



Technology Commercialization



Annual Report
Fiscal Year 2009

(1 July 2008 - 30 June 2009)



UNIVERSITY of
ROCHESTER



■ CONTENTS

Letter from the Directors	3
The Year's Highlights	4
The Technology Commercialization Process	5
Sponsored Research	5
Proposals Submitted	6
Sponsored Program Expenditures	7
Award Funding Received	11
Overview of Material Transfer Agreements Activity	12
Technology Transfer Data	13
Discoveries	13
Patent Prosecution	14
Licensing	20
The University of Rochester's Technology Portfolio	21
New Additions to the Portfolio—Hottest Technologies of FY 2009	22
Licensing Royalties	24
Economic Development	26
Technology Commercialization for Economic Stability	26
Start-Up Activity	26
Outreach, Education, and Marketing	28
FY 2009 Staffing	29

LETTER FROM THE DIRECTORS

Dear Colleagues:

FY 2009 presented one of the most significant economic challenges of our times. The Offices of Technology Transfer and the Office of Research and Project Administration worked both together and separately to respond to those challenges. Reduced budgets required substantial efforts to be invested in cost containment while ensuring that the future value of the University's assets was not compromised. In addition, we recognized the need to continue to extract optimal value from our existing technology assets. For FY 2009, some of our key initiatives and accomplishments are listed below:

- We made improvements in research administration processes to better serve our investigators and research sponsors. FY 2009 brought its fair share of excitement and challenges as the American Reinvestment and Recovery Act (ARRA) was enacted in February 2009. This resulted in many additional funding opportunities for our faculty. ORPA worked closely with the Clinical Translational Sciences Institute to ensure that proposal opportunities were vetted and disseminated to our faculty, that assistance was provided when necessary, and despite the challenges of Grants.gov, that proposals were submitted on time. As noted in this report, in FY 2009 alone, the University submitted 443 ARRA proposals for a total of more than \$221 million. While the proposal activity was analogous to "drinking from a fire hose", faculty took full advantage of the opportunities presented and ORPA accommodated the proposal process to ensure successful applications.
- In FY 2009, we continued toward our goal of advancing nascent technologies to improve their commercial viability by investing some royalty revenue into some of our most promising new technologies. One award involved the participation of both the School of Medicine and Dentistry and the School of Arts and Sciences in funding the research for proof of principle in a biological assay system and related compounds with potential medical applications; the second was for a treatment for the prevention of infection in bone surgery.
- We have continued to refine the proposal for a new philanthropic Technology Investment Fund.
- We sustained our efforts to provide a consistent and seamless process of technology transfer for our academic and industry clients while addressing the needs of the unique environments of both campuses. The Technology Transfer Policy Committee chaired by Provost Kuncl has proven to be an effective vehicle for ensuring communication and resolution of research and technology transfer challenges that have potentially broad impact. Thoughtful, reasoned discussions have resulted in improved communication, more informed decision-making, and greater consistency. Frequent meetings among the offices at the operational level have yielded similar results. In addition, the offices have begun a collaborative effort with the aid of a legal intern to redraft model technology transfer agreements in order to achieve greater standardization of terms.
- The offices have worked effectively to enhance technology marketing activities. In the summer of 2008, a new combined website (<http://www.urmc.rochester.edu/technology-transfer>) was launched representing one of the first cross-campus websites at the University. The technology search engine was further refined early in 2009 to optimize the identification of our technologies by commercial search engines. Software and templates were launched to enable easy uploads of marketing materials to other commercial databases. We are exploring the opportunities to utilize social media as a marketing tool, establishing a Commercial Link group to attract the expertise of UR alumni and friends.

This report shows the results achieved in FY 2009. We are continually impressed with the range of technologies that are generated by the faculty of the University of Rochester and proud of the achievements we have made to allow so many of them to be used for public benefit.

Sincerely,

Gail M. Norris
Director
River Campus

Marjorie D. Hunter
Associate Vice President for
Technology Transfer, URM

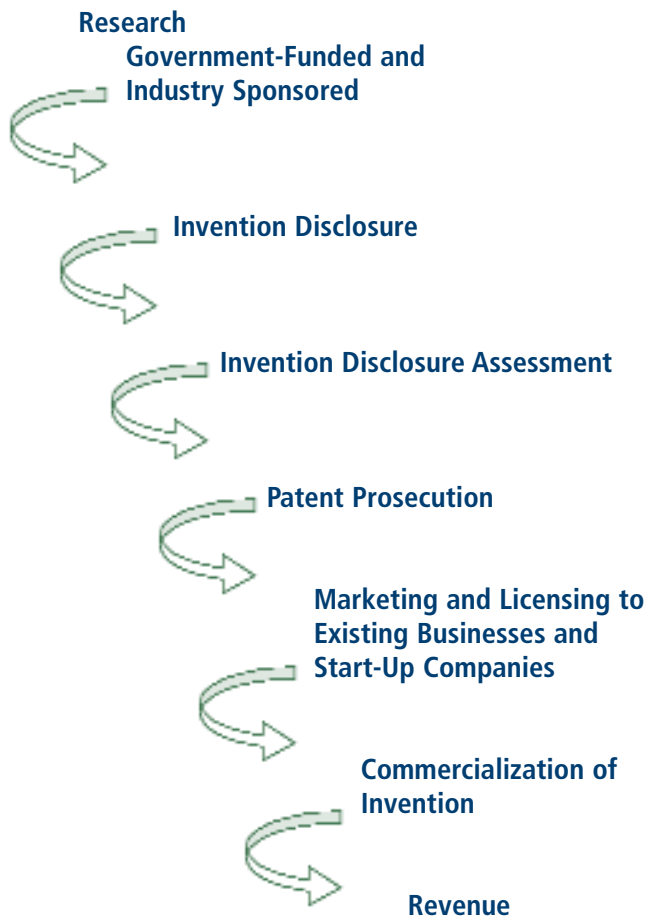
Gunta Lidars
Associate Vice President for
Research Administration

THE YEAR'S HIGHLIGHTS

- **Royalty Revenues.** Rochester continues to be a national leader in generating revenue from its licensed technologies. For FY 2009, the University again was among the top academic institutions in the country for royalty revenue. While the majority of our royalties have been generated from a few licenses, we continue to enter into new licensing transactions to commercialize our technologies and to provide the University with important revenues for research and education.
- **Research Funding.** Including the increased proposal activity generated by ARRA, sponsored programs expenditures exceeded \$377 million and rose by more than 4 percent from FY 2008. Given the downturn in the economy and corresponding decrease in industry funding, and the flattening of (pre-ARRA) federal support, the increase in research expenditures reflects the quality of our research programs and the innovation of our investigators.
- **New Inventions.** The University again received more than 140 invention disclosures from faculty and staff in FY 2009. These technologies include significant breakthroughs in such areas as cancer research, shape memory polymers, diagnosing and treating kidney disease, new materials and coatings, novel medical devices, and repairing damaged nerve tissue (see “New Additions to the Portfolio—Hottest Technologies of 2009” section on page 22).
- **Patenting and Partnering Remain Priorities.** At the end of Fiscal Year 2009, the University held 369 U.S. and foreign issued patents and, like the year before, nearly half are under license to commercial entities
- **CTSI.** The University’s Clinical and Translational Science Institute (CTSI) has a primary goal of ensuring that new preventive interventions, diagnostic procedures, and novel therapies get into the healthcare communities and to patients as quickly and safely as possible. The Institute continues to work with the Offices of Technology Transfer on new paradigms that can “package” the research results we produce into commercial opportunities for development in the for-profit sector.
- **Economic Development.** Two new start-ups were spun out of the University of Rochester this fiscal year involving distinctive technologies. One is based on safe and cost-effective patient care products, and the other is based on small molecule inhibitors of mixed lineage kinases to provide potential treatments for various metabolic, cardiovascular, and neurological diseases. In addition, we continue to build the necessary resources and infrastructure within the community to launch technologies created at the University toward new commercial entities. The University will continue to work with regional and national venture capitalists, angel investors, and entrepreneurs to optimize the transfer of our technologies for the greatest public benefit.
- **Seamless Operations in Our Research and Technology Transfer Areas.** Technology Transfer, Research Administration, Corporate Alliances, and the academic research community at the University of Rochester have continued to increase their harmonization efforts throughout FY 2009. As industry/academia relationships have increased in complexity, the need to coordinate and manage our relationships internally is critical. Some of the initiatives we have undertaken in FY 2009 to improve in this area include the launch of a fully integrated [Technology Transfer website](#), the increased coordination and oversight of research initiatives and attendant policy implications by the Technology Transfer Policy Committee, regular combined meetings of the various offices who contribute to our research relationships with industry partners, the use of a shared database for all external industry contact information, and the introduction of plans to co-locate the offices that interface with industry for corporate relations and alliances

THE TECHNOLOGY COMMERCIALIZATION PROCESS

Results for FY 2009 are organized in the order they appear in the technology commercialization process.

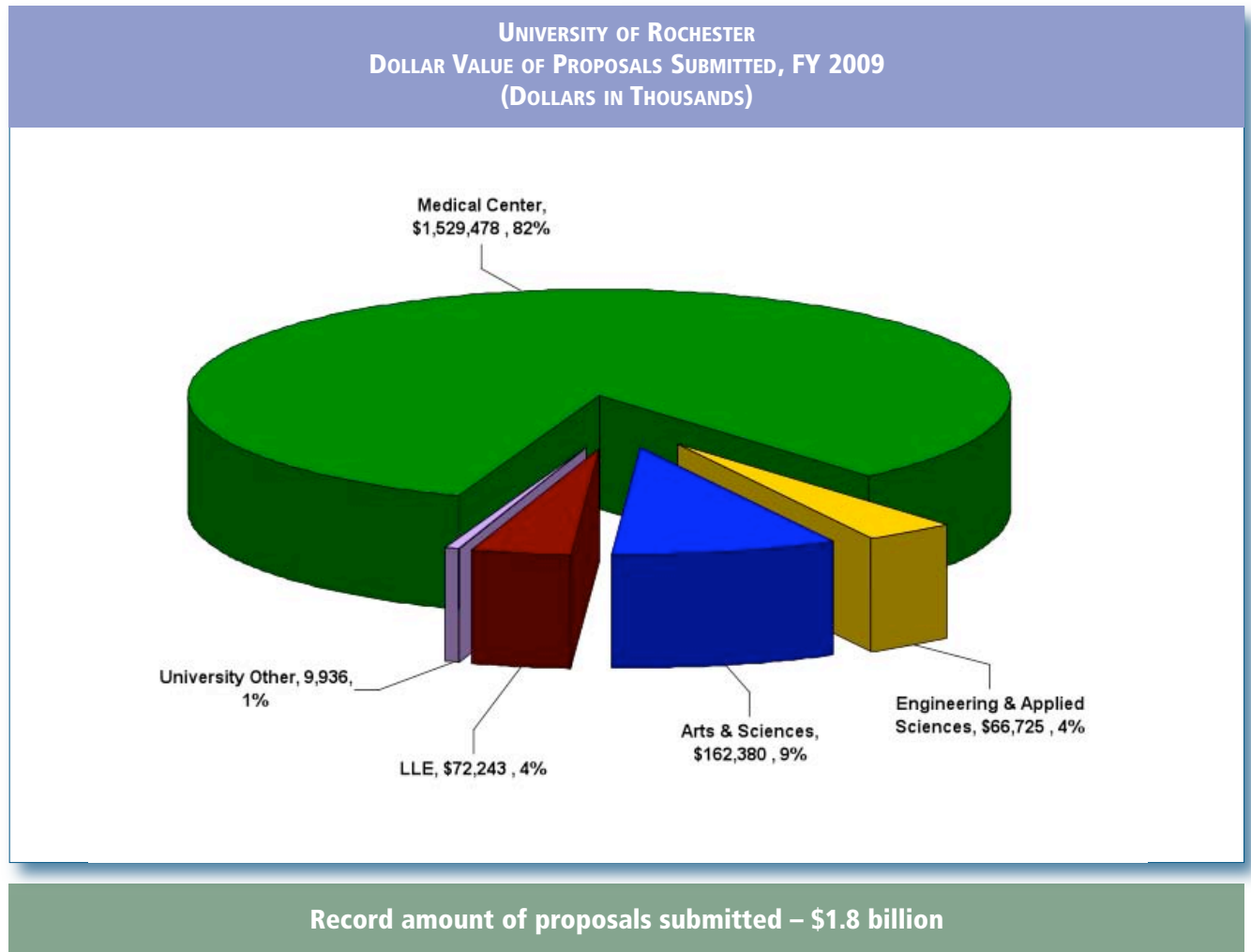


SPONSORED RESEARCH

The principles and practices of research extend to every academic undertaking of the University, including the humanities, social sciences, arts, education, business, and the natural, physical, and clinical sciences. All of these research endeavors, relying on various internal and external sources of sponsorship, contribute significantly to Rochester's standing as a national research university.



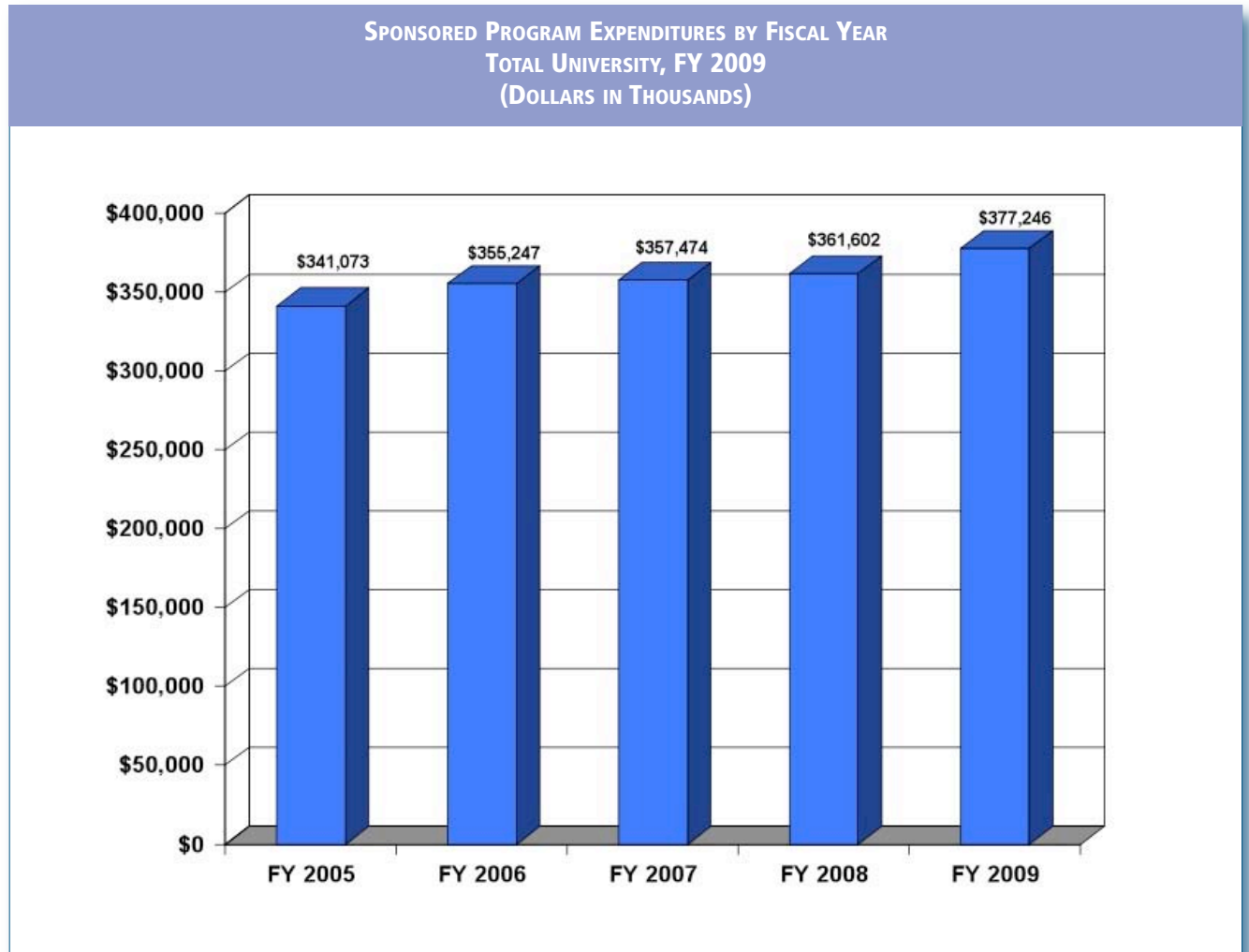
Proposals Submitted



In FY 2009, 2,703 proposals were submitted for a dollar value more than \$1.841 billion. Of that number, 443 were proposals submitted for a total of \$221 million under the American Recovery and Reinvestment Act of 2009. The School of Medicine and Dentistry submitted 391 ARRA proposals for over \$196 million, and the remaining schools submitted 52 for a total of almost \$25 million. The majority of ARRA proposal submissions

(378) were to the National Institutes of Health. Most ARRA proposals requested funding in support of research activities (408). There were also 23 funding requests for equipment, 4 in support of training activities and 8 for other activities. These numbers reflect the commendable effort on the part of our faculty and staff to secure the University's share of these additional funds.

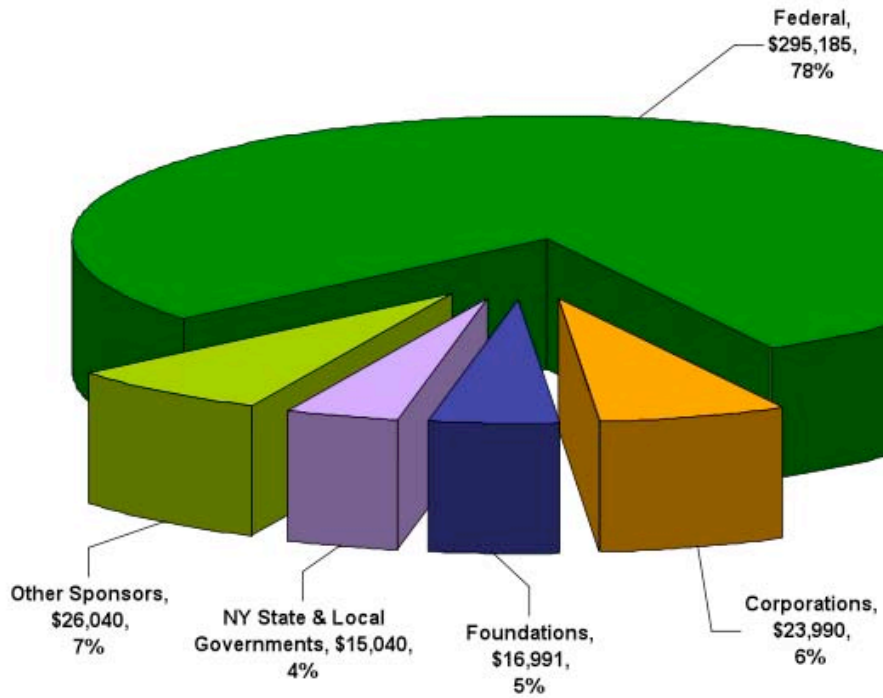
■ Sponsored Program Expenditures



Research expenditures continue to rise

As shown by the chart above, expenditures rose by more than 4 percent from FY 2008. This increase is not yet reflective of the funding opportunities provided by ARRA. In FY 2009, expenditures exceeded \$377 million.

Sponsored Program Expenditures by Agency Type
Total University, FY 2009
(Dollars in Thousands)



**The federal government remains major source of research funding,
but the contributions of other agencies can't be ignored**

Sponsored Program Expenditures by Agency Type
Total University, FY 2009
(Dollars in Thousands)

Agency Type	FY 2009	FY 2008	Increase/Decrease
Federal	\$295,185	\$278,273	+\$16,912 (+6.1%)
Corporate	\$23,990	\$28,388	-\$4,398 (-15.5%)
State & Local Government	\$15,040	\$13,492	+\$1,548 (+11.5%)
Foundations & Voluntary Health Organizations	\$16,991	\$16,545	+\$446 (+2.7%)
Other Sponsors	\$26,040	\$24,904	+\$1,136 (+4.6%)
Total	\$377,246	\$361,602	+\$15,644 (+4.3%)

Federal expenditures rose by \$16.9 million over FY 2008. Given the relatively flat budgets received by all federal agencies in the last few years, this increase is significant.

Corporate funded expenditures decreased by nearly \$4.4 million. Corporate funding is composed primarily of clinical trials, and the drop in expenditures is most likely reflective of the economic recession.

Expenditures in the "Other Sponsors" category increased by \$1.1 million. This category includes expenditures from research subawards or subcontracts received from other collaborating institutions, primarily other schools and colleges. This is indicative of the increasingly collaborative nature of research.

TOTAL FEDERAL EXPENDITURES (DETAIL)
TOTAL UNIVERSITY, FY 2009
(DOLLARS IN THOUSANDS)

Federal Agency	FY 2009	FY 2008	Increase/Decrease
Public Health Service (includes NIH)	\$192,309	\$181,303	+\$11,006 (+6.1%)
Department of Energy	\$67,278	\$62,212	+\$5,066 (+8.1%)
National Science Foundation	\$11,122	\$10,661	+\$461 (+4.3%)
Department of Defense	\$11,798	\$12,889	-\$1,091 (-8.5%)
Department of Education	\$8,498	\$8,023	+\$475 (+5.9%)
National Aeronautics & Space Administration	\$602	\$424	+\$178 (+42.0%)
National Endowment for the Arts/Humanities	\$137	\$51	+\$86 (+168.6%)
Other Sponsors	\$3,441	\$2,710	+\$731 (+27.0%)
Total	\$295,185	\$278,273	+\$16,912 (+6.1%)

Award expenditures under Public Health Service grants and contracts, which include the National Institutes of Health, increased by more than \$11 million. When compared to the almost flat NIH budget for FY 2009, this increase is notable. NIH is the University's largest source of sponsored research support.

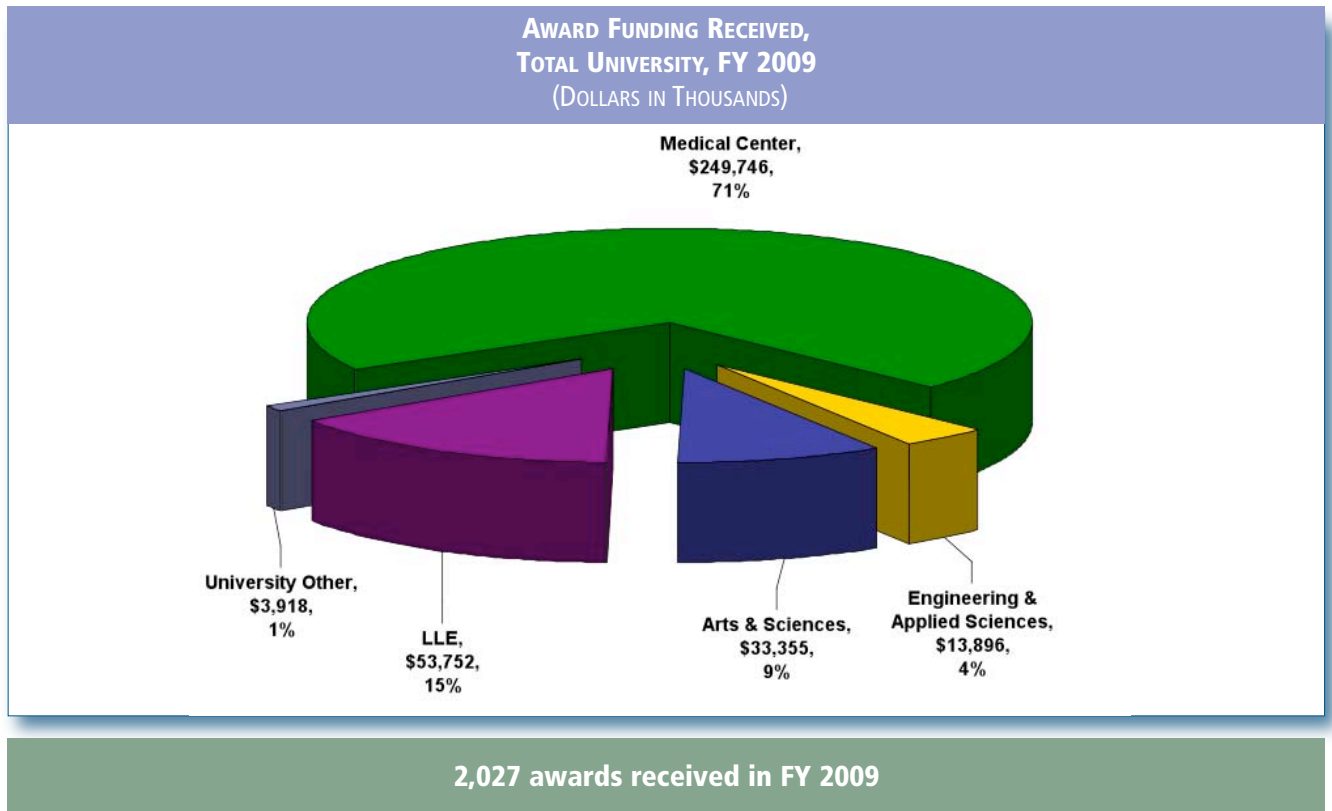
Department of Defense award expenditures decreased by nearly \$1.1 million, but all other categories of federal agencies witnessed increases. The National Science Foundation, the Department of Education, and

the Public Health Service saw increases in the 4 – 6% range. Department of Energy expenditures increased by more than \$5 million, or 8%. Expenditures under "Other Sponsors," the National Aeronautics and Space Administration, and the National Endowment for the Arts/Humanities saw more dramatic percentage increases, but on a much lower basis.

Award Funding Received

In FY 2009, the University received over \$354 million in grants and contracts and expended over \$377 million to advance its mission in research and other sponsored activities. At 160 years of age, the University is both more diverse and more focused on its research than ever before, and shows every promise of delivering the next generation of science and scientists.

This strong foundation of research funding has fueled the steady stream of invention disclosures and a pool of intellectual property that can be tapped for commercialization purposes.



For the University as a whole in 2009, total research funding received declined by \$35 million, or 9%, compared to the previous year. This is largely accounted for by the construction funding of the OMEGA EP laser facility, which was funded in prior years, but not in FY 2009. It should be noted that the dollar value of both proposals submitted and awards received fluctuate depending upon program announcements, funding trends, availability of funds, and timing of award actions. With the completion of the OMEGA EP laser facility, federal funding dropped by \$18 million in 2009 to a level that now supports the facility's annual operations and research programs. In addition, like most institutions, the University of Rochester has been impacted by the current economic climate. The University did experience a \$5 million dollar decline in award funding from foundation and

voluntary health agencies (e.g., American Heart Association, American Cancer Society, etc.) Many of these organizations experienced significant declines in their endowments and consequently cut back on research funding.

Under normal circumstances a decline in awards may foreshadow a decline in expenditures. However, we anticipate that funds from the American Recovery and Reinvestment Act (ARRA) will more than make up for the shortfall in funding and maintain (and perhaps even increase) research expenditures in the coming year.

The amount reported represents 2,027 awards made during FY 2009.

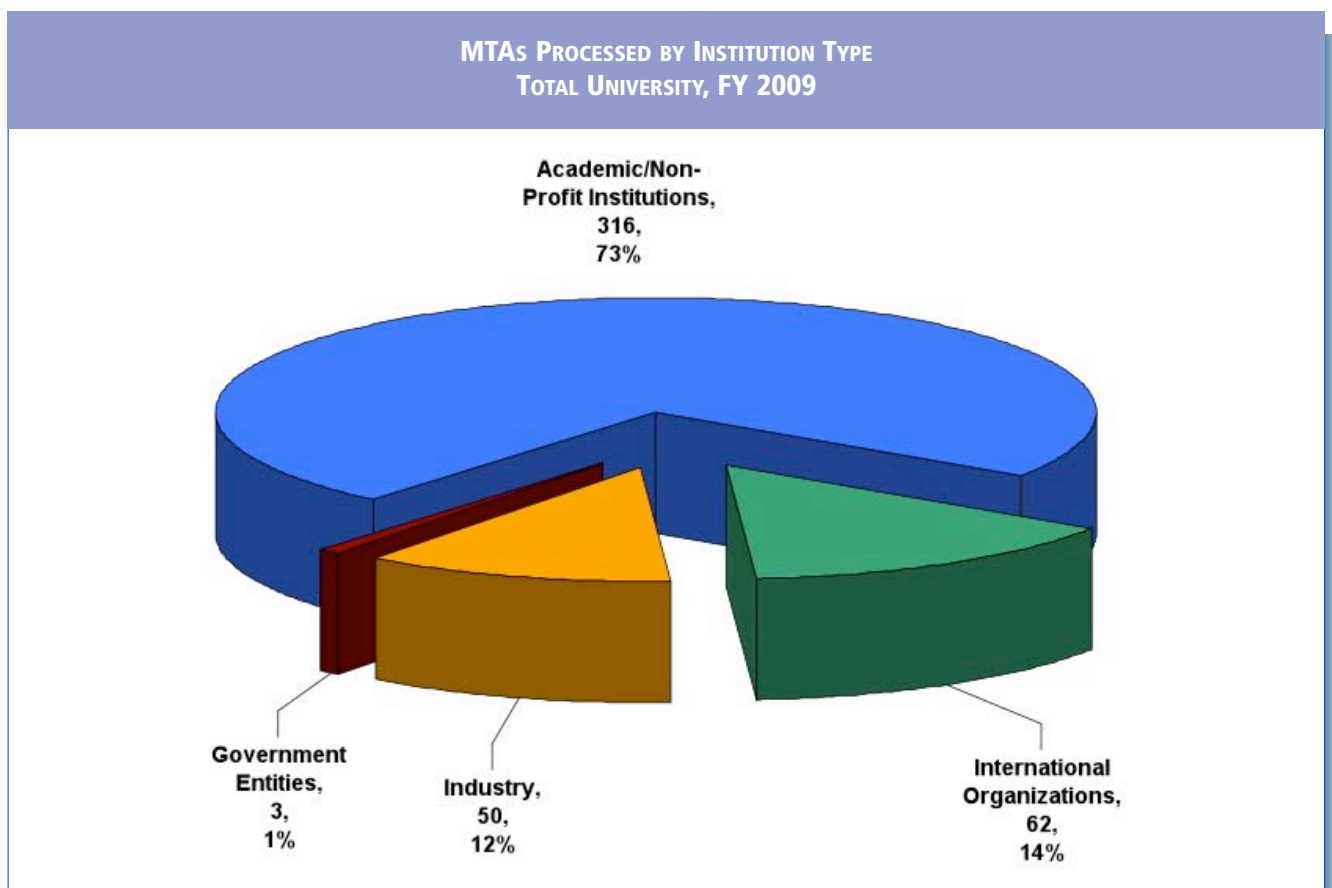
Additional information is available at <http://www.rochester.edu/ORPA/AnnualReport/index.html>.

■ Overview of Material Transfer Agreements Activity

As a general definition, a Material Transfer Agreement (hereinafter MTA) is a contract executed between two entities which outlines the rights and responsibilities of each party that arise due to the transfer of materials for research purposes from one party to the other. The MTA dictates how the materials and the results from using the materials can be used, along with other significant terms, conditions, and obligations. Typically, there is no fee associated with such a transfer. Occasionally, a small fee

is assessed to cover the cost of transporting the materials or to offset a portion of the costs associated with maintaining the materials at the originating site.

In Fiscal Year 2009, the University of Rochester received a total of 369 MTA requests. Of these requests, 224 were for incoming materials requested by UR researchers, and 145 were for outgoing materials requested of UR researchers.



The majority of MTAs continue to be with academic institutions

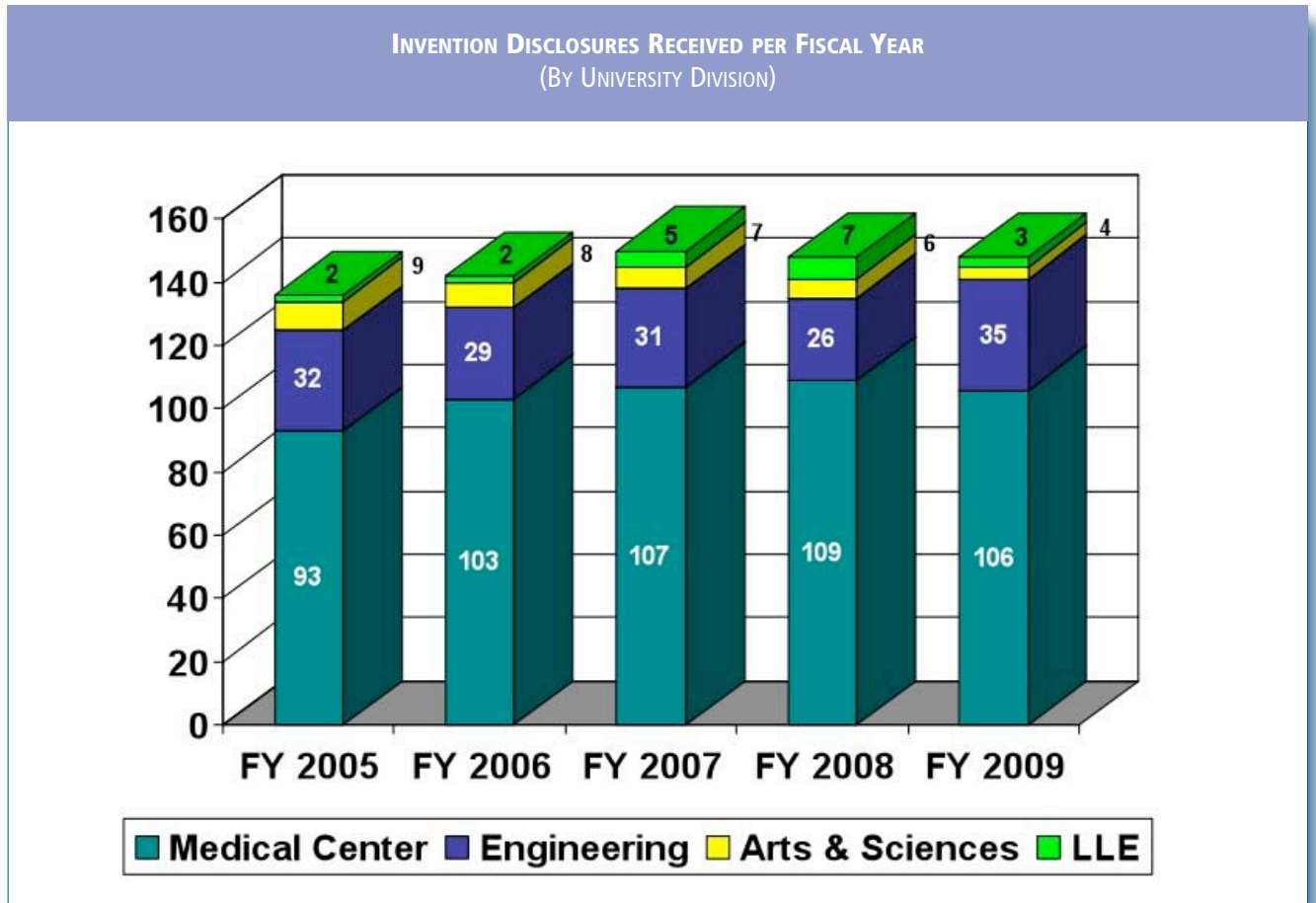
The University of Rochester entered into a total of 299 new agreements in FY 2009. This number includes 283 of the 369 MTA requests received during FY 2009 and 16 pending from the previous fiscal year. We have focused our efforts on responding promptly to MTA requests so that most are processed and executed in two weeks, or less.

Technology Transfer Data

Discoveries

The Offices of Technology Transfer continue to receive a steady stream of invention disclosures from a breadth of academic disciplines throughout the

University. The number consistently remains above 130 disclosures per year.



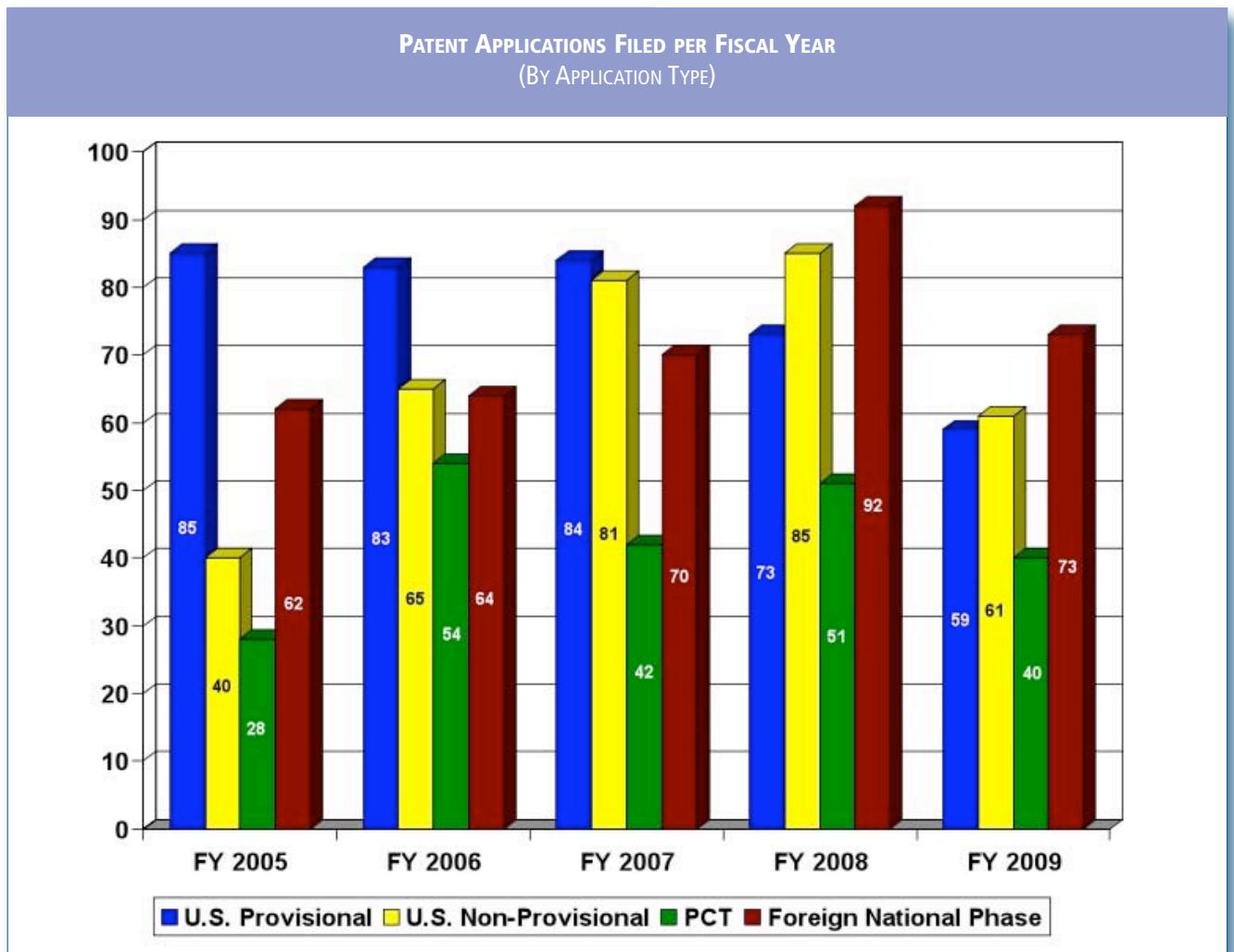
Rate of invention disclosures holds steady

The Offices of Technology Transfer’s faculty and researcher outreach and education programs will continue to foster invention disclosures and to involve researchers in the technology commercialization process.

■ Patent Prosecution

Although new invention disclosures have remained relatively consistent for the past five years, the total number of new patent applications filed in FY 2009 has been managed down by 25%. This decrease can be attributed to a concerted effort to utilize a more disciplined approach to technology evaluation. In addition to working to maintain a reasonable level for our expense budget, we are also drawing upon our experience in assessing what potential licensees will

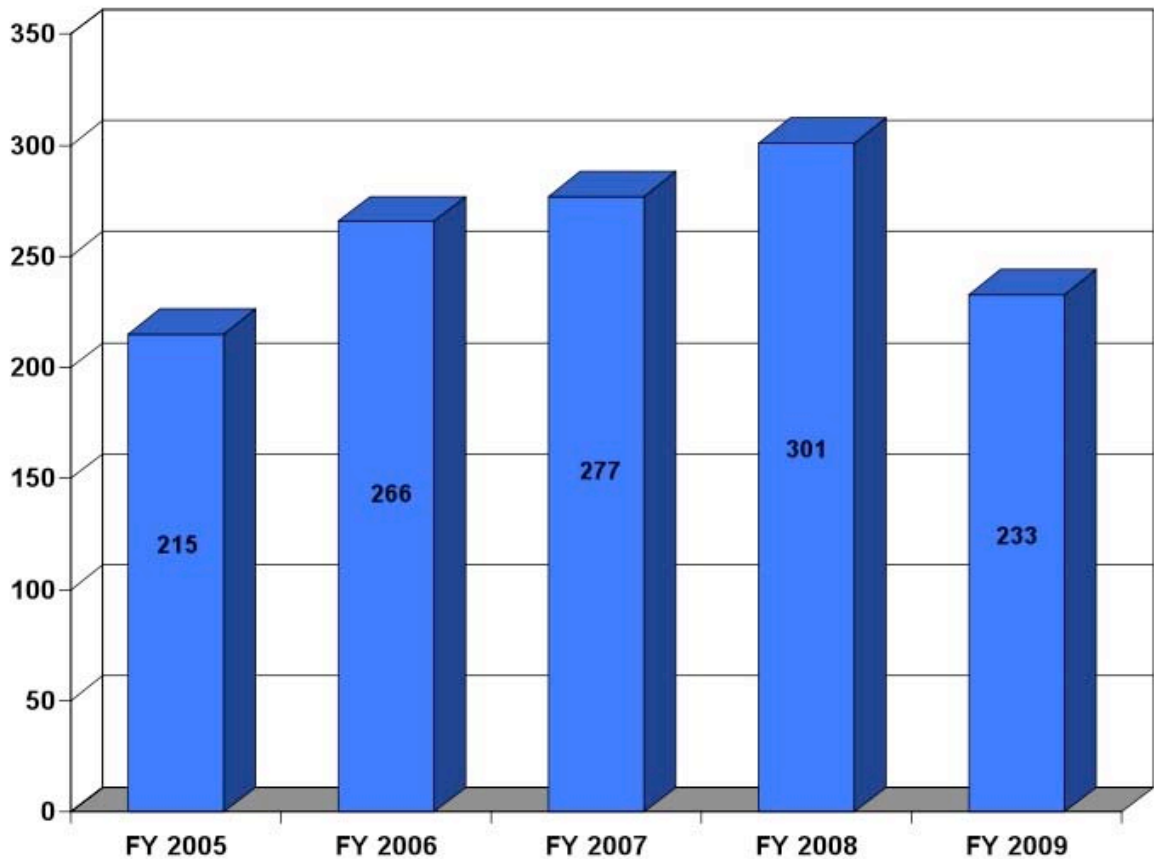
consider sufficient intellectual property protection on a technology-by-technology basis. As shown by the following graph, the results are dramatic. Our FY 2009 U.S. provisional application filings have been lowered by 20 percent; U.S. non-provisional filings have also decreased by nearly 30 percent; and Patent Cooperation Treaty (PCT) and national phase filings are down by 21 percent from FY 2008.



All types of patent filings actively managed to produce a reduction in FY 2009

Overall, we have effected a 22 percent drop in our total patent application filings in FY 2009 compared with FY 2008, when more active management toward a reduction of the portfolio began.

TOTAL PATENT APPLICATIONS FILED PER FISCAL YEAR

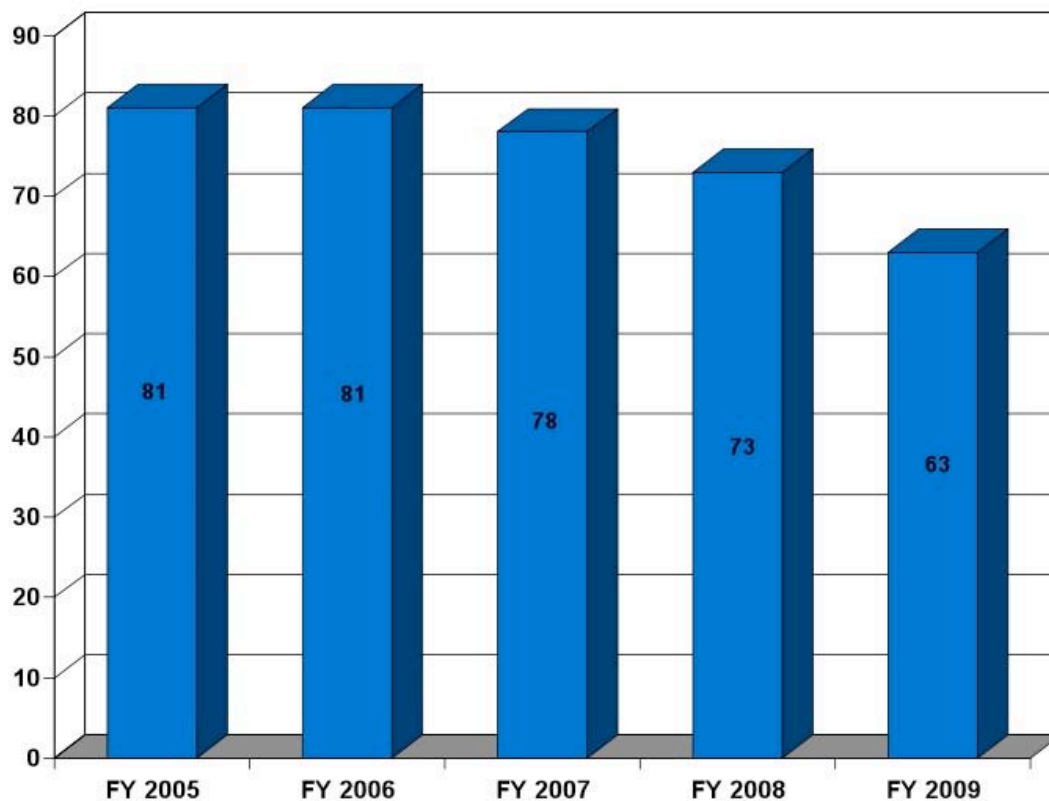


New strategies lead to 22% reduction in overall patent filings in FY 2009

A count of new patent applications filed is not directly correlated to the new technologies being added to our portfolio. Many patent applications are merely the geographical and procedural extensions of intellectual property protection already begun in the U.S. on existing technologies as a provisional or utility patent application. To understand better the number of new

inventions which we are seeking to protect, we measure new matter filings, or the first time an application is filed on a particular invention. The following graph illustrates the number of new matter filings per fiscal year. The steady decline in new matter filings is evidence of our more disciplined and judicious evaluation and patenting strategies.

NEW MATTER FILINGS PER FISCAL YEAR



Judicious patenting strategies lead to decline in new matter filings

Despite the decrease in new matter and overall patent application filings, the University of Rochester's intellectual property inventory continues to rise. This is a simple and anticipated function of the patenting process. As an application progresses through the system, it generates additional applications to cover various geographical areas and possibly new subject matter that is discovered along the way.

The following graph shows the status at the end of FY 2009 of patent applications filed over the previous five fiscal years. The blue bar represents the total number of patent applications (U.S. Provisional, U.S. non-Provisional, PCT, and National Phase) filed in each

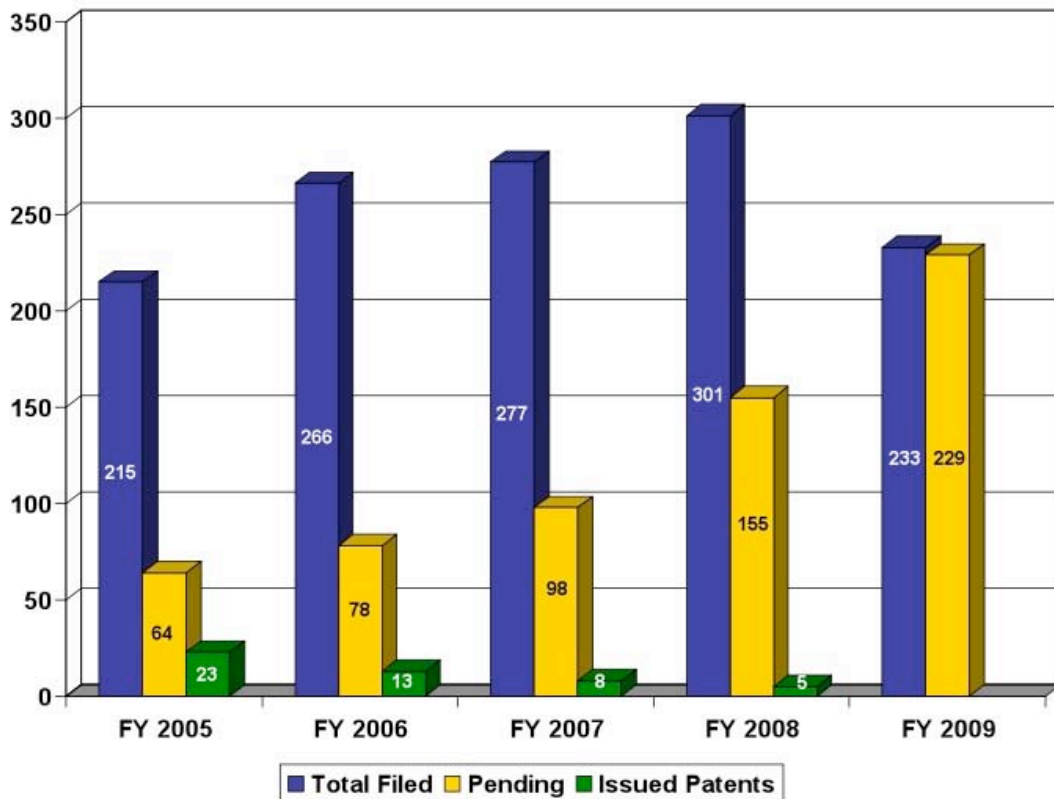
year since FY 2005. The yellow bar represents those applications remaining active as of 1 July 2009. An application can go inactive for a number of reasons. First of all, time itself takes a toll. Provisional applications filed in the United States have a lifespan of twelve months. At the expiration of that term, the application will either be converted to another application type, or be allowed to expire. The same holds true of a PCT application filed with the World Intellectual Property Organization (WIPO), although the term for a PCT is 18 months—at which time the application will be nationalized into selected patent offices, or be allowed to expire. Another reason for an application going inactive is an adverse ruling at the

patent office. The third major reason for a patent application to go inactive is for the petitioner, for one reason or another, to abandon the patent prosecution. We carefully monitor ongoing patent prosecutions and constantly evaluate the benefits offered by patent protection compared with the cost of obtaining that protection.

For example, in FY 2005 we filed 215 patent applications. Eighty-five of those applications were U.S. Provisionals and 28 were PCT applications. After twelve months, all 85 either expired or converted to U.S. Utility or PCT applications.

After 18 months, all 28 PCT applications either expired or were converted to U.S. or foreign patent applications. Of the original 215 applications, 108 expired or converted within the first 18 months. Of the remaining 107 applications filed in FY 2005, only 64 remained active on 1 July 2009. The other 43 were either abandoned for strategic reasons, or deemed unpatentable upon examination. Of the 64 active applications, the graph shows that 23 have actually issued patents. The remaining 41 applications are still awaiting or undergoing examination at the appropriate patent office

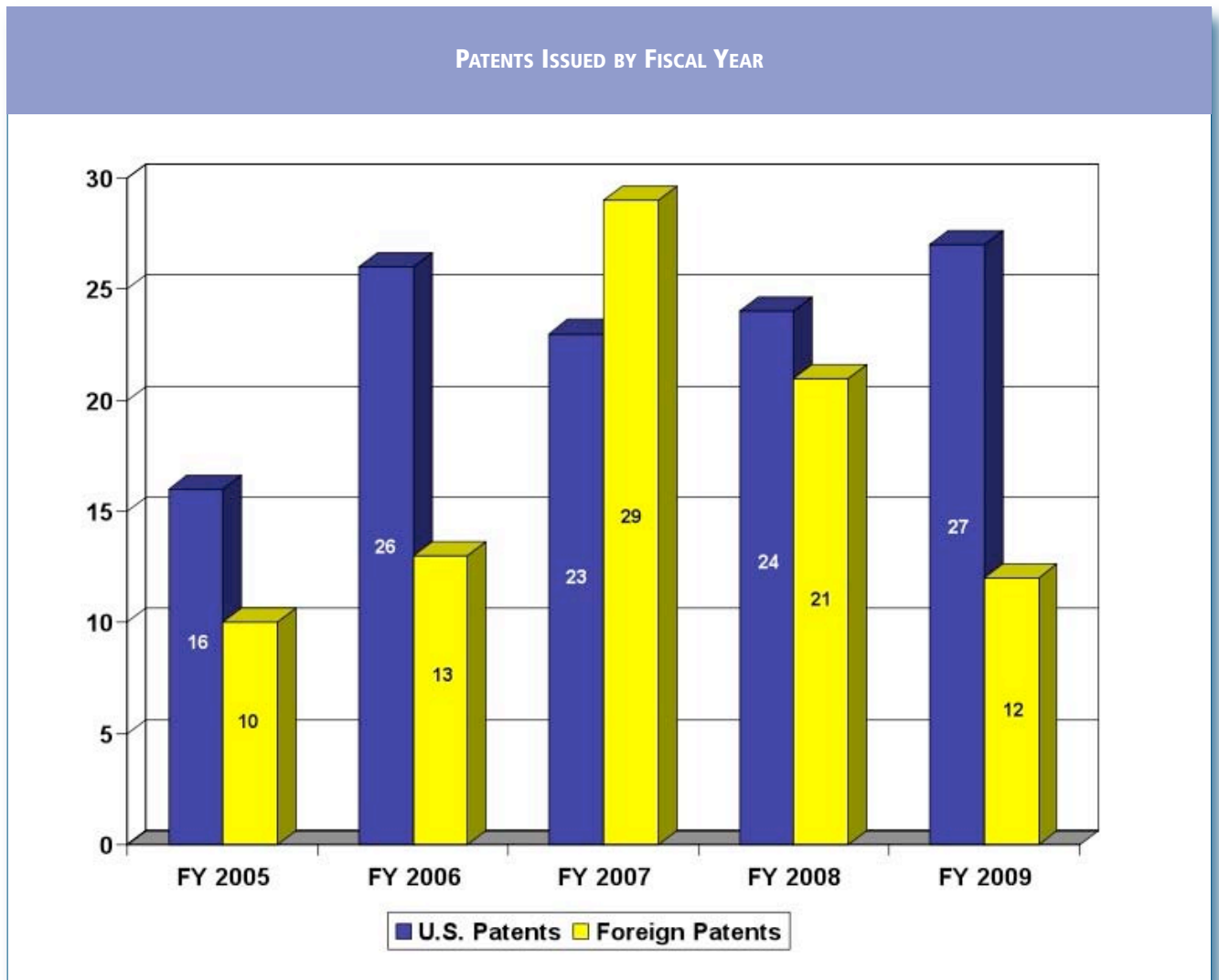
STATUS OF PATENT APPLICATIONS PER FISCAL YEAR OF FILING
(AS OF JULY 2009)



Successful patent prosecution requires patience and careful forethought

As the chart below shows, Rochester continues to prosecute our patent applications successfully, receiving dozens of U.S. and foreign patents every year. It is worth noting that the decline in foreign patents issued in FY

2009 is the result of many of our licensees electing to forego the considerable expenses related to pursuing foreign patent protection.



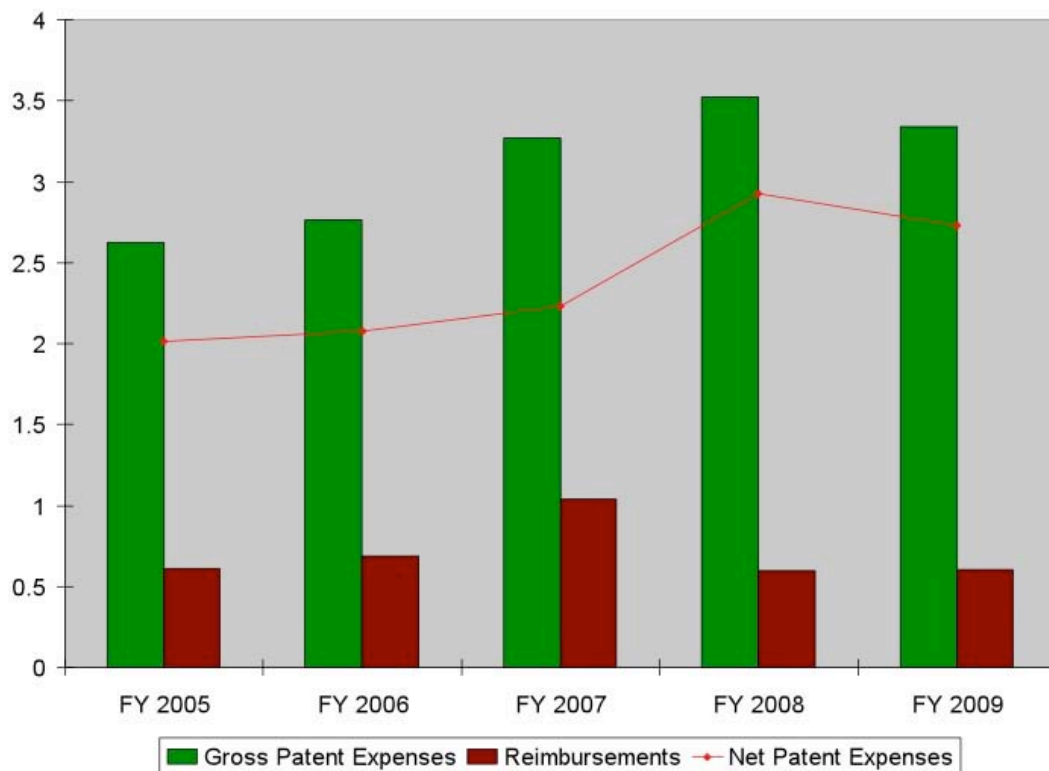
Rochester achieves consistent success at the patent office; licensees increasingly forego foreign patent protection

As the costs related to patent prosecution continue to rise, the University Offices of Technology Transfer are making every effort to contain those costs in a responsible manner while protecting our intellectual property assets in the best ways possible. The graph, below, shows the increased total patenting expenses but also shows the portion of our patenting expenses being reimbursed by our licensees. The Offices continue our efforts to notify our licensees of their obligations to reimburse patent expenses, to monitor compliance, and to work with licensees to arrive at mutually beneficial solutions to non-compliance.

Although the overall number of patent and new matter filings for FY2009 has decreased, our overall patent expenses (as seen below) have not yet fully reflected this

decline. One reason for the continued level of patent expenses is that the costs associated with drafting, filing, and prosecuting patent applications continue to rise. However, the primary reason that our decrease in patent filings is not resulting in commensurate cost savings is that the initial patent expenses related to preparing and filing an application represents only a portion of that application's lifetime expenses. Existing patent applications filed in previous years continue to accrue expenses. Through active inventory control and management, we have made progress in pruning some expensive and arguably unnecessary applications from our portfolio, but a judicious hand is needed when making irreversible decisions, such as ending patent prosecution on a particular matter in a particular country.

PATENT EXPENSES AND REIMBURSEMENTS
(IN MILLIONS)



**Cost control efforts reduce some patent expenses,
but continued successful patent prosecutions come at a price**

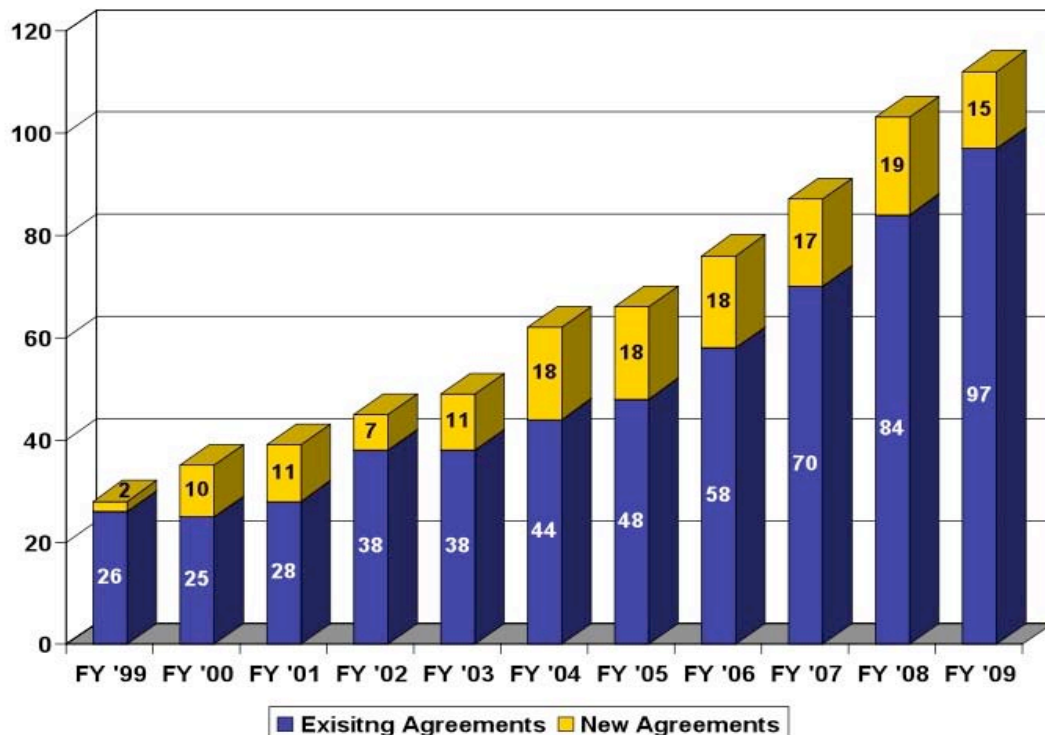
Licensing

Licensing the patents that result from our research for commercial use is at the heart of technology transfer. The Offices of Technology Transfer continue to think creatively and to collaborate to find ways of getting our novel technologies noticed by potential commercial partners. We always have a number of new technologies that we think are exciting opportunities, but for which we have not yet been able to find a willing corporate partner to champion those technologies into the marketplace.

The “New Additions to the Portfolio—Hottest Technologies of 2009” section on page 22 gives examples of these early stage technologies.

The University of Rochester has more than 100 active license and option agreements in its portfolio. The Offices of Technology Transfer continue to marshal our resources to ensure that these agreements are monitored for compliance and that appropriate royalties are collected and distributed in accordance with our royalty sharing policies. Newly executed agreements in FY 2009 included, among others, three options, three exclusive licenses and one copyright license to start-ups, as well as two options to a pharmaceutical company, one copyright license to a biotech company, and four non-exclusive licenses.

EXISTING ACTIVE AND NEWLY EXECUTED LICENSE AND OPTION AGREEMENTS
(As of 1 JULY 2009)



Robust licensing efforts result in continued technology transfer successes

Of the University’s total portfolio of 283 issued U.S. patents, 106, or 37.5% are licensed. In addition to U.S. patents, the University also holds 86 issued foreign patents on the strongest of our technologies. Of these foreign

patents, 61, or 71% are licensed. The University holds a total of 369 U.S. and foreign patents. 45% of our overall patent portfolio is licensed to commercial partners.

■ The University of Rochester's Technology Portfolio

The University of Rochester's portfolio consists of more than 750 technologies at various stages in our technology transfer process—from the newest inventions just being reviewed for potential commercial viability, to the older technologies which have patents issued and are already under a license.

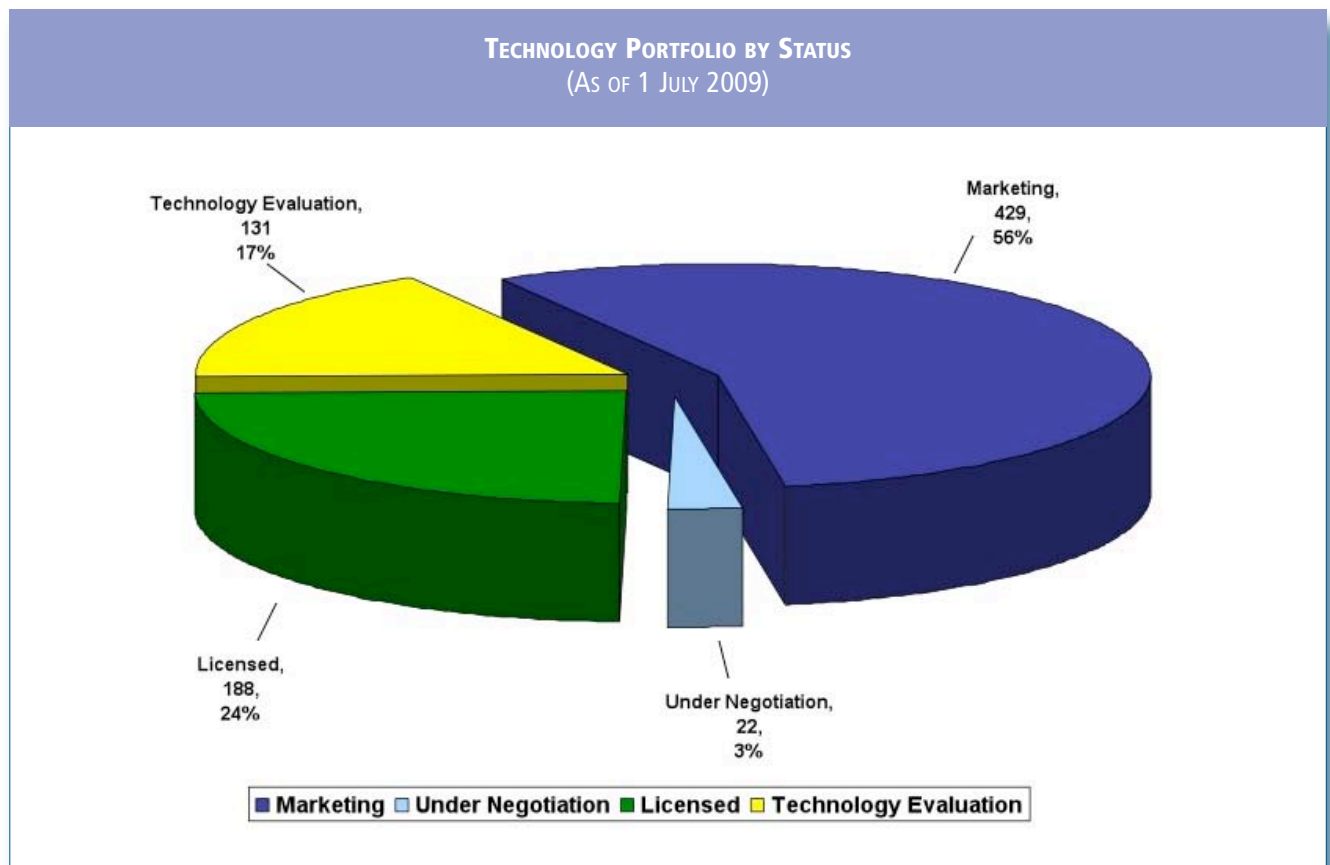
The **Technology Evaluation** stage includes the work of business evaluation and also the time when the technology is being further developed in the laboratory to a point of readiness for marketing.

The **Marketing** process includes "push" marketing with active presentations of the technology to potential licensees, "pull" marketing through press releases and advertising on our web site, and **Inter-Institutional** collaborations in which our technology is marketed by another university, often in combination with an invention from the partner institution.

A license negotiation is often a protracted process in which the firm does its due diligence on the technical concept and in which the business and legal terms of the license are discussed. In some of these situations the firm pays for an option to the technology to hold it during this period of assessment and while it is **Under Negotiation**.

A **Licensed** technology is under license to a third party for commercialization. Of our entire portfolio of all actively considered inventions at all stages of the process, 24% are licensed.

The following chart shows the breakdown of our active technology portfolio as of 1 July 2009.



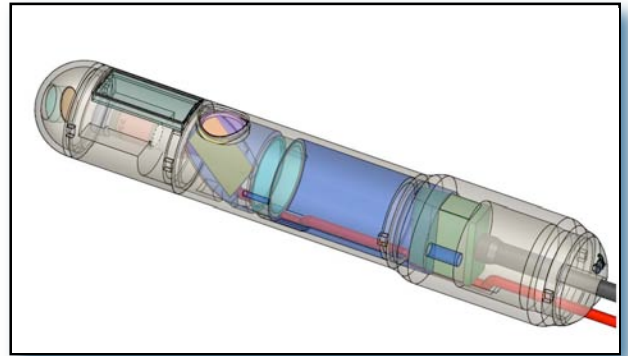
More than 25% of our technology portfolio is already licensed, or in the process of being licensed

■ New Additions to the Portfolio— Hottest Technologies of 2009

The University had no shortages of innovation this year. Among the 140+ inventions received, the following technologies are not only noteworthy, but also confirm the University of Rochester's reputation as a ground-breaking research institution.

Repair and Regeneration of Articular Cartilage—There is currently no known treatment for protecting or repairing cartilage, tendons, intervertebral discs, or ligaments. Articular cartilage in adults has an extremely limited ability to repair itself, and once deterioration begins, the outcome is progressive degeneration, pain, and dysfunction. Current and less optimal treatments include anti-inflammatory treatments, pain medications, injections of steroids, and surgery. Randy Rosier, M.D., Ph.D. and colleagues in the Department of Orthopaedics discovered what appears to be a novel method for the protection, repair, and regeneration of cartilage. Early human data suggests this alternative drug treatment could not only provide an alternative to surgery, but also prevent these patients' almost inevitable development of osteoarthritis later in life.

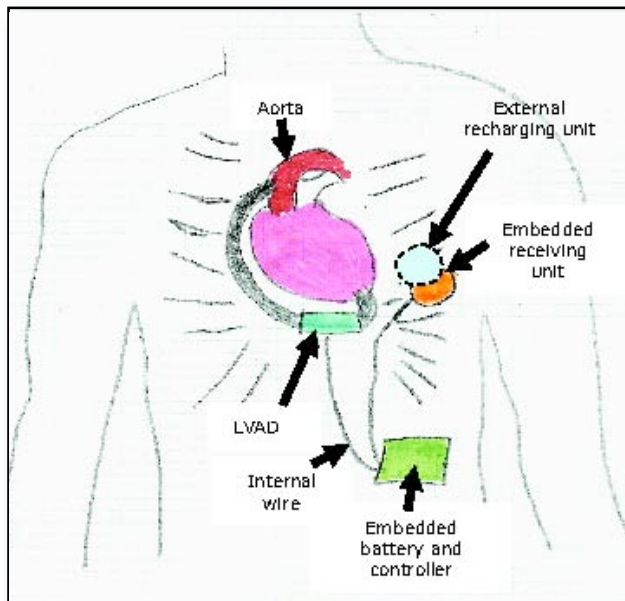
An Improved Neonatal Ventilator Monitor—Premature infants are often assisted by a high-frequency, low-volume respiratory ventilator during their stay in the neonatal intensive care unit. The current lack of adequate respiratory monitoring devices places infants at risk for undetected periods of over- or under-ventilation. By improving respiratory monitoring, the University of Rochester's Neonatal Oscillatory Respiration Monitor provides clinicians with opportunity to prevent or minimize periods of inappropriate ventilation and the risk of brain injury associated with these conditions.



Photoacoustic Imaging Probe

Photoacoustic Imaging of Prostate Gland Cancer—There were 186,320 new cases and 28,660 deaths from prostate cancer in 2008. Vikram Dogra, M.D., Wayne Knox, Ph.D. (both UR) and Navalgund Rao, Ph.D. (RIT) are developing a portable and user-friendly, low cost device for high resolution, radiation-free, C-scan photoacoustic imaging to detect prostate disease in real time. Photoacoustic imaging uses nanosecond laser pulses on the target organ to generate thermoacoustic ultrasound waves with high potential for tumor visualization and diagnosis due to distinct tissue absorption. It employs an innovative method of focusing photoacoustically generated ultrasound waves with acoustic lenses. Current detection methods have very high rates of false positives. The technology is also applicable for imaging other soft-tissue cancers like breast, liver, etc. Advanced Acoustic Imaging Technologies is a UR/RIT start-up to develop and commercialize this revolutionary technology.

A Possible New Treatment for Sepsis—Minsoo Kim, Ph.D. has developed a recombinant human activated protein C to serve as a treatment for sepsis. Currently, recombinant human activated protein C is used as a treatment of sepsis, but Dr. Kim's work has focused on the development of mutant activated protein C molecules that contain modifications in amino acids. These amino acid substitutions serve to reduce the neutrophil mitigation during sepsis that is responsible for the organ malfunction usually responsible for the mortality associated with the infection.



Transcutaneous Energy Transfer Device

Wirelessly Powering Implanted Medical

Devices—Coley Duncan, M.D. of the Division of Infectious Diseases within the University's Department of Medicine has focused on eliminating the cords that directly connect implanted medical devices to external power sources by transmitting power through the skin. Such cords, powering devices like ventricular assist devices (VADs) and artificial hearts, are a potential source for serious infections, accidents, inconvenience, and high cost of care. Annually, ~150,000 patients are eligible for left VADs in the US. Dr. Duncan's transcutaneous energy transfer (TET) technology eliminates the need for such cords and has the potential to transform VADs from a "bridge to transplant" into a "destination therapy" for end-stage heart disease. He has founded TET Solutions LLC, a UR start-up, to develop and commercialize this technology.

Compounds that Prevent Age-Related

Diseases—This breakthrough technology comes from the laboratories of David Goldfarb, Ph.D., in the Department of Biology, and involves a high throughput cell-based assay system to screen compounds for those that show promise to become novel therapeutics to treat diseases like cancer, diabetes, arthritis, Alzheimer's, Parkinson's, and cardiac disease. The University has recognized the potential of this discovery platform and provided special, internal funding from both the River Campus and University of Rochester Medical Center that is being utilized for several pre-clinical development projects. This technology will also be the basis of a local startup in the coming year. Discussions are advancing with a major pharmaceutical company and with a prominent venture capital firm.

Retraining and Restoring Visual Discrimination—

Originally disclosed in FY 2005, U.S. Patent number 7,549,743 issued late in FY 2009 and took the world by storm. Krystal Huxlin, Ph.D. and colleagues have developed a system and a method for evaluating and retraining a patient's damaged visual system (cortical or subcortical). By selectively and methodically stimulating malfunctioning areas of the brain, this system can restore vision, reduce blind fields, or even retard visual decline commonly associated with aging. Presently, the Huxlin technology is the basis for URM's latest start-up company, with a potential product launch within the first quarter of FY 2011.

This is but a small sample of the inventions received by the Offices of Technology Transfer in FY 2009. These, and all others being marketed, are summarized and can be viewed at

<http://www.urmc.rochester.edu/technology-transfer>.

■ Licensing Royalties

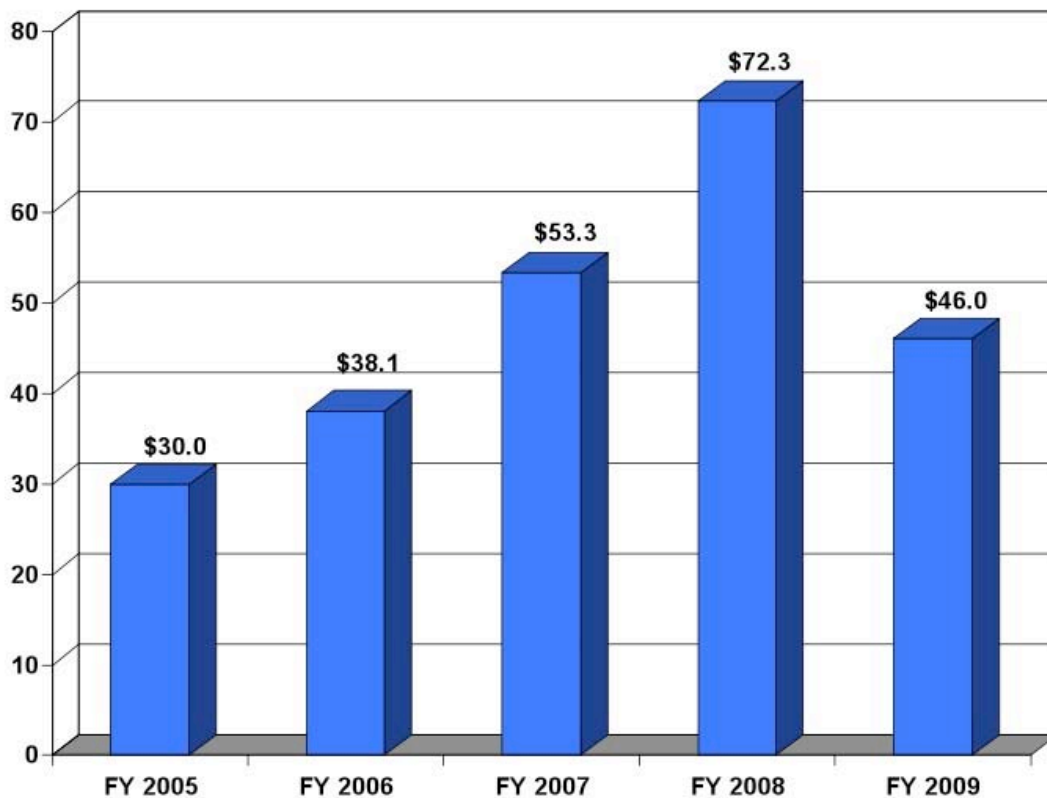
Technologies developed at the University of Rochester are among the most productive in the nation. For the past eight years, the University has been among the top ten institutions in terms of the amount of royalty revenue received from its licensed technologies, according to the Association of University Technology Managers (AUTM).

Although we are highly successful in revenue generation, we view the royalties we receive as only one indication of the public utility of our technologies. We do not believe that revenue generation should be a leading metric of the success of the technology transfer function at our University. The primary goal continues to be optimizing the utilization of UR technologies for public benefit. It is important to note that licensees of UR technologies are required to advance the development of new products

and services. In FY 2009, for example, sublicensee Depomed began Phase III clinical trials for the use of a controlled release form of gabapentin for the nonsteroidal treatment of hot flashes in menopausal women; Androscience was engaged in two Phase I clinical trials for the use of a biologic for the treatment of dermatologic conditions; and two medical device start-ups have applied for FDA approval.

Royalty revenue exceeded \$46 million for FY 2009—a significant decline from FY 2008, because the patents protecting some of our larger licenses are now beginning to expire. Even so, this level of royalty income will still maintain Rochester’s standing among the top universities in the nation.

LICENSING ROYALTY REVENUES
(IN MILLIONS)



Revenues decline but remain impressive as several successful patents expire

LICENSING ROYALTY REVENUE,
 BASED ON THE AUTM 2008* ANNUAL SURVEY OF
 UNIVERSITY TECHNOLOGY TRANSFER OFFICES
 (IN MILLIONS)

Ranking	Institution	Revenue
1	Northwestern University	\$824.4†
2	University of California System‡	\$146.3
3	Columbia University	\$134.3
4	New York University	\$104.3
5	Wake Forest University	\$90.0
6	Massachusetts Institute of Technology	\$88.9
7	University of Minnesota	\$84.7
8	U of Washington/Wash Res Foundation	\$80.3
9	University of Rochester	\$72.3
10	Stanford University	\$62.5

* 2008 AUTM Annual Report represents the most recent data available

†Includes one-time monetization of interest in *Lyrice*® to Royalty Pharma for \$700 million.

‡The University of California System is comprised of ten universities and additional research laboratories.

Rochester ranks in top-ten for eighth straight year

For the past several years, the bulk of the University of Rochester's revenue stream has been comprised of a handful of very successful technologies. These include technologies such as the vaccine against haemophilus influenza type b that has virtually wiped out a leading cause of meningitis in preschoolers and another vaccine (Prevnar®) that uses the same technology to prevent infection by pneumococcal bacteria, which causes meningitis, ear infections, pneumonia, and other maladies. Another highly successful technology is the

Blue Noise Mask that is used by virtually every printer manufacturer in the world.

While the patents—and license agreements—on many of these technologies have or will expire in the next few years, new University of Rochester-based technologies are coming to the market and revenue streams from these agreements should keep Rochester among the nation's leaders for the next several years.

Economic Development

■ Technology Commercialization for Economic Stability

In the midst of the most severe economic recession in decades, the importance of the University of Rochester to our region's economy has never been more evident.

The University of Rochester continues to be the largest employer in the region, with over 19,400 employees and the consequent infusion of demand to the local retail and service industries.

Construction continues on the Clinical and Translational Science Building (CTSB) which is scheduled for completion in March 2011. The CTSB is anticipated to add 600 permanent jobs to the Rochester economy. The CTSB has the honor of being the first building in the nation dedicated solely to clinical and translational research.

High Technology Rochester (HTR), and Rochester BioVenture Center continue to serve as a resource for university entrepreneurs exploring the possibility of venture creation. Through educational programs, consultation, and providing access to office and laboratory space, these two organizations lay down critical stepping stones in the path of commercialization for university start-up companies.

Two eye-opening white papers drafted by Excell Partners (<http://www.excellny.com>) sparked discussions at all levels on the state of the venture capital industry in New York State and across the nation:

"Venture Capital & Seed Activity in NYS: Perception, Reality, and Unrealized Potential, Part 1 of a Two-Part Series"

"Venture Capital & Seed Activity in NYS: Statistics for Upstate and Downstate, Part II of a Two-Part Series"

Excell Partners continues to work diligently to assist with new company formation and raise awareness of the dire need for seed level funding in our region.

The collaborative relationships with HTR and Excell Partners provide support for the environment necessary for successful start-up formation in our region.

Two new companies were formed in FY 2009 based upon University of Rochester technologies. These new companies add to the list of over 30 companies spawned from the University. Support of these young entities does not end with the signing of the license agreement. The Offices of Technology Transfer work closely with these nascent companies to help ensure their success. Aside from terms in the initial agreement that help keep assets within the start up, it is not uncommon to amend agreements to strengthen the IP portfolio, provide introductions to local and national funding sources, and generally "do what it takes" to help these companies survive.

■ Start-Up Activity

Two new entities formed in FY 2009 based on University Technologies.

Pro-Patient Design

<http://www.pro-patientdesign.com>

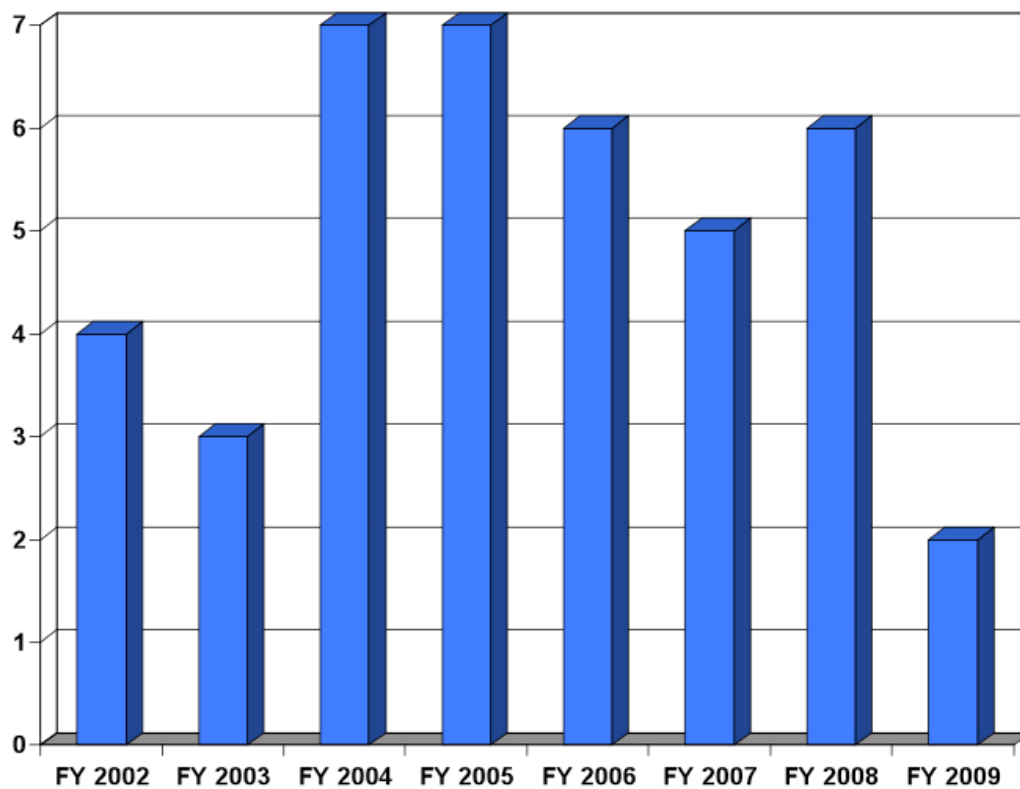
Pro-Patient Design, LLC was created to develop and commercialize a line of safe and cost-effective nursing and patient self-care products.

Califia Bio, Inc.

<http://www.califiabio.com>

Located in San Diego, California, **Califia Bio, Inc.** was established to develop a set of small molecule inhibitors of mixed lineage kinases. Mixed lineage kinases are a broad family of enzymes that play roles in a varied array of disorders including metabolic, cardiovascular, and neurological diseases.

START-UP COMPANY FORMATION BY FISCAL YEAR



Economic uncertainties inhibit start-up activities

In addition, as mentioned above, the University completed eight agreements with university start-ups. These companies covered a broad technology base including two biopharmaceutical companies, two

medical software companies, one medical diagnostic company, one medical device company, and two educational companies.

■ Outreach, Education, and Marketing

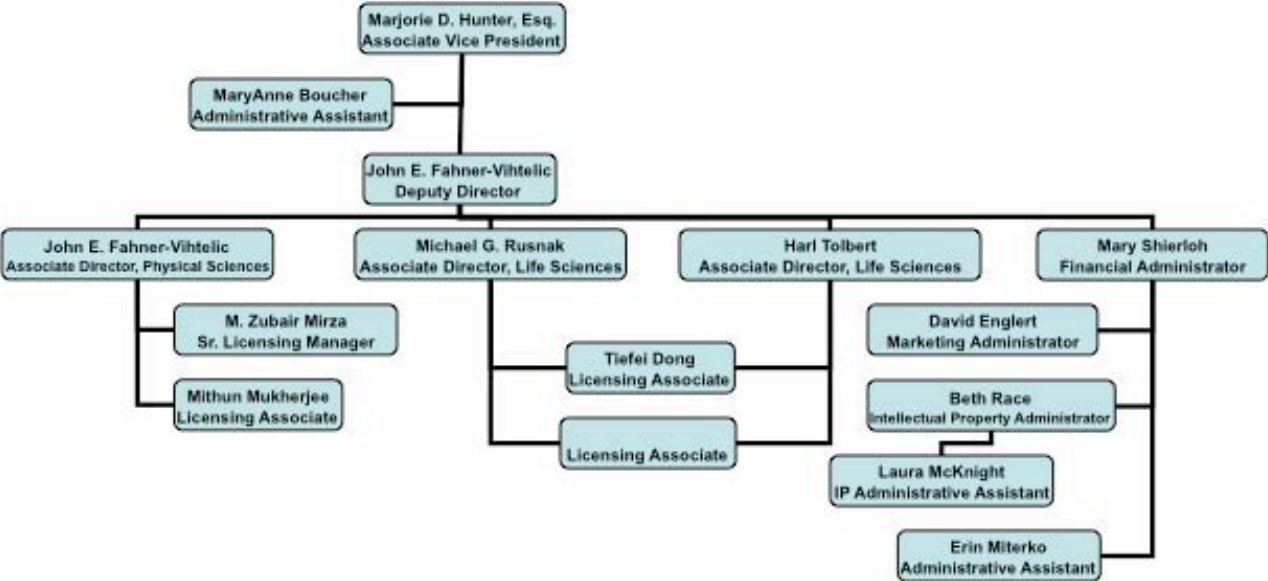
The Offices of Technology Transfer joined forces with the Center for Entrepreneurship (CFE) to build upon the success of the **F.I.R.E. (For Inventors, Researchers, and Entrepreneurs) Series**. Collaborative efforts with the CFE have opened the doors to advertise the sessions to Simon School faculty and students, to reach local entrepreneurs through the Rochester press, and the University of Rochester news service. As a result of these efforts attendance at the event has virtually doubled. Subjects covered by this educational program in FY 2009 included faculty consulting agreements, patenting strategies, public disclosures, company formation, prior art searches, and other topics. Expert presenters came from our own ranks, from the Rochester community, and from as far away as Atlanta, Georgia.

Outreach to the inventor community through informational meetings on a departmental level or on a personalized level remains a key function in the Offices of Technology Transfer. In FY 2009, the offices continued to play an active role in the Biomedical Engineering Program and the Simon Graduate School of Business entrepreneurship programs, and OTT staff members teach courses in the Technology Transfer and the Technology Commercialization programs. Internship opportunities for undergraduate and MBA candidates provide valuable experience to our students exploring varied career paths.

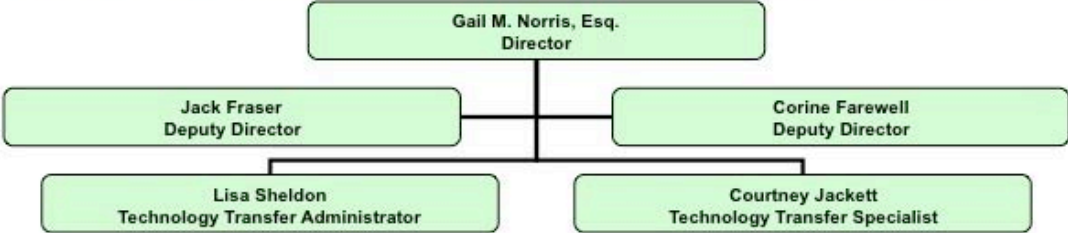
The UNYTECH/SmartStart venture forum, MedTech events, Rochester Pre-Seed Workshop, and various business plan contests all serve to attract attention to the rich and varied technologies and technology based companies forming in the region. The University of Rochester remains committed to working with these groups to bring our technologies forward for both licensing and venture creation opportunities.

The Offices of Technology Transfer are exploring new avenues of marketing technologies through internet based sites such as iBridge, CTSA*IP, and the combined University of Rochester OTT web site, launched in July of 2008. We are also continuing traditional marketing approaches of directly contacting potential licensees, as well as attending targeted trade shows such as the Biotech Industry Organization (BIO) international conference and Licensing Executive Society meetings.

FY 2009 Staffing University of Rochester Medical Center Office of Technology Transfer



FY 2009 Staffing University of Rochester River Campus Office of Technology Transfer





RIVER CAMPUS

University of Rochester
Office of Technology Transfer
611 Hylan Building, Box 270142
Rochester, NY 14627-0142
(585) 275-3998

Gail M. Norris, Esq.

Director



UNIVERSITY OF ROCHESTER MEDICAL CENTER

Office of Technology Transfer
30 Corporate Woods, Suite 310
Rochester, NY 14623
(585) 784-8850

Marjorie D. Hunter, Esq.

Associate Vice President

OFFICE OF RESEARCH AND PROJECT ADMINISTRATION

University of Rochester
518 Hylan Building
P.O. Box 270140
Rochester, NY 14627-0140
(585) 275-4021

Gunta J. Lidars

Associate Vice President for Research Administration