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Dominik Klauser did his PhD in the laboratory of Thomas Boller, supported by a grant of the Swiss National Science Foundation since September 2009. His main interest was in the concept of ”endogenous elicitors” or ”damage-associated molecular patterns (DAMPS)”. According to this concept, plants can sense imminent danger by microbes and other potential aggressors not only through the perception of ”microbe-associated molecular patterns (MAMPs)” or ”herbivore-associated molecular patterns (HAMPs)”, but also through perception of endogenous molecules, produced by the plant itself in response to cellular damage, which function as signals of danger. In Arabidopsis, a family of eight peptides has been discovered that may play this role, namely the peptides AtPep1 - AtPep8 (for Arabidopsis thaliana danger peptides).

Some of these AtPeps have been shown to be formed upon the detection of various biotic and abiotic stresses, and to be perceived by specific pattern recognition receptors, named Pep-Receptor 1 (PEPR1) and Pep-Receptor 2 (PEPR2). These receptors belong to the family of leucine-rich repeat receptor kinases, and they are closely related in structure to the receptors for MAMPs, such as the famous flagellin receptor FLS2, which perceives bacterial flagellin. When Arabidopsis cells or leaf pieces are exposed to synthetic AtPeps in an experimental setting, perception of the peptides by the PEPR receptors leads to a stereotypic defense response, the so-called pattern-triggered immunity (PTI). But what is the role and function of this endogenous danger-detection system in the real life of a plant? Is it important in defense against microbes, herbivores or viruses? Or does it have other functions as well?

Dominik tried to answer these questions in various collaborations within the Botanical Institute of the University of Basel and with entomologists and biochemists at the Institute of Biology, University of Neuchâtel.

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