

**Trent University
Chemistry/Physics Seminar Series**

**Dr. Richard A. Manderville
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**Wednesday, January 24, 2018
11:00 a.m. to 11:50 a.m.
Science Complex Room 115**

**Utility of Internal Fluorescent Nucleobase Probes for Aptasensor
Development**

Nucleic acid research has expanded in recent years beyond investigation of their abilities related to storage of genetic information. This has led to the development of an *in vitro* methodology for the derivation of functional nucleic acids, capable of performing binding with high specificity and sensitivity. These novel classes of biomolecules, termed aptamers, have been employed as versatile tools for the detection of important biological targets for applications in imaging, diagnostics and therapeutics. Chemical modifications of aptamers increase chemical diversity for improved therapeutic use and molecular target binding affinity. Aptamer base modifications can also create a fluorophore with emission that is sensitive to the microenvironment resulting in a versatile tool for target detection. This presentation will initially highlight the utility of internal fluorescent nucleobase probes for monitoring target binding by guanine (G)-rich DNA aptamers that produce a G-Quadruplex (GQ) structure. These dye types exhibit quenched emission in duplex DNA that lights-up in the GQ structure due to effective energy transfer from the natural G bases to the emissive nucleobase. Alternative dyes with molecular rotor character will then be presented that show promise for real-life applications. These dyes exhibit visible excitation maxima and show enhanced fluorescence upon structural rigidification making them useful for monitoring biomolecular interactions.

All Welcome!