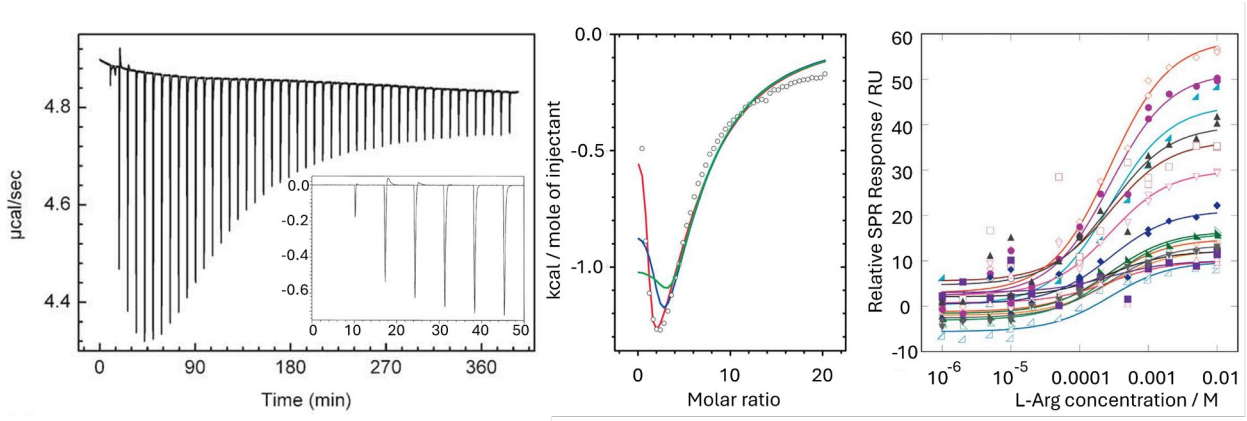
PhD course in Biophysical Chemistry (3 ECTS)

Ligand binding theory and practice

Time and location:	March 24-28 2025
Location:	Lund University, Chemical Centre, room K:W
Instructor:	Professor Jannette Carey, Chemistry Department, Princeton University, COMMONS-affiliated guest professor at Lund University
Course format:	Lectures at 8-12 each day of the week, and problem sets
Literature:	Hand-outs from book: Ligand-Binding Basics, J. Carey, Wiley
Examination:	hand-in of problem sets
How to sign up:	Send an email to jcarey@princeton.edu

The course will give a comprehensive introduction to the quantitative theory of molecular interactions ("ligand binding") applicable to any chemical or biochemical system. This basic-level course is suitable for beginning graduate students or advanced undergraduate students in any study field in science and engineering, requiring only general chemistry as preparation.



Learning outcomes:
The course is intended to equip students with the following skills that they can apply in their own work on ligand binding or to published results they must rely on:

- use basic chemical principles to derive equations describing binding processes;
- correctly plot binding data and its errors;
- use graphical analysis to interpret binding data;
- calculate predicted binding isotherms;
- simulate and fit binding isotherms;
- identify, diagnose, and evaluate random and systematic errors in binding data; and
- quantify affinity, specificity, stoichiometry, and cooperativity of binding processes.

The relationship between cooperativity and allostery will be discussed, and a historical and mechanistic perspective on allostery will be introduced that will integrate structural, dynamic, and thermodynamic viewpoints.