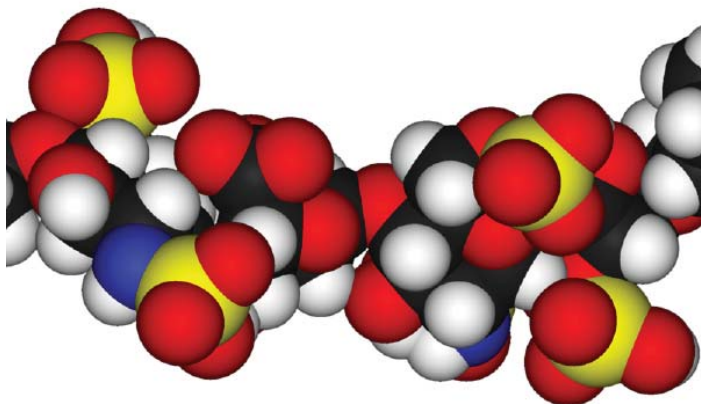


### Deadly Dose: Rensselaer Heparin Expert Helps Uncover Source of Lethal Contamination

The mysterious death of patients around the world following a routine dosage of the common blood thinner, heparin, sent researchers on a frantic search to uncover what could make the standard drug so toxic.

Robert J. Linhardt, professor of chemistry and chemical biology, and the Ann and John H. Broadbent Jr. '59 Senior Constellation Professor of Biocatalysis and Metabolic Engineering at Rensselaer Polytechnic Institute, is part of an international team that recently announced it had uncovered the source of the deadly contamination: a complex carbohydrate named oversulfated chondroitin sulfate, which has a structure so similar to heparin it was nearly undetectable to less advanced technology.



"Days after the deaths were first linked to heparin, we had the drugs in our hands from the FDA and our nuclear magnetic resonator (NMR) was set into motion to break down the structure of the drug and determine what could possibly be the source of the contamination," Linhardt said. "Now that we know the most likely source of the contamination, we are developing much stronger monitoring systems to ensure that this type of contamination is detected before it reaches patients."

Linhardt is also helping lead the race to develop a synthetic alternative to heparin that could help eliminate the potential for contamination and adverse affects of biologic heparin. His lab developed the first fully synthetic heparin in amounts large enough for human dosage in 2005, and he continues to work to get the product further tested and commercialized. Biological heparin is currently developed by purifying the scrapings of pig and cow intestines.

"This contamination is unfortunately a sign that the way we currently manufacture heparin is simply unsafe. Because we rely on animals, we open ourselves up for spreading prions and diseases like mad cow disease through these animals," explained Linhardt. "A synthetic heparin is built using sugars and enzymes found in the human body. So instead of taking pig intestines and trying to purify it over and over again to reduce it down to just heparin, we are building heparin from scratch with no foreign material present. This method ensures that we know exactly what is in the drug and have complete control over its ingredients."

#### **SPRING POSTER SESSIONS!**

On the afternoon of April 17, 2008, School of Science students and faculty gathered at RPI's Empire State Hall to enjoy Poster-Palooza, an interdepartmental research colloquium and poster session, organized by the School of Science Graduate Student Council. Over 100 students and faculty attended the event, including Wei Zhao, Dean of Science; Samuel C. Wait Jr., Associate Dean of Science; and William L. Siegmann, Associate Dean of Graduate Education and Research. Awards were presented for the best posters and research. Attendees also enjoyed a fun assortment of hors d'oeuvres made by the students. The poster session was a huge success and the council hopes to make this an annual event!

*Story continued on next page.*

## Spring Poster Sessions, continued

“I was delighted and inspired by the energy and enthusiasm at the event,” said Professor Siegmann. “The School of Science Graduate Student Council was recently formed by Dean Zhao, and the students through their hard work and strong leadership, planned and developed this event and made it a great success.”



“Our goal in planning this event was to foster relationships, both personal and professional, among students in RPI’s School of Science. The session was a great success with 43 participants from 8 departments,” said Scott LeFevre, a member of the Graduate Student Council. “Poster-Palooza was the first function undertaken by the newly formed council and we look forward to providing similar events in the future.”

Members of the council (photo on left) include Mary Abercrombie, Sarah Broderick, James Gatewood, Asif Javed, Scott LeFevre, Jeff Martin, Ya Ou, and Sanchay Subhedar.

On April 24, 2008, students from Introduction to Cell Biology also took part in a poster session. The event, organized by laboratory supervisor George Edick of the department of biology, was held at RPI’s Heffner Alumni House. The main dining room of the alumni house was packed full of students displaying and energetically discussing the posters and the work they completed over the course of the semester with teachers, guests, and other members of the class.

“Approximately 140 students were involved in our recent poster session for Introduction to Cell Biology,” Edick said. “The posters culminate the in-class research projects that were performed by the students.”

Poster events are not only fun—they are good experience in preparation for students’ future careers in the world of science. “The students were eager to discuss the findings of their research projects, and the format of a poster session prepares them for an activity that most of them will be repeating throughout their careers,” Edick explained.



**Introduction to Cell Biology Poster Session at RPI’s Heffner Alumni House**

## Honors and Awards

- **James Crivello**, professor of chemistry and chemical biology, has been selected as the recipient of the 2008 Jerome Fischbach Travel Fund. This award provides a \$10,000 grant for one member of the Rensselaer faculty, and their spouse or guest, to participate in an international meeting as a representative of Rensselaer. The grant is awarded to a member of the faculty who has been actively associated with Rensselaer for 20 years or more. The purpose of the fund is to express appreciation for the many contributions that Rensselaer's faculty have made to the education and motivation of alumni and students.
- **Joel Giedt**, assistant professor of physics at RPI and collaborator Simon Catterall of Syracuse University requested 480,000 "6n node hours" on Department of Energy funded USQCD computing resources. The proposal was entitled "Supersymmetry and Strong Dynamics on the Lattice." Giedt and Catterall presented their proposal at the USQCD All Hands Meeting at Jefferson National Lab on April 4 - 5, and later received word that the full request had been allocated. The runs are slated for the Fermilab LQCD computing cluster to run for one year beginning July 1, 2008.
- **Volkan Isler**, assistant professor of computer science, recently received a CAREER Award of more than \$80,000 on robotic sensor networks from the National Science Foundation.
- **Heather Shannon Palmeri**, an undergraduate math major, received an honorable mention for a Barry M. Goldwater Scholarship.
- **George Plopper**, associate professor of biology, has been awarded the 2008 Trustees Outstanding Teacher Award, which recognizes outstanding accomplishments in classroom instruction, and consists of a \$10,000 honorarium. Selection is based on evidence of sustained outstanding teaching as reflected by student evaluations from the last two years, peer evaluations, and letters of support from colleagues, alumni, students, and administrators.
- **David Poxson**, a graduate student in physics, recently presented a paper and received a Best Oral Presentation Award for his presentation "Multilayer nano-structured anti-reflection coating with broad-band omni-directional characteristics" at the Connecticut Microelectronics and Optoelectronics Conference (CMOC), held on April 9 at the University of Connecticut.
- **Bruce Watson**, professor of earth and environmental sciences, has just received a grant from the National Science Foundation for \$600,000 over 5 years.
- **Mohammed Zaki**, associate professor of computer science, was the program co-chair of the 8th SIAM International Conference on Data Mining, held in Atlanta, Georgia from April 24 - 26. To learn more about SIAM (Society for Industrial and Applied Mathematics) and data mining, please visit [www.siam.org](http://www.siam.org)
- At the 45th Annual Faculty Recognition Dinner, several School of Science professors received awards for their long-term service to Rensselaer Polytechnic Institute. **Michael Hanna**, associate professor of biology, and **Mark Holmes**, professor of mathematical sciences, received awards for 30 years of service. **Donald Drew**, professor of mathematical sciences, received an award for 35 years of service. **Joseph Ecker**, the EP Hamilton Distinguished Professor of Mathematical Sciences, received an award for 40 years of service. Also, **Carl McDaniel**, professor of biology, is retiring this year and was given recognition for over 30 years of service.
- The School of Science Award Reception was held on May 1 in the atrium of the Center for Biotechnology and Interdisciplinary Studies. Attendees of the ceremony enjoyed a beautiful assortment of hors d'oeuvres, door prizes, as well as a fine art show. The art was created by students and faculty within the School of Science, from **Toh-Ming Lu's** paintings of his memories of life in picturesque rural Asia, to **Heidi Newburg's** mother and baby goat, to ceramics and astronomy-themed paintings by **Benjamin Willett**. **Dean Wei Zhao** gave the opening welcome to the awards ceremony, and introductions and award presentations were given by **Samuel C. Wait Jr.**, Associate Dean of Science; **William L. Siegmann**, Associate Dean of Graduate Education and Research; and

other members of the School of Science. The event was organized by **Bonnie Carson**, assistant to the dean. The award recipients are listed below:



William Siegmann and Gwo-Ching Wang present awards at the School of Science Award Reception.

- Outstanding Undergraduate Student: **Ryan Badeau**, Physics, Applied Physics, and Astronomy
- Outstanding Graduate Student: **Brian Schulkin**, Physics, Applied Physics, and Astronomy
- Outstanding Graduate Student: **Yilin Yan**, Biology
- Outstanding Teaching: **David Hollinger**, Computer Science
- Outstanding Early Research: **Douglas Swank**, Biology
- Outstanding Staff Service: **Karen Coonrad**, Chemistry
- Poster Palooza '08 Winners: **Shreya Chad, Apirak Hoonlor, Kelly Perry, Dustin Trail**
- School of Science Artists Recognition: **Michael Aldersley, Toh-Ming Lu, Heidi Newberg, Paul Stoler, Nagamani Sukumar, Benjamin Willett**

## Other School of Science News

• **Chjan Lim**, professor of mathematical sciences, presented “Progress towards the resolution of the Anticyclonic Problem in the Great Red Spot (GRS)” at a pair of invited lectures given at mathematics seminars at Indiana University on April 9 and Purdue University on April 11. In joint work with Ph.D. student **Xueru Ding**, **Chjan Lim** made significant discoveries on the formation and stability of large vortex storms on the Gas Giants such as the Great Red Spot on Jupiter. The Great Red Spot has been observed for several hundred years and many partial explanations have been put forth but no statistical theory so far predicts correctly the predominance of anticyclonic vorticity in the formation of these coherent structures. Monte-Carlo simulations at RPI recently showed within the context of a new statistical mechanics based on the Lagrangian of the Shallow-Water Equations on a rotating sphere, that the anticyclonicity in the GRS-like structures on the Gas Giants is closely related to the relatively low mechanical energy to enstrophy ratios of the first order phase transitions in these self-organizing phenomena. High energy flow states correspond instead to cyclonic giant spots and reasons that the low energy solution in this formulation is the physical one for the Jovian atmosphere will appear in a forthcoming World Scientific book by **C. Lim, X. Ding** and **J. Nebus**. This work is supported by the ARO and the DOE and for this work, **Xueru Ding** has been awarded the Diaz Prize in 2008 by the Department of Math Sciences.

• **Carl McDaniel**, professor of biology, gave a talk on current environmental issues at the Western State College of Colorado on March 19, titled “True Hopefulness: Making the Impossible, Possible.” McDaniel has published over 60 scientific articles on animal and plant development and ecological economics, and has written two books, including *Wisdom for a Livable Planet*, published in 2005.

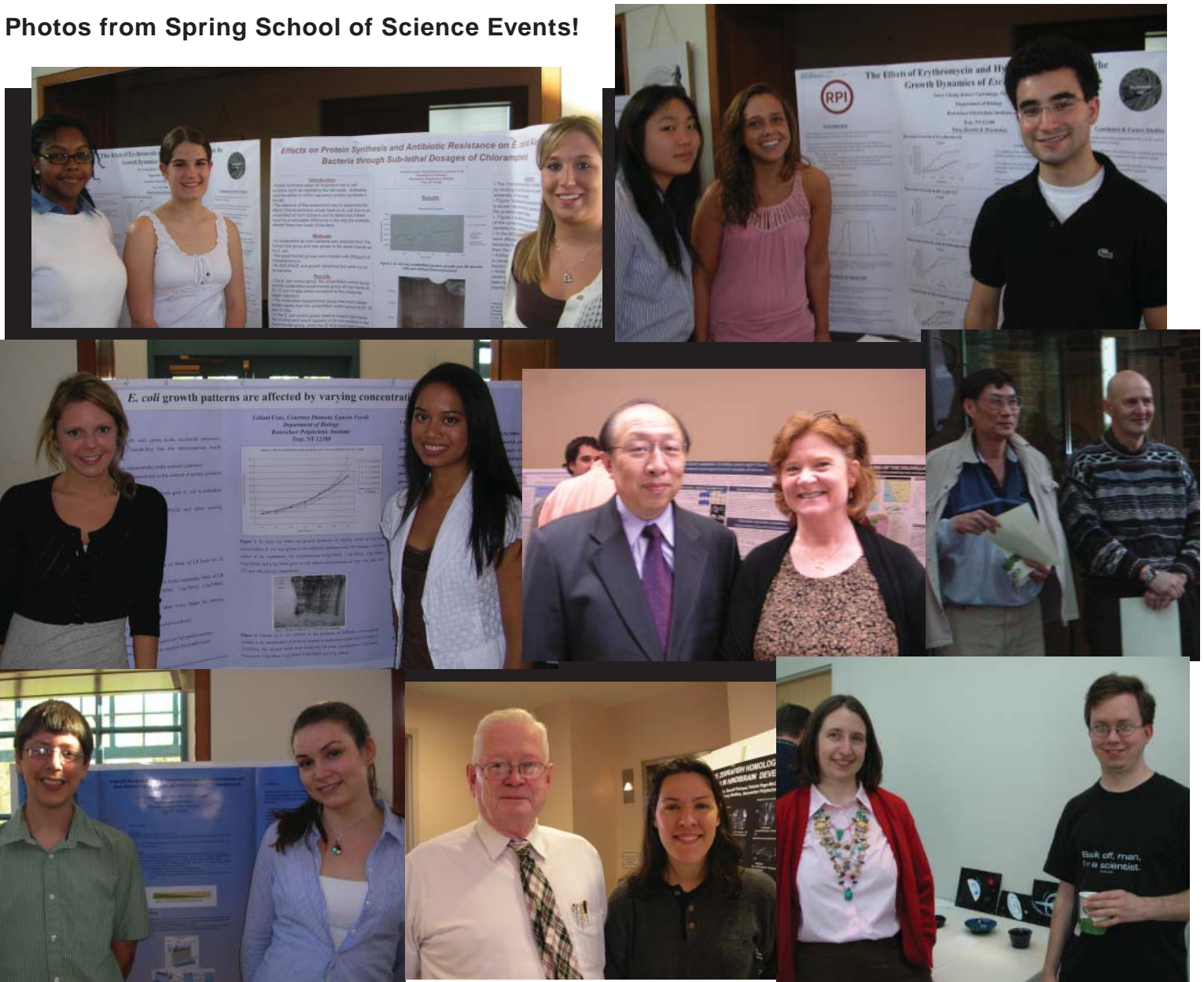
• **Rebekah Mullaney** is our new Communications Specialist for the School of Science. She will be responsible for creating the School of Science newsletters and other promotional materials. Ms. Mullaney comes to RPI from Albany Molecular Research, Inc. (AMRI) where she wrote and edited documents for the Business Development department. She holds a bachelor’s degree in English and art, with a concentration in graphic design. She says, “Please send me your photos, news items, or anything of interest for our newsletters. I want everyone to know what is going on in the School of Science!” **Colleen Carey** will continue producing the School of Science website.

• **Michael Shur**, the Patricia W. and C. Sheldon Roberts Professor of ECSE and Physics, gave an invited lecture on “Physics of III-N Devices” at the Workshop on Advanced Devices at the CS MANTECH conference on April 14. He also gave an invited talk on “Terahertz Electronics” at the CS MANTECH conference on April 15.

## Upcoming Events

- Rensselaer Biology Program Symposium: "At the Interface." May 22, 2008 from 8am - 6:30pm at the Center for Biotechnology and Interdisciplinary Studies. Featuring keynote speaker Dr. John Condeelis, Professor and Co-Chair, Department of Anatomy and Structural Biology, Albert Einstein College of Medicine. Please contact the Department of Biology to learn more about the symposium.
- Tetherless World Constellation Launch Event: "The Future of the World Wide Web." June 11, 2008 at 2:30pm in the Center for Biotechnology and Interdisciplinary Studies Auditorium. During the panel discussion, moderated by Tetherless World Senior Constellation Professor James Hendler, some of the foremost experts on the World Wide Web will come together to publicly debate the future of the greatest technological frontier. The discussion will cover a wide range of topical issues, from sustaining the usefulness of the current Web to creating the next-generation Semantic Web, as well as the role of politics, education, and sociological factors in the Web's continued evolution. For more information, please visit: <http://www.rpi.edu/news/events/tw/index.html>

## Photos from Spring School of Science Events!



*This newsletter is prepared monthly and distributed to faculty, staff and students in the School of Science to keep everyone informed of accomplishments and events within the school. Please submit news items, including photos, for the next newsletter to Rebekah Mullaney, Communications Specialist for the School of Science at [mullar2@rpi.edu](mailto:mullar2@rpi.edu).*