

The Department of Biomedical Engineering
Cordially invite you to the 2008

Ben W. Zweifach Lecture
“Enzyme Innovation by Evolution”



Frances H. Arnold

Scientists’ dreams of constructing new forms of life—either to enhance human well-being or just to prove that we can do it—are somewhat grander than the reality, because we are profoundly ignorant of the mapping from DNA sequence to biological function. Details of molecular interactions rule function, and we just don’t understand the details. For forward engineering of biological systems, I argue that we should look to the design algorithm that has produced the entire biological world: evolution. This simple algorithm works at all scales of complexity, from single proteins to ecosystems, and can be ‘directed’ by controlling the molecular diversity (mutations) and applying artificial selection.

By emulating evolution in the laboratory we create new, finely-tuned biological molecules that exhibit desired properties. And, by uncoupling evolution from biological function, we can explore what is physically possible versus what is merely biologically relevant at the time. These experiments provide insight into the remarkable ability of biological systems to evolve and adapt, and may help us understand how today’s proteins came about.

The City College of New York
Shepard Hall, Room 95
Convent Avenue and 138th Street

Wednesday, September 17th, 2008
at 3:00 PM

Reception in Steinman Exhibit Room to follow