

Signaling functions of extracellular ATP (eATP) in plants

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【日時】 2022年11月4日(金) 15:00 -16:15 (ハイブリッド開催)

【場所】 熱帯生物圏研究センター分子生命科学施設 1F講義室

【オンライン (ZOOM) 】 ID : 975 1544 4819 パスコード : 88j7Yi



A hybrid ZOOM seminar

November 4, 2022

15:00-16:15 @COMB Lecture room (+ZOOM)

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When we get hurt, our body signals our brain to warn us about stress and damage. We acknowledge the damage and then initiate the proper steps to heal. Part of this response to cellular damage is mediated by the release of ATP, which is then recognized by specific, plasma membrane receptors. In mammals, these receptors are P2X (ion channels) and P2Y (G-protein coupled receptors). A multibillion-dollar pharmaceutical industry exists to target drugs to this purinergic signaling pathway. For example, plavix (\$9 billion/year), which targets the P2Y₁₂ receptor to inhibit clotting and protect against heart attack and stroke. While it seems that virtually all organisms respond to extracellular ATP (eATP), not all have canonical P2X or P2Y receptors. In plants, for example, eATP is recognized by lectin-receptor like kinases (P2K1, P2K2), which mediate a variety of physiological processes. These include closure of leaf stomata to protect against leaf pathogens, induction of innate immunity responses, cell death and growth. Our laboratory was the first to identify plant receptors for eATP and we are busy elucidating the various components of the plant purinergic signaling pathway. This research has led us in many new directions, indicative of the wide variety of roles that eATP plays in plant physiology. However, work in this area is still somewhat new and, hence, it seems that many plant physiologists are unaware of the central importance of purinergic signaling. In my seminar, I will provide examples of this importance, emphasizing the relevance of eATP to understanding the basic biology of plants and, hopefully, encouraging others to explore the mechanisms of eATP action in plants and other organisms.