TT OPPORTUNITY

Université de Neuchâtel

Antioxidant production in plant

Opportunity on offer:

- Collaboration (Research and Feasibility)
- Co-development

Status

Expert **Know-how** in regulation of Vitamin K and E production pathways in plants

Details of the Opportunity

❑ Background

When exposed to high-energy light (e.g. UV) living organisms accumulate highly reactive oxygen species (ROS) in their tissues. If not contained ROS cause severe tissue damage and have long been recognised to contribute to tissue ageing and tumour progression.

To limit the damage caused by ROS, plants increase their levels of soluble antioxidants such as tocopherols (Vitamin E), phylloquinone (Vitamin K), and other prenylquinones which accumulate in lipid–based plastoglobules. The beneficial antioxidant effects can be harnessed in dermatological or nutraceutical products containing these plant-derived compounds.

❑ Technology

The University's plant physiology experts have a detailed understanding of the regulation and production pathways of Vitamin E and Vitamin K in plants and have hands-on experience in the manipulation of these pathways in Arapidopsis.

Specifically, the team can stimulate the accumulation of pro-vitamin K_1, Vitamin E as well as plastoquinone and plastochromanol in plastoglobules, which can be easily retrieved from plant extracts.

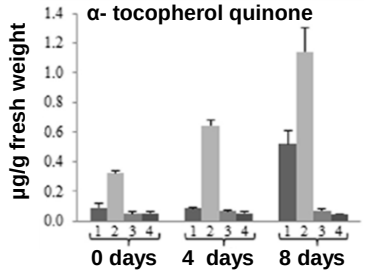

Figure: α- tocopherol quinone found in leaves of wildtype (1) and engineered (2, 3 and 4) *Arapidopsis* plants following 0, 4 and 8 days of high light stimulation.

❑ Development status

The method is at the experimental stage and we are presently looking for commercial partners to assist in the advancement of the plant-based production and extraction of overexpressed pro-vitamin K_1 and other prenylquinones from cultivated plants, algae or transgenic plants.

❑ Partner sought

To better adjust the method to different industry needs we are looking for industrial partners developing and retailing dermatological products, neutraceuticals, or food supplements.

❑ References:

- Spicher L and Kessler F: *«Unexpected roles of plastoglobules (plastid lipid droplets) in vitamin K_1 and E metabolism»*; Current Opinion in Plant Biology **2015**, 25:123-129;

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