'NANOMEDICINE: VISIONS FOR THE FUTURE'

24th-25th February 2010 – NH Carlton Amsterdam

24th February 2010: Day One

09.15 - 09.30 Welcome and Introduction
Richard Moore, Institute of Nanotechnology, UK

Keynote Presentation

09.30 – 10.10 **'Multifunctional Pharmaceutical Nanocarriers for Delivery of Drugs, Genes and Diagnostics'**
Professor Vladimir Torchilin, NorthEastern University, USA

10.10 - 10.55 **'Roadmaps in Nanomedicine towards 2020'**
Dr Sebastian Lange, Nanomedicine ETP

11.00 – 11.25 Refreshments

Session 1: Nanoscale Drug Delivery / Drug Design
Chair: *Richard Moore, Institute of Nanotechnology, UK*

11.30 – 11.55 **'Challenges to the Development of Nanomedicines'**
Dr Simon Holland, Director, Process Understanding and Control Pharmaceutical Development MOST, GlaxoSmithKline, UK

- Drivers for nanomedicines
- Current portfolio of nanomedicines
- Technological, environmental and ethical barriers to product development

12.00 – 12.25 **'Novel Non-Attrition Approaches to Water-Based Formulation of Poorly Soluble APIs'**
Professor Steve Rannard, Chief Scientific Officer, IOTA NanoSolutions, UK

- New non-attrition nanoparticle formation approaches will be described
- Results from in vivo testing of anti-infectives from IV and Oral formulations will be discussed
- Enhanced activity and bioavailability will be demonstrated through several case studies.

12.30 – 12.55 **'Nanomedicines for the Delivery of Drugs and Genes'**
Professor Ijeoma Uchegbu, University College London, UK

13.00 – 13.55 Lunch

14.00 – 14.25 **'Nanotechnology in CNS Drug Discovery'**
Dr Mohammad S. Alavijeh, Pharmidex Ltd, UK

14.30 - 14.55 **'EC-facilitated Development of Targeted Nanomedicines'**
Professor Gert Storm, University of Utrecht, The Netherlands

- targeted nanomedicines
- chronic inflammatory disease and cancer

- sponsoring by the European Commission (FP6)

15.00 – 15.25 **'Nanotechnologies for Nucleic Acid Delivery'**
Professor Elias Fattal, Université Paris-Sud, France

15.30 – 15.55 Refreshments

Session 2: Disease Imaging and Treatment
Chair: *Professor dr. Vinod Subramaniam, University of Twente, The Netherlands*

16.00 – 16.25 **'NanoMedicine: Converging Medical Technologies Impacting Healthcare'**
Professor Hans Hofstraat, Philips Healthcare, The Netherlands
- Nanotechnology
- Convergence of Medical Technologies and Biotechnology
- Diagnostics for early identification of disease and stratification of patients
- Local and image-guided drug delivery
- Electronic pills
- Regenerative medicine

16.30 – 16.55 **'3D Visualization of Fluorescence Distribution'**
Dr Jeroen van den Wijngaard, Academic Medical Center Amsterdam, The Netherlands

17.00 – 17.25 **'Towards Optoacoustic Molecular Imaging Using Targeted Particle Systems'**
Dr Robert Lemor, Fraunhofer Institute for Biomedical Engineering, Germany
- Multiscale Optoacoustic Imaging & Contrast Agent technology
- Cytotoxicity of metallic and resorbable particle systems

17.30 Close of day one

17.30 – 18.30 Poster Session

INSTITUTE OF nanoTECHNOLOGY

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25th February 2010: Day Two

09.30-09.35 Welcome and Introduction to day two
Professor Anthony Turner, Cranfield University, UK

Session 3: Nanotechnology in Diagnostics and Monitoring
Chair: *Professor Anthony Turner, Cranfield University, UK*

09.35 – 10.00 **'"Pocket Pathology" –using nanotechnology to turn the vision into reality'**
Elaine Warburton, QuantuMDx Group, UK

- The clinical and economic drive for globally affordable diagnostics
- 'Pocket pathology' – using nanotechnology to realise personalised medicine
- Using nanowire biosensors for diagnostic and DNA sequencing applications

10.05 - 10.30 **'DNA Diversity and Personalized Medicine'**
Professor Urs Meyer, University of Basel BioZentrum, Switzerland

- The interindividual variation of the human genome sequence explains differences in drug response and is an important component of personalized medicine.
- Personalized medicine is a strategy to improve clinical outcome by precise diagnosis and by optimizing drug choice and drug dose to the need of the individual patient.
- Nanotechnologies increasingly allow the rapid and affordable sequencing of human genomes and of gene expression to assess genetic risks for adverse drug reactions or lack of efficacy of drugs.

10.35 – 11.00 Refreshments

11.05 – 11.30 **'Advancing Microbiology with Miniaturized Culture Chips Fabricated from Nanoporous Aluminium Oxide'**
Dr Colin Ingham, Microdish BV, The Netherlands

- The fabrication and properties of highly subdivided culture chips based around porous aluminium oxide.
- The application of culture chips in microbial diagnostics and screening.
- Printing and handling microorganisms on this format.

11.35 – 12.00 **'Nanomedicine Enabling Point of Care Diagnostics Applications'**
Dr Paul Galvin, Tyndall National Institute, Ireland

- Examples of some diagnostic solutions based on nanomedicine will be discussed, which are enabling target biomolecules to be captured, concentrated and detected within low cost automated microsystems
- The challenges for enabling the accuracy and reproducibility of the test, together with an appropriate cost model will be discussed
- Potential ethical issues will be highlighted
- Potential commercialisation issues will also be addressed

12.05 – 12.30 **'Nanosensors for Superbugs and Superdrugs'**
Dr Rachel McKendry, University College London, UK

12.35 – 13.30 Lunch

Session4: Regenerative Medicine
Chair: *Professor dr. George Robillard, Biomade Technology Foundation, The Netherlands*

13.35 – 14.00 **'Novel Approaches to Whole Organ Tissue Engineering'**
Dr Paolo Macchiniarini, Head of Thoracic Surgery, Barcelona University Hospital Clinic, Spain

14.05 – 14.30 **'Bio-inspired Nanomaterials for Regenerative Medicine and Biosensing'**
Professor Molly Stevens, Imperial College London, UK

14.35 - 15.00 **'The Intersection of Nanotechnology and Healthcare'**
Dr Rutledge Ellis-Behnke, Massachusetts Institute of Technology, USA and University of Hong Kong, China

- Using nanotechnology to repair the brain
- Using nanotechnology to stop bleeding in less than 15 seconds

15.05 – 15.30 Refreshments

15.35 – 16.00 **'Nanofibrous Scaffolds for Soft Tissue Repair'**
Dr Mike Raxworthy, Neotherix Ltd, UK

16.05 – 16.30 **'Nanotechnology Application to the Nervous System: Carbon Nanotubes and Brain Signaling'**
Dr Laura Ballerini, University of Trieste, Italy

- Nanomaterials enter the realm of basic biological functional units due to their ability to functional integrate with bio-systems.
- In recent years we reached an increased interest and improved understanding of such interactions with biological systems at a subcellular level.
- A large body of research is emerging that hints at the potential applications of nanotechnology in neurosciences, although the basic scientific and clinical progress is limited by the intrinsic complexities of dealing with the mammalian central nervous system.
- May neurons change their behavior by interacting with interfaces at the nanoscale?
- Can these interactions affect neuronal performance?
- Have these interactions the potential to improve neuroelectronic hybrids and neuronal network behavior?

16.35 – 16.45 Close of conference