Ph.D. projects in progress

1.

Mentors: László Kozma-Bognár and Anita Hajdu

Doctoral School: University of Szeged, Faculty of Science and Informatics, Doctoral School of Biology

Ph.D. student: Vivien Dóra Nyári

Title of the research topic: Identification and functional analysis of novel circadian clock mutants in Arabidopsis thaliana

Description of the research topic: Eukaryotic circadian clocks are oscillating gene networks, where the primary rhythm is generated at the level of transcription and is then adjusted by several additional mechanisms in order to keep the app. 24 h period. The proper pace/speed of the clock is essential to maintain synchrony with the environment. After performing a successful mutant screen, we identified mutations in two proteins pointing to novel regulatory modes of the plant circadian clock. The first protein is an ubiquitin protease removing ubiquitin moieties from proteins, including clock proteins. The specific mutation that we identified suggested that this function of the protease is regulated by phosphorylation. This hypothesis will be verified by the creating and analysing artificial derivatives fixed in the non/phosphorylated states. The other protein has a well-known general interacting domain at the N-terminal part, whereas the mutation we identified marks a plant specific domain at the C-terminus with a yet unknown function. We aim to reveal this function by determining the set of clock and non-clock genes/proteins that are directly or indirectly regulated by this protein and by describing the mechanism of this regulation.

2.

Mentors: Dániel Silhavy, András Viczián

Doctoral School: University of Szeged, Faculty of Science and Informatics, Doctoral School of Biology

Ph.D. student: Csaba Péter

Title of the research topic: Functional studies with the UVR8 photoreceptor

Description of the research topic: UV-B radiation (280-315 nm) is an integral part of the sunlight. To cope with the detrimental effects of UV-B on organic macromolecules plants developed sensory and defense mechanism. To coordinate this, UV RESISTANCE 8 (UVR8) photoreceptor perceives UV-B and orchestrates a signaling pathway,

which leads to UV-B specific photomorphogenesis and increased UV-B tolerance. This research program focuses on how different protein posttranslational modifications moderate plants UV-B responses via UVR8 signaling.