

Neutrophils 'vacuum' microbes away from the brain

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Researchers from the University of Maryland, College Park, and Nanjing Medical University, China, have discovered a new way that white blood cells (neutrophils) defend our brains from infection—they move the microbes from our brains' blood vessels or vasculature so they can be disposed elsewhere instead of just killing them at the site of infection. The final version of the report appears in the March 2016 issue of the *Journal of Leukocyte Biology*.

"We hope our study opens a new field by using in vivo imaging to investigate how white [blood cells](#) interact with microbes in the [brain](#), providing the scientific basis for targeting [white blood cells](#) as preventive and therapeutic interventions in brain infections," said Meiqing Shi, D.V.M., Ph.D., a researcher involved in the work from the Division of Immunology, Virginia-Maryland Regional College of Veterinary Medicine at the University of Maryland in College Park, Maryland.

To make their discovery, the University of Maryland and Nanjing Medical University scientists used a form of microscopy, known as intravital microscopy, to visualize in mice the dynamic interactions of neutrophils with *C. neoformans* arrested in the brain microvasculature. This process enabled the observance of events in real time in living animals. They found that a therapeutic strategy aimed at enhancing the accumulation of neutrophils could help prevent cryptococcal meningoencephalitis.

"New technologies, including the ability to microscopically visualize and

watch the behavior of germs and [immune cells](#) in living tissues, are revolutionizing our understanding of infections and other diseases," said John Wherry, Ph.D., Deputy Editor of the Journal of Leukocyte Biology. "These new studies that demonstrate the ability to neutrophils to move dangerous germs away from the brain makes us rethink the coordination in the immune response since these cells were previously thought to simply be soldiers killing germs wherever they found them."

More information: M. Zhang et al. Real-time in vivo imaging reveals the ability of neutrophils to remove *Cryptococcus neoformans* directly from the brain vasculature, *Journal of Leukocyte Biology* (2015). [DOI: 10.1189/jlb.4AB0715-281R](#)

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