Center for Biopolymers at Interfaces

Mission

To perform basic research on the interactions between solid surfaces and biological macromolecules in solution, and to apply the findings to the design of new materials, including: biocompatible polymers, diagnostic devices, surfactants, and highly selective biopolymer separations products.

Measurement of surface fluorescence are useful for the development of diagnostic products.

The Center

The Center for Biopolymers at Interfaces (CBI) began its formal operation in 1986, joining together University of Utah faculty members with a common interest in surface characterization, interaction of proteins and nucleic acids with artificial surfaces, and the ultimate use of such surfaces as biomaterials and biosensors. The Center thus became a natural extension of the Artificial Organ tradition at the University. In 1991, CBI was given Distinguished Center of Excellence status by Utah Governor Bangerter. The Center is supported in a major part by corporate membership dues. More than 30 national and international corporations have held CBI membership over the years.

TECHNOLOGY TRANSFER:

Center research has resulted in about 40 patent disclosures to the University Technology Transfer Office. Of these, 12 have led to patents that have been issued or are currently pending. Two spin-off companies have been created based on center technology. Publications of Center sponsored work are currently numbering in excess of 150 documents. In addition, CBI's academic accomplishments include 16 doctorates and ten masters degrees.

Center Services

The Center maintains several state-of-the-art analytical laboratories, or facilities, that provide services to faculty and industrial members, as well as to external customers. The capabilities of these facilities include:

- Surface characterization by means of ESCA as well as static and dynamic contact angle; surface and bulk fluorescence spectroscopy and surface IR spectroscopy for the study of protein absorption and the resulting confirmational changes; and STM and AFM capabilities for the analysis of surface modification and biomolecular adhesion.
- Surface modification by means of plasma treatment; covalent attachment of proteins to surfaces, e.g. for immunosensing or diagnostic applications; and polymer coating of surfaces to enhance biocompatibility.
- Identification and quantification of protein deposits on synthetic materials via 1-D and 2-D electrophoresis, amino acid analysis, ELISA, and isotope labeling.
- Determination of colloidal sizes, size distribution and surface charge, emulsion characterization as to size, size distribution, stability, and composition.
- Protein stability evaluation by calorimetry and drop volume measurements.
- Protein and polymer visualization by molecular graphics and simulation of molecular dynamics.
- In vivo, ex vivo, and in vitro evaluations of biocompatibility.

For more information, please contact:

Dr. Karin D. Caldwell
Center for Biopolymers at Interfaces
2280 Merrill Engineering Building
University of Utah
Salt Lake City, Utah 84112