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The microfluidics core facility specializes in the generation and culture of 3D cell models in microfluidic devices for ex vivo testing.

Microfluidic devices, also called lab-on-a-chip, offer excellent spatial-temporal control over biological samples and their microenvironments. For example, in tumorous explant cultures, they enable the ex vivo preservation of the viability and original tissue architecture for 15 days.

In oncology, microfluidics can be used to study the effects of chemotherapy and radiation therapy treatments on solid cancer and biopsy samples.

SERVICES

ENGINEERING

- Custom design of microfluidic devices for 3D culture: spheroids, organoids, and explants such as microdissected tissues (MDTs), islets of Langerhans
- 3D printing and CNC micromachining
- Fabrication of polydimethylsiloxane (PDMS) microfluidic devices

BIOLOGICAL

- Tissue chopping
- Generation, culture, and treatment of 3D cell models
- Precision paraffin embedding

TRAINING

- Fabrication of PDMS devices
- Generation and culture of spheroids/organoids in devices
- Culture and treatment of explants in devices
- Microdissection and loading of MDTs into devices
- Paraffin embedding of samples in devices

RESEARCH IN ACTION

Through the conception, design, and production of a new device for a research team, our core facility has been able to culture 3D explants of human and mouse adipose tissue. Originally, these tissues could not have been cultured in our standard devices. By also adapting the loading and culture techniques, we were able to pursue working with these complex tissues rich in immune cells.

MICROFLUIDICS

HIGHLIGHTS

In 2023, over **42,500** microdissected tissues (MDTs) were generated to load onto over **1,000** chips.

Since its creation, the core facility staff have:



Supported experiments conducted by over **60** students, postdoctoral fellows and researchers



Collaborated with **23 research teams**



Trained **65 specialists** from Canada, the United States and Europe

