NanoMed Digest
Nanomedicines Alliance Newsletter **February 2012**

REGULATORY AND LEGISLATIVE DEVELOPMENTS

Global Nanomedicine Market to Reach $130.9 Billion by 2016

A report issued by BCC Research, the value of the nanomedicines industry worldwide was $72.8 billion in 2011, and is expected to reach $130.9 billion by 2016. Nanomedicines targeting the central nervous system and cancer are a large part of this value. See more at: http://www.azonano.com/news.aspx?newsID=24136

National Research Council Issues Nanotechnology Risk Report

The National Research Council has released a report entitled "A Research Strategy for Environmental, Health, and Safety Aspects of Engineered Nanomaterials," outlining a strategy to build the necessary infrastructure for conducting research to address potential health and environmental risks associated with nanomaterials. The report argues that there has been a lack of connection between research and the strategies to mitigate any risks, and identifies four topics to be addressed in the next 5 years:

- Understand processes that affect hazards and exposure
- Identify and quantify the nanomaterials used and the populations and environments that are exposed
- Understand nanomaterial interactions from environments ranging from subcellular to ecosystems
- Developing a infrastructure for research and feedback.

Implementation of the strategy would require coordination amongst all the nanotechnology stakeholders, including international and domestic organisations, federal agencies, industry, NGOs, and academia. The report points out that the NNI only coordinates between federal agencies and does not have the authority to direct nanotechnology research.
The full report can be found here: http://www.nap.edu/openbook.php?record_id=13347&page=R1

Comparison of NRC Report and NNI EHS Research Strategy Report

NNI has released a report that compares the NRC's Nanotechnology Risk Report (see previous) and NNI's Environmental, Health, and Safety (EHS) Research Strategy, issued in October 2011. The document concludes that the two strategies are generally in alignment. In particular, both reports agree that:

- NNI has been effective in promoting nanomaterials EHS research.
- Nanomaterial life cycle must be considered to analyse and identify EHS research needs.
- More research is needed on human exposure to nanomaterials and nanomaterial effects on human health and the environment.
- An infrastructure for nanotechnology EHS research is necessary.
- Stakeholder participation and engagement is crucial.
- Better tools are needed to measure and evaluate nanomaterials.

The full report can be found here: http://nano.gov/sites/default/files/pub_resource/nrc_and_nni_comparative_quotes_in_lthd_jan_30_2012.doc

New Report on EU Lack of Regulatory Control of Nanomaterials

The Center for International Environmental Law, an US-based non-profit law firm, has issued a new report entitled "Just out of REACH: How REACH is failing to regulate nanomaterials and how it can be fixed." The report focuses on how REACH, the EU's regulation on chemicals, has not regulated nanomaterials in an effective way, and identifies key gaps in REACH, including the lack of a definition of nanomaterials and the lack of consideration of the special properties of nanomaterials in its test guidelines. The full report can be found here: http://www.ciel.org/Publications/Nano_Reach_Study_Feb2012.pdf

JRC Publishes Summary of Nanomaterial Workshop

The European Commission Joint Research Centre (JRC) has published the summary of the "Challenges of Regulation and Risk Assessment of Nanomaterials," a workshop held in May 2011 by JRC and Risk Assessment of Engineered NanoParticles (ENPRA), a project under European Framework 7. The workshop focused on regulatory developments, nanomaterials characterization, exposure, and effect.
The full report can be found here:
http://ihcp.jrc.ec.europa.eu/events_workshops/joint-jrc-nano-enpra-2011/ReqNo_JRC67654_summary_report_jrc_enpra_2011.pdf

Nanomedicine Mentioned at a House Energy and Commerce Committee Hearing

The House Energy and Commerce Committee's Subcommittee on Health held a hearing on 1 February on the Prescription Drug User Fee Act Reauthorisation. During the hearing, the CEO of Alkermes referred to health applications of nanotechnology in relation to the FDA's mission statement.
Details of the hearing can be found at:
http://energycommerce.house.gov/hearings/hearingdetail.aspx?NewsID=9194

First Master's of Science Program in Nanomedicine in US

The first Master's of Science degree in Nanomedicine was announced at the Radiological Technologies University VT, located in South Bend, Indiana. The program focuses on diagnostic and therapy applications of nanomedicine. More information on the program can be found at:
http://rtuvt.com/nanomedicine.php

REVIEWS AND OTHER PUBLICATIONS OF INTEREST

Comparison of Polymeric siRNA Nanocarriers in a Murine LPS-Activated Macrophage Cell Line: Gene Silencing, Toxicity, and Off-Target Gene Expression. Pharmaceutical Research, March 2010, Vol. 29, No. 3. Linda B. Jensen, Joscha Griger, Broes Naeye, Amir K. Varkhouhi, and Koen Raemdonck, et. al.
http://www.springerlink.com/content/a649443364675mt8/fulltext.pdf

The Use of Nano Polymeric Self-Assemblies Based on Novel Amphiphilic Polymers for Oral Hydrophobic Drug Delivery. Pharmaceutical Research, March 2010, Vol. 29, No. 3. Hoskins Clare, Paul Kong Thoo Lin, Laurence Tetley, and Woei Ping Cheng.
http://www.springerlink.com/content/r23266u2226ng500/fulltext.pdf

The Complexity of Public Engagement. Nature Nanotechnology, February 2012, Vol. 7, No. 2, pp. 77-78. Craig Cormick.
http://www.nature.com/nnano/journal/v7/n2/pdf/nnano.2012.5.pdf

Nanopores: Tiny Holes with Great Promise. Nature Nanotechnology, February 2012, Vol. 7, No. 2, pp.81-82. Dario Anselmetti
http://www.nature.com/nnano/journal/v7/n2/pdf/nnano.2012.11.pdf

Intracellular Protein Delivery by Hollow Mesoporous Silica Capsules with a Large Surface Hole. Nanotechnology, 2 March 2012, Vol. 23, No. 8. Ji-Sun Lim, Kiwon Lee, Jong-Nam Choi, Yong-Kyung Hwang, Mi-Yeon Yun, Hee-Jin Kim, Yong Sun Womn, Sung-Jin Kim, Hyockman Kwon, and Seong Huh.
http://iopscience.iop.org/0957-4484/23/8/085101

Kinetics and Tissue Distribution of Neutron-Activated Zinc Oxide Nanoparticles And Zinc Nitrate in Mice: Effects of Size and Particulate Nature. Nanotechnology, 2 March 2012, Vol. 23, No. 8. Teng-Kuang Yeh, Jen-Kun Chen, Chia-Hua Lin, MO-Hsiung Yang, Chung Shi Yang, Fong-In Chou, Jinn-Jer Peir, Mei-Ya Wang, Wan-Husan Chang, ming-Hsien Tsai, Hui-Ti Tsai, and Pinpin Lin.
http://iopscience.iop.org/0957-4484/23/8/085102

A Simple Robust Method for Synthesis of Metallic Copper Nanoparticles of High Antibacterial Potency Against *E. Coli*. Nanotechnology, 2 March 2012, Vol. 23, No. 8. Arijit Kumar Chatterjee, Raj Kumar Sarkar, Asoke Prasun Chattopadhyay, Pulakesh Aich, Ruchira Charkraborty, and Tarakdas Basu.
http://iopscience.iop.org/0957-4484/23/8/085103

Gadolinium Metallofullerenol Nanoparticles Inhibit Cancer Metastasis Through Matrix Metalloproteinase Inhibition: Imprisoning Instead of Poisoning Cancer Cells. Nanotechnology, Biology, and Medicine, February 2012, Vol. 8, No. 2, p. 136-146. Huan Meng, Gengmei Xing, Elvin Blanco, Yan Song, Lina Zhao, Baoyun Sun, Xiaoda Li, Paul C. Wang, Alexandru Korotcov, Wei Li, Xing-Jie Liang, Chunying Chen, Hui Yuan, Feng Zhao, Zhen Chen, Tong Sun, Zhifang Chai, Mauro Ferrari, Yuliang Zhao.
http://www.nanomedjournal.com/article/PIIS1549963411100356X/fulltext

Nanoparticles: A Boon to Drug Delivery, Therapeutics, Diagnostics and Imaging. Nanotechnology, Biology, and Medicine, February 2012, Vol. 8 No. 2, pp.147-166. Suphiya Parveen, Ranjita Misra, Sanjeeb K. Sahoo.
http://www.nanomedjournal.com/article/PIIS1549963411001882/abstract

HPV Infections: Can They be Eradicated Using Nanotechnology. Nanotechnology, Biology, and Medicine, February 2012, Vol. 8, No. 2, pp. 131-135. Marianna Foldvari.
http://www.nanomedjournal.com/article/S1549-9634(11)00526-0/abstract

Novel Nanostructured Lipid-dextran Sulfate Hybrid Carriers Overcome Tumor Multidrug Resistance of Mitoxantrone Hydrochroide. Nanotechnology, Biology, and Medicine, February 2012, Vol. 8, No. 2, pp. 185-193. Peng Zhang, Guixia Ling, Xiaolei Pan, Jin Sun, et al.
http://www.nanomedjournal.com/article/S1549-9634(11)00260-7/abstract

Gold-doxorubicin Nanoconjugates for Overcoming Multidrug Resistance. Nanotechnology, Biology, and Medicine, February 2012, Vol. 8, No. 2 pp. 204-211. Yan-Juan Gu, Jinping Cheng, Cornelia Wing-Yin Man, Wing-Tak Wong, et al.
http://www.nanomedjournal.com/article/S1549-9634(11)00258-9/abstract

Simultaenous Basal-bolus Delivery of Fact-acting Insulin and its Significance in Diabetes Management. Nanotechnology, Biology, and Medicine, February 2012, Vol. 8, No. 2, pp.221-227. Guangjiong Qin, Yunhua Gao, Yan Wu, Suohui Zhang, et al.
http://www.nanomedjournal.com/article/S1549-9634(11)00253-X/abstract

CONFERENCES AND WORKSHOPS

Exposure to Nanoparticles in Human Populations: Immune System Biomarkers in Vitro and in Vivo, February 26-29, 2012, St. Christoph, Austria

- Biomarkers
- In-vitro models for long-term nanoparticle effects
- Nano toxicity
- Biomonitoring

http://www.neopterin.net/

Miami 2012 Winter Symposium: Nanotechnology in Biomedicine. February 26-29, 2012, Miami, FL

- Bionanomaterials
- Imaging
- Sensors
- Sequencing
- Drugs and diagnostics

http://www.nature.com/natureconferences/miami/mws2012/index.html

NanoImpactNet: "From Theory to Practice—Development, Training, and Enabling Nanosafety and Health Research," February 27- March 2, 2012, Dublin, Ireland

- Materials for the future
- Eco-hazard assessment
- From production to exposure
- Characterisation *in situ* following exposure
- Beyond non-specific hazards
- Stakeholder needs and risk assessment

http://www.nanoimpactnet.eu/index.php?page=nanoimpactnet-qnano-conference-dublin-2012

Biological Barriers 2012, February 29-March 9, 2012, Saarland, Germany

- Methods for the Skin Barrier
- Pharmaceutical Nanomaterials

http://www.uni-saarland.de/en/information/knowledge-transfer/kwt/messekongresse/biologicalbarriers-2012.html

BioNanoMed 2012. March 1-2, 2012, Krems, Austria

- Personalized medicine
- Cancer
- Regenerative medicine
- Diagnostics and therapy
- Multidisciplinary nano-technologies

http://www.bionanomed.at/

Nanotechnology, Biotechnology, and Spectroscopy International (ICNBS 2012) March 1-3, 2012, Cairo, Egypt

- Nanotechnology
- Biotechnology
- Spectroscopy

http://ises-nakaa-conf.webs.com/

EEE International Conference on Nano/Micro Engineered and Molecular Systems March 5-8, 2012, Kyoto, Japan

- Nanomaterials
- Carbon nanotube based devices and systems
- Molecular sensors, actuators, and systems
- MEMS/NEMS and molecular sensors
- Micro and nano heat transfer
- Nanobiology, bio-informatics, nanomedicine
- Micro/nano sensors and actuators

http://www.ieee-nems.org/2012/general_info/introduction/

NANO 2012 March 12-14, 2012, Omaha, NE

- Nanotech biomarker detection
- Applications of nanotechnology
- Drug delivery
- Nanotechnology
- Nano-arrays for cancer
- Nanomedicine
- Nano-sensors
- Nano-electronics
- Nano-devices

http://www.omicsonline.org/nano2012/

International Symposium on Assessing the Economic Impact of Nanotechnology, March 27-28, 2012, Washington, DC

- Input and output factors
- Role of research funding
- International cooperation
- Public-private partnerships
- Venture capital
- Patents and publications

http://www.nano.gov/node/729

Nanomedicine: Visions, Risks, Potential. April 19-20, 2012, Berlin, Germany

Will discuss trends in nanotechnological methods in medical applications, focusing on both scientific and technical aspects.

http://www.nanodiara.eu/spring-conference-2012/

The Joint European Summit for Clinical Nanomedicine 2012 (CLINAM 2012). May 7-9, 2012, Basel, Switzerland

- Clinical trials for nanomedicines
- Regulation, toxicology, ethics, sustainability
- Transition from research to industrial products
- Strategic instruments in nanomedicines

http://www.clinam.org/conference.html

Nanobio-Europe 2012, June 18-20, 2012, Varese, Italy

- Nano-enabled drug delivery
- Nanotechnology for medical applications
- In vivo imaging
- Biomarkers and nanoparticles
- Cell analysis and manipulation
- Sensors and actuators
- Bioanalytics
- Bio-nano materials and tissues

http://nanobio-europe-2012.jrc.ec.europa.eu/

9th International Conference on Nanosciences & Technologies, July 3-6, 2012, Thessaloniki, Greece

- Nanotechnology in biology
- Nanostructures for medical applications
- Cell/Nanomaterial interactions
- In-vitro and in-vivo diagnostics
- Targeted drug delivery
- Regenerative nanomedicine
- Nanotoxicity, risk assessment, and ethics
- Nanomedicine commercialization

http://www.nanotexnology.com/index.php?option=com_content&view=article&id=48&Itemid=60

Working Safely with Nanomaterials. July 6, 2012, Edinburgh, Scotland.

- Nanomaterials categories
- Nano toxicology/hazard banding
- Nano controls/monitoring
- Nano health surveillance

http://www.bohs.org/Events/WorkingwithNanomaterials/

77th Prague Meetings on Macromolecules: Polymers in Medicine. July 8-12, 2012, Prague, Czech Republic

- Polymers for Nanomedicine
- Stimuli responsive polymers
- Polymers for Advanced Drug Delivery
- Polymers for Biomedical Applications
- Biomaterials for Tissue Engineering

http://www.imc.cas.cz/sympo/pmm2012/

Colloids and Nanomedicine 2012. July 15-17, 2012, Amsterdam, Netherlands.

Biomaterials
Tissue engineering and regenerative medicine
Drug delivery
Biosensors
Toxicology and risk assessment of nanomedicine systems
Proteins and peptides at interfaces
Soft matter, surfactants, polymers in biological systems
Novel phenomena and techniques

http://www.colloidsandnanomedicine.com/index.html

Drug Carriers in Medicine & Biology, August 12-17, 2012, Waterville Valley, NH

Vascular delivery, targets and barriers
Translational studies, clinical trials, and combination therapies
Local, pulmonary, GI, and CNS delivery
Emerging technologies, materials, carriers, and mechanisms
Carriers for vaccines and antigen delivery
Intracellular delivery, trafficking and cellular barriers
Biological response to delivered drugs and genes

http://www.grc.org/programs.aspx?year=2012&program=drugcarr

IEEE Nano 2012 Conference, August 20-23, 2012, Birmingham, UK

Nanobiomedicine
Nanosensors
Nanoplasmonics

http://www.ieee.org/conferences_events/conferences/conferencedetails/index.html?Conf_ID=19746

European Congress of Molecular Spectroscopy, August 26-31, 2012, Cluj-Napoca, Romania

Spectroscopic methods and techniques
Computational and theoretical approaches
Structure and dynamics of molecular systems

http://www.nanowerk.com/nanotechnology-event.php?eventid=3484

Nanosafe 2012, November 13-15, 2012, Grenoble, France

Exposure assessment
Characterisation, detection, and monitoring
Nanomaterials life cycle
Toxicology
Environmental impact
Nanoparticle release from consumer products
Personal protective equipment
Secure industrial production
Safety parameters evaluation
Standardisation, regulations

http://www.nanosafe.org/scripts/home/publigen/content/templates/show.asp?P=121&L=EN&ITEMID=65

REFERENCE SECTION

February Feature: EU Nano Organisations

EC Directorates involved in nanotechnology (links to nano specific pages)

- Research DG (http://ec.europa.eu/research/industrial_technologies/index_en.html)
- Information Society and Media DG (http://cordis.europa.eu/fp7/ict/nanoelectronics/)
- Enterprise and Industry DG (http://ec.europa.eu/enterprise/chemicals/legislation)
- Bureau of European Policy Advisers (http://ec.europa.eu/dgs/policy_advisers/index_en.htm)
- Joint Research Centre (http://www.jrc.ec.europa.eu/nanotech/)
- Regional Policy DG (http://ec.europa.eu/dgs/regional_policy/index_en.htm)
- Education DG
- Employment and Social Affairs DG
- Health and Consumer Protection DG (http://ec.europa.eu/health/ph_risk/nanotechnology/nanotechnology_en.htm)
- Environment DG (http://ec.europa.eu/environment/chemicals/nanotech/index.htm)
- External Relations DG

Scientific Committee on Emerging and Newly Identified Health Risks (http://ec.europa.eu/health/ph_risk/committees/04_scenihr/04_scenihr_en.htm)

Scientific Committee on Health and Environmental Risks (http://ec.europa.eu/health/ph_risk/committees/04_scher/04_scher_en.htm)

Scientific Committee on Consumer Products http://ec.europa.eu/health/ph_risk/committees/04_sccp/04_sccp_en.htm)

European Medical Agency (http://www.emea.eu/)

European Chemicals Agency (http://ec.europa.eu/echa)

European Food Safety Authority (http://www.efsa.europa.eu/)

Scientific Committee for Occupational Exposure Limits (http://ec.europa.eu/employment_social/health_safety/scoel_en.htm)

Advisory Committee on Safety and Health at Work (http://ec.europa.eu/employment_social/health_safety/acsh_en.htm)

Project on Occupational Safety and Health (http://www.newoshera.eu/)

European Environment Agency (http://www.eea.europa.eu/)

European Technology Platforms

- Nanomedicine for nanotechnology for health (http://cordis.europa.eu/nanotechnology/nanomedicine.htm)
- Nanoelectronics ENIAC for nanoelectronics (http://cordis.europa.eu/ist/eniac)
- Sustainable chemistry for nanomaterials (http://www.suschem.org/)
- Industrial safety for nanosafety (http://www.industrialsafety-tp.org/)
- Innovative medicine (http://cordis.europa.eu/lifescihealth/innovativemedicines.htm)

Nanobio- and Nanomedicine Companies

Listed alphabetically:
http://www.nanowerk.com/nanotechnology/nanomaterial/nanobiomedicine_a.php

Nano Organizations

National Center for Toxicological Research (NCTR): http://www.fda.gov/AboutFDA/CentersOffices/NCTR/default.htm

National Nanotechnology Initiative (NNI): http://www.nano.gov/

Nano Science and Technology Consortium (NSTC): http://www.nstc.in/

Nano Science and Technology Institute (NSTI): http://www.nsti.org/

The Nanotechnology Institute (NTI): http://nanotechinstitute.org/

Nano Journals

American Chemical Society -- Nano Letters: http://pubs.acs.org/journal/nalefd

Institute of Physics – Nanotechnology: http://iopscience.iop.org/0957-4484/

Journal of Nanoscience and Nanotechnology: http://www.aspbs.com/jnn/

NanoTrends - A Journal of Nanotechnology and its Applications: http://www.nstc.in/journal/default.aspx

BCC Research -- Nanotechnology Reports: http://www.bccresearch.com/index/category/code/nanotechnology

Nanomedicine: Nanotechnology, Biology, and Medicine: http://www.nanomedjournal.com/home

Nanomedicine: http://www.futuremedicine.com/page/about.jsp

Nature Nanotechnology: http://www.nature.com/nnano/focus/highlights/index.html?WT.mc_id=NM1110CT010

CONTACT

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