



Stockholm Center for Biomembrane Research

Dept. Biochemistry & Biophysics

2-3 open PhD student positions: Theoretical studies of membrane protein structure & function

Application closing date: March 31, 2006

Starting date: Spring 2006 (flexible)

Up to 30% of eukaryotic genomes code for proteins associated with cell membranes. They are particularly interesting in biochemistry, since they control important biological functions like ion balance and molecular transportation. Some estimates suggest, as much as 75% of proteins targeted by the pharmaceutical industry are membrane proteins. Despite this prevalence, little is known about membrane proteins, and they are scarce in the databases. Improving our understanding of their structure and function is thus an extremely important research area. Candidate projects for new students include:

- **Structure and Function of Ion Channels**, using molecular simulation as well as bioinformatical methods to understand the molecular function of ligand- and voltage-gated channels, and how they differ between species.
- **3D-modeling of Membrane Protein Structure**, in particular developing implicit membrane potentials for scoring and ranking quality of models.
- **Studies and Prediction of Membrane Helix Dimerization**, particularly model systems such as GlycophorinA, using simplified models to predicts interaction surfaces and free energies.
- **Mapping and Prediction of Interactions of Large Membrane Proteins**, primarily with bioinformatics. Examples include prediction of membrane-exposed residues, helix-helix surfaces, and calculation/prediction of interaction sites.

The students would join the Lindahl/Elofsson theoretical groups (currently 10-12 PhD students) at the brand new Center for Biomembrane Research, which also hosts several experimental labs that we collaborate closely with. PhD studies are performed either at 100% (4 years) or 80% (5 years), and are financed with a mix of "utbildningsbidrag" and salary.

Successful candidates are expected to hold degrees in physics, chemistry, molecular biology, or other natural science area with reasonably high grades. Familiarity with biological questions, UNIX computer systems and particularly programming are highly desirable. Submit your application in English or Swedish to Erik Lindahl, Stockholm Bioinformatics Center, Stockholm University, SE-106 91 Stockholm. Please include:

- An application letter stating your background research interests (1 page)
- Brief CV (1 page)
- A copy or preprint of your diploma work ("exjobb")
- A transcript/summary of courses and grades in your undergraduate degree
- Name and contact info of at least one reference, or a letter of recommendation

For full consideration, applications must reach SBC on or before March 31, 2006. Applications by electronic mail are encouraged, provided they are sent either as PDF documents (preferred) or in clear text, but *not* word documents. For more information about the group's research, suggested projects, and the PhD program at the department, contact Erik Lindahl: lindahl@sbcsu.se .