Shaping the future with you

INFORMATION

Biomedical Polymers Laboratories at the National Research Council of Canada Industrial Materials Institute

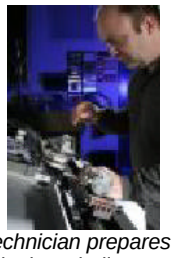
On June 7, 2005, the President of the National Research Council of Canada inaugurated the Biomedical Polymers Laboratories at the Industrial Materials Institute, a major NRC investment in this emerging field. The infrastructure will provide the industry with facilities for developing and prototyping polymer-based medical devices as well as support the development and commercialisation of new technologies from NRC research.

The infrastructure consists of three complementary laboratories for polymeric medical device fabrication and testing of biological tissues:

- Class 10,000 clean room
- Class 100,000 clean room
- Level 2 biosafety lab

The equipment and capabilities available in the infrastructure include:

- Micro-blow moulding for fabrication and assembly of medical balloons
- Medical grade extruder for fabrication of catheters/porous materials
- Deployment device for physical simulation of vascular interventions
- Plotter for fabrication of controlled 3D porous polymer structures
- Optical coherence tomography for vascular imaging
- Biorheometer for characterizing biological tissues, at 37^{o}C, in uniaxial, biaxial and compression modes
- Mechanically loaded bioreactor for tissue engineering
- Set-up for characterizing electrodeformable materials
- Standard and inverted microscopy capabilities
- Computer modeling capabilities for prediction of biomechanical behaviour



A technician prepares an angioplasty balloon using equipment at the NRC-IMI Biomedical Polymer Laboratory

Biological tissue mechanics

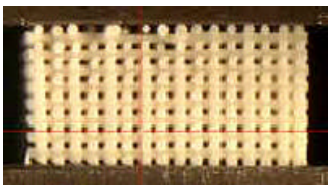
The laboratory currently supports three main research themes involving several NRC groups as well as a multitude of external partners:

1. Design for deformable biomaterials
2. Surgical simulation and intravascular imaging
3. Design of scaffolds for loaded-tissue engineering

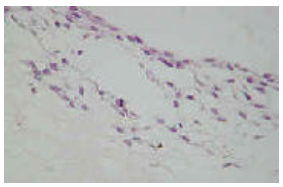
3-D Plotter

Medical balloon forming

The theme on design of advanced balloon-catheter systems aims to build on the available infrastructure, to work with industrial and medical partners on the development and commercialisation of specific novel devices. Balloon-catheter systems with specialized functions are targeted, including non-conventional dilatations, localized treatment and diagnostics.

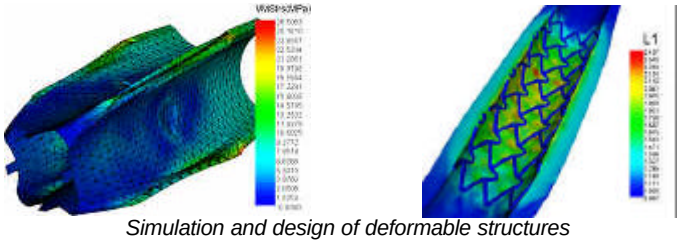


Deformable biostructures



Cell growth on polymer scaffold

The theme on surgical simulation and intravascular imaging aims to develop software and imaging tools for planning of various medical interventions, such as angioplasty and neurosurgery. The Industrial Materials Institute works in partnership with the NRC's Institute for Biodiagnostics in Winnipeg as well as medical partners such as Foothills Hospital, the McGill University Health Centre and the Montreal Heart Institute.



Simulation and design of deformable structures

Finally, the theme on design of functional polymer scaffolds aims to develop tools to prototype and optimize scaffold geometries and shapes for loaded-tissue engineering and drug/gene delivery in orthopaedics, cardiology and oncology applications. The Industrial Materials Institute works in partnership with the Biotechnology Research Institute, Sacré-Coeur Hospital, Mount Sinai Hospital and the Montreal Jewish General Hospital.

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INFORMATION

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Ce document est également offert en français

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