



TESTIMONY OF ROBERT A. ROSENBAUM

President & Executive Director, Maryland Technology Development Corporation

House Appropriations Subcommittee
Education & Economic Development
Thursday, February 16, 2012

Senate Budget & Taxation Subcommittee
Education, Business & Administration
Monday, February 20, 2012

TEDCO Operations

Mr. Chairman, members of the Committee, thank you for the opportunity to appear before you to discuss TEDCO's FY2013 budget request. This particular testimony and panel will focus on TEDCO's budget pertaining to our traditional programs and operations. I am joined by:

- Jack Lewin, Chairman, TEDCO Board of Directors and VP, M&T Bank
- Carol Politi, President and CEO, TRX Systems Inc. (2/16)
- Charles Daitch, CEO, Akonni Biosystems Inc. (2/20)
- John Wasilisin, TEDCO COO

I would like to thank Jody Sprinkle for her cooperation in working together over the last year.

While many of you are very familiar with TEDCO, for the benefit of others not so familiar, TEDCO was created by the legislature in 1998 to assist in the transfer of research and technology from Maryland universities and federal laboratories into the commercial marketplace. With that backdrop, I'd like to offer the following highlights of the many accomplishments that TEDCO has experienced over the past year.

Maryland Technology Transfer and Commercialization Fund (MTTCF)

The MTTCF provides up to \$75,000 for initiation of technology transfer projects that involve collaborations between a Maryland company and a university in Maryland or any federal laboratory, or tenant companies in Maryland's technology incubators. Funds are used to defray direct costs of developing early-stage technology. Data is of January 10, 2012:

- 186 companies in portfolio
- TEDCO funding (completed projects) = \$10.6M
- Follow-on funding received by companies = \$479M
- **Leverage of TEDCO funding = \$45 : \$1**
- ***Entrepreneur Magazine: TEDCO was ranked the #1 seed/early-stage investor in the nation for 5 consecutive years***
- 20 companies have paid TEDCO back in full

- 82% of companies are still in business

University Technology Development Fund (UTDF)

Now in its eleventh year, the UTDF provides up to \$50,000 for proof-of-principle studies on Maryland university-owned or -originating technologies. The objective is to demonstrate the ability of university technologies to meet identified market needs in addition to making the technologies more attractive to potential licensees.

- 112 completed projects
- 43 licensed technologies (35 in MD)
- 29 start-up companies created in MD

TechStart Program

The TechStart Program provides up to \$15,000 to fund university-based teams to determine whether specific technologies proposed by the universities would have the potential to be commercialized through a start-up company. The objective is to increase the number of university start-ups annually, elevating Maryland's national ranking to the top tier of universities.

- 33 projects funded
- 30 completed projects
- 21 new start-ups companies

Federal Leverage

- Federal funding received to date = \$15,884,927
- TEDCO matching funds required = \$997,720
- **Federal leverage of TEDCO funding = \$15.90 : \$1**
- 75 technology transfer and commercialization awards of \$50,000 to \$150,000 from federal funds; 63 awards to Maryland companies

Corporate Leverage: Johnson & Johnson Collaboration

Recognizing the value of innovation in the State of Maryland and seeking to partner with TEDCO, Johnson & Johnson's (J&J) Corporate Office of Science & Technology signed an agreement with TEDCO to jointly fund an award program to invest in seed-stage companies with technologies of interest to J&J. J&J provided an initial investment of \$250,000 to seed the fund. Since then, J&J has **increased their contribution to \$650,000**, as they continue to see promising technology and innovations. TEDCO is working to expand its work with other Corporate Partners.

Joint Technology Transfer Initiative (JTTI)

A new federal technology transfer initiative for TEDCO is with the Department of Homeland Security (DHS) and the U.S. Army Medical Research and Materiel Command (USAMRMC). Technology development projects will be considered within the scope of the JTTI if a company can show how the proposed technology will meet the needs of DHS and/or USAMRMC (spin-in) and/or the commercialization of DHS or USAMRMC technologies (spin-out).

JTTI awards of up to \$75,000 will be made to for-profit small businesses in support of technology development projects that fall within the scope of the JTTI. Assistance in identifying

whether or not a technology meets DHS or USAMRMC needs and in forming technology transfer collaborations will be available from TEDCO.

Relationships with Federal Labs and Institutions

- Aberdeen Proving Ground, Science & Technology Board
(Covers approximately 12 R&D tenant organizations, including the Army Research Lab)
- Johns Hopkins University Applied Physics Lab
- NASA Goddard Space Flight Center; provides access to *all* NASA labs
- National Institute of Standards and Technology
- National Institutes of Health
(Specific Partnership Intermediary Agreement with National Cancer Institute)

- National Security Agency
- Naval Air Warfare Center Patuxent River
- Naval Medical Research Center
- National Cancer Institute
- Naval Surface Warfare Center Carderock Division
- Naval Surface Warfare Center Indian Head Division
- Naval Surface Warfare Center Crane Division
- United States Army Medical Research and Materiel Command
(Includes six medical research labs and institutes)
 - 1) U.S. Army Aeromedical Research Laboratory (USAARL)
 - 2) U.S. Army Institute of Surgical Research (USAISR)
 - 3) U.S. Army Medical Research Institute of Chemical Defense (USAMRICD)
 - 4) U.S. Army Medical Research Institute of Infectious Diseases (USAMRIID)
 - 5) U.S. Army Research Institute of Environmental Medicine (USARIEM)
 - 6) Walter Reed Army Institute of Research (WRAIR))
- United States Department of Agriculture, Agricultural Research Service
(Includes over 100 national research locations and the Forestry Service)

- TechLink
(Department of Defense and NASA technology transfer partner)

Technology Business Incubators

Since introducing the “Maryland Technology Incubator Program” in 2001 as part of TEDCO’s statutory requirements, successful programs have been created and investments have been made in the State’s technology business incubators. Programs have included the Incubator Development Fund (capital incubator projects requiring a minimum 1:1 match); Feasibility Study Grants (to study potential new or expanded facilities; grants require a minimum 1:1 match); Business Assistance Grants (to provide incubator managers with discretionary funding to provide needed and direct assistance to tenant companies); and other grants and programs supporting the annual Incubator Company of the Year Awards and activities of the Maryland Business Incubation Association. The annual Incubator Company of the Year Awards has honored and recognized the superb efforts of the incubator managers and their staff, as well as the finalists and winners of these coveted awards. For ten years running, hundreds of incubator

companies have been deemed, by a committee of distinguished economic development and venture capital professionals, as the best in their respective categories, whether a new or graduate incubator company, or expert in their field of technology.

Entrepreneurial Development

TEDCO also provides a variety of assistance programs for entrepreneurial development including the Maryland Rural Business Innovation Initiative (RBI²), Achieving the Commercialization of Technology in Ventures through Applied Training for Entrepreneurs (ACTiVATE) in conjunction with the University of Maryland, Baltimore County and the Working Capital Loan Fund (supported by the U.S. Department of Commerce, Economic Development Administration).

An important mission for TEDCO is to assist in the development of entrepreneurs throughout the State of Maryland. The RBI² is designed to enhance technology commercialization activities and provide technical and business assistance to small companies and early-stage companies in rural Maryland. Assistance to companies is provided by local business mentors contracted by TEDCO. Each region has a local mentor, whose responsibility is to evaluate potential clients, provide resources, consulting services and technical management assistance. Providing technical and general business assistance is a cornerstone of this program that helps small businesses gain access to general business resources, federal laboratory and university research opportunities.

In an attempt to promote and celebrate entrepreneurship in Maryland, TEDCO held the Maryland Entrepreneur Expo on November 14, 2011 (in conjunction with Global Entrepreneurship Week) to bring together the various entities that have a vested interest in the development of entrepreneurs. The Maryland event was one of 10 nationally-recognized by Global Entrepreneurship Week. This event attracted over 350 people comprised of new and seasoned entrepreneurs, investors, students, legislators, service providers, inventors, tech transfer officers and economic development professionals. Due to its success, TEDCO is planning another Entrepreneur Expo in November, 2012.

Management and Administration

As you are aware, TEDCO is required by statute to seek an independent audit of its yearly financial statements. For the twelfth consecutive year, TEDCO received an unqualified (“clean”) audited financial statement.

I would like to thank members of this Committee for their courtesy toward me and TEDCO, and for your strong support of our programs.

Response to the DLS Recommended Action

In response to the DLS recommendation, TEDCO will ensure that its annual report will be submitted by October 1, 2012.



The Maryland Stem Cell Research Fund (MSCRF) Testimony February 16, 2012 & February 20, 2012

Margaret Conn Himelfarb
Chair, Maryland Stem Cell Research Commission

Dan Gincel, PhD.
Director, Maryland Stem Cell Research Fund (MSCRF)

Stem cell research offers great promise to people with devastating diseases and disabilities. Stem cells have demonstrated the potential to replace damaged or missing tissues and provide therapies for a multitude of diseases, injuries, and conditions, ranging from Alzheimer's, Parkinson's, ALS, and sickle cell anemia to diabetes, heart disease, arthritis, severe burns, and spinal cord and bone injuries.

Studying stem cells helps scientists understand how cells differentiate into the many types of specialized cells that function in our bodies. Some of the most serious medical conditions, such as cancer and birth defects, are caused by errors that occur somewhere in this process or, in the case of degenerative diseases, later in life. Knowing how normal cells develop will allow us to find treatments that will correct such errors. Patient-derived stem cell therapies may some day be individually tailored to best match a person's unique needs and genetics.

Stem cells are also useful in testing the toxicity of new drugs. In addition, stem cells can serve as models of specific injuries and diseases.

The Maryland Stem Cell Research Act of 2006 was established the Maryland Stem Cell Research Fund to promote State-funded stem cell research and cures through grants and loans to public and private entities in Maryland. For the past five years, Governor Martin O'Malley's annual budget has included appropriations to support the MSCRF. During this period, the Commission has funded 218 research grants with awards totaling over \$78.8 million. The FY 2012 annual budget provides \$12.4 million for stem cell research in Maryland. This funding serves to expedite the development of critical new therapies, creating new jobs and revenue for the State, at the same time enhancing Maryland's national position in the burgeoning field of biotechnology.

The Stem Cell Research Act also established the Maryland Stem Cell Research Commission (Commission). The Commission is an independent public body that operates under the auspices of the Maryland Technology Development Corporation (TEDCO). The Commission establishes policies and procedures, drafts Requests for Applications (RFAs), solicits grant proposals, and ensures the appointment of qualified, independent scientific peer review panels, selecting only the most scientifically meritorious, ethical research projects. The impact on biotechnology in Maryland and relevance to regenerative medicine (repair or

replacement of damaged, diseased, and defective cells, tissue, and organs) are important criteria for all funding awards.

The MSCRF leverages State dollars. At the 2009 World Stem Cell Summit convened in Baltimore, Governor O'Malley announced a collaboration between the MSCRF and the California Institute for Regenerative Medicine (CIRM), the nation's first state-to-state, jointly-funded stem cell research program. The goal of this collaboration is to advance critical human stem cell therapies by fostering meritorious interdisciplinary research across geographic boundaries. This pilot program has the potential to create extraordinary research teams and leverage Maryland's financial commitment with up to \$76 million from California.

The Commission has announced that the collaboration with CIRM will continue for a second year. In FY 2012, the program will allow investigators working in Maryland to conduct collaborative research relating to CIRM's Basic Biology III Grant Awards.

Because the MSCRF funds only research conducted in Maryland, these partnerships augment State dollars. Furthermore, Maryland leverages its investment in stem cell research every time an MSCRF-funded investigator receives support from NIH or another resource to advance his work, and whenever a scientist anywhere in the world cites an MSCRF-funded investigator's publication to further his own research.

In response to input from several Maryland legislators, the Commission encourages collaborations to create the best interdisciplinary team for each project. In FY 2011, 28% of MSCRF awards involved collaborations between private companies and public institutions, in some instances, across state lines and national borders. In addition, the Commission continues its second year of a pilot program collaborating with scientists funded by the **California Institute for Regenerative Medicine (CIRM)**. Most importantly, in January 2012, the Commission announced a new RFA directed solely to biotech companies.

The Commission operates efficiently and funds a variety human stem cell research. The full Commission meets at least four times a year. All Commission meetings are open to the general public except the grant review, which is closed to protect the applicants' intellectual property. Ninety-three cents of every dollar directly funds research. (*"Tracking and assessing the rise of state-funded stem cell research"; Nature Biotechnology; Vol. 28; No. 12; December 2010; Page 1247*)

The Commission has established several funding mechanisms or RFAs:

- 1) **Investigator-Initiated Research Grants**, which are designed for established investigators who have existing preliminary data to support their grant applications. Investigator-initiated Research Grants currently provide up to \$200,000 in direct costs per year, for up to three years. (The Commission has revised the grant size and duration of this RFA since the inception of the program.)

- 2) **Exploratory Research Grants**, which are designed for investigators new to the stem cell field (young investigators and scientists from other fields) and for new hypotheses, approaches, mechanisms, or models. Little or no preliminary data is required to support these applications. Exploratory Research Grants provide up to \$100,000 in direct costs per year, for up to two years. They frequently lead to much larger grant awards.

- 3) **Postdoctoral Fellowships** (added in FY 08), which are designed to train postdoctoral fellows in human stem cell research in Maryland. Post-doctoral Fellowships provide \$55,000 per year, including all direct and indirect costs, for up to two years.

- 4) In addition to these funding mechanisms, the Commission looks forward to more applications from the private sector in response to its **new pre--clinical and clinical RFA**, which is only for biotech companies interested in conducting late stage human stem cell research in Maryland. This RFA provides up to \$750,000 for projects that involve clinical trials, and is currently the Fund's largest award.

Through these four mechanisms and the CIRM pilot program, the MSCRF funds both basic science and translational research projects that use a variety of human stem cell types: adult, cord blood, embryonic, induced pluripotent (iPS), and cancer stem cells.

The MSCRF has committed \$78.8 million to 218 research projects over the past five years:

- **Fiscal Year 2007:** 85 applications received; **\$15 million committed** to fund 24 new projects (7 Investigator-Initiated and 17 Exploratory Research Grants)

- **Fiscal Year 2008:** 122 applications received; **\$23 million committed** to fund 58 new projects (11 Investigator-Initiated, 32 Exploratory, and 15 Post-Doctoral Fellowship Research Grants)

- **Fiscal Year 2009:** 147 applications received; **\$18 million committed** to fund 59 new projects (6 Investigator-Initiated, 32 Exploratory, and 21 Post-Doctoral Fellowship Research Grants)

- **Fiscal Year 2010:** 141 applications received; **\$12.4 million committed** to fund 40 new projects (5 Investigator-Initiated, 19 Exploratory, and 16 Post-Doctoral Fellowship Research Grants)
- **Fiscal Year 2011:** 180 applications received; **\$10.4 million committed** to fund 36 new projects (9 Investigator-Initiated, 13 Exploratory, and 14 Post-Doctoral Fellowship Research Grants)
- **Fiscal Year 2012:** 266 Letters of Intent (LOIs) received from interested applicants; **\$12.4 million budgeted**; scientific review, March 2012; Commission review, May 2012; awards announced, June 2012

Interest in the MSCRF continues to escalate. This increased interest clearly demonstrates the credibility of the program as well as growing awareness of the importance of stem cell research. Each successive year, many new scientists apply for MSCRF funding. FY 2011 was yet another record-breaking year for the MSCRF, with the highest number of applications ever submitted and, for FY 2012, the largest number of Letters of Intent ever received. **Any prospect of a budget cut would raise significant concerns about the future viability of our stem cell research program in Maryland.**

The MSCRF is part of a stem cell research hub, serving as a role model for the country and enhancing Maryland's national position in the Life Sciences. The State's topnotch infrastructure, combined with its highly trained scientists, has engaged and/or attracted a number of leading companies to the area:

- **Lonza** (Walkersville) is the world's largest cell enrichment and clinical manufacturing company
- **Osiris Therapeutics, Inc.** (Columbia) is the world's largest and most advanced stem cell company
- **Becton, Dickinson and Company** (Sparks) has a large division that focuses on bio-processing and diagnostics, among other interests, with approximately 1,500 employees based in Maryland.
- **Life technologies** (Fredrick) has moved its stem cell R&D from California, and now employs over 500 people in Maryland.

- **The NIH** has created a new intramural stem cell center and is looking for collaborations with Maryland companies to help develop products.

Maryland hospitals have become leaders in stem cell transplantation, with the largest programs at **Johns Hopkins** and the **Medical Center at the University of Maryland, Baltimore**. **Mercy Hospital** is collaborating to establish the first in-State umbilical cord blood bank for stem cell therapies. **Sinai Hospital** is expanding its stem cell capabilities in research and clinical application.

Included among the new stem cell research organizations are the **Lieber Institute for Brain Development**, a private company located in the Hopkins Biopark, and **Stevenson University**, which may be the first college in Maryland to train undergraduate students in stem cell research. Many additional new small Biotech companies are eligible to receive funding from the MSCRF.

The MSCRF is an economic engine for the State, creating jobs and generating new revenue. MSCRF awards support researchers, physicians, and lab technicians as well as scientists working in labs supported by its research grants. Using data from the first two years of MSCRF funding (FY '07 and '08), the Sage Policy Group conducted an independent economic development impact study, published in February 2010, which highlights the fact that the MSCRF has become an important economic engine for the State as well as a mechanism for developing cutting edge research. The Sage study reports that, during only its first two years of operation, the MSCRF funded more than 500 local jobs and generated \$71.3 million in business sales. These employment figures significantly increased during the next three years. Furthermore, the Sage Policy Group study predicts that "as research increasingly becomes commercialized, impacts are expected to expand briskly, with economic and fiscal impacts potentially doubling every three years."*(Sage Policy Group Study; Page 3; http://www.msccrf.org/media/client/pdf/Sage_stem_cell_program_impacts_Final.pdf)*

All MSCRF awardees must present their findings at an Annual Research Symposium, which provides a rare opportunity for investigators from the public and private sectors to share ideas and information. During their funding period, all awardees must submit their interim and final research results in yearly progress reports. All State-funded investigators must cite the MSCRF and credit Maryland in their publications.

The fourth Maryland Stem Cell Research Symposium was held on October 5, 2011 at Towson University, in collaboration with Baltimore County. At this event, over 20 speakers and 100 poster presentations showcased Maryland's investment in stem cell research to more than 400 participants from academic institutions, biotech companies, State and federal agencies, patient groups, non-profit organizations, and the general public. The Commission is now planning the fifth Annual Research Symposium, which will be held in Annapolis in the fall of 2012.

Although the purpose of this Annual Report is to summarize new MSCRF-funded research, the following bullets highlight several exciting State-supported research breakthroughs that occurred in FY 2011:

- Dr. Sharon Gerecht's lab at Johns Hopkins University developed a **Hydrogel that promotes the growth of new blood vessels and scar-free skin**, which could be of critical importance in severe burns (http://www.eurekalert.org/pub_releases/2011-12/jhu-itb121311.php)
- Dr. Min Li, Professor of Neuroscience and Director of the Johns Hopkins Ion Channel Center (NIH-MLPCN), was featured on the cover of the journal *Assay and Drug Development Technologies* for developing a new **high throughput screening technology for cardiac drugs using stem cells**. Dr. Li is making this database available online at <http://www.hergcentral.org/>, a new Web site that allows better sharing of results.
- Dr. George Ricarute of Johns Hopkins University, is transplanting stem cells into non-human primates with Parkinson's-type symptoms. This is the last stage of research before human subjects will be allowed to participate in a clinical trial of this treatment.

The federal challenge for stem cell research provides a critical opportunity for Maryland leadership. President Obama signed an Executive Order on March 9, 2009, repealing the policy that restricted federal funding of embryonic stem cell research to only the Bush "presidential stem cell lines." This Executive Order is still being challenged in federal court and will almost certainly continue to be challenged until Congress addresses the Dickey-Wicker Amendment of 1995 (which is part of the annual budget bill and prohibits federal funding for research involving the destruction of human embryos). A negative decision in that case (Sherley vs. Sibelius) would halt federal funding indefinitely. A change in administration could affect policy and stop federal funding of embryonic stem cell research for a minimum of four years. Furthermore, NIH funding for research in general has declined over the last several years.

Maryland is one of only six states that have taken the leadership role typically assumed by NIH in supporting vital research programs. In fact, Maryland is currently the third largest state-funder of stem cell research, behind only California and New York, a critical leadership position at a time of great need. (*"Tracking and assessing the rise of state-funded stem cell research"; Nature Biotechnology; Vol. 28; No. 12; December 2010; Page 1247*)

While court decisions cast doubt on the immediate status of federal funding for some types of stem cell research, scientists agree that stem cell technology is the future of modern medicine. According to an August 2010 Research! America poll (http://www.researchamerica.org/stemcell_issue), 70% of Americans favor expanding federal funding for embryonic stem cell research. It is reasonable to assume that, as lifesaving breakthroughs occur, people will want to benefit from these discoveries, public opinion will prevail, and federal funding will continue. When that time comes, thanks to the MSCRF, Maryland's stem cell research community will be positioned to successfully compete for NIH funding, with experience and substantive data to support their grant proposals.

In fact, because of Maryland's early support for stem cell research, more researchers remain in Maryland than would otherwise be the case, positioning the State to capture a larger share of federal research dollars going forward. (*Sage Policy Group study; page 1; http://www.mscref.org/media/client/pdf/Sage_stem_cell_program_impacts_Final.pdf*)

The Tech Council of Maryland, in its recent Policy Platform, recommended that the State "Maintain stem cell research funding at current levels for FY2012. Policymakers should continue stem cell research funding in Maryland at an appropriate level based on the needs of current stem cell funding beneficiaries...This funding allows uninterrupted research opportunities and will give Maryland a competitive advantage once there is clarity on stem cell research policy at the federal level."
(http://www.techcouncilmd.com/advocacy/policy_platform.php)

Economic recovery and the future of stem cell research in Maryland

The Sage Policy Group Study references Maryland's dominant position across the spectrum in the field of biotechnology. Maryland is a national leader in NIH awards, academic bioscience R&D, venture capital, bioscience graduate degrees awarded, and bioscience employees. (*Sage Policy Group Study; Page 1; http://www.mscref.org/media/client/pdf/Sage_stem_cell_program_impacts_Final.pdf*).

In June 2008, Governor O'Malley established his platform as a life science Governor when he introduced his signature 10-year \$1.3 billion BIO 2020 Initiative. The largest per capita investment in the biosciences made by any state in the country, it included \$20 million per year for stem cell research for the next ten years. This initiative was intended to build upon Maryland's preeminence in the life sciences. The State's incubator network, the Maryland Biotech Center, and the Maryland Stem Cell Research Fund are all critical elements of this inspirational initiative.

Because the MSCRF is now nationally recognized, it helps Maryland attract and retain the best and brightest scientists in the field. However, to maintain the credibility of this program, the MSCRF must sustain a meaningful level of funding. If funding continues to decrease, as it has over the past three years, Maryland will send a message to its scientific community that the State is pulling back on its commitment to stem cell research. The risk, of course, is that the MSCRF will lose its synergy when the core of scientists in stem cell research falls below the "critical mass" required to make the program viable. This is likely to happen because (1) Established investigators will relocate to California, New York, or other places that foster this science; (2) Young investigators with families to feed will be forced to choose other areas of research; and (3) Those who attempt to continue this work in Maryland will become more isolated, with dwindling opportunities for fruitful face-to-face exchange of ideas and information with their colleagues.

In these challenging economic times, jobs are important to the State. Keeping researchers in Maryland keeps their jobs in Maryland as well as any further funding they garner from other sources. Postdoctoral Fellowship Grants create new jobs for PhDs and MDs and heighten interest in the field of stem cell research. Exploratory Research Grants provide the unique opportunity for creative scientists to develop new ideas that will merit larger grants from other funders. And Investigator-Initiated Research Grants establish a scientist's career and

develop a knowledge base on which other scientists can build. These are high-level, well-paying, educated jobs that keep physicians and clinicians as well as researchers in the State.

Like any macroeconomic project, results can best be measured over time, and stem cell research is a complex young science. But after only five years of funding, we are beginning to see scientific breakthroughs like those described above. We must avoid the shortsighted temptation to slash funding and forfeit the momentum the State has already gained from its investment in stem cell research. The MSCRF FY 2012 budget is only half what it was in 2008. Reducing it more would have devastating effects from which it would be almost impossible to recover.

Maryland's investment in stem cell research is not only critical to advancing science, but also to moving our State's economy forward. The January 2010 Sage Policy Report states that the "largest gains are still to come...Stem cell research stands at the cutting-edge of the New Economy." (*Sage Policy Group Study;Page 1;* http://www.mscref.org/media/client/pdf/Sage_stem_cell_program_impacts_Final.pdf)

Jay Hancock, Economic reporter for the Baltimore Sun, shared that opinion on his blog January 14, 2010 when he wrote: "Biotech is Maryland's one hope for a big, private-sector surge in employment and investment over the next decade. Stem cell money is the seed for the surge. The General Assembly shouldn't cut the water and fertilizer just when it's ready to sprout." (http://weblogs.baltimoresun.com/business/hancock/blog/2010/01/dont_miss_biotech_boom_by_cutt.html)

In conclusion, the Maryland Stem Cell Research Commission respectfully requests that the legislature maintain the Governor's proposed budget of \$12.4 million for the Maryland Stem Cell Research fund for fiscal year 2012. Less than that amount will threaten the integrity of the program, jeopardizing not only it's already evidenced momentum, but also the State's leadership role in stem cell research, its contribution to humanity, and expedited economic recovery for the great State of Maryland.

With the support of the Governor and the Maryland Legislature, Maryland will be well positioned at the forefront of the New Scientific Frontier, while delivering new jobs, and providing improved quality of life and increased longevity to its citizens.

Maryland Industrial Partnerships (MIPS)

The Maryland Industrial Partnerships program is a high-impact economic development activity that creates jobs in Maryland. New technology and innovation leads to new products and new jobs. Creating jobs in innovative Maryland companies is what the Maryland Industrial Partnerships (MIPS) program has been doing for 24 years: bringing the innovative minds and extensive laboratory resources of the University System of Maryland to bear on creating the new products that feed the growth of Maryland businesses. Since we appeared here in Annapolis last year, MIPS-enabled products have sold an additional \$2B, bringing our total impact from \$21B to \$23.6B. MIPS is nationally recognized by the U.S. Small Business Administration as a model program for best practices in transferring technology. MIPS is a proven, award-winning, best-practice program that contributes significantly to job creation and high-tech product development in Maryland.

Companies look to the University System of Maryland for help in solving critical problems in developing new products, while the University is expected to contribute to economic development and job creation. MIPS projects lead to new products. These are products of any Maryland company willing to create jobs, including but not in any way limited to, the University's products and intellectual property.

MIPS provides funding, matched by participating companies, for university-based projects that help companies develop new products. The program is administered at the flagship campus at the University of Maryland, College Park and works throughout the 12 member institutions of the University System of Maryland, as well as Morgan State University and St. Mary's College. In these academic-industrial, public-private partnerships, MIPS connects the resources of the Maryland public universities to businesses all over Maryland.

With MIPS matching funding as the incentive, companies leverage the facilities, resources and expertise of USM campuses to create new products and new opportunities for high-tech jobs. In the 24 years since the program started, 377 university faculty have worked with more than 472 Maryland companies to help develop new products. These products have generated more than \$23.6 B in revenues, while Maryland companies have directly created more than 2,800 new high-paying, long-term, high-tech jobs throughout the state.

MIPS has a proven track record of success in helping companies develop many new products, resulting in substantial revenues and long-term, high-technology jobs in Maryland. Among the many successful products in which MIPS played an early, key role are:

- HughesNet: Internet-via-satellite, \$10 B cumulative revenues, 400 high tech jobs in MD
- MedImmune: Synagis – vaccine to prevent a respiratory infection that can be fatal in infants - \$11 B cumulative revenues, 2000 jobs in MD
- Martek Bioscience: Nutritional supplements for baby formula - \$2.6 B cumulative revenues, 200 jobs in MD
- WellDoc Communications: DiabetesManager™ for management of diabetics – \$20 M annual revenues and 45 new jobs in Baltimore City now, and plan to grow to 75 people in 2012.

- CSA Medical: Cryo Spray Ablation – medical device to treat pre-cancerous disease of the lower esophagus (Barrett’s disease) as an outpatient procedure – now used in 60 hospitals, 22 new jobs in Baltimore City

How does MIPS work? Hughes Network Systems of Montgomery County looked to a professor at University of Maryland College Park to develop the communications systems that led to the company’s HughesNet product, which delivers Internet via satellite all over the world. Hughes created 400 new jobs, and says that the MIPS project created a whole new industry where they are now the world leader, with sales in excess of \$10 B. Hughes was purchased by Echostar, provider of Dish Network and Slingbox, last summer for \$2 billion.

CSA Medical of Baltimore City worked with a professor at the University of Maryland, Baltimore to do the first tests of a new medical device that is now revolutionizing the treatment of esophageal cancer. They went from a one-person company to 22 from 2007 to 2012, creating high technology jobs in the City of Baltimore. Their product is now being extended to treat other forms of cancer, and MIPS provided the crucial early funding for that initial test.

Another Baltimore City success story involves WellDoc Communications, which came to MIPS for help developing their DiabetesManager® System. MIPS supported a critical study at University of Maryland, Baltimore was instrumental in helping them attain FDA clearance of their diabetes management system, and attract a recent \$30M investment in the company. They now have a relationship with AT&T, delivering telemedicine care. Importantly, they have hired 45 people in high-salary, technology-based jobs, and plan to hire 30 more, for a total of 75 new jobs in Baltimore City. For both CSA and WellDoc, MIPS provided the crucial first external funding that validated their plans and products and set them on the path to success.

Start-up company HY-TEK Bio is working under a MIPS-DNR funded project with the UMCES’ Institute of Marine and Environmental Technology (IMET) in Baltimore. Using algae technology, IMET scientists will optimize HY-TEK Bio’s technology to remove CO₂ and other harmful substances from flue gas in fossil fuel power plants along the Bay, creating cleaner energy from fossil fuels. HY-TEK plans to create hundreds of new jobs in Maryland based on this technology.

Recently, MIPS announced 16 new projects teaming Maryland companies and university faculty to develop new high-technology and biotechnology commercial products. Projects featured during this round include new technologies such as: a new heat exchanger to increase the efficiency of electricity-generating power plants, developing a new class of antibiotics, a new medical device for cancer treatment, advanced climate control systems for buildings, a novel method for new drug discovery, smart packaging for pharmaceuticals, a geosynthetic filtration system to protect the Chesapeake Bay, pest-resistant soybeans, extended shelf-life seafood soups and more.

For this round of projects, companies contributed \$2.9 million and MIPS and the participating universities contributed \$1.2 million for a total project value of \$4.1 million. The Maryland Department of Natural Resources and the Environmental Protection Agency provided additional supporting funding.

The result is new Maryland products and true high-technology job creation. These are the kinds of jobs that will lead Maryland out of this recession and position Maryland to compete on the global stage. The current, annual level of MIPS funding for projects is approximately \$1.4M, which is down about 30% due to state budget cuts in recent years. The many worthy proposed projects that MIPS is unable to fund within the current budget present a very positive economic opportunity should the MIPS budget be restored or increased.

With state taxes derived from the new jobs and revenues it has created, the MIPS program more than pays for itself, and in fact has historically shown long-term returns of 30:1 to the State of Maryland treasury. MIPS' unmatched track record of proven success has created thousands of jobs and has resulted in state tax revenues that pay the program back within the first year. Sales, income, and property taxes from participating companies and their employees yield about a 30:1 return on the funds expended. Based on past performance, the decrease of \$600,000 that the MIPS program has sustained during this recession translates to a lost opportunity each year to create 162 direct, sustainable jobs and produce \$16.8M in State revenues annually.

The MIPS program is exactly where the State should be placing additional resources. Why? As a job creation program, MIPS is extremely cost-effective and consistently delivers high impact. By funding the next generation of new Maryland products, the MIPS program leads to new technology, new products and new job creation—just what Maryland needs right now.

Contact:

Martha J. Connolly, Ph.D.
Director, Maryland Industrial Partnerships
Potomac Building 092, Room 2100
University of Maryland
College Park, MD 20742
tel: 301-405-3892
e-mail: marthac@umd.edu
web: www.mips.umd.edu

Innovation Needs Capital

