Interactions between the HIV-TAT transduction domain and cell membranes

ABHIJIT MISHRA, University of Illinois, Department of Materials Science and Engineering, GERARD WONG, University of Illinois, Department of Materials Science and Engineering, Department of Physics, Department of Bioengineering — Biologically active molecules such as proteins and oligonucleotides can be transduced into cells with high efficiency when covalently linked to a Protein Transduction Domain (PTD), such as the TAT domain in the HIV virus. All PTDs have a high content of basic amino acids resulting in a net positive charge. Electrostatic interactions between cationic PTDs and the negatively charged phospholipids that constitute the plasma membrane are likely to be responsible for peptide uptake, but no detailed structural studies exist. We compare membrane structures induced by the cationic TAT domain and those induced by other cationic polypeptides as a function of membrane composition using synchrotron x-ray scattering, and examine possible mechanisms of the anomalous transduction.

Abhijit Mishra
University of Illinois, Department of Materials Science and Engineering

Date submitted: 07 Dec 2005

Electronic form version 1.4