Strategic Research Strengths at Western

Materials & Biomaterials

Western University has demonstrated international leadership in materials and biomaterials research, specifically through pioneering work in the development of synchrotron radiation to materials science; the synthesis, characterization and application of materials, particularly lightweight materials; and emerging work in chemical biology and proteins. Western's researchers are designing, developing and creating new materials from the nanoscale to the macroscale, and producing results that can be loosely grouped into six areas:

Metals
- Improved performance and cost-effectiveness
- Characterization to understand the relationship between material properties and the manufacturing process
- Behaviour of metals in harsh environments of nuclear reactors

Polymers
- Green methods of manufacturing polymer materials to reduce environmental impact
- Development of polymer structures to deliver drugs or improve medical tests, including MRI
- Co-location of an international LANXESS – global leader in butyl rubber manufacture – R&D centre with ***Surface Science Western***

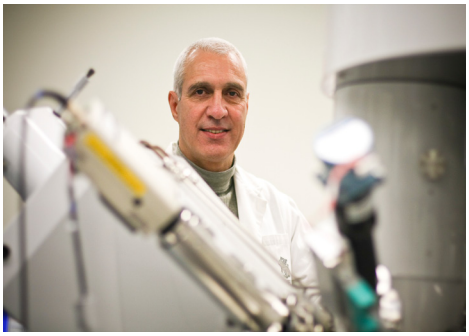
Nanomaterials
- Investigations and applications in a wide range of fields, including those facilitated by Western's ***Nanofabrication Laboratory***
- Development of nanocomposites embedded into contact lenses as non-invasive glucometers
- Computer models of carbon nanotube/polymer nanocomposites to predict how nanomaterials influence bulk material performance

Composite Materials
- Established an international, industrial-scale R&D centre with Fraunhofer Gesselschaft at the ***Advanced Manufacturing Park***
- Leverages joint expertise in the relationship between the manufacturing process, material properties and performance

Biomaterials
- Development of ceramic composite biomaterials for dental and orthopaedic implants
- Application of engineering principles to grow organs and tissues in vitro from primary cells and synthetic scaffolds
- Use of fermentation to produce pharmaceuticals, insecticides and materials that could displace petrochemicals as raw materials

Materials for Energy
- Scientific basis for large-scale production of highly tailored nanotube-based materials for applications in such areas as fuel cells, batteries and sensing technologies
- New polymer materials for lightweight, flexible batteries
- Development of low-cost, high-performance materials for solar cells

For more information, please visit: www.uwo.ca/cambr



Western's scientists and engineers are studying, designing, developing and creating new materials from the nanoscale to the macroscale.

Highlights:

- More than 50 researchers associated with the *Centre for Advanced Materials and Biomaterials Research*
- Six *Canada Research Chairs* and three *Industrial Research Chairs* in this area
- Attracted international research and development centres for two global leaders: Fraunhofer and LANXESS
- More than 400 industrial contracts annually through *Surface Science Western*
- Key facilities, including *Nanofabrication Laboratory*, *Surface Science Western* and *Compute Canada*
- Confocal microscopy, SEM capabilities, bulk material testing and processing, and nanofabrication
- ISO 9001:2008-certified laboratories

Western Research