

School Lecture

The AAS Rudi Lemberg Lecture & The Henry Bennett Lecture in Genetics



**Friday 13th March
2009**

2.00p.m

**MAWSON LECTURE
THEATRE**

**COFFEE & CAKE
3.00-3.30pm in the 1st
Floor Breakout
Space, Molecular Life
Sciences Building**

PROFESSOR JOHN F. ALLEN

**School of Biological and Chemical
Sciences, Queen Mary College,
University of London**

**“Photosynthesis explains cytoplasmic
inheritance. CoRR!”**

Chloroplasts and mitochondria are energy-converting organelles in the cytoplasm of eukaryotic cells. Chloroplasts in plant cells perform photosynthesis; the capture and conversion of the energy of sunlight.

Mitochondria in both plant and animal cells perform respiration; the release of this stored energy when work is done. Chloroplasts and mitochondria also contain small, specialised genetic systems to make some of their own proteins. Both the genetic and the energy-converting systems of chloroplasts and mitochondria are descended, with little modification, from those of the free-living bacteria that these organelles once were. Most genes for proteins of chloroplasts and mitochondria are, however, now located on chromosomes in the nuclei of eukaryotic cells. There they code for precursor proteins that are made in the cytosol for subsequent import into organelles.

So why are any characters at all inherited through the cytoplasm? In other words, why, in evolution, did a few bacterial genes remain in organelles, refusing to join the nuclear, emigrant majority?