A breakthrough for converting all blood types to type O was made by University of British Columbia researchers. The team isolated a pair of enzymes from the gut microbiome of an AB+ donor and, with the help of the CLS, were able to understand a previously unknown enzyme’s affinity for A type blood antigens. This enzyme was able to cleave all A subtypes effectively, allowing the team to convert a unit of type A blood to type O. This converted blood is being tested for any adverse effects and brings the researchers closer to their goal.

DOI: 10.1038/s41564-019-0469-7

Creating a Universal Blood Type

A team from the University of Saskatchewan have made a major discovery that has the potential to enhance effective treatments for cystic fibrosis (CF). Doctors typically treat CF patients with an inhaled salt solution that, by drawing water from blood, produces airway surface liquid (ASL), a microscopically thin liquid lining that helps remove secretions from the lungs. The research revealed that only about half of the ASL production is through osmosis; the other half is from the mist stimulating airway neurons. The researchers believe this new understanding of how the body produces ASL will lead to new formulations to maximize the beneficial effect.

DOI: 10.1038/s41598-018-36695-4

Enhancing Cystic Fibrosis Treatment

Understanding E.Coli Infections

A microbe responsible for gastroenteritis, known formally as enteropathogenic E. coli (EPEC), causes infections by directing a needle-like projection into cells in the human intestinal tract and releasing toxins that make people sick. But effective delivery of the toxins requires a chaperone, an agent that protects proteins, allowing them to achieve a specific conformation. Using high-resolution imagery, researchers from McMaster University have been able to sort out the structural details of the process and have created potential for the design of a drug or antimicrobial peptide that will neutralize the way EPEC causes infections like gastroenteritis.

DOI: 10.1371/journal.ppat.1007224

Understanding E.Coli Infections

Early diagnosis is important in order to address patient risk factors, to alter disease progression, and to find a window of opportunity where at-risk patients may respond to drug therapy.

DIAGNOSING OSTEOARTHRITIS BEFORE IT APPEARS

Arthritis is the leading cause of long-term disability in Canada and osteoarthritis is the most common form of the disease. It is estimated that 14.2 per cent of Canadians suffer from osteoarthritis. Unfortunately, most cases of osteoarthritis are identified once the disease is well advanced and irreversible damage has occurred. To better understand the causes of osteoarthritis, investigators from the University of Saskatchewan introduced a metal tracer into osteoarthritic joints and mapped changes over time using 3D imaging at the CLS. There were clear differences between healthy bone, and subjects developing osteoarthritis who showed changes beneath the cartilage and at bone edges.

DOI: 10.1002/jor.22937

Diagnosing Osteoarthritis Before It Appears

A team from the University of Saskatchewan introduced a metal tracer into osteoarthritic joints and mapped changes over time using 3D imaging at the CLS. There were clear differences between healthy bone, and subjects developing osteoarthritis who showed changes beneath the cartilage and at bone edges. Early diagnosis is important in order to address patient risk factors, to alter disease progression, and to find a window of opportunity where at-risk patients may respond to drug therapy.