

# Phagocytosis study: surprising discovery

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University of California-Santa Barbara scientists say they've made a surprising discovery: phagocytosis depends more on particle shape than size.

The research has far-reaching implications for immunology, vaccine development and drug delivery, said Samir Mitragotri, a professor of chemical engineering, and graduate student Julie Champion.

Phagocytosis, a key part of the body's immune system, depends on macrophages, which find and frequently remove particles from the body. The UCSB scientists said previous studies were performed only with spherical samples because it was presumed size was the main issue in phagocytosis.

The researchers used macrophages from alveolar rat tissue and developed polystyrene particles of various sizes and shapes as model targets. Scanning electron microscopy and time-lapse video microscopy were employed to study the action of the macrophages when presented with targets of varying shapes.

Mitragotri said the discovery might eventually allow researchers to design drug carriers that can be purposefully retained by the body for a longer period of time, or help create vaccines that would be quickly removed to stimulate a rapid immune response.

The study appears online in the Proceedings of the National Academy of Sciences and will be published in print March 28.

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