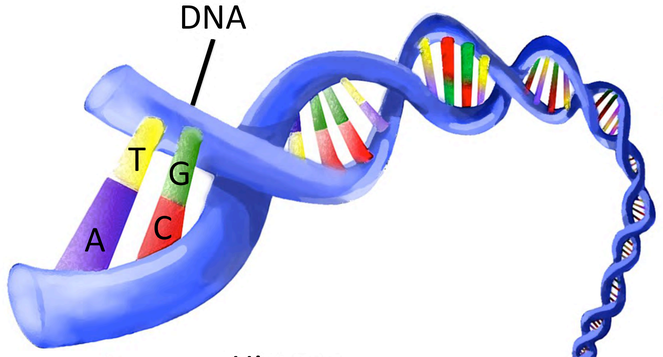
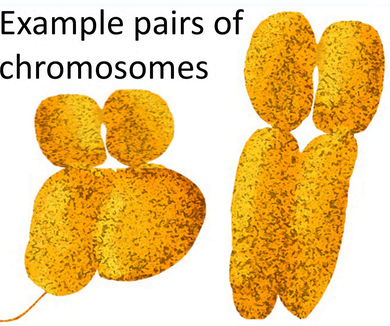
UNLOCKING LIFE'S CODE: FROM TISSUES TO CELLS TO DNA TO PROTEINS

A gene is made of 100's or 1000's of DNA base pairs. Every 3 base pairs codes for one amino acid of a protein



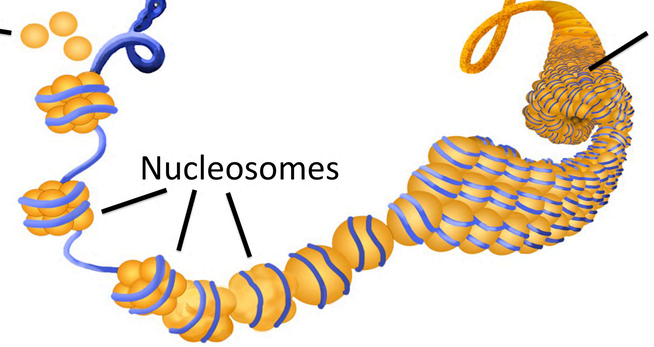
DNA is a double helix made of a sugar-phosphate backbone and 4 bases, A, T, C & G. A pairs with T and C pairs with G

Example pairs of chromosomes



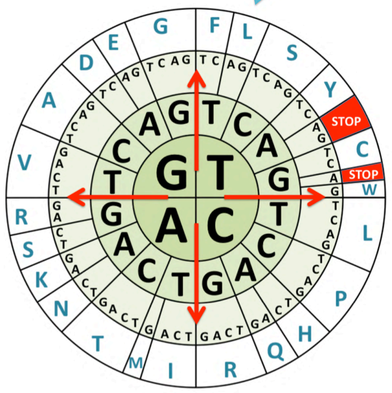
In the nucleus, genomic DNA is in large pieces. You have 23 pairs of chromosomes and inherited one copy from each parent. (zebrafish cells have 25 pairs)

Histone proteins coil DNA

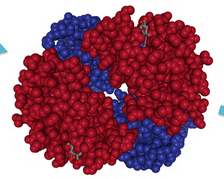


Nucleosomes

Supercoils compact 1 metre of DNA (1.5 billion base pairs) into each fish cell

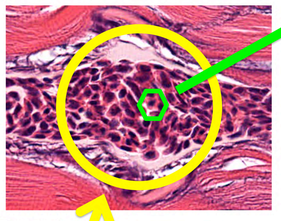


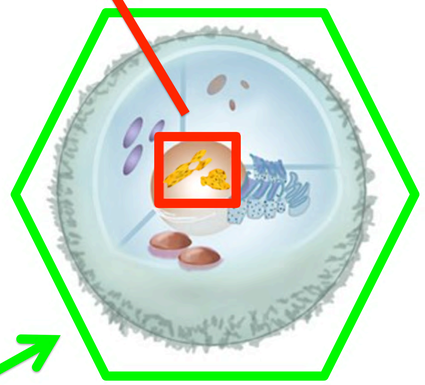
A codon chart, used for translating DNA sequence into protein sequence



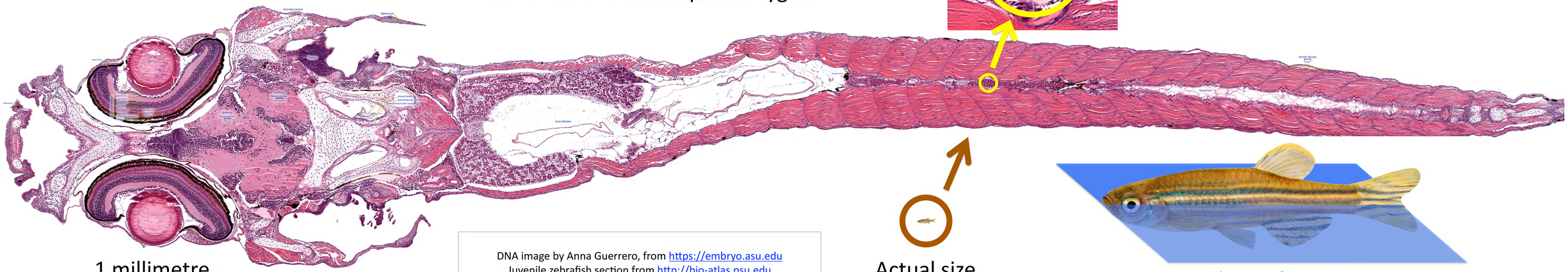
Haemoglobin – the protein in red blood cells that transports oxygen

Red blood cells in a vein. The dark dot in the centre of each cell is the nucleus.





2 to 4 µm diameter zebrafish cell



1 millimetre

Actual size

Plane of sectioning

DNA image by Anna Guerrero, from https://embryo.asu.edu
Juvenile zebrafish section from http://bio-atlas.psu.edu
Haemoglobin structure from http://www.rcsb.org/3d-view/2DHB