



Date: June 15 - June 17, 2011 (3 days)

Location: Science III, Room 0075, Universit  de Gen ve

Registration until May 25, 2011

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

**Dr. Markus Kaufmann, Dept. de Botanique et Biologie v g tale,  
Bio-molecular Analysis Platform, Universit  de Gen ve**

**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. Further participants will learn the scientific value of this data and how it complements research in plant biology.

### **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 and the oligomeric state of a protein or determine the presence of a protein complex in solution. Sample preparations, experiment demonstration, data analysis (Stoichiometry and the binding constant or Mw determination) build the practical part. Guidelines for sample requirements and 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 protein complexes for biophysical, structural and biochemical studies will be communicated.

**Individual performance and assessment: Active participation during hands-on training and data analysis; and group discussions in theoretical part.**

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

**Credit Points:** 1 CP (in total min 24 hours/max. 30 learning hours including homework) for Ph.D. students of the Swiss Plant Science Web. 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 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. Cancellation fee: CHF 50. A second workshop on the methods by the Bio-molecular analysis Platform of the SPSW will be organized later this year at the University of Lausanne.