



EVALUATION OF LIFE SCIENCE STUDIES

TEL AVIV UNIVERSITY

COMMITTEE FOR THE EVALUATION OF LIFE SCIENCE STUDIES IN
ISRAEL

March 2023

Section 1: Background and Procedures

- 1.1** In the academic year 2022, the Council for Higher Education [CHE] put in place arrangements for the evaluation of study programs in the field of Life Sciences and Biology in Israel.
- 1.2** The Higher Education Institutions [HEIs] participating in the evaluation process were:
- Achva Academic College
 - Ariel University
 - Bar Ilan University
 - The Hebrew University
 - The University of Haifa
 - Technion
 - Tel Aviv University
 - Weizmann Institute
- 1.3** To undertake the evaluation, the Vice Chair of the CHE appointed a Committee consisting of¹:
- **Prof. Lynne Regan** – Institute of Quantitative Biology, Biochemistry and Biotechnology, Edinburgh University, UK. *Committee chair.*
 - **Prof. Joseph Buxbaum** – Department of Psychiatry, Icahn School of Medicine at Mount Sinai, USA.
 - **Prof. Edna Cukierman** – Cancer Signaling & Microenvironment Program, Fox Chase Cancer Center / Temple Health, USA.
 - **Prof. Orna Elroy-Stein** – Shmunis School of Biomedicine and Cancer Research, Tel Aviv University, Israel.
 - **Prof. Mark Hauber** – School of Integrative Biology, The University of Illinois at Urbana-Champaign, USA.
 - **Prof. Bruno Lemaitre** – School of Life Science, École polytechnique fédérale de Lausanne (EPFL), Switzerland.
 - **Prof. Carol Shoshkes Reiss** – Department of Biology, New York University, USA.
 - **Prof. Shai Shaham** – Developmental Genetics, Rockefeller University, USA.
 - **Prof. Vincent Tropepe** – Department of Cell and System Biology, University of Toronto, Canada.

Anat Haina served as the Coordinator of the Committee on behalf of the CHE.

Prof. Orna Elroy-Stein recused herself from the evaluation of this institution, Tel Aviv University.

- 1.4** The evaluation process was conducted in accordance with the CHE's Guidelines for Self-Evaluation (January 2022). Within this framework the evaluation committee was required to:
- examine the self-evaluation reports submitted by the institutions that provide study programs in Life Sciences and Biology;

¹ The committee's letter of appointment is attached as **Appendix 1**.

- conduct on-site visits at those institutions participating in the evaluation process;
- submit to the CHE an individual report on each of the academic units and study programs participating in the evaluation;
- set out the committee's findings and recommendations for each study program;
- submit to the CHE a general report regarding the evaluated field of study within the Israeli system of higher education including recommendations for standards in the evaluated field of study;

1.5 The evaluation committee examined only the evidence provided by each participating institution — considering this alongside the distinctive mission set out by each institution in terms of its own aims and objectives. This material was further elaborated and explained in discussions with senior management, lecturers, students, and alumni during the course of each one-day visit to each of the institutions.

1.6 In undertaking this work, the committee considered matters of quality assurance and quality enhancement — applying its collective knowledge of developments and good practices in the delivery of higher education in Life Sciences and Biology (mainly from European and North-American countries) to the evaluation of such provision in Israel.

Section 2: Executive Summary

Life sciences at Tel Aviv University (TAU) covers a broad range of biology. The Committee was especially impressed by the zoological and botanical gardens, which are a unique national/international resource. Individual scientists are strong, but the Committee is concerned by the lack of cohesion, and school and faculty-wide processes, to make things run smoothly. Individual labs should not be responsible for their own maintenance (electricity and A/C, for example).

It was not made clear to the Evaluation Committee how space is allocated and organized. Who decides how many students a lab can/should take? If a lab is very productive and secures increased funding and attracts more students and postdoctoral fellows, is the PI restricted to the initial lab space allocated on recruitment? Transparent processes and expectations must be put in place.

The Committee recognizes that renovated labs are nicer to work in, but the faculty expressed more concern about space. Regardless, the Committee did not understand how the faculty (PIs) size was determined (from the point of view of what was desirable for the schools).

The Committee was rather confused by the nominal reorganization of schools/departments that had taken place quite recently. We found it hard to understand the rationale for such reorganization, moreover in some cases it appeared that the merged departments continued to operate separately (albeit collaboratively) within the school (e.g. neurobiology & biochemistry/biophysics). The Committee did not discern an overall vision for the Faculty of Life Sciences. Related to this point, there did not seem to be good communication between

the rector, deans and heads of schools - regarding where life sciences wanted to go and how to get there, amongst other things.

Many activities at TAU seemed to be 'managed' in an ad hoc fashion. There are many problems with this approach. Globally, the trend is for explicit and transparent guidelines for everything. For example: requirements for tenure and promotion - these were not stated in any up-to-date-document, and they were not referred to in any annual reviews of the junior faculty by a consistent group of senior faculty or deans.

This example illustrates a key issue with management at TAU. There seems to be no appreciation that the challenges faced are common to other institutions, both nationally and internationally. Much has been documented about different approaches to solve these issues - for example, Diversity. TAU would benefit by examining approaches other institutions, internationally, have taken (often with evidence-based assessment of their impact) and deciding which they can employ in their own situation. The Committee notes that there is not one key activity to be implemented, but rather several smaller ones which each contribute to the solution.

Similarly for PhD students, the internationally adopted norm is to have a thesis defense, which includes an external committee member. All committee members must have read the thesis by the defense date, students are examined verbally, and the decision is made essentially immediately - pass, fail, major revisions. TAU does not have this procedure, but the Evaluation Committee could not discern why not - no arguments were made in favor of the current system. It seems universally accepted that the procedure described above works well for all concerned. Again, TAU should look globally and adopt what works.

Section 3: Observations

3.1 The institution and the parent unit

Tel Aviv University (TAU) is the largest university in Israel, and incorporates nine Faculties, 31 schools, and over 29,000 students enrolled in BSc, MSc and doctoral programs. The George S. Wise Faculty of Life Sciences is one of the nine Faculties, and is in turn composed of four schools. Other programs within TAU overlap with the Faculty of Life Sciences (e.g., the Sagol School of Neuroscience, and the Sackler Faculty of Medicine) providing opportunities for synergy and cohesion and/or creating friction and competition. Understanding the relationships between the Faculty of Life Sciences, the parental unit, and other programs within the TAU was therefore a critical part of the evaluation process by the Committee. However, the Self-Evaluation Report (SER) did not detail these issues to any degree and the feedback over the course of the onsite visit was contradictory, as detailed below.

The SER reflected the status and progress of the Faculty of Life Sciences (FLS). The Committee was therefore appreciative of the opportunity to meet the Rector and Vice-Rector to learn more about the overall vision of TAU and the role that the Faculty of Life Sciences plays within that vision. Unfortunately, this meeting did little to dispel key concerns that the Committee identified in the SER. Profs Shtauf and Zisser shared the Committee's concerns about the makeup of Schools within the Faculty of Life Sciences, and the lack of integration between, for

example the Faculty of Medicine and the Faculty of Life Sciences but appeared unable or unprepared to address these issues. More to the point, Profs Shtaif and Zisser deflected responsibilities for issues both upwards (e.g., the Rectors does not control funds for some specific activity) or downwards (e.g., the Schools in Life Sciences should be integrated but it is “very difficult” and the Dean is “too careful”), did not have objective data to support any proposed directions (“trying very hard to be attractive to women faculty,” but could provide no studies or policies to support this statement), and generally took a laissez-faire attitude to management and improvement. The Committee is concerned that this may reflect long-term frustration with attempting to effect change within TAU and within the Faculty of Life Sciences, which raises concerns about leadership at multiple levels. This is discussed further here and in section §3.3.

Leadership concerns are likely to contribute to many lost opportunities manifested at the meetings the Committee had with every level of management, where there was little or no evidence for coordination up and down the hierarchy or across programs with shared focus. Examples abound and many are detailed below, but to cite some specific examples: 1) there are competing PhD programs (e.g., the School of *Biomedicine* and Cancer Biology in FLS versus Faculty of Medicine) which impacts student experience, level of core services, research opportunities, etc.; 2) there are differing expectations and opportunities for students across the 4 schools of the FLS even with a single degree (e.g., time spent TAing, how well they are aware of expectations etc.); 3) there was a disconnect between the focus of higher leadership on the urgent need for renovation and the opinions of the faculty, where more space was more important than renovation; 4) the Vice Dean for Teaching articulated proposed changes that were made without student input and without supporting data, and in some instances provided contradictory statements (the Vice Dean indicated that a further move to hybrid is important, something which some students disagreed with, but also noted that with remote teaching it is harder to identify students that are struggling and had no proposal as to how to address this); etc.

It is hard to envision effective positive change in TAU without a clear vision; engaged leadership; coordination across all levels within the FLS; and coordination across related Faculties/Schools (e.g., Sackler and Sagol) and museums across TAU. All of the above are to be coupled with a change in management culture, focusing on defined, well-articulated, and transparent processes, data collection and review for all processes, open discussion about all initiatives — including opportunities for feedback and then for tracking of stated objectives etc. In short, the interests of the faculty members, staff, and students of the Faculty of Life Sciences are not best served by the current structures and management culture, neither within the Faculty or within TAU.

3.2 Internal Quality Assurance

The Evaluation Committee found that the Faculty of Life Sciences of Tel Aviv University provided an extensive self-evaluation report. We acknowledged that the faculty seriously took the self-evaluation process by dedicating a specific assistant and a team headed by a professor and the Faculty management. The FLS has also addressed many of the points raised by the

previous CHE evaluation committee, while mentioning that some concerns could not be addressed without better support from the University Leadership.

The Evaluation Committee however raised several criticisms on the self-evaluation process that became clearly apparent during the visit day and were a source of great concern. While data were collected, the Committee felt that SER was not taken as an opportunity for a collective introspection of the Faculty. Students and faculty members should have been better solicited to identify the weaknesses and the strengths of the Faculty, also no overarching vision of the Faculty mission was articulated to the Committee.

While the role of the Dean was recognized by the Evaluation Committee, a collegial spirit gathering the various parties of the faculty members is clearly missing. As a consequence, many important issues were raised during the visit that are not mentioned in the SER. Moreover, the University Leadership did not seem to be aware of issues in the Faculty of Life Sciences, and could not articulate a specific vision. They mentioned points (space used by emeritus professors, no willingness of professors to duplicate class sections because of the shortage of lecture rooms that can accommodate the enrolled students in courses) that were not relevant issues for the Faculty. These disparities between the Faculty of Life Science and University Leadership are a source of concern. They need to better work together to improve Faculty life.

The Committee found the numerous folders and sub-folders provided with supporting documents to the SER difficult to navigate, and urge consolidation of the files into a more user-friendly format for future evaluations. Much information found in the SER itself should be moved to supplementary materials to facilitate its reading (ex. the list of learning outcomes of each track). Further, during the visit day, some groups with whom the Committee met were not representative. For example, there were only three alumni that are still linked to the university, and a few MSc students. The Committee should have had the opportunity to meet with the heads of schools independently.

The Faculty evaluated its overall performance in Internal Quality Assurance:

(1=unsatisfactory, 2=needs significant improvements, 3=needs minor improvements, 4=satisfactory, 5=highly satisfactory)

	1	2	3	4	5
					X

The Evaluation Committee evaluated the Faculty's overall performance in Internal Quality Assurance:

	1	2	3	4	5
		X			

The self-evaluation process should be a collective analysis of Faculty strengths and weaknesses that includes all the parties and objective data. Possible solutions should be proposed.

3.3 The Department/Study Program

The Faculty of Life Sciences is composed of four schools. The School of Zoology is the largest in Israel and has unique resources to support research not only into traditional zoological disciplines, but also into conservation, habitat protection, etc. Similarly, the School of Plant Sciences and Food Security is a unique and exceptional resource in Israel and also has unique aspects including understanding human impact and the protection of key flora. These two Schools stand out and form the basis of a potential expansion into research and education on the impact of global/climate change, which is a major, emerging focus of research and education throughout the world.

The two other schools are more complex and reflect a somewhat artificial attempt (apparently in response to the administration concerns about numbers of faculty in some schools) to yoke together diverse schools and interests. Biomedicine and cancer biology don't necessarily go together seamlessly, and biomedicine would be more naturally aligned with the Faculty of Medicine. Neurobiology is not a natural (or exclusive) partner with biochemistry and biophysics and, again, would be naturally aligned with the School of Neuroscience. We learned that the merger of six schools into four happened in 2015; and, over the course of the Site Visit day the Committee repeatedly learned that, while the combined departments were "functioning," there were still some things to iron out. It is the opinion of the Committee that the structure of the schools be reevaluated, and the process of reevaluation be done at the level of the Rector, such that thoughtful decisions could be made that include Sagol, Sackler and other Schools and Faculty. It should be noted that other institutions have confronted these problems and have found successful solutions; we urge TAU to seek out examples that might benefit their situation.

The presence of multiple doors to a PhD degree in life sciences (and especially biomedicine or neuroscience) is a structural issue which must be addressed. Specifically, the Committee feels that there should be a single entry to a single graduate Life Sciences/Biomedicine Program that includes the Faculty of Medicine [FOM], FLS and Sagol. (Note that, although we were not able to learn about the degree to which the Sagol School for Neuroscience was, or was not, integrated into either the FLS or FOM, the website suggests that it is independent, such that there are potentially three ways to apply to overlapping and redundant programs).

Similarly, the issue of minimal interaction and engagement by the School of Life Sciences with biotech and industry could be ameliorated by a joint effort across Sagol, FOM and FLS, because Sagol and FOM seem to already prioritize industry relationships. Such engagement could potentially benefit collaborative research projects and provide internships or research laboratory spaces for the FLS students.

The Committee was surprised and concerned that the greater context of the Faculty of Life Sciences with TAU was not addressed, and the Committee is concerned that this reflects resistance to integration, which is to the detriment of TAU. For example, the Committee did not meet representatives from Sagol or the museum of natural history.

Students expressed frustration with several aspects of the graduate school experience, which are detailed further below. While MSc students have a standard thesis defense, PhD students do not. Rather, dissertations are evaluated by an internal committee and sent to an external committee member for evaluation. The Evaluation Committee was told that this evaluation takes an average of 4-6 months, but one of the interviewed students has been waiting more than 10 months to receive the initial feedback. The Committee believes in the strongest possible terms that this practice for evaluating PhD thesis is inappropriate. Students who have secured postdoc opportunities overseas cannot begin visa applications without their degree in hand, and the uncertainty accompanying the current thesis review process places them at a major competitive disadvantage. The Committee urges the Faculty to immediately institute a standard thesis defense procedure, with a definitive meeting date, as is common in many, if not most, academic institutions in Israel and worldwide.

An elaborated example of the process can be: Upon submission of PhD dissertation, reviewers should be contacted (including at least one international reviewer - the external reviewer may participate via Zoom if travel is not possible) and an oral exam scheduled, which will occur within 6-8 weeks from the date of the dissertation submission. For example, during that time, the reviewers would read the thesis, and provide written comments and questions at least 2 weeks before the oral exam. The student would then review the questions and prepare responses, together with the mentor and other experts. At the thesis defense, discussion between the examiner and student would take place, beginning with the questions submitted and extended to other areas as needed. At the end of this, the examiners would meet briefly with a representative of the program and pass or fail the student. If the student passes the exam, the examiners would alternately request no changes, minor changes (to be completed within 4 weeks), or major changes (to be completed within 8 weeks). In parallel, the student will give a public lecture, either immediately before the thesis defense or in the week preceding the thesis defense. The examiners would attend the lecture (including remotely).

The Faculty evaluated its overall performance in Study Program:

(1=unsatisfactory, 2=needs significant improvements, 3=needs minor improvements, 4=satisfactory, 5=highly satisfactory)

	1	2	3	4	5
				X	

The Evaluation Committee evaluated the Faculty's overall performance in Study Program:

	1	2	3	4	5
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		X			
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The composition of the Faculty of various schools should be reevaluated and perhaps organized to better suit the purposes and integration of the diverse fields of study. PhD degrees have a few “entrance doors” to overlapping programs, and there is no mechanism or clear standards for the evaluation of PhD dissertations. All these require significant modifications.

3.4 Teaching and Learning Outcomes

The Committee agrees that the creation of the Innovation in Teaching and Learning Center could be an asset to improve teaching at Tel Aviv University. The Committee were impressed by the diversity of courses and tracks offered at TAU. During the visit, several concerns about teaching and learning outcomes were raised, notably by students, that should be addressed.

The Faculty of Life Sciences does not have access to teaching rooms of sufficient capacity to host first year students enrolled in the required courses. Some stakeholders suggested that this was just a transient issue due to an increased on-site attendance following the COVID pandemic. Students however testified that the overpacked teaching room did not encourage them to attend the course on-site. The Committee recommends discussions with the University heads to solve these issues, as large teaching rooms seem to be available in other faculties on the campus.

Another issue raised by students is inadequate preparation for introductory courses, and inadequate description of course prerequisites. For example, some courses given in the first year start too abruptly without providing the basics. Not all students have the required familiarity with the material, and as a consequence, some of them have difficulties grasping the content. The fact that most courses in the first semester are in physics, chemistry and math, and life sciences courses being introduced only later in the curriculum, could discourage some students to continue, possibly contributing to the high attrition rate.

The Evaluation Committee recommends that course prerequisites be explicitly made available to students before they sign up, and updated as needed. The curriculum should be reevaluated so that course order provides appropriate instruction sequences. The Evaluation Committee further recommends the creation of a gradual learning curve: Implement ‘bootcamp’ courses, and possibly placement exams, prior to the beginning of the semester to bring undergraduates to the level required for first year courses. Incorporate this remedial preparation into the TAU curriculum - would obviate the need for students to pay for expensive external courses. The Evaluation Committee also recommends development and implementation of a robust advising team including professors for all students enrolled in the FLS programs to support the students throughout their studies.

Many BSc courses have lectures in Hebrew with English support (slides and textbooks). The mix of the two languages did not facilitate the learning by students. A suggestion is that

courses are given either in Hebrew or in English, with the appropriate support (courses given in Hebrew could have an additional support in English available on Moodle).

Most courses are recorded, and many are also offered live on Zoom. The Committee learned that some important courses, for example, the course on Python, were given remotely with little individual support. Students also noted that equipment failure can preclude students from attending lectures online. In other cases, there is a “virtual TA”, available to answer only emails on the course. It appears that not all faculty have dedicated office hours for courses. We heard from students that one reason for choosing to go to a University was for frontal teaching, not online classes. The Faculty must address these issues.

The Evaluation Committee asked students about their independent research experiences. The consensus opinion was that information about research opportunities is difficult to obtain. The Committee was surprised to learn that there are strong disparities between the BSc research projects offered in third year. There seems to be no clear guidelines on how long the research projects should be. Furthermore, student researchers are generally supervised by graduate students, with apparently only little input from lab heads. Finally, it appears that students receive no formal feedback on their research work. Student’s access to the list of research projects proposed by the faculty is also in dire need of improvement. To address these issues, the Committee recommends that the Faculty centralize and regularly update information about research opportunities, either online or through an office. Information about research opportunities and requirements for achieving academic credit should be easily accessible. The Committee also believes that a mechanism for providing undergraduates with constructive feedback on their research performance should be formalized.

Students conveyed that because some laboratory courses or sections have a delayed start at the beginning of the semester, the students may find it impossible to change or drop the specific lab course, due to an arbitrary deadline for adding or dropping classes. This problem must be addressed administratively.

Students felt that their course evaluations were not taken into consideration by instructors or the Faculty. The Committee recommends a better dialogue between students and faculty members to improve course quality. For instance, a short moment should be taken at the end of the course by the teacher to discuss the evaluation. In addition to student surveys, the Vice Dean of Teaching could assess course quality issues by interviewing selective students, and other faculty members (or the Vice Dean) sitting in on classes. These are common and recommended means of assessment.

The Evaluation Committee recommends that student representatives be added to the FLS Teaching committee to provide their input when discussions are underway.

The Faculty evaluated its overall performance in Teaching and Learning Outcomes:

(1=unsatisfactory, 2=needs significant improvements, 3=needs minor improvements, 4=satisfactory, 5=highly satisfactory)

	1	2	3	4	5
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				X	
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The Evaluation Committee evaluated the Faculty's overall performance in Teaching and Learning Outcomes:

	1	2	3	4	5
			X		

The Committee felt a disconnection between faculty members and students. A better dialogue between the two parties would improve teaching and help students to cope with the difficulty inherent to at large University.

3.5 Students

The Faculty of Life Sciences at Tel Aviv University offers undergraduate BSc degrees, as well as graduate MSc and PhD degrees, including a direct-track PhD route. The Evaluation Committee interviewed students in these programs, as well as alumni recently graduated from the graduate programs.

The Evaluation Committee was impressed with the thoughtfulness of the undergraduate students interviewed, and asked them to reflect on their experiences. All replied that they would recommend the Faculty of Life Science for undergraduate studies. Students pointed out that courses in zoology, molecular biology, and bioinformatics are particularly strong, and that overall teaching is administered at a high level. Students also remarked that teaching labs, while not all modernized, were adequate. Nonetheless, a number of issues suggest room for improvement.

The Evaluation Committee noted the high attrition rate of undergraduate students (with ~50% not completing their studies). One explanation offered by the Dean and by faculty members was that students leave the program to pursue medical studies. Students remarked that while the first year of studies is manageable, there is a large increase in the workload in the second year, which may account for some students leaving the program. Lacking data, the Evaluation Committee was not able to verify these speculations. The Evaluation Committee strongly urges the Faculty to track the reasons for student attrition and to develop evidence-based intervention plans to address the attrition issue.

The Evaluation Committee was told that many of the Arab students needed support during the first year because of their need to master academic and scientific Hebrew in the lectures. They said that some more advanced students provided peer support in and outside of class. As described above, placement exams and possibly a “boot camp” might be valuable for the students for whom Hebrew is not their first language; this might include international students as well as Arab-Israelis.

The Evaluation Committee also learned that most undergraduate students commute to the university, and that there are no programs on campus that encourage student community building. The absence of such efforts probably reduces the interest of international students who come alone (without family support) for their studies. The Evaluation Committee encourages the Faculty to review their efforts in this area, which may help promote internationalization of the program. In general, it seems that support for international students in TAU is not a priority.

Interviews with graduate students suggested that most are satisfied with their overall research experiences; however, a number of issues were raised that the Committee feels need to be addressed. Students experience a serious financial burden, as their salaries are not commensurate with the high cost of living in Tel Aviv. Many students earn supplemental income by becoming Teaching Assistants. However, it appears that different schools have different restrictions on the number of sessions students are allowed to serve as TAs. Furthermore, the Committee received ambiguous information regarding uniformity of pay levels. Some students suggested that TAs in other Faculties (e.g. Computer Science) receive 2-3 times higher compensation per hour of teaching. The Committee believes that to attract strong graduate students, which serve as the backbone of scientific research at TAU, the Faculty must work with University administration to standardize TA salaries, eligibility and opportunity, to offer more fellowships, and to subsidize student housing to a greater extent.

At both the graduate and undergraduate levels, the Committee found that career preparation information was not sufficient. Most students do not pursue academic postdocs, yet, information regarding alternative careers for life science graduates was hard to come by. The Committee was told by interviewed faculty members of a recently implemented course that addresses this concern. Interviewed students were, however, unaware of this course. The Committee believes that developing a career counseling program accessible by all students is critical. While there currently is a single career counselor covering several hundred students, this does not address most Faculty of Life Sciences student needs.

Career planning could take advantage of an outstanding cadre of alumni from the Faculty. However, it appears that the Faculty does not maintain detailed alumni records. The Committee recommends integrating alumni into students' career planning strategy. It does not necessarily mean an institution-level alumni association, or approaching alumni for large donations, but taking advantage of the links established by new graduates to better inform current students about career opportunities.

The Faculty evaluated its overall performance in Students:

(1=unsatisfactory, 2=needs significant improvements, 3=needs minor improvements, 4=satisfactory, 5=highly satisfactory)

	1	2	3	4	5
			X		

The Evaluation Committee evaluated the Faculty's overall performance in Students:

	1	2	3	4	5
		X			

The main drivers for the difference between the institution and Committee assessments are the attrition rates, student financial support, and career counseling. Lecture rooms of sufficient size to accommodate all enrolled students are important as is the consistent language of instruction. The Evaluation Committee believes that implementing changes on these issues will greatly strengthen student experience within the Faculty. We were also concerned about the high level of attrition of students from the BSc program and recommended determining the reason(s) and addressing the underlying problems early.

3.6 Academic Faculty and Human Resources

The members of the Life Sciences Faculty are receiving prestigious grants, publishing high impact papers, training a significant number of graduate students, and engaging in international collaboration. As the SER articulated, and as was emphasized by Faculty leadership during our meetings, there is a strong emphasis on recruiting excellent new junior faculty members, and providing them with competitive start-up packages, access to core facilities, and initial financial support to recruit MSc and PhD students.

The Evaluation Committee learned from the SER that improvements in the processes for tenure and promotion to Associate Professor (which are separate) have been made in recent years. However, discussion with various faculty members suggests that clearer and more timely information on promotion requirements should be provided to new faculty. The process is perceived by faculty members as being somewhat informal, in the sense that criteria for promotion to Associate Professor represent a higher bar that is quantitative rather than qualitative. However, how many more papers or grants needed, for example, to reach this bar seems to be opaque, and the time it takes to complete this process is long. Also, it seems that there may be different norms for the different Schools and the Evaluation Committee recommends that consistency and transparency of the promotion process be further strengthened across the Faculty.

Importantly, newly hired faculty are assigned a senior faculty mentor and they meet with the Dean annually. Regardless, the Committee heard that there is significant heterogeneity in the frequency of meetings and there is concern from some faculty members that the mentors may be too senior and distant from the current realities of starting a new lab, interacting with graduate students, and managing a team, so the advice and guidance may or may not be helpful. The Dean and Heads of Schools should pay greater attention to provide a more suitable match for mentor and mentee. Furthermore, post-tenure mentoring should also be provided since the promotion to Associate Professor and, then, to Full Professor, are separate processes.

As discussed in other sections, the Evaluation Committee heard concerns from both faculty and students that the graduate student stipend is too low. This makes it difficult to recruit students, especially those interested in interdisciplinary training, such as computational biology where there is significant competition from industry. The base stipend for students is too low and while faculty members often supplement it from their grants, there is a limit to how much they can support. TA-ships in the Life Sciences are also limited as means of increasing student income. The Committee recommends a systematic assessment of graduate student stipends in the Life Sciences, given that most students that enter graduate school live in Tel Aviv, one of the most expensive cities in the world.

There has been a change in the policy for the institutional status of Lab Managers assigned to each faculty's research: instead of a tenurable status fully paid for by institutional funds, these positions are currently funded at the 50% (or lower) level by the institution on an annual basis and must be supplemented to appropriate levels from grant (laboratory) funds. This precludes long-term commitment from the PI and a long-term sense of job security on behalf of the Lab Manager. In the absence of a more heavily post-doc driven research environment at TAU (and in Israel in general), long-term employment of Lab Managers is the basis of student training and lab-research continuity. A reversal in the status of Lab Managers is the explicit wish and desire of faculty members at TAU. This includes the ability to raise salaries as needed beyond the annual 3% max allowed by the university.

Funding and status for professional and knowledgeable Core facility staff scientists are also needed at a level that assures competitiveness with alternative career options for these staff. Currently, there is a feeling amongst the faculty that core staff scientists are not up to date in their training and dedication for the otherwise state-of-the-art core facilities to allow high quality data acquisition and initial analyses as is typically done at core facilities. The Faculty also faces similar issues with the IT personnel and support at TAU; many such staff have the options of going to industry with their skill sets, and those remaining at the University may not provide the fullest service and assistance for faculty and student needs.

The Faculty evaluated its overall performance in Academic Faculty and Human Resources:

(1=unsatisfactory, 2=needs significant improvements, 3=needs minor improvements, 4=satisfactory, 5=highly satisfactory)

	1	2	3	4	5
				X	

The Evaluation Committee evaluated the Faculty's overall performance in Academic Faculty and Human Resources:

	1	2	3	4	5
			X		

Many policies and processes regarding promotion and progress along the faculty ranks need to be formalized for transparency. The Lab Manager's status needs to be revisited at the Institutional level. IT personnel and Core Staff Scientist recruitment and retention should generate staff with sufficient technical skills to meet faculty and student research needs.

3.7 Diversity

Diversifying TAU appears not to be a priority or part of any vision for the Faculty of Life Sciences. The Committee believes there must be a commitment to addressing deficiencies in this area of the program writ large. There are data within and outside TAU on demographics and many examples and strategies available for remediating deficiencies. The Evaluation Committee strongly advises making a commitment to and achieving Diversity at every level.

The fraction of Arab students reflects the demographics of Israel, but drops precipitously from 15.8% among the BSc students to 7.2% in the MSc cohort to 4.7% among PhD students. It is unclear from the data provided if there is disproportionate attrition of Arab students during their BSc, despite the statement that there are specific support services for this cohort of undergraduate students. As described in the Student section of this evaluation, far too many students do not complete their BSc degree and more than half take longer than the funded 3 years of study. The Committee urges TAU to devote more resources to cultivating and supporting this minority group through successful completion of their studies. If financial needs are contributing to the reason students leave, this must be addressed, just as social and health needs, or tutoring in language fluency for academic success.

The data indicate that no Ethiopian students are enrolled in the MSc or PhD programs, and only one in the BSc program. No data were presented about other minority groups in the student body. Efforts should be made to include students of Ethiopian origins, and other under-represented groups in the student body of the Faculty of Life Sciences.

The Hebrew language requirement for undergraduate courses discourages the application of foreign students. Students we spoke with indicated that most classes were hybrid with lectures in Hebrew, PowerPoint presentations and textbooks in English, some quizzes in English and final exams in Hebrew; this induced dissonance in class and learning, especially for those students who are not fluent in both languages. All courses should be taught in a consistent language. Students indicated that some instructors spoke with accents that made understanding the lecture challenging; language lessons (elocution) should be made available to all faculty who are not native speakers of the language in which the course is taught.

At the graduate level, faculty members pointed out burdens when international students are involved. It appears that the International Office in the University did not meet many of the needs of these students, and many faculty members in the Faculty of Life Sciences had to assist the international students. Specifically, faculty had to facilitate visa applications and other bureaucratic activities. The Evaluation Committee recommends that TAU enhance the staffing of this central International office and make it effective for all international personnel.

No data were provided about postdoctoral fellows, their numbers, their country of origin, gender, or minorities among this group.

Only one Arab, the Dean, is among the faculty members in the Faculty of Life Sciences. When we asked about this situation, the Dean said that no Arab candidates applied in the last 20 years when searches were undertaken. Other faculty members said they did not know any Arabs, so they could not reach out to solicit applications. While the pipeline may be limited, they must make better efforts to locate and recruit Arab colleagues into the FLS. Further, the cultivation of their own Arab students, encouraging them to do postdoctoral fellowships and academic careers, will ultimately lead to a new generation of Arab scientists that may join the TAU faculty. Note, this advice applies for all under-represented groups.

There were few non-Israeli faculty members, which is dissonant with the goal of Internationalizing aspects of the Faculty of Life Sciences and programs. The Evaluation Committee thinks that the internationalization of the Faculty of Life Sciences should be a priority. New approaches should be implemented to attract colleagues from other countries (international advertising, invitation for seminars, contact of potential non-Israeli candidates...). The Faculties should explore the successful strategies that other institutions around the globe have put in place in this aim.

Approximately a quarter of the Biology Faculty members are female, mostly at the most junior levels. We were told that a strong effort is underway to recruit more female faculty members. The SER indicates the Faculty of Life Sciences has a goal of achieving 45% women among the faculty by 2025. Given the small number of faculty searches every year, this goal will be impossible to achieve unless many older male faculty members retire simultaneously in the next 3 academic years. The Evaluation Committee commends this initiative to increase the number of female faculty members, but would like to see a realistic goal, and a specific mechanism to achieve it.

While two of the four schools are headed by women (those programs that were combined in the recent realignment), the most senior nine TAU leaders (two Rector office and the seven FLS leaders) we met were exclusively male. TAU and the Faculty should recognize that female faculty should be brought into these forward-facing leadership roles.

Student Maternity leaves are for 15 weeks only, and this may negatively impact funding from lab PI, who continues to pay a student on leave. This also is penalized in terms of the time for fellowship support for graduate students. There are also uncompensated needs to address family illness, which may prevent a student from attending class or attend to research project. Both TAU and the Faculty of Life Sciences must devise a solution, and CHE must increase support for students who are new mothers.

Military reserve interruption(s) in a student's program of study are not uncommon in Israel. Accommodation must be made to enable students on military reserve to complete their degrees without penalty. If this means extensions of deadlines or delays in taking examinations, accommodation should be easily and routinely made. There should be no penalties in the period of fellowship support for student-soldiers, either.

Accessibility issues were raised by students, by faculty (during the facilities tour), and also by the Evaluation Committee itself. We noted that although there are handicapped stalls in

bathrooms, the architect or builder put an obstruction in the placement of the sink in one visited by the Evaluation Committee. Many buildings have stairs at the entrance, posing a challenge for people with mobility issues. By contrast, the Botanical Garden has been recently renovated for mobility-accessibility throughout the park.

Many classrooms have been accommodated to allow for wheelchair seating in the front row. However, students with visual or hearing impairments are not specifically addressed. Further, we were told that the TAU office for disabilities is understaffed and unable to assist students in need. Other disability concerns such as neuro-diversity seem completely overlooked. The Evaluation Committee recommends that consideration of these students (and faculty) be given priority and accommodated as appropriate for each individual.

The Faculty evaluated its overall performance in Diversity:

(1=unsatisfactory, 2=needs significant improvements, 3=needs minor improvements, 4=satisfactory, 5=highly satisfactory)

	1	2	3	4	5
		X			

The Evaluation Committee evaluated the Faculty's overall performance in Diversity:

	1	2	3	4	5
		X			

There is little vision or reflection by TAU and the FLS leadership about the value of Diversity and ways to address the conditions. Minority populations in students are low to absent, and drop with academic degrees, and similarly with faculty. Disabilities, military commitments, and motherhood are handled suboptimally. The most senior levels of Leadership (both at the university level and in the Faculty of Life Sciences) are male and efforts to increase diversity are recommended.

3.8 Research

The research at The George S. Wise Faculty of Life Sciences is outstanding. The faculty members, in all four schools, are very well recognized at both National and International levels. Faculty members have historically demonstrated (and continue to do so now) an exceptional ability to assure funds, publish often and impactful research, and become leaders of their own research fields. For example, the Israeli Zoology and Plant Sciences research are world renowned, and the Evaluation Committee noted much of this International recognition is due to the research being conducted at TAU's Faculty of Life Sciences. Similar accolades are

also true for research being conducted in the other two schools. In addition, the Committee noted that the research (in all labs) is accessible to international trainees.

Nonetheless, while the research is indeed “top notch” the Committee is under the impression that the Faculty’s noteworthy research accomplishments are achieved despite enduring challenges, which stem mostly from the lack of:

1. Communication between the Institution and the Faculty, which seems to be mostly ad hoc.
2. Transparency and consistency in policies at all levels (institutional, Faculty, and School).
3. Strategic Planning and Implementation; vision and procedures are apparently non-existing and should be implemented.

The support provided by the institution is limited at best. Institutional, as well as Faculty funds that can serve for scholarships or to initiate new research avenues within established and new laboratories, etc., seem to be limited or lacking. The Evaluation Committee learned that the amount of overhead funds (indirect grant money) being placed back into the Faculty is often utilized for the routine maintenance of PI’s labs.

Another aspect that could enhance the research possibilities, as well as funding, would be to implement the possibility (at the Faculty and School levels) for “sponsored research agreements” with industry. This could increase the student research slot possibilities, could enhance the breadth of research being conducted, flow additional overhead, and complement other external funding.

The Evaluation Committee was unclear as to whether there is a mechanism in place for evaluating research achievements, coordinating multi-lab research endeavors, etc. It was also unclear whether mid-career researchers are supported and helped to sustain impactful research after tenure and until promotion to the Associate (as well as full) professorship level(s).

The Faculty evaluated its overall performance in Research:

(1=unsatisfactory, 2=needs significant improvements, 3=needs minor improvements, 4=satisfactory, 5=highly satisfactory)

	1	2	3	4	5
					X

The Evaluation Committee evaluated the Faculty's overall performance in Research:

	1	2	3	4	5
			X		

While the Committee agrees that the level of research conducted by the entire Faculty is outstanding, it is the Committee's impression that this is despite the support and structure behind the research endeavors. It is the Committee's recommendation that the Institution and the Faculty implement a more structured (as opposed to ad hoc) strategy for planning and then implementing research support.

3.9 Infrastructure

The Faculty of Life Sciences is currently based in 3 main buildings as well as the new teaching lab annex, with research labs positioned at the new Natural History Museum building and future (but limited) space coming online in the Nanoscience Building. In addition, two entirely unique resources exist for the Faculty: the Botanical Gardens and the Zoological Gardens. Both of these field facilities are excellent and carry out public outreach functions as well as basic and applied research roles, in plant and crop sciences, zoology, and even in neurobiology.

Despite these resources, the Evaluation Committee was told that this generally large Faculty is limited by research space. The Evaluation Committee was shown an example of a current faculty member who has ~90 sq m of research labs for ERC funded research, with 10+ grad students working side by side. Overall, the lack of space seems to preclude future recruitment plans for new faculty for whom research space simply does not exist. Construction is ongoing for a new Life Sciences building for research space, but in return the Faculty will be giving up one of its own buildings for expansion by the Engineering Faculty.

The Evaluation Committee also learned that the overhead fund from external grants that flows back to the Faculty is very limited (~6%), and distributed to the individual labs. The individual laboratories are then expected to utilize these insufficient funds for the maintenance of their often old lab space, like fixing air conditioning units and electrical outlets. The Committee recommends that more of the overhead funding should flow back to the Faculty, and that the FLS should centralize the management of these types of infrastructure issues, not PIs, so that there is more consistent and timely support, and less stress, for faculty members. Many institutions have a school or department Facilities Manager who oversees the maintenance and repair of laboratories; FLS might want to adopt this model.

Teaching space is also limited, in terms of maximum classroom sizes, whereby 300+ enrollment large introductory biology courses are channeled into classrooms with 250 occupancy limits. The Evaluation Committee heard mixed views regarding large classroom utilization. The Rector seemed to indicate that the Faculty could simply use existing classrooms with multiple sections to accommodate teaching needs, while the FLS leadership rely on a lower percentage of student attendance in large courses to accommodate their needs in these classrooms. Students, on the other hand, feel frustrated at times that the classes are full and there are no seats, with overflow rooms accommodated via Zoom.

Classroom renovations are ongoing at Life Sciences, to generate updated space with IT facilities for simultaneous ZOOM classrooms and electrical outlets for student computers and tablets. This will positively impact the student and faculty experience for in-person learning.

Regardless, better coordination of large classroom utilization across TAU should be pursued in the near term. Similarly, an ongoing process is in place for renovating teaching laboratories to complement the new teaching labs in the annex building which serve both University needs and high school biology Olympiad students.

Plans have also been approved to renovate existing space to consolidate all Core facilities housed at the Faculty of Life Sciences into a centralized and updated facility space. In turn, these facilities, including Next Generation Sequencing, are complemented by access to use core facilities at the Faculty of Medicine of TAU, focused mostly on imaging resources. Staff support in these facilities is not always considered adequate, and there was concern that there is insufficient access and support in the Core facilities during specific times of the year (e.g., summer holidays), and there is a need for operations in these facilities to align with research needs of the Faculty.

Regarding large-ticket new equipment, these are typically purchased from new faculty start-up funds or external research grants. Occasionally, the purchase is done in collaboration with Core facilities where specific faculty contribute partially to the purchase costs in return for usage-hours for these particular PI, while the instrument also serves the larger needs of the Faculty and the University. The Evaluation Committee heard from faculty that the equipment needs upgrading and that some key items to support current faculty are missing (e.g., mass spectrometry, NMR, and flow cytometry).

The SER indicates that library space and resources are shared with the Faculty of Medicine. Access is available to a broad range of biology electronic journals and many digital search engines and databases, though some rarer items must be sourced through interlibrary loans. Overall, the library seems convenient regarding its location and generous with respect to opening hours, with extended hours offered during the exam periods, but space is limited for study groups for students. As with other universities in Israel, TAU would benefit from a nation-wide unified contract with publishers to access e-journals and databases country-wide.

The Faculty evaluated its overall performance in Infrastructure:

(1=unsatisfactory, 2=needs significant improvements, 3=needs minor improvements, 4=satisfactory, 5=highly satisfactory)

	1	2	3	4	5
		X			

The Evaluation Committee evaluated the Faculty's overall performance in Infrastructure:

	1	2	3	4	5
		X			

Sufficient and functional research and teaching space is the major limiting factor and constraint for the Faculty of Life Sciences. Many plans and much progress are in place to renovate faculty labs and teaching spaces, but the square footage available in the current buildings belonging to the Faculty is finite. It remains unclear, however, whether a strategic plan exists about which older labs are in queue for renovation and at what level of the administration this progress plan is formulated.

Section 4: Conclusions and Recommendations

4.1 Conclusions

The Faculty of Life Sciences at TAU represents a large and thematically diverse group of life scientists, whose research outputs and grant income matches those of the best international universities. The Committee especially welcomed the presence of strong organismal research and facilities in botany and zoology, which both feature unique inter/national experimental resources. Whether the different arms of the Life Sciences Faculty fit cohesively into a single administrative unit remains an open question, even after the organizational restructuring that took place 6 years ago at the levels of the former departments.

The higher administration and the Life Sciences faculty all indicated to us, and we agree, that space limitation is a serious constraint on the current and future growth of Life Sciences at TAU; while a new building (for FLS) and additional research space in the Nanoscience compound are coming online, a current building is being taken away for growing the Engineering Faculty instead. The Evaluation Committee is also unclear about how faculty recruitment and growth are being strategically planned at the Life Sciences – it seemed to the Committee as if the proportional representation of the current 4 units had to remain stable as a primary guiding principle for new recruitment. This implies a need for both more planning at the level of the Faculty and, perhaps, even beyond the Faculty, in collaboration with the Faculty of Medicine and the higher administration's vision for TAU biomedical and life sciences in general.

Several of the decisions, reviews, and plans for the Faculty of Life Sciences seemed to be managed through 'ad hoc' means. This goes contrary to globally accepted principles of explicit and transparent procedures, decision making, and accountability. Such principles and processes are especially important for tenure and promotion (to be included in a future self-review), including the annual reviews of junior faculty on their way to tenure, and for the efforts being made to recruit a more diverse faculty using institutional steps rather than personal who-knows-whom approaches. The Evaluation Committee also found the policy of separating tenure and promotion at the associate professor level unusual, and not necessarily most productive for those involved with split decisions.

Finally, the Evaluation Committee highly recommends restructuring the PhD dissertation defense process to include an oral defense presentation followed by an in person examination so as to avoid unnecessary delays in the external processing of solely written thesis examinations.

4.2 Recommendations

Essential

The Faculty of Life Sciences must articulate its vision, including the research areas to focus or expand to, the size of the faculty and student body, and so on. Strategy and milestones for planning, budgeting, recruitment and infrastructure should be developed and set.

The Faculty must analyze and determine the reasons for the high attrition of the BSc students, using data-driven metrics, and early interventions should be introduced to retain the students through graduation.

PhD thesis committees must include external scientist members (virtually or in person) for a Defense, as is the international standard.

The Faculty must develop a diversity policy, and address the low diversity (ethnicity and gender) especially at the faculty level. An action plan must be proactive and have pre-defined metrics for success.

The Faculty must develop a policy/standard regarding lab size (personnel and physical space) distribution.

Important

Teaching evaluation should not rely on student surveys alone, and other mechanisms, such as peer observation, should be incorporated.

The process of mentoring and evaluation of junior faculty members should be revised so that research, teaching and outreach and engagement should all be included in the 'package' reviewed. On annual reviews, the group of reviewers should be consistent throughout the years.

The Faculty must specify explicitly and transparently to the junior faculty the requirements for promotion. This document must be kept up to date.

TAU should provide 100% salary coverage of the Lab Manager position, and ensure the compensation commensurate with the professional nature of this essential position.

Core Facilities should be staffed by Staff Scientists, paid centrally by the Faculty (not by user fees) at a level commensurate with their skill set and essential role. Further, the Cores should not close during times when no classes are offered, as this is the ideal time for research activities.

Using placement exams, students whose background is in need of enrichments must be identified. Implement 'bootcamp' courses at the beginning of the semester [or prior to matriculation] to bring undergraduates to the level required for first year courses. Incorporate this into the curriculum - do not require students to pay for expensive external courses to achieve this.

The FLS should develop a strong advising program for all BSc students. Career counseling must be developed and implemented for all students.

Course syllabi should be clear, and the prerequisites should be explicit. The add/drop dates for laboratory course sections should not be before the start of those courses.

The language of instruction must be consistent in the taught courses in the Faculty. Additional academic support should be provided for students whose first language is not Hebrew.

The Faculty of Life Sciences must improve the learning and working experience for students and faculty with special needs or disabilities, by making appropriate accommodation of the facilities and support given.

Laboratory repairs and maintenance should be coordinated and paid for at the Faculty level, not by the PI's.

Graduate student stipends should be increased centrally.

Desirable

The self-evaluation process should be more reflective, and students and faculty members should be better involved in identifying critical issues, discussion, conclusion deduction, and suggesting solutions.

For better involvement, students should be included in the Facultative Teaching/Curriculum committee membership.

Graduate students should be encouraged and supported by the Faculty to present their work at international conferences.

The University should expand the staffing and responsibilities of the International Office, so it serves the needs of all international students, staff and faculty.

The Teaching Assistant positions should be uniform in the number of terms/contact hours as well as compensation from one Faculty to another. Employment and work conditions should be transparent, as well as the process for hiring of students for these positions.

Signed by:

Prof. Lynne Regan

Committee Chair

Lynne Regan

Prof. Joseph Buxbaum

JB

Prof. Edna Cukierman

Edna

Prof. Mark Hauber

Mark Hauber

Prof. Bruno Lemaitre

Bruno Lemaitre

Prof. Carol Shoshkes Reiss

Carol Shoshkes Reiss

Prof. Shai Shaham

Shai Shaham

Prof. Vincent Tropepe

Vincent Tropepe

Appendix I: Letter of Appointment



October 3, 2022

Prof. Lynne Regan,
Institute of Quantitative Biology, Biochemistry and Biotechnology,
Edinburgh University
UK

Dear Professor,

The Israeli Council for Higher Education (CHE) strives to ensure the continuing excellence and quality of Israeli higher education through a systematic evaluation process. By engaging upon this mission, the CHE seeks: to enhance and ensure the quality of academic studies, to provide the public with information regarding the quality of study programs in institutions of higher education throughout Israel, and to ensure the continued integration of the Israeli system of higher education in the international academic arena.

As part of this important endeavor, we reach out to world renowned academicians to help us meet the challenges that confront the Israeli higher education by accepting our invitation to participate in our international evaluation committees. This process establishes a structure for an ongoing consultative process around the globe on common academic dilemmas and prospects.

I therefore deeply appreciate your willingness to join us in this crucial enterprise.

It is with great pleasure that I hereby appoint you to serve as chair of the Council for Higher Education's Committee for the Evaluation of **Life Science and Biology** departments. Other members of the Committee will include: Prof. Joseph Buxbaum, Prof. Edna Cukierman, Prof. Orna Elroy-Stein, Prof. Mark Hauber, Prof. Bruno Lemaitre, Prof. Carol Shoshkes Reiss, Prof. Shai Shaham, and Prof. Vincent Tropepe.

Ms. Anat Haina will be the coordinator of the Committee.

I wish you much success in your role as a member of this most important committee.

Sincerely,

Prof. Edit Tshuva
Vice Chair,
The Council for Higher Education (CHE)

Enclosures: Appendix to the Appointment Letter of Evaluation Committees

cc: Dr. Varda Ben-Shaul, Deputy Director-General for QA, CHE
Dr. Liran Gordon, Senior Advisor for Evaluation and Quality Enhancement
Ms. Anat Haina, Committee Coordinator