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Laser traps shed light on infection defenses

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A new technology that mimics the suspension of white blood cells in blood in the body is reported online this week in *Cell Research*. The novel joystick-controlled laser traps that the authors use provide valuable new information on how white blood cells engulf bacteria - a crucial part of the body's defense against infection.

Hiroshi Kubo and colleagues use an innovative new system to investigate how neutrophils - which account for 70% of all white blood cells - ingest microorganisms. The new system mimics the situation in the body better than previous studies, which used white blood cells that are stuck to a surface (adherent cells).

Two laser traps were used: one to hold the neutrophil and another to hold a protein-coated bead that mimics a bacterium marked for ingestion. Using a joystick to control the laser trap, the bead was presented to the neutrophil. The authors found that the laser-suspended neutrophils extended parts of the cell membrane (pseudopodia) towards the bead before being ingested, unlike the adherent cells in previous studies where they ingested the similarly coated particle without pseudopodia forming.

In his accompanying Research Highlight, Maurice Hallett comments that the new system promises 'a new wave of advances' as other labs take up this technology.

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