

Chemical Engineering
 Phone [REDACTED]
 Email [REDACTED]

November 1, 2015

 Faculty Search Committee
 Department of Chemical Engineering
 [REDACTED]

Dear Faculty Search Committee,

I am writing to apply for the position of Assistant Professor in the Department of Chemical Engineering at [REDACTED]. I believe that my background in chemical biology and polymer science will allow me to build an innovative research group at [REDACTED]. My research focus on developing macromolecular chemical tools to study important, fundamental questions in biology will help [REDACTED] attract a diverse group of talented, motivated students and strengthen its already world-class program. In addition, my enthusiasm for mentoring and teaching will help develop students into independent scientists and, more broadly, encourage them to pursue careers in science-related fields.

broader impact

My research interests are at the intersection of chemistry, biology, and materials science and are motivated by a goal to improve human health. I earned my Ph.D. in Chemistry at [REDACTED] in the laboratory of [REDACTED]. For my doctoral research, I developed bioconjugation reactions for the selective modification of proteins and created new targeted imaging agents based on virus-like particles for the detection of cardiovascular disease. To broaden my training to include an engineering perspective, I decided to pursue postdoctoral research with [REDACTED] in the Chemical Engineering Department at the Massachusetts Institute of Technology. As a postdoctoral fellow, I have focused on determining the principles that govern the liquid-liquid phase separation of proteins with oppositely charged polyelectrolytes and applying this coacervate phase to create biocatalytic coatings.

academic pedigree

Unique background

shows breadth of projects and approaches

branding again

In my independent career, I plan to draw on my training in both chemical biology and polymer science to create new protein-based materials to study and modulate the immune system. My expertise in protein modification, materials synthesis and characterization, and cell culture will enable me to accomplish the proposed research program. The highly interdisciplinary research program I have proposed will provide both chemical insights into protein-polymer hybrid materials and excellent training for students. Specifically, research within my group will create a tag for protein self-assembly to purify proteins and create synthetic vaccines (proposal 1), polymeric photoswitches to control cytokine signaling (proposal 2), and biomimetic antimicrobial peptides to function as dual-action antibiotics (proposal 3). Together, these avenues of research will produce novel protein materials and an enhanced understanding of the interplay between components of the immune system.

application

fundamental science

I believe that my proposed program of research will complement the active areas of research in your department and will thrive at [REDACTED]. In particular, the [REDACTED] will equip my group with the infrastructure and expertise needed to accomplish our research goals. I am excited about the possibility of working with and learning from colleagues who are creative scientists and dedicated mentors. "I will fit into your department"

be quantitative

I also genuinely enjoy teaching and mentoring students. I have had the opportunity to mentor several students who have become productive independent scientists capable of designing and performing their own experiments. This experience has solidified my desire to lead a group of scientific colleagues. At [REDACTED] and [REDACTED], I also gained valuable experience teaching a range of courses, which resulted in recognition with two teaching awards. My interdisciplinary background will allow me to teach multiple courses in the department.

Enclosed are my curriculum vitae, summaries of my previous research and proposed research plans, a teaching philosophy statement, and representative publications. Letters of reference will be provided by my research advisors and mentors: Profs. [REDACTED], [REDACTED], and [REDACTED]. Thank you for your time and consideration of my application.

Best regards,