Nano-Biotechnology Laboratory to Fabricate Metallic Orthopaedic Protheses with Ceramic Wear Properties

With a new piece of equipment and a new laboratory location, the department’s nano-biotechnology projects are moving forward, according to Dr. Fereydoon Namavar, professor and director of Nano-Biotechnology. “Last fall, we moved into the Scott Technology Center and soon after, we purchased an ion-beam-assisted deposition (IBAD) system,” he says.

Dr. Namavar said the department was fortunate to purchase this equipment from Mill Lane Engineering in Massachusetts, a company that manufactured the system for a fiber optic company. Similar systems were used commercially to produce communication and laser components. Because the market has been saturated with optical communication systems, the IBAD machine became available at a very reasonable price, Dr. Namavar says. “Next we’ll adapt and calibrate the system for orthopaedic applications.”

Once it’s fully operational, the IBAD system will produce nanocrystalline super hard coatings to protect and reduce the wear of metallic artificial implants. “This technology will be instrumental to fabricate metallic orthopaedic prostheses with ceramic wear properties,” Dr. Namavar says. Longer patient life spans require prosthetics with increased longevity to minimize the possibility of revision surgery.

The IBAD machine generates a vapor flux of atoms with an electron beam and/or thermal evaporator and deposits them on a substrate. Ions of argon or nitrogen are simultaneously extracted from an ion gun and accelerated into the film at energies of several hundred to several thousand electron volts. Ion bombardment is the key factor in controlling film properties in the IBAD process and is crucial for improving adhesion, morphology, and chemical composition. “This ion-enhanced process ‘stitches’ ceramic films and coatings to the metallic substrate with better adherence than those produced without ion enhancement,” Dr. Namavar explains.

Dr. Namavar and Dr. Cheng-Hsin Ma are developing several nanocrystalline, multiphase ceramic/metallic coatings for orthopaedics. Presently the team is optimizing coating for flat objects, but continues to explore ways to solve the task of uniformly coating round objects. Research has already begun under the supervision of Dr. Hani Haider, associate professor and director of biomechanics, as he studies how to fabricate a robotic system for IBAD.

Dr. Namavar’s diverse career includes experience in metallurgy, nuclear physics, solid states, condensed matter, polymers nanotechnology, optoelectronics and materials for space electronics. Dr. Ma has a background in materials science and engineering, and his doctoral research used an IBAD system. Drs. Namavar, Ma, and Haider, and the biomechanics lab’s wear simulation facilities have the right chemistry for this promising area of orthopaedic research.

Orthopaedics loses a loyal teacher

Dr. Jackson Bence, 75, passed away February 3, 2004, at his home in Lincoln. Dr. Bence supervised orthopaedic surgery residents training at the Veterans Administration Hospital. Last year, he was promoted to clinical assistant professor.

After graduation from Broken Bow High School, he served in the U.S. Navy, then attended Hastings College. He was called back into the Navy Reserves during the Korean War and served another two years before finishing his pre-med education. He earned his M.D. from the University of Nebraska College of Medicine in 1958. After several years in private practice, he moved to Kansas City for an orthopaedic residency. He practiced in Grand Island until he retired in 1986. He moved to Lincoln and went to work at the VA Medical Center, still traveling to see patients in Grand Island and Omaha.

“We must learn constantly,” Dr. Bence once said. “That’s what makes medicine exciting; and that’s why I enjoy teaching residents, because I learn too.”
A Message From the Chair

This time of year we tend to look backward and ahead; this issue of Breaking News does both. We are excited about what is ahead, and we are reminded of the debt we owe those who have gone before us.

As graduation approaches, our chief residents look back on their experience here and look ahead to what’s next. Soon new residents will arrive. There was lots of reminiscing when dozens of former Nebraska residents gathered at the March AAOS meeting in San Francisco. As the photos show, the reception was a fun event that gave alumni a chance to find out what friends are doing today. The AAOS meeting was also a chance for several faculty and residents to demonstrate the strength and future of our research program. Two of our newest research staff are featured in this issue. Andres Barrera and Shashank Mupparapu, are working with Dr. Hani Haider on several bioengineering research initiatives. Dr. Fereydoon Namavar is working on some forward-thinking research with the new ion-beam-assisted deposition machine.

Also in this issue, you’ll learn more about Dr. Charles F. Burt, a 1998 graduate of our program who is now a clinical instructor. Also in this issue, Dr. Walter Huurman launches a series of columns about the department’s colorful history.

Our department’s future is strengthened by the generosity of many alumni and friends. Dr. and Mrs. Wayne Ryan of Omaha are the latest additions to our department’s “Wall of Honor,” recognizing extraordinary support that will have a positive effect on our patient care, research efforts, and resident training programs.

A future publication will look back on the department’s activities. For the first time, we will publish a departmental report covering the scientific, clinical, and research activities of 2002-2003. Watch for your copy later this summer.

Kevin L. Garvin

Dr. Charles F. Burt: A Not-Really-New Instructor

Dr. Burt earned his medical degree from the UNMC College of Medicine in 1993. After his orthopaedic residency, he packed up his family and moved to the “land down under.” He went through a sports medicine fellowship at the Orthopaedic and Sports Medicine Center in Sydney, Australia. “Professionally and personally, our experience in Australia was amazing,” he says. “I learned a great deal from the supervising surgeons. Two of our children attended school in Australia, and we made many friends.” The family hopes to return to Australia for a visit later this year.

Sydney, Australia, is a long ways from Lincoln, Nebraska, where Dr. Burt grew up and attended college at Nebraska Wesleyan University. He majored in biology and played basketball. He said the peak of his basketball career came when Wesleyan team played in the NCAA Division III Final Four in 1988, the same year he earned the Most Valuable Player Award. Dr. Burt says he has “hung up his basketball shoes,” but he enjoys playing golf and windsurfing. He also spends lots of time in the stands at his children’s sporting events.

Dr. Burt practices with seven other surgeons at the Nebraska Orthopaedic Associates in Omaha. He specializes in the care of sports-related injuries, knee and shoulder problems, fracture care and general orthopaedics. He earned board certification in 2001 and is a member of the American Academy of Orthopaedic Surgeons. Dr. Burt and his wife, Julie, have three children: Alexandria, 14; Samuel, 13; and Audrey, 7.

New Researchers Find a Home at the Scott Technology Transfer and Incubation Center (STC)

The Orthopaedic Department’s newest research associates come from different parts of the world, but both now call Omaha home. Andres Barrera and Shashank Mupparapu work with Dr. Hani Haider in the Biomechanics Laboratory.

Shashank Mupparapu grew up in south central India. He earned his bachelor’s degree in technology in production engineering and a post-graduate diploma in computer applications. He applied to several U.S. graduate schools and chose the University of Nebraska at Lincoln due to its specialization in finite element analysis. “I thank my family

and my uncle (an engineer with Caterpillar in Illinois) for their advice and support,” he says. Shashank was working on an M.S. degree in mechanical engineering at UNL when he met Dr. Haider. Shashank moved to Omaha in the late stages of his thesis work (Continued on next page)
New Researchers Find a Home at the Scott Technology Transfer and Incubation Center (STC)

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and began working with Dr. Haider, commuting to Lincoln until completing his degree in December 2003. His background includes understanding and using finite element methods in analytical and numerical form, designing robotic manipulators, and developing a way to parameterize the material behavior of steel. His thesis focused on finite element analysis of bones and knee implants in vivo.

“In the Biomechanics Lab, we are setting up a system called radiostereometric analysis to accurately measure small relative displacements of body or implant segments in vivo,” he says. Shashank lives a few blocks from the STC. During his non-work time, he enjoys playing pool, cricket, and reading. He also likes exploring but says, “It was too cold to go anywhere this winter.” He’s looking forward to exploring the Omaha area in warm weather with his fiancée.

Andres Barrera grew up in Argentina and earned a bioengineering degree with a focus on medical imaging analysis. He considered coming to the U.S. to study English, and was advised to attend a school in the middle of the country where he “would learn a more pure form of English.” He enrolled in UNO’s Intensive Language Program.

Andres met Dr. Haider and was soon working as a graduate assistant in the Biomechanics Lab. While pursuing an M.S. degree in computer science at UNO, Andres worked in the lab and began developing a computer-assisted orthopaedic surgery and freehand surgery system. He finished his degree in December. Dr. Haider and Andres are now developing software for medical image applications (PACS, 2D/3D visualization and processing, navigation, and virtual reality). In Argentina, Andres taught electronics, designed interactive science exhibits, and developed software for medical image applications. Although he played rugby in college (and some teammates went on to play professionally), Andres isn’t on a rugby team here. Andres enjoys music and is a founder/member of an Omaha group that plays traditional South American Indian music. Andres and his wife, Julieta, skied in Utah this winter and hope to explore more of the U.S. this summer.

Streck Labs Founder Supports Orthopaedics

Dr. Wayne L. Ryan has a unique perspective of the University of Nebraska Medical Center...several perspectives to be exact. Over the years, he has been able to view the medical center as a faculty member and researcher, as an administrator, as a leader in the business community, as a patient, and as a philanthropist. And Dr. Ryan likes what he sees from all perspectives.

“As a long-time faculty member and now emeritus professor, I feel a great deal of pride in what has been accomplished at UNMC,” said Dr. Ryan, a former faculty member in the Departments of Biochemistry, and Obstetrics and Gynecology. He also gained a wider perspective as assistant dean for research in the UNMC College of Medicine. Currently, Dr. Ryan is professor emeritus of Ob/Gyn.

Dr. Ryan is also a business owner and entrepreneur. He founded Streck Laboratories in 1971, and under his direction the company produced the country’s first hematology quality control products. Today, Streck Labs is a leader in the innovation, research, and manufacture of hematology, chemistry, immunology, and histology products for the clinical laboratory. “As our corporation grew, I found I could support more and more research,” the Streck CEO and chairman says. “UNMC faculty members told me how their research suffered from lack of funds, the same problem I had experienced as a faculty member.”

Dr. and Mrs. Ryan have an insider’s view of UNMC as patients. Dr. Ryan is one of Dr. (Continued on next page)
Garvin’s patients, and he praised the department’s physicians, residents, and staff. “One could not ask for better care. I have sent friends, family, and employees to Dr. Garvin.” He adds, “Eileen also holds Dr. Garvin and the department in high regard and has similar views of the Ob/Gyn group.”

The Ryans’ generous contribution to the department will be used to support the research activities in orthopaedics. “We are small town kids,” he says. “Eileen is from Nebraska, and I grew up in Iowa.” He earned a B.S. in chemistry and an M.S. in biochemistry from Creighton University. His Ph.D. in biochemistry is from the University of Missouri. He has written dozens of scientific publications and holds 25 patents.

Dr. and Mrs. Ryan support a variety of organizations and causes, especially in the Omaha area. “By supporting the Department of Orthopaedics and other UNMC areas, I can help causes in my area of interest,” he says.

The department is honored to have Dr. John Anthony “Tony” Herring, chief of staff at the Texas Scottish Rite Hospital for Children in Dallas, as the speaker for the 2004 graduation weekend.

Dr. Herring is a Texas native who earned an M.D. degree from Baylor University College of Medicine in 1967. He moved to Boston for a medical internship at the Peter Brent Brigham Hospital, followed by an orthopaedic surgery residency in the Harvard Combined Orthopaedic program. He then served two years in the Navy at San Diego before returning to Texas in 1975 when he became the assistant chief of staff at the Texas Scottish Rite Hospital for Children.

Dr. Herring is an associate editor for the Journal of the American Academy of Orthopaedic Surgeons. He served on the board of directors of the Pediatric Orthopaedic Society of North America for nearly 10 years and was president of that organization, 1993-94. He also has served on the Scoliosis Research Society’s board of directors and was chairman of the Instrumentation Committee. Most recently he served as chairman of the Scoliosis Research Society’s Research Coordinating Committee. Dr. Herring is active in many medical organizations in Texas, nationally, and internationally, and is an oral examiner for the American Board of Orthopaedic Surgeons. He has written numerous scientific articles and book chapters, and he has written and edited widely used medical texts. He has lectured in the U.S. and abroad, and was selected as the Alfred R. Shands, Jr. Lecturer for the 2000 AAOS annual meeting.

The celebration for our graduating residents will be Friday and Saturday, June 11-12, 2004. Four University of Nebraska/Creighton University orthopaedic surgery residents will graduate: Drs. Richard Davis, Brian Hasley, Stephen Hansen, and Lori Reed. The featured speaker for the weekend is Dr. Tony Herring, chief of staff at the Texas Scottish Rite Hospital for Children in Dallas. Here is a tentative schedule:

**Friday, June 11, 2004**
- 8:00 a.m. - 11:30 a.m. Scientific presentations by graduating residents
- Eppley Science Hall, UNMC campus
- Noon - 5:30 p.m. Golf outing and picnic at Indian Creek Golf Course

**Saturday, June 12, 2004**
- 8:00 a.m. - Noon
- Scientific Symposium Guest Speaker: Dr. Anthony Herring
- Eppley Science Hall, UNMC campus
- 6:00 p.m. Banquet – Shadow Ridge Country Club

Plan to join the department residents, faculty, and staff for the weekend’s activities. Please call Susan Siebler at 402-559-4251 for more information.

**New Residents Announced**

Congratulations to the following medical students who will be welcomed as the newest UNMC Department of Orthopaedic Surgery residents, July 1, 2004. You will learn more about them in the fall issue of Breaking News.

- **Erica Burns,** Creighton University School of Medicine
- **Casey Johnston,** University of Nebraska College of Medicine
- **Brian Kleiber,** University of Missouri-Columbia School of Medicine
- **Justin Siebler,** University of Nebraska College of Medicine

In addition, **John Gardner** joins the department as an HO II from the University of Illinois.
Conference Presentations, Seminars, and Publications

Department faculty members present many lectures, seminars, and courses from the UNMC campus to locations around the world. They also serve in leadership positions and offices for local, state, national, and international organizations. Here are some of our faculty’s presentations, publications, offices, and other professional activities during November 2003 – May 2004.


Conference Presentations, Seminars and Publications

(Continued from front page)


Scherl, S. A.: Assessment and Care of the Pediatric Patient. Orthopaedic Care Update: Assessment and Advancements, Omaha, NE, The Nebraska Medical Center - Clarkson Hospital, November 7, 2003.

Clare, M. P.: Assessment and Management of Common Foot and Ankle Problems. Orthopaedic Care Update: Assessment and Advancements, Omaha, NE, The Nebraska Medical Center - Clarkson Hospital, November 7, 2003.


Scherl, S. A.: Orthopaedic Medical Student Educators Project 100, 3/2003 - present.

Kudos to...

• Dr. Paul Esposito was elected to be the chair of the Department of Surgery at Children’s Hospital.

• Dr. Kevin Garvin was recently elected to serve as President of the Mid-America Orthopaedic Association for 2004-2005, a title that he assumed during the annual meeting in April 2004.

• Dr. James Neff, who is just beginning a three-year term as chairman of the Musculoskeletal Transplant Foundation (MTF) Medical Board of Trustees and was recently named to the MTF Board of Directors, and the MTF Executive Committee, Research Committee, and Clinic Studies Design Committee. Also, Dr. Neff was listed in the 2004-2005 edition of the National Register’s Who’s Who in Executives and Professionals.

• Physicians Practice, a journal published by The Nebraska Medical Center, recently featured Dr. Todd Sekundiak and his work with minimally invasive hip and knee joint replacement surgery. The magazine stated: “The orthopaedic team at The Nebraska Medical Center, led by orthopaedic surgeon Todd Sekundiak, MD, is playing a pivotal role in developing and refining the procedure by assisting in the design of the implants and surgical instruments, as well as the development of computer-assisted programs to improve the accuracy of the procedure.”


• Dr. Fehringer receives grant to research shoulder tears. Congratulations to Dr. Ed Fehringer, who was recently notified that he will receive a two-year grant from the American Geriatric Society. The $200,000 Career Development Award will fund a research project to assess the prevalence of symptomatic and asymptomatic rotator cuff tears in men and women 65 years of age and older.

“During my fellowship at the University of Washington, I learned how to do ultrasound on shoulders to assess rotator cuff tears,” says Dr. Fehringer. “Radiologists use ultrasound, but it isn’t a tool traditionally used by orthopaedic surgeons to evaluate rotator cuff problems.” The procedure is routinely performed in Europe and Australia, but MRI tends to be more popular in the U.S. People develop rotator cuff tears as they age. Some people experience symptoms and others don’t, according to Dr. Fehringer. The Universities of Washington and Minnesota, as well as Washington University in St. Louis have been leading the resurgence of interest in ultrasound.

This award will fund the purchase of a portable ultrasound machine and provide free ultrasounds for patients who participate in Dr. Fehringer’s study, which will take place at The Nebraska Medical Center. Watch future issues of Breaking News for updates on this research project.

• Dr. Michael Gross, a long-time volunteer faculty member who works with orthopaedic residents, has been honored with the “Orthopaedics Overseas Volunteer of the Year Award” for his long and dedicated service to that organization. Dr. Gross has served in St. Lucia, Honduras, Ethiopia, Bhutan, and Uganda in support of the Orthopaedics overseas mission.
Nearly 50 Nebraska orthopaedic alumni and their guests gathered at the departmental reception in San Francisco, held in conjunction with the annual American Academy of Orthopaedic Surgeons (AAOS) meeting in March. People came from across the country and had a great time catching up with friends in the historic setting of the Marines Memorial Club and Hotel.

Also at the AAOS meeting, Orthopaedic Department faculty, residents, and research staff presented research results at conference venues, including seven poster presentations, a scientific exhibit, and another presentation during the five-day meeting. Their topics ranged from computer simulations of bone cutting for knee replacement surgery, to results of a treatment protocol for calcaneal fracture malunions, to a study of faculty review and differences in orthopaedic residency applications. For details on the presenters and their topics, see “Conference Presentations, Seminars, and Publications” inside.

For their significant contributions to local and statewide communities, Omaha’s two academic medical centers, UNMC and Creighton, received the prestigious Outstanding Community Service Award in 2003 from the Association of American Medical Colleges (AAMC). This is the first time two schools have shared the award. UNMC and Creighton were selected from among 150 U.S. medical schools. Chancellor Harold Maurer called the award “a testament to our strong commitment to reaching out to people in need” and praised UNMC faculty, students, and staff for being “among the very best” and “dedicated to improving the health of all Nebraskans.”
The Early Days

As many of you may recall from exposure to history of the University of Nebraska College of Medicine, the school was preceded by the type of institution of which was common in the earliest days of medical education – a proprietary medical school. In those institutions physicians were educated not unlike an apprentice in a preceptorship system. In Midwestern frontier days, much of the medical care was little better than that available from “irregular” practitioners and entrepreneurial purveyors of poultices, onion soup, asafoetida, and alcohol-based tonics. No doubt musculoskeletal injuries, including fractures, were treated with crude splints since operative intervention usually led to life threatening sepsis.

In 1866 a group of Eastern-trained physicians interested in guaranteeing the quality of medical care attempted to develop a medical society in Omaha. By 1868 the Nebraska Medical Society was incorporated, and in 1869 the Omaha Medical College also became a corporation with five physicians serving as the Board of Trustees. Individuals for 11 professorship chairs were selected by the trustees and a curriculum developed. This latter corporation never really got off the ground due to lack of facilities and bickering among the faculty. It was ultimately dissolved as a corporation in 1881. With the death of this initial school, the Omaha Medical Society also disappeared, a victim of the same dissension, animosity, and competition among members. The Nebraska Medical Society somehow survived. Although the University of Nebraska in Lincoln lacked funds, classroom space, and despite the fact that there was no hospital in Lincoln in 1875, the Board of Regents became interested in establishing an institution for medical education.

Such an institution never came to fruition. Nevertheless, interest led to the opening of the Nebraska School of Medicine in 1880, not in Lincoln, but in Omaha. Its purpose was not to prepare young men to practice medicine, but to be qualified for entry into any ‘graded’ medical school, essentially a pre-medical curriculum. The initial class of 14 was so successful that at the end of the first year, the Nebraska School of Medicine reorganized and took the name of the Omaha Medical College. With funds invested by each faculty member, facilities near St. Joseph’s Hospital were acquired.

The proprietary Omaha Medical College grew from its original enrollment of 14 students and one paid faculty member in 1880 to 35 entering students in 1881. Stimulated by the success of the private Omaha Medical College, the Board of Regents initiated the first University of Nebraska Medical School in Lincoln in 1883. This venture, perhaps stimulated by inter-city rivalry, lasted until 1887 when it was closed due to lack of funds and the absence of a hospital in Lincoln.

Unlike many proprietary schools which were willing to accept students who might not be academically qualified but were able to pay the tuition, the existing Omaha Medical College gained sufficient stature that the admission committee had the luxury of rejecting many applicants who had the money but lacked intellectual requirements. Growth of the student body lead to affiliation with an increasing number of Omaha-area hospitals: St. Joseph’s, Immanuel, Bishop

(Continued on next page)
Our Newest Alumni

After graduation, our four residents will take the next step in their professional careers. Here are their plans:

- **Dr. Lori Reed** will move to Tampa, Florida, for a fellowship in foot and ankle and lower extremity reconstruction at the Florida Orthopaedic Institute.

- **Dr. Brian Hasley** has accepted a fellowship in pediatric orthopaedics at the Texas Scottish Rite Hospital for Children in Dallas.

- **Dr. Stephen Hansen** will move to Indianapolis for a fellowship with the Indiana Spine Group.

- **Dr. Richard Davis** will be a general orthopaedist at Mike O’Callaghan Federal Hospital, Nellis Air Force Base in Las Vegas.

Dr. Jason Browdy in the News

Dr. Jason Browdy (2003) was spotted in a spring issue of *ESPN Magazine*. He was in the O.R. instead of a stadium. The article by Jerry Crasnick, “The Big Fix,” describes each step of the entire surgical procedure to repair pitcher Steve Nelson’s torn ulnar collateral ligament. The Vero Beach Dodger right-hander underwent surgery at Centinela Hospital Medical Center.

Dr. Browdy is doing a sports medicine fellowship at the Kerlan Jobe Clinic in Los Angeles. A photo shows Drs. Jason Browdy and Frank Jobe assisting Dr. Ralph Gambardella. Drs. Jobe and Gambardella are well-known sports medicine surgeons who have helped many injured baseball players. Thanks to Dr. Clare for sharing the article with department staff. Unfortunately, copyright restrictions prevent reproduction of the photo in *Breaking News*.

The Early Days

(Continued from previous page)

Clarkson, the Douglas County Hospital, and St. Bernard’s Hospital in Council Bluffs. Industrial accidents, including those at the Union Pacific Railroad, provided patients with bone and joint injuries for the students to learn orthopaedic principles from general surgeons on the faculty. The three-year curriculum of 1890 was expanded to four years in 1896 in response to public demand for high standards as well as stiffening licensure requirements of the Nebraska legislature.

In the 1890s, attempts at developing affiliations with the Nebraska Episcopal College in York and the University of Omaha never came to fruition. It became clear that a proprietary medical college without university affiliation could not survive. The costs and facility demands were too onerous. In 1902 a somewhat loose affiliation of the Omaha Medical College with the University of Nebraska was instituted. Dr. Baldwin Ward, a zoology professor, and Dr. Harold Gifford, Sr., an ophthalmologist, became Dean and Associate Dean of the new University of Nebraska College of Medicine. An innovative six-year course of study leading to Bachelor of Science and Doctor of Medicine degrees was offered. By 1908, two years of preparatory college education were required for admission into the College of Medicine, a move that was well ahead of what became widely accepted by other medical schools across the country. Ultimately, the two-year pre-medical requirement was extended to three or four years, with the University of Nebraska leading the way.
Geri Miller Receives Silver U Award

Secretarial Specialist Geri Miller recently received the Chancellor’s Silver ‘U’ Award. Working with Drs. Neff, Mormino, Haider, and Namavar, she handles everything from coordinating grant applications and preparing manuscripts for publication, to scheduling medical students for orthopaedic rotations. A 20-year UNMC employee, Geri says she loves working in the department “because the people here are all so nice.”

Geri first met some of the orthopaedic physicians before she began working for the department in 1999. “Years ago, Dr. Esposito treated our son Jarrod after he was in a bus accident, and last year Dr. Ginsburg did two hip surgeries on our younger son, Alan. Dr. Sekundiak also treated my mother after she broke her hip in December of last year.”

Geri and her husband, Lynn, their sons, three dogs and two cats live on a century farm near Woodbine, Iowa. Everyone who nominated the Iowa native for the Silver U Award agreed that Geri skillfully and graciously handles all people, projects, and problems coming her way. Geri’s friendly smile and willing attitude make her “pleasant to work with” and “an asset to the department.” Congratulations, Geri!