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

Sub: **Dennis Livesay**

Dear Professor de Ruyter van Steveninck,

It is a distinct pleasure to recommend Dennis Livesay for a faculty position in your Department.

Dennis was my graduate student at the University of Illinois, in the Chemistry Department. He joined my laboratory to carry out his thesis research in 1997. He came to UIUC with outstanding credentials.

Within one year of joining my group Dennis demonstrated his outstanding skills at scientific research. He expressed a strong interest in working on computational aspects of molecular recognition and began his research working on a model antibody-antigen complex system. Within a few months, he became proficient in the technique of computing pH dependent properties of proteins and characterized the pH dependence of complexation of lysozyme with the monoclonal antibody fragment D44.1. His work was published in *Molecular Immunology*. In collaboration with another graduate student, Dennis also carried out accurate calculations of association rate constants of an antibody-antigen complexation using a sophisticated diffusional simulation algorithm. This work has been published in the *Biophysical Journal*. In his next project, Dennis used simulation methods to characterize the conserved structural evolution of the enzyme superoxide dismutase and other enzyme families. In this work Dennis demonstrated through his calculations that despite large sequence variation and change in isoelectric point across species, the enzyme conserves the functional motif of positive electrostatic potential in the active site, which is responsible for steering the substrate the substrate to the enzyme. He further quantitated the rate constants across 7 species variants to delineate the diffusion-limited the encounter between the enzyme and the substrate. This manuscript has been accepted for publication in *Biochemistry*.

Continuing in the theme of sequence-function correlation Dennis explored a very interesting family of proteins to assess the leit motif for their function. The enolase superfamily of enzymes are present in all species and are key enzymes in metabolism. Dennis focused on the active site and demonstrated that the

evolution of these enzymes is driven by the acid-base functional motif that is responsible for catalysis. This paper has been accepted in Biochemistry.

To complete his dissertation, Dennis is currently exploring the important question of deciphering the antigen-binding motifs in antibody combining sites. Given the large repertoire of antibodies that cells produce in response to foreign molecules, Dennis asks the fundamental question what is common and what is different in producing selectivity and specificity in antigen association. His results will be significant for antibody design and choice. His manuscript on this is being reviewed in Journal of Molecular Recognition.

Dennis demonstrated that he was a truly outstanding graduate student in my group. It is to his credit that he graduated in 4 years time from Illinois. When he graduated Dennis was keen on teaching in a major undergraduate institution. He accepted a job offer from CalPoly in Pomona as an Assistant Professor.

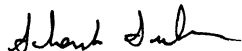
I have been in touch with Dennis since the time he joined CalPoly. He has been an incredible addition to the faculty in CalPoly. His Chair remarked to me that Dennis was absolutely the best addition to his Department in years! Dennis quickly became a great teacher and mentor! He obtained extramural research funding and with merely undergraduate students carried out exemplary research to win a "Protein Society" Poster Award. His research was on thermophilic proteins. Using a number of different methods, Dennis has gotten a very good understanding of sequence-function relationships in thermophilic proteins. Dennis has published several papers from Pomona along with his undergraduate students. It is remarkable given that all of this work was carried out by Dennis and his undergraduate students on top of the heavy teaching Dennis does!

Dennis has a large number of ideas and can make significant contributions in the interface area between chemistry, biology and computational science. His grasp of conceptual foundations of biomolecular structure and function is very sound and his quantitative approach to biomolecular problems makes him an extremely good researcher. Given this I suggested to him that he should consider the possibility of moving to a graduate institution where his full potential can be realized. Despite his lack of a postdoctoral stint, I believe that Dennis would make a superb faculty member pulling in a lot of graduate students and funding support and be enormously collaborative with other faculty. Dennis is a very good teacher. He is very good at articulating his ideas and brings passion to teaching.

Dennis will be a very good addition to your department and in my opinion your department will be enriched by the presence of Dennis Livesay. You will find him an exceptionally wonderful colleague. I urge you strongly to consider him. Should you have any questions, please do not hesitate to call me.

Best regards.

Sincerely yours,



Shankar Subramaniam