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Swimming Patterns of Zoospores

Abstract

Oomycetes are a group of pathogens that cause many destructive diseases in animals and plants. One species in particular, *Phytophthora Infestans*, is perhaps the most well known and is responsible for the potato late blight disease. It was the cause of the infamous Irish potato famine in the 1880s and remains a significant global problem with associated costs estimated at \$3 billion annually. Key to the success of this pathogen is the dispersal of free-swimming cells called zoospores. A poorly understood aspect of zoospore behaviour is auto-aggregation — the spontaneous formation of large-scale patterns in cell density. Current competing hypotheses suggest that these patterns are formed by one of two distinct mechanisms: chemotaxis and bioconvection. In this talk we present mathematical and experimental results that together provide strong evidence that auto-aggregation can only result from a combination of these mechanisms, each having a distinct, time-separated role.