

SurFACTS in *Biomaterials*

October/November 2008 Volume 13 Issue 3

BioInterface 2008

By Carl Turnquist

We are all almost there!

As October arrives, I am excited about seeing all of you at the BioInterface 2008 meeting in Minneapolis! Good work and good cheer will come from this conference. Industrial members meet and greet their colleagues as well as some of our academics friends as well. Monday's workshop will feature important work that is going on at universities that might one day change the world for all of us! Later on Monday, we have our Applied Technology Workshops where companies serving our industry can showcase their technology. Finally, Monday wraps up with our keynote speaker, Art Coury (who recently retired from Genzyme). On Tuesday and Wednesday, we will have our top-notch technical symposium.

Each session chair has arranged a great program in his/her topic area. Also on Tuesday we have judging for our student poster competition. On Wednesday, Ken Stokes (Medtronic – retired) will be honored with the Excellence in Surface Science Award.

I look forward to seeing you at the Millennium Hotel from Monday, October 27, through Wednesday, October 29. If you haven't already, take the time now to reserve your hotel room at the Millennium Hotel! Then go to www.surfaces.org to register for our conference.

Convenient online registration is available for your use.

Best Regards,
Carl Turnquist
Foundation President

From the Editor

With this issue of *SurFACTS* there are some changes on the masthead. Matthew Phaneuf and Min-Shyan Sheu have "departed" as section editors for Biology and Surface Modification, respectively. They have served the *SurFACTS* readership well, and the Surfaces in Biomaterials foundation is very appreciative of their efforts and contributions.

Beginning this issue, *SurFACTS* welcomes Dan Storey and Joe Berglund.

Joe Berglund will be our new Biology Section Editor. Joe is currently Principal R&D Engineer at Medtronic CardioVascular in Santa Rosa, CA, where he has been working since 2004 on
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projects ranging from assessing biocompatibility of drug eluting stent (DES) coatings to developing bioabsorbable and polymer-free drug delivery platforms. Joe attended Johns Hopkins University for his biomedical engineering bachelor's degree with a concentration in materials science. He then conducted graduate studies at the Georgia Institute of Technology where he worked on methods to incorporate and characterize elastin in tissue engineered blood vessel grafts. While at Georgia Tech, Joe performed internships with Ethicon-J&J in Bridgewater, NJ and Medtronic Interventional Vascular in San Diego, CA, prior to obtaining his Bioengineering Ph.D.

Following graduate school, Joe worked briefly at Kinetic Bioreactors Incorporated, a start-up company that was developing a spinning centrifugal bioreactor using the principles of fluidized beds to amplify cell density and growth potential. He then conducted a post-doctoral fellowship out of the Cardiology department of the Emory School of Medicine where he investigated the effects of different shear forces on endothelial cell function and matrix remodeling in atherosclerotic blood vessels with particular focus on MMP-9 and MMP-2.

Joe is excited to have the opportunity to become more involved in the Surfaces in Biomaterials Foundation, and is looking forward to taking on the role of Biological editor of *SurFACTS*.

Our new Surface Modification editor is Dan Storey. Dan is Chief Technology Officer of Chameleon Scientific, a Plymouth, MN start-up company of 25 people with a core technology of surface modification based in plasma physics. Dan was a co-founder of Chameleon in 2004 (at that time called IFC Medical).

By Steven L. Goodman, Ph.D.,
10H Technology Corporation

Dan has 15 years of experience in the Materials science industry, mostly in startups, and has also worked at Lawrence Livermore National Laboratory and the University of Missouri – Rolla. He is an accomplished serial inventor with about 30 issued and pending patents on coatings for biomedical applications, and author of over a dozen journal publications. His core areas of activity have been Ionic Plasma Deposition, Physical Vapor Deposition (CAVD) plating to create biointerfacing materials including silver oxide antimicrobial coatings, surface modifications to enhance biological adhesion, drug release coatings, and biomimetic nano-structured coatings. He has previously developed coatings for electric razors and anti-corrosion coatings for defense applications.

Dan received bachelor degrees in both Physics and Biology, and a Masters in Physics from the University of Missouri – Rolla, and is currently ABD toward a doctorate in Mechanical Engineering from Colorado State University - Fort Collins. Dan is also an Ironman triathlete. He clearly brings to us a diversity of experience and a broad industrial view that will serve us well.

I am excited to welcome both Joe and Dan to the Foundation to serve with us as section editors of *SurFACTS*. I greatly look forward to working with them to report to you on interesting advances in Biomaterials Science. I hope you will seek out Joe and Dan at the upcoming BioInterface 2008 meeting to say hello and thanks. While you are at, please also thank Phil Triolo (Regulatory Editor), Klaus Wormuth (Characterization and Analysis Editor), and Joe Flannigan (Staff Editor - who makes my job as Executive Editor easy), and don't forget our past Editors as well.

SurFACTS in Biomaterials is the official publication of the foundation and is dedicated to serving industrial engineers, research scientists, and academicians working in the field of biomaterials, biomedical devices, or diagnostic research.

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Angiotech to Close Plant, Delay Product, Financing

By Robert Greene

Angiotech Pharmaceuticals Inc., the Canadian developer of drug-coated medical devices, plans to cut jobs, close a plant and delay a new product. It also may drop a financing deal and will withdraw offers to buy outstanding notes.

The actions follow a cost-cutting plan announced in April, the Vancouver, British Columbia, company said in a statement. Further steps are needed, Angiotech said. Angiotech has been hurt by declining sales of drug-coated heart stents by partner Boston Scientific Corp.

The company's manufacturing and research center in Rochester, NY, will be closed in December 2009, and Angiotech said it will postpone the scheduled introduction of a drug-coated catheter, the 5-FU CVC. Office and laboratory space will be cut or eliminated in Vancouver, as well as in North Bend, WA, and Herndon, VA.

Moreover, the company will determine whether it can complete its previously announced arrangement with the investment management firm Ares Management LLC, of Los Angeles,

and the venture capital firm New Leaf Venture Partners, of New York and Menlo Park, California. Angiotech announced in July that it would sell \$200 million to \$300 million in convertible notes to Ares and New Leaf in an effort to form a new operating unit and reduce debt.

The company "plans to withdraw its outstanding tender offers for its senior floating rate notes and its senior subordinated notes."

Call for Nominations to Board of Directors, Committees

You can help make the Surfaces in Biomaterials Foundation stronger by adding your voice and opinions to the Board of Directors. The Foundation's mission is to explore creative solutions to technical challenges at the BioInterface.

The Surfaces Foundation is now accepting nominations to the Board of Directors. The positions of President-Elect, Vice President, Treasurer and Secretary

will be filled at the annual meeting at the BioInterface Conference in October. Vice President, Treasurer and Secretary are one-year terms. The President-Elect effectively is a three-year term, as that person becomes President, then Past President, in succeeding years.

The Surfaces Foundation also is recruiting members for the Membership Committee — and for an editor and

writers for SurFACTS, the newsletter of the foundation.

If you or someone you know can help move the Surfaces Foundation forward as a member of the board of directors, or through service on a committee, please forward nominations to Bill Monn at billm@surfaces.org. Deadline for nominations is Oct. 15.

Meeting/Conference/Trade Show Calendar

Meeting/Conference/Trade Show	Dates	Place	Web Address
Transcatheter Cardiovascular Therapeutics (TCT) 2008	Washington, DC	Oct. 12-17	www.tctconference.com/
American Vacuum Society (AVS) 55th International Symposium	Boston, MA	Oct. 19-24	www2.avs.org/symposium/
Medical Design & Manufacturing (MD&M)	Minneapolis	Oct. 21-23	www.devicelink.com/expo/minn08/
BiInterface 2008	Minneapolis	Oct. 27-29	www.surfaces.org
American Association of Ophthalmology (AAO)/European Society of Ophthalmology (SOE) 2008 Joint Meeting	Atlanta	Nov. 8 - 11	www.aao.org/meetings/annual_meeting/
AHA Scientific Sessions 2008	New Orleans	Nov. 8 - 12	www.americanheart.org
American Institute of Chemical Engineers (AIChE) 2008 Annual Meeting	Philadelphia	Nov. 16-21	www.aiche.org/annual

Medical Research Project Joins Two Firms

Active Implants pairs with InMotion to test new medical device

By Daniel Connolly

Memphis-based medical device startup Active Implants Corp. plans to start testing its products at the InMotion Musculoskeletal Institute, a local independent research lab.

The agreement is an example of two new organizations helping each other, said Chris Przybyszewski, InMotion's director of grants and communications. "It's great that we're kind of able to grow up together."

InMotion incorporated in 2006, while Active Implants launched in 2004.

InMotion has already done work for big companies, including medical device maker Stryker Corp., but it could arguably have a bigger impact on smaller companies.

The lab has a staff of specialists and owns expensive machines that measure the levels of pulling, compression or bending that surgical implants or other materials can withstand before failing.

Supporters such as venture capitalist Robert Compton, whose family donated \$1 million to the nonprofit lab this year, argue that research can yield many high-paying jobs.

Small companies can't afford to create a lab like this on their own, acknowledged Rick Treharne, Active Implants' vice president for orthopedic research. "It's nice to have a place like InMotion that has those capabilities here in town," he said.

Active Implants already has its own researchers in Israel and cooperates with universities around the nation.

In the short term, the company plans to use InMotion machines to test its first product, the TriboFit Buffer.

The TriboFit is a flexible cup implanted in the hip sockets of patients undergoing joint replacement surgery. It has already been approved in several countries — mostly in Europe — and the testing at InMotion will help sup-

port an application for approval in the United States, Treharne said.

Active Implants signed a general agreement with InMotion late last month, and future agreements will spell out financial terms for individual research projects.

The contract also addresses the question of intellectual property rights for any discoveries made while working jointly and provides for the parties involved to split the rights under certain circumstances.

The partnership between Active Implants and InMotion also reflects local leaders' efforts to build up the orthopedic medical device sector, which makes products such as artificial hips and knees.

Memphis is already home to the world's second-largest cluster of orthopedic companies, following Warsaw, Ind.

Merck Ends Research Collaboration Deal with SurModics

By Anand Basu, Deepak Kannan

SurModics Inc said Merck & Co Inc will discontinue a June 2007 license and research collaboration agreement, a move that will trigger an additional payment of \$9 million to the drug delivery technology company.

Merck's decision comes after a strategic review of its business and product development portfolio and is not based on any concerns about the safety or efficacy of SurModics' drug delivery systems, the company said in a statement.

The companies had entered into an agreement in June last year to jointly develop and commercialize SurModics' drug

delivery system with triamcinolone acetonide and other products that combine Merck's drug compounds for the treatment of serious retinal diseases.

Under the agreement, SurModics received an upfront licensing fee of \$20 million and was eligible to receive up to an additional \$288 million in fees and development milestones.

In August of this year, the company said Merck had suspended enrolment in a mid-stage trial for I-ivation TA in patients suffering from diabetic macular edema (DME).

Nanotubes on the Brain

By Katherine Bourzac

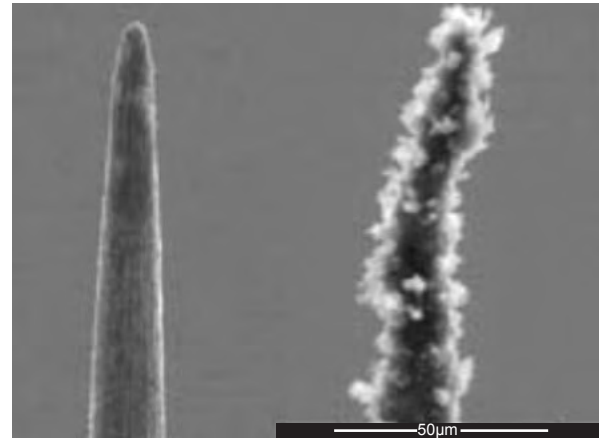
Metal electrodes are increasingly being used in brain implants that help treat depression and the tremors of Parkinson's disease, and in evermore sophisticated prosthetic devices. In spite of these successes, conventional metal electrodes have major limitations: performance deteriorates over time, and it's difficult to design electrodes that are efficient at both sending and receiving electrical signals. Now researchers at the University of Texas are developing electrodes that are more efficient at both sending and receiving electrical stimuli. These electrodes, which are coated with carbon nanotubes, could lead to neural implants that monitor how they affect the neurons that they stimulate, conserving battery life and reducing side effects.

Researchers led by Edward Keefer at the University of Texas Southwestern Medical Center developed a simple method for coating electrodes with carbon nanotubes. The coated electrodes were better at recording neural activity than were bare electrodes when implanted in mice and in a monkey. Importantly, the coated electrodes

provided less-noisy recordings than bare ones did. They also required less power to operate.

And the nanotubes enhanced the electrodes' ability to both record and stimulate neural activity more than any other coating previously reported. Today's neural prosthetics are good at sending electrical signals but not at receiving them, says Ravi Bellamkonda, director of the Neurological Biomaterials and Therapeutics group at Georgia Tech. Thus, the batteries in deep-brain stimulators — implanted devices used to treat Parkinson's — last only three years because the devices are constantly on. "You want to see if the neuron is quiet," says Bellamkonda. A feedback-enabled device that powered off when not needed could potentially use the same battery for a few more years.

The University of Texas researchers' technique for modifying electrodes is simple. Electrodes are placed in a water-based solution of carbon nanotubes;



Neural nanotubes: In these scanning electron microscope images, electrodes coated with carbon nanotubes, like the one on the right, are more conductive and better at interfacing with nervous tissue. The electrode on the left is bare. Credit: Edward Keefer

when a small voltage is applied to sites on the electrodes, carbon nanotubes localize there and can be fixed. Joseph Pancrazio, a neuroscientist at the National Institute of Neurological Disorders and Stroke, says that Keefer's electrode modification "is something that can be done readily." This means that other labs experimenting with neural prosthetics are likely to adopt the technique. By contrast, Pancrazio says, other methods for interfacing carbon nanotubes with neurons have required the use of special substrates and must be done at very high temperatures.

BIO INTERFACE BIO

A wonderful place to gather for a great meeting! These are the words that come to mind as I look forward to the Surfaces in Biomaterials Foundation's next annual workshop and technical symposium — BioInterface 2008. It will be held in downtown Minneapolis at the Millennium Hotel from Monday, October 27 through Wednesday, October 29.

This year, Monday's workshop will give special coverage to "Successful Applications of Tissue Engineering in Regenerative Medicine" led by Dave Sogard. Later in the day, we will host exciting Applied Technology

Workshops in which

several companies will highlight and explain the practical uses of their technologies. Following the early evening conference reception, we will hear from our conference keynote speaker, Arthur J. Coury, Ph.D., who has led a distinguished career in biomaterials at Medtronic, Focal and Genzyme. He will share his perspectives on

this unique field where technology continues to mature and surprise.

Tuesday will feature a number of great learning opportunities, including the Student Poster Session, where students will be at their posters to discuss their research with you; an informal Town Hall setting to learn more about career paths following graduation; a technical symposium with sessions entitled "NanoBioTechnology," "Surface Characterization" and "Orthopedic Implants and Devices."

Then Joe Chinn moderates the popular "Point-Counterpoint" debate session, "Nanoengineering: Enabling Technology or Marketing Slogan?" to conclude the day's activities.

Wednesday includes sessions entitled, "Drug Eluting Medical Devices" and "Hospital Acquired Infections and the CMS: The Coming Wave of Anti-Infective Medical Devices," The Excellence in Surface Science Award, which will be given to Ken Stokes; a unique technical session entitled "Cell Communicating Surfaces" and the symposium closing session entitled, "Antimicrobial Technology Solutions," which comprises a series of 5-minute presentations on specific antimicrobial technologies, followed by a poster session in which attendees can engage presenters in depth.

All in all, an enlightening three days together where folks from industry can meet and greet their colleagues from academia and medicine!

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Conference Highlights

- **Excellence in Surface Science Award**

This year's winner:



Ken Stokes, Medtronic (retired)

- **Student Town Hall Meeting**

- The Place where technical students can “meet the industry” during a luncheon. This Q&A plus networking session is a successful introduction for students to industry perspectives.

- **Student Poster Award competition**

- Students: submit a poster and receive FREE admission to the symposium!

- **Keynote Speaker**

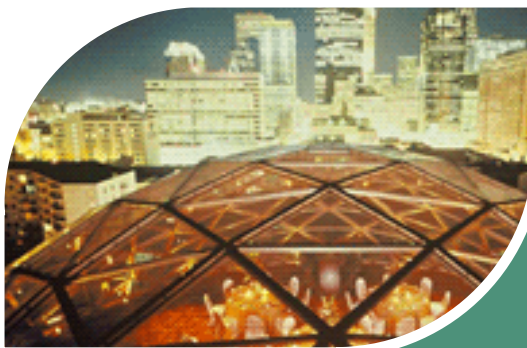


Art Coury, Genzyme

- **Lively debate session**

- You will be enriched by the science, by the Minneapolis area, by our debate session and by our unique blend of industry, academic, regulatory and clinical attendees.

- **Great networking opportunities**



Hotel Information

Millennium Hotel Minneapolis

1313 Nicollet Mall

Minneapolis, MN 55403

T: +1 (612) 332 6000

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millenniumhotels.com/millenniumminneapolis

Nestled in downtown Minneapolis on the tree-lined sidewalks of Nicollet Mall, the Millennium Hotel Minneapolis offers convenient access to dining, entertainment, shopping and business destinations.

Experience one of the 321 guest rooms and suites, providing amenities such as an indoor swimming pool and business center, or Club Level rooms with premium touches such as special bedding, bathrobes and complimentary breakfast.

It is an ideal location for sightseers and business travelers with its close proximity to Minneapolis/St. Paul International Airport as well as the Guthrie Theatre and Walker Art Center.

Single room: \$169, Double room: \$179

Deadline for reservations: October 3, 2008

You must reference “The Surfaces in Biomaterials Conference” in order to receive discounted rates.

BioInterface 2008

Cost

Full Conference – Oct. 27, 28 & 29 (Includes workshop and 2-day symposium, all meals, breaks, an evening reception and the Point-Counterpoint session)

Member Combined \$850
 Non-Member Combined \$950
 Students \$350

Workshop Only – Oct. 27 (Includes the entire workshop, lunch and breaks)

Member \$350
 Non-Member \$450
 Students \$200

Symposium Only – Oct. 28 & 29 (Includes the 2-day symposium, meals, breaks, an evening reception and the Point-Counterpoint session)

Member \$550
 Non-Member \$650
 Students \$200

¹Students who submit a Technical Poster are given free registration to the Symposium (Technical Symposium only; not the workshop)

Membership – Join now and save on your Symposium registration. Visit www.surfaces.org for complete member benefit information.

Corporate Annual Membership Rates (includes one full conference registration & one exhibit option) \$2,500

Smaller Corporations (less than 50 employees) (includes one full conference registration & one exhibit option) \$2,000

Academic Membership (one discounted full conference registration at half the member price and one free exhibit option) \$625

Individual Membership (entitles registration at Member rates) \$50

TOTAL \$ _____

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Cancellation Policy: With written cancellation notice, received by Oct. 15, 2008 you will receive a full refund, less a \$50 administrative charge. Cancellations after Oct. 15, 2008 are non-refundable. Notices of cancellation must be faxed to the Surfaces in Biomaterials office at 651-290-2266. No-shows will not receive refunds.

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Bausch & Lomb Says FDA Approves Akreos Lens

Eye care products maker Bausch & Lomb said its Akreos implantable lens has received regulatory approval in the U.S., and it plans to begin shipping the product later this month.

The Akreos Advanced Optics Aspheric Lens, which is designed to improve vision for people with cataracts, was approved by the Food and Drug Administration. The lens is designed to be free of aberrations, and is implanted with Bausch & Lomb's AI-28 inserter.

AngioDynamics Targets Promising New Market

AngioDynamics Inc., a medical device manufacturer in Queensbury, has decided to push a new product to move the company away from slowing markets that threaten revenue growth.

In a September 9 letter to shareholders, CEO Eamonn Hobbs touted a new device called the NanoKnife, branded as "surgery at the cellular level." The device should help AngioDynamics tap into multibillion-dollar markets, enabling the 20-year-old company to rely less on longtime products stuck in crowded markets, such as the dialysis/catheter segment, growing at single-digit rates.

"This is the single biggest market opportunity in the company's history," Joseph Gersuk, the company's chief financial officer, said in an interview. "This has the potential to be our largest product line of all."

AngioDynamics set revenue records in its last fiscal year, which ended May 31. The company had net sales of \$166.5 million, a 48 percent increase from the year before. But, Hobbs warned in his letter, it will be "increasingly difficult" to maintain growth rates unless the company moves into new markets.

Prosthetic Ears Boost Hearing After Injury

Prosthetic ears can help improve hearing and speech recognition for people who've lost an outer ear due to injury or cancer surgery, a new U.S. study reports.

In many cases where the outer ear (pinna) has been lost, the external auditory canal is usually intact, and the remainder of the person's hearing system should function normally. "In these patients, the physician must strive not only to correct the aesthetic defect caused by the missing pinna, but also to correct the hearing loss caused by its absence," wrote Dr. William E. Walsh, of Northwestern's Feinberg School of Medicine, and colleagues.

The researchers analyzed eight different silicone rubber prosthetic ears. In the first part of the study, they attached

a microphone at the entrance to a simulated ear canal on a life-sized plastic foam head. The microphone measured sound pressure levels both with and without the ear prostheses attached to the head as it was rotated 360 degrees.

On average, the prostheses improved sound pickup by 8.1 decibels (normal conversation is about 60 decibels) when the frequency of sound was 4.6 kilohertz, and by 9.7 decibels when the frequency was 11.5 kilohertz.

The second part of the study included 11 young adults with normal hearing who took part in a speech test involving simulation of hearing problems associated with the loss of an outer ear. In this test, the prosthetic ears improved speech recognition.

The findings were published in the September/October issue of the journal Archives of Facial Plastic Surgery.

"Auricular prostheses provide an acoustic gain at certain head positions and frequencies, and this acoustic gain is clinically relevant, because it benefits speech recognition in noise," the study authors wrote.

"In some individuals, auricular prostheses not only effectively restore aesthetics, but also may improve hearing. To verify the results of the present experiments, the main outcome measures described in this study will be used to obtain future measurements from individuals who wear auricular prostheses."

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- Have your voice heard and your interests represented within the surface science and biomedical community
- Help shape workshops and symposia that further the world-wide education of surface science
- Promote understanding of interfacial issues common to researchers, bio-medical engineers and material scientists.

Benefits of Membership:

- Discounted registration at BioInterface, the annual symposium of the Surfaces in Biomaterials Foundation.
- Your logo and a link to your Web site in the member directory on the official Web site of the Foundation, www.surfaces.org.
- Complimentary full page ad in surFACTS, the Foundation's newsletter and discounts on all advertising.

Join the Foundation that connects the academic, industrial, and regulatory committees within the surface science/biomedical communities!

Visit the Foundation at www.surfaces.org for a membership application or call 651-290-6267.



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