During my free time, when I am extremely bored, I often start thinking about random things to integrate science. For example, the other day, I humorously wrote “I love you, but we are too young to make such a decision since our frontal lobes are not fully developed.”

“The distance between us is actually zero, where our hearts collide.”

“We follow the same heartbeat and pattern. Our trig functions match perfectly together.”

“The bond between us is stronger than any bond that exists in the chemistry world.”

These quotes may sound cheesy, but it feels amazing writing these phrases, and anyone can actually use them as love phrases.

Therefore, I have decided to continue my journey of pursuing my dream to become a doctor or a scientist to make the world a better place and to make a difference in peoples’ lives. Science is the reason I decided to pursue my postsecondary education at McGill University, where I may continue learning more about science research. In the end, it is science that provides us—humans—with curiosity and the true meaning of existing in this world…or I should say the universe.

CONSIDERATIONS FOR SCIENTIFIC RESEARCH

By Abeera Shahid

Scientific research is happening across the world in environments such as university labs and pharmaceutical companies. Globalization has allowed for the sharing of this research, and people are now collaborating across borders. This is beneficial, as scientific research continues to be the driving force in our understanding of diseases, environment and beyond; any progress can make all the difference.

In 2013, our country’s most popular discoveries were cancer-related. For example, 2 Ottawa researchers managed to create 2 cancer-killing, or oncolytic, viruses that block antiviral proteins in cancer cells only. This discovery may allow healthy cells to remain untouched, and minimize the damage that a patient undergoes during treatment in the future. For research like this to occur, there are considerations about scientific research one must acknowledge.

SCIENTIFIC RESEARCH IS DEPENDENT ON FUNDING

If you ask a professor in charge of a university lab what their time is spent on, it is surprisingly not in the lab. As one progresses in academia, there is a shift from being a bench researcher (in the lab) to a supervisor, who secures funding and mentors graduate students. It is important to understand that money plays a large role in where research is concentrated. We no longer live in a society where research is done mainly for the purpose of understanding our surroundings. Researchers are now looking to better understand complex problems such as climate change and cancer that go beyond what meets the eye.

SCIENTIFIC RESEARCH SPREADS

In the 18th century, the discovery of the vaccine by Edward Jenner, a British doctor, changed the world. At the time, smallpox was killing 1 in 10 children in some European countries. Obtaining immunity to this disease at the time consisted of contracting the disease and surviving it. Jenner noticed that milkmaids who contracted cowpox (a non-fatal disease similar to smallpox) seemed to be immune to smallpox itself, and tried to ‘transfer’ their immunity to others. Thus, he took the fluid from a milk maiden’s cowpox sores and cut a young boy’s arms to insert the fluid into his body. After a couple of days, he exposed the boy to smallpox, discovering that he was immune. This technique is referred to as the first vaccination. The concept of vaccinations is now prominent throughout the world and it shows that over time, scientific research has been able to cross borders, and even more so with the development of technology.

TECHNIQUES AND METHODS ACROSS FIELDS ARE CONNECTED

A polymerase chain reaction machine is able to amplify a small DNA sample. You will find this machine in labs around the world, and it serves as a tool in different fields. You will see it in labs that study genetics, lipids, and proteins, among many other biomaterials. Ultimately, the lesson to be learned is that researchers use the same techniques for
different purposes throughout the world. This makes it possible for researchers to switch to a similar field that isn’t necessarily tied to the topic they studied. Hence, research does not put people in boxes but permits flexibility and collaboration.

**TIME AND FAILURE ARE RESEARCH’S BEST FRIENDS**

The general population gets excited when they hear about a discovery made at the molecular level about a disease such as cancer. However, transferring research from the lab to application requires time and is challenging. Failure is something researchers encounter on a daily basis and it inevitably influences the time it takes for discoveries to be made.

These are some considerations to keep in mind when viewing the world of research. You will learn more by getting involved in the world of scientific, and as you speak to more people in the field. Scientific research is an area that will continue to play a role in Canada and around the world.

Where will it take you?

**MULTIDISCIPLINARY FOOT CLINICS IMPACT ON THE DIABETIC WORLD**

By Chavan Williams, Downsview Secondary School (Toronto District School Board), University of Toronto’s Summer Mentorship Program, Faculty of Medicine

In today’s society, diabetes is a prevalent illness afflicting people of various races, ages, genders and social statuses\(^1\). Diabetes is a chronic illness in which the body is unable to break down sugars due to poor insulin production and function\(^3\). Diabetes can be classified as type I or as type II, and may be categorized as moderate or advanced. In type I diabetes, a person isn’t able to produce insulin, while someone with type II diabetes cannot produce enough insulin and suffers from “insulin resistance”\(^3\). Diabetic patients may suffer from health complications as the illness becomes more advanced, such as foot complications. Often, foot complications can result in amputation of the lower limbs or in some cases, mortality. To address this problem, multidisciplinary foot clinics have been created to aid patients, reduce mortality rates, and decrease the occurrence of limb amputations. These programs provide information to diabetic patients and their families, providing foot-oriented treatments and monitoring patients’ progress through after care. This article will argue that the practices and procedures in multidisciplinary foot clinics help significantly reduce diabetic foot complications, resulting in amputation or death for diabetic patients.

Multidisciplinary foot clinics inform patients on all aspects of their conditions, as some patients with chronic illness lack knowledge on how to deal with their condition, while also providing treatments and medications to patients. Furthermore, these clinics offer information regarding the impact diabetes and its treatments has on patient’s bodies and warning signs they should look out for. Various studies have shown that education, care, motivation and action by patients with diabetes themselves are important in protecting the feet from health complications\(^1\). Within any given clinic, there are numerous health care professionals whose sole purpose is to educate patients. It can be difficult for patients and their family members to speak up for themselves towards health care professionals if they’re uneducated about certain medical conditions or illnesses. Thus, the clinics provide patients and their families the tools they need to speak up for themselves towards health care professionals. Patients are also given information regarding the types of precautions they should take after receiving a diagnosis. For example, patients are advised to avoid specific types of footwear and various activities. Activities such as walking, running and other exercises involving the feet can cause additional strain, which may lead to ulcer and further foot complications. Therefore, with all the diverse care provided at multidisciplinary foot clinics, patients can be properly educated about basic care and advocacy they can administer for themselves.

The prevention of progressing foot complications is given particular attention in these clinics as foot focused treatment is provided. Common types of foot complications include peripheral neuropathy (which leads to problems with the way nerves carry out signals) and peripheral arterial disease (which are the complications of blood flow). Peripheral arterial

---

DOI: 10.13034 / JSST-2015-044