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Burkholderia Bacteria are Genralist Invaders of Distantly-Related Social Amoebae that Sometimes also Establish Cooperative Farming Interactions

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Toward a Better Understanding of...

Burkholderia Bacteria Are Generalist Invaders of Distantly-Related Social Amoebae that Sometimes also Establish Cooperative Farming Interactions

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One of the big surprises in studies of life is how many of an organism's traits come not from itself but from the microbes it harbors. These relationships can be both beneficial and disadvantageous. Examples include how *Rhizobia* bacteria can perform nitrogen fixation for its legume host and how *Salmonella* bacteria can infect the small intestines of mammals and cause disease. This discovery is still revolutionary, and it is not always known whether host-symbiont relationships are generalizable or specific. Recently, the social amoeba *Dictyostelium discoideum* was discovered to have a symbiotic relationship with *Burkholderia* bacteria. Previous work has shown that colonization with certain *Burkholderia* species causes *D. discoideum* to carry not only *Burkholderia*, but other bacteria as well in a stable association. What is unclear is if this symbiotic relationship expands beyond the *D. discoideum* species boundary. To test this, we are colonizing five other *Dictyosteliacea* species of which *D. discoideum* is a member. We will use two symbiontic *Burkholderia* isolates from each of three different *Burkholderia* species known to form stable associations with some clones of *D. discoideum* and then passage them to determine if this new association is stable. We are also testing to see if colonization affects the fitness of Dictyostelids. We measure fitness as the total spores produced by a Dicyostelid clone. We have already performed this experiment on two members of *Dictyosteliacea*: *Dictyostelium mucoroides* and *Polysphondylium violaceum*. We found that both are able to carry *Burkholderia* and that this carriage decreases the fitness of both strains. This means that the ability of *Burkholderia* to invade other species exists, but that the cooperative aspects of the interaction have not evolved.