Postdoc position in phytochemistry of plant-herbivore interaction

Research: We are an interdisciplinary team of bioinformaticians, chemists, and molecular biologists applying a metabolomics and multiomics approaches to identify molecular mechanisms underlying an interaction between the two-spotted spider mite (TSSM), *Tetranychus urticae*, and its host plants. TSSM is an extreme generalist with an outstanding ability to rapidly develop resistance to xenobiotic compounds. Our group developed genomic resources for TSSM, established robust RNAi-reverse genetics protocols, and derived mite strains with different degrees of resistence to *Arabidopsis* and tomato defense compounds. Our central questions are:

- What is the complexity and the identity of acaricidal plant defense compounds (focusing on *Arabidopsis* and tomato plants)?
- How mites detoxify plant defensive compounds?
- How mites evolve resistance to plant defensive compounds?

Within this project, we use genomics, cell biological, biochemical and genetic approaches, metabolomics, single-cell transcriptomics, and reverse genetic screens.

Key responsibilities: We are looking for a Postdoc with proven expertise in phytochemistry. The postdoctoral researcher will investigate targeted and untargeted metabolomics of plants and mites, and will isolate and identify target compounds, aiming at uncovering plant defense compounds and mite detoxification pathways. Core responsibilities include:

- Developing metabolite extraction and isolation protocols, including approach validation
- Isolation and identification of novel metabolites, including interpretation of NMR and mass spectra
- Working closely with the rest of the team to evaluate the quality and reproducibility of metabolomic measurements and analysis, and to integrate metabolomic data with other data (e.g. transcriptome, enzymatic activities, genetic analysis, etc.)
- Compiling data and conducting preliminary statistical analyses (e.g. PCA, univariate and multivariate testing, etc.)
- Presenting results to the team and to the wider scientific community
- Drafting manuscripts and publishing results in peer-reviewed journals
- Developing and implementing novel approaches when standard approaches are not sufficient

Requirements:

- PhD in natural products chemistry, analytical chemistry, biochemistry, or related field;
- Demonstrated experience in isolation and identification of natural products;
- Demonstrated experience in interpreting NMR and MS data for structural elucidation of natural products;
- Knowledge of plant metabolism, phytochemistry including both primary and secondary metabolites;
- Demonstrated hands-on experience in operating LC-MS instrumentation and in generating high quality targeted and untargeted, LC-MS based metabolomic data;
- Demonstrated experience in data deconvolution and filtering, data quality assessment, particularly mass-spectrometry data (e.g. LC-MS, MS2, etc.);
- Basic knowledge and understanding of statistical analyses and functional interpretation of

multi-omics data (e.g. principal components analysis, univariate/multivariate statistical methods, etc.);

- Strong verbal and written communication skills in English;
- Strong organizational skills and record keeping;
- Ability to work in a diverse and dynamic multi-disciplinary team and desire to acquire new skills as required for research studies;
- Ability to manage multiple research studies simultaneously;
- Knowledge of R is a plus;
- Excellent communication, presentation and writing skills;
- Strong ability to work in a team.

Our team

The successful candidate will join a team of PI's, postdocs and graduate students working on the identification and isolation of plant natural product and their modification in mites. This international collaborative project is funded through grants from the Province of Ontario, EU and the USDA. Our group is located in the Department of Biology and Faculty of Science at the Western University where a world-class staff and students work together in a dynamic international environment. The team has access to state-of-the-art technologies, including LCMS and GCMS instruments in our analytical suite and the state-of-the-art environmental facility – Biotron.

Terms and conditions

We offer a full-time, 2 year term position, with the possibility of renewal based on need, funding and performance. Salary is commensurate with experience and ranges from \$36,000 to \$48,000 per year. The terms and conditions of the employment are governed by the collective agreement (http://www.uwo.ca/humanresources/facultystaff/emp_agree/union_contracts/union_contracts_id x.htm and

http://www.uwo.ca/humanresources/facultystaff/comp/benefits/postdocassoc/index.htm).

Western is an equal opportunity employer. The employment will be carried out by the central administration of the Western University.

Please send your application as a composite pdf-file in English to <u>vgrbic@uwo.ca</u> and <u>bernards@uwo.ca</u>. Please include a letter of motivation with your research interests (also highlighting your suitability for the position), CV, and names and addresses of three referees.

Position is available immediately and will remain open until a suitable candidate is found.