The key to minimizing health risks associated with aging

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Researchers hope developing therapies that target CD47 will significantly reduce the impact these health issues have on older individuals and health systems globally.

During old age, some of the body's most important functions, like the formation of new blood vessels, blood flow and metabolism deteriorates. The research team, led by WIMR's Associate Professor Natasha Rogers and Dr. Kedar Ghimire, have discovered that interrupting CD47's ability to function in aging has the potential to slow or stop these dysfunctions.

Associate Professor Rogers, who leads WIMR's Kidney Injury Research Group, says the group studied the role of CD47 in aging in both human and animal models.

"We have identified that, as we age, CD47 levels increase in our blood vessels. In conjunction with this, we also noticed a reduction of self-renewal transcription factors in arteries. These factors help cells divide to make more cells, continuing the cell pool throughout life. We wondered what effects reducing CD47's function would have on vascular and metabolic function in old age," says Associate Professor Rogers.

Dr. Ghimire, who conceptualized and conducted the study, found the answer. "In older mice, we observed that endothelial cells that form the inner lining of arteries showed signs of exhaustion, including decreased proliferation, migration and tube formation. However, when the same cells were devoid of CD47, they did not show signs of this deterioration. We also treated the arteries of older people with a CD47 blocking antibody and observed the same effects," says Dr. Ghimire.

This study indicates that CD47 increases during aging and facilitates the dysfunction of arteries and metabolic balance. If this protein is not allowed to function during aging, many of these health issues can be minimized.

Associate Professor Rogers says, "With the aged population currently at its highest level in human history and expected to increase in coming years, reducing the health risks to older community members has never been more vital. Our findings provide a strong indication that a therapy to target CD47 could minimize some of these serious dysfunctions associated with aging."

Dr. Ghimire says, '"As a next step, we plan to study the consequences of increased CD47 in human metabolism and hope to unravel the effects of

CD47 in diabetes."

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More information: Kedar Ghimire et al. CD47 Promotes Age-Associated Deterioration in Angiogenesis, Blood Flow and Glucose Homeostasis, *Cells* (2020). DOI: 10.3390/cells9071695

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