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IN BRIEF

ENVIRONMENTAL MICROBIOLOGY

Limited diffusive fluxes of substrate facilitate coexistence of two competing bacterial strains

Dechesne, A., Or, D. & Smets, B. F. *FEMS Microbiol. Ecol.* **64**, 1–8 (2008)

Soil is considered to be one of the main reservoirs of microbial diversity, as there are estimated to be 10^4 different microbial species in 1 gram of surface soil. Arnaud Dechesne and colleagues were interested in how this diversity is maintained. Previous work had suggested that in unsaturated soils, low solute diffusivity might have a role in limiting bacterial competition. Dechesne *et al.* developed a simple experimental model, based on a modified Petri dish, to investigate this hypothesis. This system allows the diffusive flux of substrates to be controlled independently while competing bacterial populations are directly observed under the microscope. They found that in liquid culture the fast-growing *Pseudomonas fluorescens* strain KT2440 could out-compete the slower-growing *P. fluorescens* F113 strain. However, in the model system, when the strains were grown on solid media and the diffusive flux of substrate was decreased, this competitive advantage disappeared and the two strains could coexist. The limited diffusive flux of substrates could therefore explain why isolates that are unable to coexist under standard laboratory conditions are able to coexist in soil.

MALARIA

A malaria parasite formin regulates actin polymerization and localizes to the parasite–erythrocyte moving junction during invasion

Baum, J. *et al. Cell Host Microbe* **3**, 188–198 (2008)

The malaria parasite and other apicomplexans move using a form of motility that is known as gliding motility and is actomyosin-based. Actin polymerization and actin-filament turnover are known to be essential for this motility, but how these processes are controlled in apicomplexans is unknown. In eukaryotes, formins have been shown to be actin nucleators, and previous microarray analysis had indicated that *Plasmodium falciparum* produces two formin proteins. Baum *et al.* confirmed that both these proteins are expressed during the erythrocytic stages of the parasite's life cycle. Immunofluorescence analysis showed that PfFormin1 localizes at the apical pole of free merozoites. Further immunofluorescence combined with phase-contrast microscopy revealed that, during invasion, PfFormin1 co-migrates with the moving tight junction that is formed between the merozoite and the host erythrocyte and is thought to be the location of the actinomyosin motor. This effect was also observed with the *Toxoplasma gondii* homologue of PfFormin1. Finally, *in vitro* analysis demonstrated that PfFormin1 is a potent nucleator of filamentous actin. The authors conclude from these results that formins are key regulators of apicomplexan cell motility.