

CAN OLD SKIN CELLS BE REPROGRAMMED TO MAKE THEM YOUNG?

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Scientists have developed a new technique for rejuvenating skin cells. This technique has allowed researchers to rewind the cellular biological clock by around 30 years according to molecular measures, significantly longer than previous reprogramming methods. The partially rejuvenated cells showed signs of behaving more like youthful cells in experiments simulating a skin wound (*eLife*). This research, although in early stages, could eventually have implications for regenerative medicine, especially if it can be replicated in other cell types.

The new method, based on the Nobel Prize winning technique scientists use to make stem cells, overcomes the problem of entirely erasing cell identity by halting reprogramming part of the way through the process. This allowed researchers to find the precise balance between reprogramming cells, making them biologically younger, while still being able to regain their specialised cell function, says a press release.

The new method, called 'maturation phase transient reprogramming', exposes cells to Yamanaka factors for just 13 days. At this point, age-related changes are removed and the cells have temporarily lost their identity. The partly reprogrammed cells were given time to grow under normal conditions, to observe whether their specific skin cell function returned. Genome analysis showed that cells had regained markers characteristic of skin cells (fibroblasts), and this was confirmed by observing collagen production in the reprogrammed cells.

To show that the cells had been rejuvenated, the researchers looked for changes in the hallmarks of ageing. The first is the epigenetic clock, where chemical tags present throughout the genome indicate age. The second is the transcriptome, all the gene readouts produced by the cell. By these two measures, the reprogrammed cells matched the profile of cells that were 30 years younger compared to reference data sets.

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