



Keeping in view our endeavor to highlight areas of current cutting edge science, we bring out this special issue on Nanobiotechnology, guest edited by one of our young faculty members. With our Institute putting efforts to start bioengineering as a new emerging area of research, this collection of articles seems appropriately timed. The issue consists of five specialist review articles drawn from a wide spectrum of topics. Dr. Ambarish Ghosh has collated the articles dealing with application of nanomedicine in treatment of cancer, nanobiotechnology in Indian agriculture, biosensing devices and imaging at ultra high resolution. On behalf of all the editorial board member I express my special thanks to Dr. Ambarish Ghosh for this effort.

We have kept our promise in bringing the issue well before time and hopefully we expect the journal to be on the web of science as soon as possible. Special thanks to our editorial staff for making this possible. The next two issues for the year are covering different areas in biology and the guest editors are at work already to get the articles of high quality and in good time.

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Nanobiotechnology

Nanobiotechnology is an emerging area of interdisciplinary research that lies at the intersection of nanoscience and biology. Broadly speaking, it refers to the development of micro- and nanoscale tools and devices used to probe and study biological systems, offering a wide range of application areas, such as those pertaining to sensing, imaging, targeted drug delivery, tissue engineering and many more. From detecting diseases at an early stage to providing minimally invasive therapeutic methods, nanobiotechnology has the potential to revolutionize various aspects of modern medicine.

The present issue of the IISc journal provides a glimpse on some of the topics falling under the broad umbrella of “nanobiotechnology”, that are of great current interest. The article by Divya Rani *et al.* describes the application of nanomedicine to the treatment of cancer, with emphasis on various types of nanostructures that are used for targeted drug delivery and Hyperthermia. A completely different impact area has been reviewed in the second article by Arunava Goswami *et al.* where the authors describe the contribution of nanobiotechnology in Indian agriculture and livestock industries. The second and third articles are in the area of biosensing, with special emphasis on optical methods. Frank Vollmer *et al.* review micro- and nanoscale optical resonators that serve as label-free biosensors down to the level of single molecules, and as platform for constructing nanoscale optical switches using biomolecules of high quantum efficiency. The article by Soumyo Mukherjee *et al.* reviews various nanotechnology based methods of optical biosensing, and how these methods are used in the development of integrated Point of Care (POC) diagnostic tools, including various examples of lab-on-chip microfluidic devices. The fifth and the final article by Joseph Grogan *et al.* reviews a recent advancement in the application of electron microscopy for imaging samples in their native environments, paving a way towards observing biological systems and processes in real time at ultrahigh resolutions.

I would like to thank Prof T.N. Guru Row and the editorial board of the journal for providing me with this unique opportunity. I would also like to express my gratitude toward Prof. Ananthasuresh and Ms. Kavitha Harish for their many help and suggestions. Finally, I thank the authors and the reviewers for their contributions towards making this issue possible.



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