EVALUATION OF LIFE SCIENCES STUDIES

UNIVERSITY OF HAIFA

COMMITTEE FOR THE EVALUATION OF LIFE SCIENCE STUDIES IN ISRAEL

September 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 of[1]:

- **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 Systems Biology, University of Toronto, Canada.

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

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;
- conduct on-site visits at those institutions participating in the evaluation process;

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

- 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 countries and North-American countries) to the evaluation of such provision in Israel.

Section 2: Executive Summary

The Faculty of Natural Sciences at the University of Haifa serves an important role in Life Sciences education and research in the northern part of Israel. The commitment of the University to hiring scientists with exciting research programs is evident, and reflects on the University's commitment to excellence. This vision also appears to be taking shape with plans to reorganize Life Sciences programs at the University into Schools, facilitating communication and scientific exchange.

The Committee identified several critical issues that need to be addressed as the University moves to enhance the impact of its Life Sciences program. The planned restructuring efforts are an excellent opportunity to address many of these. Chief among the issues encountered by the Committee is the financial commitment of the University to Life Science research and teaching. The Committee believes that this commitment should be multi-pronged, and must include, among other things, providing a modernized infrastructure for researchers; availing scientists of top-of-the-line core facilities; ensuring that graduate students are paid adequately to be free of financial worries; modernizing and expanding teaching venues; and reducing to the greatest extent possible the excessive teaching responsibilities of faculty and graduate students alike, so that they can focus on research. In addition, it is imperative that financial input into the undergraduate program to ensure that admitted students have adequate language and all other needed types of remedial support. The Committee believes that overhauling and strengthening these financial commitments is a prudent investment that will pay off very quickly. Ensuring success of the program will result in influx of grant revenue, increased private donations, greater international recognition, and growth in the number of outstanding degree applicants from Israel and outside. All of these potential boons will benefit not only the Life Sciences program, but the University as a whole. Such investment will also

further the University's stated commitment to sustainability, as the potential impact of Life Sciences education and research to this goal is well documented.

The Committee fully supports the integration of the Life Sciences programs, including the intended merger with the Biology Department at Oranim, under a common administrative umbrella. We were therefore disappointed to learn that the program in Marine Biology will be excluded from these unification efforts. The Committee strongly believes that integrating this fifth department under the planned School of Life Sciences umbrella can only have a positive impact on all researchers, promoting unique and exciting collaborations, and reducing duplication of instrumentation, classes of instruction, and teaching responsibilities. Because most Life Sciences programs in Israel and abroad do not have a Marine Biology component, integrating the programs at the University of Haifa would create a unique environment that would draw outstanding talent at all levels.

In summary, the Committee believes that the Life Sciences program at the University of Haifa is at an important transition point, and that generous investment and resource allocation to the program on multiple fronts would in short order transform the program into a nationally and internationally impactful one.

Section 3: Observations

3.1 The institution and the parent unit

The University of Haifa has been traditionally strong in the Humanities. Currently, the Faculty of Natural Sciences (FNS) represents the smallest Faculty and it was this Committee's impression that FNS is in a precarious state vis-à-vis stability and growth. This is important because researchers at the University of Haifa (including the Biology Department at Oranim College which brings additional strengths in Ecology and Sustainability) are internationally recognized for their accomplishments. Yet, the Committee questions whether the leadership of the University recognizes what is required for a successful Life Sciences program.

The Committee recommends that the institution bring in an external advisory committee to review Life Sciences overall and make recommendations. Of particular concern, some of the Life Sciences departments (e.g., Marine Biology) and critical partners (e.g., Computer Science) have been moved out of the FNS, taking them outside of the Committee's purview. The Committee was presented with these changes as a fait accompli – and it was not clear if these changes were both fully accepted and beyond our purview to comment upon, or if any direct recommendations/statements by this Evaluating Committee could still have a meaningful effect. It is the Committee's recommendation for the University to reconsider the affiliation of all the relevant departments, including the already intended merging with Biology at Oranim, but also Marine Biology, and Computational Sciences, within FNS.

The Rector is in the process of restructuring the FNS so that at the University level, all departments will be clustered into schools. This has happened, for example, in humanities where there were many departments that have been now re-framed under five schools. The

vision of the Rector is that the FNS will comprise two schools, the School of Life Sciences (SLS) and the School of Exact Sciences (SES).

In the meeting with the Heads of the Department and senior faculty, the Committee learned that they were not all informed about the planned changes. It is the Committee's recommendation that leadership develops a process to achieve buy-in into the proposed reorganization by all stakeholders.

The removal of the Department of Marine Biology from the FNS raised clear questions about the process. We were assured and then reassured by the Rector, Vice-Rector, and Dean that all steps towards restructuring are taken in a judicious manner with consultation, discussion, and ultimately a vote by the faculty and by the Senate. However, we also heard unequivocally from FNS faculty members, which was later confirmed by the Vice-Rector, that the majority of life sciences faculty members opposed this decision, and this opposition was not only from the members in the current FNS, but also from faculty members of the Department of Marine Biology. The decision clearly was not supported by the faculty members, Department Heads, or Dean that we met with. It is the opinion of the Committee that this decision needs to be reconsidered and evaluated on an organic level, considering the needs of all the members of the Faculty of Natural Sciences.

A new initiative was described to incorporate the faculty members of the Biology department of Oranim College with FNS. We hope that the process for this change will be transparent and that the buy-in from all the stake-holders will be achieved. The Committee is unanimous in its opinion that all significant changes in an Institution require a healthy, transparent, and inclusive process.

3.2 Internal Quality Assurance

University of Haifa restructuring into Faculties and Schools was a complex idea that was conveyed to the Committee only during the on-site visit. Submission of three excessively long and partially overlapping SERs that were written before finalizing the main ideas related to the restructuring, made the evaluation process confusing and rather exhausting to the CHE Committee. In addition, there were two other major changes in the Faculty between the time they wrote and submitted the report and the visit by the Evaluation Committee: i) the separation of the BSc and Medical Sciences teaching program from the Human Biology department, with the appointment of a new department Head; and ii) the welcomed notion that a day prior to our visit it was agreed to merge the faculty members currently located at the Biology Department at Oranim with the Faculty at the Carmel campus of the University of Haifa. A supplemental document should have been sent to the Evaluation Committee to describe these changes.

Then again, it is important to note that in the preparation of the SER, committees of faculty in each department wrote the assessment with its strengths and weaknesses and circulated this to other faculty members, administrators and students, all of which provided their feedback in surveys. This inclusive and candid process was well-received by the Evaluation Committee.

Also important is to note that various strengths, as well as some challenges faced by the University of Haifa, were highlighted to the Evaluation Committee during the site visit. Professors and students articulated the relevant problems, alongside their good experiences

and appreciation. Hence, the Committee acknowledges the good will of all parties to take the self-evaluation discussions very seriously with openness in order to provide clear insights and enable them to address the current challenges.

A major predicament noted during the visit is the fact that faculty members were not fully informed of University Leadership's reconstruction plans, which highlighted a problem of communication and of understanding the problems the faculty members face. During the site visit the Evaluation Committee determined that the final goal of the restructuring process is to establish a School of Life Sciences (SLS) and a School of Exact Sciences (SES) under the umbrella of the Faculty of Natural Sciences. The School of Life Sciences will include three research Departments (HB, EEB, NB) and one Unit allotted for the execution of the BSc program. With regards to Research topics, the Committee is confident that the incorporation of faculty members currently at Oranim Biology into the Carmel campus will be consciously carried out, and wants to re-state that the inclusion of Marine Biology as an additional research Department in the School of Life Sciences would be a wonderful opportunity to enrich the strength of the SLS, ultimately leading to a win-win situation for all parties involved.

Since there were three separate self-evaluation reports, the numeral ranking in summary tables was based on the "Biology and Human Biology" self-evaluation report, and based on the average provided.

The Department evaluated its overall performance in Internal Quality Assurance (in the Human Biology document):

(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 Department's overall performance in Internal Quality Assurance:

	1	2	3	4	5
			X		

The Committee was faced with three long reports (instead of one); in the future, the SER should be more concise and unite all the Life Sciences departments.

3.3 The Department/Study Program

The Faculty of Natural Sciences includes three graduate professional research departments and an undergraduate BSc teaching unit. The Departments are Neurobiology (NB), Evolutionary and Environmental Biology (EEB), and Human Biology (HB).

As a first step of restructuring by the Rector (see § **Institution and the Parent Unit**), there is now a specific unit for the BSc degree program, with its own Head (essentially the Dean for Undergraduate Studies). The Committee was very supportive of this change and would like to see this extended to the graduate (MSc and PhD) programs in the School of Life Sciences, with the appointment of a Dean for Graduate Studies (who may also be responsible for postdocs). The positives of this restructuring are clear both to the faculty members in FNS and to the Evaluation Committee. For example, in the past, the HB Department was responsible for supervision of and much of the early level teaching at the BSc level, which are now shared with EEB and NB faculty. In addition, all BSc students in the Life Sciences have a dedicated Dean/Head who is committed to streamlining the courses of study and eliminating barriers that students had encountered with scheduling conflicts for dual major tracks. Teaching responsibilities will also be more equitably distributed.

The Committee views this structure favorably in comparison to the graduate programs. When the Committee met with the MSc and PhD students, it rapidly became clear that the student experience was very dependent on the home Department. For example, the students in EEB have community-building happy hours, work-in-progress seminars (WIPs), luncheons, etc., and are aware of all the other students and other laboratories in their Department. While in other departments, the students we met did not even know each other and there were no significant attempts by their Departments to facilitate networking. The Departments also differed in mentoring structure and the requirement for presentations by graduate students. A unified Graduate program would ensure that the experience of all the graduate students would be the same and any issues would be addressed on a school-wide level rather than on a departmental level.

The mentoring structure, meeting frequency, frequency of presentations by graduate trainees, travel funding, retreats, and networking opportunities, should all be uniform and well-communicated across the FNS. It was surprising to hear from some of the senior leadership that unifying the three graduate programs across the future School of Life Sciences would be difficult as there are specific needs for each department in terms of Graduate school with a Head/Dean for Graduate Studies. The Evaluation Committee has wide experience of such a structure being successful at other institutions and agrees that the details of the core curriculum and associated events should be different to match each Department's needs. However, the Committee recommends that the programs should establish standard practices for all graduate students across the entire Faculty of Natural Sciences.

The School of Life Sciences historically offers dual BSc majors. This has proven challenging for some students. The future addition of the option for a single major in Biology will enhance focus and may offer the possibility for a greater focus on research for those students that seek it. The Evaluation Committee endorses this new Biology major (still under review at CHE), especially with the planned merger with the Biology Department at Oranim.

The most common dual major of Biology and Medical Sciences is under the complete control of the Faculty of Natural Sciences and so it can be well organized. However, dual majors that involve other Faculties (e.g., Biology/Psychology or Biology/Education) generate many challenges, for example, coordination of required courses and day-to-day scheduling for class attendance, research endeavors, etc. The Dean of the Faculty of Natural Sciences noted that this has been recently addressed by formal coordination across Faculties, but the students we met were unaware of these proposed (or actual) changes. The Dean indicated that they are now turning to simplifying the student experience for the Biology/Statistics dual major (across the two *proposed* schools within the FNS – Statistics is a department in the School of Exact Sciences). These issues should be monitored and conflicts resolved.

There is no discipline of biology today that does not require intensive computational processing and statistics. With the recent move of the Computer Science Department to a separate downtown campus, and the final standing of the Department of Statistics not yet clear, there are concerns raised about the effectiveness of teaching modern biology at the University of Haifa in the absence of extensive computational and statistical expertise integrated and on site.

The Department 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 Department's overall performance in Study Program:

	1	2	3	4	5
			X		

There are multiple improvements that can be made to enhance the various study programs, and the Committee believes the University can utilize the reorganization endeavor to solve other administrative and structural problems.

3.4 Teaching and Learning Outcomes

The Committee was impressed by the depth and breadth of courses and tracks offered in FNS, and the strong commitment of faculty members to teaching. The planned inclusion of all the departments in teaching at the BSc level will homogenize the teaching commitment of the various faculty members. The Evaluation Committee observed a good connection between

students and faculty members, and students stated that the faculty members are accessible. This family spirit of the University of Haifa was well appreciated by students with diverse backgrounds.

Considering the background diversity of students entering University of Haifa, traditional live lecture-based teaching might be important, but other modern approaches for active learning could be considered.

The establishment of the university-wide Unit for the Advancement of Teaching and its integration into the Unit for Online Learning provides support to faculty members for improving teaching. However, while teachers with low scores from student surveys are encouraged to participate in enrichment workshops, senior and new faculty are not fully encouraged to use the opportunity to advance their teaching tools. The Evaluation Committee recommends that faculty take advantage of the enrichment workshops throughout their career, and introduce more active learning techniques into courses with the help of the Unit for Advancement of Teaching. During the visit we were told that a few faculty members were asked to prepare new BSc level courses; this can be an opportunity to incorporate modern teaching tools. The Evaluation Committee endorses the process of peer teaching evaluations of new faculty by the Faculty Dean and Department Heads. This procedure might also be extended to tenured professors, notably those with low student evaluation grades.

There is some variability in teaching quality, as some students raised serious issues about some courses, especially referring to the first year of the BSc program. For example, the Physics course is taught in the absence of a textbook or alternative references to information sources. Moreover, the Committee was told that some instructors tend not to internalize students' criticism of their teaching and continue giving the course without taking into account the suggestions. The Evaluation Committee recommends that the FNS Head should take full responsibility of the situation by closely monitoring all teaching aspects and use means as he/she feels fit, to ensure significant improvement. The Head should be empowered to direct professors with low evaluation grades to improve their teaching, monitor their improvement and replace instructors if necessary. In some cases, this may mean that the Head of FNS will need the cooperation of other units, to work across departments of different Schools (for instance SES for courses in mathematics and physics) at the University of Haifa.

The format of the 'Human Biology' course syllabi (Some for BSc+MSc) are well described and contain expected learning outcomes. All course syllabi should include the intended learning outcomes (ILOs). Thus, the Evaluation Committee supports the proposal of the department to provide a new syllabus that includes all the ILOs of each course, for all undergraduate and graduate courses provided by FNS.

35-40% of the courses ILO are assessed solely by multiple choice exams. It is recommended to include additional assessment methods (open-end questions, quizzes, writing assignments, presentations, etc.), especially in advanced courses. To fully meet these requirements, it is necessary to increase the number of TA positions.

The Department 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
				X	

The Evaluation Committee evaluated the Department's overall performance in Teaching and Learning Outcomes:

	1	2	3	4	5
			X		

The Committee recognizes the diversity of courses and tracks offered in the Life Science programs, the strong commitment of faculty members to teaching, and the positive connection between students and faculty. There is, however, room for improvement in certain courses, and professors with low evaluation grades should be instructed on how best to enhance their teaching expertise and/or, when needed, re-evaluate the courses accordingly.

3.5 Students

As part of the Life Sciences studies program, the University of Haifa offers an undergraduate BSc degree, as well as graduate MSc and PhD degrees. The University serves an important need for students that reside in the local geographic area. BSc students take courses over a 3-year period and earn a dual degree in Biology and a related field. MSc and PhD studies are performed under the auspices of the Departments of Neurobiology (NB), Human Biology (HB), and Evolutionary & Environmental Biology (EEB). The Evaluation Committee interviewed students in the various programs, as well as alumni who recently graduated from the undergraduate and graduate programs.

The Evaluation Committee was impressed with the enthusiasm expressed by many of the interviewed students for their study program, and with the collegial and supportive interactions among students in all the programs. In the BSc program, about half of the students participate in research projects in faculty laboratories, and students interviewed by the Committee commented on the value of this experience for acquiring technical skills and in developing critical thinking. A mentoring program in which first-year BSc students are guided by third-year students was considered by the Evaluation Committee to be a major strength.

Graduating BSc students who wish to pursue higher degree studies do not usually continue these at the University of Haifa. Thus, most of the MSc and PhD students have distinct prior educational experiences, which the Committee viewed as a strength. Travel funds are available for graduate students and can be used on an annual basis to attend professional meetings in Europe and present their research findings. This exposes students to the great variety of international science and allows networking for future postdoc opportunities.

The Committee noted some areas where changes should be considered to improve the study program and student experiences. First, perhaps the biggest issue with the undergraduate program is the high attrition rate of students, primarily after the first year of study. A rigorous assessment of the causes for students leaving the program was not undertaken by the institution. Some faculty and students suggested that attrition can be attributed to a lack of preparation for the academic challenges and independence expected of university students. A disproportionate number of students who leave are Israeli Arabs who may lack command of the Hebrew language, which is the language of instruction in most classes. In addition, it was the opinion of some students that the specific Hebrew language test administered was not suitable, as it did not represent the ability of students to comprehend lecture material and/or to communicate. In addition, the grade necessary for a student to pass the test seemed to be higher than the one required for students enrolled in other majors. Specifically, a written essay, with a short time limit, seemed ill-suited for assessing student communication skills in Hebrew.

Students also mentioned that some of the courses are not well organized and do not offer enough material for self-study. Courses in Statistics and Physics were specifically discussed in this context. While most BSc students pursue Medical Sciences dual degrees, others choose alternative dual study tracks. Students reported that these other tracks can be harder to maneuver, due to course and exam scheduling conflicts.

Since many students are commuting from home and are not residents of the dormitories, BSc students have difficulty developing a community and finding opportunities to study together. Space in the departments is extremely limited and lacks student lounges that would allow BSc students to work and study together. Hence, The Evaluation Committee recommends that the University provides dedicated space(s) for both undergraduate and graduate students in the FNS departments so students can gather for studying and for social activities.

In the MSc and PhD programs, the Committee found that both the number of available Teaching Assistant (TA) positions (see Human Resources for further details) as well as the number of graduate fellowship/scholarship, needed to complement student stipends is far below the levels of similar opportunities at other universities in Israel. A major issue here was availability of enough University-funded TA positions, the salaries accompanying existing positions that are much lower than comparable Israeli university programs, and the accessibility for students to apply for and attain complementary fellowships. There does not appear to be a consistent policy about determining which courses are eligible for TAs and how many. Further, on the rare occasions when a laboratory loses its grant funds, there appears to be no financial safety net for students within the lab. At minimum, the Faculty should ensure (at the time a student commits to conduct their graduate research at a particular lab) that there are sufficient funds to provide stability and allow students to complete their research projects and graduate.

MSc students in the Life Sciences are at a major disadvantage in competing (and obtaining) university-sponsored graduate scholarships. The August 1st deadline for applications precludes many from even applying because they have not completed all the Master's requirements. The administration of graduate fellowships/scholarships should be at either the level of the Faculty of Natural Sciences or the respective Department, and not centrally by the President/Rector.

As for the coursework, over a 2-year period, MSc students are required to take, on average, 9-10 courses, which they tend to complete in the first year of their studies. This leaves only one uninterrupted year dedicated to the research project. The Faculty should consider allowing more flexibility and financial support in the MSc program, as one year for research may be insufficient to complete some of the projects.

Student community programs were less structured at the graduate level. While student-led community-building activities were pursued in the EEB Department, these were not available for Neurobiology and Human Biology graduate students. This also limits students in select departments in opportunities to discuss their work in public forums.

Students we interviewed complained that the often outdated or altogether lacking infrastructure and equipment was a handicap for pursuing their research. And both in the undergraduate and the graduate level, there seems to be little availability and access to information for those students considering non-academic careers upon graduation.

The Committee interviewed alumni of the undergraduate and graduate programs of the University. All of whom reported positive experiences while they were students, and are pursuing either academic or non-academic careers. While informal ad hoc contact with alumni is maintained in some instances, there is little or no outreach to or tracking of alumni.

The Department 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 Department's overall performance in Students:

	1	2	3	4	5
		X			

Significant improvements are needed in the Students aspect of the programs; starting from conflicting courses, community building, and to financial stability to graduate students.

3.6 Academic Faculty and Human Resources

The vision of the University to adopt the United Nation Sustainable Development Goals (UN SDGs) as a guiding principle was conveyed to the Committee during the visit. Similarly, the Committee learned during the visit of the University's intent in restructuring the Faculty of Natural Sciences into Schools. Perhaps the most important first point to raise in this section is

that the new model for a School of Life Sciences has yet to be clearly articulated to faculty members in the FNS Departments. We understood from our final meeting with the Vice Rector and Dean that while the overarching model will proceed, the next phase will require extensive consultation with the Departments on how best to configure the roll-out for the structure of the new School. Obviously, this will be a critical phase in this process since the distribution of faculty lines and resources may come to be governed by a different model.

The University's policies and guidelines on recruitment and promotion are published by the Office of the Rector and available to all faculty members. The Faculty perspective is that, overall, the process of recruitment and promotion is fair and transparent. We heard from the Dean that he focuses strongly on ensuring that the different Departments (future schools) hire the best researchers in the field, which is of course an important consideration for supporting the excellence and vitality of these Life Science departments. Nonetheless, faculty members raised concerns that definitions of excellence are not always agreed upon, as these can vary by discipline, and therefore, every field emphasizes different aspects of research excellence. They claimed that department leadership, through consultation with their faculty members, is in the best position to know what is relevant. The Committee was pleased to learn from the Dean that all new recruits will now be appointed at the rank of Senior Lecturer (equivalent to Assistant Professor at many universities outside Israel), and that promotion will lead to the rank of Associate Professor with tenure. The concern raised by some faculty members around the notion of receiving tenure without promotion should be thus resolved in the near future.

Nonetheless, the main weakness in the promotion process is noted at the start of their faculty member appointment; the delays that faculty members experience in establishing their research programs due to space and infrastructure issues upon arrival constitute a significant concern. Consideration should be given to granting extensions to the tenure clock in cases where faculty members are experiencing significant delays in receiving a refurbished lab or other resources that are out of their control. This topic is discussed in the Infrastructure section, but we learned of one example of a pre-tenured researcher still waiting for a lab to be renovated after years and doing sensitive experiments in substandard space. This does not seem to be the case for another recently hired faculty member where new space for the lab and equipment were made available in a reasonable amount of time. Perhaps this situation is an outlier, but it needs urgent attention. The University and the FNS must make every effort to equitably provide fully functional laboratory space for every newly recruited faculty member within a year of hiring.

When asked if the new School of Life Sciences will have advantages with faculty recruitment, the Dean indicated that the new structure will decrease administrative burden and costs, and provide a strong basis for hiring in areas of interdisciplinary research. While this is a reasonable assumption, it really depends on the strategic planning, means for its implementation, and buy-in from each of the constitutive departments, and ultimately, where the faculty line will reside. This also relates to the focus on the UN SDGs. How will this emphasis on SDGs affect the aspirations of the separate departments? The Committee could not get a good assessment of the perspective of the Department Heads because they were not really aware of the impending structural model for the new School or have yet to really absorb what the impact of the University's SDG focus will be for the future of their disciplines. The take away for the Evaluation Committee was that the Dean will be the main arbiter for these critical decisions. Even if there is a strong, supportive, and visionary Dean, the process

for collegial decision making in this new structure will need to be clearly articulated to the rank-and-file faculty members to achieve success (e.g., via a transparent policy). Hence, a clear plan for the consultation and implementation of the new structure will be critical in this regard.

The Committee also learned that new faculty positions must be negotiated with the Dean only after potential candidates are identified. While it is common practice to have some level of negotiation for startup packages once a candidate is identified to be recruited, the position itself should be approved for funding prior to the search. It places the departments at a clear disadvantage in recruiting top scientists, who often have competing offers already in hand when they are interviewing, and jeopardizes the department's reputation. The Committee strongly recommends a process whereby department chairs have their positions approved and guaranteed (including laboratory space) for a given level of funding before the search process begins.

The three professional departments are generally cohesive with a good culture of support and cooperativity, especially for space, equipment, and other resources which can be limited. The Department Heads are in close communication and coordinate efforts especially when it comes to delivering the undergraduate biology teaching program. The recent move to create a separate Head for the BSc program's teaching needs (apart from the Head of Human Biology) is a welcome improvement in the overall management and workload for these administrative leaders. The number of administrative staff available to each department should be reviewed to ensure that there is adequate support for the volume of students, programs and faculty members they support.

Department Heads and Senior Faculty raised concerns about the process of assigning TAs for courses. The criteria for assignments should be fully transparent so that it is equitable for faculty members, especially given that the "soft" resources available for TA slots could be variable from year to year and are under the control of the Rector. The Committee recommends that these resources be in the control of the FNS Head or the Heads of the different departments, as part of the annual budget process since they will be best positioned to efficiently deploy these resources.

Faculty members also raised concerns over teaching replacement coverage during sabbatical leaves. Some universities hire adjunct faculty to replace full-time faculty during these periods. The Committee urges the Faculty to develop and implement a defined policy for replacing the teaching responsibilities of faculty on Sabbatical or other Leave.

Faculty members also identified the need for a more formal mentoring process for researchers at all levels, and especially young faculty members. One suggestion is to appoint a committee (with at least two members) to each PI, who will accompany the researchers and provide advice on promotion, including tenure, needs, and procedures; grant writing and publishing; teaching; and generally navigating academia. Indeed, more formal feedback for teaching that goes beyond just course evaluations by students (which can be problematic) was also identified. This could be envisioned including a peer evaluation process as a lead up to the tenure review (and potentially beyond) as well as recommendations to attend workshops or other training opportunities that the university provides.

The Department 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 Department's overall performance in Academic Faculty and Human Resources:

	1	2	3	4	5
			X		

The Committee felt that the overall research productivity and standing of the faculty were high, internationally competitive, and generously funded extramurally, yet there is vast room for improvement as noted above.

3.7 Diversity

The University of Haifa has a stated commitment to gender and ethnic diversity. The Committee noted that this commitment has been implemented. Women are not significantly underrepresented in the undergraduate or graduate student body. The commitment to hiring female junior faculty is evident, and in the Department of Human Biology, which is the youngest department, women and men are equally represented overall and at the tenure level. Women are also represented in senior leadership positions in the departments, although not at the Dean’s level or senior university administrative positions.

Among the students, many are from Arab communities from the region around Haifa. Arab representation on the faculty is considerably lower than the student numbers, and additional effort to recruit Arab professors is recommended. Although the Committee found less representation of Ethiopian and Haredi minorities among students and faculty, this may reflect a nationwide trend seen in other institutions as well.

As mentioned in the "Students" section above (3.5), for any students entering for whom Hebrew and English are not native fluent languages, The University of Haifa should provide language training at no cost to the students. The goal of this supplemental program is to bring them up to the level of language facility needed for classroom and laboratory participation.

The Department 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 Department's overall performance in Diversity:

	1	2	3	4	5
				X	

The Committee commends the University of Haifa for its pluralistic vision and diversity strategy. It recommends adherence to the policies that have been successful to date.

3.8 Research

Research at the University of Haifa is at a high level. The Evaluation Committee was very impressed with the outstanding level and depth of research being conducted in all three Departments of the FNS. The commitment of faculty members to research is impressive, despite significant teaching loads and difficulty attracting and retaining the best students. The vision of the University to adopt the United Nations Sustainable Development Goals (UN SDGs) as a guiding principle was conveyed to the Committee during the visit.

While reviewing the Executive Summary comments made by the previous Evaluation Committee (over 10 years ago), it was noted that there is great danger for Israel to lose its footing on some of the most relevant research disciplines of our times; *Ecology*, *Evolution*, *Biodiversity*, and *Sustainability.* It is well known that one of the most important internationally recognized niches for this type of research endeavor is currently being conducted by the Biology Department researchers at the Oranim Campus, who are somewhat affiliated with the Faculty of Natural Sciences (FNS). The Committee was happy to learn of the intent of both the University Rector and FNS' dean to incorporate the Oranim faculty members as *bona fide* faculty members of FNS at the Carmel campus of the University of Haifa, as this will assure Haifa's International recognition in these noteworthy disciplines. However, how (and whether) this will happen is not clear. The research and teaching of the future School of Life Sciences should also be complemented by Marine Sciences, a department that was recently removed from the School, administratively, as discussed above (§3.1 Institution and Parent Unit).

The Department 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 Department's overall performance in Research:

	1	2	3	4	5
				X	

The commitment of the faculty to research is impressive despite only modest financial support and a high teaching load. The Faculty should continue to recruit the best researchers in Life Sciences to increase grant revenue and increase its appeal to potential student and faculty recruits. This evaluation is made with the expectation that Oranim Biology Department researchers (PIs) as well as Marine Biology will be fully recognized/integrated as FNS faculty members.

3.9 Infrastructure

The Haifa City Campus is situated in a beautiful locale that is a major strength for bringing diverse new students to this University (as per their own admissions). Many facilities and labs also allow personnel to experience these views, adding to the attractive nature of the campus as a place to work and learn. At the same time, several of the buildings have been built decades ago and the laboratories' milieu reflects this age. There is also limited space for some departmental functions (seminar/conference rooms), some of which are also shared with other schools/Faculties. Departmental research outputs and productivity are nicely illustrated along the corridors and other display cases in various buildings, including specimens, photographs, posters, and digital boards. There is a 50% university support for lab managers in each research lab, which is a strong benefit of being at University of Haifa.

The Evaluation Committee visited several research laboratories and facilities during the visit day, including the state-of-the-art greenhouse and freezer bank for the study of the genomics of wheat domestication; this resource has, in turn, resulted in several top-ranked research outputs and external-grant funded projects, including by the ISF, BSF/NSF, DFG, and other national and international collaborative funding sources.

The Committee also visited a lab that is still the temporary housing space for a tenure-track faculty member. Because of the electrical noise in these lab spaces, the research output spectrum is limited for this investigator, although they are making the most of the available space resources. Finally, there is a donor committed to provide funds for a 2-photon microscope in this lab but there is no allocated space for it yet. There are already two other 2-photon microscopes in Life Sciences and one of the aging ones in the core facility will be soon replaced.

The Faculty is in urgent need for a formal space audit to allow for better space utilization and planning. Clearly, there is a lack of communication and strategic planning to fully capitalize on

external sources of funding. Overall, research space seems to be both limited and delayed in being refurbished in a timely manner for several newly recruited faculty to begin work soon after their arrival. This situation needs urgent attention.

However, we inspected a new laboratory space of a more recently recruited researcher, which includes faculty and student office space, and adequate wet-lab spaces for molecular biology research. At the Faculty level, there are extensive collaborations using space and equipment within and between Departments and even with other schools, including the Marine Biology program's faculty also housed on the city campus but belonging to the Marine Sciences School at Haifa.

Amongst the core facilities we visited the bioimaging suite with several heavily used pieces of equipment, supported by a PhD-level staff scientist, who provides training for new users through several individualized teaching sessions. User fees are generously low at this facility, but service contracts are not paid for these pieces of equipment, which might put their effective use at risk at later points. There is already funding and strong hope for building a new animal facility for the campus, but the plans are not firmed up yet.

There was a general feeling by both faculty and by students (including on social media) that lecture halls allocated to Life Sciences were not adequate in their equipment and modernization. They are also not on the 5-year plan to be refurbished and renovated. Such a plan has to be developed, and to include space allocation, renovation of teaching and laboratory spaces, and upgrading equipment and core facilities.

Although we did not visit it, the self-evaluation report indicates that the library is both sufficient in its holdings of electronic journal titles for each of the Life Sciences departments, and provides an inviting space for reading and study. The librarians provide helpful support for departmental needs. However, institutional software support is thought to be poor, and some labs and students are even in need of frequently used statistical and graphing software packages. The University IT department should provide site-licenses for all necessary standard research software for student and research needs.

Also, we did not visit the Oranim College Campus but it houses 13 Environmental Biologists, who are critical towards the University's UN Sustainability Goals, and publish their research with the Haifa University affiliation. The Committee was told that they may soon become 50% (or more) employed directly by the Haifa Life Sciences Faculty. Space is not available for them to work on the City Campus but their current resources and facilities at Oranim will continue to be available in the future.

The Department 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 Department's overall performance in Infrastructure:

	1	2	3	4	5
		X			

The Committee felt that space needs for new faculty need to be met at a faster pace. The aging teaching and lab facilities, including the animal care spaces, needs to be on a schedule for renovations and refurbishments.

Section 4: Conclusions and Recommendations

4.1 Conclusions

The University of Haifa is internationally recognized in the Life Sciences, and is engaged in studies aligned with the University's Sustainability initiatives. The faculty and students are diverse, but the infrastructure needs upgrading. Recent reorganizational plans, promulgated by senior University leadership have been poorly communicated and have not been accompanied by a planning process that engaged the stakeholders. Prior changes included the removal of the Marine Biology department from the Life Sciences umbrella against the vote of the relevant faculty. There is a need to create a Graduate School unit, comparable to the recently developed undergraduate unit. Graduate fellowships must be comparable to those provided across other Israeli universities and managed by the future Head/Dean of the graduate program. Teaching assistantships should be managed by the School of Life Sciences and not by the Rector's office.

4.2 Recommendations

Essential

The Committee supports the initiative to reorganize all Life Science faculty members under a common umbrella program. The inclusion of Oranim will reinforce Life Science at Haifa and is critical for pursuing the stated UN sustainability goals.

The University leadership should communicate the proposed reorganization to all faculty members in the Departments. A process allowing input from all stakeholders should be established. This reorganization should be done without exhausting professors who are already over-committed to Faculty teaching and service.

The inclusion of Marine Biology as an additional Department in the School of Life Sciences is essential to reaching the noteworthy potential of the University, leading to a win-win situation for both sides in the long run.

The Faculty administration has to streamline their policies for teaching and degree-related requirements at all levels, to ensure all students across the Life Science departments gain similar conditions and support.

The University and Faculty should find means to better support graduate students financially, notably by providing TA opportunities and fellowships at levels similar to other Israeli universities. The fellowships and methods of support of graduate students should be handled within the Faculty of Natural Sciences, or the proposed Graduate School of Life Sciences.

Recruitment of new faculty should follow the commitment by the Dean of the Faculty of Natural Sciences of discrete line(s), and the commitment of laboratory space.

A University-wide formal space audit is necessary to allow better space utilization, upgrading, and planning for both research and teaching endeavors.

Important

The University could benefit from a standing external advisory committee, composed of leading experts in the relevant field, to review and advise on the research and the facilities available to the Faculty of Natural Science, in the prospect and implementation of the structural changes.

The Department heads should be empowered to direct professors with low evaluation grades to improve their teaching.

For courses where extensive student complaints are registered, a careful evaluation of instructional materials and all other teaching aspects should be undertaken, to ensure significant improvement

Criteria for promotion should be clarified to include field-specific criteria for research excellence. The Faculty should ensure it is appropriately communicated.

The Faculty should ensure space and modernization of infrastructure should be done on time for newly recruited faculty so that they can begin working at full steam immediately upon arrival, and the research not be impaired by lack of space for essential equipment. Also, the tenure clock should be extended for faculty members experiencing significant delays in lab renovations or in the implementation of other resources out of their control.

The unit in charge of BSc should do a rigorous assessment of the causes leading to students leaving the program to reduce the high attrition rate.

The Faculty should include courses on computer science and statistics at the highest level to undergraduate and graduate Life Science students.

Institutional efforts must be made to reduce the burden posed by language barriers in the courses of instruction. Entering students should receive intensive remedial training in English and/or Hebrew to be able to successfully complete their course of study. The proficiency level for these should match the Life Sciences' comprehension and communication needs.

The Faculty should encourage and create opportunities for graduate students to present their work in public.

The Faculty should develop a formal mentoring process for researchers at all levels, and especially young faculty members to advise on promotion, including tenure, needs, and procedures; grant writing and publishing; teaching; and generally navigating academia. Specific efforts should be made in the Faculty to hire outstanding Arab and female faculty members, to reflect the student populations.

Desirable

The future SER should be more concise and unite the Life Sciences (or relevant) departments in one document.

The Committee recommends the University to establish a well-advertised career office, as well as publicized access to information about academic and non-academic career tracks.

The Head of the BSc program and the Dean of the Faculty should work with course directors from other Faculties to remove barriers for dual majors, eliminating conflicting schedules.

The Evaluation Committee recommends that the undergraduate teaching program be referred to as a Unit and not a “department”, as that designation is for the three research departments.

The Evaluation Committee recommends the Faculty of Natural Science to establish a Graduate School Unit with its own Head for all MSc and PhD programs across the Faculty.

The University or Faculty should create an alumni association which can assist students networking and could be used to solicit donations.

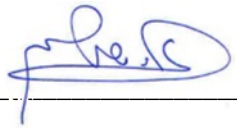
Signed by:

Prof. Lynne Regan
Committee Chair

Prof. Joseph Buxbaum

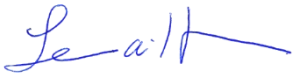
Prof. Edna Cukierman

Prof. Orna Elroy-Stein



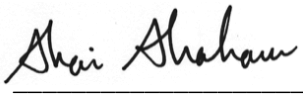
Prof. Mark Hauber

Prof. Bruno Lemaitre



Prof. Carol Shoshkes Reiss

Prof. Shai Shaham



Prof. 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