



Seminar

Engineered Metal Oxide Nanostructures based Biosensors for Neuropharmacological Applications

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Venue: Room 316, Department of Engineering

Mental health plays a major role for the growth, development and productivity of a society and is essential for a joyful and healthy life of human being. In the modern materialistic world, many neurological diseases and mental disorders are reported due to life style change, environmental degradation, malfunction of neuropharmacological drugs, etc. Appropriate tools for the diagnosis of the mental health are in big demand. In this aspect, the determination of several very minute amount of neurochemicals with the help of electrochemical biosensors is an emerging field of research. We have been working on the design and development of a vareity of biosensors for biomedical, food and environmental applications.

Here, we report, as one typical example, synthesis of WO_3 nanostructures by chemical precipitation method and, its modification through chemical approaches (surrfactant assisted templates) and physical means through irradiation with ultraviolet-visible light, gamma rays, swift heavy ion and low energy ion beam. The irradiation leads to the production of lattice defects such as vacancies, defect clusters and dislocations and these defects act as recombination centres by trapping the generated carriers. Sensors were fabricated using optly engineered nanostructures and tested towards the detection of neurotransmitters such as acetylcholine, dopamine, norepinephrine, epinephrine, serotonin, melatonin, histamine, tyrosine and tryptophan by voltammetric methods. The fabricated sensors can be used for simultaneous determination of 2 to 3 neurotransmitters in human blood samples with high sensitivity, selectivity and reproducibility.



Chinnathambi SEKAR received his Ph.D. degree in Materials Science with specialisation in nanomaterials in October 1997 through Anna University Chennai. He did his Post Doctoral Research at Nippon Telephone and Telegraph (NTT) Corporation-Japan (1997-2000) and the Institute for Solid State and Materials Research (IFW)-Dresden, Germany (2000-2005).

In recognition of his signifcant contributions, Periyar University awarded him with Sir. C.V. Raman Innovative Research Award in 2009. Currently, Prof. Sekar serves as Professor and Head of the Department of Bioelectronics and Biosensors at Alagappa Univrity, India. His current research activities include biosensors, gas sensors and materialss science. He has published close to 100 papers (h-index 23, 1771 citations, i10-index 50) and presented more than 120 papers in conferences. He has been awarded with the Alagappa Excellence Research Award (2017) in recognition of his research contribution.

All are cordially invited to attend