Microbes meet Structure Soil Ecology in Microengineered Soil Chips

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Microfluidic chip technology





Design drawn in AutoCAD



Cleanroom outfit

Aleklett et al. & Hammer 2018 ISMEJ

Soil chips can be used to study different aspects of the soil ecosystem:



Manipulating microbial interactions

Aleklett et al. & Hammer 2018 ISMEJ

Soil chips allow us to simulate a soil's pore space system and study the influence of its structures on soil microorganisms and functions.

Chips can be inoculated with lab strains or with whole soil ecosystems, to study e.g. fungal behavior (Aleklett et al. under review), microbial interactions and feedbacks to the microhabitats (Mafla et al. under review), organic matter cycling (Arellano et al. under prep.), food web interactions, or the effects of drying and rewetting at micrometer scale.

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We are currently developing the chips further to simulate chemical heterogeneity and allow chemical analysis within.

The chips act like a window into the soil, and have besides scientific value also a great potential to bring soils closer to people and hopefully increase engagement in soil health conservation.

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