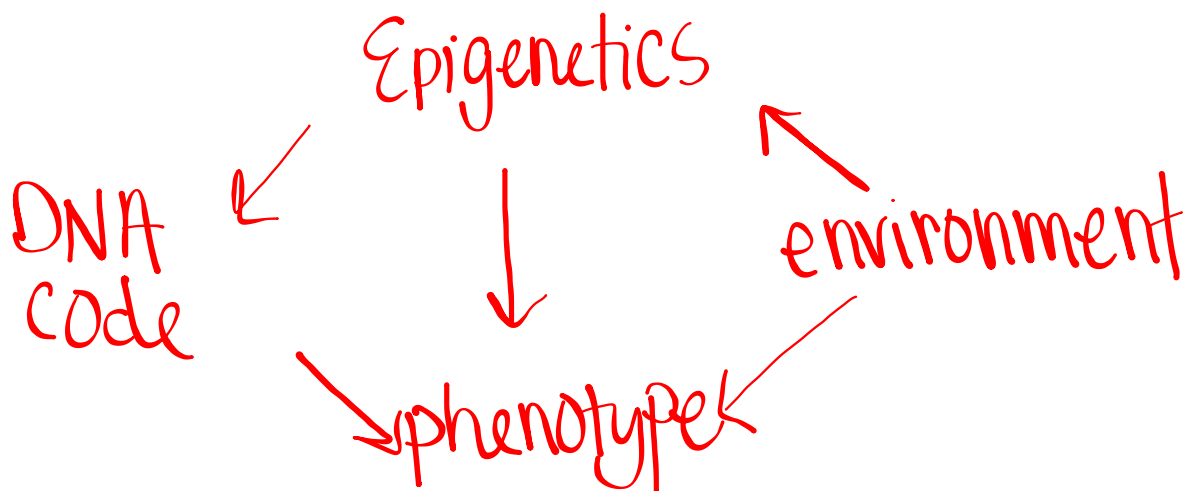


Epigenetics:

Heritable change in gene expression but NO change in the DNA sequence.



Genome: All of an organism's genetic material. (~20,500 human genes)

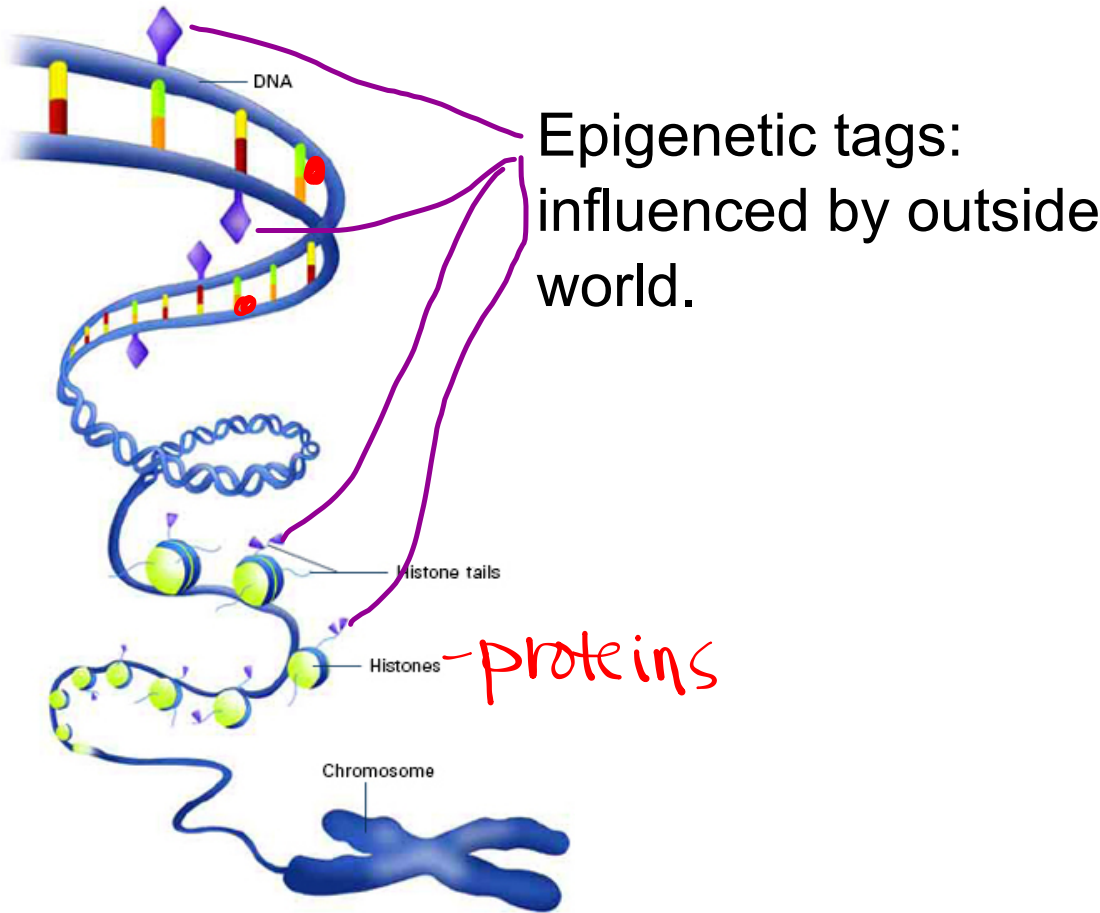
can't change

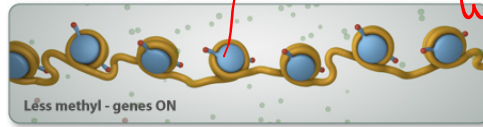
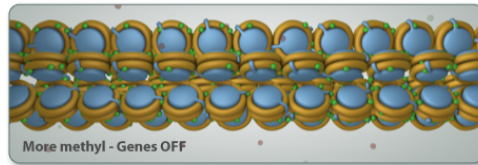
Epigenome ("above" the genome)

Shapes the physical structure of the genome.

Can change

Second Level of DNA Structure



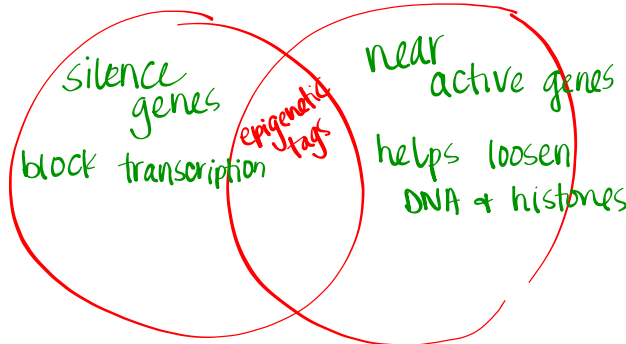


histones: proteins DNA wraps around

epigenetic tags (methyl + acetyl)

methyl

Acetyl



Rat Experiments

1. Agouti mice

Agouti gene = overeating

fed folic acid, turned off agouti gene

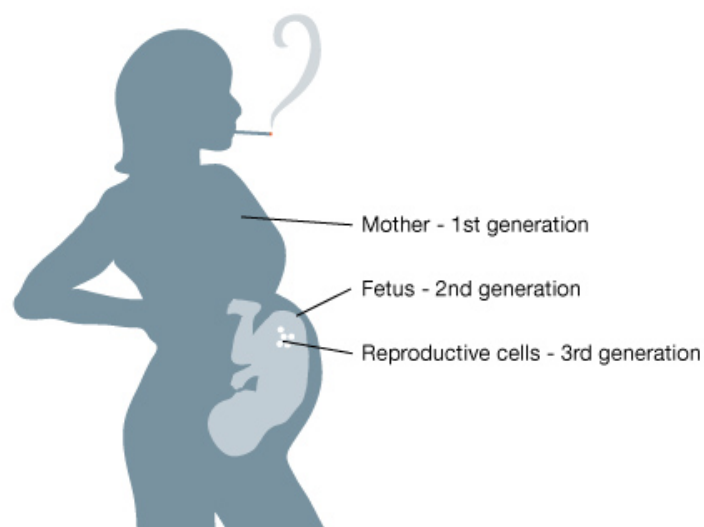
pups are brown + slender (agouti gene = off)

2. pesticides

rats exposed to pesticides get diseases

↓
passed diseases on to offspring

Can our epigenome be passed down from generation to generation?



Twin Studies:

Fraternal Twins: individuals who come from separate eggs and share half of their DNA.

Identical Twins: individuals who come from a single fertilized egg that splits in two.

Why not study siblings?