# BIOENGINEERING & BIOMEDICAL ENGINEERING

# RESEARCH SEMINAR

## ENGINEERING DIVERSE APTAMERS FOR APPLICATIONS IN BIOSENSING AND THERAPEUTICS

The oligonucleotide equivalents of antibodies, known as aptamers, have emerged as potential molecular recognition rivals. Aptamers possess several ideal properties including chemical stability, in vitro selection, and lack of batch-to-batch variability. These properties have motivated the incorporation of aptamers into a wide variety of analytical, diagnostic, and therapeutic applications. This presentation will examine the work of our group in the selection, characterization, and application of aptamers. As one example, we engineered RNA aptamers to regulate gene expression in cells and whole animals. On the other hand, we are developing highly modified DNA aptamers to identify and quantify biomarkers relevant to disease.

Maureen McKeague
Assistant Professor,
Department of Pharmacology & Therapeutics and Department of Chemistry
McGill University

Assistant Professor Maureen McKeague obtained a BSc in Biochemistry and Biotechnology (2007), followed by a PhD in Chemistry (2012) both at Carleton University. Her research applied DNA nanotechnology to detect food toxins. She wanted to apply her interest in nucleic acids to the newer field of "synthetic biology", so she moved to the Department of Bioengineering at Stanford University in California from 2012-2016 for an NSERC postdoctoral fellowship award. She then transitioned to ETH Zurich in Switzerland for 2 years as a senior researcher in the Department of Health Sciences and Technology. Here, she studied the biological relevance of alkylating DNA damage in mutagenesis and carcinogenesis. At the end of 2018, she joined McGill University as a unique joint appointee in both the Department of Pharmacology and Therapeutics and the Department of Chemistry. She is a recognized aptamer expert, as evidenced by her selection as the Vice-President of the International Society on Aptamers as well as an Associate Editor for the Molecular Therapy Nucleic Acids and Aptamers journals. She is currently the Canada Research Chair in Genomic Chemistry. Her lab is interested in engineering functional nucleic acids as therapeutics and biosensors.

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