



Date: April 25-27, 2012 (Wednesday 13.00 h - Friday 16.30 h), Registration until April 01, 2012  
Location: Université de Genève, Science III, Room TP 0035

## Biophysical methods (ITC, MALS) to study protein - ligand interactions

Dr. Markus Kaufmann, Département de Botanique et Biologie végétale,  
Bio-molecular Analysis Platform, Université de Genève

**Course objectives:** Modern molecular biological research methods will require the quantification and the qualification of protein - ligand interactions. Students will get hands on experience on two of the state of the art biophysical methods to study molecular interactions: ITC (Iso-thermal titration calorimetry) and MALS (Multi-angle light scattering). They will learn the theoretical background and the knowledge to successfully plan experiments. Participants will learn the scientific value of this data and how it complements research in plant biology. The course is also of particular interest to researchers that start working with recombinant proteins or intend to use biophysical methods to characterize biological systems.

### Course content:

- 1) **Biophysical methods ITC micro-calorimetry and MALS light scattering:** ITC and MALS are two state of the art biophysical methods to quantify and qualify molecular interaction. Interaction data generated with ITC micro-calorimetry are based on the analysis of the heat of interaction. MALS light scattering in combination with SEC (Size exclusion chromatography) will allow you to analyze the molecular mass, the oligomeric state of a protein or protein complex in solution and to perform sample quality control. Sample preparations, experiment demonstration, data analysis (Stoichiometry and the binding constant or Mw determination) build the practical part. Guidelines for sample requirements, experimental set-up, theoretical background and an introduction to complementary methods to quantify interaction and the size of molecular complexes will be presented. Expert guest speaker on ITC.
- 2) **Challenges in recombinant protein technology - protein complexes.** Knowledge in producing proteins for biophysical, structural and biochemical studies will be discussed.

**Guest lecturer on ITC:** PD Dr. Ilian Jelezarov, Dept of Biochemistry, University of Zurich

**Credit Points:** 1 CP (min 24 hours/max. 30 learning hours including homework) for Ph.D. students of the Swiss Plant Science Web. Individual performance and assessment: Active participation during hands-on training and data analysis; group project and discussions in theoretical part. Contact Melanie Paschke (email: [paschkme@ethz.ch](mailto:paschkme@ethz.ch)) to see if the credit points will be accepted by your particular Ph.D. program. For questions about the workshop, contact Markus Kaufmann ([markus.kaufmann@unige.ch](mailto:markus.kaufmann@unige.ch)).

**NB** Participation will be limited to 8(-10) people; and an abstract with motivation to do the course is required for registration. Preference will be given to motivated individuals from different research groups of the SPSW and CUSO doctoral program. Cancellation fee after April 10, 2012: CHF 50.