



REGULATORY AND LEGISLATIVE DEVELOPMENTS

2012 Global R&D Funding Forecast: Industrial R&D—Chemicals, Materials

This summary of global funding for the development of new materials dedicates a section on opportunities for nanotechnology development. Beginning with the NCI's recently created Translation of Nanotechnology in Cancer (TONIC), the summary reviews US government involvement in nanotechnology development. The report notes that of the 15 US government agencies investing in nanotechnology research, the top five are the DOE (\$611 million), NIH (\$465 million), NSF (\$456 million), DOD (\$368 million), and NIST (\$116 million).

The summary can be found here:

<http://www.rdmag.com/Featured-Articles/2011/12/2012-Global-RD-Funding-Forecast-Industrial-RD-Chemicals-Materials/>

German Social Democrats Propose Motion on Nano Regulation

The Social Democratic Party in Germany proposed a motion in December 2011 to regulate nanomaterials. The regulation would include the implementation of a EU-wide register for products utilizing nanotechnology by 2013. The motion also includes a proposal for the better verification and application of the precautionary principle for labeling of nanotechnology in consumer products, development of a safe disposal method for waste products that contain engineered nanomaterials, and an increase in funding for research on the safety of nanomaterials.

The motion can be found here (in German):

<http://chemicalwatch.com/9500/german-social-democrats-propose-motion-on-nano-regulation>

FDA sued over lack of Nano Regulations

FDA has been sued by a group of consumer advocacy groups for the lack of response to a 2006 petition to regulate nanotechnology and require labeling of the use of nanotechnology in consumer products. The group includes the

International Center for Technology Assessment (ICTA), Friends of the Earth, Food and Water Watch, the Center for Environmental Health, the ETC Group, and the Institute for Agricultural and Trade Policy. The group is concerned about the safety effects of chronic exposure to nanomaterials, especially nano-titanium dioxide, which is used in sunscreen.

The original 2006 petition can be found here:

<http://www.icta.org/doc/Nano%20FDA%20petition%20final.pdf>

Office of Inspector General Releases Report: "EPA Needs to Manage Nanomaterial Risks More Effectively"

The Office of the Inspector General released a report on 29 December 2011 concluding that the EPA needs to manage nanomaterial risks more effectively. The report finds that the EPA does not have sufficient information or appropriate infrastructure to assess the health and environmental risks of nanomaterials.

Specifically, it highlights the lack of a formal process to coordinate the dissemination and use of information, lack of communication of an overall message regarding nanomaterials to stakeholders, and the lack of risk information and reliance on industry-submitted data. The report recommends that the Assistant Administrator for Chemical Safety and Pollution Prevention develops a process for ensuring effective dissemination and coordination of information on nanomaterials across EPA offices.

The full report can be found here:

<http://www.epa.gov/oig/reports/2012/20121229-12-P-0162.pdf>

Proposed EU Biocidal Products Regulation Addresses Nanomaterials

The EU Council's committee of the permanent representatives of member states (COFEPER) approved the proposed regulation on biocidal products that would replace the existing Directive 98/8/EC. This proposed regulation would require approval for biocides to be renewed at least every ten years, and more

frequently for certain substances. The regulation includes a statement on the “scientific uncertainty” about the safety of nanomaterials. Specifically, the legislation states “to ensure a high level of consumer protection, free movement of goods and legal certainty for manufacturers, it is necessary to develop a uniform definition for nanomaterials, if possible based on the work of appropriate international fora, and to specify that the approval of an active substance does not include the nanomaterial form unless explicitly mentioned.”

The full article can be found here:

<http://nanotech.lawbc.com/2011/12/articles/international/proposed-eu-biocidal-products-regulation-addresses-nanomaterials/>

Incomplete Nanotoxicology Research Hampering Introduction of Regulations

This news article from *Nature* highlights the lack of comprehensive nanotoxicity research, which is needed to create regulations for nanomaterials. The author argues that nanotoxicity studies require more standards than other toxicity studies because nanoparticles can vary more widely within a batch than other chemicals. While currently there are no widely-accepted criteria for reviewing nanotoxicity studies, the NNI will be developing a set of standards for researchers and agencies to use to fill this gap.

The full article can be found here:

<http://www.nature.com/news/nano-rules-fall-foul-of-data-gap-1.9548#auth-1>

Bioengineering Sciences and Technologies Integrated Review Group, Nanotechnology Study Section Closed Meeting

The National Institutes of Health (NIH) Center for Scientific Review (CSR) Bioengineering Sciences and Technologies Integrated Review Group, Nanotechnology Study Section is holding a closed meeting on February 2-3, 2013 in San Francisco, CA to review and evaluate grant applications. Information on the Nanotechnology Study Section is available at:

<http://public.csr.nih.gov/StudySections/IntegrateReviewGroups/BSTIRG/NANO/Pages>

European Revenue from Nano Products to Surpass US by 2015

Noting that European revenue from nanotechnology-related products will surpass the US' by 2015, this article emphasizes the importance of funding for the US to keep its lead in nanotechnology. The article discusses the tight budget climate and highlights Senator Pryor's Nanotechnology Regulatory Science Act of 2011 and the National Nanotechnology Initiative as examples of US commitment to nanotechnology.

The full article can be found here:

<http://www.genengnews.com/insight-and-intelligence/u-s-lead-in-nanotechnology-depends-on-growth-of-fda-and-gov-t-initiatives/77899511/>

European Journal of Law and Technology Special Issue on Nanotechnology Regulations

This special edition of the European Journal of Law and Technology reviews nanotechnology from multiple aspects, including philosophical, ethical, and regulatory issues. Below is a selection of articles from the journal.

The full issue can be found here:

<http://ejlt.org/index.php/ejlt/index>

- *Regulating Nanoparticles: The Problem of Uncertainty*

Roger Strand, Kamilla Lein Kjølberg

<http://ejlt.org/article/view/88>

- *Complexities of Labelling of Nanoproducts on the Consumer Markets*

Harald Throne-Holst, Arie Rip

<http://ejlt.org/article/view/83>

- *Regulation and Governance of Nanotechnology in China: Regulatory Challenges and Effectiveness*

Darryl Stuart Jarvis, Noah Richmond

<http://ejlt.org/article/view/94>

- *How Resilient is India to Nanotechnology Risks? Examining Current Developments, Capacities and an Approach for Effective Risk Governance and Regulation*

Shilpanjali Deshpande Sarma

<http://ejlt.org/article/view/98>

RECENT REVIEWS AND OTHER PUBLICATIONS OF INTEREST

Journal Information Flow in Nanotechnology.

Journal of Nanoparticle Research, December 2011, Vol. 13, No. 12. Rostislav A. Andrievski and Svetlana V. Klyuchareva.

<http://www.springerlink.com/content/w2m50385x63328h5/> (OPEN ACCESS)

Needs for Regulations, Training, and Education for Health Protection and Environmental Security of Nanotechnologies.

N. Opopol. In *Nanotechnology—Toxicological Issues and Environmental Safety*. Edited by P.P. Simeonova, N. Opopol, M.I. Luster.

<http://www.springerlink.com/content/70062h2245thw7w/> (OPEN ACCESS)

How Interdisciplinary is Nanotechnology? Journal of Nanoparticle Research, July 2009, Vol. 11, No. 5. Alan L. Porter and Jan Youtie.

<http://www.springerlink.com/content/556h21hq434410m/> (OPEN ACCESS)

Trends for Nanotechnology Development in China, Russia, and India.

Journal of Nanoparticle Research, November 2009, Vol. 11, No. 8. Xuan Liu, Pengzhu Zhang, Xin Li, Hsinchun Chen, Yan Dang, Catherine Larson, Mihail C. Roco, and Xianwen Wang.

<http://www.springerlink.com/content/88g5160k0w003281/> (OPEN ACCESS)

Worldwide Nanotechnology Development: A Comparative Study of USPTO, EPO, and JPO Patents (1976-2004).

Journal of Nanoparticle Research, December 2007, Vol. 9, No. 6. Xin Li, Yiling Lin, Hsinchun Chen, and Mihail C. Roco.

<http://www.springerlink.com/content/t177nw2uw7v27752/> (OPEN ACCESS)

Trends in Worldwide Nanotechnology Patent Applications: 1991 to 2008.

Journal of Nanoparticle Research, March 2010, Vol. 12, No. 3. Yan Dang, Yulei Zhang, Li Fan, Hsinchun Chen, and Mihail C. Roco.

<http://www.springerlink.com/content/d269011318757721/> (OPEN ACCESS)

Distribution of Functionalised Gold Nanoparticles between Water and Lipid Bilayers as Model Cell Membranes

Environmental Science Technology, January 2012. Wen-Che Hou, Babak yaghoubi Moghadam, Charlie Corredor, Paul Westerhoff, and Jonathan D Posner.

<http://pubs.acs.org/doi/abs/10.1021/es203661k?journalCode=esthag>

Nanotechnology Research Directions for Societal Needs in 2020: Retrospective and Outlook.

Mihail C. Roco, Chad A. Mirkin, and Mark C. Hersam. June 2011. <http://www.amazon.com/Nanotechnology->

Research-Directions-Societal-

[Needs/dp/9400711670/ref=sr_1_1?s=books&ie=UTF8&qid=1326320178&sr=1-1](http://www.amazon.com/Nanotechnology-Needs/dp/9400711670/ref=sr_1_1?s=books&ie=UTF8&qid=1326320178&sr=1-1)

Click Chemistry for Drug Delivery Nanosystems.

Pharmaceutical Research, January 2012, Vol. 29, No. 1. Enrique Lallana, Ana Sousa-Herves, Francisco Fernandez-Trillo, Ricardo Riguera, and Eduardo Fernandez-Megia.

<https://springerlink3.metapress.com/content/v257326r04672476/resource-secured/?target=fulltext.pdf&sid=fqliveqbmvpwasnrq v4zw0u&sh=www.springerlink.com>

Opsonisation, Biodistribution, Cellular Uptake, and Apoptosis Study of PEGylated PBCA

Nanoparticle as Potential Drug Delivery Carrier.

Pharmaceutical Research, January 2012, Vol. 29, No. 1. Kiran Ramanlal Chaudhari, Mukesh Ukawala, Arehalli S. Manjappa, Abhinesh Kumar, Piyush Kishor Mundada, Anil Kumar Mishra, Rashi Mathur, Jukka Mönkkönen & Rayasa S. Ramchandra Murthy.

<http://www.springerlink.com/content/c5177274n120031/fulltext.pdf>

Solid Lipid Nanoparticles Loaded with Anti-microRNA Oligonucleotides (AMOs) for Suppression of MicroRNA-21 Functions in Human Lung Cancer Cells.

Pharmaceutical Research, January 2012, Vol. 29, No. 1. San-Jun Shi, Zhi-Rong Zhong, Jie Liu, Zhi-Rong Zhang, Xun Sun & Tao Gong.

<https://springerlink3.metapress.com/content/n68226588753271p/resource-secured/?target=fulltext.pdf&sid=fqliveqbmvpwasnrq v4zw0u&sh=www.springerlink.com>

Preparation, Characterization, and Cytotoxicity of Carbon Nanotube-Chitosan-Phycocyanin

Complex. Nanotechnology, 27 January 2012, Vol. 23, No. 3. Xiaoxia Liao and Xuewu Zhang.

<http://iopscience.iop.org/0957-4484/23/3/035101>

Review: Controllable Synthesis and Biomedical Applications of Silver Nanomaterials.

Journal of Nanoscience and Nanotechnology, November 2011, Vol. 11, No. 11, pp. 9395-9408. Zhihai Huang, Xiaoli Jiang, Dawei Guo, and Ning Gu.

<http://openurl.ingenta.com/content?genre=article&issn=1533-4880&volume=11&issue=11&spage=9395&epage=9408>

Ferroxidase Activity of Apoferritin is Increased in the Presence of Platinum

Nanoparticles. Nanotechnology, 27 January 2012, Vol. 23, No. 3. Afolake Sennuga,

Jacqueline van Marwijk, and Chris G. Whiteley.
<http://iopscience.iop.org/0957-4484/23/3/035102>

Mutagenic Effects of Gold Nanoparticles Induce Aberrant Phenotypes in *Drosophila Melanogaster*. Nanotechnology, Biology, and Medicine, January 2012, Vol. 8, No. 1, pp. 1-7. Giuseppe Vecchio, Antonio Galeone, Virgilio Brunetti, Gabriele Maiorano, Lóris Rizzello, Stefania Sabella, Roberto Cingolani, Píer P. Pampa.

<http://www.nanomedjournal.com/article/PIIS1549963411005132/abstract>

Cellular Transport Pathways of Polymer Coated Gold Nanoparticles. Nanotechnology, Biology, and Medicine, January 2012, Vol. 8, No. 1, pp. 8-11. I-Chun Lin, Mingtao Liang, Tzu-Yu Liu, Michael J. Monteiro, Istvan Toth.

<http://www.nanomedjournal.com/article/PIIS1549963411003716/abstract>

Infection by Plasmodium Changes Shape and Stiffness of Hepatic Cells.

Nanotechnology, Biology, and Medicine, January 2012, Vol. 8, No. 1, pp.17-19. Peter Eaton, Vanessa Zuzarte-Luis, Maria M. Mota, Nuno C. Santos, Miguel Prudencio.

<http://www.nanomedjournal.com/article/PIIS1549963411003777/abstract>

Bionanoscience: Nanoparticles in the Life of a Cell. Nature Nanotechnology, January 2012, Vol. 7, No. 1, pp. 9-10. Huw Summers.

<http://www.nature.com/nnano/journal/v7/n1/pdf/nnano.2011.207.pdf>

Review:

Nanoparticles in Targeted Cancer Therapy: Mesoporous Silica Nanoparticles Entering Preclinical Development Stage. Nanomedicine, January 2012, Vol. 7, No. 1, pp.111-120.

Jessica M. Rosenholm, Veronika Mamaeva, Cecilia Sahlgren, Mika Linden.

<http://www.futuremedicine.com/doi/pdf/10.2217/nnm.11.166>

Review:

Interaction of Nanoparticles with Immunocompetent Cells: Nanosafety Considerations.

Nanomedicine, January 2012, Vol. 7, No. 1, pp. 121-131. Diana Boraschi, Luca Constantino, Paola Italiani.

<http://www.futuremedicine.com/doi/pdf/10.2217/nnm.11.169>

RECENT AND UPCOMING CONFERENCES AND WORKSHOPS

International Conference on Biomedical Engineering. December 10-12, 2011, Manipal Karnataka, India

Medical applications of nanotechnology will be one of focus areas at this event

<http://uic.manipal.edu/icbme/#contact>

International Conference on Nanotechnology & Biosensors. December 28-30, 2011, Dubai, UAE

Aims to foster cross-pollination between nanotechnology and biosensors

<http://www.icnb.org/index.htm>

Bionanotechnology III: From Biomolecular Assembly to Applications. January 4-6, 2012, Cambridge, UK

Large natural and designed assemblies
 Single-molecule studies
 Nanomaterials and devices in vitro
 Nanomaterials and devices in vivo
 Biomolecular self-assembly

<http://www.biochemistry.org/Conferences/AllConferences/tabid/379/View/Conference/MeetingNo/SA121/Default.aspx>

Nano Health. January 15-16, 2012, Egypt, Cairo

To address the future of nanotechnology, potential risks and regulatory issues

New frontiers in drug delivery and therapeutics

New frontiers in imaging and diagnosis

Nanotechnology and the developing world

Roadmapping new technologies

Novel medical materials and products

<http://www.clocate.com/conference/Nano-Health-2012/13170>

International Conference on Nanoscience and Technology. January 20-23, 2012, Hyderabad, India

Advances in nanomaterial synthesis

Technology and commercialization

Energy applications

Biotechnology and biomedical applications

CNTs and graphene

Physics of nanomaterials

NEMS, lithography, etc.

Catalysis

Nanocomposites

Surface engineering and tribology applications
Advances in nanomaterials characterization
Nanotoxicology and nanoregulatory aspects

<http://www.iconsat2012.com/>

**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>

**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

Nanophotonics
Nanomaterials
Carbon nanotube based devices and systems
Nanoscale robotics, assembly, automation
Molecular sensors, actuators, and systems
MEMS/NEMS and molecular sensors
Microfluidics and nanofluidics
Micro and nano heat transfer
Nanobiology, bio-informatics, nanomedicine
Micro and nano fabrication
Micro/nano sensors and actuators
Micro/nanoelectromechanical systems

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

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

Nanomaterials
Nanoparticles
Nanotech biomarker detection
Applications of nanotechnology

Drug delivery
Antimicrobial activity of metals
Nanotechnology
Nano-arrays for cancer
Nanomedicine
Nano-sensors
Nano-electronics
Nano-devices

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

**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>

**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
Surfaces and colloids in imaging and diagnostics
Microfluidics with colloidal systems

Toxicology and risk assessment of nanomedicine systems
 Responsive colloids and materials
 Lipid and biomimetic membranes
 Proteins and peptides at interfaces
 Soft matter, surfactants, polymers in biological systems
 Adsorption, catalysis, and electrochemistry in biological systems
 Interfacial processes, capillarity, and wetting 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
 Natural carriers
 Carriers for vaccines and antigen delivery
 Latest news and young voices
 Intracellular delivery, trafficking and cellular barriers
 Biological response to delivered drugs and genes

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

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>

REFERENCE SECTION

January Feature: US Nano Organisations

National Center for Toxicological Research (NCTR):

<http://www.fda.gov/AboutFDA/CentersOffices/NCTR/default.htm>

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/>

Nanotechnology Task Force (FDA)

<http://www.fda.gov/ScienceResearch/SpecialTopics/Nanotechnology/NanotechnologyTaskForce/default.htm>

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

- Bureau of Industry and Security, Department of Commerce (BIS/DOC)
- Consumer Product Safety Commission (CPSC)
- Department of Defense (DOD)
- Department of Education (DOEd)
- Department of Energy (DOE)
- Department of Homeland Security (DHS)
- Department of Justice/National Institute of Justice (DOJ/NIJ)
- Department of State (DOS)
- Department of Transportation, Federal Highway Administration (DOT, FHWA)
- Department of Treasury (DOTreas)
- Department on Labor/Occupational Safety and Health Administration (DOL/OSHA)
- Environmental Protection Agency (EPA)
- Food and Drug Administration (FDA)
- National Aeronautics and Space Administration (NASA)
- National Cancer Institute (NCI)
- National Institute for Occupational Safety and Health (NIOSH)
- National Institute of Standards and Technology (NIST)
- National Institutes of Health (NIH)
- National Science Foundation (NSF)
- Nuclear Regulatory Commission (NRC)
- U.S. Department of Agriculture, Forest Service (USDA/FS)
- U.S. Department of Agriculture, National Institute of Food and Agriculture (USDA/NIFA)

- U.S. Geological Survey (USGS)
- U.S. Intelligence Community
- U.S. Patent and Trade Office (UPTO)
- U.S. International Trade Commission (USITC)

Nanobio- and Nanomedicine Companies

Listed alphabetically:

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

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

For further information, or if you have any questions about the Nanomedicines Alliance, please contact the Nanomedicines Alliance Secretariat at 1-202-230-5607 or info@nanomedicines-alliance.org

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