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Center for Nanotechnology in Society
University of California, Santa Barbara

www.cns.ucsb.edu

WEEKLY CLIPS

February 17 – February 23, 2009

Reportbuyer: Nanotechnology in Lithium Ion Batteries to Drive Electric Vehicle Uptake, Says New Report

M2 Communications (February 19, 2009)

Report Buyer, the online destination for business intelligence for major industry sectors, has added a new report which offers a detailed outlook of the worldwide nanotechnology electric vehicle markets.

"Worldwide Nanotechnology Electric Vehicle (EV) Market Shares, Strategies, and Forecasts, 2009 to 2015: Electric Vehicle Markets Set to Grow Rapidly", available at <http://www.reportbuyer.com/go/WIN00057> reports that electric vehicles represent a quantum shift in transportation, opening up new ways of understanding and considering the basic functions of vehicles.

The car companies that leverage the market opportunity to shift to a new paradigm are likely to succeed. With countries seeking to invest in infrastructure that will provide economic growth, it is clear that special infrastructure for electric vehicles will stimulate growth from the private sector.

Furthermore, worldwide nanotechnology thin film lithium-ion batteries are poised to achieve significant growth as units become more able to achieve deliver of power to electric vehicles efficiently. Less expensive lithium-ion batteries allow leveraging economies of scale and proliferation of devices into a wide range of applications.

http://www.smalltimes.com/news/display_news_story.cfm?Section=WireNews&Category=HOME&NewsID=174253



Abstract:

US-Africa and Caribbean Nanotechnology Initiative (USACANI) Workshop is scheduled for June 21-26, 2009 at Trinidad; Trinidad and Tobago

US-African and Caribbean Nanotechnology Initiative (USACANI)

Trinidad | Posted on February 20th, 2009

The workshop will bring together nanoscience and nanotechnology leaders to discuss on nanoenergy (solar cell), nanomedicine-drug delivery and vaccines for cures and prevention of HIV/AIDS, cholera, tumor, cancer, malaria, tuberculosis, etc; nanostrategy and policies, nanofinancing, nanosensors, nanofiltration, nanoeducation, nanoagriculture, etc that are crucial to US, Africa and the Caribbean all round development. Program includes tours around the beautiful Island of Trinidad and Tobago. The President of Trinidad and Tobago; George Richard will deliver a keynote speech. The tri-partite of academia, policy makers and private sector will be represented in this prestigious gathering.

http://www.nanotech-now.com/news.cgi?story_id=32228



APR Acquires A New Drug Delivery Nanotechnology Platform Providing Innovative Treatment Solutions For Critical Diseases

Main Category: [Pharma Industry / Biotech Industry](#)

Article Date: 20 Feb 2009 - 1:00 PST

APR Applied Pharma Research s.a. ("APR") announces the acquisition of a new platform technology consisting of a patented Nanocoating process for the preparation of new patent protected biotechnology products for the treatment of several critical diseases in multiple therapeutic areas. APR is already developing specific applications of the resulting products in ophthalmology and dermatology. Financial terms of the acquisition were not disclosed.

"We decided to acquire this new platform technology when we understood the great potential of combining a process based on nano-coating technology to totally biological compounds to obtain products with powerful healing capabilities and minimal side effects or tolerability issues" - said Paolo Galfetti, CEO of APR - "The products based on this new technology may unlock new therapeutic solutions to unmet needs in several critical therapeutic areas".

APR has first targeted the treatment of eye injuries, including cataract, chronic and acute infected wounds, including surgically induced wounds and skin and eye infections, where initial tests made with the first product derived from the new technology showed most promising results. Several other applications of this technology are also being studied.

<http://www.medicalnewstoday.com/articles/139668.php>



New Technique Breaks Nano-Particle Self-Assembly Barrier **Method holds promise for mass-produced nanoparticles**

Posted February 20, 2009

Researchers on the cutting edge of chemistry and materials science are striving to manipulate nano-particles—bits hundreds of times smaller than the diameter of a human hair—to assemble themselves into miniscule machines capable of all manner of functions. Scientists have long been able to create non-structures from a single particle type, but assembling sophisticated structures from multiple types of particles has never been achieved.

Scientists succeeded in getting three different types of nano-particles to self-assemble.

Now, scientists at Duke University and the University of Massachusetts, Amherst, have coaxed three different-sized particles to self-assemble into elegantly shaped structures the scientists say are “simply beautiful.” Under the microscope some look like flower petals, others resemble Saturn and its rings.

The structures are formed in a solution containing suspensions of nano-particles composed of iron-containing compounds, which can be highly magnetized by external magnets. Changing the levels of magnetization of the fluid controls how the particles are attracted to or repelled by each other. By tuning these interactions, the magnetic and non-magnetic particles form around each other much like a snowflake forms around a microscopic dust particle.

<http://www.usnews.com/articles/science/technology/2009/02/20/new-technique-breaks-nano-particle-self-ass>

The pros and cons of nanofoods

Nanotechnology has the potential to improve the foods we eat, making them tastier, healthier and more nutritious. Yet little is known about how nanoparticles behave in the body, or what kind of toxic effects they could have. Hermann Stamm works on this issue for the European Commission's Joint Research Centre (JRC); he gave a presentation on the topic of nanofoods at the American Association for the Advancement of Science (AAAS) Annual Meeting in Chicago, US.

Before travelling to the event, Dr Stamm spoke to CORDIS News about how nanotechnology is used in the food industry, what the risks are, and what research is needed. Citing food industry experts, he explained that foods containing artificial nanomaterials are not on sale in Europe, although they are available over the Internet.

Nanotechnology can be used to enhance the flavour and texture of foods, to reduce fat content, or to encapsulate nutrients such as vitamins to ensure they do not degrade during a product's shelf life. In addition to this, nanomaterials can be used to make packaging that keeps the product inside fresher for longer. Intelligent food packaging incorporating nanosensors could even provide consumers with information on the state of the food inside.

However, adding nanomaterials to food is not without risks. 'One knows that due to their small size, nanomaterials can overcome barriers like the epithelium in the gut and get into the blood stream,' said Dr Stamm. 'They can then reach secondary target organs and accumulate there.'

http://cordis.europa.eu/fetch?CALLER=EN_NEWS&ACTION=D&SESSION=&RCN=30485



Evaluation of 'green' nanotechnology requires a full life cycle assessment

(Nanowerk Spotlight) As nanotechnology applications and nanomaterials slowly move into mainstream manufacturing, there will have to be an increasing focus on the environmental footprint that the production of various nanomaterials creates. A growing research body promises to lead to green(er) nanomanufacturing technologies (see: "[Toward Greener Nanosynthesis](#)" and the efforts of the University of Oregon's [Safer Nanomaterials and Nanomanufacturing Initiative](#)).

However, as we discussed in our Nanowerk Spotlight "[Nanotechnology - not that green?](#)" last year, and to quote one of the conclusions from the paper above, "this emerging field of green nanoscience faces considerable research challenges to achieve the maximum performance and benefit from nanotechnology while minimizing the impact on human health and the environment".

As it stands now, it remains to be seen what the environmental footprint of nanotechnologies will be. So far, the message is mixed.

"Life cycle studies of emerging nanotechnologies are susceptible to huge uncertainties due to issues of data quality and the rapidly evolving nature of the production processes," [Vikas Khanna](#) tells Nanowerk. "With missing data about the large scale impact of nanotechnology, life cycle assessments of potential nanoproducts should form an integral part of nanotechnology research at early stages of decision making as it can help in the screening of different process alternatives."

In a new study, Khanna, a Ph.D. candidate in the Process Systems Engineering Research Group in the Department of Chemical and Biomolecular Engineering Ohio State University (OSU) and [Bhavik R. Bakshi](#), leader of the group, have compiled a life cycle inventory for carbon nanofiber (CNF) reinforced polymer nanocomposites (PNCs) based on available engineering information and published literature.

<http://www.nanowerk.com/spotlight/spotid=9386.php>

Nanoparticle 'smart bomb' targets drug delivery to cancer cells

Researchers at North Carolina State University have successfully modified a common plant virus to deliver drugs only to specific cells inside the human body, without affecting surrounding tissue. These tiny "smart bombs" - each one thousands of times smaller than the width of a human hair - could lead to more effective chemotherapy treatments with greatly reduced, or even eliminated, side effects.

Drs. Stefan Franzen, professor of chemistry, and Steven Lommel, professor of plant pathology and genetics, collaborated on the project, utilizing the special properties of a fairly common and non-toxic plant virus as a means to convey drugs to the target cells.

The researchers say that the virus is appealing in both its ability to survive outside of a plant host and its built-in "cargo space" of 17 nanometers, which can be used to carry chemotherapy drugs directly to tumor cells. The researchers deploy the virus by attaching small proteins, called signal peptides, to its exterior that cause the virus to "seek out" particular cells, such as cancer cells. Those same signal peptides serve as "passwords" that allow the virus to enter the cancer cell, where it releases its cargo.

"We had tried a number of different nanoparticles as cell-targeting vectors," Franzen says. "The plant virus is superior in terms of stability, ease of manufacture, ability to target cells and ability to carry therapeutic cargo."

Calcium is the key to keeping the virus' cargo enclosed. When the virus is in the bloodstream, calcium is also abundant. Inside individual cells, however, calcium levels are much lower, which allows the virus to open, delivering the cancer drugs only to the targeted cells.

"Another factor that makes the virus unique is the toughness of its shell," Lommel says. "When the virus is in a closed state, nothing will leak out of the interior, and when it does open, it opens slowly, which means that the virus has time to enter the cell nucleus before deploying its cargo, which increases the drug's efficacy."

The researchers believe that their method will alleviate the side effects of common chemotherapy treatments, while maximizing the effectiveness of the treatment.

http://www.eurekalert.org/pub_releases/2009-02/ncsu-nb021209.php

EPA to Enforce Premanufacture Reviews for Carbon Nanotubes Beginning March 1

Summary posted by Meridian on 2/20/2009

Source: The Bureau of National Affairs' Daily Environment Report

Author: Pat Rizzuto

The United States Environmental Protection Agency (EPA) plans to begin enforcing a requirement that directs companies to file premanufacture notices if they manufacture or import carbon nanotubes. Carbon nanotubes are generally considered to be new chemicals subject to such notices. The EPA's Office of Enforcement and Compliance Assurance will examine, starting as early as March 1st, whether carbon nanotube manufacturers and importers have filed their premanufacture notice requirements. Lynn Bergeson, an attorney with the firm Bergeson & Campbell, P.C., speaking at the 2nd Annual Conference on Nanotechnology Law, Regulation, and Policy, this week said "[C]arbon nanotube producers should know this," going on to say that EPA considers most carbon nanotubes to be "chemical substances distinct from graphite or other allotropes of carbon listed on the [Toxic Substances Control Act] Inventory." Jessica Barkas, an attorney with EPA's Chemical Control Division said the EPA is putting conditions, such as development of toxicity data, requiring carbon nanotubes to be embedded in a polymer or metal structure, and requiring workers to use protective equipment, on firms that want to make new nano-scale chemicals. The agency is also considering issuing a data call-in for basic production volume and exposure data for nanomaterials. According to Barkas, the EPA will eventually shift from its "...current focus of collecting information to a focus of controlling risks."

<http://www.merid.org/NDN/more.php?id=1728>

science progress

By [Rick Weiss](#) | Monday, February 23rd, 2009

It suddenly struck me while attending a two-day nanotechnology conference in Washington last week: I should have gone to law school.

This fascinating conference, sponsored by the Food and Drug Law Institute and aimed largely at company officials, offered panel after panel of lawyers telling nanotech execs how to avoid getting sued by...other lawyers.

CAP Senior Fellow Rick Weiss covered science and medicine for *The Washington Post* for 15 years, and now he brings his investigative eye to science policy. From cloning and stem cells to agricultural biotechnology and nanotechnology, Weiss examines the issues at the intersection of cutting edge research and public policy.

Whether it's about suing or being sued, it seems that nanotechnology—and every other new technology with a still-uncertain benefit-to-risk ratio—is a 21st century Full Employment Act for attorneys.

“‘Sophisticated user’ is a great defense....That’s how we’ve escaped liability for lots of clients.”

“If you think nanotech liability claims are never going to be a problem, you’re dreaming,” said Lynn L. Bergeson, a partner at Bergeson & Campbell P.C. in Washington, noting that even a “fear of disease” is sufficient basis these days for filing a lawsuit. That’s a standard that may not be difficult to meet today given the array of worrisome, if inconclusive, studies about the possible health risks posed by nanotech’s microscopic fibers and engineered particles, which, depending on who you ask, are either the key to future techno-prosperity or the harbingers of environmental and medical Armageddon. It’s even possible, Bergeson said, that a court might consider it a violation of current worker safety laws if a company is not maintaining detailed records of each employee’s exposure to nanomaterials, for reference years later should certain cancers or other ailments come to be associated with the high-tech materials.

<http://www.scienceprogress.org/2009/02/the-big-business-of-nano-litigation/>

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