



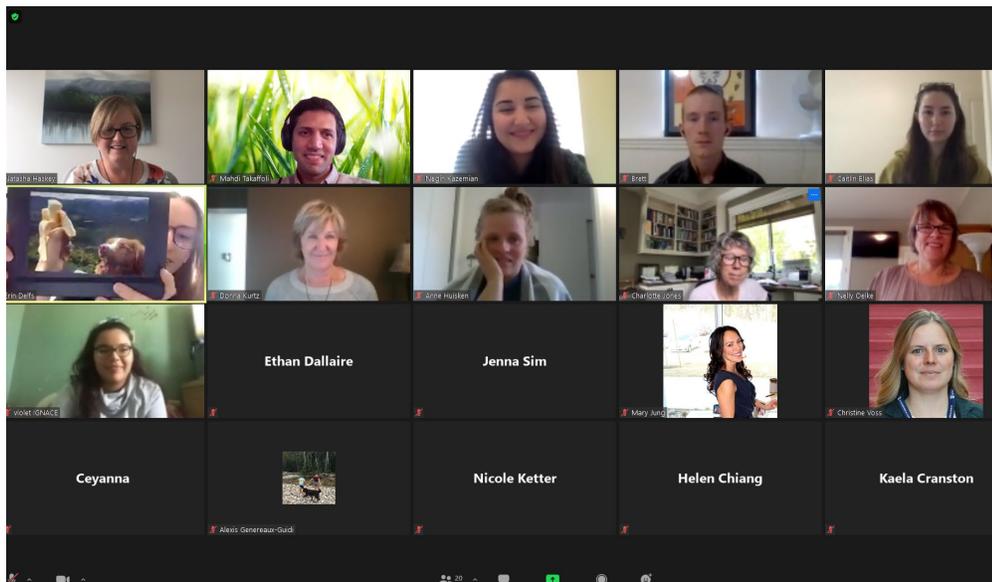
Multidisciplinary Undergraduate Research Projects in Health

Evaluation Report 2019-2021

2019-2020
MURPH Scholars



2020-2021
MURPH Scholars





MURPH is an undergraduate research program at UBC Okanagan (UBCO), awarded through the UBC's [Program for Undergraduate Research Experience \(PURE\)](#) competition, which aims to offer a unique cross-disciplinary platform to undergraduate students for engaging in academic research, while also providing professional training through MURPH-specific workshops. The core component of MURPH includes project teams comprising multiple undergraduate students and faculty members across faculties to conduct applied health research projects.

MURPH Management Team

Dr. Abbas Milani, Professor, School of Engineering

Dr. Joan Bottorff, Professor, School of Nursing

Dr. Natalie Anne Forssman, Lecturer, School of Engineering

Dr. Neil Eves, Associate Professor, School of Health and Exercise Sciences

Dr. Harry Miller, Professor, Psychology, Southern Medical Program

Dr. Mahdi Takaffoli, Research Engineer, MMRI

MURPH Graduate Mentors

Negin Kazemian, PhD Candidate in Applied Science

Natasha Haskey, RD PhD Candidate in Biology

Administrative Assistant

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Website

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Description of the MURPH Program at UBCO

MURPH was designed to engage undergraduate students in multidisciplinary research and incorporate learning objectives—mainly revolving around collaborative techniques—that are not typical outcomes of current undergraduate research programs (URPs). ‘Health’ as a theme was selected for this program after consultation with several department heads and institute directors to ensure maximum interest and engagement by students and faculty. Through MURPH, the Materials and Manufacturing Research Institute (MMRI) leveraged its partnership with health-focused institutions at UBCO, namely the Centre for Heart, Lung & Vascular Health (CHLVH), and the Institute for Healthy Living & Chronic Disease Prevention (IHLCDP), with the support of Faculty of Health and Social Development (FHSD), Southern Medical Program, as well as the School of Engineering to place undergraduates from all the disciplines in health-related research projects, exposing them to the world of research-based careers by providing multi-lab research experience and mentorship. The core component of MURPH included project teams that were comprised of multiple MURPH Undergraduate Research Scholars (named as MURPH UR Scholars) and faculty from different departments and institutes collaborating around “applied” health research projects that call for multidisciplinary collaboration.

Core Objectives

MURPH aimed to offer a unique multidisciplinary research setting along with scholarly and professional development training to undergraduates at UBCO, targeting various learning objectives including:

1. Developing skills for collaboration, scientific discussion, and brainstorming with undergraduate/graduate peers and PIs from other disciplines;
2. Developing and refining research plans and protocols collaboratively; and
3. Engaging in research activities that are meant to have meaningful impact on communities, healthcare institutions, industries, etc.

Approach

A call for MURPH proposals was announced among faculty members across UBCO in the Summer 2019 & 2020 Terms. Interested faculty provided a high-level description of the intended multidisciplinary project, as well as the required competency of each of the 2-3 undergraduates from different faculties needed for the project.

Undergraduate students from across campus were invited to apply to the MURPH program by applying to an on-line portal. The students provided their resume, transcripts and a short description of their purpose and interest in health-related projects. Select candidates were introduced to the faculty members or PIs for interviewing. More details on the application can be viewed [here](#).

Fourteen projects were selected encompassing 12 disciplines (**Figure 1**). A total of 28 faculty mentors and 32 UR Scholars participated in the program.



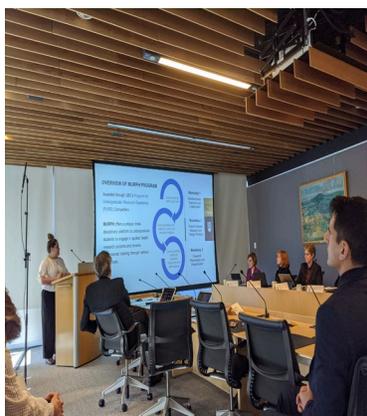
Figure 1. Disciplines involved in the MURPH Program

Phase 1 & 2 of the program were conducted over the Fall (2019 & 2020) & Winter (2020 & 2021) academic years. The UR Scholars conducted part-time research over 20 weeks (\$15/hour for 10 hours/week), in addition to pursuing their regular course work as part of their degrees. UR Scholars participated in three workshops designed to enhance professional skills (Table 1), in addition to a Launch/Welcome Event. In Phase 2, all workshops were held virtually due to COVID. For more details on the workshops please refer to our website [here](#). UR Scholars presented their research at one of two undergraduate research conferences (Multidisciplinary Undergraduate Research Conference (Vancouver) and the 2020 & 2021 UBC Okanagan Interdisciplinary Student Health Conference (Kelowna) with the additional benefit of networking opportunity with community, colleagues, and academic associates. A MURPH graduate mentor was assigned to each research group to offer guidance and support throughout the program. Successful UR Scholars were awarded a certificate of completion of the MURPH program if they successfully completed their research projects to the

satisfaction of their faculty mentor, attended all three MURPH workshops, and presented their research at minimum one undergraduate research conference.

Accolades

- MURPH was featured as a model program at a the UBC Board of Governors meeting on Feb. 14, 2020 (**Figure 2a**).
- Two of the 9 MURPH posters presented at the 2020 UBC Okanagan Interdisciplinary Student Health Conference (Kelowna) were awarded best poster in their respective categories (**Figure 2b and c**). At the 2021 UBC Okanagan Interdisciplinary Student Health Conference (Virtual), one scholar was awarded best poster in their respective category.
- Five students were offered summer employment as a result of the MURPH program.
- One MURPH research group presented their work at the International Conference on Radiology and Physics of Medical Imaging.



(a)



(b)



(c)

Figure 2. MURPH Scholars achievements: **(a)** Nicole Ketter attended UBC Board of Governors meeting in February 2020 to talk about her experience with the MURPH program, **(b)** Andrew Nicholson, Reece Walsh and Joan Brewer, and **(c)** Noman Mohammad and Angela Leung won the best poster awards at the UBC Okanagan Interdisciplinary Student Health Conference in March 2020.



Demographic Information

A total of 189 students applied to the MURPH program with a final number of 32 spots available for UR Scholars. In Phase 1, two students exited the MURPH program midway, one as a result of completing their degree requirements and the other not being able to fulfill the requirements of the program. Thus, two new students entered the program midway and replaced those students. Out of the 32 participants, 31 (97%) of the students met the requirements for completion. The one student that didn't receive a certificate joined the program midway and was unable to meet the requirements of attending all three workshops.

UR Scholar Workshops

Overall, the results of post-workshop evaluation surveys indicate the MURPH workshops were well attended by UR Scholars and that the UR scholars benefited from the content delivered at the workshops (Table 1). Seventy-four percent of students rated the workshop as either good or great. After examining the qualitative responses of the UR Scholars, key learning themes emerged from each workshop and are summarized below.

Table 1. Summary of UR Scholars Workshops

| | Workshop #1: Teamwork & Collaboration | Workshop #2: Patient-Oriented Research & Design Thinking | Workshop #3: Research Dissemination |
|-------------------|--|---|--|
| Objectives | 1) Understand the role of a multidisciplinary team in the context of research, 2) Understand the key components of a strong multidisciplinary team, 3) Describe your personal and disciplinary strengths that contribute to effective multidisciplinary research; and 4) Learn to reflect on your own role within a team environment, and to pragmatically apply workshop concepts and insights to current teamwork challenges. | 1) Define patient-oriented research (POR) and how it applies to health research, 2) Explain why POR/design thinking and usability research is valuable and beneficial, 3) Identify potential opportunities to engage patient partners in your own research project, 4) Identify examples of ethical and cultural competence considerations in POR/design thinking and usability research; and 5) Learn to effectively communicate with participants/patients in research. | 1) Employ best practices for effectively communicating within the research community and with industry; and 2) Practice giving and receiving peer feedback. |



| | | | |
|--|---|--|---|
| Attendance (UR scholars) | 97% | 97% | 100% |
| Level of Satisfaction | 88% satisfied or extreme satisfaction | 88% satisfied or extreme satisfaction | 97% satisfied or extreme satisfaction |
| Key Learnings Reported by UR scholars | <p>“There are various ways of approaching a multidisciplinary research setting, each one bringing different pros and cons.”</p> <p>“We all have different work habits and can contribute to the team in various ways. Learning how to work together to overcome our differences but still excel in our areas of expertise can lead to a cohesive and well-rounded team.”</p> <p>“How valuable proper communication is to making an interdisciplinary team effective.”</p> | <p>“It is important to involve patients in every step of the research process, and develop ideas based on their lived experiences.”</p> <p>“One of the advantages of adopting POR is one of a human-centered design perspective, where involving the patients/users of the study is aimed at optimizing the reception and how well a need is addressed.”</p> <p>“Thoroughly searching to identify all stakeholders within a project and approaching them appropriately.”</p> | <p>“The presentation practice and feedback was great.”</p> <p>“Posters need to be in language that the audience can understand.”</p> <p>“I learned how to give a better (research) presentation.”</p> |
| Program Evaluation | <p>87% (somewhat or a great deal) feel they understood the connections among scientific disciplines</p> <p>94% (somewhat or a great deal) felt comfortable communicating in a multidisciplinary team</p> | <p>89% (good or great) understand the concepts of patient-oriented research (POR) or design thinking</p> | <p>97% (somewhat or a great deal) feel comfortable presenting a scientific poster at a professional conference</p> <p>97% (somewhat or a great deal) feel they could explain their research project to people outside their field</p> |

Program Evaluation by UR Scholars

Following the conclusion of the MURPH program an evaluation survey was administered to the UR Scholars with a completion rate of 78% (n = 25). Twenty percent (n = 5) of UR Scholars reported no research experience prior to entering the MURPH program with 56% (n= 14) having little to no experience working in a multidisciplinary team. **Table 2** summarizes how the UR Scholars understanding of the scientific research process improved as a result of the MURPH program. Eighty-eight percent (n = 22) of UR Scholars report that



they are likely to engage in multidisciplinary research in the future, with 72% (n = 18) interested in pursuing a graduate degree.

Table 2. Global understanding of research skills

| Item | Response |
|---|--------------------------------|
| As a result of your research experience, to what extent do you feel you could formulate a research question that could be answered with data? | 94% (somewhat or a great deal) |
| As a result of your research experience, to what extent do you feel you can observe and collect data? | 92% (somewhat or a great deal) |
| As a result of your research experience, to what extent do you feel you can analyze data for patterns? | 85% (somewhat or a great deal) |
| As a result of your research experience, to what extent do you feel comfortable figuring out the next step in a research project? | 90% (somewhat or a great deal) |
| As a result of your research experience, to what extent do you feel you understand what everyday research is like? | 97% (somewhat or a great deal) |
| How would you rate your research experience overall? | 86% (good or great) |

UR Scholar Focus Groups & Faculty Mentor Interviews

Focus groups with the UR Scholars (n = 3) and faculty interviews (n = 2) were conducted at the conclusion of the MURPH program by the MURPH Graduate Mentors. The UR Scholar focus group/faculty interviews lasted approximately 30-40 minutes, with informed consent being obtained prior to each focus group. Discussions were recorded and transcribed for analysis. Analysis of the data was compiled into themes.

A. Prominent themes from UR Scholars

1. The MURPH Program was viewed as a valuable experience.

A: "It was a really valuable experience and the focus on the multidisciplinary part was really interesting to me and showed me how all of these fields in health research are all so connected. Which I knew before but actually seeing it in action was something completely different."



B: *"I got way more out of it than I was, not necessarily anticipating but it was really amazing. Couple of times after meeting with my supervisor (I remember) being so happy like OMG I can't believe I'm doing this right now."*

C: *"It was a really good experience to experience, positive overall – it led to summer work."*

2. UR scholars are more likely to attend graduate school.

A: *"I had to confirm for myself if I wanted to go to graduate school (and MURPH) confirmed the area I would like to study."*

B: *"I'm planning right now to do a MSc degree with my supervisor which was not something that I had been planning before."*

3. The MURPH program provided guidance, networking and the development of new skills.

A: *"It was nice to have that structure and then having guidance from the workshops and you guys on our posters was really helpful because it benefits me beyond this as well... just having formal guidance at this early stage it's helpful."*

B: *"As the newbie researcher that I feel like I had the opportunity to connect with my peers."*

C: *"I personally really like the workshops and meeting with everyone and interacting with others...I felt like it was really valuable when we could get all together and have discussions."*

B. Prominent themes from Faculty Mentors

1. The MURPH program allowed for completion of research that might otherwise not been feasible to complete.

A: *"I had this project lined up and submitted for three years in a row and it didn't get traction, so it was a nice opportunity to get this off the ground."*

B: *"It allowed collaboration and provided that opportunity and to at least get a beginning start on our project. We actually probably progressed a lot further than we thought we would in the time available."*

2. MURPH workshops were perceived as a benefit to the program.

A: *"I think the workshops are helpful. I think especially the workshop on setting expectations for interdisciplinary work and working as a team are a really important piece."*



B: "The work you folks did showing them how to create a poster and present a poster, which I think is very beneficial."

A: "The fact that students were able to share ideas even in the workshops from across different faculties and hear from students they might never otherwise interact with or hear from, I think is a real strength of the program."

Summary

The MURPH program was beneficial to both UR Scholars, in addition to faculty. The MURPH program helped the UR Scholars acquire research skills but the MURPH workshops further enhanced competencies related to collaboration in a multidisciplinary team, communication, research dissemination, as well as patient-oriented research. UR Scholars were dedicated to the program. Their commitment was evident from having over 97% attendance at all events. In addition, 78% reported that they were excited about their project and worked extra hours (above paid hours by MURPH).

"I view the MURPH program as a great opportunity to recruit summer students and it's a great way to try out an idea before you're fully committed for research dollars. It'd be a great way to start a pilot project. It's a great program. I hope it continues."
(Faculty Advisor)

"The program was really amazing and a really cool opportunity that was presented to students. Especially for myself, I thought that because I didn't have any previous research experience that I wasn't going to be a good candidate but just giving those opportunities out for research for students was great. I feel so much more confident going into my future post-undergrad life." (UR Scholar)

87% of UR Scholars rate the MURPH program as good or great.