Free Radical Research, September 2006; 40(9): 1011–1012

informa
healthcare

Book reviews

Power, sex, suicide: Mitochondria and the meaning of life

by Nick Lane
Publisher: Oxford University Press, Oxford
Publication Date: 1 December, 2005
ISBN: 0192804812
£12.55

Nick Lane wrote the book "Oxygen", which I reviewed enthusiastically for this journal in April 2003. I thus looked forward to his sequel, and was not disappointed, especially as it begins with the assertion that mitochondria are the "clandestine rulers of the world" (notwithstanding the fact that the data for the number of mitochondria per cell contradict each other on pages 1 and 2) and ends with the concept that all age-related diseases might be cured by modulating mitochondrial free radical production. The book contains excellent discussions of the origin of eukaryotes (why they only evolved once), including descriptions of early eukaryotes allegedly without mitochondria (not quite what they seem) and why protection against O_2 toxicity may have been one reason to retain engulfed bacteria but not the reason for acquiring them in the first place. Perhaps eukaryotes even obtained "mitochondria" first and a nucleus later. The book reveals that human cells generate more energy than the sun (the average person making 65 kg of ATP per day), that the French sculpture of Lavoisier has the wrong face, that the mitochondrial membrane potential is like a bolt of lightning, why there is a limit to the size of bacterial genemes and bacterial cells, why no mitochondria have yet transferred all their genes to the nucleus, and why we should be grateful to rats.

In addition, there are fascinating discussions on the relation between size and metabolic rate, why Galileo could never have been a biologist, how a blood sinus in lizards can not only warm the animal up before it comes out for the day but also deter nosy dogs, and why it would not benefit by wearing a fur coat. Some flatworms have fencing penises for a good evolutionary reason and Tsar Nicholas 2 had heteroplasmic mitochondrial DNA. Selfishness and cooperation are the two sides of a Darwinian coin, and great evolutionary biologists often disagree, just as cancer is an ultimately-futile disease. Most of our apoptotic machinery originated from bacteria, the gonococcus is really a bastard, and the biggest difference between the sexes is not the Y chromosome, although it may cause models and actresses to be attractive to men.

The book abounds with pithy phrases ("in necrosis the carpet is left stained with blood and gore", "the link between life and death depends on the subcellular location of a single molecule", "when the host cell is damaged the mitochondria signal their displeasure by producing an angry burst of free radicals"). Mitochondria trade off ATP, heat, and free radical production, and the balance may be different in different countries.

A great read. I recommend wholeheartedly this book. It is superbly written.

Prof. Barry Halliwell
Department of Biochemistry
Yong Loo Lin School of Medicine
National University of Singapore
Singapore

ISSN 1071-5762 print/ISSN 1029-2470 online
DOI: 10.1080/10715760600836237

Jeff's View on Science and Scientists

by Gottfried Schatz
Biozentrum, University of Basel, Switzerland
ISBN: 0-444-52133-X
Publication date: 2005
£7.99

At the original invitation of Felix Wieland, Gottfried (Jeff) Schatz has been contributing several essays a year to the journal *FEBS Letters*. The journal has now decided to publish the collection of essays as a book. I am pleased that they did — I had read some of these gems before, but missed many others. Among his pithy statements "Zero and infinity are the catchwords of fundamentalists", "he who always agrees with you cannot be very bright", "my mitochondrial genome does not say much, but what it does say counts. It detests small talk", "in fundamental long-term research, milestones are ridiculous" and "in the code of academic recommendation letters, *solid* is the stop codon". The field of antioxidants and oxygen radicals is succinctly described in such phrases as " lifes' refuse made the oceans rest", "living matter fights a losing battle against its fragility and ends up scorched", "a healthy respiration system … emits sparks", "ROS … put any soccer hooligan to shame" and "sooner or later, oxygen gets us all".

This book is a great read. I recommend it to all biologists.

Prof. Barry Halliwell
Department of Biochemistry
Yong Loo Lin School of Medicine
National University of Singapore