

## Fusion of bio nano science to fight against cancer

**D. Sakthi Kumar**

Bio Nano Electronics Research Center, Graduate School for Interdisciplinary New Science, Toyo University, Japan

Fusion of Bio and Nano science opens up innovative and versatile research field which can solve many unsolved problems related medical field especially in cancer related problems. New drugs and medical devices developed due to the fusion of bio nano science could target and remove the cancer cells without making any collateral damage to healthy tissues. Even at its infancy stage of this research field, it started delivering very promising research results which could revolutionize the medical field in near future. We have developed “Nanosurgeons” by combining magnetic nanoparticles and aptamers to perform surgical actions on cancer cells. Though magnetic nanoparticles are using in the cancer related research field for the past some decades to kill cancer cells by hyperthermia, we have used magnetic nanoparticles in a different dimension in the cancer related research world. “Nanosurgeon” is the new incarnation of magnetic nanoparticles in bio nano science research world based on our research. We have also developed nanomaterials which can be used as “theragnostics” materials by coupling aptamers and antibodies as sensing elements for site specific drug delivery to the drug loaded nanoparticles to fight against cancer cells and imaging materials such as QD's and FITC as diagnostic tools.

### Biography

Sakthi Kumar is currently working as Deputy Director (International Affairs) for Bio Nano Electronics Research Centre and as Professor in Graduate School of Interdisciplinary New Science, Toyo University, Kawagoe, Saitama, Japan. He is currently leading a group of 15 researchers, in different research fields for developing bio-nano devices and nanodrugs to fight against cancers with including radio nucleotides, biomaterials to use as scaffolds and also for implantations, bio/chemical sensors, carbon nanotubes for bio imaging and as a treatment method for cancers, quantum dots for bio imaging and solar cell applications. He is having 60 peer reviewed research articles and 7 patents.

sakthi@toyo.jp