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Characterization Secreted Lipid Molecules Involved in the Apoplastic Accumulation of Shikonin derivatives

脂溶性二次代謝産物シコニンの細胞外蓄積に関与する分泌脂質分子の解析

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Plants synthesize a variety of organic compounds that contribute to adapt to the environmental stresses and the ecological niches. Lipophilic specialized metabolites often accumulate in extracellular spaces and function as barrier to biotic and abiotic stresses. It is, however, largely unknown how these lipophilic metabolites are secreted into the extracellular spaces. Shikonin derivatives produced by Lithospermum. erythrorhizon are a suitable model system for investigating the transport mechanism of plant lipophilic metabolites. These red pigments are synthesized in the root epidermis and secreted into the apoplastic space and thus thought to serve as a chemical barrier for plant roots. In an attempt to understand the transport and accumulate mechanisms of these compounds, we analyzed the cultured cells and hairy roots of this plant by electron microscopy, which suggested that the secreted shikonin derivatives form droplet structure with a membrane. Moreover, we analyzed lipid extracts of L. erythrorhizon cultured cell using the LC-MS-based lipidomic platform. In the meeting, we will report these analysis data. This study is supported in part by NEDO in Japan.