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

To the Search Committee:

This letter concerns Osamu Miyashita who is applying for a position in your institution. Osamu is a talented theorist with a deep understanding of theory and an appreciation of how theory can be connected to experimental results. I have known Osamu for a little over 3 years since he came to UCSD as a postdoc with Jose Onuchic. We have worked together on the problem of inter-protein electron transfer from cytochrome  $c_2$  to the bacterial reaction center (RC) using data obtained in my lab. He has attacked this problem with a wide range of computational skills; calculations to determine the optimal pathway for inter-protein electron transfer, molecular dynamic simulation to elucidate the molecular basis for the reorganization energy in the electron transfer step, an electrostatic calculations on the docking of the cytochrome prior to electron transfer. Osamu has good physical insight and strong computational skills and finds innovative approaches to obtain significant results. His latest project has been to analyze a large set of data obtained in our lab on the effect of charged mutations on the second order rate of electron transfer between the two proteins. He was able to search through the configuration space for the two proteins to determine an optimal configuration corresponding to the transition state. He found that the two proteins in the transition state are positioned with the contact

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points important for electron transfer in close juxtaposition and charged surfaces with close to optimized electrostatic interactions. He has done a detailed analysis of the electrostatic and solvation interactions between the two proteins and comparing the configuration in the transition state to the optimal electrostatic complex corresponding to an encounter complex. This work clearly assesses the factors that make this reaction extremely fast, with a rate constant close to the diffusion limit. Osamu deserves full credit for this work which he conceived and carried out entirely on his own. In addition to the work on electron transfer, he has also done important work in other fields. He has been on a project with Peter Wolynes on conformational changes in enzyme function and with Charles Brooks on modeling electron microscopy data. He has published a significant body of work for a young investigator and is only at the beginning of a very promising career.

On a personal note, Osamu gets along well with everyone and is a pleasure to work with. I am confident that he would make a strong contribution to the computational program in your department and give him my highest recommendation.

Sincerely,



Melvin Okamura  
Professor of Physics