

MASSACHUSETTS
LIFE SCIENCES
CENTER

Fiscal Year (FY) 2012 Annual Report

OUTPACING THE COMPETITION





To: Governor Deval Patrick
Secretary of Administration and Finance Jay Gonzalez
Senate President Therese Murray
Speaker of the House Robert DeLeo
State Comptroller Martin Benison
Clerk of the Senate William Welch
Clerk of the House of Representatives Steven James

By forward: House and Senate Committees on Ways and Means and the Joint Committee on Economic Development and Emerging Technologies

From: Susan Windham-Bannister, Ph.D.

Date: September 28, 2012

Re: FY 2012 Annual Report of the Massachusetts Life Sciences Center

The Massachusetts Life Sciences Center (the "Center") respectfully submits this Annual Report detailing our operations and accomplishments during FY 2012.

We are the hub of the Commonwealth's thriving life sciences community and proudly serve as stewards of the \$1 billion Massachusetts Life Sciences Initiative, which was passed by the state legislature and signed into law in June 2008. In FY 2012, through investments made by the Center, Massachusetts pulled away from its major competitors and emerged as the undisputed global leader in the life sciences.

This report and the accompanying FY 2012 Audit Report are submitted in fulfillment of the requirements mandated by the General Court pursuant to the Center's enabling statute of the Massachusetts General Laws, Chapter 23I (formerly Section 7, now Section 15), as amended by Chapter 130 of the Acts of 2008. Financial statements are contained in the accompanying FY 2012 Audit Report by PricewaterhouseCoopers.

As always, we appreciate your continued interest and support.

Sincerely,

A handwritten signature in blue ink that reads "Susan Windham-Bannister".

Susan Windham-Bannister, Ph.D.
President & CEO

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Outpacing the Competition

Four years ago, Massachusetts was a recognized leader in the life sciences, but the state faced stiff competition, both domestic and international. Inaction would have diminished our leadership position – with negative repercussions for the state’s scientific reputation as well as our economy.

At the 2007 BIO International Convention, Governor Deval Patrick proposed the Massachusetts Life Science Initiative, a 10-year, \$1 billion investment to secure and strengthen the state’s leadership in the life sciences, and to bolster the life sciences as an economic engine for the Commonwealth. This initiative was passed by our State Legislature and signed into law in June 2008.

The Center is charged with implementing the Life Sciences Initiative. The Center’s strategic priorities include funding translational life sciences research, making financial investments in promising new technologies, ensuring that the next generation of life sciences workers has skills that are well-aligned with industry needs, and building unique partnerships between sectors of the local and international life sciences communities. Since 2008, we have not only been investing in innovation, we have been innovating – creating new programs, tools and partnerships that create jobs, drive business growth and accelerate the commercialization of good science that holds the potential to improve the human condition.



President & CEO
Dr. Susan Windham-Bannister

Since the enactment of the Initiative in 2008, the Center has made numerous investments that have secured and strengthened Massachusetts’ leadership in the life sciences. The Commonwealth has pulled ahead of the competition – Massachusetts is now **the** recognized life sciences leader in the U.S. and across the globe. This past December, independent studies once again rated Massachusetts number one for life sciences in the U.S. by a wide margin (Jones, Lang, Lasalle, 2011) and the number-one region for biotech construction (Richards, Barry, Joyce, 2011).

The Bottom Line

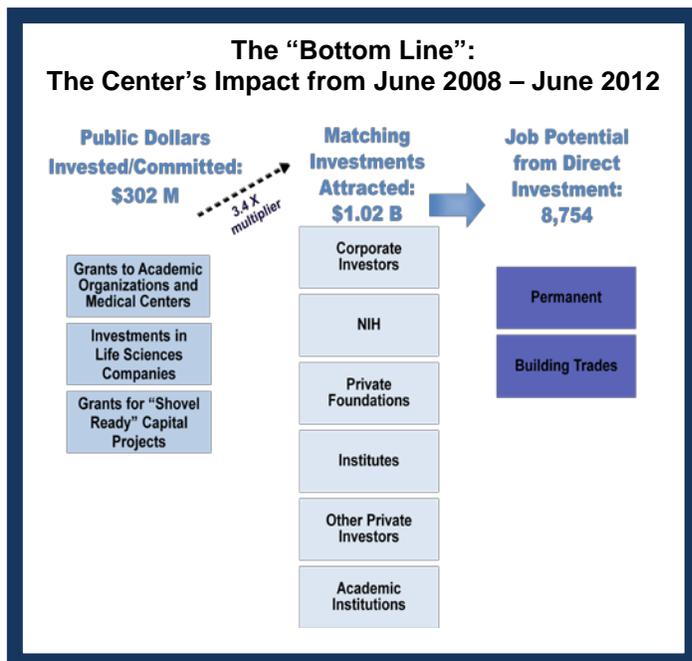
The Center’s investment strategy is based on public-private collaboration to leverage public tax dollars. This strategy has proven effective; since 2008, the Center has directly invested or committed more than \$300 million and leveraged more than \$1 billion in third-party investment. In other words, for every \$1 of taxpayer money that the Center has invested, Massachusetts has attracted \$3.40 in additional, outside investment – creating a public-private investment fund of more than \$1.3 billion for the state’s life sciences ecosystem that would not have existed without the Life Sciences Initiative.

For every \$1 of taxpayer money that the Center has invested, Massachusetts has attracted \$3.40 in additional, outside investment.

The Center uses a portfolio of tools and investments to achieve its goals and objectives. To ensure that all investments are evaluated on the basis of merit and “relative best use” of the Commonwealth’s funds, the Center makes its awards based on competitive solicitations and a rigorous, transparent review process that draws on experts from the life sciences sectors across the state. The broad expertise that informs the Center’s decisions has enabled us to make smart, strategic investments that attract matching investment capital and highly leverage the public dollars that have been entrusted to the Center.

The Center's direct investments to date are projected to create thousands of jobs across Massachusetts. According to MassBio's "2012 Biopharma Industry Snapshot," biopharma employment has grown 42

percent in Massachusetts since 2002, and the new jobs being created are not only for scientists. Most of these new jobs are for people with skills in manufacturing, IT, sales and marketing, and other fields. A large percentage of the available jobs are open to workers with a Bachelor's degree or less.



Furthermore, the Center's investments are made with the goals of improving health-care quality for and reducing the health-care costs of patients. A substantial portion of our portfolio represents investments both in translational research with strong potential for commercialization and in companies that are bringing new products to the marketplace.

During these challenging economic times, the Center is proud to play such a prominent role in Massachusetts' economic recovery.

Investment Portfolio

The Center's investments in FY 2012 included six new capital projects, grants or loans to nine early-stage companies and tax incentive awards to 26 companies.

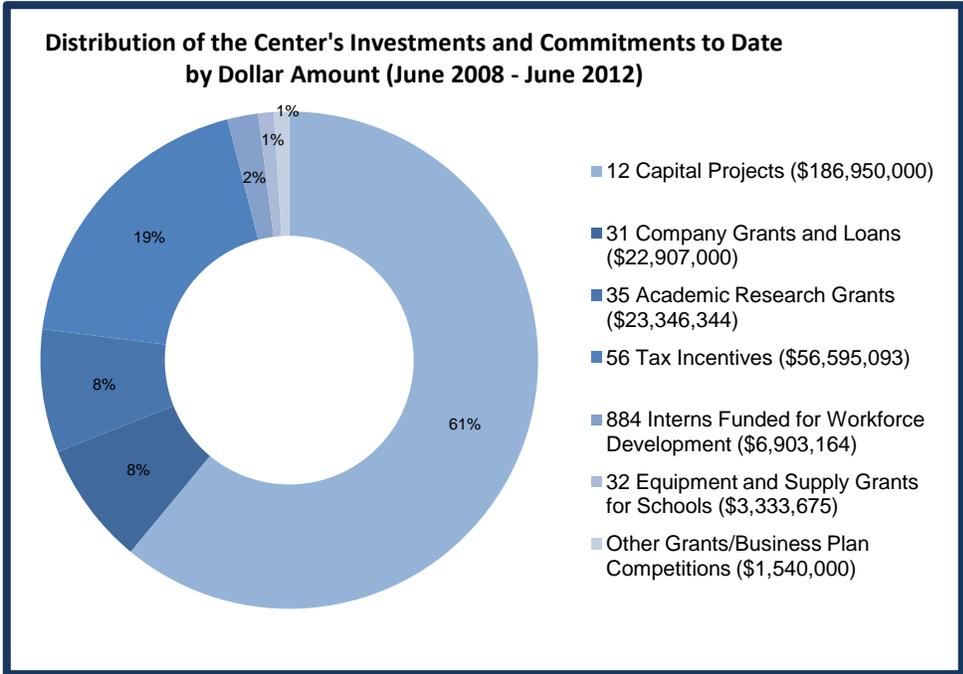
In FY 2012, more than 1,600 students applied for the Life Sciences Internship Challenge, and the Center placed 405 interns at 203 companies across Massachusetts. The Internship Challenge is now in its fourth year of investing in the next generation of talented life sciences workers in Massachusetts.

FY 2012 was also a strong year for company recruitment to Massachusetts. Motivated by the Center's tax incentives and investments in the state's life sciences ecosystem, several global life sciences leaders significantly expanded their presence in the state. The Center welcomed companies, large and small, to the Massachusetts life sciences community, helping to organize their ribbon-cutting events and collaborating on their press announcements.

The Center plays an important role as a convener across the life sciences industry at the global, national and state levels. One manifestation of these efforts is the creation of the Massachusetts Neuroscience Consortium ("the Consortium"). This pioneering model for supporting pre-clinical research, announced at the 2012 BIO International Convention, is designed to leverage the rich research environment in Massachusetts and build on the Commonwealth's status as a global leader in neuroscience. Charter sponsors of the Consortium are Abbott, Biogen Idec, EMD Serono, Janssen Research & Development LLC, Merck, Pfizer and Sunovion Pharmaceuticals Inc. The Consortium announced its first solicitation for research projects in September of 2012.

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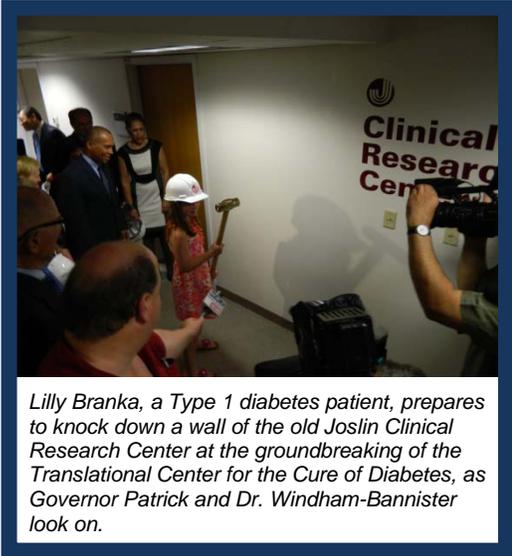
Concluding a great fiscal year, in June the Center co-hosted with MassBio Massachusetts' presence at the 2012 BIO International Convention in Boston. This convention was a landmark opportunity to showcase the accomplishments in Massachusetts since the inception of the Life Sciences Initiative and all that Massachusetts has to offer as the global leader in the life sciences.

Investing in Infrastructure

Massachusetts has demonstrated its commitment to the life sciences community through investments in infrastructure to accelerate promising science as well as to create a business-friendly environment. Half of the resources, \$500 million, committed via the Life Sciences Initiative are dedicated to capital projects designed to ensure that more institutions and regions of the state have the necessary infrastructure to be "life-sciences ready." The Center's investments in infrastructure are funded through our capital fund, which received \$43.5 million in bonding capacity in FY 2012 as part of the state's overall capital plan. Grants from the Center not only make possible the creation of the cutting-edge infrastructure needed for scientific advancement but also support basic infrastructure upgrades that often are needed for biomanufacturing and company expansion. Additionally, the Center is committed to funding the development of novel resources that companies and researchers will be able to find only in Massachusetts.

The Center's Board of Directors approved six new infrastructure projects in FY 2012, totaling \$56 million:

- Joslin Diabetes Center** was awarded \$5 million to support the construction of its comprehensive **Translational Center for the Cure of Diabetes**. According to Joslin officials, the Center's grant is the largest single grant ever awarded to support diabetes-related research in Massachusetts. This new facility will enable the Joslin Diabetes Center to accelerate its clinical and research endeavors through the creation of cutting-edge labs and platforms. The work at this new facility will lead to the development of translational studies for curing Type 1 and Type 2 diabetes and their complications, as well as to the advancement of



Lilly Branka, a Type 1 diabetes patient, prepares to knock down a wall of the old Joslin Clinical Research Center at the groundbreaking of the Translational Center for the Cure of Diabetes, as Governor Patrick and Dr. Windham-Bannister look on.

Joslin's work in diabetes prevention and obesity. Joslin will renovate nearly 20,000 square feet of space, and the project is projected to create approximately 50 construction jobs beginning in FY 2013 and approximately 50 new permanent jobs in the life sciences. At the 2012 BIO International Convention, the biopharma giant, Sanofi, and the Joslin Diabetes Center announced a new collaboration to promote the development of medicines for the treatment of diabetes and related disorders. The creation of Joslin's new Translational Center will enable this partnership.

Over the past four fiscal years, the Center has committed \$187 million to 12 capital projects, which have so far created more than 2,000 jobs in the building trades and 425 permanent jobs in the life sciences.

- **Dana-Farber Cancer Institute** was awarded \$10 million to support the expansion of its Molecular Cancer Imaging Facility, a pioneering \$20-million research initiative to develop new molecular imaging probes. The facility will ultimately allow physicians to better diagnose and characterize cancer, choose targeted therapies, monitor treatment efficacy and improve the outcomes of patients with cancer. This project is expected to create 100 construction jobs and 15 permanent positions in the facility.
- The **Boston Museum of Science** was awarded \$5 million for the construction of its "Hall of Human Life." Envisioned as one of the museum's largest and most far-reaching exhibits, the "Hall of Human Life," opening in July of 2013, aims to revolutionize the way people understand their own biology and manage their health. Designed to evolve with the increasing number of breakthroughs in biology and biotechnology, this 10,000 square-foot exhibit will spark visitors' curiosity about innovations in the life sciences, address their concerns about health care and help them develop the thinking skills needed to make informed choices. The Center's grant has leveraged \$11 million in project funding from other sources, and the project is expected to create 75 jobs in the construction trades and 20 permanent new jobs at the museum.
- **UMass Dartmouth** was awarded \$14.6 million to build its new Massachusetts Biomanufacturing Center in Fall River. Designed to accelerate the development of the life sciences industry in the region, the 32,000 square-foot building will provide emerging companies with a place to prove the feasibility of their products to investors and will feature R&D laboratories and educational space. The new facility will anchor the recently established Fall River Biopark. This \$28-million project is expected to create 120 construction jobs, 10 permanent positions and additional jobs within the biomanufacturing industry.

The Center's infrastructure investments have contributed to the creation of more than one million square feet of new life sciences research and manufacturing space across the Commonwealth.

- **UMass Lowell** was awarded \$10 million to equip laboratories within its new Emerging Technologies and Innovation Center. The 84,000 square-foot facility builds on UMass Lowell's unique expertise in plastics engineering, nanotechnology, bioprocessing, electro-optics and advanced manufacturing. The grant will fund research facilities at the new center, providing the university and companies access to clean-room capabilities that are unparalleled in this region of the Commonwealth and a state-of-the-art lab focused on developing new medical applications and other capabilities tied to nano, bio-optics and other technologies. This \$70-million project is expected to create 100 construction jobs.
- **UMass Dartmouth** was awarded \$11.4 million to purchase the land and finance improvements, previously funded by Massachusetts Development Finance Agency, needed to establish the Advanced Technology Manufacturing Center (ATMC). This facility is designed to leverage university resources for regional economic development on the South Coast. The ATMC engages in research and works with industry partners to provide opportunities for technology exchange, while providing educational opportunities for students, and research and commercialization opportunities for faculty. The facility also includes a Technology Venture Center that incubates early-stage companies. The Center's funding has allowed UMass

Dartmouth to accelerate its investment in campus labs by approximately five-to-eight years through the investment of \$13.2 million in internal funds.

Three of the six aforementioned projects – the Dana-Farber Cancer Institute, Joslin Diabetes Center and the Museum of Science – were funded through the Center’s first-ever Capital Project Matching Grant solicitation. The Center received 22 applications for infrastructure projects from across the state through this program. In FY 2013, the Capital Project Matching Grant program will make \$40 million available for life-sciences-related capital projects around the state.

Over the past four fiscal years, the Center has committed \$187 million to 12 capital projects, which have thus far created more than 2,000 jobs in the building trades and 425 permanent jobs in the life sciences, with many more jobs projected as the projects are completed and the facilities become operational:

Investments in Infrastructure			
Project	Award Amount	Year of Award	Status at End of FY 2012
Framingham Wastewater and Pumping Station	\$14.3 million	FY 2009	Substantial completion and under-budget
Marine Biological Laboratory in Woods Hole	\$10 million	FY 2009	Project completed in FY 2010
Tufts/Cummings School of Veterinary Medicine, NE Regional Biosafety Lab in Grafton	\$9.5 million	FY 2009	Project completed in FY 2010
Albert Sherman Center at UMass Medical School	\$90 million	FY 2010	Project to be completed in Winter 2013
Worcester Polytechnic Institute/Gateway Park	\$5.15 million	FY 2010	Project construction well underway
UMass Boston/Dana Farber Center for Personalized Cancer Therapy	\$2 million	FY 2011	Project construction to begin in FY 2013
UMass Dartmouth Biomanufacturing Center	\$14.6 million	FY 2012	Project underway
Dana Farber Molecular Cancer Imaging Center	\$10 million	FY 2012	Project underway
Joslin Translational Center for the Cure of Diabetes	\$5 million	FY 2012	Project underway
Museum of Science “Hall of Human Life”	\$5 million	FY 2012	Project underway
UMass Lowell Emerging Technologies and Innovation Center	\$10 million	FY 2012	Project underway
UMass Dartmouth Advanced Technology Manufacturing Center (ATMC)	\$11.4 million	FY 2012	Project authorized for FY 2015

The Center’s infrastructure investments have contributed to the creation of more than one *million* square feet of new life sciences research and manufacturing space across the Commonwealth.

Incubating the Companies of the Future

Accelerating the Growth of Early-Stage Companies

From the Accelerator program's inception through the end of FY 2012, the Center has funded or committed to a total of \$11.2 million in Accelerator Loans.

In FY 2012, the Center continued its commitment to building the pipeline of new life sciences companies in Massachusetts by committing to a total of \$3.1 million in Accelerator Loans to six early-stage companies. The Center's Accelerator Loan program provides working capital to early-stage life sciences companies at a critical stage in their development. This program seeks to de-risk these companies for future – usually private -- investors by funding the necessary steps to achieve critical milestones. Some of these companies may hold the promise of becoming the next Vertex or Boston Scientific, while others may be acquired by large companies that are increasingly depending on the creativity of entrepreneurs to find the next promising technology. These young companies help to create an exciting environment in Massachusetts for life sciences entrepreneurs. They also make Massachusetts a fertile environment for mature life sciences companies, whose business models are increasingly reliant on “external innovation.”

During FY 2012, the Center expanded the Accelerator program from one round per year to two, with the goals of reaching more prospective applicants and reducing the “wait time” for companies that miss the deadline on a particular round of the program. Over the past year, the Center received a total of 67 applications, of which 63 were eligible for review by experts selected from among the Center's 200-plus *pro bono* volunteer peer reviewers. The Center's peer reviewers recommended 33 of these applicants for review by the Center's Scientific Advisory Board (SAB – see Appendix B). Eight companies were recommended by the Investment Subcommittee of the Center's Board of Directors (“the Board” – see Appendix A), approved by the Board and designated by the Center as certified life sciences companies, as required by the Life Sciences Act. However, one company exited the program prior to receiving an award because it was acquired by a larger company. Another one of the eight recommended companies became ineligible because of a change in its strategic direction. The Center committed to a total of six loans during FY 2012, as indicated below:

To date, Accelerator companies have raised more than \$100 million in funding subsequent to receiving a loan from the Center.

Accelerator Loans in FY 2012			
Company	Location	Area of Development	Loan Amount
Allurion	Wellesley	Developing a novel medical device designed to induce significant weight loss by displacing volume in the stomach	\$750,000
Alcyone Lifesciences, Inc.	Ayer	Developing novel micro-catheter approach for treating neurological conditions	\$750,000
Christcot Medical	Sudbury	Developing an innovative and unique device for rectal medication delivery to enhance the lives of patients with chronic diseases	\$257,000
HepatoChem	Beverly	Developing difficult-to-synthesize small molecules based on chemical reactions allowed by porphyrins and other catalysts	\$330,000
Sample6 Technologies	Boston	Building the world's first “near-real-time” microbial monitoring system with first application in food safety	\$750,000
Strohl Medical	Weymouth	Creating a new medical device for triaging potential stroke patients to accelerate their time to treatment	\$245,000

From the Accelerator program's inception through the end of FY 2012, the Center has funded or committed to a total of \$11.2 million in Accelerator Loans.

In FY 2012, two companies repaid Accelerator Loans with interest early, after achieving significant success in private fundraising or the sale of the company. As of the close of FY 2012, a total of four companies have pre-paid their loans: two in FY 2012 and two in prior fiscal years.



Pluomed, recipient of an Accelerator Loan in 2009, repaid its loan in FY 2012 after being acquired by Sanofi. Pluomed's product, a new and simple device for clampless vascular and cardiovascular surgery, will now be marketed globally by Sanofi's Biosurgery Division. In addition, 4s3 Bioscience, recipient of an Accelerator Loan in 2010, prepaid its Accelerator loan after raising \$20 million in private financing. To date, Accelerator companies have raised more than \$100 million in funding subsequent to receiving a loan from the Center.

Support for Small Businesses



The Small Business Matching Grant (SBMG) program builds on federal investments Massachusetts companies have received through grants from the National Institutes of Health (NIH), the National Science Foundation (NSF) and the Department of Defense (DOD). One of the goals of this program is to create jobs in Massachusetts based on the commercialization of products with high potential for market adoption and penetration.

In FY 2012, 19 small businesses applied for the SBMG program. The Center awarded a \$500,000 SBMG grant to Firefly Bioworks, Inc., based in Cambridge, after extensive review by the Center's peer reviewers, the SAB and the Board. Per statute, companies receiving a SBMG award are not required to be certified.

Firefly BioWorks, Inc.'s first product was recently launched and is designed to detect microRNAs, an emerging class of biomarkers that has shown great promise in the diagnosis of cancer, neurological disorders and many other diseases. This product consists of a high-performance, universal technology platform for multiplexed biomarker detection, with applications in life sciences research and diagnostics. The platform enables detection of clinically relevant biomolecules with an unprecedented combination of performance, throughput and cost.

Small Business Matching Grants in FY 2012			
Company	Location	Area of Development	Amount Awarded
Firefly Bioworks, Inc.	Cambridge	High-performance, universal technology platform for multiplexed biomarker detection for life sciences research and diagnostics	\$500,000

From the time of the SBMG program's inception through the close of FY 2012, the Center has awarded \$4 million to eight companies. To date, SBMG awardees have raised more than \$20 million from other grants, investments or sale of the company.

Also, the Center supported entrepreneurship and company creation by co-sponsoring two important business plan competitions in FY 2012: MassChallenge received a \$100,000 contribution, and the WPI Venture Forum received a \$10,000 contribution for its annual business plan competition.

From the time of the SBMG program's inception through the close of FY 2012, the Center has awarded \$4 million to eight companies. To date, SBMG awardees have raised more than \$20 million from other grants, investments or sale of the company.

From Bench to Bedside: Academic Research Matching Grant Programs

The promise offered by innovation begins with "discovery," usually in an academic setting. Thus, the Center's key priorities are to preserve the strong competitive position of Massachusetts' academic institutions and medical centers, support translational research in the life sciences, and accelerate the discovery and transfer of technology out of academic settings. To accomplish these objectives, the Center has created several research matching grant programs. During FY 2012, 19 of the 34 grants awarded through these programs concluded, and most of the remaining grants will conclude by December 31, 2012.

New Investigator Research Matching Grants

The New Investigator Research Matching Grant program is designed to spur innovative research and advance the careers of new investigators working in the life sciences at research institutions in the Commonwealth. To date, the Center has awarded 21 grants, totaling \$5.1 million to early-career investigators.

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As of September 2012, 62 percent of the Center's New Investigators (13 of 21) have leveraged their grants from the Center with awards of follow-on funding from other sources (i.e. federal agencies, private foundations, academic institutions, etc.). The Center's investment in these 13 investigators totaled \$3.25 million. Since being awarded the Center's New Investigator Grant, these 13 investigators have won at least 28 additional research awards and grants from other sources, totaling over \$13 million — leverage of 4-times the Center's initial investment.

The New Investigator Grants have also enabled the awardees to advance science. Ninety percent of the Center's New Investigators (19 of 21) have published articles based on the projects funded by the Center. These 19 grantees have published a combined total of 80-plus articles in more than 50 scientific, peer-reviewed journals, including the following:

Advanced Materials
Cell
EMBO Journal
Gastroenterology
Genes & Development
Journal of Cell Biology
Journal of Bacteriology
Journal of Infectious Diseases
Lab on a Chip

Nature
Nature Biotechnology
Nature Materials
New England Journal of Medicine
Optics Express
PLoS One
Proceedings of the National Academy of Sciences (PNAS)
Science

These publications include top-tier journals – the most prestigious, high-impact publications in the life sciences, such as *Nature*, *Science* and *Cell*.

The case study below provides an illustrative example of the scientific impact enabled by the New Investigator Grants:

Case Study: Dr. Matthias Marti

A \$200,000 New Investigator Grant was awarded to Harvard School of Public Health's Dr. Matthias Marti in 2009 to establish a high throughput screen focused on preventing the development of gametocytes, which mediate transmission of malaria. No current drugs target the sexual part of the parasite's lifecycle and the therapeutic value of these drugs is decreasing.

- **2010**
 - Generated a fluorescent-reporter parasite line.
 - Established , optimized, and validated screen assay in 96-well format, using known bioactive malaria compounds.
- **2011**
 - Performed small-scale screen targeting a pathway that had been implicated in sexual-conversion of malarial parasites. This standardized screen addressed conflicting evidence in the literature regarding the role of pathway components in malaria.
- **Current**
 - Pursuing additional small-scale screens with collaborators targeting other pathways
 - Developing a new screening assay with higher throughput and increased sensitivity.

Dr. Marti's work is creating a screening assay that has the potential to identify the next generation of malaria drug candidates.

Cooperative Research Grants

The Center's Cooperative Research Grants encourage industry-sponsored research at Massachusetts academic institutions and accelerate translational research. Between 2008 and 2011, the Center has awarded eight grants, totaling \$4.78 million.

As of September 2012, two of the eight, or one quarter, of the Cooperative Research Grants' academic

researchers have leveraged their grants from the Center with follow-on funding. The Center's investment in these two investigators totals \$1.35 million. These two investigators have won three additional research grants from other sources, totaling more than \$8.6 million — leverage of approximately 6.4 times the Center's investment. Moreover, one investigator has received follow-on funding from the project's industry partner to continue his translational research project.

Four of the eight, or half, of the Cooperative Research investigators have published articles based on the work conducted through their cooperative research projects funded by the Center. These grantees have published a combined total of at least 10 articles that have been presented in six scientific journals. Moreover, through their sponsored research projects, of the eight investigators, one has been granted a full U.S. patent, and another has filed a U.S. provisional patent application and international PCT provisional patent application.

The case study below provides an illustrative example of the scientific impact of the Cooperative Research Grants:

Case Study: Baxter Healthcare and the Immune Disease Institute

A \$750,000 Cooperative Research Matching Grant was awarded to the Immune Disease Institute's Dr. Judy Lieberman in 2008 (matched by Baxter Healthcare) to develop an siRNA-based microbicide for viruses, such as herpes, HPV, and HIV.

- **2009:**
 - Improved siRNA's effectiveness and targeting for multiple species, including human
 - Optimized conditions for formulation of siRNA-based microbicide
 - Developed an human *ex vivo* system for testing infection and siRNA-based microbicide
- **2010:**
 - Optimized conditions for formulation of siRNA-based microbicide
 - Optimized methods for human *ex vivo* system
 - **Awarded 5-year grant from NIAID of NIH based in part on these studies**
- **2011:**
 - Assessed optimized siRNA-based microbicide's effectiveness against herpes virus in mice, and characterized the mechanism by which protection was achieved
 - Published on siRNA-conferred protection from HIV infection in mouse and *ex vivo* human studies
- **2012:**
 - US Patent granted for "siRNA microbicides for preventing and treating diseases"
 - Characterized HIV-targeted siRNA efficiency and protection from infection in humanized mice and human explants

Developing the Next Generation of Life Sciences Leaders

The Internship Challenge Program

The Internship Challenge is a workforce development program focused on enhancing the talent pipeline for life sciences companies in Massachusetts while simultaneously providing interns with practical, "hands-on" experience that prepares them to step into the workforce ready to meet the job requirements of life

Since the program first launched in 2009, 884 interns representing 124 different colleges and universities, have been placed at 290 companies across the state.

sciences employers. The program provides paid internships to sophomores, juniors and seniors; community college students; graduate students; and recent college graduates. Since the program first launched in 2009, 884 interns representing 124 different colleges and universities have been placed at 290 companies across the state.

In this program, host companies commit to providing a dedicated mentor and a meaningful internship opportunity related to the academic focus of eligible students. The Center uses a web-based interface to connect student candidates and the host companies; there, students post resumes, and host companies can match skills with their needs. Host companies then contact and interview candidates, select interns for their programs and notify the Center of their desire to provide an internship to a qualified student.



On August 30, 2012, SouthCoast participants in the Massachusetts Life Sciences Center's Internship Challenge gathered at UMass Dartmouth's Advanced Technology and Manufacturing Center to present on their summer internship experiences.

The Internship Challenge is designed to expand the pool of prospective employees who have practical experience, enhance opportunities for mentoring, enable more students to explore career opportunities despite the challenging economic environment, and provide students interested in working in the life sciences with a peer network through educational and informational exchange events. The Center's interns usually work in smaller and younger companies, so they also receive exposure to the dynamic environment of entrepreneurship.

The Internship Challenge is also a human-capital subsidy program for small and early-stage companies. The Center only reimburses student stipends for companies with 100 or fewer employees. Life sciences companies with more than 100 employees and research institutions can recruit students from the Center's database,

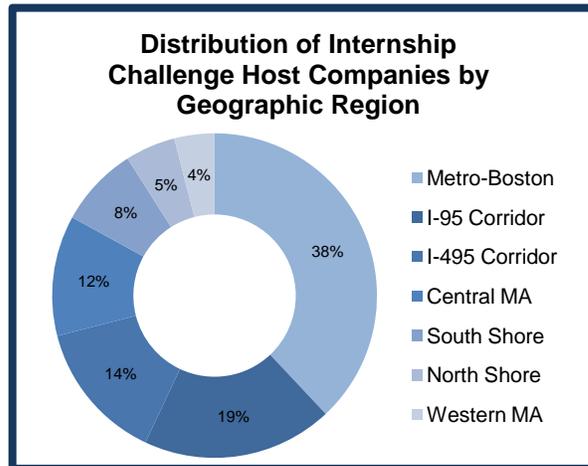
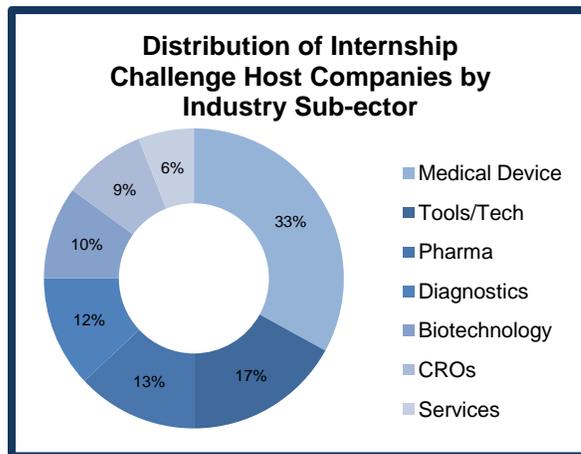
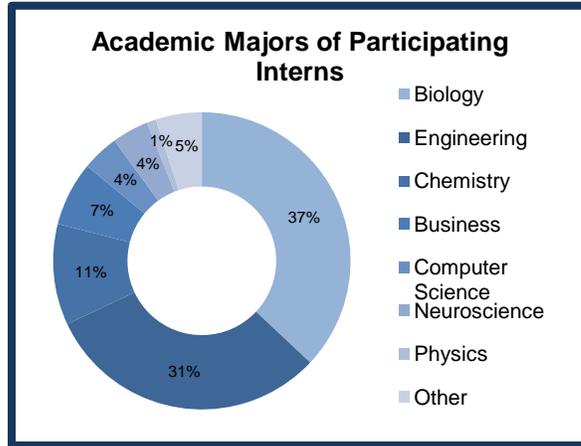
but do not receive reimbursement for the interns that they hire. Host companies represent a broad spectrum of the life sciences industry, including pharmaceuticals, medical devices, biotechnology and contract research organizations.

Based on the success of the program, on May 25, 2011 the Center's Board of Directors authorized its expansion from a summer-only program to a year-round program, allowing greater flexibility for students and companies.

As a result, FY 2012 brought additional growth, funding and recognition for the Center's Internship Challenge program. More than 1,645 students submitted applications for review by 274 life sciences companies across Massachusetts. The program placed a total of 405 interns with 203 host companies, a substantial increase over prior years. (See Appendix C for a complete list of the FY 2012 Internship Challenge host companies.) Interns were demographically diverse and represented 79 different colleges and universities. Nearly all of the interns selected for the Internship Challenge were hired for a 12-week work period, with a maximum reimbursement from the Center of \$15 per hour, up to \$7,200 total per intern.

More than 1,645 students submitted applications for review by 274 life sciences companies across Massachusetts in FY 2012. The program placed a total of 405 interns with 203 host companies, a substantial increase over prior years. Interns were demographically diverse and represented 79 different colleges and universities.

The Center's Internship Challenge program is broadly inclusive, as the following data on participating interns and sponsoring companies illustrates:



Feedback about the Internship Challenge Program

The Center conducts a survey of both interns and sponsors at the conclusion of the internship period because we believe that the Internship Challenge participants themselves provide the best evidence of the program's value and impact.

Surveys of participating interns show that nearly 30 percent of the interns that were entering the workforce (recent graduates) found immediate full-time employment as a result of their internships. In most cases, these interns were hired by the company that hosted their respective internships.

Additional feedback from participants, both interns and host companies, is included below:

"Interning with NuOrtho Surgical has enhanced my understanding in both the marketing and financial fields. The opportunity to work with such upbeat and intuitive professionals has been an exceptional introduction to the business world. I feel as though I have already become a more confident and skilled individual thanks to the practical training this internship has provided."

– Tamer Plourd, UMass Dartmouth

"We are very pleased with the biology and analytical students that have worked with us. The program gives us the opportunity to hire talented students that we would otherwise not have access to. It's a win-win situation: We are extremely impressed with the contributions the students make, and it's great work experience for them."

– Shana Dobson, Operations Manager, Tetrphase Pharmaceuticals

"This summer internship has been much more than I expected. Working at a biotech start-up has opened my eyes to the great potential there is in the life sciences industry right here in Massachusetts."

– Juan Betanzo, Babson College

"We were fortunate to have two interns this past summer, [and one] has proven to be a great addition to our team and was recently promoted to a project engineer. All four of our engineers started as interns, two of them as part of the Internship Challenge. Their hard work and dedication contributed to a 30 percent growth in 2011."

– David Comeau, President, Albright Technologies

"Comprising of five full-time employees, the company at which I interned allowed me to thrive through regular contributions to several different projects and has introduced me to the intricacies of running a biopharmaceutical company. This experience has inspired me to pursue a career in the business sector of the biopharmaceutical industry."

– Renee McKell, Massachusetts Institute of Technology

The Skilled Careers in Life Sciences (SCILS) Initiative

In March of 2012, the Center competed for and received for the first time federal grant funding, with the funds going to supplement the Internship Challenge program. The Center will be receiving \$800,000 over the next four years as part of a \$5 million grant to the City of Boston from the U.S. Department of Labor intended to grow and maintain the area's life sciences workforce. The SCILS Initiative is being implemented in collaboration with the City of Boston's Department of Jobs and Community Services, as well as with the Metro North, Metro Southwest and South Coastal workforce regions. This program will serve more than 80 cities and towns in greater Boston.

The Center will be receiving \$800,000 over the next four years.



Boston Mayor Thomas Menino speaks at the SCILS Initiative announcement at Boston University.

Supporting STEM (Science, Technology, Engineering, and Math) Education and an Inclusive Workforce

The Center awarded grants totaling \$180,000 to four programs focused on STEM education and diversity in the life sciences workforce during FY 2012. The grants build upon the Patrick/Murray Administration's strategy for enhancing STEM educational opportunities across Massachusetts, and on the Center's commitment to ensuring an inclusive life sciences workforce. Dr. Windham-Bannister serves on the Governor's STEM Council.

The four organizations that received grants focus on different strategies for enhancing STEM education and diversity:

- **Women in Engineering, Science and Technology (WEST)** was awarded \$30,000. WEST is primarily focused on workforce development for women at all career stages in science and technology: students, early career, mid-career and executive. WEST's programs are designed to develop skills, build and expand professional relationships, and empower women to achieve full leadership potential. The purpose of the Center's grant was to expand WEST's offerings to regions of Massachusetts outside of Cambridge and Boston. The WEST organization is using the Center's funds to add 12 programs, targeting two main corridors – Route #128/Suburbs and Route #495/Worcester – and cities and towns along these corridors. These two corridors are home to more than 230 life sciences companies and 18 colleges.
- **The Urban Massachusetts Louis Stokes Alliance for Minority Participation (UMLSAMP) program at UMass Boston** was awarded \$50,000 to expand its offerings. The UMLSAMP program is a consortium of eight Massachusetts academic institutions of higher learning: UMass Boston, UMass Dartmouth, UMass Lowell, Wentworth Institute of Technology, and Bristol, Bunker Hill, Middlesex and Roxbury Community Colleges. The mission of the NSF UMLSAMP grant under which this consortium has operated for the last five years has been to establish best practices and innovative approaches to increase the number of STEM bachelor-degree graduates, especially those from underrepresented minority communities. The Center's funds will be used for the design, development and implementation of two undergraduate Biotechnology Research

The Center awarded grants totaling \$180,000 to four programs focused on STEM education and diversity in the life sciences workforce during FY 2012.

Skills Development workshops that will be delivered in April of 2012 for the Boston and New Bedford/Fall River metropolitan areas.

- Consistent with the Center's emphasis on promoting diversity in the life sciences workforce, the Center awarded a \$50,000 grant to the **Girl Scouts of Eastern Massachusetts (GSEM)** in November 2011 to support girls and their involvement in STEM education and careers. GSEM serves 178 communities composed of 41,000 girls ranging in age from five to 18 and more than 17,000 adult volunteers. One of every seven girls in eastern Massachusetts is a Girl Scout. In particular, this grant will fund a 10-week module in STEM within the FaB Factor program, which is an early intervention and prevention program for at-risk, low-income, inner-city girls ranging in age from five to 17 years old, designed to address the fact that women are underrepresented in the majority of STEM fields.
- **Search4STEM** was awarded \$50,000 that will be put toward creating a "one-stop" portal for STEM education – to connect teachers, educational leaders, businesses and other stakeholders with STEM programs, projects, products, initiatives, collaborations and services. Millions of dollars are appropriated every year for STEM initiatives throughout the nation, but existing STEM data warehouses, inventories and other resource lists are disconnected, disparate and difficult to use, and challenging to find. Search4STEM is an interactive, searchable "one-stop" portal for resource and knowledge exchange. The Center's funds will be used to develop the interactive web-based portal; fund the programming activities and technical consultant; and pay for materials and supplies.

The Center will continue to seek additional opportunities to expand access to STEM education and to ensure an inclusive life sciences workforce in the fiscal year ahead.

Investing in Industry and Job Creation

The Life Sciences Tax Incentive Program

In calendar year 2012, the Center awarded \$20.3 million in tax incentives to 26 life sciences companies under the Center's 2011 Life Sciences Tax Incentive program. The companies receiving tax incentive awards have committed to creating more than 900 new jobs in the Commonwealth during calendar year 2012.

The Life Sciences Act authorizes up to \$25 million in tax incentives each year for companies engaged in life sciences research and development, commercialization and manufacturing. The primary goal of the program is to incentivize life sciences companies to create new long-term jobs in Massachusetts. Companies receiving incentives must commit to the creation of a specific number of net new jobs during the following calendar year and also to the retention of those jobs for a five-year period.

The 2011 round of the program featured 10 different incentives, which address the significant capital expenditures associated with the life sciences R&D cycle and the high costs of translating research into commercially viable products. A total of 45 companies applied for tax incentives in 2011. Details of the 26 tax incentive awardees are below:

Tax Incentives Awarded Under the Center's 2011 Life Sciences Tax Incentive Program

Company	Location	Tax Incentive Amount Awarded	Jobs Committed
Aegerion Pharmaceuticals, Inc.	Cambridge	\$661,122	27
AVEO Pharmaceuticals, Inc.	Cambridge	\$2,301,683	94
Biogen Idec MA, Inc.	Weston	\$1,836,449	75
Blueprint Medicines Corporation	Cambridge	\$160,750	15
Boston Heart Diagnostics Corporation	Framingham	\$220,000	31
Cell Signaling Technology	Danvers	\$489,720	20
Courtagen Life Sciences, Inc.	Woburn	\$125,000	13
DePuy Orthopaedics, Inc.	Raynham	\$1,224,300	50
Ironwood Pharmaceuticals, Inc.	Cambridge	\$1,836,449	75
Knome, Inc.	Cambridge	\$49,000	12
LightLab Imaging, Inc.	Westford	\$636,636	26
Metamark Genetics, Inc.	Cambridge	\$269,346	11
Moderna Therapeutics, Inc.	Cambridge	\$138,270	13
Momenta Pharmaceuticals, Inc.	Cambridge	\$1,224,300	50
New England Biolabs, Inc.	Ipswich	\$244,860	10
NinePoint Medical, Inc.	Cambridge	\$313,483	15
Nova Biomedical Corporation	Waltham	\$244,860	10
Organogenesis, Inc.	Canton	\$857,010	35
PAREXEL International Corporation	Billerica	\$150,000	32
PerkinElmer, Inc.	Waltham	\$1,224,300	50
Pharmalucence, Inc.	Bedford	\$293,832	12
Quanterix Corporation	Cambridge	\$465,234	19
Ra Pharmaceuticals, Inc.	Cambridge	\$161,270	10
Shire HGT, Inc.	Lexington	\$3,000,000	100
T2 Biosystems, Inc.	Lexington	\$244,860	10
Vertex Pharmaceuticals	Cambridge	\$2,448,599	100

In FY 2012, Shire HGT, Inc., of Lexington received an additional \$3.5 million of tax incentives under an existing tax commitment by the Commonwealth.

The Center takes its stewardship of these resources seriously and has built in strong accountability measures to ensure that the program has “teeth.” The Center is carefully monitoring the performance of companies that have received tax incentives to ensure compliance with the tax incentive agreements they are required to execute with the Center. Headcount requirements must not only be met in the year following receipt of the award, but also maintained for the following five years. Under agreements by awardees, recipients of tax incentives are required to report job creation results to the Center by the end of the calendar year. Under the Life Sciences Act, the Department of Revenue has the authority to recover or “claw back” incentives from companies that the Center determines will not meet the minimum job creation threshold in their tax incentive agreement.

Through three rounds of the program, the Center has provided 86 awards to 71 companies at an aggregate amount of \$73.6 million. Ten awardees declined their awards due to changes in their business or general economic conditions. Eighteen awardees determined that they were unlikely to reach their job creation commitment under the statutory guidelines and opted to voluntarily terminate their agreements, either by foregoing taking the tax benefits at all or by returning the benefits to the Commonwealth if they had already received them. The Center decertified two awardees for not achieving the statutory thresholds. As of June 20, 2012, the Center had provided 56 active awards across all program years to 44 different companies. Eight active companies have received two or more active awards, illustrating their continued commitment to grow their headcount in the Commonwealth.

To date, the tax program has resulted in a combined net new hire commitment of more than 2,000 jobs among active awardees.

In FY 2012, awardees from the 2009 and 2010 tax programs were required to report their headcount as of December 31, 2011. As of December 31, 2011, reporting awardees from the 2009 and 2010 programs had hired or maintained 1,899 new employees, representing a 145 percent attainment of their commitment.

As of June 30, 2012 there were 30 active awards from the 2009 and 2010 program years, with a combined commitment of maintaining or fulfilling their 1,150 new hire commitment under the program. The 26 active awardees from the 2011 Tax Incentive program will provide their initial headcount reports – reflecting headcount as of December 31, 2012 – in January of 2013, as required under the program. The 2011 awardees have committed to creating an additional 915 jobs within the Commonwealth in calendar year 2012. To date, the tax program has resulted in a combined net new hire commitment of more than 2,000 jobs among active awardees.

Attracting Companies to Massachusetts

Massachusetts continues to be a magnet for growing companies, both domestic and international. The Commonwealth is a great place for life sciences companies to do business because it is home to cutting-edge research, a superior workforce, a vibrant investment community and a supportive environment for growth. The Center actively recruits new companies to the state through extensive marketing efforts and our portfolio of tools and programs, and supports the integration of these companies into our life sciences community.

FY 2012 was an active year for the Center -- we helped organize numerous grand openings and press announcements for new or expanding life sciences companies in Massachusetts:

- Thermo Fisher celebrated the opening of its new manufacturing facility in Tewksbury, a project that will bring approximately 100 new jobs to Massachusetts.
- Lieutenant Governor Murray helped to celebrate the grand opening of Forma Therapeutics' new headquarters in Watertown.
- Spanish life sciences company Progenika opened its expanded facilities in Medford.



- U.K.-based Xenetic announced plans to relocate its drug discovery operations to Massachusetts, a direct return on investment for the Governor's trade mission to the U.K., in which the Center participated.
- H3 Biomedicine, a start-up drug discovery company funded by Japan-based Eisai, located its facilities in Cambridge.

Other recent arrivals include Batavia Bioservices from the Netherlands, Izon from New Zealand, Ohio-based Navidea and California-based BioSurplus; these companies opened new facilities in Woburn, Cambridge, Andover and Boston, respectively.

In addition, U.K.-based IDBS celebrated a significant expansion in Burlington, including the designation of its Burlington office as the company's U.S. healthcare headquarters. Ipsen-Biomeasure, based in France, announced a \$45-million expansion of its facilities in Milford. Ipsen, Izon and IDBS all came as a direct result of a meeting that each company had with Governor Patrick at the BIO Convention in 2011. These companies continue to cite the Life Sciences Initiative, along with the state's talented workforce, world-class academic institutions and industry-leading companies, as their primary reasons for locating or expanding in Massachusetts.

Company officials cite Massachusetts' Life Sciences Initiative, talented workforce, and leading research institutions as important reasons for choosing the state. A sampling of companies that have expanded or located in Massachusetts over the past four years is shown below:



The Center continues to engage companies across the nation and around the world, in order to encourage them to invest and locate in Massachusetts. We anticipate many more announcements in FY 2013.

Building Partnerships

International Partnerships

The Center continues to solidify Massachusetts' global life sciences leadership. In 2012, we further expanded relationships with companies and governments around the world by cultivating important new relationships in Brazil as a result of the Governor's trade mission to this emerging life sciences leader.

Another significant international collaboration for the Center emerged through the Northern Ireland Massachusetts Connection (NIMAC): a new multi-national research study that will develop non-invasive procedures to detect pre-malignant lesions. An international contingent of academic and economic development officials representing Finland, Northern Ireland and Catalonia have also made commitments to be part of the study. The study, which is being supported by the Center with a \$300,000 grant, will look at samples from all of the participating regions and will also utilize the most effective, cutting-edge applications to analyze the data collected. The result will be to determine at-risk patients without unnecessary surgery.



Governor Patrick speaks at the MIIP announcement on June 19, 2012 at BIO.

At the 2011 BIO International Convention, Governor Patrick joined Avi Hasson, the Israeli Chief Scientist, the U.S.-Israel Science and Technology Foundation (USISTF), and three Massachusetts economic development agencies, including the Center, to announce a formal collaboration between the State of Israel and the Commonwealth of Massachusetts to encourage and support innovation and entrepreneurship between Massachusetts' and Israel's life sciences, clean energy and technology sectors.

During FY 2012, this partnership, known as the Massachusetts-Israel Innovation Partnership (MIIP), launched a joint solicitation seeking Industrial R&D collaborations between Massachusetts and Israeli companies. After an

eight-month process, Governor Patrick and Chief Scientist Hasson announced the award winners at the 2012 BIO International Convention in Boston.

The Center, along with the Massachusetts Technology Collaborative (MTC) and the Massachusetts Clean Energy Center (MassCEC), awarded a total of more than \$600,000 to fund four partnerships between Massachusetts and Israeli companies. The two projects awarded by the Center, for a total of \$300,000 in expected grant funding, are as follows:

MIIP Projects in Round 1			
Companies	Massachusetts Location	Project Description	Amount Awarded
Automated Medical Instruments (AMI) and STI Lasers (Israel)	Needham	Emerging medical device company developing new radio frequency energy-based approach to perform circumferential ablation of the pulmonary veins	\$116,000
SBH Sciences and Improdia (Israel)	Natick	Developing and planning to manufacture chronic inflammation-dependent immunosuppression prognostic kit using a novel biomarker, which predicts changes in patient's immune system response as an indicator of disease status	\$184,000

The Center also participated in Massachusetts Senate President Therese Murray's announcement at the 2012 BIO International Convention that the first-ever United States-European Union (U.S.-E.U.) Conference on Connected Health would be held not in Washington, D.C., but in Boston in October of 2012. The European Commission selected Massachusetts to hold this conference to further develop and implement the U.S.-E.U. Memorandum of Understanding on e-Health between the E.U. and the U.S. Department of Health and Human Services. Senate President Murray is hosting the E.U.; other states; and biotechnology, medical device and e-health companies from across the globe. This two-day event will include a business marketplace that will provide opportunities for companies, health care providers, research institutions and others from both sides of the Atlantic to encourage business relationships, research and collaboration.

Pursuing a Strategy for Biomanufacturing

The Center's priorities include making investments that strengthen Massachusetts' ability to compete for biomanufacturing jobs. In August of 2011, the Center provided a second \$50,000 grant to support the Massachusetts Biomanufacturing Roundtable ("the Roundtable"), a partnership between the Center and Massachusetts Institute of Technology's Industrial Performance Center to work with industry and academic biomanufacturing leaders and experts from across the state. The Roundtable is co-chaired by Eleven Biotherapeutics, Inc., CEO Abbie Celniker; Acceleron Pharma Senior Vice President of Manufacturing Bob Steininger; and former Pfizer Vice President Mickey Koplove.

Current priority areas include biomanufacturing technology innovation, workforce development and business development. To further these priorities, the Center worked with members of the Roundtable to host a panel at BIO 2012 on Massachusetts' leadership in biomanufacturing. In addition, the Center worked with the Roundtable to develop a brochure to showcase biomanufacturing innovation in Massachusetts, the global leadership role played by Massachusetts companies in biopharmaceutical manufacturing and technology, and the strength and depth of biomanufacturing experience in academic institutions as they collaborate with industry partners.

The Massachusetts Neuroscience Consortium

Beginning in 2009, the Center began work to create a Massachusetts Neuroscience Consortium ("the Consortium") to accelerate pre-clinical research available to the pharmaceutical industry, introduce academic researchers to the challenges of targeted research and facilitate industry-academic partnerships. We were thrilled when Governor Patrick joined the Center to announce the formalization of this new Consortium at the 2012 BIO International Convention. The Consortium is comprised of seven global pharmaceutical leaders that recognize the value of leveraging the rich Massachusetts environment in the field of neuroscience. Consortium members are seeking an

The charter Consortium members are Abbott, Biogen Idec, EMD Serono, Janssen Research and Development, Merck, Pfizer, and Sunovion Pharmaceuticals Inc.



On June 20, 2012, Massachusetts Governor Deval Patrick, the Massachusetts Life Sciences Center and seven global biopharmaceutical companies announced the formation of the Massachusetts Neuroscience Consortium (the "Consortium").

opportunity to advance our collective understanding and treatment of neurological diseases through engagement with researchers representing all major fields of neurobiology and neurology.

The charter Consortium members, Abbott, Biogen Idec, EMD Serono, Janssen Research and Development, Merck, Pfizer, and Sunovion Pharmaceuticals Inc., have pooled their resources to fund the identification and validation of novel targets for the symptomatic treatment and modification of chronic and debilitating neurological diseases. Each Consortium member has agreed to contribute \$250,000, for total first-year funding of \$1,750,000.

During FY 2012, the Center grew its email list from 3,900 to more than 4,700 contacts.

The Center had more than 2,200 media mentions during FY 2012.

During FY 2012, Center staff participated as presenters, speakers or panelists at more than 50 public events.

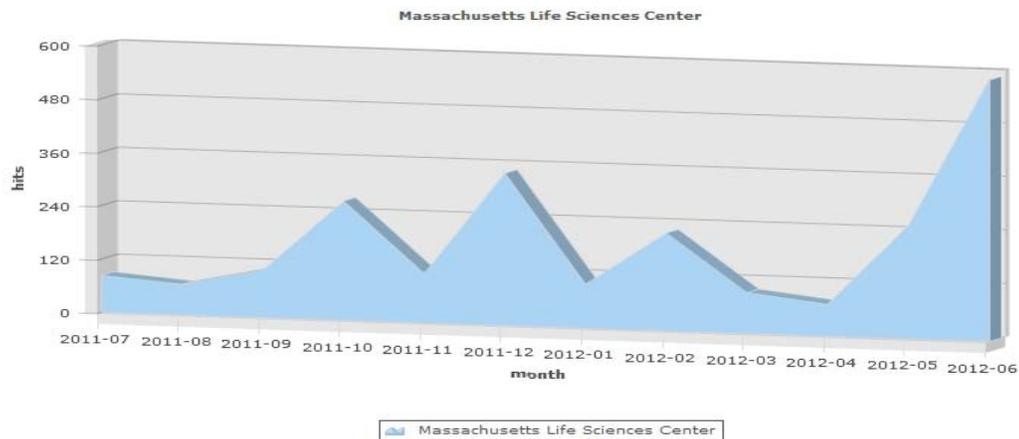
Staying Connected

The Center's communications program keeps our stakeholders and the general public informed about the Center's investments of public dollars, promotes public accountability for the Center's progress in accomplishing our mission, and provides ongoing updates and information exchange with the life sciences community in order to encourage its involvement and input. Communication and outreach have been integral to the Center's success in attracting a robust and diverse pool of applicants for Center programs.

During FY 2012, the Center grew its email list from 3,900 to more than 4,700 contacts. We used our website as both a clearinghouse for information about the Center and a portal for applying to the Center's programs.

The Center had more than 2,200 media mentions during FY 2012. Publications across the nation and around the world covered our activities. The chart below shows the monthly distribution of the Center's media coverage during FY 2012. Periods of greater coverage tended to coincide with the announcement of new programs or investments, with a substantial increase resulting from the 2012 BIO International Convention in June.

**Monthly Distribution of MSLC Media Mentions
(July 1, 2011 – June 30, 2012)**



During FY 2012, Center staff participated as presenters, speakers or panelists at more than 50 public events.

Massachusetts Takes BIO 2012 by Storm

One noteworthy event is the 2012 BIO International Convention, which was an important moment for Massachusetts that provided an opportunity to showcase all that the Commonwealth has to offer. More than 16,500 people participated from 48 states and 65 countries. The Massachusetts Pavilion experienced heavy traffic throughout the event. More than 100 business development meetings took place with companies from all over the world, and new relationships were forged with regions across the globe, including the signing of formal agreements with the Medicin Valley region (Denmark and Sweden) and the Catalonia region (Spain).

Pulling Ahead and Taking the Lead

In FY 2012, Massachusetts emerged as the clear global leader in life sciences. The Center made enormous strides in fulfilling our mission and delivering on the promise of the Life Sciences Initiative to create jobs, advance good science and coalesce the state's life sciences community.

The year ahead will present major opportunities to showcase Massachusetts' leadership in the life sciences, with the AdvaMed and International Society for Stem Cell Research annual conferences both coming to Boston during FY 2013.

The state budget calls for a FY 2013 investment fund appropriation of \$15 million, a \$5-million increase over the course of FY 2012, contingent on the comptroller's declaration of a consolidated net surplus for FY 2012. We are appreciative and excited about this vote of confidence by Governor Patrick, Lt. Governor Murray and the State Legislature, under the leadership of Senate President Murray and Speaker of the House DeLeo. We look forward to delivering another productive and impactful year.

Appendix A - The Board of Directors of the Massachusetts Life Sciences Center as of June 30, 2012

- **Gregory Bialecki, Co-Chair**
Secretary, Executive Office of Housing and Economic Development
- **Jay Gonzalez, Co-Chair**
Secretary, Executive Office for Administration and Finance
- **Edward J. Benz, Jr., M.D.**
President and CEO, Dana-Farber Cancer Institute
- **Josh Boger, Ph.D.**
Founder & CEO (retired), Vertex Pharmaceuticals
- **Robert L. Caret, Ph.D.**
President, University of Massachusetts
- **Abbie Celniker, Ph.D.**
CEO, Eleven Biotherapeutics, Inc.
- **Lydia Villa-Komaroff, Ph.D.**
Director and Chief Scientific Officer, Cytonome/ST

Appendix B - Massachusetts Life Sciences Center Scientific Advisory Board Members as of June 30, 2012

- **Harvey Lodish, Ph.D., Chair**
Whitehead Institute for Biomedical Research and Professor of Biology and of Bioengineering, Massachusetts Institute of Technology
- **James Barry, Ph.D.**
Executive Vice President and COO, Arsenal Medical
- **Gary Borisy, Ph.D.**
Director and CEO, Marine Biological Laboratory
- **Dalia Cohen, Ph.D.**
Chief Scientific Officer, Asterand, Inc.
- **James Collins, Ph.D.**
Professor of Biomedical Engineering, Boston University
- **John Collins, Ph.D.**
Chief Operating Officer, Center for Integration of Medicine & Innovative Technology
- **T. (Teo) Forcht Dagi, M.D.**
Partner, HLM Venture Partners
- **Robert D'Amato, M.D., Ph.D.**
Judah Folkman Chair in Surgery and Director, Center for Macular Degeneration Research, Children's Hospital, Boston
- **Jonathan Fleming, M.P.A.**
Managing General Partner, Oxford Bioscience Partners
- **Rainer Fuchs, Ph.D.**
Chief Information Officer, Harvard Medical School
- **Richard A. Goldsby, Ph.D.**
John Woodruff Simpson Lecturer and Professor of Biology, Amherst College
- **Dale Larson**
Director of Biomedical Systems, Draper Laboratory
- **Lita Nelsen**
Director, Technology Licensing Office, Massachusetts Institute of Technology

- **Carmichael Roberts, Ph.D.**
Partner, North Bridge Venture Partners
- **Lauren Silverman, Ph.D.**
Managing Director, Novartis Option Fund
- **Alan Smith, Ph.D.**
Former Chief Scientific Officer, Genzyme Corporation
- **Allison Taunton-Rigby, Ph.D.**
Co-founder, CEO and Director, RiboNovix, Inc.
- **David Walt, Ph.D.**
Robinson Professor of Chemistry and Howard Hughes Medical Institute Professor, Tufts University School of Medicine
- **Philip Zamore, Ph.D.**
Professor, Biochemistry and Molecular Pharmacology, UMass Medical School

Appendix C - FY 2012 Internship Challenge Host Companies

480 Biomedical, Inc.
A Chemtek Inc.
AB Biosciences, Inc.
Abazyme LLC
AbPro Labs
Acceleron Pharma, Inc.
Addgene, Inc.
Advanced Research and Development
AdvanDx, Inc.
Advantagene, Inc.
Aegerion Pharmaceuticals
Agilux Laboratories
Agrivida, Inc.
Akaza Research, LLC
Alacrita LLC
Albright Technologies
Allied Minds Devices, LLC
Alzheimers Disease Center
Antigen Pharmaceuticals, Inc
Antigen Targeting & Consulting Services Inc
Appempler, Inc.
Arsenal Medical
Arteriocyte Medical Systems
Aushon BioSystems
Avaxia Biologics, Inc.
Averica Discovery Services Inc
Bach Pharma, Inc
BIND Biosciences
Bio2 Technologies
Biomedical Research Models, Inc.
BIOS2 Medical, Inc.
BioSensics LLC
BioSurfaces, Inc.
BioTechnic Products, Ltd
Biotrofix, Inc.
Blossom Innovations
Blue Ocean Biomanufacturing, Inc.
Blue Sky Biotech, Inc.
Blue Stream Laboratories, Inc.
Boston Biomedical Associates
Boston MedTech Advisors
Boston Microfluidics Inc.
Boston Micromachines Corporation
Boston Open Labs
Cambridge Biolabs LLC
Cambridge Biomedical, Inc.
Cambridge Polymer Group, Inc.
CBT Advisors
Celloy, Inc.
Celldex Therapeutics, Inc.
CellMosaic LLC
Celltreat Scientific Products
Cephos Corp.
CeQur Corporation
ChemGenes Corp.
Christcot Medical Company
Clover Medical LLC
Constellation Pharmaceuticals
Convergence Medical Devices, Inc.
Court Square Group, Inc.
Courtagen Life Sciences, Inc.
CreaGen Biosciences, Inc
Cytonome/ST, LLC
Daktari Diagnostics, Inc.
Dentovations Inc
Differential Proteomics, Inc.
Digilab, Inc.
DMI Dx, LLC
DNA Medicine Institute
DocBox Inc
Ekam Imaging, Inc.
Emergent Inc.
EndoDynamix, Inc.
EndoSim, LLC
Energesis Pharmaceuticals, Inc.
Ensemble Therapeutics Corporation
Enumeral Biomedical
EpigenDx, Inc.
Essential Life Solutions Ltd.
Eutropics Pharmaceuticals
Excellims Corporation
First Light Biosciences
Five Star Manufacturing, Inc.
Five Star Surgical, Inc.
FloDesign Sonics
Flow Forward Medical, LLC
G&F Industries, Inc.
G&F Medical Inc.
Genocea Biosciences, Inc.
Giner, Inc.
Ginkgo BioWorks, Inc.
Global Business Support, Inc.
GlycoSolutions Corporation
Glycosyn Inc.
Grove Instruments, Inc.
Harvard Apparatus
Hemedex Inc.
Hepatochem, Inc.
Hepregen Corporation
HighRes Biosolutions Inc
HPA Ventures
Hstar Technologies Co.
HydroCision, Inc
Imgen BioSciences, Inc.
Immunetics, Inc
Immunotrex Biologics Inc.

InCrowd, Inc.
incTANK Ventures Management LLC
InfoBionic
Infraredx, Inc.
Institute for Pediatric Innovation, Inc.
Interactive Motion Technologies
Interscope, Inc.
inviCRO
InVivo Therapeutics Corporation
IonSense
iQuartic, Inc.
Janus Biotherapeutics
JEF Core, Inc.
JNK Healthcare Inc
KeraFAST
LaVoie Strategic Communications, Inc.
Ligon Discovery
MagneMotion Inc.
Massachusetts Medical Devices Journal, LLC
Matrigen LLC.
Matrivax R&D Corporation
Maxiom Consulting Group Inc.
Med Techna, Inc.
MedChem Partners LLC
MedPanel
Metis Manufacturing LLC
Microbiotix, Inc.
Microtest Laboratories, Inc.
Most Corporation
MOSTMED, Inc.
Mouse Specifics, Inc.
MSM Protein Technologies
MX Orthopedics
Myomo, Inc.
Nemucore Medical Innovations, Inc.
Neo-Advent Technologies, LLC
New England Peptide LLC
Nexcelom Bioscience LLC
NKT Therapeutics Inc.
Northeast Biomedical, Inc.
NovoBiotic Pharmaceuticals, LLC
Nuclea Biotechnologies, Inc.
Ocean Genome Legacy
OnSite Therapeutics, Inc.
OpenClinica, LLC
Ora, Inc.
PharmaHealth Clinical Research Services
Pharmalucence, Inc.
Phosphorex, Inc.

Phylonix Pharmaceuticals, Inc.
pION INC
Pluromed, Inc
Pressure BioSciences, Inc.
Privo Technologies
Progenika Inc
Quanterix Corporation
Reflectance Medical Inc.
Relay Technology Management, Inc.
Respiratory Motion, Inc.
ReSurfX LLC
Safe Food Scientific, LLC.
Safety Partners, Inc.
Sage Science, Inc.
Sample6 Technologies, Inc.
SBH Sciences, Inc.
Scientia Advisors, LLC
Segterra Inc.
Selecta Biosciences, Inc.
SemiNex Corporation
Senscio Systems, Inc.
Sentien Biotechnologies, Inc.
Seventh Sense Biosystems
Sharp Edge Labs, Inc.
SonyaSoft
Sproxil, Inc.
STAR Analytical Services
STC Biologics, Inc.
Targeted Cell Therapies, LLC
TDC Medical, Inc.
Tetraphase Pharmaceuticals, Inc.
TheraTorr Medical, Inc.
THINQ Pharma
TRA360
Two Square Science, LLC
Union Biometrica, Inc.
VasoTech, Inc.
VelQuest Corporation
Vista Scientific LLC
VitaThreads Inc.
VivoPath, LLC
WaterSep Technology Corp
WaveGuide Corporation
White Systems, Inc.
WorldCare Clinical, LLC
X-CHEM, Inc.
Xtal BioStructures Inc.
ZeptoMetrix Corporation

Appendix D - List of Active Certified Life Sciences Companies as of June 30, 2012

Company	Location
4s3 Bioscience, Inc.	Medford
Aegerion Pharmaceuticals, Inc.	Cambridge
AesRx, LLC	Newton
Aura Medsystems, Inc.	Duxbury
Avaxia Biologics, Inc.	Burlington
AVEO Pharmaceuticals, Inc.	Cambridge
Bind Biosciences, Inc.	Cambridge
Biogen Idec MA, Inc.	Cambridge
Bluebird Bio, Inc.	Cambridge
Blueprint Medicines Corporation	Cambridge
Boston Heart Diagnostics Corporation	Framingham
Cell Signaling Technology	Danvers
Christcot Medical, Inc	Sudbury
Constellation Pharmaceuticals, Inc.	Cambridge
Courtagen Life Sciences, Inc	Woburn
Cubist Pharmaceuticals, Inc.	Lexington
DePuy Othopaedics, Inc.	Raynham
Dyax Corporation	Cambridge
Eutropics Pharmaceuticals, Inc.	Dorchester
Foundation Medicine, Inc	Cambridge
Good Start Genetics, Inc.	Boston
Grove Instruments, Inc	Worcester
Infinity Pharmaceuticals, Inc.	Cambridge
InfraReDx, Inc.	Burlington
Instrumentation Laboratory Company	Bedford
InVivo Therapeutics, Inc.	Cambridge
Ironwood Pharmaceuticals, Inc	Cambridge
Knome, Inc	Cambridge
LeMaitre Vascular, Inc.	Burlington
Lightlab Imaging, Inc.	Westford
Merrimack Pharmaceuticals, Inc.	Cambridge
Metamark Genetics, Inc	Cambridge
Mevion, Inc.	Littleton
Moderna Therapeutics, Inc	Cambridge
MoMelan Technologies, Inc	Cambridge
Momenta Pharmaceuticals, Inc	Cambridge
Myomo, Inc	Cambridge
New England Biolabs, Inc	Ipswich
NinePoint Medical, Inc	Cambridge
Nova Biomedical Corporation	Waltham
NxStage Medical, Inc.	Lawrence
OmniGuide, Inc.	Cambridge
Organogenesis, Inc.	Canton
PAREXEL International Corporation	Lowell

PerkinElmer, Inc	Waltham
Pharmalucence, Inc	Bedford
Pluromed, Inc.	Woburn
Quanterix Corporation	Cambridge
Ra Pharmaceuticals, Inc	Cambridge
Sanofi-Aventis, Inc.	Cambridge
Shire Human Genetic Therapies, Inc.	Lexington
STD Med, Inc.	Stoughton
Sunovion, Inc.	Marlboro
T2Biosystems, Inc	Lexington
Valeritas, Inc.	Shrewsbury
Vertex Pharmaceuticals, Inc	Cambridge
Wadsworth Medical Technologies, Inc	Westborough
Wolfe Laboratories, Inc.	Watertown