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A renaissance of elicitors : perception of microbe-associated molecular patterns and danger signals by pattern-recognition receptors

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Microbe-associated molecular patterns (MAMPs) are molecular signatures typical of whole classes of microbes, and their recognition plays a key role in innate immunity. Endogenous elicitors are similarly recognized as damage-associated molecular patterns (DAMPs). This review focuses on the diversity of MAMPs/DAMPs and on progress to identify the corresponding pattern recognition receptors (PRRs) in plants. The two best-characterized MAMP/PRR pairs, flagellin/FLS2 and EF-Tu/EFR, are discussed in detail and put into a phylogenetic perspective. Both FLS2 and EFR are leucine-rich repeat receptor kinases (LRR-RKs). Upon treatment with flagellin, FLS2 forms a heteromeric complex with BAK1, an LRR-RK that also acts as coreceptor for the brassinolide receptor BRI1. The importance of MAMP/PRR signaling for plant immunity is highlighted by the finding that plant pathogens use effectors to inhibit PRR complexes or downstream signaling events. Current evidence indicates that MAMPs, DAMPs, and effectors are all perceived as danger signals and induce a stereotypic defense response.

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