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Oral Communication Abstract – PH.04

AT THE EDGE OF THE GATE: DISCERNING THE GLUTAMATE RECEPTOR-LIKE LIGAND-BINDING ROLE IN PLANT SYSTEMIC RESPONSES

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Throughout their life plants being sessile organisms are continuously exposed to environmental challenges that need to be properly perceived and that require appropriate local and systemic responses. Systemic responses are mediated by long-distance signaling that require the activity of Glutamate Receptor-Like channels (GLRs). GLRs are homologs of animal Ionotropic Glutamate Receptors (iGluRs) which are ligand-gated cation channels in the central nervous system. Despite the fact that iGluRs are gated through the binding with glutamate, the mechanism throughout GLRs are activated is poorly understood. As an example, we still do not know if the GLRs binding of amino acids is necessary for their activity. Here, I report the setup of a reliable protocol to visualize long-distance calcium waves in flowers that are almost abolished in the glr3.3 KO mutant. In order to define the role played by the GLR3.3 amino acid-binding in the long-distance signaling, I took the advantage of the recently obtained crystal structure of the GLR3.3 Ligand Binding Domain (LBD) with the identification of the residues involved in the amino acid-binding. I, therefore, introduced single point mutations in the genome sequence of the GLR3.3 gene to prevent or abolish its amino acid-binding, and with the obtained constructs I complemented the glr3.3 KO. By performing calcium imaging analyses using the established protocol I will define, in vivo, the role of the GLR3.3 amino acid-binding in the long-distance signaling.