

## **BIOL 481.6 CRN 81724 & 21886 Extended Research Project (Fall 2023 & Winter 2024)**

### **Sequencing & Comparison of DNA Isolated From Heritage Wheat Rust Samples**

Instructors – Professors Yangdou Wei & Tracy Marchant

We are looking for a 4<sup>th</sup> year Biology or ENVB student to complete an undergraduate research project that will involve the sequencing and analysis of DNA from heritage (approximately 100 year-old) cereal rust samples.

The Department of Biology holds an extensive collection of wheat and other cereals that were collected from fields infected with one or more rust pathogens (most likely *Puccinia triticina* or *Puccinia graminis* f. sp. *tritici*). These specimens were collected by Professors [W.P. Fraser](#), [TC Vanterpool](#) and their students in the early 1900s from fields across western Canada. At that time, fungal pathogens caused significant crop losses for Prairie farmers, and faculty and students from the Department of Biology made important contributions to the identification of the pathogens responsible. The heritage samples currently held by the Department of Biology represent an opportunity to compare DNA from the original rust races to that found in extant (modern) forms. This project has the potential to provide unique insight into how rust DNA has evolved over time, especially as rust-resistant varieties of cereal crops and other control measures were developed to mitigate crop damage for the agriculture industry.

Completion of BIOL 222 and BIOL 226 within the prerequisites for BIOL 481.6 will be required. Completion of senior courses such as BIOL 316, 342 or 345 will be helpful but not required. This project will require a commitment of approximately 6 hours per week by the student. Initial work will involve the completion of a literature review and research proposal as well as the selection and identification of suitable rust samples to sequence. Laboratory and sequencing work will then be conducted in Professor Wei's laboratory. A final thesis-like research paper and a public presentation will be required at the end of second term.

For more information, contact Professor Marchant ([tracy.marchant@usask.ca](mailto:tracy.marchant@usask.ca)). Interested students should be prepared for an in-person interview with Drs. Marchant and Wei during the first week of term (Sept 5 to 8, 2023).