

Luce Scholars Committee

Dear Sirs:

It is a pleasure to write a letter supporting Jane Smith's application for a Luce Scholarship. Jane was my student in an advanced course in Evolution; she also worked as my field assistant in Summer, 1994 and Summer, 1996. Jane then carried out her senior honors thesis research under my direction; her work on the thesis included 7 weeks of field work on Isle Royale, a wilderness National Park in Michigan, and an academic year's work on molecular biology in the laboratory.

Through all this I've come to know Jane well, and this letter is perhaps too long because I have had extensive contact with Jane in the classroom and as an advisor. But my overall message is that I think that Jane is an extraordinarily strong candidate for a Luce: she has a very unusual combination of academic talent, resourcefulness, and enthusiasm for independent research. Jane is very adaptable to uncomfortable living situations and has a talent for learning in novel situations. She interacts very well with people and naturally takes to leadership roles, yet she is clearly thoughtful and introspective about her experiences. Jane has invested substantial time and planning to gain international experience, and she has already used travel experience very well, getting to know some of the people and natural history of East Africa during her semester abroad.

Academic Performance

Jane's academic performance is excellent. The evolution course focused on recent literature, which included many highly quantitative papers. In class discussion, Jane stood apart in the quality of her questions about the papers: whereas most of the discussion centered on clarification issues, Jane often asked more penetrating questions about the design of the research papers, and about where the research is going. Jane's written essays for the course were models: concise, well organized, and at a high level of critical analysis. Her final paper was the best in the class: Jane extracted gene sequence data from GenBank for a group of *Heliconius* butterflies, and used phylogenetic inference programs to show that species diversification within the genus is associated with the systematic structure, indicated by subgenera, of passion flowers, *Passiflora*, the host food plant. Jane's paper was a joy to read - she stated a clear hypothesis, and tested her idea with skillful analysis and use of the literature.

Jane's capacity for independent work is extraordinary - she ranks at the very top of the students that I have supervised in 18 years at Williams. I first became aware of this as Jane worked for me as an assistant. More recently, as I've watched her design her own projects, I've become particularly impressed by her talents for framing testable ideas, and for devising projects that have a solid prospect for success. We all work hard to teach students to motivate their work in terms of hypotheses that are of general importance, and this is a difficult thing to do. But Jane is so good at it that I find myself using her work as a model!

Jane began working with me on the evolution of phenotypic plasticity in tadpoles in the summer after her freshman year. Although only a freshman, Jane was one of my very best field assistants: she always had critical questions about the experimental designs, and she collected first-rate data on tadpole demography and growth; Jane also worked on a project on protozoan community structure, teaching herself over 70 protozoan taxa, and she then censused the effects of nutrients and tadpoles on protozoan community structure. The tadpole work included the problem of measuring tadpole morphology from video images, and using the images to identify known individuals. Jane devised and tested a series of methods for obtaining and cataloguing morphometric measurements; her work was extremely carefully done and well documented, and I anticipate that the results will be published. Though all this work, Jane has been a marvelous student to supervise: it has been a pleasure to watch her work out solutions to difficult research problems, then carry through with a thorough and careful analysis of data to arrive at a clean and well documented result.

Jane's thesis work was of extraordinarily high quality. Jane successfully carried off an ambitious experiment in the field; the work required continual trouble-shooting and thinking about the design, and Jane was able to do this with far less supervision than any of the students I have had in the past (many of these students were excellent themselves). Jane's work in the laboratory has been the best in our lab: she is careful and thoughtful, yet very persistent. The DNA analyses that we are doing are intricate and require patience and attention to detail, yet Jane's experiments virtually always worked - this is highly unusual. We are currently revising her thesis results for publication, and I have no doubt that they will be accepted for publication.

Career Interest

It has been clear throughout Jane's work at Williams that she has a sustained interest in evolution, and in continuing towards excellence in research and teaching. Jane has maintained her work in ecology and evolution without a break since her first year at Williams. After graduation, she returned and worked in the laboratory on molecular genetics work; and she is now helping with research in the Peruvian Amazon. She is single minded and remarkably motivated in her pursuit of her career goals, and I am confident she will achieve a very high level of excellence.

Leadership Potential and Sensitivity to Others

Jane works well with other students. She tends to take on a leadership role in working groups, guiding the other students in framing questions, gathering data, and evaluating the results. I've seen this happen with two groups of students- and the other students in these groups were themselves highly selected, and very strong academically and highly motivated to do research. Our current group of students (doing research on Isle Royale, supervised with Professor Joan Edwards) is working on a set of projects which have quantitative genetics as an important part of its theoretical basis. Jane has worked through the classic reference on quantitative genetic theory on her own (no mean feat in itself), and in the process she has pulled the other three students along with her, organizing a weekly discussion group that met during the last half of the summer.

Jane was remarkably skilled in working with others in our research group; she listens carefully to their ideas and communicates very easily and well. She is very open to criticism, and she is easy to interact with.

Jane speaks well in front of groups. She presented her thesis research to the Biology Department, and I think her talk was by far the best among the talks given by Honors Students: she linked her general statement of purpose to her specific experimental designs in an unusually clear way, and her explanations were lucid and easy to follow.

Proposed Work in Asia

Jane's proposed project in Asia looks solid: she would benefit substantially from exposure to Asia, and she would synthesize her work there with her previous experiences in other tropical areas, in Africa and South America. East Asia has remarkable biological diversity that is currently under tremendous pressure, and an opportunity to see this diversity first hand would provide substantial potential for Jane's intellectual growth.

Overall

I recommend Jane enthusiastically and without reservations. Jane's academic performance has been excellent. But I think that her greatest strength is that she has a clear aptitude and enthusiasm for independent work. I have had no other research student at Williams in 18 years equal the way Jane combines academic abilities with a talents for taking advantage of independent research opportunities (and many of the students that I have had over the years have been impressive). Jane's proposed focus in Asia brings together a number of themes that she has developed in a sustained way throughout her time at Williams. Jane's project is carefully thought out and original, and I have absolutely no doubt that Jane has the talents to benefit tremendously from the opportunity that a Luce Scholarship would provide.

Yours sincerely,