

# Journal of Student Research 2019



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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 non-binary students are placed in Science, Technology, Engineering or Math (STEM) projects, and we place a few male students who demonstrate a genuine interest in nursing, nutrition, and/or human ecology.

## 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 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 U of A 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 U of A, 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 and 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 2019, 190 people gave 9,401 hours of their time to support this program.

# Thank you to our 2019 Funders:



# The Spirit of Dr. Armour Award



WISEST lost an important member of our community this 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 announce the **“Spirit of Dr. Armour Award”**, a new award dedicated 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, PIs, graduate students, WISEST staff, and the lab staff
- an innovative and creative problem-solving approach
- demonstrated resilience in overcoming barriers and obstacles

*In this inaugural presentation,  
WISEST would like to recognize:  
**Dr. Kasja Duke &  
Yosamin Esanullah**  
with the Dr. Armour Spirit Awards.*

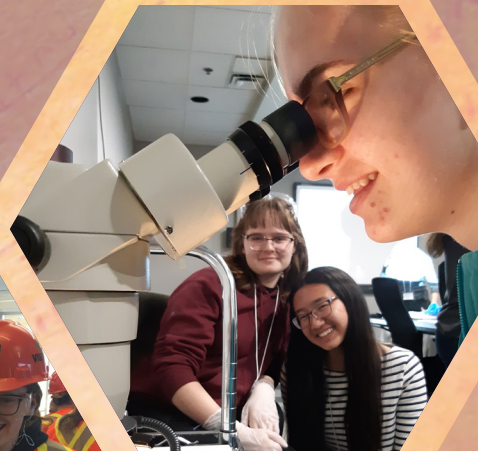
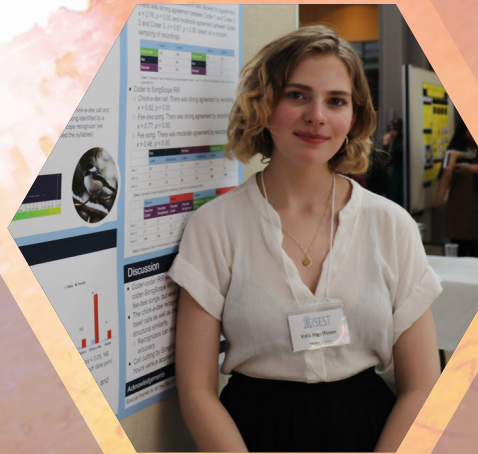


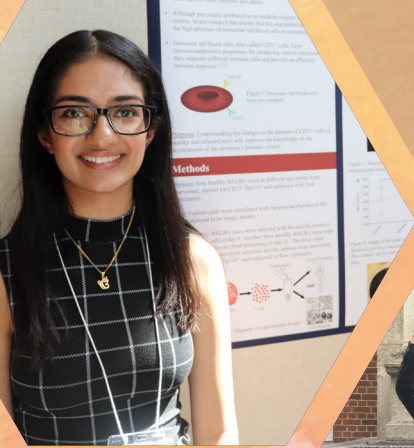
**Dr. Kasja Duke**



**Yosamin Esanullah**

# 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.



# Haniya Ahmed

## High School

J Percy Page

## Lab Placement

Computer Science, Faculty of Science

## Supporter

Wong LB, Faculty of Science, and Motorola



I am Haniya Ahmed from Edmonton, Alberta and I am a WISEST student researcher doing an internship in the faculty of Computer Science. Ever since I was a kid, I have always been interested in computers and programming and I really wanted to pursue it as a career. In high school, I was given the opportunity to be a part of Computer Science class, however, on the first day of my class, I realized that there were only a few women with me from which most left resulting in only four girls in a class that was majority guys. It extremely discouraged me to pursue a career of my interest, since of all the girls that were left in the class only a few were productive learners. I felt like I didn't belong where I always wished to. After being discouraged so much, in the gloom of darkness, I came across the WISEST program. It was like an angel has descended from heaven to give me some support so I can have more confidence in myself, telling me that I belong here. As a result, I was delighted to get into the program and I would love to acknowledge all the WISEST staff and my sporters for giving me this amazing opportunity to be a part of the WISEST Summer Research Program.

In this program, my job was to take the data from 10 massive open online courses (MOOCs) and get a sentiment analysis of student's comments. In short, this is to help the instructor so they can help the students in their courses. It may sound quite complicated and I admit that some areas were strenuous, for example, you may spend the whole day trying to figure out why your code is not working when you only needed one more bracket. Yet, true happiness is only achieved when you struggle and I never felt more happy in my life than when my code worked after hours of patience.

Being in WISEST is about learning more about any underrepresented careers and getting some experience. However, there are way more things that WISEST has to offer. I have learned so much in such a short time. I learned how to navigate my way around the University's campus, which is handy since U of A is a big place. Moreover, WISEST also made sure that you start networking early on, which is beneficial for some people like me who are nervous about meeting new people. I got the opportunity to build some connections in the networking fair which would hopefully even help me with my future. WISEST even prepared us and helped us to write our resumes to help us in the future. WISEST SRP was definitely an amazing experience that would leave a permanent mark on my heart. I would encourage everyone to apply for this program since this is such a golden opportunity that it really can't be described in words. You will have to experience it.

# Rakshanda Alam

## High School

Westwood Community High School, AB

## Lab Placement

Mechanical Engineering, Faculty of Engineering

## Supporter

Syncrude



My name is Rakshanda Alam and I am from Fort McMurray, Alberta. Ever since I was a kid, I have always been fascinated by science and curious about how things around us work. Same with math, being my favourite subject. I just love really thinking about different problems and feeling super satisfied after solving it correctly. Almost everyone in my family from my dad, brother and cousins are engineers. Sadly only having one female engineer in my family, I want to change that by hopefully pursuing engineering in the future. I was placed into a mechanical engineering lab LIMDA (Laboratory of Intelligent Manufacturing, Design, and Automation), under Dr. Rafiq Ahmad. My project was researching drone design from nature and processing a design plan for Alberta Learning Factory for education purposes. Drones are the raging fire of this generation and learning about them made this summer even more fun. All this was made possible because of my lab (LIMDA) and sponsors, Syncrude and Canada Summer Jobs. As well to my whole family for supporting me and encouraging me every step of my journey.

In this six-week research program, I have learned many life skills that will help me in my personal life, school and future careers. One of the most important skills I have had the help of developing due to the program was confidence. I always used to be scared to express myself and ask questions, believing that it will make myself look unknowledgeable or weak compared to the others but WISEST made me ask questions and be able to express how I am with my research. Going into grade twelve this fall, I am looking forward to speaking out in class if I am unaware or aware of the questions asked by the teacher, helping me understand the matter more. This was one of the key skills I've learned this summer and one that I will hold close to myself forever.

This program is a door for those that are interested in STEM (science, technology, engineering, math). Ever since I was a kid, becoming an engineer for me is like gaining superpowers to help people around me and making the impossible possible through innovation. This program helped me get an insight into what research in an engineering lab is truly like, increasing my love for research as well as engineering. WISEST taught me the art of networking, I was able to network with people with the same interests as myself through many events such as the networking fair, making me believe there is a room for me in STEM. WISEST taught me things such as professional behaviors in the workplace, communication skills and overcoming obstacles independently. This program teaches skills that are pretty unfamiliar for a high school student but WISEST also allows one to use their personal interests. I encourage everyone to apply for this program because it is worth every minute and I really believe this is was one of the best summers of my life.

# Sarah Amaneddine

## High School

Queen Elizabeth High School

## Lab Placement

Computing Science, Faculty of Science

## Supporter

Process Solutions



My name is Sarah Amaneddine and I go to Queen Elizabeth High School in Edmonton, Alberta. I'm interested in physics, math, and computer science and in university, I want to pursue something along those lines. This summer I helped develop a website called the Reading Tutor that allows low-literacy adults to improve their English. A surprisingly large population of adults in North America can only read at a grade three level but there is still a stigma around attending English classes as an adult. The Reading Tutor is supposed to help these adults learn without feeling embarrassed or ashamed. One of the greatest challenges that came with my placement in the Department of Computing Science was my lack of experience in coding. During my first week and a half of work, I had to teach myself the basics of HTML, CSS, and Javascript. Of course, this was a big challenge for me but I made sure to ask my team a lot of questions and use all the resources I could find on the internet. I'm glad that I have some coding skills now because most jobs today require some knowledge of computers.

The three most important things I learned this summer would be to always ask questions, to step out of my comfort zone, and to enjoy the process! Asking questions is so important when working in a new environment. Unlike some of the other SRP students, I wasn't working with chemicals or heavy machinery. I was, however, working on an important website with limited coding skills. I improved my coding by asking questions and I learned from how my team members dealt with the problems that I was facing. Stepping out of my comfort zone was the other thing that I learned from both my team members and the other SRP students. It's really easy to become introverted when working hard on something. I typically make a few close friends and stick to them, but this summer I pushed

myself to talk to more people. My lab was a huge help with that because they invited me to quite a few lunch and after-work activities. WISEST also organized many events that allowed us SRP students to hang out with each other. I always had fun with the people that I spent time with and that leads me to my last point about enjoying the process. There is a lot of hard work that comes with the SRP. However, there are also a lot of opportunities to have fun. My one piece of advice to future SRP students is to go to every event and talk to as many people as possible. That's what really makes the experience.

Finally, I would like to thank Dr. Carrie Demmans Epp, Tyler Heise, and the EdTeKLA Research Group for providing me guidance and support during my time at the university. I would also like to thank Canada Summer Jobs and Process Solutions (PSCL) for sponsoring my WISEST SRP position.

# Madison Barth

## High School

St Dominic Catholic High School

## Lab Placement

Civil and Environmental Engineering

## Supporter

Society of Petroleum Engineers Canadian Educational Trust Fund, and Motorola



My name is Madison Barth and I am from Rocky Mountain House, Alberta. I enjoy learning but my favorite courses in school are chemistry and biology. In the future, I want to pursue a degree in something related to sciences but currently, I am unsure what specifically I want to do.

I got the opportunity to work with so many amazing people who understood that I was just a high school student. My supervisor specifically was amazing. At the start of the six weeks, I did a literature review to get caught up on some past research. My research project was: The optimal zwitterionic surfactant slug for improved oil recovery in oil-wet carbonate rocks. Which without that literature review I would not have understood that entire statement. My research was focused on the use of surfactants which are a type of soap to extract oil out of an underground reservoir.

I am so grateful to have partaken in the WISEST summer research program. During the program, there were professional development sessions that focused on skills that are not taught at school like networking and how to build an effective resume which are skills everyone needs. The program also encouraged me to step out of my comfort zone and helped me with public speaking. I was not going to apply because I thought I was not going to be accepted and almost threw away an amazing experience. My chemistry teacher was the reason I applied, throughout the school year he kept bringing it up so I thought what's the worst that can happen, I don't get accepted.

During the six weeks I stayed in the St. Joseph's women's residence. It was hard not to go home every night to my house. But the other SRP students made the residence feel more home-like.

The program is so much more than a job it's a family. Everyone wants to see you succeed and when you fail they are there to encourage you to try again. It is amazing to see how much support the people around you can provide. I had to write a few reports which were a little bit stressful but everyone was there for me even at 11:30 pm proofreading my paper so I could submit it before midnight.

# Keeya Beausoleil



## High School

Vista Virtual School

## Lab Placement

Psychology, Faculty of Kinesiology, Sport, and Recreation

## Supporter

Chapman Lab, and Faculty of Science

My name is Keeya and I live on an acreage outside of Spruce Grove. I am incredibly passionate about the inner working of the world, how the human mind works, and making a difference in our society. This short, but very sweet program has taught me so much. I gained a new level of confidence through the networking events, new friends, and the expertise I acquired from my research. This was not an area of my personality that I believed needed the extra push, but after spending 4 hours talking to strangers about my passionate research, my perspective has changed. Now, as I go into grade 12 at a new school, I feel more confident in fostering new friendships and lasting connections. This courage has also spread into my self-confidence and belief in my own abilities. Running from Van Vliet complex to CCIS for a field trip in the last week made me realize I learned a lot about the university campus and the opportunities we have while we decide this crucial step of our future. Not only did I learn I could declare a minor in a BSc honors degree, but I explored the possibilities of a research career. Everyone in this program repeatedly told me to follow my passion in spite of possible obstacles. Finally, the most important thing I learned about was the world of research. My lab allowed me to experience different careers within this fascinating pursuit, helping me to understand the lengths of this career. This was paired with the fantastic posters each student researcher presented, showing me the influence research has on the world and the opportunities it gives anyone with a passion. Who knew research could be a career?

This summer, I was placed in a psychology lab where I compared human behaviour with that of a machine learning model in a variety of video game-like foraging tasks. When I received my research outline before the program, I was confused, just like many of my fellow

students. What is Reinforcement Learning (RL)? How could computers be like the human mind? RL is a form of machine learning where a computer agent is programmed to learn from its own experience on a policy maximizing reward. Computer agents act similarly to humans as they input their environment and understand it through a complex neural network, similar to a human brain, outputting possible directions. In my six weeks, I only got to run six human participants from my lab, but this offered an introduction to the future of my supervisor's research. This was just a small portion of my research and what I learned, yet this confirmed my hunch, I want to pursue a minor in psychology or neuroscience. Thank you to my sponsors in the Faculty of Science and each of the researchers at Dr. Craig Chapman's lab for this enlightening opportunity to have unexpectedly one of the best summers imaginable.

# Adnan Black

## High School

TEMPO School

## Lab Placement

Nutrition/Dietetics, School of Public Health

## Supporter

WISEST Advisory Board, and Faculty of Nursing



My name is Adnan Black and I am sixteen years old. I currently attend TEMPO School in southwest Edmonton, and I enjoy learning about biology and chemistry. In the future, I plan to study sciences in university, and I hope to pursue a career in public health or in the sciences which also incorporates an element of research. For a long time, I believed that WISEST was exclusively for young women looking to pursue a career in science, technology, engineering, or mathematics. However, my teachers informed me that the program is actually for all young adults looking into fields in which their genders are underrepresented; once I knew this, I readily applied to the program in hopes of being accepted into either nutrition or nursing. I was delighted to find out that I had been accepted to work in a nutrition lab, and I spent the summer engaging in public health research with Dr. Melissa Fernandez (my supervisor) and Dr. Kim Raine (my principal investigator).

I spent my time investigating the issue of credibility of nutrition content posted on Instagram, and observing the differences in credibility of information posted by health professionals and by non-health professionals on Instagram. However, in addition to allowing me to work in a research lab, this program has also allowed me to experience a number of professional development seminars that will benefit me in the future regardless of the career path that I pursue. These seminars included information regarding communication, resume building, and networking, as well as exposure to other fields of study. In addition, my time on campus has allowed me to become accustomed to the routine of daily university life and has also ensured that I know my way around the university campus; altogether, I now feel more prepared to begin my post-secondary education.

Additionally, my time in the program allowed me to meet with a number of university researchers and professors, all of whom took time to engage in discussions with me regarding their career paths, educations, and general advice for my future. As a result, I have learned that I do not necessarily need to make a choice regarding my career right now - instead, I should simply pursue the courses for which I have a passion and see where that leads me in life. In fact, during my time on campus, I have even met researchers in their late twenties who still do not know what they ultimately wish to pursue in life. All of this has led me to understand that I should pursue my scientific interests in university as a way to enhance my knowledge and satisfy my curiosity, not simply as a means to an end. Most importantly, this program has allowed me to form a number of meaningful relationships with many bright, young minds who share my passion for the pursuit of knowledge. Overall, this summer has provided me with a number of friends and memories that I definitely will not forget!

# Sarah Breitzkreuz

## High School

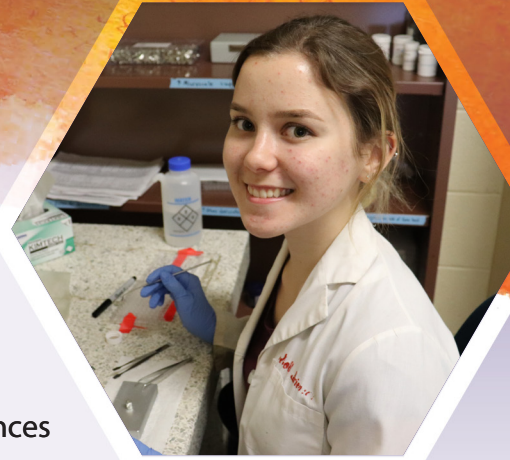
St. Mary's Catholic High School

## Lab Placement

Renewable Resources, Faculty of Agriculture Life and Environmental Sciences

## Supporter

Threshold Impact, and Faculty of Agriculture, Life and Environmental Sciences



My name is Sarah Breitzkreuz and I am from the small town of Vegreville, AB. Biology has always been an interest of mine, however, I enjoy all aspects of sciences. Before I began the WISEST Summer Research Program I didn't have a clue about what I wanted to pursue in STEM, but the program helped narrow it down for me. I am hoping to study biomedical engineering or environmental sciences at either the UofA or UBC. Primarily, I have two goals: the first is to help people, and the second is to make a difference. Through STEM I believe I can do this. Above everything, that is what I want in my future.

For my project, I was placed in a soil science lab in the department of renewable resources. I studied the effects of improved grazing management systems, specifically something called Adaptive Multi-Paddock Grazing, and how it impacts carbon sequestration in Canada. Our research can benefit ranchers and the economy, as well as aid in the mitigation of climate change.

The WISEST Summer Research program taught me a lot, but not all of it was about STEM. One of my most memorable moments was after a session about dreaming big. I walked out of the room with an overpowering feeling that I can accomplish anything, so long as I put in the effort to do so. I know that everyone always says this, but I learned that attitude really is everything. I wouldn't say this is something I learned about myself, however, I do consider it a life lesson. With newfound confidence and a growing curiosity, I hope I can carry this mindset on through the rest of my career.

At the end of the program, I am filled with pride. After weeks of research and many hours spent creating my poster, I was beginning to grow tired. However, the

last week when I went to pick up my completed poster from printing, I have never felt more proud. When the celebration of research came a few days later, I was worried I wouldn't succeed. I had so many doubts about myself. Would I forget my research? Would I trip over my words? Perhaps. But when the time came, I realized one thing: I can do this. As the day ended, not only was I proud of my work, but I was overjoyed with the fact that I could be proud of myself too.

I would like to thank the Faculty of Agriculture, Life and Environmental Sciences and Threshold Impact for sponsoring my lab placement. Additionally, thank you to my PI, Dr. Scott Chang, my supervisor, Laio Silva Sobrinho, and the rest of my lab for guiding me throughout the program. To my teachers: your encouragement and occasional science chats were a huge motivator for my participation in WISEST - for that I thank you. As well, thank you to my friends and family for supporting me throughout the program. Finally, I would like to acknowledge the WISEST staff and my fellow student researchers, for you truly made this experience memorable.

# Angelina Bustos

## High School

Archbishop MacDonald

## Lab Placement

Dentistry, Faculty of Medicine and Dentistry

## Supporter

Alberta Education, and Faculty of Medicine and Dentistry



I'm Angelina Bustos, a student from Archbishop MacDonald High School in Edmonton, Alberta. My passion lies with biological sciences, theatre and teaching, so I hope to pursue a career that involves all three by going into the education combined degree program! This summer I investigated why the immune systems of newborns are so weak by comparing white blood cells between baby and adult mice. I gathered the kind of preliminary data that can go forward to look at improving infant immunity and saving the lives of newborns. However, the SRP is more than technical lab work, there are three big life lessons I learned.

Number one is that you don't need to know everything. In fact, you will never know everything. Which is all totally okay, no one expects you to. That was one of the first things my PI told me. I was skeptical, but then it rang true as everyone in the lab treated me with the utmost patience and kindness. They were ready to fuel my curiosity, with no expectancy that I should already know something. You just have to be willing to try new things and put yourself out there.

Next is this: you have the rest of your life to figure out...well, the rest of your life. I've always felt impending doom about university because I thought that was when I would choose the one career I would have forever. But after talking to countless university students who have changed programs within the same 2 years and to working professionals decades into a career that went back to school to pursue a newly discovered passion; I see that no matter your age or gender, you are not stuck in one place. Lastly, you need to do something you love with your life. Whether you know right now what you want to do, or you find it in 20 years, just find your passion. You have to deal with your choice

to be happy your whole life, not your parents, friends or teachers. Waking up every day dreading your job is not sustainable, and the work you put into the world will be less meaningful if you don't love it.

That last point ties into my biggest personal epiphany from the SRP. I don't want to go into research. This program taught me to find my passion, and academia isn't it. My favorite part of the program was getting such great mentorship and then getting to explain what I learned to my friends and family. I have to thank Garrett Dunsmore, Lai Xu from my research team and my school teacher, Savannah Dowell for that. They showed me how important good engaging mentorship and education is, and that, I want to be a teacher. Maybe in science, but maybe even in drama. Because that is my true passion. If looking at your future fills you with dread, it is not your passion! You should look forward to your future. Don't try to convince yourself you like something, as I did with academia. What you or others see for yourself isn't necessarily what you actually want. Without the SRP, I may never have realized that. So, pursue what you love and good luck!



# Rachel Butler

## High School

William Aberhart High School

## Lab Placement

Chemical and Materials Engineering, Faculty of Engineering

## Supporter

Faculty of Engineering



Hi! My name is Rachel Butler, and I attend William Aberhart High School in Calgary, Alberta. My favorite subjects are Math, Chemistry, and Social Studies, but I genuinely love learning about everything I can. I enjoy being part of a wide variety of school clubs and activities, including Principal's Advisory Council, Leadership Club, Debate/Model UN Club, and the AP Program. In my free time, you can find me reading, playing the piano, or bouncing my volleyball off the side of our house (sorry Mom!).

This summer I worked in Professor Gupta's lab under the supervision of Dr. Deepak Pudasainee in the Department of Chemical Engineering. I helped analyze the concentration of rare earth elements and trace metals present in froth treatment tailings, a byproduct of bitumen production. This research is particularly important due to the increased risk tailings ponds pose to the environment, as well as the potential benefits selling rare earth elements could bring to Alberta's economy.

A lot of people have the misconception that a career in STEM means being either a doctor, engineer or computer scientist, however, in reality, there are thousands of different sectors in STEM with tangible job prospects to explore. The WISEST SRP is an effective initiative that helps break down barriers for women and other under-represented groups in STEM fields by bringing awareness to different career opportunities and creating supportive networks/mentorship opportunities. I know that the SRP certainly helped me discover a wide variety of career paths that I had never even considered before through the U of A research lab tours, industry tours (ex: Shell and Micralyne), and simply chatting with friends in other labs about their experiences. I know now that there is a place for everyone in STEM.

The WISEST SRP was truly a once-in-a-lifetime opportunity. Getting to participate in cutting-edge research at 16 or 17 years old is already something not many people can say they did, but WISEST also provided me with an opportunity to build a network of 46 other brilliant, like-minded people, some of which I already know will be life-long friends. One of the highlights of my experience would definitely be living in residence. It gave me a chance to see what life as a U of A student might look like, as well as create lasting friendships and memories while exploring the city of Edmonton. I wouldn't have wanted to spend my summer any other way.

I would like to thank Canada Summer Jobs and the Faculty of Engineering for sponsoring me, the Gupta research team for welcoming me into their lab, and WISEST for selecting me to be a part of this amazing program. Thank you as well to my wonderful teacher references, Mr. Feller and Mr. Clark, who made Chemistry and Math class pass by way too quickly. Lastly, shoutout to Keagan and Dana (our Residence Advisors) and everyone in residence for making this summer an absolute blast!

# Joanne Cai

## High School

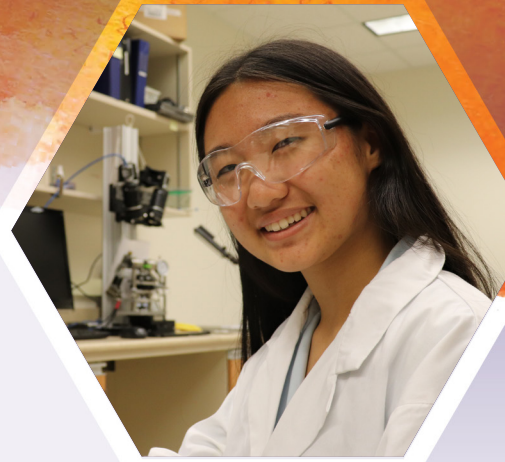
Archbishop MacDonald High School

## Lab Placement

Mechanical Engineering, Faculty of Engineering

## Supporter

Rotary Club of Edmonton Glenora



My name is Joanne Cai and I am from Archbishop MacDonald High School in Edmonton. I love reading, writing, and fine arts, but above all, I am passionate about learning. Science has always filled me with a certain type of wonder, one that asks questions and craves answers. I enjoy learning about mathematics, anatomy, genetics, space, and engineering. These interests have led me to consider going into engineering and biology. Luckily, the WISEST SRP allowed me to pursue both in a mechanical engineering lab that studies the periodontal ligament, which connects teeth to the alveolar bone. Specifically, I examined the mechanical response of dental stone, a plaster-like substance, to submersion in saline.

I decided to apply for the SRP after attending the WISEST CHOICES conference in grade six and having many friends recommend the program to me. Initially, I was doubtful that I would get in, but submitting the application was one of the best decisions I ever made. The SRP is an invaluable experience for young people who strive to go into fields where they will be a minority. It is for anyone who loves science but has been told that STEM is not for them. The program gives students the opportunity to find what they love and pursue it. Personally, I was interested in engineering, but hardly knew anything about what a career in it would look like. Through the SRP, I was able to explore that, and so much more—professional skills, the importance of networking, and how to find my place in a male-dominated field. My favourite moment throughout the entire program was learning how to code, a skill I had never considered, always dissuaded by a subconscious belief: “Coding is for boys.” I spent hour upon hour debugging and wanted to give up, but my supervisor convinced me to keep going. The moment when it finally worked was so rewarding, it was worth

every struggle I had along the way. One of the most valuable lessons I experienced was to take risks and stop fearing independence. While my lab provided unwavering encouragement, they also gave me the freedom to voice my opinion. At first, this intimidated me—an eleventh-grade student, making decisions in a university lab? However, as the summer progressed, I cherished this and was able to learn so much from my own mistakes and successes.

I would like to thank Dan Romanyk and Kate Houg for welcoming me into their lab with open arms and providing me with an unforgettable experience. Along with them, the Carey-Romanyk Lab members made each day brighter and helped me through every setback. Of course, none of this would be possible without WISEST and my supporters, Canada Summer Jobs, and the Rotary Club of Edmonton Glenora. Finally, thank you to my family and teachers, all of whom have shaped me into who I am today.

# Vienna Chen

## High School

Ross Sheppard High School

## Lab Placement

City of Edmonton, Integrated Infrastructure & Engineering Services,  
Industry Placement

## Supporter

WISEST Advisory Board



My name is Vienna Chen, and I currently attend Ross Sheppard High School in Edmonton. I have always enjoyed the maths and sciences, so naturally, I gravitated towards the very broad field of engineering as a future career option in STEM. Although not offered at the University of Alberta, I am also interested in architecture. The basis of these interests stems from my enthusiasm for not only its logical and technical aspects but also the more abstract and artistic aspects of creativity and design. Whatever career I end up pursuing, I hope that it will help stimulate ideas and create solutions in bettering the world.

As an industry placement, I was provided with the opportunity to work with the City of Edmonton in an exploration of careers in engineering and architecture. The scope of this placement was centered around the different sub-branches that encompass the department of Integrated Infrastructure and Engineering Services. Instead of performing research in labs, I absorbed information mostly through observation. Through shadowing multidisciplinary engineers, technologists and architects, I gained experience in both administrative and more hands-on fieldwork. I attended various site visits, building and lab tours, and even meetings in downtown. I learned about reviewing reports and drawings, on-site testing, data logging, and so much more.

In my application essay, I expressed how growing up I heard about many famous women, who advanced not only their fields of science but society too. Although some people are personally motivated by their stories, I struggled to find that type of connection, I was only able to admire them from afar. The SRP is important because young people, young girls, need more figures that we can look up to in our real lives, and not just from far away.

WISEST SRP's significance lies in its ability to create role models that girls like me can see and talk to on a daily basis, role models that we can relate to, and role models that we ourselves can aspire to be.

I was motivated to apply for the SRP in search of my own role models. While planning for a school fundraiser event, an SRP alumna applied her knowledge of cancer cell research to advocate for the Canadian Cancer Society. It was inspiring to see someone my age with similar interests, actively apply skills learned through the SRP to facilitate change in the community. Through the SRP, I found role models amongst my PI, supervisors, the WISEST staff, fellow researchers, and especially in the legacy that Dr. Margaret-Ann Armour left behind.

I would like to thank my PI, Dr. Wanda Goulden, and my supervisors and their teams for clearing up their schedules to ensure I had both an educational and enjoyable time. Thank you WISEST and the University of Alberta for providing this amazing opportunity, and to Canada Summer Jobs for sponsoring my placement. Thank you to everyone who not only taught me how to build cities but (as cheesy as it sounds), how to build worlds.

# Saraiah Cottrell-Callbeck



## High School

Assumption Jr/Sr High school

## Lab Placement

Biology, Faculty of Science

## Supporter

Syncrude, and Faculty of Science

My name is Saraiah and I am from Cold Lake Alberta. I'm most interested in math, biology and chemistry classes in school. In the foreseeable future, I will be attending university (possibly at the University of Alberta) in an engineering program and will work towards becoming an Environmental Engineer. I was placed in an Entomology lab during my six weeks of the WISEST program. I was studying the dispersal of a wing-dimorphic species of beetle known as *Pterostichus Melanarius*. I would like to thank my research team for making my SRP experience the best it could be. Especially Maggie MacDonald and Dr. Maya Evenden, for helping me throughout the program and for everything they taught me about beetles and insects. I would also like to acknowledge Syncrude and the Faculty of Science for sponsoring me and making this experience possible for me.

Apart from all that I have learned about my area of research, WISEST SRP has taught me many useful skills. I think one of the most important skills I have gained this summer is networking. The art of networking allows people of similar interests or careers to connect and can create strong, important relationships that can become assets to you and your career in a multitude of ways. Although I only made one or two important relationships through networking, I know this skill will benefit me in the future.

I would recommend this program to everyone finishing grade 11 as it is not only a summer job but is an amazing experience with so many benefits. The WISEST Summer Research Program provides its students with multiple Professional Development and Lunch n' Learn sessions, through which we learn different skills such as making resumes and research posters. The WISEST team also

takes it upon themselves to plan lab tours and industry tours, broadening our awareness about the possible fields of study and career options STEM has to offer. This program also introduces nervous students who are close to graduation to university life. We got to explore campus and those who stayed in residence got to feel what it's like to live on our own. WISEST is an amazing experience that I will remember for the rest of my life. I will be encouraging everyone to apply for the program so they can have a chance to benefit from it in the same way I did.

# Tanika Desai

## High School

Harry Ainlay

## Lab Placement

Solstice Environmental Management, Industry Placement

## Supporter

Edmonton Chapter of Beta Sigma Phi



My name is Tanika Desai, and I am a student at Harry Ainlay High School in Edmonton, Alberta. Since I could remember, science and math have always been my favourite subjects in school and at this point, I want to pursue engineering in post-secondary. Because of the wide range of contemporary global environmental issues, I knew with whatever I was doing, I wanted to make a positive impact on the planet. I wanted to help the environment and the people in it; whether it be working on water or air pollution or helping people mitigate their environmental damage or even finding innovative solutions for climate change. Just knowing that I want to protect the planet, I aspire to become an environmental engineer.

Over the summer, I got an industry placement with Solstice Environmental Management and did varying work on the field and in the office. With the projects I was put on, I learned a lot about environmental management and specifically the steps that need to be taken with each project. This placement could not have been a better fit for me! It showed me the vast range of things I could be working on as an environmental engineer. It allowed me to dip my foot in the water and see if I enjoyed it before studying it in university. While I did not expect fieldwork to be like it was, I still loved it because it was more hands-on. The WISEST Summer Research Program helped me further reinforce that this was something I was passionate about.

Through WISEST, I was able to see and learn about a broad range of STEM fields talking with other SRP students and going on research/industry tours. Not only that, but the program taught me very important life skills like resume building, public speaking and most importantly networking. I would recommend this program to anyone interested in STEM, willing to get out of their comfort zone

and spend their summer exploring different fields of study and engaging with like-minded participants. Everyone really bonds because of their love for STEM but gets closer throughout the program because of the organized lunches, PD sessions and socializing events.

I could not be more grateful for this experience and would like to thank the WISEST team for organizing it and being there with you along every step of the way, offering help, guidance, and encouragement. A big thank-you to my sponsors, Canada Summer Jobs and Edmonton Chapter of Beta Sigma Phi. I would also like to thank the entire Solstice team for welcoming a high school student into their workplace and taking the time out of their day to help me understand new concepts and taking me out into the field. Finally, I would like to acknowledge my science and math teachers for their references and igniting my love for those subjects.

# Yosamin Esanullah

## High School

Jasper Place High School

## Lab Placement

Civil and Environmental Engineering, Faculty of Engineering

## Supporter

Rotary Club of Edmonton Glenora



My name is Yosamin Esanullah, and this year I took part in the WISEST Summer Research Program. The past six weeks have given me great insight into the greater scientific community, as well as the vast opportunities for students like me in STEM. In the future, I will be pursuing aerospace engineering, mainly to quench my overwhelming curiosity of space but also to be alongside the production of space shuttles and rovers.

My research placement was geared more toward petroleum engineering. I was looking at the use of a zwitterionic surfactant at altering the wettability of carbonate rocks and lowering the interfacial tension between oil and brine. This is essential in determining whether or not it should be used in enhanced oil recovery, which is the third stage of oil recovery in conventional reservoirs. Due to the depletion of the world's oil reservoirs and rising demand for energy, scientists must look towards alternate sources of hydrocarbons and fewer research methods of extraction. The concepts that I learned during my lab placement are those that I will more than likely carry with me during my academic career.

If I were to describe what it was like to be a part of the WISEST summer research program, it would be like putting on one's first pair of prescription glasses. Everything is seen in a much clearer perspective, the other summer research students and I now look towards the future with a greater understanding of what is to come. Not only were we given the chance to broaden our horizons career-wise, but also to improve skills that aren't conventionally taught. (Such as interpersonal, communication and public speaking skills.) During our professional development seminars, we learned how to publish a scientific article, design a research poster and how to effectively communicate science to our peers

through social media. The program had fostered a greater love and appreciation of STEM despite the gender barriers that may prevent us and other students from pursuing our interests.

In the past six weeks, I have made very strong friendships and long-lasting memories. I have gone to different research facilities outside of the campus and toured around different laboratories on campus. I was given the opportunity to talk with other students and working professionals, to network and to hone my small-talk skills. I was given a fantastic experience to write on my resume, but more importantly, I was given a head start on my career path.

I would like to thank my sponsors, supervisor and principal investigator for all that I have accomplished this summer. I would also like to thank WISEST for giving me this opportunity and encourage all grade 11 students interested in STEM to apply for the program.

# Monica Figueroa



## High School

Strathcona High School

## Lab Placement

Civil Engineering, Faculty of Engineering

## Supporter

NSERC Promo Science

My name is Monica Figueroa and I am really passionate about physics. I go to Strathcona High School in Edmonton and my favorite subject in school is math. Before moving to Canada last winter I used to live in Colombia, which has given me different perspectives about life and career options. I want to pursue physics in the future because I am very curious about how the universe works, and I would like to solve some of the gaps that exist in our understanding of the cosmos. Aside from school I play the violin and take part in environmental groups that fight for climate action.

This summer I researched the physical and chemical properties of mine waste, which needs to be studied and effectively disposed of in order to reclaim the land. My project focused on measuring the compressibility behaviour of precious mine tailings and monitoring three chemical parameters over time. I really enjoyed reading geotechnical articles to grasp the importance of this field of research and then conducting experiments that would contribute to a larger effort.

WISEST has been an amazing opportunity to explore life at the University of Alberta, as well as meeting fascinating people who share a passion for science. I really enjoyed the PD sessions in which we learned to network, communicate more effectively and build ourselves professionally. Thanks to the encouragement of our coordinators, and the open environment on campus, I was able to network with professors that inspired me to follow a career path in academia and scientific research.

After completing the Summer Research Program I am most proud of coming out of my comfort zone, both academically and socially. Conducting research without

knowing the complete background of that field of study made me a better listener and helped me become more flexible. Through this program, I understood that scientific knowledge is constructed collectively, and I became less fixed on understanding everything beforehand.

I would like to acknowledge the great work of the WISEST coordinators in organizing this summer job experience. All the PD sessions make the program very holistic, and they are a great opportunity to interact with fellow researchers. In addition, I would like to thank my supervisor Ahlam Abdunabi for being so supportive during my learning experience, and to all the people in the team that made me feel welcome throughout the six summer weeks.

# Nadia Gifford

## High School

Caledonia Senior Secondary

## Lab Placement

Mechanical Engineering, Faculty of Engineering

## Supporter

WISEST Advisory Board, and Motorola



This summer in my lab I found out that my name, Nadia, has another root in the Middle East. It means 'caller' which I find very appropriate for me. I heard the call of the Summer Research Program all the way from my home in Terrace, B.C from my physics teacher. As a caller, I like sharing my ideas through creative writing and participating in creative adventures like drama performances and cinematic reviews. I am working hard to discover where my future will take me, but I know I want to publish my writing so everyone can see a little portion of my world. My world this summer was focused on the field of machine learning as I was tasked with enabling a robot to read through programming for the aide of humans in manufacturing environments. I was eventually able to write a convolutional neural network in Python that could read handwritten alphabet characters with 99% accuracy.

My lab, which was full of very diverse individuals that made me feel valued and special, can now take my work and develop after I'm gone. This summer I learned the importance of the human experience. Since I had to fight with a computer tooth and nail, it emphasized for me how incredible humans are and how what we are capable of which can be under-appreciated. This is why WISEST is also so important because it recognizes the talent and magnificence of young people and gives them

the opportunity to shine. I was led to a place where the excellence of people like me and the passion of so many that have previously been overlooked due to factors that mean close to nothing. For as difficult as my project was for me, it gave me invaluable insight into the life we're given on this earth.

I won't recommend this program as a guaranteed path into one's future career but as an amazing way to look at the world through the lenses of people who see the beauty hidden within this mysterious universe and as a means to appreciate that beauty for yourself despite any difficulties that come your way.



# Jappn Grewal

## High School

Harry Ainlay High School

## Lab Placement

Dentistry, Faculty of Medicine and Dentistry

## Supporter

Alberta Education, and Faculty of Medicine and Dentistry



My name is Jappn Grewal and I currently attend Harry Ainlay High School in Edmonton. Upon graduating high school, I hope to attend the University of Alberta to study in the fields of neuroscience or microbiology. Ever since I was young, I have enjoyed the sciences and math, especially biology and physics. This passion stemmed from my love of problem-solving and critical thinking. The sciences always challenged me to look at the world and find answers to the question of why. My love for STEM and scientific research is what motivated me to apply to the WISEST Program. I believed that this program would provide me with the opportunity to gain work experience in a professional research setting and allow me to determine if research was a career path I should consider. I also hoped that this program would help me gain critical thinking and general lab skills that would help me thrive in post-secondary.

Prior to this program, I had believed that I had my entire life planned out. I knew exactly the undergraduate and graduate programs I was going to go into and the schools I would study these programs at. However, WISEST broadened my knowledge about the careers and fields within STEM; fields I had never considered but would enjoy. For example, this summer I was placed in Dr. Elahi's immunology lab. My project centered around investigating the role of immature red blood cells in the immune system. In specific, I was researching how the amount of immature red blood cells changed throughout the different age points and during different infections in an attempt to gain a better understanding of how the immune system develops. Through this placement, I was able to learn about the complexity of the immune system and how vital research in this field is. Immunological research allows us to gain a better understanding of diseases and infection,

bringing us a step closer to finding cures. The knowledge I obtained this summer in immunology made me realize that this was a field that I thoroughly enjoyed learning about, and I feel I would now consider as I apply to university.

WISEST not only broadened my knowledge of other careers in STEM, but it also allowed me to develop many other crucial skills that will allow me to thrive in university and the workplace. The various events and sessions held by WISEST taught me many skills I never believed I needed or was lacking in. Through the weekly WOW and WOF sessions, I learned about networking, public speaking, resume building, research in university and much more. These are skills and knowledge that I will carry for the rest of professional career.

I would like to thank WISEST, Dr. Elahi and his lab, and my sponsors, Alberta Education and The Faculty of Medicine and Dentistry, for providing me with this amazing opportunity. I would also like to extend a special thank you to Lai Xu for patiently mentoring me and guiding me.

# Keelin Henderson-Pekarik



## High School

St. Michaels University School

## Lab Placement

Biological Sciences, Faculty of Science

## Supporter

WISEST Advisory Board, and Motorola

My name is Keelin and I attended the WISEST Summer Research program this year. I'm from the Yukon but moved to Victoria two years ago to attend St. Michaels University School. Outside of school, I enjoy taking yoga and meditation classes. I am very passionate about biology and chemistry. Over the past academic year, I enjoyed my science classes and math class the most. I am looking forward to continuing in these subjects in my grade twelve year, and into university as well.

During my time in the 2019 WISEST program, I worked in a Biological Sciences lab where I helped with a project about tracking gunshot patterns. This information is helpful for tracking illegal hunting as it demonstrates what time of the day and the location where guns are being fired. Through this work I also had the opportunity to learn about spectrograms (graphs of frequency and time) and how to code.

In addition to developing new lab skills, I also had the opportunity to learn new skills when I attended a series of professional development sessions during the Summer Research Program. In these sessions, I learned about designing a research poster, the publication process, digital science communication, the art of networking and public speaking. Each session taught us new skills that I will be able to use in my future academic and professional career. For example, I learned how to build professional connections and how to keep your audience engaged during speeches.

I would like to thank my sponsors; Motorola, Canada Summer Jobs, and the WISEST Advisory Board for giving me such an amazing opportunity. Also, I want to thank my Supervisor Richard Hedley and Justin Johnson and Jeremiah Kennedy and my Principal Investigator Dr. Erin Bayne for all their help and support. I have gained more than I could've imagined from being a part of this program and for that, I thank everyone who made it possible.

# Gabriela Holko

## High School

Mother Margaret Mary Catholic High School

## Lab Placement

Linguistics, Faculty of Arts

## Supporter

Threshold Impact



My name is Gabriela Holko and I am a student at Mother Margaret Mary Catholic High School in Edmonton. I am an eager learner, especially in my math, English, and physics classes. Outside of academics, I participate in several extracurricular activities, including Polish folk dancing, acting, and writing and editing my school newspaper. I am also proud to be a Type 1 Diabetes advocate, which I have been since not long after my own diagnosis at the age of four. While I am unsure of the career I will pursue at this time, a profession that combines my passions and creates a genuinely positive impact on people is my goal.

My project for the WISEST Summer Research Program (SRP) studied how native Mandarin speakers perceive English speech sounds that are not present in Mandarin. I investigated their response time--as representative of processing difficulty--when reacting to words with these sounds, analyzing the vowels and consonants separately.

The larger experiment that my data was gathered from is the Massive Auditory Lexical Decision (MALD) task, which my lab placement, the Alberta Phonetics Laboratory, has been running for several years. In an auditory lexical decision task, the participant, in a sound booth with headphones, listens to recorded utterances and decides whether what they hear is an English word or a made up word called a pseudoword. MALD is a mega-study intended to be used by anybody; its purpose is to collect an extensive amount of data on human recognition of speech and the factors that affect it. My research project explored an aspect of this data to add to the general understanding of it. I also spent time in the lab running new participants in MALD to further contribute. In these ways, I was able to have an original project while still connecting to the primary research in my lab.

The point of the SRP is not necessarily to discover your ultimate career plan. Instead, it is to expose you to a variety of possibilities that, although you may have heard of, you had not considered or understood. After all of the professional development sessions, I realized that not all careers operate exclusively in one discipline. There is actually a lot of interaction between seemingly distant fields, which reassured me that following one interest does not necessarily require abandoning others. Additionally, participating in a professional academic environment encouraged me to consider continuing to do research in university and beyond. The SRP taught me new paths for the future and how to follow multiple opportunities.

I would like to thank the entire Alberta Phonetics Laboratory for supporting me this summer, especially Scott Perry, Matt Kelley, Kirsten Mulder, Siyu Chen, and my principal investigator, Dr. Benjamin V. Tucker. Thank you also to the WISEST team for creating this remarkable experience, and Threshold Impact for sponsoring my research. Finally, thank you to my teachers at St. Basil's JP11 Polish Bilingual Program and Mother Margaret Mary for inspiring me, and my family for their continued guidance.

# Mehrin Hoque

## High School

Edmonton Islamic Academy

## Lab Placement

Civil and Environmental Engineering, Faculty of Engineering

## Supporter

Hendry Lab, and WISEST Advisory Board



My name is Mehrin Hoque, and I am currently going into grade 12 at Edmonton Islamic Academy. I enjoy most of my classes, but I especially love math, physics, and chemistry. This summer, I was placed in a geotechnical engineering lab in which I performed many tests on clay soil in order to understand its properties. By doing these tests, the results can be applied to fieldwork and the study of why these soils fail and cause destruction to our infrastructure in forms of landslides, rockfalls, and more. I was especially lucky to have gone on a trip to Drumheller to visit a landslide site and get some hands-on experience working with these issues. After completing this program, I plan to pursue a future in civil engineering. I would not have been given this amazing opportunity had it not been for the generous support of my sponsors, supervisors, and teachers.

I first heard of WISEST from my science teacher, and then spoke with a former researcher in the grade above me. Hearing about the great experience she had all the amazing things she had done had me intrigued, and I wanted to know more about this program. Before I knew it, deadlines for applications were rolling in and I did not want to let such a once in a lifetime opportunity like this slip away, so I applied - and I got in! I didn't believe I would be able to do it, nor did I think I deserved to get in, but that was my mentality for a lot of things - before this program.

Throughout my research experience, I learned a lot of things about engineering and sciences, but I also had the opportunity to learn more about myself. I learned that a little bit of motivation can go a long way, and help encourage me and others to not give up, especially when things are becoming increasingly difficult. All of the kind and supportive words from the WISEST coordinators

and from my supervisors made this program much more comforting and less intimidating and made me feel a sense of belonging in research in the STEM fields. Without this program, I would not have the motivation to want to pursue a career in a field where my gender is underrepresented.

Although this program comes off as very research-based, there were many opportunities to bond with the other researchers and get to create fun and long-lasting memories with them. At the beginning of the program, we had a team-building activity that was dysfunctional - but nonetheless a great ice breaker game that helped us understand each other's personality types more. Sometimes, we'd even go on mini trips to Whyte Avenue for food and explore our city. My favourite memory was spending our lunches together, where we would talk about our research, our lives and everything in between. This program has helped me create many strong friendships and memories that I will never forget and cherish forever.

# Vala Ingolfsson

## High School

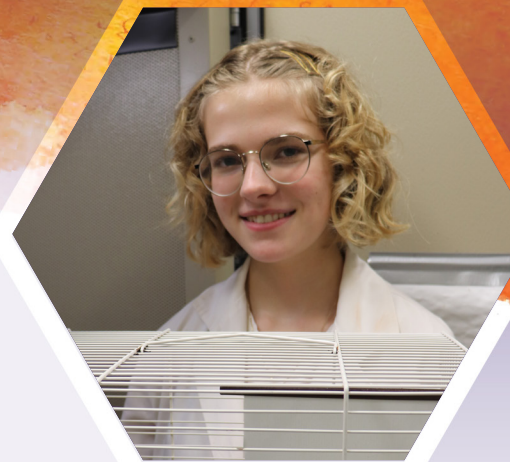
Victoria School of the Arts

## Lab Placement

Psychology, Faculty of Science

## Supporter

NSERC Promo Science



My name is Vala Ingolfsson, and I am from Edmonton, Alberta, although my family is from Iceland. I have lived in Edmonton all my life, and I'm going to be starting my senior year at Victoria School of the Arts in the fall of 2019. I have always been interested in science and art, and the influences from both of these areas have given me a unique perspective when it comes to STEM.

For six weeks during the summer of 2019, I had the opportunity to participate in the WISEST Summer Research Program at the University of Alberta. I was placed in the Songbird Neuroethology Lab in the Faculty of Science's Department of Psychology. Here, I developed a recognizer program that can identify chickadee vocalizations, which has the potential to make wildlife research more efficient. My placement has given me incredibly valuable experience in research and the fields of psychology, animal research, and neurology. In the future, I'm thinking of studying neuroscience or linguistics, and I definitely want to continue doing work in research.

I would like to thank my family and friends for supporting me throughout the program, as well as the Neuroethology lab team, Dr. Christopher Sturdy for letting me work in his lab, and my excellent supervisors, Will Service, and Kina Montenegro, for helping me every step of the way. I also want to thank my sponsor, NSERC PromoScience. Without their generosity, I wouldn't have had this incredible experience. I am a huge believer in the importance of the WISEST program. The value of everything the students get to learn in these six weeks cannot be overstated. From weekly professional development sessions to meeting with industry professionals to the lab experience itself, this program provides more opportunities and resources that students our age would normally ever get. Giving young

people, especially young women, a leg up in entering STEM fields where they are at a disadvantage is incredibly important, and WISEST does an excellent job of giving its students that advantage.

Past the technical skills we are taught, WISEST also succeeds in giving its participants meaningful social skills. This program helped me become more confident in both social and professional situations. Being thrown into a lab full of professionals where you know next to nothing about the subject of study can be disorienting, and it forces you to adapt quickly. I think that for women especially, it is difficult to ask questions and deal with the vulnerability that comes with not knowing something. So having a safe space to learn how to ask those questions and get help when I needed it was very valuable. After this program, I feel more able to put myself out there and make meaningful connections, whether that is making friends with the other incredible students in WISEST, or talking to professionals in a field that interests me. Everything I have learned in my lab and out of it, will help me in my future academics, career and beyond.

I can honestly say this has been the best summer of my life.

# Iqmat Iyiola

## High School

Medicine Hat High School

## Lab Placement

Chemical and Materials Engineering, Faculty of Engineering

## Supporter

NSERC Promo Science



Growing up I was a massive bookworm. I loved to read and I especially loved asking questions about the certainties of the world. To this day, it boggles my mind that stars are actually relics of the past. This pursuit of knowledge has seen me through soccer coaching and refereeing, community volunteering, and lots of humanities and STEM courses, with a standout being my math and chemistry classes. Math and chemistry have taught me to format my days with the products and reactants of my own decisions. A lesson I aim to take into everything I do.

When I found out about the Women in Scholarship, Engineering, Science, and Technology (WISEST) Summer Research Program, I thought it would be the perfect opportunity for me. It would allow me to further my learning while keeping me productive over the summer. While I have an interest in medicine and I know students from my high school applied to the Heritage Youth Researcher Summer (HYRS) Program, WISEST stood out to me as it advocated for men and women in underrepresented fields. I am glad to say WISEST did not disappoint.

I was placed in Dr. Rajender Gupta's lab where I researched biochar production from biomass using thermal conversions. Before my placement, I had no idea what any of these terms meant or how to apply them to the real world. Over six weeks I learned about the properties of biochar, its applications as a soil amendment, and how to grow as a researcher. I've learned that research can be slow, but that doesn't discredit its worth.

WISEST is important because it provided me and forty-six like-minded student researchers a platform to boost and accommodate our intellectual curiosity and ambition.

Through Wednesday and Friday professional development sessions, I became more adept at networking, public speaking, and science communication. Touring TEC Edmonton and OEM Engineering opened my mind to the ways science can diverge.

This summer I also lived in St. Joseph's College Women's Residence with twelve other WISEST students and 7 HYRS students. This meant that for us, the program was 24/7. Over the course of six weeks, I was given a window into dorm life, taught independence, and learned to navigate myself on a university campus. The memories that I made on residence with the people I met are ones I will cherish forever.

Huge thanks to Dr. Rajender Gupta, Dr. Deepak Pudasainee, and Dr. Gupta's research group for supporting me throughout my research work and poster. Shoutout to all the WISEST students for being so utterly amazing this summer. I would also like to thank my sponsor NSERC PromoScience, as without their support I would not have been able to participate in such an amazing program. Massive thanks to WISEST for teaching me skills that I know will shine bright as I further my career.

# Nicole Jaremco

## High School

Archbishop Jordan High School

## Lab Placement

Biological Sciences, Faculty of Science

## Supporter

NSERC Promo Science



My name is Nicole Jaremco, and I am a student at Archbishop Jordan Catholic High School in Sherwood Park, Alberta. I love to learn, and that has led me to enjoy aspects of all of my classes, although my favourites are Biology, English, and Physics. I have found that each subject is interesting in its own way. Unfortunately, there is a downside to having such a wide variety of interests – I am not sure as to what, exactly, I want to do with my life. I have, however, come to the conclusion that no matter what I end up doing, I have to enjoy it. I have no intention of slogging through each day, spending every moment yearning for the weekend. In addition, each interesting opportunity that comes my way is to be explored thoroughly. The WISEST Summer Research Program is one such opportunity. Therefore, when my science teacher recommended it to me, I was intrigued. When I was accepted, I was ecstatic.

When I learned my lab placement was the paleontology lab I was incredibly excited. After all, I got to spend my summer surrounded by – and working with – dinosaur bones. Throughout the program, I helped my lab partner scan and 3D print the skull bones of a *Gorgosaurus libratus*, cleaned and pieced together fossils, and worked on my main project. That project was to take the massive old topography maps marking the locations of dig sites and upload the points to Google Earth. Some of those maps when unrolled are bigger than I am and all of them are yellow and ripped with age. I felt rather like an adventurer planning out my next trip, working as I was with what amounted to enormous treasure maps. What truly made the experience so great, though, was the people. Everyone I met was incredibly kind and very willing to help. I would like to thank my P.I., Dr. Phil Currie, for allowing me the chance to work in the lab. I would also like to thank

my supervisor, Howard Gibbins, and all the students and volunteers in the lab for their help and kindness throughout the summer. You are what made this whole experience both possible, and incredibly fun, and I am incredibly grateful that I met all of you.

Applying to WISEST was well worth it, in more ways than one. Some of the best parts of the program were the social aspects – and coming from an introvert, that is truly saying something. Among the most important things, I learned this summer is that people are not as scary as they may appear, regardless of their accomplishments. They are still human: emotions, flaws, and all. A lot of the time, that conversation I was dreading was not nearly as awful as I had imagined it to be. Another, equally important lesson I learned is that mistakes are not only expected, but accepted. They are an important part of research and life in general, and I learned to work past them. In fact, a lot of the time the mistakes I made were what helped to guide me to success – along with the age-old technique of asking for help. All in all, I learned that the WISEST program is indeed an interesting opportunity, both in and out of the lab, and I would most certainly recommend applying.

# Megan Joy

## High School

St. Francis Xavier High School

## Lab Placement

Chemistry, Faculty of Science

## Supporter

NSERC Promo Science



My name is Megan Joy, and I live in Edmonton, Alberta. I am entering my last year of high school at St. Francis Xavier High School. I enjoy all the classes that I take, but I especially enjoy chemistry and math. After high school, I am not exactly sure of what I want to do but I know I want those two subjects involved in whatever I end up doing. I was actually very lucky to have been placed in the department of chemistry for this program.

My research this summer was based on the thermochemical and structural analysis of tautomers of RNA molecules containing selenium or sulfur through the use of computational chemistry software. My work required me to run geometry optimizations and frequency computations on molecules I built and then use their computed properties to make infrared and ultraviolet-visible light spectra and analyze the molecules. Through my work, I learned something very important about myself. I never realized how quickly I could pick up new information and apply it to what I am doing.

This program can be difficult in that you are placed in a field that you know nothing about and then are required to do research in that field. Without realizing it, I picked up so much information despite it being so foreign to me just weeks before. As well, the research I did was so interesting and allowed my perspective of what science and research involves to grow immensely. Before going into the SRP, I thought chemistry needed to involve beakers and chemicals, however, now I know that chemistry can be done through so many different mediums.

This program was so much more than a job, it was a way to connect with other students with similar interests and a way to experience a variety of PD sessions and activities

that WISEST facilitates. Between activities such as paint or movie nights, you are always busy socializing with fellow SRP students, and everyone becomes so close because of it. It is for these reasons why I recommend the SRP to anyone who has a love of STEM and the opportunity to apply to this summer experience. Of course, this program and my research wouldn't have been possible without the WISEST team, NSERC PromoScience, and my lab. I would specifically like to thank Dr. Alex Brown, Maria Rossano-Tapia, Arturo Gomez, and Shyam Parshotam for all of their help over the course of the program. Without them or the other supporters of the SRP, it would not have been the same amazing summer that I was lucky to experience.



# Cora-Lee Kashuba

## High School

Roland Michener Secondary School

## Lab Placement

Psychology, Faculty of Science

## Supporter

NSERC Promo Science



My name is Cora-Lee Kashuba, I am from Roland Michener Secondary School in Slave Lake. When I started in this program I wanted to become a doctor specialized in neurology; now that I have gone through this experience and have had my eyes open to so many areas of science, I am unsure what I would like to pursue.

Over the summer I had the pleasure of working alongside the animal cognition research group. Our study focused on Zebra Finches and their ability to use social learning from previous nest-building experiences, to enhance their behaviours in the future. To test this we set up an experiment using each birds colour preference between two strings and giving them either a good previous experience or a bad experience, we then allowed these birds to observe others and we then analyzed how this affected their next nest-building interaction.

I would just like to thank my amazing research team, as well as the WISEST group for allowing me to have this amazing opportunity. Along with my team, I would like to thank my partner from the Summer Research program. Everyone welcomed me in with open arms and I genuinely believe my experience would not have been nearly as amazing if I had not had the pleasure of working with them. When I first heard about this program, I did not think that I should apply because I thought that I was not good enough. I felt that others deserved this experience more than I did, and if it had not been for a strong push from my amazing biology teacher I would have missed out on such a wonderful experience.

Over the six weeks of this program, I learned a lot, especially about myself. I learned that I am capable and I deserved to be there; and that I have so many

opportunities in life but if I do not believe in myself I am going to miss out on them. If I were to be asked why I would recommend this program to others I would say that you are never going to get the same type of experience anywhere else. This program was more than just a job to me, it guided me in my path of curiosity, as well as made me form friendships that will last forever.

WISEST pushed me to be confident in myself and to understand that I may change my mind about what I want to do in the future a million times, but in the end my love of science will guide me towards something great. I would recommend this program to others so that they can be given the opportunity to explore and learn in ways that they never thought possible. I will forever be grateful for all of the things that this program has done for me, and for all the ways it will enhance my future.

# Madiah Khan

## High School

Wainwright Highschool

## Lab Placement

Chemistry, Faculty of Science

## Supporter

NSERC Promo Science



My name is Madiah Khan and I go to Wainwright Highschool. Through the years I have developed a passion for math and science as well as a love for learning, and have always known that I would like a career in the STEM fields. As of now, I am uncertain of what lies ahead or what I would like to pursue, however, the WISEST program has brought me one step closer to my decision. This summer I was able to work in the Department of Chemistry with the Veinot Research Group, investigating silicon nanoparticle-polystyrene hybrids and the tunable luminescence and unique chemical properties. The objective of the project was to create LED lights by synthesizing silicon nanoparticle-polystyrene hybrids using different methods. These methods were to determine which polymer hybrid offered the greatest spin-coating properties and luminescence.

The WISEST Summer Research Program was an incredibly eye-opening experience. Before the program, I was unsure what careers there were in the fields I was interested in. As the program continued, I was exposed to a variety of endless possibilities. I gained a new perspective on what it is like working as a woman in less traditional fields as well as formed a new-found appreciation for those who do. Going on the multiple lab tours and networking with women who work in different fields has shown me that there are so many opportunities present and that everyone faces uncertainty when it comes to their future career paths. During WISEST I have gained valuable knowledge and experience that I otherwise would not have received.

Throughout the program, I learned what it is like to work in a lab and the true definition of research. I was able to work alongside numerous professionals handling different chemicals, machines, and tools. I not only gained valuable

experience within the lab but skills that can be used towards my future work like academic writing, presenting and communication. Working in a lab has shown me that it is okay to make mistakes and learn through experience. I was given an overall understanding of what life is like in university, making me feel well prepared to enter post-secondary.

I have gained so much from this program and would like to thank the Veinot Research Group for welcoming me to their lab with open arms and answering all my questions. Special thanks to Alyx and Emily for their time, patience and incredible guidance through the six weeks. Thank you to my teachers at Wainwright Highschool for their unconditional support and encouraging my enthusiasm for math and science. To my sponsor NSERC Promo Science for making my participation in the program possible. Finally, thank you to the WISEST Team for their hard work and dedication for making this an unforgettable summer.

# Zoe Lau

## High School

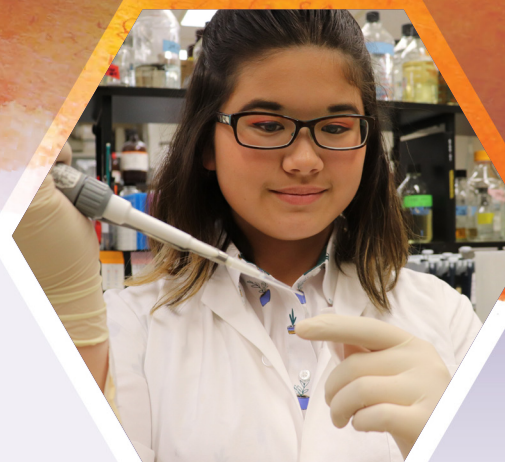
Archbishop Jordan High School

## Lab Placement

Biochemistry, Faculty of Medicine & Dentistry

## Supporter

Edmonton Chapter of Beta Sigma Phi



I am Zoe, a 17-year-old student from Sherwood Park, Alberta. I have a passion for science, politics and the performing arts! I still have no idea what I want to do with my future but I do know that I want to make a positive change in order to leave some sort of impact.

I was placed in a Biochemistry lab, which daunted me at first because even though I loved biology, the chemistry was not my strong suit. The goal of the lab is to find ways to produce biofuels from agricultural wastes, and specifically yeasts. This idea of researching possible resources that could leave a lasting positive impact on the world really sparked my interest. Soon I was thrown into a world of plasmids, PCR and Western blots; all things I had only heard of briefly before my first day but can now speak about fluently.

In the lab, I was also able to learn about the significance of mistakes and failures. Before coming into this program I had a huge fear of failure, as did many of my fellow SRP friends. I was scared to mess up and I thought I would never be good enough for the job. I, of course, made many mistakes and there were negative results but I learned to celebrate and learn from those mistakes and failures. Over the course of the summer, I have become more comfortable in my own skin as both a student and a young woman.

WISEST has taught me lessons that I cannot get in the classroom. I have been mentored and taught by other confident women and that is probably what has impacted me the most. After this summer, I have been empowered

that I can do anything if I put the effort into it. I still do not know what my future holds, and whether or not I continue in a STEM field, I will carry the lessons I learned this summer forever as well as the friends and memories I made along the way.

I would like to thank my lab team, my sponsors and especially WISEST for giving me the opportunity to grow into a confident young woman this summer. Thank you for reigniting my passion for the unknown and for the wonderful world of science.

Finally, I still remember sitting in my room, filling out the WISEST application and just sending it in impulsively because there was no hurt in trying. I honestly had little confidence that I would get in but when I was told that I had gotten into the program I was over the moon. I also remember reading the 2018 journals just like this one before I decided to apply, so if you are considering applying, even if you think you're not smart enough, apply. Take a leap of faith and I promise it will be rewarding. Stay curious and keep shining.

# Sarah McClelland

## High School

Paul Kane High School

## Lab Placement

Mechanical Engineering, Faculty of Engineering

## Supporter

Syncrude



My name is Sarah McClelland and I attend Paul Kane High School in St. Albert. My favourite subjects include physics and biology, as well as visual arts including printmaking, painting, and sculpture. I aspire to pursue a career in which I can use both my passions of art and science together. Currently, I am most interested in biomedical engineering.

This summer I was placed in a biomechanics lab, researching the regional symmetry of the pelvis. With the objective of assisting with the surgical planning of pelvic fractures in the future. If the symmetry of the different regions of the pelvis are understood, the intact side of the bone can be used as the basis for the reconstruction of the fracture.

I would like to thank my Principal Investigators, Dr. Kajsia Duke and Dr. Lindsey Westover for including me in their research this summer. I am also grateful for my supervisors, Maha Ead and David Li for working with myself and my lab partner every day and being so incredibly welcoming and supportive. Thank you to my sponsors, Syncrude and Canada Summer Jobs for allowing my participation in the SRP.

The WISEST Summer Research program benefits me in so many ways that will last beyond the program. It gave me the chance to experience firsthand, and be a part of ongoing research in a supportive environment. The lab was so kind and made me feel important and respected, even considering my lack of experience. The SRP gave me the opportunity to be surrounded by like-minded individuals who also have a passion for STEM and make lasting friendships.

Personally, I feel I gained more confidence to ask questions and make mistakes throughout my research. As well as becoming more comfortable with failure, and learning from my errors. I would encourage anyone curious in exploring STEM fields and research to apply to WISEST and participate in an amazing summer. This program opened my eyes to careers and fields I hadn't even considered, specifically engineering. I was not previously aware of just how broad engineering and all its disciplines were. The new connections I have made with my PI as well as my supervisors are invaluable and give me more options when thinking about my future career and aspirations. Thank you to the WISEST staff for making this experience happen!

# Mikayla McKenna-Pettit

## High School

Bev Facey Community High School

## Lab Placement

Chemical and Materials Engineering, Faculty of Engineering

## Supporter

International Paper



My name is Mikayla McKenna-Pettit, and I go to Bev Facey High School in Sherwood Park, Alberta. My favourite classes in school are physics and chemistry, although I like math and Spanish too. When I'm not in school, I love to play rugby with my school and my community team, work on my truck, and take piano lessons; I've been playing piano for 10 years now. I hope one day to pursue a career in biomedical engineering or in anesthesiology since both health care and engineering have always interested me.

My project this summer was to characterize the particles of lignin, an organic aromatic compound found in trees. I used both the ImageJ processing software and the Zetasizer Nano ZSP to measure particle diameter and zeta potential, which is the electric charge on particles dispersed in a liquid. Characterizing lignin allows us to decide what experiments should be conducted with lignin depending on its characteristics. Researching lignin and its applications are very important for future biofuel and renewable energy research.

I would like to thank my P.I, Dr. Neda Nazemifard and my supervisor Niloufar for allowing me to be a part of this awesome project, even though my research is a very small part of the overall research regarding lignin. My experience in the WISEST SRP was somewhat of a whirlwind.

The six weeks flew by so quickly, between cramming new information into my head about my research for weeks and attending many PD sessions that helped me grow as a person. I benefited from the program greatly, because it allowed me to come out of my shell and to learn many new skills, such as presenting and public speaking. Before the program, I wasn't really friends with a lot of girls because of the difference in interests I had with many girls in my

town, but through WISEST I made some really meaningful friendships. I was also able to travel around the campus to many of the faculties I am interested in, and I was able to really narrow down my future career options because of that.

I would recommend this program to other students for many reasons! Not only does it cater to all sorts of students and their interests, but it also allows you to get a good taste of the world of STEM research and how university life will treat you. It is the most inspiring and worthwhile opportunity available for students in grade eleven.

# Mackenzie Neufeld



## High School

Holy Trinity Academy

## Lab Placement

Mechanical Engineering, Faculty of Engineering

## Supporter

Society of Petroleum Engineers Canadian Educational Trust Fund, and WISEST Advisory Board

My name is Mackenzie Neufeld and I am going into grade 12 at Holy Trinity Academy in Okotoks Alberta. It is an understatement to say that I love school! I have such an immense desire to learn and I feel blessed to live in a part of the world where my passion is nurtured. Some of my favorite subjects include Physics, Math, and English- my passion for learning was born from physics. I have always been inspired by the mathematical language behind the elegant theories to the bizarre and unpredictable nature of the quantum world. The more I learned, the more I realized that humans have just branched the surface of our intellectual exploration of the universe. There's only so much we know, and this ocean of truth has yet to be discovered. I wanted a way to share my ideas and theories, so out came my motivation to write a book. As I continue my journey within academia, I hope to pursue my passion by becoming a professor of physics, and fingers crossed, a published author.

This summer I was placed in the department of Mechanical Engineering where I worked with braided composite materials. My project required me to come up with an effective design for a badminton racket on a 3D modeling program called Solidworks, and later create a prototype out of braided Kevlar samples. By doing so, I explored Kevlar's various properties and whether or not it would be a suitable material for rackets in the future. Aside from my research in engineering, this summer was packed with learning opportunities I'd never thought I would have the opportunity to participate in. I had mentors that really inspired me to harness my passion and persist through whatever boundaries I encounter. To set the bar high and exceed all expectations set in front of me. So, to my PI and supervisors, I'd like to say thank you. I'd also like to say thank you to all of my sponsors who made this experience possible.

A few years back, my mom told me she was a WISEST summer research student in grade 11, but before I looked into the program myself, I never knew what this entailed. My love for science has never really existed out of my head, so learning that there was an opportunity to apply my passion in the real world I excitedly applied. I strived to meet individuals who would share my love for science, and it was incredibly rewarding doing so.

This summer I grew a lot as a person. What I am most proud of is how I developed confidence in myself and my abilities, something I struggled with prior to this program. I learned firsthand that it's okay to make mistakes, and that these mistakes may flourish new ideas and creativity. I learned that although I am still in high school, my mind is valuable, and my ideas have a place in this world. I am so incredibly proud that I learned to be inspired to pick myself up after I fall down, and that there is a world out there waiting for our generation of creative and intelligent minds.

# Brittany Perkins

## High School

Fairview High School

## Lab Placement

Psychology, Faculty of Science

## Supporter

International Paper



My name is Brittany Perkins, and I attend Fairview High School. In school, I enjoy all of my science courses but have a particular interest in biology.

This summer, I worked at the University of Alberta with the Animal Cognition Research Group, where we studied social learning in Zebra Finches. Last year, I did not know a lot about the STEM careers available to me and therefore felt that I was unequipped to make an informed decision about what career I should pursue. This uncertainty motivated me to apply to WISEST, which I hoped would show me a wide variety of careers that would be of interest to me. The program succeeded in doing this, and I feel that I, as well as all of the other participants, have had our eyes opened up to all the limitless possibilities and opportunities around us.

The Summer Research Program also allowed us to develop skills significant to us in the future, such as networking and public speaking. I feel that the WISEST SRP is very important to members of my generation, as it encourages both young men and women alike to pursue their passions, even if their gender is underrepresented in said passion. I would recommend this program to others, especially if they are unsure about what career they want to pursue. It is an excellent way to experience new opportunities, and one might even find their passion through participation in the program. I have met so many amazing people through this

program, built a strong network, and have had my eyes opened to all the new possibilities waiting for me in STEM fields. It has truly been a once in a lifetime experience, and one that I will never forget.

I would like to thank my sponsors International Paper Company and Canada Summer Jobs for supporting me and making this experience a possibility. I would also like to thank the members of the Animal Cognition Research Group, who welcomed me into their lab this summer.

# Hannah Pfeil

## High School

Christ the King

## Lab Placement

Computer Science, Faculty of Science

## Supporter

WISEST Advisory Board, and Motorola



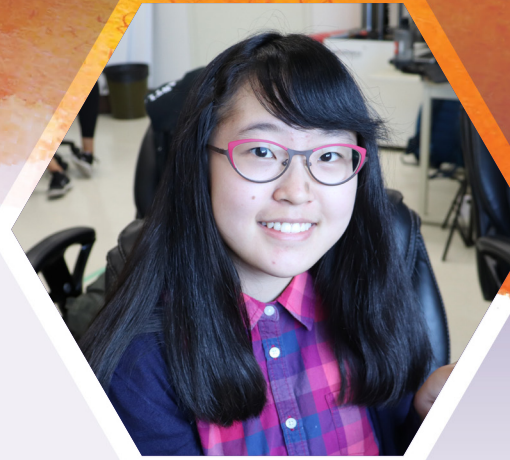
My name is Hannah Pfeil, and I am from Christ the King School. I am planning on going into engineering physics, with a specification for nanotechnology. Over the summer, I have had the opportunity to work with computer music. More specifically, I had to program a bagpipe using Supercollider, and then compare how similar the synthesized version sounds to a real one. I was given this opportunity, because an amazing group of people, like my PI and supervisor, as well as organizations, like WISEST and my sponsors, chose to invest in young minds like mine.

When I first heard about this program, I was not planning on applying. I did not think that I had anything to offer, even though I am one of the top students in my grade, and an active member of my community. Obviously, I ended up applying, but that was only because one of my teachers made a point to specifically say that she thought this would be a good fit for me. And I can say that, without that support, I wouldn't have even sent my name in. That lack of confidence in myself and my abilities exemplifies why a program like WISEST is so necessary, and important.

This program gave me a platform to develop my confidence and abilities, they gave a space where I was supported to learn more about myself, research, and STEM. And most importantly, I found a network of forty-six other like-minded young men and women. I would highly recommend that any young person who has an interest in science, or research apply for the Summer Research Program. Even if they get placed in an area of science that they are not interested in, they still get to meet amazing people. And if they find out they do not like research, that is still valuable. The way I see it, there is more to lose in not applying, than applying and getting rejected.



# Samantha Polege



## High School

Central High Sedgewick Public School

## Lab Placement

Mechanical Engineering, Faculty of Engineering

## Supporter

NSERC Promo Science

My name is Samantha Polege and I'm going into Grade 12 at Central High Sedgewick Public School in Sedgewick, Alberta. I was born in Edmonton but I've been living the small-town life for as long as I can remember. At school, my favourite subjects are the sciences, where I have a particular interest in the human body. When I'm not in school, I enjoy drawing, playing the piano, and all things computers, from surfing the internet to tinkering with digital audio workstations and speech synthesizers. After graduating from high school, I intend on majoring in biology at the University of Alberta, then possibly going on to medical school. My SRP experience has sparked an interest in engineering I want to explore eventually, but I'm currently most strongly considering a career as an ophthalmologist.

I heard about the SRP at the 2017 SET Conference, but it remained a forgotten hope until I'd been suddenly reminded of it in January. I wanted to apply, but I was certain I wouldn't make the cut. Incredibly, fortunately, I swallowed my fear and applied anyway, as the mere chance to participate in relevant, modern scientific research was too enticing. I was placed in a biomedical engineering lab, where my work involved virtually reconstructing pelvic fractures, specifically cases in which one side was fractured but the other remained intact, as well as analyzing the symmetry and deviation exhibited by both sides of the pelvises studied. This aids in the process of blueprinting pelvic surgery, making the procedure more accurate and reliable. Before applying to the program, I had a limited sense of direction and a lack of confidence in "following my passion." It was a phrase I'd heard countless times but didn't really digest the meaning of at the time. I was petrified of making the "wrong" choice and wasting my life away, never to find my true calling.

It turned out that I didn't need to have every step of the way meticulously accounted for. Simply trying something new and being open-minded went a long way. Coming face-to-face with setbacks like misnamed files and poster mishaps was especially frustrating for someone who likes to feel prepared, but these encounters helped me realize that roadblocks aren't equivalent to failure. Instead, they're opportunities for growth. Meeting others with similar minds and goals as me reminded me that I was far from alone. My experiences in the program allowed me to kickstart the process of breaking out of a barrier I was never truly aware of, becoming more confident in my abilities and feeling like I'm where I really belong.

I would like to thank Ms. Jo and Mr. Vaclavik for writing my teacher references and allowing me a chance to participate in this once-in-a-lifetime opportunity. The Margaret-Ann Armour Endowment Fund, as well as NSERC PromoScience, also contributed to making this possible. Finally, a huge thank you goes out to WISEST and the members of my research team, who all made this summer unforgettable.

# Nabiha Saghar

## High School

Lloydminster Comprehensive High School

## Lab Placement

Mechanical Engineering, Faculty of Engineering

## Supporter

Faculty of Engineering



I am Nabiha Saghar and I attend the Lloydminster Comprehensive High School located in Lloydminster, Alberta. I have a very strong passion for theoretical physics — some call it an obsession, I beg to differ — which I wish to pursue at either the University of Alberta or the University of Waterloo. Placed in the department of mechanical engineering, I constructed a model airplane wing by using SOLIDWORKS®, a computer-aided design software, to make a mold to shape the wing. I was to make the wing based on existing research in braided composites, a concept that utilizes braiding metals like Kevlar® together in the desired form and then coating them in resin, demonstrating possible applications for aerospace components.

In the WISEST Summer Research Program, I learned of how strongly I believe in pursuing what I love and I was also given an insight into possible future careers, like engineering physics. I applied to the WISEST Summer Research Program in hopes that I could experience actual research instead of living vicariously through others. I also applied so that I could hone my soft skills of communicating effectively both formally and otherwise. I did indeed improve in public speaking and communicating my thoughts and ideas. In extension, the SRP allowed me to grow and learn about how I best absorb information which will be an important skill in the future of academia.

To note those that made my SRP experience so successful I am extremely grateful to the Carey lab members: Dr. Jason Carey, Samir, Eric, Ahmed, Xiao, Sissi, Bill, and Ross. They provided a supportive, kind, and entertaining environment. The SRP itself was really amazing and left me with many great memories; and given the opportunity to continue getting involved in WISEST, aside from the SRP, I most definitely would opt to do so!

# Manisha Saraswat

## High School

Mother Margaret Mary Catholic High School

## Lab Placement

Biological Sciences, Faculty of Science

## Supporter

Edmonton Chapter of Beta Sigma Phi, and Faculty of Science



Hi! My name is Manisha Saraswat. I go to Mother Margaret Mary Catholic High School. I am from Edmonton. My favorite subjects in school would be Chemistry and Physics. Besides school, I love to sing. Prior to this program, I had no idea what I wanted to do in the future. After the program, I am considering Paleontology. It's something I never really gave thought to. This summer I had the pleasure of working in the Paleontology Lab. I laser scanned the skull bones of a Gorgosaurus libratus. I articulated the model on a computer, and 3D printed it. After that, we put the model together. We used countless computer programs. The whole thing was a lot of trial and error.

One of the greatest challenges I had this summer was letting go of things I could not control. Trust me it's easier said than done. I cannot tell you the number of times I thought our project would not be done in time. There was nothing I could have done to fix that. It did get done. However, the feeling of inevitable failure that you cannot control is terrifying. I struggled with realizing that there is no point in stressing yourself out for no reason. This is still a work and progress. This summer has definitely helped me with this.

If you are considering applying to this program... do it! I did not only learn computer skills this summer. I also learned trust, patience, communication skills, and networking skills. I learned things that will help me throughout my life. You probably have your doubts that you will get into this program. I did too. Don't let that stop you. The fear of being rejected should never stop you from pursuing opportunities. I was going to let it stop me if it wasn't for the encouragement of the people around me. I know I am most likely a complete stranger to you. However, this may be something we need to hear. You deserve all of the opportunities you earned in your life. Do not allow yourself

to take away your achievements. They matter. You matter. That being said, I highly recommend this program to anyone who is confused about life. You can shock yourself with how much you can achieve if you try. This program is great if you want to gain more self-esteem and less doubt.

I would like to thank the Dino Lab at the University of Alberta and WISEST. The passion and kindness shown to me this summer has truly been inspiring. They made me feel so welcome. I would also like to thank my sponsors: the University of Alberta Faculty of Science and the Edmonton Chapter of Beta Stigma. Lastly, I would like to thank my parents. They have supported me throughout my life. They encourage me to follow my passions and dreams.

# Anusha Sivakumar

## High School

Sir John Franklin High School

## Lab Placement

Agriculture, Food and Nutritional Sciences, Faculty of Agriculture, Life and Environmental Sciences (ALES)

## Supporter

NSERC Promo Science



My name is Anusha Sivakumar and I'm from Yellowknife, Northwest Territories. Coming all the way to Edmonton has been a completely eye-opening experience for me since I come from such a small city outside of Alberta. Being on a university campus was still a foreign experience to me so I am truly grateful to have such an opportunity available.

For the vast duration of the summer, I have been spending my time in the Department of Agriculture, Life and Environmental Sciences. I got to conduct various experiments in the lab related to muscle fiber research and the effect of production factors on meat quality. I would like to thank my lab for supporting my research during the SRP as well as the WISEST coordinators and all those involved in WISEST for organizing such an incredible program.

When first applying to the WISEST SRP, I really wanted to take these six weeks to see if I could narrow down my options for what I wanted to pursue in university but coming here has probably done the opposite, if anything, in a good way though. I got to explore a whole new field that I was

completely unfamiliar with and discover what research was really about. Now I am more knowledgeable about the world of research and all the opportunities that come with it.

The one thing that I am most proud of from this experience was having completed a research poster. Having that finished product at the end of the six weeks had given me a sense of accomplishment and joy. It was a display of all the hard work each student had put into everything they had done throughout the program.

# Alison Smith

## High School

McNally High School

## Lab Placement

Civil and Environmental Engineering, Faculty of Engineering

## Supporter

Edmonton Chapter of Beta Sigma Phi



My name is Alison Smith and I was born in Edmonton and I have lived here my entire life. I have always enjoyed school, but in particular science classes have been my favourites. I also enjoy playing many instruments including: flute, piano, ukulele, and the ocarina. I am passionate about science and engineering and plan to pursue a career in Mechanical Engineering or Computer Science.

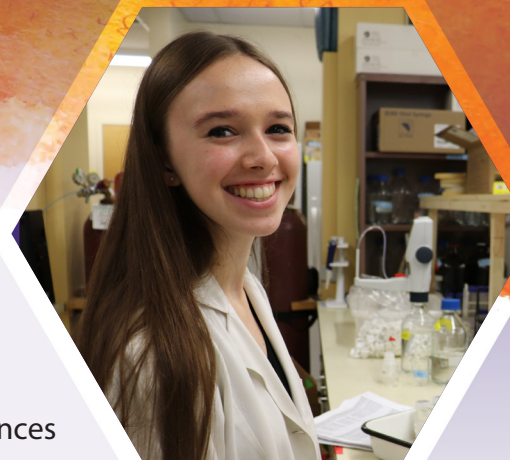
This summer I had the opportunity to work in Dr. Simaan AbouRizk's lab under Rana Ead. I was using simulation software to model construction projects to increase accuracy in the planning stage. In the first couple weeks of the six-week program, I had a lot of learning to do such as, learning how to represent the tasks in construction projects and the relationships between them with the Critical Path Method (CPM), and how to use the simulation software.

Before I started the WISEST program I was unsure of what I wanted to take in post-secondary school. I applied to the WISEST Summer Research program hoping that it would give me hands-on experience with STEM research and help me realize what STEM field interests me the most. Throughout this program, I have learned a lot about construction simulation in Civil Engineering and many more STEM research projects going on at the U of A. I learned in-depth about my particular field of placement while also getting to encounter a large variety of STEM fields by talking to other WISEST students and participating in WISEST's campus tours. This program has helped me see many of the options available to me as I pursue learning and a career in STEM at the University of Alberta.

The WISEST Summer Research Program has been an amazing experience that I wish every student could participate in. It really helped me see the future options for a woman in STEM and I would recommend it to anyone interested in pursuing science or engineering or would like to find out more about it. This program was definitely well worth the time I spent participating in it.

I would like to thank all those who helped me with my research project, especially my supervisor Rana Ead and Dr. Simaan AbouRizk. I would also like to thank the Edmonton Chapter of Beta Sigma Phi and Canada Summer Jobs; without their sponsorship, I would not be able to have this amazing opportunity. Finally, I would like to thank the WISEST team for planning and organizing this enriching program.

# Leah Stachniak



## High School

Memorial Composite High School

## Lab Placement

Renewable Resources, Faculty of Agriculture, Life, and Environmental Sciences

## Supporter

Isomass, and Faculty of Agriculture Life and Environmental Science

My name is Leah Stachniak and I am a student at Memorial Composite High School in Stony Plain. As a diligent and hard-working student, I am always eager to learn. I am a dancer as well as a dance teacher and I adore being with and teaching my students! I enjoy reading, taking photos, baking, and playing games. My favourite classes are math, chemistry, sports medicine, and physics. After high school, I am planning on traveling the world and attending post-secondary, however, I am unsure of which program or career I will be pursuing. The main goal I want to achieve in whatever career path I choose is that I want to be able to make a difference. I want to be able to change the world.

This summer, I worked on a small portion of a huge project that is studying the differences between conventional grazing systems and a new system for ranchers called the Adaptive Multi-Paddock grazing system. My responsibility was to measure the soil pH and electrical conductivity on these ranches. I would like to thank my supervisor, Laio Silva Sobrinho, for all of his support and guidance throughout the summer. He was always so patient and willing to answer my endless amount of questions. I also want to thank Sarah Breitzkreuz for being the best lab partner I could have asked for. You two helped make my lab experience so enjoyable and memorable. To my entire lab, thank you for welcoming me into your team and including me in this important project.

During the summer, I learned that you do not have to know what you want to do with your life in high school. I met dozens of professionals and they still were unsure of which path they were on or where they're future will take them. It's ok to not know. I learned that failure is a huge part of research, which is something I struggled to comprehend. School often enforces the idea that failure is a crime that

should be avoided at all costs. At WISEST, I learned that mistakes and failure are actually embraced. In research, the outcomes are rarely what you expected or hoped for. Research requires a lot of tedious work, patience, problem-solving abilities, but most importantly, love and passion for what you are studying. I learned that research does not always lead to victory, but it always leads to learning.

The absolute best part of the WISEST program was being able to meet people who were just like me. I have never met people who are also passionate about learning, discoveries, and innovation. Everyone was so open-minded and willing to hear about crazy ideas or seemingly-impossible dreams. People thought outside of the box, looked beyond the horizon, and were not afraid to challenge what is "normal". They were welcoming and made me feel like this was where I belonged. The WISEST program was an amazing, once-in-a-lifetime experience that will impact me forever.

# Laraib Syeda

## High School

Holy Trinity Catholic High School

## Lab Placement

Chemical and Materials Engineering, Faculty of Engineering

## Supporter

Society of Petroleum Engineers Canadian Educational Trust Fund



My name is Laraib Syeda, and I currently attend Holy Trinity Catholic High School here in Edmonton, Alberta. I have always been interested in math/sciences, with my favourite subjects being math and chemistry. Although I don't quite know what I would like to pursue in university yet, I do know I'd want it to incorporate those two subjects. This summer I was placed in a Chemical/Materials Engineering lab under Dr. Zhang and Dr. Qian. The project I was assigned to was focused on the formation of surface nano lenses, and studying their optical properties. I specifically focused on finding the ideal concentrations in which the lenses would form, and later observed how they reacted under a light source.

Going into the WISEST SRP program I had no idea what I wanted to study in university, and so I thought this program was the perfect opportunity to help narrow down my choices. When instead it did the exact opposite. This summer I was exposed to such a vast variety of careers, and degree paths that I didn't even know existed prior to the program. This completely changed the way I thought of a career in the STEM field, opening up new opportunities I never would have known existed otherwise. Every day I got the chance to meet new people who were passionate about their research, and I find that absolutely inspiring as not one person I met had a traditional route to their jobs, but loved what they did. This is one of the reasons I would recommend the WISEST summer research program to any student interested in the sciences, as this program is more than just a summer job. The opportunity to spend 6 weeks working on trailblazing research is incredible, alongside experiencing campus life and partaking in the various social events such as the craft nights, movie nights and the WISER bubble tea night. We also learned various real-life skills through the lunch'n learns and professional

development (PD) sessions, such as resume building, networking, and interview prep that will help us long after the program is over.

One of the best parts of the WISEST SRP program happened to be something I initially overlooked, the students. The opportunity to be surrounded by 46 other like-minded individuals was amazing, as everyone was at a similar point in their lives and could relate to what you were experiencing. Even if you are unsure about applying I would definitely recommend taking a chance, as you won't regret it.

I would like to thank Dr. Xuehua Zhang, alongside the rest of my lab group for letting me work in their lab and guiding me throughout the summer. Also, I'd like to thank my sponsors Canada Summer Jobs, and Society of Petroleum Engineers Canadian Educational Trust Fund for their generous donations, and a huge thank you to the WISEST team for giving me this opportunity. As none of this would have been possible without the support of these individuals.

# Carmen Van Horn

## High School

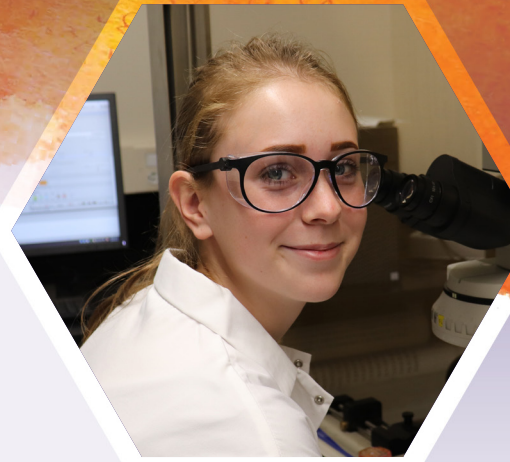
Jasper Place High School

## Lab Placement

Chemical and Materials Engineering, Faculty of Engineering

## Supporter

Alberta Education, and threshold Impact



My name is Carmen Van Horn, I attend Jasper Place High School in Edmonton Alberta. I have always been drawn to math and science and hope to pursue them in university. I enjoy working through problems and seeing them from start to finish. I will be taking advanced construction and am hoping to participate in Skills Canada for cabinet making. Aside from school, I enjoy many sports like ringette, rugby, and rowing. I do not have specific plans for the future aside from going to university. I know I do want to get a degree and continue in research.

This summer I was placed in a chemical engineering lab focusing on the formation of nano lenses and observing their optical properties. I worked on finding the ideal concentration of a solution to create the ideal nano lens. Then I would observe how the lenses act under a light. I was able to create different solutions and look at nano lenses through a microscope.

I applied to WISEST SRP because I thought it would give me a memorable experience that would give me insight into research in STEM. I am very passionate about science and believed that this was one way that I could further explore it and take my learning outside of the classroom. As well, I was looking for a different way to grow personally, meet new people and give insight for future careers.

This summer I experienced many setbacks and challenges. The greatest challenge was trying to learn all the mechanics and processes that I had to use in my lab. There were many years of research I had to learn in a few days. Through working in the lab and talking with my lab team, I was able to learn everything I needed to be able to understand and complete my project.

I would recommend this program because it is truly an amazing experience. The WISEST SRP is the best summer job out there, it fuels your love of science and curiosity in an unconventional way. Through the program not only do you get to work in a lab but you meet so many amazing people and gain numerous valuable experiences. The PD sessions and lunch'n'learns teach you many new skills like networking, building a resume, and they teach you about yourself and to embrace your love of science. This program shows you that the sky's your limit and do not let anything stop you from going and reaching your dreams. The WISEST SRP is one step toward achieving your dreams.

I would like to thank Dr. Jiasheng Qian and Dr. Xuehua Zhang, as well as my lab group for letting me work in their lab and teaching me throughout the program. Also, thank you to the generous sponsors who funded me being in the program, Alberta Education and Threshold Impact. Without them, I would not have had this amazing summer. Lastly, a huge thank you to the WISEST team for coordinating this program.



# Hannah Veinot

## High School

Paul Kane High School

## Lab Placement

Biology, Faculty of Science

## Supporter

NSERC Promo Science



My name is Hannah and I live roughly 30 minutes away from the University of Alberta in St Albert. I am passionate about biology and the environment. After high school, I hope to pursue a career in marine biology. This summer, I worked in the laboratories of Prof. Goss in the Biological Sciences Department. The study I was working on focused on determining if embryonic exposure to the medical ingredient in cannabis (CBD) affected the swimming performance of adult zebrafish. The WISEST program allowed me to meet other students who share my love of science. It also allowed me to create long-lasting friendships that I will cherish for the rest of my life. My WISEST placement gave me the opportunity to experience “real” research. When people think of a scientific career, they only consider the lab experiments; but there is another whole side of research most people don’t even know about and it is far from glamorous: it involves a lot of reading, waiting, trial and error, as well as writing.

My experience in WISEST taught me so much about myself, but first and foremost it showed me that I am persistent, patient, and optimistic. When things were not working in the laboratory the way I had hoped, I was determined to seek out other people in my lab so that I could still get some lab experience even if it was not directly part of my project. In doing so, I was not only practicing my networking skills, I also learned about the research opportunities available to me in the broader field of biology.

In addition to my fantastic research experience, I also learned that time management is an essential skill to develop if you are to be a successful scientist. Because my project was very time dependant, it was challenging to balance the needs of my fish studies and complete them

in the required timeframe while attending the mandatory biweekly WISEST career development sessions. While it was initially frustrating because these sessions took me away from the lab work that I loved, they provided information that will certainly help me in my future career development. Overall, I thoroughly enjoyed my research experience and it has solidified my desire to pursue a research career.

I would like to thank Erik Folkerts, Prof. Greg Goss, MD Ruhul, Prof. Declan Ali, Shannon Graham and all the Goss Team members for making my WISEST research experience one that I will never forget. I would also like to thank the University of Alberta, Natural Science and Engineering Council of Canada (NSERC) for supporting my research activities, as well as WISEST for helping make this incredible experience possible.

# Clara Vicera

## High School

Charles Spencer High School

## Lab Placement

Chemistry, Faculty of Science

## Supporter

Lundgren Lab, and International Paper



My name is Clara Vicera. I am a Charles Spencer High School Maverick from Grande Prairie, Alberta. I was incredibly fortunate to be a WISEST Student Researcher. I was placed alongside the Lundgren Research Group; we researched new ways to make molecules. I synthesized Z-Olefins through Rhodium Catalysis and the Hydrofunctionlization of Dienes; this process can help create complex molecules such as pharmaceutical drugs. I stepped outside of my comfort zone to apply for this program, and in return, my summer was greatly fulfilled.

Since kindergarten, math and science were my favourite subjects. However, junior high was when my passion for STEM peaked. Questions bombarded my mind, and I was surrounded by clouds of curiosity. I enjoyed nerdy discussions, yet I avoided conversations that focused on what to do with my life. It was clear that my future leads to the sciences, but what exactly? It wasn't until I came across the WISEST SRP on Instagram. Their photos caught my attention, and soon enough, I was reading their website thoroughly. I dreamt of being a scientist and exploring the realm of STEM. WISEST was the perfect match. Anxiety tried to restrict me, but I conquered through. I was a researcher during my summer, an achievement my kindergarten-self would have never envisioned.

WISEST shared wisdom every step of the way. I cannot list them all, but I can narrow down my three most important lessons. Firstly, make long-lasting connections. Networking is a fundamental key in academics and the workplace. By building relationships, new opportunities bloom. Secondly, it is completely okay to not have a clear vision of your future. Do not isolate yourself to one subject, take the time to fully experience this world. Finally, work in a career doing what you truly love. Follow your passions. Find the

career that best suits you, as you are the only one can make this decision. Prior to arriving at WISEST, I was hesitant to talk to new people, and I constantly worried about my future. I am grateful for the information and support WISEST provided that will last well throughout my life.

Six weeks are not enough to fully experience a researcher's life, but the snippet I saw was truly impactful. I pushed past my limits and grasped new opportunities. Most importantly, I developed a deeper appreciation for the STEM community, especially some honourable mentions. I thank Dr. Rylan Lundgren for welcoming me into his brilliant lab. Thank you to my supervisor, Raphael Dada, for teaching me valuable knowledge and skills. To the WISEST Team, your hardworking hours make this program possible. I extend my appreciation towards my supporters, Canada Summer Jobs, International Paper, and Dr. Lundgren. I acknowledge my teachers, Mme Doris Duret, and M. Daniel Doiron, for their guidance during my application. Finally, I thank my loving family; without their encouragement, I would not be where I am today. Being a WISEST Student Researcher Alumna is a grand accomplishment, and I am proud of all of my student researcher friends!

# Allison Wan

## High School

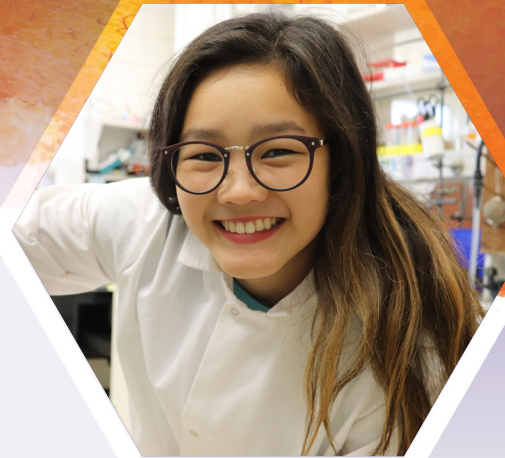
M.E. Lazerte

## Lab Placement

Chemistry, Faculty of Science

## Supporter

NSERC Promo Science



Hi, my name is Allison Wan, and I am from M.E. Lazerte High School in Edmonton. Like most high school students, I have a genuine interest in all subjects, ranging from Social Studies to Mathematics and anywhere in between. However, because a majority of my childhood was spent at the Telus World of Science, I decided to apply for WISEST in hopes of exploring that nurtured love of science that held a special place in my heart.

To my delight, over the six week period of the WISEST program, I was doing hands-on work in a chemistry lab, under the supervision of Dr.Vederas and Ms.Ibarra-Romero. My research project was investigating a specific strain of bacteria that creates a compound called a bacteriocin—a peptide that would kill other bacteria. These antimicrobial effects show great promise for use in antibiotics or food preservation!

Prior to the WISEST program, I had been struggling to identify which specific types of sciences I wanted to pursue, so being placed in a project that incorporated many different branches of science—microbiology, biochemistry, genetics—was a dream come true. This opportunity definitely opened my eyes to the vastness of science, and the endless career paths that one could take in STEM, and so I implore any high school students who love science and feel lost on their way to postsecondary to apply for this life-changing experience.

Furthermore, to simply say I learned a lot from the WISEST program would be an understatement; in addition to all the cool daily tasks I was completing at work in the lab, I attended several professional development sessions where I learned invaluable life skills such as public speaking, networking, and resume building. This goes to show

that the applications of skills learned during the WISEST program are not only beneficial to STEM fields, but also to the rest of your life. As I reflect back on my time spent in WISEST, one of my proudest accomplishments sits next to my computer: my research poster. It still amazes me how easily all the WISEST participants are able to organize such refined, detailed accounts of their research and be able to share their work with others. I'm truly proud that I was able to achieve such a level of knowledge in only one summer.

On a final note, I would like to thank my teachers Ms.Fischer, Ms.Higham, and Mr.Romanchuk for their endless support and encouragement; my incredible summer spent in the WISEST Summer Research Program would not have been possible without them. Additionally, I'd like to extend my thanks to all the members of the Dr.Vederas lab, for being so extremely welcoming and friendly, and making my lab experience nothing short of amazing. Though I am disheartened to know the WISEST program has ended, the summer it has created will be one I will cherish forever.

# Qin Tong (Rong) Wu

## High School

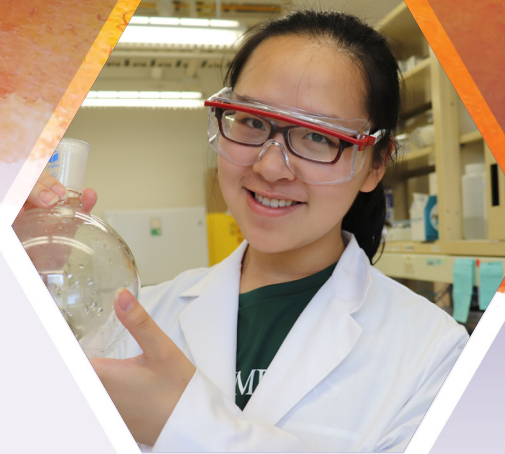
Old Scona Academic

## Lab Placement

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

## Supporter

Edmonton Chapter of Beta Sigma Phi



My name is Qin Tong (Rong) Wu and I am from Old Scona Academic High School located in Edmonton. My favorite subjects in school are biology, chemistry, and physics. Through studying all 3 sciences, I found myself fascinated by the interconnection between the different subjects. This interdisciplinary nature of science prompted my interest in scientific research. In the future, I would like to attain a masters or Ph.D. degree in either neuroscience or chemistry.

I was motivated to apply to the WISEST Summer Research Program because I wanted to explore the diverse fields in STEM. I knew the program was a great opportunity due to its focus on real hands-on research experiences. Furthermore, I admire the WISEST mission to empower young women. Currently, gender disparity still exists in most STEM fields, and I hope to become one of the young women that will challenge this phenomenon in the future.

This summer, my placement in the Agricultural, Food, and Nutritional Science department allowed me the opportunity to work on a solution for water contamination caused by high concentrations of heavy metals. I extracted carbohydrates from banana peels, which have multiple hydroxyl and carboxyl functional groups that can capture heavy metal cations, and tried to modify it to produce an easily available and cost-effective adsorbent. The purpose of the modification is to improve the current efficiency of this technique through the development of a banana peel/graphene oxide hybrid adsorbent. The cross-linking

graphene oxide possesses numerous hydroxyl, carbonyl, carboxyl, and epoxide functional groups that can be used to induce chemical reactions with banana peel carbohydrates -- providing the graphene oxide with additional functional groups. This change can potentially increase the adsorption capacity of banana peel derived adsorbents.

The entire experience instilled confidence in me as a young researcher. I learned many invaluable skills such as creating a poster, writing a report, and communicating effectively with others about my research. These developed skills will help me in my future endeavors as a young researcher.

I would like to thank my PI, Dr. Aman Ullah, and my supervisor, Muhammad Zubair, for welcoming me into the Utilization of Lipids lab. I'd like to further thank Mr. Zubair for helping me adjust to the lab setting and answering all of my questions throughout the summer. I would like to further acknowledge Canada Summer Jobs and Beta Sigma Phi for their sponsorship. Lastly, I am thankful for all WISEST volunteers and coordinators for making the SRP 2019 program possible.

# Bin Ge Yang

## High School

Archbishop Macdonald High School

## Lab Placement

Nursing/Critical Care Medicine, Royal Alexandra Hospital, Industry Placement

## Supporter

WISEST Advisory Board



My name is Bin Ge Yang. I am a student at Archbishop MacDonald. In school, I enjoy all the subjects, particularly biology and math. I find it fascinating to learn how to run statistical tests and solve problems logically. In the future, I plan on pursuing a career in health sciences, an area that I am very passionate about.

The objective of my project is to assess health clinician's perceived versus actual chest compression quality in CPR, and to evaluate the impact of using feedback from the Laerdal CPRMeter2. I would like to start off by thanking the WISEST team and sponsors for their support throughout the internship and putting in the effort to make the WISEST SRP 2019 a special summer that I will always cherish. Without your encouragement, I would not have the confidence to be part of this program or be proud of the person I have become. A huge thanks go out to my principal investigator-Matthew Douma and my supervisor-Chris Picard for the remarkable experience to be able to work at both the Royal Alex and Misericordia Hospital.

Through going between both hospitals, I started seeing the field of nursing through a new perspective. After being exposed to the demanding role that nurses have to play in today's healthcare system, it motivated me to be a better version of myself each day and focus on a brighter future for the healthcare industry. Last but not least, I want to thank my teachers, Mrs. Andison and Mrs. Fenske, for teaching with great passion and encouraging me to be the best I can be.

From the WISEST Summer Research Program, I learned so much about the endless academic and research career paths that can be taken in post-secondary. WISEST provided me with the ability to meet and speak with many

professionals in fields of interest and learn from them. From my placement at the Royal Alexandra, I learned about how to do introductory level statistics, perform high level CPR, while learning how to make a research paper. Over the course of my SRP experience, I benefited a lot from being able to actually work at a hospital and gain clinical experience. Now, whenever I visit the emergency room, I am less nervous as I understand how busy a waiting room can be.

Over the summer, I learned that if I can focus, I am capable of exceeding my expectations. At first, I was unsure if I would even finish my project on time because getting nurses to participate was a hard task. However, by channeling my energy on one task at a time and breaking down my goals, I was able to accomplish so much more than I assumed. During the celebration of research, I was very excited to present my 6 week project to others. I felt overjoyed that many health clinicians were impressed by the device and even wanted it to be incorporated into their hospitals. I did not expect that my research project was so successful.

# Monique Yuan

## High School

TEMPO School

## Lab Placement

Psychology, Faculty of Science

## Supporter

NSERC Promo Science



My name is Monique Yuan, and I am a high-school student from Edmonton, Alberta. I am currently attending TEMPO School where I carry out my studies. My passion lies in biology. However, chemistry, physics, and math are not out of the question. I intend to study neuroscience in university, as the work in this field is so new and uncomprehended, but honestly, who knows where I will end up in the future? Having attended TEMPO School since kindergarten, I naturally got very used to having the same people and environment around me every day.

When I found out about WISEST from my chemistry teacher, I was very eager to sign up, but I was always a bit hesitant since I was already so comfortable in my high-school bubble. When I got the acceptance call, I was equally nervous as I was ecstatic to be a part of such an esteemed program. It was not until days before orientation that the nerves hit me, and I started worrying about the social aspect. However, the moment the program began, I got so caught up in the awesome experience that I forgot all about my initial anxiety. By the end of the program, I got to know so many amazing students and researchers.

I realize now that, at some point, taking the first step to socialize and introduce myself became natural because the SRP program helped ease all of us into networking by bringing everyone together. Networking with ease is one of the most important skills that this program has taught me. So, for all of those who have a passion for STEM, but are afraid of the social aspect, I encourage you to apply to WISEST and to put yourselves out there. You would be surprised at the connections you can make and how meaningful they might become.

This summer, I got placed in a lab that researches cognitive neuroscience. My project was based on how we cannot perceive the change that happens when a magician performs a trick, despite being in plain sight. We tested this change blindness by having subjects identify sudden changes on a computer task while recording EEG data, and we found that people's attention is automatically drawn to a larger change in stimuli, which explains why we cannot perceive the truth behind magic.

This fantastic experience is credited to many people. Firstly, I would like to thank my parents, brother, and teachers for being so supportive of me. Without them, I never would have gotten to this stage in my life where I could get accepted into this honourable program. I would also like to thank my supervisor, Sarah Sheldon, and the rest of my research team for teaching me and for being such fun people, and I would like to thank my PI, Dr. Kyle Mathewson, for allowing me to participate in his research. Lastly, thank you to Mr. Norman Marcotte at NSERC for sponsoring me, and the WISEST team for putting together such a life-changing program.

# Ziad Zahoui

## High School

M.E. LaZerte

## Lab Placement

Nursing, Faculty of Nursing

## Supporter

WISEST Advisory Board, and The Faculty of Nursing



My name is Ziad Zahoui and I am partaking in my last year of high school at M.E. LaZerte composite high school. It was in my pursuit of higher academic I have found my love for biology. When first learning about human anatomy I was fascinated by all the processes that happen within our bodies, nevertheless, it was the complexity of our bodies natural defences that grasp my interest. It, alongside my passion for helping kids and desire to serve the community, shown a career in medicine was practically unavoidable.

After a considerable amount of self-reflection, I plan to pursue a career in pediatric surgery, where I hope to couple my passion for helping kids, with my love for biology. Originally I planned to complete my undergraduate degree in the sciences then going to medical school, however, after only six weeks in an amazing research placement, I now hope to enquire my undergraduate degree in nursing.

My research was a scoping review (a literature review on the quality of studies and literature) on African immigrant children with sickle cell disease, and from my review, I found quite shocking revelation. From discovering only seven studies focused on African immigrant health, to almost all of stating this population were at a significant disadvantage compared to their non-African immigrant population, it was quite shocking to see how inadequate the data was regarding this vulnerable population. After conducting this review and seeing how passionate I was, and with this overwhelming support from my supervisor and principal investigator I realize how much nursing aligned with my core beliefs.

Shockingly I would never have discovered my passion for nursing, or been apart of this incredible program if it was not for my sister. I have always been one of the top students in my grade, and a well-recognized member of my community, may, due to my lack of confidence in my abilities and skills I never believe myself capable of getting into any program. But the WISEST program differed greatly from this rest, with it being widely recognized and sponsored within my school, and after reading previous student profile and comparing it to my own I gained the confidence to start the application process.

Through my teacher and friends overwhelming support, and my sister personal critiques I was able to submit an application that truly recognizes my complex character. Besides from this program building my confidence and showing me my passion for nursing, the memories and skills I shared with my forty-six other SRP students truly elevated this six-week program into a life-changing experience that I will never forget. I would highly recommend that any young person who remotely interested in science, or research to apply for the Summer Research Program, and as one of the three boys in WISEST I can not stress enough the importance of applying, because to be honest all forty-seven us are still shocked we got in.