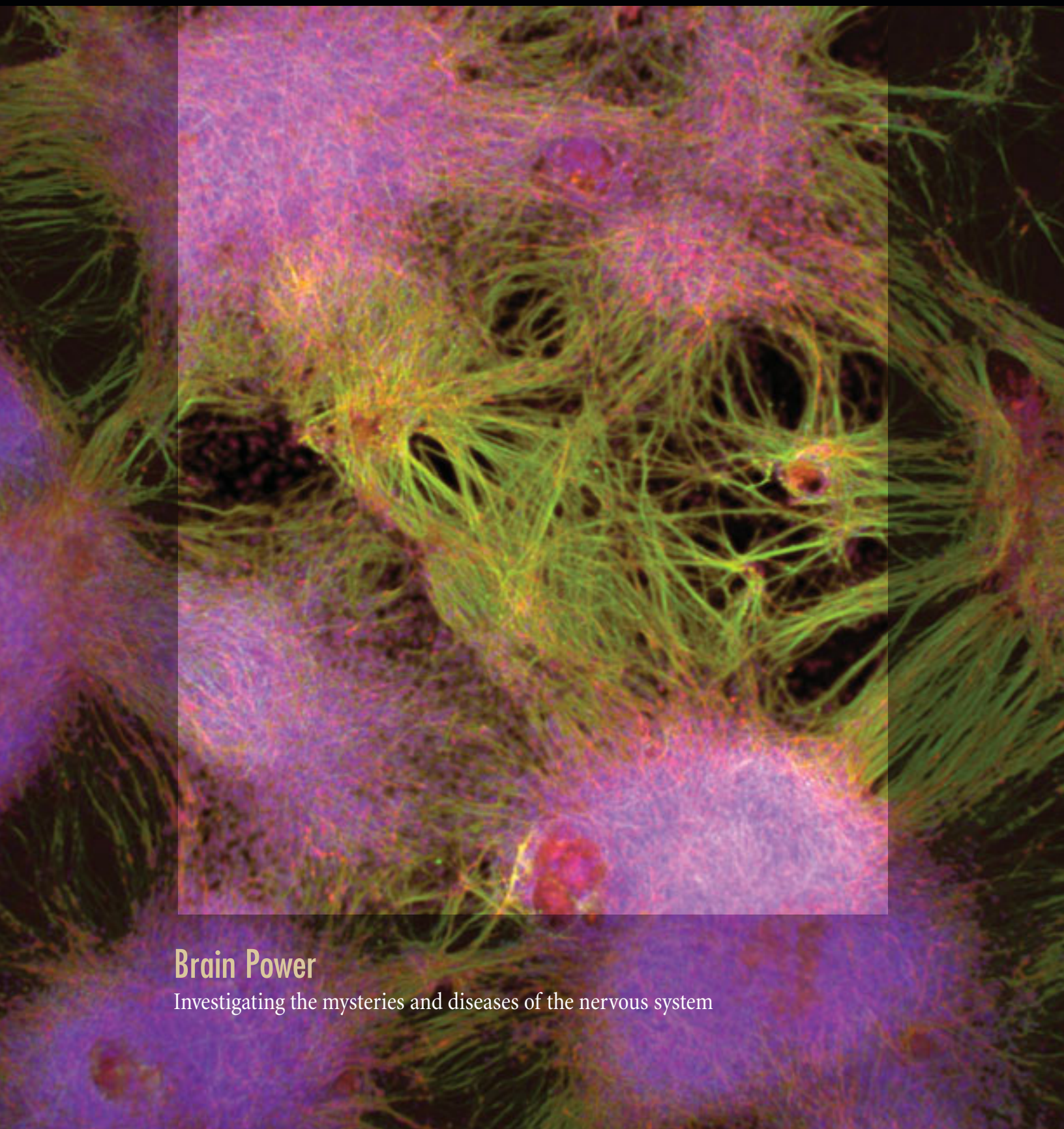
ROCHESTER MEDICINE

UNIVERSITY OF ROCHESTER MEDICAL CENTER • SCHOOL OF MEDICINE AND DENTISTRY SPRING/SUMMER 2007



Brain Power

Investigating the mysteries and diseases of the nervous system

On the cover Human dopaminergic neurons generated from human embryonic stem cells. Photo by Neeta Roy, courtesy of Goldman Lab and *Nature Medicine.*

Keeping hearts healthy and getting damaged hearts well again occupies a lot of my time. That's one reason I am very pleased with the early success of iCardiac Technologies, Inc., one of the newly established companies based on technology developed at the University of Rochester Medical Center (URMC).

The importance of technology for future growth of URMC's reputation and revenues will become clear in the several examples I discuss below.

iCardiac grew out of research at the Medical Center's Heart Research Follow-up Program, a national and international leader in the science of heart arrhythmias. Software developed by biomedical engineer Jean-Philippe Couderc, Ph.D., provides a more accurate and reliable method to analyze data from electrocardiograms and other types of heart monitors to determine whether a drug is toxic to the heart. This helps a pharmaceutical company decide on the fate of drugs in development and also builds confidence in the safety of drugs. Earlier this year, iCardiac entered into a multi-year research alliance with Pfizer Inc. to develop and validate advanced ECG-based cardiac safety biomarkers utilizing iCardiac's technology known as COMPAS. Pfizer also became an equity investor in iCardiac.

This is good news for the safety of drugs and protection from heart arrhythmias. But this also is welcome news for economic development. The company has 20 full-time and contract employees and expects to add more. Just as significantly, iCardiac enhances URMC's and Rochester's reputation for advanced analytics in the biopharmaceutical industry. VirtualScopics Inc., another successful company founded on technology developed at the Medical Center, helped establish that reputation.

Much of the world by now has heard about the vaccine against human papillomaviruses (HPV). This is more good news. HPV causes most cases of cervical cancer and a vaccine will save thousands of lives. Work by a trio of Medical Center virologists — Robert Rose, Ph.D., William Bonnez, M.D., and Richard Reichman, M.D.—was key to the development of the vaccine. About two years ago, the University, Merck and Co., GlaxoSmithKline, and several other parties agreed on a settlement involving patents and royalties related to a vaccine.

The University will receive royalties from the HPV vaccines. The University owns a stake in iCardiac. As state and federal budgets get even tighter, investments in successful companies become more important for the Medical Center and for the Rochester area. In fiscal year 2006, Medical Center revenues from licenses rose to an all-time high of $37.7 million, a 34 percent increase over the previous year. In the same time period, 10 new patents were awarded and 101 invention disclosures were filed. We expect growth will continue in both of these areas.

Biomedical research can provide increased financial resources for the Medical Center and opportunities for economic development in the Rochester area. We have superb physicians, scientists and technicians at URMC that can make this happen. The Medical Center will increase investment in the Office of Technology Transfer for two reasons. First, this will enable us to develop existing technologies more rapidly and efficiently. Second, when appropriate, start-up companies will be facilitated in Rochester. Development of technologies for software, drugs and devices is now as key component of the URMC mission.

Bradford C. Berk, M.D., Ph.D.
(M'81, PhD'81)
CEO, University of Rochester Medical Center;
Senior Vice President for Health Sciences

Neurological disease creates a terrible burden and that burden seems to grow each year.

Diseases of the brain and central nervous system, including neurodegenerative conditions, affect one in five Americans with an estimated $400 billion in direct costs and lost productivity. Alzheimer's disease alone costs about $100 billion a year for treatment and care in the United States. As the population ages, the human toll and cost will accelerate. By mid-century, for example, Alzheimer's could become the number one cause of death in the United States, eclipsing cardiovascular disease and cancer.

Addressing this growing health burden is a tremendous challenge. At the School of Medicine and Dentistry (SMD) we have an abundance of nationally recognized talent in neuromedicine and neuroscience. The Department of Neurology and the Department of Neurosurgery are ranked in the top ten in National Institutes of Health funding. Berislav Zlokovic, M.D., Ph.D., professor of neurosurgery and neurology, received a very prestigious honor earlier this year in Washington — the MetLife Foundation Award for Medical Research in Alzheimer's Disease. Steven Goldman, M.D., Ph.D., professor of neurology, and Maiken Nedergaard, M.D., Ph.D., professor of neurosurgery, routinely publish their breakthrough findings in the prestigious journal *Nature Medicine*, landing a half-dozen cover articles between them in the past several years. Our Clinical Trials Coordination Center, directed by Karl Kieburtz, M.D., M.P.H., is recognized as a leader around the world.

This issue of *Rochester Medicine* examines neuromedicine and neuroscience. Important research in this field goes on in many corners of the University, such as the Center for Aging and Developmental Biology at SMD and the Department of Brain and Cognitive Sciences on the River Campus. The feature articles in this issue are just a sample of the work in three SMD departments: neurology, neurosurgery and neurobiology and anatomy. Since Robert C. Griggs, M.D., assumed the chair of the Department of Neurology in 1986, the department has expanded from 22 full-time faculty members to more than 90. The department's reputation under Berch Griggs has grown as well. One reason is the Neuromuscular Disease Center, which is directed by Richard Moxley III, M.D., professor of neurology. The center is well known for faculty who are dedicated to patient care and research, such as Charles Thornton, M.D., who is closing in on a treatment that could reverse myotonic dystrophy.

The integration of research and clinical treatments, faithfully practiced in the Department of Neurology, is a Rochester hallmark. Webster Pilcher, M.D., Ph.D., chair of the Department of Neurosurgery, has recruited a quartet of neurosurgeons who also are dedicated to patient-oriented research. SMD's neuroscience resources — and the opportunity to work with Professors Goldman, Nedergaard or Zlokovic — drew these surgeons to Rochester.

Neuroscience is very much about our ability to get around and communicate in the world or, as Gary D. Paige, M.D., Ph.D., chair of the Department of Neurobiology and Anatomy, says, our survival in the world. Scientists in this department investigate the ways we recognize faces and voices and maintain our balance and move and how the brain can restructure itself. It's easy to see the application of this research to autism, Alzheimer's and other conditions.

We have much to rely on as we meet the challenge to investigate and develop therapies for neurological diseases — and much to be proud of, as this issue of *Rochester Medicine* will attest.

David S. Guzick, M.D., Ph.D.
Dean of the School of Medicine and Dentistry

ROCHESTER MEDICINE

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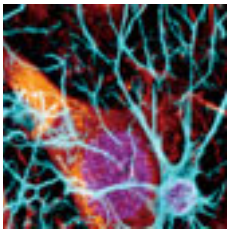

DEPARTMENTS

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Director of Public Relations and Communications	Teri D'Agostino
Editor	Michael Wentzel
Contributing Writers	Lori Barrette, Karin Christensen, Heather Hare, Mark Michaud, Leslie Orr, Germaine Reinhardt, Tom Rickey, Leslie White and Greg Williams
Art Director	Mitchell Christensen
Photographers	Spiros Kapatos, Vince Sullivan and Will Yurman
Alumni Council Liaison	Leslie Chambers

For questions or comments, contact:
Department of Alumni Relations and Academic Development
300 East River Road, Rochester, NY 14627
800–333–4428 | 585–273–5954 | Fax 585–461–2081
Comments on this issue, e-mail: *Michael_Wentzel@urmc.rochester.edu*

Untangling the mystery

By Michael Wentzel

For four decades, Rochester neurologists have advanced the care of people with muscular dystrophy while searching for the cause and a cure.

Muscle stiffness is a hallmark of myotonic dystrophy. In this photo of mouse muscle cells with myotonic dystrophy, many chloride ion channels are missing. The loss of the chloride channels causes the stiffness. Rochester's Charles Thornton, M.D., and his collaborators discovered the chloride channel connection.
Photo courtesy of the Thornton Lab

For many years,

Carol Harrier proudly

worked the farm

she and her husband,

Don, owned near

Seneca Falls.

She did her share of digging and carrying.

She sometimes drove a tractor to prepare

the land for soybeans and wheat.

She routinely loaded bags of seed corn

on the flatbed of a pickup truck to take

into the fields —

—until one day

she could no longer

lift the bags.

“It seemed to happen just like that. I could lift the bags and then one day I couldn’t,” she said. “I couldn’t even unzip the bags.”

That day occurred in 1992, the year Harrier, now 62, was diagnosed with myotonic dystrophy.

Harrier was referred to the University of Rochester Medical Center and to Richard Moxley III, M.D., a professor of neurology at the School of Medicine and Dentistry and director of its Neuromuscular Disease Center. He diagnosed her myotonic dystrophy, an inherited disorder, even though Harrier could find no one in her family with the condition.

Through Moxley, Harrier found a perfect place to help her deal with her disorder, the School of Medicine’s Department of Neurology, which has a long tradition of excellence in treatment and research. Department physicians and staff members have cared for patients with different forms of muscular dystrophy for more than 40 years, working closely with patients’ families and care providers in the community. The department’s commitment to research not only has produced fundamental discoveries in muscular dystrophy but also has provided Harrier and other patients access to clinical trials and new treatments.

“Our infrastructure gives us our particular strength,” Moxley said. “No other department of neurology has the components we have. We are, to a large degree, unique in this regard,”

That sturdy infrastructure has many components. The Neuromuscular Disease Center (NDC) maintains the National Registry of Myotonic Dystrophy and Facioscapulohumeral Muscular Dystrophy, which helps connect patients with researchers. It also oversees a Paul D. Wellstone Muscular Dystrophy Cooperative Research Center, which supports collaborations between scientists around the country. In addition, the NDC leads the Muscle Study Group, a consortium of investigators that promotes and conducts clinical trials in neuromuscular disorders. The Clinical Trials Coordination Center, a unit of the department, develops and manages extensive controlled trials with researchers around the world. Department chairman Robert Griggs, M.D., heads a group that investigates rare conditions, such as non-dystrophic myotonias and episodic ataxias, called neurologic channelopathies. Rochester’s new Clinical and Translational Science Institute, one of 12 in the country funded by the National Institutes of Health, will add significantly to the available resources.

“We are eager to do whatever is possible to advance our research findings from the lab into actual current management at the bedside,” Moxley said. “Patients yearn for that.”

Richard Moxley III, M.D., examines Carol Harrier.

Going on her merry way

Since 1992, Harrier’s condition has worsened. She and her husband sold their farm. Her hands have weakened, she said, and she falls more often than in the past. She relies on the strong bond she formed with Moxley, whom she refers to as “a great man” for helping her deal with many of her symptoms. He gives her encouragement and she takes part in clinical trials.

“I’ve participated in a lot of trials,” Harrier said. “Some of the trials have not worked for me, but what doesn’t help me might help someone else or help others in the future. That’s what’s important.”

Moxley recently led a study with 40 patients of a drug known as mexile-

(right) Robert C. Griggs, M.D.

(far right) Christine Quinn, health project coordinator, and Richard Moxley III, M.D., go over details from a clinical trial.

tine, which is often used to treat heart arrhythmia. The drug ameliorated myotonia in many patients, and they did not experience any untoward side effects. Moxley plans another study to investigate mexiletine's effect on gait stability and muscle mass and its ability to reduce pain. Harrier found, however, that mexiletine did little for her, especially failing to tame pain that often lasted throughout the day and, for many months, became so severe she could only sleep in a reclining chair.

Last year, Harrier took part in another trial as Moxley tested a unique insulin-related compound. More than 20 years ago, he discovered whole-body and forearm-muscle insulin resistance in myotonic dystrophy patients. That observation triggered a longtime interest in the insulin connection in dystrophy.

A decade ago, a trial at a New York City hospital of a hormone called insulin-like growth factor-1, or IGF-1, showed some benefits in myotonic dystrophy patients, but the hormone also produced significant side effects. Moxley now has begun an investigation of Iplex, a recombinant protein complex of IGF-1 and insulin-like growth factor binding protein-3 developed by Insmed Inc., a biopharmaceutical company in Virginia.

"In myotonic dystrophy, there is a loss of leadership in the cell that slows the building process and causes it to veer off the typical blueprint and manufacture inappropriate proteins in various sites," Moxley said. "It really fouls up the cell and the insulin receptor is one thing that is affected."

Moxley put Iplex through a small safety and feasibility study with 15 participants, including Harrier.

"I don't want to go overboard because this was a small study, but this growth factor may be a very effective intermediate therapy to keep patients where they need to be," Moxley said. "The fact is patients are tolerating the daily injections. Each one has reported feeling more energized. It could be a placebo effect but it would be a prolonged one. This has been a six-month treatment. The patients have reported improved mental and gastrointestinal function. There have been no side effects. More definitive studies are needed but there's no reason to hold back."

For Harrier, like most of the Iplex trial participants, long-existing pain vanished.

"They had tried everything they could to get rid of the pain, but nothing really worked before," Harrier said. "I'm not someone who is going to spend the day in bed. I keep active. I don't give up. I didn't give up from day one. Dr. Moxley told me I was a good patient with a good attitude. I didn't complain about the pain, but it was a big deal getting rid of it. I don't know why it went away. But it did, and I went on my merry way."

Closing in on a cure

In the same year that Carol Harrier was diagnosed with myotonic dystrophy, scientists discovered the cause of the disorder — a mutation of the DPMK gene on chromosome 19. But in 1992, no one had figured out how the mutated gene caused trouble. More than a decade passed before a research team led by Charles Thornton, M.D., professor of neurology, discovered the culprit — what Thornton calls a toxic messenger RNA.

Normal messenger RNA transmits genetic information out of the nucleus and into the main part of the cell, where the instructions from the molecular blueprint get carried out. In myotonic dystrophy, the faulty messenger RNA accumulate in the nuclei of cells and draw in proteins that then can't do the required jobs. Because proteins are deficient, other RNAs are not spliced together properly and do not function correctly. Thornton believes that at least 40 RNAs — and perhaps as many as 150 RNAs — are affected and do not function as they should.

"We have isolated this RNA. We can see it under the microscope," Thornton said. "We can literally see the collections of expanded repeat RNA. We can see what proteins have glommed on to them. We can see which ones had been sucked into the tangles so strongly they were depleted in other parts of the cells. Those are the ones we now think are stuck in the wrong locations. And the symptoms can be improved by prying them loose."

In 2000, Thornton's team developed the first transgenic mouse model of myotonic dystrophy that, along with the participation of dystrophy patients through the registry or the Wellstone center, has enhanced research significantly.

"The ability to carry out parallel lines of research using the transgenic mouse models and people with myotonic dystrophy has been extremely powerful," Thornton said. "Now we are using the mouse models as the main way of testing treatment effects. This means we can see changes in the transgenic mouse models and instantly look at tissue samples from people who have the disease to see if the same changes take place there. The process also has gone in the other direction. There have been changes we have first observed in people with the disease and then have checked to see how that happens by doing experiments in transgenic mice. Following these parallel threads — clinical research, laboratory research — has allowed us to make discoveries. I did not see this coming. It had not occurred to me there would be this very synergistic interaction of doing research in parallel in animal models and patients."

The research team has developed a molecule that pries loose the tangled proteins in mice. When that occurs, the disease goes in reverse, even after its symptoms are fully developed.

"Clear targets for drug treatment have been identified. I believe this will be a disease that will be unusually treatable. I think it will be reversible and preventable," Thornton said. "Having a treatment is still years away. People would most like to hear that a cure is just around the corner. But knowing that there is steady progress and that after a period of years of deep puzzlement that there has been a break in the logjam is exciting."

A natural history of muscular dystrophy

In the same way a naturalist gets to know a familiar forest from seeds to fruit, Rochester physicians and researchers explore myotonic dystrophy and facioscapulohumeral muscular dystrophy (FSHD), the two most common forms of adult muscular dystrophy, and Duchenne muscular dystrophy, the most common childhood form.

Rabi Tawil, M.D., professor of neurology (R'91, FLW'93), for example, is conducting genetic studies on FSHD as well as investigating development of the blood supply in muscle tissue and in the eyes of people with FSHD. Efforts by Tawil could make Rochester's Neuromuscular Disease Center the international center for clinical care and research for FSHD.

"We would partner with others but we want to make Rochester the largest national and international repository of clinical information on disease manifestations of FSHD," Moxley said.

Griggs, Moxley and other Rochester researchers also have been leaders in establishing the efficacy of prednisone as a treatment for Duchenne. The Neuromuscular Disease Center is taking part in a study sponsored by the Centers

(Left, facing) Charles Thornton, M.D.

(below) Kirti Bhati, a technical associate in the Thornton Lab, readies a sample for testing.

for Disease Control on the prevalence and patterns of care for Duchenne and another disease, Becker muscular dystrophy. The study will involve most dystrophy clinics in western New York. The New York data will be compared with data from clinics in Iowa, Colorado, Arizona and Georgia.

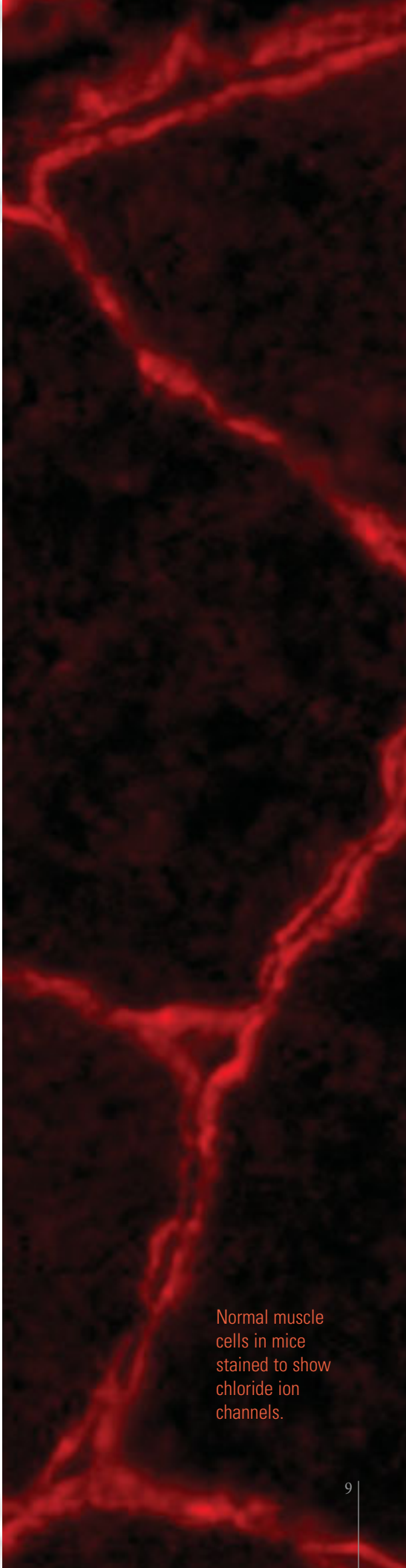
"We have a deep past history with prednisone. We can bring that together with the new data and ongoing research to develop a new portrait of Duchenne," Moxley said.

People with muscular dystrophy from across the country come to see Moxley and other physicians in the Neuromuscular Disease Center. The patients often ask Moxley to talk to their local physicians about their condition. Moxley now is looking into using the Internet to distribute the knowledge and deep natural history on muscular dystrophy that Rochester has gathered.

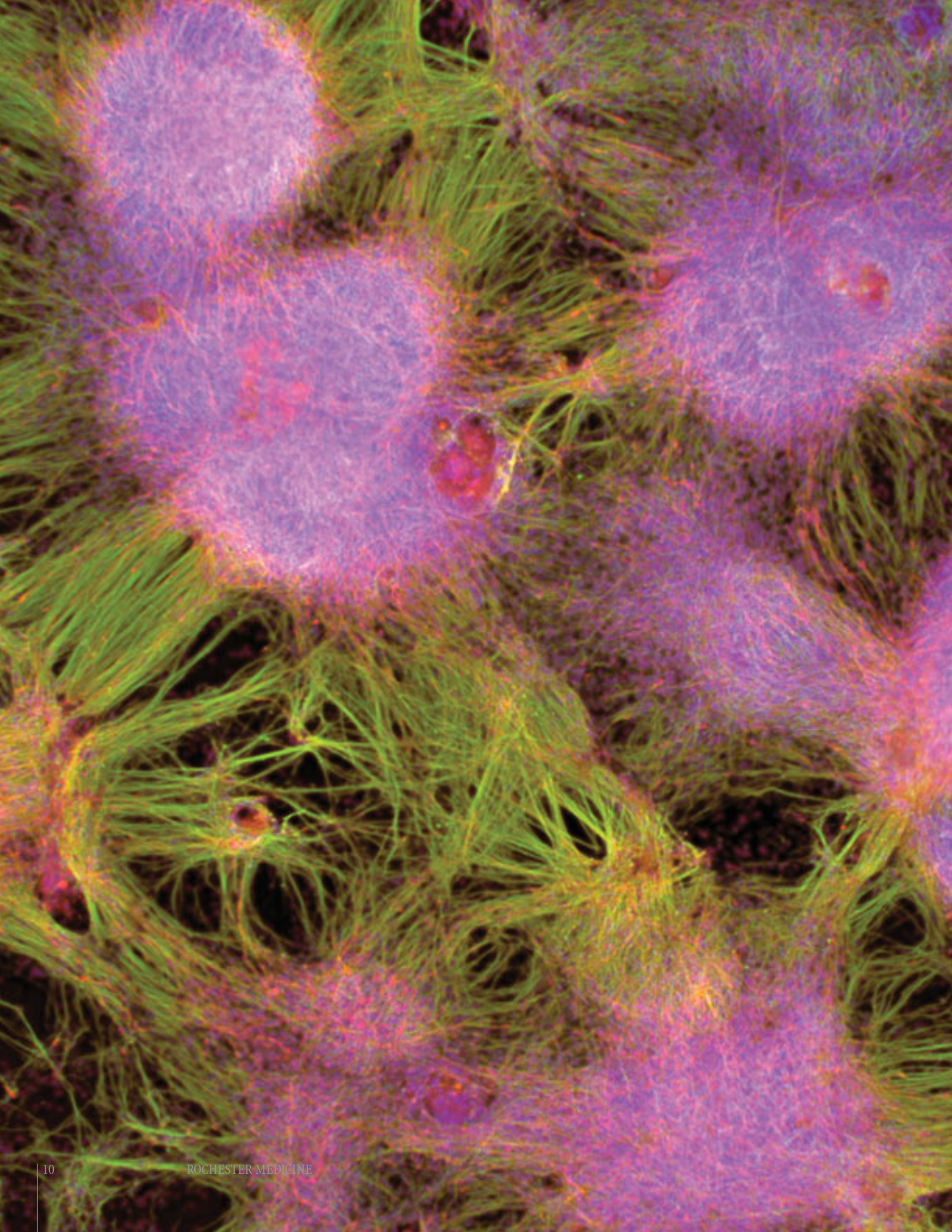
"We're focusing on getting what we know from the bench to the bedside, from the bench to the community," Moxley said. "We want to take what we know about care and ways to improve the standards of care and tell as many people as we can what we have learned."

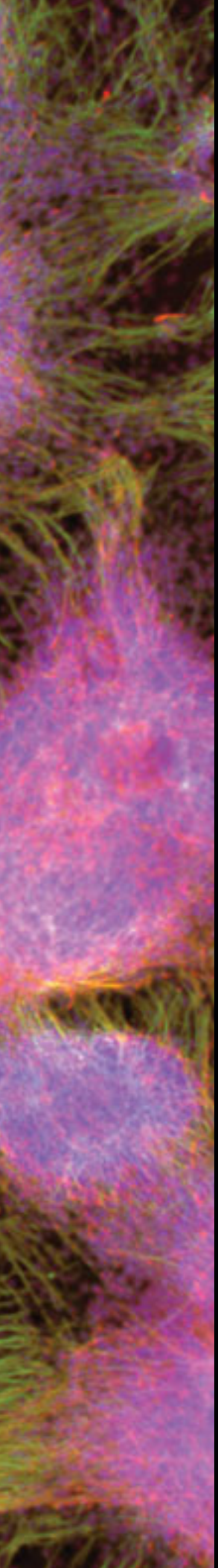
Meanwhile, Carol Harrier stays active. She keeps her fingers as nimble as possible working on craft projects. She goes out. She visits with friends. She keeps going while she waits for research to untangle her condition.

"I'm not giving in," Harrier said.



Normal muscle cells in mice stained to show chloride ion channels.





OF TWO MINDS

GOLDMAN NEDERGAARD

GOLDMAN NEDERGAARD

By Tom Rickey

Steve Goldman and Maiken Nedergaard are raising a family together but independently they are redefining the roles of brain cells and devising new ways to treat disease.

Three years ago, Maiken Nedergaard, M.D., Ph.D., was able to make paralyzed rats walk. Only a handful of people worldwide have accomplished anything so stunning with an injury so severe.

While the reaction of patients and scientists around the world has been astonishment, the reception at home — in her household — has been much more muted. Her husband, Steve Goldman, M.D., Ph.D., might be forgiven if he has a "been there, done that" attitude.

Nedergaard and Goldman lead labs at the University of Rochester Medical Center. But indeed, Goldman has been there and done that, accomplishing the same feat independently.

Besides their marriage, five children, and a life together, the two share a love of science and a determination to affect the health of millions of people around the globe through medical discovery. Both are turning heads as they explore the potential of separate groups of cells in the human brain for the treatment of a broad array of diseases.

Goldman's realm is stem cells, a phrase that serves as a red flag for many. Nedergaard, on the other hand, has made a name for herself in the realm of astrocytes, a research area once perceived — until she entered it — as a backwater with little relevance to human health. Nedergaard and Goldman are discovering that the relationship between "her" and "his" cells is increasingly complex, with cells networking together and relying upon each other in ways not thought possible as recently as five years ago.


Maiken Nedergaard, M.D., Ph.D.

The research projects led by the husband-and-wife duo offer promise against a Who's Who of neurological diseases: Alzheimer's disease, cerebral palsy, epilepsy, spinal cord injury, multiple sclerosis, pediatric leukodystrophies, Parkinson's disease, brain tumors, Huntington's disease, stroke and migraines. Name a condition above the neck, and it's likely that neural stem cells or astrocytes are, or soon will be, implicated as a cause or cited as key to a new treatment.

Mice are often a necessary stopping point for researchers ultimately seeking new treatments for people, and Nedergaard and Goldman have contributed their fair share of advances in treating diseases in animal models. Mice with damaged spinal cords walk and run again. Mice debilitated by Parkinson's disease are cured of symptoms and run freely. Mice normally felled in their youth by a fatal disease of myelin live a normal lifespan. Those and other projects continue to thrive on the long road to human application.

The promising work is recognized in a number of ways. Since uprooting their labs in New York City and moving to Rochester with more than 25 of their lab personnel nearly four years ago, they've brought in more than $25 million in funding to Rochester, and their combined staffs of about 50 people are pursuing a dozen separate research projects. Between them, Nedergaard and Goldman have landed a half-dozen articles on the cover of the prestigious journal *Nature Medicine* in the past several years and published more than 250 papers, many the product of their 20-year collaboration.

The move to Rochester was a monumental decision for two world-renowned researchers used to the opportunity a city like New York affords. With five children now between ages 7 and 16, the couple found "the city" increasingly hostile to what might be termed a normal lifestyle. Goldman worked in Manhattan, Nedergaard worked north of the city, and their children were in scattered schools across the metropolitan area.

"I was getting used to things that no one should ever become accustomed to, like spending four hours a day in the car every day," said Goldman. "Between research and clinical duties, sometimes I wasn't seeing my children for days at a time. They were in bed when I left in the morning and in bed when I returned home. The logistics of living were just impossible. We got fed up with the compromises involved."

So the couple began looking for opportunity beyond New York, where Goldman was firmly ensconced as a senior neurologist and professor with an endowed chair at Cornell's Weill Medical College, and Nedergaard had established a thriving laboratory at New York Medical College. Including his time as a student at Cornell, Goldman had spent nearly 25 years as part of the institution, and was even recognized as one of the top patent holders.

The couple was invited by Howard Federoff, M.D., Ph.D., a neuroscientist and, at the time, the senior associate dean of

research, to consider Rochester.

"I'd never been to Rochester, and I thought Howard was kidding," said Goldman. "But on our first visit, we met a bunch of expatriate New Yorkers, and we were really charmed. The quality of schools is superb, the neighborhoods are nice, and everything's quick and convenient. It's great for raising a large family."

With some added persuasion by top University executives and Webster Pilcher, M.D., Ph.D., (M'83, R'89) chair of neurosurgery, the pair moved to Rochester.

"You could build a whole center around each one of these outstanding scientists," said Pilcher. "Each is attracting so many great young scientists that the challenge becomes where to put all these talented people who want to pursue their own careers. They are true colleagues — competitive, yet highly supportive. They maintain their independent status. They are driven to do good science, and they collaborate very well."

Creating hope where none exists

The two met at Cornell in 1987, where Nedergaard was a research fellow and Goldman was chief resident in neurology. It was a few years earlier, as a graduate student at Rockefeller University in the early 1980s, that Goldman began studying the brain's stem cells — though few people used that term then. He was looking at the creation of new brain cells in adult birds.

Steven Goldman, M.D., Ph.D.

"To be good with the ladies, the male canary learns new songs," said Goldman, "and every time it does so, it creates new neurons." His doctoral thesis in 1983 was the first report of neurogenesis — the production of new brain cells — in the adult brain, and opened the door to the idea of neural stem cells as the source.

Goldman quickly became one of the world's leading researchers on stem and progenitor cells, exploring the basic biology of the cells as well as their use treating people for a variety of neurological diseases. Stem cells along with progenitor cells, which can't renew themselves indefinitely as stem cells can, produce all the brain's cells, including neurons, astrocytes, and oligodendrocytes.

Goldman hopes diseases involving oligodendrocytes in children — rare but fatal childhood demyelinating diseases called pediatric leukodystrophies — will become the focus of the first successful stem cell therapy in people.

Myelin is a type of natural insulation made of fat that wraps around nerve cells and allows them to fire crisply. When the myelin breaks down, the electrical signals that underlie all brain activity become sluggish, and a variety of symptoms result. In diseases such as Tay-Sachs, Krabbe and Pelizaeus-Merzabacher, young children begin losing myelin, setting off a childhood and young adulthood that can include seizures, premature dementia and death.

Three years ago, Goldman's group was the first to report the restoration of myelin in a widespread area of an animal's brain, restoring proper nerve function in virtually the entire brain of a mouse. Basically, the team re-wired the brain of a congenitally demyelinated mouse, by injecting into the mice highly purified progenitor cells, which ultimately evolved into oligodendrocytes, the cells that produce myelin.

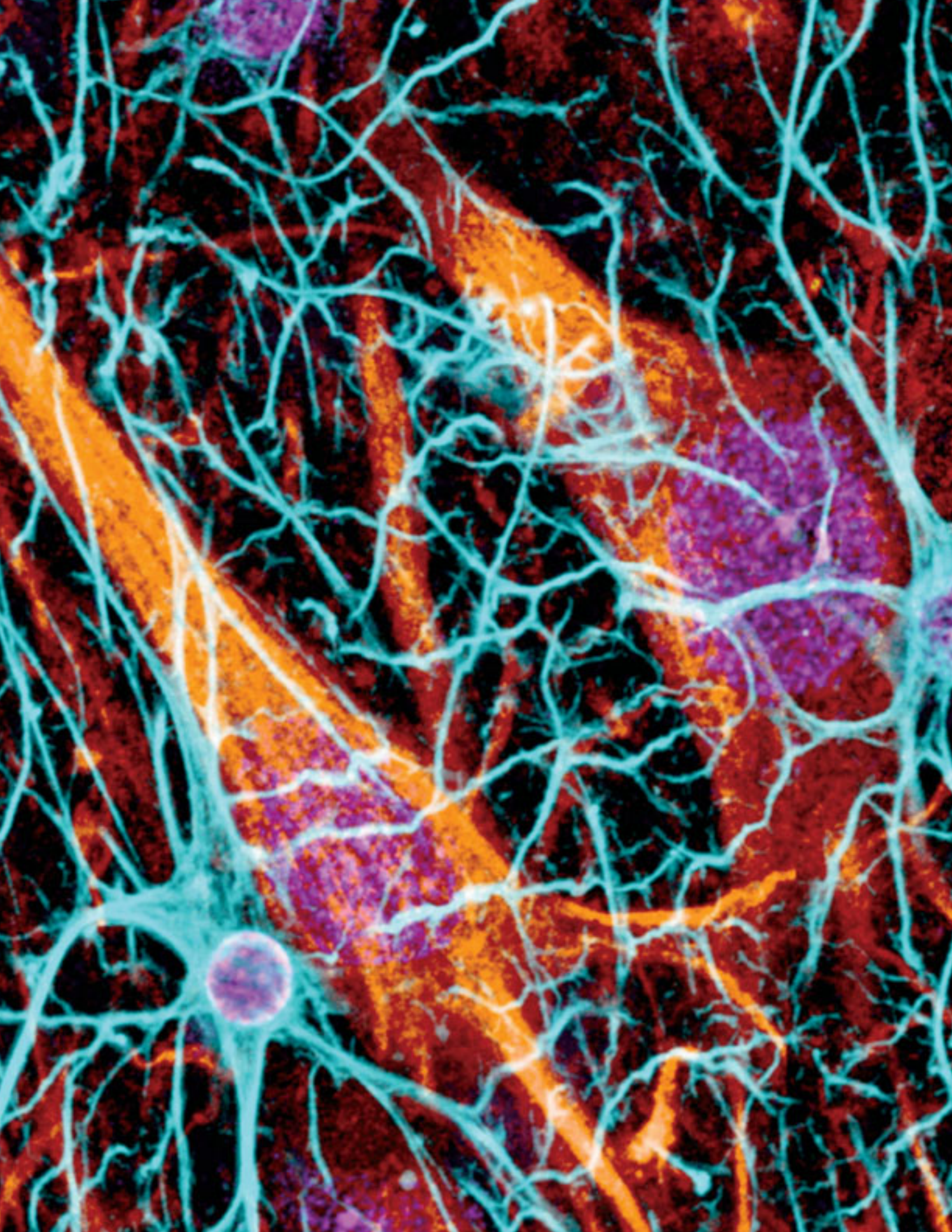
Since then, the team has seen even more dramatic results while working with a special strain of mice that is born without myelin and generally dies after about four months. By using stem cells to replenish the oligodendrocytes, such mice in Goldman's lab routinely live beyond a year, more than four times the expected life span, and many seem cured.

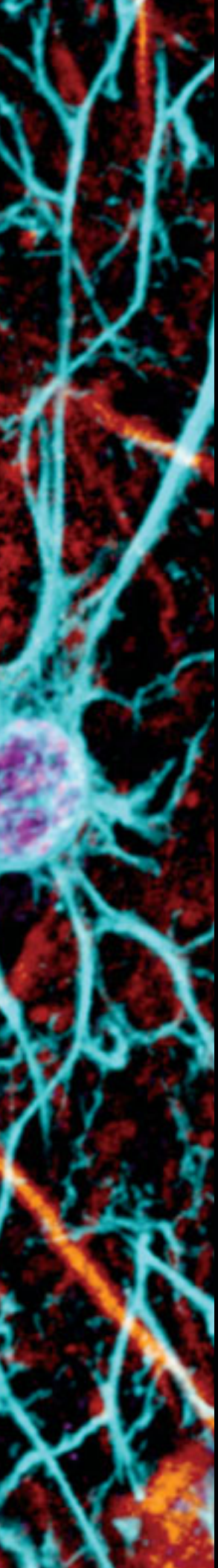
"Scientifically and medically, we are ready to go to a human clinical trial, but there are other barriers," he said, most notably a manufacturing facility to prepare the cells.

While Goldman tackles the scientific issues one by one, patiently pushing in all directions to bring what he views as a promising treatment to people, others have a more forthright view. Recently he was approached at a national meeting by other scientists who questioned the ethics of not moving forward more rapidly with what already seems a likely treatment for a fatal disease for which there is currently none.

"It's extremely exciting to think about not only treating but actually curing a disease, particularly an awful disease that affects children," said Goldman. "Unfortunately, right now, we can do nothing but tell parents to prepare for their kids to die."

Goldman's research holds out hope for several diseases for which little hope currently exists. In Huntington's disease, for instance, there is no way to slow the inexorable decline the disease brings. And no treatment in people has come close to reversing the consequences of a spinal cord injury. Goldman's lab





ASTROCYTES

Nedergaard has discovered what might be called the secret lives of astrocytes. She has made a series of startling discoveries: astrocytes send signals to the neurons and the neurons respond; neurons and astrocytes talk back and forth, indicating that astrocytes are full partners in the basic working of the brain; and astrocytes are central to conditions like stroke, Alzheimer's, epilepsy, and spinal cord injury.

In this confocal microscope image of human brain cells, the green cells are astrocytes and the red are neurons. The astrocytes are stained against glial fibrillary acidic protein (GFAP), neurons against microtubuli associated protein 1 (MAP1), and nuclei with DAPI.

Courtesy of Nedergaard lab.

has developed stem cell-based approaches for treating both conditions that have proven successful in animal models. People with these conditions who hear about his work and are anxious for human tests frequently contact Goldman. But three years ago, when rats with spinal cord injuries began walking and then running in his laboratory, Goldman declined publicity for fear of raising the hopes of paralyzed patients prematurely.

"Good science takes time," he said. "The worst thing that could happen would be to try something in patients before it's been completely vetted. That would not only be dangerous for the patient, but if things went poorly, it could bring a premature end to research that might otherwise be successful."

Research with stem cells is under intense scrutiny even under the best of circumstances. Last year, using human stem cells, Goldman was able to nearly cure rats of Parkinson's symptoms, but the rats also grew brain tumors as a result of the treatment. The work, reported by media around the world, was latched upon by both proponents and opponents of stem cell research. Opponents heralded the "failure" of the experiment, while Goldman instead felt optimistic.

"This is the way medical discoveries move forward: one step at a time," said Goldman, professor of neurology and neurosurgery and chief of the division of cell and gene therapy. "Currently we're working on the next problem, achieving the same benefit without creating tumors. We expect to be able to solve this problem within the next year or two."

He has not been as aggressive a political voice as some, preferring to let his work speak for itself. He makes the most of the stem cells lines approved by the federal government, though he notes their shortcomings and explores private funding for possibly working on other lines some day. The federal ban restricting the use of certain cell lines likely contributed to the tumor problem in his Parkinson's work, Goldman said, and is limiting application of the technology in human patients.

In spite of stem cell controversy, Goldman's work remains enormously popular with funding groups. The National Institutes of Health is supporting five separate large projects. More than 20 organizations and corporations, including the National Multiple Sclerosis Society, the Michael J. Fox Foundation, Merck and Sanofi-Aventis, back other studies.

"More than anyone I've ever met, Steve is able to approach the challenges and tragedies of neurologic disease as viable opportunities for translational research that will lead to a cure," said Pilcher. "He's a brilliant thinker and a creative scientist, who shares with Maiken a sense of urgency for achieving and contributing at the highest level. Steve's and Maiken's timelines move faster than the average person's. The goals they set for themselves are beyond what most people expect."

Making discoveries in uncharted waters

While Goldman is exploring the science of cells that have been thrust into the political limelight, Nedergaard has been busy with a type of cell often glossed over even in medical textbooks.

Star-shaped cells known as astrocytes have long been considered passive support cells, a means to hold the rest of the brain cells together. Medical students might spend a few minutes thinking about them before moving on to their flashy counterparts, the neurons that constantly fire, sending electrical signals that are crucial to pretty much everything we do. It's the electrical activity of neurons that constitutes brain activity, and it's the neurons that are the target of every currently available drug aimed at brain cells.

(Above) Goldman says good science takes time.

(Right, facing) Nedergaard and her team have targeted many diseases.

Astrocytes generally have been considered important insofar as they support the neurons, keeping them nourished and cared for. Astrocytes supply neurons with chemicals needed to do their job. They allow neurons to keep their signals crisp by vacuuming up excess chemicals, recycling neuronal waste into useful chemicals that are delivered back to neurons, and maintaining precise balances of ions and chemicals in their environment.

"The main function of astrocytes has been regarded as maintaining a healthy environment for neurons," said Nedergaard, professor of neurosurgery. "The electrical signaling in the brain is so sophisticated that it's crucial that the environment be optimal. There's not much room for error. When the astrocytes start acting abnormally, it's easy to see how serious disease might result."

Nedergaard has discovered what might be called the secret lives of astrocytes. She has made a series of startling discoveries: astrocytes send signals to the neurons and the neurons respond; neurons and astrocytes talk back and forth, indicating that astro-

cytes are full partners in the basic working of the brain; and astrocytes are central to conditions like stroke, Alzheimer's, epilepsy, and spinal cord injury.

Pilcher, a neurosurgeon who has spent a lifetime studying and healing the brain, said of Nedergaard: "She's like Magellan, taking her ship into uncharted waters. Everything she sees is brand new. It's likely that many new therapies against several diseases will be directed at glial cells such as astrocytes, thanks to her work."

Epilepsy has long been considered a disease of neurons, Pilcher said. But Nedergaard has found that astrocytes play a role, actually setting off seizures by sending out glutamate, causing brain cells to fire out of control.

"When neurosurgeons would see a scar made of glial cells like astrocytes, we would see a scar that has nothing to do with epilepsy," said Pilcher. "Maiken has shown that astrocytes can actually begin a seizure. That's a complete departure from everything that has been known or even considered before. We've been ignoring this very important cell type in epilepsy and other diseases."

So much of a departure, Nedergaard said, that when her colleague, Guo-Feng Tian, did the initial experiments, he spent several months thinking he had done something wrong because the results were counter to much of what is known about epilepsy.

How have scientists missed all this activity all these years? The tools widely used to measure brain activity focus on the electrical firing of cells, what neurons, not astrocytes, do. It turns out that astrocytes have their own way of communicating, not captured by conventional technology. Rather than realizing their tools were incomplete, scientists assumed that astrocytes were silent.

"It's like having two communication networks using different languages," said Nedergaard. "You have a highly sophisticated electrical network embodied in the neurons, which send signals instantaneously. And then you have a much slower network whose signals are 10,000 times slower."

Nedergaard first started thinking about astrocytes in depth as a physician doing research on stroke in Copenhagen. Stroke is a condition long thought of mainly as a disease of neurons. Limited oxygen to the brain's neurons causes brain damage. But she felt it likely that astrocytes were central to stroke damage, explaining that the way in which stroke damage occurs in the brain often follows the general manner in which astrocytes, not neurons, are connected.

At Cornell, she devised a new way to "listen" for astrocyte activity, developing a sophisticated laser system to look at their activity by measuring the amount of calcium inside the cells. Her team uses a fluorescent calcium-sensitive dye to look at astrocytes, using one laser to activate the calcium, and another laser to monitor how astrocytes process the chemical. It's called two-photon imaging, and it allows her team to look at astrocytes in living animals, a crucial step beyond the laboratory studies that long have dominated astrocyte studies.

"For a long time, astrocytes were thought of simply as the housekeepers of the brain, feeding the neurons and regulating their environment," said Nedergaard. "But astrocytes are much more active than we have thought. It appears that astrocytes even give out the instructions telling neurons what to do. It's very likely they play an important role in many human diseases."

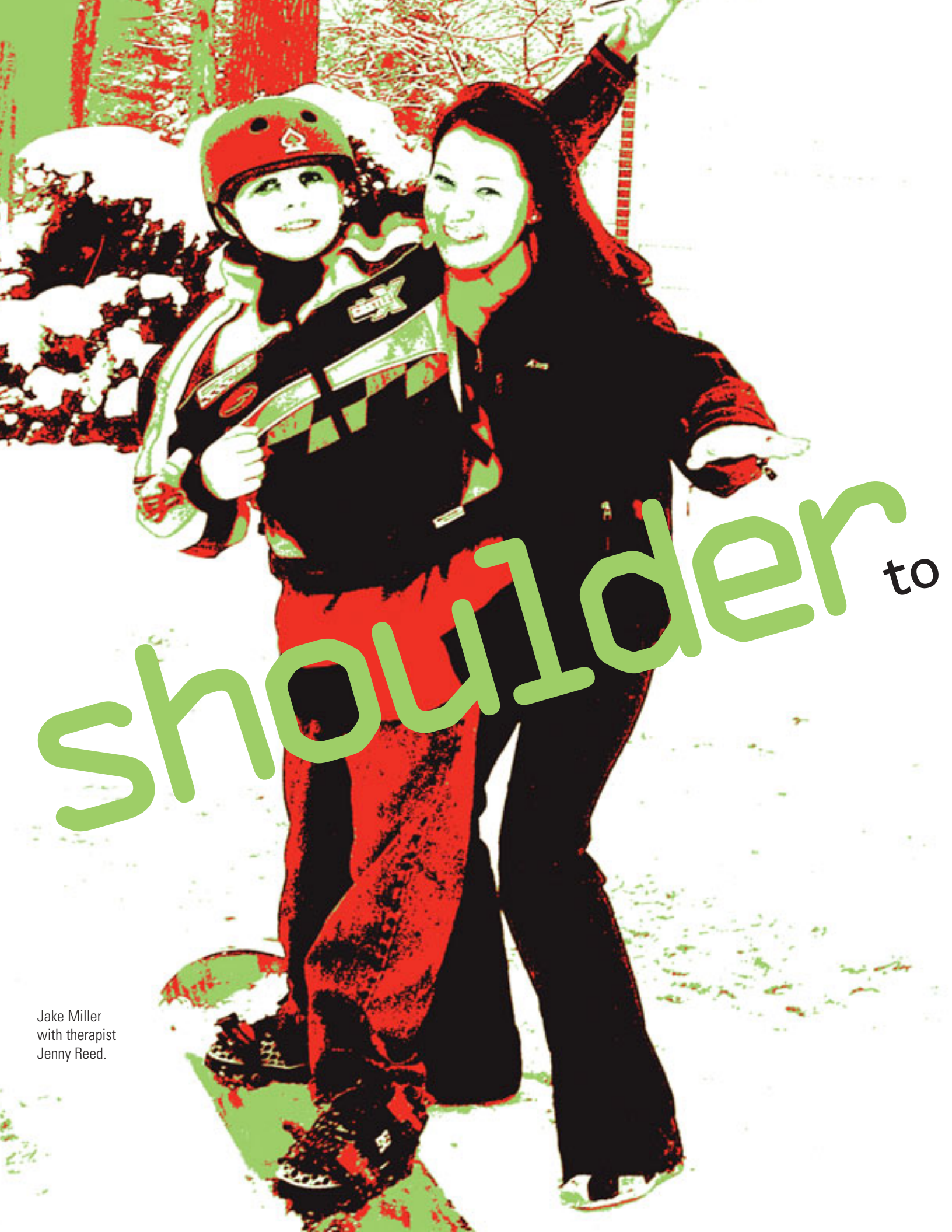
Now that she has cracked the language of astrocytes, Nedergaard has found them active in nearly every condition she has studied. It turns out they play a key role in cerebral palsy, producing a compound that makes the brain especially vulnerable in an infant born prematurely. In Alzheimer's, it's long been recognized that sick, bloated astrocytes are the first sign that something is amiss. And in the spine, tweaking the astrocytes may present a new way to try to alter the damage from spinal cord injury.

It's fertile new territory not only for Nedergaard but also for pharmaceutical firms whose research efforts in the brain have been devoted almost exclusively to neurons, not astrocytes.

Nedergaard notes that the human brain has about 10 times as many astrocytes as neurons, and that they are more complex. While our neurons are much like those found in a mouse, human astrocytes are three times as large, with 10 times as many connections to other cells.

"It may be that humans have a much higher capacity in large part because our astrocytes are much more sophisticated or complex," said Nedergaard. "These cells are part of our higher cognitive functioning that defines who we are as humans.

"We have a feeling that we're just scratching the surface of their importance of astrocytes. In my opinion, a decade from now, the astrocyte will be as hot as stem cells are now."



shoulder to

Jake Miller
with therapist
Jenny Reed.

By Michael Wentzel

Pilcher's recruits broaden neurosurgical care, expand research and point to a future of leadership

shoulder

Jason H. Huang, M.D., had not even served a week on the University of Rochester School of Medicine and Dentistry neurosurgery faculty when he encountered Jake Miller, a 13-year-old who had been struck by a car as he rode his skateboard.

When Jake arrived at Strong Memorial Hospital that Sunday in July 2006, he was comatose with a bilateral skull fracture. His mother, Lisa Miller, remembered: "Dr. Huang examined Jake for a few minutes and said he had to operate right away or Jake would die. I said go do it — do what you can to save my child."

The tradition in cases like Jake's is to monitor and manage medically, Huang said.

"If you ask 10 neurosurgeons what to do in this case, nine would say to wait rather than operate. I believe you have to be aggressive with surgery to protect the brain," he said.

Huang removed Jake's left skull bone flap, then, a day later, he took off the right side. It was a dramatic beginning to Jake's road to recovery.

Huang's skills and confidence in aggressive neurosurgery interested Webster Pilcher, M.D., Ph.D. (M'83, R'89), chair of the School of Medicine's Department of Neurosurgery, who recruited him to Rochester. Since he was appointed chair and Frank P. Smith Professor in 2002, Pilcher has worked persistently to replenish the department and to broaden the department's vision. Now, with a department clinical faculty of 12, he has more than doubled its size.


Jake Miller

"Neuromedicine is where cardiology was in the 1980s, when clinical and basic research started to impact the clinical arena," Pilcher said. "In the next 10 to 20 years, translational neuroscience research will contribute many new and important therapies. I want our department to be in a leadership position to develop and introduce those new therapies."

Huang, a graduate of the Johns Hopkins School of Medicine, came to Rochester from the Hospital of the University of Pennsylvania, where he did his residency and had a fellowship. The other new recruits include: Jason M. Schwalb, M.D., G. Edward Vates, M.D., Ph.D., and Kevin A. Walter, M.D. Each brings research interests as well as clinical strengths. Huang investigates nerve repair. Schwalb looks at new targets for deep brain stimulation. Vates studies the causes of stroke and new approaches to prevention. Walter researches the genetic make-up of brain tumor blood vessels for new methods of treatment.

"I recruited young faculty with a vision for how translational research in neuromedicine will shape the future of clinical neurosurgery. They can help us make a national contribution with new therapies and techniques that will transform the field," Pilcher said. "We are placing clinical care and research shoulder to shoulder. We want clinical care and research supporting each other."

Growing axons, repairing nerves

Jason Huang, with Pilcher's support, is working to establish a neurosurgical intensive care unit at the Medical Center. He also plans to help develop aggressive protocols, modeled on what he learned at the University of Pennsylvania, for the treatment of traumatic brain injury and other nervous system injuries.

"Traumatic brain injuries are the number one cause of death of people age one to 40 in the United States. It's not coronary artery disease or cancer. It is accidents, shootings and other trauma," Huang said. "We want to have a major effort to develop our own program."

That program would involve surgery as well as research in spinal cord and peripheral nerve injuries and their repair. Huang, for example, treats injuries to the brachial plexus, the network of nerves that conduct signals from the spine to the shoulder, arm and hand. Patients from the Rochester region with these injuries routinely have been referred to the Mayo Clinic or the University of Pittsburgh Medical Center for surgery. They now can receive treatment at Rochester's Medical Center.

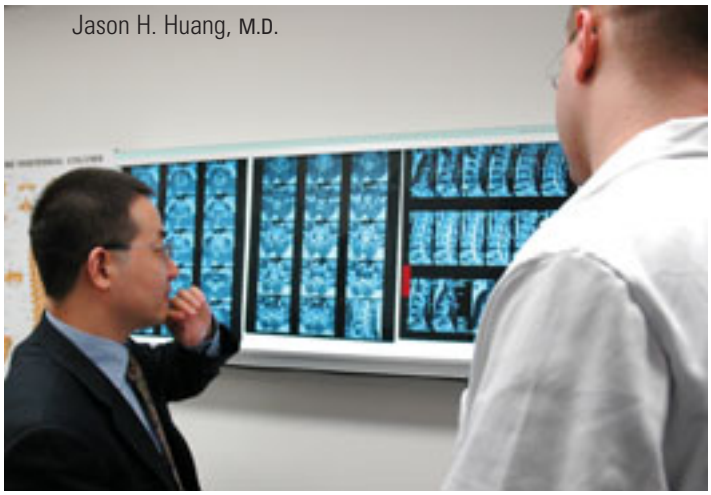
Webster Pilcher, M.D., Ph.D.

Huang continues his research work with University of Pennsylvania scientists and engineers on in vitro growth of bundles of neurons — some as long as 10 centimeters — that could be used to repair injuries. In one project, the newly grown axon could be connected to an electrical array that would act as an interface between nerves.

"The concept is that eventually we will be able to transplant the nerve and the array interface into a patient who has lost use of an arm and the interface can restore function," Huang said. "There is a lot of preliminary data showing that it is a viable option. It is in the concept stage and there is a long way to go, but I can see it being a reality in five to 10 years."

Huang also has started a collaboration with Roman Giger, Ph.D., an associate professor of neurology in the School of Medicine's Department of Biomedical Genetics. They are investigating the molecular mechanisms of neural development as a path to the regeneration of damaged spinal cords or severed nerves.

The primary reason he came to Rochester, Huang said, was to work with scientists like Giger and Maiken Nedergaard, M.D., Ph.D., professor of neurosurgery. "You want to collaborate with these people. The research here is as good as at any institution," he said. "The second reason I'm here is clinical opportunity. A city like Boston or Philadelphia is somewhat saturated. You only get to do so much as a young surgeon. I've done more than 150 cases in my first six months here. That's very busy. But I like operating. I enjoy being in the operating room."



Jason H. Huang, M.D.

Finding new targets in the brain

Jason Schwalb investigates new targets for deep brain stimulation beyond Parkinson's disease, dystonia and essential tremor. He helps develop better maps and models of the human brain altered by disease. He also conducts research, but he prefers to collect his data in the operating room rather than at the lab bench.

"A neurosurgeon can collect data in the operating room that no one else can," he said. "I can learn things about human brain function during operations that cannot be studied in a mouse brain or even a rhesus monkey's."

In deep brain stimulation (DBS), Schwalb inserts a tiny electrode about 60 microns (0.0024 inches) in diameter through an opening in the skull about the size of a nickel. Scans and other imaging techniques already have marked the target and designed anatomical coordinates. As he threads the electrode deeper into the brain, the electrode, connected to an amplifier, picks up the firing of neurons. Schwalb feels his way by the sound of the firing.

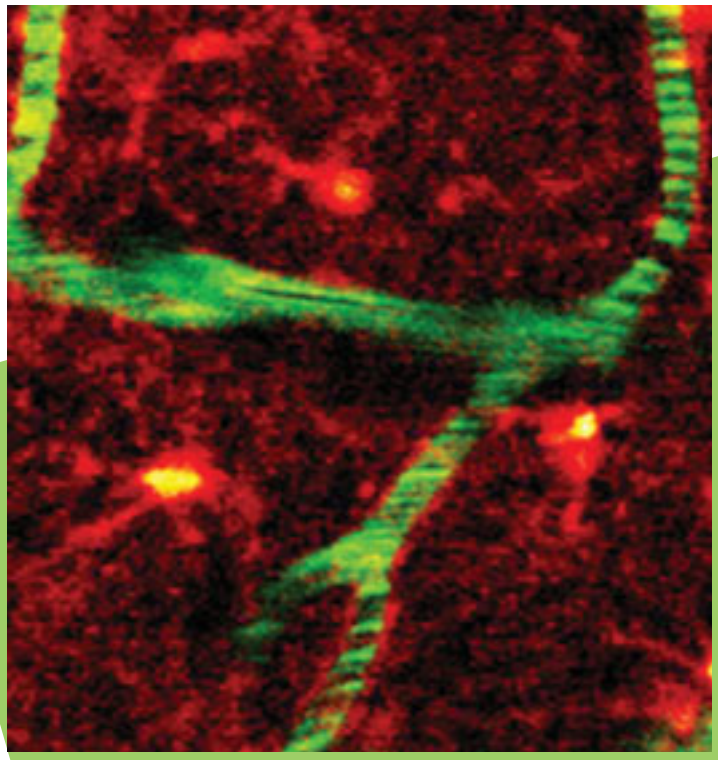
"You move the electrode down slowly into the brain, less than a millimeter at a time, but you can collect a lot of data on what happens when a patient's brain is firing," Schwalb said. "I can see how a neuron responds to a patient doing a task — to a patient moving an arm passively or reaching volitionally for a target."

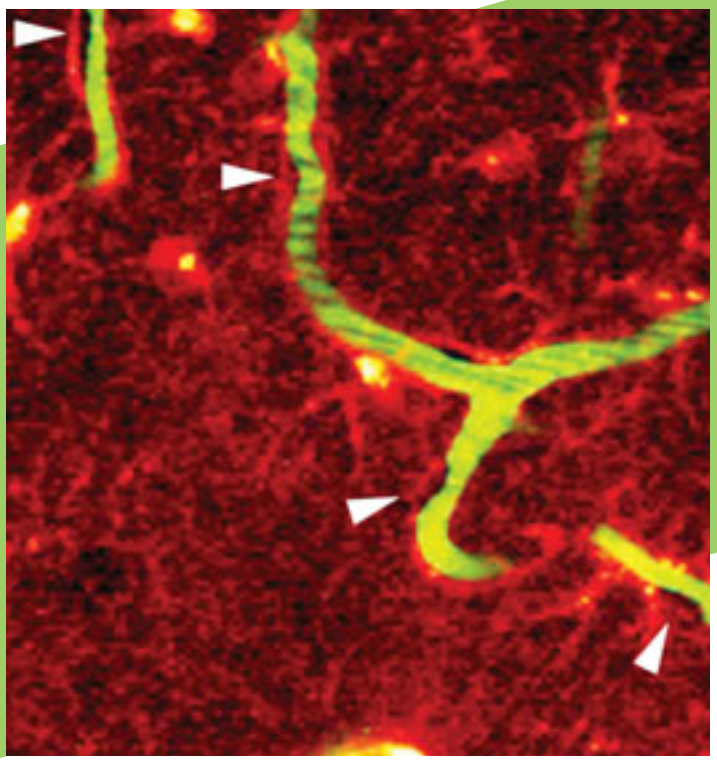
Robert Bakos, M.D. (R'77), associate professor of neurosurgery, built the DBS program in Rochester. Schwalb, a Yale University School of Medicine graduate who did his residency at the University of Pennsylvania and fellowship training at the University of Toronto, sees DBS as the field in neurosurgery with the most potential for expansion.

"People with Parkinson's disease do pretty well with medications for about 10 years, but then many patients do quite poorly," Schwalb said. "They have large fluctuations in activity related to their medication dosing. They go from being frozen, where they can't move — which is very painful — to having all sorts of extra movements that they can't control. DBS does level that out. It may not cure the disease. It does not make you better than the best conditions on medication, but it does level people out. It really does improve quality of life."

The department's DBS program has become a regional center for treatment of Parkinson's disease and especially dystonia. Schwalb expects DBS to someday play a major role in treating many diseases and conditions. He is working with renowned neurobiologist Suzanne Haber, Ph.D. The goal is to

In the normal brain of a mouse (below left) orderly rows of blood cells flow through the capillaries and astrocytes do not interfere. But in a mouse that has had an experimental subarachnoid hemorrhage (below right), swollen astrocytes appear to compress the capillaries, possibly preventing the cells from delivering oxygen to the brain.





utilize Haber's expertise in primate brain research to support Medical Center efforts in defining new therapeutic targets for treatment of depression, Tourette's Syndrome, Parkinson's, obsessive compulsive disorder and other maladies.

"The scientific leadership in systems and cognitive neuroscience spanning both the River Campus and the Medical Center will be essential to developing new DBS therapies and to evaluating the outcome of our interventions," Pilcher said. "By linking scientists across the University, this program will define the 'brain-machine interface' as a focus of new treatments for many disabling neurological conditions."

As a fellow in Toronto, Schwalb participated in a trial that showed promise for a new DBS target for treatment resistant depression. He hopes a new trial of DBS at this target will start this year with Rochester as one of the centers.

With support from the Schmitt Foundation, Schwalb and Martha Gdowski, Ph.D., assistant professor of neurobiology and anatomy, are investigating learning deficits in Parkinson's patients. The goal of the project is to collect data on behavior and sensory integration from people with Parkinson's and control subjects performing certain tasks and compare the data with neuronal responses in animals doing similar tasks.

"There are some indications that Parkinson's is more than just difficulty moving, that there are learning components," he said. "Take a person with Parkinson's disease and set off a metronome. They can integrate that sensory information and walk better. If you put cutouts of feet along a path, they can walk better. But people with Parkinson's often get stuck in doorways. How do you explain that well-known phenomenon if Parkinson's disease affects only the motor system?"

Schwalb also works closely with Rochester area physicians to build a group approach for managing complex pain patients with spinal cord stimulation. He joins Huang in treating brachial plexus injuries, performs minimally invasive spine surgery and also offers five procedures for trigeminal neuralgia. In his 18 months in the department, he has handled more than 300 cases.

"The neuroscience infrastructure here is really spectacular. It's like a Disneyworld for a functional neurosurgeon," Schwalb said. "There are an incredible amount of resources already here and new faculty members like me bring things that have not been here."

Unmasking the astrocyte

Edward Vates finds as much reward in the research laboratory as he does in the operating room. The work and skills of neuroscientist Maiken Nedergaard attracted him to Rochester. He even uses one of Nedergaard's two-photon laser scanning microscopes.

Tests can detect large-vessel vasospasm, but we can't see spasms in the small vessels that deliver oxygen and nutrients to the brain.

But when he studies minute networks of blood vessels and their neighboring astrocytes, he has not forgotten the people he treats.

"I am motivated to do my science by what I see happening to my patients and what I see happening to them informs the questions I want to address in the laboratory," Vates said. "The two are intimately braided. I'm always thinking about the other when I'm doing one. It would be easy as a scientist to burrow down the rabbit hole and not think about the implications or lack of implications for human disease and the problems patients face. But really we're here trying to figure out better ways to fix broken brains and provide new therapies that will translate into better outcomes for patients."

Vates recently joined with Laura M. Calvi, M.D., an endocrinologist and assistant professor of medicine, to establish a clinic, the first of its kind in upstate New York, to address pituitary gland tumors. In his research and clinical work, he focuses on aneurysms and vascular malformations in the brain and he is especially interested in the consequences of bleeding into the brain and spinal fluid.

The most fearsome consequence of bleeding from a brain aneurysm is vasospasm. Blood from an aneurysm irritates the muscle in an artery. As a consequence, the muscle contracts, the artery shrinks and blood flow is choked off. More than a third of patients who have bleeding from an aneurysm will go on to have problems with vasospasm. Many will have strokes and other permanent problems.

"Tests can detect large-vessel vasospasm, but we can't see spasms in the small vessels that deliver oxygen and nutrients to

G. Edward Vates, M.D.


Kevin A. Walter, M.D.

the brain," Vates said. "If we see an artery suddenly narrow down, we can inject chemicals into the artery and relax the vessels. In the same way as we do in a heart, we can advance a small balloon to the point and force the artery open. It's a delicate and risky procedure. It's not something you enter into lightly. We need to develop better tests to detect spasm in smaller arteries."

Vates, a graduate of Weill Cornell University Medical College and Rockefeller University, did his residency at the University of California at San Francisco. In his research, which is supported by the National Institutes of Health and the American Association of Neurological Surgeons, he studies blood vessels and blood flow in the brain in real time in animals that have bleeding into their spinal fluid. He manipulates the astrocytes to cause them to relax or constrict the blood vessel.

"Astrocyctes regulate how big a blood vessel is in the brain and clearly regulate blood flow. They are not the only regulators, but they are important," Vates said. "We now know that astrocytes are affected by subarachnoid hemorrhage. What is the effect and is that why we see reduced blood flow in some instances? We've been able to show that blood flow is decreased after subarachnoid hemorrhage in our mouse model. We are beginning experiments to look at what it is about astrocytes that contribute to decreased flow. Astrocytes are an unrecognized participant. Our goal is to pull the mask off and show that astrocytes are one of the culprits that lead to decreased blood flow and stroke."

Vates also plans to investigate the chemical compounds astrocytes use to regulate their internal machinery or to communicate with the other cells that help regulate blood flow.

"If those chemical signals are being thrown off, that points to a particular point in the cascade of events where we might be able to intervene and cause the blood vessels to operate properly," he said. "Our inadequate understanding has left us unable to treat the consequences of subarachnoid hemorrhage and vasospasm. People lose the ability to move, talk, see and understand. We see it all too commonly. Until we understand what is going on we're not going to be able to do better for our patients who face devastating consequences."

Tracking tumor vessel's code

After Kevin Walter removes a tumor from the brain or spinal cord of a patient, he studies that tumor in his laboratory, investigating the genes active in the tumor's blood vessels. He is trying to find what makes blood vessels in brain tumors different from normal blood vessels, and already has identified several indicators.

"When we find those genes, and those targets, we can use them for a variety of purposes. If we have something that is seen only in brain tumor blood vessels, then we can develop a drug that would target or inhibit it and, we hope, block the development of those abnormal blood vessels," said Walter, former director of the adult neurosurgical oncology at the University of Pittsburgh Medical Center. Walter graduated from Hopkins School of Medicine and did his residency and fellowship training there.

"We also hope that we will be able to identify ways to prevent the swelling in the brain that occurs as a result of brain tumors. We can try to reverse a lot of the side effects that go along with brain tumor growth — the headaches, the seizures — so even if we can't kill the tumor by our approach, then we can alleviate a lot of the suffering," Walter said.

The genes also could provide a diagnostic tool. When a potential target is present, that would indicate a tumor or an abnormal blood vessel process forming in the brain.

"If we can extend that and look at the molecules these abnormal vessels produce and shed in the bloodstream, we can develop blood tests that can detect brain tumors earlier — particularly, we could detect tumors for patients who have lung cancer or breast cancer and detect when those tumors have spread to the brain," he said.

Walter also envisions blood vessels as an imaging target. The vessels could be treated with agents that would be visible on an MRI, scan or other device so they could be spotted as they are forming before standard imaging technology would reveal that a patient has a tumor. In his research, Walter works with his wife, molecular biologist Eleanor Carson Walter, Ph.D., who manages their lab. He started his tumor work five years ago at Hopkins and continued it at Pittsburgh. He collaborated with Genzyme Corp. on the initial molecular analysis. He also works with groups in Finland to look at the expression of the molecules in a large patient population base, using a Scandinavian tumor registry.

Jason M. Schwalb, M.D., right, and Jeffrey Tomlin, M.D.

"Finland has an extensive database of patients with brain tumors and they have specimens. They know what has happened to these patients," Walter said. "We can quickly look at our target molecules over a very large population of patients to see how common it is and what potentially its application would be."

Berislav Zlokovic, M.D., Ph.D., professor of neurosurgery and the department's vice chair for research, is internationally recognized for his work with brain blood vessels in Alzheimer's disease and stroke. His leadership in this arena has led to new therapeutic approaches that are currently under investigation in humans, and was a major drawing card for Walter in his decision to move to Rochester. Walter sees similarities between his studies of human brain tumors and Zlokovic's investigations of vascular endothelial biology in other diseases, and says that Zlokovic's research will help move his tumor research forward.

The main goal in the surgical removal of brain tumors continues to be development of safer, less invasive approaches with reduced potential of injury to the surrounding brain.

"In the long term, progress in surgery might come from what we put in tumors rather than in taking them out," said Walter, who is investigating biodegradable polymers and other potential implants. "We use surgery as a way to deliver drugs to brain tumors. We place small micro catheters in a tumor, and then use a pump to deliver biologically targeted therapies against the tumor. A drug is pumped through the brain at a very slow rate so it doesn't injure the brain. But this allows a drug to get into the brain and into the tumor at a much higher concentration than would be possible through the standard intravenous route."

As part of a planned regional brain tumor center, Walter and others at the Medical Center are setting up an extensive patient database that will allow them to routinely track patients. "This is more than a standard follow-up," he said. "How long did the patient live? How large is the tumor? How is it responding to treatment? Those are important questions and will be tracked. But just as important for brain tumor patients are quality of life issues. How long can we keep people cognitively intact? Can we avoid depression? Can we keep people living independently? We're setting up a network to collect data to see how they are doing as people, not just as tumors or survival statistics. We want to see how treatments we are developing are affecting them."

Getting back to the kid he was

Medical Center neurosurgeons help many patients every day. Jake Miller is only one, but he shows the department's prowess.

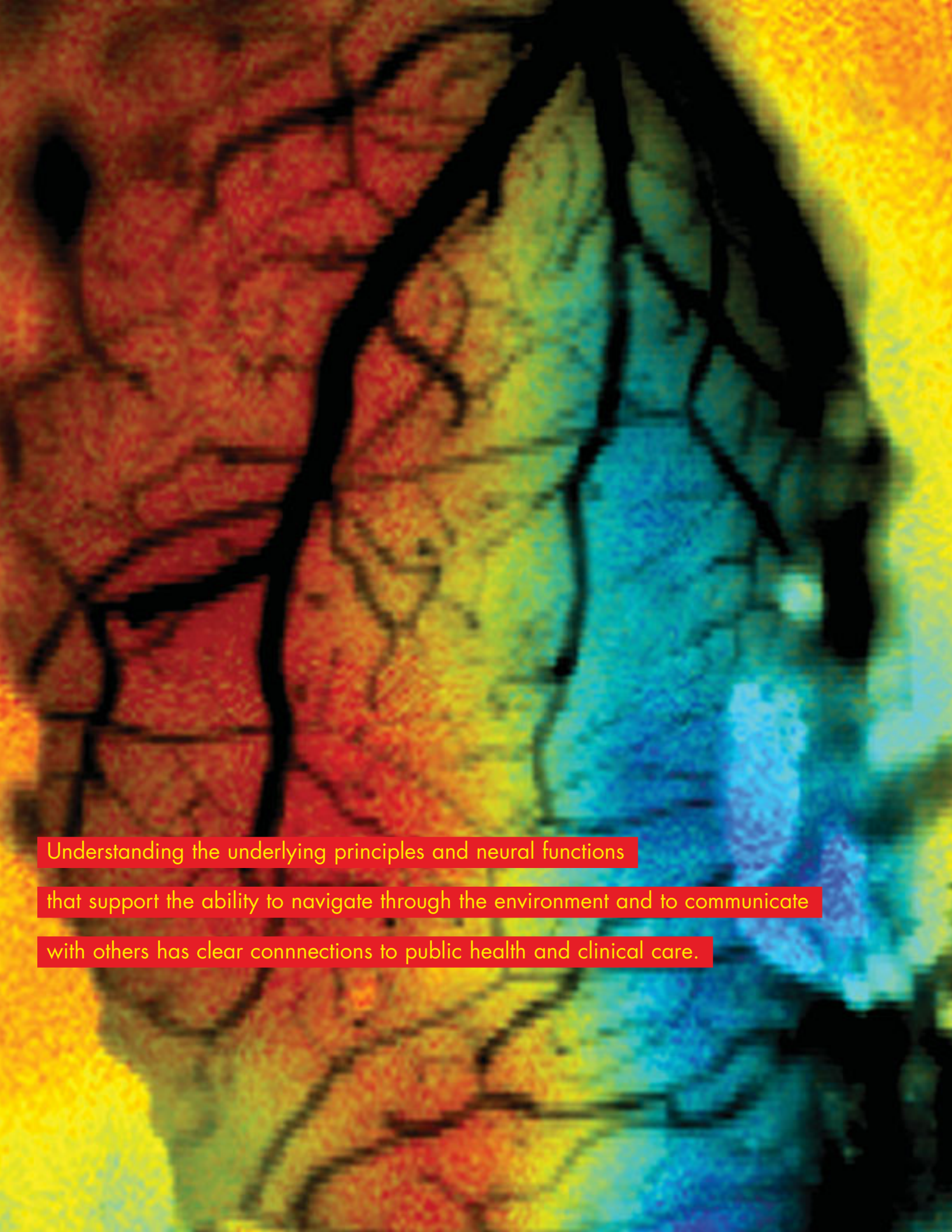
Jake was an active, athletic boy before he was hit by a car. He remained in a coma for more than three weeks after the initial surgery. Jason Huang restored his skull after three months and Jake's recovery quickened. Learning to hold up his head became a victory, the first of many. Lisa Miller, Jake's mother, ordered a wheelchair for him, but by the time it arrived, Jake could walk and was kicking a soccer ball in his backyard. In spite of his injuries, he looks like a regular kid. Six months after he was hit by the car, Jake began to speak again. He returned to his middle school for some classes. He took tests by typing his answers on a computer—and he passed.

"Intellectually, Jake is fine," Lisa Miller said. "He has problems with his right side. His arm is weak. He walks with a slight limp. And his right eye is not aligned. He's getting stronger. He has some social problems but he is getting back to the kid he was. Jake is still here. If Dr. Huang did not do what he did, Jake probably would not be here."

In the world of the senses

Scientists probe neurons and study responses to learn how the brain navigates, balances, recognizes, adjusts and recovers.

By Michael Wentzel



Understanding the underlying principles and neural functions that support the ability to navigate through the environment and to communicate with others has clear connnections to public health and clinical care.

Gary D. Paige, M.D., Ph.D., prepares an eye and head tracker for an experiment.

Walk to an intersection busy with passing cars and trucks. When a car horn sounds, check each direction. Quickly, pick out the honking vehicle. Walk fast on a curb's edge and try to maintain balance like a tightrope walker high above the ground. When someone calls out loudly from a crowd, determine if that is a known voice. Walk home on unfamiliar streets. Remember the route.

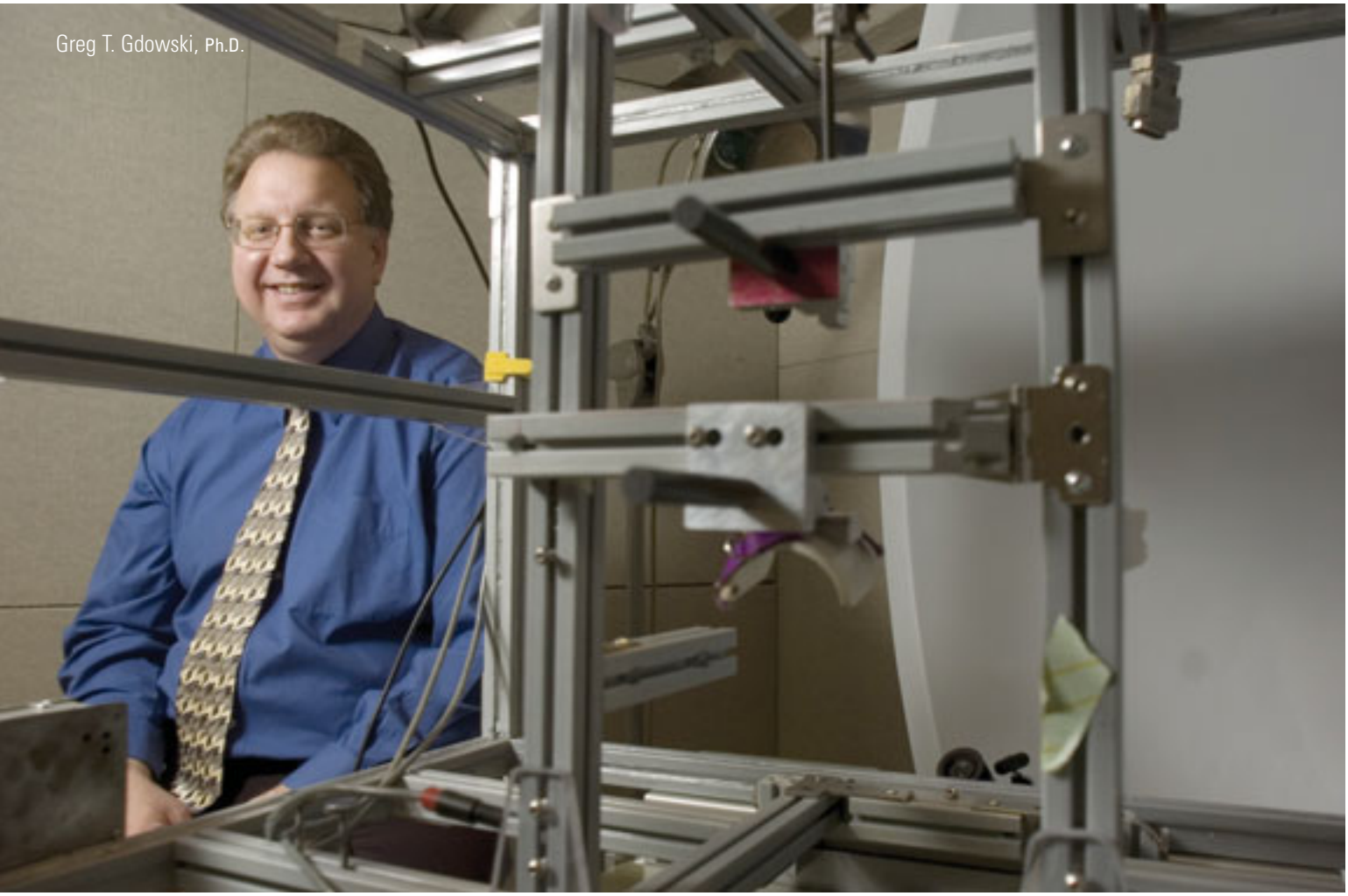
Scientists at the University of Rochester School of Medicine and Dentistry study these experiences and distorted versions of such tasks to understand how the senses work with the brain to get us going and keep us going safely and correctly.

"This kind of work seems esoteric and eclectic because it doesn't meet the preconceived notions of biological research. But it has everything to do with daily life from the time you wake up to the time you go to sleep," said Gary D. Paige, M.D., Ph.D., chair of the Department of Neurobiology and Anatomy. "Fancy organisms that we are, we have just six senses. The senses are present in some form throughout the animal kingdom and have existed for at least 600 million years. They are part of how we evolved and they help us survive. Selective advantage has everything to do with knowing what's out there, what's coming at you and where you need to go. Those abilities are required to simply make it through the day."

Understanding the underlying principles and neural functions that support the ability to navigate through the environment and to communicate with others has clear connections to public health and clinical care.

"Most patient complaints are generated by sensory dysfunction," Paige said. "Patients do not say that their body

Glasses with prisms shift the field of vision for sensory studies.


Greg T. Gdowski, Ph.D.

is expressing the wrong protein. Tumors occur but no one knows until they generate a dysfunction or sensory disturbance. They say there is pain or weakness or double vision. A patient says he can't do something as well as he used to. Just getting old entails a deterioration of the senses, and motor control. This is a major public health concern. Falling down when you are over the age of 70 is a very serious matter that can be fatal."

Paige's department is on the front line of research into the sensory and motor elements of navigation and communication. Insights on the ability of the brain to integrate sounds and images and to adaptively revise itself, new targets for treatment or prosthetic devices for brain disorders and a test for Alzheimer's disease are just some of the potential outcomes of the department's research.

"We're putting the pieces together," Paige said. "Once you have information about what functions and processes are happening in the brain — down to sub-units of neurons — then you can begin to know where to intervene in order to adjust how the brain responds to solve problems or recover from loss."

The rocket gyro and whiplash control

Return to the honking car. Locating that car among other vehicles requires information from multiple senses.

"It requires orienting, looking around and seeking cues," Paige said. "The entire world shifts relative to your head every time you move so you had better know that you, in fact, moved your head and that it was not the visual world that moved. The integration of vestibular and neck inputs relative to self-motion, along with visual and auditory cues about the outside world, must all be in register. How does spatial orientation and integration actually take place? How do the senses get together?"

Paige calls the vestibular system a sense, the sixth sense, and the "rocket gyro" of the nervous system that operates 24 hours a day seven days a week to register self-motion and orientation — to maintain balance.

"The vestibular system is the least famous but most ubiquitous of senses," he said. "All the spatial senses are unique, complete with their own sensory organs, pathways and processes in the brain, and neural representations. And yet, given a common meaning, such as space or communication, they must combine forces to unify a single reality. It's just one of many cars honking, after all—better get it right."

The brain and the senses create spatial maps through experience. No one could correctly locate the honking car without a combination of inputs from the senses. No one could move out of the way quickly without a well-connected

The brain and the senses create spatial maps through experience. No one could correctly locate the honking car without a combination of inputs from the senses. No one could move out of the way quickly without a well-connected vestibular and motor system.

vestibular and motor system. What would happen if one of the senses — such as the vestibular system — were absent?

"Life would look like bad home movies made by walking around with a hand-held camera," Paige said. "All the neurons from the labyrinth enter the brain to convey movement. Ten degrees of head movement produces 10 degrees of eye movement in the opposite direction to stabilize the visual image. That precision must be calibrated and the system achieves the calibration during natural activities throughout life."

Greg T. Gdowski, Ph.D., assistant professor of neurobiology and anatomy, focuses on control of reflexive head movement — what protects the head and the neck from injury during that search for the honking car. The vestibular organ senses the movement and alerts the brain, which tells muscles in the neck to react to the movement.

"Essentially, the muscles contract to protect the neck from injury," Gdowski said. "If you didn't have this reaction, the head would snap backwards. You'd have whiplash all the time, even when just you're walking down a hallway."

In his postdoctoral research, Gdowski discovered the vestibular system is exquisitely set up to distinguish between voluntary and involuntary movement. It's critically important that the system know when to generate a reflex. The muscles should contract to protect during a run or in the event of a collision. But if the muscles tighten at the wrong time — during a quick turn to react to a warning sound, for example — the honking car can't be located.

"You don't want a reflex reaction when you are voluntarily turning your head," Gdowski said. "The system decides the difference quickly. The first neuron that receives input from vestibular organ responds like crazy when you are being turned around involuntarily. It does not respond at all when you turn your head voluntarily. We're trying to tease out some of the mechanisms of how the brain does that."

Gdowski, who receives funding from the National Institute for Deafness and Communication Disorders and the National Institute of Neurological Disorders and Stroke, recently began investigating how this system adapts to different situations. The system has to fine tune the muscle reactions in the neck as a person develops, accounting for increases in the mass of the head from infant to adult, for example. In one project, he is looking at football players and their adaptation to the weight of helmets and the context of movement on the field.

"A player might get tackled while standing or hit while moving. You could be hit when you can see it coming or when you can't. You can be hit while you are tracking a receiver and there'll be head movement. Are the reflexes generated the same for all these circumstances?" Gdowski asked. "Whiplash occurs more often in rear-end accidents than front end. Does visual input play a role? We're looking at the ability to forecast how the body will move and change the way a reflex is generated.

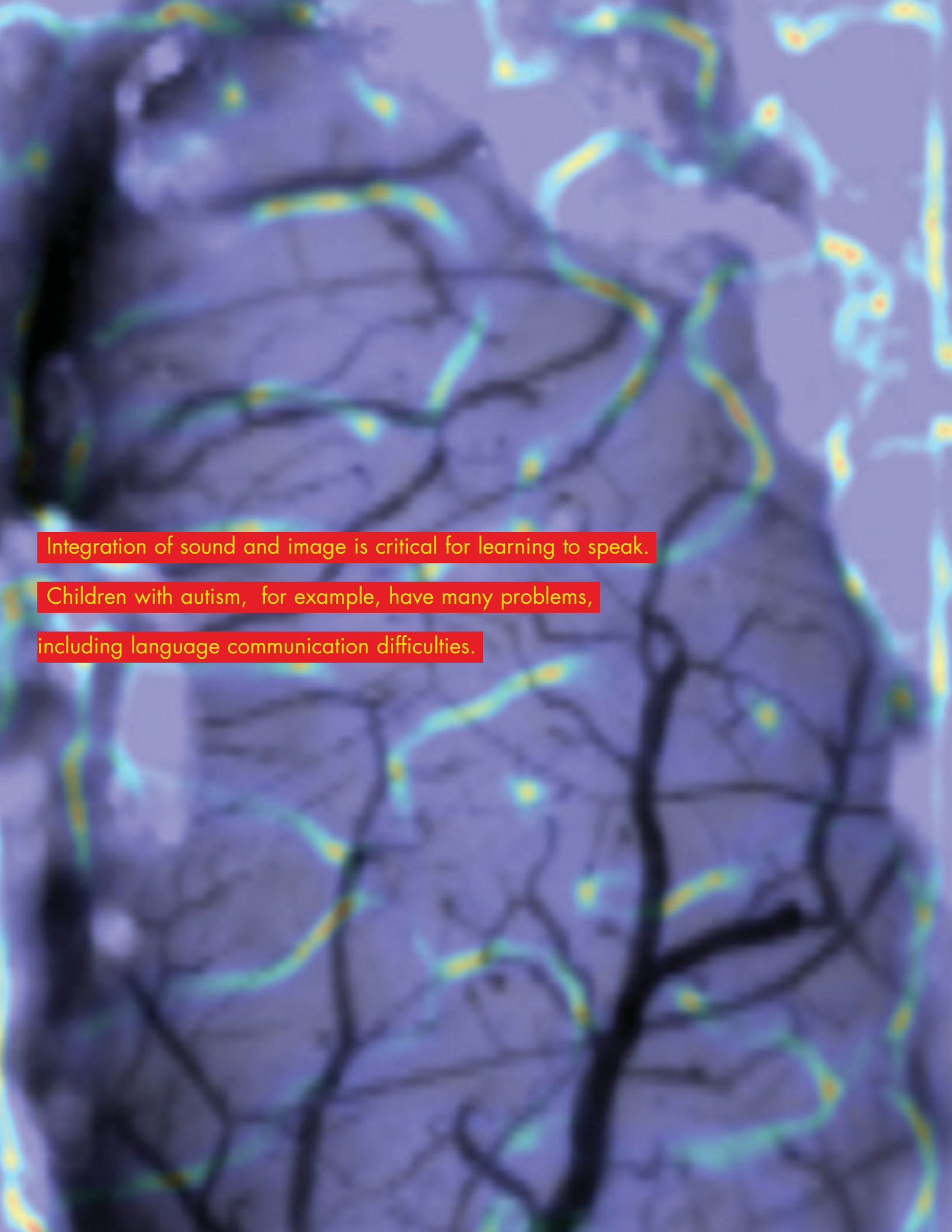
"We're trying to understand the system and its limits. When we do subject our body to movements that are hazardous, when is it critical to protect the body? How do you protect the body? This is where neuroscience comes to grips with physics."

Fire truck or red Ferrari

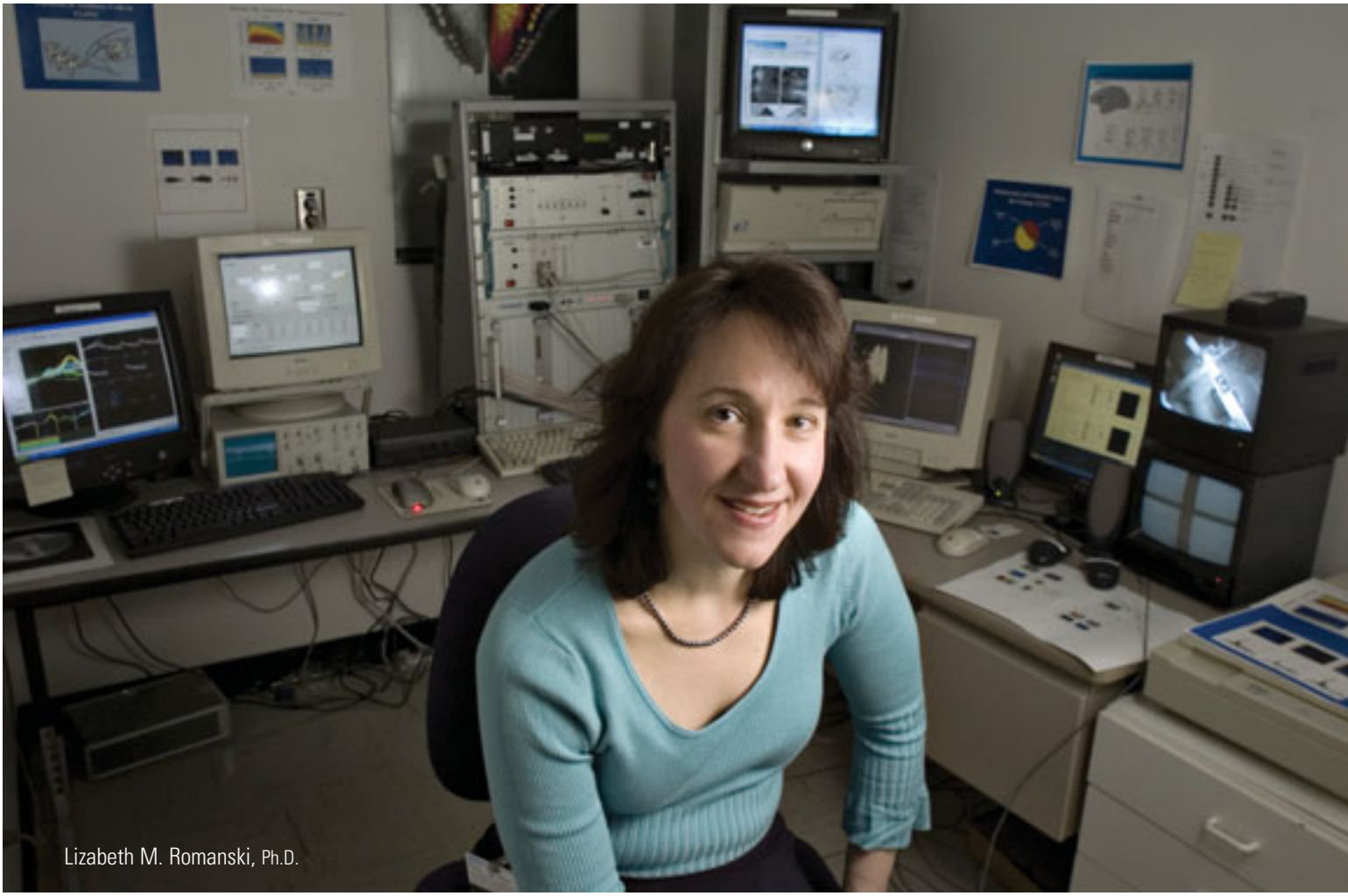
During waking hours at least, the brain brings together information about what is seen and what is heard — the image of the car and the sound of its horn, for example, or a call from a person in a crowd.

Lizabeth M. Romanski, Ph.D., associate professor of neurobiology and anatomy, examines the role of cells in the frontal lobe of the brain in this vital process. She studies how we identify people we know and people we don't know, how we understand things that are being said, how what we say is combined with facial gestures when we say it. She records live brain cells as they fire in response to a complex sound or a human word.

"We have found an area in the prefrontal lobe where single neurons are not only responding to sounds but also to faces that match the sounds," said Romanski, whose research is supported by the National Institutes of Health and Cure Autism Now. "The cells identify the subject but also extract additional meaning. These cells are integrating face and voice information. We don't know just yet for what particular task. We're trying to find out if this area is taking information and integrating it to



Integration of sound and image is critical for learning to speak. Children with autism, for example, have many problems, including language communication difficulties.


Lizabeth M. Romanski, Ph.D.

determine who someone is or to perform another task. In what context do the cells integrate this information?"

Romanski records brain neuronal activity while a subject is shown photographs or videos of another subject vocalizing in combination with sounds that match the image and others that do not match.

"We think it is very important that sounds match with images and that the brain is integrating something meaningful rather than responding to any two auditory and visual events that happen," Romanski said. "There are big implications for this area of the brain being involved in communication processing. This is not just the simple happenstance of a sound occurring along with a visual event. Faces and vocalizations particularly activate this area of the brain. Our recordings show the cells have a bigger response—they are turned on by the combination."

Integration of sound and image is critical for learning to speak. Children with autism, for example, have many problems, including language communication difficulties.

"In language, watching something and imitating it is very important. When a child views her mother's face, it is important that she gets the happy look as her mother coos and talks. If those elements are not integrated, you might really lack the will to speak," Romanski said. "Integrating sound with the appropriate visual counterpart figures prominently in everything — identifying who is speaking or knowing a fire truck is going down the street and not a red Ferrari. Integrating different sensory cues is so critical to what we do."

As Romanski records neuronal responses, she also maps the connections the cells make in other areas of the brain where the cells send information. It's a lot like putting together a schematic of the software and hardware connections of a computer.

"If you are able to map anatomically how things should work, you should be able to detect changes when, say in autism, things do not work," Romanski said. "It might be that a protein is lacking and that lack is not allowing a particular progression to take place. If it is a circuitry issue, you might be able to apply current in the right place to relieve some of the symptoms. Autism is so far-reaching in the systems it affects that I don't think we will find a single cause."

When Romanski discovered that single neurons increased activity when the audio and the visual matched—and behaved differently when they didn't match—she had to reexamine her previous findings.

"The brain is far more complex than you could ever imagine," she said.

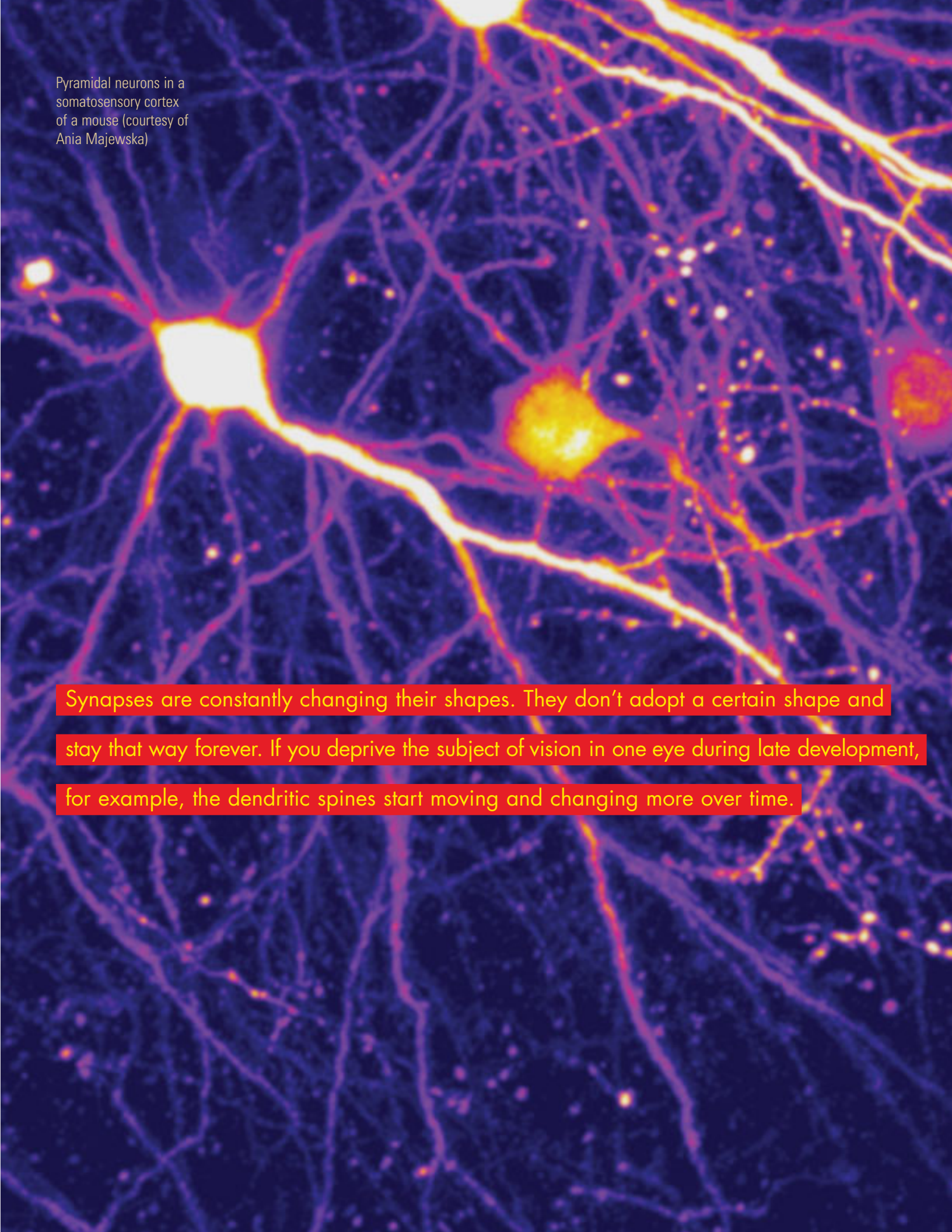
Ania K. Majewska, Ph.D.

Shape-shifting and disappearing synapses

How do networks of neurons get established in sensory areas of the brain to help us understand a busy intersection or the rest of the world around us? How does the sensory world impinge on development? How does the nervous system remodel itself so we can learn and adapt?

To try to answer these questions, Ania K. Majewska, Ph.D., assistant professor of neurobiology and anatomy, uses a laser-scanning two-photon microscope to investigate dendritic spines, the postsynaptic elements of the majority of excitatory synapses in the cortex of the brain. This method provides detailed images and volumes of information not available as recently as 10 years ago. Majewska focuses on the visual system, which, she says, has a well-understood and beautiful structure.

"Synapses are all about creating networks and communication between cells. For a long time, people thought dendritic spine structures became static after they initially set up connections between neurons, and that all the changes afterward were functional," Majewska said. "When you learned something, that meant you got more receptors at this synapse rather than that one. But we are finding that the structure of the synapse is very plastic. Synapses are constantly changing their shapes. They don't adopt a certain shape and stay that way forever. If you deprive the subject of vision in one eye during late development, for example, the dendritic spines start moving and changing more over time. It's a way for a synapse to say: 'I'm not getting enough input. Let me see if I can change my functionality by changing my shape. Maybe I can find a different presynaptic partner by moving around in space and form a better



Pyramidal neurons in a somatosensory cortex of a mouse (courtesy of Ania Majewska)

Synapses are constantly changing their shapes. They don't adopt a certain shape and stay that way forever. If you deprive the subject of vision in one eye during late development, for example, the dendritic spines start moving and changing more over time.


Charles J. Duffy, M.D., Ph.D.

connection that can be more useful.' In this case, vision has a huge impact on structural dynamics of the system and presumably on its function."

In addition to moving and changing shape, dendritic spines, after short periods of deprivation, actually can dismantle completely so new connections can be made to serve a new use, new circuit and new system, Majewska said.

"The system ignores the stuff that isn't useful and gets neurons to do something completely different. When one eye is closed, it uses information from the other eye to get around in the world and it needs synapses to remodel structurally to create new circuits to extract useful information from the open eye," Majewska said. "Changes in the shape of dendritic spines can happen so fast in early development that we can't keep up. Seconds are long in those time scales. The fast remodeling of synaptic structure is a very new idea. It still amazes me that this happens."

The brain probably adapts on a daily basis, changing to accommodate mood as well as the environment.

"The brain's plasticity, the ability of connections to be constantly tweaking themselves to act at optimal level, allows us to be productive," Majewska said. "The process of plasticity can be hijacked though. Look at aging or neurodegenerative and developmental diseases where there is a lot of change, a lot of gain and loss of synapses. Presumably, the system becomes destabilized and that is not good."

Majewska is beginning to study developmental diseases, such as Fragile X Syndrome and Rett Syndrome. "These diseases have major changes at the synaptic level, but there is very little known about the dynamics of these changes. If we can understand what's going on and how synapses are changing in these diseases — with the added arsenal of understanding molecular pathways that govern normal synaptic function and development — maybe we can create custom treatments. There is huge potential for a cure by focusing on synaptic change," she said.

Tissue plasminogen activator, or tPA, is an enzyme that breaks up clots and is used in the treatment of strokes and heart attacks. Majewska has found that tPA also influences the function of neurons and the remodeling of dendritic spines. She is investigating ways tPA might be used to help neurons recover after injury and disease and also to alter neuronal activity to block cancer growth in the brain.

"We're learning more and more and we have so much information that it is difficult to put together," Majewska said. "That's because we have not figured out the code yet — but we're getting there and we will figure it out."

Lost in the optic flow field

A walk on unfamiliar streets can be fun or even a challenging way to learn a neighborhood. But for some, it is disorienting and they need help to find their way. Others can get lost on the street where they live.

Charles J. Duffy, M.D., Ph.D., director of cognitive and behavioral neurology, studies the intersection of navigation and disease. He investigates neural mechanisms and spatial processing in different parts of the brain.

"How do these different parts of the brain communicate and interact to create abilities and how might they contribute to our personal identity: who we are, and what we are capable of, what we see and don't see and what we do and don't do?" Duffy asked. "That's the crux of cognitive and behavioral neurology. It is about people, their abilities, and, in the case of aging and Alzheimer's disease, their disabilities."

In one approach, he observes the electrical activity of single neurons of the brains of subjects trained to play in computer generated virtual environments. Duffy wants to understand how the neuron computes and encodes information about the environment. He engages subjects in different behaviors to see how those behaviors influence the processing of information.

A driver of a car has a variety of sources of information, including what Duffy calls the optic flow field, or the pattern of visual motion.

"It tells you about your self-movement and the structure of environment. You also are aware of discrete objects — another car, a truck, a tree — that tell you about your movement relative to those objects," Duffy said. "Trees don't move, so you know the visual movement of a tree through the field reflects your own movement. Trucks do move, so you know that their visual movement is ambiguous as to whether it reflects the truck's movement or your own. So you must integrate multiple sensory cues to disambiguate the visual movement you see as you move."

Duffy records the firing of neurons when an object violates the optic flow field, as if a truck pulled in front of a car. As subjects change focus from moving to fixed objects, he studies how the choice affects the activity of neurons. Steering through the field appears to involve one set of neuronal processors while pointing to a fixed object involves another. This research has overlapped and melded into research on Alzheimer's disease.

"Our Alzheimer's research started with the understanding that the critical disabling characteristic of early Alzheimer's is the loss of independence because of an inability to find your way," Duffy said. "That inability reflects an impaired capacity to process the visual cues about self-movement that guide us in our daily activities. This feeds into a higher order process of building an internalized representation of your environment that you need to find your way in familiar environments."

That "higher order process" is cognitive mapping. Park a car and the brain should construct a map of the path taken to the car and the path taken away.

"You take information from the optic flow field, from landmarks, from namable cues and non-namable cues — all sorts of things from the environment," Duffy said. "These give you a sense of direction of self-movement. You know about turns, objects, orientation, the effort made in walking. All combine. Neurons fire, record and feed into a network for navigation. The network builds a cognitive map. When you go back to the car, you call up that map. Each cue triggers the next cue."

Duffy also records brain waves to quantify the mapping process and to characterize and understand the impairments in that process that come with aging and Alzheimer's.

"We developed a new way of visually stimulating brain waves to record the responses to optic flow and determine whether subjects can distinguish optic-flow patterns representing different direction of self-movement," he said. "We then showed that these brain-wave patterns can help us predict who will have navigational difficulties in a real world environment."

Specifically, Duffy has found that both normal aging and Alzheimer's cause impairments in the ability to navigate through the environment. The critical factor is a type of motion blindness, an inability to process the patterned visual motion of optic flow.

"Optic flow accompanies observer movement and provides information about the direction, speed, and extent of that movement as well as the 3D layout of the environment. The loss of access to that information may impede the development and utilization of cognitive maps of our environment and our understanding of where we are and how we should move," he said.

Duffy's method of recording reactions to optic flow provides a test for Alzheimer's and for the aging brain.

"This will allow the earliest detection of brain disorders," Duffy said. "It will help us monitor the efficacy of therapeutic interventions and will promote the development of new therapies to cure or prevent mental disorders."

A walk on unfamiliar streets can be fun or even a challenging way to learn a neighborhood.

But for some, it is disorienting and they need help to find their way.

Others can get lost on the street where they live.

University to build home for clinical and translational science

The University of Rochester School of Medicine and Dentistry's Clinical and Translational Science Institute will bring key personnel, resources and programs under one roof in a new facility.

The University will construct a 150,000-square-foot building for the Institute. The proposed site is adjacent to the School of Nursing's Helen Wood Hall. The project's estimated cost is $56 million and construction could begin in 2008. The new building is part of a six-year $430 million initiative to cement the University's role as a national leader in translational science.

Last year, the National Institutes of Health selected the School of Medicine as one of 12 institutions to receive a prestigious Clinical and Translation Science Award (CTSA). The School will receive $40 million from NIH over five years to produce innovative technology and methods that more efficiently and more quickly advance treatments to patients. The CTSA is the largest grant ever from NIH to the University.

David S. Guzick, M.D., Ph.D., dean of the School, is principal investigator of the CTSA. Thomas Pearson, M.D., M.P.H., Ph.D., senior associate dean for clinical research, is co-principal investigator. Sixteen of the School's most accomplished scientists lead the 11 components of the award. More than 80 faculty members played an important role in the grant.

Concentrating clinical and translational investigators and an extensive research infrastructure in one building will create a magnet for government, industry and foundation grants and a significant local resource for public health policymakers, advocates and grassroots organizations.

The new building will bring together senior leadership for clinical research, human subject protection, research contract administration, technology transfer and regulatory compliance as well as professionals in biostatistics, informatics, epidemiology, outcomes research, clinical pharmacology and health economics.

The new building is part of a six-year $430 million initiative

The Clinical Trials Coordination Center, the Neuromuscular Disease Center, the National Center for Deaf Health Research, the Heart Research Follow-up Program and others will get new homes in the building, as will the Center for Community Health and other outreach activities. Low-risk clinical studies will be conducted there. Education and training programs funded by the NIH award will be based in the new building.

The new building will allow the School to increase the number of clinical and translational investigators through promotion and recruitment. Approximately 30 to 50 new research positions could be created over the next several years.

Relocation of the Department of Biostatistics and Computation Biology and clinical cardiovascular research programs to the new facility will open up the ground floor of the MRBX, the research building adjacent to the Kornberg Medical Research Building. Renovation will create a 20,000 square feet of state-of-the-art basic science laboratory space, which could accommodate 12 new principal investigators and their support staffs.

Faculty and staff from the Department of Community and Preventive Medicine now located in Helen Wood Hall will move to the new building. This will allow the School of Nursing to expand its research and education activities. The General Clinical Research Center will move from Strong Memorial Hospital to a site close to the new building. This will increase accessibility for study participants and allow expanded services. The vacated space will be converted to much-needed patient rooms.

Rochester scientist wins major Alzheimers's research award

By Tom Rickey

A University of Rochester School of Medicine and Dentistry researcher who is pioneering a new approach to Alzheimer's disease has received a major national research award.

Berislav Zlokovic, M.D., Ph.D., professor of neurosurgery and neurology, received the MetLife Foundation Award for Medical Research in Alzheimer's disease in February in Washington, D.C. He received the award along with David M. Holtzman, M.D., of the Washington University School of Medicine in St. Louis. Each received $50,000. A $200,000 research award also was presented to their institutions.

Berislav Zlokovic, M.D., Ph.D.

Zlokovic was recognized for a string of scientific accomplishments that have put physicians and scientists back in touch with the vascular roots of the disease and opened up new avenues to counter the devastating effects of Alzheimer's. Zlokovic is looking not only at the damage to brain cells but also at the underlying difficulties in the vascular system, and at the crucial role of the blood-brain barrier in the disease process.

"Dr. Zlokovic's research is a great example of how insights gained in the laboratory can bring new hope around the globe for patients with Alzheimer's disease and their families," said David Guzick, M.D., Ph.D., dean of the School of Medicine and Dentistry.

Zlokovic has shown that the brain's vascular system and the activity at the body's blood-brain barrier play a key role in ridding the brain of the toxic amyloid beta that speckles the brains of Alzheimer's patients. His team has identified much of the molecular machinery that allows amyloid beta to sidestep the body's safeguards and enter the brain, and he has discovered the molecules that falter when the toxic protein accumulates in the brain. He has also demonstrated several strategies for preventing or lowering amyloid beta accumulation in the brain.

In research at the University's Frank P. Smith Laboratory for Neuroscience and Neurosurgery Research, which Zlokovic directs, he is working on ways to increase the action of molecules that haul amyloid beta away and lessen the activity of molecules that escort the toxic protein into the brain. Partly as a result of Zlokovic's work, new drugs that target these molecules are being tested in people in a completely new effort to prevent or slow the progression of Alzheimer's. Such drugs would complement other current medications that doctors use to treat patients with the disease.

Recently, Zlokovic's team identified a link between decreased activity of a vascular gene and dysfunction in the blood vessels of Alzheimer's patients. When scientists restored the effects of the MEOX-2 gene at the blood-brain barrier, they noticed growth of new blood vessels, reduction in the death of cells and improved clearance of amyloid beta out of the brain.

Zlokovic also is known internationally for his work on stroke. A decade of his research stands behind a new approach to treat acute stroke that is now being tested in Rochester and in three other cities around the nation. The experimental treatment is a form of a medication, Activated Protein C, which doctors now use to treat sepsis. Zlokovic has shown that the compound offers promise for stroke patients as well.

Zlokovic also is the founder of Socratech, a Rochester biotech company searching for new treatments for Alzheimer's and stroke.

Research dean named at SMD

Stephen Dewhurst, Ph.D., Dean's Professor of Microbiology and Immunology, has been named senior associate dean for basic research at the University of Rochester School of Medicine and Dentistry.

The senior associate dean for basic research is charged with fostering a research environment that drives scientific breakthroughs, supports multidisciplinary collaboration and translates basic science into new treatments for major diseases.

Stephen Dewhurst Ph.D.

David S. Guzick, M.D., Ph.D., dean of the School of Medicine and Dentistry, described Dewhurst as an exremely accomplished researcher and award-winning educator who is highly respected by his peers.

Dewhurst earned his Ph.D. from the University of Nebraska Medical Center in 1987, followed by postdoctoral training at Columbia University and the Harvard School of Public Health. His doctoral and postdoctoral work focused on the mechanisms by which HIV and related viruses cause disease. He joined the faculty in 1990, became Dean's Professor of Microbiology and Immunology in 2002, and associate chair of that department in 2005.

He has more than 20 years experience as a molecular virologist, developing novel methods for the delivery of experimental HIV and herpes vaccines. He also made key discoveries as part of a team that in October 2006 received a $7 million grant from the National Institutes of Health to develop experimental drugs against neuroAIDS.

Continued on page 72

University physician to lead national residency organization

Donald R. Bordley, M.D.

Donald R. Bordley, M.D. (R'80), associate chair of medicine and director of the Categorical Internal Medicine Residency program at the University of Rochester School of Medicine and Dentistry, has been chosen to lead an international organization dedicated to improving and supporting the graduate education of doctors in internal medicine.

Over the next three years, Bordley will serve as president-elect, president, and then past-president of the Association of Program Directors in Internal Medicine (APDIM). With a membership of over 1,900 individuals from 377 medical schools and teaching hospitals, APDIM represents nearly all of the accredited internal medicine residency programs in the United States, Puerto Rico, and Canada. The announcement was made at the APDIM Spring Meeting in San Diego, Calif., in April.

An undergraduate of Yale University, Bordley received his medical degree from Johns Hopkins University before serving his residency and fellowship in general internal medicine at Strong Memorial Hospital. He is currently the University of Rochester's William L. Morgan Professor of Medicine.

Bordley has headed residency programs at Rochester General Hospital and the University of Rochester Medical Center since 1981. He is the recipient of numerous teaching awards, including the American College of Physicians' Laureate Award, the University of Rochester Alumni Gold Medal Award for Teaching Excellence, and has won both the Keith Miner Ford Award for Excellence in Teaching and the Harry L. Segal Prize for Excellence in Third Year Teaching two times.

"We are fortunate to have Dr. Bordley heading our internal medicine residency programs," said Paul Levy, M.D., who was acting chair of medicine at the School of Medicine and Dentistry. "His superb teaching and mentoring skills have positively influenced the careers of hundreds of physicians in training. He has also developed innovative teaching strategies to enhance learning in today's challenging health care environment."

"It is not surprising that APDIM looked to Don Bordley for national leadership in setting current standards for graduate medical education in internal medicine, and creating a vision for its future," said David S. Guzick, M.D., Ph.D., dean of the School of Medicine and Dentistry. "Dr. Bordley has taken Rochester to the forefront of contemporary training in internal medicine, crafting a residency experience that attends to the realities of both inpatient and outpatient practice, and both generalist and specialist care."

As a member of APDIM since 1981, Bordley has served on its leadership Council and Accreditation Committee, co-chaired its Residents as Teachers Task Force, and represented APDIM on the Educational Innovations Project subcommittee of the Residency Review Committee for Internal Medicine. Bordley is the first William L. Morgan Professor in Medicine.

We are fortnuate to have Dr. Bordley … his superb teaching and mentoring skills have positively influenced the careers of hundreds of physicians in training.

Worldwide Parkinson's disease will double in 25 years

By Mark Michaud

The number of individuals with Parkinson's disease in 15 of the world's largest nations will double over the next generation, according to a study published in the journal *Neurology*. The study highlights the significant challenge facing countries with rapidly growing economies, particularly in Asia, many of which are ill prepared to meet this impending public health threat.

While infectious diseases have attracted the greatest attention from international donors, it is non-communicable chronic diseases, such as Parkinson's, that represent a far greater burden in terms of economic and social cost to developing nations.

University of Rochester neurologist Ray Dorsey, M.D., and a team of researchers examined the projected population growth in the five largest countries in Western Europe (France, Spain, Germany, the United Kingdom and Italy) and the 10 most populous nations worldwide (China, India, Indonesia, the

United States, Brazil, Pakistan, Bangladesh, Nigeria, Japan and Russia). They then projected the prevalence of the disease by age group in each country. Their research estimates that the number of individuals with Parkinson's disease in these 15 countries will grow from 4.1 to 8.7 million by the year 2030. While the number of individuals with the disease will nearly double in the United States to 610,000, the greatest growth will occur in developing countries in Asia. By 2030, an estimated 5 million people in China will have the disease.

"The bulk of the growth in Parkinson's disease in the next 25 years will not be in the United States and Europe but in other places, namely China, where Parkinson's may not be viewed as a major public health problem," said Dorsey. "This growth will occur in societies where there is very limited infrastructure in place to diagnose individuals, much less address their medical needs or the societal impact."

Many individuals in the developing world do not receive appropriate care and may not even be aware of their diagnosis. Dorsey and his colleagues noted that in door-to-door surveys in Bolivia, for example, none of the individuals that were found to have Parkinson's disease had ever seen a physician for their problem.

In terms of the rise in chronic diseases, the key factor is not overall population growth but rather the number of people over age 65 and thus at risk of developing Parkinson's and other chronic conditions.

Taubman named chairman of Department of Medicine

After a national search, Mark Taubman, M.D., has been appointed chairman of the Department of Medicine at the University of Rochester School of Medicine and Dentistry.

Mark Taubman, M.D.

Taubman, who has been chief of cardiology since 2003, becomes the Charles E. Dewey Professor of Medicine, overseeing the single largest department within the School of Medicine. He will continue serving as director of the Cardiovascular Research Institute. According to Jeffrey H. Peters, M.D., the Department of Surgery chair who led the search, Taubman's selection was a natural choice.

"After nearly nine months of effort, in the end the search committee felt strongly and unanimously that we had the right mix of leadership, skill, talent and humanism in one of our own — Dr. Mark Taubman," Peters said.

… we had the right mix of leadership, skill, talent and humanism in one of our own."

As chair of medicine, Taubman succeeds Bradford C. Berk, M.D., Ph.D., who became senior vice president for health sciences and CEO of the Medical Center and Strong Health last August.

"Mark is an accomplished researcher, clinician, and educator, nationally recognized in all three areas," said David S. Guzick, M.D., Ph.D., School of Medicine dean. "He has the knowledge, experience, personality, drive, and depth of commitment to be a stellar chair of medicine."

Taubman joined the University of Rochester from Mount Sinai School of Medicine and is credited with significantly advancing that school's M.D.–Ph.D. program. Since Taubman took over leadership of cardiology, overall funding for research in the unit has increased by 11.8 percent to $9.5 million by the end of 2006.

He also has been the guiding force behind the expansion of cardiac patient care services, strengthening treatments for those with heart arrhythmias and heart failure, adding new preventive cardiology programs such as the women's heart program, and forging strong regional services.

Taubman is a graduate of the New York University School of Medicine who interned at Peter Bent Brigham Hospital before completing his medicine residency and cardiology fellowship training at the Brigham & Women's Hospital. He has held academic appointments at Harvard Medical School, Boston's Children's Hospital Medical Center, and Mt. Sinai.

"Mark has clearly earned the respect of his colleagues within the Department of Medicine and across the country. He is a brilliant scientist, skilled administrator and an accomplished clinician and teacher," Berk said. "He is the ideal person to lead the department and help the Medical Center take full advantage of the opportunities that lie ahead."

Taubman also recently was named editor-in-chief of the journal *Arteriosclerosis, Thrombosis and Vascular Biology* (ATVB), one of five medical journals produced by the American Heart Association (AHA). In conjunction with the appointment, the journal offices will move to the University.

$20 million in NIAID funding boosts AIDS Treatment, vaccine research in Rochester

The University of Rochester Medical Center will continue to play a leading role in the nation's efforts fighting AIDS, with more than $20 million to be directed to Rochester doctors and researchers.

The funding comes from the National Institute of Allergy and Infectious Diseases, which selected the University as one of 60 U.S. and international institutions to be funded for the next seven years as HIV/AIDS Clinical Trials Units.

School of Medicine and Dentistry researchers are international leaders in searching for a vaccine and testing new treatments, thanks largely to the participation of more than 3,000 Rochester-area residents who have taken part in treatment and vaccine studies. The School is the only institution in the nation to be part of both efforts since their inception by the federal government.

Nearly every one of the more than 20 drugs now available to treat AIDS has been tested in Rochester, which is the site of one of the original 11 AIDS treatments units established by the National Institutes of Health in 1986. Currently more than 900 patients with HIV are cared for by doctors at the University's AIDS clinic at Strong Memorial Hospital.

"It's absolutely critical to develop a vaccine to effectively control this epidemic," said Richard Reichman, M.D., professor of medicine, microbiology and immunology, and chief of the infectious diseases division, who heads the University's AIDS research and treatment efforts. "The number of people who are becoming infected continues to increase dramatically. Many people are under the mistaken impression that the problem has been solved. That's just not true."

Rochester's HIV vaccine efforts are led by Michael Keefer, M.D., professor of medicine and director of the University's HIV vaccine trials unit. Keefer also serves as associate director of scientific administration for the international HIV Vaccine Trial Network.

"The vaccine program is unique in the fight against AIDS, as the vast majority of our participants are normal healthy people from everyday walks of life, who do not have HIV, and in fact are not even at risk for acquiring the infection. It is truly a community collaboration and is something the entire community can be proud of," said Keefer.

More than 900 people in the Rochester area have taken part in HIV vaccine studies, making Rochester one of the top cities in the world for participation. Currently, the unit is involved in 14 studies.

Rochester scientists are also leaders in studying the phenomenon of resistance to antiviral medications in patients. Research on that front is one reason why today's medications are so much more successful compared to drugs available a decade ago.

The funding announced by NIAID marks a major reorganization of the nation's research effort aimed at AIDS. The reorganization means a major expansion of the international portion of AIDS research funded by NIAID, and it brings together under one umbrella six different AIDS research networks. Rochester is involved in two, the search for a vaccine and the evaluation of new treatments through clinical trials.

NIH grant establishes new flu center to improve vaccines

By Greg Williams

The National Institute of Allergy and Infectious Diseases (NIAID) has awarded $26 million to a research team at the University of Rochester Medical Center to establish the New York Influenza Center of Excellence (NYICE).

David Topham, Ph.D.

The goal of the new center is to make future influenza pandemics less deadly. John J. Treanor, M.D., professor of medicine and of microbiology and immunology at the School of Medicine and Dentistry, is the principal investigator for the NYICE. The School of Medicine is one of only six institutions nationally that together will receive approximately $138 million in new flu research funding over seven years.

Each new center will focus on basic research, surveillance studies or both. Teams will elucidate the molecular and environmental factors that influence the transmission and evolution of flu viruses and further study the immune system's reaction to them. Others will seek to identify strains with pandemic potential, to create new vaccine candidates or to bolster pandemic preparedness.

"The current strategy of relying on vaccines that match each year's particular strain imposes severe limitations on our ability to prepare for a pandemic," said Treanor (M'79). "Our goal is to transform our understanding of influenza through intensive and synergistic exploration of the virus, the human host, and the immune system. We hope that this will lead to more effective control of the viruses through a single vaccine that can be effective against many strains."

David Topham, Ph.D., associate professor of microbiology and immunology at the School, is co-director.

The NYICE projects include:

- Study how T cells and B cells recognize qualities shared by many different influenza strains on the way to designing a vaccine that would confer permanent immunity.
- Determine the specific proteins within the virus that turn on "helper" T cells, causing them to attack infected cells and result in better antibody responses to infection or vaccination.
- Understand how immune cells communicate with one another in response to infection and vaccination.
- Explore how the viral protein, hemagglutinin, changes as avian viruses genetically jump from birds to mammals. The protein is involved in the ability of the virus to stick to mammalian cells, a first step in invasion. This project will be led by scientists at Cornell University.
- Study the properties of viral polymerase, the enzyme used by the virus to copy its genetic material, and learn how it becomes better at promoting viral reproduction in mammalian cells.

"We aim to better understand the human immune response to vaccination and infection so that we can improve vaccines against emerging influenza viruses, like the bird flu, that pose the risk of causing a pandemic," Topham said.

Researchers will follow college students, healthy adults and 150 families with young children in the Rochester area for seven years, monitoring them for exposure to flu and responses to vaccination.

"We are tremendously excited about the new center as a powerful example of cutting-edge translational science at our medical school," said David S. Guzick, M.D., Ph.D., dean of the University of Rochester School of Medicine and Dentistry.

John Treanor, M.D.

For more information, see the dean's newsletter online at: *www.urmc.rochester.edu/smd/about/newsletterArchive/newsletter04112007.cfm.*

An alumnus in Addis Ababa

Rick Hodes treats, heals, adopts and finds a home in Ethiopia

As medical director for Ethiopia for the American Jewish Joint Distribution Committee, Rick Hodes, M.D. (M'82), is responsible for the medical care of the Falash Mura, Ethiopians who want to immigrate to Israel. He also is the medical advisor to Mother Teresa's Mission for Sick and Dying Destitutes in Addis Ababa. Hodes often takes sick children from the mission to his home in Addis Ababa to care for them and sometimes sends them to Ghana or the United States for treatment. He also has adopted several boys he first encountered at the mission, including two with tubercular spondylitis and one with growth hormone deficiency. Hodes, a religiously observant Jew, does not impose his religion on the children, who are mostly Ethiopian Orthodox Christians. Hodes took time out from his remarkable work for an e-mail conversation.

Describe the living conditions and health status of the Falash Mura.

Let me back up a bit. I've been a doctor here for nearly 20 years. I came in 1985 to teach at the medical school as a Fulbright lecturer. Did that for 2½ years, then left. I came back in 1990 to be in charge of the health care of the Ethiopian immigrants to Israel. I have been the doctor for about one percent of Israel before they became Israelis. At various times I have been in charge of up to 25,000 Ethiopian immigrants to Israel, 50,000 Rwandan refugees in Zaire, 25,000 Kosovo refugees in Albania, and now about 10,000 potential immigrants to Israel.

Back in the early 1990s, TB was a major problem. We started a 6-month, 62-dose DOT (directly observed therapy) regimen, which worked well. We see a lot of very common stuff: colds, diarrhea, intestinal parasites, and some hypertension. Rheumatic heart disease is not uncommon. The death rate in the population I care for is far lower than the death rate in Ethiopia.

What happens during a typical day for you as a doctor and as a medical director?

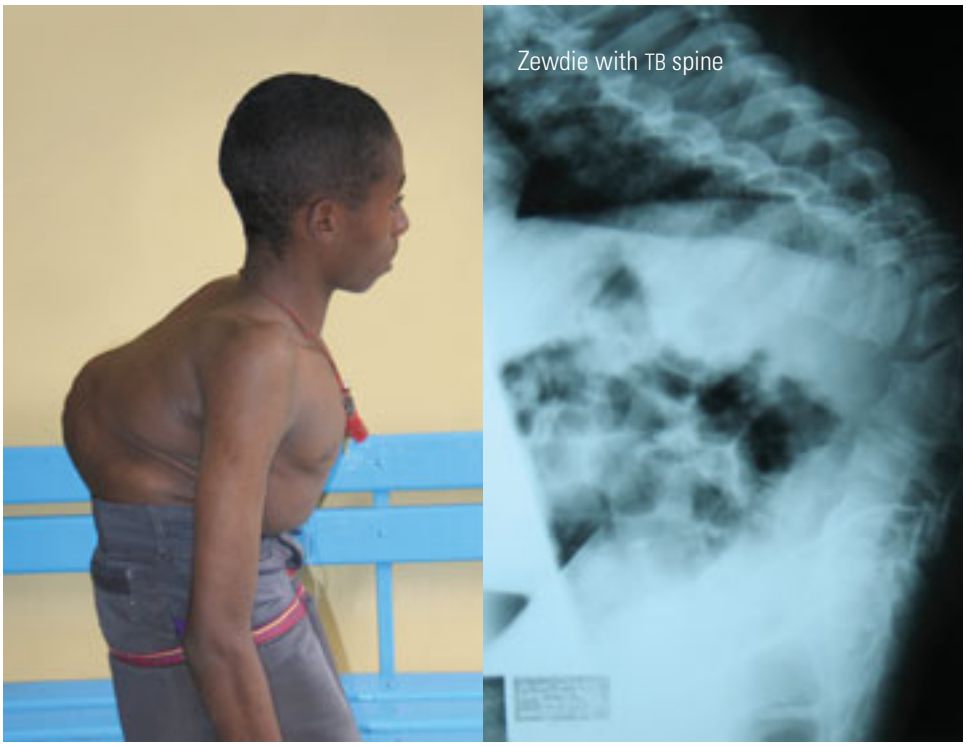
Today, for example, I got up at 6 a.m. when my son came in to ask me for money for something or other. I had been planning on going to Gondar today (my clinic there follows 7,500 people), but last night one of my kids developed a fever of 39.5 and shaking chills, so I canceled the trip so that I could observe him. He has titanium rods in his back and I wanted to make sure that he was OK.
I check e-mails on my slow dial-up connection as the kids are getting ready for school. Then I drove off to pick up lab results I had ordered yesterday: a chest x-ray and bloodwork on a 21-year-old with metastatic osteosarcoma, and the uric acid level on a 5-year-old with non-Hodgkin's lymphoma. Then I stopped at Mother Teresa's Mission to discuss this week's chemotherapy with the nuns.
I recently started a small cancer center there, and right now we're treating a 10-year-old with desmoid tumor of the mandible, a 10-year-old with Wilm's tumor, three kids with osteosarcoma, and a 6-year-old with Hodgkin's disease getting a complicated regimen called Stanford-5.

I have developed an interest in spine disease. We see a lot of severe scoliosis and also TB spondylitis. I get a new TB spine almost every week. I am able to treat them and often these days can get surgery for them in the States or in Ghana. So today, I gave my Ethiopian assistant a list of four patients who need spine work-ups (x-rays, bloodwork, PFTs, EKG, and MRI) so that they can be sent for surgery overseas. Most of the TB spines have at least 90-degree angles in their backs; some have well over 120 degree angles. As I type this, I have an 18-year-old orphan girl sleeping on my couch who just had major spine surgery in Ghana by the FOCOS team there. (FOCUS is The Foundation of Orthopaedics and Complex Spine founded by Oheneba Boachie-Adjei, M.D.) She had some neurological damage, and I wanted to keep her here so I could see her every day and also so she could eat better and get stronger.


Hodes in traditional Ethiopian dress at Easter.

All day long I get "missed calls" from poor patients who are phoning me, and I call them back. A one-armed priest (who had his arm amputated for chondrosarcoma) phoned me from Gondar to tell me that his son has a terrible problem: he's accused of killing someone's horse, and he needs $100 to pay his fine. I had my assistant transfer the money to him. A young man with endocardial cushion defect phoned to see if I had any news on his care.

I went to the U.S. embassy and used their Internet to order cancer meds from India. It costs $700 to cure Hodgkin's disease with ABVD imported from India. And I corresponded with osteosarcoma experts to see if anyone had any ideas about my patients with metastatic disease. I sent an e-mail out about which bisphosphonate might be best to try for metastatic disease to people who are working in this field. Then I met with an Ethiopian doctor from Washington, D.C., met with my head nurse about our difficult patients, and did office work for an hour.
I saw a patient with an abnormal EKG. She has fixed-splitting of one of her heart sounds, so I suspect that she has an atrial septal defect. I sent her for an echo. We have a program to assist Gondar Medical College, and I have two Gondar doctors going to Israel for training and needed to deal with their visa issues. I sent a memo to my office about my meeting yesterday at the med school in Addis Ababa about expanding our cancer program there. We have been funding free treatment of Hodgkin's disease, and now want to add testicular cancer, Wilm's tumor, and choriocarcinoma, all largely curable malignancies



Zewdie with TB spine

— but we need to come up with funding to do that.

I answered e-mails from a group of George Washington University med students coming in March about the security situation here. I got an e-mail from a med student in Virginia who wants to volunteer here, and an e-mail from a cardiologist saying that his teenage sons are giving him a hard time so he's not going to be visiting this month. Now I have to look for a volunteer cardiologist to come here to teach. I came home for dinner and checked my son (whom I had spoken to by phone several times today to make sure that his fever had not returned) then napped before writing this. Normally I swim at least a kilometer, but have not made it today. I'll go tomorrow morning before starting work.

What drew you to this work?
Why have you stayed with it so long?
What keeps you going?

Well, I had planned on coming to Africa for a year after residency in 1985. It's now been nearly 19 years. Everything is more difficult here. I chose my son's growth hormone preparation not by ease of use but by level of stability if there is no electricity. What keeps me going is seeing the results of my efforts — lowering the death rate of the immigrants to Israel, sending kids for spine surgery, and treating kids with cancer then funding their education.

You also put in many hours at Mother Teresa's Mission in Addis Ababa and you often pay out of your pocket for medical care for people from the mission at private hospitals. Why do you take on this additional work?

Over a decade ago, I was following a kid with rheumatic heart disease who was discharged from the hospital to Mother Teresa's Mission. I started volunteering there. Then I took some of the patients into my home so I could follow them easier. It took off from that. People ask me if I have a private practice. I joke that I do, but it costs me money. Anyway, I like helping these people, and there's nobody else who seems interested in the patients or disease that I'm focusing on.

Did any part of your Rochester medical education play a role in your decision to work in Ethiopia or the mission?

Well, I really appreciate my Rochester education. It was very intense, very well thought out. We got a lot of individual attention. I knew that I was interested in international health when I entered med school. Twice Rochester gave me funding for this, so I spent the summer after my first year in med school in Bangladesh, and the winter of my senior year in southern India. I really appreciate that, and now when I give my meager contributions to the University, I allocate them to med students going overseas. If I win the lottery, Rochester students will benefit!

How often do you take breaks?

Well, I fly a lot. I go to Gondar, where I have a clinic. I bring sick immigrants to Israel a few times a year, and I fly back to the States to deal with donors. This year I have flown about 100,000 miles. Last year it was more. I don't have a lot of time for breaks, but I do try to get a couple of quiet weekends in and occasionally hang out on the Kenyan Coast or in London. I teach in Israel and in San Antonio. In the summer, we try to hang out with family in Colorado. But I'm usually in Ethiopia. That's my home and that's where my family is.

What do you want to say to your Rochester medical school classmates?

What to say? Perhaps that they can come and volunteer to teach here if they like. It's a different world medically. I am not a Luddite, but you can do a lot without a lot of technology.

Rick Hodes can be e-mailed at
AJDC@ETHIONET.ET

Hodes with Zewdie and his father after Zewdie's surgery.

Honors for students and a father

Alicia Zysman Cromwell experienced a singular honor twice in one night. She was inducted into Alpha Omega Alpha, the national medical honor society, and, during the same ceremony in February, presented the chapter's award honoring a clinical volunteer faculty member to her father, Jules Zysman, M.D. (R'80). The honoree is selected by the graduating class.

"I was nervous but I was very happy that he was getting recognition for what he has worked so hard for," Zysman Cromwell said. "He loves medical students and he's committed to their education."

Jules Zysman, a family physician, practices in Honeoye Falls, N.Y., with his wife, Nadette Jacob, M.D. (R'80). He has been teaching Rochester medical students and residents for the past 26 years. He volunteers to have 1st and 2nd year ambulatory clerkship students at the same time as 3rd and 4th years on their clinical electives. His student reviews have consistently been so glowing that he recently was asked to lead a class on how to be a better preceptor.

"Amazingly, after 26 years leading the hectic, and often underappreciated, life of a small town family doctor, Jules Zysman, is still energized, idealistic, and loves his patients," his daughter said. "A striking testament to his passion and belief in primary care is that just about every member of our graduating class who is planning on pursuing primary care has rotated with him at some point in their four years."

She closed her remarks by saying: "Dad, as a physician, father and human being, you are truly inspirational to me and so many of my classmates."

Receiving the award from his daughter was a "surprise and a thrill," he said. Zysman was inducted in Alpha Omega Alpha as a medical student at Rutgers University.

"She's taken a little from me and her mother but her real role model is her mother," he said.

Fifteen members of the Class of 2007 were inducted into Alpha Omega Alpha. In addition to Zysman Cromwell, they are: Katherine Blumoff, Kimberly Corbin, Jessica Felt, Waseem Khan, Joy Knopf, Benjamin McClintic, Catherine Moore, Alexis Mottl, Sarah Peterson, Anthony Petraglia, Gretchen Rickards, Andrew Sauer, John Scherer, and Karolina Zareba.

James Cox, M.D., Class of 1965, was the alumni inductee. He is professor of radiation oncology and director of the division of radiation oncology at M.D. Anderson Cancer Center. John Bisognano, M.D., associate professor of medicine, and Garrett Riggs, M.D., assistant professor of neurology, were the faculty inductees. The resident inductees were Chris Burke, M.D., Tran La, M.D., and Ryan Nelson, M.D.

A doctor at Fort Defiance

A sense of community in an isolated world

Margaret Talley Bartholomew, M.D., graduated from the School of Medicine and Dentistry in 2000. She did a pediatric internship at Yale New Haven Hospital and completed her residency at Dartmouth Hitchcock Medical Center, where she met Michael Bartholomew, who is now her husband. After residency, they moved to Madison, Wisc., where her husband did his pediatric training. While in Madison, Margaret worked as a pediatric hospitalist for three years. Michael is a Kiowa Native who received an Indian Health Service scholarship to Dartmouth Medical School. His scholarship requires a year-for-year payback by serving a federally recognized tribe. In July 2006, Margaret and Michael began working at Fort Defiance Indian Hospital on a Navajo Reservation in Arizona. They expect to practice there for four years. Their first child, a daughter named Isla Talley Bartholomew, was born Feb. 14. Margaret answered a few questions about work and life at Fort Defiance.

Why did you choose Fort Defiance Indian Hospital?

We looked at several different areas, including urban and rural Indian Health Service sites as well as tribal health facilities in the Midwest and Southwest. Over the last several years, we have met a number of people who had worked as pediatricians at various rural IHS service units on the Navajo Indian Reservation. Everyone that we spoke with had positive experiences living and working on the Navajo Reservation. At most Navajo IHS facilities, pediatricians work in the clinic, do inpatient care, and take care of newborns. Pediatricians also have opportunities to get involved in public health projects and take leadership roles. I think that I have learned more in six months here than I did working as a pediatric hospitalist for three years.

What has surprised you about Fort Defiance and practicing on a reservation?

The most surprising thing to me is that there are people in this country in 2007 who are living under such impoverished conditions. The Navajo Nation is approximately the size of West Virginia and has roughly 225,000 people, more than half of whom are living below the poverty level. Most families lack plumbing, do not have telephone service and heat exclusively with wood. As you might expect, there are a lot of social problems on the reservation that go hand in hand with poverty. There are higher rates of drug and alcohol abuse, suicide, violence, SIDS, infectious disease and accidents on the reservation.

What would surprise your Rochester classmates about the hospital and practicing on a reservation?

My classmates would be surprised to learn that Fort Defiance Indian Hospital is a state-of-the-art hospital. It is about three years old. One of the nice things is that a lot of services are housed under one roof. FDIH has adult and pediatric inpatient wards, an emergency department, adult and pediatric clinics, a dental clinic with a pediatric dentist on staff, physical, occupational and speech therapy, an eye clinic, ENT, podiatry, social work and inpatient and outpatient pharmacy all at one site. They also would be surprised to learn that we have a traditional Navajo Medicine Man on staff at the hospital. Many Navajo families are comfortable using traditional medicine in combination with Western medicine. We need to learn how to integrate two very different approaches to illness and health. It has been one of the more challenging but rewarding parts of working here.

What is the best thing that has happened so far?

I'd say the people. We have met so many interesting and wonderful people since moving here. A lot of physicians who end up here have had experiences in international medicine or have done rotations during medical school on an Indian reservation. We live in government housing just minutes from the hospital. Everyone who lives in the neighborhood works at the hospital. This is as close to communal living as I have ever experienced. The sense of community is amazing.

What is the biggest challenge?

One the biggest challenges has been getting used to practicing in an environment where there is not subspecialty backup except by phone. The closest tertiary care centers are 2½ hours away in Albuquerque, and six hours away in Phoenix. There are subspecialists who come to the reservation every three to four months. Another challenge has been the isolation, but as we have met more people that has become less of an issue. We do have to drive quite a distance to get to the grocery store or a movie theater.

What do you do for fun?

There are all sorts of great hikes right out our back door. This place seems to attract people who like the outdoors. We are in the high desert at about 7,000 feet and there is plenty of sunshine. Even in the hottest part of the summer, it cools down to the 50s or 60s at night. We do get snow, though it rarely sticks around for very long. Durango and Telluride are about 3½ hours away and many people go there to ski, snowshoe and hike. The Grand Canyon is four or so hours away.

Leon Miller: A man who still has a lot to do

At the age of 94, Leon Miller, Ph.D., M.D. (M'45), professor emeritus of biochemistry and biophysics, soon will complete seven decades at the University of Rochester School of Medicine and Dentistry — and he has no desire to stop.

He started at the School of Medicine and Dentistry in January 1938 as a post-doctoral research fellow in the laboratory of George Hoyt Whipple, the School of Medicine's founding dean. Over the many years, he has taught pathology, tracer chemistry (the use of radioisotopes in biomedical research) and biochemistry. He mentored graduate students, practiced medicine for a few years before concentrating full time on research, and published frequently cited papers. He still interviews many applicants to the School of Medicine. Since the inception of the Double Helix curriculum in 1999, he has served as a tutor for a problem-based learning class called "Molecules to Cells" for first-year medical students.

"The interviews and the class give me a chance to do something useful," Miller said. "Doctor means teacher. In the problem-based session, you don't teach in the traditional way. You lead them on so they can learn themselves. I ask questions. They have to find the answers. You hope they learn that if you like medicine and you want to be in medicine, you can't stop learning. It's a commitment for perpetual learning."

Miller attends Department of Medicine grand rounds, biochemistry and physiology seminars and guest lectures. According to Robert A. Bambara, Ph.D., chairman of the Department of Biochemistry and Biophysics, he is not someone just hanging around.

"He has a lot of vim and vigor. He's a participant. He listens carefully and he asks good, insightful questions," said Bambara, who noted that Miller often arrives at at the office before he does and stays later.

Miller, a Rochester native, is the son of immigrant parents. His father was a wrought-iron worker and his mother a seamstress. During the Depression, he earned his bachelor's degree and doctorate at Cornell University, relying on scholarships and an austere $1-a-day budget. After receiving his Ph.D. in 1937, he found his first job with a New Jersey chemical company frustrating. His brother, Mitch Miller, an Eastman School of Music graduate who already had launched his notable career, introduced him to a music aficionado, Hans Clarke, chair of biochemistry at Columbia University College of Physicians and Surgeons. Clarke had no jobs to offer but soon provided Miller a link to Whipple. Whipple needed a research biochemist to collaborate in his ongoing studies of hemoglobin and plasma protein production. Miller, appointed by Whipple as the Eli Lilly Fellow in Pathology, found himself working with young physicians, learning about medicine and enjoying it. He received permission from Whipple to study medicine while he continued the lab's metabolism studies. Miller worked virtually seven days and evenings every week for four years in order to earn his medical degree in 1945.

He left Rochester briefly, from 1946 to 1948, to become an assistant professor of biochemistry at Jefferson Medical College in Philadelphia. He returned to take a position as associate professor of radiation biology and to head the tracer chemistry section in the atomic energy program. He also taught biochemistry, mentored research studies of doctoral students in biochemistry and intensified his studies of the liver's role in amino acid and protein metabolism, an interest derived from Whipple.

Between 1949 and 1952, Miller and his collaborators developed the isolated perfused rat liver system, in which a liver was kept alive in a sterile closed environment while oxygenated blood containing hormones and nutrients circulated through the portal vessels for up to 24 hours. With easy controlled addition of metabolites and hormones, the system yielded 59 published studies.

Miller and his group produced the first unequivocal demonstration of the direct and antagonistic action of insulin and glucagon on protein, amino acid and glucose metabolism in the liver. They proved the dominant role of the liver in the biosynthesis of the plasma proteins with the exception of the gamma globulins. The article describing these findings became a Citation Classic.

Miller's research "propelled him into the national and international limelight," said George Kimmich, professor emeritus of biochemistry and biophysics.

"He was able to sort out a great many liver functions and understand the various attributes of the liver," said Kimmich, who describes Miller as a man with a gentle and generous nature. "He has not lost ground at all. He still makes people think about what they're doing."

The National Institutes of Health supported Miller's research for 25 years. He received his last NIH grant in 1985, but Miller, who became professor emeritus in 1978, continued his research with private and

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Gift from alumnus to Wilmot Cancer Center will expand research

By Leslie White

John Wallis "Jack" Rowe, M.D. (M'70), former chairman and chief executive officer of Aetna Inc., has donated $5 million to support the James P. Wilmot Cancer Center's comprehensive campaign to expand cancer care and research.

It is the largest single gift from a living alumnus of the School of Medicine and Dentistry and one of the largest private donations to a Medical Center program in its 86-year history.

"This tremendous gift is a testament to the confidence that our alumni have in the quality clinical and research programs at the Medical Center and Wilmot Cancer Center," said Joel Seligman, president of the University of Rochester. "Jack Rowe's gift furthers the University's commitment to provide the highest quality cancer care and research. I am most grateful for his inspirational gift."

Rowe said his family, like many others, has experienced the fear and triumph of a diagnosis of cancer.

"Advances in diagnosis and therapy have made survival with cancer an expectation for many types of cancer. Our gift will enable research in novel areas such as cancer immunology that hold promise for all cancer patients," Rowe said.

The Wilmot Cancer Center is raising $42.5 million to construct a new facility to double clinical and research space, consolidate outpatient cancer care and research laboratories in a single location, recruit additional scientists and build translational research programs to find cures. Rowe's donation brings the five-year campaign total to $30 million.

The laboratories dedicated to translational research in the new Wilmot Cancer Center facility will be named in recognition of Rowe's gift.

"Cancer is one of the most prevalent diseases that we face as individuals and physicians, and providing outstanding cancer care and cutting-edge research is a top priority for the Medical Center," said Bradford C. Berk, M.D., Ph.D. (M'81, PhD'81), CEO of the University of Rochester Medical Center and senior vice president for health sciences. "The Wilmot Cancer Center is key to the future growth of the Medical Center and we are pleased to see Jack Rowe's gift support our efforts."

Rowe was president and CEO of Aetna Inc., from 2000 to 2006. Before joining Aetna, he was president and chief executive officer of Mount Sinai New York University Health. Internationally recognized for his research and health policy efforts for the care of the elderly, Rowe was a founding director of Harvard Medical School's Division on Aging.

"It's exciting to see this level of giving from a fellow alum and Jack Rowe's gift will help the Wilmot Cancer Center become a national leader in the field of cancer care and research," said William A. Peck, M.D. (M'60), University trustee and chair of the Health Affairs Committee.

The Wilmot Cancer Center has adopted an ambitious plan to capture the National Cancer Institute designation as one of the country's top cancer centers. Over the past four years, more than 20 scientists and clinicians have been recruited to bolster research and patient care programs.

A key element of the plan is the construction of a new state-of-the-art, four-story, 163,000-square-foot facility at the corner of East Drive and Crittenden Boulevard, which began a year ago. This new building, set to open in spring 2008, was designed with patient comfort at the forefront and will offer unprecedented levels of privacy, educational opportunities and ease of access.

"Expanding our programs will let people of the Finger Lakes region stay close to home for the very best cancer care," said Richard I. Fisher, M.D., director of the Wilmot Cancer Center and vice president for clinical services at the University of Rochester Medical Center. "The new facility will allow us to better serve the growing number of patients from outside the region coming to Rochester for our expert, multidisciplinary cancer care."

Alumnus creates a legacy that will touch many lives

Robert C. Manchester, M.D. (M'32), who believed in securing education for future generations of physicians, died Jan. 21 at his home in Cupertino, Calif. He was 100.

More than 20 years ago, Dr. Manchester, along with his sister, Winifred Manchester, established a scholarship fund to assist students in financial need as a tribute to their father. The Dr. William C. Manchester Memorial Scholarship Fund has helped 26 University of Rochester School of Medicine and Dentistry students. The fund is now valued at almost $1 million.

Dr. Manchester made sure the fund will grow. Through his will and charitable trusts, the fund will receive at least another $4 million. It will become the largest School of Medicine scholarship fund.

"Robert Manchester's vision and gifts will allow us to help many medical students for years to come," said David S. Guzick, M.D., Ph.D., dean of the School of Medicine. "The fund honors his father and bears his father's name. Robert Manchester did not seek to

have his own name remembered, but we will remember him for his generosity and for his dedication to his medical school."

Dr. Manchester was born in Alliance, Ohio, where his father was a general practitioner for almost 50 years. He graduated from Ohio Wesleyan University and entered the School of Medicine in 1927 before the School had graduated its first class. He spent a year as a research fellow, graduating in 1932 with a master's and a medical degree.

After an internship at Strong Memorial Hospital, Dr. Manchester did his residency at New Haven Hospital in Connecticut. From 1941 to 1946, he served in the U.S. Naval Medical Corps, including 18 months on a destroyer, the U.S.S. O'Bannon, which took part in the Battle of Guadalcanal and several other important engagements. After the war, Dr. Manchester practiced internal medicine and cardiology in Seattle. He served as chief of medicine at Swedish Medical Center there. He retired in his mid-60s.

"He retired after having a stroke, thinking he faced a good chance of dying. But he lived for almost 40 years," said Rudolph Bumgardner 3rd, Dr. Manchester's nephew. "He was a thoughtful, generous person. He was dedicated to his profession and I'm sure he was a very considerate and very knowledgeable physician."

Dr. Manchester loved the outdoors. He rode horses and hiked. He also loved to travel. He hiked in Nepal when he was 75 years old. And in 1995, he and his wife took a trip around the world, flying on the Concorde. He was intellectually sharp and curious throughout his life and still was handling all his investments and financial affairs until just a couple weeks before his death, his nephew said.

Dr. Manchester's first wife, Mary Margaret Bumgardner Manchester, died in 1975. In addition to his nephew, Dr. Manchester is survived by his wife, Dorothy Manchester, of Cupertino, and a stepdaughter, Doree Masters, of Magalia, Calif. He was buried at Bethel Presbyterian Church in Staunton, Va.

University President Joel Seligman with Robert C. Manchester, M.D.

Merit scholarships work as a valuable recruitment tool

Even without an alluring award, Sarah Spencer Welsh might have chosen the University of Rochester School of Medicine and Dentistry.

"Certainly, being offered a merit scholarship pushed forward my decision to attend Rochester," said Welsh, a member of the Class of 2009. "It felt really good to be honored for the work I had done to get to medical school and the financial assistance was very enticing. But the University of

Rochester was already near the top of my list — the scholarship just made me even more sure."

In Welsh's case, the merit scholarship achieved the goal of tilting the scale in Rochester's favor.

"The best students have multiple acceptances. They have a choice. Sometimes a merit scholarship makes the difference in a student's decision to select Rochester," said John Hansen, Ph.D., the School of Medicine's associate dean for admissions. "We want the best and the brightest for every class, obviously. The very best students pull the class along. They raise the bar in expectations and performance."

The large and growing debt burden faced by medical students is a national problem. Tuition alone for this academic year at the School of Medicine is $35,800. More than 90 percent of Rochester medical students receive financial aid. Average debt at graduation exceeds $130,000.

Scholarships to address need are one issue. Merit scholarships are about another — attracting the best students to the School of Medicine. Most medical schools in competition with Rochester for students have significant merit scholarship programs. The School of Medicine has long recognized the need for financial assistance and has a tradition of generous support for students. But merit scholarships have not been a part of the aid arsenal. As recently as a decade ago, the School did not offer any merit scholarships. The Dr. Marvin J. and Nancy Yanes Hoffman Medical Scholarship Fund became the first merit scholarship five years ago.

Two years ago, David S. Guzick, M.D., Ph.D., dean of the School of Medicine and Dentistry, launched a merit scholarship program for awards to applicants with a strong academic record, demonstrated interest in research or academic medicine and unique backgrounds and experience. A merit scholarship in this program provides $10,000 a year for four years. The dean has awarded five scholarships each year since the program began.

"A merit scholarship is another tool we can use to convince top applicants that our School of Medicine will provide the best education and the best environment," Guzick said. "Merit scholarships help ensure the strength and progress of our medical school and the excellence of the next generation of physicians, investigators and educators."

Halee and David Baldwin

At the Whipple Society dinner in 2004, the dean announced a $10 million initiative for medical school scholarships. The increase in scholarship endowment could generate $550,000 a year in new scholarship aid, and would grow across time with additional contributions and with investment returns on the endowment. Many have responded to the campaign; cash and pledges have reached almost $10 million and, if planned giving is added, the total comes to $11.3 million.

The money raised through the campaign will enhance the School of Medicine's ability to address financial need. The campaign also has raised funds and pledges that, so far, have established more than 20 named merit scholarships.

"When these new scholarships mature, they will pay dividends in the students we bring to Rochester and in advancing the reputation of our School of Medicine," Guzick said.

Merit scholarships interested David Baldwin, M.D. (BA'43, M'45) and his wife, Halee Morris Baldwin (BA'44), longtime supporters of the School of Medicine and the University's River Campus. For 50 years, the Baldwins had a summer house on Fire Island. The most recent house, built in 1910, had five small bedrooms and screened-in porches. The Baldwins, who raised four sons, have many fine memories of summer days at the house and the nearby beaches.

"When we couldn't actively pursue tennis, biking and hiking on the beach as we had, the house got to be a chore," said David Baldwin, specialist in kidney disease and chief of nephrology at New York University School of Medicine. He's a professor emeritus now, but he still teaches.

The Baldwins donated the Fire Island house to the University. The house sold to a young doctor and his wife and the proceeds from the sale fund a scholarship on the River Campus and a merit scholarship at the School of Medicine.

"We usually think of need for scholarships. Our merit scholarship will help the school attract top-tier students," David Baldwin said.

Paul H. Fine, M.D. (BA'57, M'61, R'65), had a similar reason for establishing a merit scholarship.

"Aid to needy students is very important," said Fine, professor of clinical medicine at the School of Medicine. "I was the first in my family to go to college. I needed help. I see that merit scholarships are one way we can get the cream of the crop."

Welsh, a 1998 graduate of Brown University with a degree in English and American Literature, qualified as a top-of-the-line student. She had taught in a large public high school. When she decided on medicine as a career, she took her science courses and did research at Harvard University. She also had a record of community service and an interest in academic medicine. Several medical schools accepted Welsh. Her choices narrowed to her state medical school, another medical school that also offered a scholarship, and Rochester.

"Good teaching, thoughtful teaching, with adult learners in mind — that was what I most wanted out of a medical school," Welsh said. "That is a priority here. I didn't find that anywhere else I interviewed … Dr. Hansen expressed such a clear vision for medical education — one that was built around real understanding and practical learning, not just rote memorization. I really wanted to come to a place that had its own identity and mission, not just churning out doctor after doctor, but thinking about how to effectively educate us in medicine in four years, which is such a Herculean and actually impossible task."

As the clock ticked toward noon on March 15, David Lambert, M.D., the School of Medicine and Dentistry's associate dean for undergraduate medical education, emceed a version of *Deal or No Deal* to award several gifts and prolong the tension. The true focus of this dramatic day — the match letters with the decisions on residencies — waited on a table at the front of the Class of '62 Auditorium. After the time finally arrived and students rushed the table, shouts and shrieks of virtually unanimous joy filled the auditorium.

On the page at left, clockwise from the upper left, are: Holly Ann Russell and Richard (Scott) Dent; Namrita Malhi and David Lambert; Jacqueline Zayas, Illena Antonetti, M.D., Tearikirangi Elijah Benioni and Briana Southerland. Above, clockwise from upper left, are Jennifer Corbelli and Jeremy Kimmel; Gregory Wolff and his wife, Karen Wolff; Frank Akwaa, Joanne Moreau, NanaEfua Baidoo, Karolina Zareba, Charles Denman, Justin Brucker and John Scherer.

Enjoying Match Day, clockwise from the upper left, are: Ryan Flanigan; Julie Yee and Barry Fields; John Ok; and Arthur Swann, Trey Swann and Shawana Swann.

University of Rochester/ Strong Memorial Hospital

Matthew Bellizzi, neurology
Tearikirangi Benioni, emergency medicine
Craig Benson, medicine-pediatrics
Natalie Bertoia, obstetrics-gynecology
Sarah Bolduc, medicine-pediatrics
Michael Ferrantino, internal medicine
Ryan Flanigan, orthopaedic surgery
Stephanie Giannandrea, psychiatry
Joy Knopf, urology
Namrita Malhi, pediatrics, child neurology
Benjamin McClintic, internal medicine
Karoline Moon, internal medicine
Catherine Moore, internal medicine
Meena Moorthy, diagnostic radiology
Swapnil Munsaf, internal medicine
Andrea Noronha, internal medicine
Anthony Petraglia, neurosurgery
Le Keyah Quinn, pediatrics
Justin Rymanowski, neurology
Jessica St. Cyr, pediatrics
M. Kristina Subik, pathology
Marianne Taylor, medicine-pediatrics
Jared Tomlinson, general surgery
Sarada Uppuluri, internal medicine
Melissa Whitenack, obstetrics-gynecology
Alicia Zysman-Cromwell, family medicine

ARIZONA

Julie Yee, Mayo Graduate School of Medicine, general surgery

CALIFORNIA

Brian Curley, UC San Diego Medical Center, internal medicine
Charles Denman, UC Davis Medical Center, internal medicine
Rashmi Narayan, UCLA Medical Center, pediatrics
Paul Puri, UC San Diego Medical Center, psychiatry

COLORADO

Gregory Wolff, University of Colorado School of Medicine, anesthesiology

CONNECTICUT

Barry Fields, Yale-New Haven Hospital, primary medicine

DISTRICT OF COLUMBIA

Sheena Mathew, Washington Hospital Center, obstetrics-gynecology
Michael Pirri, George Washington University Hospital, emergency medicine
Brooke Shuster, Georgetown University Hospital, pediatrics

HAWAII

Gretchen Rickards, Tripler Army Medical Center, internal medicine

ILLINOIS

Kimberly Corbin, University of Chicago Medical Center, radiation oncology
Joanne Moreau, University of Chicago Medical Center, pediatrics
Sarah Peterson, Northwestern McGaw, internal medicine
John Scherer, Northwestern McGaw, internal medicine
Briana Southerland, University of Chicago Medical Center, emergency medicine
Karolina Zareba, Northwestern McGaw, internal medicine

MAINE

Thomas Cochran, Maine Medical Center, emergency medicine
Alexis Mottl, Maine Medical Center, emergency medicine

MARYLAND

Frank Akwaa, Johns Hopkins/Bayview, internal medicine
Corinne Erickson, University of Maryland Medical Center, dermatology
John Ok, Johns Hopkins Hospital, anesthesiology

MASSACHUSETTS

Katherine Dudley, Beth Israel Deaconess Medical Center, internal medicine
Emily Pilger, Beth Israel Deaconess Medical Center, neurology
Daniel Reilly, Cambridge Hospital, psychiatry
Andrew Sauer, Massachusetts General Hospital, internal medicine

NEW JERSEY

Beth-Ann Shanker, Robert Wood Johnson Medical School, general surgery

NEW MEXICO

Jeremy Richards, University of New Mexico School of Medicine, psychiatry

NEW YORK

Gregg Chesney, Long Island Jewish Medical Center, emergency medicine
Kuei-Cheng Lim, NYU School of Medicine, neurology
Sarah Vanderlinde, St. Luke's-Roosevelt, diagnostic radiology
James Wood, North Shore University Hospital, internal medicine
Svetlana Zhovtis, Mt. Sinai Hospital, neurology

NORTH CAROLINA

Amanda Guidon, Duke University Medical Center, neurology
Michael Katz, Duke University Medical Center, internal medicine

OHIO

Katherine Blumoff, Case Western/University Hospitals of Cleveland, family medicine

PENNSYLVANIA

Adeel Abbasi, Hospital of the University of Pennsylvania, emergency medicine
Jennifer Corbelli, University of Pittsburgh Medical Center, internal medicine
Richard (Scott) Dent, Lancaster General Hospital, family medicine
Sughosh Dhakal, Lehigh Valley Hospital, transitional
Kavita Kadiwar, University of Pittsburgh Medical Center, psychiatry
Waseem Khan, Thomas Jefferson University, diagnostic radiology
Michael McGrath, University of Pittsburgh Medical Center, emergency medicine
Adaobi Okobi, St. Christopher's Hospital, pediatrics
Rachel Rubin, Temple University Hospital, internal medicine
Holly Ann Russell, Lancaster General Hospital, family medicine

RHODE ISLAND

Brian Daly, Brown University, psychiatry
Vincent Duron, Rhode Island Hospital/ Brown University, general surgery
Lindsay MacConaghy, Rhode Island Hospital/Brown University, emergency medicine
Katharine Price, Rhode Island Hospital/ Brown University, primary medicine

SOUTH CAROLINA

Shawana Swann, Medical University of South Carolina, obstetrics-gynecology

TEXAS

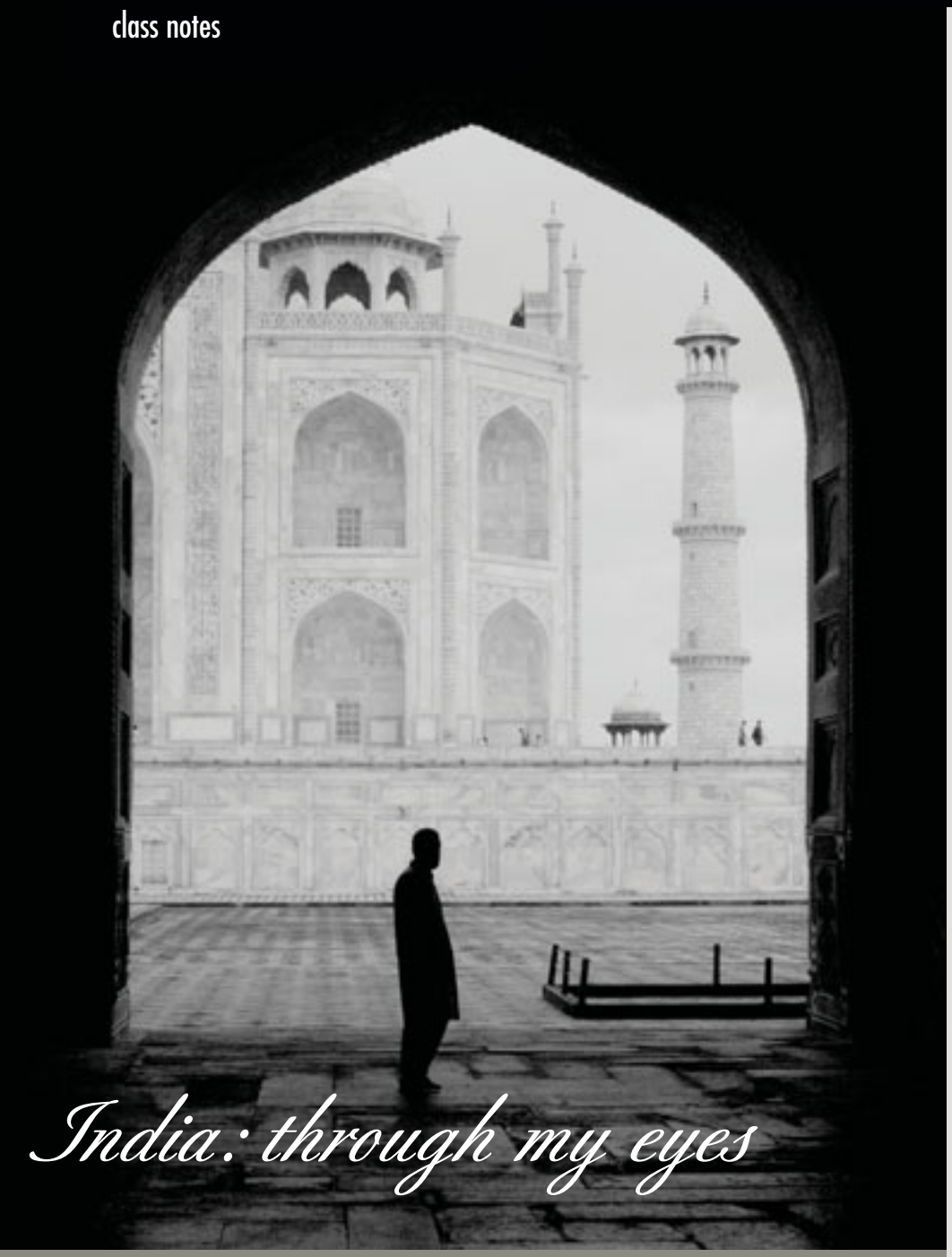
Amy Mayhew, Baylor College of Medicine, psychiatry
Marcus Rampton, Brooke Army Medical Center, anesthesiology

VIRGINIA

Hadley Herbert, Virginia Commonwealth University Health System, general surgery
Erik Lovria, University of Virginia Health System, surgery

WASHINGTON

Jessica Felt, University of Washington Affiliated Hospitals, anesthesiology



India: through my eyes

Jonathan Black, who recently completed his second year as an MD/MPH student at the University of Rochester School of Medicine and Dentistry, spent 10 weeks last summer doing research, traveling and hanging out in India. The country, he says, has captured his heart as well as his photographic eye. Jonathan graduated from the University of Rochester in 2003 with degrees in film and media studies and economics. His photographs of India were exhibited in the Miner Library this spring.

If you see any alumni whom you would like to contact, use the Online Directory at *www.alumniconnections.com/URMC* to find address information.

Submit your class notes to your class agent or e-mail to: *RochesterMedicineMagazine@urmc.rochester.edu*.

Note: MD Alumni are listed alphabetically by class. Resident and Fellow alumni follow in alphabetical order, and Graduate alumni are listed separately in alphabetical order.

MD Alumni

Class of 1931

Norma Bloor Bowles Utley (BA '26, MS '29) celebrated her 103rd Birthday on March 25, 2007.

Norma Utley

Class of 1941

Clem Finch writes: "Genia and I are living in La Jolla, Calif. Our two children are in medicine. We are retired."

Class of 1942

65th reunion September 27–29.

Class of 1944

Stuart Finch writes: "**Ellen Binkley** wrote some very kind words about **Felix Cohen** and particularly in recollection of his many subtle jokes and the fine sense of humor that he displayed while we were students. He was a good friend, but one of my more vivid recollections of Felix was the difficulty he had in learning to do a successful venapuncture on me. Perhaps that was one of the early indicators as to why he eventually felt more comfortable going into the field of psychiatry. In a note from **Dick Wilson** he also emphasized how sad it was to have lost four outstanding classmates in one year.

"**Henry** and **Blanche Clark** just celebrated their 60th wedding anniversary. Henry wrote that, despite some medical problems, he and his wonderful wife remain deeply

involved with their 10 lively grandchildren, their church and a variety of other community activities. They are especially interested in sports at the University of North Carolina. Most of us did not know Henry very well while we were medical students, as he joined our class late due to three years spent at Trudeau, while a medical student recovering from tuberculosis. After graduating AOA from Rochester, a fellowship year in pathology at Strong, and a medical internship at Duke, he embarked on an outstanding 40-year career of medical administrative appointments. These included successive two-year appointments as assistant director and director of Strong Memorial and Vanderbilt University hospitals, respectively. He then spent 15 years as vice chancellor for health affairs at the University of North Carolina. Other highlights of his career were seven years as director of the Connecticut Regional Medical Program, three years as visiting professor at the University of Connecticut and two years as director of Project Hope in Jamaica. His career also included a number of appointments as an advisor or consultant to such organizations as the University of Puerto Rico, the University of Leiden, the National Institutes of Health and the Tuskegee medical and academic institutions. He and Blanche have been very active over the years in Habitat for Humanity in both the Orange County area of North Carolina and in several countries outside of the United States. Their personal contributions and fund-raising efforts have resulted in the construction of many homes for the needy in these areas. Henry and Blanche initiated a program of undergraduate student involvement at the University of North Carolina in the Habitat program which has been very successful. The Clarks are now retired and enjoy living at the Carol Woods Retirement Community in Chapel Hill. Their lifelong legacies in medicine will be for their many contributions to the health and welfare of the disadvantaged and willingness always to help others.

"**George Holton** continues to be a faithful correspondent and a bountiful source of interesting information about many of our classmates. From time to time he also sends me some wonderful photographs of classmates which greatly enhance my recollections of those memorable days when we were learning to be doctors with World War II lurking in the background. George and Eileen continue to live in a great retirement facility in Ponte Vedra, Fla., where golf facilities are some of the best in the country. George noted in his last letter that it was **Bill Weeden** and **Ivan Gotham** in the class of 1945, both of whom are recently deceased, who lured him into starting his practice of medicine in Canandaigua, a move that he never regretted."

Class of 1945

Nevin S. Scrimshaw (R '47) celebrated his 65th wedding anniversary with his wife, Mary, and their five children and eight grandchildren in August in the White Mountains of New Hampshire.

Class of 1947

60th reunion September 27–29.

Class of 1950

Helen C. Davies received an Alpha Omega Alpha Robert J. Glaser Distinguished Teacher Award in fall 2006. She was recognized by the Association of American Medical Colleges for her efforts to provide the nation's next generation of doctors with an exceptional educational experience. She is currently a professor of microbiology and ombudsman for students at the University of Pennsylvania School of Medicine.

Class of 1952

55th reunion September 27–29.

Class of 1953

Robert L. Brent (BA'48, PhD '55, HNR '88) writes: "**Lillian** (BA'50) and I want to thank **Robert Palmer** (M'53) for being the first contributor to the program we initiated to try to reduce the tuition for incoming medical students (ATFP, Alumni Tuition Free Program). As soon as Bob Palmer heard about the program, he was the first one to send in $10,000 and his name is already up on the wall in the Forbes Mezzanine. We hope to make the medical school tuition-free with this program. Fourteen other donors have contributed even before active solicitation has begun."

In February, Brent received the Jefferson College Dean's Medal, celebrating his 50 years of service. He recently was appointed to the executive committee of the School of Medicine and Dentistry's Alumni Council. He is also chair of the communications and development committee for the council.

Class of 1954

Chloe Alexson (R'57, F'59) writes: "After about 35 years teaching microbiology and infectious

On the day they graduated from the School of Medicine and Dentistry in 1944, several classmates stood on the steps of Strong Memorial Hospital for a photograph. From left to right, they are: Stuart Finch, Hyzer Jones, Benedict Duffy, Willis Weeden, Leonard Smith and Chester Haug. All are deceased with the exception of Finch and the photographer, George Holton.

diseases at the U of R, **Don Hare** retired to be on the National Ski Patrol at a local ski area. His wife, Nancy, continued to work as a pediatric nurse practitioner in the offices of **Neal McNabb** and **Jim MacWhinney**.

"Ten years of ski patrolling was long enough to be encumbered with schedules, so he retired from that as well. Nancy also retired and they have since divided their time between Rochester and Martha's Vineyard where he started to run a set of lobster traps, providing them with a constant supply of very expensive lobsters!

"Their daughter Kathy works as a molecular biologist and her husband, Rich. is a molecular endocrinologist. Their son, Christopher, is their man of many talents, a chemistry major, then crewing coach at MIT, Columbia and, briefly, the U of R. After marrying a lawyer, he went to law school and practices patent law. For some time, he worked at Abgenics, a biotech firm making monoclonal antibodies. He and his second wife now raise cattle and 'cutting' horses in Oregon. Jonathan, who developed an interest in fish growing up at the Vineyard, earned a Ph.D. at Stony Brook and joined the National Fisheries, first in Beaufort, N.C., and now in Rhode Island.

"Their recent life has been pretty mundane. The biggest issue to have arisen is that he has been diagnosed with a bone marrow dysplasia, currently being evaluated. 'We'll see where this goes in the near future. Stay tuned!' Nancy is also in the final stages of recovery from a seriously broken leg, with very little residual disability."

Chloe Alexson has left the Alumni Council. She writes: "One of the pleasures of being on the Council was a chance to work on the Heritage Trail which brought back many memories of days not just as a student but also as a resident. Those memories were just one of the reasons I was eager to go to work every day for more than 45 years. For our students, I hope they will also wake up every morning grateful that they knew what they wanted to be when they grew up - and were right! I'm still trying to get the corners of one of the stairwells painted white and to get the paint removed from at least a portion of the wall outside Whipple Auditorium."

John Castellot writes: "Following graduation from Rochester in 1954, I spent the next 40 years training in and practicing internal medicine in the U.S. Army and the Veterans Administration. Then, in 1994, a myocardial infarction, followed by two cardiac arrests while recovering, brought a prompt end to a most interesting, challenging and rewarding government medical career.

"After implantation of the first of three defibrillators in my abdomen and a long rehabilitation, I joined Maria in the two volunteer activities she had already been engaged in for many years—once a week in the White House Correspondence Section and once a week at the main information desk at Walter Reed Army Hospital (currently a very depressing task). As a career government employee, career political junkie, and career husband (60 years this year), these have also been interesting and rewarding activities.

"Age and additional health problems for both of us have finally forced us to give up the White House this year, but we still volunteer at Walter Reed once a week, the hospital where I spent so many wonderful professional years."

Class of 1955

Allan Inglis has left the Alumni Council. He writes: "Carpe Diem. Nice to have been asked to serve on the Alumni Council. Indeed, it was a real privilege to have the opportunity to contribute to the institution that played such an import role in my private and professional life. As a physician and a surgeon, meeting with my fellow alumni and the current educators and administrative staff was a great experience assuring that the medical college was in the best of hands."

Class of 1956

In the fall/winter 2006 issue of *Rochester Medicine,* on page 45, upper right, **Cyril Worby** (R '60) is misidentified as Karl Johnson. We apologize for this error.

Class of 1957

50th reunion September 27–29.

Class of 1959

Paul F. Griner has joined the Alumni Council. He lives in Boston, consulting part time with the Institute for Healthcare Improvement and at the Massachusetts General Hospital as mentor for faculty of the general medicine unit. Griner writes: "My identical twin and I are now back in the same city from where we took our separate paths 53 years ago."

Michael B. Sporn's paper, "Dichotomies in cancer research: some suggestions for a new synthesis" was published in the July, 2006, Vol. 3, No. 7 edition of *Nature Clinical Practice Oncology* journal. Sporn is a professor of pharmacology and medicine at Dartmouth Medical School.

Class of 1960

Roswell Eldridge writes: "I provided the initial funding for the upcoming PBS *American Masters Series* documentary, *John James Audubon: Drawn from Nature.* The world premiere was held October 21, 2006 in the hamlet of Rensselaerville, N.Y. For more detail, visit *www.huyckpreserve.org* and click on Audubon. A pivotal moment in the film's inception occurred in St. Louis, Mo., on the day after the dinner sponsored by the medical center to honor my classmate **Bill Peck**. Bill was a classmate and fellow year-outer with **Lowell Orbison** in 1957/58. Bill had an illustrious career as director and CEO of Barnes Medical Center and I was thankful my wife and I could attend the dinner. I had an exciting 30-year career in clinical neurogenetics research following graduation from the University of Rochester School of Medicine. I am grateful for Larry Young and Bob Berg among others for introducing me to the new field of medical genetics."

Stanley O. Foster, a leader of the effort to eradicate smallpox, received the Bicentennial Medal from Williams College, which honors members of the Williams community for distinguished achievement in any field of endeavor. This year's recipients were chosen because of their service to the world. Foster led the smallpox campaigns in Nigeria, Somalia and Bangladesh, where he identified the last naturally occurring incidence of smallpox in the world. He continues to consult with governments and international organizations and serves as visiting professor in the Department of Global Health at Emory University's Rollins School of Public Health.

Class of 1961

Daniel E. Clapp was named 2006 Community Clinician of the Year by the Hampshire District Medical Society of the Massachusetts Medical Society. The award recognizes a practicing physician who stands out in terms of professional accomplishments and community contributions.

Heshy Tabechian has left the Alumni Council. He writes: "My membership on the Alumni Council was one of the most gratifying assignments. As the chair of the awards committee, my most challenging and rewarding experience was to conduct the selection of the honorees for the Gold Medal Award presented to an inspiring teacher with integrity and devotion to medical students; the Alumni Service Award given to an alumnus for furthering the interest of the School and the alumni association through support, commitment and service to School; and finally the Distinguished Alumni Award which is given annually in recognition of outstanding and widely recognized achievement. The award salutes, in particular, those who exemplify the standards and objectives of the School of Medicine and Dentistry through personal conduct, professional accomplishments and community service. Distinct preference is given to those alumni whose achievements create significant impact to the medical field on a national and global scale. I'm pleased to have the privilege of continuing on the awards committee."

Class of 1962

45th reunion September 27–29.

Ezra A. Amsterdam (R '63) received the 2005 Gifted Teacher Award of the American College of Cardiology and in 2006 was named Distinguished Teacher for Professional Schools of the University of California, Davis. Amsterdam writes: "I am currently associate chief, division of cardiovascular medicine, University of California at Davis School of Medicine and Medical Center. I edit the journal *Preventive Cardiology*, which I founded and which is listed in *Index Medicus.* I continue full time with teaching, research and clinical activities."

Ron Bruce has joined the Alumni Council. Bruce is on the board of directors of the Charleston Area Senior Citizens, a nonprofit which manages Meals on Wheels and other activities for seniors. He also chairs the stewardship committee for the Unitarian Church of Charleston and belongs to SneeFarm Country Club, where he plays a lot of golf.

Robert S. Crumrine (R '67) received the Crawford W. Long Award at the Georgia Society of Anesthesiologists meeting in January. The award is the highest honor bestowed on a member of the society and is given in recognition of physicians who have made exceptional contributions to the GSA.

Class of 1963

Joseph L. "Joel" Andrews writes: "I recently started a primary care medical practice with the Harbor Medical Group in Marblehead, Mass., which is part of the North Shore Medical Center and Partners Health Care. In August, I welcomed my first grandchild, Michael Joseph Andrews, who was born to my son, Joe, and his wife, Lesley, who live outside San Francisco."

Merrill C. Oaks retired from his ophthalmology practice and spent six years

Boston-area alumni from 1963, 1964 and 1965 gathered at the Harvard Faculty Club in Cambridge for a mini-reunion two years ago and they will get together again this year. Robert Ackerman is the contact. Seated in the photo above, from left to right, are: David Harris, Carol Agnello and Vincent Agnello. Standing from left to right are: Ingvar Vittands, Allen Lapey, Janet Lapey, Robert Ackerman, Emily Lamont, Elaine Li, Fred Li, Donna Vittands, Tom Lamont, Dotty Bless, Eleanor LaRiviere, Sam Dugan, Stuart Bless, Gene LaRiviere, and Diane Dugan.

as a full-time general officer for the Church of Jesus Christ of Latter-day Saints, including three years supervising the activities of the church in the Philippines. He and his wife of 48 years, Jo, enjoy their nine children and 38 grandchildren. They also love traveling.

Albert Wiley, Jr. is currently director of the National Nuclear Security Administration's Radiation Emergency Assistance Center Training Site, and director of the World Health Organization Collaborating Center at Oak Ridge. He writes: "My work with radiation emergency response and preparedness involves work and collaboration with International Atomic Energy Agency and WHO, so I am now quite busy with much travel."

Class of 1965

Don Catlin has stepped down as director of the UCLA Olympic Analytical Laboratory, described by *USA Today* as, "one of the world's best sports drug-testing labs." He will continue his research on improving ways to detect drugs.

James D. Cox, professor of radiation oncology and head of the division of radiation oncolaogy at M.D. Anderson Cancer Center, is the 2007 alumni inductee to Alpha Omega Alpha (AOA). The induction ceremony took place in February at the Genesee Valley Club.

Class of 1966

Frank LoGerfo has left the Alumni Council. He writes: "During my time on the Alumni Council, it has been heartwarming to see the continued focus on nurturing the humanistic aspects of a medical education. Medical and medical science alumni who become engaged in the many activities of the Alumni Council will find it a rewarding experience."

Class of 1967

40th reunion September 27–29.

Class of 1968

Mary E. Costanza is a medical oncologist at the University of Massachusetts Memorial Health Center and professor of medicine at the University of Massachusetts School of Medicine. She was involved with the Boston Women's Health Collective and her writing has appeared in editions of *Our Bodies Ourselves*. From 1993–2003, she chaired the Gender Equity Committee at the University of Massachusetts Medical School, and is now a member of the Women's Faculty Committee. She was in the 2006 book *Feminists Who Changed America 1963–1975.*

Class of 1969

Thomas A. Bonfiglio (R '72) received the President's Award of the American Society of Cytopathology in recognition of his outstanding service in the field at the annual meeting of the society in November.

Robert Crapo writes: "I gave the Distinguished Scientist Honor Lecture at the American College of Chest Physicians Meeting in October. Also in 2006, I underwent surgery and chemotherapy for colon cancer. The prognosis is very good."

Richard Davey recently accepted the position of director of transfusion medicine at the Methodist Hospital in Houston. Davey previously held positions as chief medical officer of the American Red Cross and chief medical officer of the New York Blood Center.

Mark H. Weinstein (BA '65) has left the Alumni Council. He writes: "I have enjoyed my many years on the Alumni Council. The experience has become even more meaningful to me, since my son-in-law is now a second-year medical student at the University of Rochester. I believe that one of the major roles of the council is to reach out and connect with other alumni in order to support the present medical students in their career choices, and hopefully to help defer the escalating costs of their medical education. I encourage other alums to participate in the activities of the council."

Class of 1972

35th reunion September 27–29.

Richard Everson has joined the Neag Comprehensive Cancer Center at the University of Connecticut Health Center as deputy director for cancer control. He will see patients in the cancer center and will continue to pursue his research interests in molecular epidemiology, cancer risk assessment and cancer prevention. Everson joins the center from the Hudson-Webber Cancer Research Center in Detroit and the Karmanos Cancer Institute, where he was a professor of medicine and part of the multidisciplinary teams for breast cancer and GI oncology.

Glenn A. Lux is president and CEO of a physician-owned professional service corporation of 66 pediatric practitioners in the Greater Seattle area. He also is clinical associate professor of pediatrics at the University of Washington and adjunct professor of management at the Albers School of Business and Economics at Seattle University. He received a master's degree of business administration from Seattle University in June

2006. At graduation, he also received the Jerry A. Viscione Graduate Scholar Award which is presented each year to the outstanding graduating graduate business student in the Albers School.

Class of 1973

James William Battaglini recently joined the medical staff at Parrish Medical Center in Titusville, Fla., as a cardiothoracic surgeon.

Elizabeth Downing has been named director of student health services at the University of California at Santa Barbara.

Class of 1974

John C. Morris received the 2006 Neville Grant Award for Clinical Excellence in November, from the Barnes-Jewish Hospital Foundation in St. Louis. Morris, the Friedman Professor of Neurology at Washington University School of Medicine, was cited for his excellent medical skills coupled with compassion for patients and their caregivers and his mentorship of house staff, medical students, and fellows.

Class of 1975

Andrew M. Golden (BS '71, R '78) has been appointed director of clinician patient communication training and development for the 8,000 physicians of the Southern California Permanente Medical Group.

Class of 1977

30th reunion September 27–29.

Kathleen Gensheimer has been appointed to the executive committee of the School of Medicine and Dentistry Alumni Council.

Philip A. Gruppuso is a professor of pediatrics and research professor of molecular biology, cell biology and biochemistry at Brown Medical School, where he has spent his entire career. He completed his training in pediatric metabolism and endocrinology at Brown and eventually became head of Brown's division of pediatric endocrinology and the director of Brown's M.D./Ph.D. program until last year, when he became associate dean for medical education. He continues to direct a laboratory research program, and is still an active musician, playing keyboard for an R&B band, The Automatics. His wife, Martha Manno, is an independent publisher (Little Pear Press), and his 27-year-old twin daughters are art school graduates who live and work in New York City.

Class of 1978

David Diamond was awarded first prize in clinical research at the annual meeting of the Academy of Pediatrics, Section on Urology, for work on adolescent varicocele.

Robert W. Loss, Jr. (R '81) writes: "Dermatology Associates opened its third office in Naples, Fla., in December 2006. We also have full-time facilities in Rochester and Syracuse and employ 82 people within our practice, spa services and research center."

Ronald G. Schwartz (BA '73) has been promoted to the faculty rank of professor of medicine (cardiology) and of imaging sciences at the University of Rochester Medical Center, and has recently been elected as a fellow of the American Society of Nuclear Cardiology. He serves as attending in clinical, preventive and nuclear cardiology, the director of nuclear cardiology, and the director of the cardiac PET program at Science Park. Schwartz's published research demonstrates the ability of cardiac imaging to detect preclinical coronary artery disease in patients with diabetes mellitus, and to monitor the effectiveness of medical therapy.

Ronald Schwartz

Class of 1979

Carl Patow, executive director of HealthPartners Institute for Medical Education, has been appointed director to the board of the Accreditation Council for Graduate Medical Education. He was selected as a representative of the American Hospital Association, a three-year appointment.

Class of 1980

Barry J. Goldstein (PhD '82, R '85) was elected to the Association of American Physicians (AAP) honorary society in 2006.

Wendy S. Harpham was named the 2006 Tree of Life Award recipient from the national office of the Leukemia & Lymphoma Society. This award honors an individual or organization that has played a major or lasting role, with national impact, in improving the quality of life of patients and their families.

Bruce M. Weinraub was recognized as one of the top 10 percent of primary care physicians in 2005 through Blue Cross Blue Shield of Massachusetts.

Class of 1981

Steven B. Levine writes, "I am an otolaryngologist and head and neck surgeon in private practice in Fairfield County, Conn., and assistant clinical professor of surgery at Yale University. I am legislative chair for the state ENT society and on the legislative committee of the state medical society. Most recently, I was named for the sixth consecutive year to the *Castle Connolly Guide, Top Doctors: New York Metro Area.* Married for 16 years, Jamie and I have three children. Our son, Zachary, is 14 years old and our twin daughters, Alexa and Jenna, turned 12 this April."

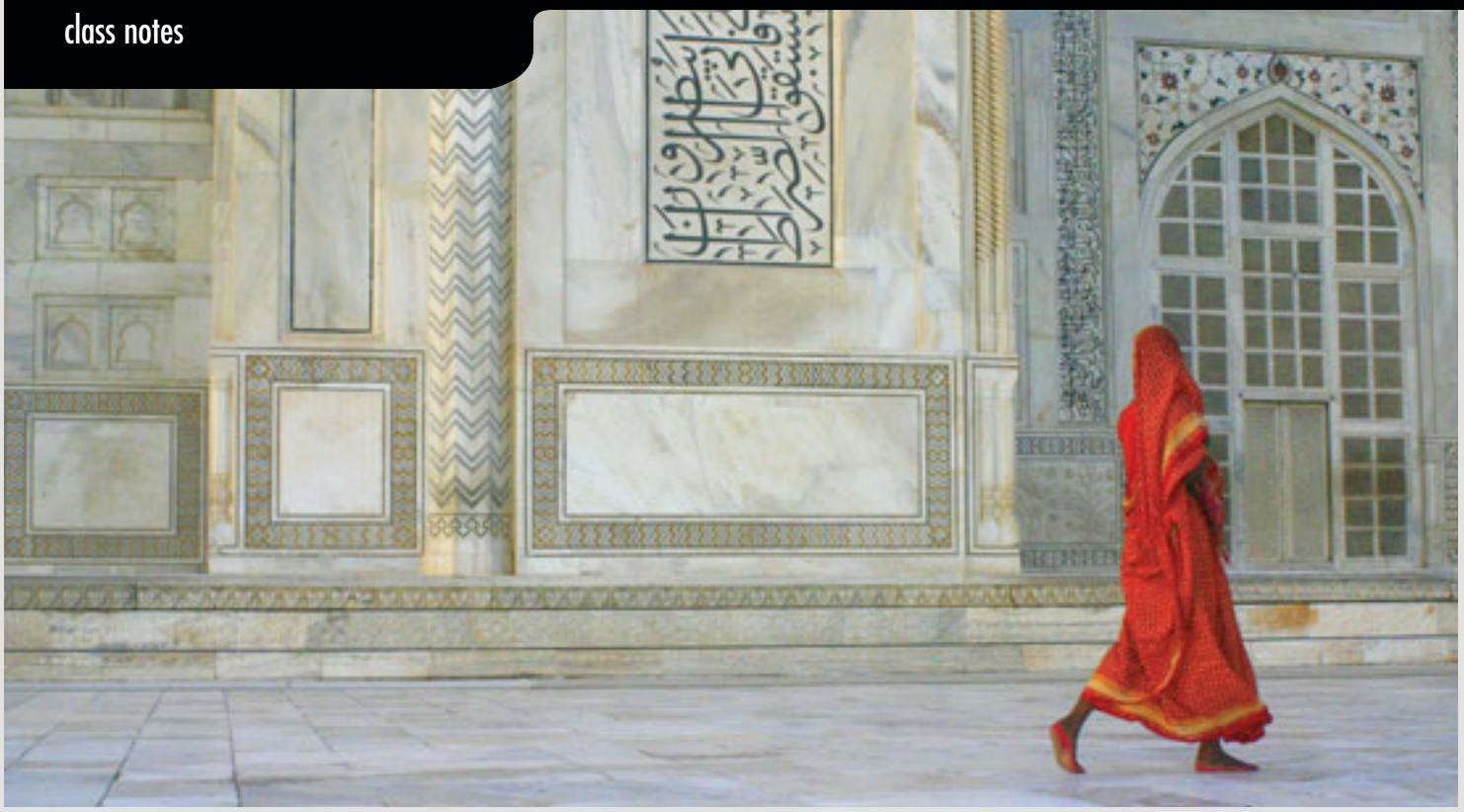
Class of 1982

25th reunion September 27–29.

David Liebers was appointed vice president of medical affairs at Ellis Hospital in Schenectady, N.Y. He was named vice chief of staff at Ellis in 2004 and is currently chief medical officer. Liebers is boarded in infectious diseases and continues to practice clinically. His oldest son, David, 19, is a sophomore at the University of Rochester, enrolled in a premed curriculum. In addition to his work at Ellis, Liebers has been a clinical assistant professor of medicine at Albany Medical Center since 2000. He holds membership in numerous medical organizations, including the Schenectady County Medical Society, the New York State Medical Society, the American Society of Microbiology, the New York State Society-Internal Medicine, the Infectious Diseases Society of America and the American Society of Internal Medicine.

Class of 1983

Allan R. Macdonald (R '86) writes: "I am now working as a full-time faculty member at McLeod Regional Medical Center's Family Practice Residency Program in Florence, S.C., where I serve as director of obstetrical education. We are a regional tertiary care community-based medical center offering an unopposed 7-7-7 family medicine residency. My duties include private patient care, heading the family medicine obstetrical



component of our program, and teaching the residents in all areas of family medicine. I am also in charge of the pediatrics and newborn nursery portions of our program."

Thomas Peterson has been named acting chair of family medicine at the University of Vermont College of Medicine and acting physician leader at Fletcher Allen Health Care, where he also is an attending physician. Peterson is an elected member of the finance committee of the Faculty Practice Plan, and serves as chairman of the board of the University Health Center.

Class of 1986

Ralph A. Lanza is a managing partner at Great Valley Medical Associates, P.C. He is also director of Berwyn/Paoli Little League and a member of the board of trustees for the Paoli Hospital Foundation.

Class of 1987

20th reunion September 27–29.

Jean M. Culver has joined the physician staff of Berkshire Occupational Health in Great Barrington, Mass. She is board-certified in occupational and environmental medicine.

Sarah Whitman has launched her Website and blog: *www.howtocopewith pain.org.* Both discuss coping with chronic pain, which is her specialty in her psychiatric practice. The sites help patients with chronic pain, providing information and support. They have a psychiatric and psychological focus, and also include information from other disciplines, and interviews with providers, researchers, patients, and families on topic related to pain.

Class of 1988

Immanuel K. Ho (BS '84) was elected governor of the American College of Gastroenterology for Eastern Pennsylvania.

Class of 1989

Tim Evans (PhD '89, R '92) writes: "I am here (in Fresno, Calif.) with my wife, **Amy Evans** (M'88, R '91) and my children, Colin (12) and Hannah (10). I am the director for critical care medicine at Community Regional Medical Centers, affiliated with UCSF-Fresno Medical Education Program, and also practice pulmonary medicine. Being close to family and also to Yosemite National Park is idyllic and I have never looked back! Amy is associate professor of pediatrics at UCSF-Fresno, works in our medical education program and practices general academic pediatrics. In addition, she is the director for the Center for Breastfeedinig Medicine at Community Regional Medical Centers, which is a subspecialty in her pediatric department serving mothers and babies and their related medical conditions."

Barry J. Wu was promoted to clinical professor of medicine at Yale University School of Medicine.

Class of 1990

Luke Loveys (R '96) has left the Alumni Council. He writes: "Participating on the Alumni Council for the past 10 years has been a great opportunity to stay in touch on a personal level with the School of Medicine and Dentistry while at the same time assisting with its mission to serve the interests of the alumni. It was truly a rewarding experience. I look forward to staying connected through continued participation with the Alumni Association."

Glenville A. March, Jr., co-founder and CEO of March Vision Care, Inc., announced that March Vision Care has received its California Knox-Keene license as a vision plan. The Knox-Keene license is California's HMO license. With the license, March Vision Care can now contract with employer groups and unions. March Vision Care manages primary vision care benefits for nearly one million people in California, Michigan, New Mexico, Ohio, Utah, and Washington. The company plans to launch its own vision benefit in 2007.

Class of 1991

David M. Hoenig (BS '87) has received a

recent academic promotion to associate professor in the Department of Urology at Albert Einstein College of Medicine/ Montefiore Medical Center. He is also chief of Weiler Hospital Division and director of laparoscopy and endourology.

Class of 1992

15th reunion September 27–29.

Class of 1995

Don Dizon (BA '91) is director of medical oncology of the Program in Women's Oncology at Women & Infants' Hospital of Rhode Island/Brown Medical School. Dizon is coauthor of *100 Questions and Answers About Ovarian Cancer,* which was just published in its second edition.

Dwight Heron has joined the Alumni Council. He is an associate professor at the University of Pittsburgh School of Medicine and vice chairman of clinical affairs in the Department of Radiation Oncology at UPMC Cancer Centers. As director of radiation services for 21 cancer centers in the United States and two centers in Europe, he has spearheaded the development of innovative, evidence-based clinical pathways to aid in the coordination and delivery of quality care to all patients throughout the system. Heron is the primary investigator for NCI grants fora Cancer Disparities Research Partnership and for the Center to Reduce Cancer Disparities Patient Navigator Program. His clinical and research interests include the integration of advanced imaging in oncology, such at PET/CT and 4D CT which are used in modern radiation treatment planning, and their delivery as cranial and body radiosurgery. Heron, the author and co-author of numerous journal articles, book chapters, monographs and abstracts, continues to teach and mentor medical students and residents in the tradition of the biopsychosocial model.

Michael Wang and **Cecilia Chiacheh Low Wang** write: "We are doing great here in Denver, Colo. We brought our daughter Maia Yienfan Low Wang back from Hubei, China in July 2005. She is 2 1/2 now and the light of our lives. Please e-mail or call us, especially if you're coming through the Rockies!"

Class of 1996

Hugh P. Babineau writes: "I am in solo practice in Tyler, Tex. I primarily do bariatric surgery (gastric bypass and Lap-Band), about 300–400 procedures per year. My practice, in conjunction with the East Texas Medical Center, was one of the first in Texas to receive a Center of Excellence designation by the American Society for Bariatric Surgery. My wife **Nicole (Wood) Babineau**, R.N. (BSN '95) and I have five children, age six to 17."

Timothy Beittel writes: "Early in 2005, I accepted a position as medical director for ACT Medical Group. We are a private multi-specialty group providing primary care and psychiatry and psychology services, as well as medical directorships, to long-term care facilities throughout North Carolina. In addition, we operate geriatric specialty teams for several counties and provide clinical services for a number of community agencies such as Easter Seals and ARC. We are the largest long-term care provider in the state and are continuing to grow. In addition to day-to-day work, I am also very involved in organized medicine as president of my county medical society, delegate to the state medical society, chair of the state young physicians section, and delegate to the national young physicians section. These roles have allowed me to get a whole new take on leadership and politics and other issues. There is just so much more to caring for people and the profession of medicine than doing what you can for individual patients, although that will always remain at the heart of things. My wife, Rebecca, teaches English at the local community college and enjoys it, although it's driving her a little batty trying to juggle being a mom and having a full-time career. She's had the opportunity to present at some local conferences and is starting to gain some recognition for innovative teaching methods along with being well-liked and respected at her own institution. Our daughter, Elaina, is six and started kindergarten this year. Depending on the day you ask her, she either really likes it or thinks it's the stupidest, most horrible place ever, but there's no denying she likes her teachers, is making a lot of friends, and is learning all kinds of things (starting to read and write and spell, counting and doing simple arithmetic, etc.). Her sister, Lexi, is two and starting to talk and count and do similar things a little earlier than Elaina did, probably because she has Elaina as an example. Unlike Elaina, who is a very finicky eater and seems to survive on a few pieces of candy and chips every day, Lexi will devour just about anything we give her and say 'Yummy.' Now, if we could just get her potty-trained."

Class of 1997

10th reunion September 27–29.

Class of 1998

Daniel Saurborn (R '99) is a radiologist, working for Virtual Radiologic Corp. as a teleradiologist from his home office in Las Vegas, Nev. He may be contacted by classmates at *dpsmd@yahoo.com.*

Kate (Cooley) Weller is currently a partner at Family Medicine of Port Angeles, Wash. The 2007 National Committee for Quality Assurance and the American Diabetes Association recognized the high quality of diabetes care at Family Medicine, and the growing practice is working on building a new clinic in Port Angeles to meet greater needs.

Class of 1999

Heather L. Evans writes: "After eight years of general surgery residency in Charlottesville, Va., my husband, Chris, son, Nash (3), and I will be moving to Seattle this summer. I've matched in the surgical critical care and trauma fellowship at Harborview Medical Center, University of Washington for the 2007–08 year."

Class of 2000

David W. Chen (BS '96, BA '96) finished his neurology residency in Boston, did a year of research in neuropathic pain, and has been working as an attending at Massachusetts General Hospital.

Jeremy Hogan continues to work as a general neurologist for Rees-Stealy medical group in San Diego. He is a clinical instructor at UCSD and has a subspecialty interest in neuromuscular diseases. He was recently appointed to the City of Chula Vista's Planning Commission. He and his wife, Shannon, have been married for six years.

Aaron M. Lewis (R '01) is living in San Francisco, and works as a neurologist and neuromuscular/EMG specialist at Kaiser Permanente San Francisco.

Sage Elisabeth Swayze was born to parents **Evan Swayze** and **Nancy (Schwartz) Swayze** (M'99, BS '94) and her doting big brother, Orion, on April 11, 2006. Nancy writes: "Evan is in his first year of an emergency medicine residency at University of Massachusetts and I am

doing geriatrics for Fallon Clinic. We are thrilled to be in central Massachusetts where we get to see old Rochester friends."

Ethan Sullivan was born to parents Ivette Motola and John Sullivan on October 13, 2006, at 1:30 a.m. weighing in at 7 lbs. 8 oz. and 20.5 inches long. Motola writes: "He is the light and new love of our lives!"

Ethan Sullivan

Class of 2001

Katherine Zopf Landy writes: "I finished my residency in family medicine in Tacoma, Wash., in 2004, and I am working for a nonprofit organization called Community Health Care, also in Tacoma. We are a federally subsidized group of community clinics doing full-spectrum family medicine mostly for patients without any insurance (on a sliding scale) and with Medicaid/ Medicare.
I do office medicine for all ages, as well as prenatal care, deliveries, and inpatient adult and pediatric care. I'm working in the office three days a week. I'm lucky to work with a fabulous group of doctors, and I love my job.
I got married to John Landy (a social worker) in 2003, and we had our wonderful baby boy, Emmett, on April 4, 2006."

Aidan Patrick O'Connell was born to **Donna O'Connell** and her husband, Kenneth, on May 29, 2006. O'Connell writes, "We are living in Plainville, Mass. I am in private practice as a pediatrician at Pediatric Associates of Norwood and Franklin."

Adam Vogel and **Tiphanie J. Phillips** of Moreno Valley in Riverside, Calif., were married November 1, 2006 at Cook County courthouse in Chicago. Vogel is a senior surgery resident at the University of Chicago.

Class of 2002

5th reunion September 27–29.

Mathew Empie (BA '97, R '06) has been hired as a physician at Long Pond Pediatrics in Rochester. He previously served as chief resident in pediatrics at Golisano Children's Hospital at Strong

Greg Lam and his wife, Kristen, are the proud parents of Benjamin. Lam is a third-year cardiology fellow at Duke University where he performs research on the role of vascular progenitor cells in angiogenesis. He recently won second place in an international research competition sponsored by the International Society of Endovascular Specialists, and was also selected as a finalist for the Northwestern University Cardiovascular Research Forum.

David Maine and wife, **Rachelle Smith Maine**, welcomed their first child, Zachary, on January 15, 2007. David is a fellow in the division of pain medicine at The Johns Hopkins Hospital.

David Maine

Class of 2003

Lissette Lopez writes: "I am happy to say that I graduated from the UCLA Family Medicine Program and became board certified!
I started my new job at Kaiser Permanente in San Francisco, and I am enjoying life back in northern California!"

Class of 2004

Jennifer C. Schecter is doing an emergency medicine residency at SUNY Downstate in Brooklyn.

Class of 2006

Constantine Farmakidis has joined the Alumni Council. He is completing his preliminary year of internal medicine training prior to starting his neurology residency again in July. He writes: "My interest in joining the Alumni Council is to assist with the exciting initiatives already in place to raise funds for medical student scholarships."

Class of 2007

Craig Benson has left the Alumni Council. He writes, "I will be entering a four-year, combined internal medicine/pediatrics residency in June. After residency, I hope to combine my background in health informatics with a clinical practice in an academic setting. I will be getting married in October to Randi Potter, a Ph.D. student in the toxicology program here at Rochester."

Graduate Alumni

arranged alphabetically

Robert L. Brent (BA '48, M '53, PhD '55, HNR '88)—See SMD Class of 1953.

Patricia L. Carlson (MPH '06) received two awards in 2006: the Bibby Fellowship Award and the Buonocore Award.

Edmund S. Copeland (MS '61, PhD '64) was married to Candia Sue Hench on December 23, 2006, in Crozet, Va.

Jeffrey M. Devries (MS '89) is a member of the American Academy of Pediatrics and the Ambulatory Pediatric Association. He is active in the community of West Bloomfield, Mich., and has been honored for his leadership by the Ambulatory Pediatric Association, Michigan Health & Hospice Association and the United Way. He has also been named one of the Best Doctors in America by Best Doctors, Inc. At Oakwood Healthcare System in Dearborn Mich., Devries helped develop and obtain funding for a three-year, community-wide childhood asthma initiative, recruited a full-time, comprehensive pediatric neurology and movement disorder service, and created Program for Exceptional Families, a comprehensive, coordinated program for children with chronic, complex disorders and disabilities.

Julian M. Earls (MS '66) retired in December as director of the NASA Glenn Research Center. He joined the Cleveland State University's Nance College of Business Administration as an Executive-in-Residence.

Tim Evans (PhD '89, R '92) — See SMD Class of 1989.

Barry J. Goldstein (M'80, PhD '82, R '85)—See SMD Class of 1980.

Teresa A. Liberati (MS '93, PhD '95) has joined the faculty at Southern Illinois University School of Medicine as director of laboratory animal medicine and research assistant professor of internal medicine.

Guido V. Marinetti (BS '50, PhD '53) is the author of a new book, *I Beat Heart Disease, So Can You,* published by iUniverse. Marinetti was a professor of biochemistry for 40 years at the University of Rochester School of Medicine and is emeritus professor of biochemistry and biophysics. He did research on lipid biochemistry and has published 168 scientific papers in leading scientific journals. He writes: "*I Beat Heart Disease, So Can You* is aimed for the general public, medical students, and practicing physicians. It covers lipid-lowering diets (such as the Willett diet, based on sound science) lipid-lowering drugs, and the benefit of daily exercise. Emphasis is placed on the health benefits of fish omega-3 fatty acids (DHA and EPA), olive oil, and exercise, and the harmful health effects of saturated and trans fatty acids, refined carbohydrates, and overweight. The saying 'You are what you eat' still holds true. I wrote *I Beat Heart Disease, So Can You* from my personal experience with high blood cholesterol and open-heart coronary artery surgery. For many years I taught medical students and practicing physicians the biochemistry of blood lipids and how to treat persons who are at risk for coronary artery heart disease."

Helene McMurray (MS '00, PhD '04) has joined the Alumni Council. She writes: "I am a postdoctoral fellow in the lab of Hartmut Land in biomedical genetics. I study the mechanisms underlying cancer formation, in hopes of identifying better therapeutic targets for cancer treatment. I am a founding member of the URMC Post-doctoral Association, which came into existence in 2006. My husband **Jason** (MS-Ed. '00) and I have a son, Aidan, who has just started kindergarten this year. In addition to the URMC Alumni Council, we are also involved with the Cornell Club of Rochester, keeping up ties to our undergraduate alma mater."

Hongdao Meng, (PhD '04), assistant professor in the graduate program in public health, Department of Preventive Medicine, Stony Brook University Medical Center, has received the James G. Zimmer New Investigator Research Award from the Gerontological Health Section of the American Public Health Association. The award is for his research on the cost-effectiveness of community-based disease management/health promotion interventions among older adults with chronic conditions.

Amy L. Parkhill (MS '01, PhD '04) writes: "I married James Hilbert on April 22, 2006. I also started as an assistant professor at the Wegmans School of Pharmacy at St. John Fisher College in May."

Robert M. Sutherland (PhD '66) has been named vice president for commercialization for the Ontario Institute for Cancer Research in Toronto. Sutherland will develop intellectual property management, identification of projects for early stage development and the engagement of market receptors and investor groups. He most recently was president of Varian Biosynergy, a subsidiary of Varian Medical Systems in Palo Alto, Calif.

Norma Bloor Bowles Utley (BA '26, MS '29, M '31) — see SMD Class of 1931.

Rhonda A. Wallen (MS '94, MBA '94) recently signed on as CEO of a new biotech company developing innovative medicines for hematology/oncology based on receptor tyrosine kinase inhibition. Caveo Therapeutics, based in Denver, Colo., is conducting its first financing round to prepare for clinical trials in 2008.

William Wong (BA '74, PhD '79) has been named chief scientific officer at Q-RNA, a New York-based biotechnology company focused on protein. Also a vice president for product development, Wong is a 20-plus-year veteran of the pharmaceutical, biotechnology, diagnostics and device industries.

Resident/Fellow Alumni

arranged alphabetically

Chloe Alexson (M'54, R '57, FLW '59) — See SMD Class of 1954.

Ezra A. Amsterdam (R '63) — See SMD Class of 1962.

Kristen Andresen (R '02) joined Prevea Heart & Vascular Care in Green Bay, Wisc., as a cardiologist.

Meri Atanas (R '88) has been appointed as chief of radiation oncology for Rochester General Hospital's Lipson Cancer Center. In addition to her own practice, she previously served as an associate professor in radiation oncology at the School of Medicine. Atanas lives in Victor, N.Y.

Beth Bell (MPH '89, R '85) began working for the Center's for Disease Control in February as associate director for epidemiologic science in the National Center for Immunization and Respiratory Diseases. The center is charged with working on vaccine preventable diseases. Bell writes: "It certainly has been a rewarding and eventful time for me to be working in the area of viral hepatitis epidemiology and prevention. I am looking forward to interesting new horizons in my new position."

Bob Berkow (R '59) has been editing a new online healthcare magazine called *yourhealthnow.com.*

Thomas A. Bonfiglio (M'69, R '72) — See SMD Class of 1969.

Roger Boulay (R '61) was nominated for the 2006 AAMC Humanism in Medicine Award. The award singles out a positive and caring role model among a school's entire faculty and physicians whom students would like to emulate. Boulay was nominated by members of the Organization of Student Representatives chapter at the Medical Center.

Diego Cahn-Hidalgo (R '98) won the University of Rochester Department of Medicine James Stewart Award for teaching in June 2006.

Anna Chacko (R '77) has been named vice chairman of the division of radiology at

Boston Medical Center and professor of radiology at Boston University School of Medicine. For the past five years, Chacko served as chairman of the Department of Radiology at the Lahey Clinic Medical Center in Burlington, Mass. She previously served as the radiology advisor to the Surgeon General for the United States Army.

Robert S. Crumrine (M'62, R '67) — See SMD Class of 1962.

Jonathan D. Dehner (R'70), president and CEO of Scott Radiological Group in St. Louis since 1990, has been appointed chairman of its board of directors.

Joseph Delehanty (R '89) associate professor of medicine and director of the Cardiovascular Center, was recognized with the 2006 Board Excellence Award for Physicians. He is known for his exceptional dedication to the Medical Center and the patients he serves, and is considered one of the very best critical-care clinicians in the region, providing expert care and outstanding clinical competency and judgment. Delehanty lives in Brighton, N.Y.

Robert B. Diasio (BA '67, R '73) is the director of Mayo Clinic Cancer Center in Rochester, Minn. He also will oversee cancer center activities at Mayo Clinic in Scottsdale, Ariz., and Jacksonville, Fla. Diasio, who was at the University of Alabama School of Medicine in Birmingham, writes: "This is an incredible opportunity — to lead one of the top NCI-designated comprehensive cancer centers, and I'm excited to enter an organization with such a strong track record in discovery and in translating research findings into new treatments for patients."

Tim Evans (M '89, PhD '89, R '92) — See SMD Class of 1989.

Armando R. Filomeno (R '71) has written El niño con déficit de atención o hiperactividad: cómo pasar del fracaso al éxito (The child with attention deficit and/or hyperactivity: how to turn failure into success), published in Spanish by Universidad Peruana Cayetano Heredia. The foreword was written by Robert J. Joynt, M.D., Ph.D., Distinguished University Professor of Neurology, under whom the author trained at Strong Memorial Hospital. In his introduction, Filomeno says the main reason for writing the book is the lack of knowledge and misconceptions about the disorder and its treatment.

Jonathan B. Gavras (R '88) has been appointed Blue Cross and Blue Shield of Florida's vice president, medical operations. Gavras held several leadership positions at UnitedHealth Group, including chief operating officer for South Florida, chief medical officer for Florida and president of the south region for Medicare operations. Most recently, he was the national medical director with oversight of the health plan clinical operations for UnitedHealthcare.

Andrew M. Golden (BS '71, M'75, R '78) — See SMD Class of 1975.

Barry J. Goldstein (M'80, PhD '82, R '85) — See SMD Class of 1980.

Peggy Kelley (R 91) has written three chapters, one titled "Painless Tonsillectomy," in *Current Opinion in Otolaryngology & Head and Neck Surgery* (December 2006), another titled "Microtia and Congenital Aural Atresia" in Otolaryngologic Clinics of North America (February 2007), and "Supraglottoplasty" in Atlas of Sleep Apnea and Snoring (anticipated publication 2007). Kelley was elected to Best Doctors in America 2005–06, was voted a top local doctor in the Denver-area magazine *5280* and was voted as a top doctor in 2007 by *Core Magazine*.

Aaron M. Lewis (M'00, R '01) — See SMD Class of 2000.

Robert W. Loss, Jr. (M'78, R '81) — See SMD Class of 1978.

Luke Loveys (M'90, R '96) — See SMD Class of 1990.

Matthew H. Lowry (R '00) joined Caritas Norwood Hospital as a specialist in lung diseases. He is board-certified by the American Board of Internal Medicine and its subspecialty board in pulmonary medicine. Lowry has earned the board's certificate of special qualification in critical care medicine.

Charles MacLean (R '88), associate professor of medicine at the University of Vermont College of Medicine, has been named research director. He will maintain his faculty appointment and continue his activities and research within the primary care internal medicine division. He is co-investigator and project director of a National Institute of Diabetes and Digestive and Kidney Disease-funded project called the Vermont Diabetes Information System.

Jerry Marty (R '82) is director of cytopathology, medical director of the School of Cytotechnology and head of the Fine Needle Aspiration Clinical Service at the International/National Reference Laboratory, Quest Diagnostics, Inc., Las Vegas business unit in Nevada.

Allan R. Macdonald (M'83, R '86) — See SMD Class of 1983.

Barry Poret (R '76, FLW '79) continues to practice primary care adult internal medicine in western Massachusetts, all outpatient, with a subspecialty referral practice and in his primary care practice in biopsychosocial relevant health care. His interest is in the interface between organically categorized disease and the psychosocial state of the person who is having illness behavior, to determine the organic and psychological contributions to their illness in order to help them understand why they are not feeling well, and guiding them to the appropriate healing modalities, some of which he provides. Poret said he feels so blessed to have trained at Rochester, with its rich tradition of combining excellent teaching in the biomedical aspects of health care along with the infusion into medical student training of the importance of seeing, feeling, and exploring with the patient the determinants of their illness and feelings about their illness. UR has always been a leader in integrative medicine in this regard, he says.

Eric J. Rashba (R '95) has joined the Heart Center at Stony Brook University Hospital as director of electrophysiology.

Jerald L. Reisman (R '76, FLW '77) writes: "I have just completed a life dream of climbing Kilimanjaro with my two children. We summitted on Dec. 9, the 45th anniversary of Tanzania's independence. I also stepped down as the chief of emergency services at Lawrence Memorial Hospital and am now working part time."

Daniel Saurborn (M'98, R '99) — See SMD Class of 1998.

Stephen C. Scheiber (R'70) completed 20 1/2 years as the chief executive officer of the American Board of Psychiatry and Neurology in June 2006. He maintains academic professorial appointments at Northwestern University Feinstein School of Medicine and at the Medical College of Wisconsin. The American College of Psychiatrists has chosen him to receive the Distinguished Psychiatrist Service Award in recognition of his contributions to American psychiatry, including his leadership in gaining recognition for ten new subspecialties in both disciplines since 1990.

1939
Dr. John Frazer
329 Orchard Park Blvd
Rochester, NY 14609
585-288-4002

1942
Dr. Arthur Redmond
210 Hollywood Ave.
Rochester, NY 14618
585-271-2339

1943
Dr. Ralph Prince
17 Tobey Woods
Pittsford, NY 14534
585-586-9117

1944
Dr. Stuart Finch
20 Avondale Ave.
Haddonfield, NJ 08033
856-427-0772
spfinch@aol.com

1945
Dr. William Bergstrom
4689 Whetstone Rd
Manlius, New York 13104

1947
Dr. Richard "Rip" Collins
106 Temple St.
Avon, NY 14414
(585) 226- 2344
temple3@frontiernet.net

1949
Dr. Ruth Lawrence
1836 Clover St.
Rochester, NY 14618
585-461-0018
ruth_lawrence@urmc.rochester.edu

1951
Dr. George D'Angelo
3232 Westwood Estates Dr.
Erie, PA 16506
814-833-9065
gjdmd@adelphia.net

1953
Dr. Robert Palmer
5357 Chipwood Lane
Indianapolis, IN 46226
317-562-0116
rwpalmer@indy.net

1954
Dr. Chloe Alexson
57 Inglewood Dr.
Rochester, NY 14619
585-328-4193
drcgamd@aol.com

1955
Dr. Saul Milles
304 Hotchkiss Rd
Orange, CT 06477
203-795-4019
docsaul@aol.com

1956
Drs. William and Kathryn Kern
109 Breeze Haven Ter.
Huddleston, VA 24104
540-297-2312
williamakern@b2xonline.com

1957
Dr. Jules Cohen
152 Burkedale Cres.
Rochester, New York 14625
Jules_cohen@urmc.rochester.edu

1957
Dr. C. McCollister Evarts
Univ. of Rochester Med Center
601 Elmwood Ave, Box 706
Rochester, New York 14642
mac_evarts@urmc.rochester.edu

1960
Dr. I. Donald Stuard
1507 Greenhill Rd
West Chester, PA 19380
610-429-4362
idstuard@alumni.princeton.edu

1961
Dr. Hechmat Tabechian
3901 East Ave.
Rochester, NY 14618
585-385-2413
htab@rochester.rr.com

1962
Dr. Frederick Parker
310 Dewittshire Rd S
De Witt, NY 13214
315-446-8495
parkerf@upstate.edu

1964
Dr. Philip P. Bonanni
9 Prospect Hill Rd
Pittsford, NY 14534
585-271-2632
pbonanni@unityhealth.org

1965
Dr. John Randall
3641 Middle Cheshire Rd
Canandaigua, New York 14424
jerandall@pol.net

1965
Dr. Laurence Jacobs
60 La Serena Trl
Santa Fe, NM 87506
505-982-8666
Summer:
3499 Lakeview Lane
Canandaigua, NY 14424
585-396-2968
lsjacobsnynm@msn.com

1966
Dr. Donald A. Grover
21 Countryside Rd
Fairport, NY 14450
585-385-3639
dagrover@frontiernet.net

1967
Dr. Bob Tortolani
145 Oak Grove Ave.
Brattleboro, VT 05301
802-257-1575

1970
Dr. Philip A. Pizzo
Stanford University School of Medicine
300 Pasteur Dr
Suite M-121
Stanford, CA 94305
650-724-5688
philip.pizzo@stanford.edu

1971
Dr. Thomas McMeekin
300 White Spruce Blvd
Rochester, NY 14623
585-385-1500
041745@msn.com

1976
Dr. Beverly Love
111 Hampton Hills Boulevard
Canton, MS 39110
601-853-4110
brlovemd@hotmail.com

1977
Dr. Kathleen Gensheimer
73 Main Street
Yarmouth, ME 04096
207-287-5183 (work)
kathleen.f.gensheimer@maine.gov

1977
Dr. James Powers
714 Darrow Dr.
Pleasant View, TN 37146
615-746-8917
James.Powers@Vanderbilt.edu

1981
Dr. Linda Brodell
2660 East Market Street
Warren, OH 44483
330-393-4004

1982
Dr. Joseph Serletti
U Penn Health Services
10 Penn Tower 14385
Philadelphia, PA 19104
215-662-3743
joseph.serletti@uphs.upenn.edu

1985
Dr. James Haley
9 Bordeaux Way
Fairport, NY 14450
585-425-8520
jhaley@rochester.rr.com

1990
Dr. Peter S. Reichard
8 Cliffside Way
Boonton Township, NJ 07005
973-394-7995
preichard@optonline.com

1995
Dwight Heron
5150 Centre Ave, #545
Pittsburgh, PA 15232
412-623-6723
herond2@upmc.edu

1995
Lisa Plotnik
Reed Dr
Bedford, NH 03110
603-668-5331
lisakiddoc@yahoo.com

1999
Dr. Hans Stohrer
530 East 90th St. #2L
New York, NY 10128
212-828-4011
hans_stohrer@hotmail.com

2000
Dr. Ivette Motola
13060 Keystone Terrace
North Miami, FL 33181
305-892-1908
ivettemotola@yahoo.com

2001
Dr. Jennifer Mattucci Santoro
8301 Arlington Boulevard
Suite 505
Fairfax, VA 22031
703-207-0001
jennifermattucci@yahoo.com

2002
Dr. David Maine
2836 Quarry Heights Way
Baltimore, MD 21209
410-484-1977
dmaine2@jhmi.edu

2003
Dr. Shana Katzel
1 River Place #626
New York, NY 10036
585-746-5611
shanadowell@gmail.com

2004
Grace Chen
1446 Butler Ave.
Los Angeles, CA 90025
gchen47@yahoo.com

CORRECTION
In the fall/winter 2006 issue of *Rochester Medicine,* on page 45, upper right, Cyril Worby (M'56, R '60) is misidentified as Karl Johnson (M'56). We apologize for this error.

A Reason for Being There

By Lt. Col. Paul D. Danielson, M.D. (M'92, R'95)

In May 2003, Paul D. Danielson, M.D., director of pediatric surgical oncology at the University of Massachusetts Memorial Medical Center, said goodbye to his pregnant wife and eleven-month-old son to deploy to Iraq with the U.S. Army Reserve, Medical Corps, 912th Forward Surgical Team (FST). Danielson and his unit used gallows humor as a kind of emotional defense mechanism against the stress of daily realities. His account is excerpted from Operation Homecoming by Andrew Carroll, editor. Copyright (c) 2006 by Southern Arts Federation. Reprinted by arrangement with Random House Publishing Group.

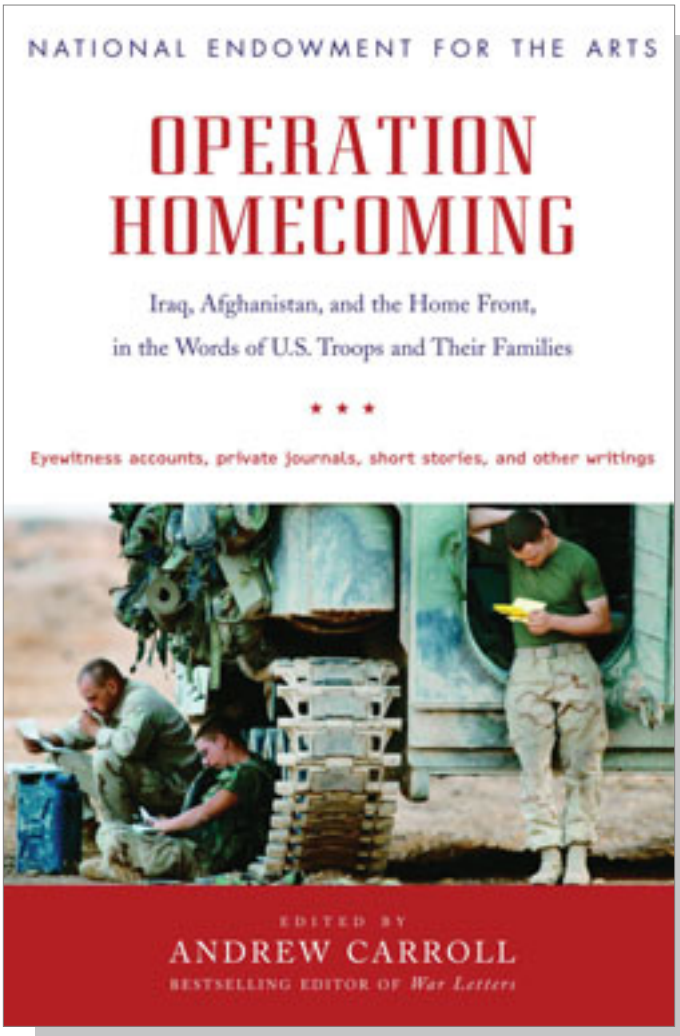
"Wakey, wakey, boyzzzz," Butter purred. "Someone mixed it up with hajji and we've got us some casualties comin' in."

Butter was our overtattooed trauma nurse who earned his nickname on account of the gold second-lieutenant bars he wore. He was different. Most men who experience a midlife crisis quit a respectable job and go out and buy a Harley. Butter did it backwards. He woke up when he was forty and decided enough with the Jack Daniels and motorcycle set. He figured he'd join the Army Reserve, and six months later he found himself in Mesopotamia.

The casualties turned out to be from an armored cavalry unit. These fellows always earned our respect. After dark they'd mount up and drive through the bad sections of town. They were trying to draw fire so that they could shoot back and put the hurt on the insurgents. Success with this tactic relies upon poor aim by the enemy and superior firepower by the Cav troopers. Unfortunately, during this particular mission an IED blew up one of their Humvees.

I batted my way out from under the mosquito netting and slipped on my flip-flops. I had stopped wearing my boots to trauma codes for two reasons. First, it got too difficult to wash the blood out of them. Second, it was too damn hot. Our two field operating tables were set up in a glorified closet in one part of the aid station. When you got an OR team in there and all the lights and equipment going, the temperature would be over 100 degrees Fahrenheit. Consequently, my uniform for patient care consisted of shorts, a T-shirt, and a sidearm. We'd add Kevlar and flak vests if the war came knocking a little too close. It went against all Army regulations. It was also against common sense as far as avoiding contact with bodily fluids. However, I viewed it as a calculated risk. Two of my co-surgeons were similarly clad, which did little to improve the reputation of the reservist medical corps in the eyes of the regular Army. Every time a sergeant major from the battalion walked through we had to have the defibrillator ready since he almost had an arrhythmia just looking at us.

The trio of yawning surgeons staggered down the hallway to the trauma bay. It was an open area in the front corner of the aid station with two litter stands in the center. The harsh fluorescent glow of two Bruce lamps strung from the ceiling illuminated the workspace. While Butter's staff was spiking bags of IV fluid and opening up packs of dressings, the FST's first sergeant, Cueball, came in wearing his combat boots. We figured he slept in them; no one could lace up a set that fast. Cueball loved his docs and his enlisted, and all of us respected him. He was in his familiar role of playing bouncer in the trauma bay. He was



giving the heave-ho to various wallflowers and rubberneckers who hoped to see some blood and guts. I never knew how all these trauma groupies got to the aid station so quickly. Of course, I'm being unfair in labeling them. They showed up to pitch in, and their assistance in moving patients, guarding EPWs, or just being "gofers" was indispensable. The medical service corps lieutenant came over to meet us.

"Morning, El Tee," Warthog, my partner in general-surgery crime, grinned. "What are you doing up so early?"

"Sir?" the youngster replied, still no more certain on how to interpret us than the day we first met him in Kuwait. "I just came over from the TOC. I can report three or four definites coming, maybe more."

Warthog was about to ask him how many "definites" three or four actually meant, but decided it was too early to tease the young officer. Our banter was interrupted as the walls rattled from the roar of a low-flying helicopter. There was a mass movement of people to the rear of the aid station. I glanced over at Warthog, who looked positively meditative as we waited.

"The last moment of tranquility, huh?" I observed.

His mind was on other thoughts. "I hope I covered up my pillow," he said, referring to the fine layer of silt that coated everything in the aid station after a helicopter landing. Any sense of calm was gone a moment later as the first of the four-man litter teams burst through the door.

"I was worried he wouldn't make it to the CSH," the flight medic reported as he followed behind the second litter. "Two urgent surgicals. The first is an Iraqi interpreter with shrapnel all over. The second is a Cav officer with a near-amputation of his right upper extremity."

We followed the teams into the heart of the aid station, taking care not to slip on the blood trail. We exploded into the light and openness of the trauma bay, and then, just as a hush follows the roar of a wave crashing onto a beach, a soft hum filled the room to replace the clamor of our arrival. I headed toward the second litter: white male, mid-30s, 80 kilos, awake but looking "shocky." His uniform had already been cut away by the time I reached him. A new IV was being started and vital-sign monitors were being slapped onto his pale skin. My quick primary survey revealed that his right forearm was nearly amputated and his left foot had caught a sizable piece of shrapnel.

"We are going to take good care of you, Major," I said to the wounded officer. "But you're going to need an operation on your arm and foot."

"OK, sir," he said simply. I was impressed by his calm. If my severed arm was hanging by a sinew, I would have been screaming my head off and crying like a baby. Not him. No tears in his eyes, and only a grunt here and there as we adjusted his tourniquet. He was 100 percent warrior. Pooh, the orthopedic surgeon, appeared at the foot of the litter. As big as a bear and as gentle as the A. A. Milne character, he had left his lucrative sports-medicine private practice to come over to Iraq.

"He needs your magic, Pooh," I said.

"Nerves intact?"

He was already trying to decide whether to try to salvage the upper extremity or just amputate. I frowned.

"We'll see." Pooh shrugged and shuffled off toward the OR to get ready. Warthog and I turned away from our patients to confer in the narrow aisle between the litters.

"Mine's stable," he said. "But needs lots of debridement. He keeps asking about your guy."

It turned out that the Iraqi national was an interpreter. He had been studying to be a doctor until Saddam closed all the medical schools. When the U.S. Army arrived, the young man decided to put his English skills to work. On this particular evening, it was his knowledge of first aid in controlling hemorrhage that kept the major alive long enough to reach us. I walked a few steps down the corridor to the adjoining makeshift operating room. Looking in, I found the OR techs opening pans of instruments, and the nurse anesthetists drawing up their induction medications.

"We're all ready for you," Mookie greeted.

"It's Pooh's show tonight," I replied.

I felt a bit disappointed. First, I was thinking about the major who was about to lose his arm. Second, I was depressed by the prospect of being idle. Pooh would be doing the amputation, and Warthog would be cleaning up the Iraqi interpreter's wounds. I could kill a little time doing some paperwork, coordinating the post-op evacuation of the casualties, and communicating with the CSH to give them a heads-up. After that, however, I would be back to thinking about home. Half an hour later I was self-medicating my self-pity by eating an MRE. I had saved the peanut butter tube from one meal and the bag of shelled and salted peanuts from another. Now, I could mix the two together, add them to the standard chow mein packet and season it with Tabasco. It gave the entree a little

"I was worried he wouldn't make it to the CSH," the flight medic reported as he followed behind the second litter. "Two urgent surgicals. The first is an Iraqi interpreter with shrapnel all over. The second is a Cav officer with a near-amputation of his right upper extremity."


Paul D. Danielson, M.D.

Thai flare. It was perfect comfort food at two in the morning.

Cueball came round the corner.

"You've got to have some," I offered, desperate to talk to anyone as a distraction.

"No thanks, sir," he grimaced. "But I was sent to find you. They want you to poke your head into the OR."

My mood immediately improved. I left the doctored MRE and thoughts of my family behind and headed to the OR. Pooh looked up from the major's arm.

"His elbow is blown away," he said. "I think the only thing holding his forearm on is a bridge of skin and his median and ulnar nerves. I can't find his radial. And I think that this is his transected brachial artery."

I peered over at the sterile field. There was a huge gaping hole where the elbow joint should have been. The sharp, fractured ends of the bones of his arm and forearm protruded menacingly into the wound area. The stump of his brachial artery was in spasm. It stood up on end throbbing with each pulse. It was a sticky situation. It is often possible to restore blood flow to an amputated limb. However, the efforts are useless unless the nerves will work. The nerves carry the messages to the muscles to make them move. They also carry sensory information back to the brain. There is little use in saving an extremity that won't work or that will constantly be getting injured without the owner's awareness. Moreover, the technology of prosthetic limbs had advanced so much that many patients have a better long-term outcome by having a mangled extremity amputated.

"Think we should try?" Pooh asked.

With two out of the three nerves identified and intact, I thought it was worth a shot. If it didn't work out, they could always just take the forearm off back at Landstuhl or Walter Reed.

"I'll scrub," I replied.

Once gowned and gloved, I started dissecting through the mess of damaged muscle and tendons to find the ends of the brachial artery. A portion of the vessel had been destroyed from the blast. In addition, the distal segment in the forearm had retracted several centimeters. It was apparent that the two ends would not reach one another. I needed a graft to bridge the gap. Warthog showed up, having finished with his patient.

"I could use your help. You want to get to work on this guy's groin?"

"I beg your pardon," he said indignantly. "He hasn't even bought me dinner yet. Let me also remind you that I wear Army green and not Navy white. I will not be a part of any of those 'don't ask, don't tell' activities no matter how . . ." His words trailed off as he went out for a quick scrub. A few minutes later, Warthog was flaying open the patient's thigh to harvest a piece of the saphenous vein. We would use it to replace the missing segment of artery. I continued to clean up the elbow area and tie off some bleeders. The game was on and everything else was secondary. I became focused on the operation and lost touch with much of what was going on around me. I remember Cueball coming in asking for updates so that he could plan the timing of the medevac chopper. The anesthesia team asked about blood loss a few times. I sewed in the bypass and removed the clamps. The patient's hand immediately pinked up, and the distal side of the wound started to ooze blood.

I rested the pad of my gloved index finger on the shiny segment of vein and felt the thrill of blood coursing through the vessel. The graft was open. The repair was working. It was a moment to savor. My silent celebration was interrupted by Mookie slapping, rather painfully, a loaded needle driver into my other hand. It was his not-so-subtle way of drawing me back to reality.

"Four-O nylon, sir," he announced, as he handed me the suture I would need for closing the skin. "Screw you, Mookie," I shot back. "This is the closest thing I've had to sex in four months. Don't ruin the moment."

We finished quickly and dressed the wounds as Pooh put the finishing touches on the external fixation device. I then broke scrub as the recovery-room team came in to help package the patient for transport to the CSH. I sat down on a medical chest in the corridor between the trauma bay and the operating room. After draining my CamelBak of tepid water, I leaned back against the wall and sighed. I am certain that I smelled to high heaven. I didn't notice, and it didn't really matter. By that point in the war everyone reeked.

Over the next few days we tried to figure out what happened to the major and his arm. Unfortunately, because casualties were evacuated out of the country so rapidly, the answer eluded us. In some ways, it was better not to know. Everyone was willing to assume that the arm was saved. Morale was so high that to consider the other possibility would have been too depressing, especially since that night was such a powerful justification for our being there. Several months after getting home I was back at my civilian hospital sitting in my comfortable office when Pooh telephoned.

"Did you happen to see Oprah yesterday?" he asked.

"No, I missed it," I replied, worried that he had some psychological scars left over from the war that were driving him to watch daytime television. "Pooh, why in God's name were you watching Oprah?"

"No, no, I wasn't," he clarified. "But someone told me that she did a feature on some of the wounded U.S. soldiers being treated at BAMC in San Antonio. She interviewed a major who had had his arm saved. I pulled the transcript off the Internet, and I'll e-mail it to you. The name and dates seem to correspond. I think it's our guy, and it looks like his limb was salvaged!"

I swelled with professional pride that our operation had succeeded. However, it was what this officer said during the television

Continued on page 72

Albert V. Cutter, M.D.

Albert V. Cutter, M.D. (M'40), a child psychiatrist who also led a medical education business, died Dec. 3 in East Amherst, N.Y. He was 92.

Dr. Cutter, a native of Lawrence, Mass., graduated from the University of New Hampshire in 1936 with a bachelor's degree in bacteriology and zoology. On the day he graduated from the University of Rochester School of Medicine and Dentistry — June 17, 1940 — he married Janet Gracey West of Rochester, who had graduated from Wellesley College with a bachelor's degree in zoology.

Dr. Cutter served in the U.S. Navy during World War II, spending four years aboard destroyers as a medical officer. He had special memories of his time on the U.S.S. Tripp.

Dr. Cutter initially planned to follow his father into a career as a surgeon, but he became interested in psychiatry during the war. In 1946, after receiving his initial training through the Navy, he began a three-year residency at the Menninger Foundation School of Psychiatry in Topeka, Kan. He then became a fellow in child psychiatry at the Louisville Mental Hygiene Clinic in Louisville.

In 1951, he became medical director of the Psychiatric Clinic in Buffalo, N.Y., a position he held until 1962, when he took over a psychiatry and neurology medical education business that also was based in Buffalo. The business, which he called Albert V. Cutter, M.D., Inc., helped physicians prepare for board certification exams in psychiatry and neurology. He researched and wrote a quarterly publication for the business. Dr. Cutter maintained the medical education business, along with his private practice, until 1980. He continued his private practice until 1998.

Dr. Cutter co-wrote many clinical articles and often consulted for Buffalo-area educational institutions.

Dr. Cutter's wife died in 1993. In 1997, he married Linda M. J. Barnett, a longtime friend and a psychiatric nurse practitioner. In addition to his wife, he is survived by his daughters, Ann C. Sist of Lake Jackson, Texas, and Susan Cutter of Brooklyn, N.Y.; a sister, Ruth Sander, of Port Orange, Fla.; two grandchildren and two great-grandchildren.

Christopher E. Desch, M.D.

Christopher E. Desch, M.D., a cancer specialist who was chief resident of internal medicine at the University of Rochester Medical Center from 1984 to 1985, died Dec. 10 when the single-engine plane he was flying crashed near the Charlottesville-Albemarle Airport in Virginia.

Dr. Desch, 51, was national medical director of the National Comprehensive Cancer Network. He also was an adjunct professor at Virginia Commonwealth University's Massey Cancer Center. He lived in the Richmond, Va., area with his wife, Roxanne Cherry, and son, John Tobias.

Dr. Desch was an internal medicine resident at the Medical Center from 1981 to 1984 before becoming chief resident.

"His death is such a tragic loss. Over his career he was always a leader and made many wonderful contributions. He was a superb clinician, a great patient advocate. We have lost one of our best," said Paul Levy, M.D., acting chairman of the Department of Medicine.

The National Comprehensive Cancer Network (NCCN), a not-for-profit alliance of 20 of the world's leading cancer centers, is dedicated to improving the quality and effectiveness of care provided to patients with cancer. Dr. Desch was the clinical leader of several of the organization's programs, including the NCCN Clinical Practice Guidelines in Oncology.

Dr. Desch received his medical degree from the Ohio State University College of Medicine. His postgraduate training included fellowships in hematology and oncology at the University of Washington. He served as the research director for the Virginia Cancer Institute and as associate director of the Massey Cancer Center. He was chairman the Health Services Committee at the American Society of Clinical Oncology and had been a member of a variety of other societies, including the American College of Physicians and the American Society of Hematology.

Dr. Desch wrote and co-authored articles and book chapters on cost-effectiveness and oncology resource utilization, and served as principal investigator on several clinical research studies. He was recognized nationally for his outstanding work in the areas of health services research and policy.

According to the *Times-Dispatch* newspaper in Richmond, Dr. Desch had his pilot's license and had been a member of a flying club for three years. He was flying one of the club's planes when the accident occurred. He radioed the flight tower at Charlottesville-Albemarle Airport near Earlysville for landing instructions. A few moments later, he radioed again, saying the engine was cutting out. The plane crashed into a large tree.

Memorials can be sent to the Evans Scholars Foundation, 1 Briar Road, Golf, Ill., 60029. The memorials will endow the Christopher E. Desch Room at the new Scholarship House being built at Ohio State University. Without the support from this national scholarship organization, Dr. Desch's education would not have been possible, his family said.

Lyman C. Wynne, M.D., Ph.D.

Lyman C. Wynne, M.D., Ph.D., a founder of family therapy and an influential researcher who helped transform the treatment of schizophrenia, died Jan. 17 of cancer in Bethesda, Md. He was 83.

Dr. Wynne chaired the University of Rochester School of Medicine and Dentistry's Department of Psychiatry from 1971 to 1977, and then served as professor of psychiatry until his retirement to emeritus status in 1998. During the 1950s and 1960s, as a researcher and an official at the National Institute of Mental Health (NIMH), Dr. Wynne pioneered new approaches to mental illness, especially schizophrenia.

"His rigorous communications research was essential to debunking the blaming notion that a child's early family environment, particularly the mother, caused schizophrenia," said Eric Caine, M.D., chair of the Department of Psychiatry. "It had a tangible positive impact on how families regarded their affected children or siblings. This work served to liberate families and to directly foster the emergence of the family-oriented community support and advocacy groups that we value so highly. Put simply, Lyman was central to bringing the family burdens associated with schizophrenia 'out of the closet' and promoting a guilt-free discussion about how best to deal with the complex challenges that confront everyone involved."

For 30 years, Dr. Wynne conducted a longitudinal study in Finland, studying the interaction of genes and environment in the development of schizophrenia. His landmark work with his collaborators, Pekka Tienari and Karl-Erik Wahlberg, shows that family environment can influence a genetic susceptibility to the schizophrenia.

Dr. Wynne also was an active family psychiatrist, frequently seeing challenging cases with his favorite co-therapist, his wife, Adele Wynne, who died in 2003. In 1997, the couple gave an endowment to the University of Rochester to start the Wynne Center for Family Research. Since its founding, the Wynne Center has conducted important studies on foster parenting, partner violence, women with pain, and depression.

"Lyman and Adele had the extraordinary vision to endow a Family Research Center to move the field along and to make sure that research would continue into the future to better understand how to strengthen and support families in their struggles with medical and mental illness, as well as other life challenges," said Susan H. McDaniel, Ph.D., the center's first director.

Dr. Wynne was well known as a generous mentor.

"Despite his international prominence as a researcher and scholar, Dr. Wynne was always humble, patient and kind," said J. Steven Lamberti, M.D., associate chair of psychiatry who studied under Dr. Wynne. "A gifted writer, he encouraged generations of students to find new and better ways to assist patients and their families. Despite an often hectic schedule, Dr. Wynne's door was always open to families, faculty members and students alike. He embodied the very best that the university has to offer."

Dr. Wynne was born in Lake Benton, Minn. At age 11, with his mother dying of cancer, he decided to become a medical researcher. He attended Harvard College on a full scholarship. During World War II, he was assigned by the U.S. Army to attend Harvard Medical School. He received his medical degree in 1947.

At Harvard Medical School, Dr. Wynne became a protégé of Erich Lindemann, M.D., a significant figure in social psychology and community health. His work with Lindemann changed his decision on a career from cancer researcher to psychiatrist.

"At a time when families of patients with schizophrenia were neglected by medical professionals, Dr. Wynne devoted his career to understanding them. He knew first hand about the devastating impact of mental illness upon families, losing a beloved sister to suicide early in his career," Lamberti said.

During the 1952 call-up of doctors for the Korean War, Dr. Wynne was sent by the Public Health Service to take part in beginning a new research program at NIMH. Among other positions, he was chief of the adult psychiatry branch of NIMH from 1961 to 1971. From 1965 to 1969, he also served as a special consultant to the director general of the World Health Organization in Geneva, Switzerland. Dr. Wynne published numerous articles. His studies of communication deviance and schizophrenia were first published in a series of articles with his colleague, Margaret T. Singer, in the Archives of General Psychiatry in 1963 to 1965. He co-edited The Nature of Schizophrenia.

Dr. Wynne is survived by five children, Christine Wynne of Oswego Lake, Ore., Randall Wynne of Tampa, Fla., Sara Wynne of Oakland, Calif., Barry Wind of Bethesda, and Jonathan Wynne of Brooklyn, N.Y., and five grandchildren.

Contributions can be made to the Wynne Center for Family Research at the University of Rochester Medical Center, 300 East River Road, P.O. Box 278996, Rochester, N.Y. 14627.

IN MEMORIAM

Black, James, M.D. (R '39)
Bonner, John, (MS '40, PhD '48)
Browne, James, M.D. (M '48)
Cutter, Albert, M.D. (M '40)
Dibble, Robert, M.D. (M '57)
Diehl, Kenneth, M.D. (R '47)
Forman, Richard, M.D. (M '40)
Frank, Donald, M.D. (BA '48, MS '51, M '55, R '60)
Freeman, Donald, M.D. (M '61)
Glaser, Gerald, M.D. (M '52)
Gruebel, Barbara, M.D. (R '77)
Hoefer, Jean, (MS '48)
Kaufman, Janice, M.D. (R '55)
Keller, Guy, M.D. (R '52)
Kolb, Lawrence, M.D. (R '36)
Lipphardt, Edith, M.D., (M '42, R '45)
Lux, James, M.D. (M '52, F '55)
Manchester, Robert, M.D. (MS '30, MD '32)
Nixon, Samuel, M.D. (M '40)
O'Grady, Joseph, M.D. (M '41)
Pearson, Raymond, M.D. (R '43, R '48, F '50)
Pinsky, Harry, M.D. (BA '47, M '51, R '59)
Pizzarelli, Anthony, M.D. (M '47)
Rendall, Edward, M.D. (M '46)
Rimer, David, M.D. (R '53)
Sadd, John, M.D. (M '59)
Saraf, Pradeep, M.D. (R '79, R '84)
Savlov, Edwin, M.D. (BA '46, M '48)
Sherman, Signe, (BA '35, MS '37)
Sottong, Philipp, M.D. (M '45, R '51)
Spence, George, M.D. (M '69)
Tenney, Lillian, M.D. (M '49, R '52)
Totah, Victor, M.D. (BA '42, M '44)
Warner, Robert, M.D. (R '51)
Watts, Russell, M.D. (M '51)
Wert, Alvin, M.D. (M '41)
Zugibe, Frederick, M.D. (F '81, F '83)

Dewhurst

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Dewhurst is a member of the NIH Recombinant Advisory Committee, which oversees all gene therapy studies in humans, and is chair of the University of Rochester Institutional Biosafety Committee. He also is an accomplished mentor, receiving the Graduate Student Society Faculty Teaching Award in 1996 and the Graduate Alumni Award for Excellence in Graduate Education in 2001. He serves as director of the University's Post-Baccalaureate Research and Education Program, which provides training in microbiology and immunology for underrepresented minority students, and is the current principal investigator of a NIH-funded predoctoral training program in HIV-1 research.

Dewhurst replaces Howard J. Federoff, M.D., Ph.D., who left the post to become executive dean of the School of Medicine at Georgetown University.

Leon Miller

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foundation support until 2000. He criticizes the tightening financial support for research and worries that young scientists are not receiving the funds they need.

Miller is the father of six children, three of whom graduated from the School of Medicine — Michael Miller, M.D. (M'76), Ellen Miller, M.D. (M'77) and John Rhodes Miller, M.D. (M'90). To honor his contributions to science, Miller's family and friends established a fellowship in his name that is awarded annually to a student entering the Ph.D. program in biophysics and biochemistry.

Miller endorses exercise as one path to healthy old age. When he was younger, he played tennis and squash and liked to ski. Today, for exercise, he walks the hallways and stairwells of the Medical Center, traveling far from his small, fifth-floor office.

"I pass places where people I knew once worked — people I know are gone. It's hard to contemplate sometimes," Miller said. "I go to the Miner Library almost every day, where I read to keep up in medicine and science. So much is fascinating I don't need to read Time or Playboy. There's still a heck of a lot to learn and a heck of a lot to do."

Being there

Continued from page 68

interview that moved me. When I got home that night, I helped my wife put our two sons to bed before sharing the transcript with her. She sat down at the kitchen table to read. It was only a couple of pages of text, but in it the officer described lying on the battlefield after being wounded. He was staring up at the Iraqi nighttime sky bargaining with God for the chance to see his daughter again. Then, later in the transcript, the major went on to share his feelings of joy once he made it home safely and wrapped both of his arms around his family.

My wife looked up and dabbed her cheeks with the back of her hand. She had never complained to me about my mobilization although I knew how hard it had been on her. She had managed all the challenges: child care, work, pregnancy — you name it. She is a strong and optimistic individual, but even at that moment I knew she was dreading the day when I would be called for a second tour.

"You know," she said trying to smile. "I hated every minute of that deployment."

"I know," I said.

"But it was worth it, wasn't it?"

University of Rochester
School of Medicine and Dentistry
601 Elmwood Avenue, Box 643
Rochester, NY 14642

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