Examensarbete

In vitro evolution of protein stability

A fundamental problem in protein science, biomedicine, biotechnology and the pharmaceutical industry is to develop proteins with increased stability. For example, proteins delivered as drugs must maintain their functional form at elevated temperatures and when formulated in drug delivery systems. Enzymes used in biotechnology have to have increased stability to function in harsh conditions. In our lab we are designing proteins from scratch using computational protein design. Many of these designed proteins are only marginally stable and needs to be improved.

Currently there exist methods to stabilize proteins with enzymatic functions or with certain characteristic reactions. However, for a vast number of proteins there is no general method to improve their thermodynamic stability.

In this project you will develop a novel method to evolve proteins with higher stability using laboratory evolution and a new screening system. You will then apply the method to stabilize a protein with limited stability.

In this master thesis project you will learn:

I) Advanced methods of DNA manipulation
II) Biophysical characterization of protein stability
III) Image analysis

Don't hesitate to contact me, ingemar.andre@biochemistry.lu.se, for further information about the project!