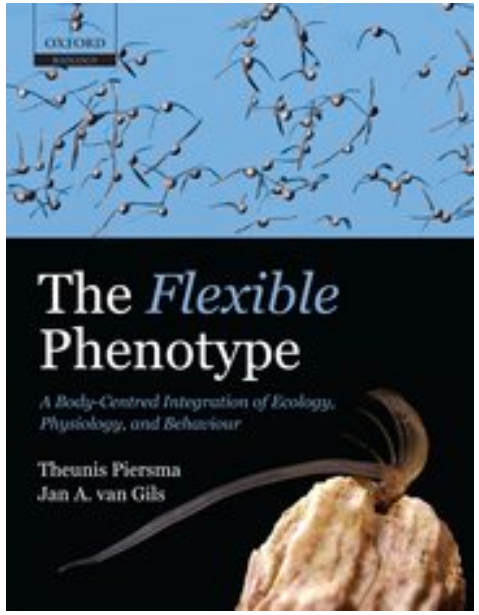
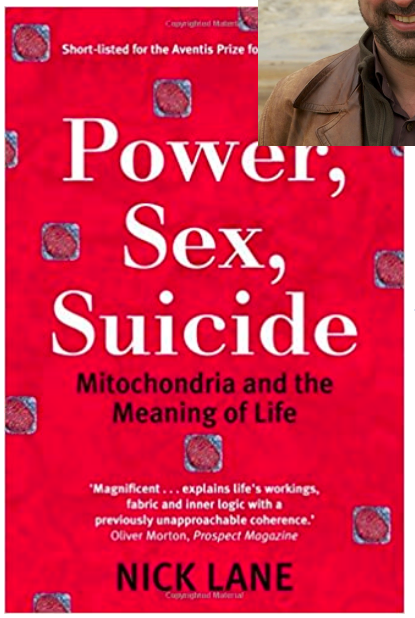
# Mitonuclear ecology

# What is mitonuclear ecology?

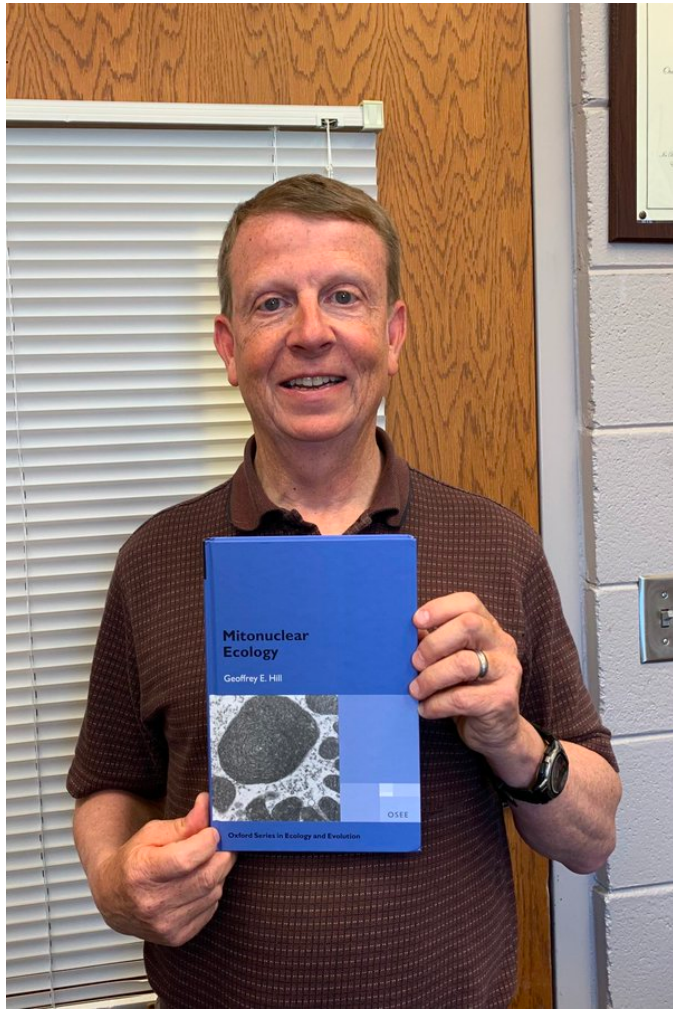
- Old ideas, new name
- “Reinterpreting key features of eukaryotic life in light of the necessity of coadaptation of co-functioning mt and N-mt genes”
- “Reassessing core concepts in evolutionary ecology in light of mitonuclear interactions”

# History of mitonuclear ecology



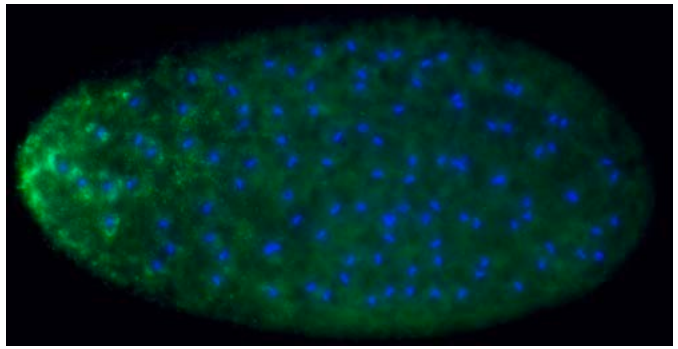



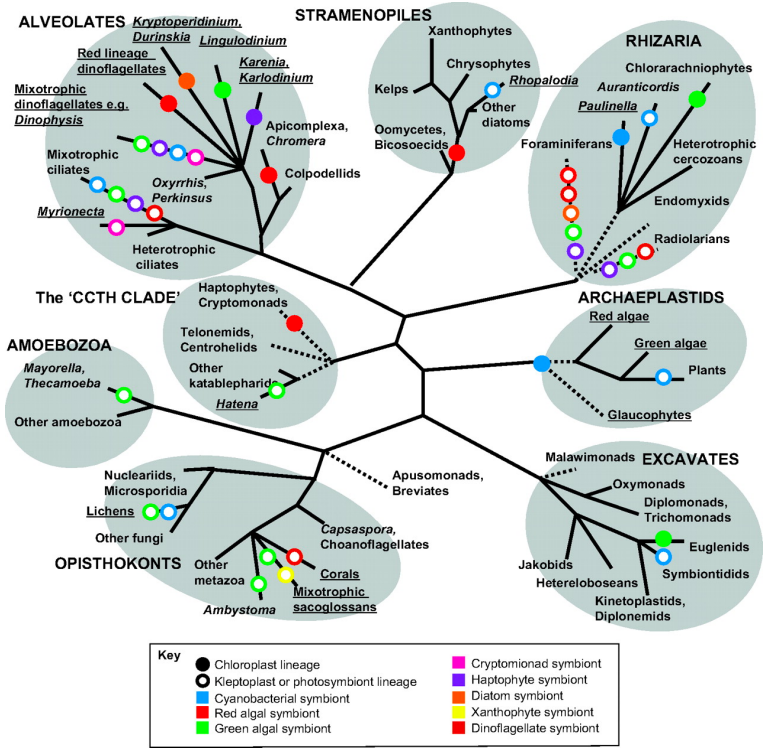




# Limitations

- Other cytoplasmic genomes are not considered







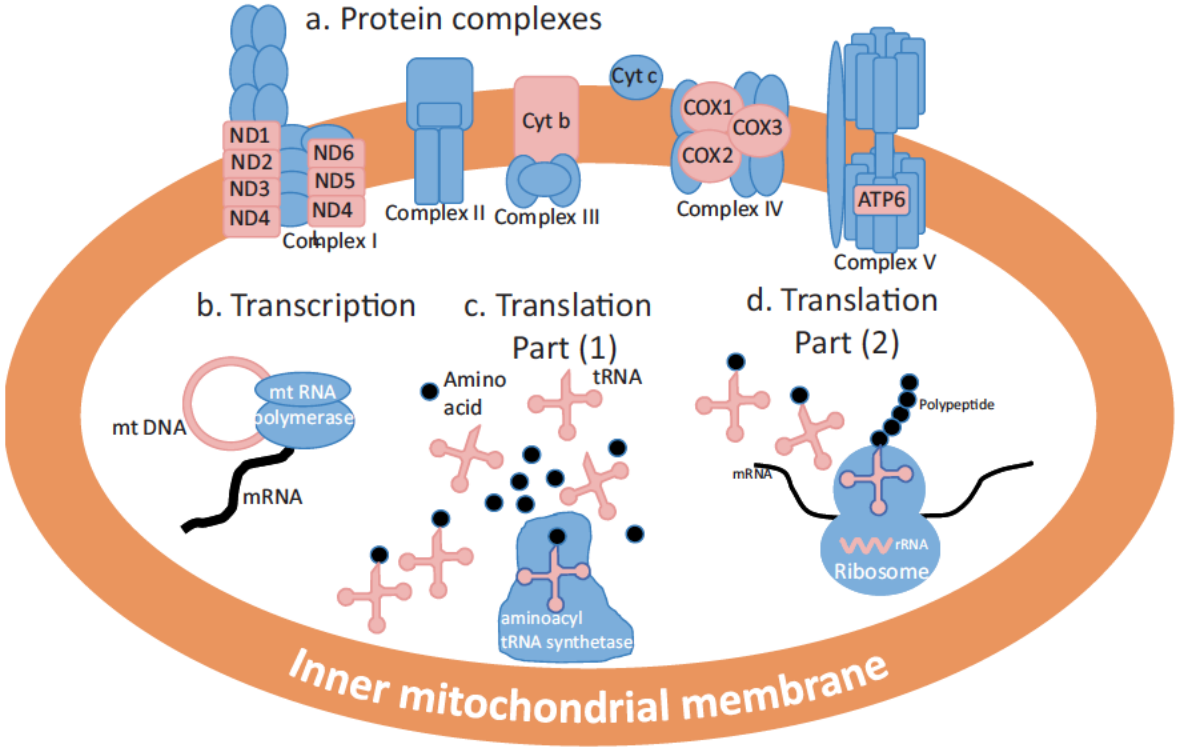
- Animal centric

# Hill 2015 MBE – take home points

- Considers how the presence of mt genome may influence
  - Position of N-mt genes on chromosomes (sex linkage)
  - The evolution of ”sex”
  - The evolution of 2 sexes
  - Adaptation
  - Speciation
  - The evolution of spliceosomes and introns

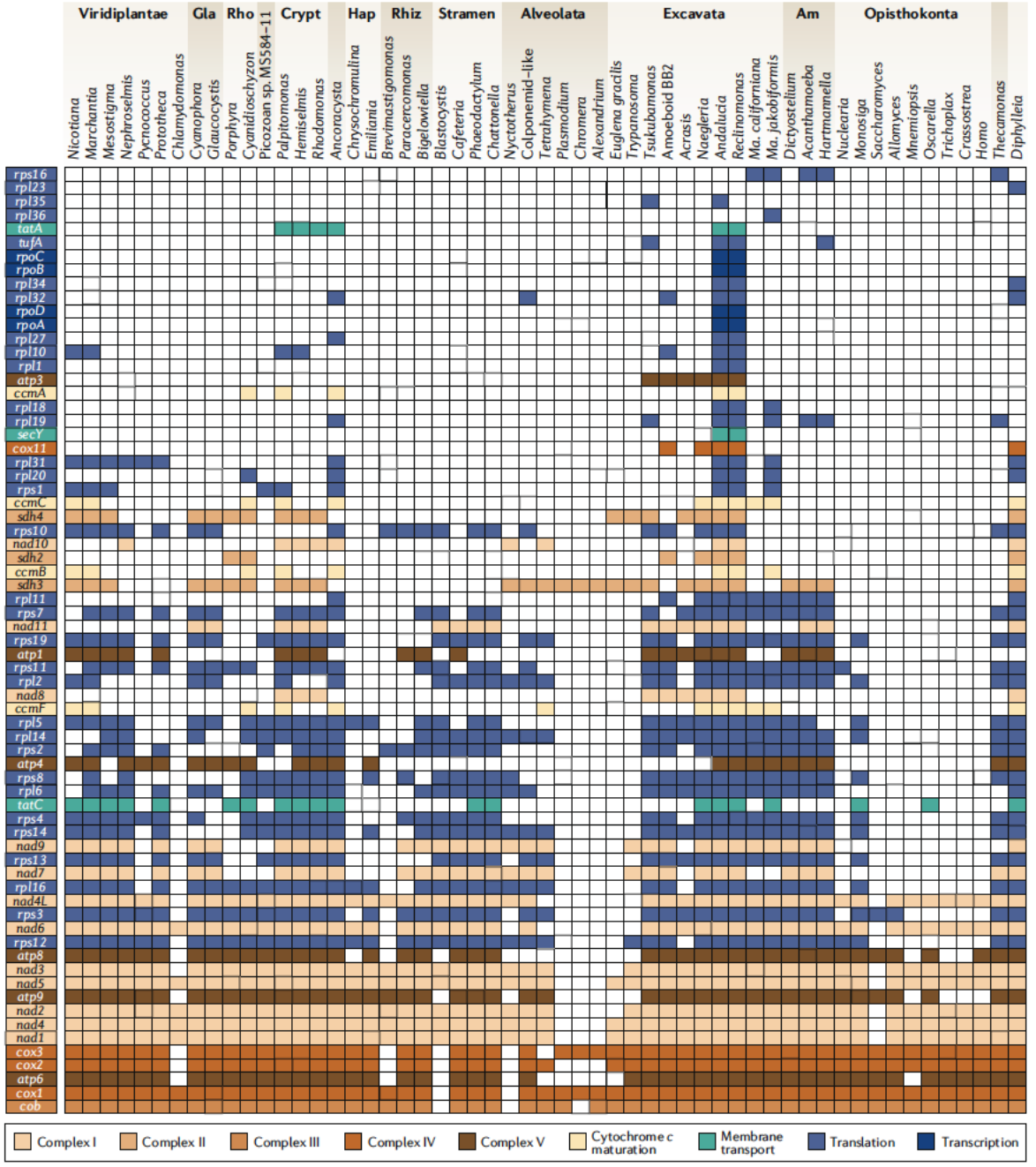
# mt and N-mt genes

- Intimate vs. non-intimate N-mt genes



# mt genes vary considerably across eukaryotes

- PC genes vs tRNA vs rRNA genes




Sloan et al 2018, Nat Rev Genet

# Hill 2015 – caveats

- Origin of eukaryotes/mitochondria is still an active area of research, mainly genomics based (e.g., Loki-like archaea)
- Movement of mt genes to nuclear genome was likely not entirely an adaptation
- Retention of mt genes also has neutral/constraint basis
- High mt mutation rates are not universal (and mt mutational meltdown may not be inherit)