



UChicagoTech

The University of Chicago
Office of Technology & Intellectual Property

BRINGING INNOVATION TO LIFE

FIVE-YEAR REPORT

Contents

Nurturing Innovation: “From Bench to Bedside”	1
Repairing Injury	2
Developing New Seed Products	4
Keeping Killer Bacteria Quiet	6
Enabling Drug Discovery, Development, and More	8
Revolutionizing Mammography	10
Building New Math Curricula	12
Other Developments in the Pipeline and on the Market	14
Office of Technology & Intellectual Property Activity Overview	16

Nurturing Innovation: “From Bench to Bedside”

In our sixth year of growth, the Office of Technology & Intellectual Property (UChicagoTech) has much to report. Over the past five years, we have worked hard to become an effective business agent for faculty inventors and a translational resource for the University of Chicago. We have placed a strong emphasis on the delivery of service, user-friendliness, and accountability to the faculty and institution we serve.

In fiscal year 2006, new invention disclosures to our office hit an all-time high of 142—more than double the number in 2001. Royalties have more than tripled over this period (to more than \$8 million in fiscal year 2006), and over \$5 million was returned to inventors, labs, departments, and divisions this year alone. Since technology transfer activities started at the University of Chicago in 1987 (under the banner of ARCH Development Corporation until 2001), the cumulative impact includes 2,400 patents filed, 266 license agreements executed, 46 companies formed, and more than \$59 million in revenues to the University received. We estimate that companies based on technologies licensed from the University have created approximately 1,200 jobs, raised more than \$600 million in capital, and rented close to 250,000 square feet of office and industrial space.

The 2001 reorganization was motivated by the insight that an effective capability to develop discoveries with market potential was not a peripheral activity, but core to the University's duty to disseminate knowledge to the world and to provide the best possible resources to those of its faculty with inventive and entrepreneurial energies. The articulation of our office's mission, its governance through reporting to the Vice-President for Research and for National Laboratories, and monthly meetings with the dedicated Faculty Advisory Committee have been central to the promotion of this activity in the distinctive environment of the University of Chicago.

As we build on our first five years, we aim to steadily grow our ability to foster creative connections to resources both within the University and without, and to more effectively link faculty inventors with the industrial research community, potential and current licensees, entrepreneurs, alumni, and funding sources. The growth of our external profile has prompted our recent name change from UCTech to UChicagoTech to more closely identify ourselves with our university.

Innovation across all academic disciplines is a hallmark of the University of Chicago. With a world-class faculty, a culture of the most rigorous inquiry, and a distinctive organizational structure that fosters interdisciplinary collaboration, the University offers unique opportunities to cultivate scientific and technological discoveries to enhance the lives of present and future generations.

In this report, we offer examples of how University of Chicago researchers are transforming industries and making a difference in the lives of millions of people around the world.



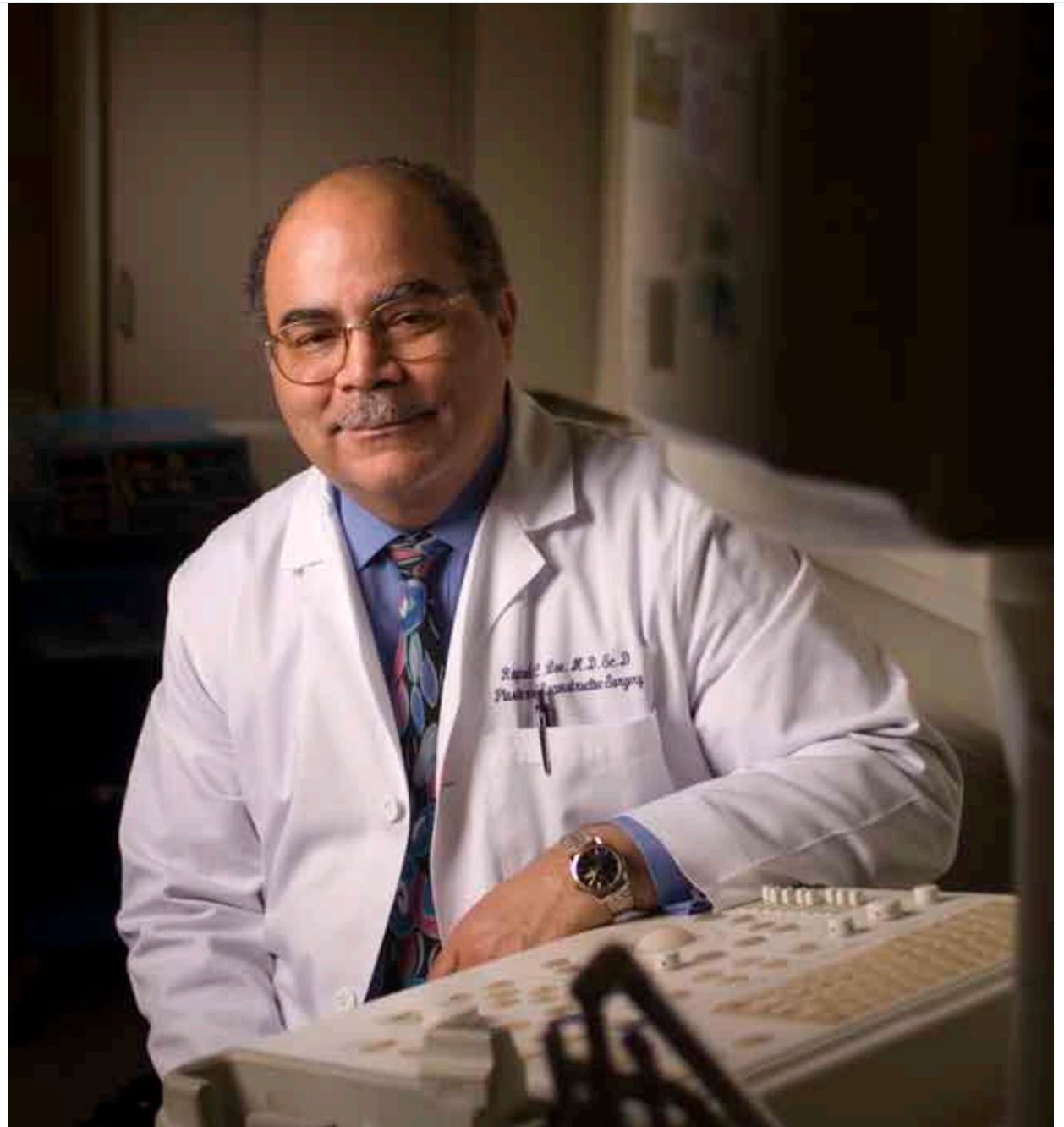
ALAN THOMAS, Director, Office of Technology & Intellectual Property



Raphael Lee

Repairing Injury

- > Avocet Polymer Technologies, Inc.
- > Maroon Biotech Corporation
- > Electrokinetic Signal Research, Inc.
- > Renacyte BioMolecular Technologies, Inc.



“The growing expectation for researchers who are awarded federal grants is that they will use them not only to solve problems that benefit the public, but also to generate new technologies that will keep our country competitive in a world where technology leadership is synonymous with world leadership politically, economically, and militarily.”

RAPHAEL LEE

When Raphael Lee, Professor in the Departments of Surgery/Section of Plastic and Reconstructive Surgery, Medicine/Section of Dermatology, and Organismal Biology & Anatomy/Biomechanics, and the Committee on Molecular Medicine, first proved that damaged cell membranes could be effectively resealed with biocompatible surfactants, the “conventional wisdom” was that it was impossible. Sixteen years and four growing companies later, Lee’s breakthrough technologies are moving closer to the goal of improving outcomes for victims of trauma and burns.

Lee’s first start-up, **Avocet Polymer Technologies, Inc.**, develops strategies that limit the amount of scarring that forms following trauma-related injury or surgery. “Avocet’s scar management products are capturing increased attention, from plastic surgeons to the U.S. Army burn center,” says Lee. “Today effective treatment of wounds also includes achieving minimal and functional scarring. Avocet has very effective products on the market today, a robust intellectual property portfolio, and a strong pipeline.”

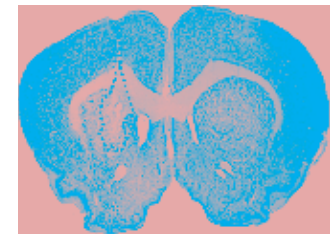
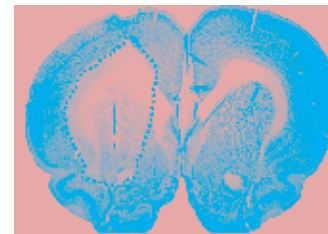
Maroon Biotech Corporation is the first company to develop therapeutics to enhance the healing of cellular wounds. This healing is important for improving tissue survival following such forms of trauma as vehicular accidents, burns, military injuries, and traumatic brain injuries. The therapies work by using biocompatible surfactants to alter solvent-biomolecular interactions that limit membrane reformation and protein refolding after structural disruption. This therapy restores molecular structure and function after trauma and prevents tissue death. Currently, **Maroon Biotech** is developing strategic partnerships and working closely with several federal agencies to develop battlefield therapies and treatment for malignant hyperthermia. Preclinical trials are under way, and products may be available within two to three years.

“**Maroon Biotech** went through a process that more and more technologies are benefiting from—the [Edward L. Kaplan] New Venture Challenge competition sponsored annually by the Graduate School of Business’s Polsky Center for Entrepreneurship,” says Lee. **Maroon Biotech’s** team was selected to represent the University in national and international business plan competitions. These efforts helped to secure funding for the company’s start-up phase.

Under contract to a defense technology company, **Maroon Biotech’s** scientists examined the safety of certain electromuscular incapacitation military devices that promise to incapacitate fighters in armed conflicts without inflicting injury. Need for further development of this technology led Lee to launch his third company, **Electrokinetic Signal Research, Inc. (ESR)**. **ESR** develops neuron-decodable signals that can be used to reduce the use of physical violence in military actions. Lee’s fourth company, **Renacyte BioMolecular Technologies, Inc.**, is a merger-and-acquisition structure for technologies related to **Avocet, ESR, and Maroon Biotech**.

What’s next on the horizon? **Maroon Biotech** has licensed surfactant copolymer technology from UChicagoTech that disaggregates and refolds proteins that have undergone denaturation, which occurs when proteins are heated. In addition to providing new ways to preserve foods, the technology may have implications for people with Alzheimer’s disease, type 2 diabetes, and other diseases in which denaturation of cell proteins occurs. Recently, investigators in Lee’s lab team on campus demonstrated the ability to unpoach an egg using these surfactants.

“There are lots of things you can do to help cells survive an injury if you know ahead of time that the injury is coming, but to repair the damage after the injury—that’s the challenge,” says Lee. “Trauma therapy is evolving from the use of gauze and tape to treatment at the molecular level, and our companies are at the forefront of this evolution.”



Daphne Preuss

Developing New Seed Products

> Chromatin, Inc.



“Not all scientists are interested in engaging people from the business community: it is a different style, a different culture. However, if you enjoy seeing your technology move forward, it can be incredibly rewarding.”

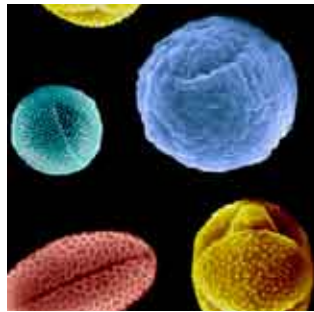
DAPHNE PREUSS



“The concept for building mini-chromosomes in plants came to me in a rapid moment when I was a postdoc,” says Daphne Preuss, the Albert D. Lasker Professor in the Department of Molecular Genetics & Cell Biology, Committees on Genetics and on Developmental Biology, Institute for Biophysical Dynamics, and the College.

“As the work in my laboratory on chromosomes and chromosome assembly progressed, I realized at an early stage that this might be useful to agriculture in general. I knew that the best way to ensure that our work could be used by the community at large was to protect it by patenting it,” says Preuss.

In 2000, Preuss and two of her postdoctoral students, Gregory Copenhaver and Kevin Keith, started **Chromatin, Inc.**, negotiating an exclusive license to the University’s mini-chromosome patents and raising \$4.9 million in venture capital to launch commercial research. They wanted to see if their work on the genetics of *Arabidopsis thaliana*, a weed with no obvious commercial appeal, could be extended to crops used in agricultural biotechnology. They continued their research, but focused more and more on ways to use their technology for adding multiple genes—rather than one or two at a time, the current state of the art—into a plant.



Although the genetics community has long paid close attention to Preuss, the world of agribusiness initially did not. Advances in weed cultivation, even rapid, dramatic advances, bring no clear reward. A robust weed, bred to resist insects, drought, salt, and herbicides, is still a weed. But little by little, Preuss and her colleagues learned how to assemble and insert what they call mini-chromosomes—whole stacks of genes, a dozen or more—in a reliable, lasting, controlled, and heritable way. They secured their first patent in 2000—three years after Preuss had submitted it—followed by many more. Slowly these tools began to accumulate, and in 2004 **Chromatin** received \$7.3 million in financing that led to increased facilities and staff.

Two years later, the U.S. Patent and Trademark Office issued **Chromatin** its eighth patent covering plant centromere compositions. Although they have thirty-four more applications pending, foreign and domestic, this was the big one. It extends the exclusive right to use of these mini-chromosomes, developed in *Arabidopsis*, in all plants.



“The technology could have a real impact on world hunger in places like Africa, Asia, and Latin America by increasing the hardiness, yield, and nutrition of third-world crops,” says Preuss. “It could radically improve the production of ethanol or other biofuels. It could be used to make inexpensive medicines.”

To help realize the possibilities that lie ahead for **Chromatin**, Preuss decided to resign from her position as a Howard Hughes Medical Institute Investigator and take a leave of absence from teaching and academic research to manage the company as its chief scientific officer and president.

“It has been quite a thrill to take an idea so far from concept to corporation, but we’re not yet to the end of this road,” says Preuss. “I think this technology can make a positive difference in the lives of all sorts of people. We are close to that now—so close that if we don’t keep going, there is just no good excuse.”

John Alverdy

Keeping Killer Bacteria Quiet

> Midway Pharmaceuticals, Inc.



“The University of Chicago, which has outstanding scientists in a hospital with an outstanding reputation and a well-oiled machine like UChicagoTech, allows one to navigate in many different directions as a clinician, a basic researcher, and a founder of a company. Without the organizational framework and the support the University provides, it would be impossible for me to do this.”

JOHN ALVERDY

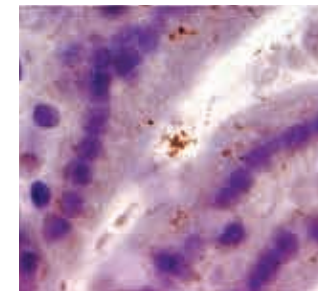
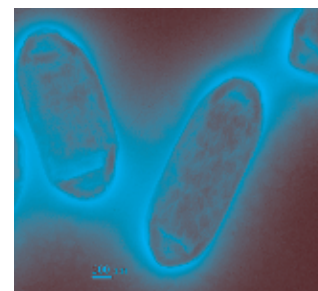
Midway Pharmaceuticals, Inc., founded in 2005 and a winner of the New Venture Challenge at the University of Chicago Graduate School of Business, develops nonantibiotic therapies for hospital-acquired infections and for a range of gastrointestinal conditions that include Crohn's disease, ulcerative colitis, and irritable bowel syndrome. The company's therapies are based on a proprietary compound, the polymer MDY-1001, discovered by University researchers John Alverdy, Professor in the Department of Surgery and Director of the Center for the Surgical Treatment of Obesity and of the Minimally Invasive Surgery Program; Eugene Chang, the Martin Boyer Professor in the Department of Medicine/Section of Gastroenterology; and Elaine Petrof, Assistant Professor in the Department of Medicine/Section of Infectious Diseases. Delivered orally, the compound lines the gastrointestinal tract and inhibits the pathogenic behavior of bacteria there.

According to the Centers for Disease Control and Prevention, each year approximately two million patients in the United States get an infection while hospitalized, and about 250,000 die as a result. Both antibiotic resistance and the body's inability to fight infection due to an existing condition are at the root of the problem. Unlike antibiotics, which kill not only the problem bacteria but also many of the normal flora, MDY-1001 restrains bacterial populations, preventing them from attaching to tissues and releasing toxins, and thereby lessening the odds of sepsis and other deadly infections. According to Alverdy, if MDY-1001 lives up to its promise, it could affect the lives of millions of people.

"Often patients have sepsis characterized by low blood pressure, high fever, and organ failure. Infection is suspected, but the offending bacteria cannot be localized or identified," says Alverdy. "We have long suspected that the patients' own intestinal bacteria could be a major source of this sepsis, eluding even the most astute clinician.

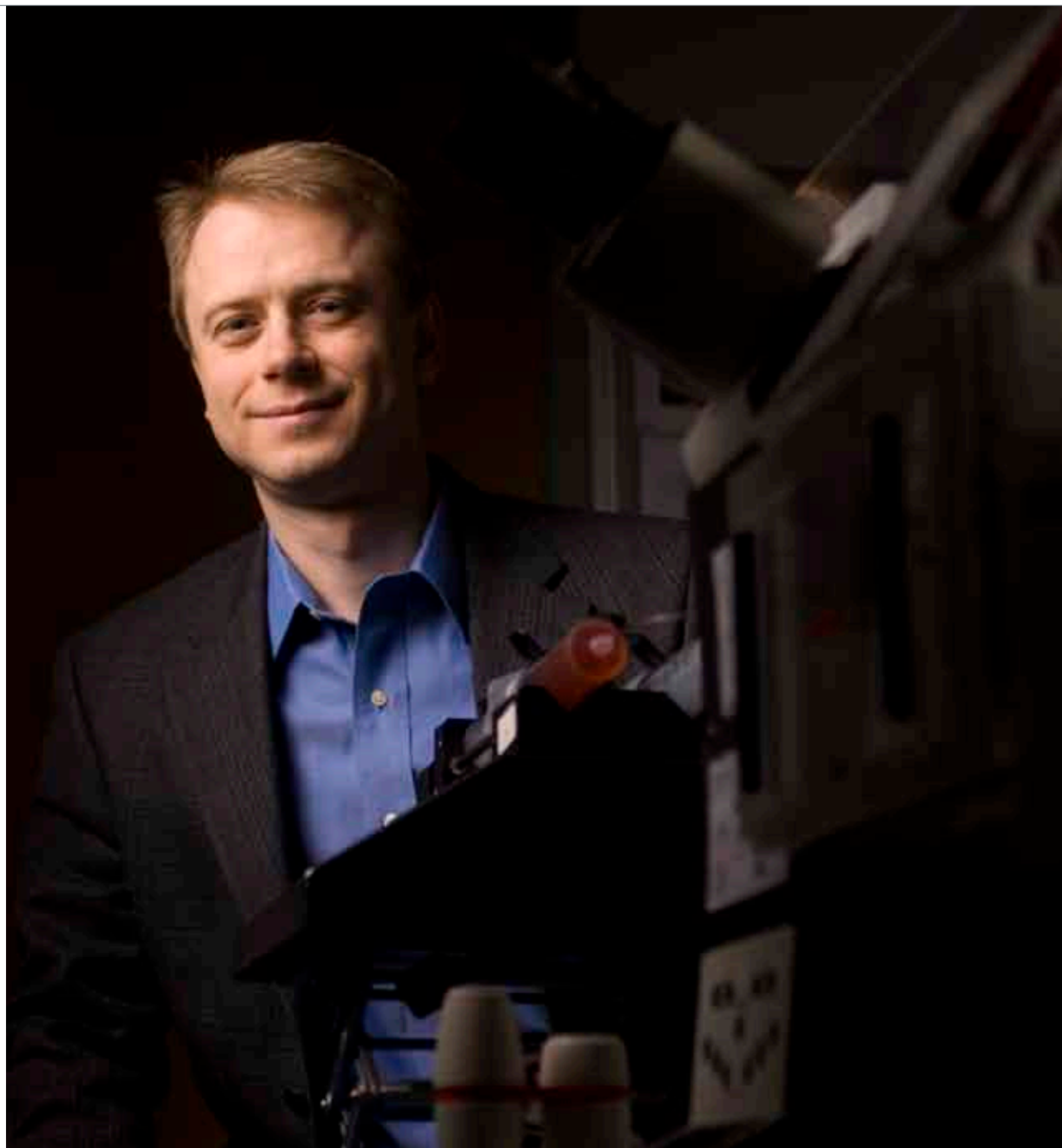
"In preliminary studies performed out of pure frustration while I was caring for five very septic high-risk patients, I felt that the only way to possibly treat this problem was to attempt to flush the bacteria directly out of the intestinal tract with a lower-molecular-weight polyethylene glycol compound, since many intestinal bacteria cannot be eliminated with antibiotics," says Alverdy. "To my surprise and delight, all five patients recovered very dramatically."

With the encouragement and support of UChicagoTech, which helped to build the intellectual property, create the business plan, and find funding, **Midway Pharmaceuticals** raised \$500,000 through BioAdvance, an early-stage biotechnology investor, and another \$500,000 with Ben Franklin Technology Partners. The funding will be used to complete preclinical testing and to move the compound into clinical trials.



Rustem Ismagilov
Enabling Drug Discovery,
Development, and More

- > deCODE chemistry & biostructures
- > Emerald BioSystems, Inc.



“Commercialization provides employment opportunities for students. If they choose to continue working on this technology, they will become experts on the systems and highly sought after by employers. That’s very gratifying.”

RUSTEM ISMAGILOV



The past five years have been extremely productive ones for Rustem Ismagilov, Associate Professor in the Department of Chemistry, Institute for Biophysical Dynamics, and the College, and his research team. He came to the University of Chicago in 2001 and soon began developing a technology for microfluidics-based protein crystallization—an offshoot of a broader effort to develop an understanding of complex chemical and biological systems in space and time using microfluidics.

Most pharmaceutical drugs work on human proteins. Better understanding of protein structures enables pharmaceuticals to be designed more rapidly, cheaply, and effectively.

“The structures of proteins are a critical link in converting genomic information into medicines,” says Ismagilov. “Proteins are the molecules made when genes turn on, and they do most of the work in the cell. By knowing the structures of proteins we can design chemical entities that will bind these proteins and control their function.”

Ismagilov’s technology shrinks the amount of protein necessary to determine crystallization conditions and to grow crystals, key steps in determining protein structure. Such miniaturization and parallelization save time, cost, and labor. Thus a key advantage of Ismagilov’s approach is the ability to screen thousands of different crystallization conditions very quickly. His team then utilizes the Advanced Photon Source at Argonne National Laboratory (managed by the University of Chicago via UChicago Argonne, LLC, for the Department of Energy), a research facility that provides the brightest x-ray beams in the Western Hemisphere, to determine the structures of proteins via x-ray crystallography.

Patents for the technology were filed in 2002, and the paper describing the work was published in 2003, stimulating immediate commercial interest on the part of **deCODE chemistry & biostructures**, the contract drug discovery subsidiary of **deCODE genetics, Inc.**, headquartered in Reykjavik, Iceland. In 2005, the University of Chicago licensed Ismagilov’s technology in the field of crystallization to **deCODE biostructures** and its sister company **Emerald BioSystems, Inc.** (Bainbridge Island, Washington), which is responsible for commercializing labware automation technologies that evolve out of the **deCODE biostructures** labs. Since then, Ismagilov and his team have collaborated with **deCODE biostructures** and **Emerald BioSystems** to bring the technology to the marketplace.

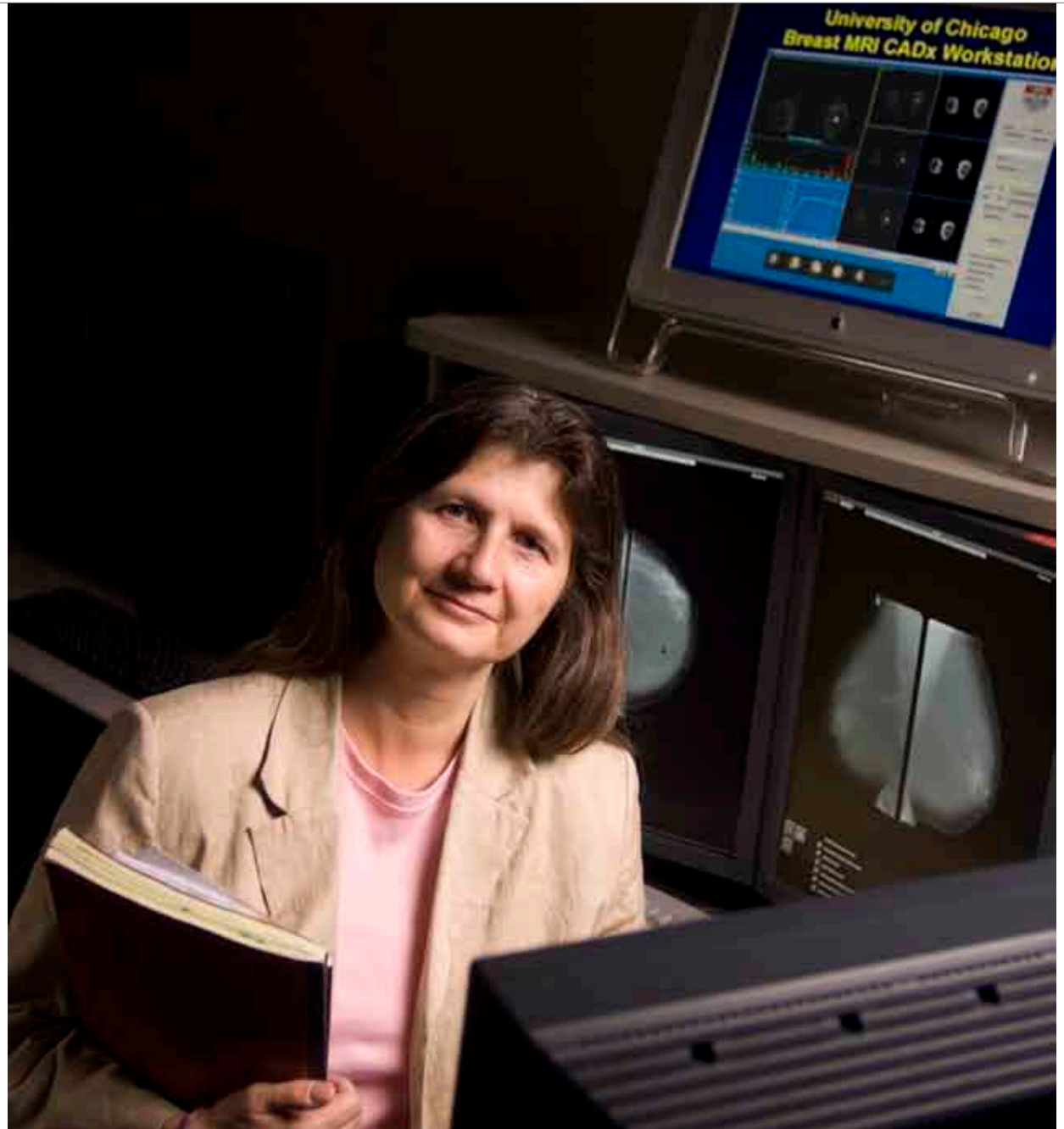


Maryellen Giger
Revolutionizing Mammography

> R2 Technology, Inc.

“The academic mission of this university has not changed because of patenting and licensing activities. We still create new knowledge and teach. The licensing revenue from our inventions enabled us to further our research and also take on additional students. The technology transfer process has enhanced our understanding of bringing developments to the public.”

MARYELLEN GIGER



Thanks to technology developed by University researchers, millions of women may now benefit from earlier detection of breast cancer and improved outcomes.

University faculty members are pioneers and leaders in computer-aided detection (CAD), a technology that provides a “second pair of eyes” for radiologists to detect cancer from radiological images, including masses and clusters of microcalcifications in mammograms. Study data have shown that more than 20 percent of cancers detected with traditional screening mammography could have been detected at an earlier stage by using CAD technology.

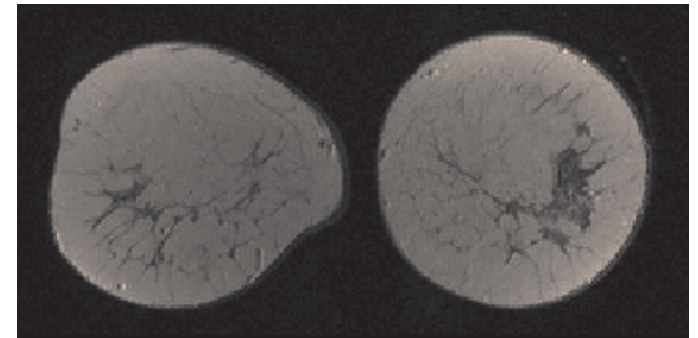
The team of scientists who developed the technology included Kunio Doi, the Ralph W. Gerard Professor of Biological Sciences in the Department of Radiology and Committee on Medical Physics; Maryellen L. Giger, Professor in Radiology and Committee on Medical Physics; Heber MacMahon, Professor in Radiology; Charles E. Metz, Professor in Radiology and Committee on Medical Physics; Robert M. Nishikawa, Associate Professor in Radiology and Committee on Medical Physics; Robert Schmidt, Professor in Radiology; Carl J. Vyborny, Professor in Radiology (now deceased); and Heang-Ping Chan, now Professor of Radiology at the University of Michigan.

In 1993, the University licensed its CAD system to **R2 Technology, Inc.**, a privately held firm based in Sunnyvale, California. Five years later, **R2 Technology** launched its ImageChecker mammography system and became the first vendor to gain clearance by the U.S. Food and Drug Administration to use CAD with screening mammography. Since then, the firm has installed more than 2,500 systems worldwide, and more than eight million women a year have their mammograms interpreted with the aid of this system. In 2005, **R2 Technology's** revenues were approximately \$45 million. The following year, **Hologic, Inc.**, a leading developer, manufacturer, and supplier of premium diagnostic and medical imaging systems in women's health care, acquired **R2 Technology** in a \$220-million stock swap. The partnership enables even broader distribution to medical facilities worldwide.

“The revenue from the licensing transaction had a wonderful effect on my laboratory,” says Giger. “I was able to hire more lab investigators and take on more students than my National Institutes of Health grants would allow.” It also helped to finance a new facility at the University, the Carl J. Vyborny Translational Laboratory for Breast Imaging Research, now directed by Robert Nishikawa.

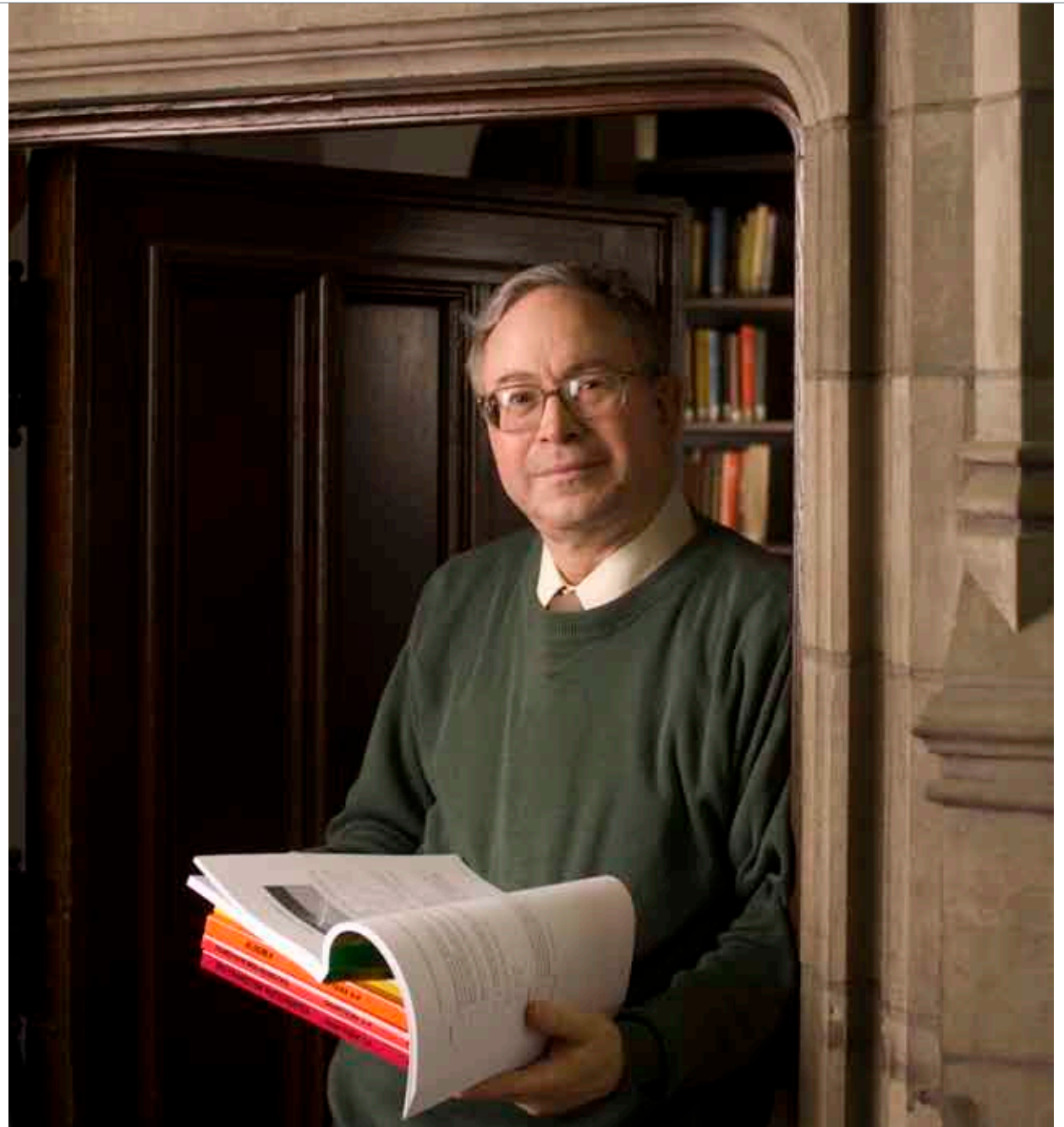
Next up for Giger and her colleagues? They are waiting to hear if industry receives FDA approval for their licensed and patented computer-aided interface that incorporates the computerized analyses of mammographic, sonographic, and MRI breast images for cancer diagnosis. A radiologist can compare the case under examination to graphical distributions of cancers and benign lesions within the practice's particular geographic area by displaying similar cases from an online atlas. The interface assists the physician in assessing the probability of malignancy, identifying the characteristics of the lesion, and determining appropriate patient management.

“Through patenting and licensing, our new developments actually get to the public more quickly,” says Giger. “At the same time, the resulting revenue comes back to the lab. So the commercialization has not hindered the academic mission, it has helped it progress.”



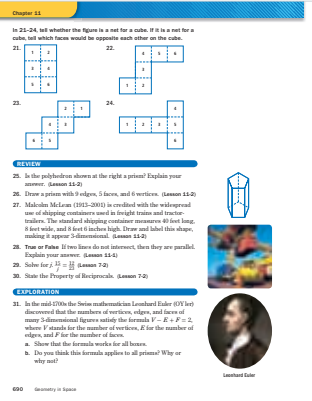
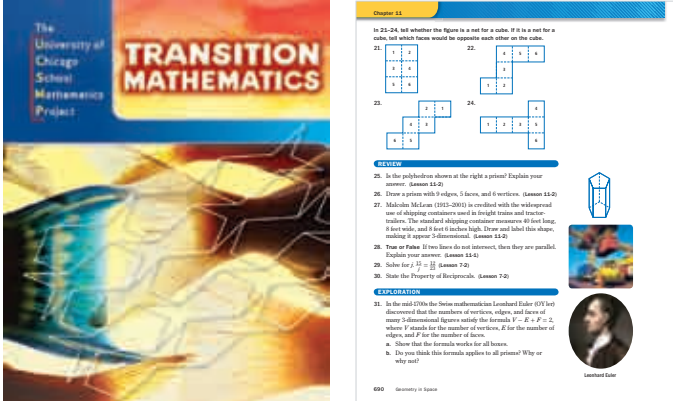
Zalman Usiskin and Max Bell Building New Math Curricula

> University of Chicago
School Mathematics Project



“With the use of UCSMP materials, many teachers have told us that for the first time their students do not ask, ‘Why are we learning this?’ or ‘When am I ever going to use this?’”

ZALMAN USISKIN



The numbers are adding up quickly for the original mathematics curricula for prekindergarten through grade twelve developed by the **University of Chicago School Mathematics Project (UCSMP)**, founded in 1983 thanks to a six-year, \$6.4-million grant from the Amoco Foundation. **UCSMP** brought together the work of Max S. Bell, Professor Emeritus in the Department of Education and the Division of the Physical Sciences; Paul J. Sally, Jr., Professor in the Department of Mathematics and the College; Zalman Usiskin, Professor in the Division of the Social Sciences and current Director of UCSMP; and Izaak Wirszup, Professor Emeritus in the Department of Mathematics and the College.

Today, some four million schoolchildren throughout the United States are using **UCSMP** elementary or secondary materials. Tests show they are outperforming their peers on the broader range of content covered in the **UCSMP** curriculum while holding their own on traditional content. In addition, tens of thousands of teachers and teacher educators have participated in **UCSMP** teacher development programs or attended the organization's conferences.

The secondary curriculum, created under the leadership of Usiskin, was developed first. The series of six books for grades seven through twelve was notable for the infusion of real-world applications and calculator and computer technology in an integrated approach to mathematics. With its strong Transition Mathematics text, meant for students at a seventh-grade level or above, it encouraged schools to teach a full algebra course in eighth grade.

"We had so much demand for the materials that we were forced to self-publish before we had an agreement with a publisher," says Usiskin. In 1987, publisher Scott Foresman took the series to even greater heights. "The first offering was an amazing success. The secondary curriculum had close to three million students in the early nineties."

In 1988, the University's Office of Technology & Intellectual Property helped to fund the **Everyday Learning Corporation (ELC)**, which then launched the first two levels of Everyday Mathematics, a curriculum developed under the leadership of Max Bell and Jean Bell. Everyday Mathematics subsequently became a full prekindergarten-through-sixth-grade curriculum and is now in its third edition. Their novel program includes solving problems in everyday situations, linking past experiences to new concepts, and solving problems using multiple strategies. Since then, Everyday Mathematics has captured close to 20 percent of the total market and in recent years has generated over \$100 million annually in revenue for its current owner, McGraw-Hill. "From a beginning base of a few hundred users, Everyday Mathematics had growth rates of 50 to 100 percent in the early years, and it is still growing at a modest pace," says Bell. "It's been a terrific success for the University."

The Tribune Company acquired **ELC** in 1995 for \$25 million and subsequently sold the business to McGraw-Hill. Recently, UChicagoTech cemented a multimillion-dollar follow-on deal with McGraw-Hill to provide support for the writing of the third editions of the materials for grades seven through twelve and the creation of a new grade six text.

"UChicagoTech was able to harness resources and expertise in the publishing business that put us in a great negotiating position," says Usiskin. "Everyday Mathematics is probably the best selling elementary school series in the country. It is a great symbiotic relationship between a company that wants product and the University, which wants to deliver the latest research-based materials. As a result, UChicagoTech made a very good deal for both parties."

Today, the Wright Group/McGraw-Hill Everyday Mathematics curriculum generates annual royalties of over \$4.5 million for the University, enabling the establishment of the Center for Elementary Mathematics and Science Education in 2002 to help teachers implement the new curriculum and study its impact on student performance.

Other Developments in the Pipeline and on the Market

New Cancer Therapeutics—GenVec, Inc.

In the early nineties, technology that may ultimately have the potential to help people with many types of cancer, including malignancies of the lung, head and neck, ovaries, and bladder, was licensed to **GenVec, Inc.** (Gaithersburg, Maryland). The technology, developed by Ralph R. Weichselbaum, the Daniel K. Ludwig Professor and Chairman of the Department of Radiation & Cellular Oncology and Director of the Ludwig Center for Metastasis Research, and colleagues, involves delivering a gene for a potent anticancer protein (tumor necrosis factor-alpha or TNF-alpha) directly into tumors linked to a radiation- and chemotherapy-inducible promoter. The construct initiates its anticancer effects only when localized to the tumor and when exposed to radiation and/or chemotherapy. Known as TNFerade™, the therapy is in a pivotal Phase III clinical trial for pancreatic cancer, Phase II clinical trials for rectal cancer and melanoma, and two Phase I/II clinical trials for head and neck cancer.

Treatment for Opioid Side Effects—Progenics Pharmaceuticals, Inc.

The investigational drug methylnaltrexone (MNTX) was invented in 1979 by the late University of Chicago pharmacologist Leon Goldberg to block the severe side effects of chronic treatment with opioids, which include constipation, delayed gastric emptying, nausea and vomiting, itching, and urinary retention. Current treatments for these often debilitating conditions are only minimally effective, and patients often stop pain therapy because of opioid side effects. Results have shown that patients treated with MNTX experience a dramatic reduction in many of the side effects related to opioids with no decline in pain relief.

The University licensed rights to MNTX to UR Labs, Inc., which then sublicensed those rights to **Progenics Pharmaceuticals, Inc.**, in October 2001. **Progenics Pharmaceuticals** has subsequently partnered with **Wyeth Pharmaceuticals** for final commercial development and marketing. MNTX is being developed in subcutaneous and oral forms to treat opioid-induced constipation and an intravenous form for postoperative ileus, a prolonged dysfunction of the gastrointestinal tract following surgery. In March 2007, **Progenics Pharmaceuticals** submitted a new drug application for subcutaneous use of MNTX for opioid-induced constipation in patients receiving palliative care. **Progenics Pharmaceuticals** and **Wyeth Pharmaceuticals** are conducting two global Phase III clinical trials in postoperative ileus and are targeting a new drug application submission in this indication for late 2007 or early 2008. An oral formulation for opioid-induced constipation in patients with chronic pain is currently under development, with a new drug application submission anticipated in late 2009 or early 2010.

Several other University investigators were responsible for the early clinical development of MNTX, in particular Jonathan Moss, Professor in the Department of Anesthesia & Critical Care and the College, and Chun-Su Yuan, the Cyrus Tang Professor in the Department of Anesthesia & Critical Care and Director of the Tang Center for Herbal Medicine Research. These investigators continue to explore a number of new potential applications for the drug, including the treatment of cancer and infection.

Electronic Resource Development—PhiloLogic

In 1981, Robert J. Morrissey, the Benjamin Franklin Professor in the Department of Romance Languages & Literatures, Committee on Interdisciplinary Studies in the Humanities, and the College, and Executive Director of the France Chicago Center, helped to establish ARTFL (American and French Research on the Treasury of the French Language), a multifaceted project to create electronic resources for the study of French.

In conjunction with the Digital Library Development Center at the University of Chicago, ARTFL developed **PhiloLogic**, a full-text search, retrieval, and analysis tool that contains a database of nearly 2,000 texts ranging from classic works of French literature to various kinds of nonfiction prose and technical writing.

Originally implemented to support large databases of French literature, **PhiloLogic** has been extended to support a wide variety of textual and hypermedia databases in collaboration with numerous academic institutions and, more recently, commercial organizations. Following is a sample of the collections of texts included in **PhiloLogic's** database that, when searched for online, have received thousands of hits from library catalogs as well as popular search engines:

- American Civil War: Letters and Diaries
- American Film Scripts Online
- Asian-American Drama
- Black Short Fiction
- Latin-American Women Writers
- North-American Immigrant Letters, Diaries, and Oral Histories
- North-American Women's Letters and Diaries
- Scottish Women Poets of the Romantic Period
- Twentieth-Century North-American Drama

PhiloLogic is a modular system in which a text is treated as a set of coordinated or related databases, typically including an object (a unit of text such as a letter, scene, document, etc.) database, a word forms database, a word concordance index mapped to textual objects, and an object manager mapping text objects to byte offsets in data files. Each of these databases is stored and managed using its own subsystem. Such a database structure leads to the ability to ask more powerful questions than simple text searching and is of great interest to scholars and researchers.

In the commercial field, the humanities publisher Alexander Street Press, LLC, took a license to **PhiloLogic** in 2002.

Anticipating Machine Failure—SmartSignal Corporation

In the late 1980s and early 1990s, scientists in the nuclear reactor analysis division at Argonne National Laboratory developed a suite of signal-processing software with a revolutionary ability to anticipate machine, process, and system failure long before it happens. The algorithms turned out to have general applicability beyond nuclear reactors. The software can be used with any machinery or system, can train itself in a matter of minutes, and predict equipment failure sometimes months in advance. Benefits include increased asset availability and utilization, new revenue opportunities, reduced maintenance costs, and a new paradigm of manufacturing analytics.

The University's Office of Technology & Intellectual Property formed a company, **SmartSignal Corporation**, in 1995 to commercialize the software. After two false starts, **SmartSignal** received significant venture financing in 1999. It now employs thirty-five people and has received several awards for its software. The software has met with particular success in the power generation industry, a capital-intensive field where revenue loss from unavailable assets can never be recaptured. **SmartSignal** customers in the fossil fuel power generation sector now represent some 40 percent of fossil fuel generating capacity in the United States and some 10 percent worldwide. The software has also met with success in the aviation industry: Delta Air Lines and Southwest Airlines both use the software to monitor their jet engines.

Office of Technology & Intellectual Property

Activity Overview

SUMMARY OF ACTIVITY BY DIVISION
FISCAL YEAR 2002 (JULY 1, 2001—JUNE 30, 2002)
THROUGH FISCAL YEAR 2006

Disclosures

	02	03	04	05	06
Biological Sciences Division	83	78	72	77	106
Physical Sciences Division	26	15	30	16	28
Argonne National Laboratory	0	1	2	2	1
Humanities Division	0	0	0	1	2
Social Sciences Division	1	1	0	1	1
Graduate School of Business	0	4	2	0	2
Other	0	0	10	2	2
Total	110	99	116	99	142

Agreements

	02	03	04	05	06
Biological Sciences Division	36	25	26	33	21
Physical Sciences Division	1	3	0	1	0
Argonne National Laboratory	0	0	1	2	0
Humanities Division	0	1	0	0	0
Social Sciences Division	0	0	0	0	1
Graduate School of Business	0	0	0	0	0
Other	0	3	1	0	12
Total	37	32	28	36	34

Patents Filed

	02	03	04	05	06
Biological Sciences Division	153	149	114	112	108
Physical Sciences Division	51	41	44	40	17
Argonne National Laboratory	4	3	9	3	4
Humanities Division	0	0	0	0	0
Social Sciences Division	1	1	0	1	0
Graduate School of Business	0	0	0	0	0
Other	0	0	2	0	2
Total	209	194	169	156	131

Patents Issued

	02	03	04	05	06
Biological Sciences Division	50	70	78	43	46
Physical Sciences Division	22	30	24	13	11
Argonne National Laboratory	2	0	4	0	1
Humanities Division	0	0	0	0	0
Social Sciences Division	1	0	0	0	0
Graduate School of Business	0	0	0	0	0
Other	0	0	1	0	0
Total	75	100	107	56	58

Trademarks and Copyrights Filed

	02	03	04	05	06
Trademarks	4	0	0	1	2
Copyrights	1	1	1	0	0
Total	5	1	1	1	2

Trademarks and Copyrights Issued

	02	03	04	05	06
Trademarks	0	2	1	0	0
Copyrights	1	1	1	0	0
Total	1	3	2	0	0

LICENSING REVENUE AND DISTRIBUTIONS
FISCAL YEAR 1992 (JULY 1, 1991–JUNE 30, 1992)
THROUGH FISCAL YEAR 2006

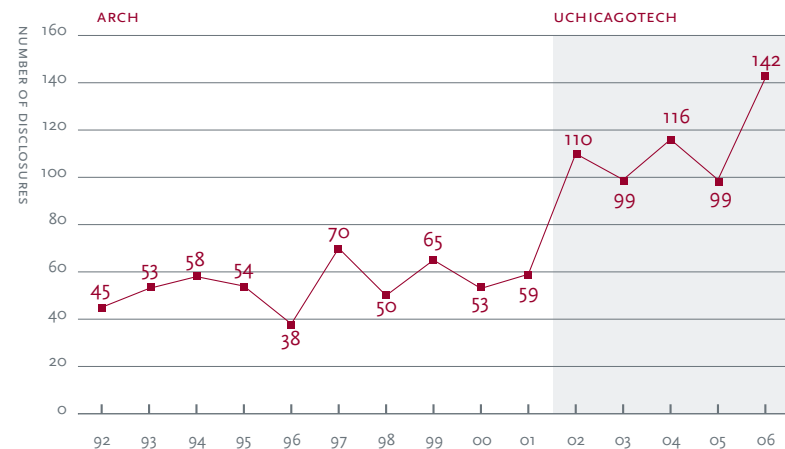
Licensing Revenue

	02	03	04	05	06
Royalties and Upfronts	2,296,812	4,163,901	6,602,232	6,839,839	8,412,995
Extraordinary Items	939,345	92,471	2,848,561	201,169	492,349

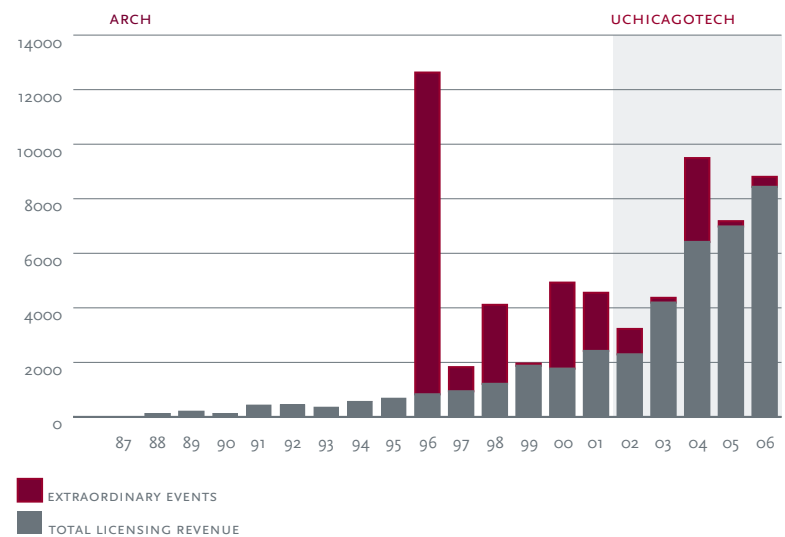
Distributions

	02	03	04	05	06
Inventor	559,980	360,863	1,913,597	609,995	791,406
Laboratory	0	894,130	2,216,998	1,573,678	2,125,325
Department	0	65,275	562,420	111,839	639,004
Division	15,225	743,875	1,393,468	1,351,839	1,339,004
Total Distribution including Inventor	575,205	2,064,143	6,086,483	3,647,351	4,894,739
% of Total Licensing Revenue	18	48	64	52	55
Total Distribution excluding Inventor	15,225	1,703,280	4,172,886	3,037,356	4,103,333
% of Total Licensing Revenue	0	40	44	43	46

DISCLOSURE VOLUME WITH TIME
FISCAL YEAR 1992 (JULY 1, 1991–JUNE 30, 1992)
THROUGH FISCAL YEAR 2006



HISTORICAL REVENUES (IN THOUSANDS)
FISCAL YEAR 1987 (JULY 1, 1986–JUNE 30, 1987)
THROUGH FISCAL YEAR 2006





UChicagoTech

The University of Chicago
Office of Technology & Intellectual Property

5555 South Woodlawn Avenue | Suite 300 | Chicago, Illinois 60637

Phone: 773.702.1692 Fax: 773.702.0741 | Web: <http://tech.uchicago.edu>