Protein Drug Discovery & Development
Postdoctoral Research Opportunity

The lab of Dr. Pete Heinzelman in the University of Oklahoma School of Chemical, Biological & Materials Engineering has biopharmaceutical engineering research opportunities for a motivated postdoctoral researcher who would like to translate their life science research experiences and skill set to the development of novel protein drugs. A chemical engineering background is a strong positive but not required; we are more focused on what new team members will achieve going forward than on what nomenclature might be attached to prior experience.

We apply the methods of protein engineering in developing novel biopharmaceuticals that will improve the lives of persons afflicted with Alzheimer’s Disease (AD), cancer, diabetes, and other conditions. Several facets of this research are enabled by our utilization of high-throughput screening platforms for performing in vitro laboratory directed evolution of new proteins with increased therapeutic efficacy. Pursuit of these objectives takes place in an intense and invigorating environment of discovery and possibility modeled after the research settings that I have been fortunate to experience during my time as a postdoctoral fellow at Caltech, a graduate student at MIT, and an undergraduate at The University of Wisconsin-Madison. We are seeking to add a postdoctoral team member who wants to help grow this environment while acquiring new skills that will help them make an impact in the biomedical arena both during their time as a member of our team and beyond. There are opportunities for a postdoctoral researcher to help us reach our goals in the context of four well-defined projects, with the door always open to turning a new idea into that next research initiative-

Blood Brain Barrier-Traversing Alzheimer’s Disease Therapeutics: One-half of persons beyond the age of 85 are stricken by AD, with the annual economic impact of this condition in the US alone exceeding $100 billion. As the population demographics of the US and other developed nations continue shifting toward more elderly persons, the number of individuals suffering from AD, and the cost of helping them maintain their quality of life, will only increase from already staggering levels. We are applying a unique new approach to develop therapeutic proteins that efficiently move from circulation to brain tissue and can provide AD patients with high levels of therapeutic efficacy. These evolved BBB-traversing biopharmaceuticals can also find clinical relevance in treating a range of other nervous system disorders.

Whole Cell Therapeutics for Cancer Therapy: Utilization of reprogrammed immune cells in cancer therapy has yield exciting results; some cell-based cancer treatments lead to positive outcomes in over fifty percent of patients. Regardless of these successes, whole cell therapies have not reached their full potential in improving the lives of those stricken with cancer. We are using a novel method for engineering cell-activating proteins to develop new cell circuitry that allows transplanted immune cells to mount highly specific and robust responses against tumors in vivo. This engineered circuitry will lead to the development of new immune cell-based cancer therapy regimens that have both greater antitumoral impact and fewer side effects than current treatment programs.

Tumor-Sensing Proteins For Chemotherapeutic Delivery: Regardless of whether the active agents are whole cells, proteins, or small molecules, attenuating tumor growth and metastasis without harming normal cells is one of the greatest challenges in cancer drug development. We have identified a class of proteins that are highly sensitive to conditions unique to the tumor microenvironment and are engineering them to accumulate in tumors while having low propensity to enter healthy tissues. These tumor-sensing proteins can act as vehicles for specific delivery of anti-tumor small molecules to neoplastic tissues, halting tumor growth without eliciting the negative responses caused by standard chemotherapy.

Orally Available Protein Therapeutics: Although the ability to engineer and optimize protein drugs has advanced tremendously over the past twenty years, the predominant mode of administration, i.e., injection, has not changed. We are applying a novel engineering approach to develop protein drugs that can both survive the protease-rich, acidic environment within the stomach and efficiently move across intestinal endothelium to enter the bloodstream. Our strategy for developing such highly transported therapeutics is generalizable and could thus greatly simplify administration of protein drugs for patients with a wide range of health conditions that are currently treated via protein injection.

I emphasize team member professional development and encourage researchers to not only vigorously pursue existing project objectives but to expand and take ownership over them based on their own personal visions. Team member development is further fostered by making participation in conferences and involvement in collaborative research key parts of team member experiences. With respect to compensation, I make certain that it is highly competitive and reflective of appreciation for high level performance.

We are eager to add a motivated postdoctoral researcher who could begin as soon as January of 2014. I ask that interested candidates not put off contacting me via email – proteinpete@gmail.com. I’m excited about the multiple avenues by which an enthusiastic postdoctoral fellow can contribute to this research group and am eager to hear from you!