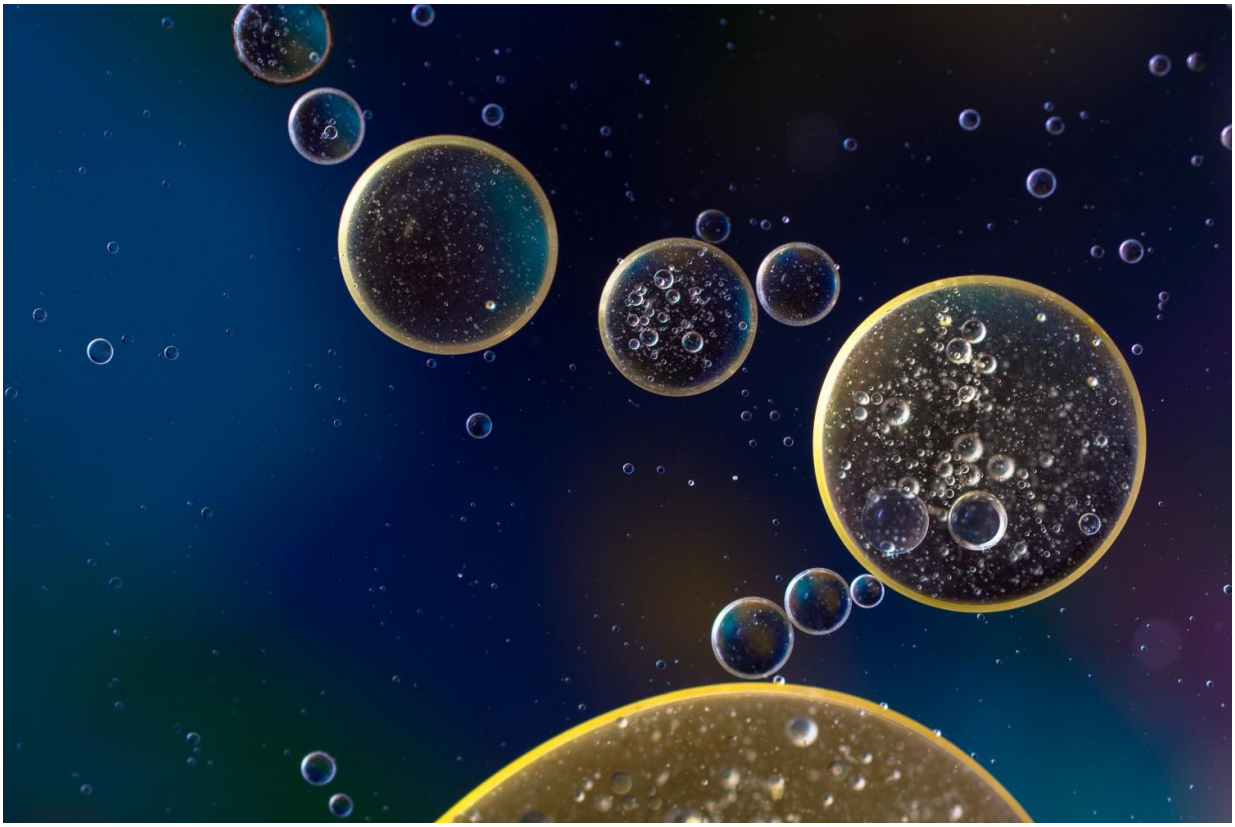
Research shows it's possible to reverse damage caused by aging cells

August 15 2018



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What's the secret to aging well? University of Minnesota Medical School researchers have answered it- on a cellular level.

Aging starts in our cells, and those aging cells can hasten cellular senescence, leading to tissue dysfunction and related health impacts.

New research involving University of Minnesota Medical School faculty Paul D. Robbins and Laura J. Niedernhofer, recently published in *Nature Medicine*, shows there are types of small molecules called senolytics that can reverse the impact of aged, senescent cells.

"We've always thought of aging as a process, not a disease," said Dr. Robbins, Associate Director of the newly founded Institute on the Biology of Aging and Metabolism (iBAM). "But what if we can influence the impacts of aging at a cellular level to promote healthy aging? That's what senolytics seeks to achieve."

The research determined whether introducing senescent cells to human and animal tissue would impact the cellular health of surrounding cells. Surprisingly, the transplant of a relatively small number of senescent cells caused persistent physical dysfunction as well as the spread of cellular senescence in previously healthy cells.

In addition, researchers found that a high fat diet, which causes a type of metabolic stress, or simply being old, enhances the physical dysfunction that comes from senescent cells.

"Previous research has shown that our immune system's ability to eliminate or deal with senescent cells is based 30 percent on genetics and 70 percent on environment," said Dr. Robbins, noting that what we eat and how often we exercise can affect senescence or aging of cells.

Conversely, the researchers determined that treatment with senolytic drugs, able to eliminate senescent cells, can reverse physical dysfunction and actually extend lifespan even when used in aged animal models.

"We saw greater activity, more endurance, and greater strength following use of senolytics," said Dr. Robbins.

The paper notes that the results provide proof-of-concept evidence that improved health and lifespan in animals is possible by targeting senescent cells. The hope is that senolytics will prove effective in alleviating physical dysfunction and resulting loss of independence in older adult humans as well.

"This area of research is promising, not just to address the physical decline that comes with aging, but also to enhance the health of cancer survivors treated with radiation or chemotherapy—two treatments that can induce cell senescence," said Laura Niedernhofer, Director of iBAM.

More information: Ming Xu et al, Senolytics improve physical function and increase lifespan in old age, *Nature Medicine* (2018). DOI: 10.1038/s41591-018-0092-9

Provided by University of Minnesota