

Postdoctoral Associate – Plant Biology and Nanotechnology

Location: Biology Department and Biotron Experimental Climate Change Research Centre, University of Western Ontario, London, Ontario, Canada

Category: Research

Group: Postdoctoral Scholar

Department: Biology

Duration: 1.5 years

Tenure: Full-time; Grant funded

Remuneration: \$52,600/annum. Information about PDA benefits at Western University is available at: https://www.uwo.ca/hr/benefits/your_benefits/pda

Deadline: Applications will be accepted for two weeks from the date of posting

Anticipated Start Date: April 15, 2024

Position Summary

This position seeks a scientist with interest in nanotechnology to resolve plant response to environmental stress. Specifically, this position seeks a postdoctoral associate who has experience with seed germination, or dormancy using different techniques such as priming, matricconditioning, hormones and nanotechnology. Any applications using these techniques for increasing seed germination, seedling vigor or stress tolerance during regular crop production, forest regeneration or reclamation is an asset.

The postdoctoral associate will have opportunities to conduct this work in the state-of-the-art Biotron Experimental Climate Change Research Centre, Department of Biology, University of Western Ontario, and the Northern Alberta Institute of Technology/Centre for Boreal Research and Canada's Oil Sands Innovation Alliance (COSIA).

About the Role

We invite applicants for a postdoctoral associate position to conduct research (Plant Biology and nanotechnology) in Dr. Raymond Thomas' Nootropic Foods Innovation, Brain Health and Lipid Bioinformatics Research Program and the Biotron Climate Change Experimental

Research Centre. The research program is multidisciplinary and focuses on application of lipidomics to assess climate resilient food systems, agricultural and nootropic food production, neurobiology/brain health validation, food/nutrient security, food system circularity, climate change mitigation, environmental stress biology, and boreal forest reclamation.

The Biotron Experimental Climate Change Research Centre at Western University is a unique, purpose-built facility housing specialized environmental chambers, laboratories and equipment dedicated to research in the fields of environmental sciences, biotechnologies, materials and biomaterials, and engineering. The Biotron is a keystone facility supporting research on biotic and abiotic processes in the environment and specializes in the simulation of natural environments at a range of scales.

Research Focus

The successful candidate will be responsible for research projects using nanotechnology to enhance plant performance in the boreal ecozone. The project goals will be to evaluate the effectiveness of nanoparticles in improving seed germination, dormancy, and broad-spectrum abiotic stress tolerance in native boreal plant species for use in forest reclamation or revegetation following resource mining.

Key Responsibilities

- Conceptualize, develop, and conduct experiments using the state-of-the-art methods from the scientific literature to develop technologies for resolving seed dormancy, low germination and induce broad spectrum stress tolerance in non-resource boreal forest species.
- Use nanotechnology and other innovative approaches to resolve seed dormancy, low germination or rate of germination and induce broad spectrum stress tolerance in non-resource boreal forest species used for forest reclamation or regeneration.
- Complete all research project objectives.
- Contribute to authoring reports, abstracts, poster presentations, peer-reviewed publications, and other relevant deliverables.
- Use a combination of microscopy, mass spectrometry, vibrational spectroscopy, and nanotechnology to interrogate plant samples.
- Data collection, analysis, interpretation, and presentation of results to technical, government, academic and industry partners.
- Prepare and review analytical output from experiments.

- Perform other duties as assigned within the scope of the position.
- Work collaboratively in a multidisciplinary research program with graduate students, research staff, academic, industry and government partners to cocreate new knowledge in plant stress biology and nanotechnology.

Qualifications

Education:

- A Ph.D. degree in biology, plant science, agricultural science, or similar discipline with a strong background in plant stress biology, nanotechnology, and reclamation.

Experience:

- Strong background in plant and/or agricultural science and use of nanotechnology in plant science.
- Research experience with plant stress biology and/or land reclamation.
- Experience with nano-priming and other seed priming technologies to resolve seed dormancy.
- Research on seed dormancy, germination, plant stress tolerance.
- Working with environmental or germination chambers or plant biomes to grow plants or conduct germination experiments.
- Experience with lipidomics or membrane lipids in stress biology and/or multimodal chemical lipid imaging is an asset.
- The ideal applicant will possess a curiosity and passion for science, and a talent for independent multidisciplinary research in life, medical or natural sciences. This should be supported by a strong publication record with at least two first authored publications in respected journals.

Required Skills:

- A strong understanding of research design, research methodology and data analysis.
- Understanding of multivariate biostatistics and associated analytical software (e.g., XLStat, R, OriginPro, MathLab etc.).
- Proficient in using MS Office (Word, Excel, PowerPoint, Outlook, Teams, SharePoint).
- Well-developed oral, written, and interpersonal communication skills in English.
- Ability to manage and prioritize workload responsibilities and timelines.
- Ability to work effectively under pressure and meet project deadlines.
- Must be able to work independently and in a collaborative team environment.
- Must be able to interact effectively with diverse stakeholders.

- Deep understanding and expertise in plant stress biology, seed dormancy and applications of nanotechnology to enhance plant performance (germination, growth, vigor, stress tolerance).
- Experience working with nanoparticles, nanopriming, seed priming, and hormones in breaking seed dormancy.

Preferred Skills:

- Understanding of lipid metabolism and lipidomics in plant stress biology or environmental stress.
- Different analytical techniques to identify, view or quantify nanoparticles in plant samples e.g., seeds or seedlings.
- Experience with multimodal chemical imaging using microscopy, vibrational spectroscopy and/or imaging mass spectrometry to view seed morphology, biomolecules, and applied nanoparticles.
- Experience with tandem mass spectrometry, confocal Raman microscopy/FTIR, and super-resolution microscopy (e.g., TEM, SEM, STED, SEM-Raman etc.).

Application Instructions

Interested applicants should submit the following documents to Dr. Adam Dempsey at adempse6@uwo.ca with the Subject *"Application: Postdoctoral Associate in Plant Biology"*:

- **Cover Letter including your academic interests, expertise and career goals**
- **CV**
- **One sample publication related to this area of research**
- **Applicants should include the names and e-mail addresses of three potential referees familiar with your academic work.**

Additional Contact Information

Dr. Raymond Thomas, Ph.D.

Professor and Western Research Chair

Director Biotron Experimental Climate Change Centre

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About Western

Western ranks as one of Canada's top research-intensive universities. From fundamental to applied discovery and other scholarly activities, its scholars advance knowledge that provides tangible benefits for the economic, social, health and cultural development of citizens in London, in Canada, and around the world. Western Research supports scholars through collaboration, communication, and service. Western University and its affiliate colleges received more than \$267 million in research funding over the past year.

Western Values Diversity

The University invites applications from all qualified individuals. Western is committed to employment equity and diversity in the workplace and welcomes applications from women, members of racialized groups/visible minorities, Indigenous persons, persons with disabilities, persons of any sexual orientation, and persons of any gender identity or gender expression. Accommodation is available for applicants with disabilities throughout the recruitment.
