

Biology Seminar



Western
UNIVERSITY · CANADA

12:30 - 1:30 pm
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BGS 0165



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Understanding of plant molecular responses to the production of enveloped VLPs

Transient expression mediated by *Agrobacterium tumefaciens* is a powerful tool to express recombinant proteins in plants. Making use of plant cells as protein “biofactories”, this molecular farming approach is usually performed in *Nicotiana benthamiana*, a model for research on plant immunity and host of choice for the large-scale production of biopharmaceutical products. Using automated agroinfiltration in *N. benthamiana* leaf tissues, the former biopharmaceutical company Medicago was able to develop and commercialize the first plant-made vaccines against influenza and COVID-19. These processes similarly relied on the expression of recombinant virus surface proteins that spontaneously form virus-like particles (VLPs) in planta, namely influenza hemagglutinins (HAs) and SARS-CoV-2 spike (S) proteins. This presentation aims at providing a brief overview of what was Medicago and of the unique methods that were developed to produce plant-made vaccines at a commercial scale. We will also explore plant molecular responses induced by foreign protein expression, with a focus on the effects provoked by influenza HA and SARS-CoV-2 S proteins. Based on fundamental learnings that were made, we will finally discuss some of the strategies developed to improve the expression platform used by Medicago.

