

SPECIFIC ENTRUSTABLE PROFESSIONAL ACTIVITIES (observable & measurable) and CORE MILESTONES

A – WELLNESS, RESILIENCY AND EQUITY

1. Survival skills: Integrate learning opportunities designed to enhance personal wellness

- Recognize the importance of *personal wellness*; take advantage of the Program's commitment to help you accomplish personal and professional goals.
- Develop *self-awareness* of your development as a scientist/researcher. Use a structured personal *professional development plan*: the Program strongly recommends the use of a formal Individual Development Plan (IDP) tool. You may wish to learn about research roles/organizations that are relevant/of interest to your career pathway.
- Develop strategies for personal *adaptability* to adjust to work load, settings, interpersonal/other challenges.
- *Seek help* to address challenges (e.g., completing core curriculum or research in the face of unique pressures and demands; need to repeat studies/experiments; difficulty achieving sample sizes; dealing with ongoing demands. Reach out to the Program for help to navigate challenges and develop strategies to overcome obstacles.
- Recognize *signs and symptoms of burnout*; learn to ask for help as early as possible if you think that you are experiencing symptoms.
- *Network* to get to know peers; meet new faculty, thesis committee members or others at meetings/ conferences

2. Demonstrate cultural and EDI (equity, diversity, inclusiveness) awareness and sensitivity

Understand and apply best practices to achieve equitable, diverse, and inclusive representation.

Know how to apply EDI principles for patient-oriented and patient-partnered research.

- Complete training for *implicit bias, sex and gender in research, and EDI considerations/actions*
- Develop the ability to integrate *sex and gender considerations* into research projects and proposals.
- Recognize how to think about EDI practices to *reduce biases in research* that arise due to systemic inequalities.
- Develop skills to *recognize* instances of institutional racism, discrimination, and sexism that are barriers to advancing health, education, and career development of racialized groups.
- Demonstrate knowledge about the implications of *health inequalities*, recognize them, and how to rectify them in research design and logistics. Identify concrete practices that *promote EDI* in your research environment.

3. Research in partnership with Indigenous Peoples, Communities

Recognize important considerations for conducting research in partnership with Indigenous (First Nations, Inuit and Métis) peoples of Canada.

- Demonstrate *cultural and humility and safety* practices in acknowledging Indigenous communities.
- Recognize and respect *First Nations OCAP* (Ownership, Control, Access, Possession) principles in research.
- Discuss the *impact of colonization and intergenerational trauma* on health and well-being.

B – KNOWLEDGE ACQUISITION

4. Broad knowledge of a scientific discipline

Demonstrate broad knowledge of a scientific discipline.

- *Integrate knowledge* to articulate connections between new information and existing knowledge

5. Current content expertise in a specific area

Develop up-to-date expertise in a specific scientific area of focus.

- Demonstrate an *area of focused expertise* after performing literature searches and attending relevant seminars. Demonstrate ability to critically evaluate papers, question dogma, see the bigger picture, deliver knowledgeable seminar, consistently acquire new knowledge.
- Design and *plan for research* in your primary area of scientific/health research expertise.

6. Knowledge of research tools and approaches (broad / area-specific)

Identify and differentiate appropriate tools and approaches to answer key research questions.

- Describe key principles, ask relevant questions, *integrate multiple disciplines*, use existing experimental tools.
- Develop *new tools* and/or approaches, demonstrate comprehensive knowledge of tools & approaches.

C – RESEARCH SKILLS & SCIENTIFIC RIGOR

7. Critical thinker

Apply critical and creative/innovative thinking skills.

- Recognize and formulate *important questions*, design and execute feasible experiments and experimental protocols to answer questions (testable hypotheses), interpret data, evaluate results, recognize significant results, data integrity and validity.
- *Plan research project*, prepare background information, interpret data, evaluate results, recognize significant results, data integrity and validity.

8. Skilled investigator

Demonstrate essential skills of a successful investigator

- Use appropriate *research protocols* (understand, design, explain, select); identify & troubleshoot technical issues.
- Develop and manage accurate research records and *data storage*. Understand importance of maintaining original data *confidentially and securely*.

9. Computational/analytical skills

Analyze and synthesize data using a repertoire of relevant computational & analytical abilities

- Develop basic *statistical and analytical skills*: use of appropriate statistical tests and data types that inform test choices; differences between qualitative and quantitative data analyses; generate and graph summary statistics; understand type 1 and type 2 errors and mitigation of errors; recognize when statistical consultation is needed.

D – RESEARCH REGULATORY CONSIDERATIONS

10. Knowledge & demonstrated practice of responsible conduct of research

Recognize and practice responsible conduct of research

- Describe rules, follow principles, recognize *ethical & unethical research*.
- Demonstrate ability to *seek help* if you encounter *unethical practices*.
- Demonstrate *honesty, fairness, and integrity*.

11. Research safety & regulatory issues

Read and apply relevant safety and regulatory guidelines

- Complete required training and demonstrate compliance related to *ethical conduct in research*.

12. Regulations, governances, quality assurance and risk management

Demonstrate knowledge of regulatory, governance, quality assurance, risk management, and data ownership principles; application to your research

- Recognize issues pertaining to *data ownership* and their application to both intra- and inter-lab collaborations.
- Recognize the *risks for research participants* and know strategies to ensure safety for all

E – COMMUNICATION, COLLABORATION & LEADERSHIP

13. Skilled oral and written communicator

Demonstrate effective communication skills (oral, written, other) to disseminate research knowledge to partners and end-user groups. Understand concepts of knowledge dissemination. Be a credible expert.

Oral communications:

- Demonstrate effective delivery of *informal communications* (eg at journal clubs, lab meetings, 2-min “pitch” to reply to questions about research; asking questions at seminars/talks; job interviews; institutional committee).
- Demonstrate effective delivery of *formal presentations* (eg conference presentation, seminar, job interview).
- Practice *communicating with the public* about research (eg, design 2-min elevator speech or infographic; communications of science/research to lay audiences; lead outreach activities to local schools/community).
- Take advantage of opportunities to develop and practice formal and informal *teaching skills*.

Written communications:

- Develop and produce a *research scholarship or grant proposal*. Understand structure, search for funding opportunities, learn how to review grants; develop specific aims for future independent research.
- Prepare a *poster* for a conference, and/or “graphical abstract” schematic.
- Write a *scientific manuscript* for publication. Select appropriate guidelines, know how to cite references, understand plagiarism. Learn how to analyze & interpret data, prepare figures, write introduction/literature review/discussion without plagiarizing, format for journal style, draft responses to critiques.

14. Integrated team player

Use opportunities for collaboration and team-based science initiatives.

- openness to *collaboration*, with awareness of your strengths, weaknesses, and intrinsic biases.
- ability to *integrate and modify research framework* as result of interactions with others (develop interdisciplinary research frameworks).
- ability to *work effectively as a team member*; use interpersonal skills to optimize group dynamics; contribute to group discussions; learn about interpersonal relationships; be respectful of others; be well-prepared for meetings; listen actively and show understanding by acknowledging others’ ideas; help ensure that all voices are heard.

15. Mentorship, management, and influence

Use opportunities to develop leadership and/or management skills.

- Apply *mentorship* best practices both as a mentee and a mentor; formulate career path, research vision.
- *Articulate* team/lab’s research, explain agenda and research directions.
- Develop and use *time-management* and *organizational skills*. Demonstrate ability to prioritize and coordinate tasks effectively to manage time. Seek guidance when facing challenges with organization/time management.
- Develop and apply research *decision-making skills* along a developmental continuum (eg, first, voicing opinion when prompted, then without prompts; seeking feedback/input from others; confidence to defend decisions).
- Develop the ability to identify and *manage conflict* (eg, recognize potential and real conflicts, seek advice in difficult situations to avoid escalation, learn to mediate conflict situations by emphasizing goals/issues rather than personalities, participate in conflict resolution, guide others to a collegial research environment).
- Assess *resource management* issues and their application to managing staff, budgets, logistics, grant reporting.