

# The Immunology of Blood: Unlocking the Drivers for Neurodegeneration

## December 1

Tuesday, 12:30pm

Live Webinar  
via Zoom Conference



**Speaker: Katerina Akassoglou, Ph.D.**  
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Director, Gladstone Center for In Vivo Imaging Research  
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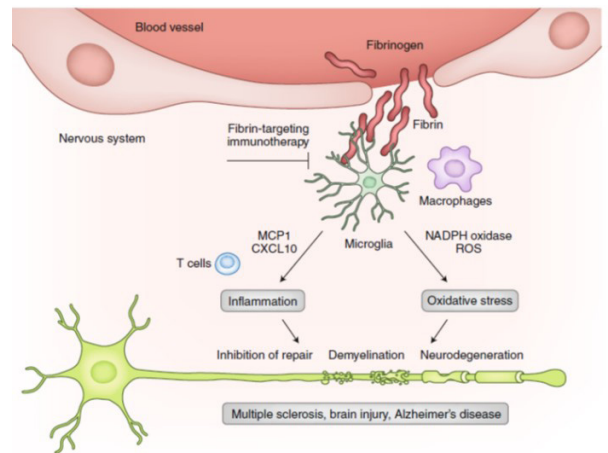
**Host: Edmund R. Hollis II, Ph.D.**

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## Abstract

The communication between the brain, immune and vascular systems is a key contributor to the onset and progression of neurological diseases. The Akassoglou lab identified the coagulation factor fibrinogen as a blood-derived driver for neuroinflammation in a wide range of neurologic diseases, such as multiple sclerosis, Alzheimer's disease and brain trauma. Her lab showed that fibrinogen is necessary and sufficient for neurodegeneration and a new culprit for microglia-mediated oxidative stress-dependent spine elimination and cognitive impairment. By developing Tox-Seq, her lab reported the oxidative stress innate immune cell atlas in neuroinflammation. Her lab developed cutting-edge imaging tools to study the neurovascular interface and a first-in-class fibrin-targeting immunotherapy to selectively target inflammatory functions of fibrin without interference with clotting with efficacy in autoimmune- and amyloid-driven neurotoxicity. These findings could be a common thread for the understanding of the etiology, progression, and development of new treatments for neurologic diseases with neuroimmune and cerebrovascular dysfunction.



1. Akassoglou, K. The immunology of blood: Connecting the dots at the neurovascular interface. *Nat Immunol* 2020, 21:710-712.
2. Mendiola AS, Ryu JK, Bardehle S, Meyer-Franke A, Ang K, Wilson C, Baeten KM, Hanspers K, Merlini M, Thomas S, Petersen MA, Williams A, Thomas R, Rafalski VA, Meza-Acevedo R, Tognatta R, Yan Z, Pfaff SJ, Machado MR, Bedard C, Coronado PER, Jiang X, Wang J, Pleiss MA, Green AJ, Zamvil SS, Pico AR, Bruneau BG, Arkin MR, Akassoglou K. Transcriptional profiling and therapeutic targeting of oxidative stress in neuroinflammation. *Nat Immunol* 2020, 21:513-524.
3. Merlini M, Rafalski VA, Rios Coronado P, Gill MT, Ellisman M, Muthukumar G, Ryu JK, Syme CA, Davalos D, Seeley WW, Mucke L, Nelson RB, Akassoglou K. Fibrinogen Induces Microglia-Mediated Spine Elimination and Cognitive Impairment in an Alzheimer's Disease Model. *Neuron* 2019, 101:1099-1108.