Chapman University Researcher, Dr. Rachita Sumbria, Plays a Key Role in Groundbreaking Study on Brain Hemorrhages

ORANGE, CA, USA, November 28, 2023 /EINPresswire.com/ -- A groundbreaking study co-authored by Rachita Sumbria, associate professor in the Chapman University School of Pharmacy, has uncovered a new contributor to the formation of brain hemorrhages. Contrary to previous beliefs that such hemorrhages were solely linked to blood vessel injuries, the research reveals that increased interactions between aged red blood cells and brain capillaries can lead to brain microhemorrhages. This discovery not only enhances new understandings of the mechanisms behind these microhemorrhages but also opens up new possibilities for therapeutic targets in treatment and prevention.

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>
> *Rachita Sumbria*

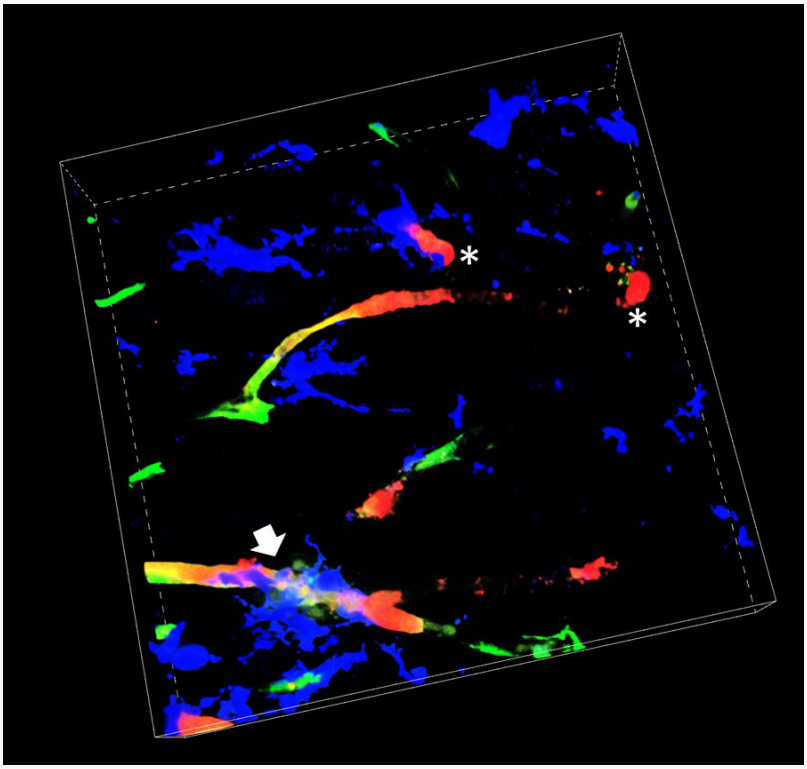
Published online in the Journal of Neuroinflammation, the study details how aged red blood cells stall in brain capillaries of mice, leading to cerebral microhemorrhages. Increased red blood cell stalling in brain capillaries was associated with activation of the immune cells of the brain and brain microhemorrhages in the absence of brain capillary rupture.

“The recent work is a culmination of experiments that we started about a decade ago using cell culture systems. We showed for the first time that brain endothelial cells are capable of engulfing aged/stressed iron-rich erythrocytes, a process known as brain endothelial erythrophagocytosis, and the recent collaborative work shows this process in mice”, Sumbria, co-corresponding author, said.

Rudy Chang, co-first author and Ph.D. student at Chapman University, started the foundational work leading to the current study with Rachita Sumbria and University of California, Irvine (UCI) researcher, Dr. Mark Fisher. The team, which was also led by UCI researchers, Drs. Mark Fisher and Xiangmin Xu, conducted experiments by injecting aged red blood cells into mice and tracking their interactions with the brain capillaries in real-time followed by postmortem imaging.

“Our findings show that age-related changes to erythrocytes, and how erythrocytes interact with the brain capillaries, are important underlying factors contributing to brain microhemorrhaging. This represents a novel mechanism distinct from the traditional view of a blood vessel rupture as the cause of brain microhemorrhages,” Sumbria said.

The study, funded by the National Institute on Aging and the National Institute of Neurological Disorders and Stroke, marks a significant advancement in the understanding of brain microhemorrhages and offers potential avenues for innovative approaches to their treatment.



Confocal imaging of postmortem mouse brain section showing aged red blood cells in red, brain capillaries in green, and brain immune cells (microglia) in blue. Asterisks show red blood cells that have migrated into the brain tissue and arrow shows microgl

About Chapman University:

Founded in 1861, Chapman University is a nationally ranked private university located in Southern California. Chapman is categorized by the Carnegie Classification as an R2 “high research activity” institution and offers personalized education to more than 10,000 undergraduate and graduate students. The campus has produced a Rhodes Scholar, been named a top producer of Fulbright Scholars, and hosts a chapter of Phi Beta Kappa, the nation’s oldest and most prestigious honor society. Based in the city of Orange, Chapman also includes the Harry and Diane Rinker Health Science Campus in Irvine. In 2019, the university opened its 11th college, Fowler School of Engineering, in its newest facility, Keck Center for Science and Engineering. Learn more about Chapman University: www.chapman.edu.

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