Proteomics:

New protein lab to help pioneer new era in medicine

By Case van Wyngaarden

These days, it's not uncommon to hear about the international effort to sequence the human genome. However, the latest installment in the fast-paced biotechnology industry is the booming field of protein identification – called Proteomics.

Proteins can often be involved in initiating disease or triggering cancer, which is why researchers are interested in identifying them. In an attempt to cure these diseases, researchers may manipulate a protein within its metabolic pathway through the use of drug therapy.

However, before any treatment can occur, a firm understanding of that protein's identity must be achieved. Accordingly, the sequencing of a protein is essential to its identity, and its role in human disease.

To improve the technology for protein identification at the University of Calgary, Faculty of Medicine professors Brian Burke and Don Fugita have received provincial and private sector funding to set up a new protein identification laboratory.

Innovative analytical tools, such as the ones proposed in the new protein lab, lead to a stronger foundation of understanding, and thus better treatments.

"Medication today is much more successful at treating diseases and preventing side effects because it is targeted to specific protein sequences and doesn't interfere with the body's other metabolic processes," says Fugita. "It is analytical equipment such as the equipment proposed in the new protein laboratory that will provide this specificity."

Historically, protein sequencing and identification has been done chemically, a method that requires a long period of time and a large amount of sample.

In many cases, the sequencing of a single protein can require kilograms of material.

The new protein identification lab will feature equipment that can work with very small amounts of sample, facilitating the sequencing of proteins that was not possible using chemical methods. Furthermore, the analyses will require only a fraction of the time compared to conventional methods. This will greatly accelerate the identification process, and hence the acquisition of knowledge needed to treat a variety of diseases.

In addition to the labs role in medical research, another important benefit is the labs contribution to Calgary's technical pool.

“It is no coincidence that technical leaders are found in areas of academic excellence,” says Burke. “If the Alberta government wants Calgary to become a technical leader, they need to realize that projects such as these breed the necessary academic success to achieve such a goal."

The project has gained considerable ground since its initiation two years ago. With the receipt of grant money, Burke and Fujita are now gearing up for equipment purchases. In fact, the only real obstacle remaining is securing someone with enough technical expertise to run the laboratory.

Although the protein identification lab is primarily intended for medical research, it could be handling samples from other U of C faculties, universities, and private industry. This means the lab will require full-time management.

The $2.3 million dollars required to fund the lab was raised through a variety of sources, including the Alberta Science and Research Authority, the Intellectual Infrastructure Partnership Program, and an anonymous private donor.

Case van Wyngaarden is a masters student in civil engineering and writer in the University of Calgary SPARK program (Students’ Promoting Awareness of Research Knowledge). He is also the President of The University of Calgary Medical Journalism Club.