

Vita

Candidate's name: Allison Ella True

Universities
Attended: University of New Brunswick (2020)
Bachelor of Science

University of New Brunswick (2021)
Masters of Science

Conference Presentations:

RSC Twitter Poster Competition 2021

UNB Graduate Research Conference 2021

Hydrogen-Bond Rich Supramolecular Systems Towards Theranostics

UNIVERSITY OF NEW BRUNSWICK

THESIS DEFENCE AND EXAMINATION

in Partial Fulfillment

of the Requirement for the Degree of
Master of Science

by

Allison E. True

in the Department of Chemistry

U.N.B., Fredericton, N.B.

**Thursday, October 21st, 2021
9:30 a.m.**

Via MS TEAMS

Examining Committee

Dr. Barry Blight

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Abstract

Iridium complexes have many applications: bioimaging, functional materials (e.g. photovoltaic cells), synthetic catalysts, and, due to their high photoluminescence, organic light emitting diodes (OLEDs). Hydrogen-bonding (H-bonding) is integral to the design of sophisticated functional organic materials because different assembly patterns of H-bond acceptor and donor atoms lead to varying association strengths. Cyclometalated iridium (III) complexes that contain self-assembling H-bonding motifs provide a colour-tuning solution to inner-sphere synthetic modifications. In the current work, a DNA-like H-bonding array is used to influence the emissive properties of eight cyclometalated iridium (III) complexes via host-guest chemistry. DNA/RNA nucleobases have naturally occurring H-bonds that mimic the organic guest molecule (pyrimido[4,5-c]isoquinolin-3-amine), making them suitable binding partners for the iridium (III) host complexes. The association strengths of these nucleobase interactions will help to predict how the colourful

iridium complexes will perform as potential theranostic (i.e. therapeutic and diagnostic) tools.