



Book review

The mitochondrial free radical theory of aging

By Aubrey D.N.J. de Grey, R.G. Landes Company, Austin, Texas, USA, 212 pp, 1999, ISBN 1-57059-564-X, price not stated.

“This book presents and discusses the hypothesis that the rate of accumulation of spontaneous mutations in our mitochondrial DNA is the principal determinant of the rate of human aging.” With this statement Aubrey de Grey has defined the limit and scope of his book which is an impressive treatise on the subject.

Aubrey calls himself a ‘theoretical gerontologist’, and appears to love theorizing. The essence of his version of the mitochondrial free radical theory or MiFRA is that the slow accumulation of impaired mitochondria is the driving force of the aging process. This is also termed *survival of the slowest* (SOS), according to which slightly damaged mitochondria have a selective advantage of not being removed from the cell, and consequently cause its demise. This book provides powerful arguments in support of this viewpoint.

The strong point of the book is that it is a very personalized and passionate account of the ideas and biochemistry behind MiFRA. The chapters on ‘An Introduction to Mitochondria’, ‘An Introduction to Free Radicals’, and ‘An Introduction to Lipid Metabolism’ provide a good refresher course on their biochemistry. Many misnomers and misunderstandings are removed. Followed by a somewhat superficial description of the aging phenomenon, the book provides useful details

on the history of the mitochondrial free radical theory, and on the mechanics of the occurrence of damage in mitochondrial DNA, and its consequences on mitochondrial function. The so-called SOS aspect of the MiFRA theory is then discussed thoroughly, and several experimentally testable predictions of the theory are outlined.

Aubrey de Grey is very optimistic about the future of anti-aging and longevity-prolonging research. Taking mitochondria as a target for anti-aging therapies, he develops and discusses various scenarios which may or may not be possible. Although he is trying hard to appear as objective and rational as possible, Aubrey is a passionate man whose writing style, content and expression speak loudly of his passion. He almost leaves an impression of being a crusader carrying on with missionary zeal. Sometimes one finds it quite irritating, but generally it is refreshing to participate in his excitement.

The book appears to have been written hurriedly, and published even more hurriedly. It is too densely packed, and its layout, font size, and too many footnotes put a strain on the eyes. The publisher could have done a better job. But, the author has made his point strongly, and it is now up to us to enter into discussion with him. Coming from a theoretical gerontologist, it is a very practical and useful book for biogerontologists.

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