

**MASS SPECTROMETRY-ENABLED SCIENCE  
AND  
ENGINEERING (MS-ESE)  
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**CENTRE FOR RESEARCH IN  
MASS SPECTROMETRY  
(CRMS)**

These talks are open to \*EVERYONE\* and should be of interest to many in  
OUR CHEMISTRY GRAD PROGRAM.

**S P E A K E R**

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**"MASS SPECTROMETRY INSIGHT INTO NUCLEIC ACIDS  
FOLDING AND INTERACTIONS WITH LIGANDS"**

**ABSTRACT:**

TA rapidly expanding area for mass spectrometry-based techniques is structural biology and biophysics. Most literature examples come from proteins. Because in the early days of electrospray mass spectrometry it was more difficult to obtain stable signals in negative ion mode than in positive ion mode, mass spectrometry of nucleic acids still carries the reputation of being difficult. This reputation is no longer justified, and a few tricks in sample preparation or instrument tuning suffice to enable studying intact nucleic acids on any modern instrument.

Here I will outline how we use mass spectrometry to study nucleic acids intact structures, and their non-covalent assemblies or complexes with ions and small organic ligands. Examples will include studies of DNA G-quadruplex folding pathways [1], and magnesium-dependent RNA kissing complexes.

I will also touch on the latest developments in mass spectrometry, aimed at obtaining additional structural information on each the complex stoichiometries that can be separated. The benefits of hyphenating mass spectrometry to ion mobility spectrometry [2] and to ion spectroscopy will be outlined. G-quadruplex DNA structures served here as model systems for the development of these new mass spectrometry-based approaches.

[1] A. Marchand, V. Gabelica, "Folding and misfolding pathways of G-quadruplex DNA", *Nucleic Acids Res.* (2016), <http://dx.doi.org/10.1093/nar/gkw970>.

[2] V. D'Atri, M. Porrini, F. Rosu, V. Gabelica, Special feature: tutorial. "Linking molecular models with ion mobility experiments. Illustration with a rigid nucleic acid structure", *J. Mass Spectrom.* (2015), 50(5), 711-726. <http://dx.doi.org/10.1002/jms.3590>

**Date: Thursday November 3, 2016  
Location : 317 Petrie Science Building  
Time: 10:00 AM– 11:00 M**