STANFORD UNIVERSITY SCHOOL OF MEDICINE
DEPARTMENT OF DEVELOPMENTAL BIOLOGY
279 CAMPUS DRIVE

Matthew P. Scott
Professor
Investigator, Howard Hughes Medical Institute

Stanford, CA 94305-5329
TEL: (650) 725-7680 FAX: (650) 725-7739
E-MAIL: scott@cmgm.stanford.edu

November 13, 2003

Biocomplexity Faculty Search Committee
c/o Prof. Rob de Ruyter van Steveninck
Biocomplexity Institute
Indiana University
Swain Hall West 117
Bloomington IN, 47405-7105

Dear Dr. de Ruyter van Steveninck:

I am writing to recommend Dr. Aviv Bergman for a faculty position in your department. Dr. Bergman is the founder and leader of Stanford's Center for Computational Genetics in the Department of Biological Sciences. This center was founded with an external grant to support investigations at the interface of biology and genetics, and has been supported by Prof. Marcus Feldman, Aviv's thesis advisor, and others.

Dr. Bergman is a computational scientist with broad knowledge of mathematics, physics, and biology, especially evolutionary biology. I have spent many instructive and interesting hours talking with Aviv, and have followed his research on evolution and other topics. My own research is in developmental genetics and cancer, topics that frequently bring me to evolutionary questions. Advances in understanding the genetics of pattern formation have stimulated a great deal of theoretical modeling, and Aviv has been helpful to me in sorting out the wheat from the chaff.

Dr. Bergman's research has approached a number of fundamental problems in biology, including most recently evolutionary "canalization" (the tendency of species to maintain phenotype despite variations in environment and genes), statistically significant unusual protein sequences, microparasite population biology, genetic redundancy, the dependence of evolution on neutrality and accident, and territorial aspects of predation. This is a remarkable range, and it shows the broad applicability of Dr. Bergman's skills. I do not consider myself an expert in many of these areas, but the publications are mostly in distinguished journals and it is clear that Dr. Bergman is an exceptional computational geneticist. By working on many topics Dr. Bergman shows himself to be less focused on any particular problem, which could be viewed negatively. My own opinion is that part of what makes Dr. Bergman especially appealing as a prospective faculty member is that he will work well with people in a number of fields. A more highly specialized theoretician may bring distinction to a department, but at the cost of interacting usefully with rather few of its members.

Unlike some theoreticians, Dr. Bergman makes a major, and usually successful, effort to base his analyses firmly on experimental biology. His critical view of theoretical biology is refreshing and constitutes a foundation for his success. Whether the topic is neural nets, punctuated equilibria, or sine wave models of striped Drosophila gene expression, Dr. Bergman will identify the experiments that distinguish theoretical

models consistent with the data from those that contradict measurement and observation. This, in my experience, is unusual.

I think that the kind of skills and knowledge Dr. Bergman possesses will become increasingly essential as biology changes. Already quantitative data from many kinds of genomics experiments are so large and complex that the traditional types of analysis are simply hopeless—no person can comprehend the data enough to analyze them. Pattern recognition and statistics must be brought to bear, and many biologists are not adequately prepared to do such studies. For example we are about to be flooded with comparative genome sequence data, from which we all hope to understand how genes are regulated in cis and trans and how evolution acts upon gene control elements. Few people are equipped to do such analyses, but Dr. Bergman is perfectly prepared. Dr. Bergman is highly interactive and engaging, and will be the sort of faculty colleague who will strengthen the research of everyone around him. His numerous collaborations are an accurate indication of this ability.

As a senior research scientist, but not a regular faculty member, Dr. Bergman has been remarkably productive. He will be even more so when he takes on the full responsibilities accorded a faculty member, i.e. the opportunity to mentor undergraduate and graduate students and direct their research. Up to now his work has all been collaborations with people in other labs, though it's worth emphasizing that many of these projects were initiated by Dr. Bergman and would not have started without him. He drives projects forward in a good way. Although it will be great if one of the Stanford departments hires him, his work is close enough to that of others here that it seems more likely that he will go to a job elsewhere. Our loss, your opportunity!

In person Dr. Bergman is warm and congenial, curious and incisive. His enjoyment of the science is evident. Students like him. He will be a major factor in any biological sciences department that wants to strengthen their computational biology.

Sincerely yours,

Matthew Scott