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Swimming Patterns Of Zoospores

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 blight disease. This causes severe economic damage estimated at 3 billion per annum. The epidemic spread of the disease is primarily based on rapid dispersal from host to host by free-swimming zoospore cells. These are single-nucleated, wall-less cells that are released only into aqueous environments. Zoospores exhibit a variety of tactic responses to their environment to locate suitable infection sites. We have begun to model this process using a PDE chemotaxis model of Keller-Segel type and in this talk we show that this approach captures some general behaviour seen in experiments. We will also discuss the existence of solutions to these equations and the metastability of such solutions.