

The Massachusetts Life Sciences Center



Return on Investment

September 29, 2010

The Massachusetts Life Sciences Initiative – Major objectives

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

- **Secretary of Housing and Economic Development**
 - Gregory 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**
 - Abbie Celniker, CEO, Taligen Therapeutics
- **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**
 - Joshua Boger, Ph.D., Former President & CEO, Vertex



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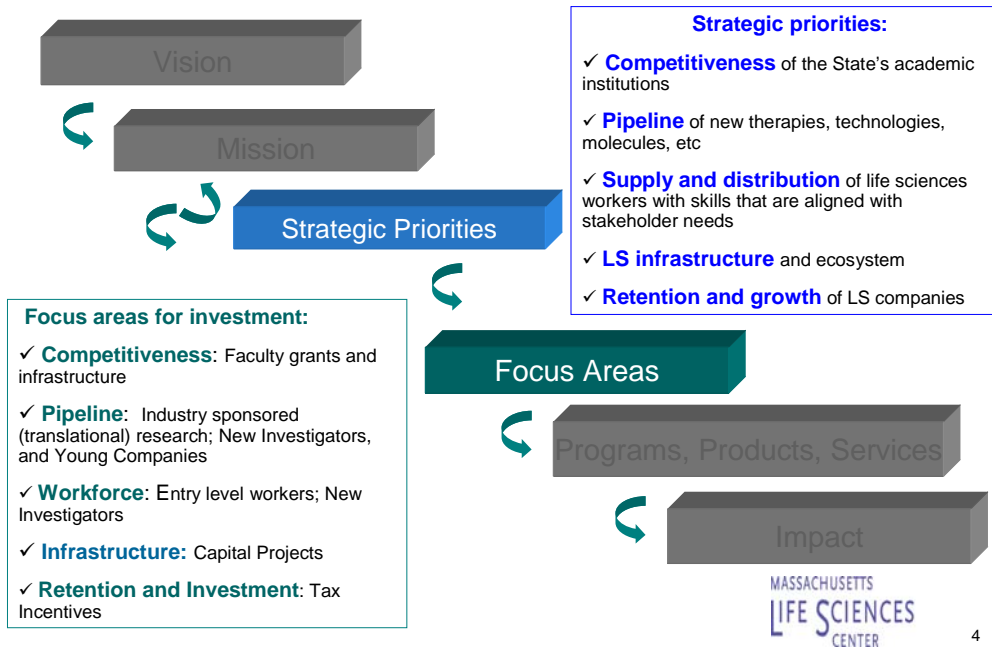
Massachusetts Life Sciences Center Scientific Advisory Board

- **CHAIR: Harvey Lodish, Ph.D.**, Whitehead Institute, and Professor of Biology and of Bioengineering, MIT
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- **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
- **David Walt, Ph.D.**, Robinson Professor of Chemistry and Howard Hughes Medical Institute Professor at Tufts University School of Medicine.
- **Jonathan Fleming, M.P.A.**, Managing General Partner, Oxford Bioscience Partners
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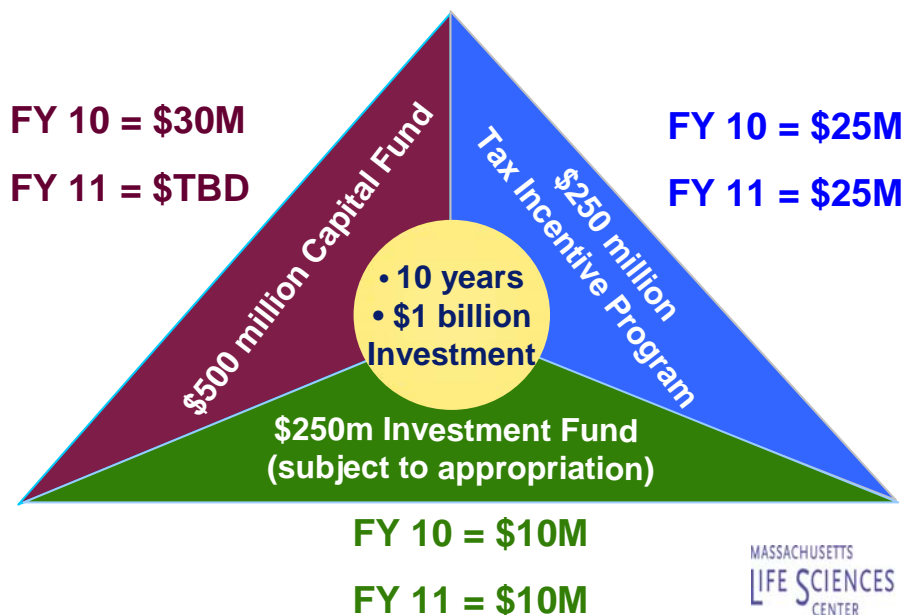


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MLSC Strategy Summary: Priorities and Focus Areas

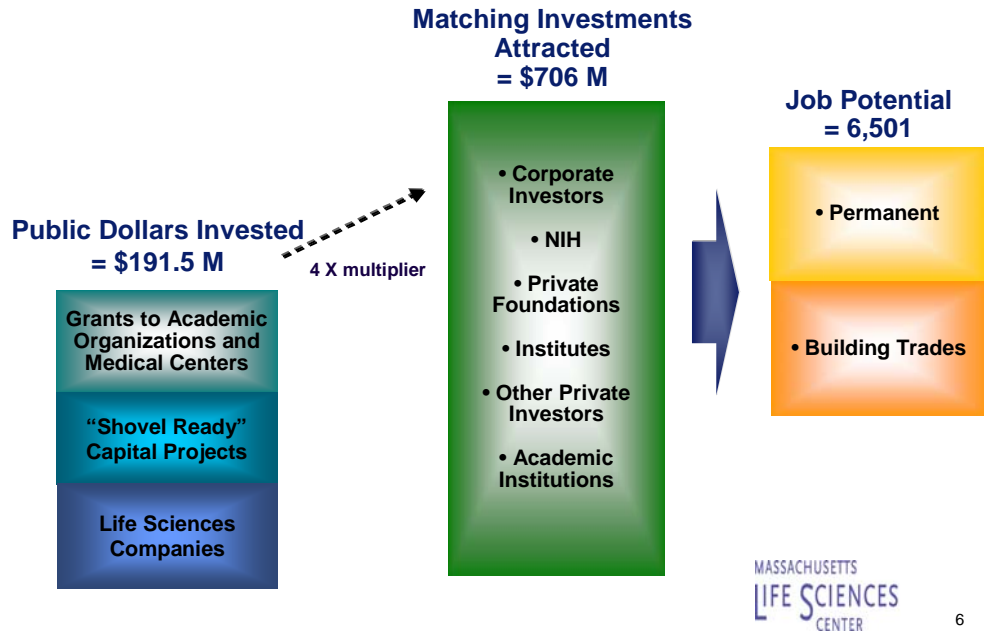


Life Sciences Initiative Investment Tools



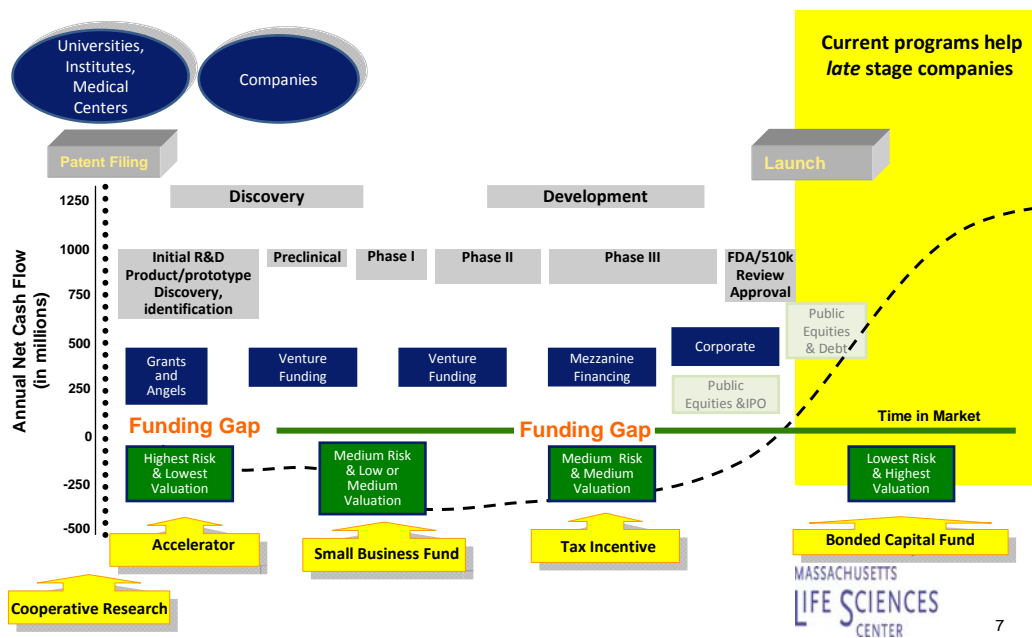
The "Bottom Line"

Life Sciences Center's Impact: June '08 – July '10



Center Programming Portfolio

Funding Gap Framework & Programming at a Glance





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

Leverage on the New Investigator Grant Program*

- To date, **nearly half (43%)** of the Center's New Investigators (9 of 21) have leveraged their MLSC grants with follow-on funding.
- The Center's investment in these nine (9) Investigators totals \$2.4M.
- However, these nine (9) New Investigators have won **15 grants totaling over \$6.5M.**

Leverage on MLSC investment = 2.7x

*A total of 21 New Investigators were funded; MLSC grants average \$100k for 2-3 years; all grants received a 1:1 match from the Investigator's affiliated academic institution



Investment Fund Programs New Investigators' Scientific Contributions*

- In addition, **over half (57%)** of the Center's New Investigators (12 of 21) have published articles based on the work being funded by MSLC grants.
- These **12 grantees have published a combined total of 31** articles that have been presented in the following journals:
 - *Applied Physics*
 - *Cell*
 - *EMBO Journal*
 - *European Journal of Immunology*
 - *Gastroenterology*
 - *Genes & Development*
 - *Hearing Research*
 - *Journal of Bacteriology*
 - *National Academy of Science*
 - *Nature*
 - *Nature Biotechnology*
 - *Nature Methods*
 - *Nature Reviews Immunology*
 - *New England Journal of Medicine*
 - *Optics Express*
 - *Proceedings of the National Academy of Sciences*
 - *Sem. Immunology*

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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.**

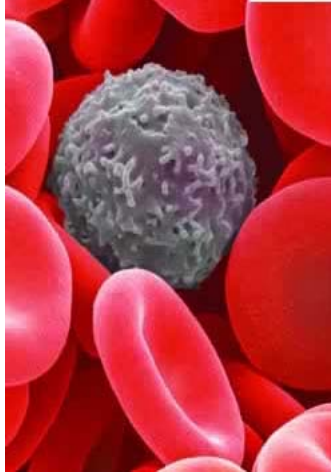
Research Partners	Award Recipient	Award	Research
UMass Lowell/ Boston Scientific	Dr. Rudolf Faust	\$199,596 per year for three years	Novel polymer biomaterials
Immune Disease Institute/ Epic Therapeutics	Dr. Judy Lieberman	\$250,000 per year for three years	An siRNA-based microbicide
Harvard School of 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 Pharmaceuticals	Dr. Michael Czech Dr. Gary Ostroff	\$249,593 per year for three years	Development of orally-delivered RNAi therapeutics



Investment Fund Programs

Focused Initiatives: Regenerative Medicine

The Center is funding resource centers to help Massachusetts grow and retain leadership in high innovation segments – such as regenerative medicine.



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



Investment Fund Programs

Early Stage Companies

- In 2009 the Center launched the Accelerator Program, which provides loan financing to promising early-stage companies
- 5-Year Loan, \$100-\$750K target range
- 10% Interest rate, Unsecured, Subordinated
- Warrant Coverage of 4%
- Payable on financing event of at least \$5M
- Required to be matched with other at-risk sources of capital
- Applicants have raised less than \$5M in equity financing
- Life science sectors as defined by the statute: device/diagnostics, biotech, pharmaceuticals, bioinformatics, etc.
- Board Observer Rights

Eleven (11) loans to date totaling \$5.9 million. The program's next round will launch in the Fall 2010.

Investment Fund Programs Life Sciences Accelerator Program



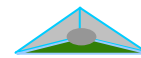
- FY 09 portfolio companies are making progress:

GoodStart Genetics
September 2010: Raised \$18 million in Series A financing and repaid their loan in full, with interest.

INVIVO
Therapeutics
June 2010: Analyzing data from large primate study, poised to submit to FDA for human Studies.

Pluromed
September 2009: Received FDA approval on BackStop, a device used in kidney stone management.
October 2009: Announced marketing agreement with Boston Scientific for BackStop.

Leveraged Impact – Corporate Consortium Program



The Center continues to highly leverage the public tax dollars that we invest by attracting matching dollars from the private and non-profit sectors.

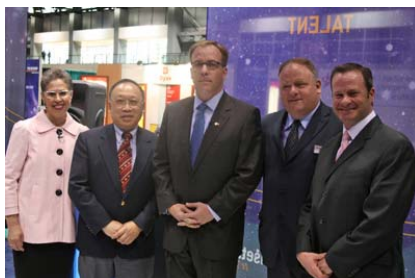
- Johnson & Johnson agreed to participate in our Corporate Consortium Program for a second year
- In FY 10, **sanofi-aventis** become the second member of the program

Johnson + Johnson

sanofi aventis

Because health matters

J&J and sanofi-aventis each committed a minimum of **\$250,000** per year for two years to match investments made by the Center in early-stage companies.



Capital Fund Programming

2010 Small Business Matching Grant Program



- The Center recently launched a Small Business Matching Grant (SBMG) program that matches federal small business grant funding for early-stage life sciences companies.
- Grantees had to have received an SBIR/STTR Phase II, post Phase II, or equivalent award(s) from federal agencies within the last ten years.
- In May of 2010 the Center awarded \$500,000 grants to three companies:
 - **Boston Biochem Inc.** (Cambridge)- the world's leading provider of ubiquitin-related research products and services
 - **Tetragenetics, Inc.** (Cambridge)-a biotechnology company meeting the needs of customers who seek a cost-effective alternative platform technology for the production of genetically engineered proteins
 - **Thermedical, Inc.** (Somerville)- designs, develops, manufactures and sells thermal ablation systems to treat previously untreatable cancers and cardiac arrhythmias.
- The grants will allow these companies to create 40 new jobs in the Commonwealth by 2011, maintain and expand R&D and manufacturing in Massachusetts, and commercialize technology platforms.

Life Sciences Tax Incentive Program



- The Life Sciences Initiative authorizes the Center to grant \$25 million per year in tax incentives.
- 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 \$24.5 million, was awarded to 26 companies in December, 2009. These companies have committed to creating more than 800 new jobs during calendar year 2010.
- Applications for the 2010 Tax Incentive Program were due by July 2. Fifty-six companies have applied.



Tax Incentive Program

- **\$25M annual cap**
- **Nine different incentives**
 - 10% Investment Tax Credit (90% refundable)
 - FDA user fees for drug applications (90% refundable)
 - Existing in-state research credit now 90% refundable
 - New credit for out-of-state research
 - NOL extension – from 5 to 15 years
 - Elimination of throwback provision for sales tax calculation
 - Deduction for Orphan Drug Testing Expenses
 - R&D Corporations for Sales Tax Purposes
 - Sales Tax Exemption for Property Used in Development of Facilities



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

MBL: \$10 million grant



- Loeb Lab renovation completed July 2010
- Created **200 building trade jobs and up to 50 permanent jobs**
- MBL leveraged to receive a **\$15 million grant** from the Howard Hughes Medical Institute



Cummings School: \$9.5 million grant

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

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.**



Gateway Park: \$6.6 million grant



- Supports construction of WPI Biomanufacturing Education and Training Center, expanded incubator space, and new academic and research space

- Leverages \$25 million private investment

- Projected to create 120 construction jobs and 142 permanent jobs at completion



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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.



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Investment Fund Programs

Investments in Workforce Development – Life Sciences Internship Challenge



In 2009 the Center established the Life Sciences Internship Challenge, a workforce development initiative that matches college students and recent college graduates with internship opportunities at life sciences companies across the state.

- The Center covers stipends for participating interns working at companies with less than 100 employees -- up to \$7,200 for twelve weeks of work
- 2009: 104 interns were placed at 59 life sciences companies and research institutions across the state.
- More than 20 of the 2009 interns were offered full or part-time jobs at the conclusion of their internships.
- 2010: Over 900 students applied for the program. 170 interns have been placed at 93 companies across the state.



Matt Gethers, 2009 Life Sciences Internship Challenge participant and recent MIT graduate with a degree in biological engineering, at the brand-new lab space of Ginkgo BioWorks in Boston. Photo courtesy of Bay State Banner/Sandra Larson

Investment Fund Programs

Workforce Development: FY 10 Internship Challenge



2009 Internship Challenge	2010 Internship Challenge
Investment: \$452,190	Investment: \$1,160,000
Eligible sponsors: any size company and research institution in MA.	Eligible sponsors: limited to small businesses in MA with 100 or fewer employees.
Interns required to be undergraduates majoring in a STEM subject.	Intern eligibility expanded to include grad students and students studying business or law.
Internship period (subsidized by Center) limited to up to 8 weeks .	Internship period (subsidized by Center) extended to up to 12 weeks .
# Applications submitted: 508	# Applications submitted: 892 (↑76%)
# Interns placed: 104	# Interns placed: 170 (↑63%)
Interns represented 29 colleges/universities 22% from public institutions	Interns represented 47 colleges/universities (↑60%) 32% from public institutions (↑45%)
# Community college interns placed: 2	# Community college interns placed: 13 (↑550%)
# Sponsors reviewing candidates: 77	# Sponsors reviewing candidates: 140 (↑82%)
# Intern sponsors: 59	# Intern sponsors: 93 (↑58%)



Investment Fund Programs Innovation Program

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.



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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.



April 2010: NeoStem, Inc, an international biopharmaceutical company with operations in the U.S. and China, launched a new facility in Cambridge



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



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Keeping in Touch

www.masslifesciences.com

- News updates
- Program Information
- Application portal

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- Weekly event listings
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