



**Committee for the Evaluation of Biology/Life Sciences Study
Programs**

**Ariel University Center
Faculty of Life Sciences
Department of Molecular Biology**

Evaluation Report

November 2010

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Chapter 1- Background

At its meeting on October 23, 2007 the Council for Higher Education (CHE) decided to evaluate study programs in the field of Biology/Life Sciences during the academic year 2007-2008.

Following the decision of the CHE, the Minister of Education, who serves ex officio as the Chair of the CHE, appointed an Evaluation Committee for the evaluation of the academic quality of biology/Life Sciences studies in Israel. The Committee consists of:

- **Prof. Michael Levitt, Department of Structural Biology, School of Medicine, Stanford University, USA - Committee Chair**
- **Prof. Ueli Aebi, M.E. Muller Institute for Structural Biology Biozentrum, University of Basel, Switzerland**
- **Prof. Yigal Cohen, Faculty of Life Sciences, Bar Ilan University, Israel**
- **Prof. Nicole Le Douarin, Institute of Embryology, College de France, France¹**
- **Prof. Shlomo Rotshenker, Department of Medical Neurobiology, The Hebrew University Medical School, Israel**
- **Prof. Daniel Simberloff, Department of Ecology and Evolutionary Biology, University of Tennessee, USA**

Ms. Marissa Gross- Coordinator of the Committee on behalf of the CHE.

Within the framework of its activity, the Committee was requested to submit the following documents to the CHE:

1. A final report for each of the institutions, which would include an evaluation of Life Science study programs, the Committee's findings and recommendations.
2. A general report regarding the status of the evaluated field of study in Israeli institutions of higher education.
3. Recommendations for standards in the evaluated field of study.

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

The first stage of the quality assessment process consisted of self-evaluation, including the preparation of a self-evaluation report by the institutions under evaluation. This process was conducted in accordance with the CHE's guidelines as specified in the document entitled "The Self-Evaluation Process: Recommendations and Guidelines" (October 2007).

¹ Prof. Le Douarin was unable attend the second round of visits due to personal reasons.

Chapter 2-Committee Procedures

The Committee held its first meetings on May 8, 2009. At this meeting committee members were given an overview of higher education in Israel and a description of the Israeli CHE. They also discussed Biology/Life Sciences study programs in Israel and fundamental issues concerning the committee's quality assessment activity.

During May 2009 Committee members conducted full-day visits to two of the eight institutions whose Biology/Life Sciences study programs the committee was requested to examine: Hebrew University in Jerusalem and Tel Aviv University. The committee visited the remaining six institutions, Ariel University Center, Bar Ilan University, the Open University of Israel, the Weizmann Institute of Science, the Technion- Israel Institute of Technology, and Ben Gurion University during March 2010.

During these meetings, the Committee met with the relevant officials at each institution, as well as with faculty members, students and alumni, and also conducted a tour of the campus.

This report deals with the Molecular Biology Program at the Faculty of Life Sciences at Ariel University Center of Samaria.

The Committee's visit to the Ariel University Center took place on Thursday March 4, 2010.

The schedule of the visit, including the list of participants representing the institution, is attached as **Appendix 2**.

The members of the committee thank the management of the institution and the Faculty of Life Sciences for the self-evaluation report and for the hospitality offered to the Committee during its visit.

Chapter 3- Evaluation of the Molecular Biology Program at the Faculty of Life Sciences at the Ariel University Center*

3.1 General Background

The Ariel University Center was established in 1982. The Molecular Biology program leading to the B.Sc. degree received full accreditation in 2005. During the academic year 2007-8 there were about 8,000 students at the center with most (94%) studying for undergraduate degrees in 23 departments under four faculties. In 2007-8 over 1,300 students graduated.

There were 420 of active students in the Faculty of Natural Sciences during the academic year 2007-8 with about a fifth, 80, studying for a BSc degree in the Department of Molecular Biology.

3.2 Executive Summary

The Department of Molecular Biology at the Ariel University Center aims to train BSc students to carry out independent scientific and technological activities after acquiring a strong basis of fundamentals in mathematics, physics, chemistry and biology. Under the very able leadership of the department chair, they perceive themselves as a research institute and they act as if they were one. This is difficult as the faculty is very small and faculty members have very high teaching loads and limited time to pursue their own individual research. Although we appreciate the remarkable efforts being made to carry out top quality research and understand their desire to become a research institution, our mandate is to evaluate them as a college since they are budgeted accordingly by the Budgeting and Planning Committee. We also feel that the active on-going research is a clear strength and increases the quality of teaching and the commitment of the lecturers. Our enthusiasm is reinforced by the satisfaction of current students and alumni who particularly appreciate the compulsory research projects and the high-quality teaching laboratories. The full time faculty show great dedication and commitment and are doing excellent research. The move to reduce the reliance on external teaching staff is welcomed by our committee.

We did have a number of specific concerns in that the teaching program is very narrowly focused with almost no electives, and there is a need to add additional classes in basic biology, systems biology, developmental biology and genetics. Such a curricular expansion will require additional faculty, as additional areas of expertise will be required and current faculty already labor under a staggering workload. Also, although other areas at the Ariel University Center are growing, the number of students in Molecular Biology is

**This Report relates to the situation current at the time of the visit to the institution, and does not take account of any changes that may have occurred subsequently. The Report records the conclusions reached by the Evaluation Committee based on the documentation provided by the institution, information gained through interviews, discussion and observation as well as other information available to the Committee.*

not. Lack of growth will limit any increase in the breadth of the program as recommended above and thus needs to be reversed as a top priority.

3.3 Goals and General Situation

The overall mission of the Ariel University Center is to establish a higher education institution dedicated to academic excellence in teaching in fields relevant to the Israeli economy and society, with emphasis on applied research relating to development of new products and processes in hi-tech industries. In the Faculty of Life Sciences, established in 2003, the mission emphasizes “fundamental basic knowledge and skills in mathematics, physics, chemistry and biology in accordance to the specific needs of each student” and aims to train students to carry out independent scientific and technological activities. In this context, the Department of Molecular Biology aims to graduate students who have strong training in basic sciences with a focus on molecular biological approaches so that they are able to apply modern multi-disciplinary approaches to “biological problems in academic biomedical research, and biotechnological industries”.

3.4 Curriculum

Strengths:

- The emphasis on basic courses in mathematics, physics, chemistry and biology is of value and does not seem to diminish the enthusiasm of the students.

Weaknesses:

- The strong focus on basic sciences and molecular biology defined rather narrowly limits teaching in other areas of biology, particularly basic biology, systems biology, developmental biology and genetics. Normally about 30% of the courses leading to a biology BSc degree are “hard” sciences, whereas here it is close to 50%.
- There are no elective courses although it is hoped to develop these in the future.

Recommendations:

- In the new medical biology program, hard sciences are being reduced. We support this move and recommend that it be continued.
- Basic biology courses, including basic survey and tree-of-life courses, should be added so that students understand the biological context of the molecular phenomena they are studying.
- Additionally, courses should be instituted in at least a subset of rapidly advancing fields that articulate strongly with molecular biology, such as developmental biology, systems biology, and genetics.
- Elective courses in both molecular biology and closely related areas of biology need to be added as the number of students allows; this is not an easy process: thought and care will be needed.
- Consult broadly with all teaching faculty to try to augment the curriculum so as to leverage the current strengths in molecular biology

to other fields of biology. We appreciate that the curriculum cannot be changed without the consent of the Faculty of Life Sciences.

3.5 Teaching and Learning

Strengths:

- The research project that each student must undertake was greatly appreciated by our committee.
- The strong interaction with the faculty increases the quality of teaching.
- Teaching labs provide a good infrastructure for learning research skills.
- The entire faculty seems to be involved in committee work, which is seen both as a way to compensate for the small numbers as well as benefit from the very high level of faculty enthusiasm.

Weaknesses:

- There is still a strong reliance on part-time lecturers. While this is expected for the basic science courses, it is clear that molecular biology is best taught by full-time faculty who have active research programs.

Recommendations:

- Continue to reduce the reliance on external part-time teachers. At the on-site visit, we were told that this had happened in the past year and now there are just four such external teachers.

3.6 BS Students, Current and Alumni

Strengths:

- The students we met with were uniformly enthusiastic.
- They feel the academic level is high, something that made them aware of the Ariel University Center.
- The compulsory research projects in which they engage are regarded as a strong positive.
- Very few students had dropped out (less than 10%).
- The alumni we met echoed the appreciation of the education they had received.
- After graduation about half of the BSc students had gone on to do an MSc degree elsewhere in Israel.

Weaknesses:

- As we only met a small fraction of the students and alumni we cannot assess how representative these positive impressions are. Nevertheless, the faculty, who are in close contact with both student and alumni, confirmed the positive attitudes of the students.
- Basically every student who applied was admitted and, as no surprise, the psychometric scores of the admitted students are relatively low.
- The number of registered students is low and, while subject to large statistical fluctuations, does not seem to be increasing. Although other

programs at the college are expanding, the molecular biology program has not expanded.

Recommendations:

- Find innovative ways to increase student enrollment without lowering standards.

3.7.1 Human Resources: Faculty

Strengths

- There are currently 7 tenure track full-time faculty members in the Department of Molecular Biology; all have active research laboratories.
- Faculty work with MSc students from Bar Ilan and Tel Aviv University in their labs, an arrangement that allows faculty to have strong research programs but that poses the difficulty that students are often away taking courses at their home university
- Overall, the faculty demonstrates remarkably high levels of enthusiasm for their research as well as their teaching responsibilities.

Weaknesses

- The department is small and thinly stretched. The addition of courses in areas indicated above would necessitate at least three new tenure-track lines.
- Doing research at a college is unusual. It clearly improves the level of education but by the same token increases the workload of the faculty.

3.7.2 Human Resources: New Junior Faculty

Strengths

- We had an in-depth discussion with four non-tenure-track junior faculty of the Department of Molecular Biology. They were all positive about the quality of teaching, the cooperative faculty, the low level of bureaucracy, and the high level of student motivation.

Weaknesses:

- It is unclear if and how junior faculty move to a tenure-track position.

3.8 Infrastructure

Strengths:

- Teaching labs provide a good infrastructure for learning research skills.
- The research laboratories are suitable for the research carried out.

3.9 Research

Research carried out by the faculty is not a primary mission of the Ariel University Center. In addition, the Department of Molecular Biology is small and many of the full-time faculty are newly appointed so that research output was not evaluated. Nevertheless, we were impressed by the diversity of the research programs mounted by the faculty as well as their high level of enthusiasm for their research, despite the fact that they are not given funding by the PBC for research.

Table 1: Quantitative Analysis of the Department of Molecular Biology

Topics Evaluated (CHE Appendix)	Evaluation Criteria	Values
The Academic Faculty	Number of faculty (PI): All	22
	Primary Appointed Full Time Lecturers	3
	Primary Appointed Full Time Profs	1
	Secondary Appointed Full Time Lecturers	2
	Secondary Appointed Full Time Profs	1
	Primary Appointed Part Time Lecturers	5
	Secondary Appointed Part Time Lecturers	10
	Retired faculty in last five years	0
The Students	Number of students: Total (2008)	80
	BSc (2008)	80
Student / Faculty	BSc students per faculty (2008)	4.8
	Ratio of TAs / Faculty	0.95
The Study Program	Number of Teaching Assistants	21

Chapter 4 – General Recommendations

Strengths:

- Students are enthusiastic and appreciate what they deem to be the high academic level. They appreciate the compulsory research projects.
- Teaching labs provide a good infrastructure for learning research skills.
- There are currently 7 tenure track full-time faculty members in the Department of Molecular Biology; all have active research laboratories and are remarkably enthusiastic.
- Strong interaction among the research faculty increases the quality of teaching.

Weaknesses:

- The number of admitted students is low and, while subject to large statistical fluctuations, does not seem to be increasing.
- The strong focus on basic sciences and molecular biology defines rather narrowly the limits to teach in other areas of biology, particularly basic biology, systems biology, developmental biology and genetics.
- The department is small and thinly stretched. The addition of courses in areas indicated above would necessitate at least three new tenure-track lines.

Recommendation:

- Make efforts to steadily increase the number of students enrolled in the Department of Molecular Biology towards the target number of 60 to 70 by a combination of innovative recruitment and revamping the curriculum to make it broader. These should be aided by the new medical biology program that we strongly support.
- Basic biology courses should be added, as well as courses in some rapidly advancing biological fields allied with molecular biology.
- Consult broadly with all teaching faculty to try and augment the curriculum so as to leverage the current strengths in molecular biology to other fields of biology.
- Add elective courses in both molecular biology and in some allied fields as the student body grows. Such additions should in turn encourage higher enrollment.
- Add at least three new tenure-track faculty lines.

Signed by:



Prof. Michael Levitt, Chair



Prof. Ueli Aebi



Prof. Yigal Cohen



Prof. Shlomo Rotshenker



Prof. Daniel Simberloff

Appendix 1: Letter of Appointment (Sample)



מדינת ישראל
STATE OF ISRAEL

May 6, 2009

Minister of Education

Prof. Michael Levitt
Department of Structural Biology,
School of Medicine, Stanford University,
USA

Dear Professor Levitt,

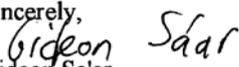
The State of Israel undertook an ambitious project when the Israeli Council for Higher Education (CHE) established a quality assessment and assurance system for Israeli higher education. Its stated goals are: to enhance and ensure the quality of academic studies; to provide the public with information 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. Involvement of world-renowned academicians in this process is essential.

This most important initiative reaches out to scientists in the international arena in a national effort to meet the critical challenges that confront the Israeli higher educational system today. The formulation of international evaluation committees represents an opportunity to express our common sense of concern and to assess the current and future status of education in the 21st century and beyond. It also establishes a structure for an ongoing consultative process among scientists around the globe on common academic dilemmas and prospects.

I therefore deeply appreciate your willingness to join us in this crucial endeavor. 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 Sciences/ Biology Studies. The composition of the Committee will be as follows: Prof. Michael Levitt- Chair, Prof. Ueli Aebi, Prof. Yigal Cohen, Prof. Nicole Le Douarin, Prof. Shlomo Rotshenker and Prof. Daniel Simberloff. Ms. Lilach Weisz will coordinate the Committee's activities.

In your capacity as a Chair of the Evaluation Committee, you will be requested to function in accordance with the enclosed appendix.

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

Sincerely,

Gideon Sa'ar
Minister of Education
and Chairperson of the Council for Higher Education

Enclosures: Appendix to the Appointment Letter of Evaluation Committees
cc: Ms. Riki Mendelzvaig, Secretary of the Council for Higher Education
Ms. Michal Neumann, Head of the Quality Assessment Unit
Ms. Lilach Weisz, Committee Coordinator

Appendix 2: Schedule of On-Site Visit
Biology/ Life Sciences Thursday March 4 2010
TEMPLATE

Biology/Life Science –schedule of site visit- Yesh College

**All meetings will be held in the upper campus, building 3a, second floor
 Unless another location is stated specifically**

DAY 1:

09:30-10:00	Opening session with the heads of the institution and the senior staff member appointed to deal with quality assessment	President: Prof. Dan Meyerstein Deputy President (Rector): Prof. Michael Zinigrad Head, Quality Assessment System: Dr. Nitza Davidovitch	
10:00-10:30	Meeting with academic leadership of Faculty	Acting Dean of the Faculty of Natural Sciences Prof. Vadim Levit	
10:30-11:30	Meeting with the academic and administrative heads of the department	Head of the Department of Molecular Biology: Dr. Albert Pinhasov	
11:30-12:30	Meeting with representatives of relevant departmental committees and Senior Faculty *	Teaching committee: Dr. Tovit Rosenzweig Admissions committee: Prof Israel Hanukoglu Internet Committee: Dr. Dror Tobi Senior Faculty: Dr. Gadi Turgeman Dr. Danny Baranes Dr. Stella Aronov Dr. Michael Firer	
12:30-13:00	Lunch		
13:00-14:00	Tour of campus (Including classes, laboratories, offices of faculty members, computer labs etc.)	Teaching and Research Laboratories	

Time	Subject	Participants	Room/Location
14:00-14:30	Meeting with Junior academic faculty* (Including Post- Docs if	Dr. Arieh Budovsky (Postdoctoral fellow) Mr. Shay Anuka	

	possible)	(Ph.D Student)	
14:30-15:00	Meeting with adjunct lecturers*	Dr. Izhak Michaelievski Dr. Orlev Levi-Nissenbaum	
15:00-15:30	Meeting with B.Sc. students***	Ms. Serah Lisson Ms. Sonia Berenstein Ms. Sandra Katz Ms. Yulia Krazov Ms. Anna Grushchenko Ms. Rotem Algon Ms. Keren or Luobarsky Ms. Raneen Shawahna	
15:30-16:00	Meeting with Alumni	Ms. Ronia Victor Ms. Maya Saduvnik Ms. Yulia Yerukhimovich Mr. Yakov Fogel Mr. Konstantin Rozenberg	
16:00-16:30	Closed-door working meeting of the evaluation committee		
16:30-17:00	Summation meeting with heads of the institution and of the department	President: Prof. Dan Meyerstein Deputy President (Rector): Prof. Michael Zinigrad Head, Quality Assessment System: Dr. Nitza Davidovitch Head, Department of Molecular Biology: Dr. Albert Pinhasov	

* The heads of the institution and academic unit or their representatives will not attend these meetings.

** Please make sure that these are different students than those meeting with the committee the next day.

*** The visit will be conducted in English with the exception of students who may speak in Hebrew and anyone else who feels unable to converse in English.