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Dear Search Committee,

I am writing you with respect to Dr. Aviv Bergman who is being considered for a faculty position in your Department. Aviv has all the characteristics I would look for in a faculty colleague; he is very bright, productive, communicates well, has good interactions with others, and is a nice person. He has my extremely strong recommendation.

I first got to know Aviv about 10 years ago when he took a genetics course from me while he was a graduate student here. I was very impressed then with the depth and insightfulness of his questions. He moved away from Stanford after graduate school and we lost contact. When he returned to Stanford about five years ago we resumed contact and during the past three years have had extensive contact, since he has been doing bench work in my laboratory in collaboration with one of the postdoctoral fellows (Mark Siegal) and is in the lab part of nearly every day. In addition, Aviv and Mark have collaborated on theoretical/modeling studies and recently published 2 very nice papers in PNAS and Nature on some of this work. These papers concern canalization, a term coined by Waddington in the 1940s to describe the robustness of developmental systems to mutation. Waddington postulated that natural selection would favor canalized systems because phenotypes would depart less from their optimum, and his view has been widely accepted. However, Aviv and Mark showed by numerical simulation that canalization does not require selection, but instead emerges as a property of complex genetic networks that produce any phenotype.

Aviv has also presented his work in our lab meetings during the past couple of years, and so I have had the opportunity to hear him talk. It is on the basis of these interactions with Aviv that I write my recommendation. I am not competent to evaluate the larger body of Aviv's published work, as much of it is very far a field from my expertise; and for such an evaluation you will need to rely on others.

During the past few years I have come to appreciate Aviv not only for the strength and breadth of his own research program, but also because he is a wonderful person to have as a collaborator and resource. To cite but a few personal examples. During the past couple of years Aviv has (1) collaborated with me to develop the computational tools needed to test a hypothesis I had about gene evolution in Drosophila; (2) helped a postdoctoral fellow in my lab, who is molecular biologist/biochemist using DNA chip technology to find genes expressed differently in males and females, to develop computer programs that allow for the analysis of her data in ways we could not previously do and (3) is carrying out the experiments with Mark mentioned above to test theoretical considerations concerning the evolution of sex determination regulatory genes. This is a major long term (22 generation) experiment that is nearing completion and indicates that Aviv is willing and able to combine his theoretical strengths with experimental work. More generally Aviv's skill at seeing the questions others are dealing with in a quantitative fashion makes him an enormously valuable colleague, who can bring computational and mathematical skills to a wide range of collaborations that will materially enrich them and move them to new levels of understanding.

Indeed, much of Aviv's research involves multi-disciplinary approaches to outstanding questions in biology that are quantitative in nature and can be attacked by computational and mathematical, as well as experimental tools. One of his main strengths is the ability to take a topic or question from the natural world and simplify it sufficiently to approach it mathematically or computationally, yet to not simplify it so much that the substance and relevance of the original question is lost. To my mind this is a particularly valuable and needed skill at this time in the biological

sciences where we are more and more often requiring quantitative approaches, and frequently interdisciplinary collaborations with a quantitative component, in so many areas of biological research. It has been widely recognized that continued scientific breakthroughs and groundbreaking research in the coming decades will require multidisciplinary approaches in many areas of research. In the biological sciences a salient current example is provided by the need to understand and interprete the vast amounts of genetic information (both at the sequence level as well as the functional level) being generated by the various genome projects. It is apparent to all that these require advanced skills from the biological, mathematical, computational and engineering sciences. Continued scientific progress in many fields, ranging from natural to sociological and philosophical investigations, will likewise require the employment of multiple viewpoints and the development of appropriate methodologies to assemble them into a coherent form. Aviv's background and years of experience in physics, computer science, and evolutionary biology, puts him in an ideal position to carryout his investigations with a unique integrative approach where the development of methodologies is a guiding principle. Moreover, he is a very accessible person with the skills to bring quantitative approaches to collaborations with others in a wide variety of fields. Indeed his breadth of interests and outgoing nature make him a natural catalysis for such collaborations.

An additional very valuable skill of Aviv is in communicating. I have heard Aviv lecture and give scientific talks and he is not only always well prepared, but most importantly also very skilled at transmitting the nature of, and results from complex theoretical studies to a diverse biological audience.

Finally, I can add that Aviv is personally a wonderful person. He is very open and sharing with everyone from graduate students through faculty. He always seems to be able to make time for others, and it is stimulating and lots of fun to talk with him.

In summary, Aviv is eminently qualified for a tenured position at a major university and he has my strongest recommendation. I strongly believe he will greatly enrich your institution as he has Stanford.

Sincerely,

Bruce Baker

Bruce Baker
Morris Herzstein Professor of Biology