

**Dean's Newsletter August 18, 2006**  
**Annual Report of the School of Medicine and Dentistry**

This newsletter is the annual report of the School of Medicine and Dentistry. It has been an exciting time at the School of Medicine and Dentistry. On July 10, 2006, President Joel Seligman announced that Bradford C. Berk, M.D., Ph.D. has been selected as the new Senior Vice President for Health Sciences and CEO of URM. As a 1981 M.D./ Ph.D. alumnus of the School, as a distinguished cardiovascular scientist and clinician, as a highly successful Chair of Medicine at Rochester since 1989, and as an incredibly smart, talented and humane person with roots and commitment to the community, there is no doubt that Brad will provide stellar leadership for the future. The medical school community and your Dean, look forward to working with him on the exciting opportunities that lie ahead.

Dr. Berk will be taking over the reigns capably held by C. McCollister Evarts, M.D. since August 2003. The institution is indebted to Mac for many accomplishments. A short list of selected items might include establishing a truly constructive partnership with our local insurers and the business community; creating a Primary Care Center and the Center for Community Health; setting a firm foundation for a strategic plan of the Medical Center that will now be completed and implemented; and ensuring that the School of Nursing receives the elevated status it deserves, including support for its facility expansion. And let us not forget his attention to our medical school's history, such as installing photos of all the class pictures in the *Hall of Classes* and creatively engineering the "Heritage Trail" of medical school history. Dr. Evarts will continue to work on behalf of URM as a Distinguished University Professor; we will continue to benefit from his wisdom, and enjoy his wit.

Here now is SMD's annual report, reporting on accomplishments for the fiscal year ending June 30, 2006.

### **Overview**

The first Dean of the Medical School, Nobel Laureate George Hoyt Whipple, M.D., came to Rochester in 1921 to put a revolutionary concept into practice. Whipple's vision, built on the philanthropy of George Eastman and the insights of Abraham Flexner, was a school and hospital under one roof that integrated basic science and clinical practice. Today, Whipple's concept of physically integrating patient care and academics under one roof continues. The main campus of the University of Rochester Medical Center comprises the School of Medicine and Dentistry (SMD) and Strong Memorial Hospital (including the Ambulatory Care Facility), which occupies 2.1 and 1.6 million sq. ft. of space, respectively, along with the School of Nursing and Eastman Dental Center, each of which occupies 100,000 sq. ft. Off-site locations for SMD research and faculty practice add 27,000 sq. ft. and 376,000 sq. ft., respectively.

Integrated academic and clinical space is important, but what sets SMD apart are the people that fill this space and the work that they do. SMD people include 1440 employed faculty, 1039 voluntary faculty, 400 medical students, 565 graduate students, 150 post-doctoral fellows in basic science, 529 residents, 127 fellows, and 2697 full- and part-time staff. This report summarizes the achievements of these dedicated faculty, staff and students in our four missions of patient care, research, education and community health. Accomplishments in academic affairs, finance and development are also summarized.

### **Patient Care**

During FY2006, health care was provided to the Rochester community and our broader region by 912 faculty members in 19 clinical departments. The collective clinical practices of our faculty are organized according to a distributed model in which Department Chairs, Division Directors and/or Center Directors are responsible for overall practice activities--clinical, administrative, financial and strategic. Importantly, however, this confederation of primary care, specialty and sub-specialty practices is bound together by a central entity known as University of Rochester Medical Faculty Group (URMFG).

While the number of faculty providers is fluid in that certain providers join and leave at various times throughout the year, URMFG experienced net growth overall. The current provider census of 912 (M.D.s, D.O.s, Ph.D.s, R.N. midwives) represents a 5% increase over the last fiscal year.

Faculty practice visits in FY06 totaled 800,348. This figure, which includes both on-site and off-site visits, represents an increase of 12.1% over FY05. In addition, URMFG providers covered 38,378 hospital admissions in FY06, trending up 1.2% from FY05.

During FY06, URMFG faculty received payments for patient care services totaling \$262 million, a 12% gain from \$234 million in FY05. Revenue has increased in part due to URMFG's improved working relationship with Excellus, its major local payer. Recognition by Excellus and other commercial payers of "endangered specialties" has resulted in successful negotiations for enhanced reimbursement. Various payers now recognize over 30 specialties as "endangered." All told, taking into account payments for endangered specialties and a general increase in reimbursement across all services, negotiations with payers during FY06 will garner over \$8 million of additional revenue during the current fiscal year.

During FY2006, URMFG received full certification by the National Committee for Quality Assurance. We now have delegated credentialing with 22 payers, significantly decreasing the effort required of physicians and staff for credentialing with commercial payers. E-Delineate, an electronic privileging form that allows facilities to view physician privileges on-line, was also implemented.

The AllScripts project to automate outpatient practices completely began in 2003 as a pilot program that included 5 ambulatory practices. AllScripts is now operational for 661 providers and staff, with over 200 more scheduled for implementation from July to December 2006.

## **Research**

The University of Rochester Medical Center sponsors a nationally-recognized research portfolio evenly balanced between basic science and clinical research. Its research enterprise is by far the largest in upstate New York, accounting for 44% of NIH-sponsored research to all upstate New York institutions. During FY2006, expenditures on research conducted by SMD faculty totaled \$216 million, of which \$147 million was supported by NIH. As part of a University-wide space survey, 537,000 sq ft of space were identified as devoted to research. Given our \$216 million in research funding at SMD, this translates to \$397 of externally sponsored funding per square foot of research space.

In recent years, despite having available only a constant level of institutional resources in the SMD budget to support research, the extraordinary efforts of our faculty and staff have led to continued increases in expenditures from NIH grants (\$120.5M in FY2003, \$134.9M in FY2004, \$143.5M in FY2005 and \$147.1M in FY2006), despite a flattening of the overall NIH budget. From 2002 through June, 2006, annualized expenditures of \$6.68 million in faculty start-up packages have been associated with an annualized \$28.72 million in total externally-sponsored research funding (\$20.37M direct and \$8.35M indirect) to these faculty. In FY2006, of \$26.2 million cash expenditures from the SMD budget to support research infrastructure, start-up research expenses and unfunded faculty salaries, \$23.2 million was to support basic research and \$3.0 million was to support clinical research.

To assess our progress, a Research Resource Inventory is carried out every two years; the most recent survey was conducted in the third quarter of 2005. A total of 649 faculty (up from 586 in 2003) were P.I.s on 1526 research projects. Of these, 873 were categorized as clinical research projects and 440 as basic research. In dollar terms, these projects were evenly divided between clinical and basic science research (\$92.8 million versus \$96.4 million, respectively). For clinical research, 48% of funds were from NIH and 6.2% were from other federal sources; for basic research, 82% of funds were from NIH.

The subject areas of grants > \$2.5 million funded during FY2006, along with the P.I.s and total project costs, were: Center for biophysical assessment and risk management following irradiation (Okunieff, \$21.1 million); General clinical research center (Guzick & Gerich, \$12.2 million); Program project in vascular inflammation and atherosclerosis (Berk, \$10.5 million); Center for biodefense immune modeling (Wu, \$9.9 million); Center for immune function and biodefense (Sanz, \$9.8 million); Coordinating center for Huntington's Disease studies (McDermott, \$8.1 million); Health effects of ultrafine particles (Oberdoerster, \$8.0 million); Coordinating center for Parkinson's Disease studies (Oakes, \$4.7 million); Randomized clinical trial of primary-care based patient navigation (Fiscella, \$3.2 million); Effectiveness of school-based asthma therapy (Haltermann, \$3.1 million); Neural network of deep brain stimulation in obsessive-compulsive disorder (Haber, \$3.1 million); Risk

stratification in heart failure patients (Zareba, \$2.8 million); STD/HIV prevention training center (Urban, \$2.8 million); National registry for myotonic dystrophy patients and family members (Moxley, \$2.7 million), and senior mental health and research alliance (Conwell, \$2.6 million).

These grants add to ongoing large national federally-funded programs in gene therapy of Parkinson's Disease (Federoff), environmental health (Gasiewicz), lung damage from *P. carinii* (Gigliotti), rare neurological diseases (Griggs), HIV vaccine delivery (Keefer), Parkinson's Disease study group coordinating center (Kurlan), anion transport in salivary glands (Melvin), human immunology (Mosmann), muscular dystrophy research (Moxley), psychoneuroimmunology (Moynihan), deaf health research (Pearson), AIDS clinical trials (Reichman), genetics, pathophysiology and treatment of autism (Rodier), and regulation of brain thrombosis in stroke models (Zlokovic).

The medical school has a long tradition of training leaders in academic medicine, and has responded to the NIH request for additional training of clinical and translational researchers. SMD serves as a fertile environment for research training programs in a wide variety of fields funded by NIH. Currently, there are 32 Institutional Training Grants (T32), 3 faculty development programs (R25) and 3 other PHS training grants at URMC supporting 111 predoctoral and 95 postdoctoral trainees. In addition, SMD sponsors 43 individual career development grants (K awards). Many of these K awards interface with the Rochester Clinical Research Curriculum (RCRC) Program, a K30 grant from NIH that was renewed for 5 years during FY05-06. The K30 supports clinical research training for medical students, fellows, and junior faculty, and consists of a didactic curriculum leading to an MPH in a Clinical Investigator Track, a series of Skill-building Workshops, and a mentored research project. Each year, 14-20 new RCRC Scholars matriculate into the program. A total of 124 scholars have entered the program since 1999 with only 7 withdrawals and 52 completions. RCRC trainees are derived from 19 Departments in the Medical Center. As a measure of productivity, 33 have already become principal investigators on their own grants and, as of March 2005, RCRC Scholars have been awarded \$22.2 million in sponsored research awards. They have also been highly productive in publishing their findings, accounting for 349 first authored and 224 co-authored publications since 1999.

In FY 2006, technology transfer activities showed continued growth. Invention disclosures rose 10% from the previous year, to a total of 101. Although new U.S. patent application filings dropped to 45 from the previous year's 54, filing of foreign cases rose showing a 5% increase in total patent filings. At the same time, 10 new U.S. patents issued – a 100% increase over the previous year. Licensing activity increased as well, as we entered 20 new agreements. Amongst these were three new licenses with Socratech and iCardiac, two of URMC's start-up companies. Other licensees included Wyeth, NovoNordisk, Eli Lilly, Novadaq and Stressgen, among others. In FY 2006, revenues from licenses rose to an all-time high of \$37.68M representing a 34% increase over the previous year. In non-revenue generating activities, the number of Material Transfer Agreements and Confidentiality Agreements processed continued to increase to a total of 441, a 20% increase over the previous year's total. Three start-up companies were formed: EZMed, Lighthouse BioSciences and iCardiac.

Consistent with the NIH Roadmap initiatives, we have focused this past year on translational research. Dr. Randy Rosier and the Center for Musculoskeletal Biology led by Regis O'Keefe received the best priority score of the Study Section for their Center on translational research in Orthopaedics. Funding for this grant will begin this year, with total project costs over 5 years of \$7.8 million. In addition, in October, 2005 an RFA for Clinical and Translational Science Awards (CTSAs) was released with a March 27, 2006 deadline. The URMC application, which requested \$42 million over 5 years, included ten key function activities including the rejuvenation of the GCRC, a program of community engagement in research, an Upstate consortium of clinical research institutions, two new Masters Programs and a new PhD Program to support a predoctoral training grant (T32) and an institutional career development award (K12), and many more innovations. A total of 37 of the largest and finest research-oriented medical centers applied for CTSA awards, and another 50+ applied for smaller planning grants. Preliminary results of the NIH review of our proposal revealed that we have an outstanding score in the fundable range, and we have been given reason to be optimistic about funding by October 1, 2006. As a CTSA awardee, URMC will be recognized as one of a few vanguard centers of excellence for clinical and translational research in the United States. This will have a multiplier effect on our competitiveness for other research funding, both federal and private, as well as our rankings in NIH funding.

## Education

Medical School. About 4200 applications for medical school were submitted to SMD; about 3500 completed our secondary application. We interviewed 639 applicants for 100 places in the Class of 2009. This class has 55 women and 45 men, ranging in age from 21-35, with about 40% 24 years or older. Of the entering class, 37% are New York State residents and 27 different states are represented in the class. The class includes 2 REMS students, 8 MD-PhD students, 4 former Peace Corps members and 2 former AmeriCorps volunteers. They attended 62 different colleges and universities as undergraduates. Twelve percent attended UR, 5% each attended Cornell and BYU, 4% attended Williams, and 3% Columbia and Dartmouth, while 2% each attended Berkeley, Boston University, Carnegie Mellon, Emory, Harvard, Hopkins, NYU, Pomona, Princeton, Rice, SUNY-Geneseo and Wellesley. About 35% are non-Caucasian students, and 14% are underrepresented minorities. Academic measures have trended up over the past 5 years: mean MCAT scores for 2001-2005 were 10.4, 10.3, 10.4, 10.5 and 10.7; mean GPAs were 3.62, 3.66, 3.67, 3.70 and 3.68.

The Academic Research Track was initiated in 2005-6 to attract 10-20% of the medical school class into an enriched curriculum that enhances their training as future academic leaders. This entails lecture series on research topics, research placements in the summer between Year I and II, and an additional year of research or research training.

Despite the fact that our Double-Helix Curriculum does not "teach to the Boards," our second-year medical students achieved scores on Part 1 of the National Boards that averaged 225 (national mean=217). Our fourth-year students averaged 225 (national mean=220) on Step 2CK. As measured by the quality of residencies to which our students matched, the residency match this past March was the best in the 17 years for which data are available.

The primary metrics for curriculum currently are in the form of exit surveys from medical students. Reports from last year demonstrated a need for more intensive instruction in pharmacology and clinical reasoning, and better integration of the second-year pathophysiology sequence and third-year basic science blocks. All of these recommendations have culminated in new curricular offerings: a 2-week pharmacology course, revision of basic science block during the medicine-surgery clerkship, revision of the DPT (Disease Process and Therapeutics) course, and "master clinician rounds" and other activities to promote expert reasoning. The assessment of clinical reasoning has been incorporated more formally in the Comprehensive Assessments for second- and third-year students using oral and written examination formats coupled with standardized patient exercises.

We also implemented several enhancements to the learning environment in response to student requests: wireless internet capability in the Case-Method Room, conversion from analog to digital technology in the PBL rooms and elsewhere, an upgraded student lounge, and development and implementation of a web portal for efficient navigation.

Faculty members gave 25 presentations at national conferences on curricular innovations and educational research. Seven papers were published on such topics by faculty in the past year, and five more are in press in leading educational journals, one in the *New England Journal of Medicine*. This level of activity for the Medical Education Research Team makes it one of the most active units in the U.S. We have served as consultants to five medical schools in the past year about curriculum, as well as to the National Board of Medical Examiners. Grants are under review at 3 Foundations.

The Deans Teaching Fellows program has expanded to include 8 fellows, each of whom is involved in an educational project that will culminate in publication and presentation at a national conference. This year there were 10 applicants, all accomplished educators, for 3 positions.

Graduate School. The graduate school student body comprises 425 PhD students and 140 candidates in professional science M.S. programs, in the MPH program, and in Marriage and Family Therapy. This year, the Office for Graduate Education has developed online registration for PhD students: registration for the fall using this system was flawless, resulting in major time savings and accuracy. Applications for admissions are now also online.

As part of our medical center initiative in clinical and translational science, we took steps last year toward developing new M.S. and Ph.D. programs in Translational Research. These are under consideration for approval by NYS.

In PhD programs, class size has been adjusted downward from annual entry of 84 new students to 65, based on a strategy that accommodates anticipated NIH funding for the immediate future (3 years) while providing balance between new and established programs. New recruitment efforts target regional schools and enhanced quality of international enrollees. Program reviews emphasize core course revision and effort to shorten PhD by a semester through earlier qualification.

An Office of Post Doctoral Affairs, with formal membership in the AAMC-GREAT group and the National Post Doc Association, has been established, to serve the 150 basic science post doctoral fellows in SMD. A Policy for Post Doctoral Fellows has been approved by UR. Career development assistance by symposia and a faculty mentor group was established this year.

Graduate Medical Education. The GME Office is responsible for 70 ACGME accredited residency and fellowship programs containing 656 trainees (529 residents and 127 fellows). In addition, there are 7 GME Dental Programs with 54 trainees. In the Spring 2006 Match, 92.5% of all University of Rochester positions offered were filled in the match, with 85% filled by US medical school graduates. (The National fill rate by US graduates is 65%.)

Internal work hour surveys are conducted by the GME Office to track every resident's activities for 2 weeks, two times a year. The spring 2006 work hour survey revealed 100% response rate (all 626 trainees currently on clinical service completed the survey.) From November 7-16, 2005, there was an unannounced visit the Island Peer Review Organization to monitor resident work hours by New York State. The institution received notification in December 2005 that it was found to be in full compliance with the regulations.

Based on data from the GME exit survey in June, 2006, 39% of all 2006 residents and fellow graduates are staying in the Rochester area. Residents reported the following plans: 47.2% will go into fellowships; 13% will go into academic practice; 25% will go into private practice; and 15% will pursue a variety of other options. Among fellows: 7% will go on to additional, subspecialty fellowship training; 25% will pursue academic practice; 40% will go into private practice; and 12% will pursue other options.

The GME office remains in a leadership position nationally, as recognized by its status as the first Academic Health Center to be awarded 6 years of Institutional Accreditation by the Accreditation Council on Graduate Medical Education. The GME Committee has worked with the hospital's Office of Quality and Safety on several projects to track medical quality/safety issues and incorporate these practices in the training and everyday practice of all UR residents and fellows.

During the past year, the GME office implemented an electronic information management system to track all GME finance issues as well as resident, faculty and program performance data. All program directors and administrators from our 70 programs went through extensive training and have been supported in their implementation activities by GME staff. The evaluation software is currently used by 35 programs with the goal of activating the remainder by Fall 2006. This system will acquire outcomes data regarding the quality of resident, faculty and overall program performance.

### **Community Health**

As part of the transition from Project Believe, Community Health was established as the fourth mission of the medical school in 2003. Based on the principle that community health interfaces with the other three missions, we documented the breadth and depth of community health activities across many of our clinical and basic science departments and were awarded the AAMC Award for Excellence in Community Service in 2004. This past year, a Center for Community Health (CCH) was established at the Medical Center under the leadership of Nancy M. Bennett MD, MS, Professor of Medicine and Community and Preventive Medicine. Dr. Bennett was the Deputy Director of Health for Monroe County and continues to serve in that role for a portion of her time, thus assuring the close collaboration of the URMC with the Department of Public Health. An Executive Committee was charged with developing a strategic plan to implement the community health mission. The

strategic plan includes three goals and seven strategies, including the establishment of a new organizational structure to coordinate and support community health efforts across the Medical Center.

Accomplishments in the area of community health include the continuation of a variety of effective community programs. Among a very long list, key examples are:

- A telemedicine demonstration project, supported by a large number of community partners, brings pediatric care to over 8500 area day care and elementary aged children. This program improves health, improves work force productivity and reduces the overall costs of providing health care to children.
- A childhood immunization program has eliminated city-suburban and racial disparities in childhood immunization rates through a highly cost-effective method, sustained through broad based community partnerships.
- The Racial and Ethnic Disparities in Immunization Initiative (READII), a successful community intervention that has reduced racial disparities in adult immunization, was awarded the 2005 Excellence in Immunization Award by the National Partnership for Immunization.
- Multiple efforts in the Jay-Orchard Street neighborhood, one of the city's most impoverished areas, have led to increased access to health care services in the area, including much-needed oral health services, and a model program to eliminate the exposure of children to lead paint.
- The establishment of the Center for Deaf Health Research, a CDC-funded Prevention Center, the first and only center of its kind in the world. This Center will identify the unique health risks of the deaf and hard of hearing population, and create better strategies for improving access to needed health care.
- The formal integration of community health into the curriculum of our School of Medicine and Dentistry, making our medical school one of few in the nation that requires community service as part of the core curriculum.
- A science outreach program has improved the academic performance of high school aged children in the Rochester City School District.
- The Healthy Living Program, a church-based health program implemented by the Center for Lifetime Wellness, that addresses obesity and lack of physical activity in African American adults, received the 2005 Secretary's "Innovation in Prevention Award" from the U.S Department of Health and Human Services.
- A student run volunteer clinic at St. Joseph's that seeks to improve access to health care for the uninsured was awarded the 2005 AAMC Caring for Community Grant to further the "UR Well" program.
- The Women's Health Partnership, supported by grants from the CDC and NYS, assures coverage for breast, cervical and colorectal cancer screening for those without sufficient insurance coverage.

### **Academic Affairs**

Faculty appointment, reappointment, and promotion actions for FY2006 year totaled 1647. The Promotion and Tenure Steering Committee recommended 119 faculty appointment and/or tenure decisions at the level of Associate Professor or higher, which were forwarded to the Dean and University Trustees for approval. Nine sabbaticals were also recommended for SMD faculty and forwarded to the University Trustees for approval.

In the summer of 2005, after 13 glorious years as Chair of the Department of Pediatrics, in which she accomplished so much to better children's health and advance the academic standing of the Department's national stature, Elizabeth McAnarney, M.D., announced that she would step down at the end of the 2005-06 academic year. An exhaustive search, led by Richard Burton, M.D., led to the appointment of Nina Schor, M.D., Ph.D. as the new Chair of Pediatrics and Physician in Chief for the Golisano Children's Hospital. Dr. Schor received her BS with honors from Yale majoring in Molecular Biophysics and Biochemistry, received her PhD in Biochemistry from Rockefeller University, earned her MD from Cornell (NIH Medical Scientist Training Program), and then completed residencies in both Pediatrics and Neurology at Children's Hospital and Harvard Medical School. She has received multiple teaching awards in the course of her career, is a very successful NIH funded researcher, and is an accomplished clinician and administrator. Dr. Schor was recruited from the University of Pittsburgh where she was Professor of Pediatrics, of Neurology, and of Pharmacology, and Director of the Division of Child Neurology.

The Conflict of Interest Group (CIAG) met monthly and developed a standardized approach to the evaluation of faculty situations with potential conflict of interest. The CIAG developed criteria for either recusal from the research or divestiture of financial interest, and agreed upon guidelines for the development of management plans should that be necessary. These systematic guidelines, which coordinate level of financial involvement

and degree of control of research projects, have been shared with other leading academic health centers, and have generated enough national interest that several other centers have requested permission to utilize these forms as well.

In response to two faculty committee recommendations on faculty development in specific areas of need, we have created two Associate Dean positions for faculty development in the past year, one in education and one in the broad area of recruitment, retention and promotion of women and minorities. The duties and goals for these positions were delineated, priorities were established, with implementation to begin on September 1, 2006. The Associate dean for Faculty Development--Education is Denham Ward, M.D., Ph.D. and the Associate Dean for Faculty Development--Women and Diversity is Vivian Lewis, M.D.

### **Finance**

SMD revenues in FY2006 totaled \$594.5 million. The largest contributors were professional collections from faculty practice (\$262.5 million), research grants and contracts (\$216 million), endowment (\$26.5 million; draw rate=5.5%), and transfers from the hospital to support clinical faculty (\$10.2 million) and research faculty (\$7.5 million). Net tuition from medical student, graduate student and other educational programs amounted to \$13.8 million, or 2.3% of the SMD budget.

Prior to the current fiscal year, in order to cover an expected shortfall of revenues relative to expenses, \$2 million of reserves was set aside in the SMD budget. Due to better-than-expected grant revenues and lower-than-expected utility costs, as well as disciplined efforts on the part of all of the Chairs in running their Departments on a zero-based budget, only \$.37 million of reserves were actually used. At the same time, mainly due to the SMD share of royalties and to successful clinical and other departmental programs, cash reserves across SMD as a whole increased by \$9.8 million.

### **Development**

Total philanthropic support of SMD was \$16.5 million in FY06. The number of donors to SMD increased from 4,069 to 5,099, and the number of alumni donors increased from 1,750 to 1,906. The 24.8% participation rate of M.D. alumni compares favorably with benchmark institutions.

At the end of FY06, \$5.93 million in cash gifts and pledges had been secured toward the School's 3-year, \$10 million merit-based scholarship initiative--21 months into a 36-month effort. As of this writing, the total has exceeded \$7 million.

The William Morgan Professorship in Medicine was fully endowed in FY06. Other significant gifts and commitments of note include: \$1 million from Dr. Robert Brent for medical student scholarships; \$1 million from Jack and Norma Erdle to support stem-cell research; \$450,000 from the Glover-Crask Foundation for the UR Eye Institute and \$350,000 from Dixon Gannett to support Primary Care

More than 31 alumni and donor events were held in Rochester and in 17 other cities around the country. Events ranged from a full SMD reunion to "intimate conversations with the Dean" to alumni receptions in conjunction with professional conferences. More than 700 individuals were hosted in Rochester and an additional 300 alumni were visited around the country.





## SEAS ALUMNI FUEL LOCAL ECONOMY

**OVER THE LAST 20 YEARS,  
SEAS ALUMNI HAVE  
FOUNDED 29 COMPANIES  
IN THE ROCHESTER AREA,  
PUMPING SOME \$85  
MILLION DOLLARS INTO  
THE REGION'S ECONOMY**

While the University works to expand and fortify the entrepreneurial culture on campus, graduates of SEAS have carried that culture into the surrounding community. Over the last 20 years, SEAS alumni have founded 29 companies in the Rochester area, pumping some \$85 million dollars into the region's economy through annual salaries alone.

"SEAS has provided technology leaders for the Rochester region, both the entrepreneurs and the people who lead large divisions in the established high-tech companies," Kevin Parker, dean of SEAS, says. The companies are in a range of fields, including biomedical engineering, optics, electronics, and information technology. Together they employ almost 900 people.

On a national scale, Rochester graduates dominate the optics industries, Parker says, and have major leadership

roles in electronics, computers and software, construction, and a variety of other areas.

As SEAS faculty, students, and alumni contribute to the development of new technologies, so, too, do they establish the foundations of new enterprise. As a result, the school has an impact on the regional and national economies, as well, as on the progress of science.

"SEAS is characterized by very high quality in both research and teaching," he adds. "This provides the 'raw materials' for new startups, in that new technologies are developed in our labs, along with new graduates who are eager to see these developed in the larger world."

Fred Beer '95 and Damir Saracevic '95 established Auragen Communications, Inc., a Web-based software company, soon after their graduation. At the beginning, Beer and Saracevic worked out of a Rochester apartment. Today, Auragen employs more than 25 staff members who design and maintain Web sites for Rochester-based corporations like Eastman Kodak Co. and Wegmans Food Markets, as well as other national companies, including Amazon, Birds Eye Foods, Dell, Expedia, and Miller Brewing.

Jose Tamez-Pena '96 (MS), '99 (PhD) worked with other University researchers, including Dean Kevin Parker, to establish Virtual Scopics, LLC, a software company whose

product provides formerly unavailable information about disease progression from ordinary MRI and CT scans. The technology is useful for tracking disease—for example, showing a three-dimensional image of a brain tumor and measuring its volume within 2 percent accuracy, allowing for precise readings of the tumor's response to treatment. It is also valuable for the \$30 billion drug research market, allowing researchers to track tissue response to drugs for conditions such as epilepsy, cancer, Alzheimer's disease, multiple sclerosis, and osteoporosis. The technology was commercialized in partnership with the University.

Many of the companies founded by alumni in areas such as medicine, aerospace, defense, and biotechnology reflect Rochester's exceptional place in the field of optics. Jay Eastman '70, '74 (PhD), for example, founded Lucid, Inc., in 1991 to develop electro-optical equipment for medical use. QED Technologies, Inc., founded by Donald Golini '86, produces precision optics derived from technology developed at the University's Center for Optics Manufacturing. QED Technologies has grown steadily and now employs some 40 people in Rochester.

Underpinning this successful enterprise is an exceptional optics education. "I could not have been better prepared for a career in optics," says Laura Weller-Brophy '80, '84 (MS), '87 (PhD), a SEAS Visiting Committee member and the director of intellectual property



Advanced Computer Innovations, Inc. Amarel Precision Instruments Inc. Apollo Optical Systems LLC ASE Optics Inc. Auragen Communications Inc. Burleigh Instruments Inc. Convergent Audio Technology CPAC Inc. Detection Systems Inc. GG&C Imaging Systems Inc. Gradient Lens Corp. Holotek LLC Imagilent Inc./JSR Ultrasonics Javlyn Inc. LaserMax Inc. Lucid Inc. MPX Inc. M/E Engineering P.C. Ormec Systems Corp. QED Technologies Inc. RPC Photonics Inc. Semrock Inc. Soyata Computers of Rochester Inc. Strategic Triangle Inc. Tailored Lighting Inc. Upstate Medical Physics Inc. Velmex Inc. Viewpoint Systems LLC Virtual Scopics LLC

for optical display films at Eastman Kodak. "As I've moved into positions where I need to be able to assess and understand a broader scope of technical work spanning optical sciences and materials, I can depend upon the foundation of knowledge that I gained while at SEAS to help me to make sound judgments and to ask judicious questions."

Future SEAS students will develop that foundational knowledge in the new, 100,000 square-foot biomedical engineering-optics building now under construction on campus. The Center for Institute Ventures, to be housed in the building, will help researchers to realize

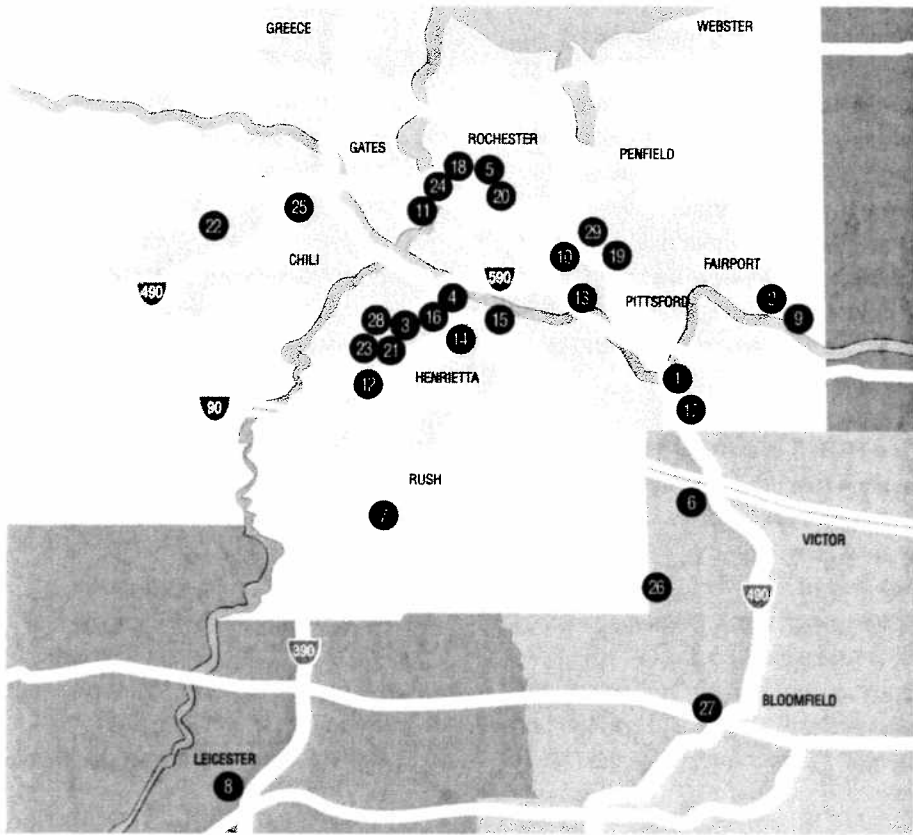
the commercial potential of developments in the biomedical engineering and bio-optics areas.

"With the help of the Kauffman Foundation for our Entrepreneurship Initiative, we expect that more graduates of SEAS will be choosing to start companies on their own, particularly in growing areas like bio-optics," Parker says.

"SEAS attracts students with an abundance of both talent and drive," says Murray Rudin '83, a member of the SEAS Visiting Committee and a partner with the Los Angeles-based private equity firm of Riordan,

Lewis & Haden. "Combine those gifts with the College's great education and plentiful opportunities for independent research and you have a winning formula that encourages business entrepreneurship. That was true when I was a student and continues to be so today."

SEAS is a tireless generator of new technology. Through the energy and vision of alumni and faculty, the school is reaching beyond the campus to the surrounding region. As New York State looks to technology as an important component of its economic future, SEAS plays a pivotal role in positioning the region for growth.



- 1 Advanced Computer Innovations, Inc.
- 2 Amarel Precision Instruments Inc. (now part of Thales Optem Inc.)
- 3 Apollo Optical Systems LLC
- 4 ASE Optics Inc.
- 5 Auragen Communications Inc.
- 6 Burleigh Instruments Inc. (now Exfo Burleigh Products Group Inc.)
- 7 Convergent Audio Technology
- 8 CPAC Inc.
- 9 Detection Systems Inc. (now Bosch Security Systems Inc.)
- 10 GG&C Imaging Systems Inc.
- 11 Gradient Lens Corp.
- 12 Holotek LLC
- 13 Imagilent Inc./JSR Ultrasonics, division of Imagilent
- 14 Javlyn Inc.
- 15 LaserMax Inc.
- 16 Lucid Inc.
- 17 MPX Inc.
- 18 M/E Engineering P.C.
- 19 Ormec Systems Corp.
- 20 QED Technologies Inc.
- 21 RPC Photonics Inc.
- 22 Semrock Inc.
- 23 Soyata Computers of Rochester Inc.
- 24 Strategic Triangle Inc.
- 25 Tailored Lighting Inc.
- 26 Upstate Medical Physics Inc.
- 27 Velmex Inc.
- 28 Viewpoint Systems LLC
- 29 Virtual Scopics LLC