

# ACTIVITIES, EQUIPMENT AND FACILITIES

The **Macromolecular Interaction Analysis Unit** is available for scientific collaborations or for fee-for-service by the university community and by biotechnological or pharmaceutical companies

## ANALYSIS AVAILABLE:

**SPR or MST analyses of interactions with measurements of kinetic parameters:** association and dissociation rate ( $K_{on}$  and  $K_{off}$ ), kinetic and steady state dissociation constant ( $K_d$ ).

**SPR or MST analyses of drug/target interactions:** direct interaction with measurement of kinetic parameters or competition experiments with calculation of the inhibitory potency ( $ID_{50}$ ) of the drug on the target ligand/receptors interaction.

**Characterization of the biological consequences of the interactions analyzed:** in vitro cell culture assays, *ex vivo* assays for endothelial physio-pathology, oncology and cardiovascular diseases.

## EQUIPMENT AND FACILITIES:

At the **Macromolecular Interaction Analysis Unit** are operative one **SPR BIACORE X-100** apparatus and one **MST MONOLITH NT.115** apparatus fully equipped with dedicated software for macromolecular interaction analysis.

**Sample handling:** automatic, 15 samples max, 24 h unattended operation  
**Molecular Weight (MW) detection:** Down to 100 Da  
**Refractive Index range:** 1.33-1.40  
**Sample Volume:** 20 to 30  $\mu$ l  
**Sample Type:** LMW drug candidates to HMW macromolecules and viruses  
**Analysis time per sample:** 5 min-1 h  
**Detection limit:** 0.1 nM for  $>10.000$  Da  
**Association range constant:**  $10^3$ - $10^7$   $M^{-1}s^{-1}$   
**Dissociation range constant:**  $10^{-5}$ - $0.1$   $s^{-1}$   
**Flow rate range:** 1-100  $\mu$ l/min  
**Analysis temperature:** 4 - 40°C  
**Reference subtraction:** automatic  
**Number of flow Cells:** 2  
**Baseline Drift:**  $<0.3$  RU/min  
**Baseline Noise:**  $<0.1$  RU



**BIACORE X-100**

**Maintenance free instrument:** MST is a contact-free optical technology which does not require liquid handling or fluidic system checking  
**Buffer independency:** even serum or cell lysate  
**Sample handling:** manual, maximum 16 samples  
**Molecular Weight Detection:** Down to  $10^{-7}$  Daltons  
**Sample Volume:** 4  $\mu$ l  
**Sample Type:** from ions to small chemical compounds, peptides, proteins, nucleotides, liposomes, nanoparticles, Ab  
**Analysis time per sample:** 15 min  
**Detection limit:** 1 nM to 1 mM  
**Dynamic range constant ( $K_d$ ):**  $10^{-2}$ - $10^{-12}$   
**Analysis temperature:** 22 - 45°C  
**Fluorescence channels:** 2  
(blue, green or red)



**MONOLITH NT.115**

Also, the **Macromolecular Interaction Analysis Unit** has fulfilled the requirements for microorganism/gene manipulation, bacteria growth, protein purification and analysis and cellular biology studies:

protein and RNA electrophoresis apparatus, PCR apparatus, ultrafiltration apparatus, FPLC system, cold/sterile rooms, biohazard/chemical hoods,  $CO_2$  incubators for mammalian cell cultures, stereomicroscope and inverted fluorescence microscope for time-lapse studies.

