# Pseudomonas aeruginosa evades predation by Myxococcus xanthus

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Multidrug-resistant *Pseudomonas aeruginosa* causes an estimated 32,600 hospital-acquired-infections and 2,700 estimated deaths in the US in 2017(CDC). *Myxococcus xanthus* is a strain of myxobacteria that preys on *Pseudomonas sp*, through the production of antibiotics and digestive enzymes. In previous experiments, *P. aeruginosa* evaded predation, through an unknown mechanism. Using confocal microscopy, this research investigates if quorum sensing, a cell density-dependent signaling pathway, could be a factor in motility and evasion of *M.xanthus*. Liquid suspensions of log-phase PA01 were dyed with two fluorescent dyes: SYTO 9 for marking live cells and Propidium iodide (PI) for marking dead cells. Images were captured using the Zeiss Axio Observer Confocal Microscope. The single-cell assays consisted of a single, mixed spot (2μL of predator and prey suspension) while the spot predation assays consisted of a spot of each bacteria placed 2 mm apart. Single-cell assays included equal concentrations of 2×10^8 cell per mL for both strains, and the spot predation assay's contained 2×10^6 cell per mL DK1622 and 2×10^7 cell per mL PA01. When observing the single-cell assays with equal bacteria concentrations, researchers observed numerous instances of individual myxobacteria cells being able to penetrate micro-colonies of PA01 and consume prey, leaving behind a red fluorescent tunnel or trail. When concentrations of prey were 10 times greater than those of predators, researchers observed swarms of PA01 moving both away from and towards the myxobacteria, in many cases surrounding the predatory species.