

“THE ROOT EXTRACELLULAR TRAP: A KEY INTERFACE BETWEEN ROOTS AND ENVIRONMENTAL STRESSES”

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Abstract text: Root tips represent a critical interface between plants and the soil environment. We previously highlighted the role of root cap-derived cells (AC-DCs) in root responses to pathogens [1]. These cells are released from the root cap and remain embedded in a thick mucilage, forming a complex structure that we termed the Root Extracellular Trap (RET), by analogy with the Neutrophil Extracellular Trap (NET) described in mammals. In legumes such as *Pisum sativum* and *Glycine max*, the RET has been reported to either repel or trap microorganisms, acting as both a physical and biochemical barrier that protects the root tip. More recent studies have shown that osmotic stress also impact the RET structure with an increase in mucilage release. In RET, mucilage consists of a network of polysaccharides, extracellular DNA, and hydroxyproline-rich glycoproteins. Arabinogalactan proteins (AGPs) are promising candidates contributing to the protective functions of the RET. However, key questions remain: what is the precise mode of action of AGPs in regulating RET functional properties under environmental stress? Do AGPs influence interactions between roots and the rhizosphere? Addressing these questions could provide new perspectives for improving plant resilience to environmental stresses.

[1] Driouich et al; (2024) Curr Opin Plant Biol.82:102656.