



EVALUATION OF LIFE SCIENCES STUDIES

ARIEL UNIVERSITY

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 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 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

Ariel University is Israel's youngest university with CHE support; in its past 10 years since receiving university status, it has undergone tremendous growth and development. Their investment into additional faculty ranks, and brand-new life science and biomedical research and teaching buildings, positions the institution towards achieving its self-proclaimed goal of reaching excellence and productivity. New faculty in the life sciences are being hired on an annual basis and new research labs are already constructed to house these additional PI recruits. PhD students receive full scholarships from Ariel University, and PIs are not limited by the number of graduate students when they are able to attract them to their labs. Over the past decade, teaching loads have been gradually reduced, especially for those faculty members who show research productivity. In addition, the number of lab managers has also been increasing, though not all faculty have one assigned to their labs yet.

Student life is expensive at Ariel University – there is a waiting list for dormitory space and local housing is costly. International graduate students are unable to earn additional funds through TA-ing, because of their visa status. This makes it difficult to recruit top-notch students from around the world. Course offerings are limited, especially at the graduate level, because of the current limited size of the faculty in Life (and Biomedical) Sciences. At the same time, Ariel places a lot of novel and well-received emphasis on assisting students with learning disabilities at the undergraduate and graduate levels, which is highly innovative and strongly commendable.

Despite many of its advantages and opportunities, Ariel faces difficulties in freely growing its Life Science (and other) research programs through world-class scientists and talented graduate students. One of the causes for this includes a lack of sufficient Life Science faculty members in specific fields already represented at Ariel, so that existing research strengths

(based on a well-thought-out strategic plan) can be used to attract additional faculty in targeted molecular biology fields. Another cause is the still relatively high teaching load required of the faculty members. Additionally, due its geographic location, Ariel has limited access to several international funding sources, including the EU's ERC programs, representing a barrier for scientific recruitment, growth, and excellence.

Whereas the Self-Evaluation Report and our visit's organization were both clear, well structured, and informative, many of the above and other difficulties noted by the Committee below appear to stem from the sense of political predicament in which the university finds itself. The University would have benefitted from tackling this issue head-on in the Self-Evaluation Report, as the political issue casts a shadow on every aspect of the University's operation.

Section 3: Observations

3.1 The institution and the parent unit

Ariel University was established as a college in 1982 and became an extension of Bar-Ilan University in 1990. In 1996, the Council for Higher Education (CHE) accredited the college, giving it the authority to award academic degrees. 2002 was the last year that the college accepted students for the Bar-Ilan University degree program, and by 2006 all study and degree programs at the institution were independent and under the sole direction of the institution. In July 2007, the College was temporarily approved to act as a "University Center", and Ariel University (AU) was fully accredited in December 2012.

AU's four faculties (Engineering, Social Sciences and Humanities, Natural Sciences, and Health Sciences) and three schools (Architecture, Communications, and Medicine) offer undergraduate programs in 28 departments; 20 of these departments also award Master's degrees. The AU also offers 12 dual-major programs. 80 AU professors from all faculties are approved to serve as Ph.D. advisors.

The University is located on a large campus on the outskirts of Ariel, a city located beyond the green line in the West Bank. The campus is built on over 1.1 square kilometers, with 25 buildings containing 51,000 sqm of classroom space, research facilities, and administrative offices; of these, 9,200 sqm are devoted to laboratories.

The Faculty of Natural Sciences was founded in 2003. It includes five departments: Computer Science, Mathematics, Chemical Sciences, Molecular Biology, and Physics. The Faculty of Natural Sciences at AU brings together multidisciplinary teaching and research activities in the core sciences. A significant number of research centers operate under the umbrella of the Faculty: The Center for Brain Research, the Cancer Research Center, the Center for Personalized Medicine, the Cyber Center, the Center for Materials Research, and the Center for Applied Radiation.

The Faculty's stated mission is to deliver state-of-the-art research and education that will provide graduates with access to successful careers, either in industry or in academia.

3.2 Internal Quality Assurance

The Committee was impressed by the dedication of the Department of Molecular Biology to the self-evaluation process, which was largely transparent and carried out effectively by the ad-hoc team. The process included discussions and ideas for improvements by PIs who wished to be actively involved. The Self-Evaluation Report (SER) itself was well-written and focused. However, a bit more background about the history and characteristics of Ariel University at the beginning of the report would have benefited the Evaluation Committee members. The Department should address the University's political and geographic challenges, and the resulting concerns regarding faculty and graduate student recruitment in the SER.

Overall, the Department has integrated previous recommendations of the CHE and has taken advantage of the self-evaluation process to address already identified weaknesses. The Committee felt that there was a strong desire from the leadership and faculty members to improve Ariel University and make it an impactful research and educational institution. This was emphasized by the threefold increase in undergraduate students, as well as the increased number of Molecular Biology faculty members since the last evaluation.

The visit was well organized; however, the students and professors selected for the interview did not display diversity. For instance, the Committee was informed that Arab students were not able to attend the meeting. The Committee was disappointed with not being able to hear from them directly.

The Department evaluated its overall performance in Internal Quality Assurance:

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

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

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The Committee felt that the challenges faced by Ariel University's strategic goals could have been highlighted more during the visit.

3.3 The Department/Study Program

An overarching issue at Ariel is that it is difficult to attract new faculty members to teach Molecular Biology courses at the University. In turn, the main criterion for recruitment is 'research excellence' – which was not explicitly defined in the SER. While research excellence is fundamental to providing a good study program, it is important to also value faculty who put effort into teaching, to ensure ongoing excellence of curriculum, courses, content, and style of delivery.

Students both at the BSc and MSc/PhD level complained about the lack of choice in elective courses. However, the Committee was told that students were allowed to take courses in other institutions, which are paid for by Ariel. But the reality is that it is hard for students to commute to distant institutions, and they need more guidance to select appropriate courses. A bit of overlap between undergraduate courses was also noted, but the students thought that it was helpful.

For BSc students, the Committee learned that each 3rd-year student conducts a research project in pairs (very commendable). Nonetheless, the availability of ongoing lab research opportunities is limited because of the few staff in Molecular Biology. We learned that there are currently some 80 students and 16 PIs. About 10% of students do their research internships in industry or in medicine/clinical settings. It should be noted that the duration of this research opportunity for undergraduate students is relatively short, although other practical and lab skills are still acquired by the students during their additionally required lab-based coursework in the BSc degree. It would be beneficial for the students to have research opportunities at other institutions and biotechnology companies. For this, it is recommended to enlist a "research coordinator" who will assist students in finding and enlisting to the best fit internship/research site for their interests and needs.

A PhD program in Life Science is not formally recognized by CHE. Instead, PhD students are managed by a central Graduate School office. Further, some, but not all, faculty are permitted to be PhD advisors; the granting of this mentoring privilege requires prior co-supervision of doctoral students. It appeared to the Committee that the current strategy for PhD acceptance is somewhat functional. PIs interview students, and they then put forward one(s) they would like to admit. The candidates then must meet the relevant standards by the Graduate School before being accepted. This policy would preclude the possibility of lab rotations to select a research mentor. From the SER, it appears that half of the PhD students were international, principally from India and Eastern Europe. No data were presented about the demographics of the postdoctoral fellows. Also unclear in the SER was the manner faculty members seeking PhD students would "advertise" their laboratory availability and research/expertise needs.

The Department representatives indicated that, nevertheless, this was a successful approach in that virtually all graduate students complete their degrees. Given that PhD students are taken on an individual faculty-level basis (and permits), the Department would greatly benefit from an accredited PhD program in the Life Sciences.

The Committee was impressed that many students (of the alumni we met with) found post-graduation jobs on LinkedIn. Putting in place some informal meetings with alumni to expose graduating students to strategies and options for post-graduation is recommended.

The Department evaluated its overall performance in Study Program:

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

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

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The Evaluation Committee commends the research opportunities available to 3rd-year BSc students; we recommend additional research opportunities be developed and a coordinator assigned to assist the students in placement. Regardless, the courses offered for all degree levels, and especially in the MSc and PhD levels are limited due to the small faculty size. The Department offers students the opportunity to enroll in courses at other institutions, but better support of selection and travel should be provided. The University should also consider accrediting the PhD program as a part of the Molecular Biology department. A more robust program for preparing graduating BSc, MSc and PhD students for jobs and for advanced degrees is recommended.

3.4 Teaching and Learning Outcomes

The Evaluation Committee was told on several occasions that teaching was not a main focus of hiring and promotion, and the Faculty's leadership was not aware of different ways of evaluating teaching (apart from the well-recognized as inherently flawed mechanism of student feedback questionnaires). The Committee recommends consideration of peer observation of teaching for the assessment of instruction at Ariel University.

Related to this, it seemed that the only time faculty received advice on teaching was if they scored less than around 3.5/5 on their student evaluations. It is out of step with the global culture of universities not to assess and value teaching in diverse ways. It is recommended to include in the students' teaching feedback questionnaire several direct questions about the course itself and about the lecturer in addition to free style comments. It was also not clear to the Committee how teaching assignments were decided upon or how courses and teaching loads are allocated.

Occasional training seminars related to modern teaching are organized by the University to enhance awareness of modern teaching, but participation in these seminars and implementation of the new tools are voluntary. The Committee heard that insufficient attention was allocated so far for workshops related to the implementation of techno-pedagogic tools, and that effective in-house techno-pedagogical support is insufficient. During the visit, it was apparent to the Evaluation Committee that insufficient attention was allocated to this important topic. It is hence recommended to allocate more time and attention to the implementation of active teaching and learning techniques. A gradual move to modern teaching will also require additional TAs to help with student engagement and assessment in the classroom, which will potentially attract added studentship.

Assessment of students' learning is mainly based on a final exam (multiple-choice question style), while a few courses also include different styles of assignments. Upgrading evaluation methods, especially for the BSc program (e.g., exam styles, oral presentations, written assignments, regular quizzes), is recommended. Final graduation grades (average grade of 85) are high but might imply that better learning-evaluation tools are needed.

While some of the identified teaching and learning drawbacks were already changed successfully between completing the SER and our visit (generation of comprehensive syllabi, for example), the methods to evaluate and improve the quality of teaching are not satisfactory, especially because AU's studentship encompasses such a high number of students with special needs. The student survey questionnaire for each course is inadequate, as it has only two open-ended questions. It is recommended to include in the students' teaching feedback questionnaire several direct questions about the course itself and about the lecturer, in addition to free style comments.

Similarly, to the point above and in addition to it, the Committee was hoping to learn about the innovative assessment (as well as learning) methods used by the faculty members at Ariel, as the student body includes an unusually high number of students with special needs. The Committee was hence disappointed that the leadership and faculty did not share this information.

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)

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

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The Committee concurs with the Department's evaluation, and stresses that significant changes are needed, especially in the methods of evaluation of teaching and innovative means for learning.

3.5 Students

Virtually all applicants are admitted to BSc and graduate programs. The yield of enrolled students is about 50%. The University wants to increase both the class size and quality of the incoming students, which will be exceedingly difficult to achieve, especially in the geographic and political context of this institution.

Furthermore, the Committee is very concerned by the high attrition rate among the enrolled undergraduate students. The dropout rate of the BSc program is high, and according to the data in the SER only ~50% of students in all cohorts graduate within 3 years. When asked about the high attrition rates, the interviewees indicated that some students are immature and may have unrealistic expectations of the college experience. They also suggested that some Arab students struggle with Hebrew and English, since their education had been predominantly in Arabic. There is also a 10-15% dropout from the PhD program. This is especially surprising because the PIs invest a lot of time with the students, and the University provides them with good financial support.

During the site visit it was also emphasized that AU does not compromise on teaching quality but does not plan to change the liberal admission criteria to be more selective. The Department would like to provide the university-education opportunity for those who may not be accepted elsewhere in Israel. The Committee would like to emphasize that we are fully supportive of keeping admission criteria relatively liberal – to give students a chance of enrolling, even prior to that point their academic performance has not been stellar. However, the very high dropout rate of Molecular Biology students must be remedied – the University should research to uncover the reasons for the high dropout (these may be academic preparation, financial concerns, housing/commuting difficulties or of a medical nature), at all degree levels, and take the necessary professional measures to significantly reduce these going forward.

The Committee understands that if any student is having difficulties, the student should ask for help. During the in-course assessment and midterm grades, the instructor of the course should be able to identify struggling students and refer them for help, although the Committee is not clear on what sort of help is available at this point. We cannot overemphasize the importance of supporting students by identifying needs early on – and not when they are near failing. This point was also brought up with respect to Arab students, and there was discussion whether their higher dropout rate was a consequence of language issues, age at the onset of university studies, or specific personal circumstances. It is important for the University to determine what these causal factors might be, and to put into place measures that will truly address the issues that are fixable. The University should therefore develop a program to identify students who are having difficulties and proceed to determine

the reasons, to then address and find means to implement their individual needs and effectively prevent attrition.

The Evaluation Committee was told that the Arab students enrolled were Israeli Arabs and not the local Palestinian Arabs; we were told that Palestinian Arabs could not enroll at AU – this is surprising since Palestinian Arab students are enrolled at Hebrew University, the Weizmann Institute and other universities supported by CHE. It would be advantageous to recruit local Palestinian students to their academic programs.

The assistance program for neuro-divergent students at Ariel University is impressive. The commitment to mainstream these students should be a model for commitment to the other struggling and minority students, with investment of the necessary resources needed. To prevent dropout, Ariel's students would benefit from mirroring the approach implemented for students with learning disabilities, and supplement students with free training on soft (organizational), Hebrew and English language skills, as well as mental wellbeing through social worker assistance.

It is extraordinary that Ariel University provides 100% stipend support for all the graduate students who have enrolled. The stipend level is competitive, but is low for living in the school dormitories or renting an apartment in the city of Ariel. Some students can supplement their fellowships with a TA position, while others (such as international students) cannot.

The Committee saw a need for Ariel University to develop a robust program for career development for students at all levels. Students should know the diverse types of positions they can apply for with a Molecular Biology degree, and the types of additional credentials that might still be needed to achieve their identified professional goals. Alumni should be invited back and encouraged to participate in career fairs, but they should include a wide range of occupations where Biology training is important. An alternative (or in addition) is to establish an Alumni network, and rely on those graduates to be ambassadors for the school, as well as potentially mentor current students interested in their careers. Using LinkedIn to seek jobs, as suggested by the alumni interviewed, is efficacious but clearly insufficient.

There is no external research or future career seminar series in the Department. The Committee encourages that students, particularly PhD students, have access to academic seminars given by external speakers, whether in person or via webinars. Seminars and informal discussions with external speakers could broaden the perspectives of students on the current trends in science and technology in Israel and elsewhere. This approach could also help fill some of the teaching gaps due to low numbers of teaching faculty members. Support for graduate students to participate in international scientific conferences to present their research, meet international scientists, and potentially find the next position, should be increased to a level necessary to cover true expenses of a conference. The attendance of at least one meeting a year, in their discipline, is desirable.

Because most of the students are commuters, they have little opportunity to develop a student community. Efforts should be made to encourage communal student activities, for instance, using the modern library space for group study and peer mentoring. This is especially important for minority students, including international students, attempting to integrate into the University community.

The Department evaluated its overall performance in Students:

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

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

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The high attrition of the students in the BSc program is troubling, and measures should be taken to minimize this trend by identifying the problems of individual students and addressing their cause. There is a need to have a space for commuting students to gather between classes for study and to establish a community. Professional development seminars, a wide range of career opportunities, and national as well as international networking, should all be implemented.

3.6 Academic Faculty and Human Resources

The Department of Molecular Biology currently has 16 faculty members and has been recruiting one faculty member per year, on average, over the last 5 years. The Evaluation Committee was told that there are plans to continue to recruit faculty at this pace for the next 5 years, which is supported by the senior leadership of the University. Indeed, the Rector emphasized that Ariel is the youngest university in Israel and the largest employer in its region, and that he wants to bring the academy and research to the region with a vision for developing a “University City” atmosphere. Despite the unique context of the University’s location and mission, a clear emphasis was placed on research excellence as the central criterion for hiring and retaining faculty members based primarily on the ability to publish in top tier journals, as well as other standard metrics appropriate to the field. The Dean confirmed that funding for 3-4 new faculty members is available for the Department, with lab space already allocated, suggesting that there is strong support for growth.

While the SER described areas in which the Department lacks critical mass or specific expertise, such as immunology, microbiology, and bioinformatics, no specific plan was articulated to target these areas for future growth. The Evaluation Committee suggests developing a strategic plan for recruiting new faculty members whose research would either complement or enhance existing strengths and build capacity in key areas of interest. Furthermore, the Department should engage in collaborative and coordinated planning with colleagues in the AU Medical School to ensure that recruitment strategies are complementary

and not competitive. This is especially important if the Molecular Biology Department is interested in expanding in areas such as immunology, microbiology, and/or cancer. To this end, it is this Committee's recommendation that the faculty members (from both Faculties) and leadership gather together and carefully generate a clear strategic plan in which the current strengths and possible opportunities are recognized, resulting in the identification of the disciplines in which they seek to hire new PIs (see section 3.8 for further discussion).

At various points in our meetings with the Rector, Dean, and Department Head, there was an acknowledgement that recruiting women for faculty positions is a priority to improve gender balance. In this regard, the University developed a model for supporting short, 2-5 month, visiting foreign fellowships for women. This is usually within the first 6 months after being hired, and serves as a track toward a tenure-stream appointment. The Committee applauds such efforts to increase opportunities for women to join the academy, but given this short length of time, it does not really substitute for a formal postdoctoral fellowship. At best, it allows for limited additional training in a specific technique or type of analysis. The Department identifies ways for improving recruitment of highly qualified women and men, including increasing the national and international visibility of the research in the Department with invited international speakers, and improving the generally low start-up packages and the still growing core facilities. But there are also excellent Israeli trained postdoctoral fellows that might be interested in faculty positions at Ariel, and this seems to be an untapped resource in building critical mass, especially with regards to women.

From the perspective of faculty members, there is a collegial environment in the Department with appropriate consultation and that there are no factions. The University's policies on recruitment and promotion are available online, making them transparent and easily accessible for all prospective and current faculty. It is a testament to the Department Head's leadership that this young department is working very well in this respect. Junior faculty report that they are well mentored, that the tenure process is transparent with clear expectations, and that they are inspired and proud to work at AU. Nonetheless, the mentoring program solely consists of a single individual. Hence leadership may want to consider establishing a policy and a formal process for mentoring. It is recommended to have more than one individual as a mentoring committee to ensure the mentee is well informed on policies, opportunities, various points of view and approaches to excellence, as well as the best strategic means to attain promotion and tenure.

Training for new pedagogical approaches and technologies is available at the University, but the take up seems modest; the Committee noted that there seemed to be no emphasis on training for the PIs in how to teach or how to mentor research students and other trainees. There is also a need for formal pedagogical training for TAs, as well as feedback on their efforts to improve their teaching skills.

The Evaluation Committee also learned that the Department Head feels that her voice is heard amongst the University's administrators and that she frequently interacts with the Dean and Rector and considers her and the Department strongly supported. The Committee was also impressed that the Dean personally meets with all faculty members in the Department on an annual basis and even attends undergraduate classes to encourage students to fill out the course evaluations, emphasizing to them that the evaluations are an important tool for evaluating faculty performance and to improve the quality of courses. There was extensive

discussion on integrating peer teaching evaluation by and for faculty members to avoid relying solely on students' course evaluations, which can be problematic, and the Dean was very receptive to this idea for assessing teaching.

Regarding the Dean's approaching end of term, it was unclear to the Evaluating Committee whether his positive and confident team-work/multidisciplinary approach will prevail as a policy to assure his efforts are continued by his successor. The Evaluation Committee recommends that the incoming Dean is provided with an onboarding overlapping period for transitioning into their new role, while clear policies (approved by a representative body of Faculty Members) are noted and recognized.

The main concern expressed by faculty members was the number of hours teaching per week, which is 8 hours for most faculty members, though it was 12 before and is being decreased to 6 for PIs' with productive research programs; how this productivity is specifically measured should be very clearly articulated to the faculty members so the expectations are transparent. The Evaluation Committee feels that the department should consider approaches to further reduce the number of teaching hours so that faculty members have more time to devote to research. This could include hiring added teaching-specialized PIs by, for example, recruiting Israeli trained postdoctoral fellows, as well as tapping into national and international colleagues for selected "guest lectures" when needed. The latter could include hosting these invited guests for a day or two at AU to allow frontal teaching as well as interactions with students and Faculty members. Further, reducing the amount of service teaching that the faculty provide to the health science related programs is imperative. Also, giving added teaching credits as the result of mentoring students (implementing means to gauge success), both undergraduate project students and graduate research students, in their labs. In addition, increasing the number of TAs could help lower the faculty member's teaching load and simultaneously complement the trainee's income/stipends.

Finally, there was universal support for developing a sustainable plan to recruit and retain much needed lab technicians and/or lab staff managers. For example, the Rector described a strategy where in addition to providing a salary for 50% FTE for lab managers, in select cases the University could hire the lab manager (staff scientist) to teach courses for an additional 25% FTE with the remaining 25% being covered by the PI grant. This should be available to all faculty, but it is already being implemented automatically to newly recruited faculty for their first 3 years. Please note that this type of proposed position is different from the Adjunct Faculty members, with sole teaching responsibilities addressed in the next paragraph.

At Ariel, adjunct faculty were conceptualized differently from what the Evaluation Committee members expected. The Committee expected that full-time teaching faculty would be recruited to solely teach (typically basic/introductory topics and required laboratory courses) to relieve the core tenure-track faculty and balance their teaching loads. By contrast, the Ariel adjunct faculty, with whom the Committee met, seemed to be individuals already doing research or running facilities at the University who need 50% more of some other responsibility to cover their salaries. The Evaluation Committee believes that the Faculty can use both. In addition, teaching oversight of this staff (adjunct and/or lab-embedded staff scientists) was noted to be minimal. The budget and needs for adjuncts (and lab-embedded staff scientists) were not made clear to the Evaluation Committee.

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)

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

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The Department should create a sustainable plan to recruit and retain lab technicians, lab staff scientists, and adjunct faculty members, and thus reduce teaching hours for faculty members, and rethink its mentoring processes. The Faculty should also create a clear transitioning period for changes in the Dean’s leadership.

3.7 Diversity

According to the data provided in the SER, only 5 of the 16 Tenure Track faculty, and 7 of 13 adjuncts are women. Only 1 Arab faculty member was noted in the report. Among the Students, 66% are women, and 13% of the students are Israeli Arabs. It is unclear if all the Arab students are in the BSc and/or MSc/PhD programs (table includes aggregate data). All of the Arab students are Israeli citizens and not residents of the West Bank, where Ariel is located. No statement was made about the inclusion of Haredi or Ethiopian individuals either among the faculty or the student body.

The interviews with various stakeholders in the Department and University, suggested that it is very difficult to recruit any new faculty members. For women candidates who have done an Israeli postdoc, the University supports a short international research ‘sabbatical’ to gain new skills and research outlooks.

The University has an extraordinary percentage of disabled students (19%); this was not explicitly discussed or broken down among many potential disabilities, but it was inferred that the neurodivergent student program is the principal component of these students. Ariel was particularly (and rightly) proud of catering to individuals on the autism spectrum or other neurodivergent individuals. They indicated that this group was provided with dedicated resources including assigned assistants to promote their academic success. However, the Committee repeatedly asked for details about how this system works (it sounded like there was a ‘24/7 helpline’), and was not satisfied with the answers. The Committee was never told why this focus was initiated nor how it is being implemented.

As mentioned in the "Students" section, the Committee emphasizes the importance of supporting all academically weaker students by identifying their individual needs early on, and thus cater to all students based on their needs (e.g., Arab students struggle with language, or other personal circumstances and their individual needs are to be recognized and addressed).

The Department evaluated its overall performance in Diversity:

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

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

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The Evaluation Committee concurs with the Department's evaluation, yet emphasizes the need to diversity and support diverse groups within the student body and faculty.

3.8 Research

It was communicated to the Evaluating Committee that Ariel strives to “become one of the best universities in the World”. The Committee noted the significant progress in growing the number of faculty members in recent years; this also includes increased numbers of grants received and peer-reviewed publications generated, as well as increased numbers of researchers at all levels of training and mentoring. These achievements are to be applauded. The Committee also recognizes the difficulty Ariel faculty members face in attracting new colleagues and trainees to the Department of Molecular Biology (and other research faculties) at the University.

While Ariel University has significantly grown in its life science infrastructure, and the leadership provides all graduate students with a research fellowships, the Evaluation Committee still noted a lack of critical mass in defined biological research fields to facilitate being successful and recognized for unique research endeavors in selected life science research disciplines (of their choice). Given that numerous gifted scientists are unattractive to some Universities nation-wide for reasons that are not necessarily related to their skills (i.e., they have not done a postdoc abroad), AU’s idea of hiring researchers (at all levels, as well as students, postdocs, and others) who could not secure offers elsewhere in Israel is a creative approach. Still, Ariel appears to suffer from its location and perception politically even in research contexts. PIs are not able to apply for ERC or other EU grants and International

resources. Moreover, so far, their success rate in ISF grants is low. This constrains the University's abilities to recruit leading researchers for its positions, and requires donor-based or other research-funding sources to be innovatively sought out by the PIs and the University overall.

Regarding all researchers at all levels, yet especially for young PIs, there was no strong evidence that the leadership provides a well-structured mentoring plan or that they appoint a committee (with more than one member) to each PI, who accompany the researchers and provide advice on promotion, including tenure. This committee could meet with the researcher on a regular basis and inform them on their progress and requirements to accomplish both tenure and promotion (especially after two- or three-year tenure at Ariel). Similarly, students and postdocs should be assigned, well-crafted, oversight committees.

Another noted fact was that researchers are provided with unlimited subsidized PhD students, yet university-funded (or partially-funded) technicians and staff scientists are not provided to all faculty labs and Core facilities. To assure the continuity of research in the laboratories, the administrative leadership may want to consider lowering the number of subsidized graduate students and provide instead 100% financial support for hiring this technical staff for each research laboratory and Core facility.

It was noted that the Faculty of Natural Science at Ariel only provides some but not all faculty members with "permits", allowing them to mentor PhD students at their labs. It was explained to the Committee that to attain such a "permit" the PI needs first to co-mentor a PhD student.

It was not immediately clear to the Committee the manner that leadership assesses "research excellence". This is particularly important as this measure also provides these individuals the opportunity to mentor PhD students. However, it is to be applauded that leadership considers grant submission, and not necessarily the amount of grants being awarded, as an "excellence" measure. In addition to mentoring faculty on grant writing and conducting internal (or sourcing external) peer evaluations for these, this Evaluation Committee recommends that the manner "excellence" is measured will be well defined, as its vague description could be the source of conflict.

The number of hours that the faculty members are required to teach has declined over the past decade yet it remains significantly higher than at other research-focused universities. Research quality at Ariel could be highly served by providing more postdocs and graduate students the opportunity to TA. This will not only increase the payment for students but will decrease the load of teaching responsibilities for full time faculty members. As discussed above, recruiting full-time non-tenure track faculty would also be beneficial to the range of courses offered and to the teaching load of tenure-track faculty.

The Department evaluated its overall performance in Research:

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

| | | | | | |
|--|---|---|---|---|---|
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|--|--|--|--|---|--|
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The Evaluation Committee evaluated the Department's overall performance in Research:

| | | | | | |
|--|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 |
| | | | X | | |

We consider the high teaching load vs. research excellence to be a conflict for full time PIs at Ariel University. There is also a need for laboratory managers and staff scientists for core facilities to be funded by the University.

3.9 Infrastructure

Ariel University has invested a tremendous amount into the building and development of new research facilities for the life sciences. There are two newly constructed buildings where Molecular Biology faculty members have moved in: one of these is a state-of-the-art building that is housing current PIs and their lab spaces; the second is allocated space in the new medical school building, where future faculty recruits to Molecular Biology will be housed (including one already recruited faculty member).

The laboratory, student, and faculty office spaces are generously spaced and allocated in the new Life Sciences building, with separation between the dry-lab/workspaces for students and faculty, and the wet-lab spaces required for conducting traditional molecular biology studies and experiments. The configuration of both the dry- and wet-lab spaces is flexible and allows for both collaborations across faculty labs and research groups as well as separation when needed. This building also includes state-of-the-art teaching facilities, including both lecture rooms and teaching laboratories.

The biology lab units in the medical school building are markedly smaller than in the other life science building, but their availability and configuration still allow for the rapid establishment and onboarding of newly recruited, and future, faculty members. Still, the limited space might make it difficult for PIs to house all the undergraduate research project participants, the many PhD students, and the increasing numbers of lab managers joining each lab group. From the views of faculty members, Ariel's advantage in modern lab spaces' availability is counterbalanced by the small amount of non-competitive start-up funds offered for the newly recruited biologists. However, the Committee found it difficult to determine the extent of the imbalance. The University provides 50% FTE salary for a lab manager for three faculty members (and more are planned), a healthy subsidy for all graduate students regardless of length of time in the program, free use of the core facilities, as well as the new labs. Any additional cash support as part of the startup package should be judged based on these additional contributions.

Core facilities for Life Sciences at Ariel University include a generous suite of imaging devices and microscopes in the bioimaging core, with appropriate service contracts. There is also a

new Mi-Seq sequencer at the newly established Genomics facility. The latter will be suitable for some local sequencing needs while other sequencing projects will still have to use facilities at nearby Israeli Universities/Institutes and beyond. Similarly, there is no equipment/supply store on campus, but supplies are readily obtained through external sources. Finally, the current animal care facilities are being replaced by a new specific pathogen-free animal care suite being built as part of the new medical sciences building.

Although we did not get a chance to visit the modern library, we heard about its important role as a student study and communal space. Journal-access resources online have also been improving on campus and the library is responsive to individual and departmental needs for more access on a case-by-case basis.

Many students live in dormitories on the campus, including the increasing number of international students attracted to Ariel. However, dormitory space is limited and there is a waitlist for admission, despite the relatively high fees.

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 commends Ariel University on its investment into new infrastructure, core facilities, and lab spaces already ready and available for future recruits.

Section 4: Conclusions and Recommendations

4.1 Conclusions

Ariel University has grown and developed tremendously in the past decade, especially in the Faculty of Natural Science and its research infrastructure, including modern buildings and facilities. Yet, the recruitment of leading Israeli and other biologists to Ariel University continues to be difficult, in part because of the University's geographic and political context.

This issue has not been addressed directly in the SER, yet the Committee experienced these institutional constraints repeatedly throughout our visit. In addition, whereas PhD students are recruited and provided scholarships without a limit to their numbers, the faculty's recruitment is further limited by low start-up packages and high (though decreasing) teaching loads. There is also a lack of short- or long-term Strategic Plans to enhance the existing life science research strengths (that are potentially in sync with the Faculty of Medicine) at Ariel and to ensure the hiring of future faculty to diversify beyond these foci.

Regarding teaching, the courses would benefit from being evaluated by means other than student feedback, and by providing more TA-ships on a course-by-course basis. International graduate students would also benefit from being able to TA to gain instructional experience and additional income. Course offerings are still limited in molecular biology, because of the current limited size of the faculty in life sciences. The Evaluation Committee commends the University's practice to provide undergraduates with research experiences in their third year, and suggests establishing career fairs and other programs to inform students at all levels of training about job prospects in the life sciences within and beyond academia. Finally, the Committee also applauds Ariel for its emphasis on assisting students with learning disabilities.

4.2 Recommendations

Essential

The Faculty must develop and implement a Life Sciences strategic plan regarding teaching, research, and recruitment goals for five year intervals. Further, an External Advisory Committee should be established to provide guidance on the implementation approach of the strategic plan.

While retaining the policy for accepting individuals who could have not gained an opportunity to enroll elsewhere, the University needs to provide further support for students in need for social, personal, mental well-being, economic, organizational, and/or academic assistance, at all levels. The University should also develop mechanisms to identify individual student's needs and act upon these early on – not when the students fail, or dropout.

At the Institutional level, address the disparities in faculty members' representation and diversity; develop a plan to recruit more women and Arab faculty members.

Important

The Faculty should define and communicate the various criteria for "research excellence" for recruitment and promotion.

The Institution should establish faculty peer teaching evaluations, or various other mechanisms to evaluate instruction, as opposed to solely relying on student surveys.

The Faculty and the Department should define policies for teaching oversight, pedagogical instruction and help, and allocation of teaching assignments amongst faculty members. These should be communicated and available to faculty members, adjunct faculty, and TAs.

The Institution should make an effort to improve the currently insufficient monetary amounts granted as start-up packages for new faculty hires.

The Department should implement a structured mentoring committee for faculty members to improve the opportunities for attaining tenure and promotions.

The Department should offer more diverse courses in molecular biology by augmenting the teaching personnel with dedicated teaching adjuncts and TAs.

At the Department level, diversify and upgrade student coursework evaluation methods through presentations, writing assignments, regular quizzes, and other means in addition to end-of-course exams only.

Establish a series of academic lectures, seminars and workshops by external professionals, to enhance the networking opportunities for the Department and broaden the education and expertise of the students.

Establish career development seminars and work fairs including alumni in the activities.

At the Faculty level, identify and provide an onboarding period for incoming Deans and other leadership positions, and ensure continuity of best practice.

The Faculty should develop a plan to recruit and retain lab technicians and/or Core facility staff managers, to assist more PIs, and ensure the continuity of research in laboratories.

The institution should make efforts to increase the Arab student enrolment and retention to provide a critical mass for peer support. The institution should also provide the needed resources for academic success.

Desirable

In future SERs, address all relevant ongoing and future challenges, including the political and geographical challenges, so they are clear to the evaluating Committee prior to the visit.

At the Department level, provide the opportunity to take more Molecular Biology courses at other institutions to compensate for the lack of breadth in the courses currently available; facilitate means for commuting and/or allow hybrid attendance, and provide guidance to students in selecting the relevant courses.

At the Institutional level, provide a program for student activities to foster a sense of community amongst and between commuter and dorm-living students.

Signed by:

Prof. Lynne Regan
Committee Chair



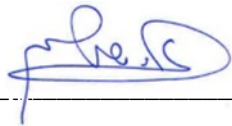
Prof. Joseph Buxbaum



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