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Cover photo: Brain scan images produced by 3D MPRAGE invented by Drs. John Mugler and James Brookeman. (See page 19)
When people ask what the future holds for the
Patent Foundation and technology transfer at U.Va., I am invariably optimistic. I believe the number of faculty inventions disclosed to the Patent Foundation will continue to climb, as will the number of technologies we license to industry and the number of products based on U.Va. research that will reach the public. I am also confident that this growth will lead to increased revenues, which will fund foundation programs and provide healthy returns to the University and its inventors.

A look at the past 20 years can help us envision the future. On the top chart, we see how invention disclosures by U.Va. faculty have significantly increased over the past 20 years. In FY 1986, 27 inventions were disclosed. In FY 2005, the number was 184—a 581 percent increase! Of course, University research programs expanded dramatically during this period. We have also seen an explosion in the number of license transactions, as shown in the bottom chart. In FY 1986, two licensing agreements were signed. In FY 2005, 61 were signed—a 3000 percent increase!

Projecting from our results over the past five years, we feel confident that a decade from now invention disclosures will exceed 290 per year and licensing agreements will surpass 80 per year. Estimating future income is more complicated, since only about 20 percent of all licenses issued ever generate product royalties, and it generally takes 7 years or more for new products to reach the marketplace. Furthermore, royalties vary widely, depending on the size of the market for new products. However, we soon expect to see new products resulting from licensing agreements signed in the late 1990s, and we are optimistic that our rate of revenue growth over the next decade will be considerably higher than in the past.

But statistics alone cannot tell the whole story. Technology transfer is becoming increasingly integrated into the University’s culture and translational research is becoming more common, moving basic science findings towards widespread public use. An example of the University’s new climate is the publication of The U.Va. Faculty Entrepreneur’s Guidebook, described on page 16. Its release demonstrates U.Va.’s support of faculty entrepreneurship. Additionally, Spinner Technologies is expanding its support for faculty start-up companies by creating a local angel investment fund, the Jefferson Corner Group, described on page 23.

In short, these are exciting times for the Patent Foundation. With your help, we will turn the bright future we foresee into reality.

Robert MacWright
Turning a U.Va. Invention into a Licensed Patent

The process of patenting and licensing a new technology is a complex one. The U.Va. Patent Foundation strives to make the process easier for U.Va. faculty. From the day the invention is disclosed until the day the patent expires, the foundation staff works closely with U.Va. inventors to help bring their technologies to the marketplace.

1. The inventor discloses an invention
   • Submits the invention disclosure form (please see www.uvapf.org)

2. A Patent Foundation licensing associate evaluates the invention
   • Conducts a patent and literature search to assess patentability
   • Evaluates commercial potential by identifying a market and potential licensees

3. A Patent Foundation lawyer protects it
   • Files a provisional patent application (good for one year)
   • Converts it to a regular application before the provisional expires if a licensee has been found

4. A Patent Foundation licensing associate markets and licenses it
   • Identifies interested companies, markets the invention, and negotiates a license agreement
   • License includes provisions to assure the company will be diligent in commercial development and product marketing

5. A Patent Foundation business expert monitors the license
   • Ensures the licensee is meeting its contractual obligations
   • Shares royalty income with the inventors and U.Va.
## Patents Issued in Fiscal Year 2005

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<tr>
<th>U.S. Patent Number</th>
<th>Title</th>
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<tr>
<td>6,759,402</td>
<td>Cyclic Felbamate derived compounds</td>
<td>Timothy L. Macdonald Thomas A. Miller Charles D. Thompson Christine M. Dieckhaus</td>
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<td>6,775,568</td>
<td>Exchange-based NMR imaging and spectroscopy of hyperpolarized Xenon-129</td>
<td>John P. Mugler, III Kai Ruppert James R. Brookeman</td>
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<td>6,804,551</td>
<td>Method and apparatus for the early diagnosis of subacute, potentially catastrophic illness</td>
<td>Pamela M. Griffin Randall J. Moorman Boris P. Kovatchev</td>
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<td>6,805,697</td>
<td>Method and system for fusing spinal region</td>
<td>Gregory A. Helm David F. Kallmes Gerald R. Hankins Mary E. Jensen</td>
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<td>6,834,201</td>
<td>Catheter navigation within a MR imaging device</td>
<td>George T. Gillies Roger N. Hastings Jeffrey M. Garibaldi William C. Broaddus</td>
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<td>6,853,452</td>
<td>Passive remote sensor of chemicals</td>
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<td>6,856,831</td>
<td>Method for early diagnosis of subacute, potentially catastrophic illness</td>
<td>Pamela M. Griffin Randall J. Moorman</td>
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<tr>
<td>6,900,400</td>
<td>High sensitivity infrared sensing apparatus and related method thereof</td>
<td>Michael L. Reed Travis Blalock</td>
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INVENTION DISCLOSURES BY DEPARTMENT, 2005

SCHOOL OF ENGINEERING
27.2% OF 2005 INVENTION DISCLOSURES

- Mechanical & Aerospace 20.6%
- Biomedical 10.4%
- Civil 3.0%
- Systems & Information 1.0%
- Chemical 2.6%
- Computer Science 12.0%
- Electrical & Computer 28.4%

SCHOOL OF MEDICINE
53.8% OF 2005 INVENTION DISCLOSURES

- Internal Medicine 14.5%
- Center for Cell Signalling 0.5%
- Pharmacology 5.7%
- Center for Organizational Development 1.0%
- Family Medicine 1.0%
- Anesthesiology 1.0%
- Plastic Surgery 3.0%
- Center for Global Health 0.5%
- Psychiatric Medicine 1.0%
- Health Sciences Foundation 1.0%
- Center for Comparative Medicine 1.0%
- Neurology 2%
- Physical Medicine & Rehab 0.3%
- Biochemistry & Molecular Genetics 7.1%
- Orthopaedic Surgery 13.7%

COLLEGE OF ARTS & SCIENCES
18.5% OF 2005 INVENTION DISCLOSURES

- Chemistry 67.6%
- Physics 14.7%
- Biology 11.8%
- Psychology 5.9%

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The U.Va. Patent Foundation has had an extremely successful year in marketing and licensing University inventions. Not only were a record number of invention disclosures received this year, but there were also record numbers of provisional applications filed and deals completed.

Inventors from the School of Medicine provided slightly more than half of the disclosures received in fiscal year 2005; 26 different departments contributed to the 99 invention disclosures received from the School of Medicine. The Departments of Internal Medicine, Cell Biology and Orthopaedic Surgery each contributed 14 disclosures to the total from the School of Medicine.

The School of Engineering and Applied Science provided 50 disclosures this fiscal year, including over 14 disclosures from Electrical and Computer Engineering, and more than 10 disclosures each from Materials Science and Engineering, and Mechanical and Aerospace Engineering.

The College of Arts and Sciences provided a record number of disclosures from the school this year. The Department of Chemistry contributed the most disclosures from the College of Arts and Sciences with 23 disclosures.

The remaining disclosure for fiscal year 2005 came from the Alderman Library.

Many of the inventions resulted from collaborations between two or more schools or in some cases, multiple departments within a school. In such cases, each school/department received partial credit for the disclosure.

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**Fiscal Year 2005: More Disclosures, More Deals**

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**Year at a Glance**

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<td><strong>License Fees and Royalty Revenue Earned (in $millions)</strong></td>
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*Includes U.S. designations in Patent Cooperation Treaty (international) patent applications*
Physician-scientists Benjamin Gaston, M.D. and John Hunt, M.D. met in the U.S. Navy, where they discovered a shared passion for improving the treatment of lung disease. Deployments separated them for a time, but the pair eventually wound up working together at U.Va. Not only has their collaboration resulted in several promising inventions, but it has also led to their designation as 2005 Edlich-Henderson Inventor(s) of the Year by the U.Va. Patent Foundation.

The focus of their research has been lung disease—particularly asthma, a chronic ailment characterized by inflamed lung tissue and obstructed airways that afflicts more than 100 million people worldwide. Lung tissue is under enormous stress due to its role in capturing oxygen.
for the body. Drs. Gaston and Hunt found that breath exhaled from diseased lungs is 100 to 1000 times more acidic than breath exhaled by healthy lungs, coining the phrase “airway acid stress” to describe this discovery. They speculated that a tool to accurately measure the acidity of breath condensate would make it easier for clinicians to tailor treatments to their patients, possibly easing or eliminating some of the side effects common with powerful asthma medications.

“This developed out of a project John began to work on when we were stationed in San Diego,” says Gaston, a professor of pediatrics and renowned asthma expert. “He started trying to develop a prototype breath measuring device in his basement using different types of tubes.”

“Ben is my mentor,” says Hunt, an assistant professor of pediatrics who came to U.Va. to take advantage of fellowships in allergy, immunology, and pediatric pulmonology that Gaston had helped him to secure. “Developing a breath condensate tool to measure airway chemistry was originally Ben’s notion.”

Once the two were able to put their heads together in Charlottesville, the project became a success. Their invention is a technique for collecting breath samples non-invasively and determining acid and oxidant stress levels in the lungs. The collection method and the RTube™ measurement device they developed have been used to date in more than 300 laboratories on six continents. In addition to monitoring the breath condensate of asthmatics, the technology is used in this country to identify the presence of gastric acid reflux, which often results in lung disease, and to test for active tuberculosis in Thailand and West Africa. It is being marketed by Respiratory Research, Inc., a Charlottesville-based start-up company launched in 2000 by Gaston and Hunt, along with engineer Rafi Baddour.

“The RTube™ is so simple to operate that patients can easily collect samples of their own breath condensate at home for monitoring purposes,” says Hunt.

This breakthrough technology has had a major impact on the medical research world. It has led to “an entirely new paradigm of lung disease,” says Peter Heymann, M.D., professor of pediatrics and head of U.Va.’s Division of Pediatric Respiratory Medicine. Gaston and Hunt have had their research cited at least 100 times in scientific articles over the past four years.

But the technology to identify and measure acidity in exhaled breath is not the duo’s only U.Va. invention. Over the past seven years they have submitted 15 invention disclosures to the U.Va. Patent Foundation. Several of these inventions have been licensed to industry. “We’ve learned that it’s important to patent our inventions,” says Hunt. “Otherwise inventions would never make it to the marketplace where they have the potential to help patients.”

“The Patent Foundation is highly effective at negotiating licensing agreements with businesses to get the best deal for the University,” says Gaston. “We’re happy to work with the foundation staff because they know what they’re doing and, above all, we’ve found them to be trustworthy.”

Despite their considerable success as inventors, Gaston and Hunt are motivated primarily by research interests. “Our work is helping to change current understanding of airway biochemistry and how it underlies multiple respiratory diseases,” says Gaston. “Our goal is to use our creativity in the lab to help people afflicted by lung disease.”
Winners of the Edlich-Henderson Inventor(s) of the Year Award

2005  Benjamin Gaston and John Hunt
2004  Haydn Wadley
2003  William A. Petri, Jr. and Barbara Mann
2002  Joel Linden
2001  Doris Kuhlmann-Wilsdorf
2000  Ron Taylor
1999  John Herr
1998  Not awarded
1997  Richard Guerrant and Timothy Macdonald
1996  Jessica Brand, Patrice Guyenet, Richard Pearson, and Janine Jagger
1995  Donald Hunt, Jeffrey Shabanowitz, and George Stafford
1994  Gerald Mandell and Gail Sullivan
1993  Joseph Larner
1992  Robert Berne, Luiz Belardinelli, and Rafael Rubio

Edlich-Henderson Inventor(s) of the Year Award

The Edlich-Henderson Inventor(s) of the Year Award is presented by the Patent Foundation to recognize an invention with notable value to society. The brainchild of Richard Edlich, M.D., U.Va. professor emeritus and currently editor-in-chief of the Journal of Long-Term Effects of Medical Implants, the award is also named for Christopher J. Henderson, president and chief financial officer of Robbins & Henderson, LLC, a New York firm specializing in financial and related services for institutions. Deeply committed to the University of Virginia, Henderson promotes partnerships between universities and industry.
Featured Technologies

Moving to the Marketplace

These technologies developed by U.Va. inventors were licensed to various companies during the 2005 fiscal year.

**Anti-Src Monoclonal Antibody**
*Inventors: J. Thomas Parsons and Sarah J. Parsons*
This technology is an antibody that binds to an enzyme called Src tyrosine kinase naturally found in the human body. If too much Src is produced, excessive cell growth and cancer often result. Using this monoclonal antibody, diagnosticians will be able to determine when Src over-production is occurring. **TriPath Oncology, Inc.**, is developing the technology into a test for cancers that result from Src over-production. A wholly owned subsidiary of **TriPath Imaging** of Durham, N.C, the company develops molecular diagnostic products for malignant melanoma and cancers of the cervix, breast, ovary, and prostate.

**mTOR Inhibitors Enhance Treatment for Breast and Other Cancers**
*Inventors: Richard Santen, Wei Yue, John Lawrence, Lloyd McMahon*
The inventors have been working with a compound that is being developed as a cancer therapy by Sunrise, Fla.-based **Concordia Pharmaceuticals, Inc.** The U.Va. inventors have discovered that the compound blocks action of the growth signaling protein kinase mTOR in patients who have the type of cancers that grow in the presence of steroid hormones. Breast cancer cells deprived of the hormone estrogen for a long period increase their expression of mTOR, enabling the cancer to recur. Blocking mTOR along with estrogen prevents the further growth of these cancer cells.

**Transgenic Mice that Express Human MHC Molecules**
*Inventor: Victor Engelhard*
Dr. Victor Engelhard has developed transgenic mice that produce human major histocompatibility complex (MHC) molecules, in order to simulate the immune response that destroys virus-infected cells.
and tumor cells. With these mice, researchers looking for ways to arrest viral diseases and cancer will be able to evaluate how changing peptides, or antigens, on the surface of cells may influence the quality of the body’s immune response. Jackson Laboratories of Bar Harbor, ME, is making the transgenic mice freely available to universities and non-profit organizations. Companies may purchase them after obtaining a license from the U.Va. Patent Foundation.

**Medical Center Job Description and Performance Appraisal Forms**  
*Author: Medical Center Department of Human Resources*  
In an effort to better assess job competency and manage performance, the U.Va. Medical Center’s Department of Human Resources has developed a set of forms known as the “Job Description/Performance Appraisal Forms” and the “Orientation Competency Assessment and Evaluation Forms,” for use throughout the hospital. These forms have been licensed to Thomson Delmar Learning, a division of Thomson Learning, Inc., for incorporation into their NetCompetency software package, which was released in late 2005. Other medical centers that buy this software package will now be able to obtain and use the forms developed by U.Va.

**VQuant Software for Analysis of Cardiac Images**  
*Authors: Denny Watson, Bill Smith*  
This software technology facilitates the quantitative processing of images obtained from Single Photon Emission Computed Tomograph (SPECT) studies of the heart. It uses standardized methods to quantify the heart’s uptake of tracer compounds in stress testing, but uses a new simplified method to display numerical results along with anatomically correct and visually interpretable images. VQuant has been licensed to Corscan Information Products, LLC, to be incorporated into their information management system for cardiologists.

**High Mast Inspection System**  
*Inventors: Pradip Sheth and Dominick Monte*  
High mast lamp pole structures, some exceeding 150 feet in height, are abundant on our highways, and are difficult to inspect for signs of potential catastrophic failure due to corrosion and cracks at welding joints. Current inspection systems are expensive, subjective, and time-consuming, and often place inspectors in harm’s way. The inventors have developed a non-invasive wireless inspection system that overcomes such deficiencies, and provides objective criteria for determining pole safety. This system is being developed and marketed by Utilivations, LLC, a division of International Energy Products, Inc.
U.Va. microbiologist Deborah Lannigan, Ph.D., is always searching — far beyond her microscope — for ways to make life better.

She is particularly passionate about drug discovery. “There is a huge need for new pharmaceuticals, and it’s important that we care enough to find them,” says Dr. Lannigan, an assistant professor in the Department of Microbiology and Center for Cell Signaling. “By developing promising drugs, we’ll be helping people worldwide.”

She finds the search for cancer drugs with fewer side effects especially compelling. Working with research partner Jeffrey Smith, she discovered that a rare plant from the Amazonian rain forest prevents breast cancer. The plant is one of a large number of exotic specimens collected by the National Cancer Institute in the 1960s for research purposes and maintained at U.Va. by chemistry professor Sidney Hecht. A compound from the plant *Forsteronia refracta* works as a key in a molecular lock. It prohibits tumor growth by stopping the action of a cancer-linked protein called RSK.

“By preventing RSK from working, we completely halted the growth of breast cancer cells in the lab but did not affect the growth of normal breast cells,” says Lannigan, who is currently testing the compound in mice. Luna Innovations, a Blacksburg-based company, has licensed this and a number of her other discoveries.

Lannigan has also identified proteins that signal when they bind with targeted molecules, to create novel detection systems. These biosensors could have numerous practical applications, including the detection of poisons and land mines.

She takes her role as inventor seriously. “It’s foolish to announce a new discovery without protecting the intellectual property, and then expecting companies not to come along and scoop it up. By patenting and licensing my inventions, I’m benefiting the University and the taxpayers who support it.”

Lannigan describes her work as both mind engaging and relaxing. “It’s great fun to fill a practical need,” she says. |||
A neurosurgeon once told aspiring chemist James Bennett, who was then interested in a research career, about a patient who was able to brush her teeth for the first time in a decade after taking L-dopa, the drug that revolutionized Parkinson's disease treatment.

Bennett was blown away by the notion. “When I realized that medical researchers had identified and corrected what was chemically amiss in that woman’s brain, my career plans changed,” he says. “As a physician scientist, I figured I could both contribute to basic science and help patients with chronic brain disease.”

With this plan in mind, Dr. Bennett earned his M.D. and Ph.D. before coming to U.Va. as a neurology resident. He is currently a professor of neurology and psychiatric research.

He believes that R(+)pramipexole, the chemical mirror image of a drug effective in treating Parkinson’s disease, will help patients with Amyotrophic Lateral Sclerosis (ALS). Also called Lou Gehrig’s disease, ALS is a terrifying disorder that kills nerve cells, paralyzing muscles and gradually robbing its victims of their ability to move, and eventually, breathe.

Results from Bennett’s tests of the drug in ALS patients are very encouraging. By scavenging reactive oxygen so harmful to nerve cells, R(+)pramipexole appears to halt the destruction and may even restore lost function. “It seems to buy very sick people more time and make this devastating disease a bit less deadly,” he says.

The Food and Drug Administration may “fast track” the drug’s approval, based on results from a future effectiveness study currently being planned.

“Treating desperately ill patients has changed me profoundly as a scientist and a clinician,” says Bennett, who has pledged not to accept any income from the sale of R(+)pramipexole. “Since public funds support my research, I believe this is my way to give back and to acknowledge the important assistance I’ve received.”
The U.Va. Faculty Entrepreneur’s Guidebook

U.Va. and UVAPF Collaborate to Aid Faculty Entrepreneurs

The University of Virginia and the
U.Va. Patent Foundation are enthusiastic supporters of entrepreneurial activities by University faculty members. Faculty entrepreneurship, in fact, is an integral part of U.Va.'s research mission for several reasons. First, faculty-launched companies bring new ideas, excitement, and funding to the University's research programs. Second, company executives recognize that scientific discoveries made at the University create local jobs for skilled scientists and other talented citizens. Finally, the Patent Foundation believes that faculty-launched companies can be ideal commercialization partners for technologies not yet embraced by industry because they are too “early-stage,” require extensive product development, or challenge conventional wisdom.

Scientists attempting to straddle the university and business worlds often face unique challenges. At U.Va., we believe that entrepreneurism and more traditional faculty activities can productively co-exist. To help our faculty balance the two, the Office of the Vice President for Research and Graduate Studies (VPRGS) and the Patent Foundation have produced The U.Va. Faculty Entrepreneur’s Guidebook. This book explains how the University is applying its policies in the area of faculty entrepreneurship with the goals of developing new technology companies and preserving the unique nature of its academic research enterprise. The publication is the first major project of an "overlap" team comprising members from VPRGS and UVAPF that was created in 2004 to disseminate information about intellectual property and technology commercialization to entrepreneurial faculty.

The guidebook has been praised, not only by U.Va. faculty entrepreneurs, but also by their companies' business managers and investors, other small companies interested in collaborating with U.Va. faculty, research offices in other Virginia universities, committees interested in fostering high-tech company growth across the state, and colleagues in university technology transfer offices.

"We believe this book sends a clear signal that the University encourages and supports faculty entrepreneurship in all its forms," says David J. Hudson, U.Va.’s Associate Vice President and Director of Academic Research Compliance. “More than merely desirable, this type of activity will be absolutely essential to the University’s vitality in the years ahead.”

Electronic copies of the guidebook can be obtained through Web sites for VPRGS (www.virginia.edu/vprgs) or the Patent Foundation (www.uvapf.org). Please contact either office to request a hard copy.
Each set of arrows represents a different relationship between the parties.

1. employment contract
2. relationship between UVA and UVAPF
3. license agreement
4. consulting/founders agreement
5. sponsored research agreement
When the Commonwealth of Virginia’s first whole-body Magnetic Resonance Imaging (MRI) device was installed at U.Va. in the mid 1980s, physicist James Brookeman, Ph.D. supervised its installation. He also began to educate young researchers who could develop ways to improve the then-nascent technology. Today, biomedical engineer John Mugler, Ph.D., one of Brookeman’s first graduate students, is an important research partner.

“As an engineer with an interest in medicine, I’m fascinated by medical applications for MRI technology,” Mugler says.

Working together, Drs. Brookeman and Mugler have developed a number of techniques to enhance MRIs, which employ static and radio-frequency magnetic fields to produce images of the body’s internal structures. One such technique is a three-dimensional imaging method that produces more than 100 high-resolution, high-contrast images in as little as three minutes of imaging time.

“This technology provides detailed, yet comprehensive coverage, conceivably from any orientation, so doctors seeking to diagnose a problem or researchers trying to understand how the body works get sharp images in much less time,” Brookeman says.

The duo has worked with other researchers to obtain the first MRIs of human lungs using hyperpolarized xenon-129. They have also performed many studies using hyperpolarized helium-3. Since conventional MRIs are most effective in tissue containing water, and lungs contain very little, these technologies capture subtle variations that could not have been imaged previously. In addition to being widely used in basic science research, they have important implications for the early detection of diseases such as asthma, emphysema, and cystic fibrosis, when intervention is more likely to result in successful treatment.

According to Brookeman, U.Va. is a natural birthplace for the latest in MRI technology. “We benefit greatly from bright students, some of whom serve as co-inventors on our projects. We view this collaborative approach as part of our responsibilities as researcher-educators. It is our job to think outside the box and to enable our students to do so, too.”

Working together, Drs. Brookeman and Mugler have developed a number of techniques to enhance MRIs, which employ static and radio-frequency magnetic fields to produce images of the body’s internal structures.
Drs. Poon and Shiflet were involved in interdisciplinary research when few others could see its value. Physicist Joseph Poon, Ph.D., and materials scientist Gary Shiflet, Ph.D., both joined the University of Virginia faculty two decades ago and quickly began to collaborate.

“We both develop metal alloys,” says Poon, William Barton Rogers Professor in the Department of Physics. “We just approach the work from different directions. It’s a blend that seems to work.”

“Much of the equipment we use is in the Engineering School,” says Shiflet, William G. Reynolds Professor in the Department of Materials Science and Engineering, “but we definitely work as a team.”

The two consider themselves to be especially goal-oriented basic scientists. But they are so frequently encouraged by research sponsors to deliver new products that they are also recognized as inventors. In 2004, Scientific American, which names 50 research leaders each year, recognized Poon and Shiflet because they created amorphous steel, a glasslike, non-magnetic form of ferrous alloy two to three times stronger than conventional steel and less susceptible to corrosion. The U.S. Navy, which supports their research, believes Poon and Shiflet have invented an ideal material from which to manufacture submarine hulls capable of escaping magnetic detectors and mines detonated by magnetic fields. It also has potential for making ship hulls, lighter automobiles, tall buildings, corrosion-resistant coatings, surgical instruments, and recreational equipment. After some fine-tuning, it could be ready for commercial use in a few years.

Meanwhile the pair will go back to the lab for more theoretical work. “Futuristic metal alloys are so complex that they won’t be predicated using existing laws of nature, so we’ll have to start fresh in order to advance technology yet again,” says Poon.

“If we really stray, we have little to help us except computational techniques,” says Shiflet. “That’s what makes this work exciting.”

They created amorphous steel, a glasslike, non-magnetic form of ferrous alloy two to three times stronger than conventional steel and less susceptible to corrosion.
Spinner Companies Continue

Recognizing that faculty entrepreneurship is a national movement, the Patent Foundation created Spinner Technologies, Inc., five years ago. Spinner's targeted mission is to assist U.Va. inventors in turning their inventions and ideas into technology-oriented businesses.

“Spinner Technologies is a for-profit subsidiary of the Patent Foundation that provides hands-on business advice, affordable real estate, referrals, and guidance with University policy,” explains Andrea Alms, General Manager of Spinner Technologies, Inc.

Adenosine Therapeutics, LLC (ATL)

Faculty Entrepreneur: Joel Linden

ATL is discovering and developing new pharmaceutical products that target adenosine receptor subtypes for a broad range of potential indications, such as sepsis, heart attacks, and diabetes.

Allomics, LLC

Faculty Entrepreneurs: Zhifeng Shao and Sitong Sheng

Allomics is developing a novel platform technology for analyzing gene expression in small tissue samples. This technology can enable research scientists to analyze samples that were previously too small for routine testing, potentially leading to valuable new clinical diagnostic devices.

Cellular Materials International, Inc. (CMI)

Faculty Entrepreneur: Haydn Wadley

CMI is developing novel multifunctional structures that have open spaces within them without losing strength. These materials can reduce weight, increase performance and reduce costs of structural materials used for making military aircraft, ships, automobiles, and structural reinforcements in bridges, as well as in many other applications.

ContraVac, Inc.

Faculty Entrepreneur: John Herr

ContraVac is a reproductive health biotechnology firm specializing in products to test male fertility. ContraVac is working to commercialize the world’s first in-home immunodiagnostic products for sperm counting and other sperm testing.
Spinner Technologies Starts the Jefferson Corner Group

Spinner helps University of Virginia entrepreneurs with the development of their technology companies. Over the years, we have sought to expand our services to fulfill the growing needs of these start-ups. One area that is often particularly difficult for young companies is the acquisition of early-stage financing. In order to improve the availability of this type of early funding, Spinner recently formed an angel investment fund called the Jefferson Corner Group (JCG) which hopes to provide investment capital to U.Va. faculty spin-off companies and other technology businesses in the region.

“We thought it was critical to create a structure like JCG to provide local funding opportunities for start-up companies based on U.Va. technologies,” Andrea Alms, General Manager of Spinner, notes.

The Jefferson Corner Group I, LLC is a member-managed angel fund designed to capitalize on the growth in entrepreneurial activity in Charlottesville and also in other areas. The Fund will seek to enhance wealth creation by its members by investing money and time in early stage, quality, high-growth technology companies. It is expected that the Jefferson Corner Group members will be primarily from communities in Virginia. The members may be entrepreneurs, venture capitalists, angel investors, attorneys, managers, professional service providers, and other high-net worth individuals.

One of the distinguishing characteristics of the Jefferson Corner Group is that unlike some other member-managed funds, there will be an administrator working under the guidelines set by the membership to oversee due diligence, review business plans, and monitor portfolio companies. Spinner Technologies will administer the Fund and provide these services to JCG’s membership.

The Jefferson Corner Group has achieved significant progress in recent months. In addition to establishing the group, Spinner has recruited the founding angel investors. JCG hosted a very successful founding angel meeting in November, and this group of investors may play an increasing role in JCG’s development. We are very pleased that the University of Virginia itself is one of the founding members. We look forward to closing the Fund shortly and having the membership begin investing.

Pinnacle Pharmaceuticals, Inc.
Faculty Entrepreneur: Sidney Hecht

Pinnacle Pharmaceuticals is focused on the discovery, development, and commercialization of anti-infective and anti-tumor compounds.

PluroGen Therapeutics, LLC
Faculty Entrepreneurs: George Rodeheaver and Adam Katz

PluroGen is a biotechnology company developing a stable gel carrier for advanced wound management such as the topical delivery of medication for burns and other open wounds.

Goha Learning, LLC
Faculty Entrepreneur: Yitna Firdyiwek

Goha Learning is an educational technology services and software company that partners with students, educators, and educational institutions to implement innovative educational technologies.
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Professor, Biology

Kathryne Carr
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Charlottesville, VA
The Faculty Advisory Committee (FAC) provides one-on-one advice and counseling to U.Va. faculty members on the technology transfer process, including strategies for understanding what is already in the patent literature and publications, managing strategic alliances with industry, negotiations, licensing, start-up companies, research and development agreements, and industrial grants. Emphasis is placed on how to disclose inventions, how to manage interactions with patent attorneys, writing and reviewing the structuring of broad and relevant patent claims, and most importantly, understanding the types of data required to successfully obtain key patent claims.

The FAC may also be approached for suggestions on research strategies to enhance the patentability of basic discoveries by focusing on proof of principle experiments. The FAC serves as a sounding board for U.Va. faculty seeking to understand and critique the process and the pitfalls of intellectual property management, patenting, and technology transfer. The FAC also provides advice to the Patent Foundation on matters of policy affecting U.Va. faculty.

The FAC helps faculty inventors learn how to disclose their inventions, explore the full scope of their inventions, and develop data needed to obtain the best patent claims possible.
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### UVAPF Fiscal Year Revenues & Distributions

#### Revenues

<table>
<thead>
<tr>
<th>Source</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>License fees and royalties</td>
<td>$6,043,493</td>
</tr>
<tr>
<td>Research grants</td>
<td>9,081</td>
</tr>
<tr>
<td>Patent costs reimbursed</td>
<td>741,624</td>
</tr>
<tr>
<td>Interest and other income</td>
<td>157,025</td>
</tr>
<tr>
<td><strong>Total revenue</strong></td>
<td><strong>6,951,223</strong></td>
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</table>

#### Distributions

<table>
<thead>
<tr>
<th>Category</th>
<th>Amount</th>
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</thead>
<tbody>
<tr>
<td>Distributions to University of Virginia</td>
<td>1,878,655</td>
</tr>
<tr>
<td>Distributions to inventors</td>
<td>1,238,412</td>
</tr>
<tr>
<td>Other distributions (CIT, CME, ATI, etc.)</td>
<td>862,515</td>
</tr>
<tr>
<td><strong>Total distributions</strong></td>
<td><strong>3,979,582</strong></td>
</tr>
<tr>
<td><strong>Net revenues</strong></td>
<td><strong>2,971,641</strong></td>
</tr>
</tbody>
</table>

![Graphs showing distribution to inventors and accumulated distribution to inventors over the years.](image-url)

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University of Virginia Patent Foundation  2005 Annual Report  Bringing Technology to the Marketplace
## Patent Royalty Distribution Schedule

<table>
<thead>
<tr>
<th>Total Royalty Income</th>
<th>Inventors' Income</th>
<th>Inventors' Research</th>
<th>Patent Foundation</th>
<th>Inventors' School</th>
<th>Scholarly Activities Fund</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;$100,000</td>
<td>50%</td>
<td>7.5%</td>
<td>42.5%</td>
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<td>—</td>
</tr>
<tr>
<td>$100,000-299,999</td>
<td>30%</td>
<td>20%</td>
<td>42.5%</td>
<td>7.5%</td>
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</tr>
<tr>
<td>$300,000-999,999</td>
<td>25%</td>
<td>15%</td>
<td>40%</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>&gt;$1,000,000</td>
<td>15%</td>
<td>15%</td>
<td>40%</td>
<td>20%</td>
<td>10%</td>
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</tbody>
</table>

## Software Royalty Distribution Schedule

<table>
<thead>
<tr>
<th>Total Royalty Income</th>
<th>Authors' Income</th>
<th>Authors' Research</th>
<th>Patent Foundation</th>
<th>Authors' School</th>
<th>Scholarly Activities Fund</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;$100,000</td>
<td>50%</td>
<td>25%</td>
<td>25%</td>
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<td>—</td>
</tr>
<tr>
<td>$100,000-300,000</td>
<td>30%</td>
<td>30%</td>
<td>25%</td>
<td>10%</td>
<td>5%</td>
</tr>
<tr>
<td>&gt;$300,000</td>
<td>25%</td>
<td>25%</td>
<td>25%</td>
<td>15%</td>
<td>10%</td>
</tr>
</tbody>
</table>

- To provide accessible, responsive, competent, timely, and professional patenting and licensing services to U.Va. and its faculty and staff.

- To serve as an efficient and effective conduit for the licensing of promising U.Va. technologies to industry, thus promoting their entry into the commercial marketplace, and also generating royalties that can fund further U.Va. research.

- To support and encourage local economic development by licensing locally, by licensing to start-up companies, and by encouraging and supporting faculty start-up activities.

- To serve as a resource for information about patents and licensing, and to encourage recognition that such matters have become meaningful and valuable aspects of academic life.

- To encourage greater integration between academia and industry, hence improving the flow of innovative university technologies to the public marketplace.