

Phagocytic processes in *Tetrahymena pyriformis*

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Phagocytosis is a fundamental process of heterotrophic protists yet little is known about how different prey are recognized. If the process is akin to non-opsonised phagocytosis in macrophages, then two families of receptors could be involved, i.e. C-type lectins (CLs) and Scavenger receptors (SRs). Blocking CLs reduces Live prey uptake in both protists and macrophages (no data on Dead prey uptake). Blocking SRs reduces Dead prey and microsphere uptake in macrophages (mixed opinions on Live prey uptake; no studies on protists).

This study is examining the role of CLs and SRs in the uptake of Live, Dead and inert prey by the ciliate *Tetrahymena pyriformis*. Initial experiments have compared prey uptake, and phagosome formation, when prey were presented alone and in 50:50 mixtures. Prey were 0.5µm diameter fluorescently-labelled microspheres and 9 bacterial strains either live (expressing the red-fluorescent protein) or heat-killed-DTAF-stained. The ciliate fed for 5 min before fixing and determining the number of prey/cell, vacuoles/cell and prey/vacuole.

The significant ($P < 0.05$) findings were: (i) ingestion of microspheres, Dead and Live cells alone led to *ca.* 2, 3 and 4 phagosomes/cell (*ca.* 20, 37 and 42 prey/cell), respectively (*T. pyriformis distinguishes between the three prey*). (ii) When Dead or Live cells were mixed with microspheres, vacuole formation remained at 3 and 4 phagosomes/cell, respectively (*Vacuole formation was governed by the cells, not microspheres*). (iii) In the Dead/microspheres mixture, ingestion rates were equivalent to those alone (*No interference suggests different recognition mechanisms*). (iv) In the Live/microspheres mixture ingestion rates of both were higher compared to those alone (*A synergistic interaction on ingestion*). (v) In the Live/Dead mixture ingestion rates of both, and vacuole formation, were higher than in isolation (*A synergistic interaction on both ingestion and vacuole formation*). Work is now evaluating these trends when CLs and SRs are blocked.