

The Hebrew University of Jerusalem
The Academic Program in Computational Biology
REVIEW COMMITTEE
Executive Summary

Thursday, December 8, 2005

The academic program in Computational Biology here called "the Program," was established in 2001 following an initial phase as a double major beginning 1999. Following the decision of the Rector and the Standing Committee of the Hebrew University, a Review Committee was called to review the Program and assess its success. The members of the Review Committee were: Prof. Ron Shamir (Tel Aviv University, Computer Science); Prof. Jeremy Smith (Heidelberg University, Computational Molecular Biophysics); Prof. Joel Sussman (the Weizmann Institute, Dept. of Structural Biology); Prof. Michael Waterman (Chair) (University of Southern California, Biological Sciences, Math and Computer Science). The Committee convened for four intensive days (5-8 Dec.), read and discussed material prepared by the Program Directors and other faculty involved. They interviewed the Program Directors, the Program's academic committee, the Dean of the Faculty of Science and the chairmen of the relevant departments. The Committee also met separately with several groups of students (undergraduates, graduates and Ph. D) of the Program, and faculty members of CS and LS.

Due to the explosive growth in quantitative biological sciences in recent decades there is a pressing and sustained need for highly-trained people to manage and analyze the large amounts of resulting data. To meet this need the Program Directors created an innovative, highly-successful elite program. The Program, which has particularly stringent entry requirements, attracts some of the brightest students to the Hebrew University. In addition to constructing a strong and coherent interdisciplinary program of courses the Program Directors have introduced an innovative research component as exemplified by the research seminar, retreats and individual projects, some of which have even resulted in high-quality research publications. The Program leads to a full CS degree allowing the graduates to successfully compete in the high tech industry or to go on to a higher degree. An essential component of the Program's success is the close personal student guidance provided by the Directors and Program staff. The selective character and challenging intellectual content has created an impressive *esprit de corps* among the students.

Further evidence of success is that the majority of the students that completed the undergraduate Program have continued on to graduate studies in various related fields. While a fraction of the students who begin the Program do not complete it, most of these transfer early and successfully to other programs without significant delay in their academic progress. The Masters Program has attracted only a small number (4) of these students, a fact primarily due to the structure of graduate student support at Hebrew University.

The committee congratulates the Program Directors for their tireless efforts in voluntarily building up this critical elite Program with very few additional or dedicated resources while simultaneously carrying out their normal duties. Hebrew University can take pride in this unique world-class Program which is one of the two premier undergraduate bioinformatics Programs in Israel. There is for example no such Program on Germany. The Program has now proven its worth and requires some specific measures to be undertaken to ensure its stability and sustainability. The most important of these measures are listed below:

Recommendations:

- 1) **Teaching credit.** Teaching by faculty members in this Program should be credited fully to their regular teaching load. A faculty member should receive full teaching credit whether the Program course is listed in their own or another department.
- 2) **Hiring new faculty.** At least three new faculty should be recruited from areas which are complementary to the interests of the present faculty. For example: Computational Genomics, Computational and Mathematical Systems Biology, Structural Bioinformatics, or Computational Genetics.
- 3) **Teaching Assistants.** The Program requires the allocation of four new Teaching Assistants dedicated to the Program, one to work in the Computational Bioskills Workshop and three to help in supervision of research projects. Allocation of these Teaching Assistants should be independent of the goodwill of the Departments.
- 4) **Masters Programs.** Recommend integration of the various Masters programs in Quantitative Biology (e.g. this Program (Computational Biology), Bioinformatics and Genomics, Proteomics) as separate tracks under a single umbrella. This will make the Programs easier to administrate, more attractive to students, and likely will reduce costs.
- 5) **Financial Support.** Secure dedicated fellowships for the top students in the Master level section of the program. Maintaining the student fellowships as well as special activities such as retreats is critical to the continued success of the program.
- 6) **Program duration.** Given the density of the program students should be given the option to extend the B Sc into the fourth year with minimal additional tuition cost.
- 7) **Program Content.** Some specific suggestions for streamlining and improving the program content are made in the full report.