Grade 9

Mitosis in live cells

Explore the use of live cells in basic research, to understand the role of cell division in tissue maintenance, healing and regeneration, and disease.

Activity: Observe live cardiac fibroblast cells under a phase contrast microscope compared to previous day photos to understand normal growth cycle. Live cell culturing technique to lift cells from dish, count them and observe scale of millions of cells in pile.

Time required
Half day (2.5h)

Mitosis is an important process in maintaining healthy tissues and its rate varies by different tissue depending on function, for example skin cells have high turnover while neurons and heart muscle cells are maintained for longevity. We will demonstrate how in vitro cell culture is used in every day lab work and how mitosis varies in different disease conditions such as cancer and fibrosis.

Specific learning outcomes addressed: 9-1-01; 9-1-02; 9-1-13; 9-1-16

Time Required	Student Experience
30 min	Introduction to the Research Centre and research interests, connect Research Centre labs to cells and mitosis in health and disease
5 min	Break for washrooms
15 min	View live cells under phase contrast microscope with attention to scale, size, specialization and cell culture techniques. View 24 hour growth cycle.
1 hr 15 min	Cell passaging activity using droppers and a series of different reagents to safely lift cells off of cell culture dish viewing after each step under phase contrast microscope to check the cell health. Cells are counted using a hemacytometer as a group and we estimate the total number of cells form the dish before centrifuging to see a visible pellet. 5 groups
15 min	Questions, wrap-up, and clean up

Questions, wrap-

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