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Fighting diseases of farm animals
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Getting to the heart of the matter is the work of cardiovascular researchers Robert Straka, College of Pharmacy, and Donna Arnett, School of Public Health. Page SF 1

Whole Hearted

AcademicHealthCenter
University of Minnesota

A publication for friends of the University of Minnesota
In February, Medical School students, faculty, and staff gathered for the third year in a row to hear Guthrie Theater actors read Miss Evers’ Boys. The play, says Jon Hallberg, includes “a caring nurse who loses sight of her ideals, several poor black sharecroppers with ‘bad blood,’ and two misguided physicians who feel they’re doing what’s right—but they weren’t.” Hallberg, a University family practice physician who also serves the Guthrie troupe as company physician, made the connections between the theater and the Medical School a few years ago. The 1990 Pulitzer-Prize winning play by University alum David Feldshuh, a physician who is now a Cornell professor and artistic director for the Cornell Center for Theatre Arts, concerns the Tuskegee experiment on men with syphilis. The reading is one session in the Physician and Society course for first-year students. The play, says PAS course director James Pacala, addresses issues that the students have just been studying. “Informed consent and the issues around it, such as assessing competence, recruiting subjects into research trials, truth telling about potential risks and benefits, using coercive methods for recruitment, and confidentiality,” he says. “All of these are touched on in the play in a very provocative fashion.”
PICTURES OF HEALTH

Kevin Smith combines his stand-up comedian skills with his experiences as a care-giver and shares the results with students. Page 6

Modeling teamwork for students are physician Terry McCarthy, front left, with pharmacist Tom Lackner at center, and nurse Karin Schurrer-Erickson, right. Page 8

College of Pharmacy researchers William Elmqquist, left, and Nagdeep Giri are investigating the brain’s defenses. Page 10

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From acupuncture to cell therapy, researchers across the Academic Health Center are exploring ways to improve heart health and treatments.

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At the Minnesota Legislature this spring, actions have been taken to attempt to restrict legal yet controversial research on embryo stem cells. Researchers aim to improve treatments for diabetes, heart disease, Parkinson’s, Alzheimer’s and other maladies. The cells used in the research are donated by those who have used fertility clinics. These unused embryos, about the size of a cross-section of human hair, would otherwise be discarded. Scientific research is best conducted in full view at a public university, says senior vice president for health sciences Frank B. Cerra. Members of the University Senate concur. They wrote in a statement. “Only with a commitment to [academic freedom]—vigorously practiced within University—can the objectives be met of extending the reach of academic institutions and supported broadly throughout society and by government—can the objectives be met of extending the reach of knowledge, solving problems facing the planet, and preparing individuals for productive and ethical lives.” For more background on the issue, go to the Web page www.ahc.umn.edu/stemcells/.

Neuroscientist A. David Redish was awarded a 2004-06 McKnight Land-Grant Professorship for his study of dynamics of information processing: from brains to behavior. The image at right shows the location and signals of a brain recording in the striatum. Redish was one of this year’s nine recipients of the McKnight award, with which the University recognizes junior faculty whose achievements and ideas demonstrate originality, imagination, and innovation, who demonstrate potential to make important contributions to their fields, and who will attract talented students. The two-year award includes funding and a leave to facilitate research.

Warren Warwick, University pediatrician who developed high-frequency chest compression to improve bronchial drainage and help cystic fibrosis patients, recently received the Angela Warner Friend of the Foundation lifetime achievement award from the Minnesota chapter of the Cystic Fibrosis Foundation. Warwick was the first director of the Minnesota Cystic Fibrosis Center, serving for nearly 40 years, and still sees patients regularly.

Women’s use of all medications—including herbal supplements—is higher than anticipated, and they’re unlikely to tell their health care providers about the medications they take, according to University Journal of Obstetrics and Gynecology determined that health care providers need to ask more about medication usage. “We really need to inquire better about patients taking herbal and over-the-counter medications,” says Timothy Tracy, one of the article’s authors and a professor at the University of Minnesota College of Pharmacy and in the University of Minnesota Center of Excellence in Women’s Health. “The care providers need to ask, and patients need to tell. Neither one is doing a good job.”

In January 2004, Benjamin S. Pomeroys died at age 92. Known by many as “Mr. Turkey,” Pomeroys’ research on preventing poultry diseases helped make Minnesota a top turkey-producing state. He published more than 140 articles on avian diseases, served the University for 47 years, and remained active at the University even after he retired in 1981. He lobbied at the Legislature on behalf of veterinary medicine, animal health, agriculture, and the University. “He would work tirelessly for causes he believed in,” his extension colleague David Halvorson told the Star Tribune. “If things didn’t go well, he would keep going…. Ben always had a positive attitude.”

Schools may become safer environments for adolescents because of School of Nursing research. Nursing faculty Elizabeth Saewyc will study how some students are stigmatized, targeted for violence at school, and engage in risky behaviors such as drug use in three countries—the United States, New Zealand and Canada. Students can be targeted because of visible disabilities or more hidden stigma, such as sexuality issues or mental health problems. “Students forced to bear an unfavorable label feel rejected and discriminated against,” Saewyc says. “We know this affects their physical and psychological health from previous studies that tell us they are more likely to drink, use drugs, feel unsafe, skip school, and even attempt suicide or some other violent response. We want to find out how schools and students can change this cycle of violence and risky behavior.”

The School of Dentistry has a new dean, Patrick Lloyd. Lloyd comes to the University of Minnesota from the University of Iowa, where he headed of the Department of Family Dentistry. “I feel that he has the vision and leadership skills, along with excellent communication, consultative, and administrative skills, that will serve the school well in moving ahead,” said Frank B. Cerra, senior vice president for health sciences. Lloyd began his duties in April, joining an ongoing strategic planning process.

Recently stepping down after 13 years as head of the School of Public Health’s Division of Epidemiology is Russell Luepker. Luepker says he’s proud of his past work in developing faculty, many of whom have gone on to become leaders in their field. One is John Finnegan, who assisted on Luepker’s Minnesota Heart Health Program, a community-wide effort to reduce cardiovascular risk. “One feature about Russell’s leadership that I will always be grateful for is his mentorship,” Finnegan says. “I started in the school almost 25 years ago as a graduate student with skills in media communication but relatively little knowledge of public health. Russell was a great mentor in helping me get a career started in public health.”

Stephen Haines recently returned to the University of Minnesota from the Medical University of South Carolina to lead the Department of Neurosurgery. The department ranks 15th nationwide in National Institutes of Health research funding. Haines’ own research interest focuses on the application of advanced clinical research techniques to neurosurgery and the development of resources for the evidence-based practice of neurosurgery. “Dr. Haines brings his expertise and experience to a department that has consistently ranked among the top in the country,” says Medical School Dean Deborah Powell.

The Medical School’s Graduate Program in Neuroscience recently was selected as one of nine neuroscience programs nationwide to participate in the Carnegie Initiative on the Doctorate (CID), a five-year action and research project aimed at improving doctoral education at American universities.
Anh Kov knows the value of an encouraging word. Her path to dental school was long and often circuitous, but at every turn, there was always a steadying hand or a supportive comment from a friend, teacher, or family member. “All along, there have been so many people who have helped me, people who urged me to reach a little further,” the University student says.

Last year, Kov got a chance to return the favor when she signed on to mentor a high-school student as part of a new program initiated and run by School of Dentistry students. Each week during the academic year, pupils from Roosevelt High School in Minneapolis, a medical-magnet school with a diverse population of students, e-mail their mentors at the School of Dentistry. The kids’ messages contain questions about science, musings about life, and speculation about careers and the future.

Twice each semester, the students and their mentors meet face to face, first at the high school, then at the dental school.

Shawn McMahon, a third-year dental student who launched the program with classmate Dawn Maertz, says he modeled the operation on a National Guard mentoring program that he participated in a few years ago. He’s been thrilled with the response of his peers at the dental school. “We thought maybe 20 to 30 people would be interested in doing this,” he says. “We ended up having 110. All four dental classes have had someone represented, and two of the hygiene classes had people mentoring as well.”

The mentoring program, says Roosevelt science teacher and program coordinator Jenny Olson, boosts kids’ interest in learning as well as their overall self-confidence. “Studies show that the more adult mentors in a child’s life, the more chance they have of succeeding,” Olson says. “The e-mentoring also gives them something to look forward to in class. They get to e-mail and talk to someone—someone who is interested in them—about science.”

Joshua Vang, a second-year dental student, says the Roosevelt freshman with whom he was paired, a Hmong girl, wasn’t initially all that interested in science. That’s changing, he adds, but he doesn’t mind if the e-mail correspondence drifts away from dentistry and medicine, as it often does. “The main goal is to get kids thinking about continuing their education after high school We want to be role models, people that they can talk to about what college is like.”

“We’re not trying to force dentistry on them,” says Kov. “We’re trying to show them that there are role models who love science.”

Dentistry students not only established the program and currently run it, they have also helped finance it. Bussing costs for the face-to-face meetings are paid by Achieve! Minneapolis, a local nonprofit, but the American Student Dental Association’s local chapter and the School of Dentistry’s student council have chipped in dollars to cover the cost of food and other expenses. Procter & Gamble provided free toothbrushes.

Roosevelt students have been particularly excited by their visits to campus, says Olson. “They like the hands-on aspects,” she says. The high schoolers get to watch dental students fill cavities and make crowns. The University students, in turn, talk about their studies and work. Science, they point out, has real-life applications.

Dental students connect with high schoolers in a student-run program

Investing in the Future

The mentoring relationships have had a big impact on some students, Olson says. “Some of the at-risk students may only come to class if they know we’re e-mailing.” And even if they drop out of school or move away, they may still keep ties with their mentor. They appreciate the relationship.

Michael Madden, chair of the School of Dentistry’s multidimensional task force, says he hopes the program will spur high-school students, including Somali, African-American, Latino, and Asian kids, to consider careers in health care. “As a profession, we continue to draw from the same small pool of qualified candidates, and that pool isn’t very diverse,” he says. “Hopefully this program will result in strong ties between the high school and dental students, and as the kids begin to examine career opportunities, they’ll consider the health sciences—and perhaps even dentistry in particular.”

—Anh Kov

Dental students connect with high schoolers in a student-run program

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Kevin Smith teaches that humor has a place in health care.

As he zips through the syllabus for his Humor and Health class, instructor Kevin Smith holds up a plastic baggie containing a collection of torn and tattered papers.

“This is the only evidence—ever—of homework that was eaten by a dog,” he deadpans. “If the dog eats your homework, please present it this way.”

It was a fittingly funny introduction for the two dozen students, most of them in the health sciences.

Smith, a registered nurse and family nurse practitioner, has taught at the School of Nursing for nine years. He also happens to be a stand-up comedian who counts Bob Newhart, Bill Cosby, the Smothers Brothers, and George Carlin as early influences.

“I took a humor writing class at the Open U and one of our assignments was to perform stand-up comedy,” he recalls. From there it “was a natural progression in bringing humor and health together. I developed a presentation called the Art and Science of Humor. The audience was primarily health professionals.” For the past 12 years, Smith has taught the popular course through continuing education.

Two years ago, he approached the Center for Spirituality and Healing about offering Humor and Health as a one-credit elective for health professions students (and others) to learn how to use humor as a communications tool for relating to patients and co-workers. The second major course component is an examination of existing research on the therapeutic benefits of humor, laughter, and positive attitudes.

“It seemed to me that bringing this into an academic environment could expose health care professionals to something that is different and interesting,” Smith says. “It might help them with communication skills. It might help them with patient-relations skills. And also I think that the notion of attitude or sense of humor having an effect on our physiology is worth being explored.”

“Kevin was the perfect person to teach it,” says Mary Jo Kreitzer, director of the Center for Spirituality and Healing. “He has a wealth of experience to draw upon when teaching students how humor can effectively be used and understood.”

Smith even addresses gallows humor.

“Freud felt that gallows humor was a very effective way for dealing with very difficult situations,” says Smith who performs stand-up mainly at corporate events, such as annual meetings and conferences. “It’s the humor used in morgues, emergency rooms, and operating rooms that really does have a benefit.”

The class meets five times during the semester. Lectures include plenty of class discussion. Students have reading assignments, two writing assignments, and a final written exam.

Karyn Grenz, a graduate student in the family nurse practitioner program, is taking the class to learn how to use humor to enhance communications with adult patients. Currently, Grenz is working in a pediatric intensive care unit.

“A lot of my co-workers use sarcasm, which doesn’t always seem appropriate,” she says. “If used appropriately, humor can enhance communication,” says Kreitzer. “However, one needs to be very sensitive to humor that is offensive, divisive, or inappropriate.”

While the interpersonal benefits to humor seem self-evident, therapeutic benefits have not been proven, something Smith emphasizes to his students.

“There are many studies looking at the physiological response with humor and laughter, such as effects on serum cortisol levels, heart rate, and pain tolerance,” Smith says. “We look at it as a question. Do you feel that these studies hold weight?”

For Smith, the most important lesson for his students is to know that they don’t need to be funny to have a sense of humor.

“You don’t have to be a joke teller, you don’t have to be the life of the party, but you can still use humor in an effective way.”

—Mark Engebretson
Bridge Work

Building connections
—AND A FOUNDATION FOR THE FUTURE— AMONG HEALTH CARE PROFESSIONAL AND ADMINISTRATION STUDENTS.

Alison Page says that as a staff nurse she used to wonder: “Who are these people and why are they running my hospital?” Now that she’s vice president of patient safety for Fairview Health Services, Page has bridged the divide between those who deliver health care and those who administer it.

The need to build bridges in health care extends also to gaps in understanding among health professionals about others’ roles. That’s why University students—future doctors, nurses, pharmacists, and health care administrators—created an organization to build interprofessional knowledge and to lay the foundation for a better health care system. The group, the Clinician Administrator Relationship Improvement Organization, is called CLARION. A clarion is a medieval trumpeter and the word has come to mean “loud and clear”; certainly these students are trumpeting change.

“One of our purposes is to break down those silos” between and among administrators and health professionals, says Rachael Albertson, a health care administration student at the Carlson School of Management who serves on CLARION’s council. “We’re all here for a common purpose, to treat patients—whether you are working on the financials or performing treatments.”

Growing up with a surgeon father and a nurse mother, Alan Johnson learned early about the need for an overarching vision to span a variety of perspectives. Now a second-year medical student who also serves on the CLARION council, he says, “We need to look at health care as a delivery system—not as a visit to the doctor’s office.”

The student-run group was conceived a couple of years ago by Jon Rathbun, then a student in health care administration. Rathbun, now UnitedHealthcare’s director of operational performance measurement, says the idea arose because of debates with his closest lifelong friends, who are all clinicians, about the roots of problems in health care. “We all agree that a core factor is our inability to trust each others’ values and skills and to collaborate as professionals to change our system. We feel that the best opportunity to change that from the ground up is to help students learn these skills early in their professional training.”

Rathbun’s vision was buoyed by an Institute of Medicine report, Crossing the Quality Chasm, which included among its recommendations interprofessional education to reduce medical errors and improve patient safety. The organization came to life with the help of Jenny Meslow, head of the University’s Center for Health Interdisciplinary Programs, an extracurricular program. “CHIP really gives students the ability to have a great deal of autonomy in developing their ideas,” Meslow says. “They’re learning how to take a germ of an idea and make it real.”

Faculty members like Sandy Porthoff from the Carlson School’s health care management program have also contributed to the development of CLARION.

CLARION’s activities include fun like the Friday Night in the ER game as well as the serious annual case study competition in which interprofessional teams present solutions to cases to a team of working professionals as judges. Members of the group are learning leadership skills across the professions that will serve them well in their future careers, says Barbara Brandt, vice president for education in the Academic Health Center—lessons that currently are not taught in a classroom. She adds that the time outside of classes that students devote to the cases for the one-day competition, held April 17, gives them a valuable exercise in self-directed learning and teamwork. “CLARION is a model of where we need to be headed in our schools,” Brandt says.

The University of Minnesota is a great place to implement the CLARION program, says Johnson. “We have a virtually comprehensive health care education complex here.” The program seems to be unique in the country, says Meslow. And it may become a national model, adds Brandt. Students from the University of Wisconsin at Madison plan to come to Minnesota to observe this spring’s case study competition.

Serving as a case study judge again this spring is Page. She finds the students’ enthusiasm inspiring and their knowledge impressive. Most important, learning interprofessional teamwork is essential. “Being a good team starts with having an appreciation for the other people on the team and an understanding of what it is they bring to the table,” Page says. “CLARION is the beginning of establishing appreciative relationships. That’s really step one.”

“CLARION is really working to create what the health care systems want to see in the new people we hire.”

Alison Page
Team SPIRIT

Students and patients benefit from team-based care.

It’s Monday morning at the 44-bed Walker Methodist Transitional Care Unit in South Minneapolis, and members of an interprofessional University team are holding the team’s regular patient conference.

Seated knee-to-knee in a cubbyhole office, team leaders Karen Schurrer-Erickson, a nurse practitioner and adjunct faculty member at the School of Nursing, Terry McCarthy, a physician with the Medical School’s Department of Family Practice, and Tom Lackner, from the School of Pharmacy, take Margaret Patterson, a nurse practitioner student, and family practice resident Elizabeth Frost, through a review of new patients on the ward. For the next several weeks Frost and Patterson, along with a pharmacy resident who is at another site today, will rotate through the TCU, working side-by-side with the faculty.

As Patterson reads through the results of her visit with a 90 year-old patient recently admitted for neurological symptoms, the atmosphere in the room is informal and very collegial, with McCarthy, Lackner, and Schurrer-Erickson asking low-key but probing questions about the patient’s physical symptoms, diet and drug intake. Frost occasionally offers her own observations. As the pieces of the patient’s condition come together and the team reaches consensus about the next step in his treatment, it is clear that the educational value of this session is not just intellectual but behavioral as well, with the faculty modeling an almost ideal version of interprofessional teamwork. Since the TCU team’s inception in 2002, several dozen residents and fellows from family practice, nursing, and pharmacy have learned on-site at Walker, and soon the team hopes to offer opportunities to students in other health care disciplines.

“Essentially, geriatrics is a team discipline that requires more than just a physician’s set of skills,” says McCarthy. “That’s why the leadership role here is very flexible. Sometimes Karin will handle the psychosocial questions revolving around things like discharge and family issues, other times the pharmacy issues are overriding and Tom leads the way. Our approach enables students to be exposed to some core geriatric issues as well as to the benefits of working as a team.”

Today the University team handles a patient load of 20 to 25 patients per week and is self-supporting. Both figures are remarkable given that the team is one of only a half-dozen around the country, which is itself a reflection of the relative novelty of TCUs in the United States.

The need is great, as the population of elderly Americans continues to rise yet hospitals are under pressure from many sources to hold down costs and to shorten hospital stays. “Sicker and quicker” is the phrase professionals often use to describe the condition under which patients are now released. “I tell my residents that when I was in school, the kinds of patients we see here would have been in the hospital,” says McCarthy.

New kinds of care facilities also have been advocated by health professionals who recognize that patients who end up in the hospital for acute conditions—surgeries, heart problems, or broken bones—actually benefit by getting up and around as quickly as possible. This is especially true for elderly patients for whom lengthy hospital stays increase the risk of morbidity and general debilitation—and the end of independent living.

“We saw that the acuity of patients admitted to the unit was changing,” explains John Huhn, administrator of the Walker Methodist Health Center and one of the key players in bringing the University team to the TCU. “We knew we needed to do something different.”

From the beginning, Walker Methodist TCU had adopted an interdisciplinary “whole patient” approach to care, combining the on-site services of nurses, physical therapists, diabeticians, recreational therapists, chaplains, and others working as a team under the director of coordinated care. But until the arrival of the University team, the unit had to rely on the family practice doctors or internists of individual patients to provide physician coverage.

The agreement to bring in the University team, first on a provisional, now on a permanent basis, was “a visionary as well as an operational tactic,” declares Huhn.

“This not only improves the quality of care we can provide patients,” he says, “but I also believe it is where the health care industry needs to go, with better communication between all members of health care delivery teams.”

“I believe it is where the health care industry needs to go, with better communication between all members of health care delivery teams.”

—JOHN HUHN
Though researchers at the School of Public Health are still studying the program, early evidence strongly suggests that the Walker Methodist-University collaboration is yielding successful patient outcomes, as measured by lengths of stay at the TCU and the rate of readmission of TCU patients to the hospital. As Patterson observes, “A lot of the time when a patient’s condition worsens, we have a forewarning because our team is here on site, monitoring progress.”

The TCU team is equally beneficial to students. Not only are they gaining invaluable hands-on experience in geriatric care, they are also witnessing and participating in a successful real-life interdisciplinary, interprofessional team, a model for what very well may be the future of medical care for geriatric and perhaps even for all in-patient care.

“The modeling behavior is what students have been most impressed with,” says Lackner. “This unit offers both an opportunity to interact with other students from other professional disciplines but also to witness teamwork between members of the faculty. At the end of their rotations, I always challenge them: You have a model to participate in and learn from here and there is no reason you can’t take this experience and use it wherever you are even if it’s a totally dissimilar setting, like a retail pharmacy. Your time here should help you gain the confidence to take the initiative and talk to doctors and patients about their drug therapies.”

The interprofessional dimension of the TCU team is stressed at the first patient conference students attend the week they begin their rotation. At that time, McCarthy, Schurrer-Erickson, and Lackner each go over their individual roles, training, and background as faculty and how each fits into the team.

“For a Pharm.D. student who may have never have heard of a nurse practitioner, this can be very enlightening,” says McCarthy. “Certainly for the medical residents who may never have worked with one, it is. This is a chance for them to see how the roles complement each other, that it’s not a turf issue, not a situation where the doctor is dictating things to other team members.”

McCarthy stresses that this open-minded spirit is merely the application to a new setting of the approach she herself witnessed during her own medical education.

“When I was a resident back when Frank Cerra [now senior vice president for health sciences] ran the surgical intensive care unit, this was the model we used, making our rounds everyday with a pharmacist and a nurse.” The insight this experience gave her into the contributions other health care disciplines can make to patient care made, she says, “a lasting impression on me.

“It’s why I was so open to this concept decades later,” she explaines. “Sometimes even a limited exposure to a good idea is all it takes.”

Richard Broderick
Reclaiming the Brain

A pharmacy researcher seeks ways around some of the brain’s natural defenses.

William Elmquist is trying to outsmart the human brain.

It’s a formidable task inspired by an ambitious goal. Elmquist, professor in the College of Pharmacy, hopes to devise new strategies for delivering drugs—particularly those used for treating AIDS and various forms of cancer—to the brain.

“Normally, the term ‘bioavailability’ indicates getting a drug into the blood. What we want to do in my lab is take it to the next level and get the drug to its target site—in this case, primarily the central nervous system,” says Elmquist, who transferred his trailblazing research to the University of Minnesota from the University of Nebraska in August 2002. “In other words, we’re trying to improve targeted bioavailability to the brain.”

Trouble is, the brain is protected by a mighty microscopic shield known as the blood-brain barrier, manned by an army of proteins whose job is to expel invading toxins from the brain. This built-in “efflux” mechanism has generally thwarted efforts to deliver effective doses of many potentially life-saving drugs to the brain.

“We’re working against the natural tendency of the brain to keep toxic chemicals out for its own protection. That’s a difficult thing to do,” says Elmquist. “After millions and millions of years, the human body has developed a pretty good way of keeping toxins out.”

Ironically, the same defense mechanism that provides a nearly impenetrable barrier against drugs also serves as a protective cover for many deadly diseases, which regard the brain as a sanctuary.

Consider AIDS, for example. The virus is most commonly treated with Highly Active Anti-Retroviral Therapy (HAART), which was first implemented in the mid-1990s. It’s a “cocktail” typically containing three or four drugs prescribed to many HIV-positive patients before they develop symptoms of AIDS. Early on, doctors discovered that patients treated with HAART soon showed no measurable signs of the virus in their blood. But when those patients were taken off the drugs, the virus quickly reappeared.

Elmquist, who at the time was working on brain-delivery strategies at Nebraska, recalls hearing this discouraging finding while listening to National Public Radio. “I thought to myself, ‘The virus hasn’t left the body. It’s found a sanctuary site,’” he says. He theorized that certain proteins in the blood-brain barrier were preventing adequate levels of protease inhibitors—one of the drugs in HAART that are largely responsible for reducing the viral load—from being distributed to the brain.

“We started to investigate and it turned out that’s what was happening. The efflux proteins were limiting the delivery of protease inhibitors to the brain,” says Elmquist. The body’s white blood cells, he adds, also provide sanctuary for the AIDS virus.

Since then, Elmquist and his Nebraska collaborators Alexander Kabanov, Donald Miller, and Yuri Persidsky, have been exploring ways to prevent these efflux proteins from performing their designated tasks. One intriguing weapon: a polymer used by New Jersey-based BASF Corporation for a variety of industrial applications. In both animal and in vitro experiments, the polymer has exhibited encouraging efflux-inhibition ability, as well as some unexpected antiviral behavior. “We don’t yet know why…” says Elmquist.

“But it’s pretty exciting.”

Ultimately, Elmquist and his collaborators hope to employ the polymer as a drug-formulation additive that improves the targeted brain delivery of multiple drugs in HAART. “A single-drug treatment in that sanctuary can be a very bad thing,” he says, because AIDS and cancer are adept at developing drug resistance. “If a little bit of one drug trickles in, then that little bit of drug may be worse than no drug at all. The virus would then be more likely to develop resistance to that particular drug.”

If Elmquist and company are successful, however, the AIDS virus—as well as many other deadly diseases—will have one less human-body hideout from drug treatment. “We want to eliminate that sanctuary,” he says.

Andrew Bacskai
Herd Mentality

The University of Minnesota takes the lead in fighting devastating diseases of cattle and swine.

Johne’s disease and Porcine Reproductive and Respiratory Syndrome virus (PRRS) menace the livelihood of swine producers and dairy farmers. The most devastating diseases for cattle and pigs respectively in the United States, they cause a combined annual economic loss estimated at nearly one billion dollars.

Fighting these menaces are University of Minnesota scientists, who long have been nationally recognized for their expertise in these diseases. Much of the genomic and immunology work on the PRRS virus was done previously at the College of Veterinary Medicine. And Vivek Kapur, professor of microbiology, and co-director of the Biomedical Genomics Center, led the team that identified the genetic sequence of Johne’s disease in 2002.

Now, with the help of nearly $9 million in recently awarded federal grants, University scientists will combine their efforts with others to continue to analyze these diseases and to work to eliminate them.

The largest ever animal research grants from the U.S. Department of Agriculture’s Cooperative State Research, Education and Extension Service will make the University of Minnesota a national research center for Johne’s and PRRS.

Johne’s disease is a chronic wasting disease that causes severe, chronic gastrointestinal inflammation in cattle and other ruminants, such as deer, sheep, and goats. Johne’s disease is difficult to detect, virtually impossible to treat, and can spread rapidly within a dairy herd.

In the new Johne’s study that builds on his previous work, Kapur will focus on how Johne’s disease is transmitted throughout the herd, how it progresses, and how to better track it. The scientists aim to develop a vaccine or other methods of boosting herd immunity.

Approximately 40 percent of all dairy farms in the United States are infected with the bacterium that causes Johne’s disease.
About the only drawback John Schreiber sees in coming to the University of Minnesota is the state’s reputation for modesty. “The University of Minnesota has a lot of strengths, but you don’t want to talk about them. It’s very Minnesotan,” says Schreiber, who was recently named head of the Medical School’s Department of Pediatrics. “You need to toot your own horn a bit more.”

Schreiber plans to build on existing strengths and help spread the word when he officially takes the reins Aug. 1. He comes from Case Western Reserve School of Medicine, where he was professor and chief of Infectious Disease/Allergy/Immunology/Rheumatology at Rainbow Babies and Children’s Hospital.

“I am very impressed with the quality of the faculty and the leadership of the medical center,” he says. “There is a clear vision that the Department of Pediatrics will become a national leader. And I found that a very exciting vision.”

“Doctor Schreiber is a scientist of national stature in pediatric infectious disease who will bring with him several grants, and will be submitting a Program Project grant with the Division of Neoratology,” says Deborah Powell, dean of the Medical School. “He—and the number of new individuals who will be recruited in the next few years to expand our talented pediatrics faculty—will make our pediatrics program, including its research component, even stronger.”

Schreiber’s interest in pediatrics infectious disease was sparked at Tulane University when he was a master’s student in public health and tropical medicine.

“It became clear to me that, in the developing world at least, the majority of deaths in children, and adults, are caused by infectious diseases,” he says. “As a doctor and scientist, you could have the biggest impact through prevention of serious infections in children.”

Schreiber completed his M.D. at Tulane University School of Medicine and performed his internship, residency, and fellowship at Boston’s Children’s Hospital, and a research fellowship at the hospital and Harvard Medical School. He joined the faculty at Case Western Reserve in 1988, following time at Massachutett General Hospital and Albany Medical College.

His research focuses on two areas. One is to improve vaccines for such diseases as bacterial meningitis to make them more affordable and practical for immunizing children in developing countries.

“These vaccines are very expensive, and you have to give four doses to get protection,” he says. “We’re investigating the basic immunology of these diseases to learn how you can reduce the number of doses and still protect children.”

Schreiber is also investigating why it so common for premature infants in the United States to develop serious infections. “We’re trying to understand what’s wrong with their immune system so we can correct it.”

His shared vision with Dean Powell is to achieve national recognition in the department’s education, research, and patient care programs. He’ll start with reinvigorating the department’s research program. Next is patient care.

“The department needs new clinical facilities,” Schreiber says. “Minneapolis is a world class city and there needs to be a world class facility to take care of children.”

— John Schreiber

Mark Engebretson