

# New group of drugs found to eliminate 'zombie' cells associated with cardiovascular disease

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Graphical abstract. Credit: *The Journal of Cardiovascular Aging* (2023). DOI: 10.20517/jca.2023.07

Researchers show that use of senolytics can improve the reparative properties of human heart cells by eliminating senescent "zombie cells," known to be associated with cardiovascular disease and other age-related conditions

Aging is the greatest risk factor for many life-threatening disorders, including [cardiovascular disease](#) and cancer. "Senescence" is the term given to the biological aging process which involves the build-up of senescent cells, called "zombie" cells, which refuse to die.

Zombie cells release chemicals that can be harmful to nearby cells, affecting [cell survival](#) and reparative potential. The build-up of these zombie cells in our bodies promotes aging and age-related conditions, including cardiovascular disease.

Researchers from the Center for Human & Applied Physiological Sciences at King's College London, led by Professor Georgina Ellison-Hughes, recently tested a new group of drugs, known as "senolytics," which eliminate zombie cells. Their study, titled "Senolytics rejuvenate the reparative activity of human cardiomyocytes and [endothelial cells](#)," is published in *The Journal of Cardiovascular Aging*.

In [lab studies](#), senolytics have been shown to improve conditions such as cataracts, diabetes, osteoporosis, Alzheimer's disease, [heart failure](#), kidney problems, and age-related loss of muscle. Overall, they have been shown to improve poor physical function and extend health span and lifespan.

For this study, the researchers used a lab model where zombie human heart cells are grown together with healthy human heart cells; cardiomyocytes (the contractile cells of the heart) and endothelial cells (vasculature cells).

The results of the study show that human senescent "zombie" cells decrease survival and cell cycle activity of human cardiomyocytes or endothelial cells. If you eliminate the senescent cells using senolytics (Dasatinib and Quercetin), this improves cardiomyocyte survival and cell cycle activity, and the ability of endothelial cells to migrate and form [new blood vessels](#).

"In a human cardiac cell system we show that senescent cell removal by senolytics shows therapeutic potential in rejuvenating the reparative activity of human cardiomyocytes and endothelial cells. These exciting

results open the path to further studies using senolytic therapy to treat age-related heart disorders and the toxic effects of cancer chemotherapy on the heart," says Professor Georgina Ellison-Hughes.

The removal of senescent cells shows promise in rejuvenating the heart's reparative potential. Clinical trials using senolytics are already underway and have shown promising results thus far. The authors believe that pre-clinical studies are warranted to arrive at evidence-based [clinical trials](#) using senolytics in age-related disorders.

**More information:** Piotr Sunderland et al, Senolytics rejuvenate the reparative activity of human cardiomyocytes and endothelial cells, *The Journal of Cardiovascular Aging* (2023). [DOI: 10.20517/jca.2023.07](https://doi.org/10.20517/jca.2023.07)

Provided by King's College London

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