Comparative functional genomics of chloroplasts, mitochondria and their bacterial homologues: New perspectives on symbiosis in cell evolution

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Chloroplasts and mitochondria are energy-converting organelles of eukaryotic cells. They also contain small, specialised, functional genomes. While their genetic and energy-converting systems are evidently bacterial in origin, most genes for chloroplast and mitochondrial components now reside in the cell nucleus. So why did some genes move, while others did not?

The above subject was the focus for a Royal Society Discussion Meeting held on 26 and 27 June 2002 and will be published as an individual volume of Philosophical Transactions: Series B in January 2003.

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All papers presented at the Meeting* are listed overleaf …

* The published contents may vary from those listed overleaf
Symbiosis and genome function
The roles of cyanobacteria and proeobacteria in symbioses with eukaryotes
John A Raven, University of Dundee, UK

Secondary symbiogenesis and eukaryote evolution
Tom Cavalier-Smith, University of Oxford, UK

Redox control of gene expression as the function of genomes in bioenergetic organelles
John F Allen, Lund University, Sweden

Bacterial homologues of compartments and organelles
How big is the iceberg of which organellar genes in nuclear genomes are but the tip?
W Ford Doolittle, Dalhousie University, Nova Scotia, Canada

Hydrogenosomes: unusual organelles of anaerobic ATP synthesis in amitochondriate protists and their possible evolutionary significance
Heinrich-Heine University, Düsseldorf, Germany

On the origin of mitochondria: a genomics perspective
Siv Andersson, Uppsala University, Sweden

Similarities in bacterial and plant light perception
Carl Bauer, Indiana University, USA

Chloroplasts
Evolution of the chloroplast genome
Christopher J Howe, University of Cambridge, UK

Thylakoid biogenesis and dynamics: the result of a complex phylogenetic patchwork
Reinhold G Herrmann, Ludwig Maximilian’s University, Munich, Germany

Coordination of plastid and nuclear gene expression
John C Gray, University of Cambridge, UK

Parasite plastids: maintenance and functions
RJM (Iain) Wilson, National Institute for Medical Research, London, UK

Mitochondria
Integration of the mitochondrial genome in the plant cell
Axel Brennicke, University of Ulm, Germany

Mitochondria and hydrogenosomes: two different faces of the same organelle
Martin Embley, Natural History Museum

Evolutionary aspects of anaerobically functioning mitochondria
Aloysius GM Tielens, Utrecht University, The Netherlands