FOX CHASE
CANCER CENTER

Baruch S. Blumberg, M.D., Ph.D.
Senior Advisor to the President
Fox Chase Distinguished Scientist

215 728 3164
FAX 215 728 5310
bs_blumberg@fccc.edu

215 728 6900
FAX 215 728 3574
7701 Burholme Avenue
Philadelphia, Pennsylvania 19111

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

To Whom It May Concern:

I write to support the application of **Dr. Aviv Bergman** for a position at your institution. I have known Dr. Bergman for more than seven years. We have conducted collaborative research and taught together at Stanford University. I have also had the pleasure of many hours of discussion with him on genomics, evolution, and aspects of the early evolution of the genome. He is an outstanding scholar and scientist with very original ideas about the molecular aspects of evolution.

He has made several highly significant contributions to the field of evolutionary and systems biology. In his paper in the journal *Evolution* (2003) he discussed the evolution of prions as a mechanism for general evolvability. Aviv revived the important concept of introducing developmental processes to evolutionary dynamics. This work produced numerous publications most notably in *PNAS* (August 2002) and in the journal *Nature* (July 2003). The work is centered on the notion that most phenotypic traits are the result of complex networks of interacting genes, and that the constancy of phenotypic character within and sometimes between species is the result of the complexity of the interaction rather than the act of selection as has been assumed since late 30's. Aviv did not stop there but continues to tackle the issue using newly available large scale genomic data of the yeast knockout experiments. He showed that indeed, there is no need to evolve dedicated mechanism, such as the chaperon *HSP*90, as a buffering mechanism but most genes, by virtue of their being part of complex gene network, have the capacity to harbor genetic variation and reveal it when functionally compromised.

Aviv uses his theoretical and quantitative biological skills to exercise an original and ingenious approach to many problems in population biology and molecular evolutionary genetics. He is remarkably adept at using the genomic data bases to deal with issues that were approachable only with great difficulty before their availability. We have an ongoing project on the prevalence and significance of sequences with high homology to hepatitis B virus in the human genome and have found some very interesting associations. My interest in this problem developed while I was Director of the NASA Astrobiology Institute at the NASA Ames Research Center in California and became intrigued by the role of viruses in the early evolution of life on Earth and, possibly, elsewhere. HBV has interesting relations to the gender of infected individuals. For example, there is a higher sex ratio (M/F X 100) in the offspring of chronic carriers of HBV than in the offspring of infected parents who developed antibody against the surface antigen after infection. We are examining this phenomenon by identifying regions homologous with HBV sequences on the X and Y-chromosomes. Aviv brings to this problem exceptional technical skill as well as an exciting biological imagination. I could not have approached this project without his help.

These few examples illustrate Aviv's capacity to engage himself with novel ideas and illustrate his capability to not only talk about interdisciplinary research, but to actually do it. They also show his ability to identify and choose biologically interesting and relevant problems; design and execute mathematical and numerical modeling; and relate and interpret modeling results in a biologically meaningful way. Aviv has a broad and deep background in multiple disciplines ranging from physics through computer science to theoretical and experimental biology; he has been and will be a great collaborator with theoretical and experimental biologists as well as computer scientists.

I strongly endorse his application and know that he would be an important addition to the scientific strength of your institution.

Sincerely yours,

Baruch S. Blumberg, MD, PhD
Nobel Prize in Physiology or Medicine 1976