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Biocompatible Nanomaterials for Drug Delivery and Cancer Theranostics**Amit Nag***BITS Pilani, India*

Nanomaterials are making significant transformation to our world, especially in healthcare and the treatment of diseases. This presentation will demonstrate the application of different types of bio-inspired nanomaterials, such as, niosomes, polymersomes, bio-synthesized carbon nanoparticles etc. for drug delivery and cancer theranostics. Controlled and targeted delivery of therapeutic drug molecules to the targeted site of medical attention are highly required to overcome the side effects of medical treatment. The last two decades have seen various developments in this direction in nanomaterial-based drug delivery applications. In this regard, niosomes¹ and polymersomes are two important biocompatible synthetic vesicles with similar self-assembled structures, prepared using non-ionic surfactant and amphiphilic copolymers, respectively. Using hybrid niosomes, the tuning of the phase transition temperature of the vesicles between 38°- 42°C will be demonstrated for its application in mild hyperthermia treatment. Whereas, using functionalized polymersome, pH-sensitive, targeted release of curcumin was achieved. On the other hand, theranostic nanomedicine holds the potential to revolutionise future disease management. Red-emitting carbon nanoparticles, produced by an economical and green hydrothermal method using Eucalyptus leaves as a precursor, were used for the first time for Chemo-PDT combination therapy after conjugating with the anticancer drug mitoxantrone electrostatically.

Biography

Amit Nag is an Associate Professor in Chemistry, at BITS-Pilani Hyderabad Campus. He received his Ph.D. in 2009 from IIT Kanpur, India under the supervision of Professor Debabrata Goswami on femtosecond laser chemistry. He worked as a Post-doctoral fellow at the University of California, Irvine, U.S.A with Professor Ara Apkarian on scan-probe microscopy and at the Department Chemie und CeNS, LMU, Munich, Germany with Professor Achim Hartschuh on plasmonics and Tip-Enhanced Raman Spectroscopy. He has successfully completed sponsored projects funded by BITS-Pilani, DST and CSIR. His research interests include Nonlinear laser spectroscopy, Scanning-probe microscopy, Plasmonics, Carbon Dots, Biophysical chemistry.