Postdoc position: Subcellular trafficking and secretion of scent

Type: Post Doc
This contract is for 3 years
Start of the position May 2024
Affiliation : Laboratoire de Biotechnologies Végétales aux Plantes Aromatiques et Médicinales, Université Jean Monnet (UJM), St. Étienne, France
https://lbvpam.univ-st-etienne.fr/fr/index.html

Contact DRH: recrutementsujm@univ-st-etienne.fr

Contact Laboratory: sylvie.baudino@univ-st-etienne.fr

Application deadline: 25th of May, 2024

The BVpam laboratory

The BVpam laboratory (CNRS UMR 5079: Plant Biotechnology applied to aromatic and medicinal plants) of the University of Saint-Etienne studies plant volatile organic compounds (VOCs) from their biosynthesis to their ecological function with strong publication records[1-3](https://lbvpam.univ-st-etienne.fr/fr/index.html).

The proposed project

The project, based on an international collaboration between **BVpam** (Saint-Etienne, PI **Sylvie Baudino**) and **Purdue University** (PI **Natalia Dudareva**) involves several other French partners (IRHS Angers and Institut Fresnel Marseille) and is founded by ANR/NSF. Plants emit a diversity of VOCs that are important for reproduction and defense. Over the past decades, significant progress has been made in elucidating the biosynthesis of these VOCs but the mechanisms by which they are transported across the cell and released into the atmosphere remains largely unknown. The project partners have published pioneer studies including the active transport of VOCs across the plasma membrane[4], the role of flower cuticles in VOC emission[5], or the transport and perception of VOCs between floral organs[6-7]. The post-doc will study the role of lipid droplets (LDs) in the trafficking and secretion of VOCs in two plant species having distinct type of secretory cells: rose petals which emit VOCs in the atmosphere and glandular trichomes of pelargonium in which VOCs are stored. The candidate will employ cutting-edge genetic, biochemical and cell biology approaches to test the hypothesis of transport (or storage) of VOCs by LDs. The post-doc will use proteomic and transcriptomic analyses on purified LDs to identify genes involved in their formation and trafficking and will characterize the candidate genes by modern molecular biology methods. The candidate will develop a live-imaging method using cutting edge RAMAN spectroscopy coupled to

imaging, a unique method available at our French partner, to co-localize VOCs with LDs and follow their movement in flower petals and trichomes.

What we offer: We offer a one-year fellowship starting in Spring 2024 which can be extended for up to three years. The eligible candidate will work in a modern lab and will interact with our national and international partners.

The expected profile and how to apply:

PhD in plant molecular biology, plant biochemistry or plant cellular biology with a focus on plant specialized metabolism. General skills in molecular biology are mandatory. Experience in the study of plant metabolites, plant volatiles or lipid droplets are welcome. Experience with metabolomic, proteomic, transcriptomic and microscopy is a plus.

To apply, please send your detailed CV (Including list of publications and contact of two references) and a cover letter summarizing your research interests, experience and motivations to sylvie.baudino@univ-st-etienne.fr, caissard@univ-st-etienne.fr and benoit.boachon@univ-st-etienne.fr.

Selected publications of the lab

[1]Magnard, J. L. et al. Biosynthesis of monoterpene scent compounds in roses. **Science** 349 (2015). [2]Conart, C. et al. Duplication and specialization of NUDX1 in *Rosaceae* led to geraniol production in rose petals. **Mol. Biol. Evol.** 39 (2022). [3]Conart, C. et al. A cytosolic bifunctional geranyl/farnesyl diphosphate synthase provides MVA-derived GPP for geraniol biosynthesis in rose flowers. **PNAS** 120 (2023). [4]Adebesin, F. et al. Emission of volatile organic compounds from petunia flowers is facilitated by an ABC transporter. **Science** 356 (2017). [5]Liao, P. et al. Cuticle thickness affects dynamics of volatile emission from petunia flowers. **Nat. Chem. Biol**. 17 (2021). [6]Boachon, B. et al. Natural fumigation as a mechanism for volatile transport between flower organs. **Nat. Chem. Biol.** 15 (2019). [7]Stirling, S. A. et al. Volatile communication in plants relies on a KAI2-mediated signaling pathway. **Science** 383 (2024).