In Review

BIOMEDICAL ENGINEERING

Mighty Membrane

PUMP IT UP: A composite photograph highlights a super-thin silicon membrane that could one day lead to diagnostic devices the size of credit cards. Part of research in the lab of James McGrath, associate professor of biomedical engineering, the project demonstrates a new version of an electroosmotic pump—a device in which fluids move through porous media in the presence of an electric field. The Rochester researchers were able to reduce the required electrical voltage from 10 kilovolts in a typical pump to about one-quarter volt, demonstrating a potential way to drastically reduce the size of future devices. PHOTOGRAPHY BY ADAM FENSTER
STUDENT LIFE
Fudge Factor
CANDY ENGINEER: Kiara Medina ’15 of Ridgewood, N.Y., sorts M&Ms as part of the process of making fudge for sale at the Common Market, the on-campus convenience store in Wilson Commons. She and Jessica Brogdon ’16 of Watkins Glen, N.Y., were among this year’s “candy engineers” at the market. In addition to making the gooey treat, holders of the competitive jobs help devise new flavor combinations and help plan fudge production and inventory for the store. PHOTOGRAPH BY ADAM FENSTER
INNOVATION

Start-Up Scene

OPTICAL OPPORTUNITY: Members of the student-led company Ovitz—Pedro Vallejo-Ramirez ’16, Joung Yoon (Felix) Kim ’14, Samuel Steven ’13, graduate student Aizhong Zhang, Len Zheleznyak ’05, ’06 (MS), and Nicolas Brown ’16 (left to right)—strike a pose with a portable eye-diagnosis instrument that they developed and are working to commercialize. Developed with the Institute of Optics and the Flaum Eye Institute, the “EyeProfiler” is designed to be smaller, cheaper, and more accurate than existing devices and especially suited for use with children. The group won a $10,000 award in November at a competition sponsored by High Tech Rochester, a nonprofit organization that promotes entrepreneurship in Rochester and western New York. For more about the company: www.o-vitz.com.

PHOTOGRAPH BY ADAM FENSTER
UNIVERSITY CAMPAIGN

‘Thanks a Billion!’

The Meliora Challenge, the University’s comprehensive fundraising effort, passes the $1 billion milestone.

By Sara Miller

The University is moving into the final phase of its first comprehensive fundraising initiative on a historic note, reaching the $1 billion mark in November. The milestone places Rochester among 29 private universities that have raised at least $1 billion and moves the University closer to the $1.2 billion goal set for The Meliora Challenge in 2011.

“This is a special day, literally a red-letter day,” said President Joel Seligman during a November 20 announcement. “I encourage everyone to take a deep breath and stop and smell the roses. It’s important to celebrate the victories.”

Planned to be completed in 2016, the Campaign is the largest comprehensive fundraising effort in the University’s history.

The $1.2 billion goal incorporates five priorities: $225 million for student support, primarily endowed scholarships and fellowships; $350 million for faculty support with an emphasis on endowed professorships; $375 million to support programs vital to the schools and units; $130 million in unrestricted support through the annual fund; and $120 million for new facilities and campus renovations.

“We are grateful for the vision, generosity, and support of our alumni, friends, faculty, staff, parents, and students,” Seligman said. “Let me especially thank [Chief Advancement Officer] Jim Thompson and the great Advancement team for our progress to date.

“On behalf of the University, I say to them all: ‘Thanks a billion!’”

Noting that the University will continue to face challenges, particularly due to changes in health care and other issues affecting the funding of federal agencies, Seligman also referred to remarks made by Rochester’s first president, Martin Brewer Anderson:

“But let me add, ‘Our work is but begun.’ We still have much to do to effectively support our faculty, students, and staff and to develop programs that place us in...
the vanguard of cutting-edge research, the highest quality education, clinical care, professional schools, and the creative arts.”

A commitment of more than $4 million from James Aquavella, professor of ophthalmology, pushed The Meliora Challenge past the historic mark. A clinician and researcher in the University’s Flaum Eye Institute, Aquavella made the gift in memory of his late wife, Kay, who was a nurse and administrator dedicated to the establishment of the institute.

Aquavella, who joined the University in 1963 and specializes in corneal surgery, said that he and his wife were guided by three great passions: their commitment to one another and their work together; the advancement of ophthalmology; and the University.

“Our gift to the University combines them all,” he said, noting that his work as a clinician and scientist and his wife’s work as a nurse and administrator at the institute are a “case study in the principles of Meliora.”

“I merely represent the many thousands of people who gave gifts of all sizes,” he said.

G. Robert Witmer Jr. ’59, chair emeritus of the Board of Trustees, said the Campaign is one of the University’s most significant initiatives in the five decades that he has been connected to Rochester, noting that the effort is an important partnership among alumni, faculty, staff, and members of the Rochester community.

Beginning with the founding of the University in 1850, and continuing through the 1920s campaigns that helped establish the River Campus and the Medical Center, the Rochester community has a long history of supporting the University, he said.

“The Rochester community has assisted the University and vice versa,” Witmer said. “It’s a symbiotic relationship, and the Rochester community has helped us accomplish what we have achieved to date.”

Seligman said that while major fundraising efforts often are characterized by the amount of money that they raise, he hoped members of the University community would remember that the fundamental purpose of the Campaign is to support faculty, clinicians, alumni, and students as they try to make a difference in the lives of those around them.

“When we started the Campaign, we realized that it’s not about the dollars,” Seligman said. “Dollars enable you. The Campaign is about touching people’s lives.”

Sara Miller is University spokesperson.

Meliora Milestones

Chaired by University Trustees Cathy Minehan ’68, dean of Simmons College School of Management in Boston and a former U.S. Federal Reserve executive, and Rich Handler ’83, chairman and CEO of Jefferies & Company, The Meliora Challenge was publicly launched in 2011 after a quiet phase that began in 2005. The $1.2 billion goal incorporates five areas, including student support, primarily endowed scholarships and fellowships; faculty support with an emphasis on endowed professorships; support for school and unit programs; unrestricted support through the annual fund; and new facilities and campus renovations.

The Medical Center is a major part of the overall Campaign with a goal of $650 million, of which $510 million has already been raised. Among the key priorities are programs and research to find breakthroughs that will treat—and perhaps cure—many diseases, such as muscular dystrophy, Alzheimer’s, spinal cord injury, Parkinson’s, and cancer.

**Key gifts since 2005 include:**
- A $30 million commitment from Board Chair Ed Hajim ’58, and his wife, Barbara, to fund student scholarships and to support the endowment of the Hajim School of Engineering & Applied Sciences.
- $25 million in support from Rich Handler and his wife, Martha, for student scholarships.
- A $20 million commitment from Paychex founder B. Thomas Golisano for the construction of a new Golisano Children’s Hospital, scheduled to open in 2015.
- $14 million in support from Trustee Robert Goergen ’60 and his wife, Pamela, including $10 million for the Robert B. Goergen Hall for Biomedical Engineering and Optics.
- A $10 million gift from Eastman Kodak

**Recent projects supported by the Campaign include:**
- Golisano Children’s Hospital, an ongoing project scheduled to be completed in 2015.
- Ronald Rettner Hall for Media Arts and Innovation, opened in 2013.
- Raymond F. LeChase Hall, home to the Warner School of Education, opened in 2013.
- The Eastman Theatre renovation and expansion project, completed in 2011.

**Donor Data**
- Represented by all 50 states and 78 countries
- 90,000-plus donors in the Rochester area
- 50,000-plus donors outside Rochester
- 38 percent of faculty and staff have contributed to the Campaign

**Facts & Figures**

AS OF DEC. 1, 2013
- The Meliora Challenge: $1 billion
- 68 endowed professorships
- 247 endowed student scholarships and fellowships
- 2,700 George Eastman Circle members

For more information about The Meliora Challenge, visit campaign.rochester.edu.
Discover

Can You ‘See’ in the Dark?

A new cognitive sciences study finds that at least 50 percent of people can “see” the movement of their own hand even in the absence of all light.

Reporting on results from five separate experiments involving 129 individuals, a team led by Duje Tadin, associate professor of brain and cognitive sciences, found that the eerie ability suggests that human brains combine information from different senses to create perceptions. The team, which included researchers from Rochester and from Vanderbilt University, published the findings online in the Association for Psychological Science’s journal Psychological Science.

As part of the experiments, the researchers set up several scenarios to gauge each subject’s self-reported ability to see the motion of their hands in conditions of total darkness.

Participants also were fitted with a computerized eye tracker in total darkness to confirm whether self-reported perceptions of movement lined up with objective measures. The eye-trackers indicated that even in total darkness, many subjects could follow the movement of their hands smoothly, an ability that requires being able to track an actual object.

First author Kevin Dieter, a postdoctoral fellow at Vanderbilt, helped devise several of the experiments while he worked toward his PhD in Tadin’s Rochester lab. He says the research “underscores that what we normally perceive of as sight is really as much a function of our brains as our eyes.”

For most people, the ability to see self-motion in darkness probably is learned, the authors conclude. “We get such reliable exposure to the sight of our own hand moving that our brains learn to predict the expected moving image even without actual visual input,” says Dieter.

—Susan Hagen

Menstrual Cycle Influences Concussion Outcomes

How well a woman recovers from a concussion may depend on that time of the month.

In a study published in the Journal of Head Trauma Rehabilitation, Medical Center researchers reported that women injured during the two weeks leading up to their period had a slower recovery and poorer health one month after the injury compared with women injured during the two weeks directly after their period or women taking birth control pills.

If confirmed, the findings could alter the treatment of and prognosis for women who suffer head injuries from sports, falls, car accidents, or combat.

In the study, researchers Jeffrey Bazarian, associate professor of emergency medicine, and Kathleen Hoeger, professor of obstetrics and gynecology, explored the influence of sex hormones such as estrogen and progesterone in how women recover from head injuries. They analyzed hormone levels of 144 women ages 18 to 60 who arrived within four hours of a blow to the head at five emergency departments in upstate New York and one in Pennsylvania.

The researchers believe that progesterone levels in women drop sharply after a head injury, especially among women whose progesterone levels are naturally high, as they are in the two weeks leading up to a period. That drop produces a kind of hormonal withdrawal which either contributes to or worsens post-concussive symptoms.

And that may account for why women recover differently from men, the researchers conclude. “I don’t think doctors consider menstrual history when evaluating a patient after a concussion, but maybe we should,” says Bazarian. “By taking into account the stage of their cycle at the time of injury we could better identify patients who might need more aggressive monitoring or treatment. It would also allow us to counsel women that they’re more or less likely to feel poorly because of their menstrual phase.”

—Emily Boynton
Depression Therapy Helps Poor, Minority Moms

A Rochester study indicates that screening for depression and providing short-term, relationship-focused therapy can relieve the disorder among minority mothers, even in the face of poverty and personal histories of abuse or violence.

Sherree Toth, lead author and executive director of the University’s Mt. Hope Family Center, found that a 14-week series of convenient, one-hour therapy sessions relieved depression in participants much better than standard clinic-based care. The study participants also continued to improve eight months after the treatment ended, regaining a sense of hope and control over their lives and reporting feeling more connected to and supported by others.

Published online in Development and Psychopathology, the findings are good news for mothers and their children alike, says Toth. “Extensive research has shown that young children whose primary caregivers are depressed often begin life on the wrong foot,” she says. “They may fail to develop secure attachments, setting them up for a cascade of difficulties, from behavior problems during childhood and failure in school to involvement in the juvenile justice system and major psychiatric problems down the road.”

Despite the widespread prevalence of depression among minority mothers, researchers have largely overlooked the population. For the new study, researchers tracked 128 low-income mothers of one-year-olds, 60 percent of whom were African American, 20 percent Hispanic, and 20 percent Caucasian. In addition to poverty, the vast majority of the mothers faced extensive life challenges. All but 6 percent had been depressed for more than a year, 87 percent reported histories of child abuse, 30 percent had been raped or sexually assaulted by a relative, and 27 percent suffered from post-traumatic stress disorder.

Over the course of a 14-week intervention that featured home-based therapy sessions, women in the study group saw their depressive symptoms decline. By contrast, women who received community care remained clinically depressed at follow-up sessions eight months later.

The results, says Toth, point to the need for screening high-risk populations, and the authors suggest future research should explore ways to make the interview process more welcoming.

—Susan Hagen

To Sleep, Perchance to Clean

Rochester scientists are giving new meaning to the adage that a good night’s sleep clears the mind.

In a study published in the journal Science, researchers led by Maiken Nedergaard, the Frank P. Smith Professor of Neurosurgery and codirector of the Center for Translational Neuromedicine, report that a recently discovered system that flushes waste from the brain is primarily active during sleep.

The findings could transform scientists’ understanding of the biological purpose of sleep and point to new ways to treat neurological disorders.

“This study shows that the brain has different functional states when asleep and when awake,” says Nedergaard. “In fact, the restorative nature of sleep appears to be the result of the active clearance of the by-products of neural activity that accumulate during wakefulness.”

The new findings hinge on a discovery last year by Nedergaard and her colleagues that the brain has its own closed “ecosystem” to manage the removal of neurological waste created by normal neural activity. The system differs from the lymphatic system that disposes of cellular waste in the rest of the body because that system doesn’t extend through the complex system of molecular gateways—called the blood-brain barrier—that controls what enters and exits the brain.

Using a new imaging technology, researchers observed what amounted to a neurological plumbing system that piggybacks on the brain’s blood vessels and pumps cerebral spinal fluid through the brain’s tissue. The process flushes waste back into the circulatory system where it eventually makes its way to the general blood circulation system and, ultimately, the liver.

The study indicates that the brain’s system is highly active during sleep, clearing away toxins responsible for Alzheimer’s disease and other neurological disorders. The researchers also found that during sleep the brain’s cells reduce in size, allowing waste to be removed more effectively.

The removal of waste from the brain is essential because nearly every neurodegenerative disease is associated with the accumulation of cellular waste products.

—Mark Michaud
Grant Holcomb Retires after Three Decades as Gallery Director

After leading the Memorial Art Gallery for nearly three decades, Grant Holcomb will step down this summer.

In announcing his retirement last fall, Holcomb, the Mary W. and Donald R. Clark Director of the Memorial Art Gallery, noted that his decision coincided with the end of the gallery’s 100th anniversary year.

“What more appropriate time to conclude my long tenure as director than after an extraordinary and exhilarating year-long celebration of the gallery’s centennial anniversary,” he said. Holcomb’s retirement also marks the end of a 29-year tenure that has seen the gallery increase its permanent collection, expand its facilities, and broaden its exhibition programs.

Named the gallery’s sixth director in 1985, Holcomb has also led collaborations with cultural, educational, and medical organizations—programs that emphasized the gallery’s role as a publicly engaged institution.

Last fall, the gallery formally dedicated Centennial Sculpture Park, which includes four site-specific sculptures and recasts 10 acres of the gallery’s grounds into a showcase of public art and urban space. A multiyear project, the park was the largest initiative in the gallery’s history. University President Joel Seligman recognized Holcomb’s leadership of the gallery.

“Grant has shaped the gallery’s internal and external spaces and enhanced its collections in ways that will benefit art lovers for generations to come,” Seligman said.

Under Holcomb’s direction, the gallery also initiated high-profile exhibitions featuring the work of Maxfield Parrish, Edgar Degas, Georgia O’Keeffe, and Jacob Lawrence.

The gallery also acquired works of art ranging from an ancient Egyptian sarcophagus and a Renaissance suit of armor to works by such noted 19th- and 20th-century artists as Albert Bierstadt, Leonard Volk, Walter Goodman, George Bellows, Joseph Cornell, Jaune Quick-To-See Smith, and Christian Boltanski. The centennial year included the addition of major contemporary works by Yayoi Kusama and Kehinde Wiley.

Jim Durfee, president of the gallery’s board of managers, will lead a committee charged with identifying Holcomb’s successor.
New Public Safety Director Named

A former trooper, investigator, and administrator with the New York State Police who has spent the past two years serving as deputy director of the University’s Department of Public Safety, has been named to lead the department. Mark Fischer, who joined the department in 2011 as part of a leadership succession plan, became director in December.

He succeeds Walter Mauldin, who will become a senior advisor, focusing on assessment, policy, and planning for the department. Mauldin joined the University in 1980 as director of what was then known as security services.

Ron Paprocki, senior vice president for administration and finance and chief financial officer of the University, saluted Mauldin for his long tenure in working to ensure the safety of students, faculty, and staff.

“Walter has provided nearly 34 years of key leadership to the department that serves our most critical function—the safety of our University community members,” said Paprocki. “He has created a department that is well respected by our community and by our local law enforcement agencies. Most recently, his leadership in the multiyear effort to establish the University’s first sworn officer program has resulted in a stronger and coordinated response structure within public safety.”

Fischer becomes chief of a 134-member force that includes 27 newly active sworn peace officers and another group of 25 currently in training.

Nursing Earns Accreditation

The School of Nursing has earned full, 10-year accreditation for all of its baccalaureate and master’s degree programs, as well as its doctor of nursing practice program, the Commission on Collegiate Nursing Education reported last fall. The commission conducted a three-day, onsite evaluation of the school last March.

The commission evaluates the quality and integrity of baccalaureate, graduate, and residency programs in nursing, according to nationally recognized standards. The accreditation process is designed to hold nursing programs accountable to the profession, consumers, employers, higher education, and students and their families by measuring each academic program’s success at achieving its mission, goals, and expected outcomes. The process helps ensure that nursing graduates are prepared for their professional roles and fosters continuing improvement in nursing programs.

“This is a true testimony to the hard work and investment put forth by our entire school, our faculty, staff, and our students,” said Kathy Rideout ’95W (EdD), dean of the school.

Mellon Grant Focuses on Humanities and Technology

Doctoral students in the humanities will have new support to study and to learn to use new technology.

That’s after the Andrew W. Mellon Foundation awarded the University a $1 million grant to support a graduate program designed by Rochester faculty to train humanities students to integrate digital technologies into innovative research programs.

The award is one of a series of grants the foundation has made in recent years to equip faculty and students at colleges and universities with tools and protocols in the digital humanities.

Students from any of Rochester’s four humanities PhD programs—English, history, philosophy, and visual and cultural studies—are eligible for the fellowship. Fellows will study the theory and practice of digital humanities as a way to discover new avenues of inquiry within their own fields and to serve as apprentices and mentors to communities of undergraduates and faculty members who are collaborating on research projects.

The grant is the latest in a series of initiatives in the digital humanities at Rochester. In addition to hiring faculty in fields related to digital media, the University last fall opened Ronald Rettner Hall for Media Arts and Innovation, a space designed to facilitate multidisciplinary collaboration through technology.

Civil Rights Leader to Give MLK Talk

Benjamin Todd Jealous, the youngest person ever appointed president and CEO of the National Association for the Advancement of Colored People, is scheduled to deliver the University’s Martin Luther King Jr. Commemorative Address in January.

A former community organizer and newspaper editor, Jealous was 35 years old when he was named president of the NAACP in 2008. He announced last fall that he planned to step down from the leadership position at the end of 2013.

A fifth-generation member of the NAACP, Jealous began his career in civil rights at age 18, opening mail at the organization’s Legal Defense Fund.

He has since become an outspoken leader of successful state and local movements to ban the death penalty, outlaw racial profiling, defend voting rights, secure marriage equality, and free wrongfully incarcerated people. A Rhodes Scholar, Jealous is a graduate of Columbia and Oxford universities.

The January 24 talk begins at 6 p.m. in Strong Auditorium.

GUEST: The youngest person to lead the NAACP, Jealous is set to give the 2014 MLK address.
HIGHLIGHTS

Women Swim Away with League Title
Three Yellowjackets recognized for individual performances.

By Dennis O'Donnell

THE ROCHESTER WOMEN EASILY SWAM AWAY with the Liberty League title this winter to earn the Yellowjackets’ fifth straight conference championship while the men just missed repeating as league champions. The women scored 1,960.5 points, more than 800 points clear of second-place Rensselaer Polytechnic Institute, who ended with 1,163 points. The men finished with 1,586.5 to RPI’s 1,702.

The junior from Ossining, N.Y., was named the league’s Swimmer of the Year, one of several individual honors awarded to Yellowjackets. She was joined by Danielle Neu ’17, who was named Diver of the Year for her first-place finish in the 1-meter competition and second-place finish on the 3-meter board. Jen Enos ’17 was named Rookie of the Year after winning two events, the 500-yard and 1,650-yard freestyle, both in University and league record times. For the men, freshman Kasey Kwong

Lauren Bailey ’15 won all seven events she entered during the two days of competition at Union College, setting six school and seven conference records. She took individual titles in the 100- and 200-yard butterfly, the 200-yard freestyle, and the 200-yard medley, and she was part of the top 200-yard and 400-yard medley relay team with Karen Meess ’14, Alex Veech ’17, and Vicky Luan ’16, and part of the top 200-yard freestyle relay team with Khami Simpson ’17, Emily Simon ’17, and Luan.
ATHLETIC HONORS
Two Named to Classic Hall

Two Rochester basketball players who helped lead the Yellowjackets to regional and national success have earned recognition from one of the longest-running Division III tournaments.

Jon Onyiriuka ’08 and Alex Porter ’09 were inducted into the Wendy’s College Classic Hall of Fame in December.

Onyiriuka is the fourth Rochester men’s player to earn induction, while Porter is the first Rochester woman to be honored.

Launched in 1998, the hall recognizes outstanding players, coaches, administrators, and long-time contributors to the event. The men’s tournament played its 47th edition in 2013. The women’s tournament is 20 years old.

Onyiriuka was a four-year starter for the Yellowjackets, finishing his career with 1,267 points (seventh all-time entering the 2013–14 season), 829 rebounds (fifth), and 109 blocks (fifth) with three appearances in the NCAA tournament.

He’s a vice president at BTIG, a financial services firm in New York City.

During her four seasons at Rochester, Porter helped the Yellowjackets to an 88–24 record and advanced to the Sweet 16 of the NCAA Division III playoffs each year.

She works with the National Institutes of Health in Bethesda, Md.

In other highlights from the late fall:

Men’s basketball: The Yellowjackets were heading into the new year at 5–5 for the season. The team was led by Nate Vernon ’14, Tyler Sankes ’15, and Sam Borst-Smith ’17, who have each averaged in double figures for scoring early in the season. The men won the annual Holiday Inn Tournament in November, and finished third in the Chuck Ressler Tournament and fourth in the Wendy’s Classic. They begin UAA conference play in January.

Women’s basketball: The women were 4–4 with one game left in 2013. Led by Ally Zywicki ’15, who was averaging 15.4 points a game early in the season, and Loren Wagner ’14, who was averaging 13.3 points a game, the Yellowjackets begin UAA conference play in January.

Squash: In a battle of two top eight programs, the No. 5 Yellowjackets defeated No. 7 Princeton in December at the Lyman Squash Courts. The win moved Rochester to 6–1 for the season. Freshmen Aria Fazelimanesh ’17, Ryosei Kobayashi ’17, and Mario Yanez ’17 won key matches to clinch the victory, with sophomore All-Americans Neil Cordell ’16 and Faraz Khan ’16 as well as senior Karm Kumar ’14 also winning their matches. At the Liberty League championships in late November, the Yellowjackets’ six-year title streak came to an end when host St. Lawrence University knocked off Rochester in the final match of the tournament. The Yellowjackets return to the courts on January 18 to host No. 3 Yale University.

Volleyball: Junior Xiaoyi Li ’15 was named UAA honorable mention, her first all-UAA honor this season after being one of the top players on a young Yellowjacket squad that ended the year with a 9–27 record. The setter from Derwood, Md., led the Yellowjackets with 944 assists this season while also providing a career high of 71 kills.

Men’s and women’s soccer: Jessica Smith ’14 was named first team all-East Region by the National Soccer Coaches Association of America. Five men earned similar honors: Alex Swanger ’15 and Keith Grafmeyer ’16 were named to the first team; Andrew Sheridan ’15 and Max Fan ’14 were named to the second team; and goalkeeper Mike Moranz ’14 was named to the third team.}

Dennis O’Donnell is director of athletic communication for the Department of Athletics and Recreation.