Investigating whether epigenetic aging is the manifestation of one or more aging hallmarks

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A team of researchers affiliated with a host of institutions in the U.K. and the U.S. has conducted an investigation into whether epigenetic aging is the manifestation of one or more aging hallmarks. In their paper published in the journal *Nature Aging*, the group describes subjecting human cells to three kinds of abuse and then testing them to see if the cells aged epigenetically.

Over the past several years, some researchers focusing on the science of aging have become proponents of what is described as epigenetic aging, whereby certain attributes of our bodies age at a rate that may not be consistent with our biological age. That has led to studies aimed at measuring the epigenetic age of people (and other animals) using DNA methylation clocks, ostensibly as a means to circumvent them and allow people to live longer. In this new effort, the researchers studied hallmarks of aging such as exposure to radiation, reproduced them and tested the effects on the pace of epigenetic aging.

The work involved collecting tissue samples from 14 healthy people and dividing them into four groups. One group was subjected to a small dose of radiation, another had some of their cell properties altered to become cancerous, and yet another set was subjected to induced senescence. The fourth group was left undisturbed. Each of the groups represented a hallmark of aging. Exposure to radiation can, for example, make changes to the genome that results in accelerated aging.

None of the tissue samples exhibited changes in epigenetic aging. But the researchers did find...
changes to the way the cells handled energy—their ability to sense nutrients was impacted. This ability plays a major role in cell growth, reproduction and death. The researchers also found changes in mitochondrial activity and in the number of stem cells in their samples. They suggest that epigenetic aging does not predict changes in senescence, nor does it match with age-related changes to telomeres, one of the major indicators of aging in general.


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