

Transnational Access Report

1. General Information

Project Acronym (ID):	UV4information
Project Title	Using phenotyping to elucidate the role of UV radiation as a source of information for plants
Name of Group Leader	Aphalo, Pedro José
Name of organization	University of Helsinki, Department of Biosciences

2. Project summary (max. 250 words)

This project is part of ongoing research at my research group (SenPEP) at the University of Helsinki. The work is part of the PhD thesis research of Neha Rai and Yan Yan, and another PhD student Sari Siipola will co-author the resulting publication. The aim of the project is to study the role of UVB radiation as a source of information for preemptive acclimation to drought and more generally how molecular understanding obtained under controlled conditions in the model species *Arabidopsis* relates to the functioning and regulation of metabolism and development leading to acclimation under field conditions in species of commercial importance.

The specific work funded by EPPN directly contributes to understanding the consequences of using different experimental protocols on the apparent ability of *Arabidopsis* mutants to tolerate exposure to UVB and UVA radiation. It also, together with earlier experiments by our research group, contributes to understanding the role of UVA/Blue photoreceptors in acclimation to sunlight leading UVB tolerance of UVB exposure.

We have applied to the Academy of Finland for a four years research grant. The planned research includes further experiments at the solar simulation facility in Munich, with partial funding included in the budget.

3. Main achievements (max. 250 words)

Objective 1: study whether gene expression changes associated to drought tolerance can be triggered by UVA and UVB radiation and/or blue light, and which photoreceptors mediate the responses (UVB photoreceptor UVR8, and UVA/blue photoreceptors cryptochromes CRYs, and phototropins PHOTs).

Good samples obtained. PCRs and RNAseq not yet done. Four true replicates done in time.

Objective 2: test whether the *uvr8* mutants can grow in the sun simulator in the presence of UVB radiation, when exposed to UVB radiation since germination, and if the UVB daily pattern follows the natural gradual increase and decrease during the day.

*Done. The *uvr8* mutant survived and grew under long term exposure to UVB radiation (since germination). The realistic daily schedule of UVB irradiation centred on midday with gradual irradiance increase in the morning and gradual decrease in the afternoon had not been used in earlier similar experiments in the facility.*

Objective 3: compare the results obtained in the sun simulator to those from equivalent experiments in sunlight. *Same samples as for Objective 1 will be used for this. Samples have been collected. Lab work pending.*