

RhizosPHARE

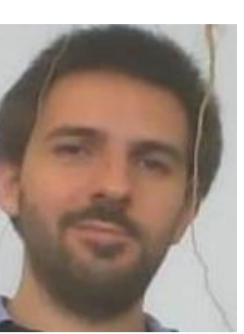
An interdisciplinary network dedicated to the understanding of the rhizodeposits-mediated communication between roots and soil organisms



Further Information



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WHAT IS RHIZOSPHERE?

- A French interdisciplinary scientific network
- Created by INRAE (the French National Research Institute for Agriculture, Food and Environment)
- To better understand the communication between roots and living soil organisms, mediated by rhizodeposits and microbial exudates and highlights their importance for plant and soil health.

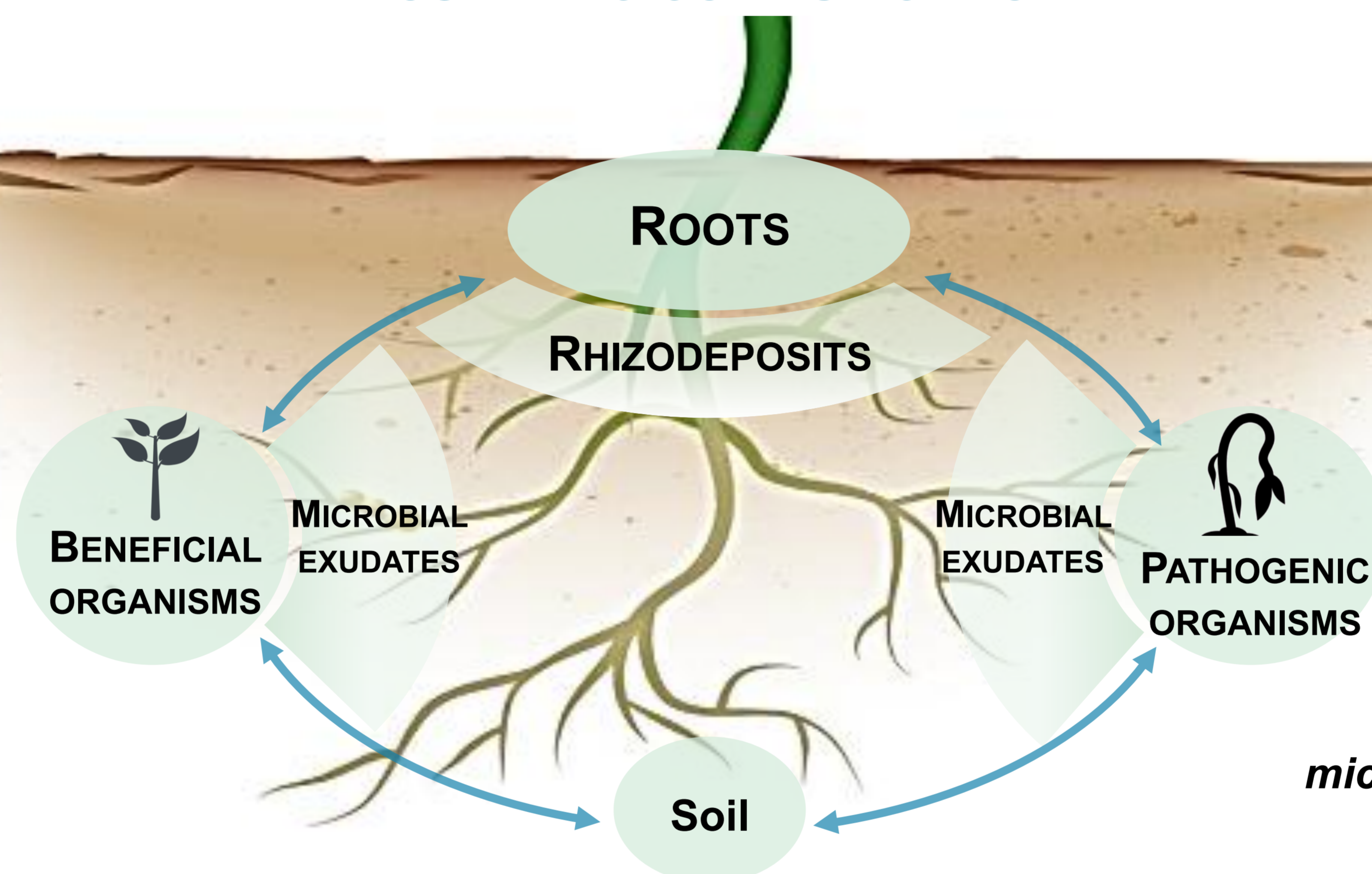
WHY WORKING TOGETHER ON RHIZODEPOSITS AND RHIZOSPHERIC BIOTIC INTERACTIONS ?

- Plants, pathogenic and beneficial soil organisms form dynamic associations in constant interactions, mutually influencing one other, and affecting plant health and soil functions.
- Rhizodeposits (any organic material released by roots into the soil over plant's life) directly shape the communities of organisms surrounding roots, influence plant development and plant susceptibility to biotic and abiotic stresses. However, the function, nature, and mode of action of rhizodeposits remain poorly understood.
- It is crucial to elucidate the principles and complexity of this communication in the soil and to establish a functional relationship between the nature of rhizodeposits and the regulation of biotic interactions in the rhizosphere

SCIENTIFIC QUESTIONS

- ? Which root traits are involved in rhizospheric communication?
- ? Does the plant always benefit from rhizodeposition?
- ? How are root signals perceived by soil organisms?
- ? How do the distribution and nature of the exudates vary along the root and over time?
- ? How do soil properties influence rhizospheric communication?
- ? What is the influence of one plant on the composition of the neighboring plant's rhizodeposits?

RHIZOSPHERIC COMMUNICATION



? What are the biotic and abiotic mechanisms regulating rhizospheric communication?

? Which root-derived compounds can guide pests and/or promote hatching?

? How do rhizodeposits influence soil organisms?

? How to disentangle the roles of microbial exudates vs root exudates?

? How does the exudation influence the soil health?

? What is the impact of soil quality on rhizodeposition?

AN INTERDISCIPLINARY NETWORK

DISCIPLINES AND SKILLS AREAS

MICROBIOLOGY Modelling GENETICS
 BIOCHEMISTRY METABOLOMICS STATISTICS
 IMAGE ANALYSING RHIZODEPOSITS Chemistry
 CHEMICAL ECOLOGY EXUDATE HARVESTING
 BIOPHYSICS Bio(geo)chemistry PHENOTYPING
 PHYSIOLOGY ECOPHYSIOLOGY

ACTIONS



- Build a French interdisciplinary scientific community.
- Organize annual scientific meeting (2019, 2020, 2024, 2025 ...) and regular themed webinar (exudates harvesting, metabolomic analysis, molecular communication ...)
- Favor the sharing of expertise, methods and material

- ➡ To promote interdisciplinary approaches, overcome barriers and develop new concepts in plant health and adaptation to environments
- ➡ To build collaborative projects around new research questions and international collaborations

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