

14th World Summit on

Alzheimer's Disease, Dementia Care Research and Awareness

6th World Summit on **Heart, Stroke and Neurological Disorders**

August 31- September 01, 2018 | Boston, USA

Detection of neurotransmitters by using quantum dots

Jongsung Kim

Gachon University, South Korea

During the past two decades, a lot of attention has been paid to quantum dots(QDs) nanocrystalline semiconductors because of their potential applications in optoelectronics, bioimaging and biosensing. Various types of quantum dots have been prepared and used as chemical, physical and biological sensing media. In this presentation, the preparation of colloidal quantum dots and their optical characterizations are discussed. The preparation of quantum-dot based sensors for temperature, pH, chemical ions and neurotransmitters such as dopamine, gamma-aminobutyric acid and acetylcholine are discussed. The fluorescence of quantum dots can be quenched depending on various environmental factors. The fluorescence quenching occurs due to fluorescence resonance energy transfer or electron transfers. By using the fluorescence quenching depending on these factors, various kinds of quantum dot-based sensors can be prepared. A unique and facile bio sensing system for the detection of low-concentration divalent calcium ions (Ca^{2+}) in human serum was developed using an environmentally benign, blue-colored fluorescent multi-carboxylic acid-functionalized carbon dots (CDs) synthesized from ethylenediaminetetraacetic acid (EDTA) via a hydrothermal process. Our results showed that this newly developed strategy can offer an expeditious, highly sensitive and selective detection of Ca^{2+} ions in human serum, with a detection limit as low as 77 pM and a potent working range of 1–10 nM.

Biography

Jongsung Kim has completed his Ph.D. in Rensselaer Polytechnic Institute in USA on 1993. Then, he worked as a Senior Researcher at Samsung Advanced Institute of Technology from 1993 to 1997. Currently working as Director of BioNano Applications Center in Gachon University. He has been working as Professor in the Department of Chemical and Biological Engineering in Gachon University since 1997.

jongkim@gachon.ac.kr

Notes: