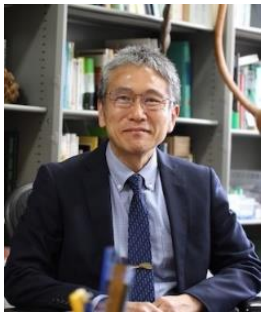
Katedra biofyziky UP Vás pozýva na prednášku:

Exploring biological questions by establishing new model plants

prof. Mitsuyasu Hasebe (National Institute for Basic Biology, Okazaki, Japan)

Seminar room in F2 building (F2.124), Holice campus, 28th May 2024, 10:00



Living organisms have evolved specific adaptive traits to thrive in various environments on Earth. However, these traits are not fully understood using previously established model organisms alone. To address this gap, we have sequenced genomes and developed genome editing techniques for several unique plant species. In our previous work, we focused on the moss *Physcomitrium patens* and identified the master regulator responsible for reprogramming fully differentiated leaf cells into stem cells (Ishikawa et al., 2019, Gu et al. 2020). The comparison between *P. patens* and flowering plants revealed the common cell-division mechanisms underlying the body plan in land plants (Ishikawa et al. 2023). Additionally, we studied the sensitive plant *Mimosa pudica*, revealing the adaptive significance of its unique seismonastic movement (Hagihara et al., 2022). Furthermore, we investigated the Venus flytrap *Dionaea muscipula*, uncovering the molecular mechanisms behind plant memory and rapid responses to mechanical stimuli (Suda et al., 2020). Moreover, we analyzed the development of carnivorous pitcher leaves in the Albany pitcher plant *Cephalotus follicularis* (Fukushima et al. 2017). We are now researching the generation and transmission of action potentials, which should be regulated differently from those in animals but have not been well explored in plants, with the sundew *Drosera rotundifolia*, *Dionaea muscipula*, and *Mimosa pudica*. In this presentation, I will provide a comprehensive summary of these studies with recent progresses, shedding light on the previously unexplored adaptive traits of living organisms.

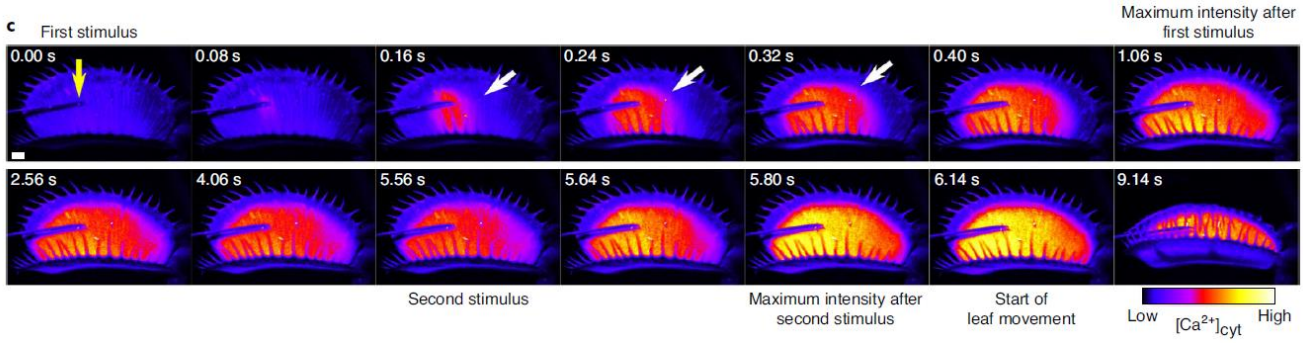


Fig. 1 Propagation of intracellular calcium wave $[Ca^{2+}]_{cyt}$ in response to trigger hair stimulation in the carnivorous plant Venus flytrap (*Dionaea muscipula*) transformed by calcium reporter system GCaMP6f (Suda et al., 2020).

References:

1. Ishikawa et al. (2019) Nature Plants 5, 681-690.
2. Ishikawa et al. (2023) PNAS 120: e2210632120.
3. Gu et al. (2020) Nature Plants 6, 1098-1105.
4. Hagihara et al. (2022) Nature Communications 13, 6412.
5. Suda et al. (2020) Nature Plants 6, 1219-1224.
6. Fukushima et al. (2017) Nature Ecology & Evolution 1, 0059.

Tešíme sa na Vašu účast!

Andrej Pavlovič