

# The impact of the mitochondrial bottleneck on mtDNA disease risk and embryogenesis

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Propositions belonging to the thesis:

**The impact of the mitochondrial bottleneck on mtDNA disease risk and embryogenesis – Studies in humans and zebrafish**

1. Due to biological variation in the bottleneck, every woman has a risk to give birth to a child with a mitochondrial DNA disease (*this thesis*).
2. Positive selection is active during the segregation of mitochondria (*this thesis*).
3. Errors made by the mitochondrial polymerase *POLG* can explain the high *de novo* mitochondrial DNA mutation frequency (*this thesis*).
4. Mitochondrial DNA patients are victims of evolution (*this thesis*).
5. Scientists should learn from journalists how to communicate science, in order to win the public debate (*valorization*).
6. Mathematicians will take over biology.
7. Targeting mitochondrial metabolism is a new option for cancer therapy.
8. Nothing in biology makes sense except in the light of evolution (*T. Dobzhansky*).
9. In het leven van ieder mens komen ogenblikken voor waarop hij tot zichzelf zegt: "Tsjja, dat kán niet." En dan dóet hij iets (*Erik Hazelhoff Roelfzema, Soldier of Orange*).
10. Truth like a cow: in the Netherlands, only fans of PSV can look upstairs in Europe (*translation inspired by Louis van Gaal*).

Auke B.C. Otten

Maastricht, November 15, 2016

Stellingen behorende bij de thesis:

**The impact of the mitochondrial bottleneck on mtDNA disease risk and embryogenesis – Studies in humans and zebrafish**

1. Door biologische variatie in de bottleneck loopt elke vrouw het risico te bevallen van een kind met een mitochondriële DNA aandoening (*dit proefschrift*).
2. Er vindt positieve selectie plaats tijdens de segregatie van mitochondriën (*dit proefschrift*).
3. Fouten gemaakt door het mitochondriële polymerase *POLG* verklaren de hoge frequentie waarmee *de novo* mitochondriële DNA mutaties worden gevonden (*dit proefschrift*).
4. Patiënten met een mitochondriële DNA mutatie zijn slachtoffers van de evolutie (*dit proefschrift*).
5. Wetenschappers moeten van journalisten leren hoe wetenschap te communiceren om het publieke debat te winnen (*valorisatie*).
6. Wiskundigen zullen de biologie overnemen.
7. Het aanpassen van het mitochondriële metabolisme vormt een nieuwe mogelijkheid voor kankertherapie.
8. Nothing in biology makes sense except in the light of evolution (*T. Dobzhansky*).
9. In het leven van ieder mens komen ogenblikken voor waarop hij tot zichzelf zegt: "Tsjja, dat kán niet." En dan dóet hij iets (*Erik Hazelhoff Roelfzema, Soldaat van Oranje*).
10. In Nederland houden alleen supporters van PSV aansluiting bij de Europese top.

Auke B.C. Otten

Maastricht, 15 november, 2016