J Biosens Bioelectron 2015, 6:3
http://dx.doi.org/10.4172/2155-6210.C1.025

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4th International Conference and Exhibition on
Biosensors & Bioelectronics
September 28-30, 2015 Atlanta, USA

Biosensors technology and molecular imprinted polymers: Potential applications in theranostics, food safety and environment

Hossam Ezz El-Deen Mohamed Sayour
Animal Health Research Institute, Egypt

No society is capable of reaching the goals of a comprehensive, sustainable development, and facing the demands of the future except with knowledge, technological development and innovation through channeled academic research, which is considered in any society the cornerstone to academic progress and development. Therefore, advanced countries strove to increase their support of academic research and its development. Methods and multiple forms were founded to achieve the utmost avail of academic research in its various types with special attention to the innovative, technological and industrial aspects. As a result, there emerged an escalation in endowing chaired positions in advanced and future sciences, expanding the establishment of research and technology parks, incubators, centers for innovation and excellence, the valleys of research and development, all of which are efforts aiming at initiating fertile domains for innovation. Importance of effecting more interconnection and integration among the functions and activities of science and technology institutions, along with creativity, Biosensors Technology and Molecular Imprinted Polymers (MIPs): Potential Applications of Theranostics, Food Safety and Environment were suggested. Early identification and rapid investigation are crucial for outbreak prevention. Several international organizations such as WHO, OIE, FAO and EPA called upon the development of rapid, sensitive, low cost, and easy to use early diagnosis of pathogens, "rapid field test" or "point of care diagnostics". The detection and monitoring diseases has been a huge burden due to the high cost of reagents, laboratory sophisticated equipments and trained personnel. Most of the expenses spent for disease diagnoses are for the analytical and diagnostic devices. Moreover, sophisticated laboratories are hard to find in the remote epidemic areas and agricultural farms. There has been tremendous development and advancement in the field of Molecular biology, Nanotechnology, Electromechanical, Bio-MEMS systems and Wireless Sensors Networks (WSNs). These advanced technologies led to the development of Bio-microchip devices for the detection of chemical and biological hazards. Lab-on-a-chip technique is considered to be one of the top emerging technologies. In chemistry, molecular imprinting is a technique to create template-shaped cavities in polymer matrices with memory of the template molecules, the same merits of Lock and the Key theory/paradigm. Scientists have been working for decades to mimic the exquisite molecular recognition ability of biological molecules such as antibodies, enzymes, and receptors. In the recent years, imprinted polymers have been used to capture/recognize everything from macromolecules to inorganic ions. Recognition plays an important role in biological systems and are observed in between receptor-ligand, antigen-antibody, DNA-protein, sugar-lectin, RNA-ribosome, substrate-enzyme etc. The world is living the plastic age. So MIPs would offer smart solutions in the fields of theranostics, food safety, environmental and sensor technology. Molecular Imprinted Polymers (MIPs) have been applied as artificial antibodies, catalysts, sensors, drug assay and delivery tools, and chromatographic separations. Finally, MIP is a science that goes market upon business analysis based on patents.

Soomy111@yahoo.com