mitochondria
Posted by mARK bLOORE - 2008/05/12 23:11

When the organism is growing, it will be the nucleic DNA that define how the cells produce the organism, and this has nothing to do with the mitochondrial DNA. unless the mtDNA stunts the growth or function of those cells by producing poor mitochondria.

==========

mitochondria
Posted by Andrea Baines - 2008/05/12 23:11

And, mtDNA doesn't evolve, it just mutates, really? if there are mutations then there are differences. Yep. From time to time, a change in the mtDNA takes place. just as, from time to time, changes take place in bacterial dna. bacteria evolve, do they not? granted, they live more independent lives, but it is only differential reproductive success (of the mitochondrion or the bacterium) that matters, not life cycle. if there are differences then there will be selection. gametes with better mitochondria do better. Well, not really no. if your testes developed from a cell with low-functioning mitochondria, they might produce a low sperm count, or low-motility sperm. if your ovaries had a similar problem, they might produce low-fertility ova. bodies with poor mitochondria do poorly. No. i recently read (i forget where, i'm afraid) an article on diseases caused or complicated by mitochondrial mutations. mitochondria that reduce the fitness of the body they are in are less likely to appear in the next generation. thus, evolution of the mitochondria in a population is tied up with evolution of the population of whole organisms. the details of the life cycles of the reproductive units are vastly different, but that does not matter. genetic variation causing reproductive variation is what matters. so unless mtDNA has hit the one-and-only sequence that creates perfect mitochondria (does that even make sense?) there will be mitochondrial evolution. ... if harmful, as most mutations are, the mitochondria will vanish quickly within the cell, ... there's the rub. they don't necessarily disappear. they can hang around doing a poor job of supporting respiration, and making the cell do a poor job of whatever it does. this is how mtDNA mutation can cause disease. ... all subsequent offspring will have that new mtDNA although their nucleic DNA will be far more varied due to sexual reproduction. and if the mtDNA is better or worse than normal, then the offspring will be better or worse, and this affects the offspring's, reproductive fittness. in effect, the somatic and mitochondrial genomes are evolving together. When the organism is growing, it will be the nucleic DNA that define how the cells produce the organism, and this has nothing to do with the mitochondrial DNA. unless the mtDNA stunts the growth or function of those cells by producing poor mitochondria.

==========