

A Publication of



The NanoNewsLine[®]

Volume 5, Number 1

First Quarter, 2009

In this issue...

NBMI/XETA licenses proprietary nanofabrication technology to the Institute of Innovation and Technology Transfer, Monterrey City, Mexico.....

Dr Klostergaard presents an update on our work in treating Inflammatory Breast Cancer at the M D Anderson Cancer Center.....

NBMI establishes cross-license agreement with nanoTherics (UK), which opens new opportunities for both companies.....

News from NBMI.....

News from XetaComp.....

The NanoNewsLine is a publication of XetaComp Nanotechnology LLC. Submission of news releases and research articles are invited. Send your submissions as a Word Document and photos in jpeg format info@nanobmi.com

The NanoNewsLine is provided to our readers for informational purposes only. The publisher is not responsible for the content of any submission. Publisher reserves the right to accept or decline or edit submissions as deemed necessary for publication.

Copyright 2006-2009, XetaComp Nanotechnology LLC. All rights reserved

To Our Friends & Associates

Our first issue of 2009 has an unexpected contributor: the faltering economy, and all the peripheral baggage that comes with it. So, in response, NBMI and XETA, like a lot of other developing companies, are taking steps to focus on immediate needs. We want to ensure that we are correctly positioned to successfully advance our business objectives, when economic climate changes for the better.

In this issue you will read about steps that NBMI is taking in an effort to move closer to product commercialization. The company has established a cross-license agreement with nanoTherics, a UK company, who is introducing a commercial device for gene transfection. We hope this will lead to other business opportunities.

You will also read about our IP agreement with the Institute of Innovation and Technology Transfer, Monterrey City, Mexico, under which our nanofabrication platform will be installed in their newly established Nanotechnology Incubator. Client companies of the Incubator will have access to various nanofabrication platforms, to develop commercial processes for their respective product technologies. In the end, for-profit companies spinning out of the non-profit Institute will owe NBMI license fees and royalties.

A technical update is provided by Dr. Jim Klostergaard, the Principal Investigator (PI) on our collaboration with the M D Anderson Cancer Center, and we have a short introduction to our newly forming collaboration with Dr. Rheel Towner, Oklahoma Medical Research Foundation, who is studying targeted delivery to brain tumors.

Last, but certainly not least, is an update on commercialization activities at XetaComp, where we have generated much interest in the cosmetics arena with our **sunVex[®] IM** products. A shift in product interest, from IM30 to IM50, coupled with the economic downturn, will cause some additional delay in our commercialization efforts, however, based on the feedback we have received, the product potential remains significant.

So, again I hope you find this issue especially interesting. Let us have your comments.

A handwritten signature in black ink, appearing to read "Charles Ly". The signature is fluid and cursive, with a long horizontal stroke at the end.

A Case for an Oklahoma-Based *NanoCluster* for Nanotechnology Commercialization



In many different forums over the past couple of years, I have been promoting the establishment of a nanofabrication development center in Oklahoma. This center -- I call it a **NanoCluster**, would house and provide resource

support for developing nanotechnology businesses, who have established proof-of-concept and need to move to some level of scaled or advanced manufacturing. Access to a range of nanofabrication platforms, where process methodologies can be evaluated and tested, will give such developing companies a greater chance of commercial success. Once the client company has developed its commercial nanofabrication process, and perhaps even initial sales agreements, it moves from the **NanoCluster** to a technology or industrial park for growth and commercialization of its products. Within time, the **NanoCluster**, as a result of equity positions with its client companies, in exchange for services provided, becomes self-sustaining. The outcome or return for the State lies in the building of a nanotechnology infrastructure that can serve an emerging global industry, and the creation of new high-tech jobs that could help spur local economic development.

While the State has definitely demonstrated its support for nanotechnology development and commercialization through various OCAST programs, such as the Oklahoma Nanotechnology Applications Project (ONAP), there remains a need for nanotechnology companies to be able to economically access production-scale resources, and shorten the time to commercial applications and markets.

“Creation of a nanotechnology incubator or nanofabrication center will meet a real need in stimulating nanotechnology commercialization in Oklahoma,” said Jim Mason, Executive Director of the Oklahoma Nanotechnology Initiative. “Such a Center could be of significant assistance to two groups of companies: 1) emerging companies with technologies nearing the commercialization

phase and, 2) established companies who want to add a nanotechnology application or process to make an existing product better but would like to do so offsite of their existing facility.” The old adages about “time is money” and the “value of a dollar” certainly apply here. So, for the State, there is much to gain, for a very small initial investment.

I am again focusing on the establishment of a **NanoCluster** at this time, because of a unique opportunity that has presented itself: The recent Technology Transfer Agreement with the Institute of Innovation and Technology Transfer, Monterrey City, Mexico, in which our nanofabrication platform will be installed in their newly established Nanotechnology Incubator. Present plans call for the installation of several pilot plants, each designed as platforms, which will be used by client companies to produce their respective commercial products. Dr. Jaime Parada, President and CEO of the Institute for the Government of Nuevo Leon, México, the group retained to in-license nanofabrication technologies, states that, “We have looked all over the world for nanofabrication platforms that will lead to commercial opportunities, and economic development. We were very pleased to find XetaComp, and look forward to an exciting time as we build a nanotechnology eco-system.”

Thus, the potential exists for a partnership between the Institute in Monterrey City, Mexico and the **NanoCluster** in Oklahoma, in which joint efforts would lead to novel nanofabrication processes and the commercialization of nanotechnology-based applications. It is through international and global alliances such as this, which combine resources to create a broad-based nano eco-system, as Dr. Parada describes it, that we will find commercial success and global markets. A recent presentation from Lux Research indicates that in 2009, the sales of nanotechnology enabled products, intermediates and materials will be \$500,000,000 and by 2015 sales will total \$3.5 trillion.” We now have an opportunity in Oklahoma to take a leading edge position in this emerging technology.

What's New at NBMI

Cross-License Agreement with nanoTherics (UK):



NBMI and nanoTherics have entered into a cross-license agreement that opens global business opportunities for each company. Both organizations have developed similar technologies for driving movement of magnetically responsive nanoparticles, but have targeted different healthcare applications. The agreement allows each company to market their respective products in a broader geographic area, and opens business opportunities for additional collaborations with respect to new markets and new product development.

nanoTherics is now commercially introducing “magnefect-nano™”, a device designed to promote DNA uptake into cells, targeting research into genetic diseases such as cystic fibrosis. The company was formed in August 2007 to exploit a novel gene transfection technology arising from biomedical research conducted at Keele University and the University of Florida. The patented technology uses nanoparticles and magnetic fields to facilitate improved delivery of foreign molecules, including DNA, into living cells. nanoTherics’s gene transfection studies have shown significant performance enhancement over the best non-viral techniques currently on the market, demonstrating high levels of transfection while maintaining viability of transfected cells.

Both nanoTherics and NanoBioMagnetics believe this agreement will enable both companies to maintain leading edge roles in the development and commercialization of their respective technologies. We will have more on this collaboration for the next issue.

Magnetically Enhanced Drug Targeting

(Dr. Jim Klostergaard: The M D Anderson Cancer Center)



Inflammatory breast cancer (IBC) is the most aggressive subtype of locally advanced breast cancer, with the worst prognosis and shortest overall survival time. IBC rarely presents as a lump, but rather as diffuse tumor cells, rendering diagnosis by mammography and sonography less effective. Instead, IBC commonly presents as a skin rash from infiltration of IBC tumor cells into dermal lymphatics. Due to this unique pattern of presentation, IBC is commonly initially misdiagnosed as mastitis, with subsequent treatment being with antibiotics, delaying correct diagnosis; with this lost window of time, a subset of IBC patients initially present with advanced stage aggressive disease by the time they are correctly

diagnosed.

IBC currently has no novel treatments and has high rates of recurrence after conventional treatment. Both drug-resistance and inadequate drug delivery to the tumor have been proposed to contribute to this dilemma. At MD Anderson, we are developing a therapeutic strategy in collaboration with NBMI for the use of magnetically-vectorable, drug-loaded nanoparticles to achieve superior drug levels in tumors compared to that achieved with free drugs, as currently practiced. The initial clinical presentation of IBC is in the skin, which is also known to harbor residual disease as it is the primary site of loco-regional recurrence. Our approach would exploit this superficial presentation, accessible to the required magnetic field strengths and gradients inherent in currently available permanent magnets: thus, being translatable to clinical application if validated pre-clinically. Successful demonstration of this technology is intended to lead to chemotherapies having higher effective therapeutic indices by enhancing delivery of effective agents to this high-risk skin, which behaves as a superficial tumor sanctuary.

In this collaboration, we have conducted localization studies, using immuno-deficient mice that were implanted in their mammary fatpad with the human MDA-IBC-1 cell line. After IBC tumors were established, the magnetically-responsive nanoparticles (MNPs) produced by NBMI were injected i.v. with a magnet juxtaposed over the tumor. Pre- and post-injection magnetic resonance images of the tumor were acquired; resulting evidence for MNP-induced MR signal was clear, verifying tumor localization of the MNPs. The results from these MR images was substantiated by scanning electron microscopy which showed evidence for particles of the correct size remaining in the tumor for at least 48 hr.

These localization studies were presented in an oral format at the recent NanoTechInsight meeting in Barcelona, Spain, held March 29-April 2. The next phase of these studies will evaluate the anti-tumor effects of drug-loaded MNPs localized to IBC tumors, with comparisons to free drugs. This phase would be an important proof-of-principle for this tumor targeting strategy, which we envision as a platform applicable to cytotoxic chemotherapeutic agents as well as gene-based therapies.

NIH Challenge Grants in Health and Science Research (New Federal Grant Opportunities)

The American Recovery and Reinvestment Act of 2009 is a Federal public law passed by the 111th United States Congress and signed into law by President Barack Obama on February 17, 2009. As part of the Recovery Act, NIH has designated at least \$200 million in FYs 2009 - 2010 for a new initiative called the **NIH Challenge Grants in Health and Science Research**, to fund 200 or more grants, contingent upon the submission of a sufficient number of scientifically meritorious applications.

Projects receiving these funds are required to meet “a rigorous evaluation of the impact of different options that are available for treating a given medical condition for a particular set of patients”. Such a study may compare similar treatments, such as competing drugs, or it may analyze very different approaches, such as surgery and drug therapy.” Such research may include the development and use of clinical registries, clinical data networks, and other forms of electronic health data that can be used to generate or obtain outcomes data as they apply to CER. The research in these areas should have a high impact in biomedical or behavioral science and/or public health.

NBMI, directly or as a participant, now has three applications pending review.

What's New at XetaComp

XetaComp continues to make progress with the introduction of its **sunVex IM** intermediates.



Our market entry product was the IM30, a 30% solids nanoparticle titanium dioxide aqueous dispersion, which received much positive feedback. However, the organization that was connecting us to the cosmetics industry felt that a 30% solids product was too limiting and had indications from the marketplace that a 50% solids product would have greater acceptability across a wider range of applications. So, earlier this year, we successfully produced and scaled IM50 production. We have not seen anything comparable in the marketplace, and have the advantages of cost economics and product performance. We now have this product in assessment studies, and look for more positive feedback and orders.

However, the economic environment looks difficult, especially with headlines like this appearing:

May 5, 2009: Avon profit drops a greater-than-expected 36%

May 6, 2009: L'Oreal's Revenue Stagnates After Luxury Sales Plunge

Dec 22, 2008: L'Oréal Restructures US and Cuts Jobs

May 7, 2009: Sales Drop 3.4% at Elizabeth Arden in 3Q

Apr 30, 2009: Drop in Sales at P&G for 3Q

While the news is not *all* bad, the cosmetics industry is in something of a "pushback" as the effects of the economic downturn continue to unfold. As companies restructure, the focus appears to be on core products and market share, with a decrease in spending for new product development. However, progressive companies will be also concerned about positioning themselves for the recovery, and we believe that our IM50 will become the product of choice for building UVA/UVB attenuation.

In addition to working with a cosmetics supplier in the US, XetaComp has also signed an exclusive distributor in Korea, and is in discussions with a group interested in marketing **sunVex®** through Central and South America. So, interest in our products continues to be very positive. So, like NBMI, XetaComp is becoming an international company.

On the retail side, XetaComp has prepared and introduced a new high-SPF, sweat resistant skin care product, **sunPrep™ XL**, for the active outdoor individual. This new product was introduced at the 2009 Cosmeceutical Summit, which XetaComp helped sponsor.

In the News:

Edmond, OK (April 27, 2009): nanoTherics and NanoBioMagnetics Enter Global Magnetic Nanoparticle Cross-License Agreement for Bioapplications

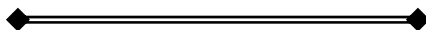
Edmond, OK (February 12, 2009): NanoBioMagnetics CEO Invited to Speak on Nanotechnology at Cosmeceutical Summit 2009.

The Journal Record (December 23, 2008): Do-it-yourself venture capital, by Brian Brus.

Spirit Magazine, Southwest Airlines (December 2008): A Healthy Attraction, by Brad Cope.

Edmond, OK (November 13, 2008): NBMI CEO Appointed to Governor's Science and Technology Council.

Edmond, OK (Nov. 15, 2008): XetaComp Signs Intellectual Property Agreement with Technology Institute in Mexico.



Safe Harbor Statement

Certain statement included in this press release may constitute forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. These forward-looking statements relate to, among other things, plans and timing for the introduction or enhancement of products and services, statements about future market conditions, supply and demand conditions, and other expectations, intentions and plans contained in this press release that are not historical fact and involve risks and uncertainties. The company's expectations regarding future revenues are dependent upon the ability to develop and supply products and services that meet defined specifications. When used in this press release, the words "plan," "expect," "believe," and similar expressions are generally considered forward-looking statements. These statements reflect current expectations.