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Free radical theory of ageing

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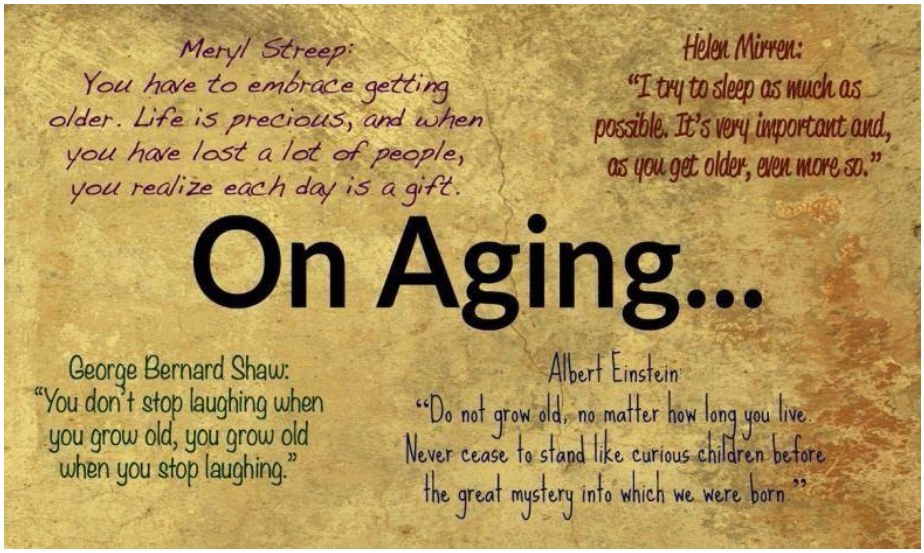
Abstract
There are about 300 hypotheses that attempt to explain the ageing process. Many of them are based on the analysis of cumulative changes over time. The free radical hypothesis of ageing, proposed initially by Harman and based on the molecular nature and ubiquitous existence of free radicals, is the most popular and thoroughly tested of all the hypotheses. The goal of this study is to summaries numerous studies on the subject. This review will summaries different research on the function of free radicals in DNA damage, oxidative stress, antioxidants, the existence of auto antibodies, and their influence on the ageing process.

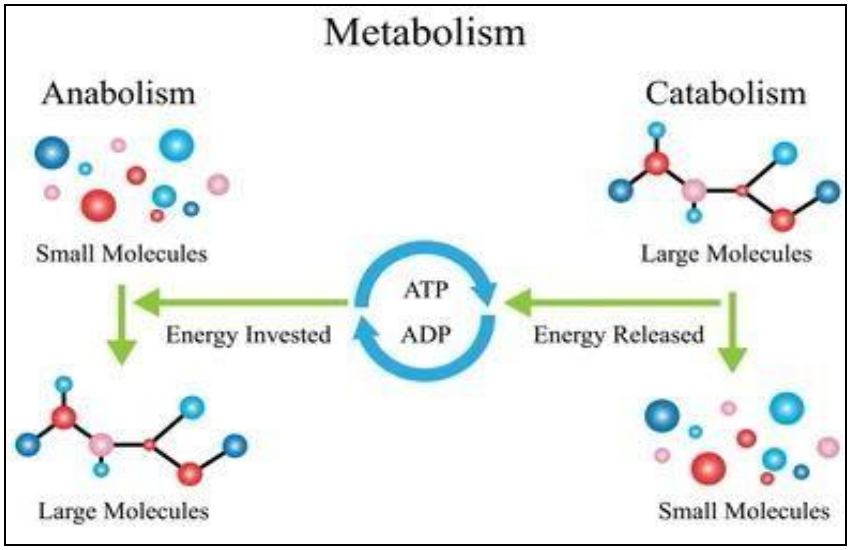
Keywords: ageing, oxidation, aerobic metabolism, free radical, antioxidants

Introduction
Ageing in humans refers to the gradual accumulation of changes in a person's physical, psychological, and social characteristics through time. For example, reaction speed may reduce as people get older, yet knowledge of current events and wisdom may increase.



Many of the changes that occur as our bodies' age are said to be triggered by free radicals, according to the free radical theory of ageing. Free radicals have been linked to DNA damage, protein cross-linking, and other alterations. This damage accumulates over time, resulting in the onset of ageing.

Oxidation
Is a chemical reaction that uses oxygen to produce energy from carbohydrates (sugars). It's also known as aerobic metabolism. Antoine Lavoisier used the term "oxidation" to describe the interaction of a material with oxygen. Much later, it was discovered that the material loses electrons when oxidized, and the definition was expanded to encompass any process in which electrons are lost, regardless of whether oxygen is present.



Free radical: Any atom or molecule with a single unpaired electron in its outer shell is referred to as a free radical. While certain free radicals, such as melanin, are not chemically reactive, the majority of physiologically important free radicals are.

Work from a variety of labs backs up the idea, with studies demonstrating that over expression of antioxidant enzymes leads to longer life spans. Other studies, on the other hand, have discovered a link between increased oxidative stress and enhanced lifespan in some situations. The finding that free radicals may cause molecular harm to cells as well as function as messages led to the hypothesis that they might act as a signaling system. It was proposed that they operate as modulators of physiological processes as a result of this research. Reactive oxygen species (ROS), for example, induce physiological responses to physical activity.

Only a certain amount of electrons can fit into each shell

The first shell may store two electrons, the second shell eight (2 + 6) electrons, the third shell 18 (2 + 6 + 10) electrons, and so forth. The nth shell may theoretically store up to 2(n2) electrons, according to the general formula.

*According to the free radical theory of ageing (FRTA), organism age as a result of free radical damage accumulated over time. In the 1950s, Denham Harman suggested the free radical hypothesis of ageing.

Free Radicals: Hydrogen Peroxide -Oxygen Singlet -Hydroxyl -Nitric Oxide

Antioxidants are chemicals that help prevent or delay cell damage caused by free radicals, which are unstable molecules produced by the body in response to environmental and other stresses. They're also known as "free-radical scavengers." Antioxidants can come from both natural and synthetic sources.

Vitamin C (Ascorbic Acid) Leutine – Green leafy vegetables

Carotinoids - Bright yellow, red, and orange colors in plants, vegetables, and fruits Flavanoids - Yellow color fruits and vegetables

Lycopene - Red and pink fruits

Theobromine - Theobromine is found in chocolate, tea and cocoa products. Caffeine

Anthocyanin - The pigment compounds responsible for pale yellow, orange, red, magenta, violet and blue colors

Vitamin E (tocopherol)

Omega-3 Fatty Acids – DHA (docosahexaenoic acid), EPA (eicosapentaenoic acid) and ALA (alpha-linolenic acid)

The Remainder

If the function of the theory in determining longevity is the gold standard by which it is judged, it appears that there is now a significant body of evidence to cast doubt on that role. However, it has lately been proposed that the lifetime impact may be overly harsh criteria by which to judge the hypothesis. Rather, evaluating the impact of oxidative stress on organism health could be a more acceptable technique. This idea might just be recognition that comprehending complicated biological phenomena like ageing would never be possible with such a basic concept. Indeed, a more nuanced approach to the notion of free radicals and oxidative stress, and their involvement in degenerative illness, than a simple ‘yes' or ‘no' answer to whether the free radical damage hypothesis is accurate or not, may be a far more rational way to understand the process of ageing. Regardless of the findings, eating a nutritious diet, not smoking, limiting alcohol use, getting enough of exercise, and avoiding air pollution and direct sun exposure are all good ideas. Taking these steps is not only beneficial for your overall health, but it can also help to reduce the formation of free radicals.

References

1. NIH, National Library of Medicine, National Centre for Biotechnology Information; The aging paradox: free radical theory of aging; https://pubmed.ncbi.nlm.nih.gov/10433385/
2. Wikipedia; The free encyclopedia; https://en.wikipedia.org/wiki/Free-radical_theory_of_aging
3. Free Radicals and Ageing; @1992; Ingrid Emerit Britton Chance; ISBN: 978-3-0348-7460-1; Springer Link:
4. https://link.springer.com/book/10.1007/978-3-0348-7460-1
5. Advanced Nutrition and Human Metabolism; By Sareen S. Gropper, Jack L. Smith, Timothy P. Carr. 2021; ISBN: 9780357450109, 0357450108; Publisher:Cengage Learning