

AGE REVERSAL -A NEW PARADIGM SHIFT IN MEDICAL SCIENCES**Binafsha Manzoor Syed***Medical Research Center, Liaquat University of Medical & Health Sciences, Jamshoro, Pakistan***Correspondence:****Prof. Dr. Binafsha****Manzoor Syed****Medical Research****Centre, LUMHS,****Jamshoro****Email: binafsha.syed@lumhs.edu.pk**

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Ageing is a physiological phenomenon in all living beings, including plants, animals and humans. It is associated with reduced physiological reserves, frailty and comorbidities, especially diabetes, cardiovascular and cerebrovascular diseases and eventual death. For a long time, ageing was considered a Deoxyribonucleic Acid (DNA) programming mechanism. However, the recent discovery by Prof. David Sinclair's team has clarified that it is an epigenetic process(1). Epigenetics is the pattern which guides DNA to work in a particular direction. There are several epigenetic mechanisms which lead to ageing, and recent research has shown that they have the potential to reverse the mechanism(1). These experiments were initially reported in yeast.

The telomere and pericentromeric are the particular regions which become more euchromatic as age advances. Telomere is proposed to be a marker of biological ageing; however, there is a lack of exact measurement cut-offs to define biological age(2). Though, there are proposed mechanisms for the determination of telomere length. Thus one potential answer to ageing is the age reversal through repair of telomere length. Another proposed process

was calorie restriction, which then slows down metabolism(3). Increased metabolic rate, particularly associated with a high-calorie diet, raises the production rate of toxic metabolic products such as oxidants. They raise inflammatory mechanisms and DNA mutations. All these mechanisms contribute to ageing or, at times, expedite the ageing process. Thus calorie-restricted diet improves life span by improving cellular mechanisms improving energy metabolism. There are drugs under investigation that follow the same pathways as the mechanism of a calorie-restricted diet. Such drugs include Remodelin and spermidine(3).

More recent studies have shown that each cell has a mechanism that causes the reversal of ageing if activated. Previously, Yamanaka et al. reported that the cells could return to their embryonic state by using the Yamanaka factor targeting a set of four genes(4). However, three genes were recently used to reverse cellular ageing to a younger state. This was brought about by these four genetic factors to telomere length to the original embryonic state (i.e. full length). Later, the Sinclair team used three out of four factors where the cells went to an adult younger state. The experiments have been successful in animal models being tried in monkeys now. In future, it is expected to be tested in humans. Pharmaceutical agents (i.e., Doxycycline) are under investigation to work and reverse ageing. Investigators hope to reverse diabetes, cardiovascular and cerebrovascular diseases with the same anti-ageing medication. The question is not too far from the answer.

CONCLUSION

Age reversal is ground-breaking news in medical sciences. Since there are several diseases associated with senility, thus, the reversal of the aging concept is under investigation to treat senile diseases.

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