



## REGULATORY AND LEGISLATIVE DEVELOPMENTS

### **FDA Nanotechnology Guidance**

The US FDA has released a final guidance *Considering Whether an FDA-Regulated Product Involves the Application of Nanotechnology*. On this question, the guidance considers whether any dimension or structure of the product is considered to be in the nanoscale range and whether a product or material in the product exhibits properties or phenomena that can be attributed to its dimensions. The guidance is intended to help industry consider how the regulatory status and impact of a product.

<http://www.fda.gov/RegulatoryInformation/Guidances/ucm257698.htm>

### **Progress Review on NNI Research Initiative**

In June 2014, the National Nanotechnology Initiative (NNI) released a *Progress Review on the Coordinated Implementation of the National Nanotechnology Initiative 2011 Environmental, Health, and Safety Research Strategy*. The report details the development of comprehensive measurement tools and collection of exposure assessment data for engineered nanomaterials and a better understanding of the transport and transformations of nanomaterials and interactions in the human body. Progress also included the coordination of efforts between agencies to build a collaborative nanoinformatics infrastructure.

[http://www.nano.gov/sites/default/files/pub\\_resource/2014\\_nni\\_ehs\\_progress\\_review.pdf](http://www.nano.gov/sites/default/files/pub_resource/2014_nni_ehs_progress_review.pdf)

### **EU Paper on Nanosilver**

The European Commission's Scientific Committee on Emerging and Newly Identified Health Risks has put out a final opinion paper on *Nanosilver: safety, health, and environmental effects and role in antimicrobial resistance*. The paper expresses concerns over toxicity and environmental and occupational exposure. The opinion piece also cites the possibility of bacterial resistance developing against nanosilver.

[http://ec.europa.eu/health/scientific\\_committees/consultation/public\\_consultations/scenih\\_r\\_consultation\\_17\\_en.htm](http://ec.europa.eu/health/scientific_committees/consultation/public_consultations/scenih_r_consultation_17_en.htm)

### **EU NanoSafety Compendium 2014**

The EU NanoSafety Cluster has released the 2014 edition of its compendium detailing European Commission funded research projects on aspects of nanosafety. Several projects focus on risk management, national and international collaboration, nanomaterial databases, exposure modeling, and particle size measurement.

[http://www.nanosafetycluster.eu/uploads/files/pdf/2014\\_NSC\\_Compendium.pdf](http://www.nanosafetycluster.eu/uploads/files/pdf/2014_NSC_Compendium.pdf)

### **European Project to Fight Antibiotic Resistance**

A project called PneumoNP, funded by the European Union's Seventh Framework Programme, plans to use inhaled nanomedicine particles and a nanocarrier to treat antibiotic resistant bacterial infections in the lungs. The project will also develop a new aerosol technology specifically for delivery of the nanotherapeutic system. The initiative involves eleven industry, clinical, research, and academic partner institutions across six EU nations and is planned to be completed in 2017.

<http://www.pneumonp.eu/>

## REVIEWS AND OTHER PUBLICATIONS OF INTEREST

### **Engineered nanomedicine for myeloma and bone microenvironment targeting.**

Proceedings of the National Academy of Sciences, June 2014. Archana Swami, Michaela R. Reagan, Pamela Basto, Yuji Mishima, Nazila

Kamaly, Siobhan Glavey, Sufeng Zhang, Michele Moschetta, Dushanth Seevaratnam, Yong Zhang, Jinhe Liu, Masoumeh Memarzadeh, Jun Wu, Salomon Manier, Jinjun Shi, Nicolas Bertrand, Zhi Ning Lu, Kenichi

*For further information, or if you have any questions about the Nanomedicines Alliance, please contact the Nanomedicines Alliance Secretariat at 1-202-230-5653.*

Nagano, Roland Baron, Antonio Sacco, Aldo M. Roccaro, Omid C. Farokhzad, Irene M. Ghobrial. <http://www.pnas.org/content/early/2014/06/26/1401337111?ab=author-info>

**Intravenously administered nanoparticles increase survival following blast trauma.**

Proceedings of the National Academy of Sciences, June 2014. Margaret M. Lashof-Sullivan, Erin Shoffstall, Kristyn T. Atkins, Nickolas Keane, Cynthia Bir, Pamela VandeVord, Erin B. Lavik. <http://www.pnas.org/content/early/2014/06/25/1406979111>

**Decoding long nanopore sequencing reads of natural DNA.** Nature Biotechnology, June 2014. Andrew H Laszlo, Ian M Derrington, Brian C Ross, Henry Brinkerhoff, Andrew Adey, Ian C Nova, Jonathan M Craig, Kyle W Langford, Jenny Mae Samson, Riza Daza, Kenji Doering, Jay Shendure, Jens H Gundlach. <http://www.nature.com/nbt/journal/vaop/ncurrent/full/nbt.295.0.html>

**Mimicking subsecond neurotransmitter dynamics with femtosecond laser stimulated nanosystems.** Scientific Reports, Vol. 4, No. 5398, June 2014. Takashi Nakano, Catherine Chin, David Mo Aung Myint, Eng Wui Tan, Peter John Hale, Bala Murali Krishna M., John N. J. Reynolds, Jeff Wickens, Keshav M. Dani. <http://www.nature.com/srep/2014/140623/srep05398/full/srep05398.html>

**Targeting and stimulation of the zebrafish (Danio rerio) innate immune system with LPS/dsRNA-loaded nanoliposomes.** Vaccine, Vol. 32, Issue 31, pp. 3955 – 3962, June 2014. Angels Ruyra, Mary Cano-Sarabia, Pablo García-Valtanan, Daniel Yero, Isidre Gibert, Simon A. Mackenzie, Amparo Estepa, Daniel Maspoch, Nerea Roher. <http://www.sciencedirect.com/science/article/pii/S0264410X14006665>

**Self-assembly of amphiphilic Janus dendrimers into uniform onion-like dendrimersomes with predictable size and number of bilayers.** Proceedings of the National Academy of Sciences, Vol. 111, No. 25, June 2014. Shaodong Zhang, Hao-Jan Sun, Andrew D. Hughes, Ralph-Olivier Moussodia, Annabelle Bertin, Yingchao Chen, Darrin J. Pochan, Paul A. Heiney, Michael L. Klein, Virgil Percec. <http://www.pnas.org/content/111/25/9058>

**Etchable plasmonic nanoparticle probes to image and quantify cellular internalization.** Nature Materials, June 2014. Gary B. Braun, Tomas Friman, Hong-Bo Pang, Alessia Pallaoro,

Tatiana Hurtado de Mendoza, Anne-Mari A. Willmore, Venkata Ramana Kotamraju, Aman P. Mann, Zhi-Gang She, Kazuki N. Sugahara, Norbert O. Reich, Tambat Teesalu, Erkki Ruoslahti. <http://www.nature.com/nmat/journal/vaop/ncurrent/full/nmat3982.html>

**Preparation and evaluation of polyethyleneimine-single walled carbon nanotube conjugates as vectors for pancreatic cancer treatment.** Journal of Materials Chemistry B, Vol. 2, pp. 4740 – 4747, May 2014. Enrico Andreoli, Rei Suzuki, Alvin W. Orbaek, Manoop S. Bhutani, Robert H. Hauge, Wade Adams, Jason B. Fleming, Andrew R. Barron. <http://pubs.rsc.org/en/Content/ArticleLanding/2014/TB/c4tb00778f#divAbstract>

**MagnetoSperm: A microrobot that navigates using weak magnetic fields.** Applied Physics Letters, Vol. 104, June 2014. Islam S. M. Khalil, Herman C. Dijkslag, Leon Abelmann Sarthak Misra. <http://scitation.aip.org/content/aip/journal/apl/104/22/10.1063/1.4880035>

**Introducing Mixed-Charge Copolymers As Wound Dressing Biomaterials.** Applied Materials and Interfaces, Vol. 6, Issue 12, pp. 9858 – 9870, June 2014. Jheng-Fong Jhong, Antoine Venault, Lingyun Liu, Jie Zheng, Sheng-Han Chen, Akon Higuchi, James Huang, Yung Chang. <http://pubs.acs.org/doi/abs/10.1021/am502382n>

**Protein delivery into live cells by incubation with an endosomolytic agent.** Nature Methods, June 2014. Alfredo Erazo-Oliveras, Kristina Najjar, Laila Dayani, Ting-Yi Wang, Gregory A Johnson, Jean-Philippe Pellois. <http://www.nature.com/nmeth/journal/vaop/ncurrent/full/nmeth.2998.html>

**Optimization of lag time underlies antibiotic tolerance in evolved bacterial populations.** Nature, June 2014. Ofer Fridman, Amir Goldberg, Irine Ronin, Noam Shoshitaishvili, Nathalie Q. Balaban. <http://www.nature.com/nature/journal/vaop/ncurrent/full/nature13469.html>

**Correlated motions are a fundamental property of  $\beta$ -sheets.** Nature Communications, Vol. 5, June 2014. R. Bryn Fenwick, Laura Orellana, Santi Esteban-Martín, Modesto Orozco, Xavier Salvatella. <http://www.nature.com/ncomms/2014/140611/ncomms5070/full/ncomms5070.html>

**Resolving the molecular mechanism of cadherin catch bond formation.** Nature Communications, Vol. 5, June 2014. Kristine Manibog, Hui Li, Sabyasachi Rakshit, Sanjeevi Sivasankar.  
<http://www.nature.com/ncomms/2014/140602/ncomms4941/full/ncomms4941.html>

**Engineering human tumour-associated chromosomal translocations with the RNA-guided CRISPR–Cas9 system.** Nature Communications, Vol. 5, Article No. 3964, June 2014. R. Torres, M. C. Martin, A. Garcia, Juan C. Cigudosa, J. C. Ramirez, S. Rodriguez-Perales.  
<http://www.nature.com/ncomms/2014/140603/ncomms4964/full/ncomms4964.html>

**Light-Activatable Gold Nanoshells for Drug Delivery Applications.** AAPS PharmSciTech, Vol. 15, Issue 3, pp. 741 – 752, June 2014.

Burapol Singhana, Patrick Slattery, Aaron Chen, Michael Wallace, Marites P. Melancon.  
[http://link.springer.com/article/10.1208/s12249-014-0097-8?wt\\_mc=alerts.TOCjournals](http://link.springer.com/article/10.1208/s12249-014-0097-8?wt_mc=alerts.TOCjournals)

**Nanodrug Delivery Systems: A Promising Technology for Detection, Diagnosis, and Treatment of Cancer.** AAPS PharmSciTech, Vol. 15, Issue 3, pp. 709 – 721, June 2014. Anish Babu, Amanda K. Templeton, Anupama Munshi, Rajagopal Ramesh.  
[http://link.springer.com/article/10.1208/s12249-014-0089-8?wt\\_mc=alerts.TOCjournals](http://link.springer.com/article/10.1208/s12249-014-0089-8?wt_mc=alerts.TOCjournals)

**Nanoemulsions in Translational Research—Opportunities and Challenges in Targeted Cancer Therapy.** AAPS PharmSciTech, Vol. 15, Issue 3, pp. 694 – 708, June 2014. Srinivas Ganta, Meghna Talekar, Amit Singh, Timothy P. Coleman, Mansoor M. Amiji.  
[http://link.springer.com/article/10.1208/s12249-014-0088-9?wt\\_mc=alerts.TOCjournals](http://link.springer.com/article/10.1208/s12249-014-0088-9?wt_mc=alerts.TOCjournals)

## CONFERENCES AND WORKSHOPS

### NANOSMAT Conference, September 8 – 11, 2014, Dublin, Ireland

Drug delivery  
 Diagnostics  
 Imaging  
 Biosensors  
 Biomarkers  
 Biomaterials

<http://www.nanosmat-conference.com/default.asp>

### Physical Chemistry of Functionalized Biomedical Nanoparticles, September 17 – 19, 2014, Bristol, UK

Magnetic nanoparticles  
 In vivo targeting

[http://www.rsc.org/conferencesandevents/rsconferences/fd175/index.asp?utm\\_content=chemistry-conf&utm\\_source=non-rsc-website&utm\\_medium=link&utm\\_campaign=mkt-eet-fd175](http://www.rsc.org/conferencesandevents/rsconferences/fd175/index.asp?utm_content=chemistry-conf&utm_source=non-rsc-website&utm_medium=link&utm_campaign=mkt-eet-fd175)

### ETP Nanomedicines Annual Event 2014, October 15 – 16, 2014, San Sebastian, Spain

Nanomedicine developments  
 Diagnostics & imaging  
 Nanotherapeutics  
 Regenerative medicine  
 Clinical interface  
 Toxicology & Characterization

<http://www.etp-nanomedicine.eu/public/news-events/events/etp-nanomedicine-annual-event-2014-1/etp-annual-event-2014-programme>

### Trends in Nanotechnology International Conference, October 27 – 31, 2014, Barcelona, Spain

Nanofabrication tools  
 Nanoscale integration  
 Toxicity  
 Regulation  
 Nanobiotechnology

<http://www.tntconf.org/2014/topics.php?conf=14>

### Proteins and Nanoparticles @ Membranes 2014, 19 – 22 October, 2014, Julich, Germany

Nanoparticles  
 Biological systems

[http://www.fz-juelich.de/ics/ics-2/EN/Leistungen/ConferencesAndWorkshops/Particles@Membranes/\\_node.html](http://www.fz-juelich.de/ics/ics-2/EN/Leistungen/ConferencesAndWorkshops/Particles@Membranes/_node.html)

### Nanoinformatics for Environmental Health and Biomedicine, 2 – 5 November 2014, Belfast, UK

Data management  
 Nanomaterial characterization  
 Computing applications for nanomedicine

<http://nanoinfo2014.weebly.com/>

### NanoCon 2014, 5 – 7 November, Brno, Czech Republic

Tissue engineering  
 Biochemical applications  
 Nano-implants  
 Anti-tumor therapy

<http://www.nanocon.eu/en/topics/>

## REFERENCE SECTION

### Nanobio- and Nanomedicine Companies

Listed alphabetically:

[http://www.nanowerk.com/nanotechnology/nanomaterial/nanobiomedicine\\_a.php](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/home0>

Nanomedicine:

<http://www.futuremedicine.com/page/about.jsp>

Nature Nanotechnology:

[http://www.nature.com/nnano/focus/highlights/index.html?WT.mc\\_id=NM1110CT01](http://www.nature.com/nnano/focus/highlights/index.html?WT.mc_id=NM1110CT01)

## CONTACT

For further information, or if you have any questions about the Nanomedicines Alliance, please contact the Nanomedicines Alliance Secretariat at 1-202-230-5653 or [info@nanomedicines-alliance.org](mailto:info@nanomedicines-alliance.org).

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