Employment Outcomes of Life Science Industry Job Simulation Program Alumni at the University of Toronto—Where are They Now?

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Challenge

- Life science graduate trainees may not be competitive in the industry job market if they do not have knowledge, skills and experience that employers can relate to
- Experiential learning, including job simulation, can help trainees prepare themselves for the job market

Job Simulation Program @ Univ. of Toronto: Industry Team Case Study (ITCS)

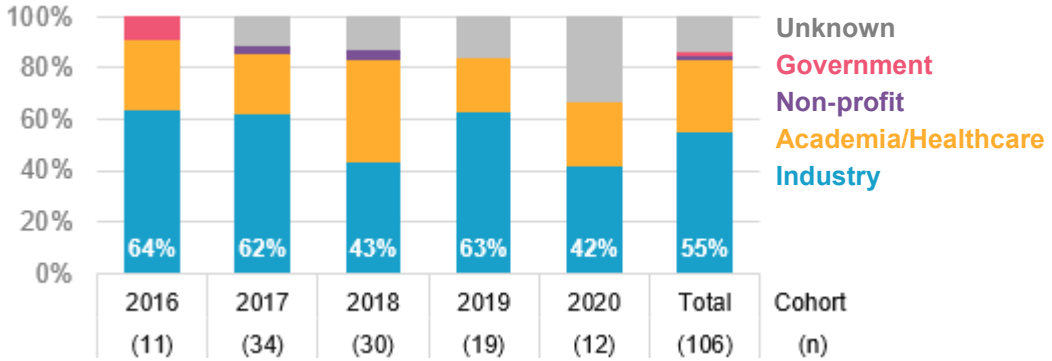
- Trainees (graduate students, postdoctoral fellows) work in teams on **simulated industry projects with mentorship from professionals**
- Trainees
  1. **Identify a business or policy challenge**
  2. **Conduct research and analysis**
  3. **Propose a solution to address the problem**
  4. **Present their findings to industry professionals**
- Mentors provide feedback on proposed topics and quality of the work, and explain complex aspects of their field
- Program developed and operated by Science Career Impact Project and Life Sciences Career Development Society

Conclusions

- Life science job simulation program, internships and other training were associated with employment in industry
- To prepare for industry employment, job simulation is an alternative or complement to an internship

Sector of first employment after completing degree/fellowship

- 184 trainees participated in the job simulation program from 2016 to 2020 (p4)
- As of Jan. 2021, 55% (58/106) of the trainees who had graduated / completed training were first employed in industry



- Historical benchmark: 951 life science PhD graduates from 2012 to 2015; in 2016, 20% were employed in private sector (industry); see Methods (p4)

Job simulation program benefits

Trainees	• Develop knowledge, insights, teamwork, technical skills, project portfolio • Engage hiring managers and boost employment prospects • Explore careers
Industry Advisors	• Mentor and coach talent • Hone people development skills
Employers	• Incubate, scout and acquire specialized talent • Develop people leaders
Universities	• Deliver valuable training to students and prepare them for the workforce • Recruit top students by increasing graduate employment metrics • Build connections with employers

Paths to employment in industry

58 alumni graduated / completed training after the Industry Team Case Study job simulation and were first employed in industry

52% completed **job simulation** and no internship → **Job simulation** → **Employed in industry**

48% completed **job simulation** and **≥1 internship** → **Job simulation** + **Internship** → **Employed in industry**

Sector	Industry job simulation: project		First employment in industry: role	
	Clinical Development	Assay Development	Clinical Devlpmt., R&D	Data Science
	Market Access	Product Development	Market Access	Business Development
	Medical Affairs	Business Development	Medical Affairs	Sales & Marketing
	Regulatory Affairs	Marketing	Regulatory Affairs	Medical Communications
				Project Management
				Consulting
				Investment Banking
				Market Research
	Internship in industry: employer		**First employment in industry: employer**	
Pharmaceutical Biotechnology Healthcare	Apopharma	Mint Pharmaceuticals	AbbVie	Johnson & Johnson
	Gilead	Northern Biologics	BlueRock Therapeutics	Mint Pharmaceuticals
	Iconthin Biotech Corp	Paradox Immunotherapeutics	Dalriada Drug Discovery	Novartis
	Janssen	Proteorex Therapeutics	Edesa Biotech	Pfizer
	Johnson & Johnson	Sanofi Pasteur	Gilead	Sanofi Pasteur
			Janssen	Triumvira Immunologics
Devices Diagnostics	Fluidigm	Roche Molecular Diagnostics	Fluidigm	Medgenome
	GE Healthcare		Geneseq Technology Inc.	Neuroblot
			Globus Medical	Thermo Fisher Scientific
Consulting Professional Services	Bereskin & Parr LLP	Sixsense Strategy Group	Arnot Research and Consulting	IQVIA
	Boston Consulting Group	Toronto Bioscience Consulting Group	Bain and Company	Klick
	KSAR & Associates	Trindent Consulting	Boston Consulting Group	PIVINA Consulting
	MORE Research Group		ClearView Healthcare Partners	Preyra Solutions Group
			EY	Shift Health
			Financeit	Sixsense Strategy Group
			GlobalData Plc	Windsor Clinical Research
Information Technology	BenchSci	Knowtions Research	BenchSci	Knowtions Research
			conversationHealth	
Banking Finance	Bank of Montreal	Canada Pension Plan Investments	Bloom Burton & Co.	
	Bee Group Ventures	Diamas Capital		
	Beehive Venture Capital	Mitsui & Co. Global Investment Ltd.		
	Bloom Burton & Co.			
Communication	Massive Science	QuillDrive	Cactus Communications	Integrated MedHealth Communication
Other	DermEdge		Canadian Tire Corporation	WeavAir

Many trainees pursued other development activities including internships in non-profit organizations and/or other training

	Internship in non-profit		First employment in non-profit
Health	BioCanRx	Osteoarthritis Research Society International	Canadian Partnership Against Cancer
	Canadian Cancer Society	United Against Cancer	Canadian Psoriasis Network
Consulting	180 Degrees Consulting	University Consulting Group	
	Endeavour Consulting	University of Toronto Consulting Association	
	Meristem Health		
Research	Ontario Institute for Cancer Research	Vector Institute	
Other	Agincourt Community Services Association	March for Science Toronto	
	American Society of Human Genetics	Overseas Chinese Healthcare Innovator Society	
	Health Innovation Hub	TO Health	
	Foundation for Student Science and Technology		

	Other training		
Professional Designation	Charted Financial Analyst	Law	Project Management Professional
Post-Secondary Education	PhD degree (post-Master degree)	Seneca College: Pharmaceutical Regulatory Affairs & Quality Operations	Algonquin College: Regulatory Affairs
Research Training	Good Clinical Practice	Good Manufacturing Practice	Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans
	Good Laboratory Practice		
Courses, Workshops, Certificates	Bloomberg Professional Services: Market Concepts	Lighthouse Labs: Web development bootcamp	SAS Certified Programmer
	Cheeky Scientist: Scientist MBA for STEM PhDs	Hospital or Sick Children: Scientist Knowledge Translation Training Workshop	Ted Rogers Centre for Heart Research: Entrepreneurship for Cardiovascular Health Opportunities
	Clearview Healthcare Partners: Connect 2 Clearview	Medical and Related Sciences: Venture Ready Project	Rotman School of Management: Pharmaceutical Strategy, Business of Healthcare
	DataCamp: Data Science	Mitacs: Foundations of Project Management	University of California San Diego: Drug Development
	Data Science: The Data Incubator	Mitacs: Skills of Effective Communication	University of Toronto: Medicine by Design, Quantitative Methods for Business Management
	Duke-NUS Medical School, Centre of Regulatory Excellence: Medical Affairs	NSERC: Collaborative Research and Training Experience Program	Y Combinator: Startup School
	Graduate Management Consulting Association: Business Fundamentals (miniMBA)	Ontario Bioscience Innovation Organization: Health to Business Bridge MedTech Bootcamp	
	Impact Centre: Entrepreneurship		

>180 trainees participated in the job simulation program from 2016 to 2020

Cohort	2016	2017	2018	2019	2020	Total
Total	*11*	*45*	*41*	*40*	*47*	*184 (100%)*
***Master**	-	12	19	11	19	*61 (33%)*
PhD	11	25	18	23	17	*94 (51%)*
Postdoc	-	6	2	2	8	*18 (10%)*
PharrmD	-	1	-	-	-	*1 (<1%)*
Other	-	1	2	4	3	*10 (5%)*

*MSc, MHSc, MASc

Methods

- Publicly available data were retrieved from institutional sources (eg, University of Toronto Online Thesis repository, department websites), online networks (eg, LinkedIn) and other online sources (eg, PubMed) to identify training activities and employment outcomes of Industry Team Case Study job simulation program alumni
- Data were current as of January 2021
- To determine a historical benchmark rate for sector of employment, data were derived from the 10,000 PhDs Project, School of Graduate Studies, University of Toronto (Reithmeier et al. 2018. Retrieved March 25, 2021 from www.sgs.utoronto.ca/about/Pages/10,000- PhDs-Project.aspx). From 2012 to 2015, there were 951 PhD graduates in life sciences (Faculties of Medicine, Dentistry, Pharmacy, Public Health). Their employment as of 2016: post-secondary, 47%; private (industry), 20%; public, 18%; charitable, 4%; individual, 1%; unknown, 10%. These rates were not compared to the rates for the Industry Team Case Study alumni due missing data on potential confounding factors.

Suggested Reading

Kozma, K., Meyer-Miner, A., Chio, J., Mak, S., El-Boraie, A., Sealey, D. (2021). Developing an industry job simulation program for graduate and postdoctoral trainees in the life sciences. Canadian Journal of Career Development. 20(2), 84-93. doi.org/10.53379/cjcd.2021.102

Sealey, D., Yung, A., Rinchon, C., Wehrle, C. (2020). Case studies give grad students a chance to tackle industry challenges. University Affairs. www.universityaffairs.ca/career-advice/career-advice-article/case-studies-give-grad-students-a-chance-to-tackle-industry-challenges/

Yung, A., Wehrle, C., Rinchon, C., Sealey, D. (2019). Getting hired in industry – life science graduate students use case studies to get noticed by employers. OSF Preprints. doi.org/10.31219/osf.io/x6fny

Her, S., Jacob, M., Wang, S., Xu, S., Sealey, D. (2018). Non-academic employability of life science PhDs: the importance of training beyond the bench. BioRxiv. doi.org/10.1101/485268

Freeman, M. (2017). How case studies can help to smooth the academy-to-industry transition. University Affairs. www.universityaffairs.ca/career-advice/career-advice-article/case-studies-can-help-smooth-academy-industry-transition/