

# The Massachusetts Life Sciences Center



Life Sciences Technology  
Insights

February 23, 2010

# **The Massachusetts Life Sciences Initiative – Major objectives**

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## **State investments in the life sciences “Super Cluster”:**

- **Promote economic development**
- **Support the Commonwealth’s world-class academic medical centers, research institutions, universities and industry leaders**
- **Promote a highly skilled and educated workforce**
- **Create an industry-friendly environment**
- **Strengthen and protect Massachusetts’ global leadership position in the Life Sciences**
- **Support the development of treatments, therapies and cures**

# The Massachusetts Life Sciences Center – Board of Directors

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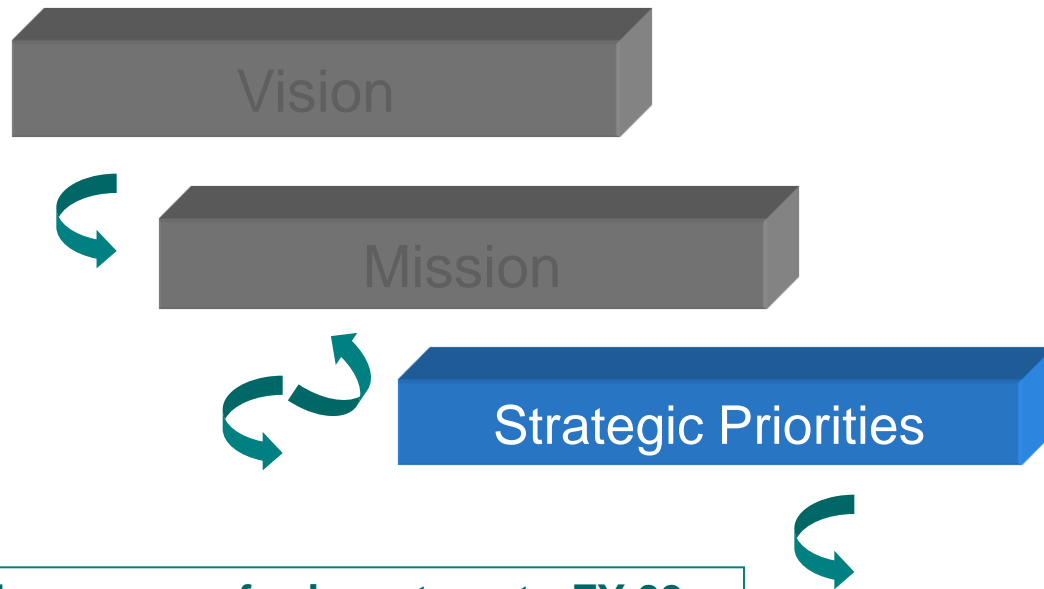
- **Secretary of Housing and Economic Development**
  - Greg Bialecki
- **Secretary of Administration and Finance**
  - Jay Gonzalez
- **President of the University of Massachusetts System**
  - Jack Wilson, Ph.D.
- **A CEO of a Massachusetts-based life sciences corporation**
  - Josh Boger, Ph.D., Vertex Pharmaceuticals
- **A researcher involved in the commercialization of biotechnology, pharmaceuticals or medical diagnostic products**
  - Lydia Villa-Komaroff, Board Member and CSO, Cytonome/ST
- **A physician licensed to practice medicine in the Commonwealth and affiliated with an academic medical center**
  - Peter Slavin, M.D., President, Massachusetts General Hospital
- **A person with financial expertise in the life sciences**
  - Marc Beer, former CEO, ViaCell Inc.

# Massachusetts Life Sciences Center

## Scientific Advisory Board

- **CHAIR: Harvey Lodish, Ph.D.**, Whitehead Institute, and Professor of Biology and of Bioengineering, MIT
- **James Barry, Ph.D.**, Vice President, Corporate Research and Advanced Technology Development, Boston Scientific
- **Doug Cole, M.D.**, General Partner, Flagship Ventures
- **James J. Collins, Ph.D.**, Professor of Biomedical Engineering, Boston University
- **George Q. Daley, M.D., Ph.D.**, Children's Hospital Boston, Harvard Medical School, Harvard Stem Cell Institute
- **Patricia K. Donahoe, M.D.**, Director of the Pediatric Surgical Research Laboratories and Chief Emerita of Pediatric Surgical Services at Massachusetts General Hospital, and the Marshall K. Bartlett Professor of Surgery at the Harvard Medical School
- **Jonathan Fleming, M.P.A.**, Managing General Partner, Oxford Bioscience Partners
- **Jean M. George, M.B.A.**, Partner, Advanced Technology Ventures
- **Lila Gierasch, Ph.D.**, Professor of Biophysical Chemistry, Department of Biochemistry, University of Massachusetts Amherst
- **Richard A. Goldsby, Ph.D.**, John Woodruff Simpson Lecturer and Professor of Biology, Amherst College
- **Jeffrey Leiden, M.D., Ph.D.**, Managing Director, Clarus Ventures
- **David T. Scadden, M.D.**, Professor of Medicine, Harvard University, Co-Chair, Department of Stem Cell and Regenerative Biology, Harvard University, Co-Director, Harvard Stem Cell Institute, Director, MGH Center for Regenerative Medicine
- **Alan E. Smith, Ph.D.**, Chief Scientific Officer, Genzyme Corp.
- **Allison Taunton-Rigby, Ph.D.**, CEO and Director, RiboNovix, Inc.
- **David Walt, Ph.D.**, Robinson Professor of Chemistry and Howard Hughes Medical Institute Professor at Tufts University School of Medicine.
- **Philip Zamore, Ph.D.**, Professor, Biochemistry and Molecular Pharmacology, UMass Medical School

# MLSC Strategy Summary: Priorities and Focus Areas



## Strategic priorities – FY 09:

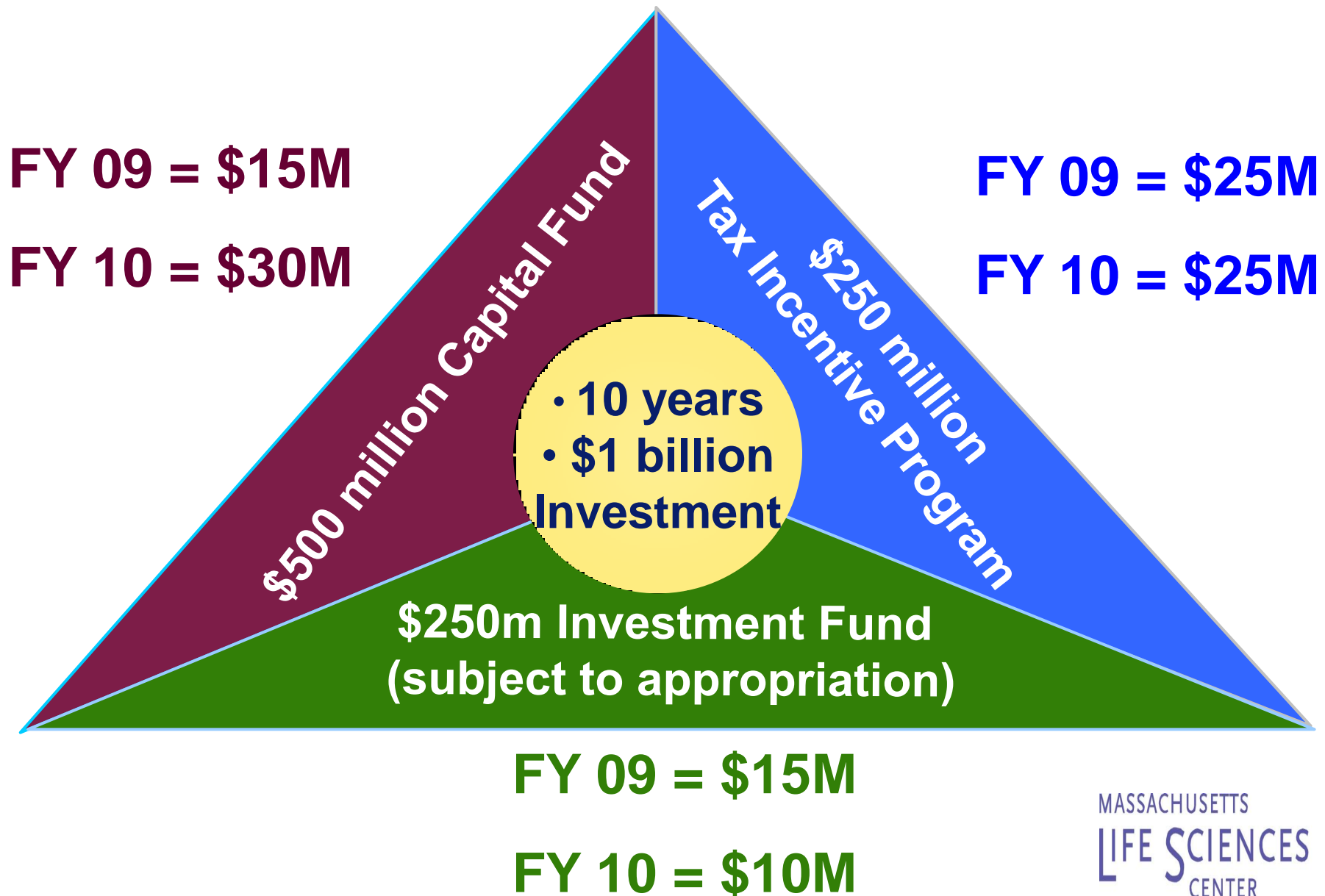
- ✓ **Competitiveness** of the State's academic institutions
- ✓ **Pipeline** of new therapies, technologies, molecules, etc
- ✓ **Supply and distribution** of life sciences workers with skills that are aligned with stakeholder needs
- ✓ **LS infrastructure** and ecosystem
- ✓ **Retention and growth** of LS companies

## Focus areas for investment - FY 09:

- ✓ **Competitiveness:** Faculty grants and infrastructure
- ✓ **Pipeline:** Industry sponsored (translational) research; New Investigators, and Young Companies
- ✓ **Workforce:** Entry level workers; New Investigators
- ✓ **Infrastructure:** Capital Projects
- ✓ **Retention and Investment:** Tax Incentives



# Life Sciences Initiative Investment Tools



# The “Bottom Line”

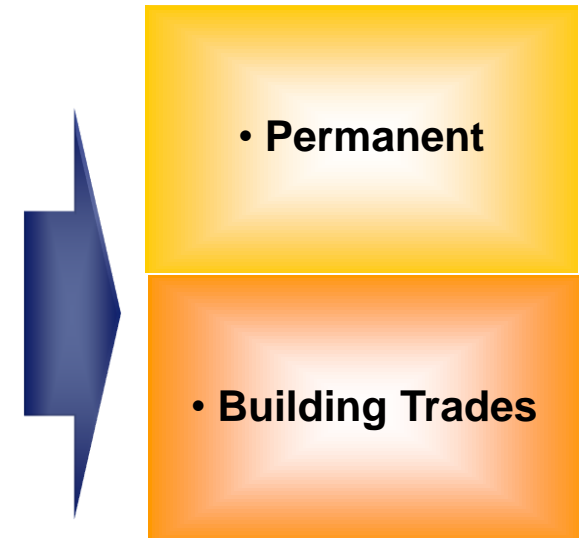
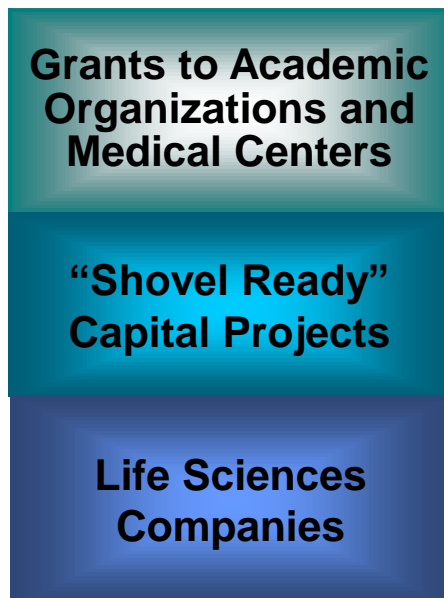
## Life Sciences Center’s Impact: June ‘08 – December ‘09

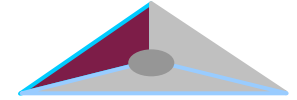
**Matching Investments  
Attracted  
= \$679.1 M**

**Job Potential  
= 6,289**

**Public Dollars Invested  
= \$180.5 M**

**4 X multiplier**





# Capital Fund Projects - Investments in Infrastructure



## Town of Framingham: \$12.9 million grant

- New wastewater facility for Framingham Technology Park
- Allows Genzyme to build a new facility
- Creates more than **300 new manufacturing jobs** this year, and 165 jobs in construction

genzyme

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## MBL: \$10 million grant

- Renovate the Loeb Lab
- Will create **200 building trade jobs and up to 50 permanent jobs**
- MBL leveraged to receive a **\$15 million grant** from the Howard Hughes Medical Institute



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## Cummings School: \$9.5 million grant

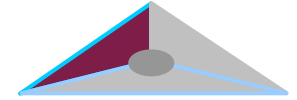
- Supports construction and equipping of the New England Regional Biosafety Laboratory in Grafton
- Projected to create **56 FTE construction jobs and 29 long-term positions**

Tufts  
UNIVERSITY

Cummings School of  
Veterinary Medicine



MASSACHUSETTS  
LIFE SCIENCES  
CENTER



# Capital Fund Projects - Investments in Infrastructure

**Albert Sherman Center: \$90 million  
multi-year grant**

•500,000 square foot research facility

•Projected \$1 billion statewide  
economic impact

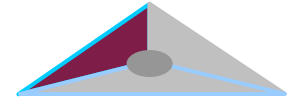
•Donahue Institute projects **more than  
6,000 jobs created through direct  
construction spending, and 1,600 jobs  
supported through facility operation.**



# Capital Fund Programming

## 2010 Small Business Matching Grant Program

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- The Center has launched a Small Business Matching Grant (SBMG) program that will match federal small business grant funding for early-stage life sciences companies.
- Grantees must have received an SBIR/STTR Phase II, post Phase II, or equivalent award(s) from federal agencies within the last ten years
- **\$3M Total Investment**
  - SBMG Program grants will match federal SBIR /STTR grants one dollar to one dollar, up to \$500K
- Grantees must be small businesses, as defined by the U.S. Small Business Administration
- Companies are not eligible for the Center's SBMG grants if they have raised more than \$5 million in equity financing
- Grants will support life sciences companies that have developed new commercialization-ready technologies to reach production and create manufacturing jobs in the Commonwealth
- **Applications are being accepted for this program through March 1 at [www.masslifesciences.com](http://www.masslifesciences.com).**



## Tax Incentive Program

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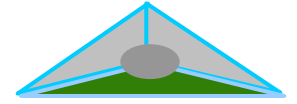
**The Tax Incentive Program was implemented on January 1<sup>st</sup> 2009, as required by the Life Sciences Act.**

- **First round applications were accepted between January 1- May 15, 2009**
- **84 companies applied**
  - Diversity across industry segments
  - Geographic representation
  - Small and large companies
- **The Center convened a roundtable of stakeholders, state agencies and academic experts to develop the criteria for awarding the incentives**
- **The first round of tax incentives, totaling \$25 million, was awarded to 28 companies in December, 2009. These companies have committed to creating more than 800 new jobs during calendar year 2010.**

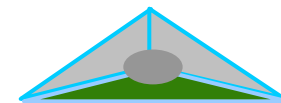
# Life Sciences Investment Fund

## Life Sciences Accelerator Program At-a-Glance

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- **5-Year Loan**
- **\$100-\$500K target range**
- **10% Interest rate**
- **Unsecured**
- **Payable on financing event of at least \$5M**
- **Preference for matching other sources of capital**
- **Pre Series A & Opportunistic**
- **Life science sectors as defined by the statute:**
  - **Device/diagnostics**
  - **Biotech**
  - **Pharmaceuticals**
  - **Bioinformatics**

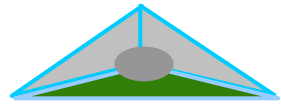


# Investment Fund Programs

## Accelerator Program – FY '09 Loans

**The Center awarded \$3.4 million in loans to seven outstanding companies.**

Company	Location	Area of Development	Loan Amount
Eutropics Pharmaceuticals	Dorchester	Developing drugs for treating aggressive forms of cancer	\$500,000
Good Start Genetics	Boston	Developing a low-cost pre-pregnancy test for 50 genetic disorders	\$500,000
InVivo Therapeutics	Cambridge	Developing technology to treat traumatic spinal cord injuries	\$500,000
PluroMed	Woburn	Pioneering injectable plugs that occlude blood flow to provide surgeons with bloodless fields	\$500,000
Spectra Analysis	Marlborough	Developing instrumentation to analyze the molecular structure of each compound in a complex mixture	\$500,000
Wadsworth Medical	Westborough	Developing a painless, needleless wound closure system without anesthesia or sutures	\$400,000
Wolfe Laboratories	Watertown	Provides quality assay, formulation, and process development for biotech and pharmaceutical co's	\$500,000



# Investment Fund Programs

## Accelerator Program Progress Report

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### FDA Approvals for Accelerator Companies



**September 2009: Received FDA approval on their DermaLOC wound closure system.**



**September 2009: Received FDA approval on BackStop, a device used in kidney stone management procedures.**

**October 2009: Pluromed announces marketing agreement for BackStop with Boston Scientific.**

# Leveraged Impact – Corporate Consortium

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The MLSC is committed to highly leveraging the public tax dollars that we invest by attracting matching dollars from the private and non-profit sectors. The MLSC is proud that Johnson & Johnson agreed to be the charter member of our Corporate Consortium Program.

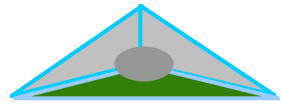
Other major life sciences corporations are expressing an interest in joining in FY 10.

## Program highlights:

- Attracts matching corporate investments in our industry-targeted programs
- Minimum of [\\$500K](#) from each corporate participant
- MLSC sources and manages investment portfolio
- Final investment decisions are made by MLSC's Board



**Committed a minimum of \$500,000  
to match investments made by the  
MLSC in FY 2009-10**



# Investment Fund Programs

## Innovation Program

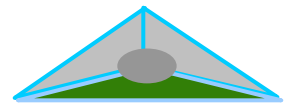
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**The Center is helping Massachusetts retain promising companies.**

In January, 2009, the MLSC Board of Directors approved a \$7.4 million grant, to be paid over two years, that will facilitate the expansion of Organogenesis, a Canton-based regenerative medicine company. Organogenesis was the first company to successfully commercialize and mass produce a living cell product. The company forecasts that the Center's investment will bring the following returns:



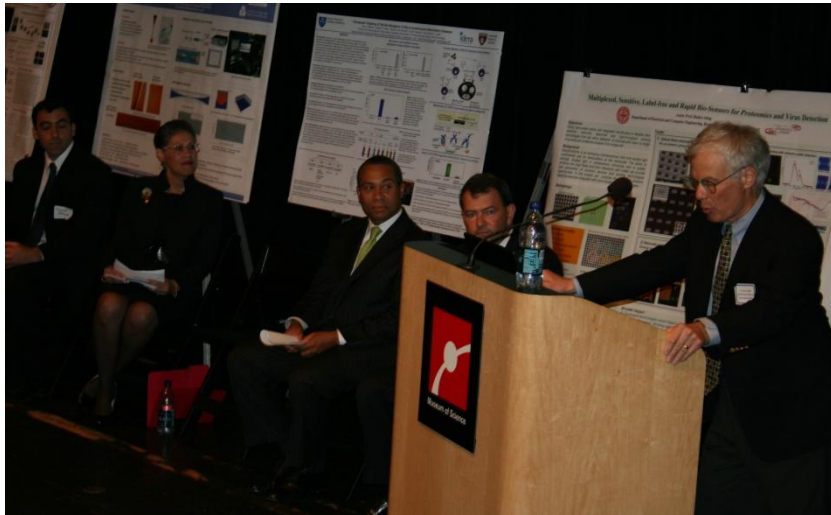
- A return on investment for the Commonwealth of **approximately \$6 million in annual tax revenue** by 2013;
- A greater than twofold increase in the company's workforce by 2013, including **the creation of approximately 280 new jobs**;
- Leveraging of **more than \$50 million in private investment**;
- A world leading regenerative medicine manufacturing facility as an anchor of the industry within the state; and
- Potential for substantial federal grants directed to Massachusetts.



# Investment Fund Programs

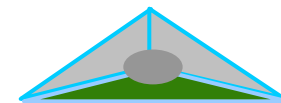
## Investments in Scientific Research: Matching Grant Program

**2008:** the MLSC launches a Matching Grant Program for new investigators, faculty positions, and cooperative research in Massachusetts. These grants:



*The Center's grants leveraged \$12.6 million in matching funds from private and public research institutions and industry sponsors -- creating a \$25.2 million investment in translational research across the Commonwealth*

- Are **enabling 21 young Massachusetts scientists** to continue their research, establish independent laboratories and possibly secure larger-scale NIH funding
- Are improving the ability of **five (5) universities and academic medical centers** across Massachusetts to compete more effectively for top faculty
- Are **funding research collaborations between six (6) industry and academic partners** focused on new therapies and technologies with high commercialization potential
- Will accelerate the **translation of treatments and therapies** “from the research bench to the bedside”

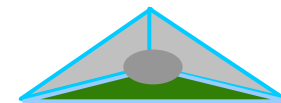


# Investment Fund Programs

## Matching Research Grants -- Cooperative Research Grants

The Cooperative Research Grants encourage industry-sponsored research at Massachusetts academic institutions and accelerate “bench to bedside.” **The Center awarded 6 grants totaling \$3.76 million.**

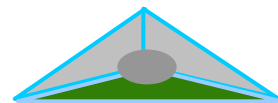
Research Partners	Award Recipient	Award	Research
UMass Lowell/ Boston Scientific	Dr. Rudolf Faust	\$199,596 per year for three years	Novel polymer biomaterials
Immune Disease Institute/ Epic Therapeutics	Dr. Judy Lieberman	\$250,000 per year for three years	An siRNA-based microbicide
Harvard School of Engineering and Applied Sciences/ Rain Dance Technologies	Dr. David Weitz	\$250,000 per year for three years	Development of a functional fluorescent- activated cell sorter
Massachusetts General Hospital/ Idera Pharmaceuticals	Dr. Andrew Luster	\$63,100 per year for three years	Targeting of toll-like receptors in A.I.D.
Brigham & Women’s Hospital/ Biomeasure	Dr. Richard Lee Dr. Prath Patwari	\$250,000 per year for three years	Design and testing of a new regenerative protein for delivery
UMass Medical School/ Rxi Pharmeceuticals	Dr. Michael Czech Dr. Gary Ostroff	\$249,593 per year for three years	Development of orally-delivered RNAi therapeutics



# FY 09 Investment Fund Programs

## Matching Research Grants: New Investigator Grants Round 1 (cont'd)

Institution	Researcher	Title of Research
Massachusetts Institute of Technology	Laurie Boyer	Investigating how chromatin organization in embryonic stem cells influences cell fate specification
Massachusetts Institute of Technology	Jeroen Saeij	Molecular characterization of toxoplasma kinases involved virulence
Tufts Veterinary School	Christopher Schonhoff	Role of S-nitrosylation in hepatic bile acid transport
University of Massachusetts Amherst	Jesse Mager	Functional assessment of epigenetic regulatory genes in vivo
University of Massachusetts Lowell	Xingwei Wang	Miniature label-free biosensing probes for rapid detection of virus, bacteria, and cells
Whitehead Institute for Biomedical Research	Iain Cheeseman	A molecular toolkit for analysis of the human kinetochore

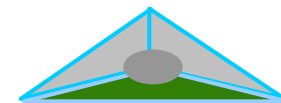


# FY 09 Investment Fund Programs

## (Matching Research Grants: New Investigator Grants Round 2)

**The 10 Round 2 New Investigator Grants total over \$2 million.**

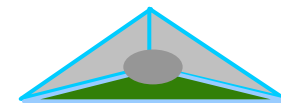
Institution	Researcher	Title of Research
Boston University Medical Center	Dr. Christopher Gabel	The study of neural regeneration in C. Elegans using femtosecond laser surgery and advanced optical neurophysiology
Brandeis University	Dr. Satoshi Yashida	How cells respond to stress
Harvard College	Dr. Briana Burton	Mechanisms of nucleic acid transport across membranes
Harvard College	Dr. Tobias Ritter	New pharmaceuticals and diagnostics by late-stage fluorination
Harvard School of Public Health	Dr. Matthias Marti	Establishment of a high throughput screen focused on preventing the development of gametocytes, the form of malaria that mediates transmission



# FY 09 Investment Fund Programs

## Matching Research Grants: New Investigator Grants Round 2 (Cont'd)

Institution	Researcher	Title of Research
Immune Disease Institute, Children's Hospital	Dr. Sun Hur	Structural and kinetic investigations of the mechanism for self vs non-self RNA discrimination by RIG-I
Massachusetts Eye and Ear Infirmary	Dr. Konstantina Stankovic	Functional role and therapeutic implications of osteoprotegerin secretion by the auditory nerve
Massachusetts General Hospital	Dr. Raul Mostolovsky	The chromatin factor SIRT6 is a master regulator of glucose homeostasis
Northeastern University	Dr. Mark Niedre	Optical tomographic sensing and enumeration of rare circulating cells in vivo
University of Massachusetts Medical School	Dr. Jeffrey Bailey	Dissecting the role of human copy number variation in severe malaria

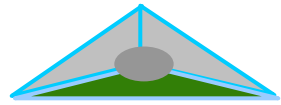


# FY '09 Investment Fund Programs

## Matching Research Grants: Faculty Startup Grants

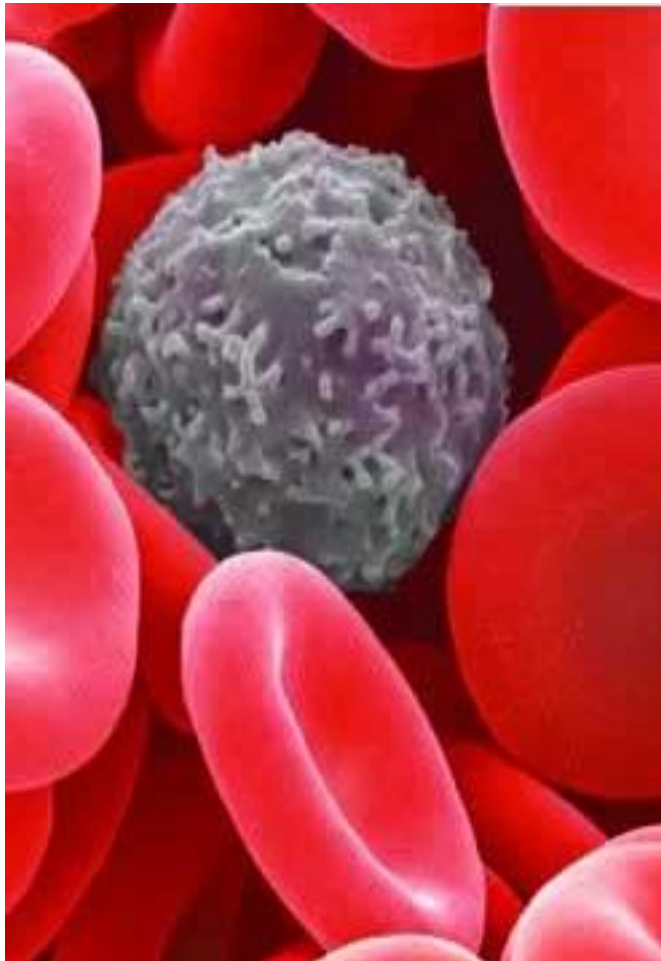
The New Faculty Startup Grants enable Massachusetts' colleges and universities to attract and retain nationally prominent faculty. **The MLSC awarded five grants totaling \$3.5 million.**

Institution	Expertise Sought	New Faculty
Boston University	Systems biology and infectious diseases	Dr. James Galagan
Brandeis University	In vivo imaging of brain function	TBA
University of Massachusetts Amherst	Systems biology	TBA
University of Massachusetts Boston	Biomedical Sciences	TBA
University of Massachusetts Lowell	Biomanufacturing science and engineering	TBA



# Investment Fund Programs

## Stem Cell Research



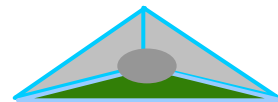
**2008:** The Center invests \$570,000 in the International Stem Cell Registry and \$7.7 million in the affiliated Massachusetts Stem Cell Bank

- The ISCR is a joint initiative between the Center and the University of Massachusetts Medical School.
- The Bank maintains and provides stem cell lines to the research community.

**2009:** The Obama Administration lifts federal restrictions on embryonic stem cell research

The Center's Board of Directors approves \$695,000 in continued funding for the ISCR.

The Center's stem cell investments **help position Massachusetts to compete for new federal research dollars** and provide stem cell lines to national and international academic and commercial organizations.



# Investment Fund Programs

## Investments in Workforce Development



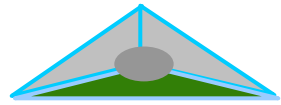
**September 2008: The Life Sciences Talent Initiative (LSTI) report, *Growing Talent*, was released jointly by the Center and the Massachusetts Biotechnology Council.**

**December 2008: The Center convenes an Education and Workforce Development Roundtable with broad participation from public and private academic institutions and industry.**

**October 2009: The Center hosts a breakfast to introduce the life sciences community to Year Up, a nonprofit working to close the opportunity divide by providing urban young adults with the skills, experience and support that lead to successful careers.**

# Investment Fund Programs

## Investments in Workforce Development – Life Sciences Internship Challenge



February 2009: MLSC Board approves the Life Sciences Internship Challenge, a workforce development initiative that provided Summer 2009 internships for **104 undergraduates majoring in Science, Technology, Engineering or Mathematics (STEM)**.

- Over 500 students applied for the program
- The Center covered stipends for participating interns -- \$4,800 for eight weeks of work
- 104 interns were placed at 59 life sciences companies and research institutions across the state.
- Interns gained practical experience in industry and academic settings
- More than 20 of the interns were offered full or part-time jobs at the conclusion of their internships.



*Photo courtesy of Bay State Banner/Sandra Larson*

**January 2010: MLSC Board approves second year of expanded Internship Challenge. Learn more or apply now at [www.masslifesciences.com](http://www.masslifesciences.com)!**

# Attracting Companies to Massachusetts

**May 2008: RainDance Technologies CEO Chris McNary moves 50-person operation from Connecticut to Lexington, Massachusetts.**



**October 2009: Italian amniotic stem cell company Biocell Center opens their North American Headquarters in Medford, Massachusetts.**



**December 2009: UK medical device company Systagenix opens their headquarters for the Americas in Quincy, Massachusetts.**



**December 2009: French biotech company CYTOO Cell Architects open U.S. Subsidiary headquartered in Framingham, Massachusetts.**



**Company officials cite the Life Sciences Initiative, our talented workforce, and proximity to leading research institutions as among their reasons for choosing Massachusetts.**

## Keeping in Touch

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[www.masslifesciences.com](http://www.masslifesciences.com)

- News updates
- Program Information
- Application portal

## Life Sciences Center Email List

- 1,800 recipients
- Quarterly E-Newsletter
- Sign up today!