Grade 11

Stem cells and heart disease

Students will learn how stem cells are used in basic research and their potential for tissue regeneration in a heart disease model.

Activity: Students will learn cell culturing technique and observe live stem cells with a microscope. Students can participate in a heart dissection to isolate the aortic valve for stem cell regeneration.

Time required
Half day (2.5h)

Heart disease is the leading cause of death worldwide, and lifestyle choices represent significant risk factors for the likelihood of events like heart attacks and strokes in Canada. Homeostasis from cell to system is a key concept in the Grade 11 Biology and students are learning how integral the cardiovascular system is in maintaining systemic homeostasis. The BIOlab will show how stem cells are involved in tissue homeostasis and how they might be used to treat heart disease. By observing live cells and tissues from our labs, students will get to see how heart disease affects the heart and explore emerging stem cell technology and its potential therapeutic use.

Specific learning outcomes addressed: B11-1-06; B11-3-16; B11-1-01; B11-3-17; B11-3-06; B11-6-05

Time Required	Student Experience
30 min	Introduction to the Research Centre and research interests, explain stem cell and regenerative medicine concepts
5 min	Break for washrooms
15 min	View live stem cells and cardiac fibroblasts under phase contrast microscope with attention to cell specialization
1 hr 15 min	Participate in a pig heart dissection with aortic valve isolation and decellularization demonstration
15min	Questions, wrap-up, and clean up

times are approximate, and can be scaled to whatever time you have available!