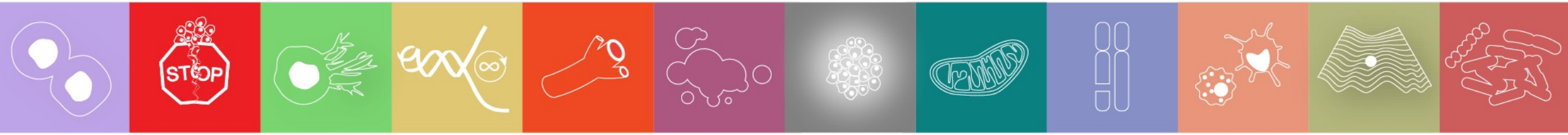
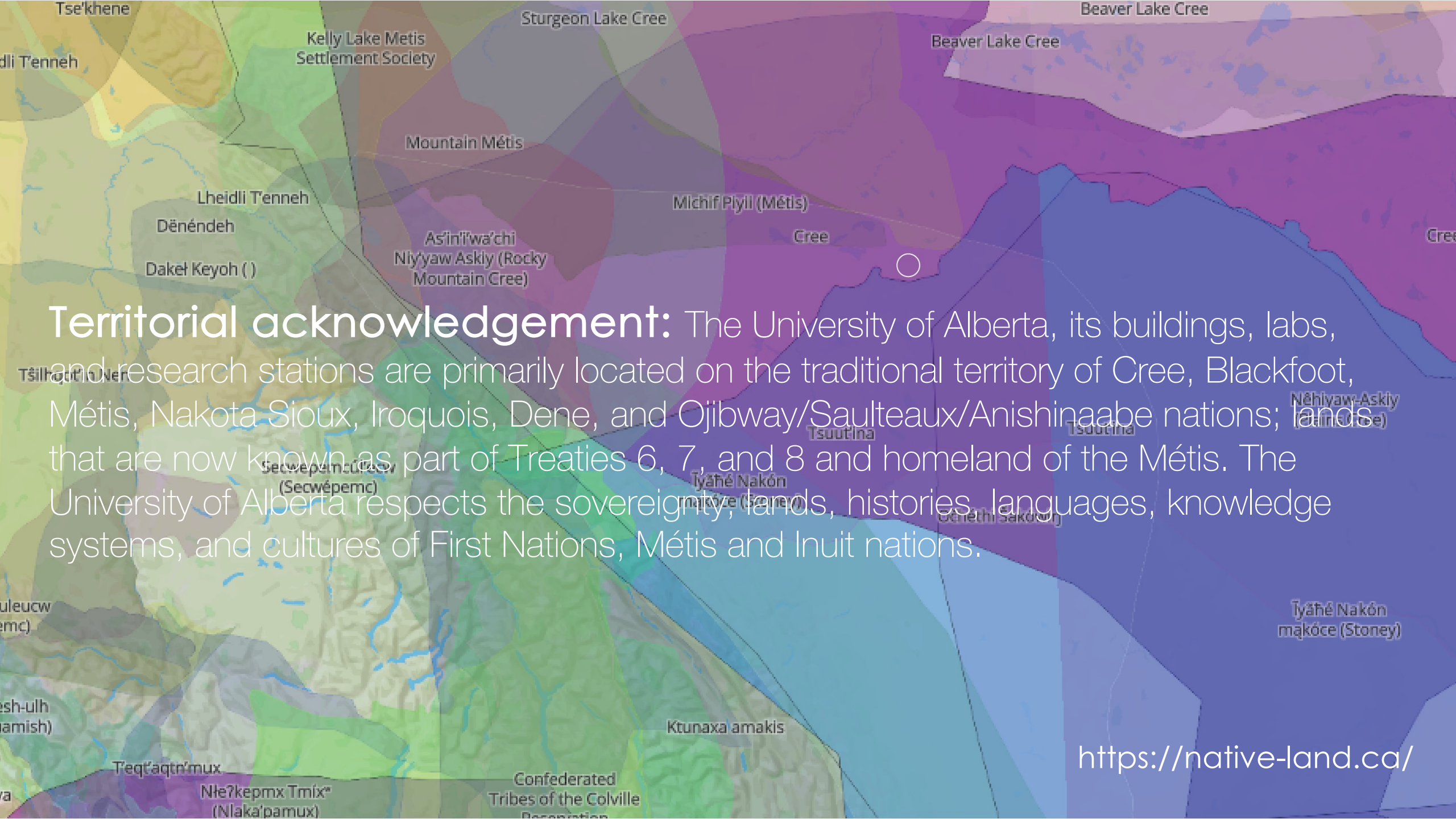
MD with STIR, MSc, and PhD: you've got options



Alan Underhill, PhD

Professor
Department of Oncology
Associate Dean Research, Graduate Programs
Director, MD/PhD program
Faculty of Medicine & Dentistry

MD research presentation
October 28, 2025



Territorial acknowledgement: The University of Alberta, its buildings, labs, and research stations are primarily located on the traditional territory of Cree, Blackfoot, Métis, Nakota Sioux, Iroquois, Dene, and Ojibway/Saulteaux/Anishinaabe nations; lands that are now known as part of Treaties 6, 7, and 8 and homeland of the Métis. The University of Alberta respects the sovereignty, lands, histories, languages, knowledge systems, and cultures of First Nations, Métis and Inuit nations.

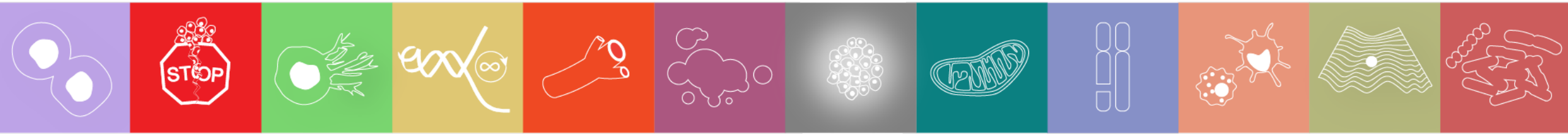
https://native-land.ca/

”Physician–scientists are traditionally the primary catalysts in bridging the translational gap—that is, the failure to link fundamental new knowledge in the pathobiology of disease with advances in health care and health policy in a timely manner”

Strong et al (2017) Academic Medicine

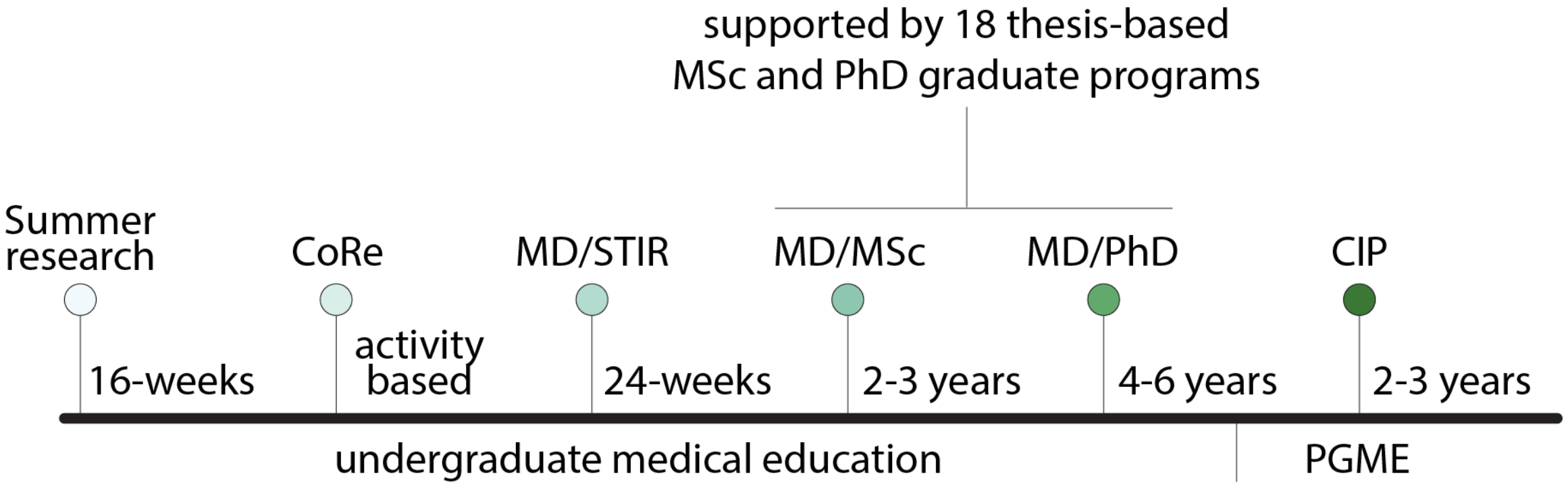
Developing the medical expertise to identify clinical gaps and the research credentials to effectively address them

Research: from bench to bedside



Sustained proliferative signaling	Evading growth suppressors	Activating invasion & metastasis	Enabling replicative immortality	Induction of angiogenesis	Resisting cell death	Tumor-promoting inflammation	Deregulation of cellular energetics	Genome instability & mutation	Avoiding immune destruction	Epignetic deregulation & plasticity	Altered microbiota homeostasis
EGFR inhibitors	Cyclin-dependent kinase inhibitors	Inhibitors of HGF/c-Met signaling	Telomerase inhibitors	Inhibitors of VEGF signaling	Pro-apoptotic BH3 mimetics	Selective anti-inflammatory drugs	Aerobic glycolysis inhibitors	PARP inhibitors	Immune checkpoint blockade inhibitors	Inhibitors of DNA/histone modification	Microbiome modulation

MD research opportunities and credentials



- Provide a range of credentials that allow you to contribute to research in different ways

https://www.ualberta.ca/en/medicine/programs/md/program/combined-programs/index.html

Summer student research

The Undergraduate Summer Students' Research Program in the Faculty of Medicine & Dentistry at the University of Alberta provides undergraduate and medical students the opportunity to participate in summer research under the supervision of a faculty member. Summer research positions are available for two, three or four months each year between May and August. Over 200 students participate annually, making this the largest program of its kind in Canada.

Provides a valuable opportunity for undergraduate students to gain research experience while in the MD program

MD with Special Training in Research

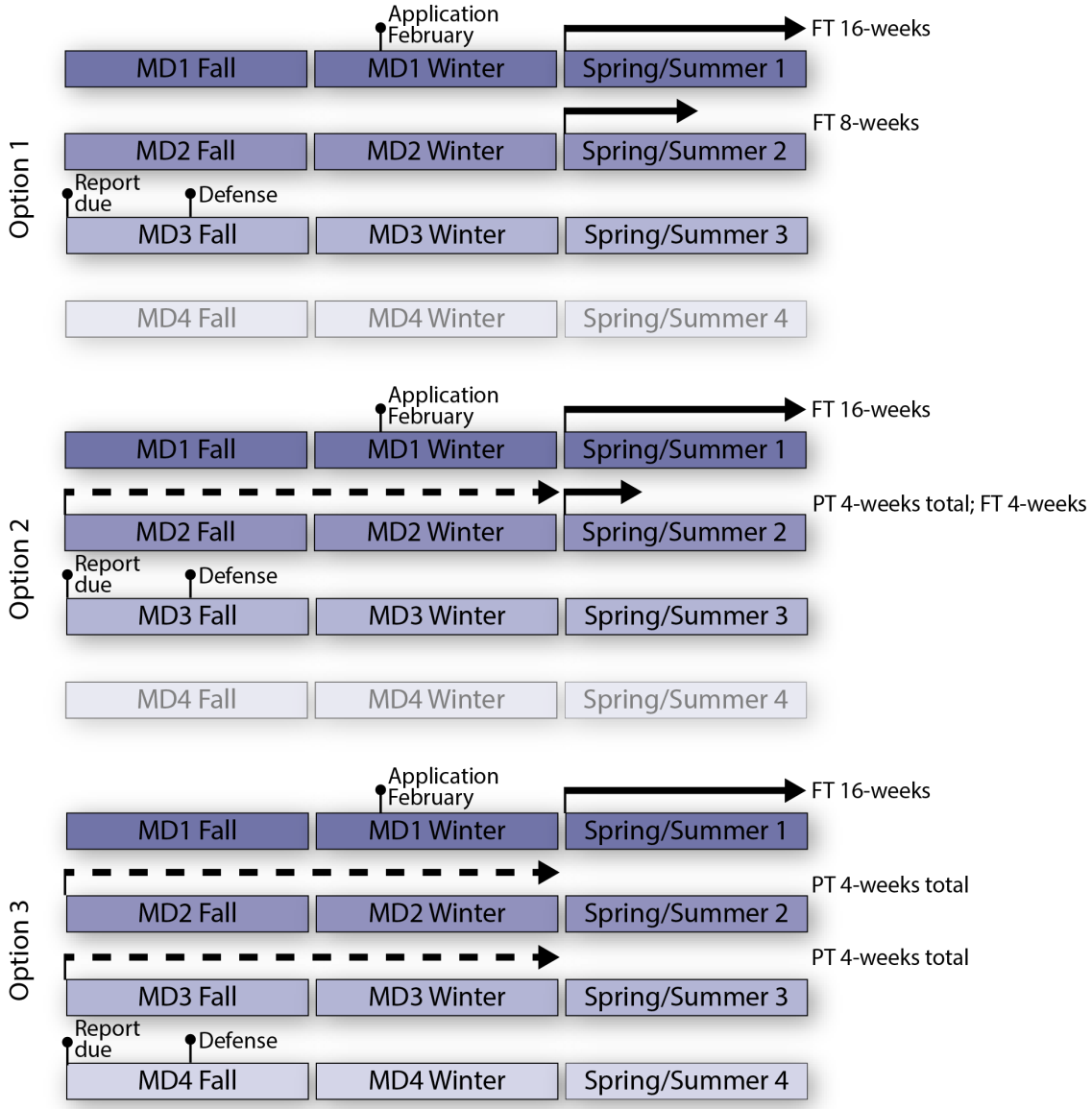
The MD with Special Training in Research program (MD/STIR) is designed for Year 1 medical students in the Faculty of Medicine & Dentistry (FoMD) who wish to participate in research above and beyond what is offered within the MD Program.

In the MD/STIR program, students join a research team and directly engage in biomedical research over 24 weeks. Students who successfully complete the program receive the designation of "Special Training in Research" on their degree parchment and transcript.

MD/STIR requirements

- Research component:
  - ~24 weeks of active research conducted under the supervision of a research-intensive faculty member
  - Produce and analyze data that tests a research hypothesis
- Written component:
  - Research proposal
  - Final report
- Presentation component:
  - 3-minute pitch
  - 15-45-minute oral seminar
  - Poster presentation
  - Final oral presentation and defense

Flexible MD/STIR program structures



Application requirements:

- Identify a supervisor
- Prepare your research proposal
- Ensure any ethics approvals are in place
- Include your *Curriculum Vitae*
- Describe research timeline (options 1, 2, or 3); all options require 16-weeks of full-time research in the spring/summer term after year 1

Additional requirements:

- 2 oral presentations in summer 1
- 1 oral presentation at time chosen by supervisor
- Poster presentation in year 2 of the FoMD Summer Student Research Day
- Apply for funding (e.g., studentships)

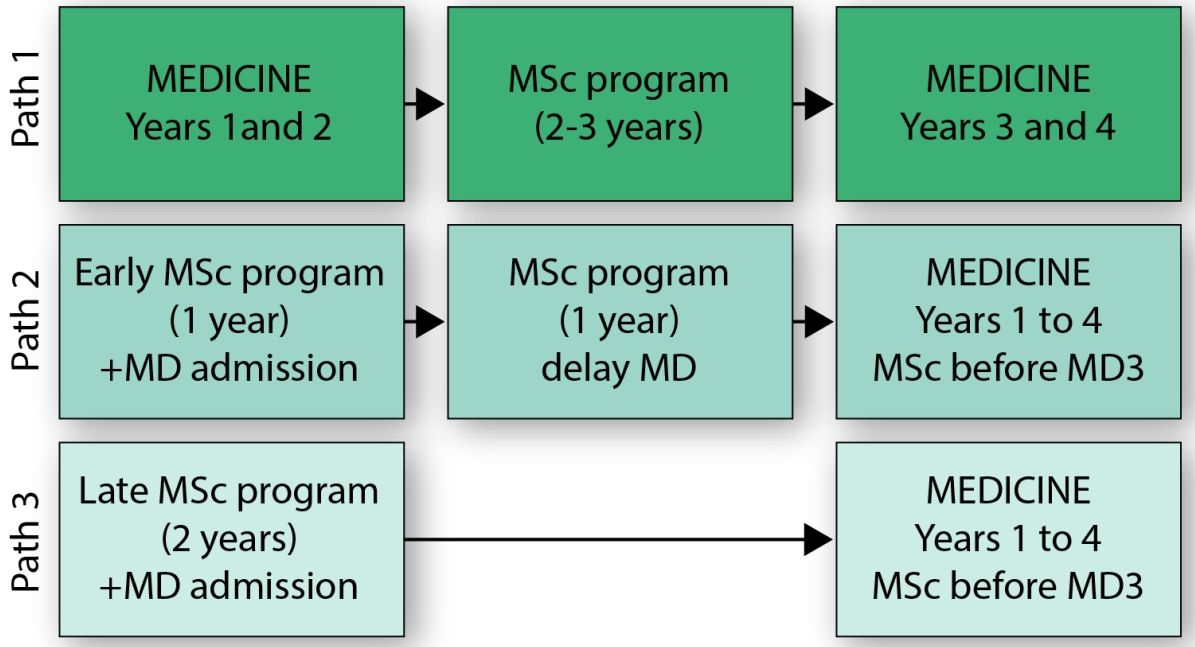
MD/STIR FAQs and feedback

- Can I participate if I already have a post-graduate degree in research?
  - Yes, this is a great opportunity to engage in different research and remain engaged with the research community, as well as align with clinical interests
- Will I be able to publish my results?
  - Yes, some undergraduate research students can and do publish their results. Almost always, their research contributes to a larger study, so there are multiple authors and the work is typically published a few years later. For this to happen, you need a good training environment with a good study design, robust data, meaningful results, and often luck!
- Feedback
  - The best part of the program was getting to officially take part in research during medical school
  - My research experience helped me develop research skills, technology development skills, complex problem-solving skills and it gave me multiple awesome interpersonal relationships with my research colleagues
  - I think the most important thing I gained from this program is further experience in presenting and defending my research. I have given presentations before, but never had to defend my work. I also liked how the program mandated a certain number of presentations during the summer, as this provided motivation for me to give more presentations than I otherwise would have.

Combined MD-graduate degree programs

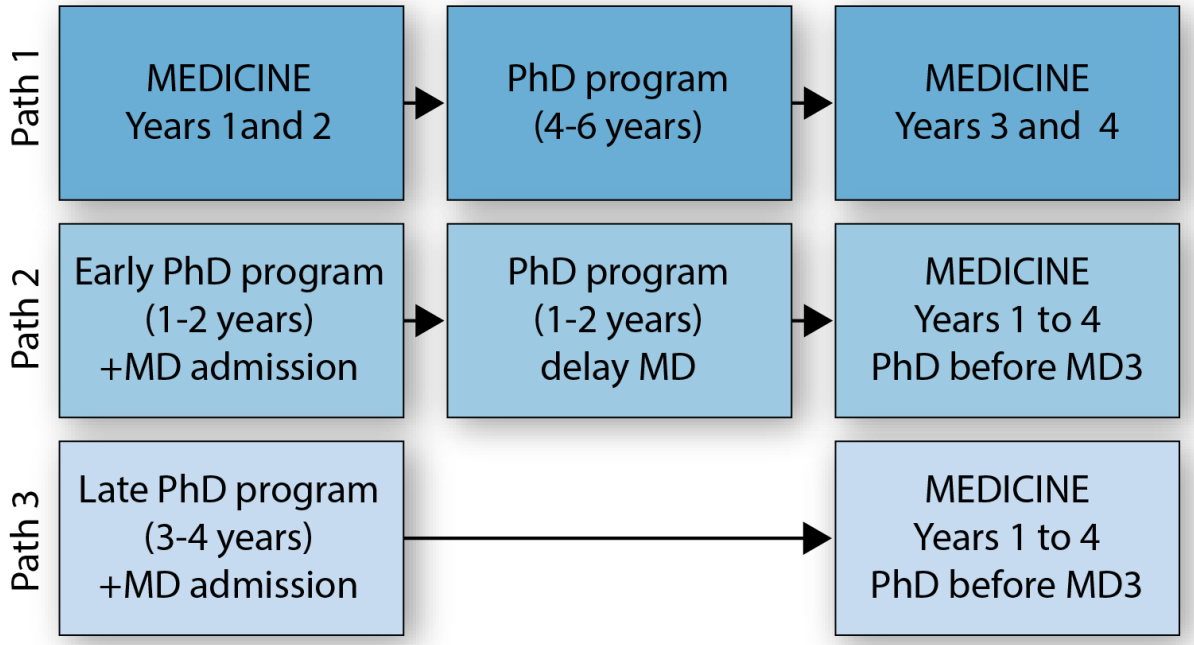
- The MD/PhD program; supported by the FoMD and UME; graduate degree is overseen by FGSR; health related but not necessarily in FoMD
- The MD/MSc program; supported by the FoMD and UME; graduate degree is overseen by FGSR; health related but not necessarily in FoMD
- Clinical Investigator Program; carried out in residency; supported by the Royal College of Physicians and Surgeons of Canada; MSc and PhD options

MD/MSc program structure



- Path 1: notify of intent by October of MD year 2; apply by November
- Paths 2 and 3: course work completed before starting MD
- All paths require that the MSc be completed and defended before starting clerkship (MD year 3)
- MSc at UofA; not necessarily within FoMD but medically-related
- Meet all requirements of MSc program (not a specific MD/MSc stream)

MD/PhD program structure



- Path 1: notify of intent by October of MD year 2; apply by November
- Paths 2 and 3: course work and candidacy completed before starting MD
- All paths require that the PhD be completed and defended before starting clerkship (MD year 3)
- PhD at UofA; not necessarily within FoMD but medically-related
- Meet all requirements of PhD program (not a specific MD/PhD doctoral stream)

Features of Canadian MD/PhD Graduates

CMAJ OPEN

Research

Characteristics and outcomes of Canadian MD/PhD program graduates: a cross-sectional survey

Michael A. Skinnider BArtsSc, Jordan W. Squair MSc, David D.W. Twa BSc, Jennifer X. Ji BSc, Alexandra Kuzyk BSc, Xin Wang PhD, Patrick E. Steadman MSc, Kirill Zaslavsky BSc, Ayan K. Dey BSc, Mark J. Eisenberg MD MPH, Ève-Reine Gagné MD, Kent T. HayGlass PhD, James F. Lewis MD, Peter J. Margetts MD PhD, D. Alan Underhill PhD, Norman D. Rosenblum MD, Lynn A. Raymond MD PhD

https://www.cmajopen.ca/content/5/2/E308

Features of Canadian MD/PhD graduates

- Surveyed 186 eligible alumni of MD/PhD programs (74.7% completed the survey) who had graduated prior to 2015
- A majority (58 [83%]) of the 70 respondents who had completed all training were appointed as faculty at academic institutions (typically below 20% for PhD graduates)
- Among the 58 respondents appointed at academic institutions, 44/57 (77%) dedicated at least 20% of their time to research 25/57 (44%) dedicated at least 50% to research
- 133/136 (97.8%) matched with their first residency choice (some programs encourage or require a graduate degree)
- The median length of physician-scientist training was 13.5 years

What have my research students done?

- Physician-scientist, head & neck surgeon (MD/PhD)
- Gastroenterology resident (MSc)
- Orthopedic surgeon (MD-STIR with residency and fellowship training)
- Completed MD training (UG with medical training)
- General surgery (UG with medical and residency training)
- Medical oncologist, genitourinary (MSc during residency)
- Senior university research administration (PhD)
- Bioinformatics specialist (MSc)
- Intellectual property lawyer (UG; completed PhD abroad and then law)
- Assistant professor (UG; completed PhD and postdoctoral abroad)
- Lawyer (UG and then law)
- Forensic scientist (UG with additional discipline-specific training)
- Research institute program manager (UG with on-the-job training)

Contact information

- MD/MSc and MD/PhD: **alan.underhill@ualberta.ca**
- Contact the FoMD Graduate Programs Advisor: **fmdgrd@ualberta.ca**

- MD/STIR: **taharkne@ualberta.ca**
- Contact the FoMD Undergraduate Programs Advisor: **nkosturi@ualberta.ca**

https://www.ualberta.ca/en/medicine/programs/md/program/combined-programs/index.html

Questions?