

# Innovator aids hip work

## Process speeds patients' recovery

By Paula Lavigne  
Staff Reporter

A UNL professor's invention could have the almost 200,000 Americans who have hip-implant surgery back on their feet sooner than before.

Jody Redepenning, assistant professor of chemistry at the University of Nebraska-Lincoln, invented a new procedure that would help the bone and hip implant device adhere more quickly.

His process uses a chemical called hydroxyapatite, which is the formula for the inorganic part of the bone. He said this chemical coated the wire-mesh attachments on the implant device.

"The bones like (the coating)," Redepenning said. "The bones grow into it more quickly."

Most current hip implants that use hydroxyapatite make weak, slow bonds with the bone, he said. These implants weren't being maintained.

"The adhesion between the device, the polymer and the bone failed," he said.

Redepenning's discovery uses electrochemistry instead of heat to apply the fusing chemical to the bone.

"Electrochemistry is an interface between electricity and chemistry," he said. "Usually we use electricity to do chemistry. Here, we used chemistry to produce electricity." Electrochemistry makes the bond adhere faster than the heat method, he said. High temperatures that formerly had been used to fuse the implant and bone, increased the implant's corrosion rate, he said.

"It's like throwing a nail outside and coming back years later to see what it looks like," he said. "Only, in this case, it happens more quickly."

Redepenning said heat, unlike electrochemistry, started a chemical reaction that changed the form of the hydroxyapatite.

Using electrochemistry initially to make the chemical allows the electrochemical fusing procedure to work, he said.

Although he knew his research in electrochemistry procedures related

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— Jody Redepenning, assistant professor of chemistry at the University of Nebraska-Lincoln

to hip implant work, Redepenning said, he didn't set out to make the discovery.

"Science doesn't really work like people think it does," he said. "It's not just plodding along — there's an element of creativity in it. Somehow, the lights just have to go on and you've got to put a lot of things together to create something nobody's done before."

"It's not a situation where there was this sequence of very logical events," he said. "When it happened it was like 'Boom! I can do this!'"

But Redepenning said the discovery still had some problems.

In the long run, the coating still wears off the device, he said.

"This just makes their lives a little better more quickly," he said.

Another problem with the procedure, he said, is that manufacturers use different procedures to apply the coating.

"The procedures are not well controlled," he said.

Although the procedure has not been tested on humans, its future looks promising, Redepenning said.

"Studies with animals have shown a 30-percent increase in the 'push-out' rate," he said. He said the "push-out" rate was the force it took to remove a plug from a bone with coating as opposed to one without.

Redepenning said he was pleased with the procedure's results so far.

"What I get from this is the luxury of getting to think things up and to pursue them," he said. "I like teaching. All I want is the ability to pursue the ideas that I have."

# Sophomore charged with sexual assault

From Staff Reports

Richard Barrett, 21, was released from the Lancaster County jail Wednesday afternoon on 10 percent of \$10,000 bond, a jail official said.

Barrett, a sophomore engineering major at the University of Nebraska-Lincoln, allegedly assaulted a 20-year-old woman after a study session at her apartment Thursday evening.

Barrett was arraigned Monday at Lancaster County District Court with Judge Mary Doyle after being cited

Friday with first-degree sexual assault.

Sgt. Ann Heermann of the Lincoln Police department said the woman, a UNL student, had several other students at the apartment to study for a test.

The alleged victim, Barrett and another woman reportedly fell asleep, Heermann said. The woman woke at 6 a.m. when Barrett allegedly had forced sexual intercourse with her, Heermann said.

Barrett is scheduled to appear again in court Nov. 1.

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