide spectral range. Applications include most solids, liquids ranging from pH 1 to 14, acidic or alkaline materials, fibers, hard or oddly shaped samples, abrasive, caustic or corrosive materials, large or small samples and paint chips.</p> | |
| Bio-Rad Reader | ChemiDoc BioRad +XRS | <p>Maximum sample size of up to 28 x 36 cm. Maximum image area of up to 26 x 35 cm.</p> | <p>Multiple detection methods including fluorescence, colorimetry, densitometry, chemiluminescence and chemifluorescence. Accommodates a wide array of samples. enables image analysis and documentation of restriction digests, amplified nucleic acids, genetic fingerprinting, RFLPs, and protein purification and characterization.</p> | |
| LiCor Reader | LiCor Odyssey | <p>Image field size of 25cm x 25cm. Solid-state diode lasers at 685</p> | <p>Measures protein express, detects target proteins, studies protein-DNA complexes, visualizes proteins on gels, monitors protein localizations in tissue sections, performs analysis of multiple tissue sections, uses antibody detection directly in</p> | |

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| | | nm and 785 nm. Resolution of 21-337 μ m. | the protein gel, monitors protein knockdown effects. Applications include western blot, in-cell western assay, EMSA, protein gel documentation, nucleic acid gel documentation, tissue section imaging, in-gel westerns, RNAi analysis. | |
| Nanodrop | ND-1000 | 1-2 μ L samples. Large dynamic range - Measures 2-3700 ng/ μ L (dsDNA) on a single sample. Full spectrum of 220-750nm. | high absorbance capability, about 50x of traditional spectrophotometers. Applications include nucleic acid concentration and purity of nucleic acid samples up to 3700 ng/ μ L (dsDNA) without dilution, fluorescent dye labeling density of nucleic acid microarray samples, Purified protein analysis (A280) up to 100 mg/mL (BSA), expanded spectrum measurement and quantitation of fluorescent dye labeled proteins, conjugates, and metalloproteins, assay analysis of proteins, cell density measurements and general UV-Vis spectrophotometry. | |
| Liquid Chromatography | Akta Start | Up to 30 fractions and supports four tube sizes, ranging from 1.5 mL to 15 mL. Fractions can be collected in volumes ranging from 0.5 mL to 15 mL. UV setector at 260nm and conductivity detector | Preparative chromatography system for protein purification. Allows implementation of all common purification techniques, like affinity, ion exchange, desalting and buffer exchange, as well as gel filtration. Supports purification of tagged proteins, antibodies, untagged or native proteins. | |
| Homogenizer | blender storm Bullet | Up to 24 samples at a time, each sample up to 0.3g. Keeps samples at 4°C. | Enables homogenizing, disrupting or lysing up tissue cell culture samples, plant matter, small organisms and microorganisms, can isolate live bacteria from organs, generate nanoparticles, and isolate organelles from cells. | |
| Cytometry Flow | CytoFlex | SCATTER RESOLUTION : Blue (488 nm) Side Scatter Resolution: <300 nm. Violet (405 nm) Side Scatter Resolution (VSSC): 80 nm polystyrene particles. SENSITIVITY FITC: <30 molecules of equivalent soluble fluorochrome (MESF-FITC) from the 488 nm laser. PE: <10 molecules of equivalent soluble fluorochrome (MESF-PE) from the 488 nm laser. | Flow cytometry that optimizes excitation from up-to three lasers (488nm; 638nm; 405nm) and 13 colors – all in all 21 configurations. Applications include immunophenotyping, cell sorting, cell cycle analysis, apoptosis, cell proliferation assays and intracellular calcium flux. | about 1000ILS/y |
| thermal titration Iso calorimetry | PEAQ- MicroCal ITC | Temperature range: 2°C to 80°C. Can use as little as 10 μ g sample. | Directly measures heat released or absorbed during biochemical binding events, from which it calculates binding affinity (KD), stoichiometry (n), enthalpy (Δ H), and entropy (Δ S). Applications include characterization of molecular interactions of small molecules, proteins, antibodies, nucleic acids, lipids and | |

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| | | | other biomolecules. It can also be used to measure enzyme kinetics. | |
| zeta potential and particle size | qNANO/ | Analysis range: 40 nm to 10 μ m. Concentration range: 1E5 to 1E11 / mL (size dependent). Electrolyte properties: Physiological. | Measures particles using the Tunable Resistive Pulse Sensing (TRPS) principle. TRPS is the most powerful particle measurement system available for nano and sub-micron particle measurement and analysis. It measures individual particles with the highest accuracy and repeatability available for, particle size and real distribution, concentration and surface charge. A range of research areas including: Extracellular vesicles, Nano and micro bubbles, Drug delivery particles, Viruses and vaccines, Biondiagnostics. | |

MS

| Equipment | Model | Characters | for Used | for Budget Maintenance |
|---|---|--|---|------------------------|
| LCMS/MS | Sciex Triple Quad 5500 | High levels of sensitivity and robustness for the most complex and demanding matrices | 1. LC-MS/MS quantitative bioanalysis of pharmaceuticals, natural compounds and metabolites in biological matrices such as plasma, serum, tissues and urine. 2. Kinetic studies of reaction mixtures | ~50,000₹/per year |
| LCMS/MS | Thermo Triple Quad TSQ Quantum Access Max | High levels of sensitivity and robustness for the most complex and demanding matrices | 1. LC-MS/MS quantitative bioanalysis of pharmaceuticals, natural compounds and metabolites in biological matrices such as plasma, serum, tissues and urine. 2. Kinetic studies of reaction mixtures 3. Rapid structure confirmation for a wide range of small organic compounds and small peptides | ~20,000₹/per year |
| High Resolution and Accurate Mass GCxGC-MS/MS | Agilent 7200 GC/Q-TOF | High Resolution and Accurate Mass GCxGC-MS/MS (Agilent 7200 GC/Q-TOF) combines high selectivity with the added value of accurate mass (<5ppm), high resolution, Electron (EI) and Chemical Ionization (CI) | Identification of unknown compounds in complex mixtures especially volatile (VOC) and semivolatile (SVOC) compounds. Targeted and untargeted quantitative analysis of biological samples | ~15,000₹/per year |
| LCMS/MS | Sciex Triple Quad 6500+(under installation) | High levels of sensitivity and robustness for the most complex and demanding matrices | 1. LC-MS/MS quantitative bioanalysis of pharmaceuticals, natural compounds and metabolites in biological matrices such as plasma, serum, tissues and urine. 2. Kinetic studies of reaction mixtures | warranty |

NMR

| Equipment | Model | Characters | Used for | Budget for Maintenance |
|----------------------------|-------------------------------------|--|---|------------------------|
| 300 MHz NMR 500 MHz NMR | Varian Mercury Bruker Avance III | Placing sample in a strong static magnetic field. The sample is irradiated with a short electromagnetic pulse, this provides information about the type of atoms present in the molecule and their positions | Chemical structure analysis ,detailed structural characterization of small molecules; Quantification of components Kinetic studies of reaction mixtures | 90,000 ILS/Year |

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| | | Characterization of polymers. | |
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Thermal Analysis

| Equipment | Model | Characters | Used for | Budget for Maintenance |
|-----------------------------------|-------------------------|--|---|------------------------|
| Thermogravimetric Analysis | METTLER TOLEDO TGA/DSC1 | Measures weight changes in a material as a function of temperature | Evaluate the thermal stability of a material, decomposition, desolvation and dehydration and solid-gas reactions such as oxidation or reduction. | |
| Differential Scanning Calorimeter | METTLER TOLEDO DSC1 | Measures enthalpy changes in a material as a function of temperature | Determine physical properties and processes like: Crystallization, glass transition, melting point, thermal stability, comparison of different batches of product | |

Researchers Labs

| Equipment | Model | Characters | Used for | Budget for Maintenance |
|--------------|---|------------|----------|------------------------|
| LCMS (Q-TOF) | Waters Acquity UPLC H-Class and Xevo X2-XS - High resolution MS | | | PI's research budgets |
| LCMS | Thermo LCQ Fleet | | | PI's research budgets |
| GC-MS | Agilent | | | PI's research budgets |
| GC-MS | | | | PI's research budgets |

5.7.6. Describe the library including computerized databases which serve the students, and teaching staff of the study program.

The Berman Medical Library of the Hebrew University of Jerusalem and Hadassah Medical Center serves the staff and students of medicine, dentistry, pharmacy, nursing, public health, occupational therapy, and the academic and clinical staff in the hospital. The pre-clinical and clinical collections are amongst the largest in Israel.

The library collections include databases, journals, books, video and multimedia, history of medicine artifacts, and most recently virtual reality content. All databases and journals are electronic and accessible within the university network on campus and remotely from any device. Most of these resources are purchased as part the Malmad consortium of Israeli universities and in collaboration with the other Hebrew University libraries. This ensures wide coverage of over 10,000 journal titles in the fields of medicine, health, life sciences, exact sciences, and engineering. The book collection is also migrating rapidly to being totally electronic. We provide access to over 100,000 titles (print and electronic) relevant to our campus. All pharmacopeias are now available electronically. The School of Pharmacy benefits from access to a rich and comprehensive list of resources.

Over the last decade all four floors of the library building have undergone basic redesign and rebuilding of traditional library spaces to accommodate new, rapidly changing information technologies and devices. The physical space is continually changing to keep in line with novel learning methods, enabling students to study in quiet areas and to collaborate in groups with technology provided by the library and with their own devices. Our recent inclusion of virtual reality devices in the library is groundbreaking in Israeli academic libraries and enables our staff and students to begin to familiarize themselves with new learning tools, soon to become part of teaching methods and curriculum on the medical campus.

Access to all resources is via the Hebrew University libraries catalog – Primo

Pharmacy resources based on type:

| | |
|--------------------------|---------|
| Total titles in Pharmacy | ~23,000 |
| By resource type: | |
| Books | ~18,000 |

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|--|-------|
| Journals | 1,650 |
| Theses (all digital) | 1,900 |
| Media | ~400 |
| Databases in Health Sciences | 58 |
| Databases for the Pharmacy School Including: Embase, Web of Science, Scopus, UpToDate, SciFinder, Micromedex, Cochrane, McGraw Hill Access Pharmacy, USP-NF, British & European Pharmacopoeia, Lexicomp, Merck Index, F1000. Pubmed and other NCBI free databases. | 28 |

5.7.7. National Infrastructure:

Hebrew University researchers have access to Instrumentation and Research Centers supported by the Ministry of Sciences and Space, as well as the cyclotrons in Europe. Each researcher is free to decide to collaborate or obtain research services from other universities or institutions in Israel or abroad.

5.7.7.1. Is there a need for facilities that can serve the evaluated field on a national level, such as unique labs, research centers, libraries etc.? If so, specify the need and the added value for their development on a national level.

The School of Pharmacy serves most of the needs for community pharmacists, clinical pharmacists, and pharmaceutical researchers. However, the School facilities do not fit the School mission to provide professionals in pharmaceuticals for the growth of the country with regard to medical treatment and the pharmaceutical industry.

School of Pharmacy facilities should be expanded to have more large classrooms, modern student laboratories as well as functioning modern well-equipped and larger research labs.

The School should develop the fields of industrial pharmacy and pharmaceutical engineering. This requires the addition of three new faculty members and the corresponding research laboratories and offices oriented to engineering, product development and industrial pharmacy. Another field that is related to sciences and to some extent to science and medicine is Forensic Science. The Hebrew University and the Faculty of Medicine were the first to establish dedicated studies in Forensic Science at the M.Sc. level. These programs are performed in collaboration with the Faculty of Law/Criminology Department. Advanced forensic science is a national need required for the national security services as well as the legal system. Forensic science is a legitimate field in science that is part of the curriculum of top universities.

5.7.7.2. Operating national infrastructures: how accessible are the services (prices, enrolment, usage, etc.)?

There are no dedicated teaching and research facilities for industrial pharmacy and engineering related to pharmaceuticals. There is a teaching program at Azrieli College for pharmaceutical engineering but with a strong engineering orientation. We propose to integrate in the School the fields of industrial and engineering pharmacy as teaching and research disciplines. It can part of the graduate program but also should be included in the undergraduate pharmacy studies. The pharmacy curriculum includes a 1 credit course on Pharmaceutical Engineering, which is expected to be expanded to 2 credit points in another year. To integrate engineering aspects into teaching and research, the recruitment of a faculty member with an engineering background and research focus is required.

5.7.8. In summary, what are the points of strength and weakness of the issues specified in this chapter?

Strength: progress has been made to improve the School facilities, including renovation of laboratories and teaching halls. However, more must be done.

Weaknesses: Beside the renovation of certain labs and offices, there is an immediate need to replace the air flow and air conditioning of the School of Pharmacy building as well as to renovate all public spaces in the building that needs to be transformed into a modern working space.

5.8. Ultra-Orthodox Study Program – Not applicable

Please answer this chapter if you offer a study program for the Ultra-Orthodox population.

Although this section is not relevant to the School of Pharmacy today, this is not to exclude a change in the very near future! As a national school that teaches the profession of licensed pharmacist, it is our responsibility to provide access to the profession to all communities in Israel, including the ultra-orthodox community. Efforts are currently invested to generate programs that will make the profession available to this community, women and subsequently men. These programs are built in collaboration with institutes that have licensed MAHAR programs. We expect that within the coming two years at least one program will be initiated. The other sections of the chapter are not relevant.

5.8.1. Overview (max. 2 pages)

- 5.8.1.1. Describe the study program: name; date of accreditation and opening; location; the connection between it and the regular program.
- 5.8.1.2. List the program's academic and administrative staff (position, name, title).
- 5.8.1.3. Describe the modifications made in the regular program to adapt it to the Ultra-Orthodox population (e.g. preparatory pre-academic program, faculty, location, tutoring, training for faculty, etc.). Specify the challenges of ensuring that the programs correspond.

5.8.2. The Study Program (max. 1 page)

- 5.8.2.1. Specify the differences (if exist) in the structure and content of the study program compared to the regular program (Number of semesters, courses/credits required, offered elective courses, different parent unit or supervision? etc.).
- 5.8.2.2. Describe the rationale for the differences, and the mechanisms to ensure the study programs correspond.

5.8.3. Faculty (max. 1.5 pages)

Is the faculty in the "Mahar" program different from that in the regular program? Indicate any constraints related to choosing the teaching staff in the program (Gender, sector, academic degrees, etc.), and their implications.

5.8.4. Students (max. 1.5 pages)

- 5.8.4.1. List the student support services (academic, personal, financial, and placement). If they differ from the services given at the regular program, please explain.
- 5.8.4.2. Specify the reasons for dropout and measures taken to address it.
- 5.8.4.3. How does the institution and/or the department maintain contact with alumni?

Supporting Documents:

Table: alumni employment (work place, position, relation to study field) + progression to advanced degrees (field of study and degree level).

5.8.5. Pre-Academic preparatory program (max. 1 page)

- 5.8.5.1. List the pre-academic preparatory study programs for the "Mahar" program. Please address admission and the graduation regulations and the curriculum.

Supporting Documents:

- Table (number of students and graduation rates in the past 3 years; and percentage of alumni that continue to the academic study program)

5.8.6. Learning Outcomes (max. 1 page)

- 5.8.6.1. Are the methods for evaluating the achievements of students in the study program similar to those of the regular program? If not, what are the differences and what are the reasons for it?
- 5.8.6.2. Final project and/or a practical training: describe the requirements; guidance; evaluation; and grade distribution in the past 3 years (compared to the regular program). Please address the differences (if any exist) from the regular program.

Supporting Documents:

- Histogram: distribution of the final grades of students in the study program over the last three years, compared with those of students in the regular program.

5.8.7. Infrastructure (max. 1 page)

Describe the overall physical infrastructure that serves the study program (as specified in clauses 5.7.3-5.7.6). Indicate any challenges caused by the physical separation from the main campus.

5.8.8. Summary (max. 2 pages)

- 5.8.8.1. List the similarities and differences between the "Mahar" study program and the regular program.
- 5.8.8.2. What are the strengths and weaknesses of the program? What actions are taken and planned to address them?