Stem cells collected from fat may have use in anti-aging treatments

February 17 2017

Adult stem cells collected directly from human fat are more stable than other cells - such as fibroblasts from the skin - and have the potential for use in anti-aging treatments, according to researchers from the Perelman School of Medicine at the University of Pennsylvania. They made the discovery after developing a new model to study chronological aging of these cells. They published their findings this month in the journal *Stem Cells*.

Chronological aging shows the natural life cycle of the cells - as opposed to cells that have been unnaturally replicated multiple times or otherwise manipulated in a lab. In order to preserve the cells in their natural state, Penn researchers developed a system to collect and store them without manipulating them, making them available for this study. They found stem cells collected directly from human fat - called adipose-derived stem cells (ASCs) - can make more proteins than originally thought. This gives them the ability to replicate and maintain their stability, a finding that held true in cells collected from patients of all ages.

"Our study shows these cells are very robust, even when they are collected from older patients," said Ivona Percec, MD, director of Basic Science Research in the Center for Human Appearance and the study's lead author. "It also shows these cells can be potentially used safely in the future, because they require minimal manipulation and maintenance."

Stem cells are currently used in a variety of anti-aging treatments and are

commonly collected from a variety of tissues. But Percec's team specifically found ASCs to be more stable than other cells, a finding that can potentially open the door to new therapies for the prevention and treatment of aging-related diseases.

"Unlike other adult human stem cells, the rate at which these ASCs multiply stays consistent with age," Percec said. "That means these cells could be far more stable and helpful as we continue to study natural aging."

ASCs are not currently approved for direct use by the Food and Drug Administration, so more research is needed. Percec said the next step for her team is to study how chromatin is regulated in ASCs. Essentially, they want to know how tightly the DNA is wound around proteins inside these cells and how this affects aging. The more open the chromatin is, the more the traits affected by the genes inside will be expressed. Percec said she hopes to find out how ASCs can maintain an open profile with aging.

Provided by Perelman School of Medicine at the University of Pennsylvania