
Editorial

Adnane Abdelghani*

National Institute of Applied Science and Technology,
Nanotechnology Laboratory, Bp676,
Centre Urbain Nord, 1080 Charguia Cedex, Tunisia
Email: aabdelghan@yahoo.fr
*Corresponding author

Bouzid Mena

Fluorotronics, Inc.,
2453 Cades Way, Vista,
CA 92081, USA
Email: bouzid.mena@gmail.com

Sherine O. Obare

Department of Chemistry,
Western Michigan University,
Kalamazoo, Michigan, USA
Email: sherine.obare@wmich.edu

Michael J. Schöning

Institute of Nano- and Biotechnologies,
Aachen University of Applied Sciences,
Campus Jülich, Germany
Email: schoening@fh-aachen.de

Biographical notes: Adnane Abdelghani is currently full Professor at the National Institute of Applied Science and Technology (Tunisia). His main areas of interest are the design of gas sensors and biosensors. He supervised more than 10 PhD theses in the field of microsensors and published more than 73 papers in international journals and two book chapters. He organised two international conferences in the field of Nanotechnology in Tunisia (2009, 2012).

Bouzid Mena is currently research program director and consultant at Fluorotronics, Inc. (CA, USA) in nanobiotechnology. His research concerns with the development of functional nanoporous biomaterials, materials using transparent nanoporous glasses and polymers as host matrices for adsorption and encapsulation of biomolecules for biomedical, pharmaceutical, environmental, optical and photonic applications. In addition, his research involves the development and utilisation of emerging analytical techniques such as fluoro-Raman spectroscopy to study biomolecule/surface interactions. He is the (co)-author of more than 40 publications including articles, reviews, proceedings, book chapters and patents.

Sherine O. Obare is an Associate Professor in the Department of Chemistry at Western Michigan University. Her research interests lie in the area of designing nanoscale materials with unique physical properties and to exploit these properties toward environmental remediation, improved healthcare, and alternative energy. Her work has been featured in over 100 publications in the form of journal articles, review articles, book chapters and conference presentations. She is the recipient of several national awards including the National Science Foundation CAREER Award and the American Competitive and Innovation Fellowship.

Michael J. Schöning is full Professor at Aachen University of Applied Sciences (Campus Jülich) and currently serves as a Director of the Institute of Nano- and Biotechnologies (INB). He has authored more than 300 technical papers, review articles and chapters in books. His main research subjects concern silicon-based chemical and biological sensors, thin-film technology, solid-state physics, microsystem and nano(bio-)technology.

The new tools of nanotechnology allow us to address biomedical and environmental issues with unprecedented accuracy and sensitivity because now it has become possible to interact with the living world at the length scale at which it operates. Different ‘hot’ topics have been presented at The Humboldt Kolleg in the frame of the ‘Nanoscale Science and Technology’ (NS&T’12) conference held from 17th to 19th of March 2012 in Hammamet (Tunisia). The NS&T’12 multi-disciplinary scientific programme has been dealing with both basic and application-oriented research as well as industrial (market) aspects:

- Molecular Biophysics, Spectroscopy Techniques, Imaging Microscopy,
- Nanomaterials’ Synthesis for Medicine and Biochemical Sensors,
- Nanostructures, Semiconductors, Photonics and Nanodevices,
- New Technologies in Market Industry,
- Environmental Applications, Electrochemistry, Biopolymers and Fuel Cells,
- Nanomaterials, Photovoltaic, Modelling, Quantum Physics,
- Microelectronics, Sensors Networks and Embedded Systems.

The conference has attracted the participation of researchers from various application areas, who are pioneering advancements in cell membranes, bio-chemicals sensors, nanomaterials, nanostructures, microsystems, microelectronics, and embedded systems to discuss problems and solutions with potential industrial partners. Scholars and junior scientists from Tunisia, Algeria and Germany took an active part in the three-day scientific event.

Representatives from spin-off companies, like Attocube AG (Germany), Horiba Scientific (France), GBX (France), Eco-chemie (The Netherlands), HTDS (France), Ametek Princeton Applied Research (USA), PCS-Techno-Park Sousse (Tunisia), IAER (Tunisia) and Malvern Instruments (UK) have been highlighting research and development strategies.

The main objectives of the Humboldt Kolleg have been:

- To encourage students to participate and engage in discussions with pioneering scientists on nanoscale science and technology.
- To strengthen the high interdisciplinarity between physicists, engineers, chemists and (micro-) biologists for modern research aspects.
- To intensify the network between junior Tunisian researchers and the Alexander von Humboldt programmes.
- To encourage junior researchers and young scientists to apply for post-doc positions with the Alexander von Humboldt foundation.
- To form a collaborative network within the developing countries.
- To show the impact of nanoscale science and technology for industrial requests (start-up and spin-off companies).

In summary, 11 plenary lectures, 30 talks and 108 posters have been presented on a high scientific level. Including the organising members, the Humboldt Kolleg involved more than 140 participants from different countries (Tunisia, Germany, USA, UK, Sweden, France, Italy, Switzerland, Spain and Algeria) that signifies the broad and international scientific interest. The booklet of proceedings has been distributed and has been well accepted by all participants.

The conference was also an opportunity to thank Prof. Erich Sackmann, considered worldwide as one of the fathers of biophysics. He pioneered, along with others, the idea of a 'bottom-up' approach towards understanding and probing living cells and biomembranes. It was a privilege and a great pleasure to have him at this conference.