

**Title : Liquid *C. elegans* culture for the study of *Burkholderia* pathogenesis**

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**Abstract :**

The nematode *C. elegans* has been adopted as a key model system for the study of bacterial pathogenesis. The practical benefits of this system are notable: ease of culture technique, minimal cost, and well-characterized host genetics. Because the same mechanisms of bacterial virulence are often utilized in multiple, often widely divergent host species, inferences from the nematode model may also prove significant in more complex host models. Thus, *C. elegans* culture may serve as an efficient gateway to more intricate methods, but a few limitations exist. First, bacterial virulence has typically been quantified on solid agar surfaces, allowing highly motile nematodes to simply avoid the pathogen. Second, nematodes are typically reared on a favored prey bacterium like *E. coli*, which then persists as a contaminant in each assay. We have developed a method that eliminates these concerns and allows the study of *Burkholderia* infection in pure liquid *C. elegans* cultures, in which each competitor is the primary carbon source for the other. Both competitors are grown separately in liquid culture and inoculated together in multiwell plates, and growth of each is assayed over the following seven days. Replicate assays of a given bacterial isolate have proven highly reproducible, and suggest that representatives of *B. cenocepacia* strain PHDC are among the more pathogenic to the nematode of isolates tested from this species. In addition, final bacterial virulence also appears affected by the growth phase of the initial inoculum, log-phase cultures being less lethal and early stationary-phase cells being more lethal. Because worm death correlates with the production of biofilms in the gut, the longer duration of these assays may potentially allow a more precise dissection of this and other essential processes for establishment of infection.

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