



**Committee for the Evaluation of
Biotechnology & Biotechnology Engineering Study Programs**

**Biotechnology program at Tel Aviv University
Evaluation Report**

____ 2012

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Chapter 1: General Background

At its meeting on July 25, 2010, the Council for Higher Education (CHE) decided to evaluate study programs in the field of Biotechnology and Biotechnology Engineering during the academic year 2012.

Following the decision of the CHE, the Minister of Education, who serves ex officio as Chairperson of the CHE, appointed a Committee consisting of:

- Prof. **Moshe Rosenberg**, Department of Food Science & Technology, UC Davis, USA, Committee Chair¹
- **Prof. Gad Galili**, Department of Plant Sciences, Weizmann Institute of Science, Israel
- **Prof. Milica Radisic**, Institute of Biomaterials and Biomedical Engineering, Department of Chemical Engineering and Applied Chemistry, University of Toronto, Canada²
- **Prof. Joseph Shiloach**, Biotechnology Core Lab, NIH- National Institutes of Health, USA

- **Ms. Yael Elbocher** - Coordinator of the Committee on behalf of the CHE.

Within the framework of its activity, the Committee was requested to:³

1. Examine the self-evaluation reports, submitted by the institutions that provide study programs in Nutritional Sciences, and to conduct on-site visits at those institutions.
2. Submit to the CHE an individual report on each of the evaluated academic units and study programs, including the Committee's findings and recommendations.
3. Submit to the CHE a general report regarding the examined field of study within the Israeli system of higher education including recommendations for standards in the evaluated field of study.

The entire process was conducted in accordance with the CHE's Guidelines for Self-Evaluation (of October 2010).

¹ During the first round of visits Prof. Carl Batt of Cornell University was Committee Chair. During the period between the two rounds of visits Prof. Batt resigned due to incomparable disagreements

² Prof Radisic joined the committee for its second round of visits, thus did not take part in the evaluation of Tel Hai College, ORT Braude College and The Hebrew University of Jerusalem

³ The Committee's letter of appointment is attached as **Appendix 1**.

Chapter 2-Committee Procedures

The Committee held its first meetings on March 14, 2012, during which it discussed fundamental issues concerning higher education in Israel, the quality assessment activity, as well as Biotechnology and Biotechnology Engineering Study programs.

In March 2012, the Committee held its first round of visits of evaluation, and visited Tel Hai College, ORT Braude College and the Hebrew University of Jerusalem. In June 2012 the Committee conducted its second evaluation cycle, and visited Ben-Gurion University of the Negev, Hadassah Academic College Jerusalem, Tel Aviv University and The Technion. During the visits, the Committee met with various stakeholders at the institutions, including management, faculty, staff, and students.

This report deals with the Biotechnology Program at The Tel Aviv University which took place on June 17, 2012 .

The schedule of the visit is attached as **Appendix 2**.

The Committee thanks the leadership of the Tel Aviv University and the Biotechnology program for their self-evaluation report and for their hospitality towards the Committee during its visit at the institution.

Chapter 3: Evaluation of Biotechnology Program at Tel Aviv University

** This Report relates to the situation current at the time of the visit to the institution, and does not take account of any subsequent changes. 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.*

Introductory Remarks

In 2008, as part of the Quality Evaluation of the Faculty of Life Sciences at Tel Aviv University, the Biotechnology Program (BTP) was also reviewed, as one of the constituent programs of this Faculty. When Tel-Aviv University (TAU) was assigned to evaluate the field of Biotechnology in 2011, it reminded the CHE about the 2008 review and the council agreed that TAU will re-submit the 2008 report along with an “executive summary” detailing the progress that has been made in the BTP between the years 2008 and 2011. This situation and the consequent agreement has presented the Biotechnology Quality Assessment Committee with a very significant challenge. Major parts of the 2008 Self Evaluation Report (SER) are completely irrelevant to the charge of the Biotechnology Quality Assessment Committee and the information included in the “Executive summary” is very limited. This uncommon and unfortunate situation has significantly compromised the ability of the committee to assess all aspects of the BTP.

The following report will thus only address those elements of the program that could be reasonably assessed by the committee. The committee hopes that despite these difficulties the assessment and report carry merit and value to the program and CHE.

3.1 Executive Summary

The interdepartmental Biotechnology Program (BTP) at Tel Aviv University consists of two study programs: a B.Sc. in Biology with emphasis on Biotechnology and a Master degree program (M.Sc.). Faculty members that are affiliated with the BTP come from the constituent departments of the Faculty of Life Science that administrates the program. The 3-year B.Sc. program is an undergraduate study program in Biology with some emphasis on Biotechnology, and its curriculum has to be enhanced and revised to properly address areas that are relevant to modern biotechnology. The BTP has to establish 3-4 study tracks where the excellence and competitive edge of the program and the Faculty, in areas that are of relevance

to modern biotechnology, can be highlighted. The students of the program are highly capable, mature and enthusiastic about the program, especially about its research capabilities and record. The faculty members that are affiliated with the program are of high academic caliber and their research programs are very competitive, successful, well funded and properly published. Housed at a highly reputable university and having both highly capable students and faculty members, the BTP has the potential to become a leading program in biotechnology. Meeting this objective requires the program to become more structured and focused, as well as the formation of defined multi-disciplinary research groups consisting of faculty members from the different programs and departments of the Faculty of Life Sciences and even beyond. The graduate studies program of the BTP has to be further developed to also include a Ph.D. in biotechnology. The teaching laboratories of the programs are in an extremely poor condition and cannot be considered suitable for instruction.

Building on the program's accomplishments and potential along with implementation of recommendations made by this committee will allow the BTP to successfully meet current and future needs and challenges of biotechnology in Israel. The committee has identified several curricular, personnel and infrastructural needs that have to be addressed.

Major recommendations are:

- The university should launch an immediate effort directed at renovating and re-tooling the teaching laboratories of the BTP. Without delay, provide students (and staff) with a properly furnished, quiet, air-conditioned space where they can have their breaks and lunch.
- Develop a concise and focused mission statement; identifying biotechnology-related strength and excellence areas where the competitiveness of the program can be highlighted, and develop a clear strategic plan for the program.
- Establish well defined multi-disciplinary research/area-focused groups of faculty members.

- Establish (3-4) study tracks reflecting the competitive edge and excellence of the program. For each track, appoint a senior faculty member as a leader; Link the study tracks to the relevant research groups.
- Establish an Industry Advisory Board to the BTP.
- Revise and enhance the curricula of the program, as detailed in this report.
- Establish and offer a Ph.D. program in biotechnology.
- Introduce and implement a Learning Outcome Assessment Concept as the main tool for assessing the learning outcomes of all the courses included in the curricula of the program.

3.2 Background

Tel-Aviv University was established in 1956; its accreditation process was initiated in 1960 and was completed by 1969. The Biotechnology program of the university is an interdepartmental study program, administrated by the Faculty of Life Science. There are six constituent independent departments in the George S. Wise Faculty of Life Sciences: Zoology, Plant Sciences, Molecular Microbiology and Biotechnology, Cell Research and Immunology, Biochemistry and Department of Neurobiology. During the academic year 2010/2011 1,890 students consisting of 1,336 undergraduate and 554 graduate students were enrolled in the different departments and study programs of the Faculty of Life Sciences. The population of the graduate students in that year consisted of 244 Master students and 310 Ph.D. students.

The faculty members and researchers of the BTP come from the six constituent departments of the faculty and, in some cases, instructors from other faculties teach some of the basic courses. The BTP at TAU consists of two study programs: a B.Sc. in Biology with emphasis on Biotechnology and a Master degree program (M.Sc.).

3.3 Mission, Goals and Aims

The mission statement of the undergraduate study program in biotechnology is to educate young professionals to become the future biotechnological workforce, researchers

and developers in Israel. The committee holds the opinion that the mission statement is too general. The mission statement addresses only teaching and training functions of the program, without addressing research functions. The BTP needs to develop a concise and focused mission statement, reflecting the collective vision of its faculty members. The BTP does not have a detailed strategic plan aimed at meeting its goals. Once the mission statement has been developed, the program has to develop a tangible strategic plan with specific long- and short-term objectives addressing curricular, research, infrastructural and personnel issues. Developing and implementing these tools will enable the program to better assess its curricula (for its content, depth and scope), will allow effective planning of faculty and staff recruitment and will allow planning the program's growth in both number of students and infrastructure.

The multi-disciplinary nature of biotechnology and the interdepartmental structure of the program should not be allowed to take away from the critical need to develop a focused program. As an integral part of developing its mission statement and strategic plan, the program has to define its specific and competitive strengths in the field of modern biotechnology. These areas should then be developed into program directions along which inter-departments research groups, study tracks, and research infrastructure should evolve and developed. Yet additionally, although the inter-departmental nature of the BTP dictates that the program does not have its "own" faculty members, the afore-stated process should also lead to the formation of well defined groups of faculty members affiliated with and committed to the promotion of each of the identified strength and excellence direction in biotechnology. Each of these groups should establish leadership and effective inter-and intra-group communication channels. Each group should also meet at least once every semester to discuss its objectives and accomplishments. These structural and organizational enhancements and modifications will not take away from the uniqueness, strength and competitive edge of each of the constituent departments of the program but rather will enhance dramatically the visibility, effectiveness and competitive nature of the BTP, both nationally and internationally. The committee considers the current lack of structure and focus of the program as a weakness that has to be addressed.

The BTP does not have an Industry Advisory Board (IAB) and the committee believes that the program can benefit immensely from establishing and interacting, on a regular basis, with an effective and committed IAB. An effective IAB can provide comprehensive feedback about the program's adequacy and can partner with the program in shaping its scope and growth. The IAB can also assist the program in assessing and enhancing its success in meeting current and future needs of the Biotechnology Industry in Israel. Such advisory boards are common in similar programs in the USA and have been proven to be a powerful and effective means that allow establishing meaningful dialogues with stakeholders.

Recommendations:

Immediate (full implementation within one year)

- Appoint, without delay, an *ad hoc* committee, consisting of senior faculty members from the constituent departments and programs, charged with the task of developing a concise and focused mission statement, identify strength and excellence areas, and develop a clear strategic plan for the program.
- Establish and install an Industry Advisory Board to the IFBP, consisting of industry leaders and alumni

3.4 - The Study Program

3.4.1 Undergraduate study program Biotechnology (B.Sc.)

The undergraduate study program is a study program in biology with some emphasize on biotechnology. The program is relatively small and during the academic years 2009/2010 and 2010/2011 the number of students enrolled in it was 65 and 73, respectively, and accounted for less than 4% of the total undergraduate students enrolled in the Faculty of Life Sciences.

The study program is rigorous and aimed at challenging the student while preparing them to either become successful professionals in the biotechnology industry or pursue studies towards graduate degrees (M.Sc. and Ph.D.). Successful completion of the program

requires students to accumulate 150 credit points (CP). The curriculum consists of a sequence of courses in the exact sciences, natural sciences and chemistry that are commonly included in the curriculum of a B.Sc. study program in biology. Additionally, the curriculum attempts to introduce concepts that are unique to biotechnology. It has to be noted that undergraduate study programs in biotechnology that are offered by universities in the USA consist of four years of study. Designing a high quality 3-year undergraduate program in biotechnology, where all the curricular needs are properly addressed is a very significant, and some might even argue an unrealistic, challenge.

In general, the committee has found the curriculum to be appropriate for a biology study program however it identified areas that need to be addressed. The curriculum consists of compulsory and semi-elective courses and thus provides the students with only limited opportunities to extend their horizons beyond the boundaries of the structured course sequence. The committee considers the latter as a weakness of the curriculum and would like to highlight the critical importance of providing students with ample opportunities to select appropriate and relevant elective courses from the different constituent departments of the faculty of natural sciences as well as from other programs.

The multi-disciplinary nature of biotechnology calls for a curriculum that successfully introduces all of the major concepts associated with modern biotechnology, at least at an introductory level. Reviewing the biotechnology-related courses that are included in the curriculum indicated that the latter objective is only partially met by the curriculum. Concepts such as fermentation sciences, materials and nano-systems in biotechnology, ethics in biotechnology, colloidal sciences, etc are either addressed to a very limited extent or are completely missing from the curriculum.

The committee recognizes the inherent constraints associated with an undergraduate curriculum that is designed to only have “emphasis in biotechnology”. The committee holds the opinion that properly addressing these constraints calls for developing a series of multi-conceptual courses in biotechnology, where all the concepts and elements that are associated with modern biotechnology are properly introduced. This approach has the potential of overcoming some of the major difficulties associated with the current curriculum, where only

some of the relevant concepts are addressed, in a series of “traditional, uni-conceptual” courses in biotechnology-related areas. The committee would like to urge the program to address this weakness of the curriculum and strongly recommends that a series of courses that are tailored to meet the afore-stated goal will be developed and introduced.

The curriculum includes compulsory courses in “Organizational behavior” and “Project Design”. Although the value and merit of including courses of this kind in the curriculum is recognized by the committee, the afore-detailed deficiencies and necessary revisions to the curriculum require either completely eliminating these courses from the curriculum or developing a single course where some of the topics associated with these concepts are addressed to a limited extent. The latter will allow freeing up CPs that are necessary in order to meet the recommended modifications.

Communication skills of students have to be developed and a course aimed at developing the technical writing skills, in both Hebrew and English, is missing from the curriculum and should be introduced. Similarly, more opportunities for students to develop and present oral presentations in courses are needed and have to be introduced.

Practical skills at the bench are of critical importance to those engaged in biotechnology. Although the curriculum includes several laboratory courses, most of them do not include modules where techniques and methodologies that are commonly used in modern biotechnology are properly instructed. This is a deficiency that has to be addressed in developing more laboratory study experiences, either in the form of a dedicated course or in the form of modules that can be incorporated into existing courses. The committee believes that it is imperative that an integral part of developing and introducing these curricular elements will include significant upgrading and updating of the analytical instrumentation and tools that students use in the lab sessions, to what is commonly used in modern biotechnology.

The committee applauds the program for offering its undergraduate students an opportunity to elect a “Project Lab” (6 CPs, 90 hours). The committee recognizes the importance of introducing students, as early as possible in their academic studies, to “real world” research. The committee did not have the opportunity to review final reports of such projects and was not provided with a list of project titles from recent years. The committee holds the

opinion that this elective should also be used as an opportunity for training students in presenting their research in an oral presentation.

Recommendations:

Immediate (full implementation within 1-2 years)

- Develop and instruct (during the first year of studies) a compulsory course in technical writing (in both English and Hebrew)
- Include in courses more elements where students have to develop and present oral presentations.
- Include as part of the grade components of the Project Lab an oral presentation.

Intermediate (full implementation within 2-4 years)

- Revise and enhance the curriculum according to the needs and deficiencies that are detailed in this report: create new and update existing biotechnology-specific courses to allow introducing all the major concepts and disciplines associated with modern biotechnology.
- Develop and introduce “multi-conceptual” rather than uni-conceptual” courses in biotechnology.
- Develop a comprehensive list of electives from both the constituent departments of the Faculty of Natural Sciences and other programs.
- Develop new and update existing laboratory courses to allow instructing students in current approaches and methods that are commonly used in modern biotechnology. Update and upgrade the instrumentation in these labs to what is common in modern biotechnology.
- Remove the two courses “Organizational behavior” and Project Design” from the curriculum.

3.4.2 - The Graduate studies program – M.Sc.

The M.Sc. program is one of the ten M.Sc. programs offered by the Graduate School of the George S. Wise Faculty of Life Sciences. Completions of the degree requires, in addition to the research thesis, accumulating 30 CPs. The curriculum of the M.Sc. study program consists of courses with clear relevance to biotechnology and adequate academic level, however, it lacks structure and breadth. The graduate students have only very limited flexibility in selecting courses. The curriculum does not include a laboratory course in advanced analytical and research methods in biotechnology and a course in experimental design. The committee has identified the latter as a weakness and deficiency that has to be addressed. Bioethics is of prime importance to those engaged in biotechnology-related research and thus the course in bioethics has to become a requirement for students that have not taken such a course in their undergraduate studies.

The program is relatively small and in the academic year 2010/2011 only 15 students, accounting to only 6.6% of the total population of M.Sc. students in the Faculty of Life Sciences, were enrolled in the BTP. The distribution of students among the constituent departments of the Faculty of Life Sciences is uneven and during the years 2008-2010 **no** Master student of the BTP was affiliated with the departments of Zoology, Cell Research and Immunology or with the department of Neurobiology. During 2008-2010, 47-80% of the master students were affiliated with the department of Molecular Microbiology and Biotechnology; 5.2-21% with the department of Molecular Biology and Ecology of Plants and 0-31.5% of the students was affiliated with the department of Biochemistry.

Similar to what has been discussed earlier in this report, the committee has identified a need of the BTP to become focused and to develop its academic activities in a way that promotes its strength in biotechnology-related fields. The graduate study program thus has to be re-organized, in the form of study tracks where its strength and excellence can be highlighted. Once the study tracks have been identified, a clear course path or cluster, consisting of both compulsory and elective courses, has to be developed for each track. The study tracks can either be affiliated with a given academic department or can span across departments,

and should each have an elected academic leader. The study tracks can be linked to the research groups that have been described earlier in this report (see 3.3).

The committee has not been provided with sample master theses and thus cannot assess the quality of research conducted by the graduate students.

Recommendations:

Immediate (full implementation within one year)

- Establish (3-4) study tracks reflecting the competitive edge and excellence of the program and its constituent departments. For each track, appoint a senior faculty member as a leader and link the study tracks to the relevant research groups (consisting of affiliated faculty members, see section 3.7).

Intermediate (full implementation within 2-4 years)

- Revise the curriculum according to what is detailed in this report and organize it in the form of track-specific course paths.

3.4.3. Ph.D. program in biotechnology

The field of biotechnology is uniquely driven by a very aggressive and fast pace inter- and multi-disciplinary research. The competitive nature and success of an academic program in biotechnology is critically dependent on the scientific merit, level, and success of its research programs.

A major component of a research platform in an academic institute is its Ph.D. program, where highly motivated and skilled young researchers are committed to the process of developing new, cutting edge knowledge and discovering new horizons. The committee has identified the fact that the BTP at TAU offers only a Master degree in biotechnology as a significant weakness of the program and holds the opinion that developing a Ph.D. program in biotechnology is imperative and critically important to the competitiveness and success of the faculty of Life Sciences in general, and to the BTP in particular.

Recommendation:

Intermediate (full implementation within 2-3 years)

- Establish and offer a Ph.D. program in biotechnology.

3.5 - Teaching & Learning Outcomes

The committee has not been provided with sufficient and relevant information that is needed in order to evaluate the quality of instruction and learning outcomes. Information about the methodology that is currently used for evaluating the teaching and learning outcomes indicated that they are being assessed based on student grades. In recent years it has been recognized that grades alone cannot serve as effective tools in assessing learning outcomes. Institutions of higher education all over the world have recognized that a full commitment to teaching and learning must be based on assessing and documenting what and how much students are learning and on using this information to improve the educational experiences. A detailed implementation of this Learning Outcome Assessment has been developed and introduced in numerous academic programs. This concept allows defining desired learning outcomes (for each course) and quantifying the success with which these outcomes have been acquired by students.

Recommendation:

Intermediate (full implementation within 3-4 years)

- Introduce and implement a Learning Outcome Assessment concept as the main tool for assessing the learning outcomes of all of the courses and learning experiences included in the curricula of the study programs. Introduce and implement BTP-specific tools to assess the effectiveness and relevance of all instructors and courses attended by the program's students.

3.6 Human Resources

3.6.1 Faculty members

Both senior and junior faculty members with whom the committee met expressed high commitment and dedication to their teaching and research activities. The committee holds the opinion that the faculty members that are associated with the program are all highly qualified, competitive and productive. Faculty members seemed to be well familiar with the promotion process and the committee did not identify weaknesses or deficiencies in this regard. Faculty members have serious concerns about budgetary cuts that have led to a significant deterioration of the laboratory, hands-on components of the curriculum. There is a concern about inability to recruit high caliber young faculty to replace those who retire. Some faculty members hold the opinion that the growth and well-being of the BTP are adversely impacted by the lack of appropriate support from the university in terms of allocated funds and space. Some of the faculty members with whom the committee met expressed desires to enhance the curriculum by introducing advanced courses, such as nano-systems in biotechnology as well as some elements from the engineering aspects of biotechnology. In general the committee is under the impression that the faculty members that are affiliated with the program are satisfied with the program and with the students, both in the classroom and at the bench. The committee congratulates the program and the Faculty of Life Sciences for having excellent high caliber faculty members that are dedicated to promoting research and teaching at TAU.

Recommendation:

Intermediate (full implementation within 2-3 years)

- Find ways to enhance the financial support to the BTP in order to enhance the competitive edge of the program.

3.6.2 Students

The committee met with a few undergraduate and graduate students during its visit to the BTP. Students selected the BTP at TAU because of its research reputation. Information that was provided to the committee indicated that students that are admitted to the program

come with a high academic record from high school. The admission rate to the B.Sc. study program in 2008, 2009 and 2010 was 12.2., 9.8 and 10%, respectively; the average matriculation grade of the admitted students was 106-107 and their psychometric test score ranged from 680 to 695. Attrition rate in these years was 31, 5.5, and 25%, respectively and was attributed to inability of the first year students to attain the required academic accomplishments. In two out of the assessed years the attrition rate was high and the committee holds the opinion that the program has to develop understanding about the causes that have led to this phenomenon. Once the latter has been identified, remedial measures have to be introduced. The committee congratulates the program on attaining 0% attrition rate in the M.Sc. program.

The committee has found the students to be mature and enthusiastic about the BTP. Students expressed significant concerns and disappointment with the poor shape and lack of appropriate instrumentation in teaching laboratories. Students feel that they do not acquire enough tools to prepare them well for pursuing career in the biotechnology industry. In general they feel that the laboratory components that are included in the current curriculum of the B.Sc. study program are less than desired. Students feel that they need more training at the bench as well as training in advanced methods that are used in modern biotechnology.

Students shared with the committee information about the financial burden of living in the Tel Aviv area and the lack of sufficient financial aid from the university.

Graduate students have only limited opportunities to become employed as T.As. This, and the inferior financial support, in comparison to some other academic institutions, makes the program, in the student's view, less attractive and competitive.

Recommendations:

Immediate (full implementation within 1-2 years)

- Identify causes for high attrition rate during first year of study in the B.Sc. program and introduce appropriate remedies.
- Meet the expectations of students for more and enhanced lab courses in the B.Sc. curriculum

- Increase the number of TA positions and the level of financial support to both undergraduate and graduate students.

3.7. Research

The committee did not receive samples of M.Sc. theses and had no opportunity to review final reports of the undergraduate Research Projects or even a list of research topics. The committee reviewed the research accomplishments of 17 faculty members that are affiliated with the BTP and for whom the committee had updated C.Vs. During the years 2006-2011 this group of researchers published 324 peer-reviewed publications in different reputable journals that are relevant to biotechnology. Research activities of researchers affiliated with the program address current challenges and knowledge gaps in different disciplines related to biotechnology. The committee holds the opinion that in general the research that is conducted in the program is of very high quality and provides the BTP (and the university) with a clear competitive edge. The number of peer-reviewed publications per faculty ranged during these years between 5 and 63 and in most cases researchers published at least 2 publications per year. Information about research grants that had been awarded to the BTP's researchers during the assessed period of time was limited and did not allow the committee to address this aspect of the program.

The committee holds the opinion that the inter-departmental nature of the BTP at TAU and the fact that biotechnology researchers in TAU are distributed over the entire range of faculties and departments, call for establishing research groups that cross the departmental or faculty divides. These research-area focused groups will provide platforms where the academic strength, excellence and competitive edge of the program and its researchers can be highlighted. The research groups can also serve as axes around which BT-related research programs will evolve and to which graduate students will congregate. Establishing "across disciplines" and/or "across departments/faculties" research area-focused platforms, consisting of faculty members, regardless of their departmental affiliation, neither call for establishing new department nor involves modifying the structure of existing ones. The research area-focused groups will complement existing research collaboration avenues, will provide

additional means to enhance the level of dialogue among researchers, and are likely to enhance developing highly competitive research directions and programs. Similar collaborative research platforms have been successfully introduced at different reputable research universities in the USA and other places. From the broader point of view, the recommended platforms can allow the faculty and the university developing its “system-wide” BT-related research directions. A designed “system-wide” research platform allows enhancing the competitive edge of academic institutions and their respective departments. Such platforms and research groups have been increasingly become a pre-requisite for successfully competing on research grants awarded by highly competitive funding agencies such as NSF or NIH.

Recommendation:

Immediate (full implementation within one year)

- Establish well defined multi-disciplinary research groups/ area-focused groups of faculty members according to the identified strength and excellence in biotechnology-related directions.
-

3.8 Infrastructure

The committee had the opportunity to visit a typical class room, the library, teaching laboratories as well as research laboratories of a well established faculty member and a laboratory that is being renovated for a new recruited faculty member. In general, buildings that house the teaching and research facilities are more than 30 years old and require major renovation and updating. Research space and equipment in research laboratories of faculty members is appropriate and adequate and the university seems to invest significantly in providing promising new faculty recruits with infrastructure that is appropriate for establishing competitive research programs.

The committee is extremely concerned about the very poor condition of the teaching laboratories that it visited. Putting it in blunt terms, **it is beyond embarrassing that students studying at Tel Aviv University are being instructed in facilities that are**

categorically unfit. The infrastructure of the laboratories is already beyond the stage of deterioration, the analytical instrumentation and teaching means are either extremely outdated or malfunctioning. Information conveyed to the committee during its visit to the program indicated that in order to carry out experiments (during the lab sessions) students have (in many cases) to ask for favors and use equipment in research lab due to the fact that analytical tools that are available to them in the teaching laboratory simply do not work.

The committee considers this situation a major and significant weakness and deficiency of the program and holds the university responsible for this situation. The university has neglected the instruction infrastructure of the program! This situation has to be fixed without any delay.

Students and staff of the BTP do not enjoy access to a place where they can rest and have their lunch. The committee visited a “designated space” where research students are expected to spend their breaks and found it to be unfit, in more than one way; the designated space, in the corner of a building, has no air conditioning, is poorly furnished and is heavily populated by refrigerators and deep-freezers containing biological material and chemicals. The committee recognizes this situation as a significant deficiency that has to be addressed without delay.

Recommendations:

Immediate (full implementation within one year)

- The committee urges the university to immediately launch an effort directed at immediately renovating the teaching laboratories and re-tooling these laboratories with modern analytical tools, instrumentation and instruction means that are needed for conducting high-quality laboratory courses in concepts related to modern biotechnology.
- Without delay, provide students (and staff) with a properly furnished, quite, air-conditioned space where they can have their breaks and lunch.

3.9 Quality assessment

As explained in the introduction to this report, the documented self assessment of the

BTP consisted of an executive summary that was added to the 2008 Self Evaluation Report of the Faculty of Life Sciences. The information that the committee received was partial and fragmented and, included only limited information beyond what was included in the 2008 report. The latter has only limited relevance to the charge of the committee. Based on the information that has been conveyed to the committee, the process directed at self assessment of the BTP was very limited. The committee thus could not comment on the quality assessment process at the BTP.

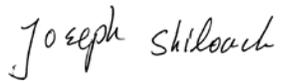
Signed by:



Prof., Moshe Rosenberg,
Chair



Prof. Gad Galili



Prof. Joseph Shiloach



Prof. Milica Radisic

Appendix 1: Copy of Letter of Appointment



May, 2012

שר החינוך
Minister of Education
وزير التربية والتعليم

Prof. Moshe Rosenberg
Department of Food Science & Technology
University of California, Davis
USA

Dear Professor Rosenberg,

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 Biotechnology and Biotechnology Engineering Studies.

The composition of the Committee will be as follows: Prof. Moshe Rosenberg (Chair), Prof. Gad Galili, Prof. Milica Radisic, Prof. Joseph Shiloach.

Ms. Yael Elbocher will coordinate the Committee's activities.

In your capacity as 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 Chair of this most important committee.

Sincerely,

Gideon Sa'ar
Minister of Education,
Chairperson, The Council for Higher Education

Enclosures: Appendix to the Appointment Letter of Evaluation Committees

cc: Ms. Michal Neumann, The Quality Assessment Division
Ms. Yael Elbocher, Committee Coordinator

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Appendix 2: Site Visit Schedule

Biotechnology and Biotechnology Engineering –Schedule of site visit- Tel Aviv University

Wednesday, March 21, 2012

Time	Subject	Participants
9:45 – 10:15	Meeting with the Dean of the Faculty of Life Sciences	Prof. Moshe Mevarech
10:15 – 10:45	Meeting with the Head of the Department of Molecular Microbiology and Biotechnology	Prof. Daniel Segal
10:45-11:30	Meeting with senior faculty and representatives of relevant committees (teaching/curriculum committee, admissions committee, appointment committee)*	Prof. Amir Sharon, Prof. Itai Benhar, Prof. Avia Zilbershtein, Prof. Amihay Freeman, Prof. Ehud Gazit
11:30-12:30	Meeting with Junior Faculty*	Dr. Avigdor Eldar, Dr. Tal Dvir, Dr. Anat Herskovits, Dr. Dan Peer
12:30-13:15	Opening session with the heads of the institution and the senior staff member appointed to deal with quality assessment	Prof. Aron Shai , Rector Prof. Dina Prialnik , Vice Rector Prof. David Horn , Head, Academic Quality Assessment
13:15-14:00	Lunch – closed meeting	Katzir Club, Green Bld.
14:00-14:45	Tour of campus (classes, library, offices of faculty members, computer labs etc.)	Prof. Moshe Mevarech
14:45-15:30	Meeting with Masters Students* ***	Up to 8 students
15:30-16:15	Meeting with PhD Students* ***	Up to 8 students
16:15-17:00	closed meeting of the committee	
17:00-17:45	Summation meeting with the heads of the institution, Faculty and Department, including the senior staff member appointed to deal with quality assessment	Prof. Aron Shai , Rector Prof. Dina Prialnik , Vice Rector Prof. David Horn , Head, Academic Quality Assessment Prof. Moshe Mevarech , Dean of the Faculty of Life Sciences Prof. Daniel Segal , Head of the Dept

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

** 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.