

Chemical Engineering

seminar

Building with Solid-binding Proteins: From Hybrid Nanostructures to Protonic Devices

February 29 at 10:30am in BDBB 105

abstract

The remarkable diversity of forms and functions found in nature has inspired countless generations of scientists. However, only recently have the building blocks of life been repurposed to build functional architectures that harness the attributes of the nanoscale while bridging lengthscales. By engineering solid binding peptides selected by combinatorial techniques within the framework of larger proteins, it is possible to construct “designer” polypeptides that combine inorganic binding or inorganic mineralization activity with the original function of the host scaffold. Here, I will illustrate how such chimeras can be used to fabricate useful hybrid nanostructures and how progress in computational protein design and biomimetic control of proton transport and energy conversion might prove useful for the production of complex systems that seamlessly interface with biology.

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biosketch

François Baneyx is the Charles W.H. Matthaei Professor and Chair of the Department of Chemical Engineering at the University of Washington. He previously served as Director of the University of Washington Center for Nanotechnology, Site Director of the Pacific Northwest node of the NSF National Nanotechnology Infrastructure Network (NNIN) and Co-Director of the NSF MRSEC Genetically Engineered Materials Science and Engineering Center (GEMSEC). Dr. Baneyx earned a Ph.D. in Chemical Engineering from the University of Texas at Austin and joined the University of Washington in 1992 after postdoctoral work in molecular biology at DuPont. His research interests are highly interdisciplinary and lie at the confluence of biotechnology, nanotechnology, materials science and molecular engineering. He is an elected Fellow of the American Association for the Advancement of Science, the American Institute of Medical and Biomedical Engineering, and the American Academy of Microbiology.

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