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January 2, 2004

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

Dear Prof. Rob de Ruyter van Steveninck:

It is my pleasure to recommend **Vincent VanBuren** for an Assistant Professor of Computational Biology position in your department. I've known Vincent since 1995 when he entered our graduate program. As a graduate student Vince worked in my laboratory, where he applied computer and mathematical modeling to better understand mechanisms underlying microtubule assembly. These methods are well outside my area of expertise and therefore Vince received additional guidance from a long-time collaborator, Dr. David Odde, a Chemical Engineer at the University of Minnesota. While Dr. Odde provided some initial ideas and feedback, Vince developed almost all of the computational methods in his thesis with minimal input from myself or others. His thesis work has provided a unique contribution to the microtubule field and his 3 dimensional, mechanical model of microtubule assembly is light-years ahead of anything anyone else has attempted.

Microtubules are self-assembling polymers of tubulin subunits. At steady-state the polymer remains dynamic and can switch between phases of growth and shortening. Microtubules are hollow cylinders made up of 13 chains of subunits and structural constraints likely play important roles in regulating the assembly/disassembly process. The assembly process is therefore far from intuitive and well-suited to computer-based modeling. Vince's models address issues of energy minimization within the microtubule lattice, how conformational changes induce strain in the lattice and how transitions between growth and shortening occur at a molecular level. Vince devised methods to calculate bond energies within the microtubule lattice and the size of the stabilizing cap at the microtubule tip. This first part of his thesis was published in PNAS. The second model developed in his thesis is a 3 dimensional, mechanical model that takes into account the structure of the microtubule. A manuscript describing the results is in preparation (the slowness to publish this manuscript reflects the fact that the three authors are in three different locations). This latter model provides an explanation for the apparently paradoxical effects of taxol on microtubule assembly and structure.

In addition to his outstanding independent research, Vince was also an exemplary graduate student. He was supported by several highly competitive university fellowships including a Dean's Fellowship and the Aventis Fellowship. In addition, several years ago Vincent was called upon to step in and teach a 400 level course (graduate level) in Human Genetics after the professor suddenly fell ill. That my colleagues would ask Vince to teach an upper level course in an emergency is a testament to the high regard everyone in the department had for his abilities and intellect.

Vince has clearly demonstrated skills in applying computational algorithms to problems in molecular cell biology and has furthered his skills in bioinformatics through his postdoctoral research. Vince is an extremely gifted individual and I believe that he has a bright future ahead of him. Finally, Vince is a pleasure to work with and a terrific person. Please feel free to contact me if you have any questions.

Sincerely,

A handwritten signature in black ink that reads "Lynne Cassimeris". The signature is written in a cursive, flowing style.

Lynne Cassimeris, Ph.D.  
Associate Professor  
Biological Sciences