

MACROMOLECULAR AFFINITY CHARACTERIZATION FACILITY

DIVISION OF BIOLOGICAL SCIENCES

INDIAN INSTITUTE OF SCIENCE

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ABOUT

This facility was established in 1997 with support from DBT, Govt. of India. There are 4 instruments in the facility. They are Biacore2000, Biacore3000, ProteonXPR36 & Octet Red96.

PEOPLE

Faculty

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We have several different instruments to measure macromolecular interaction kinetics and thermodynamics. These comprise of three instruments that use Surface Plasmon Resonance (SPR) and one that uses Biolayer Interferometry. The facilities are used by multiple faculties from across the division as well as some external users, and have an occupancy rate of about 90% and very little down time. The instruments are heavily used because of their relatively small sample requirements and accurate measurements of binding affinities.

SURFACE PLASMON RESONANCE (SPR) is a non-invasive optical measuring technique which measures the mass concentration of biomolecules in close proximity to a specially prepared surface. The technique does not require any labelling of the interacting components. The response is largely independent of the nature of the biomolecule, so that all steps in an interaction analysis may be followed with the same detection technique. The process involves flow of one molecule (analyte) over a surface with an immobilized binding partner (ligand). Binding results in a change in refractive index at the surface which is transduced to an optical signal. Dissociation of bound analyte is monitored by flowing buffer over the surface.



They are two very robust SPR instruments. These instruments use a single chip with four surfaces to which different molecules can be attached, making it possible to simultaneously determine 3 different affinities.



ProteonXPR36 is array based system with funds from the DBT-IISc partnership program. This allows for one shot kinetics and can have upto 36 ligands immobilized on the chip surface and has greatly increased the throughput of the facility.

Octet Red96 (Fortebio)



Octet is multi-functional instrument platform based on Bio-Layer Interferometry (BLI), a label-free technology that measures molecular interactions in real time for the purpose of detection, quantitation and kinetic analysis. Octet has the advantage of negligible analyte consumption and low consumable costs and was procured very recently with funding from MHRD. The Octet system is ideally suited for 96-well characterization of protein-protein and protein-small molecule binding kinetics, and for the determination of protein concentrations and titer. This uses tips which are coated with wide

selection of biosensor chemistries available for highly specific binding of target molecules in a sample.

Experiments

For Biacore2000 and Biacore3000 the chips have to be procured by the individual investigators from Wipro GE Healthcare Pvt. Ltd. The tips for Octet Red96 instrument will be provided by us and will be charged. The user should provide the samples. The samples should be prepared fresh and pure.

Requests

The request can be made via mail or call. The slots would be given according to the availability of the instruments.

Payments

The charges are subsidised for academic and Govt. users. The request should be made from the investigators.

IISc. users will be given a debit head so that they can mention the grant name/number. The charges will be Rs.500/- for half a day and Rs.1000/day.

For Companies and other users it will be charged Rs.10,000/day + 14.5% tax. The payment should be paid by a Demand Draft to "The Registrar IISc" Bangalore.

