Tata Institute of Fundamental Research
Survey No. 36/P, Gopanpally Village, Serilingampally, Ranga Reddy Dist., Hyderabad - 500107

Internal Seminar

Tuning the Binding Affinity of Oxytocin for the Development of Selective Zn(II) ion Biosensor

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Peptides are attractive candidates for the development of selective biosensors because of their high specificity to metal ions; their amino acid sequence can be easily modified and also be functionalized with different moieties to allow for self-assembling on various types of surfaces. Oxytocin (OT) is a neuro peptide that has an affinity for metal ions and highly conserved mediator of physiological and psychic processes. Immobilization of this functional OT peptide onto the electrode (OT sensor) using the surface chemistry, enables simultaneous impedimetric detection of Zn^{2+} and Cu^{2+}. However, since native OT cannot differentiate between copper and zinc ions it is not useful for selective sensing Zn^{2+}. On the other hand, the negative effect of amidation to OT affinity towards copper and using theoretical calculations, we have designed a new zinc selective OT-based biosensor with negligible response to copper. The biosensor shows exceptional selectivity and very high sensitivity to zinc in impedimetric biosensing. The study provided a useful tuning strategy of ion binding by peptides in which the affinity toward Cu^{2+} and Nickel can be eliminated by amidation of the free amine that initiates their binding cascade. We assume that such a strategy may be essential for the development of new lines of highly selective peptide-based biosensors.

Wednesday, Feb 20th 2019

11:30 AM (Tea/Coffee at 11:00 AM)

Seminar Hall, TIFR-H