



UNIVERSITY TECHNOLOGY TRANSFER
ANNUAL REPORT

STATE OF OHIO
FY 2004



Cover photo: microscopic close-up of nanomaterial

LETTER FROM THE CHAIRS

Welcome to the first Annual Report on University Technology Transfer in Ohio.

Ohio has a rich history and tradition of creativity and entrepreneurialism. From the Wright brothers' invention of the airplane to Dr. Sabin's development of the oral polio vaccine, Ohio inventors continue to impress the world with their genius. The Ohio research institutions, in close collaboration with the Ohio Board of Regents, the Ohio Department of Development and the Third Frontier Project, recognize the direct linkage between university research and economic development. As a result, each institution has created a technology transfer function to identify, protect and license new technologies. This report is a brief summary of activities and results for FY 2004.

The Technology Transfer Officers Council (TTOC), which includes the 19 public and private research institutions listed on page 17, was organized under the auspices of the Ohio Board of Regents just three years ago and has quickly developed into a strong, cohesive organization that is impacting Ohio's culture and economy. Our mission is to provide a forum for all of Ohio's academic, medical and government research institutions to share information, insight, best practices and experiences to improve the institutional technology transfer function with each organization, to enhance inter-institutional collaboration, and to elevate the role, visibility and proficiency of institutional technology transfer throughout the state.

Successful technology transfer programs ensure not only that we have access to next generation medicines, computers, medical devices, and materials, but also that these new technologies will provide improved products to assist people, society and the environment. This report shows that Ohio remains an important contributor to the innovation process. In FY 2004, TTOC member institutions* received 731 invention disclosures, filed 399 new patent applications, received 121 new patents, and executed 120 new license agreements bringing the cumulative total to 626 active licenses. In just five years since the passage of Senate Bill 286, which permitted university faculty to share in the commercialization of their research discoveries, Ohio already boasts over 81 new spin-off companies and the pace is accelerating. This report highlights some of those successes.

Universities are being called upon to be important players in economic development. As is highlighted on the back cover, "Universities bring ideas to life, but it is technology transfer that gives them wings and lets them fly." The Ohio Technology Transfer officers have combined their talent, expertise and resources to scour the campuses, searching for valuable new ideas that can be commercialized to create financial returns and better jobs for the state of Ohio.

Co-Chairs

Daniel Kory

Daniel Kory
The University of Toledo

Richard Kordal

Richard Kordal
University of Cincinnati



Daniel Kory



Richard Kordal

* Data does not include the Air Force Institute of Technology

TECHNOLOGY TRANSFER



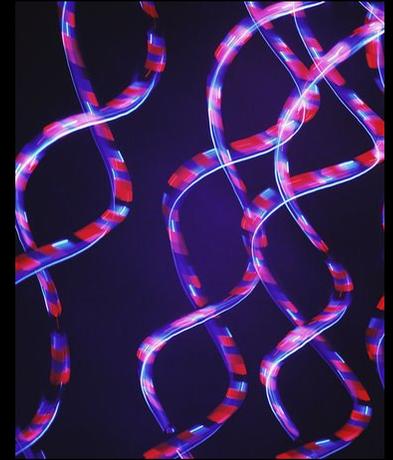
SENSORS & CONTROLS



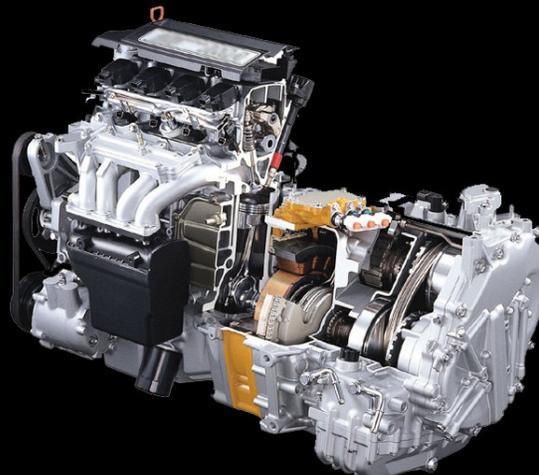
INFORMATION TECHNOLOGY



BIOSCIENCE



ADVANCED MATERIALS



POWER & PROPULSION

HIGHLIGHTS FROM FY 2004
Ohio already reaping benefits from Third Frontier Project
 Research expenditures totaled \$1.4 billion in 2004

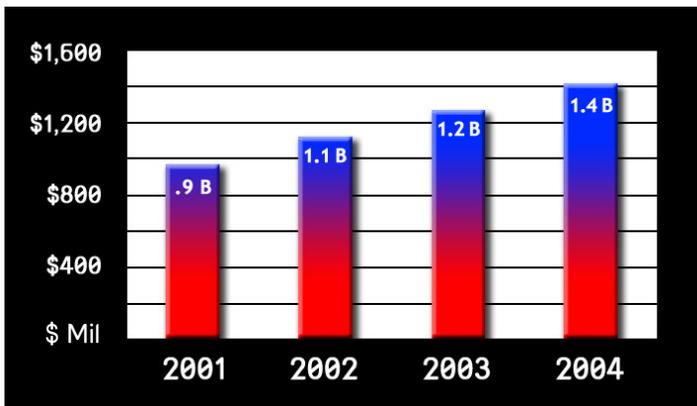


Figure 1
 Total Research Expenditures by Ohio Universities

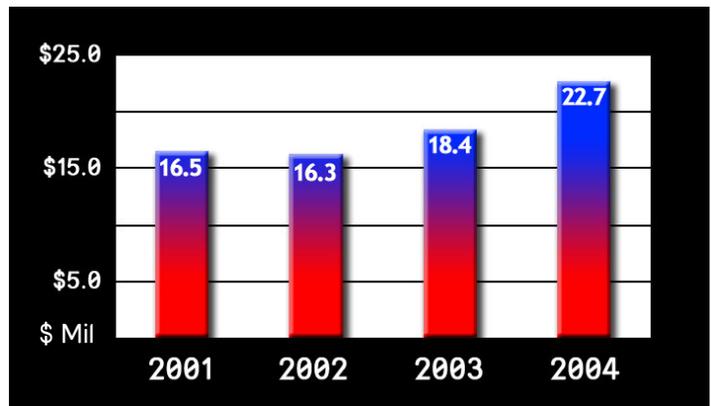


Figure 2
 License Income Received by Ohio Universities

The Ohio State University develops sensor that controls pollutants

Researchers at The Ohio State University are developing a sensor that can help control emissions from cars, power plants, and other combustion processes. The matchtip-sized device is a prototype for even smaller sensors that could one day enable new ways of controlling combustion. Several commercial companies are trying out the sensor for various applications. GE Reuter Stokes of Twinsburg, Ohio, will test the sensor array.

The Cleveland Clinic's BioGel Company: Just one of many seeking commercialization

Like the many other early stage Ohio companies created with the help of the Third Frontier Project since 2000, Ohio BioGel, founded earlier this year as a spin-off of The Cleveland Clinic, is seeking funding to commercialize its technology. Ohio BioGel has developed patent-pending hyaluronan-based hydrogels that mimic normal tissues such as cartilage and have a number of potential applications in plastic surgery, facial reconstruction, orthopedic repair, non-orthopedic tissue engineering, scar prevention, and drug delivery.

“We are committed to providing early stage capital to get research ideas to the market and launch new companies that will become large, successful employers of tomorrow,” said Gov. Bob Taft. “By creating the high-paying entrepreneurial and research jobs of the 21st century, the Third Frontier Project is reinventing the economy in Cleveland and all over Ohio.”

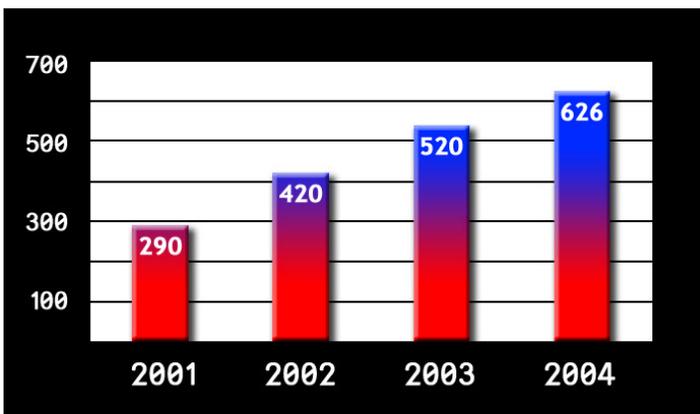


Figure 3
 Running Total of Active Licenses and Options Executed by Ohio Universities

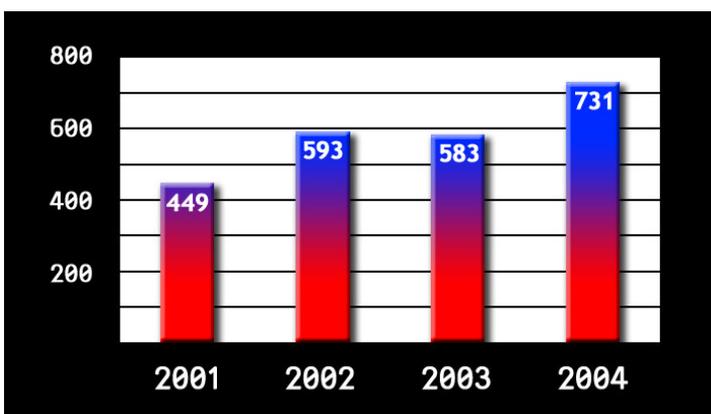


Figure 4
 Number of Invention Disclosures Received by Ohio Universities

Charts Credit: TTOC Annual Report
 Stories Credit: Ohio Dept. of Development

Nanotechnology developed at the University of Dayton Research Institute will reap benefits to Ohio; serves as model for Third Frontier success

Through an exclusive license agreement signed with Akron-based advanced-materials company NanoSpense LLC, nanotechnology developed at the University of Dayton Research Institute (UDRI) will soon go full scale -- and the economic benefit to Ohio is predicted to be significant.

The venture is also proof that Ohio's Third Frontier Project can spur research-based economic development, Lt. Gov. and Ohio Department of Development Director Bruce Johnson said at a signing event held on the University of Dayton campus.

The technology -- a unique method of uniformly distributing carbon nano-fibers throughout polymers -- will be used to produce composite materials that are lighter, stronger and more durable than other composite polymers, as well as being thermally and electrically conductive. It will have countless applications in aerospace, electronics, equipment manufacturing and automotive industries.

The technology was developed by researchers at UDRI under contract to the Air Force Research Laboratory. A Wright Capital Project Fund has been awarded to the Research Institute to scale up the technology.

NanoSpense president Arthur Fritts -- who created his company specifically to commercialize the technology created at UDRI -- said he predicts annual revenue of \$10 million within four years, growing to \$50 million in the not-too-distant future.

Johnson said the agreement demonstrates the potential for Third Frontier success. "Today we are seeing the Third Frontier Project become a viable reality through a collaborative partnership between the

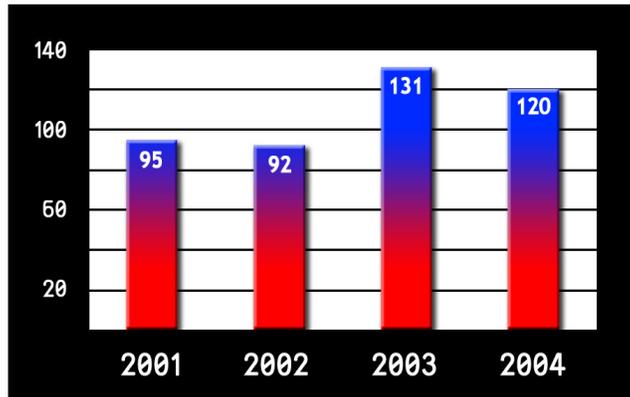


Figure 5
Total Number of Licenses Executed by Ohio Universities

University of Dayton and NanoSpense. We are observing an Ohio company and an Ohio university revolutionize a new, highly profitable technology that will be used within one of Ohio's most robust industry sectors -- the polymer industry.

"Over the past two years we have awarded nearly \$215 million in Third Frontier funding with the goal of commercializing Ohio's new technology products, and through projects like this one, we are just beginning to unlock Ohio's potential and realize these goals," Johnson added.

"And while the point of this program is to lay the foundation for tomorrow's economy, things are happening today in Dayton in the Third Frontier program."

Larrell Walters, director of technology partnerships for UD and the Research Institute, agreed.

"This license agreement represents a model for Third Frontier success in that it leverages federal dollars, state dollars and Ohio's intellectual resources to create jobs in Ohio."

*~ Larrell Walters, director
Technology Partnerships, UDRI*

"Because it utilizes one of the first commercially viable processes affordable enough to allow any company to take advantage of nanoenhanced polymers, this technology will provide a real boost to Ohio's economy through its \$49 billion polymer industry."

"The reception to this technology has been overwhelming," Walters added. Because this technology will be grown from the bottom up -- from research to scale-up to full production in Ohio -- we believe

this will create many jobs for Ohio, as well as bringing companies to the state. And it will greatly improve the competitive position of Ohio's manufacturing companies." Walters said NanoSpense will provide an additional boost to Ohio's economy by using nano-materials developed by Applied Sciences Inc. in Cedarville and manufacturing resources available at MRI in Beavercreek to produce its materials. Because of the availability of Ohio-based research and resources, NanoSpense products will be available this calendar year, he added.

"The development and commercialization of this technology exemplifies the strides the University of Dayton is making...to further position Dayton and Ohio as emerging leaders in the growing and competitive fields of nanotechnology education, research and development and commercialization."

*~ Mickey McCabe, director
UD Research Institute*

UD Story Credit: Pamela Gregg
University of Dayton Research Institute
300 College Park - Dayton, OH 45469



January 11, 2005

Larrell B. Walters
 Director Technology Partnerships
 University of Dayton Research Institute
 300 College Park
 Dayton, Ohio 45469-0102



Dear Larrell,

As our first year together wraps up and NanoSpense looks forward to 2005, I wanted to take this opportunity to thank the University of Dayton for the support and assistance you have given me since the signing of our license agreement last January.

If my experience at the University of Dayton (UD) is reflective of other Ohio universities, then Ohio is well positioned for sustained technology-based economic growth. Placing the technology with an Ohio-based startup company demonstrates your commitment to making Ohio a leader in the field of nanocomposites. I am extremely grateful for the flexibility in negotiation, for recognizing the value of start-up businesses to the state, and for giving me such substantial support over the past year to position the business in key market areas.

The Third Frontier equipment received by UD is critical to the scale-up of this technology. Through leadership at the University of Dayton Research Institute (UDRI) we are close to the installation and scale-up of manufacturing capability that will make a big difference in the composites world in the coming years. As you know, I am committed to demonstrating the wisdom of such state government investments by extensively utilizing the equipment to develop products that NanoSpense can offer for sale. We have business opportunities today that are waiting for the installation to be complete.

The publicity that you generated for NanoSpense has been exceptionally helpful. I really appreciate Ohio Department of Development Director Bruce Johnson's attendance at the licensing ceremony last January. Even more important is the continuing UD commitment to assist NanoSpense ongoing commercialization efforts. UD's direct contributions to NanoSpense's success, such as shared booth space at industry conferences, technical resource availability in support of product development and future technology enhancements, will all help to ensure NanoSpense is given every opportunity to succeed.

I firmly believe that the state of Ohio should be enjoying 10 significant new polymer-related startup companies per year. With efforts like those from UD, it can happen. Again, please pass my thanks on to everyone at UD and make sure they know our work has only begun!

Warm regards,

Arthur W. Fritts
 President

Case Western Reserve University licenses nanotechnology to Cleveland NanoCrystals

Case Western Reserve University has completed an agreement with Cleveland NanoCrystals,



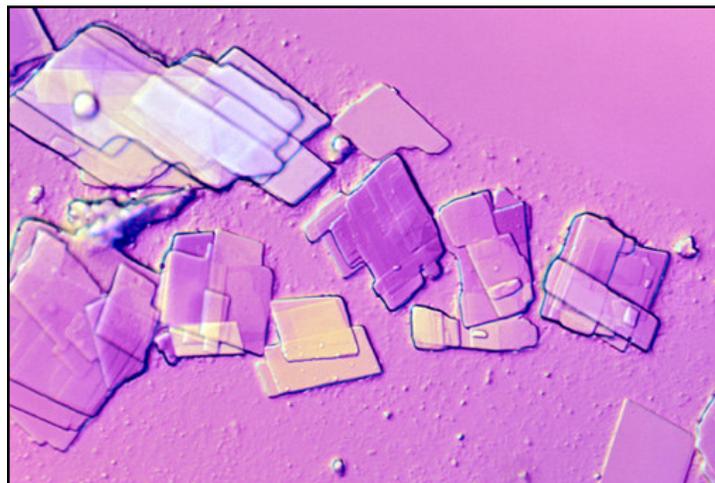
Inc. (CNC) to license a broad portfolio of nanomaterials technology with the potential to improve the performance of a variety of materials used across a wide range of industries.

The technology licensed from the university relates to a variety of nanocrystals based on titanium dioxide, copper sulfide, and other materials that can be used in applications ranging from medical imaging to paints and coatings to solar cells.

The technology was developed by Clemens Burda, assistant professor in Case's department of chemistry, and co-founder of CNC. The university received an undisclosed equity interest in the company as part of the licensing agreement.

Cleveland NanoCrystals began in June 2004, growing out of a meeting between Burda and entrepreneur Donna Richardson at Research ShowCASE 2004, the University's annual event highlighting research at the institution. CNC is a portfolio company of Case Technology Ventures (CTV), the university's internal pre-seed stage investment fund, and received an investment from the fund last summer.

"We are delighted to have secured exclusive rights to these exciting nanomaterials," said Donna Richardson, president and co-founder of CNC. "Case's expertise in nanotechnology makes it an excellent partner for Cleveland NanoCrystals, and its technology transfer office has been wonderful to work with. CNC now has the opportunity to establish a powerful intellectual property base allowing it to establish a substantial technology platform and achieve significant commercialization success."



"Starting a nanotechnology company has always been a dream of mine," said Burda. "There is much work ahead but I am looking forward to making Cleveland NanoCrystals a reality."

The company represents the third investment by CTV, Case's pre-seed venture fund, and the first nanotechnology company launched by the university since it began a new program of technology transfer in 2001. The company will use the capital to further refine its business plan and identify additional market opportunities.

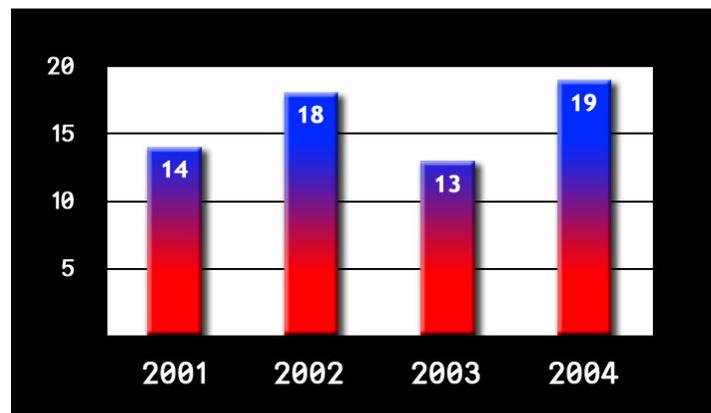
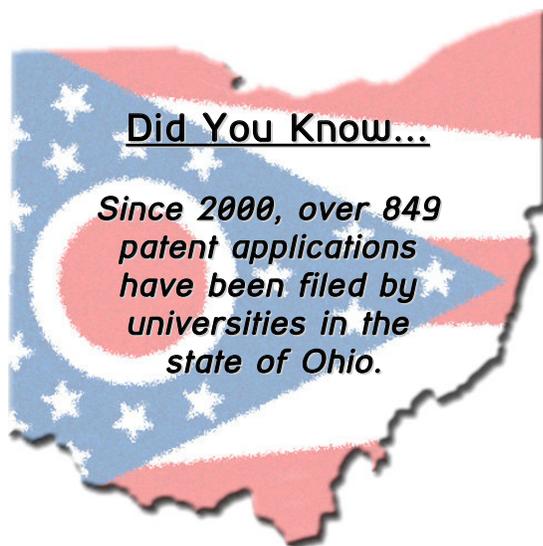


Figure 6
Licenses & Options Executed by Ohio Universities With Ohio Companies

Case Story Credit: Jeff Bendix
Case Western Reserve University
10900 Euclid Ave. - Cleveland, OH

Nanofiber bandages to treat slow-healing wounds

The University of Akron is developing nanofiber bandages to give more effective treatment to patients with slow-healing wounds, including U.S. troops serving in Iraq. Phase II clinical trials of the bandages are being conducted in Bucaramanga and Tolima, Colombia, on infections caused by the tropical disease leishmaniasis. The University of Akron and the Colombian Cardiovascular Foundation are collaborating on the trials.



Leishmaniasis, a parasitic disease transmitted by the bite of sand flies, has been a bane to U.S. troops in the Persian Gulf region. Found in 90 tropical and subtropical countries, the disease affects 12 million people.

The nanofiber technology — patented by University of Akron (UA) chemistry professor Dr. Daniel Smith and polymer science professor Dr. Darrell Reneker — releases nitric oxide in a controlled manner to kill the parasite and reduce inflammation, allowing the healing process to take effect by re-establishing the vascular flow of oxygen to the area.

Smith says the success of his research team’s clinical trials could lead to dramatically improved healing times for leishmaniasis.

“The disease’s traditional treatment is grueling, requiring a cocktail of harsh drugs delivered by intravenous therapy,” he explains. “Through the use of electro-spun nanofibers, wounds that took months or years to heal are now showing improvement in weeks.”

Marcos Lopez-Casillas, a UA chemistry graduate student who has worked on the project in Colombia, says the results seen so far have been impressive.

“In the first clinical trial, the patients on average were completely healed in about 12 days with no secondary effects,” Lopez-Casillas says. Smith adds that the technology also could help to treat a variety of other skin ailments.

“The benefits of this type of bandage would reach across all medical disciplines where the treatment of wounds is a concern,” he says.

The current clinical trials are scheduled for completion in January 2006, which will soon be followed by a massive Phase III trial to obtain Federal Drug Administration approval for use of the technology in the United States.

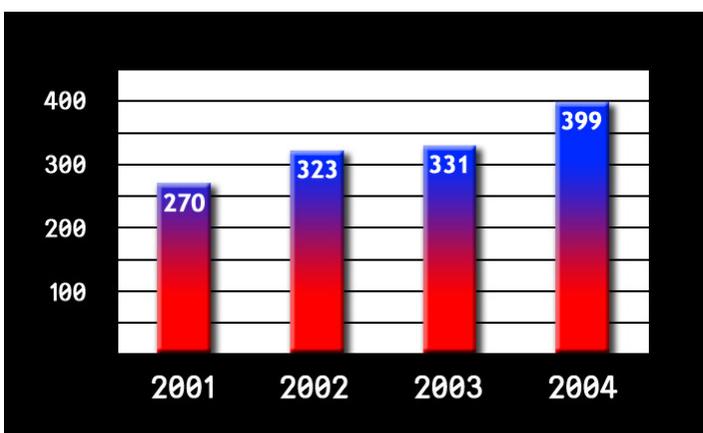


Figure 7
Total US Patents Filed by TTOC Members at Ohio Universities

UA Story Credit: Ken Torisky
University of Akron
302 Buchtel Mall - Akron, OH 44325

E-Prime Group licenses Cincinnati Children’s spine staple technology

A Cincinnati-based startup company will be taking to market a medical device developed at Cincinnati Children’s Research Foundation. In 2004, E-Prime Group, based in Blue Ash, Ohio, licensed a spine staple technology originally created and tested by Dr. Eric Wall, a pediatric orthopedic surgeon, and Dr. Donita Byliski-Astrow, an orthopedic researcher, both at Cincinnati Children’s. The spine staple technology will correct a curvature of the spine called scoliosis.



“The company will develop the technology and put it through clinical trials,” said Joe Reynolds, E-Prime’s vice president of business development.

E-Prime has created a new company called SpineForm, LLC around the spine staple technology. The spine staple will be known as the HemiBridge™ and Reynolds said the group is now preparing to meet with the Food and Drug Administration about the device.

“This is an extremely novel approach and it fulfills a significant gap in the treatment of scoliosis,” said Reynolds, who is also the managing partner of SpineForm, LLC.

The spine staples are designed to be inserted arthroscopically, eliminating the need for spine surgery, and thus reducing hospital time and overall medical costs.

“This is [a] breakthrough technology created here at Cincinnati Children’s and we are pleased that through our partnerships with E-Prime and SpineForm we are contributing to the growth of regional economic development,” Joseph D. Fondacaro, director of Intellectual Property and Venture Development for Cincinnati Children’s, said. The new surgical device is expected to hit the market in about four years.

University of Akron technology boosts clarity of liquid crystal projection televisions

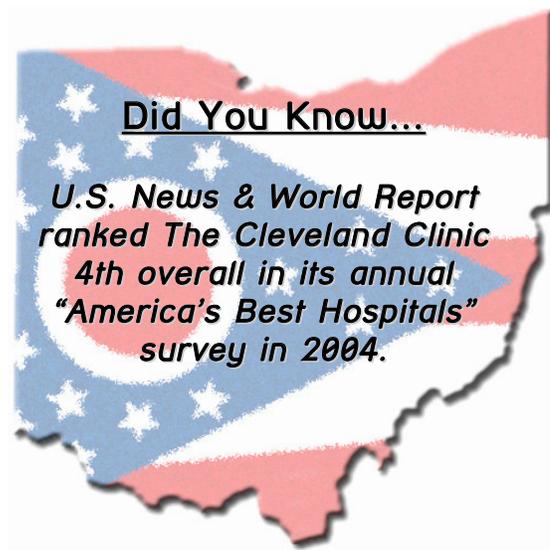
The future of liquid crystal display (LCD) projection television systems is getting clearer. The picture quality offered by the high-definition technology will soon be further improved, as Thousand Oaks, Calif.-based Rockwell Scientific Co. has signed a licensing agreement with The University of Akron (UA) for the use of C-plate technology. The technology, patented by Dr. Frank Harris and Dr. Stephen Cheng of the UA’s College of Polymer Science and Polymer Engineering, promises both brighter and clearer pictures for LCD projection TVs.



“A major advantage of LCD projection technology is the ability to display wider images, while still being more affordable than similar-sized plasma screens,” adds Joseph J. Cote Jr., president of Rockwell Scientific. “We are excited to be working with The University of Akron in exploring an area where liquid crystal technology shows significant promise.”

Through the licensing of the UA technology, the next generation of display technologies is being developed, Harris says. “Projection technology has many applications — from turning your home into a movie theater to someday bringing true reality TV where the image surrounds the viewer,” Harris explains.

“However, like other liquid crystal technologies, when viewed from wide angles the display images degrade and appear distorted. C-plate technology introduces an optical compensating element to the liquid crystal cell to reduce distortion and create a better view. Another important result will be a brighter picture for projection televisions.”



Cincinnati Children’s Story Credit: Dr. Joe Fondacaro
 Cincinnati Children’s Research Foundation
 3333 Burnet Ave. - Cincinnati, OH 45229
 UA Story Credit: Ken Torisky - University of Akron
 302 Buchtell Mall - Akron, OH 44325

Cincinnati Children's and University of Cincinnati Medical Center begin research collaboration on Creatine Transporter Deficiency

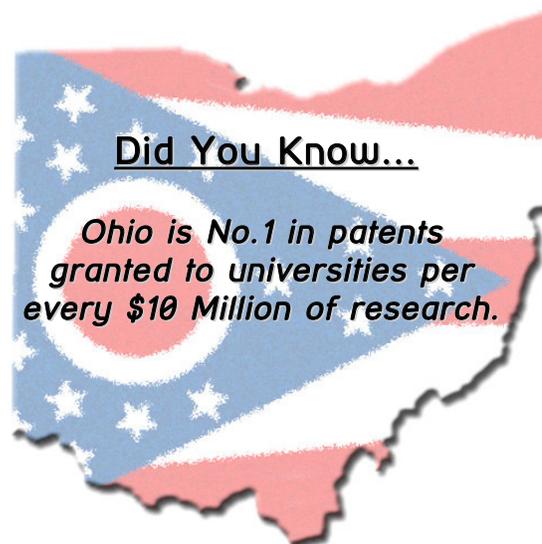
In a joint effort between the University of Cincinnati Medical Center and Cincinnati Children's Hospital Medical Center, researchers have discovered a defect on the X-chromosome housing the creatine transporter gene. This defect, named Creatine Transporter Deficiency, is expressed in humans through severe speech and language impairment, short attention span, low IQ, and the inability to follow commands.

The researchers at UC and Cincinnati Children's have formed a collaboration with the Massachusetts and California-based biotech company, The Avicena Group, Inc., to translate the discovery of creatine transporter deficiency into a method of treatment. "We have been investigating the role of the creatine kinase system in central nervous system disorders for many years," said Rima Kaddurah-Daouk, Ph.D, co-founder of The Avicena Group, Inc. "We believe that energy impairment compromises neuronal survival and cognitive functions."

In February 2003 the UC Medical Center and Cincinnati Children's began a clinical study to determine if creatine supplementation can increase brain creatine concentration and improve cognitive function among patients with creatine transporter deficiency. The goal of the treatment is to restore as much as possible of the normal creatine concentration in the central nervous system. Patients with creatine in their brains, determined by proton magnetic resonance spectroscopy, will be treated with high quality, ultra-pure creatine supplements provided by The Avicena Group, Inc. in increasing dosages for several six-week periods. Magnetic resonance spectroscopy will be repeated at the end of each six-week period. If the test shows a significant increase in creatine concentration, the study will be ended and the subjects will be offered to continue the treatment at their current dose of creatine with clinical follow-up in the neurology clinic.

"Our clinical research focuses on regulating cellular energy," said Dr. Belinda Tsao-Nivaggioli, chief operating officer at The Avicena Group, Inc. "Neurology is a major area of development for us, and we are delighted to be working with UC and Cincinnati Children's to identify an effective treatment to overcome this genetic disorder."

The collaboration with The Avicena Group, Inc. further emphasizes UC and Cincinnati Children's efforts to translate basic research into commercial products that benefit the public. "Patent protection is currently being sought for the technology, and The Avicena Group, Inc. subsequently licensed the intellectual property under a joint agreement with UC and Children's Hospital Research Foundation (CHRF)," said Richard Kordal, Ph.D, director, Intellectual Property Office, UC. "The license agreement is complemented by a collaborative sponsored research agreement program designed to investigate the extent to which this defect is involved in cognitive impairment in males, and to identify diagnostic and treatment methods and therapeutics."



"The joint research effort with Avicena is an excellent example of the benefits that can accrue when industry and academia work together collaboratively to translate basic biomedical research findings into therapeutics to fight diseases."

*~ Richard Kordal, Ph.D, director,
Intellectual Property Office,
University of Cincinnati*



"The research project and subsequent license agreement with

The Avicena Group, Inc. demonstrates that not only can our two research institutions work together collaboratively, but also cooperate and partner together with industry. We are very pleased to be part of these relationships."

*~ Joe Fondacaro, Ph.D, director
of Intellectual Property and
Venture Development at CHRF*



Story Credit: Richard Kordal, Ph.D
University of Cincinnati -- P.O. Box 670829
Cincinnati, OH 45267-0829

Bowling Green State University offers incentive for creation of local jobs

Bowling Green State University (BGSU) has licensed a proprietary hybrid diesel/electric (HBD) propulsion system for use in small transit buses offered for sale nationwide and in Canada. To encourage local business development and job creation, the university also has offered to forego 25 percent of its licensing fee if the systems are manufactured in Bowling Green.



The licensed HBD system increases fuel mileage in vehicles that make frequent stops and starts by recovering energy normally lost during braking, storing it, and then using that energy to electrically assist acceleration. The result is a more environmentally friendly vehicle that uses less fossil fuel and emits less pollution. Preliminary testing has shown fuel savings of up to 30 percent on a stop-and-go route, with a corresponding reduction in volume of pollutants.

An agreement approved by the BGSU Board of Trustees ensures that the institute's vision is on the path to potential global commercial application. It marks the first time BGSU has licensed patented and other propriety technology developed for potential commercial use.

"This agreement is good for BGSU and it is good for the City of Bowling Green. We are taking the long view and offering an incentive to bring new manufacturing jobs to Bowling Green while at the same time providing advanced academic opportunities for our students. The manufacturing proximity to the institute and the College of Technology will promote ongoing collaboration," said Dr. Sidney A. Ribeau, BGSU president.

The agreement licenses the patented Hybrid Booster Drive (HBD) technology to Goshen Coach of Elkhart, Ind., a leading manufacturer of mid-sized commercial buses and a subsidiary of the VSV Group Inc. in Cleveland. Goshen will test the diesel/electric hybrid system on its EURO Shuttle to determine commercial viability.

The HBD is ideally suited for buses and shuttles because it recovers energy from the deceleration process and applies it to the acceleration process - the engine's least efficient point. The technology is also capable of reducing brake wear in such vehicles by acting as a brake retardant during stops.

"Our hybrid system has a niche for stop-and-go vehicles like shuttle buses and delivery trucks," said Barry Piersol, director of the institute. During the first stage of the agreement, BGSU and Goshen will work jointly on an economic viability model for commercializing the HBD system.

In the second stage, Goshen will manufacture five prototype, HBD-equipped shuttles. The U.S. Department of Transportation and Federal Trade Administration have already approved the sale of the first five prototype buses.

For final approval, the vehicles will be tested and evaluated through the Federal Transit Administration's testing center in Altoona, Pa. Once all of the testing data and marketing research is evaluated to determine the project's continued viability, the project will go into the third stage-production.

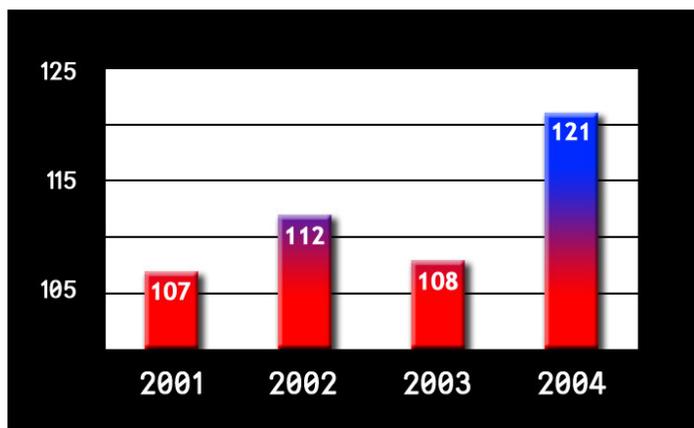
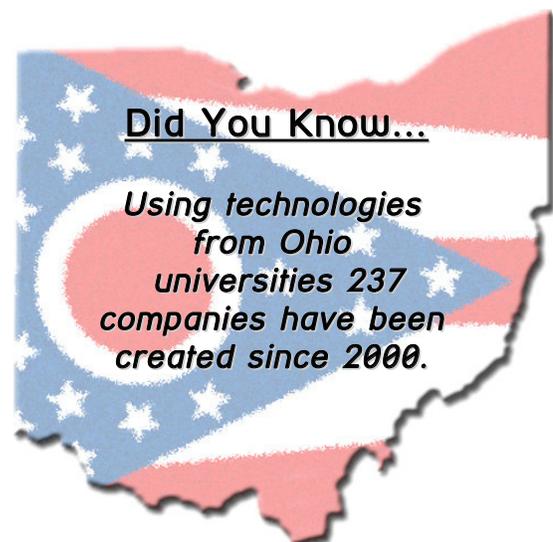


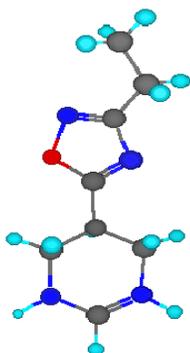
Figure 8
Total US Patents Issued to Ohio Universities



BGSU Story Credit: Scott Borgelt - BGSU
1600 E. Wooster St. - Bowling Green, OH 43403

University of Toledo licensee takes steps towards treating Alzheimer's disease

The University of Toledo licensed a portfolio now consisting of nine U.S. patents and a number of foreign equivalents to Cognitive Pharmaceuticals, Ltd., a spin-off from their College of Pharmacy. The technology platform consists of selective muscarinic receptor agents from a number of different chemical classes. The therapeutic benefits of the compounds arise from activating or blocking one or more of the five muscarinic receptor subtypes in the brain.



Cognitive is developing its lead compound, CDD-0102 for the treatment of Alzheimer's disease. The disease affects 4 million Americans and costs \$100 billion a year for treatment. None of the approved treatments addresses the underlying causes of the disease.

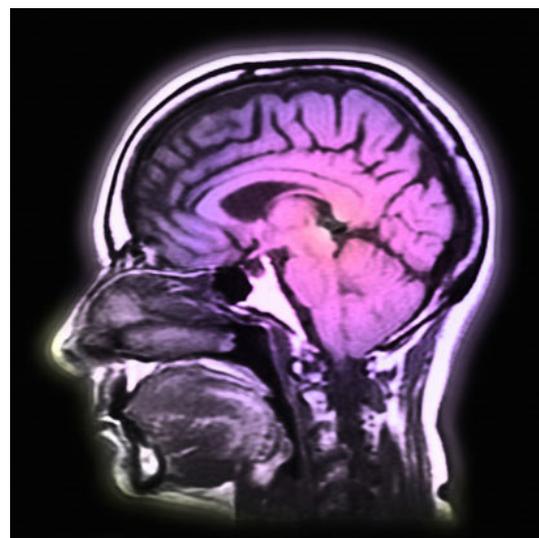
CDD-0102, selectively activates M1 muscarinic receptors that are involved in learning, memory and cognition, in the brain. Regarding the technology, Wayne Hoss, Cognitive's Interim CEO said, "We have a unique approach in which activation of M1 receptors leads to multiple beneficial effects through a number of biochemical pathways. There is a real chance that CDD-0102 will be able to treat both the symptoms and underlying pathology of the disease."

Through activation of M1 receptors, CDD-0102 improves memory in an animal model of Alzheimer's disease, activates an enzyme that reduces the amount of toxic A-beta protein formation and protects nerve cells from programmed cell death.

Cognitive is proceeding with the pre-clinical development of CDD-0102 with support from a Phase II Small Business Innovative Research (SBIR) grant from The National Institute on Aging (NIA), which is part of the National Institutes of Health. Additional funds will be required to complete pre-clinical development and file an Investigation New Drug application with the Federal Drug Administration.

The Alzheimer's product has shown negative results in tests for toxicity, including tests for genetic toxicity and a preliminary test for cardiovascular toxicity. Additional testing will be conducted in partnership with the NIA and SRI International in Menlo Park, CA, as well as other organizations.

A second product, CDD-0304 is being developed for the treatment of cognitive deficits in schizophrenia. A Phase I SBIR grant from the National Institute on Mental Health supports this work.



Did You Know...

The University of Toledo has one of the top two thin film photovoltaic research programs and one of the top two photoelectrochemical (PV-H₂) research programs in the US.

The University of Toledo College of Pharmacy has potential for creating additional spin-off companies through its Center for Drug Design and Development, as well as through individual faculty efforts.

Recently, the largest single licensing payment to the University of Toledo was received based on technology that was developed in the college for gastro-intestinal reflux disease.

Kent State University honors inventors and promotes entrepreneurship



Kent State University's Office of Technology Transfer and Economic Development recognized 72 inventors, including faculty members, administrators and students, who hold U.S. patents or copyrights or have patents pending. The February 2004 recognition ceremony began with the Entrepreneurial Speakers Series inaugural lecture, "New Ideas for Entrepreneurship in Northeast Ohio," by Ray Leach, founding chief executive of JumpStart Inc. "JumpStart Inc. provides investment funding to meet the critical need for very early stage capital for Northeast Ohio entrepreneurs, the services of seasoned 'entrepreneurs in residence' and other programs to assist the region's most promising startup companies," says Gregory Wilson, associate vice president for technology transfer and economic development.

"I am very proud of the many ways in which Kent State researchers bring their valuable creative and intellectual capital to the private sector and, ultimately, to the public good," says Kent State President Carol Cartwright. She adds, "Our commitment to incubating ideas and transferring our intellectual property has never been stronger." According to a study by the Association of University Technology Managers, Kent State is ranked fourth in the nation for the number of startup companies developed per \$10 million in research spending. Kent State inventors hold more than 100 U.S. patents or copyrights in areas ranging from advanced materials to bioscience to information technologies.



PrognostiX develops tests and treatments for cardiovascular and other diseases



PrognostiX, a Cleveland Clinic spin-off, received a \$6 million investment from ExOxEmis, of Little Rock, Arkansas. PrognostiX will develop, validate and commercialize groundbreaking diagnostic tests and personalized treatment for patients at risk for cardiovascular disease, asthma and other inflammatory diseases. Development of PrognostiX is based upon the work of Stanley Hazen, M.D., Ph.D, Section Head of the Section of Preventative Cardiology and Cardiac Rehabilitation at the Clinic. The lead product for PrognostiX is a blood test designed to identify patients at risk of having a heart attack by measuring the level of myeloperoxidase (MPO) found in the bloodstream. MPO is an enzyme found in disease-fighting white blood cells. Dr. Hazen and a group of researchers at the Clinic determined that an elevated level of MPO could signal a person's risk for having heart disease or a heart attack. A patient's risk for needing bypass surgery or angioplasty and even an increased risk for cardiac death within six months of presenting to the emergency room with chest pain could also be determined by the level of MPO. PrognostiX is on the campus of the Cleveland Clinic.

The Ohio State University Licenses Two Groundbreaking Technologies

Microfluidics: BioLOC, LLC, a newly-formed biotechnology device company, will apply innovative microfluidic technologies developed at OSU to a new generation of "lab-on-a-chip" products. The technologies to be licensed were developed at OSU's Chemical and Biomolecular Engineering Department. They include a novel chip for DNA separation and a "CD-ELISA" – a CD-based microfluidics platform that will automate the execution of enzyme-linked immunosorbent assays for complex organic molecules. BioLOC's initial capitalization will come from the transfer of a 2003 Ohio Third Frontier Action Fund grant of \$975,881 awarded to Bioprocessing Innovative Company, BioLOC's parent company.



Organic LED's: Professor Arthur J. Epstein and students invented an organic light emitting diode (OLED) device technology, also referred to as Symmetrically Configured A/c Light Emitting (SCALE) in the 1990's. OLED technology is positioned to be the next disruptive technology in the display industry. OSU's patented OLED technology has been licensed to BTG, which is currently funding technology development to demonstrate the commercial benefits of the SCALE technology for prospective OLED device manufacturers.

KSU Story Credit: Gregory Wilson - Kent State University
P.O. Box 5190 - Kent, OH 44242
(330) 672-0704
OSU Stories Credit: William Vaughan - The Ohio State University
1960 Kenny Road - Columbus, OH 43210
(614) 292-8258

Volcano Corp. uses licensed Cleveland Clinic technology to succeed

THE CLEVELAND CLINIC

California-based Volcano Corporation., which makes ultrasound catheters used to detect artery clogging plaque, will open a Research and Technology office in

Cleveland in early 2005. A key component of Volcano's technology is licensed from the Cleveland Clinic and is based on the work of Dr. D. Geoffrey Vince. The venture-backed company was founded in 2001 and had its roots in optical imaging of human tissues. In 2002, after licensing a key technology from the Cleveland Clinic, it re-invented itself as an IVUS (Intravascular Ultrasound) company. In July 2003, it acquired the assets of the IVUS business from Jomed Inc., and grew from a dozen employees to over 400 employees at its offices in Rancho Cordova, Calif., Atlanta, Brussels and Tokyo. The new Technology Center will be located on the Cleveland Clinic campus and will initially house four employees.

Central State University students develop battery-powered push mower



A team of four senior Central State University's Manufacturing Engineering students, under the guidance of Dr. William Grissom, secured a \$7,000 grant from the National Collegiate Inventors and Innovators Alliance (NCIIA) to assist a tenant of the National Environmental Technology Incubator. Global Neighbor, a developer of an environmentally friendly lawnmower headed by Mr. John Jackson, provided his patent protected "Croft Shearing System" to the students to satisfy their senior thesis requirement by developing the "manual push" version of the Global Neighbor battery powered mower. The students spent a year designing, developing, testing and fabricating their manual mower. The results were overwhelming with a final product that appears to have created two pieces of intellectual property. If confirmed, these will be the first two patents held by Central State University. The university expected to license the Intellectual Property to Global Neighbor.

Wright State University forum acts as a catalyst for technology transfer development



Wright State University's (WSU) 2nd annual "From Invention to Market" forum in 2004 enables regional economic development through proactive technology marketing. The event combines a showcase of selected inventions available for licensing with informational sessions addressing a particular aspect of technology partnerships.

The forum also provides a unique opportunity to interact with inventors and learn more about the research programs.

WSU continues to energize Ohio's technology transfer project and holds its 3rd annual "From Invention to Market" forum in 2005.

"Events like WSU's 'From Invention to Market' underscore our [Third Frontier Project] efforts, providing a unique forum for government, the business community, and higher education to engage in collaborative scientific discovery and shape the future of Ohio."

~ Bruce Johnson, Lt. Governor, State of Ohio
Director, Ohio Department of Development



Wright State University's "From Invention to Market 2004" forum

Cleveland Clinic Story Credit: Susan Bernat
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CSU Story Credit: Jerome T. Mahone
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Wright State University Credit: Isabelle Gorrillot
WSU 3640 Colonel Glenn HWY - Dayton, OH 45435
(937) 775-2651

Cleveland State University expands IP portfolio

Cleveland State University's "Center for Advanced Control's Technology's" motto is "From Theory to Practice." In more ways than one, the Center fulfills its mission through interdisciplinary research in control technologies.



Cleveland State University

The Center has developed a portfolio of Intellectual Property in Instruments, Controls, and Electronics to significantly enhance the products and services of business and government partners. The Center also maintains a hands-on learning environment in which graduate and undergraduate engineering students develop and apply these technologies to solve real world problems.

Ohio's Third Frontier Network fuels commercialization, connecting schools with companies

On Nov. 30, 2004 Ohio officially launched the Third Frontier Network (TFN), connecting Ohio's universities and colleges with each other, their business partners, Ohio's federal labs, hospitals and K-12 schools.

The new network's massive increase in capacity will provide revolutionary new ways for conducting research in such areas as fuel-cell technology with partners Case Western Reserve University and Stark State College, cancer treatment at the Cleveland Clinic, drug design at The Ohio State University, genetic research at the Cincinnati Genome Research Institute, homeland security at Owens Community College and a host of other applications.



"Ohio's future is in the hands of those who are able to take a great idea, develop it and produce a functional product that can be manufactured and sold throughout the world...those organizations...will unlock Ohio's potential and turn concepts into reality..."

- Governor Bob Taft

What they are saying about the Third Frontier Network

Dr. Paul Unger, Provost, Owens Community College

"The Third Frontier Network and the application of this technology to homeland security training will put Ohio on the cutting edge."

Dr. Joseph H. Gardner, Director of Chemistry and Intellectual Property Management, Procter & Gamble Pharmaceuticals

"The Third Frontier Network is an important component for getting the partnerships to be able to collaborate, to share data sets, and to be able to communicate with each other across the state of Ohio."

Paul Rosevear, Associate Professor, Dept. of Molecular Genetics, Biochemistry and Microbiology, University of Cincinnati

"One of the things the Third Frontier Network will enable us to do is to identify gifted students or students that are interested in science in small communities and put them in touch with a researcher at an institute and enable them to carry out undergraduate research from a distance."

Dr. Joel Saltz, M.D., Professor and Chair, Department of Biomedical Informatics, The Ohio State University

"Biomedical instrumentation is becoming increasingly expensive. The prospect of making these imaging devices available on a remote basis is a very enticing one."

Rodger McKain, President, SOFCo-EFS Holdings

"My sense is that this will greatly enhance the interaction that goes on particularly between small companies and universities. My hat's off to all of the effort that made this a reality."

CSU Story Credit: Katie Watkins - Director SPIR
Cleveland State University
Cleveland, OH 44115

Excerpt from Press Release written by: Jennifer Bartko
Ohio Department of Development
77 S. High St. - Columbus, OH 43215

FUEL CELLS - ONE OF OHIO'S FUTURE TECHNOLOGY TRANSFER EFFORTS

FUEL CELL (n) extracts energy from fuel through a chemical process, rather than by burning it. The technology is intended to produce fewer emissions than traditional combustion engines and could be used in cars or power plants.

Ohio's Fuel Cell Goals:

- Support Current Fuel Cell Companies
- Build the Future Ohio Value Chain
- Attract New Companies
- Support Technology Department
- Demonstrate Innovative Technologies
- Support Early Market Adoption

2004 - \$49 MILLION USED IN 128 PROJECTS AT OHIO UNIVERSITIES. OHIO FUEL CELL ROADMAP IS PUBLISHED OUTLINING STRATEGY FOR GROWING THE FUEL CELL CLUSTER AND STIMULATING EARLY MARKET DEMAND FOR FUEL CELLS.

2000 - FUEL CELL RESEARCH SHIFTS FOCUS TO MATERIALS, COMPONENTS, MANUFACTURING PROCESSES AND ENABLING TECHNOLOGIES

1994 - 1997 RECORD EFFICIENCY AND 50% REDUCTION IN WEIGHT OF PEM FUEL CELLS

1990 - EXPLORATORY RESEARCH BEGINS THROUGH PEMFC PROGRAM WITH INITIAL FUNDING LEVEL OF \$9 MILLION

1965 - FUEL CELLS ARE USED SUCCESSFULLY IN THE US SPACE PROGRAM IN BOTH GEMINI AND APOLLO MISSIONS.

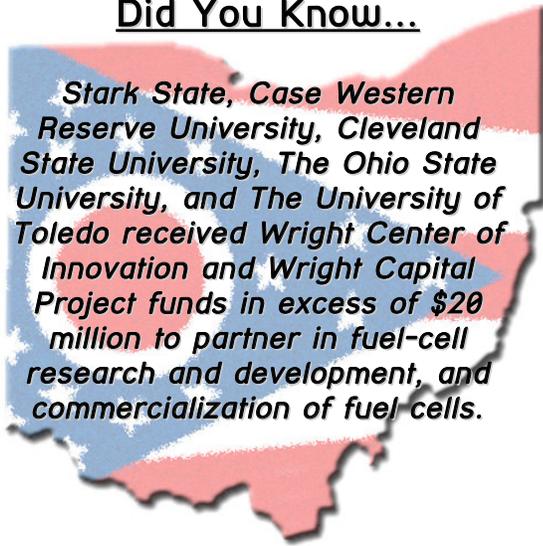
1959 - FRANCIS BACON BUILDS A FUEL CELL IN WHICH HYDROGEN AND OXYGEN REACT IN A MIXTURE OF POTASSIUM HYDROXIDE IN WATER TO PRODUCE ELECTRICITY THAT LEAD TO THE FIRST 5-KILOWATT FUEL CELL.

1889 - CHARLES LANGER AND LUDWIG MOND COINED THE TERM "FUEL CELL" AS THEY WERE TRYING TO ENGINEER THE FIRST PRACTICAL FUEL CELL USING COAL GAS AND AIR.

1839 - SIR WILLIAM GROVE DISCOVERED THAT IT MAY BE POSSIBLE TO GENERATE ELECTRICITY BY REVERSING THE ELECTROLYSIS OF WATER.



Did You Know...



"Ohio's history of fuel cell development work; its large number of fuel cell-related companies; its strong university research tradition; and strong government support, led by your governor, combine to make Ohio a true fuel cell center. There can be no doubt that you have placed your bet on the right horse."

-Mark Maddox, Acting Assistant Secretary for Fossil Energy, US Department of Energy

State Goals Credit: - Jennifer Bartko
Ohio Department of Development
Columbus, OH
Definition credit: www.bizjournals.com
Timeline information credit: Mark Maddox - U.S. Dept. of Energy

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*"Universities bring ideas to life...
...But it is technology transfer that gives them
wings and lets them fly."*

-University of Michigan President Mary Sue Coleman
Association of University Technology Managers
Annual Meeting, February 2005