





Nuclear DNA v mtDNA: principles of inheritance

Nuclear DNA (nDNA)

Mitochondrial DNA (mtDNA)





- Found in the nucleus of the cell
- 3,300,000,000 bases (A, T, C and G)
- Arranged in linear chromosomes
- Two copies of each chromosome
- Maternally and paternally inherited
- Contains approximately 20,000 genes - 93% of the genome is non-coding DNA
- Found in the mitochondrial matrix
- 16,569 bases (A, T, C and G)
- Arranged in a circular chain of DNA
- Multiple copies present
- Maternally inherited
- Contains 37 genes
- 3% of the genome is non-coding DNA

Mendelian inheritance

Non-Mendelian inheritance

cell



child: 1 in 4 chance	carrier child: 2 in 4 chance	child: 1 in 4 chance	Low level of mutation: healthy child	Intermediate level of mutation: mild disease	High level of mutation: severe disease
- Example of an autosomal recessive disease			- Disease severity is correlated to ratio of healthy to diseased mitochondria		