

## **Comprehensive Seminar**

### **Study of the mechanism of alternating access transport using SemiSWEET proteins**

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Cell, regarded as the unit of life, demarcates itself from the surrounding world by the cell membrane which is a lipid bilayer associated with proteins and linked with carbohydrate moieties. Hydrophobic part of the lipid bilayer hinders the entry of ions and polar molecules whereas the unstirred-water-layer around the bilayer, formed primarily due to polar groups, impedes the passing of the hydrophobic molecules. Despite such hindrance, cells continuously exchange substances via several transport processes and one such process is alternating access transport, where the transporter protein undergoes conformational changes in such a way that a hydrophilic cavity which is open towards both ends of the membrane at the same time, is never formed. Such mechanisms can accommodate uniport, antiport, symport etc. The rate constants between several conformational transitions play a crucial role in determining the exact transport mechanism and such rate constants are influenced by the amino acid sequence, 3-dimensional structure of the transporter and several other surrounding conditions. According to crystal structures and molecular dynamics simulations, a novel transporter, named SemiSWEET, discovered almost a decade ago, transports sugars via the alternating access mechanism. Here we expect to enrich its mechanism with determination of several relevant parameters; such as the rate constants for transiting between those conformational states, influence of the substrate on the mechanism of transport etc.

***Monday, Jun 10<sup>th</sup> 2024***

***10:30 Hrs (Tea / Coffee 10:00 Hrs)***

***Auditorium, TIFR-H***