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Catalyzing Ontario's Life Sciences Economy

The Case for Improved Access to Risk Capital for Ontario SMEs

In Partnership with Shift HEALTH

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Executive Summary

Ontario's life sciences ecosystem, a cornerstone of its innovation economy, faces a critical shortage in seed and early-stage venture capital funding ($2-10 million range) that hinders the province's ability to grow, scale, and retain homegrown companies. This funding gap undermines Ontario's life sciences strategy by limiting the province's innovation pipeline and ability to capitalize on its substantial research and development infrastructure.

The current geopolitical and economic environment presents both unprecedented challenges and opportunities for Ontario's life sciences sector. Global supply chain disruptions, shifting international partnerships, and increased focus on domestic innovation capacity have created a need for Canadian sovereignty, especially in critical technologies and therapeutics. Strengthening Ontario's life sciences ecosystem is not just an economic opportunity, but a strategic and security imperative.

Life sciences startups also face higher development risks, significant R&D costs, and longer pathways to market. Meanwhile, small-to-medium enterprises lack adequate support systems compared to other provinces like Quebec and BC, which provide comprehensive support programs. Fifteen years ago, Massachusetts acknowledged similar challenges in its life sciences ecosystem. Through strategic de-risking measures, Massachusetts has since achieved exponential growth in venture capital funding and startup creation, generating massive returns on investment and establishing itself as a global leader in life sciences innovation.

Ontario's ecosystem, already larger than Massachusetts' was fifteen years ago, can accelerate the economic impact of a vibrant life sciences sector. This report explores solutions to bridge the "funding desert" and urges government intervention through direct seed fund investment, modernized tax incentives, and private fund matching. These targeted solutions, tailored to Ontario's needs, would enable the province to fulfill the objectives of its life sciences strategy while creating thousands of high-paying jobs and attracting global venture capital to strengthen its innovation ecosystem.

This investment extends beyond individual companies—it bolsters the entire ecosystem. Supporting early-stage life sciences companies creates ripple effects, benefiting universities, research institutions, health systems, and supply chains across Ontario. Ontario has the opportunity to lead not just Canada, but the world, in life sciences innovation, with benefits flowing to companies, the broader economy, communities, and future generations.

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Key Takeaways

Ontario stands at a critical juncture in becoming a global leader in life sciences—a sector that drives economic growth and innovation and strengthens our province's health security in the face of future challenges.

Ontario's government has recognized the immense potential of the province's life sciences sector through significant initiatives and investments, including the recent announcement of $146M for phase 2 of the life sciences strategy. These investments are critical to helping the life sciences ecosystem flourish—but access to risk capital remains an urgent need for SMEs.

While Ontario's research impact eclipses some of the world's strongest clusters, we are falling short in realizing economic dividends. Indeed, the dearth of early-stage capital is stalling company growth and driving promising life sciences innovators out of the province.

Fit-for-purpose solutions to support commercialization through targeted incentives, policy reforms and direct investment are needed, with a particular focus on supporting pre-seed and seed-stage startups in the sector.

Direct seed-stage investment and specialized commercial solutions are needed to de-risk early development for Ontario's life sciences startups to unlock the sector's latent economic potential and become a top-tier global life sciences hub .

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Ontario's Life Sciences Ecosystem: A Global Research Powerhouse with Untapped Economic Potential

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The life sciences sector is a key driver of Ontario's health security and economic future

Ontario has recognized that a robust life sciences sector is not just an engine of economic growth and job creation; it's vital to Ontario's health security and the resilience of our healthcare system.
Ontario is making strategic investments to help this sector flourish.

Notable Provincial Initiatives supporting Life Sciences Sector in Ontario

Ontario

Phase 2 of Life Sciences Strategy: $146M CAD investment, including $40M for Venture Ontario, to fuel the sector's growth and establish Ontario as a global biomanufacturing and life sciences hub.[1]

OCI

LSIF (Life Sciences Innovation Fund): $15M CAD to help entrepreneurs in market entry.[2]

Intellectual Property Ontario

IPON (Intellectual Property Ontario): $4.6M CAD to strengthen researchers' IP capacity.[3]

As part of its life science strategy, Ontario aims to maintain and grow the biomanufacturing and life sciences sector by targeting 85,000 high-value jobs by 2030, a 25% increase from 2020.[4]

We're here to help Ontario deliver on these investments and fulfill the potential of Ontario's life sciences ecosystem.

[1]Phase 2 Life Science Strategy; [2]Life Sciences Innovation Fund; [3]IP Ontario; [4]Ontario's Life Science Strategy

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There is a recognized 'Ontario Advantage' for life sciences R&D

Ontario has a vibrant life sciences ecosystem that ranks among the world's best and has the potential to attract, retain and grow successful life sciences companies.

Impact of Ontario's Life Sciences Sector[1]

Ontario generates 51% of all of Canada's R&D spending in life sciences

Contributes ~$58B CAD to Ontario's GDP and $8.8B CAD in taxes (top-11 highest contributor)

3rd highest number of companies across sectors in Ontario, above food & beverage, automotive, mining and aerospace sectors

Employs ~90K highly-skilled workers across more than 6,140 companies (ranking 4th among North American jurisdictions by life science employment)

1 in 13 Ontarians work in a job connected to the life sciences sector, sustaining over 191K jobs through direct, indirect and induced impacts

Canada leads G7 nations in active clinical trials per capita, with Ontario spearheading this effort, boasting over 4,600 active studies, double the U.S. per capita rate.[2]

The 'Ontario Advantage'

Top-quality research, advanced biomanufacturing infrastructure and high rates of collaboration across borders and sectors

Leading clinical trial activity to support innovative technology development

Dynamic and advanced training environments that support highly-specialized talent attraction

With its dynamic educational institutions, diverse talent pool, and internationally recognized advancements in research and technology, Ontario is well-positioned for global leadership in the life sciences.

[1] LSO Roadmap; [2] Clinical Trials Ontario

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However, while Ontario's research impact eclipses some of the world's strongest clusters, we are falling short in realizing economic dividends

Research Impact	*Toronto Cluster*	*British Columbia Cluster*	*McGill Cluster*	*Johns Hopkins Cluster*	*California Cluster*	*Boston Cluster*	Toronto Cluster vs. Canada	Toronto Cluster vs. US
Publications in Top-10%[a]	11,586	6,061	5,162	11,261	9,269	34,777	Leading	Leading
Total Clinical Trials[b] | Interventional Trials[c]	1910 | 962	688 | 365	348 | 242	1360 | 824	1350 | 830	3624 | 2074	Leading	Leading
Economic Impact								
Employment	88,214	16,987	58,232	168,847	921,266	315,880	Leading	Lagging
Number of VC Deals | Median Size ($M) (2018-2022)	580 | $3.36	338 | $2.30	189 | $3.48	363 | $3.74	1,945 | $7.32	2,296 | $9.42	Leading	Lagging

Ontario's life sciences sector holds significant untapped potential for economic returns, but capital constraints are limiting growth in employment, commercialization, and scaling startups.

[1]Study prepared by Shift Health for TAHSN

[a] The total number of documents that are among the top 10% most cited papers in the world within their respective subject, year, and document type.

[b] Active clinical trials include observation and interventional clinical trials (including trials that did not have a phase).

[c] Interventional clinical trials that did not have a phase (e.g. behavioral, devices, etc.) were excluded from this number.

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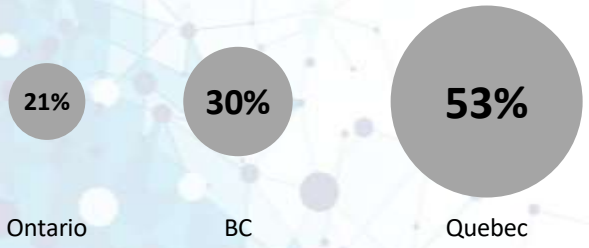
Ontario's economic underperformance is reflected in lagging VC investment and slower growth in life sciences GDP

Despite Ontario's advantages in talent, R&D and manufacturing, Ontario's life sciences companies aren't consistently realizing the growth seen in other leading life sciences ecosystems in Canada.

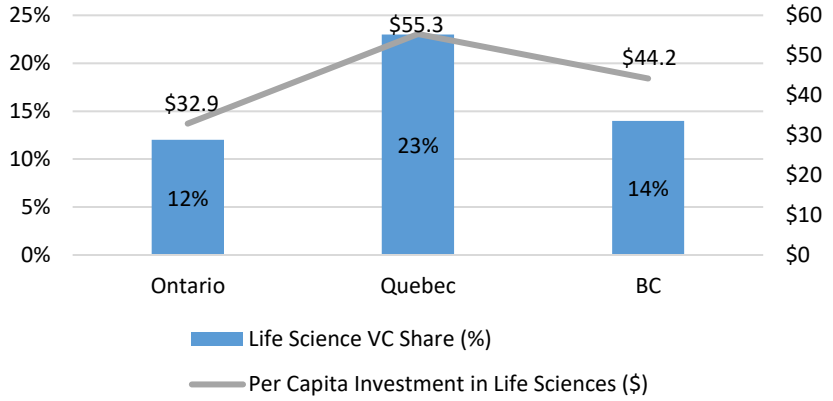
Ontario's life sciences sector ranks first in Canada for number of firms and contribution to GDP, but our recent life sciences GDP growth rate has not kept pace with Quebec and BC.[1]

Three-year growth in the life sciences sector GDP (2018-2021)[1]



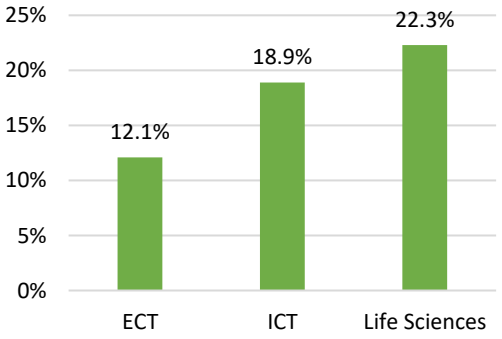
Ontario invests less venture capital (in relative and absolute terms) in the life sciences compared to Quebec and BC[2]—despite an Internal Rate of Return (IRR) for life sciences that consistently outperforms the Energy Cleantech (ECT) and Information/Communications Technology (ICT) sectors.[2]

Life Science VC Funding: Sector share and per capita investment (5-Year Average, 2019-2023)*



Source: Statistics Canada & BDC report[2]

10-year gross IRR by sector in Canada (2023)**



Source: BDC report[2]

Provinces like BC and Quebec are boosting the life sciences sector's competitiveness through targeted initiatives such as VC tax credits and pension fund investments.[3]

[1]BC Stats; [2]BDC Report; [3]Deep Centre Report

* For per capita analysis, Average VC data from the BDC's 2024 VC report was divided by average population of provinces between 2019-2023. Population data was retrieved from Statistics Canada.

**BDC direct and underlying companies are used as a proxy for sector performance

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The Challenge: Sustainable Funding for Ontario's Life Sciences Startups

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Ontario companies face their biggest funding hurdle early in the commercialization pathway

The "funding desert" challenge is compounded for life sciences startups given higher risks in product development, significant R&D costs, stringent regulatory requirements and a comparatively longer path to market.

Public Sector Grants	$2-10M Seed Rounds	>$20M VC Rounds
Discovery → Basic Research	Applied Research → Proof of Concept	Product Development → Large-scale Production
Academic Research	**Seed Stage**	**Post-seed Stage (Early to Late)**
ON Funding: $50.6M	***ON Funding: $15M***	**ON Funding: $84M**
♦ $46M Ontario Biosciences Research Infrastructure Fund[1] ♦ $4.6M CAD IPON Fund[2]	♦ $15M Life Sciences Innovation Fund (Investment up to $500K CAD at the pre-seed and seed stages)[3]	♦ $5M CAD: Clinical Trials Ontario's QuickSTART Initiative[1] ♦ $15M CAD: new wet labs program[1] ♦ $24M CAD: a new Life Sciences Scale-Up Fund (LSSUF)[1] ♦ $40M CAD: Venture Ontario Fund[1]

← **Funding Desert[1,*]** →

Seed-stage funding accounts for just ~10% of ON total

Key challenges for startups

- **Funding gap:** Shortage of capital for projects transitioning from basic research to proof-of-concept.[1]
- **High risks:** Average overall success rate for a drug pipeline is 7.6%, with risks compounded during early stages.[2]
- **High R&D costs**: R&D costs per drug range between $314M to $4.2B, with initial stages requiring major investment in facilities and equipment.[2,3]
- **Long development timelines:** Takes on average 13 years from initial patent or human trials to the launch of a new medicine.[2,3]
- **Technical challenges:** Translating lab results into viable products often encounters unforeseen technical obstacles.

[1]The Institute for Competitiveness & Prosperity; [2]IQVIA- Global Trends in R&D 2024; [3]Canadian Health Policy Institute Report;

*Source: The Institute for Competitiveness & Prosperity[1]

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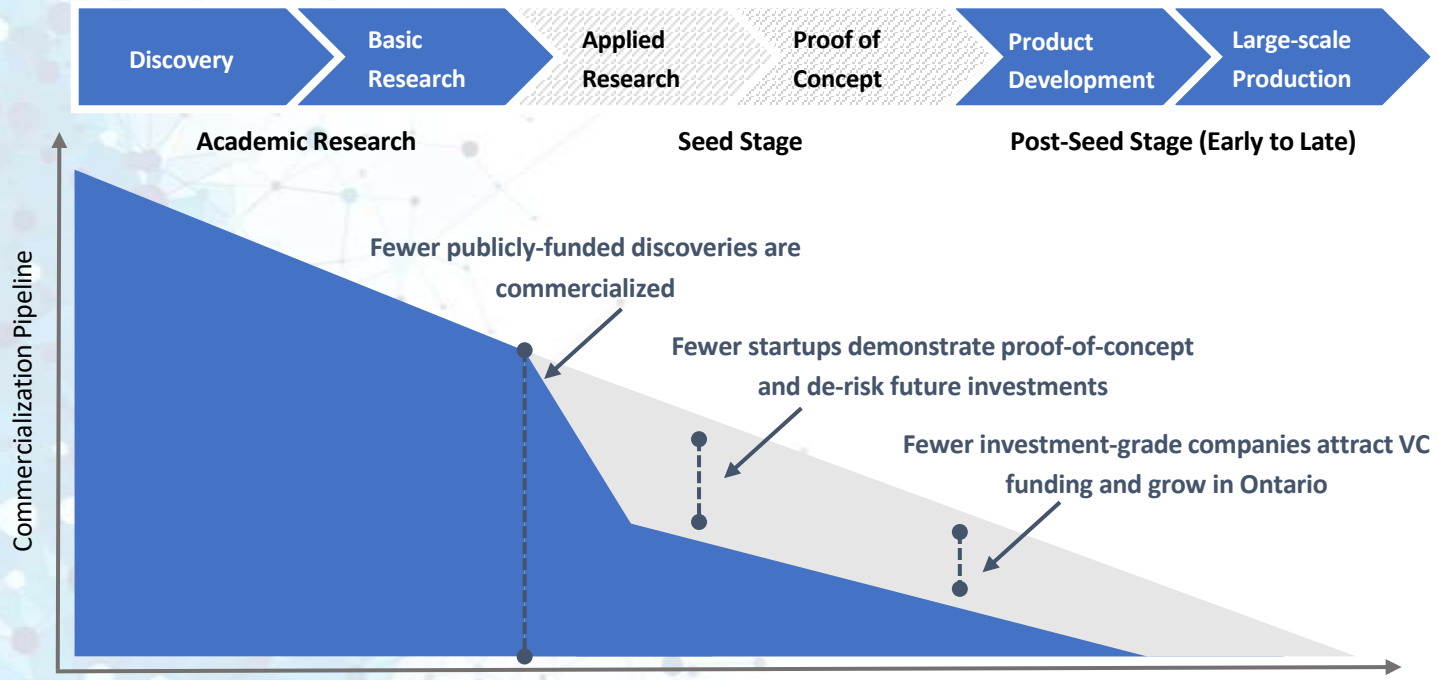
Without robust seed-stage funding, Ontario is shrinking the commercialization pipeline, curtailing future VC rounds and diminishing long-term returns on public investment in research and discovery

A lack of critical sustainable seed funding of $2-10M over 2-5 years is prematurely limiting companies with the potential to realize future VC investment and achieve scale.



Key challenges for startups

- Despite substantial investment in biomedical research, **promising Canadian companies are migrating to the US** for better market access, funding opportunities, and growing US investor influence on their boards.
- The seed-stage funding gap is impacting productivity, as **innovative Ontario startups are lost to generous US initiatives**.
- While Canada excels in biotech company creation, scaling effectively is a struggle. **Urgent government investment is needed to address this gap**, or delays will risk further diminishing available funds and slow sector growth.

[1]Phase 2 Life Science Strategy; [2]IP Ontario ; [3]Life Sciences Innovation Fund

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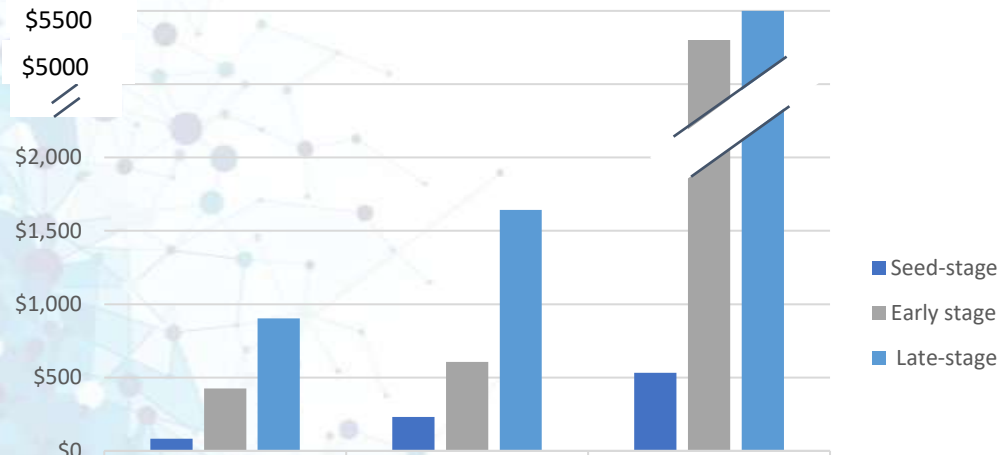
For Ontario's startups, limited access to early-stage capital is stifling company formation, investment attraction and sector growth compared to global peers

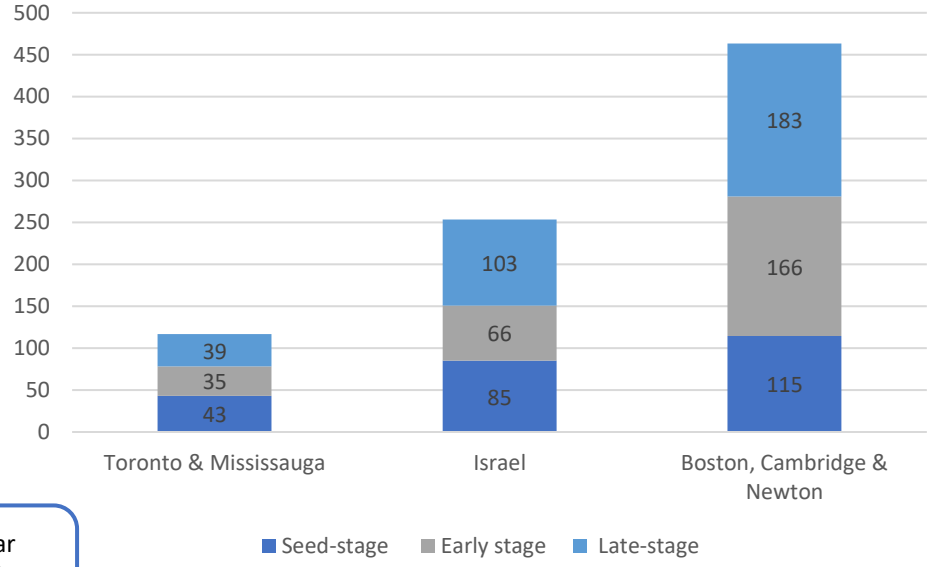
Total Venture Capital Raised by Stage (6-year Average) ($M USD)[1]



	Toronto & Mississauga	Israel	Boston, Cambridge & Newton
Seed-stage	82.6	231.2	531.9
Early stage	424.8	605.8	5,543.3
Late-stage	902.7	1643.0	5,394.2

Every seed-stage dollar generally yields a 10-fold ROI in late-stage VC funding

Total Venture Capital Deals by Stage (6-year Average)[1]



BDC reports that Canadian start-ups take 1-2 years longer than US counterparts to secure funding, highlighting the need for more early-stage investments in Ontario.[2,3]

[1]Pitchbook (data retrieved October 11, 2024); [2]BDC Report; [3]ON360 Policy Paper

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According to industry leaders, Canada's life sciences sector, particularly in Ontario, is experiencing a drain of talent, IP and companies to US markets

Venture capitalists, investment leaders, CEOs of Canadian startups, along with sector leaders from industry associations and innovation organizations unanimously warn of a critical shortage in seed and early-stage venture capital funding, urging swift action to prevent the exodus of valuable IP and talent.[1,2]

Responding to this risk, Quebec and BC's strong investor incentives, such as **provincial tax credits** and **angel investment matching programs**, have nurtured **valuable biotechs like Aurinia and Zymeworks.**

It's time to act on the $2-10M seed-stage funding desert to drive retention, growth and scaling of biotech startups in Ontario.

[1]Deep Centre Report; [2]ON360 Policy Paper

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Bridging the Gap: De-risking Early-Stage Development to Create a Pathway for Growth in Ontario

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Derisking early-stage development for biotech SMEs is crucial to capitalize on innovation and retain talent and IP in Canada

The early stages of a company's development are too risky for private capital alone. There is a need for government to de-risk the investment to create a pathway for future rounds of VC funding.

- Innovative early-stage companies, built on intangible assets like intellectual property (IP), need early financial support to navigate the funding desert commonly referred to as the "valley of death" to become anchor companies.

- While the government heavily funds discoveries through academic research and training, failing to help companies commercialize their early R&D results in a two-way loss: missed returns for both the companies and public investments.

SR&ED Tax Credit: A crucial tool that falls short without provincial support and incentives

- While the SR&ED Tax Credit is vital for Canadian biotech companies to leverage scarce capital, drive innovation, and compete globally, startups need supplemental provincial support to further the impact of SR&ED to retain companies and talent.

- SR&ED tax credit is currently restricted to Canadian-controlled private corporations (CCPCs), with expenditure thresholds set over 15 years ago, making them insufficient for today's R&D costs.[1]

- Biotech firms seeking foreign investment often lose CCPC status, making them ineligible for SR&ED benefits, which disproportionately affects SMEs that heavily rely on external capital to sustain early-stage R&D.[1]

Current federal tax incentives are inadequate to attract investments in innovative SMEs, making provincial incentives and policy reforms, especially in Ontario, essential to boost Canada's R&D competitiveness globally.

[1]BIOTECanada Report

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The most successful jurisdictions around the world have designed fit-for-purpose mechanisms to support seed and early-stage investment

Massachusetts (MA) and Israel, two leading jurisdictions in life science venture capital funding, offer extensive state and regional incentives to support innovation in life sciences.

	Looking Back: How Public Support Fostered Growth	Continuing Investment: Notable Recent Public Incentives
Massachusetts, USA	**MLSC invested over $700M** (2008-2018) through grants, loans, tax credits, and workforce programs.[1] Backed by a **2008 state initiative committing $1B over 10 years** to grow MA's life sciences sector.[1] Renewed support in 2018: **$623M in bonds and tax credits** to further expand the industry.[1]	**Life science tax incentive program:** Set of 10 different tax incentives, including refundable credits, to support companies throughout their R&D cycle (e.g., the Life Sciences Investment Tax Credit, FDA User Fees Credit, and a 90% refund of excess §38M research credits).[4] **Angel investor tax credit:** Offers investors a 20-30% tax credit on qualifying investments (up to $125K per year) in early-stage life sciences companies.[5] **Seed Fund:** $250,000 in convertible notes in emerging life sciences companies.[5]
	Strong backing from the federal **Small Business Innovation Research (SBIR)** program, initiated in 1982.[2]	
Israel	Yozma Fund (1993-1998) **used public money to attract foreign investment by providing 40% matching funds to private investors**.[3] ♦ The initiative significantly boosted Israel's startup ecosystem, **increasing annual VC outlays from $58M to $3.3B by 2000**.[3] ♦ By 1999, Israel ranked 2nd globally behind the US in private-equity capital investment as a share of GDP.[3]	**New YOZMA:** Fund of Funds model to encourage institutional investment in venture capital, with $1B over 5 years, focusing on healthcare, healthtech, and life sciences.[6] **New Start-up fund:** Collaborating with private investors, this fund will inject over $130M into startups across Pre-seed, Seed, and Round A stages, with grants covering up to 60% of total funding ($650K-$13M).[6] **Nationwide Innovation Centers:** Nine centers with a $26M budget to support regional startups, focusing on life sciences and tech sectors, fostering high-tech employment.[6] **Tax Incentives for International Business Angels:** Tax incentives to connect small enterprises and VC funds with international institutions and MNCs.[7]

[1]Massachusetts Biotech Ecosystem; [2]SBIR Program; [3]Israel VC landscape; [4]Life Science Tax Incentive Program; [5]MA Life Science Center; [6]IATI Report; [7]Israel VC

MLSC: Massachusetts Life Sciences Center

Policy / Tax Incentives / Infrastructure Direct Investments

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Success requires vision: 15 years ago, Massachusetts made a bold, long-term commitment to its life sciences economy; Ontario should be just as ambitious about the potential of our life sciences ecosystem

Massachusetts has been strategically and heavily investing in its life sciences ecosystem, which has resulted in job creation, growth in the number of life sciences companies and has attracted significant VC investment.

Life Science Initiative (LSI) passed[1]

- Discretionary Investments: $250M
- Capital Investments: $500M
- Tax Incentive Program: $250M

LSI 5 yr. extension[2]

- Capital Investments: $473M
- Tax Incentive Program: $150M

LSI 10 yr. re-authorization[3]

- Capital Investments: $500M
- Tax Incentive program: $350M (statutory cap increased from $30M to $50M)
- Operating Investments: $150M ($10M for MLSC in FY25 House 2 budget)

DECISIONS

~$1B funding (10Y) — *~$623M funding (5Y)* — *~$1B funding (10Y)*

2008 — 2018 — 2019 — 2020 — 2021 — 2023 — 2024 — 2033

IMPACT

20,000 jobs added over 10 yr.[4]

MA-based LS companies raised $5.8B.[5]

$13.66B VC funding for biopharma companies.[5]

- 10,000+ new hires resulted from TIP awards ($309M).[6]
- 11.6% more employment from 2021, outpacing national growth of 6.3%.[7]

LS: Life Science; LSI: Life Science Initiative; MLSC: Massachusetts Life Sciences Center; MA: Massachusetts; TIP: Tax Incentive Program

[1]Life Science Initiative; [2]LSI re-authorization; [3]Mass Leads; [4]MassBio News; [5]MassBio Report; [6]MLSC Tax Incentive; [7]BioSpace News

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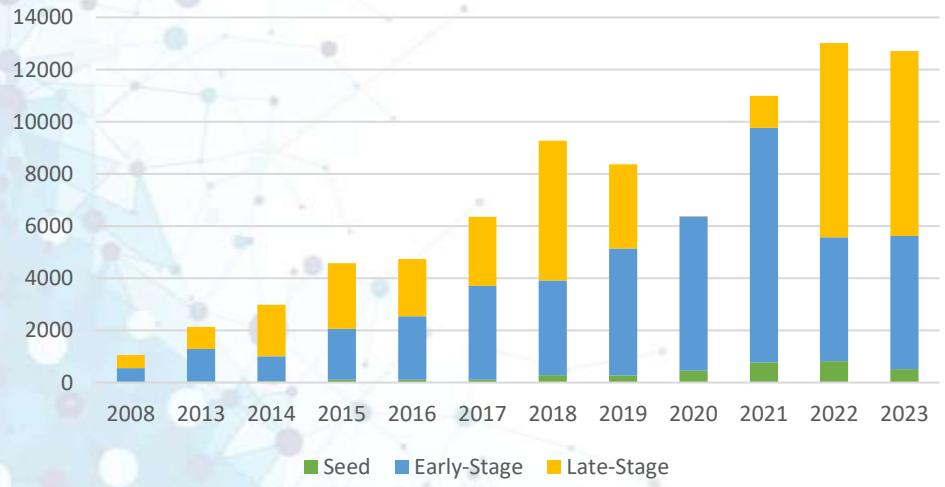
The results are clear: When Massachusetts started, its ecosystem was smaller than Ontario's is today; within a decade, it achieved nearly 10x growth in VC investment and 5x growth in homegrown companies

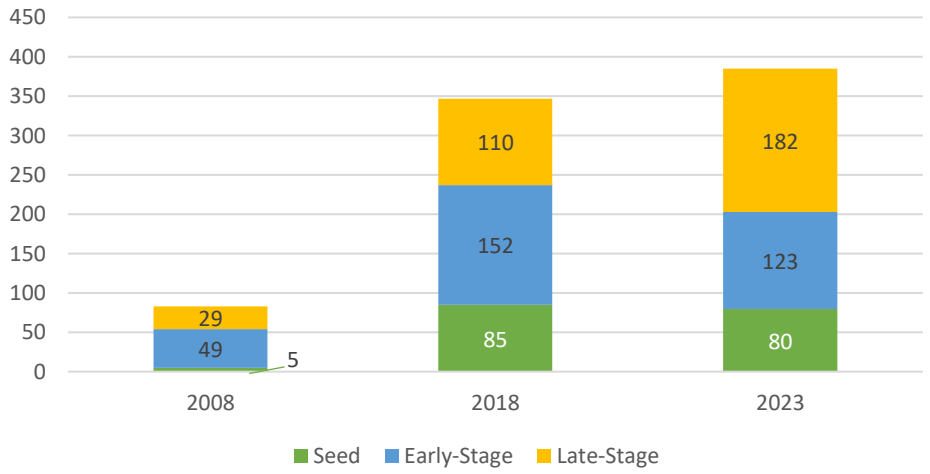
Massachusetts' strategic focus on de-risking early-stage investments has fueled a rapid rise in venture capital funding and startup growth, transforming the region into the global innovation hub it is today.

Boston's VC investment by stage ($M USD)[1]



	2008	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Total ($B USD)	1.0	2.1	2.9	4.6	4.7	6.3	9.3	8.4	6.3	11.0	13.0	12.7

Number of companies[1]



[1]Pitchbook (data retrieved October 11, 2024)

The Ask:
Direct Investment in Ontario's Early-Stage Homegrown Companies

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Ontario can realize the full potential of its life sciences sector

Ontario can become a top-tier global life sciences hub by de-risking early-stage investments and committing to specialized commercialization solutions to unlock its life science sector's untapped economic potential.

While the life sciences sector is unique and requires fit-for-purpose mechanisms to encourage private sector investment, there are a variety of de-risking approaches that Ontario can consider:

- Engaging pension funds as investors in life sci
- Tax incentives and credits for companies and angels
- Flow-through shares
- Private fund matching
- Direct investment in public seed or start-up funds

Bespoke solutions for Ontario, inclusive of direct investment in startups, are needed to position our life sciences ecosystem for success.

Policy / Tax Incentives / Infrastructure

Direct Investments

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Life sciences companies need direct investments to bolster success

Direct investments are the missing piece that can take Ontario's life sciences ecosystem to the next level.

A public start-up fund could help address a gap in access to risk capital in Ontario.

To maximize success, the fund will need to deliver sustained funding with the right deal size at the right time to the right number of companies with the right risk profile.

Deal Size[1]: $2-10M

Deal Number: 10-12 deals/year

Risk Profile: small companies with promising technology and IP that addresses an unmet need

Timing: 3-5-year program with lead rounds, not just follow-on

Decisions: Market-driven, guided by knowledgeable market advisors

[1]Deep Centre Report

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