



NEW JERSEY COMMISSION ON SCIENCE AND TECHNOLOGY

IMAGINE
INNOVATE
INVIGORATE

2004-2005
ANNUAL REPORT



Dear Friends:

In New Jersey, we recognize the importance of innovation and invention. Our life sciences and technology-based industries are the lifeblood of our thriving economy and the hope for continued economic growth in years to come.

The Commission on Science and Technology plays a unique and crucial role by nurturing these industries and working to create new companies and new, quality jobs in New Jersey.

This has been a year of change at the Commission, with new leadership tackling new challenges. I applaud the new direction and renewed vigor of the Commission. I have been pleased with the Commission's shift of programming focused on creating and supporting high-tech entrepreneurs – the future of our economy.

The Commission has played a pivotal role in creation of the Stem Cell Institute of New Jersey – our nation's first state-supported institute dedicated to both research and medical treatment. An inaugural symposium on stem cell research, hosted by the Commission, attracted 300 scientists from throughout the state and showcased discoveries being made in New Jersey. The research displayed shows New Jersey is well on its way to becoming a world leader in stem cell research and to bringing cures to families coping every day with now-hopeless diseases and injuries.

I am proud of the Commission on Science and Technology and grateful to Commission members, who are willing to share their unique personal success and professional expertise to keep New Jersey a leader in the technology-based economy of the 21st Century. Keep up the good work!

With regards,

A handwritten signature in black ink that reads "Richard J. Codey". The signature is written in a cursive, flowing style.

Richard J. Codey
Acting Governor

A Year of Change...

Our Mission:

To encourage economic development and job growth in New Jersey by:

- promoting strong ties between industry and universities in order to accelerate commercialization of technology
- supporting entrepreneurial technology businesses in areas of strategic importance to the state and
- strengthening research collaborations among universities to create new potential for increased federal funding and private investment.

New Jersey Commission on Science and Technology

Established in 1985, the New Jersey Commission on Science and Technology is responsible for the development and oversight of policies and programs promoting science and technology research and entrepreneurship in New Jersey. Commission members include business leaders, university leaders, scientists, the Secretary of Commerce and Economic Growth Commission, the Commissioner of Education, a representative of the Governor and four legislators.

Commission Members

Donald Drakeman, Ph.D., J.D., *chairman*

Dr. Drakeman is president and chief executive officer of Medarex Inc., one of New Jersey's largest and fastest-growing biotechnology companies. Medarex is developing targeted therapies for cancers and other life-threatening diseases. Medarex's patented monoclonal antibody technology is being employed by numerous companies in the development of new treatments for disease, including Pfizer, Novartis, Johnson & Johnson and Amgen. Under Dr. Drakeman's leadership, Medarex has raised more than \$1 billion in capital.

Dr. Drakeman is a founding member and former chairman of the Biotechnology Council of New Jersey. In 1995, Dr. Drakeman served as a member of the bicameral, bipartisan Joint Legislative Technology Task Force which produced a package of bills, including the popular, first-of-its-kind *Technology Tax Certificate Transfer Program*, which enables emerging technology businesses to raise capital by selling net operating losses.

David P. Beck, Ph.D., president of the Coriell Institute for Medical Research and adjunct professor in the Department of Molecular Genetics and Microbiology at UMDNJ-Robert Wood Johnson Medical School. He served in various capacities at the National Institute of General Medical Sciences of the NIH, rising to Deputy Director of the Genetics Program. Under Dr. Beck's leadership, the Coriell Institute conducts its own research in cancer, human genetic variation, mechanisms of cellular differentiation, and other genetic disorders and serves the entire scientific community by maintaining the world's largest collection of human cells for research.

Mario M. Casabona, founder and CEO of Electro-Radiation Inc., a developer of electro-magnetic interference mitigation solutions serving the defense industry. Earlier this year, Honeywell International acquired ERI, adding the Fairfield-based company to its Defense & Space Electronic Systems Missiles and Munitions business and naming Mr. Casabona its director of electrical protection products. Mr. Casabona currently serves as Chairman Emeritus of the Research and Development Council of New Jersey. Mr. Casabona holds several patents in the area of adaptive Electronic Interference Mitigation Technology.

James Coleman Jr., chairman of International Matex Tank Terminals and acting chair of NJCST from June 2003 to October 2004. International-Matex Tank Terminals is a world-class provider of bulk liquid handling services for the petroleum and chemical industries; it is a privately owned company. The company has major facilities on the East Coast, West Coast, Gulf Coast, in the Midwest and Quebec and Newfoundland with 40 million barrels of storage capacity.

Peter Eisenberger, Ph.D., professor, Earth and Environmental Sciences Department, Columbia University and former head of the Princeton Materials Institute, Princeton University. Dr. Eisenberger is co-chair of the National Advisory Board for a new science center in Tucson, Arizona. A fellow of the AAAS and the APS, he is leading an effort to devise a new way for professional societies to advise Congress.

Richard Goldberg, president of the New Jersey Commerce and Industry Association with headquarters in Paramus, New Jersey. He is also the publisher of *COMMERCE* magazine, distributed throughout New Jersey. Mr. Goldberg is a former executive director of the American Electronics Association (AeA), and vice president of the Association of Food Industries, Inc. Mr. Goldberg's areas of expertise include business development, government relations and communications.

Shui Yee Lee, Ph.D., CEO of AsiaInfo Lenovo USA which provides IT resource supplementation on-site and off-shore and solution development from concept to deployment and helps companies establish their business in China. Dr. Lee, a former AT&T Vice President with 30 years of distinguished leadership experience in IT and Network Services, has been named an AT&T Fellow.

Gregory Olsen, Ph.D., chairman of the board of directors and co-founder of Sensors Unlimited Inc., a developer and manufacturer of optoelectronic devices for fiber optic communications systems and near infrared imaging devices serving the military, aerospace and manufacturing industries. Under Dr. Olsen's direction, the company has grown into a world-class fiber optic component design, fabrication and supply operation. Dr. Olsen was a research scientist at RCA Sarnoff Labs before starting EPITAXX, a fiber optic detector company in 1984.

Senator Robert W. Singer represents District 30, including parts of Burlington, Mercer, Monmouth and Ocean counties. Sen. Singer is a member of the Commerce Committee as well as the Health, Human Services and Senior Citizens Committee.

Assemblyman Upendra J. Chivukula represents District 17, including parts of Middlesex and Somerset counties. Assemblyman Chivukula is vice-chairman of the Commerce and Economic Development Committee, as well as a member of the Telecommunications and Utilities Committee and the Transportation Committee.

Virginia Bauer, Secretary and Chief Executive Officer of the New Jersey Commerce and Economic Growth Commission

William Librera, Commissioner of the New Jersey Department of Education

Patrick Brannigan, Governor's Office

Robert Altenkirch, Ph.D., president, New Jersey Institute of Technology. Under Dr. Altenkirch's leadership, NJIT has developed a focused strategic plan emphasizing national prominence for a number of NJIT's academic and research strengths, recruiting high-achieving students from diverse backgrounds and increasing research funding

Harold Shapiro, Ph.D., president emeritus, Princeton University. Dr. Shapiro served as Princeton University's 18th president and as chair of the President's Council on Bioethics for President Clinton.

Chairman's Letter

Scientific discovery and technological innovation will be the engines of economic growth for the State of New Jersey. Our goal at the Commission on Science and Technology is to accelerate that growth by finding efficient ways to link innovation with the entrepreneurs.

Today's Commission consists of an energetic blend of successful entrepreneurs, renowned academic researchers, distinguished public officials and experienced industry executives. We have identified strategically important emerging industries in the State – including the life sciences, nanotechnology, electronics, advanced materials, telecommunications and information technology – and we have dedicated ourselves to applying the Commission's resources to fostering economic growth and to building bridges between academics and industry in these areas.



New Jersey is one of the world's most attractive places to build high technology businesses, but achieving and sustaining technology leadership is challenging. Other states and countries are actively recruiting in our pool of talented scientists, engineers and entrepreneurs, offering many forms of financial incentives. They too have seen the transformative power of a burgeoning entrepreneurial environment. We need to work hard to take maximum advantage of our resources and to look for ways to continue to build the critical mass of high technology entrepreneurship in the State.

In summary, our mission is straightforward: To accelerate New Jersey's economic growth by promoting innovation and by helping scientists and entrepreneurs convert that innovation into commercial products. To that end, the Commission will seek out the best ways to:

- Support translational research
- Promote technology transfer
- Nurture entrepreneurial enterprises

Finally, the Commission will be the State of New Jersey's window on the high tech sector. Dr. Sherrie Preische and her colleagues at the Commission will be directly connected to the leaders of our critical technology sectors, and our task forces will tap into CEOs, university presidents and state government officials to establish a high-tech policy for the state. We will then work to implement that policy in the most effective way possible — through our own resources and through other branches of state government.

As you will see in this report, the Commission is hard at work, from holding an enormously successful stem cell conference for academia and industry to establishing new programs to encourage the best and brightest Ph.D. scientists in New Jersey to seek post-doctoral training at our entrepreneurial companies. We welcome any ideas that might help us achieve our goals.

Sincerely yours,
Donald L. Drakeman, Ph.D.

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THE COMMISSION ON SCIENCE AND TECHNOLOGY

plays a unique and critical role in New Jersey's economic development effort. Building on New Jersey's world-class science and cutting-edge research capabilities, our programs encourage discovery and commercialization of new technologies here in New Jersey.

NJCST helps researchers and entrepreneurs push forward the frontiers to create tomorrow's technology.



the Commission on Science and Technology encourages discovery

Stem Cell Research in New Jersey

The Commission on Science and Technology is working with the Governor's office and the universities to make the vision of stem cell research in New Jersey a reality. To highlight research already underway in New Jersey and encourage collaboration, the Commission in November 2004 hosted the first statewide scientific conference focused on stem cell research. Stem Cell Research in New Jersey:

An Inaugural Symposium showcased New Jersey as a hotbed of stem cell research, attracting more than 300 researchers, industry representatives and funders such as the National Institutes of Health and the Juvenile Diabetes Foundation.

New Jersey's Stem Cell Research Initiative will make New Jersey an international center for this exciting new field. New Jersey offers a unique combination of pharmaceutical infrastructure, biomedical research, university expertise – and the political will – to advance stem cell research in practical and profitable ways.



New Jersey's Stem Cell Research Initiative

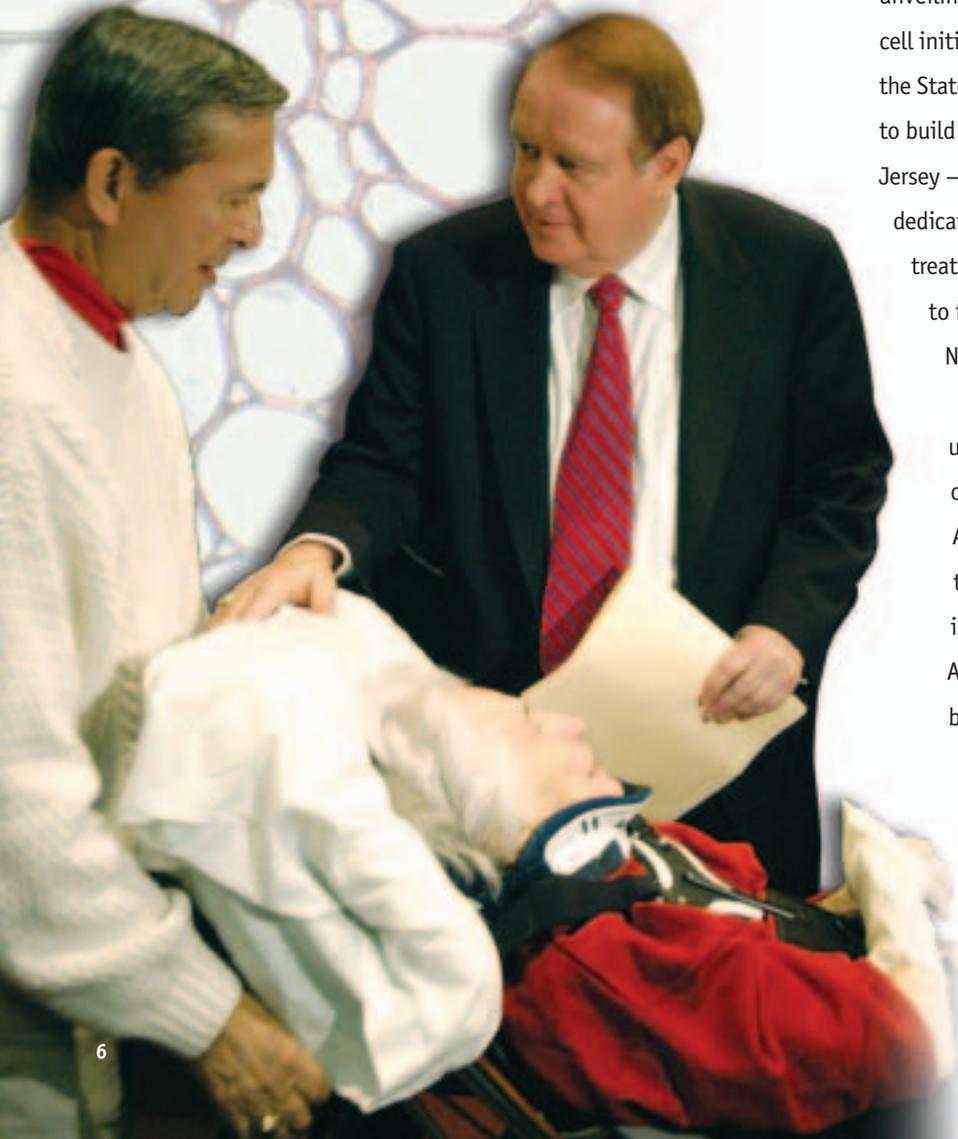
- \$150 million to build and equip the Stem Cell Institute of New Jersey — the nation's first state-funded institute dedicated to stem cell research and medical treatment
- \$230 million over seven years to finance stem cell research throughout New Jersey

For more than two years, Governor Richard Codey has been a champion of stem cell research and a catalyst for New Jersey's leadership in this promising area of medical research. His landmark legislation, introduced in September 2002, clearly stated New Jersey's intention to lead the nation in pursuing the promise of stem cell research, regardless of federal policies that may restrict medical research.

Governor Codey has made stem cell research a priority for his administration, unveiling a \$380 million stem cell initiative in his State of the State speech. The initiative includes \$150 million to build and equip the Stem Cell Institute of New Jersey — the nation's first state-funded institute dedicated to stem cell research and medical treatment — and \$230 million over seven years to finance stem cell research throughout New Jersey.

The promise of stem cell research gives us hope.

"The promise of stem cell research gives us hope," Governor Codey said. "Hope that one day we find cures for diseases like Alzheimer's, Parkinson's, and cancer. Hope that those left paralyzed by spinal cord injuries may some day lead normal lives again. And hope that families who pray for a cure are blessed with a miracle."



The Stem Cell Institute of New Jersey

The Stem Cell Institute of New Jersey was created during a public forum in May 2004 as a joint undertaking of Rutgers University and the University of Medicine and Dentistry of New Jersey. The forum attracted a standing-room-only audience including scientists, life sciences industry leaders and advocates whose families are affected by debilitating disorders and injuries.

Dr. Ira Black of the University of Medicine and Dentistry of New Jersey, and Dr. Wise Young, of the Keck Center at Rutgers University, are leading New Jersey's efforts. Dr. Black is serving as Founding Director of the Stem Cell Institute and Dr. Young is leading the international search for a director of the Institute.

Under their visionary stewardship, the Institute will promote the maturation of basic concepts into actual therapies that will help treat patients in the Institute's clinical facilities. The Stem Cell Institute of New Jersey will be the place scientists unlock the miracles of stem cells and use that knowledge to help those who are suffering.

Our Institute, bolstered by New Jersey's biotechnology and pharmaceutical industries, will play a unique role by encouraging both basic research and translational research leading to therapies for patients now suffering from devastating medical disorders.

The Stem Cell Institute of New Jersey will be the place scientists unlock the miracles of stem cells.

Stem Cell Institute Vision Statement

The Stem Cell Institute of New Jersey will attract the world's best researchers to partner with the state's renowned life sciences industry to unravel the mysteries of stem cells in order to develop cures for now-hopeless degenerative and neurological disorders.

The Stem Cell Institute of New Jersey embodies the curiosity of science, the courage of exploration and the caring of medical practice. In New Jersey, the public has joined the life sciences industry to pursue mutual goals that will benefit individuals and families throughout the world. **The Stem Cell Institute of New Jersey** will:

- Generate and support groundbreaking research that contributes to international understanding of stem cells and their potential
- Use the revolutionary products and principles of the new stem cell and regenerative biology to develop quality, innovative treatments for patients
- Strengthen collaborations among researchers, pharmaceutical and biotech industries to make new therapies available as quickly and safely as possible
- Educate a new generation of researchers and physicians in the emerging field of regenerative biology
- Accelerate commercialization of new therapies and new technologies related to stem cell research and regenerative medicine to the marketplace in New Jersey



A Medical Revolution



Ira Black, M.D., founding director of the Stem Cell Institute of New Jersey, is a clinical neurologist and neuroscientist whose groundbreaking stem cell research is opening new doors for treating a variety of medical disorders and diseases.

“The stem cell revolution represents an entirely new approach to medicine and disease,” Dr. Black said.

Dr. Black is professor and chair of the Department of Neurosciences and Cell Biology and director of the Stem Cell Research Center at the University of Medicine and Dentistry –Robert Wood Johnson Medical School.

Our dream is to get patients out of bed, out of wheelchairs to live productive lives.

His research team has converted adult bone marrow stem cells into nerve cells for transplantation to address a variety of neurologic disorders, such as Alzheimer’s disease, Parkinson’s disease and spinal injury. Dr. Black also recently published research using adult bone marrow stem cells that may foster new approaches to birth defects and developmental abnormalities.

“Our dream is to get patients out of bed, out of wheelchairs to live productive lives. We hope stem cells will get us there.”

A Source of Inspiration



Rutgers Professor Wise Young is recognized as one of the world's outstanding neuroscientists. He arrived at Rutgers in 1997 where he launched the W.M. Keck Center for Collaborative Neuroscience, and assembled a team of researchers who collaborate with more than 100 laboratories worldwide in the search for cures to spinal cord and brain injuries and disorders.

“Our goal is to move promising therapies, including those based on stem cells, from the laboratory into clinical trial as quickly possible,” Dr. Young said.

Paralysis caused by damage to the spinal cord was once thought to be a permanent and incurable condition. Today, the dream of

therapies that restore function and feeling is becoming a reality, and Young is leading the search for cures.

Looking ahead, Dr. Young states, “Stem cell research, an extremely important pursuit, holds tremendous promise for treating and curing a host of devastating diseases and disorders, including spinal cord injury, Alzheimer's and Parkinson's diseases.”

Our goal is to move promising therapies, including those based on stem cells, from the laboratory into clinical trial as quickly possible.

Nanotechnology

The biggest news in the high-tech economy of the future could be smaller than a living cell and more narrow than a human hair. Nanotechnology is the science of creating and building with materials about the size of a nanometer – one billionth of a meter. Just how small is that? Well, consider that the width of human hair is approximately 80,000 nanometers. A nanometer-sized particle is smaller than a living cell and can be seen only with the most powerful microscopes available today.

So why is something small such big news?

Nanoparticles are being used in a number of industries. Nanoscale materials are used in electronic, magnetic and optoelectronic, biomedical, pharmaceutical, cosmetic, energy and materials applications.

Today most computer hard drives contain giant magnetoresistance (GMR) heads that, through nano-thin layers of magnetic materials, allow for an order of magnitude increase in storage capacity. Other electronic applications include non-volatile magnetic memory, automotive sensors, landmine detectors and solid-state compasses.

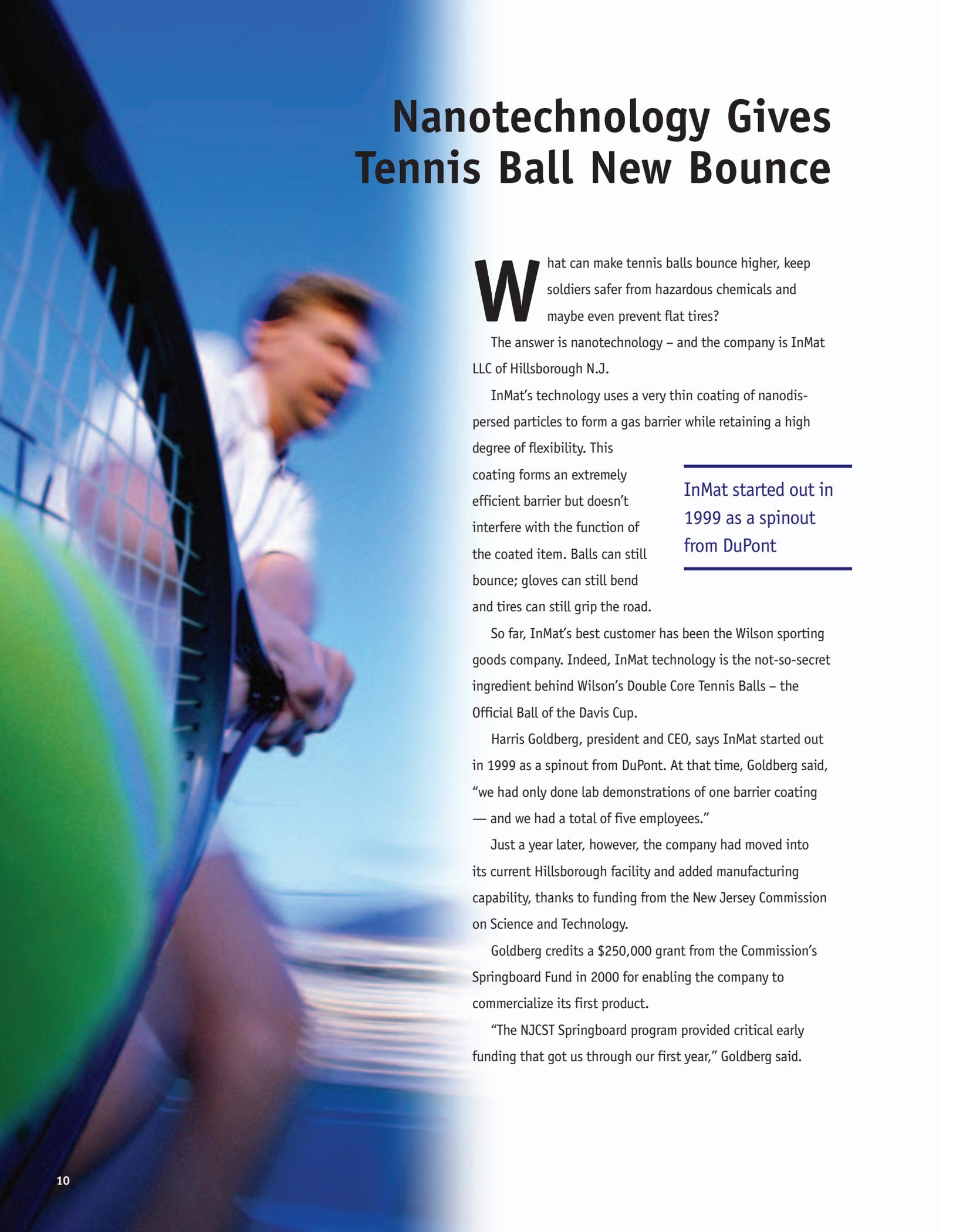
And this is only the beginning. In the not-too-distant future, look for solar cells in roofing tiles and siding that provide electricity for homes and facilities, meaning a cleaner environment and higher standard of living for parts of the world lacking efficient, reliable energy sources.

In New Jersey, nanotechnology holds great promise for our pharmaceutical and chemical industries. Anticipated commercial applications of nanotechnology include advanced drug delivery systems, including implantable devices that automatically administer drugs and sensor drug levels and medical diagnostic tools, such as cancer tagging mechanisms.

Ranking of U.S. states for economic development from Nanotechnology:

1. Massachusetts
2. California
3. Colorado
4. Virginia
5. New Mexico
6. New Jersey
7. Connecticut/Maryland (tie)
9. Illinois
10. New York

Source: Lux Research



Nanotechnology Gives Tennis Ball New Bounce

What can make tennis balls bounce higher, keep soldiers safer from hazardous chemicals and maybe even prevent flat tires?

The answer is nanotechnology – and the company is InMat LLC of Hillsborough N.J.

InMat's technology uses a very thin coating of nanodispersed particles to form a gas barrier while retaining a high degree of flexibility. This

coating forms an extremely efficient barrier but doesn't interfere with the function of the coated item. Balls can still bounce; gloves can still bend and tires can still grip the road.

InMat started out in 1999 as a spinout from DuPont

So far, InMat's best customer has been the Wilson sporting goods company. Indeed, InMat technology is the not-so-secret ingredient behind Wilson's Double Core Tennis Balls – the Official Ball of the Davis Cup.

Harris Goldberg, president and CEO, says InMat started out in 1999 as a spinout from DuPont. At that time, Goldberg said, "we had only done lab demonstrations of one barrier coating — and we had a total of five employees."

Just a year later, however, the company had moved into its current Hillsborough facility and added manufacturing capability, thanks to funding from the New Jersey Commission on Science and Technology.

Goldberg credits a \$250,000 grant from the Commission's Springboard Fund in 2000 for enabling the company to commercialize its first product.

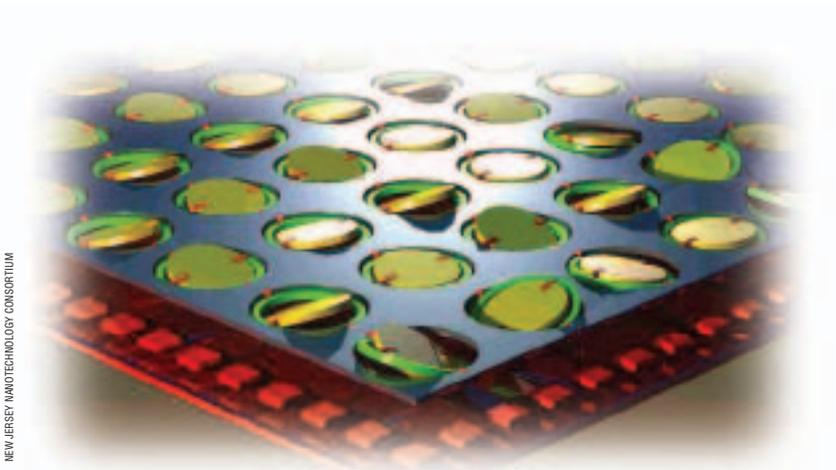
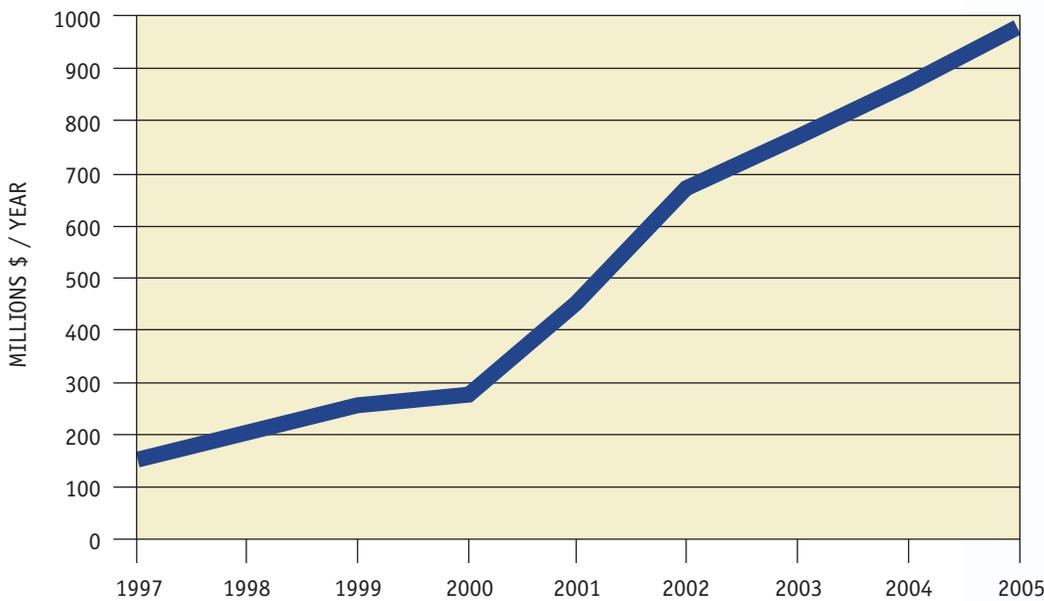
"The NJCST Springboard program provided critical early funding that got us through our first year," Goldberg said.

Our Role

The Commission is actively promoting and encouraging nanotechnology discoveries through the Greater Garden State Nanotechnology Alliance, an organization of researchers at university and industry labs. In addition, the Commission represents New Jersey as part of the new Mid-Atlantic Nanotechnology Alliance, comprised of New Jersey, Pennsylvania and Delaware. MANA is focused on building the nanotechnology industry in our region and is financed by the federal Economic Development Authority.

The Commission has established a Task Force on Nanotechnology and Advanced Materials. These leading entrepreneurs and researchers will advise the Commission on how to continue building collaborations in this field to benefit New Jersey entrepreneurs, create new business and provide new jobs.

Federal Investment in Nanotechnology



***Number of
Nanotechnology
patents awarded to
organizations in
New Jersey from
January 1999 to
May 2002: 172***

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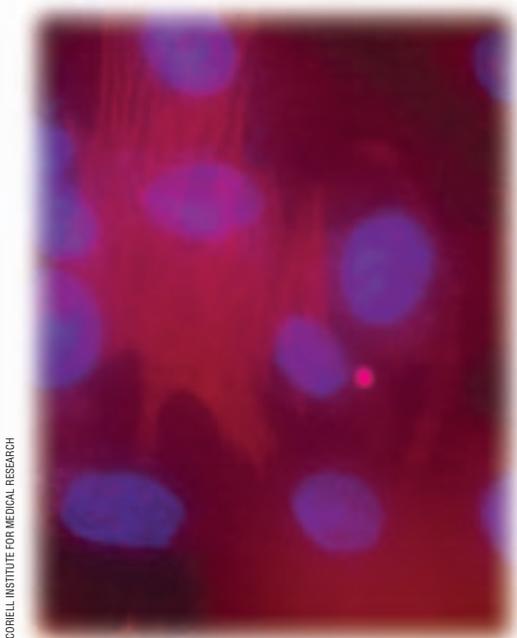
THE COMMISSION ON SCIENCE AND TECHNOLOGY

is dedicated to supporting New Jersey's technology entrepreneurs, the innovative thinkers creating new quality jobs and building tomorrow's economy.

The Commission has restructured our investments to improve the transfer of technology from the lab into the marketplace by expanding investments in early-stage companies and improving services to entrepreneurs. We are putting more funding into the hands of entrepreneurs to meet their needs and working with universities to enhance their technology transfer programs so ideas move more quickly into the marketplace.



the Commission on Science and Technology promotes entrepreneurs



CORIELL INSTITUTE FOR MEDICAL RESEARCH

CREATING ENTREPRENEURS

Commission programs enable researchers to bring their ideas to the marketplace.

- New Jersey Technology Fellowships – Placing New Jersey talent in New Jersey companies
- Commercializing University Intellectual Property – Bringing ideas to market

SUPPORTING ENTREPRENEURS

Commission funding helps promising technology firms succeed.

- Technology Incubators
- Small Business Innovation Research (SBIR) Assistance
- SBIR Bridge Grants

The Star-Ledger

IDEAS & EVENTS

Program pays to keep key grads in N.J.

BY BETH FITZGERALD
STAR-LEDGER STAFF

A state-funded program will support a few Ph.D. graduates who decide to launch their careers at New Jersey's small high-tech companies.

The New Jersey Commission on Science and Technology last week approved a \$500,000-a-year fund to pay the salaries of postdoctoral graduates who are ready to transfer their research from the university laboratory to the commercial world.

"One of our main jobs here is to build bridges between academia and industry," commission Chairman Donald Drakeman said.

Since \$500,000 is available for salaries, the number of potential candidates depends on the level of compensation which hasn't been set by the commission. For example, the program would support 10 postdocs each year if the salary is pegged at \$50,000. Only Ph.D. graduates of New Jersey universities are eligible, and the one-year grants will be renewable for a second year.

"At the end of a couple of years, this will be an extremely valuable employee for the company, and I think it's highly likely they will want to find funding themselves to encourage that employee to stay," said Drakeman, who is chief executive of the Princeton biotechnology firm Medarex. "The idea here is to encourage the most talented postdocs at our research universities to consider staying in the state and do an industry postdoc, and provide the acceleration of technology growth that comes from a strong research base and a vibrant high technology economy."

The state commission is working out a system to match high-tech firms with Ph.D. graduates. Drakeman said the students might be asked to post their ideas and their research on the commission's Web site for review by technology companies.

A strong advocate of the postdoc program is commission member Greg Olsen, the founder of Princeton-based Sensors Unlimited, which is developing night-vision camera technology for the military. "What better way is there to transfer technology from the university?" he said.

Olsen said his vice president of research and development, Chris Dries, came to Sensors Unlimited after earning his Ph.D. at Princeton University. "He came to us and commercialized the research he had done at Princeton. Now, Princeton gets royalties from it, and Chris has become one of the key people in our company."

Creating

New Jersey Technology Fellowships

Each year, several hundred graduates receive doctoral degrees in sciences and engineering from New Jersey universities. The Commission views these graduates as one of our greatest resources, bringing new ideas into the workplace and providing much-needed expertise to technology companies.

To help retain the talents of these post-doctoral graduates and to support New Jersey technology industries, the Commission in 2005 created the New Jersey Technology Fellowship Program providing funding for up to two years to selected post-doctoral graduates hired by New Jersey technology-based companies.

This new \$500,000 program will help create dozens of new technology jobs throughout the state in coming years and will spark numerous partnerships between industry and research universities.

Commercializing University Intellectual Property

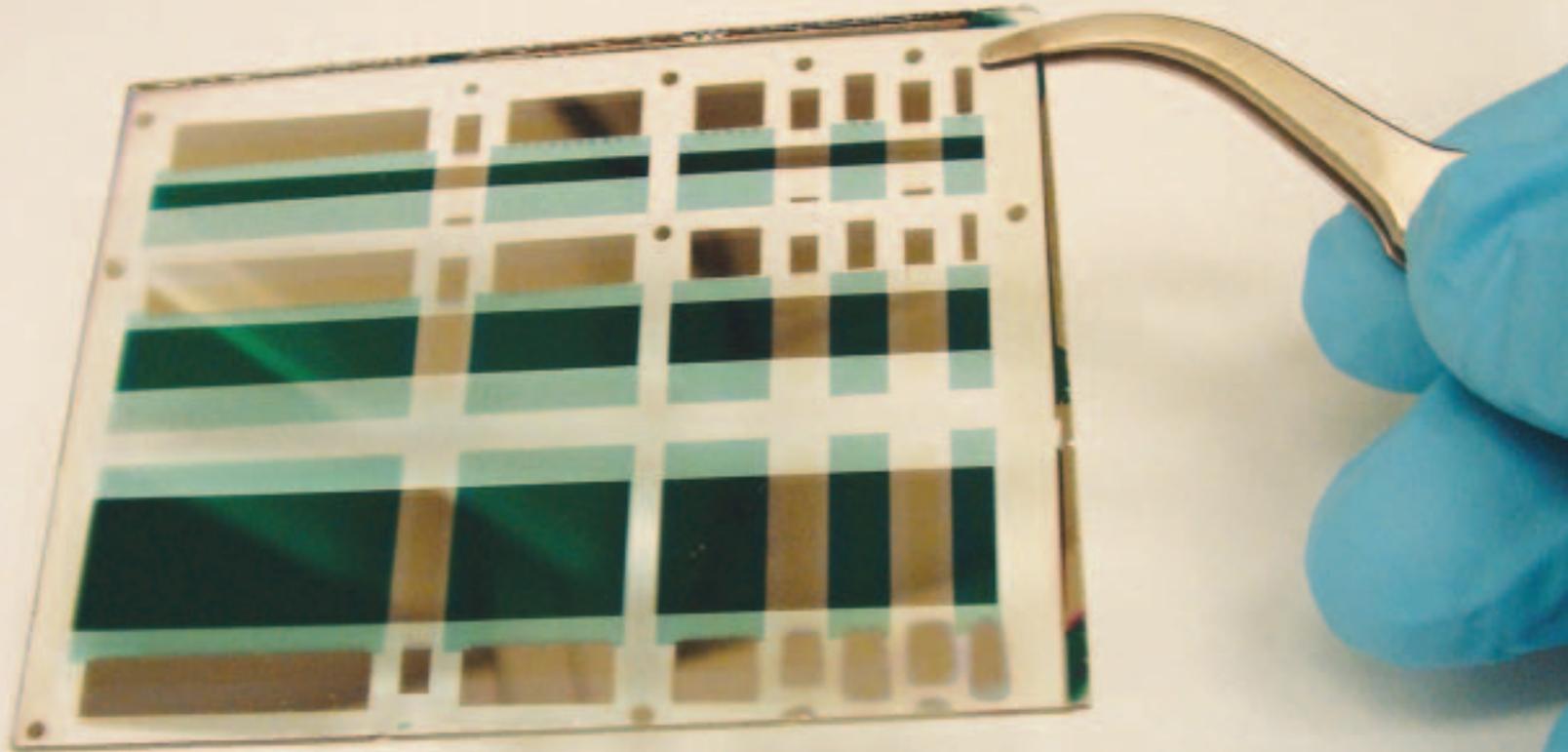
One of the most important roles the Commission plays is accelerating the transfer of new technology from labs to the marketplace. This task is central to the Commission's mission and critical to New Jersey's hopes of succeeding in the global marketplace of the 21st Century.

A review of the Commission's previous R&D Excellence Program showed that while the scientific caliber of research at New Jersey universities is superb, universities often have difficulty commercializing discoveries. Researchers too often fail to form the kinds of effective and productive partnerships with private industry needed to succeed.

The Commission responded to this concern by converting its traditional investments in university-based research to a program enabling New Jersey research universities to more effectively and efficiently promote business creation in New Jersey and licensing of intellectual property to New Jersey companies.

The goal of the University IP Program is creation of more businesses and more quality jobs in New Jersey. The Commission plans to monitor the university's progress, using benchmarks such as licenses and creation of spin-off companies.

Entrepreneurs



Building a Better Solar Cell

Thanks to financial support from the Commission on Science and Technology, Stephen Forrest and his team of Princeton University researchers is close to making organic solar cells a hot commercial product.

Global Photonic Energy, based in Ewing, N.J., is the company poised to commercialize Forrest's research, recently spotlighted in a December issue of Science magazine. Forrest praises the Commission for supporting the New Jersey Center for Photonics Optoelectrics and Materials (POEM) and for helping university researchers find commercial partners to move their ideas from the lab to the marketplace.

Such collaborations will help New Jersey keep talented high-tech researchers here and enable the state to remain a leader in the high-tech economy of the future, Forrest said.

"The secret to long-term success in high-tech is to forge strong university-industry partnerships," Forrest said. "If you do that then entrepreneurial energy just builds."

"The secret to long-term success in high-tech is to forge strong university-industry partnerships"

Creating En

Rutgers University Technology Commercialization Fund

As an example of the Commission's commitment to commercializing university research, the Commission awarded a \$325,000 grant to Rutgers University for a Technology Commercialization Fund. This grant charges Rutgers University with bringing promising technologies to the point of commercial interest by assisting both researchers and entrepreneurs trying to develop and market new technologies.

The Fund will finance validation and testing to confirm business plan development, creation of prototype devices, licensing potential, and management costs. In addition, existing businesses can seek assistance with generating data for federal grant applications, obtaining "proof-of-concept" research needed to attract private investments and conducting pilot testing. Fund administrators will strive to leverage the Commission's investment to attract private investments, as well as federal grants and contracts.

trepreneurs

Prescription for Success

TyRx Pharma is an example of what happens when innovative ideas move from the university lab to the marketplace – and why the Commission has launched a new University Intellectual Property Commercialization program. The five-year-old Monmouth Junction company designs and develops innovative medical devices and drug delivery products using technology invented by Joachim Kohn, a Rutgers University professor and scientific founder of two spin-off companies, TyRx and VectraMed.

Kohn, director of the Center for Biomaterials at Rutgers, has developed technology enabling cardiovascular stents to be coated with medicines that can be absorbed over time. The Center was established in 1996 with a \$3.5 million, five-year grant from the Commission.

Rutgers University now owns the polymer technology and has licensed it to TyRx, enabling the university to receive ongoing financial benefits. Rutgers University also holds an equity interest in TyRx.

Kohn's promising technology prompted Boston Scientific Corporation — a world leader in development, manufacture and marketing of medical devices — to make a sizeable new equity investment in TyRx Pharma.

Replicating this kind of profitable partnership – turning university discoveries into vibrant and growing businesses in New Jersey — is our goal at the Commission. Our new University IP Program provides targeted funding to enable New Jersey research universities to develop new products, create new businesses and generate new quality jobs in New Jersey.

Turning university
discoveries into vibrant
and growing businesses



Supporting

Technology Incubators

Technology incubators play a pivotal role in New Jersey's economic growth, nurturing the state's next generation of manufacturing and technology-based business. The Commission supports a widespread and diverse network of incubators designed to create successful new businesses which can stand on their own and generate high-technology jobs.

Our incubator programs help early-stage companies reduce the time it takes to move from lab to market. Supports are targeted to improving the success rate of high-growth ventures in Life Science, Telecommunications, Information Technology and Nanotechnology, Electronics and Materials.

Commission incubators house 150 start-up firms, 600 employees

Currently, NJCST incubators house approximately 150 start-up companies with 600 employees – the state's next generation of manufacturers and employers. Today, most incubators are at or near capacity, the number of graduating start-ups is increasing and incubator managers are finding new ways to focus on technology-based companies.

The Commission has doubled its investment in business incubators, spending \$1 million in FY 05 providing tenants with a variety of services, as well as networking and technical support. These grants are financing innovative programming and enhanced services tailored to specific tenant needs, rather than merely funding facility operating expenses.

NJCST Technology Incubator Network

NJIT Enterprise Development Centers I, II, III
Newark, 973 643-4063

The Technology Centre of New Jersey
North Brunswick, 732 729-0022

Picatinny Technology Innovation Center
Dover, 973 442-6400

Trenton Business & Technology Center
Trenton, 609 396-8801

The High Technology Small Business Incubator
Burlington County College, 609 894-9311

Rutgers-Camden High Tech Incubator
Camden, 856 225-6400

Business Development Incubator at New Jersey City University
Jersey City, 201 200-2313



Entrepreneurs

Cerionx, formerly Microplate Automation

This high-tech start-up company graduated from the Rutgers-Camden Business Incubator after receiving \$3.2 million in venture capital for its patented cleaning technology using atmospheric plasma.

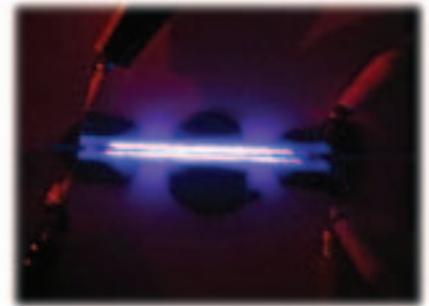
Cerionx uses a radio frequency power supply to pump energy into room air and create plasma – similar to boiling the air, said Paul Hensley, CEO. When laboratory pipets come in contact with the plasma, any material on the pipet is removed in less than 15 seconds.

Using plasma – the fourth state of matter – for such a practical use is revolutionary.

“We are bringing a product to market and inventing at the same time,” Hensley said.

Hensley credits the incubator with enabling Cerionx to survive long enough to become successful. Hensley thought he would run out of money before attracting venture funding. But moving to the incubator cut his monthly expenses to less than \$400.

“It’s fair to say that if we hadn’t been in the incubator, we probably wouldn’t have survived as a company,” Hensley said.



“If we hadn’t been in the incubator, we probably wouldn’t have survived.”

Noble Device Technologies

Starting at Bell Labs and moving on first to Lucent Technologies and then to Agere Systems, Clifford King and Conor Rafferty remained determined to develop a silicon-based digital infrared imaging technology.

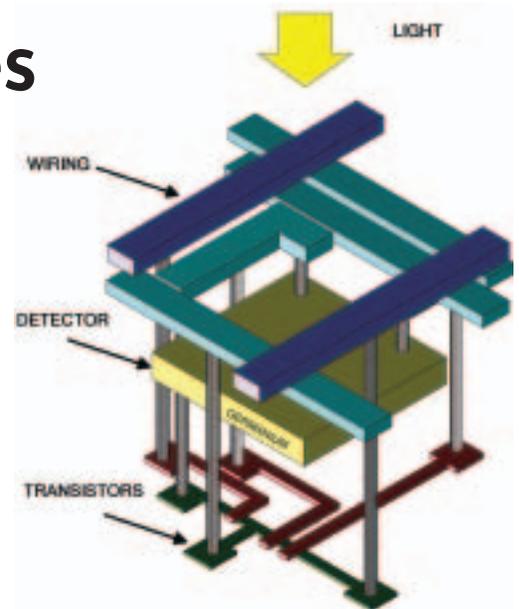
Today, two years after launching Noble Device Technologies from home offices, King and Rafferty have succeeded.

Noble Device’s patented process is truly unique in the industry. But without several state programs, King said, Noble Device may not have been a success story.

Moving into a business incubator on the New Jersey Institute of Technology campus provided easy, economical access to labs conforming to federal and state regulations, King said, adding “The facilities here are excellent.”

A \$250,000 grant from the state’s Springboard Fund also enabled the growing company to market its image sensors to medical and military customers.

“We feel very fortunate that New Jersey leaders value high technology businesses like us, and have developed programs like Springboard to ensure that we continue to grow,” King said.



Without several state programs, Noble Device may not have been a success story

Supporting

Small Business Innovation Research

The Commission recognizes that bringing more federal funding to technology companies is critical to increasing the number of quality, high-paying jobs for New Jersey residents. Commission members have targeted resources to help New Jersey entrepreneurs attract more funding through federal research grants and contracts.

Providing \$50,000 grants to sustain operations while awaiting federal funding.

In 2004, the Commission restructured its SBIR assistance to provide crucial operating funds to early-stage technology firms struggling to bridge the gap between their receipt of a federal Phase I SBIR grant for promising research and award of a Phase II Grant for commercialization. The Commission also funded an enhanced statewide training and grant assistance program and established a network of volunteer business experts to review SBIR applications.

The new \$700,000 Bridge Grant Program will provide qualified applicants with \$50,000 to sustain their operations while awaiting federal funding. Commission members in January awarded a first round of grants totaling \$150,000 to early-stage technology firms in South Brunswick, Newark and Mount Laurel. Two of the three recipients are tenants in Commission technology incubators.

Refocusing the SBIR program is expected to provide individualized support and resources to sustain firms through some of the financially difficult stages of commercialization. The Commission's goal is to increase the number and the amount of federal SBIR/STTR grants awarded to New Jersey companies.

NJIT Business Accelerator

To help New Jersey early-stage companies more successfully compete for federal research grants and contracts, the Commission in 2004 awarded the New Jersey Institute of Technology a \$100,000 grant to provide needed resources and expertise.

The New Jersey Business Acceleration Program focuses on building partnerships between university research teams and companies located in the business incubator to garner additional federal funding. NJIT has developed a resource center – ProposaLab@NJIT – providing assistance early in the grant development process. Services include competency mapping, developing databases and identifying federal funding options.

As of January 2005, the center has assisted more than 20 clients and helped submit three new federal proposals.

Entrepreneurs

SBIR BRIDGE GRANTS:

The Commission is providing \$50,000 grants to sustain technology companies awaiting larger federal grant awards.

First round recipients included:

New Jersey Microsystems • PharmaSeq

F&H Applied Science Associates

New Jersey Microsystems

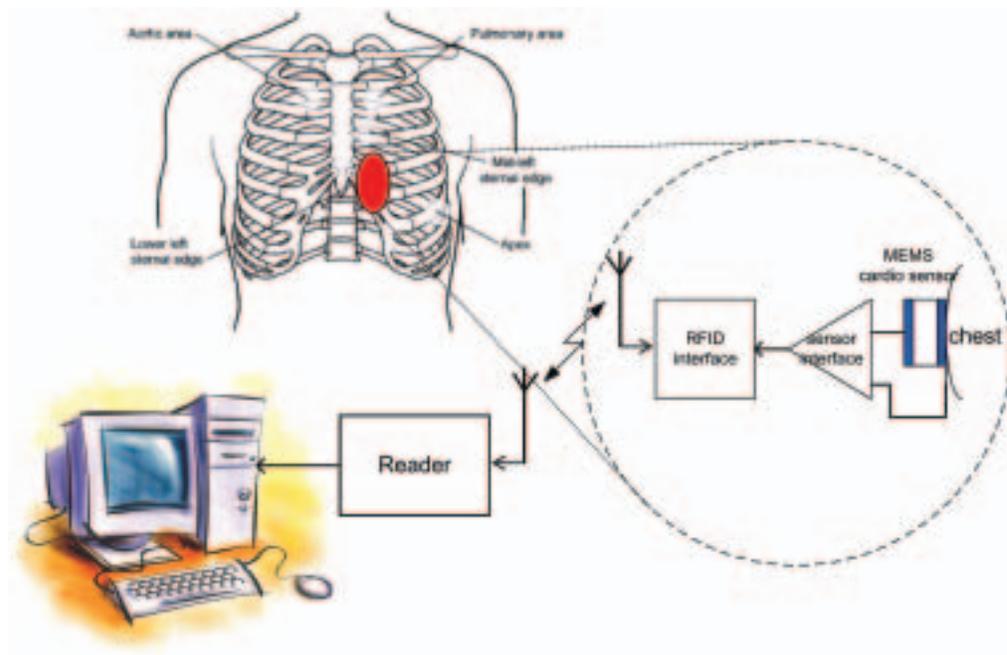
New Jersey Microsystems is working with NASA on a proposed system of small sensor tags, which include a cardiopulmonary sensor that measures heartbeat and breath rates continuously.

Astronauts can use a single wireless sensor worn as a Band-Aid like adhesive and data can be displayed locally or telemetered to earth stations for review by clinicians.

As chief technology officer, Dadi Setiadi is proud of his innovations. But he was dreading the inevitable funding gap between phases of the contract – until he successfully obtained one of the Commission’s new SBIR Bridge Grants.

Now, Setiadi is planning to use the \$50,000 to hire an employee who can help the start-up firm develop a prototype to attract ongoing private investment.

“It’s really helpful for a small company like us to have money between Phase I and Phase II,” Setiadi said. “Otherwise, you’re dead in the water.”



Supporting

PharmaSeq

Wlodek Mandrecki, president of PharmaSeq, said the Commission's new SBIR Bridge Grant program is just what his company – and the state – needs. PharmaSeq provides ultra-small electronic chips, microtransponders, and a fluids-based, bench-top reader as tools to perform a large number of biochemical measurements. The main goal is to build an instrument capable of reading the chips at two wavelengths. The technology enables high speed analysis, automation and customization for the user.

But Mandrecki said the months between contract phases would have been “difficult” without the SBIR Bridge Grant. “This comes at a difficult time,” Mandrecki said. “This will help us maintain the facility and keep people around that we need. This is a great program.”

F&H Applied Science Associates

Robert Fischl, president and COO CEO of F&H Applied Science Associates, knows that winning a research contract with a federal agency can be good news – and not so good news. “It takes forever dealing with the federal government,” Fischl said. “You’re talking about a real funding gap.”

The new SBIR Bridge Grant program enables early-stage companies like F&H to “bridge” the funding gap between phases of federal contract awards – a gap that can put an end to a promising technology. F&H, a tenant in the Commission's Burlington County technology incubator, is developing a high power amplifier that will augment the capabilities of advanced munitions for the US Air Force. But without the Bridge Grant, Fischl said, F&H would be forced to layoff employees, workers he needs to fulfill his federal Phase II contract. The Bridge Grant enables F&H to retain the staff it needs. “With this grant, we can succeed,” Fischl said.



Entrepreneurs

Innovation Zones: Research + Entrepreneur = Innovation

Innovation Zones were created in 2004 to help entrepreneurs partner with university researchers to create new technology businesses and new quality jobs in New Jersey.

Zones have been drawn surrounding public research universities in Newark, North/New Brunswick and Camden. Locating in the Zone qualifies companies for an array of popular economic incentive programs. The Commission works with the New Jersey Economic Development Authority to encourage business growth in the Zones. The Commission's role includes:

- Strengthening ties between New Jersey's technology industry and public research universities. (New Jersey Technology Fellowships)
- Promoting transfer of technology from research labs to commercialization of ideas in the Innovation Zones. (Commercializing University Intellectual Property Program)
- Using the Commission's technology business incubation facilities to provide effective support to early stage companies (increased funding for new services in FY 05)
- Developing programs to ensure that technology companies in the Innovation Zones have the support needed to successfully apply for federal grants (SBIR Training and Bridge Grant programs)
- Working to establish funding sources for early-stage "proof-of-concept" commercialization work at universities (Rutgers University Technology Commercialization Fund)

Springboard Fund

Launched in 1999, this recoverable grant program provides hard-to-get funding for start-up and early-stage technology companies in New Jersey. The Commission has contributed \$16 million – including \$1 million in FY 04 – to the loan program. Recently, the Commission entered an agreement that brings the financial expertise and backing of the New Jersey Economic Development Authority to the Springboard Fund.

New Jersey Manufacturing Extension Program

The New Jersey Manufacturing Extension Program (NJ MEP) helps established businesses maintain and grow manufacturing. In 2005, the Commission broadened NJ MEP's charter to include working with technology start-ups. NJ MEP is now assisting entrepreneurs in incubators throughout New Jersey to develop viable manufacturing and distribution strategies. By helping start-ups demonstrate that their products can be manufactured at margins and volumes anticipated, NJ MEP will help these companies become more attractive to investors.



INVIGORATE

INVIGORATE

Invigorate...

INVIGORATE

INVIGORATE

THE COMMISSION ON SCIENCE AND TECHNOLOGY is building on New Jersey's traditional strengths by responding quickly to the needs of our high-tech firms and by encouraging new collaborations between our universities and our industries. We are tracking New Jersey's technology-based business performance and exploring new and more effective ways to maintain New Jersey's leadership role in tomorrow's economy.



UNIVERSITY OF MEDICINE AND DENTISTRY OF NEW JERSEY

the Commission on Science and Technology supports industry

Clinical Trials

The extensive clinical research program at the University of Medicine and Dentistry of New Jersey is a valuable resource for New Jersey's life sciences industry.

To make these programs more accessible and more attractive to the pharmaceutical and biotech industries, the Commission in 2004 awarded a \$250,000 grant to UMDNJ for review of its clinical trials process. This review is focused on streamlining and enhancing the medical and contractual processes involved in clinical trials to more efficiently and effectively serve industry while maintaining maximum safety standards.

The project includes development of a website to provide access to processes and forms for the companies as well as to provide information to patients about clinical trials being carried out in New Jersey.

The Commission is playing a key role, facilitating discussions between life sciences industry representatives and the university. Our goal is a revamped clinical trials process that allows New Jersey-based firms to save time and money by conducting research at UMDNJ. Conducting clinical trials in New Jersey would enable our researchers and our patients to benefit.



UNIVERSITY OF MEDICINE AND DENTISTRY OF NEW JERSEY

Industry Review

Commission members believe the first step in improving cooperation and coordination among New Jersey’s technology-driven industries, the state’s universities and government agencies is to have a solid analytic baseline from which discussion and action can proceed.

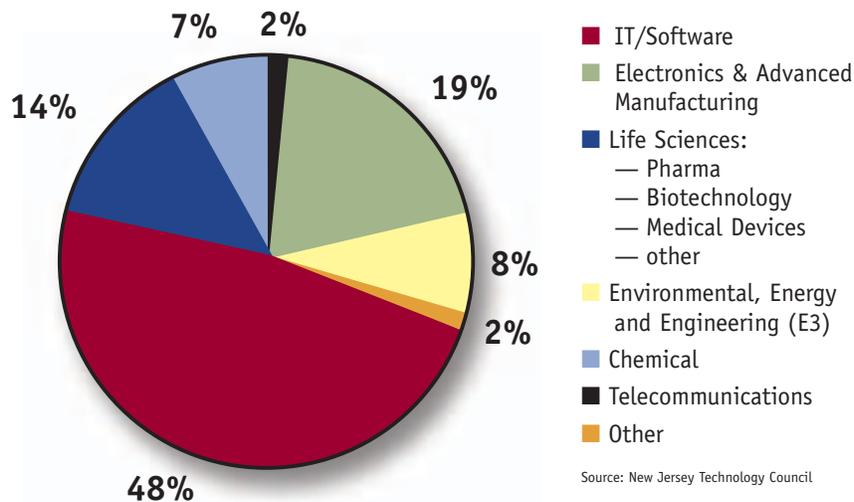
The Commission also is charged statutorily with reviewing the state of the biotech and high-tech sectors in New Jersey, including strengths, weaknesses, and emerging needs. The Commission is developing this review in partnership with statewide industry associations, including the New Jersey Technology Council and the Biotechnology Council of New Jersey. This partnership will guarantee the report’s findings are relevant and respond to industry’s information needs.

The Commission also is including industry representatives as members on several advisory task forces. Task force members will share business expertise and innovative thinking in order to inform the Commission on the effectiveness of our programs and the current challenges facing New Jersey’s technology and research-based industries. Current task forces are focused on Clinical Trials and Clinical Research, Nanotechnology and Advanced Materials, and Telecommunications and Information Technology.

The Commission on Science and Technology has played a key role as a catalyst and champion for the technology industries in New Jersey. Through the NJCST’s ongoing efforts, the state’s technology industries have clearly benefited.

— Maxine Ballen, president New Jersey Technology Council

NEW JERSEY’S TECHNOLOGY LANDSCAPE
Industry Sectors



BIO 2005

The Commission on Science and Technology is promoting New Jersey's flourishing biotechnology sector by providing sponsorship funding to make New Jersey a host of the BIO 2005 Annual International Convention to be held June 18-22, 2005 in Philadelphia.

The Biotechnology Industry Organization (BIO) is the national association of biotechnology companies. Their annual meeting this year, BIO 2005 will be the world's largest gathering of biotechnology executives. More than 20,000 life sciences professionals are expected to attend.

The Commission's sponsorship funding will enable New Jersey to be featured prominently throughout the convention as one of the strongest regions anywhere for developing new therapies, devices, diagnostic tests, vaccines... and biotech companies.

New Jersey...it's where life science lives.

Under the leadership of Donald Drakeman and Sherrie Preische, the Commission is an important partner in the growth and prosperity of New Jersey's expanding life sciences cluster.

— Debbie Hart, president
Biotechnology Council of New Jersey

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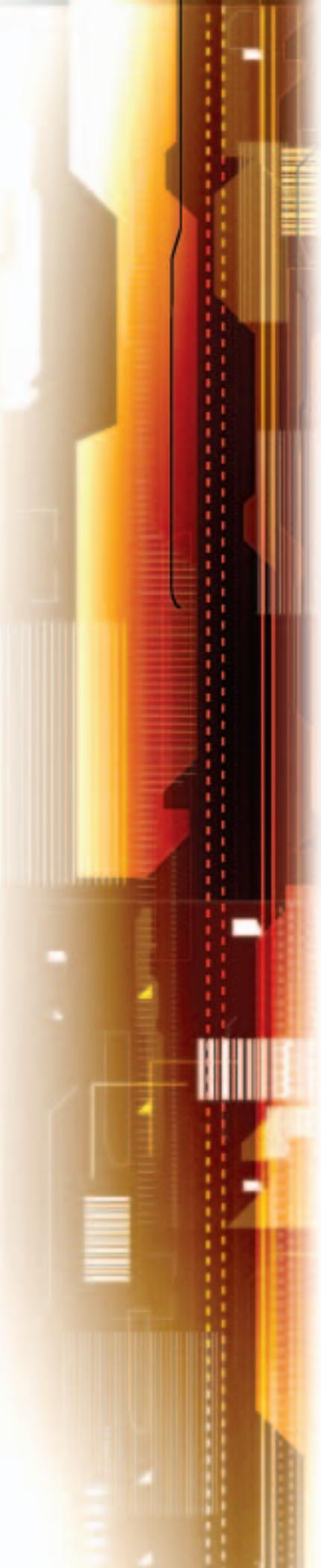
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New Jersey Microsystems

New Jersey Technology Council



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