Vita

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Universities Attended:

University of New Brunswick (2022)
Bachelor of Science, honours

University of New Brunswick (2023)
Masters of Science

Characterization of the Biosynthetic Pathway for Medicinal Monoterpenoid Indole Alkaloid

UNIVERSITY OF NEW BRUNSWICK

THESIS DEFENCE AND EXAMINATION

in Partial Fulfillment

of the Requirement for the Degree of
Master of Science

by

Jun Guo

in the Department of Chemistry

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

Tuesday, May 30th, 2023
1:30 p.m.

Toole Hall, Room 303

Examining Committee

Dr. Yang Qu	Supervisor
Dr. David Burns	Internal Examiner
Dr. Bryan Crawford	Int-Ext Examiner
Dr. Gilles Villemure	Chair of Oral Examination

Abstract

Monoterpenoid indole alkaloid (MIA) is a complex and diverse class of alkaloids found in nature, boasting over 3000 reported structures. Many MIAs exhibit human medicinal properties, such as the anti-cancer drugs vinblastine and camptothecin. In this project, we focused on elucidating and functional characterizing two enzymes involved in the biosynthesis of a plant derived MIA. We used a bioinformatics approach to shortlist candidate genes from the source plant, which we then cloned into a heterologous system to characterize the enzymes they code for. We show that one of our candidate genes codes for the required enzyme responsible for the biosynthesis of this MIA. The discovery from this work will allow assembly of the complete biosynthetic pathway in baker's yeast (Saccharomyces cerevisiae), aiming to achieve de novo MIA synthesis.