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### Inferring Natural Symbiotic Relationships Using Experimental Evolution

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# INFERRING NATURAL SYMBIOTIC RELATIONSHIPS USING EXPERIMENTAL EVOLUTION

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The symbiosis between *D. discoideum* and *Burkholderia* is fairly complex, where sometimes *Burkholderia* behaves antagonistically towards *D. discoideum* and other times mutualistically. It is still unclear though the extent to which these lab-observed interactions are present in nature, and how beneficial or harmful they actually are. Here, the goal is to try to infer mutualistic and antagonistic adaptations that would be found in wild strain pairs of the two species. This is done by isolating strains of the bacteria from their naturally occurring *D. discoideum* hosts, and experimentally evolving each on their own. Then using phenotypic assays where the newly evolved subjects are reunited and factors reflecting their symbiotic relationship are analyzed, the resulting level of toxicity of *Burkholderia* towards *D. discoideum* is measured. Early results so far show different strains of *Burkholderia* demonstrating opposite symbiotic effects, (where one seemed to evolve to become more toxic in isolation suggesting an initially more mutualistic relationship, and another evolving to become less toxic suggesting an initially more antagonistic one). Once more strains are analyzed, it will be interesting to conduct further studies with the experimentally evolved strains, and hopefully reveal more about this complex host-microbe interaction.