Wen Chen

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EDUCATION

York University   Toronto, Canada
Master of Science in Biology   Sept 2025 - Present
- Studying temporal dynamics of a phytoalexin transcription factor network of Arabidopsis thaliana.

University of British Columbia   Vancouver, Canada
Bachelor's Degree in Forest Resource Management   Sept 2022 – June 2024
- **GPA (Overall):** 87/100
- **Major Award:** Degree with Honours, Dean's Honour Roll for 2022 - 2023 and 2023 - 2024, UBC Academic Awards, Phil Haddock Prize in Silviculture, PRT Growing Services Ltd. Silviculture Scholarship, West Fraser Timber Co Ltd Scholarship in Forestry, UBC-UBG Forestry Scholarship (Level I).
- **Relevant Courses:** Computation Programs And Programming, Forest Level Measurement and Productivity (rank 1st), Modelling for Decision Support (95), Mathematical Modelling in Forest Resource Analysis, Communications and Professionalism (98).

Nanjing Forestry University   Nanjing, China
Bachelor's Degree in Forestry   Sept 2019 – June 2022
- **GPA (Overall):** 89.59/100 (top 1%)
- **Major Award:** Degree with Honours, Outstanding Student Leader of Jiangsu Province in 2022, Three times of Merit Student honours in 2019 - 2020, 2020 - 2021, and 2021 - 2022.
- **Relevant Courses**: Tree Genetics and Breeding, Forest Pathology, Plant Tissue Culture, Experimental Design (92), Soil and Plant Analysis, Plant Biology (93), Introduction to Biostatistics (96), Instrumental Analysis, Linear Algebra, Advanced Mathematics (Calculus) (95), Inorganic and Analytical chemistry.

RESEARCH EXPERIENCE

Project: Temporal dynamics of a phytoalexin transcription factor network of Arabidopsis thaliana
Sept 2025 - present
- Supervisor: Professor Nikola Kovinich in Biology Department, York University
- Reveal how key transcription factors (TFs) collaborate to increase camalexin amount by jointly profiling relative expression level of TFs and camalexin amounts at high temporal resolution, and partition the response into early, middle, and late stages based on their patterns
- Establish computational models to simulate relationship between relative expression level of key TFs and camalexin output at different response stages, and prioritize which TFs to overexpress or knock out to delay the decline point of camalexin biosynthesis and increase peak level to raise cumulative production
- Overexpress and knockout selected TFs to try to extend phytoalexin biosynthesis period and increase biosynthesis intensity.

Project (Principal contributor): RNA-seq analysis reveals essential genes potentially involved in the adaptation of *Begonia longgangensis* to karst environment   July 2023 - Aug 2025
- Supervisor: Dr. Lina Dong, Center for Plant Resources & Phylogeographical Studies, Guangxi Institute of Botany, Chinese Academy of Sciences
- Pre-process raw RNA-seq reads, assemble transcripts, annotate transcript function, and systematically identify differential expressed genes (DEG) between begonias grown in garden and karst environment with DESeq2 and Limma-Voom under gradient DEG identification thresholds, identifying 4210 DEGs.
- Further focus on function of DEGs, and performed functional enrichment analysis (Gene ontology (GO) and Kyoto Encyclopedia of Genes and Genomes (KEGG) pathway analysis), with enriched pathways and terms focusing on complex light condition in karst environment identified.
- Exploring further evidence that supports validity of interested genes' function by checking the completeness and conservation of their functional domain.

Project: Genomic biosurveillance in spread pattern of *Phytophthora lateralis*   July 2023 - Dec 2023
Supervisor: Professor Richard Hamelin in Faculty of Forestry, University of British Columbia
- Identify potential population structure of *P.lateralis* samples from Pacific North West, Europe, and Taiwan with clustering techniques (Principal Component Analysis (PCA), Discriminant Analysis of Principal

Components (DAPC), and Neighbor-Joining trees), classifying samples into 4 clusters aligning with lineages.
- Investigate potential spread direction by analyzing ancestor composition of samples with Symmetric Non-negative Matrix Factorization (SNMF), revealing spread trends aligned with global host trade routes.
- Assist in establishing code to differentiate mitotic recombination and meiotic recombination, assessing whether mitotic recombination leads to long runs of homozygosity in sample genome.

LAB WORK EXPERIENCE

Identify the severity of Swiss needle cast infection on *Pseudotsuga menziesii* leaves   May 2023 - July 2023
Tutor: Professor Richard Hamelin in Faculty of Forestry, the University of British Columbia
- Count the percentage of stoma plugged by fruit body of Swiss Needle Cast for about 100 samples, and calculate the proportion of infected trees for each sample site.

Gene cloning of two *Ginkgo biloba* genes (2500 and 2215 bp in length)   1 July 2022 - 9 July 2022
Tutor: Professor Fangfang Fu in Faculty of Forestry, Nanjing Forestry University
- Perform gene cloning on two *Ginkgo* genes with high expression and are genetically close to regeneration-related genes in *Arabidopsis thaliana* for exploration on *Ginkgo*'s regeneration system.
- Acquire cDNA template with reverse transcription, design primers, clone genes with PCR, and verify gene clone with gel electrophoresis.
- Get a successful gene clone over 2000 bp within a week, but concentration needs improvement for recycling.

Tissue culture of *sea buckthorns*   May 2022 - June 2022
Tutor: Professor Fangfang Fu in Faculty of Forestry, Nanjing Forestry University
- Assist to do tissue culture of *sea buckthorns* with their cotyledons, seeds, stem segments for 100 samples.

Extraction of DNA in *sea buckthorn* leaves   Apr 2022 - May 2022
Tutor: Professor Fangfang Fu in Faculty of Forestry, Nanjing Forestry University
- Extract DNA in *sea buckthorn* leaves with cetyltrimethylammonium bromide (CTAB) kit for 30 samples.

COURSE PRACTICES

Mathematical Modelling in Forest Resource Analysis in Vancouver, Canada   Nov 2023
Tutor: Professor Gregory Paradis in Faculty of Forestry, University of British Columbia
- Create BeanShell scripts to use Patchwork for mathematical modeling to make a forest resource management plan with real data from Mission Municipal Forest, addressing policy, cost, and sustainable needs.
- Package model inputs (BeanShell scripts, edited PIN file, and README) and outputs (ZIP archive of model results) along with a technical report.

Modelling for Decision Support in Vancouver, Canada   Nov 2023
Tutor: Professor Taraneh Sowlati in Faculty of Forestry, University of British Columbia
- Apply linear programming, sensitivity analysis and duality, integer programming, transportation and assignment models, network models (shortest path, minimum spanning tree, and maximum flow), and multi-objective and simulation (Monte Carlo Simulation) models to solve designed decision problems.

Forest Level Measurement and Productivity Practice in Vancouver, Canada   Apr 2023
Tutor: Professor Peter Marshall in Faculty of Forestry, University of British Columbia
- Apply Simple Random and Systematic Sampling, Stratified Random Sampling, Proportions and Line Intersect Sampling, Ratio and Regression Sampling, Sampling for Proportions, Double Sampling, and fitting models with ground sample data to solve designed sampling problems.

Coastal Field School in in Malcolm Knapp Research Forest, Vancouver, Canada   Apr 2023
Tutor: Professor Roeser Dominik in Faculty of Forestry, University of British Columbia
- Perform slope stability assessment, stream assessment, site assessment, stand assessment, and wildlife sign identification in assigned forest strata, and create a forest operation plan with oral defense.

Soil and Plant Analysis Practice in Xiashu Research Forest, Zhenjiang, China   May 2021
Tutor: Professor Huanchao Zhang in Faculty of Forestry, Nanjing Forestry University
- Collect soil and plant samples in Xiashu Research Forest, measure the amount of nitrogen (N), phosphorus (P) and potassium (K) in soil and plants, and submit a report on local soil nutrient condition.

EXTRACURRICULAR EXPERIENCE

Volunteer at Geneskool in Genome BC   Jan 2024 - May 2024
- Assist in hosting workshops and scientific seminars (TED-ED) within high school biological framework for teenagers in communities in Burnaby and Vancouver in British Columbia, Canada at appointed weekends.

UNITAR Global Competency Training Program   July 2022
- Study skills in negotiation, team leadership, effective feedback, self-awareness, public presentation, and conflict management, and ranked the first in the final skillset examination.

SKILLS

- Analysis skills: RNA-Seq Analysis: Raw data quality control, transcript assembly, quantification, differential expression analysis, and functional annotation and enrichment analysis.
- Programming skills: R, Linux , Python, DrRackets, Patchwork, QGIS.
- Language: Chinese (native), English (IELTS 7.0 in 2021).
- Field work: Certified in Standard First Aid & CPR/AED Level C with course-based fieldwork experience.
- Lab work: RNA extraction, cDNA synthesis, qRT-PCR.