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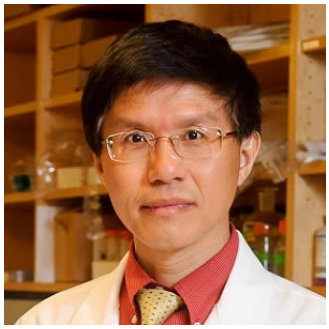
Imaging Technique Shows Stroke Damage



Ischaemic strokes account for nearly 90 percent of all strokes, as reported by the American Heart Association. Researchers at the University of Missouri School of Medicine have now developed a new, real-time method of imaging molecular events after strokes. This could potentially lead to improved care for patients.

"During an ischaemic stroke, harmful enzymes called gelatinase become overactive in areas of the brain where blood flow is cut off," said Zezong Gu, Ph.D., an associate professor of pathology and anatomical sciences at the MU School of Medicine and lead author of the study. "Over-activation of these enzymes causes brain damage. Our team hypothesised that if we could visualise and track this activity in real-time, we could then work on developing a way to block the activity and prevent brain damage from occurring."

MRI is already used often to diagnose strokes as it produces precise, sectional images of the brain. However, these images can only verify the region of arterial blockages within the brain but are not specific or sensitive enough to reveal important molecular events such as gelatinase activity.

In order to overcome this hurdle, the researchers used peptides that could specifically recognise gelatinase activity. These peptides were tagged with contrast agents through a process originally developed by research team member Roger Tsien, Ph.D., a biochemist and Nobel Laureate at the University of California, San Diego. Once these peptides travelled to the site of increased gelatinase activity, they were absorbed into the cells along with the activated enzyme. When enough peptides were absorbed, the stroke site became more visible on the MRI and could allow tracking of gelatinase activity.

This method could thus lead to a better understanding of how to treat strokes and mediate their damage and can be used as a non-invasive probe to detect gelatinase activity.

Source: University of Missouri - Columbia

Image Credit: University of Missouri - Columbia

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