Sheldon Biotechnology Centre

The Sheldon Biotechnology Centre serves as the core facility for biotechnology research at McGill University. We have state-of-the-art technical support facilities and offer reliable low cost service to investigators.

Services available at the Sheldon Biotechnology Centre are oligonucleotide synthesis/purification, peptide synthesis, protein/peptide sequencing, protein/peptide amino acid analysis and mass spectroscopy.

We are dedicated to remaining in the forefront of recombinant DNA methodology, protein sequencing analysis and protein separations. This objective will serve investigators undertaking new studies and in the transfer of information between various scientific disciplines.

Collaborative Program
The Sheldon Biotechnology Centre represents McGill University and its affiliated hospitals and research institutes to the larger community on matters relating to biotechnology. We recognize the need to form strong relationships with colleagues in industry. Our Biotechnology Collaborative Program facilitates and coordinates the development of joint ventures between the business community and McGill researchers working in the field of biotechnology.

Victor L. Cape Lecture Series
The focus of this series is on biotechnology. The program provides a forum for industry, government and university to meet and discuss mutual interests in the field. Recent speakers have included Professor Luc Montagnier, Pasteur Institute whose topic was "Biotechnology in AIDS Diagnosis and Prevention"; Dr. Webster K. Cavenee, Director, Ludwig Institute for Cancer Research whose topic was "Molecular Genetics of Human Cancer" and Dr. Leroy E. Hood, Director, Science and Technology Center for Biotechnology whose topic was "Biotechnology, the Genome Initiative and Medicine in the Twenty-first Century". We strive to maintain a high standard of internationally recognized speakers.

Teaching Program in Biotechnology
The Minor Program in Biotechnology is administered for the Faculties of Engineering, Medicine, Agriculture and Science by the Department of Biology. This Program allows students to select a package of courses that will broaden their perspective in areas impacting on biotechnology. Biotechnology 505B is a key component of the Minor Program in Biotechnology and an important course for graduate students seeking to expand their knowledge in biotechnology. This multidisciplinary course is taught by outstanding McGill professors and researchers from industry. Each lecturer presents the significance of his or her own research to the field of biotechnology.

Mass Spectroscopy
Application of mass spectroscopy (MS) to protein characterization is a relatively new field. Several applications have been realized and are routinely available, however many new applications are yet to be realized.

Mass spectroscopy is readily applied to quality control of synthetic peptides, characterization of whole protein digests, identification of post-translational modifications, etc. The Sheldon Biotechnology Centre has access to two mass spectrometers which employ different ionization technologies: fast atom bombardment (FAB) and electrospray (ES) ionizations. FAB-MS is useful in the low mass range and may provide fragmentation information. ES-MS is a milder ionization technique and allows larger molecules (up to 100,000 amu) to be characterized. Sample analysis and data evaluation are provided for both technologies.

Emphasis is placed on assessing the protein related requirement and providing guidance for appropriate mass spectral analysis.

Ordering
All work is performed upon receipt of a valid purchase order. To obtain order forms and price lists, please contact the Sheldon Biotechnology Centre by telephone (514) 398-3998 or by fax (514) 398-8069.

Telephone orders can be placed Monday through Friday during regular business hours. Fax orders can be placed 24 hours a day.

The staff of the Sheldon Biotechnology Centre respects the confidentiality of research information and projects.

For more information:
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or return the attached card, indicating your area of interest.

Acknowledgements
The Sheldon Biotechnology Centre acknowledges the following for their support: Dr. Huntington Sheldon, Pharmacia Canada Inc.; Hewlett-Packard Canada; the Deans of the Faculties of Science, Medicine, Agriculture and Graduate Studies and Research of McGill University; the Research Institutes of the Montreal Children's Hospital and the Royal Victoria Hospital. The Sheldon Biotechnology Centre has also received MRC/NSERC Equipment and Salary Support Grants.
Oligonucleotide Synthesis/Purification

Synthetic oligonucleotides are essential reagents to the molecular biologist and are used in a wide variety of recombinant DNA manipulations, including DNA sequencing, PCR amplification, site-directed mutagenesis, etc.

The Sheldon Biotechnology Centre has capabilities for high throughput and flexibility. Using the Genesynthesizer® Plus, a 2 column DNA synthesizer, we can provide you with oligonucleotides of lengths to over 100 bases that include regular or modified bases such as inosine or methylated derivatives. On-line monitoring during automated synthesis and purification by Fast Protein Liquid Chromatography (FPLC) give you complete assurance of successful synthesis, high yield and purity.

Oligonucleotides are cleaved and deprotected at 55°C for 16 hours in concentrated ammonium hydroxide. Purification by FPLC can be completed within 24 to 48 hours following deprotection.

The Sheldon Biotechnology Centre is the source for affordable synthetic oligonucleotides resulting in considerable savings to investigators. All oligonucleotides are guaranteed. Should there be a problem, we will re-synthesize and/or re-purify without charge.

Protein/Peptide Sequencing

Protein/peptide sequencing assists investigators with separation methods and physical analysis of proteins. Sample purity and quantitation are critical parameters which strongly influence data assessment and reliability particularly at the picomole level.

This facility serves as the resource for peptide and protein isolation strategies using classical as well as high performance liquid chromatography procedures.

We provide advice in the preparation of samples for sequencing and in methods of purification to those unfamiliar with the techniques of protein chemistry. We strongly recommend consultation with the Facility Manager regarding compatibility of your protein/peptide purification protocol with high sensitivity protein/peptide sequencing.

Peptide Synthesis

A very broad range of applications require synthetic peptides. Peptide synthesis can be time consuming without specialized scientists and proper equipment.

At the Sheldon Biotechnology Centre we have state of the art technology and peptide chemists that guarantee the synthesis. Solid phase peptide synthesis is carried out on the Biolynx™ Peptide Synthesizer which uses the Fmoc polypeptide peptide synthesis methodology. Up to 3 columns in series can be used for production of peptide analogues with yields of approximately 0.2 mmole/column.

We can synthesize up to 100 mg of peptide for all types of applications. The purity of the cleaved and deprotected peptide is assessed using the HPLC DB System Two which is equipped with a Rapid Spectral Detector. Depending on the sequence, the purity of the crude peptide varies between 70% and 95%. If your application requires greater purity, we offer complete purification and characterization services. We have capabilities for carrying out quality control at the level of amino acid analysis, mass spectroscopy and 10-peptide sequencing, depending on your needs.

Please contact the Facility Manager concerning specific additional requirements such as peptide couplings or incorporation of modified amino acid residues.

Protein/Peptide Amino Acid Analysis

Amino acid analysis is one of the most exciting application areas of liquid chromatography. Results have to be both accurate and reproducible.

At the Sheldon Biotechnology Centre, we use the Alpha Plus Amino Acid Analyzer. With this system, the amino acids of the most complex protein hydrolysates or physiological fluids can be analyzed.

If your demand is perfection in the chromatography of protein/peptide hydrolysates you will be impressed with the excellent resolution the sulphonated polystyrene resin provides. This is an important advantage where samples are not pure proteins but contain many other components. Hydrolysis time-course profiles and/or pre-hydrolysis chemical modifications are available for exacting quantitation of residues modified, destroyed or slowly released during routine hydrolysis conditions.

For complex biological fluids, we offer baseline separation between virtually all 40 of the amino acids and their derivatives which can occur in physiological fluids. This is ideal for complex samples such as urine, plant extracts and fermentation media.