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## Arkansas Catalyst, November 2013

University of Arkansas, Fayetteville

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## Organic Chemist Receives National Science Foundation Award for Microgels Study



*Susanne Striegler*

As an organic chemist, Susanne Striegler prepares macromolecular catalysts that promote unnatural reactions on carbohydrates glycosides that enzymes cannot perform. In the long run, she hopes to develop a kit-like tool that allows non-synthetic chemists to create glycosylation reactions needed for the preparation of new pharmaceuticals.

"Many enzymes are very specific in the reactions they can catalyze while requiring special reaction conditions," said Striegler, an associate professor in the department of chemistry and biochemistry in the J. William Fulbright College of Arts and Sciences. "Taken together, that limits their scope and usage for synthesis. Macromolecular microgel catalysts, on the other hand, consist of a catalytic center surrounded by a man-made polymer resembling the key features of an enzyme, but enable a large variety of reactions under any condition desired. These microgels work in water like enzymes would, so there is a similarity. However, ours is a totally new design of catalysts."

Striegler's research group, which currently includes three postdoctoral research associates and five undergraduate researchers, transforms transition metal complexes into selective macromolecular catalysts by immobilizing them in templated micro- and nanogels. The material is designed to transform carbohydrates into other, useful entities, such as oligosaccharides or unnatural sugars.

The National Science Foundation recently awarded Striegler a \$360,000, three-year grant for project to further develop water-soluble microgels with immobilized transitional metal complexes as catalysts for glycosylation reactions.

"There are only a handful of people in the world who are working on catalytic microgels," Striegler said. "This work covers so many fields: organic synthesis, inorganic chemistry, biochemistry and material science. You need to have expertise in all of them to actually play this game. It's fun to play."

## Supply Chain Study Focuses on Operating Rooms



Manuel Rossetti

Health-care supply chain researchers at the University of Arkansas, in a study of three hospitals within the Mercy network, have found that adoption of advanced inventory management systems can significantly reduce costs associated with medical and surgical items used in operating rooms. The study, released by

the Center for Innovation in Healthcare Logistics and funded by Covidien Inc., a health-care products manufacturer, focused on medical and surgical items used at Mercy hospitals in Fort Smith, Ark., Springfield, Mo., and Oklahoma City. Their analysis showed that holding costs associated with a high stock inventory contributed most to inefficiencies.

"Because of intermittent or so-called 'lumpy' demand, procurement and supply-chain managers struggle with how many items to order," said Manuel Rossetti, professor of industrial engineering and lead author of the study. "Traditional methods of modeling and forecasting are not sufficient. Our implementation of an advanced forecasting technique showed much greater efficiency with a majority of the items at each location. Of course, the implication is that vital items are fewer in nature – not as many held in stockrooms, for example – and adoption of inventory best practices on these items may generate considerable savings."

[Learn More](#) 

### IN THIS ISSUE

Organic Chemist receives NSF Award for Microgels Study

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Supply Chain Study Focuses on Operating Rooms

---

New Details Regarding Proposal Deadlines

---

What Are Limited Submissions?

---

### IN OTHER NEWS

SunShot Initiative Shines on Silicon Solar Solutions

---

'Shakers' Help Engineers Develop Inexpensive Soundwave Structure Test for Bridges

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Physicists Take an Atomic-Level Peek at Unexpected Behavior in Multilayered Structures

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### HELPFUL LINKS

#### The Arkansas Catalyst

*Sign up for Listserv information on the following topics: arts and humanities, high-performance computing, DNA sequencing, energy and environment, food safety, health, nanotechnology, NASA-related research, RazorGrant, STEM education and sustainability.*

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### GRANT AWARD WINNERS

The following is a sampling of grants awarded to faculty in October, with the principal

## New Details Regarding Proposal Deadlines



The office of research and sponsored programs has new information about grant proposal deadlines involving federal research agencies. Both the National Science Foundation and National Institutes

of Health have new proposal deadlines for their specific programs, which are posted at the vice provost for research and economic development website. For questions, call research and sponsored programs at 575-3845.

investigator, the award amount and the sponsor. An asterisk (\*) indicates the continuation of a previous award.

- Brent Smith, \$470,383, U.S. Department of Justice
  - Micah Hale, \$184,681, Headwater Resources Inc.
  - W. Dan Hendrix, \$160,000, U.S. Economic Development Administration
  - Patrick Wolf, \$150,000, Smith Richardson Foundation Inc.
  - Susan Schneider, \$83,751, U.S. Department of Agriculture
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## What Are Limited Submissions?

Granting agencies may impose a limit on the number of proposals submitted by an institution to a funding opportunity. In these cases, the office of the vice provost for research and economic development will be responsible for selecting proposals for submission.

If you are interested in a solicitation that limits the number of campus submissions, please contact research and sponsored programs (RSSP). By Academic Policy Series 1535.10, RSSP needs to determine the number of possible submissions and determine which proposal(s) are to be submitted. This step may seem to be generating competition for your proposal but it is in your best interest. It is better to find out early if there are other potential proposals before you expend significant effort to write a complete proposal. It also identifies potential collaborations between two different proposal teams.

[Here is a sampling of limited submission programs.](#)

### CONTACT US

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# University of Arkansas Arkansas Newswire

## Better Inventory Management Systems Can Reduce Operating Room Costs, Study Finds

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### Researchers focused on medical/surgical items at three hospitals

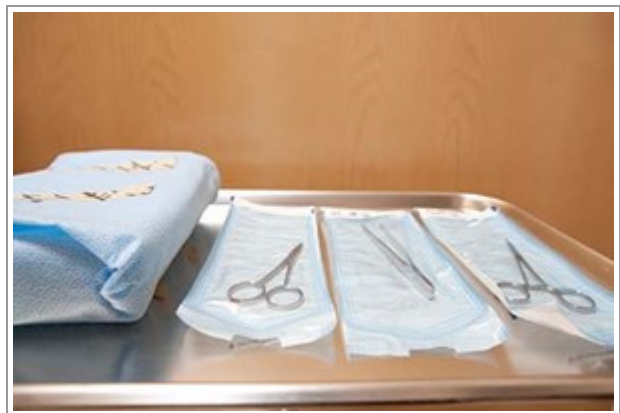
Thursday, October 31, 2013

FAYETTEVILLE, Ark. – Health-care supply chain researchers at the University of Arkansas, in a study of three hospitals within the Mercy network, have found that adoption of advanced inventory management systems can significantly reduce costs associated with medical and surgical items used in operating rooms.

>The study, released by the Center for Innovation in Healthcare Logistics and funded by Covidien Inc., a health-care products manufacturer, focused on medical and surgical items used at Mercy hospitals in Fort Smith, Ark., Springfield, Mo., and Oklahoma City. Their analysis showed that holding costs associated with a high stock inventory contributed most to inefficiencies.

In 2010, health-care expenditures in the United States reached \$2.6 trillion, nearly 10 times the \$256 billion spent in 1980. Hospital care and clinical services account for roughly half of the nation's health expenditures. According to another research study, supply chain costs may account for as much as 40 percent of the cost of providing care, and it is estimated that if demand and inventory were better managed, cost savings could range from 6 percent to 13.5 percent of total health-care costs.

The Arkansas researchers analyzed inventory and procurement practices at each hospital and evaluated the potential for cost savings. They applied an advanced inventory management system driven by actual usage data and found that it forecasts demand better than traditional methods of ordering and replenishing.



The most recent study released by the Center for Innovation in Healthcare Logistics focused on medical and surgical items used in operating rooms.

“Because of intermittent or so-called ‘lumpy’ demand, procurement and supply-chain managers struggle with how many items to order,” said Manuel Rossetti, professor of industrial engineering and lead author of the study. “Traditional methods of modeling and forecasting are not sufficient. Our implementation of an advanced forecasting technique showed much greater efficiency with a majority of the items at each location. Of course, the implication is that vital items are fewer in nature – not as many held in stockrooms, for example – and adoption of inventory best practices on these items may generate considerable savings.”

The researchers studied supply-chain processes on a total of 370 items – 119 at Fort Smith, 103 at Oklahoma City and 148 Springfield – made by Covidien. They focused on items within Covidien’s medical/surgical category, which includes diagnostic equipment and monitors, instruments such as clamps, scalpels, needles and suction tubing; and other general products such as latex gloves, towels, trays and sponges. Usage data on these items were extracted from software over a 578-day period, from October 1, 2010, to April 30, 2012.

The research team found that savings and cost reductions can be achieved by implementing advanced inventory management systems that would result in less inventory on hand while still fulfilling demand for items. Overall, the researchers analysis showed that forecasting was better for 61 percent of all items at the Fort Smith hospital, 65 percent of all items at the Oklahoma City hospital and 71 percent of all items at the Springfield hospital.

The Center for Innovation in Healthcare Logistics at the University of Arkansas partners with industry to lead a nationwide effort to identify and foster system-wide adoption of innovations in health-care supply chain and logistics. The center facilitates collaboration among U of A researchers, health-care providers and industrial sponsors. Additional information about the center can be found at [cihl.uark.edu](http://cihl.uark.edu).

Rossetti is holder of the John L. Imhoff Endowed Chair in Industrial Engineering in the College of Engineering.

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