

Carbon Nanomaterial Biology, Medicine and Toxicology (CNBMT11)

15th & 16th July 2011, Cambridge UK

Program

Friday 15th July 2011

9:00-9:15

Opening Remarks: K. Kostarelos

Carbon nanotube therapeutics and diagnosis I (9:15-10:30)

Chair: K. Kostarelos

Nanomedicine Lab, London, UK

9:15 -9:45

(Invited) *Sugars and proteins: Nano-Bioconjugates*

B. G. Davis

University of Oxford, UK

9:45 – 10:00

Small-Sized Aggregates of Carbon Nanohorns Enabling Cellular Uptake Control

M. Zhang¹, X. Zhou², Y. Tahara², S. Iijima^{1,2} M. Yudasaka¹

¹National Institute of Advanced Industrial Science and Technology (AIST), Japan ²Meijo University, Japan

10:00-10:15

Coronenes Encapsulated Single-Walled Carbon Nanotubes for Imaging Probes Targeted to Cancer Cells

Y. Iizumi¹, T. Okazaki², Y. Tahara², M. Yudasaka², S. Iijima²

¹University of Tsukuba, Graduate School of Pure and Applied Sciences, Japan ²National Institute of Advanced Industrial Science and Technology (AIST), Japan

10:15-10:30

Electrochemically Functionalized Carbon Nanotubes and Graphene: From Device Applications to On-chip Nanobiosensors

K. Balasubramanian¹, T. Kurkina¹, R. Sundaram¹, C. Gomez-Navarro^{1,2}, A. Vlandas¹, A. Ahmad¹, M. Burghard¹, K. Kern^{1,3}

¹Max-Planck-Institute for Solid State Research, Germany ²Departamento de Física de la Materia Condensada, Universidad Autónoma de Madrid, Spain ³Ecole Polytechnique Fédérale de Lausanne, Switzerland

10:30-11:00

Coffee break

Carbon nanotube therapeutics and diagnosis II (11:00-12:30)

Chair: E. Flahaut

CIRIMAT, Toulouse, France

11:00-11:30

(Invited) *Carbon Nanotube-Mediated siRNA for the Therapy of Cancer and Brain Disease*

K. Al-Jamal

¹Institute of Pharmaceutical Sciences, King's College London, UK ²Nanomedicine Laboratory, Centre for Drug Delivery Research, The School of Pharmacy, University of London, UK

11:30-11:45

Biocompatibility and Functionalization of Isolated, ssDNA Suspended Single-Wall Carbon Nanotubes

K. Kröker¹, H. Bruhn², M. Mikyna³, G. Bringmann³, T. Hertel¹

¹Institute for Physical and Theoretical Chemistry, University of Würzburg, Germany ²Institute for Molecular Infection Biology, University of Würzburg, Germany ³Institute for Organic Chemistry, University of Würzburg, Germany

11:45-12:00

Functionalization of Single-Walled Carbon Nanotubes with Ribonucleic Acids

J. Park, Y. Kim, M. Seong, H. Go, K. Lee

Department of Physics, Chung-Ang University, Korea

12:00-12:15

Cationic Carbon Nanotubes for Nucleic Acid Delivery

A. Battigelli^{1,2}, J. Russier¹, T. Da Ros², M. Prato², A. Bianco¹

¹CNRS, UPR 9021, Laboratoire d'Immunologie et Chimie Thérapeutiques, France ²Dipartimento di Scienze Chimiche e Farmaceutiche, Università di Trieste, Italy

12:15-12:30

PAMAM Dendrimers Decorating Carbon Nanohorns Surface as Efficient Gene Delivery Materials for Prostate Cancer Cells

F. Guerra Navarro^{1,2,3}, M. Herrero¹, B. Carrión², F. Pérez-Martínez², M. Lucío¹, N. Rubio¹, S. Merino¹, P. Sánchez-Verdú¹, M. Prato⁴, V. Ceña^{2,5}, E. Vázquez¹

¹Inorganic, Organic, Biochemistry Dept, Fac. Ciencias Químicas-IRICA-UCLM, Spain ²NanoDrugs, S.L., Spain ³Parque Científico y Tecnológico de Albacete, Spain ⁴Center of Excellence for Nanostructured Materials, University of Trieste, Italy ⁵Unidad Asociada Neurodeath, Farmacología, CSIC-UCLM, Spain

12.30-15.00 Lunch + Poster Session 1

The Bowling Green, Pembroke College

Nanocarbon therapeutics (15:00-16:30)

Chair: M. Yudasaka

National Institute of Advanced Industrial Science and Technology (AIST), Japan

15:00-15:30

(Invited) *Functionalization of Nanodiamond for Biomedical Applications*

A. Krueger

Institute for Organic Chemistry, Julius-Maximilians University, Germany

15:30-15:45

Carbon Nanotubes: Effects of Plasma Protein Binding

K. Pondman^{1,2}, M. Sobik¹, B. Sim²

¹Low Temperature Division, MIRA Institute, Netherlands ²Department of Pharmacology, University of Oxford, UK

15:45-16:00

Self Assembly of Lipid Nanostructures in Aligned Carbon Nanotubes

C. Paukner¹, C. Kulkarni², K. Koziol¹

¹Department of Materials Science, University of Cambridge, UK ²Department of Chemistry, University of Graz, Austria

16:00-16:15

Antibacterial Activity of Graphite, Graphite Oxide, Graphene Oxide and Reduced Graphene Oxide: Membrane and Oxidative Stress

Y. Chen, S. Liu

Nanyang Technological University, Singapore

16:15-16:30

Sensitivity of Boron Nitride Nanotubes toward Biomolecules

S. Mukhopadhyay¹, R. Scheicher², R. Pandey¹, S. Karna³

¹Department of Physics, Michigan Technological University, USA ²Department of Physics and Astronomy, Uppsala University, Sweden ³US Army Research Laboratory, USA

16.30-17.00

Coffee break

CNT Imaging (17:00-18:15)

Chair: A. Bianco

CNRS, Strasbourg, France

17:00-17:30

(Invited) *Single Nanotube Imaging to Probe Complex Environments*

L. Cognet

Institut d'Optique Graduate School, University of Bordeaux and CNRS, France

17:30-17:45

Development of Glucose Sensor Using CNT Compound Materials

T. Hirata^{1,2}, A. Katahira¹, C. Tsutsui², M. Akiya^{1,2}

¹Graduate School of Engineering, Tokyo City University, Japan ² Nano Carbon Bio Device Research Center, Tokyo City University, Japan

17:45-18:00

An Optical SWNT Biosensor for Explosives

D. Heller, G. Pratt, J. Zhang, N. Nair, A. Hansborough, A. Boghossian, N. Reuel, P. Barone, M. Strano

Massachusetts Institute of Technology, USA

18:00-18:15

Carbon Nanotube Films Preparations for Electronic, Sensors and Bioengineering Application

I. Bobrinetskiy, I. Komarov, D. Kireev

Moscow Institute of Electronic Technology (Technical University), Russia

19.00 Welcome drinks

19.30 Social Dinner

Saturday 16th July 2011

CNT Interaction with the biological milieu (9:15-10:30)

Chair: L. Cognet

University of Bordeaux and CNRS, France

9:00-9:30

(Invited) *Oxidative Stress and Nanoparticles: Badness is Only Spoiled Goodness*

V. E. Kagan

University of Pittsburgh, USA

9:30-9:45

Synthesis of Bombesin-Naphthalenediimide Conjugate Functionalized Single Walled Carbon Nanotubes as a Novel Receptor Imaging Probe

Z. Hu, S. Pascu

Department of Chemistry, University of Bath, UK

9:45-10:00

Biodegradation of Carbon Nanotubes Investigated Using Raman Spectroscopy

J. Conroy¹, A. Shvedova², V. Kagan³, A. Meade⁴, A. Knyazev⁵, D. Kelleher¹, Y. Volkov^{1,6}

¹Department of Clinical Medicine, Trinity College Dublin, Ireland ²National Institute for Occupational Safety and Health, West Virginia University, USA ³Department of Environmental and Occupational Health, Center for Free Radical and Antioxidant Health, USA ⁴School of Physics, College of Science and Health, Dublin Institute of Technology, Ireland ⁵Centre For Research On Electronically Advanced Materials, Institute of Condensed

Matter Physics, Ecole Polytechnique Fédérale De Lausanne, Switzerland ⁶Centre for Research on Adaptive Nanostructures and Nanodevices, Trinity College Dublin, Ireland

10:00-10:15

The Methods of Cell Growth on Carbon Nanotubes Substrates with Making Use of Electrostimulation

A. Seleznev, I. Bobrinetskiy, R. Morozov

Moscow Institute of Electronic Technology (Technical University), Russia

10:15-10:30

Indolizine Modified Fluorescent Single-Walled Carbon Nanotubes for Detection of Nitroaromatics

M. Bayazit^{1,2}, K. Coleman¹, L. Palsson¹

¹Department of Chemistry, Durham University, UK ²Department of Chemistry, Imperial College London, UK

10.30-11.00

Coffee break

CNT safety and toxicology (11:00-12:30)

Chair: K. Al-Jamal

Institute of Pharmaceutical Sciences, King's College London, UK

11:00-11:30

(Invited) *What are the Critical Factors in Multi-Walled Carbon Nanotubes for Mesothelial Carcinogenesis?*

S. Toyokuni, Hirotaka Nagai

Nagoya University Graduate School of Medicine, Japan

11:30-11:45

When Macrophages Digest Carbon Nanotubes: Intra-Cellular Dispersion and Decarbonation of Iron-Based Nanoparticles Attached to Carbon Nanotubes

C. Bussy^{1,2,3}, J. Cambedouzou¹, B. Fayard^{1,4}, M. Pinault⁴, N. Brun¹, C. Mory¹, J. Boczkowski², S. Lanone², P. Launois¹

¹ Laboratoire de Physique des Solides, UMR CNRS 8502, Université Paris-Sud 11, France ² INSERM U955, Université Paris Est Val de Marne, France ³Nanomedicine laboratory, Centre for Drug Delivery Research, UK ⁴European Synchrotron Radiation Facility, France ⁴CEA, IRAMIS, SPAM, Laboratoire Francis Perrin, France

11:45-12:00

Biocompatibility and Toxicological Research of Surfaces Modified with Different Carbon Nanotubes

R. Morozov, A. Seleznev

Moscow Institute of Electronic Technology (Technical University), Russia

12:00-12:15

High Uptake Cytotoxicity of Single-Walled Carbon Nanohorns in Murine Macrophage RAW264.7

Y. Tahara¹, M. Nakamura¹, M. Zhang¹, S. Iijima^{1,2}, M. Yudasaka¹

¹National Institute of Advanced Industrial Science and Technology (AIST), Japan ²Meijo University, Japan

12:15-12:45

Round table discussion

Moderator: TBC

Panelists: K. Kostarelos, A. Bianco, M. Yudasaka, E. Flahaut

12.45-15.00 Lunch + Poster Session II

The Bowling Green, Pembroke College