

WISEST Summer Research Program

Journal of Student Research 2022



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Introduction

Each summer, WISEST places 45-50 grade 11 students in a 6-week paid internship called the Summer Research Program (SRP). Students gain experience in projects where their genders are considered underrepresented. Female and gender diverse students are placed in Science, Technology, Engineering or Math (STEM) projects that they demonstrate a genuine interest for. This year, WISEST was able to place 47 students in various research placements.

Goals of the SRP for our students

- Broaden awareness about less traditional fields of study and diverse career options.
- Engage with other participants who share similar interests.
- Learn about the techniques and types of research conducted in different STEM fields.
- Connect with and learn from successful professionals in the STEM fields.
- Develop key professional skills.
- Contribute to trailblazing research (in the lab or in the field).
- Become familiar with academic and university life at the University of Alberta.

We are a donor- and volunteer-driven Community of Catalysts!

Although based on the University of Alberta campus, WISEST relies almost completely on donations from corporations, foundations, individuals and the public sector to develop and deliver our innovative programs. Contrary to perception, WISEST does not receive any core funding from the University of Alberta, but we are grateful for in-kind contributions such as space and access to campus resources.

Our Volunteers

Our program would not be possible without the Principal Investigators who invite these students into their research, the Supervisors and Research Team Members who provide mentorship and support for the students throughout the program, and the volunteers who support the Friday afternoon Professional Development Sessions. In 2022, 153 people gave 2,326 hours of their time to support this program.

Thank You to Our 2022 Funders:

Faculties and Labs from across Campus

- Faculty of Medicine & Dentistry
- Faculty of Engineering
- Faculty of Science
- Faculty of ALES
- Faculty of Arts

Off Campus Supporters

- Andrea Macyk-Davey & Robert Davey
- Bert Murray & Margaret Cook
- Margaret-Ann Armour Endowment for SRP Students
- Susan Jensen Indigenous Support Fund Endowment

Financial support also received from the following researchers*

J.Cummine, R.Lundgren, E.Bayne, S.Strelkov, B.Mori, M.Evenden, J.Harynuk, H.Bruce, M.Gingras, C.Sturdy, L.Lefsrud, M.Taylor, N.Hegde, and W.Xu.



MOTOROLA SOLUTIONS
FOUNDATION



The Spirit of Dr. Armour Award



WISEST lost an important member of our community last spring when Dr. Margaret-Ann Armour passed away. Margaret-Ann Armour dedicated her life and career to diversity and the advancement of women in the sciences. But more fundamentally, she dedicated her spirit and her passion to people. Over the years, she became a recognized leader in raising national awareness among school-aged girls, educators, parents, and employers of the importance of encouraging women to take up careers in science and engineering. Simultaneously, she became a beloved member of numerous groups and networks through her genuine enthusiasm for individuals and sincere belief in the power of community. She loved people and people loved her back. In her own words “Learning what different groups do, think and believe, can lead to empowerment”.

Margaret-Ann is deeply missed by countless people whose lives were touched by her tireless determination to make an impact and bring change to the world. She leaves us all with a call to action:

“I give you my greatest wish - to go meet your dreams”

It is in this vein that WISEST is pleased to continue the **“Spirit of Dr. Armour Award”**, in her memory and in her honour, to individuals whose spirit and enthusiasm for diversity in STEM is genuine, infectious and intentional.

The Advocate Award

This award is presented to a principal investigator or supervisor, who through their participation in the Summer Research Program has shown advocacy in creating a more diverse STEM community including:

- Enthusiastically mentoring SRP students
- Promoting the SRP & WISEST
- Participation in the SRP program with high student satisfaction results

SRP Student Award

This award is presented to a grade 11 student, who, through their participation in the Summer Research Program has shown:

- a genuine interest and passion in pursuing a STEM education
- leadership and engaged participation in all the SRP program offers
- collaborative interactions with other SRP participants, Principal Investigators, graduate students, WISEST staff, and the lab staff
- an innovative and creative problem-solving approach
- demonstrated resilience in overcoming barriers and obstacles

WISEST would like to recognize:

**Dr. Erin Bayne &
Connor Duffy**

with the Dr. Armour Spirit Awards.

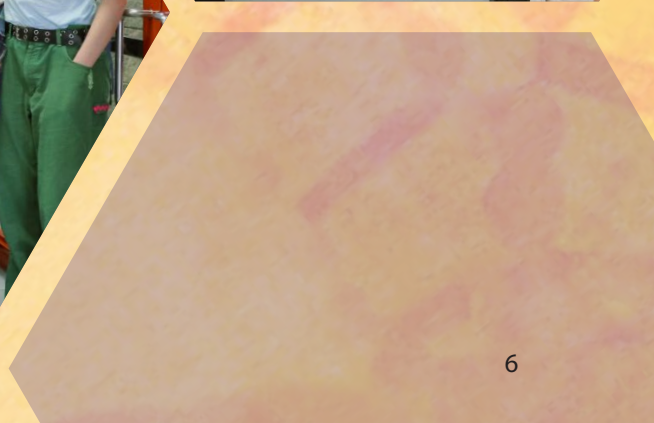


Dr. Erin Bayne



Connor Duffy

A Snapshot of the Summer







Our SRP Students Researchers

Take a moment to meet some of our SRP Students as their enthusiasm and honesty will inspire you. These capable young people are building a strong foundation for their future success, contributing to a stronger STEM community, and preparing to change the world.

Yasmin Albeny



High School

Lindsay Thurber Comprehensive High School

Lab Placement

Chemical/Materials Engineering, Faculty of Engineering

Project Title

Using Agglomerative Clustering and Vectors to Categorize Twitter Users

Final Project

<https://doi.org/10.7939/r3-gc06-vt22>

Supporter

Women & Gender Equality Canada, AI4Society & Dr. Lianne Lefsrud

My name is Yasmin and I am from Red Deer, Alberta. I go to Lindsay Thurber Comprehensive High School. My favourite subjects in school have always been science and math. I enjoy biking, reading, and learning new things. I have always liked math a little more than science, so I am planning on going into engineering for university and seeing if I like it!

This summer, I got placed in the Chemical and Materials Engineering department, where I worked on the computer science side of things on a project about Twitter. I was looking at 30 000 Twitter users who were engaging with the Energy East Pipeline Project, and I automated a computer to read their latest 50 tweets, and put them into a category based on their view. This was so the perspectives of each group could be easily studied and taken into consideration for energy policy making.

I applied for WISEST because I really enjoy science and math, and I thought it would be a great way to spend my summer. If you have any interest in math or science, just apply, you never know if you will get in or not unless you try.

One of the biggest takeaways from the program is that you do not have to have life figured out. A lot of us are stressed about what we will study in university because we think it is permanent, but it's not. Most of the people we talked to ended up in their field of study by accident. I

learned to pursue things that interest me, and see where these interests take me. It's okay to change what you are studying if you do not like it!

Another takeaway was the confidence I now have to go into STEM, more specifically engineering. We saw so many women and gender diverse students in engineering and the sciences that it inspired me to go into these fields. You will always find other people like you in STEM, so do not be afraid to go into it.

I was not expecting to be put in a computer science placement, but I learned so many new things and I have a new perspective on what I want to do. This program showed me different areas of study I can pursue, and it got me really interested in computer science, something I had not even thought of before. Keep an open mind when you get your placement, you might like it, you might not, either way, you learn something new!

Kiara Atkinson

High School

Lindsay Thurber Comprehensive High School

Lab Placement

Biological Sciences, Faculty of Science

Project Title

Why "Mite" Parasites Be A Problem?: Functional And Physical Effect Of Proximity To Parasites on Fruit Flies

Final Project

<https://doi.org/10.7939/r3-sn18-k490>

Supporter

Mikisew Group



My name is Kiara Atkinson and I currently live in Red Deer, Alberta but grew up in Innisfail. I always loved science growing up. My mom would watch science documentaries with me, we would spend nights stargazing and looking up at the moon. I have a passion for biology along with playing my guitar and painting. When I graduate high school, I want to go to Dalhousie or the University Of Alberta.

I had one of the most memorable summers of my life at the University of Alberta. I was placed in the Luong lab in the Department of Biological Sciences. For my research project, I studied how fear of parasites impacts fruit flies physically and behaviorally. Through this project, I learned a lot. I had previously worked in pest control but this project made me more interested in entomology. I have always loved minerals and crystals but after a WISEST lab tour, I realized I am interested in geology.

I want to thank WISEST for opening up new opportunities and making me realize what I enjoy. I also want to thank Mikisew for supporting me. I am touched to know Mikisew wants to encourage indigenous youth to participate in STEM. I also had a lovely time with my PI and supervisor, Lien Luong and Caroline Liang. I had a lot of fun in their lab, I cannot imagine being in another lab and not having the opportunity to meet them.

WISEST pushed me out of my comfort zone. When I returned to my family they said I was a different person. In the past, I have had issues talking to people and being around crowds. The group PD sessions and hanging out with other researchers helped me come out of my shell. I feel a noticeable difference when talking to people now. One of my favorite moments from the SRP was playing hide and go seek in CSIS. I found it really fun exploring the building and finding hiding places. When I was the seeker I kept running into this one person and that one person ended up being one of my closest friends in the program. I definitely recommend this program to youth. It is really important that women and gender-diverse people have a chance to flourish in sciences and math. During this program, I learned how unequal academia actually is. It is integral that diversity is encouraged in our world so we can have different perspectives.

Natasha Babuik

High School

Frank Maddock High School

Lab Placement

Chemistry, Faculty of Science

Project Title

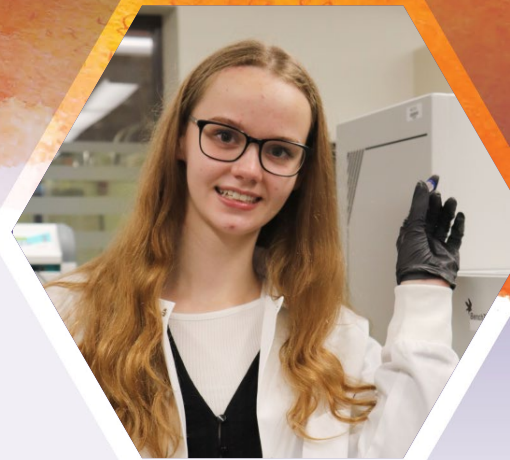
Comparison of Breath Collection Techniques Using TD-GCxGC-MS

Final Project

<https://doi.org/10.7939/r3-vztc-3b05>

Supporter

Andrea Macyk-Davey & Robert Davey, Harynuk Lab



Hi, my name is Natasha Babuik and I use she/her pronouns. I attend Frank Maddock High School in Drayton Valley, Alberta. Science has always been my favorite subject and is a topic that always keeps me wanting to learn more. The disciplines I am most interested in and passionate about are biology, chemistry, and pharmacology. In the future, I want to pursue pharmaceutical sciences and continue to do research using the foundational skills I learned in this program.

This summer I was placed in the department of chemistry in the Harynuk lab. My project was looking at the volatile organic compounds (VOCs) that exist in exhaled breath. Using comprehensive two-dimensional GCxGC-MS we compared two different sampling methods and how the sampling method impacted the VOCs collected. Our goal was to find a method that would allow us to analyze the metabolites in an individual's breath and in the future be used to diagnose diseases and monitor disease states.

The SRP has probably been the most educational and fun experience I have ever had. Not only are you learning about research processes, lab techniques, and the details of your project but you also take part in professional development sessions. These have taught me so many skills that are applicable in many aspects of life. We learned about entrepreneurship, networking, interviews, coding and so much more! Beyond the PD sessions, we also had lab tours to expose us to different fields and many social opportunities to interact with others in the cohort. I would recommend this program to anyone who wants to explore STEM. If you are hesitant to apply, do it anyway you never know what could happen and it is one hundred

percent worth it. I cannot talk about this program without mentioning all the amazing people I met. Everyone I talked to had something in common with me, whether it was a hobby or simply our love for STEM. From the very start of the program, there is so much time to get to know your cohort and peers. Learning about the other participants' projects was one of my favorite things to do. There is so much to learn and so many different disciplines and fields that students are placed in. Beyond just your cohort, you meet people in your lab, and you meet mentors through many WISEST sessions. This summer has been full of creating unforgettable memories and building relationships that will last a lifetime. I want to thank everyone who supported me this summer and allowed me to participate in this program. Thank you to my personal sponsors, and the WISEST team who made my incredible experience possible. A huge shout out to the Harynuk lab, my supervisors, Sheri Schmidt, Ewenet Mesfin, Dr. Paulina de la Mata, and my PI Dr. James Harynuk. You all made me feel welcome and made the program so valuable!

Lauren Bayne



High School

Ardrossan Junior Senior High School

Lab Placement

Renewable Resources, Faculty of Agricultural, Life & Environmental Sciences

Project Title

Keep it Clean: Using Biochars to Treat Industrial Wastewater

Final Project

<https://doi.org/10.7939/r3-0m6p-ak40>

Supporter

Canada Summer Jobs, International Paper

Hello! My name is Lauren Bayne and I am from Sherwood Park, Alberta. This summer, I was in the Forest Soils Lab studying an eco-friendly, cost-efficient, and effective way of remediating lead (II) contaminated industrial wastewater. To do this, I used biochars, which are the solid byproduct of pyrolysis. Pyrolysis is a process where a biomass is decomposed at a very high temperature without the presence of oxygen. I learned so much in my lab, from research skills to general workplace skills. I learned lab safety skills and procedures, I learned how to use all the instruments in the lab, I developed my confidence, and I practiced my communication skills with all of my lab members, especially my supervisor.

When I was not in the lab doing interesting and innovative research, I was making lifelong friends with the other researchers and participating in social events, lab tours, mentorship opportunities, and professional development sessions. One mentorship opportunity that I found especially impactful was the 2SLGBTQ+ in STEM panel. I had the opportunity to talk to queer and gender diverse mentors from different places in their post-secondary education or career. It was truly incredible to see people like me who are succeeding in their STEM journey. Every time one of the mentors answered a question I was amazed by how much I learned, how much I related to their experiences, and how inspired I was by them.

The SRP has also helped prepare me for university life. Being on campus, finding the buildings and classrooms, finding places to take meetings and do my computer

work, it has all given me a sense of preparedness for my time in university. In university, I want to do a dual degree in Native Studies and Environmental and Conservation Science at the University of Alberta. Eventually I am going to pursue a career in land reclamation. In school, I have always loved science and social studies so I think this path is going to be the right mix of both those passions.

The Summer Research Program has been an invaluable experience. I could not recommend it more for any woman or gender-diverse student considering a career in STEM. It is an eye-opening, educational, and invigorating experience that will give you an opportunity to learn, create, and innovate. Not only is the SRP a place for those looking into a career in research, it is a place for those looking to make waves in the patriarchal ideals of academia and industry by closing the gender gaps in fields where women and gender-diverse people are underrepresented.

None of my amazing experiences this summer would have been possible without the support of many people. First, I would like to thank the WISEST team for their hard work and dedication. I would also like to thank my supervisor, Dr. Christopher Nzediegwu, and the rest of the Forest Soils Lab for always answering my many questions. Finally, thank you to my sponsors, International Paper and Canada Summer Jobs, for their generous support.

Jiya Binning

High School

École Panorama Ridge

Lab Placement

Alberta Biodiversity Monitoring Institute, Faculty of Science

Project Title

Discovering Diagnostic Traits for Hidden Species in the Lichen Genus *Peltigera*

Final Project

<https://doi.org/10.7939/r3-pw57-et59>

Supporter

Canada Summer Jobs



My name is Jiya Binning and I am a student from Surrey, British Columbia. I have always loved science and am wanting to pursue a STEM related degree/career. For my lab, I was placed in the Lichen Lab within the Department of Biological Sciences. We worked on discovering anatomical traits to help distinguish and discover new species of lichen *peltigera*. I love biology, so this lab was beyond intriguing and interesting to me!

Before WISEST, I was worried about what life in residence in a new province would be like, how my lab would be, and much more. Turns out, I did not need to worry about a single thing. Nothing is perfect, but I would say WISEST turned out to be the closest thing to such. Everyday was new, exciting, and thrilling. There was never a dull moment. I never felt excluded in or out of the lab and made life-long connections. I had a fantastic time learning so much about my project and others! I never thought I would come across a summer where I would be learning about lichen and doing lab work, but now I cannot imagine my summer without this fulfilling learning experience.

The most impactful part of my WISEST and lab experience is my now deeper connection to learning and in terms of lab, nature. I love how whenever I go out I am able to identify lichen and point it out to myself and others. It's like seeing a celebrity! They likely don't know you, but you probably know a bit about them. My appreciation of the

diversity in life has amplified, and I feel much more grateful for everything unique in our world. I no longer look at trees and acknowledge them as just tall structures in nature. I want to learn more about what I am looking at and what their different traits and characteristics mean, along with how they impact and are a part of each and every individual specimen. All of this reminds me especially of why learning is so important. Of course I am aware that it is, but in school when we learn seemingly "inapplicable" topics that everyone dreads and wonders why we are even being taught, this experience reminds me that everything has an application. Every piece of information and accumulation of knowledge is salient in some way, shape or form. This motivates me to pursue my learning in STEM and to stay curious and open to innovation and new ideas.

I would like to end off by thanking everyone who has made my growth and this opportunity possible. Thank you WISEST for doing all that you can every year to make dreams come true, especially for students like myself with little to no representation and exposure to STEM in their communities. I would also like to thank my lab for allowing me to be a part of the wonderful lichen lab and for teaching so much, both lessons useful in lab and beyond.

Ekjot Brar

High School

W.P. Wagner High School

Lab Placement

Chemistry, Faculty of Science

Project Title

Analysis of VOCs in Green Coffee Beans From Various Regions

Final Project

<https://doi.org/10.7939/r3-7859-fj30>

Supporter

Canada Summer Jobs, Harynuk Lab



My name is Ekjot Brar and I have grown up in Edmonton, Alberta where I now attend W.P. Wagner High School. As I emerge into adulthood and onto my final year of grade school, I find it difficult to select one path to follow. In school I primarily enjoy chemistry, computer science, biology, and math, but the possibilities that accompany these interests are endless. Before starting the Summer Research Program, I was confident in my career choice, but this summer I have discovered endless opportunities to create change. Although I am now left with uncertainty about my future, I am incredibly grateful to have gotten this chance to discover the wide scope of STEM.

For my project, I was placed in the Harynuk lab where I explored two-dimensional gas chromatography and solid-phase microextraction. I specifically investigated the differences in the amount and variety of volatile organic compounds that exist among green coffee beans from different regions as well as the variety. Additionally, I was able to work on obtaining breath samples for developing non-invasive methods for medical testing, as well as plant sampling. Having developed my own project, as well as working with other projects in the lab allowed me to gain various skills and knowledge.

When I initially entered the program, I developed a lot of self-doubt, and felt as though I was already behind everyone else. The other students appeared to be well versed in their respective departments before the program had even begun. STEM often generates a competitive

atmosphere, especially for minorities, so I felt pressured to work hard to catch up. Over these past six weeks, I have developed an alternative mindset, one which focuses on self-improvement and aiding others on their journey. Being surrounded by grad and postdoc students who were already well equipped with the knowledge to confidently work on their projects felt incredibly intimidating, but I have learned that while it may be terrifying to not know everything at any given time, it's okay because being able and willing to learn is just as important as knowing the information. Throughout this program, I have gained a greater understanding about how to navigate academia and a career in STEM by being introduced to inspirational individuals from various backgrounds in different STEM fields, and by learning about the importance of networking and resume building.

None of this could have happened this summer without the support of my sponsors, Canada Summer Jobs and Harynuk Lab, as well as the WISEST coordinators who made all these sessions possible. I would like to acknowledge my PI, Dr. James Harynuk, for not only providing a space for me in his lab, but for also embodying a role model. I would also like to thank my supervisors, Ryan Dias and Dr. Paulina de la Mata, for their guidance and support throughout the entire program, as well as for being so patient and understanding this summer.

Selam Demoz

High School

Mother Margaret Mary Catholic High School

Lab Placement

Clean Technologies, Faculty of Industry Solutions

Project Title

The Clean Superpower: How Dimethyl Ether is Produced from Methanol

Final Project

<https://doi.org/10.7939/r3-bc6z-th75>

Supporter

Alberta Government (Jobs, Economy and Innovation), Syncrude



Hello! I am Selam Demoz and I was a student researcher with WISEST this summer. I am going into the 12th grade at Mother Margaret Mary High School in Edmonton, Alberta. When I heard about WISEST I was so excited to be able to have the opportunity to explore the different fields available in STEM and was lucky enough to have sparked an interest in Environmental Engineering which is what I aspire to do in the future. In school, my favorite subject is Chemistry and I have always been interested in how science could help the environment, so this program has introduced me to all the different ways that could be possible.

This summer I was honored to have been placed in the department of Clean Technologies lab in the Faculty of Industry Solutions at the Northern Alberta Institute of Technology (NAIT.) My project was focused on reducing greenhouse gas emissions by using methanol and sending it through a reactor along with catalysts to make an alternative form of methanol called Dimethyl Ether (DME.) DME can be used as a cleaner alternative to traditional diesel gas to be more environmentally friendly! My role in this project was mainly testing out 4 different catalysts to see which one was most effective in producing the most DME so that the experiment could be applied to a larger reactor and be used in the real world. Because of this experiment over the summer, more research into using DME as a “clean fuel” on a larger scale will be applied, as well as how we can use waste methanol in the reactor to create a cyclic production of fuel.

The WISEST program is extremely important to me and other student researchers because it opened the doors to a whole new world of science with endless opportunities. Thanks to WISEST, I have built meaningful connections with many people in fields that I am interested in that have allowed me to learn more about what my future could look like. Along with that, I have learnt skills that will be useful for me in life like learning how to network, make a proper resume, manage job interviews, and so much more! The friends I have made in this program and all the different projects I was shown have been the most useful thing to me in deciding what I want to do with my future and I am so grateful to have been given the chance to participate in this program.

This summer was truly a once in a lifetime experience and I am so happy that I was able to participate in it. I would like to thank WISEST, Syncrude, the Alberta Government, my Principal Investigator Danish Dar, and the entire Clean Technologies team at NAIT for making this all possible!

Connor Duffy

High School

Paul Kane High School

Lab Placement

Biological Sciences, Faculty of Science

Project Title

Open Wide! : A Morphometric Analysis of Ornithischian Teeth

Final Project

<https://doi.org/10.7939/r3-ca79-b473>

Supporter

Faculty of Science



My name is Connor Duffy and I am going into grade twelve at Paul Kane High School in St. Albert this year. I have been interested in STEM my entire life. My favourite subject overall would have to be palaeontology and I was lucky enough to be placed in the DINO Lab this summer. I love looking at the ecology of ancient organisms and the specific conditions that allowed life to flourish when all odds were against it. I hope to get a PhD and become a professor of palaeontology after I graduate as it will combine my love of research, travel, and teaching into one job.

There is a big issue in palaeontology, where scientists will find dinosaur teeth but have no way of identifying where it came from! I spent my summer measuring the teeth from a bunch of dinosaurs and collecting the data into a graph so when future palaeontologists find a tooth, they can measure it and determine what kind of dinosaur it came from.

This summer really showed me just how much I belong in academia. I dug through the university's collections, stared at fossils, glued broken bones back together, and most importantly, measured lots and lots of teeth. And I enjoyed every second! I was able to carry deep and nuanced conversations with professors about dinosaurs and answer tough questions; something I didn't know I was capable of doing. I feel so much more confident in my knowledge and ability to occupy academic spaces after this program.

Throughout high school I have had trouble narrowing down the long list of things I wanted to study after I graduate. But after working in a real palaeontology lab I now know this is where I belong. I had numerous opportunities to talk to both professors and students about the programs offered at the university and the differences between them. I have also gotten a more enlightened perspective on the day to day life of a researcher through mentor sessions with my Principal Investigator, Dr. Philip J. Currie, and the PhD students I have worked with.

After completing the summer research program, I am most proud of my findings. After all of the data collection was done, I sat down with an undergraduate student and he showed me how to run all sorts of statistical analyses. After hours of writing code and troubleshooting, the computer was able to correctly identify the teeth 88% of the time! I felt a huge rush of excitement ; all of my research and time spent in the lab paid off and my results were statistically significant. I feel so proud that my small research project can contribute to the future of palaeontology. I would not have been able to participate in this fantastic program without the help of my fellow students, my supervisor Mr. Howard Gibbins and of course the WISEST coordinators. They have all been incredibly supportive and made my summer unforgettable.

Ana-Lee Dyck



High School

Wetaskiwin Composite High School

Lab Placement

Alberta Biodiversity Monitoring Institute, Faculty of Science

Project Title

The Effect of Wildfire on the Abundance of Soil Arthropods

Final Project

<https://doi.org/10.7939/r3-wbrt-t767>

Supporter

Alberta Government (Jobs, Economy and Innovation)

My name is Ana-Lee Dyck, I am 17 and I attend Wetaskiwin Composite High School in Wetaskiwin, Alberta. In school, I enjoy science and math classes. I also like P.E. and I play volleyball on my school team. In the future, I would like to study neuroscience in hopes of becoming a neuropsychiatrist. I want to understand people and empathize with them; understanding how the brain operates is an essential step to strengthening that skill.

This summer I was placed in the Alberta Biodiversity Monitoring Institute in the Terrestrial Invertebrates Unit. My project investigated the differences in abundance and reactivity in groups of soil invertebrates (insects, spiders, mites) that were affected by a wildfire and soil invertebrates that were not affected by a wildfire. I would like to thank my principal investigator, Dr. Lisa Lumley and my supervisor, Victoria Giacobbo for making this project possible. I would also like to thank my sponsor, the Alberta Government for giving me this opportunity.

I applied for the Summer Research Program for many reasons but mainly I wanted some reassurance about my future. Not only about what I was going to study and my career path, but also about what university life looks and feels like. It has always been expected that I attend university but I was uneasy about going in blind. I wanted to test the waters and see what my life would be like. This program gave me the answer I was looking for: this life is

most definitely for me. I loved exploring the campus and enjoying the beauty around me. On top of that, I learned so much about myself and the parts of life that are important to me.

I learned a lot this summer, but three things stood out to me. The first thing is that when thinking about my post-secondary future I should stop thinking about what I want my career to be and start thinking about what I want to learn. Post-secondary is full of choices and one of those is what you want to gain from your experiences. In my opinion that is one of the most important choices you have to make. The second thing I learned is to take advantage of growth opportunities. This program pushed me to connect with others and learn from their experiences. I have gained more perspective and empathy through these interactions. The third thing I discovered is that trying new things and being put in new situations, however uncomfortable they might be, are so beneficial. I got that opportunity to ask mentors important questions and learned how to network with other people, a skill I will carry with me forever.

Fatima Faisal

High School

Edmonton Islamic Academy

Lab Placement

Occupational Therapy, Faculty of Rehabilitation Medicine

Project Title

Remote Monitoring: How to track and monitor your loved ones in a civilized and purposeful manner

Final Project

<https://doi.org/10.7939/r3-0tks-pt42>

Supporter

Bert Murray & Margaret Cook, Canada Summer Jobs



My name is Fatima Faisal, I am from St. Albert and am an incoming grade 12 student at the Edmonton Islamic Academy. I have come to thoroughly enjoy the problem solving process presented in physics and math, because they challenge me to question myself and grow beyond the confines that I know of now, they expect me to grow. Outside of school I enjoy reading, scrapbooking, and hiking. After attending the Summer Research Program, I have never been more eager and hopeful to pursue an undergraduate degree in civil engineering with a focus on environmental engineering at the University of Alberta.

This summer I was placed in the PATH Lab off-campus at the Glenrose Rehabilitation Hospital. My project was based on testing and collecting data regarding remote monitoring devices, wearable technology, and indoor localizers that could help patients recover at home safely and still provide adequate information for clinicians to monitor the patients health and wellness in real time.

The SRP was filled with diverse opportunities to gain new experiences and beyond research, I have been able to learn new things about myself and come closer to creating a vision of who I would like to become. I learned that I love working with people and I gain confidence in a crowd. Working in groups with a wide variety of people including researchers, mentors, and other students, I have realized that talking to people energizes and inspires me leaving me filled with adrenaline. In the future I will definitely be looking for opportunities that involve groups of people from diverse backgrounds.

This summer the biggest challenge that I overcame was imposter syndrome. Going into the program I felt like I did not belong or was faking my love for STEM. I was surrounded by intelligent and bright students who seemed to know so much more than I did. However as the program went on, I realized that I too was becoming the people I looked up to on the first day by learning from those around me. I realized that everyone including myself was continuously learning and growing and that feeling of imposter syndrome was simply my way of knowing that I had so much room to improve.

I would like to thank Mr. Bert Murray and Ms. Margaret Cook for the support that allowed me to have a spot in the WISEST SRP, as well as WISEST for the opportunity. I want to thank my supervisor Dr. Andrew Chan for all the mentorship, advice, and assistance he continuously gave me throughout the internship. Lastly, I would like to thank my math teacher Mr. Hussien Akeileh for always believing in me and for pushing me when I did not have any strength to move on my own. Thank you all for the unforgettable summer!

Kanis Fatama



High School

Strathcona High School

Lab Placement

Communication Sciences and Disorders, Faculty of Rehabilitation Medicine

Project Title

Volume of Subcortical Structures in Relation to Behaviour: Exploring the Caudate in People With Dyslexia

Final Project

<https://doi.org/10.7939/r3-3jzj-qh74>

Supporter

Women & Gender Equality Canada, Cummine Lab

My name is Kanis Fatama and I am entering grade 12 at Strathcona High School. Growing up, I have always had an interest in sciences and loved math. I would constantly change what I wanted to be when I grew up; a doctor, a teacher, an astronaut, an engineer. Nothing really stuck. That is, until I entered high school and took my first computer science class. Coding allowed me to be creative while using logic and numbers. After the first class, I realized that I loved seeing my work come to life and make a difference.

I applied to WISEST to get hands-on experience and test if I have what it takes to pursue a career in STEM. I was also curious about what it's like to work in academia and learn about the research process.

This summer, I was placed in the Department of Communication Sciences and Disorders where I explored how the volume of subcortical structures of the brain differ between people with and without dyslexia and their reading behaviours. Although I am not interested in pursuing a career in the medical field, I realized just how integrated technology is in every area of study.

In my lab, I was able to analyze data and learn about how it was collected. I was able to learn about MRI machines, different algorithms used for analysis, and was introduced to statistics. As I learned more about the different tech involved in the medical field, I began to wonder how they were made and what new inventions are still waiting to be created. I realized that by harnessing my skills in

technology and coding, I could make a difference in many important fields, whether it be in STEM or something else.

Throughout the six weeks of the program, I attended professional development sessions, went on lab tours, and enjoyed various social events. Through this experience, I learned not just about the brain but also other key skills that are useful no matter what field I decide to pursue in the future. The SRP allowed me to get a jumpstart on networking and getting accustomed to university life.

I am so grateful for this learning experience and for all of the friends I have made throughout these past six weeks. The WISEST team was so supportive throughout this entire program and helped me to believe in myself. Lastly, I am so grateful to Cummine Lab for sponsoring me and taking me into their lab, without them my internship would not have been possible.

Abegail Gagelonia



High School

Archbishop O'Leary Catholic High School

Lab Placement

Clean Technologies, Faculty of Industry Solutions

Project Title

Fuel of the Future: Stimulating the Production of Dimethyl Ethers Through Catalysts

Final Project

<https://doi.org/10.7939/r3-66a4-m714>

Supporter

Alberta Government (Jobs, Economy and Innovation), Syncrude

My name is Abegail Gagelonia and I attend Archbishop O'Leary High School in Edmonton, Alberta. I enjoy learning about a variety of things in school but physics and math have taken a special place in my heart. Outside of the classroom I have many interests and hobbies like reading, blasting One Direction in my room, and playing soccer!

I never would have expected to be placed in a lab at NAIT but I honestly would not have had it any other way. This summer, I worked with the Clean Technologies team on many different projects centered around sustainability. Our main project dealt with the production of a climate-friendly fuel called dimethyl ethers and stimulating the reaction using different catalysts. We hope to use our research in producing dimethyl ethers on a large scale to be used as a replacement for diesel. This would have a positive impact on the climate by reducing carbon emissions!

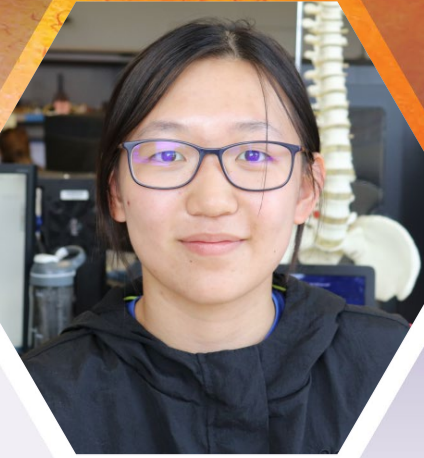
Little did I know at the beginning of this program that working with this team would have such a great impact on me. Originally I wanted to pursue a career in the space industry after university. Although that option is still on the table, working with Clean Tech has opened my eyes to possibly pursuing a career that deals with the environment and sustainability in the future. Helping to find your interests is one of the many great things about this program!

Aside from the science-y part of it all, one of the most important things I have taken away from this program is

the importance of building relationships. You will never know in the moment which people you do or do not talk to can help you farther down the road. But even more than that, the friendships and connections that you build make your work so much more enjoyable. I think a large part of what made my experience so great had to be the people. Whether it was my coworkers in the lab that brought cookies, our coordinators that were always positive, or the friends that I made who went out after work to do fun things, they were what made my experience the most memorable! My interpersonal skills are miles better than they had been before WISEST and I will be forever grateful to everyone I have met because of that.

I would like to say a special thanks to my lab partner Selam Demoz for always sticking by my side (I don't know how I would have done this program without you), the best PI ever Danish Dar for being a great mentor and for finding opportunities for us to try different things in and outside of the lab, Mr. Ferguson for being an inspiring teacher and pushing me to apply WISEST, and the entire Clean Technologies team for being so welcoming and kind! Also thank you to my sponsors Syncrude and the Alberta Government.

Yiting Han



High School

Hunting Hills High School

Lab Placement

Mechanical Engineering, Faculty of Engineering

Project Title

Braided Composite Biodegradable Tennis Racket

Final Project

<https://doi.org/10.7939/r3-3whe-za09>

Supporter

Women & Gender Equality Canada, Motorola Solutions Foundation

My name is Yiting Han and I am from Red Deer, Alberta. Next year, I will be going into grade 12 at Hunting Hills High School. My favourite classes are math and physics, but I find chemistry and English interesting as well. Outside of school, my hobbies include cooking, reading, and playing the piano. I also play tennis competitively. This summer, I was placed in the Department of Mechanical Engineering in the Composite Materials Lab. My project was to make a biodegradable tennis racket out of braided composite materials. By analyzing the physical properties of different materials and modelling the racket on SOLIDWORKS, a 3D modelling software, I was able to create a successful prototype.

Science and engineering had always been an interest of mine since way before this program, but I had never had the opportunity to learn about the different fields of STEM or the careers one could obtain within their specific field. Because of this, as soon as I heard about WISEST, a program that allows high school students to be introduced to the diverse fields of STEM, I knew I had to apply.

Throughout these 6 weeks, I was introduced to countless opportunities that I could have never found anywhere else, and they have helped me to not only find my true passions but also to cultivate soft skills that propelled me far past my classmates in terms of real-world experience. From practicing strategies on how to ace interviews to attending networking fairs, these many professional development sessions provided me with insight into how the STEM workforce functions and how to thrive within them.

WISEST is an amazing program that pushes students out of their comfort zones and forces them to face challenges

head-on in professional work environments. For me, the transition from attending high school classes to working with much more experienced people in a professional university lab was an enormous challenge. However, overcoming not only this challenge but also the ones that are introduced on a day-to-day basis in typical lab and research work ended up being my greatest achievement. This program allows its participants to grow in many different ways, whether they be in knowledge, maturity, or confidence. I guarantee that you will be a better version of yourself by the end of the summer and that this program will leave a lasting impression on you; I know it did for me.

I would like to thank my supervisors Eric and Samir as well as the rest of the Carey lab, Dan, Mairi, Evans, Cynthia and Tom, for providing me with guidance and for all their help throughout these past six weeks, as well as my direct supervisor, Dr. Jason Carey, for taking me into his lab. Finally, thank you to WISEST and my sponsors for making this experience possible.

Erin Hoveland



High School

Charles Spencer High School

Lab Placement

Mechanical Engineering, Faculty of Engineering

Project Title

A Braided Composite Cable-stayed Walking Bridge

Final Project

<https://doi.org/10.7939/r3-9jyg-hd95>

Supporter

Canada Summer Jobs, International Paper

My name is Erin Hoveland and this summer I had the pleasure to be a part of the WISEST Summer Research Program. I live in Grande Prairie, Alberta and attend Charles Spencer High School. I love learning and my favorite subjects in school are physics and math. Outside of school a few of my hobbies include reading, baking, cake decorating, hiking and traveling. After high school I hope to pursue a degree in Mechanical Engineering and continue to travel.

This summer I was lucky to be placed in the department of Mechanical Engineering working under Dr. Jason Carey and his team of undergrad and grad students in the Composite Materials Lab at the University of Alberta. There I designed a cable-stayed bridge made out of a variety of braided composite materials, which are fibers that are braided together and reinforced with cured resin. I analyzed the forces acting on the bridge, picked the best materials to combat these forces, made a 3D model of my bridge using a program called SOLIDWORKS®, and finally manufactured a prototype.

Being a part of this program was such an incredible opportunity to learn and grow. The three most important things that I have learned this summer are that there are always people who are willing to help you, to not be afraid to ask questions and that there is a place for me in STEM. At the start of the program I was worried that I was not smart enough and did not have enough background knowledge to do my project or any project for that matter. However, once I met my supervisors and everyone in my

lab, I realized that it is okay to not know everything and there are always people who can help you when you are feeling unsure. As time went on I became more confident and open to asking questions and seeking clarification, knowing that it is okay to be curious. After learning about the various projects and speaking with students in and out of the program, I realized that I belong and there is a place for me in STEM.

I would recommend this program to other students because it allowed me to explore different facets of STEM I had never been exposed to before. It was a fun and eye-opening experience that showed me the value and proper protocols with regards to networking and communicating with professionals in STEM. This program allows students to bridge the distance between high school interests and university studies as well as providing insight into the variety of career options available.

I would like to thank my lab supervisors, Eric and Samir, my Principal Investigator, Dr. Jason Carey, and the rest of the Carey Lab for their encouragement and support through these six weeks. I would also like to thank my sponsors International Paper and Canada Summer Jobs. I would finally like to thank WISEST for giving me this amazing opportunity.

Angela Huang

High School

Western Canada High School

Lab Placement

Mechanical Engineering, Faculty of Engineering

Project Title

DODO: Multiplayer Educational Game for the Visually Impaired

Final Project

<https://doi.org/10.7939/r3-dfyw-2678>

Supporter

Motorola Solutions Foundation, AI4Society & Dr. Rafiq Ahmad



My name is Angela Huang and I am currently studying at Western Canada High School in Calgary, Alberta. From a young age, I have always loved STEM subjects, especially Math and Physics. Naturally, as I grew up I knew I wanted to be in a career which applies these subjects. Currently, I am interested in entering Engineering, specifically Computer Engineering, or potentially Astrophysics.

I first heard about the WISEST SRP in a student newsletter post at my school and I was immediately interested in the program from the small blurb I read. As a female person of colour, I thought that my interests aligned with WISEST's objectives and the experience itself looked amazing. I have always wanted to pursue a STEM career. Unfortunately, as a woman pursuing a field that was not traditionally feminine and male-dominated, it was difficult to feel confident in entering these industries. I felt that this six-week program could not only solidify my decision but also grow my passion for STEM. Having this once-in-a-lifetime opportunity to not only work in a University laboratory, interact with peers with similar interests to mine, but also learn from professionals in their fields. During my time in the WISEST SRP, I have been able to interact with a variety of professionals in their respective fields, learn about their career paths and ask important questions. One panel session included a bunch of computer science students and I felt confident and solidified in my decision to pursue computer programming after the session. The SRP also presents multiple PD sessions which aim to prepare students to enter the professional workspace. Throughout

the program, I have learned what the "real world" looks like and what a professional workspace looks like. I have been able to develop my professional skills and learn new skills like networking through the multiple opportunities provided. The SRP is a research program unlike any other and I would definitely recommend this to students interested in STEM!

My project this summer was DODO, which is a tactile coding block which aims to support the visually impaired in learning computer programming. My role in this project was to create an alternate multiplayer mode for DODO, which consists of players competing with each other to complete each level the fastest. Overall, I am especially proud of myself for finishing and presenting a complete research poster at the Celebration of Research. Although there were a few challenges and uncertainty along the way, I feel accomplished and confident in the skills I developed this summer. I would like to thank the LIMDA lab in Mechanical Engineering, my PI, Dr. Rafiq Ahmad and my supervisor, Jennifer Cardenas Castaneda for supporting and guiding me throughout the program! I would also like to thank my sponsors, AI4 Society and Motorola Solutions for providing me with a life changing experience. Finally, I would like to thank WISEST for all the hard work and consideration put in for the students during this program!

Arshiya Huq

High School

M.E. LaZerte High School

Lab Placement

Mechanical Engineering, Faculty of Engineering

Project Title

Brace Yourselves: The Variation of Forces from Tooth Movements through the use of Orthodontic Braces

Final Project

<https://doi.org/10.7939/r3-ynhz-st11>

Supporter

Alberta Government (Jobs, Economy and Innovation)



My name is Arshiya Huq, and I attend M.E Lazerte High School in Edmonton, Alberta. Growing up, I held a fond interest in mathematics, physics, chemistry, and biology. Fittingly, these areas of study heightened my interest in pursuing biomedical engineering for my future career. When not in school, I love to participate in activities such as dance, competitive cheerleading, and swimming. This summer, I was given a project that allowed me to study the differences in forces through tooth movements using orthodontic braces. Additionally, I used different archwire sizes to further analyze these forces.

My experience in the SRP has been one of the most fulfilling things ever. Although the program was six weeks long, I have developed skills that would benefit my entire future. Within my lab placement, I learned how to analyze literary papers, 3D model, familiarize myself with various softwares, and acquaint myself with scientific jargon. It was quite intriguing to change my habits of approaching academics like this, as studying for exams and doing homework is one thing. But to conduct research and look for various answers regarding my project was a whole other aspect of education. One of my favourite parts of my job was sitting in team meetings with my supervisors and PI. I enjoyed this as it made my experience as a researcher feel authentic and introduced me to see how research teams function.

Apart from my lab, I also learned a lot from the Professional Development sessions WISEST organized for us

researchers to attend. I attended events that taught me how to network, present research, and better understand university. Many of these PDs had information that schools usually would not present, which makes this program so much more exceptional.

As I benefitted incredibly from the SRP, I would highly recommend it to anyone considering applying. As a high schooler, being presented with the rare opportunity to be welcomed into a university-level job is a privilege in itself. This once-in-a-lifetime experience not only prepares individuals for academics in the future but also develops crucial skills one needs for their future. Whether that is to become more confident in public speaking or to nail a job interview as an assistant researcher. In the end, this summer internship confirmed my love for STEM, and I hope it does for other students finding difficulty in discovering their passions and desires in regards to a future career.

I would like to thank Dr. Romanyk for being such an inspirational PI and mentor, as well as my supervisors Arya Subramanian, Robyn De Wet, Timothy Gadzella, and Alejandro Matos for truly making my internship a fun and impactful experience. I will never forget the number of inside jokes and memories created in the last six weeks. I'd also like to thank my teachers Mr. Smith, Mrs. Beller, Ms. Zhang, Ms. Moir, and Ms. Wong for supporting me in my endeavours as a student. Lastly, I'd like to thank the Alberta Government for sponsoring me during this internship.

Sandy Iligan

High School

Lillian Osborne High School

Lab Placement

Earth and Atmospheric Sciences, Faculty of Science

Project Title

How to Make a Rock 101: Silica Gel Formation

Final Project

<https://doi.org/10.7939/r3-3brh-z722>

Supporter

Canada Summer Jobs, Isomass Scientific Inc



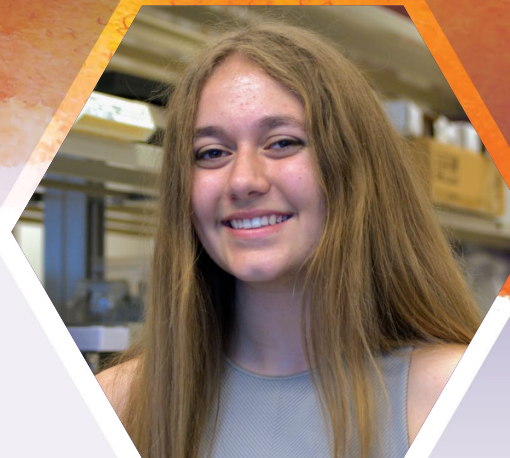
My name is Sandy Iligan and I am a student at Lillian Osborne High School in Edmonton, Alberta. In school, my interests lie in art, math, chemistry, and physics. In the near future, I hope to explore geo-related fields such as geophysics and geology in post-secondary. I was placed in the Department of Earth and Atmospheric Sciences in the Geobiology lab where I bolstered the idea of non-classical crystallization, in which there are different stages during rock formation when dealing with lower temperature and lower pressure environments. I do this by achieving the first stage of rock formation in the silica cycle which is amorphous silica in the form of silica gel, the final stage being the formation of chert (a type of sedimentary rock). I would like to thank the WISEST staff and Daniela Gutierrez Rueda for their indispensable support throughout the program, as well as Brette Harris, Kelly Rozanitis, Dr. Weiduo Hao, Dr. Kurt Konhauer and my lab partner, Sofiyah Shariff. I would also like to thank my family for continuously supporting me in what I pursue which I am eternally grateful for.

Before the Summer Research Program, my perception of STEM centered mostly around what I learned in school. Although learning math equations and scientific concepts are a part of engaging in the world of STEM, the world of STEM offers much more than I realized. STEM opens up new opportunities and challenges, especially in this new generation where women and gender-diverse individuals are only starting to get acknowledged in a very male-dominated field. For example, the gender data gap still exists, which I did not learn about until I joined the

WISEST SRP book club this year where we read *Invisible Women: Exposing Data Bias in a World Designed for Men* by Caroline Criado-Perez. Although the author fails to differentiate between sex and gender, the overall main idea of the book, in which women are underrepresented in data, remains true. But despite this, entering the STEM field presents more opportunities that allow us to explore the world and build connections that are worth these obstacles.

Overall, the Summer Research Program proved to be very beneficial in terms of figuring out what I want—and do not want—to do in the near future. I applied for this program with the intention of exploring different fields, and I was lucky enough to be placed in a lab that genuinely piqued my interest in the subject. I was given the opportunity to attend PD sessions, go to networking events, and of course, work in a university lab, which all contributed to my growth as an aspiring individual exploring STEM for the first time. But most significantly, I met like-minded individuals that ultimately became the highlight of my whole WISEST experience, making me realize the importance of community in the STEM world (or any career for that matter). Together, all of these experiences are what helped me establish my love for STEM.

Danielle Judd



High School

David Thompson High School

Lab Placement

Agricultural, Food & Nutritional Science, Faculty of Agricultural, Life & Environmental Sciences

Project Title

Effects of Low Fat Dairy Products on Hepatic Lipid Accumulation

Final Project

<https://doi.org/10.7939/r3-w1f8-fr93>

Supporter

Alberta Government (Jobs, Economy and Innovation)

My name is Danielle Judd, and I am from Alhambra, Alberta. Science has always been a passion of mine, even when I was in elementary school. Going to science class was never something I dreaded, and I would study biology and chemistry to get a break from my other classes. Pursuing science is definitely something I see for myself in the future, and because of this program, I am set on a career in research.

Even before I was in school, my parents gave me my first taste of science through museums and historical sites. At the age of 5, I was determined I was going to grow up to be a paleontologist and discover a new type of dinosaur. From this point on, I never imagined a career in anything but science research. When I came across this program, I knew I had to apply. Rereading all of the projects that had been done in past years, and all the different fields of study I didn't know were out there made me excited about the possibilities in science research. Applying to WISEST felt like the first step in my post-secondary education journey.

My project was researching how low fat dairy products in a high fat diet affect the accumulation of lipids in hepatocytes. With this study, the aim was to experiment with preventative treatment to non-alcoholic fatty liver disease.

Throughout the summer, I learned so much about the research process and livers. But the most important things

I will take away from this program are not necessarily the research aspects. Within the first week, I learned one of the most valuable pieces of advice from the Dream Big PD session presented by Fervone Goings. In this presentation, she talked about imposter syndrome, and how to overcome it. This topic really resonated with me, especially during this first week because it was something I definitely felt. But overall, knowing that I made it here, and I was supposed to be here gave me confidence that I will carry with me for the rest of my life.

The thing I am most proud of myself for is stepping out of my comfort zone and learning how to thrive. Working with so many amazing people who allowed me to learn so much from them made this experience feel so welcoming.

Thanks to my sponsor, the Government of Alberta, for giving me this opportunity to grow my passion for STEM. Thank you to my PI, Dr. Catherine B. Chan, my supervisor, Emad Yuzbashian, and to Dineli Fernando for giving me the opportunity to be a part of this lab and research. Thank you to my teachers Mrs. Janine Morrish and Mr. Richard Moore for growing my passion for science throughout high school. Finally, Thank you to my parents for exposing me to science and supporting me every step of the way.

Marina Kaminskas

High School

Bev Facey Community High School

Lab Placement

Biochemistry, Faculty of Medicine and Dentistry

Project Title

Engineering *Saccharomyces boulardii* for the Improved Production of Anti-Microbial Proteins

Final Project

<https://doi.org/10.7939/r3-487k-4580>

Supporter

Bert Murray & Margaret Cook, Canada Summer Jobs



My name is Marina Kaminskas, and I attend Bev Facey Community High School in Sherwood Park, Alberta. I have always had a huge passion for sports and fitness, however, my academic interests lie in chemistry and biology studies, as I am very fascinated by gene therapy and internal medicine and research. These subjects interest me as I want to find the root of biological issues and work to fix them to improve quality of life, without relying only on medications.

My project in the SRP fit perfectly with my interests in finding alternative solutions to drugs, as we worked on engineering the probiotic yeast, *Saccharomyces boulardii* to improve its secretion of antimicrobial factors (proteins) that can help treat pathogenic infections in the gut of broiler chickens. We specifically targeted treatment against the pathogenic bacteria, *Clostridium perfringens* because it is a major cause of exaggerated inflammation in the gut of the broiler chickens and antibiotic resistance is occurring—costing the poultry industry a two-billion-dollar loss annually.

Being a student researcher in the SRP was a phenomenal opportunity as I was able to have experiences almost no young person my age has access to and I feel so much more prepared for university and my future STEM journey. I was given so much trust and support in my lab; learning pipetting techniques, how to plate and spread samples (specifically yeast), DNA replication, transformations, and cloning, and using gels with ultraviolet light to view and cut DNA—and that is not even nearly everything I learned!

My PI taught me about the values in failure and how it is totally okay if I do not know what I want to study because people— including himself— change their majors all the time.

The constant inclusivity and support I felt during the program was so amazing and being a part of such a strong community of passionate and like minded people made making friends and networking such a great experience! Through the multitude of professional development sessions we had the opportunity to learn about our strengths and how to harness them, not only in our research but in our everyday lives. I learned the importance of networking, which was a term I did not give much mind to, and how it allows you to create a brand of yourself and make yourself available to employers and experiences. I implore anyone to apply if you have a love for learning and are interested in what STEM has to offer because the lessons and the experience you will obtain from the SRP will stick with you for the rest of your life!

Thank you so much to my supervisor, Laura Enekegho, and my PI, Dr. David Stuart as they welcomed me into the lab with open arms and taught and mentored me throughout the program. Another huge thank you to Canada Summer Jobs, Bert Murray, and Margaret Cook for supporting my placement, and the WISEST staff for their endless hours put into making the SRP such an amazing experience.

Shiloh Kirby

High School

Victoria School of the Arts

Lab Placement

Agricultural, Food & Nutritional Science, Faculty of Agricultural, Life & Environmental Sciences

Project Title

Seed Eating Ground Beetles: Assessing Plant Primers in PCR to Determine Trophic Interactions in Carabids

Final Project

<https://doi.org/10.7939/r3-5xdp-j739>

Supporter

Alberta Government (Jobs, Economy and Innovation), Mori Lab



This summer I managed to have the experience of a lifetime! Coming out of it, I have never been more confident in myself. Being able to genuinely experiment and do fieldwork was an amazing privilege as I saw some really beautiful things while doing molecular collections. This summer I had the opportunity to learn about various components of agricultural entomology, mostly focused on pest management through some really wonderful genetic engineering experiments. The fact that I understand everything I was tasked with this summer in depth makes me feel proud of myself. Dealing with burnout towards the end was a challenge, but a challenge I was so grateful to even have. I have never had many opportunities to explore a lot of my interests growing up, much less the ones that were scientifically inclined.

I have made some connections that are incredibly meaningful- not just in the academic world but genuine friendships as well. The program allows you to do a ton of things. One thing that particularly stood out to me was the offsite tour portion. Being able to go to a real chemical plant with industrial reactors was like a vision from my dreams, and for once in my life, I felt like I could really belong somewhere in the scientific community. Touring the Gilead facility was like a glimpse of hope for my future, the determination to really do something meaningful has been engraved into my mind. My time has shown me what I am capable of understanding, doing, and striving for. I feel so much more prepared for any sort of post-secondary

education now. This is only the beginning of my aspirations and words cannot describe how appreciative I am to have this knowledge on my hands.

Keegan Kirchen

High School

Archbishop Jordan Catholic High School

Lab Placement

Agricultural, Food & Nutritional Science, Faculty of Agricultural, Life & Environmental Sciences

Project Title

The Effect of Foliar Salicylic Acid Applications on Clubroot Disease in Canola

Final Project

<https://doi.org/10.7939/r3-ef39-ha58>

Supporter

Strelkov Lab



My name is Keegan Kirchen, I use he/they pronouns. I am from Sherwood Park, Alberta. I have a great love of learning, especially when it comes to biology. Learning about the natural world around me is my passion. I hope to follow this interest, as well as my love of research, in university. My goal is to do what makes me happy and to make as big of a difference in this world as I can!

This summer, I was placed in Dr. Strelkov's plant pathology lab. I studied clubroot disease in canola and a potential treatment for the soil-borne pathogen. My research looked into spraying salicylic acid, a plant defence hormone, onto the leaves of infected plants in order to reduce disease severity. This amazing opportunity taught me so many things that I hope to bring with me in my future studies.

The WISEST Summer Research Program taught me the importance of networking. We were taught how to network, making it seem so much less intimidating. The WISEST Summer Research Program taught me that failure is alright, and happens so much more often than success in research, and that's how science goes. There are often blunders on the way to discovery. Yet most importantly, the WISEST Summer Research Program taught me that it's alright not to know what you want to do in the future, even though, as grade 11 students, we need to make so many big decisions. So many of the university students who came to us as mentors had no clue what they wanted their path to be a few years from now. And more than anything, they wanted to stress to us: that's alright.

This program is one that I would highly recommend to other students, not only because of the amazing research that all participants are able to do, but because of the community that the WISEST cohort formed. It's incredible what can happen when so many like-minded youths are together for six weeks. I have never really had friends interested in the same aspects of STEM as I am, and the SRP was a space in which I was finally able to have that community. A strong science community like the one formed in the WISEST cohort, from my perspective, helps improve all those who are in it. The program also gave me the space to form friendships with people from all across the province that I would not have otherwise met.

I have come away from the program with so much invaluable experience in a field that I hope to pursue in the future. That would not have been possible without my supporter, Dr. Strelkov, and the extremely welcoming nature of the whole research team in my lab. Thank you so much for all of your support.

Tanushri Koorapaty



High School

Tempo School

Lab Placement

Renewable Resources, Faculty of Agricultural, Life & Environmental Sciences

Project Title

Canola Straw Biochar Properties Affect its Seed Characteristics for Struvite Crystallization

Final Project

<https://doi.org/10.7939/r3-arvw-7j93>

Supporter

Women & Gender Equality Canada

Hello, my name is Tanushri Koorapaty, I am 16 years old and my pronouns are she/her. I have grown up in Edmonton, Alberta for the past 13 years and currently attend TEMPO School. I find interest in a wide variety of subjects such as History and Biology. I love spending time sketching and painting while discovering different genres of music.

I first heard about WISEST after a few students from my school had shared their experiences. They told us how much they enjoyed the program and learned more than they could imagine. I immediately started gathering more information about the program and found that it aligned with all my goals and beliefs. It was incredible to find a program that helps women and gender-diverse students break down barriers and achieve their dreams in STEM. I made it my goal to become an SRP student and started becoming more involved with programs associated with WISEST such as the SET conference. When I found out about my acceptance into the program I jumped around in joy and complete shock. I became excited to start my amazing journey in the program.

This summer I was placed in the Forest Soils Lab in the Department of Renewable Resources, located in the Faculty of ALES (Agricultural, Life, and Environmental Sciences). Here I researched the utilization of various types of biochar, an ashy carbonaceous substance, to recover phosphate in the form of struvite from wastewater, specifically urine. This would help prevent the destruction of aquatic environments by removing the excess

phosphate, while also satisfying human needs by using this phosphate in the production of fertilizers.

By spending time doing research in a laboratory I gained many invaluable experiences such as working in a professional laboratory environment and learning to communicate with superiors. I also gained experience handling various instruments and reading scientific research papers. This program helped me acquire professional skills through various development sessions allowing me to expand my skill set and make myself more well-rounded to excel at any job. I now feel more independent and confident in my abilities to face any challenge that may come.

I would like to express my deepest gratitude to WISEST and Women and Gender Equality Canada for allowing me to participate in this incredible program. My project would not have been possible without the support of my Principal Investigator, Dr. Scott X. Chang, and my supervisor, Nageshwari Krishnamoorthy. I would also like to thank the WISEST Team for showing me some amazing opportunities and allowing me the chance to meet many inspiring people. I am forever grateful for this life-changing program.

Tooba Mahmood



High School

Lillian Osborne High School

Lab Placement

Psychology, Faculty of Arts

Project Title

An Eye-Catching Study: Comparing Two Portable Eye-Tracking Systems

Final Project

<https://doi.org/10.7939/r3-j27w-zd78>

Supporter

Canada Summer Jobs, Faculty of Arts

My name is Tooba Mahmood and I am a student at Lillian Osborne High School in Edmonton, Alberta. Although I enjoy every subject in school, I have loved science for as long as I could remember, both in and out of school. When I am not studying or working, you can find me baking, reading, or hanging out with friends!

I was placed in the Visual Attention and Social Processes (VASP) lab this summer where I got to use and compare two portable eye-tracking systems in order to understand which environments they thrive in and which experiments they are best suited for. Eye-tracking allows us to better understand human gaze behavior and it helps us identify patterns and methods of gaze, giving further insight on cognitive processes such as perception and attention. My research will allow lab members to gain information on what ways they can use eye-tracking as part of their studies.

Throughout the six-weeks of the program, I was able to learn many skills and gain qualities that will be beneficial to me in the future. Balancing the program along with a part-time job allowed me to effectively work on my time management skills to avoid burnout (and it was successful!). I also worked on how to efficiently communicate with others in order to reach common goals, and to initiate experiences that will guide me in the future. One of the biggest things I learned about myself this summer, that I have a lot more to offer than I give myself credit for. I thank WISEST for encouraging us and reassuring us that we do belong at the program as many of

us struggle with imposter syndrome.

I genuinely recommend this program for any grade 11 student interested in pursuing a career in STEM. This program will open your eyes to a variety of fields, allow you to make new friends, network with people in various fields at various levels, equip you with lab experience and research skills, experience the university lifestyle, and it even allows you to learn more about yourself as a person! We got to learn a variety of important topics that need to be discussed as young women and gender diverse students in STEM through professional development sessions. Amongst all of this, we were able to wind down through social activities organized by WISEST. All in all, it was an amazing experience that I'm grateful I had the opportunity to be a part of.

I want to thank the WISEST team for all of their hard work and time spent on making the Summer Research Program as incredible as it was, as well as to all the mentors who shared their experiences with us this summer. I also want to thank my supporters, as well as my supervisors and my principal investigator for making this project possible for me. Finally, I would like to thank Ms. Hollinshead and Mr. Dulai, my teacher references who inspire me to always be curious about science.

Alaina Mitchell



High School

Kitscoty Jr/Sr High School

Lab Placement

Biological Sciences, Faculty of Science

Project Title

The Influence of Traffic on Edge Use by Boreal Birds

Final Project

<https://doi.org/10.7939/r3-244v-6b24>

Supporter

Alberta Government (Jobs, Economy and Innovation), Bayne Lab

My name is Alaina Mitchell and I attend Kitscoty Jr/Sr High school in Kitscoty, Alberta. Some of my favorite classes in school are biology and math. I applied to the WISEST Summer Research Program for three main reasons. The first was to gain more insight into what a career in research could potentially look like. The second was to experience a taste of university life. The third was simply to have a full-time summer job to start saving up for university next year. I was shocked when I got accepted, knowing how competitive this program is, and I did my best to experience everything this program has to offer.

Growing up on a farm, this program gave me an opportunity to experience city living. I stayed in St Joseph's Women's Residence. At first, it was hard because I missed my home, family, and friends. As the weeks went by, I became closer with my roommates and more comfortable living away from home. Living in residence gave me a glimpse into university life.

I was placed in the Bioacoustic Unit this summer. My project looked at how traffic intensity affected birds' response to roads. We used ARUs and a website called Wildtrax to see how birds' reactions to roads changed with varying traffic levels. I had never heard of Bioacoustics before starting this program, so I was not really sure what to expect. It was exciting to learn about a field that was so new to me. I gained valuable research experience which has allowed me to think about my future plans through the lens of first-hand experience.

Throughout the program there were various professional development sessions that provided us with valuable knowledge that we do not learn in school. I learned how to network and got to practice my new-found skills at the networking fair. I also learned how to write a good resume and prepare for a job interview. These are both things that I will take with me into my future.

I would like to thank the Bayne Lab and Alberta Jobs, Economy, and Innovation for making my placement this summer possible. Thank you to my direct supervisor, Dr Lionel Leston, and my principal investigator, Dr Erin Bayne for supporting me throughout this program. Overall, this summer better prepared me for university, my career, and made me further understand the importance of diversity in STEM and I am forever grateful to have been a part of it.

Anna Nevoit

High School

Miles Macdonell Collegiate

Lab Placement

Psychology, Faculty of Science

Project Title

You're Not Like All the Other Birds: Individuality In Nest Architecture

Final Project

<https://doi.org/10.7939/r3-fb2j-kt33>

Supporter

Canada Summer Jobs



My name is Anna Nevoit and I am from Winnipeg, Manitoba. I was born in Ukraine and moved to Canada in 2013. For the past 3 years I attended Miles Macdonell Collegiate. Some of my favourite subjects in school are chemistry, French and Phys. Ed. This year, when I found a deeper passion for chemistry and sciences, I realized that I wanted to become a STEM nerd. I love organic chemistry and nutrition, and, in the future, I really want to pursue food science! One of my "whys" or motivations for this career is my concern with the global issue of malnutrition and hunger. I want to work towards a better future for everyone and help develop solutions that can help our world move towards accessible and nutritious diets for everyone. Apart from school, some of my interests include hiking, travelling, lifting, and cooking.

This summer I was placed in the department of psychology in the Animal Cognition Research Group where I worked with zebra finches. My project focused on the individuality in nest architecture and how different bird pairs may have preferences in the length and the amount of material used for their nests. Although we had very little time to complete our work, my project can be a foundation for further research in understanding certain cognitive behaviours of birds.

One of the most useful skills I gained in the SRP was networking. During the 6 weeks in Edmonton, I built a network of connections with whom I will keep in touch

for multiple years. I realized how important it is to build authentic, strong, and personal connections for future opportunities. During the SRP, I took the initiative in contacting faculty members in food science to meet and discuss their experiences. In the end, I was more than honoured to get an invitation to work in one of the labs next summer, which showed me how important it is to use these experiences wisely to their full potential.

After living alone, across the country, without my family for 6 weeks, I experienced many challenges. I was introduced to this new and scary thing called "adulting". At first, I was overwhelmed by emotions of excitement, independence and freedom while being alone. However, quickly, resilience and perseverance woke up inside of me and I learned to take full care and control of myself! It was the most rewarding feeling being an adult, going through all the possibilities and coming back stronger than ever! I would not trade this experience for anything.

Apart from the WISEST team and my lab, I would like to thank our Residence Assistants – Jennifer Peterson and Tendai Nyakabau. They put immense effort, time, and hard work into making our residence experience as comfortable as possible. They were dedicated and genuine in everything they did. By the end of the program, I felt like we built a family outside of home. I want to thank them for all the amazing work they have done for us, this experience would not have been the same without them.

Chloë Newell

High School

Strathcona High School

Lab Placement

Agricultural, Food & Nutritional Science, Faculty of Agricultural, Life & Environmental Sciences

Project Title

Effect of anabolic steroid (trenbolone acetate) and β -adrenergic agonist (ractopamine hydrochloride) on semimembranosus muscle fiber characteristics in crossbred steers

Final Project

<https://doi.org/10.7939/r3-d9yw-z621>

Supporter

Canada Summer Jobs, Bruce Lab



My name is Chloë Newell and I am from Edmonton, Alberta. I am a competitive swimmer and have swam for 7 years and am going into my 8th. Though I do not know exactly where my future will take me, I know I have a passion for STEM.

My project involved looking at cattle and how to make cattle more efficient; this is done by looking at ways to increase muscle mass to reduce the amount of methane produced. We attempted to do this with steroids to help grow the percentage of muscle fibres. I would like to thank my supporters for this opportunity, and also my lab for all of their help, especially Katie Pedgerachny. A masters student in my lab who taught me the ropes of working in a lab, she taught me so much about lab work, and the different rules of working in a lab.

Throughout this program the thing I am the most proud of is creating a research poster. Making a research poster is truly unlike anything I have ever been exposed to before in my academic career. We have made posters before but all by hand and never at a high academic level similar to this. Therefore I am extremely proud of myself for overcoming these challenges. From it being a new concept to me, and figuring out the finicky aspects of making a research poster, I ended up creating something I am overjoyed to say I made. Additionally, creating this poster will help me in my future academic endeavors, specifically learning how to use Word and PowerPoint. Prior to making the poster I had

never used Word before as my school solely uses Google, but I know that Word and PowerPoint are commonly used in universities, so by creating this poster I greatly helped my future self in her success in classes that use them. It also overall helped my knowledge of technology which is always important in life in general as life is heavily based on technology nowadays.

This program was truly a life changing experience and I know I will carry what I learned in it with me for the rest of my life.

Tiffany Ngo



High School

W.P. Wagner High School

Lab Placement

Communication Sciences and Disorders, Faculty of Rehabilitation Medicine

Project Title

Examination of Brain Structure Volume in People With and Without Dyslexia

Final Project

<https://doi.org/10.7939/r3-y266-pb68>

Supporter

Bert Murray & Margaret Cook

My name is Tiffany Ngo, and I attend W.P. Wagner High School in Edmonton. My future at the moment appears to be somewhat blurry for me, as I am unsettled on what I would like to pursue in the long run, however, the Summer Research Program has allowed me to narrow down my options. I am quite enthusiastic about motorsports, cars, and fine arts outside of school. Though in academia, I have always found myself enjoying mathematics and sciences; in the process, I developed a deep interest in biology. I grew a liking for neuroanatomy, and neuroscience after completing Biology 30 in my Grade 11 year, and I was thrilled that I had the chance to be placed in the Faculty of Rehabilitation Medicine, and the Department of Communication Sciences and Disorders for the summer.

For my particular project, I examined the volume difference in a brain structure between people who were skilled readers, and people who had reading impairments. I had the chance to gain some insight to brain anatomy, and their relation to reading and speech processing as I worked on my project. Throughout the six weeks that I was in my lab, I also gained valuable experience analyzing magnetic resonance imaging (MRI) scans, as well as working with functional near infrared spectroscopy (fNIRS). Much of this was through shadowing some of my lab members outside of work hours, and asking questions about the other research projects that they were working on.

On another note, I got to learn a couple things about myself through the program. Research is not an area of study that I would like to pursue for a future career; I definitely do not mind it, but I do not see myself working in a research environment as a long term job. Secondly,

I think I have grown to like neuroscience more; it's a complex discipline, but highly interesting at the same time. Talking to some of my lab members, undergraduate students, and work professionals, I find that we tend to sugarcoat what we do not like. Being able to find that balance between what interests me, and what doesn't has been a key factor this summer with helping myself narrow down my choices for post secondary.

Working at the University of Alberta over the summer has been such a learning curve, but has also been such a rewarding experience. Without the help of my Principle Investigator and Supervisor, Dr. Jacqueline Cummine, as well as some of my lab members, Tina Huynh, and Sarah Saju, my project would not have been possible.

Mikayla Pekse

High School

Salisbury Composite High School

Lab Placement

Biological Sciences, Faculty of Science

Project Title

Pictures to Models - Dinosaur Photogrammetry

Final Project

<https://doi.org/10.7939/r3-rmm1-wd13>

Supporter

Edmonton Chapter Beta Sigma Phi



My name is Mikayla Pekse, and I am a student at Salisbury Composite Highschool from Sherwood Park, Alberta! I enjoy chemistry, physics, and art in school, and I am hoping to find a career path that incorporates both my love of science and my love of art.

This summer, I was placed in the Dino Lab, where I performed photogrammetry— the process of taking hundreds of pictures from all sides of a 3D object and then digitally reconstructing it— on four separate specimens. All the models came out amazing in the end, and I am really proud of them. They are my first real foray into the world of 3D modelling, and the fact that I have four, good quality, fully textured models out of the experience is really inspiring. The learning curve with the programs I was using this summer was really steep, and there were some days when it felt like I was not going to finish anything because nothing was working, but between my brain, trial-and-error, and YouTube, I got there in the end. The problem solving and independence this program encourages and fosters is invaluable both in school work and in the professional world. We were pushed to think outside the box, and sometimes that's what the solution requires.

I would absolutely recommend this program to anyone who is eligible to apply. It will not be a summer wasted, between the lab work, the professional development sessions every week, all the panels and mentorship opportunities, and the friends made, it pushes boundaries, increases confidence, and helps young women (like me) and gender-diverse people see a future for themselves in

STEM, where they may have been uncertain or discouraged without the SRP. Thank you to WISEST for the incredible, once-in-a-lifetime opportunity, to the Dino Lab for the chance to work with them or learn about so many cool projects, and to everyone else who makes this program possible!

Cayla Polege



High School

Central High Sedgewick Public School

Lab Placement

Psychology, Faculty of Science

Project Title

Behavioural responses to typical and atypical calls in Black-capped chickadees (*Poecile atricapillus*)

Final Project

<https://doi.org/10.7939/r3-pv9p-1256>

Supporter

Women & Gender Equality Canada, Sturdy Lab

I am Cayla Polege, a student at Central High Sedgewick Public School from a small town called Sedgewick, located in Alberta. I have an interest in psychology and hope to pursue criminal law in the future.

The research I conducted over the summer was a study on the behavioural response to typical and atypical chick-a-dee calls in Black Capped Chickadees. We would alter the call and analyze how the birds reacted in terms of emotion, by observing any changes in behaviour.

I would like to thank everyone in the Songbird Neuroethology Lab, who guided me in this project and gave me a sense of belonging, showering me with endless encouragement and advice. I am also grateful for Dr. Sturdy who took me into his lab, providing me with this opportunity.

WISEST taught me an incredible number of skills such as networking and personal branding, both of which I confidently tested out during the networking fair WISEST hosted. At first, I felt that this program may not be for me after seeing how passionate everyone was while I was still figuring out what I wanted to do. I took on this journey to learn more about what I want to pursue in the future and to find what is right for me. Once I was in my lab and ready to conduct my research, I felt that I belonged and I began to enjoy my experience. After the professional development sessions and encouragement from my lab, I developed a new profound love for research and

science. Participating in this program was an unforgettable experience that blessed me with connections, lessons, and confidence. WISEST gave me a chance to experience, grow and tackle the under representation for women in STEM, which I am forever grateful for.

Lauren Riding



High School

Spruce Grove Composite High School

Lab Placement

Agricultural, Food & Nutritional Science, Faculty of Agricultural, Life & Environmental Sciences

Project Title

24-Hour Activity Time Budgets of Lohmann Brown and White Laying Hens in Enriched Housing

Final Project

<https://doi.org/10.7939/r3-3xa8-cj57>

Supporter

Alberta Government (Jobs, Economy and Innovation)

My name is Lauren Riding and I attend Spruce Grove Composite High School. I have enjoyed math and the sciences ever since I was little and now that I am in high school, I want to pursue a career in STEM. I am interested in environmental science and marine biology and am considering pursuing a degree in a related field at UBC after I graduate. In my spare time, I enjoy reading, spending time in nature, and baking.

During my time in the SRP, I conducted research on the behaviour of 2 different genetic strains of laying hens in enriched housing with 2 different perch shapes. The goals of my study were to identify which strain was better suited to enriched environments, determine which perch shape provided more comfort and easier balance, and understand the effect that the light phases (lights on vs. off) had on the behaviour of the hens. My study was done with the purpose of improving the welfare of laying hens in enriched housing now that the industry is moving away from conventional caging systems.

During the SRP, I learned countless skills that will help me in my future academics and career, such as defining my own version of success. It can be easy to feel lost sometimes in the fast-paced and ever-changing environment of STEM, and WISEST taught me the importance of determining what matters most to you and actively pursuing that rather than comparing yourself to others and feeling inferior. Overall, this summer has been an eye-opening experience and has increased my confidence immensely.

The WISEST SRP program is extremely important and played a vital role in encouraging me to pursue STEM. Science, math, and engineering fields can often seem daunting to young women and gender-diverse people because of the continued underrepresentation of our genders. However, this summer has allowed me to meet, learn from, and network with many amazing people whose identities are also underrepresented in STEM fields. Experiences like this are the reason why the WISEST Summer Research Program holds such importance to young individuals, such as myself, who wish to make a difference in the world of STEM. I strongly recommend that any girl or gender-diverse individual who is interested in STEM apply for the WISEST SRP as it has been the most educational and rewarding experience of my life. All that I have learned from the program, and the network I have made along the way, will stay with me forever!

I would like to give a special thanks to Dr. Clover Bench, Emily DePaoli, Nicole Desrosiers, the staff at the University of Alberta Poultry Unit, and the volunteers in the Applied Ethology research group who helped make this project possible! I would also like to thank the Government of Alberta for their sponsorship, all of the friends I made throughout my time in the program, and the WISEST staff for providing me with this incredible opportunity.

Sofia Rivasplata



High School

Harry Ainlay High School

Lab Placement

Biological Sciences, Faculty of Science

Project Title

Does How We Measure Birdsong Influence Our Understanding Of Edge Effect?

Final Project

<https://doi.org/10.7939/r3-wkjq-kp33>

Supporter

Canada Summer Jobs, Bayne Lab

My name is Sofia and I am a student at Harry Ainlay High School in Edmonton, Alberta. My favourite subjects in school are the three sciences and art. Given that engineering is a career that implements most of those subjects, I want to go to university for engineering and architecture, but my plans are still ever-changing as I discover many other career paths that I could enjoy.

My SRP project was investigating how the use of recording devices changed our perception of the effect of road edges on birdsong rates in the bioacoustics lab. We went through recordings and manually identified birds and compared how often they sing at different distances from a road, and thereby monitoring whether they prefer the road edge or the deeper forest.

I would like to thank Canada Summer Jobs and the Bayne Lab for sponsoring my project, as well as Dr. Erin Bayne and Dr. Leston for helping me throughout the program. I am so grateful for all the support that allowed me to participate in the WISEST SRP.

I applied to the WISEST SRP because I wanted to better understand research careers and narrow down what jobs I would or would not enjoy. It would give me an idea of what an actual job in STEM might look like, and I gained crucial research skills such as efficiently reading scientific papers and processing data in a program called Rstudio. I also learned how to use ArcGIS: a Global Information

System program that is becoming more common and could help me in university if I pursue a career in biology or anything else that uses ArcGIS.

These skills are just one example of why I would recommend this program to other students. The communities and knowledge built throughout this program are simply invaluable, and it better prepares its students for university and future careers. It is also quite enjoyable; the WISEST team hosted multiple social events such as game night and bubble tea night where the students can bond with one another and unwind after work. I really enjoyed the weekly book club too, and the interesting conversations and ideas we discussed were truly fascinating. I would definitely recommend this program to anyone who wants to discover more about STEM or simply wants to build friendships and knowledge with others.

Tori Rose

High School

Bassano School

Lab Placement

Linguistics, Faculty of Arts

Project Title

STOP COPYING ME: Imitation of Speech Reduction

Final Project

<https://doi.org/10.7939/r3-egj9-vt36>

Supporter

Alberta Government (Jobs, Economy and Innovation), Faculty of Arts



When I found out about the WISEST Summer Research Program, I was immediately excited! Coming from Bassano, a small town in southern Alberta, I have not had many opportunities to experience research and learn about unique career paths. I have always loved science and math, and once I began high school, physics and biology quickly grabbed my attention. The SRP seemed to be a great opportunity to experience university life and work in a real research lab while exploring my interest in STEM before even graduating high school! Over the past six weeks, I worked in the Alberta Phonetics Laboratory in the Department of Linguistics. I researched the imitation of speech reduction to explore whether humans mimic the reduction of word-medial /g/ and /d/ during lexical shadowing tasks.

This program has allowed me to network with engineers, physicists, professors, university students, and industry professionals in a variety of fields, work in a university research laboratory, participate in weekly professional development sessions, and build my own confidence. Since I live several hours away from Edmonton, I also lived on campus in St. Joseph's College Women's Residence with other SRP students. Our residence assistants planned events for us on weekdays and weekends, and were always available if we needed help. Throughout the SRP, I was able to meet like-minded peers with similar interests that I would not have met otherwise, and for that I am very grateful.

Touring other research labs on campus was another highlight of the program. We were provided with two opportunities to choose from a variety of labs to tour at the University of Alberta. This experience allowed me to explore and learn about multiple interesting labs in addition to the lab I worked in for six weeks. In the final week of the program, we were also taken off campus for industry tours where we spoke with industry professionals and observed first hand applications of science. Overall, this program has exposed me to many new career paths in STEM and allowed me to grow both personally and professionally.

I would like to thank my Principal Investigator, Dr. Benjamin V. Tucker, supervisor, Tyler Schnoor, and everyone at the Alberta Phonetics Laboratory for welcoming me into the lab, teaching and guiding me along the way, and providing me with a plethora of advice. I would also like to thank my family for all of their support, my teachers for their encouragement and amazing references, as well as the Alberta Government and Faculty of Arts for sponsoring my position.

Anna Rosvold

High School

William Aberhart High School

Lab Placement

Biological Sciences, Faculty of Science

Project Title

Living in a lonely world: how would you adapt?

Final Project

<https://doi.org/10.7939/r3-k5bt-jz18>

Supporter

Alberta Government (Jobs, Economy and Innovation), Evenden Lab



I am a student going into my grade 12 year at William Aberhart High School in Calgary, Alberta. I spend most of my time during the school year doing the things I love; studying and climbing. I study because I love learning, it is what feeds my passion for biology and chemistry. However, understanding the world around me brings me indescribable satisfaction, and that is what I love about physics and math. I also really enjoy the gym and being a part of a team, that is what motivated me to become a nationally ranked competitive climber.

As you can see, I have a lot of career paths I could explore, but I never understood quite how many and how fulfilling they all could be until I participated in the WISEST SRP. I now have a glimpse of how fulfilling STEM careers are and the intersectionality of the sciences. This program has drastically changed my perspective on what I would like to pursue in the future. When I applied to the WISEST SRP, all I knew was that science classes were my favourite. I knew I liked that I learned new things when I put together papers in biology class, and how fun the conclusion sections of physics lab reports were. Now, having completed the program, I know how fulfilling it is to do research. Going to work every day and knowing that no one else is seeing the results that you are, knowing that when you complete your project, you will have this amazing story that no one else has been able to tell. It is just incredible, it fills me with joy just writing about it. That being said, let me tell you about my project. I was placed in the Evenden lab, where I studied the physical aspects of the mountain pine beetle at its various density-dependent population stages. This research was conducted to better understand unique flight

phenotypes of the different flight population states so that we can hypothesize their dispersal patterns and therefore be able to protect our forests more effectively.

Although I was not placed in engineering, I got to see a different side of biology that I had never considered. I also found great comfort in knowing that no matter what branch of STEM I pursue, I will always find research fulfilling. Learning that about myself was incredibly valuable. Though, self-discovery is just one of the many reasons why the WISEST SRP is important. It helped me create a foundational network of people who want to create diversity in STEM, and through that will support me in the future. I also got to see a vast variety of career paths in STEM that completely changed the way I see the world and will help me plan my future. I think my favourite thing that I took away from WISEST is an inspiration to do something amazing and impactful. WISEST instilled in me the confidence to dream big when planning my future.

Yumna Saleem

High School

J. Percy Page High School

Lab Placement

Chemistry, Faculty of Science

Project Title

Synthesis of Boronic Esters from 3-Methoxyphenylboronic Acid for Comparison in Rh-Catalyzed Conjugate Additions

Final Project

<https://doi.org/10.7939/r3-48fq-p188>

Supporter

Canada Summer Jobs, Lundgren Lab



My name is Yumna Saleem, I attend J.Percy Page High School and was fortunate enough to be part of the 2022 WISEST Summer Research Program (SRP). During the summer my research in the Lundgren lab entailed synthesizing a series of boronic esters from the same reagent of 3-Methoxyphenylboronic acid for comparison in rhodium-catalyzed conjugate additions. The complex boronic esters I have made will be utilized for ongoing and future lab research projects and my methods could also potentially be applied in the pharmaceutical industry. Growing up as a kid I had always been fond of science, especially chemistry and biology, and math. I found both subjects fascinating and they have been my life-long passions ever since. In the future, I hope to pursue a career in STEM and be able to implement my love for science and math in whatever path I end up choosing!

My motivation for applying for the program was to strengthen my passion for STEM and use this opportunity to discover more fields I could go into. The inclusivity and diversity WISEST valued further led me to want to apply for the program. The SRP allowed me to grow greatly as an individual by helping me hone fundamental skills for communication and public speaking. Furthermore, I was able to develop and learn valuable research skills offered in my chemistry lab, skills which can be applied directly in my future career. Moreover, I was able to meet mentors from various fields with different lived experiences and be able to learn about their journey in STEM. They provided me with great insights into their work and were highly encouraging of questions and being open-minded.

By being part of this program I was able to learn more about myself and further explore my identity. The WISEST team provided us with multiple Professional Development (PD) sessions throughout the program and one of the most interesting and eye-opening topics discussed was Imposter Syndrome, a concept I had previously been unfamiliar with. I learned that I am as capable of achieving things as my peers, especially my male counterparts, and that I really do deserve a position here at the SRP. After that discussion, at the end of the program, I really was able to be truly proud of myself for the research I had done during the 6-weeks. Additionally, there were many challenges I faced throughout the program whether it was a reaction in the lab not going how we had planned or trying to get out of my comfort zone. I was able to overcome these challenges through the support provided to me by those surrounding me, teaching me to not give up and to continue giving my best, seeing my "mistakes" as rather "learning opportunities."

Lastly, I would like to thank my Direct Supervisor, Wesley McNutt and my Principal Investigator, Dr. Lundgren, for their great mentorship and support throughout the program. My experience also would not have been possible without Canada Summer Jobs and the generosity and time of the WISEST team!

Sofiyah Farha Shariff



High School

Lillian Osborne High School

Lab Placement

Earth and Atmospheric Sciences, Faculty of Science

Project Title

Wasteland, Baby!: Recreating the Birth of Oxygen in a Tank

Final Project

<https://doi.org/10.7939/r3-2caw-hd47>

Supporter

Canada Summer Jobs, Gingras Lab

My name is Sofiyah Shariff and I am a cisgendered woman of colour, third generation immigrant, and a settler on the unceded territory of Treaty 6 land, Amiskwaciwâskahikan. I find all subjects interesting in school and was hoping to continue my joy for the sciences through WISEST to help me decide on whether I like research or industry work (spoiler alert: I like research!). In the future I plan to bring my passion for decolonization into whichever field I decide to pursue. I also love to read *Anne of Green Gables* and play the electric guitar (and often do so at the same time).

My project this summer was a tank experiment where we took an euxinic tank (a tank with low oxygen and high sulfur conditions) that contained cyanobacteria (bacteria that photosynthesizes) and sulfur-reducing bacteria (bacteria that reduces sulfur into hydrogen sulfide), and put it in simulated sunlight conditions to measure the oxygen and sulfur levels. We did this to recreate the birth of oxygen (the Great Oxidation Event, which occurred during early Earth) in our tank! My supervisors provided an inclusive and supportive experience even when things seemed overwhelming in the beginning of the program. I would like to thank them for being such kind and empathetic human beings and supporting me throughout my time in the SRP.

The thing I am most proud of after completing the program is seeing my research come together in poster form and being able to explain my research to everyone! Once I completed the research, it's almost as if I had a sense of responsibility to help others understand the work I have done and how it can help us in the future. After watching it

all come together on a huge poster that I designed, seeing my name listed first in the authors section, it was all so inspiring because you look at that poster and it's like... I did that!

One thing I learned about myself from this program is how to trust myself, to silence my self-doubt and to use my voice to amplify my ideas and my expertise. Whether I am in the lab or I am pushing for more racial representation in sessions, I realized that I am in control of my own actions and I am accountable for them. In the lab, it's as simple as everyone's safety relies on me, so there's no room for self doubt, but when working towards dismantling systems of colonization in STEM, it's a constant battle of not listening to the voice of distrust in my head, because that is just allowing microaggressions imposed upon me to affect my judgment. As a woman of colour, WISEST gave me invaluable opportunities to learn how to deal with hard conversations, stop silencing myself so I can articulate my feelings accurately, and question institutions and their performative work to create diversity within its programs. I owe it all to WISEST.

Maria Shevchuk



High School

Mount Douglas Secondary School

Lab Placement

Mechanical Engineering, Engineering

Project Title

Coding Without Sight: 3D Models Aiding the Visually Impaired

Final Project

<https://doi.org/10.7939/r3-z026-1973>

Supporter

Motorola Solutions Foundation, AI4Society & Dr. Rafiq Ahmad

My name is Maria Shevchuk and I am a student at Mount Douglas Secondary School, in Victoria, British Columbia. From a young age I liked to create, build, and design. I would use scraps found in the recycling and re-purpose them into anything I could; gifts, inventions, storage compartments. Thus I hope to pursue a career in engineering and business, and make contributions to help better everyday lives.

This summer I was placed in the Department of Mechanical Engineering, where I modeled objects in SolidWorks for DODO: a platform allowing the visually impaired to code using physical objects and AI object detection. I modified the already existing models to better represent the fundamentals of programming, while also attaining to the needs of the visually impaired.

Growing up, I always separated arts and sciences into two different groups, with the idea that they are incompatible. I applied to WISEST with the hope of finding ways to connect my passions and make a career out of them. Needless to say, I applied to make connections with people similar to myself, to get experience in a STEM field and to get a chance to ask all the questions I had. But I also applied to prove myself; to show that I could achieve something without any connections or external help. It was an opportunity to grow confidence and realize my potential to achieve great things.

One of the many important skills I learned this summer was the importance of communication. When printing my 3D models, I failed to tell my team that my models are meant to connect and should be of equal size, so I ended up with three puzzle pieces, all different sizes, and a bunch of wasted filament. The significance of communication was echoed throughout the entire program, and will be a skill I remember in my future endeavors.

I recommend this program to anyone trying to figure out where their interests lie, who they are, and to anyone who is even a little interested in STEM! This program allows you to get experience in a STEM field, develop new skills, meet role models, friends, and grow as an individual.

My experience in this program would not have been possible without the mentorship advice of my principal investigator, Dr. Rafiq Ahmad; my supervisor, Jennifer Cardenas' endless support; the help of the Laboratory of Intelligent Manufacturing, Design and Automation (LIMDA) team members; my sponsors: Motorola Solutions, AI4Society and Dr. Rafiq Ahmad; and the kindness of the WISEST team.

Diana Streber

High School

Archbishop MacDonald

Lab Placement

Mechanical Engineering, Faculty of Engineering

Project Title

Upgrade Of Jackal UGV Robot To A Jetson AGX Computer

Final Project

<https://doi.org/10.7939/r3-7rp4-ab31>

Supporter

Canada Summer Jobs, Motorola Solutions Foundation



Hi! My name is Diana Streber and I go to Archbishop Macdonald High School in Edmonton, Alberta. I love to play soccer, I love to read, I love to explore new topics, and I love to learn. In school, I have always enjoyed math and physics so I am leaning towards a career in aerospace engineering to eventually become an astronaut.

This summer, I was placed in a Mechatronics Systems Control Lab where I got to install and update drivers, programs, and operating systems. I got to work with the Robot Operating System (ROS) to essentially operate a Jackal Unmanned Ground Vehicle robot, getting it to move remotely while it published visual data in a virtual simulation. I also got to swap the computer on-board the robot to a stronger, more compact one to essentially enhance its AI capabilities.

This summer had many challenges such as meeting new people, working in an area you have little knowledge of, and countless more. But the biggest challenge for me was overcoming error after error after error. Sometimes I would feel like I did not know anything, but I would keep working and trying until I figured it out. Those obstacles I faced made finding the answers to the problems all the more rewarding.

There are many things I have learnt this summer that could make me feel proud of what I have accomplished, but after completing the SRP I realized that one thing that I am most proud of was participating in the Celebration of Research. I felt a swell of confidence in myself when I would present my work. It made me feel like I had something important to say so people would listen. It was an inspiring moment. I have never felt so confident in my life.

This program did not only help me feel empowered in the journey towards my dream, but it allowed me to have a glimpse into what my future can look like. It gave me the skills and tools that I will need for success in the future, equipping me with communication skills, networking skills, and many more. I can say that, thanks to the WISEST SRP, I am definitely more prepared now to begin pursuing a career in STEM than I will ever be.

Not everyone gets an opportunity like this, to explore fields and partake in research at such a young age. This would not have been possible without the guidance and support from the WISEST team who worked incredibly hard to make this summer what it was. I would also like to thank Dr. Martin Barczyk and all the members of my lab who were all so welcoming and helped me get the most out of this experience. Thank you to my family for always encouraging me to reach for dreams. Thank you to my teachers for motivating me to stay curious. Finally, a thank you goes out to my sponsors who with their financial support made this summer a reality.

It was truly an unbelievable experience.

Maddy Tiano-Thorpe



High School

Mother Margaret Mary High School

Lab Placement

Agricultural, Food & Nutritional Science, Faculty of Agricultural, Life & Environmental Sciences

Project Title

The Decision to Cover Crop - Prairie Farms

Final Project

<https://doi.org/10.7939/r3-w3g4-zc35>

Supporter

Canada Summer Jobs, Rotary Club of Edmonton Glenora

My name is Maddy Tiano-Thorpe and I attend Mother Margaret Mary High School in Edmonton, Alberta. Every field of STEM has always been of interest to me, but some of my favourite subjects are math and biology. In the future, I would like to pursue a career in biomedical engineering to fuel my passion for being in the medical field. This summer, I was placed in the Cover Cropping Systems Research Lab where I analyzed the effects cover crops had on plots of wheat. From this, I was able to conclude data that would help suggest this farming technique to Prairie farmers, where cover cropping is often rejected.

I applied for this program with the hope of broadening my knowledge of opportunities and careers that invoke my interest. Knowing my passion is associated with math and science brings uncertainty, as there are subsequent career options within these fields. The past six weeks have exposed me to several opportunities and experiences of what my future could look like. From PD sessions, mentorship hours and lab tours, I was able to develop confidence in my future career as both guidance and directions were provided throughout the entire program. As a woman who is keen on entering the STEM field, I often encounter hesitancy about my future, especially regarding the stereotypes I face. This can be disheartening and dissuasive towards my future, however, participating in this program allowed my morale to grow more passionate, confident and knowledgeable about entering STEM. This was so beneficial to me as I am approaching the time to apply to post-secondary. Being placed in a judgment-free learning environment established a safe learning area where I was free to grow as a person and as a student.

Some vital skills that I learned during the SRP which I can take and apply to my future in academia were networking and communication. There are several PD sessions and workshops that address these, however, the PD session called "The Art of Networking" truly stuck with me. This allowed me to learn more about professionalism regarding communication and connections. We learned how to discuss items in a work environment, which included how to make a cold email or call, how to ask crucial questions about someone's professional life and finally, how to make lasting connections that could, later on, be beneficial. From this workshop, I gained the confidence and knowledge on how to reach out to others, and by doing so, I learned so much valuable information regarding entering STEM in post-secondary.

Finally, I would like to say a special thank you to Dr. Gorim's research team. You all provided me with guidance and made me feel so welcomed, I cannot thank you enough. I would also like to acknowledge my supporters, my teacher references and the WISEST team, as without you this summer would not have been possible. Your hard work is much appreciated. Thank you to all my fellow researchers for making this an incredible summer one that I will never forget.

Spencer Tulk

High School

École Mctavish

Lab Placement

Biochemistry, Faculty of Medicine and Dentistry

Project Title

It's in Your DNA! Analyzing the Structure of Chromosomes

Supporter

Syncrude



I am Spencer Tulk and I am from Fort McMurray, Alberta. I am a transgender, disabled, and autistic teen and I have always loved chemistry and biological sciences! I applied for the SRP after being shown the application on social media and thinking it would be a great opportunity to test myself to see how I am in a STEM/university environment.

I was placed in a virtual biochemistry lab in the SRP where I did a literature review on an article about the structure of chromosomes. In that article, it explained the 'building blocks of chromosomes' and how the structure functions. DNA has to bind to proteins called histones to make the DNA more stable, and that creates these disc-shaped things called nucleosomes! My project worked on analyzing that structural knowledge to explain it to the general public and other academics. My placement was a lot more flexible than most in-person ones due to accommodations, so I usually met with my supervisor after 5 pm two times a week to go over mine and another student's work.

The WISEST SRP as a whole is extremely important to young diverse individuals because it gives us the head start and the support we need to feel welcomed in pursuing STEM. A major issue in STEM is the lack of diversity and added challenge for diverse kids so programs like the WISEST SRP are crucial for those kids in STEM to gain knowledge and grow bonds that we so desperately need to survive the careers we aspire to have.

The program helped me understand what I want in my future, how to grow my critical thinking and work ethic skills, and how to come out of my shell to develop close

friendships with other nerds (friendships that I will cherish forever). I would recommend this program to absolutely every diverse grade 11 student who has a passion for STEM because it is just so incredible of an experience overall. You simply cannot get what you get in this program anywhere else.

The SRP includes a boat load of different things, some major ones including Professional Development sessions that teach basic STEM related and University related knowledge via lecture-like presentations, Mentor Panels that gave us the opportunity to talk to and bond with like-minded individuals, and working on our individual research projects in the lab (or for me, at the computer!). I cannot express enough how much fun and learning this program made me experience, it fully altered my worldview in a great way I will never forget.

I would like to thank my supporter Syncrude and my supervisor Dr. Rashmi Panigrahi for letting me experience the Summer Research Program. I would also like to acknowledge my parents and step-mom, because if it was not for their support I would not have been able to participate in the program, and finally my sister, because if I didn't mention her she would bug me about it (thanks Erin).

Annika Visser



High School

Edmonton Christian High School

Lab Placement

Physical Therapy, Faculty of Rehabilitation Medicine

Project Title

Comparisons of Spinal Alignment Between Standing Positions in Healthy Adolescents or Adolescents with Idiopathic Scoliosis; A Systematic Review

Final Project

<https://doi.org/10.7939/r3-8r74-1p58>

Supporter

Canada Summer Jobs, Edmonton Chapter Beta Sigma Phi

My name is Annika Visser. I live in Edmonton, Alberta. My favorite subjects in school are Math and Chemistry (and lunchtime). I am actually still unsure about what I want to do when I am older, but some of my top choices are Biomedical Engineer or Paramedic.

My project focused on effectively taking images of the spines of patients with scoliosis. Usually an x-ray is taken of the front and side of the spine. However, by having multiple scans taken frequently, the patients are exposed to high amounts of radiation, making them more likely to get cancer. New imaging methods allow for scans to be taken from both the side and the front at the same time, but this means that doctors have to get patients to move their arms out of the way. And on top of that, different physicians have different arm positions that they have their patients do, leading to inconsistency. Our project was finding the arm position that changes your spine's curvature the least. And more specifically, my project was to do a systematic review of 1,332 different articles to find the ones that were most relevant to our project (in the end, there were only 7).

I was motivated to apply for the WISEST SRP when I heard about it in biology class. I love science and math, and this seemed like the perfect way to spend my summer. I was also unsure of whether I wanted to go into STEM as a career, and I thought this would be a great way to see what it would be like.

The most valuable thing that the SRP helped me learn about myself is that as much as I love STEM, I actually do not like computer work very much. But I loved working

in a lab. It's a very different job experience from the other kinds of jobs I have heard about, and I really liked the work environment. The SRP helped me to figure out that I think a career in STEM would be great, but that I might find one that focuses a little more on actually doing things with my hands.

I think the coolest thing that I got to do was spend the afternoon in the Scoliosis Clinic in the Stollery. I got to look at the patients' x-rays to find ones that were eligible for our study, and then I got to shadow the doctors when they went for check-ups. As a huge Grey's Anatomy nerd, I was totally geeking out!

I would like to thank my PI, Dr. Eric Parent and my supervisor, Brianna Fehr, for letting me help on their project this summer. It was a great experience! I would like to thank Canada Summer Jobs and Edmonton Chapter Beta Sigma Phi for their sponsorship. And lastly, I would like to thank WISEST for the chance to work in a real lab, and for such a great summer!

Jasmine Wegewitz



High School

Mayerthorpe Jr. Sr. High School

Lab Placement

Linguistics, Faculty of Arts

Project Title

It's A World Of Robots: Speech Synthesis And The Issue Of Everyone Having The Same Voice

Final Project

<https://doi.org/10.7939/r3-km72-zm71>

Supporter

Bird Construction

Hello there! For those of you whom I have not had the pleasure of meeting my name is Jasmine Wegewitz. I hail over an hour and a half North West of Edmonton, in a small rural community. Much unlike the vast metropolis of Edmonton my hometown is a few small houses scattered miles apart across the lush rolling hills of the prairies. Upon first receiving news from the WISEST office of my acceptance, I had not the slightest clue as to what the Alberta Phonetics Laboratory was. Soon I found myself immersed in a project revolving around child speech synthesis. Fascinated by the implications that surround children with communication disorders, the lab and I set about creating a trial experiment in order to see if it is possible with open access resources to create a successful text to speech system that could possibly be used in future years to give children back their voice. The project I was associated with I soon found out was only a very, very small drop in the bucket of inter-university speech synthesis and a mininal encompassment of Linguistics.

Outside of the lab however the WISEST experience had only just begun. Hailing outside of commuting distance I had to move out to attend the program. I stayed in a residence located in the heart of central campus. Being from a small town country... I was overdue for a culture shock. In come the roommates, cafeteria food and tours. Despite all of this I still managed to get exceedingly lost more times than I am willing to admit; turns out that entrance over there does not lead to the library...

At first university life hits you upside the head, everything being acronyms, the maze of a campus (nevermind the buildings), having to run from one place to the next for

PD sessions and tours, it took me by a surprise as to how fast one can adjust to the current environment. It was stimulating, everyday a new adventure from learning new programs and procedures in the lab, to successfully managing to navigate the ETS.

My summer in the city with the WISEST program was one of the most challenging, most interesting and most intellectually stimulating summers of my life. It is an experience that one will never forget. You are on a continually tight schedule lined with a steep learning curve, for those of you who endeavor to step up to the challenge this is the program for you. This experience has challenged me to grow in a new environment, experiencing the academic lifestyle while developing the professional skills necessary for both academia and the workforce. The Industry tours in late August inspired us because it was proof... living proof that you can take your degree in any direction you choose, from office jobs to working in a plant. This revolutionary aspect helped to reinforce the dream for many of us. As for intellectually stimulating, working in the phonetics lab has been a true experience. You are all an inspiration.

Michelle Wu

High School

Old Scona Academic High School

Lab Placement

Mechanical Engineering, Faculty of Engineering

Project Title

Too Much Stress Will Strain Your Brain

Final Project

<https://doi.org/10.7939/r3-mst3-0r32>

Supporter

Canada Summer Jobs, Rotary Club of Edmonton Glenora



My name is Michelle Wu, and I am a student at Old Scona Academic High School in Edmonton, Alberta. I have always been drawn to science and math courses, and I enrolled in the International Baccalaureate program to be exposed to more STEM knowledge. Outside of school, I enjoy pursuing music, arts, and some sports like swimming and badminton. These activities all help me relax and recharge, but I also love being with my family, friends, and pets.

For the 2022 WISEST Summer Research Program, I was placed in the Orthodontic Biomechanics lab in the Department of Mechanical Engineering. Our lab took in two SRP students and had us experiment with two projects together throughout the summer, so I researched both how to model the mechanical behaviour of brain tissue and what the variation of forces was between different teeth from using braces. I got to use software like SolidWorks and FEBio Studio when delving into 3D modelling, and I worked on an orthodontic simulator (OSIM) to observe how orthodontic appliances affected teeth. I thoroughly enjoyed my research experiment, and it was rewarding to see my final poster, which I did on modelling the mechanical behaviour of brain tissue.

As I worked through the two projects with my lab partner, we received so much support from our Principal Investigator (PI), Dr. Dan Romanyk, and our supervisors, Timothy Gadzella, Arya Subramanian, Robyn De Wet, and Alejandro Matos. Their advice and warm welcomes made my experience extremely fun. Our working environment was also always inclusive and relaxed, so I never felt nervous going up to them to ask questions.

As the program progressed, we got to know everyone better, and I became more excited to perform research. Both of our projects contributed to our supervisors' research, allowing me to see how what I was doing would be important for future research. When looking at modelling brain tissue, the project provided some insight into how the tissue's different properties would affect its behaviour; this helps my lab as they are looking into understanding more aspects of the brain's mechanical behaviour, particularly under conditions that have not been investigated much. When looking at the forces present from using braces, the project showed the effect of different wire sizes on three individual teeth of interest; this helps my lab investigate the usage of varying wire shapes and sizes when trying to adjust the teeth safely in a clinical setting. Seeing the bigger picture motivated me to dive deeper and learn more about our projects, which is why I believe I gained so much complex yet intriguing knowledge from my six weeks in the SRP that I would not have been able to learn otherwise.

Lastly and most importantly, I would like to thank Canada Summer Jobs and Edmonton Glenora's Rotary Club for sponsoring my research project and the WISEST Team for giving me this opportunity, supporting me along the way, and making this the most memorable summer I have ever had.

Yanya Yang



High School

Harry Ainlay High School

Lab Placement

School of Public Health

Project Title

How do Canadian newspapers report on climate-related anxiety and grief?

Final Project

<https://doi.org/10.7939/r3-3arx-mj89>

Supporter

Canada Summer Jobs, Edmonton Chapter Beta Sigma Phi

Hi! My name is Yanya Yang and I am from Edmonton, Alberta. My favorite subjects in school are Math and Physics, and I want to pursue a career in engineering in the future! My placement in the WISEST Summer Research Program was in the School of Public Health in the Climate Change and Global Health Research Group. In my project, I screened and extracted data from articles reporting on climate-related anxiety and grief and then used descriptive statistics and graphs to analyze the results, which included time trends, content trends, and more.

Through my experience in the Summer Research Program, I have developed much more confidence, improved my communication skills, and expanded my network. I have met such inspiring people who gave me so much needed advice for the future that enabled me to have more confidence in myself and allow me to feel more prepared for the future, through networking and mentoring sessions. For example, because of a networking session we had, I was able to meet and talk to an environmental engineer, a field that I am interested in. Without this opportunity given to me by WISEST, I would have never gotten the opportunity to talk to an environmental engineer about their career path! Through the wonderful opportunities that WISEST has given me, I have had the opportunity to explore new career opportunities that I never thought existed.

I have met so many wonderful people throughout this experience who will be lifelong friends. One thing I have learned about myself is that if I am ever doubting myself but I know that I can do it and the only thing that is stopping me is what I think others will think of me, I can

do it. I just need to give myself that little extra push. This summer I was really pushed out of my comfort zone in ways that I could have never imagined, and I am so grateful that it did. Now I have the confidence to push myself to achieve goals that I know I am capable of, and there is no self doubt stopping me. I also got the chance to experience empowering sessions about imposter syndrome, and letting us know that we belong there and that we got into this program for a reason. I had a lot of self doubt going into this program, and even today I still wonder what trait about me is so special that I was selected out of hundreds to come participate in this program. However, now I have the ability to think back to that powerful session and know that I can achieve whatever I put my mind to.

I am so thankful to all the support of my lab, particularly my supervisor, Breanne Aylward, for always being super helpful and ready to answer my questions. I will be eternally grateful for WISEST for giving me this opportunity, as well as Edmonton Chapter Beta Sigma Phi and Canada Summer Jobs for their financial support.

Deborah Yun



High School

Parkland Composite High School

Lab Placement

Psychology, Faculty of Science

Project Title

Straws, Sticks, and Bricks: Does Past Nest-Building Experience Effect Construction Using New Materials?

Final Project

<https://doi.org/10.7939/r3-mw49-4028>

Supporter

Women & Gender Equality Canada, Faculty of Science

Hello, my name is Deborah Yun and I am from Edson, Alberta attending Parkland Composite High School. I have always found a lot of interest and passion towards biology and chemistry, and am hoping to take these two subjects into consideration when thinking of my future studies. While I have always been interested in pursuing a career in medicine, I applied to the Summer Research Program this year in hopes to gain a broader perspective of the fields within STEM.

This summer, I was given the opportunity to become a part of the Animal Cognition Research Group in the Department of Psychology at the University of Alberta. Our research group focuses heavily on the correlation of animal architecture and the cognitive abilities of zebra finches. With this, my project this summer was to study how prior experience with one nesting material affected the amount used when given a new material. We were looking to see the learning abilities of the zebra finches through these manipulated variables, and were able to find very interesting and puzzling results where we would need further research into!

Everyday throughout the 6 weeks of the program, I was constantly learning and encountering unique experiences from both within my lab as well as through the sessions that WISEST had prepared. From learning to search and read research papers, making connections through networking events, and touring the different laboratory studies on campus, I was able to gain a whole new perspective of the university life that I will soon be a part of. I have also learnt lifelong skills that will help me throughout my studies and careers. This program has

opened my eyes to the various possibilities that lie in front of me, and has greatly influenced my enthusiasm of pursuing a career in STEM.

I have never been a part of a more engaging, supportive and encouraging program than WISEST. Through interactions with the coordinators, mentors, as well as students, I was able to better see myself in these professional fields with confidence. Programs such as WISEST which promotes inclusion are so crucial to creating a change in our society in the aspects that we could better improve in. This program has truly changed my life as I was pushed to reach past my limits, allowing me to grasp great opportunities. I would like to truly thank the WISEST team and sponsors for allowing these 6 weeks to become possible. I would also like to express my gratitude to Dr. Guillette for welcoming me into her brilliant lab. My supervisor, Dr. Whittaker, for their constant mentorship and support. As well as the rest of the ACRG team for always being willing to spread their knowledge. I would also like to thank all of the other student researchers who took part in this program for all of the wonderful memories and friendships made. These 6 weeks have truly been life-changing and I am so grateful. I will cherish the experience that I have encountered this summer forever.

Marilyn Zhang

High School

Sir Winston Churchill High School

Lab Placement

Computing Science, Faculty of Science

Project Title

Evaluating Different Blurring Techniques on Faces to Protect Privacy Through OpenCV and Python

Final Project

<https://doi.org/10.7939/r3-4990-2157>

Supporter

Canada Summer Jobs, AI4Society & Dr. Nidhi Hegde



My name is Marilyn Zhang and I attend Sir Winston Churchill High School in Calgary, Alberta. In school, I enjoy my math and science courses, (which by the end of grade 11 surprisingly include physics,) but I have not taken any computing science classes! However, I have always been interested in the applications of the topic, whether it be video games, websites, or robots! This summer was the perfect opportunity for me to explore this interest. I am so grateful for this experience because it was the affirmation I needed to see my future self pursuing this field!

This summer I had the opportunity to use different blurring techniques with Python and OpenCV to protect people's privacy! The end goal is a mobile app called Beacon, which allows anyone to record violent or dangerous situations. Some people in the videos may be unrelated to the incident, and thus blurring would be one way to protect their identity. I am grateful to Abeer Waheed from my project team for teaching me how to debug, and incredibly thankful to Dr. Nidhi Hegde for her encouragement and endless support.

One important lesson I have learned is: Always stay resilient. Always. Some days I did feel overwhelmed by my project; I tended to overcomplicate what I needed to do. However, I learned to take one thing at a time, going at my own pace, and reaching out for help when needed. I am so proud of the days I stuck through after hours upon hours, to finally understand how a certain code works! To me, this type of problem-solving is just so rewarding. What really helped was reaching out to all the opportunities around me; I thoroughly enjoyed each social activity, whether that was an impromptu speaking presentation or games night

with the cohort! It was crucial to find a balance between professional and personal life, and truly, the SRP program was more than just a normal job or purely research. It was also about community and empowerment; it was about connecting with other passionate, encouraging, and supportive researchers. It was also very valuable to learn about the art of networking, and how to connect and stay in touch with professionals, because I am certain we will be using these skills within a year.

If you are looking into applying to this program, I highly recommend you do so! It truly is a once-in-a-lifetime experience, especially with the exposure to high-level research in a university lab and learning professional skills! Personally, I also rediscovered my voice, my confidence, and my energy that I just seemed to have lost at the start of high school. This experience was truly rejuvenating, and it sparked a light in me that will keep guiding me throughout the years.

As a final note, I would also just like to thank AI4Society and Canada Summer Jobs for supporting me, as well as WISEST for the incredible opportunity. This would not have been possible without them!

Fogil Zheng

High School

Old Scona Academic High School

Lab Placement

Computing Science, Faculty of Science

Project Title

You Won't Do It Tomorrow: A Habit Tracker for Overcoming Procrastination

Final Project

<https://doi.org/10.7939/r3-tzt2-gh62>

Supporter

Process Solutions, AI4Society & Dr. Matthew Taylor



My name is Fogil Zheng and I am a student at Old Scona Academic High School in Edmonton, Alberta. In school, I would say that some of my favourite classes include social, chemistry, and computer science. My computer science classes have inspired me to strongly consider pursuing software development as a future career.

This summer, I was placed in the Intelligent Robot Learning lab and I worked with my Principal Investigator, Dr. Matthew E. Taylor, and my supervisors, Calarina Muslimani and Dr. Christabel Wayllace, to develop a habit tracking website aimed at developing the basic habit of drinking water. The end goal of the website was to see if building good habits could eventually help people overcome procrastination, a possible extension being to involve more important habits such as doing homework. My lab had been previously working on a different study with a cognitive tutor that used reinforcement learning to help people overcome procrastination by dealing with present bias, so my project fit under the overarching theme of procrastination my lab was researching.

I would definitely recommend this program to other students for three main reasons: gaining research experience, finding mentors and friends, and experiencing university life. Firstly, the SRP provides the rare and valuable experience for high school students to engage in university level research. This sets participants apart from other students of the same age and also helps us acquire research skills we would not have otherwise. As well, the people I met through the SRP, whether it be friends or mentors, all hold such unique and interesting lived experiences as diverse individuals in STEM. Getting to

know them allowed me to build my network while also just providing the opportunity to talk to new and interesting people. Finally, being on campus and working in a lab every day is genuinely so fun and interesting. There are so many cool buildings on campus and interesting food places that I did my best to explore and try this summer.

All in all, participating in the SRP this year has made the summer so fulfilling and helped me so much personally. After completing the SRP, the one thing I am most proud of is my research poster and the opportunities I had to present it. Being able to see a physical product of my six weeks of hard work and having other people express genuine interest in my project was extremely rewarding for me and showed me the value of the work I was doing. I would like to thank all my sponsors, Dr. Matthew E. Taylor, Process Solutions, and AI4Society for funding my experience. I am so grateful to my supervisors, Calarina Muslimani and Dr. Christabel Wayllace, and my Principal Investigator, Dr. Matthew E. Taylor, for their continuous support and their role in inspiring me to continue my pursuit of computer science. Lastly, thank you so much to WISEST for making this amazing opportunity possible and for what was one of the best summers of my life!

Debbie Zhou



High School

John G. Diefenbaker High School

Lab Placement

Agricultural, Food & Nutritional Science, Faculty of Agricultural, Life & Environmental Sciences

Project Title

Leaf Diversity and Photosynthesis in Canola Germplasms

Final Project

<https://doi.org/10.7939/r3-w1f8-fr93>

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My name is Debbie, and I am from Calgary, Alberta. I go to John G. Diefenbaker High School and this summer, I studied different leaf shapes in breeds of canola in order to analyze the effect these shapes had on photosynthesis, and therefore plant growth. This is a small part of a larger project happening in my lab, which is to study these canola breeds in order to find the best one to provide to farmers in the future.

The reason why I applied for this program this summer was because I wanted to experience research from a first hand perspective. I have always loved science, and I wanted to see how the things I have learned in school can be applied in the real world. I was welcomed into my lab with open arms, and because of my supervisor, lab technicians, and my PI, I was able to have the experience of a lifetime. I went into the field to collect data from real life experiments and trials using brand new technology, interpret the data based on advice from my PI, and with that data, I came to a conclusion that helped my lab push their project forward by one more step.

At the end of the short six weeks of the program, I was able to present my project to the general public. This is what I am most proud of, as all of my fellow student researchers and I were able to show all our accomplishments, and most importantly, our love of science to the world. But above all, the thing I loved the most about this program is the connections that I built with so many amazing people. I lived in residence, and this brought me so much closer to all the other students also living there. We ate together, we cooked together, and we explored Edmonton (some people for the first time) together. I am sure we have made

memories and connections that will last a lifetime.

WISEST also had many Professional Development sessions and social connection events for the SRP students to network within the fields we are curious about. My absolute favourite session was the Networking Event. For this event, I was able to talk to a variety of people at different points in their career. I had great conversations with professions about what they do, and why they do it. I talked with a pathologist (who DOES NOT look at dead bodies, she made that very clear) who told me about her PhD thesis studying *Azotobacter Vinelandii*, a nitrogen affecting pathogen (it affects plants too!). She has a lot of passion for her work, and that really spoke to me about my future endeavours.

Lastly, I would like to thank Dr. Linda Gorim, Devin Zenchyson-Smith, and the rest of Dr. Gorim's lab team for welcoming me into their workplace this summer. Thank you to my sponsors for making this experience possible, and thank you to WISEST for creating this opportunity for me this summer.