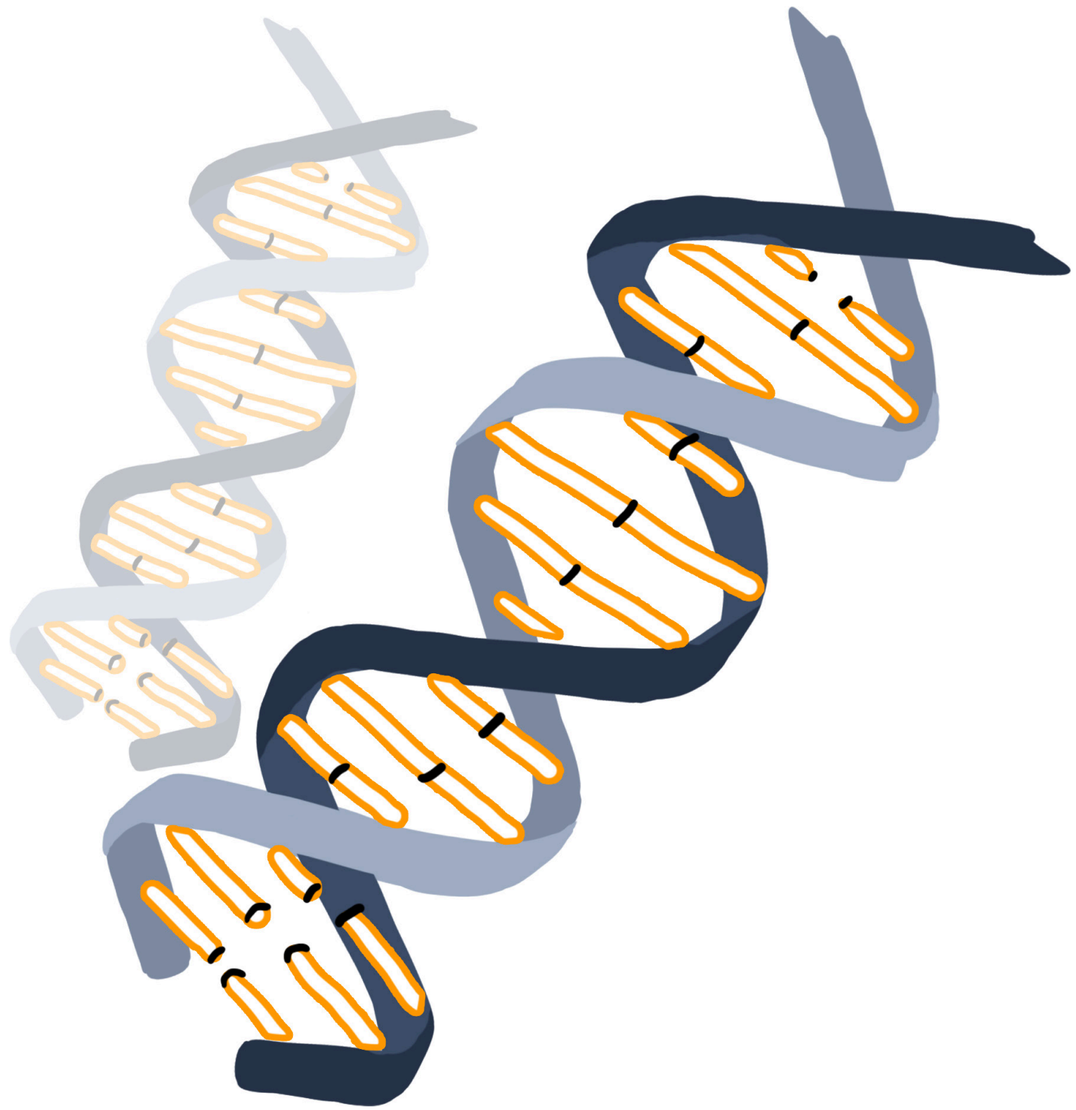
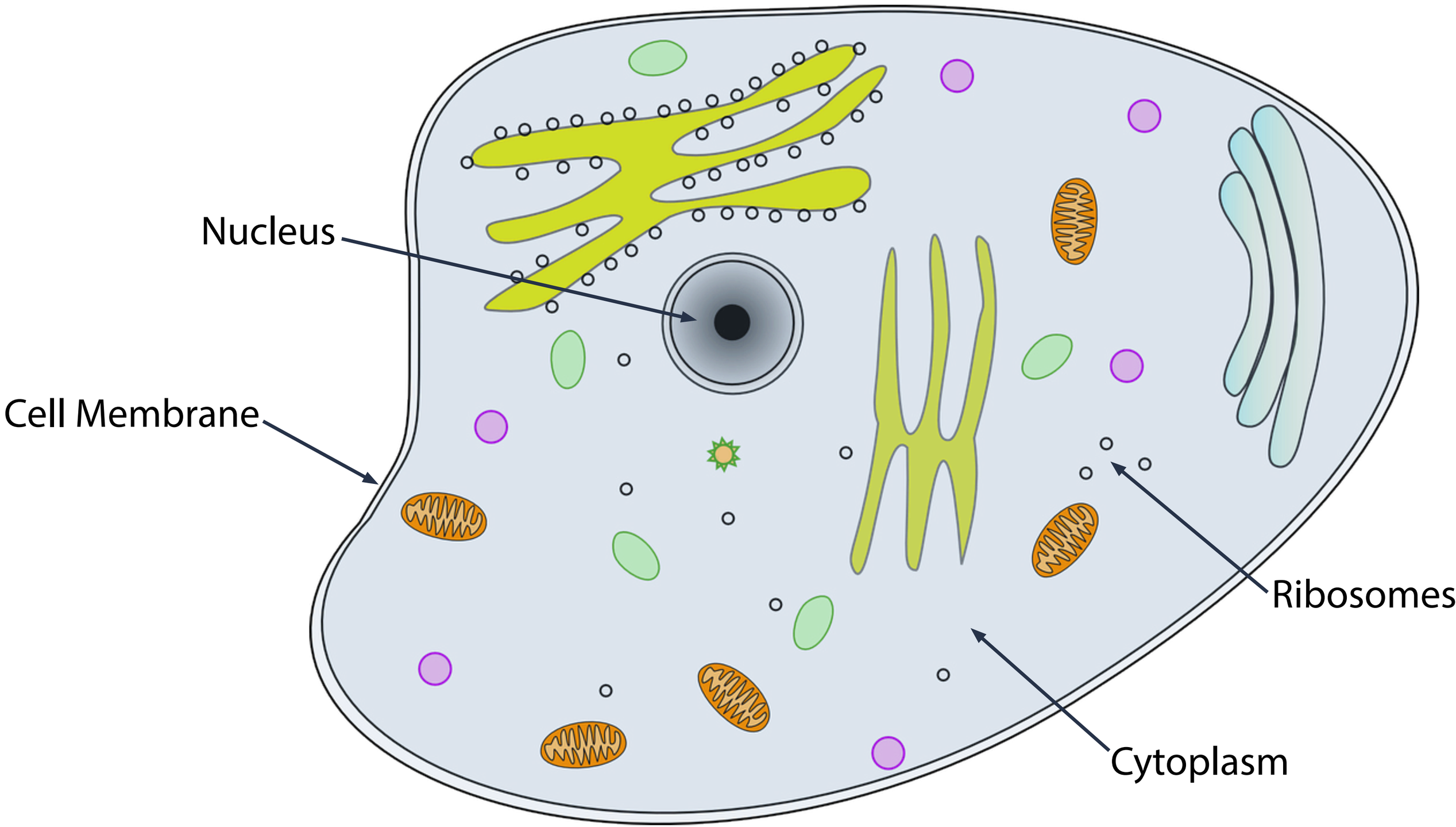
Basic Genetics & Epigenetics



steven j. barnes

Learning Goals

- Outline the mechanisms of gene expression.
- Define epigenetics and describe two epigenetic mechanisms.
- Explain what is meant by ‘transgenerational epigenetics.’



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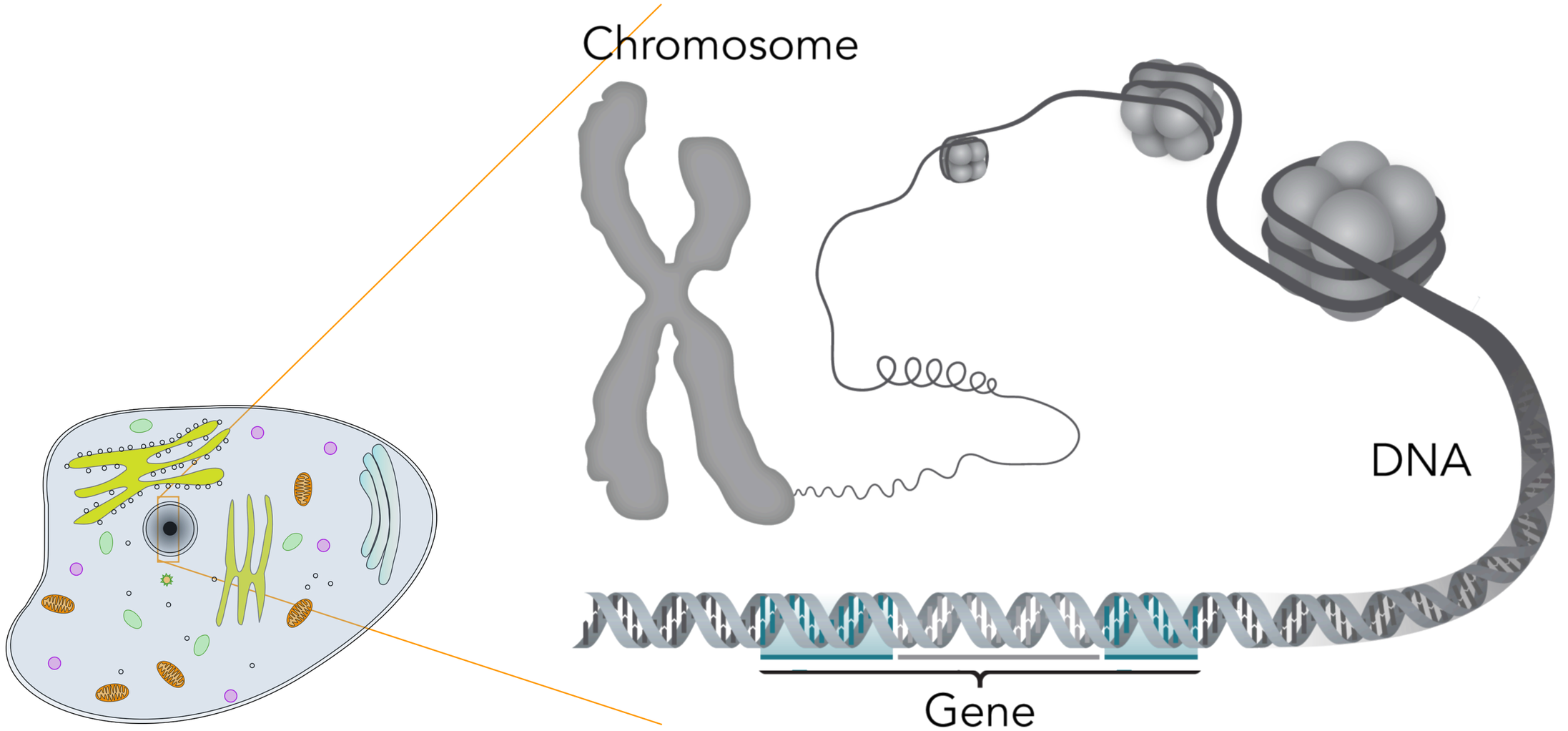

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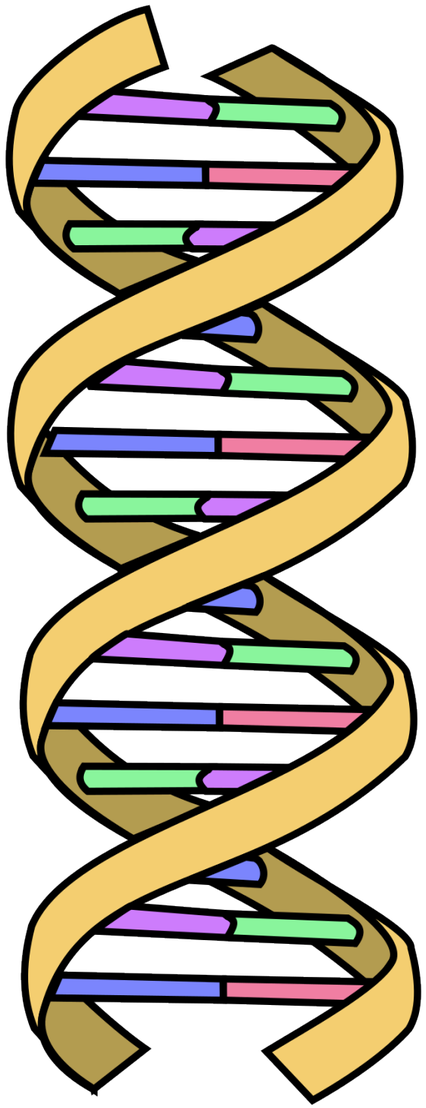


DNA

= Adenine

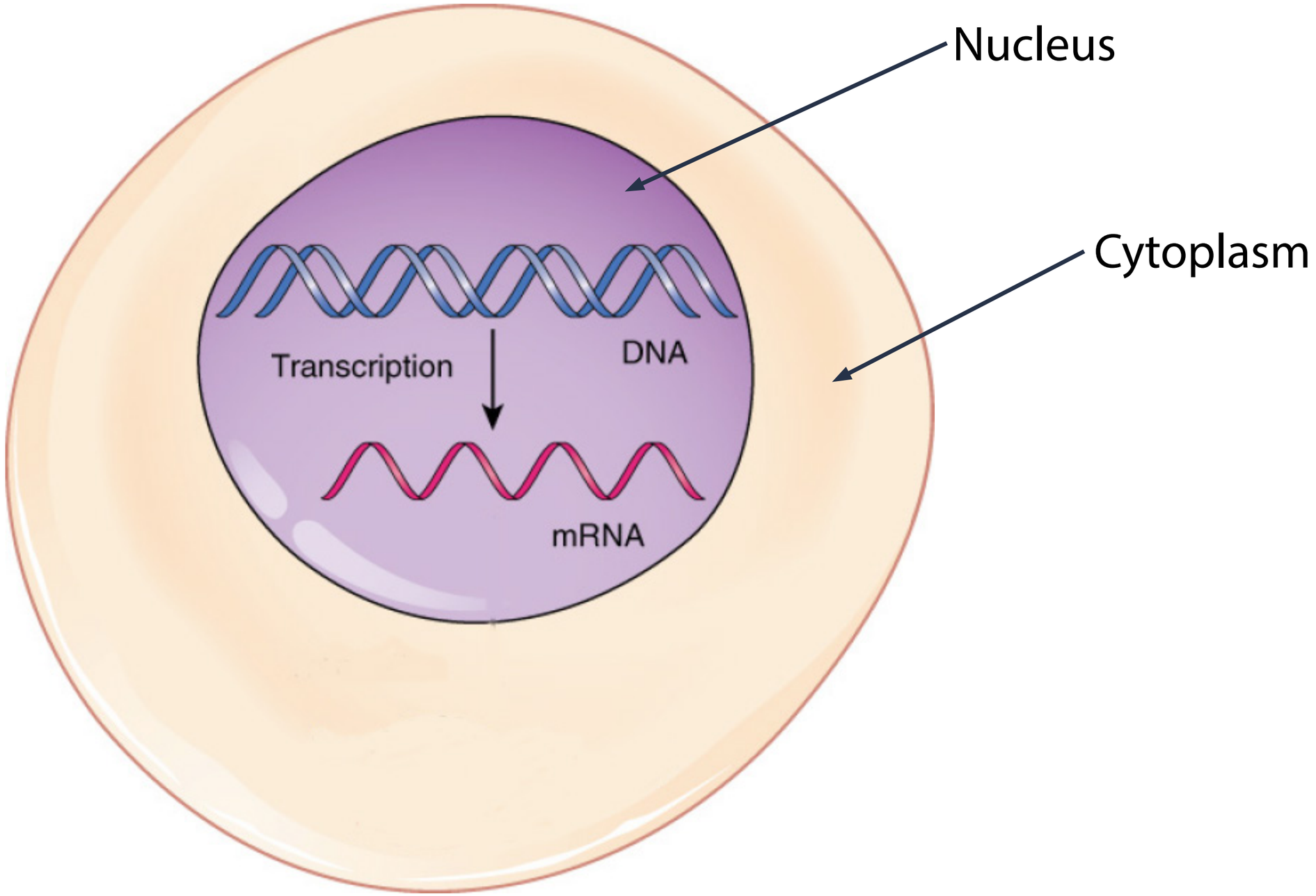
= Thymine

= Cytosine

= Guanine

= Phosphate backbone

Transcription & Translation



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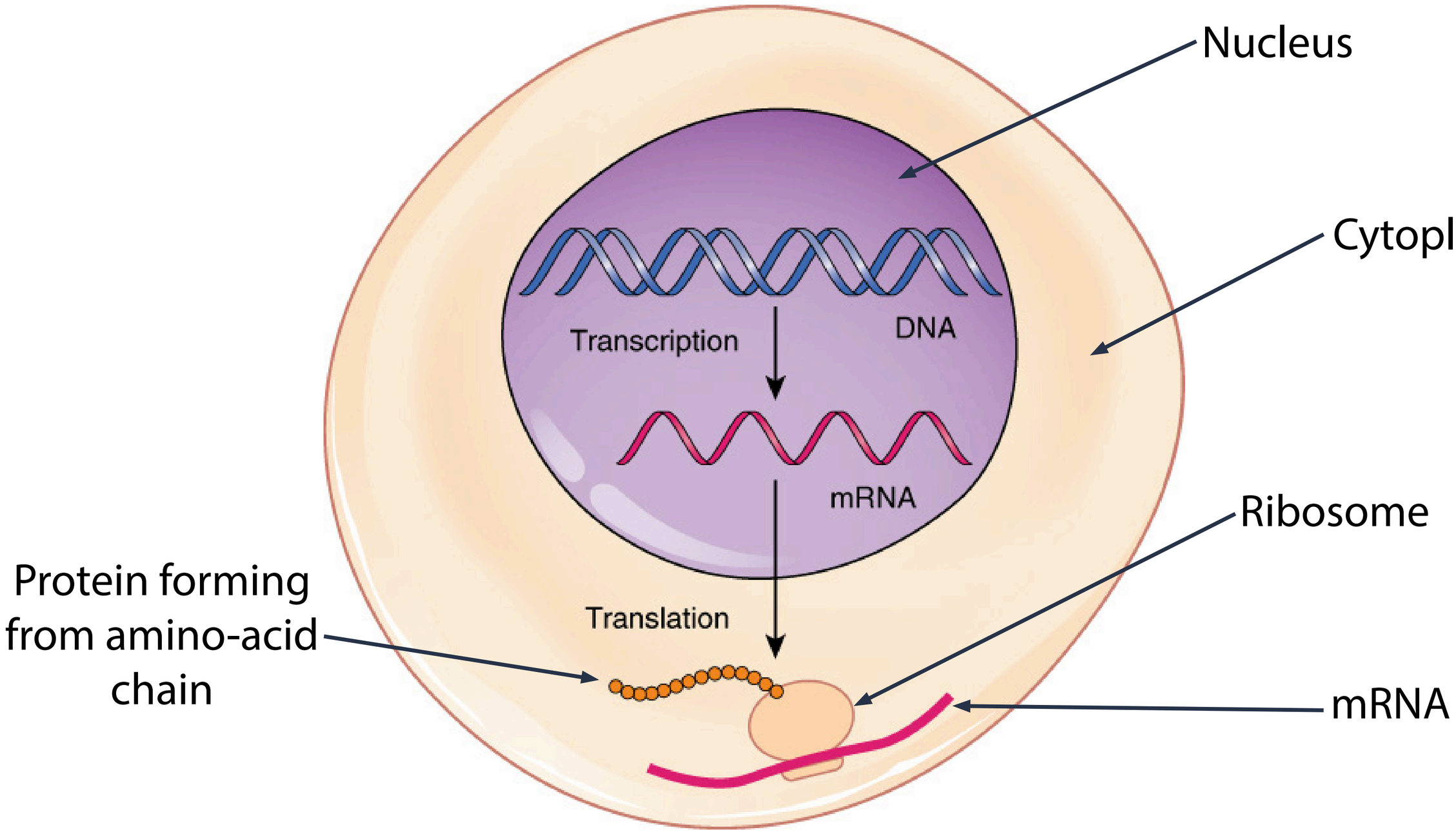

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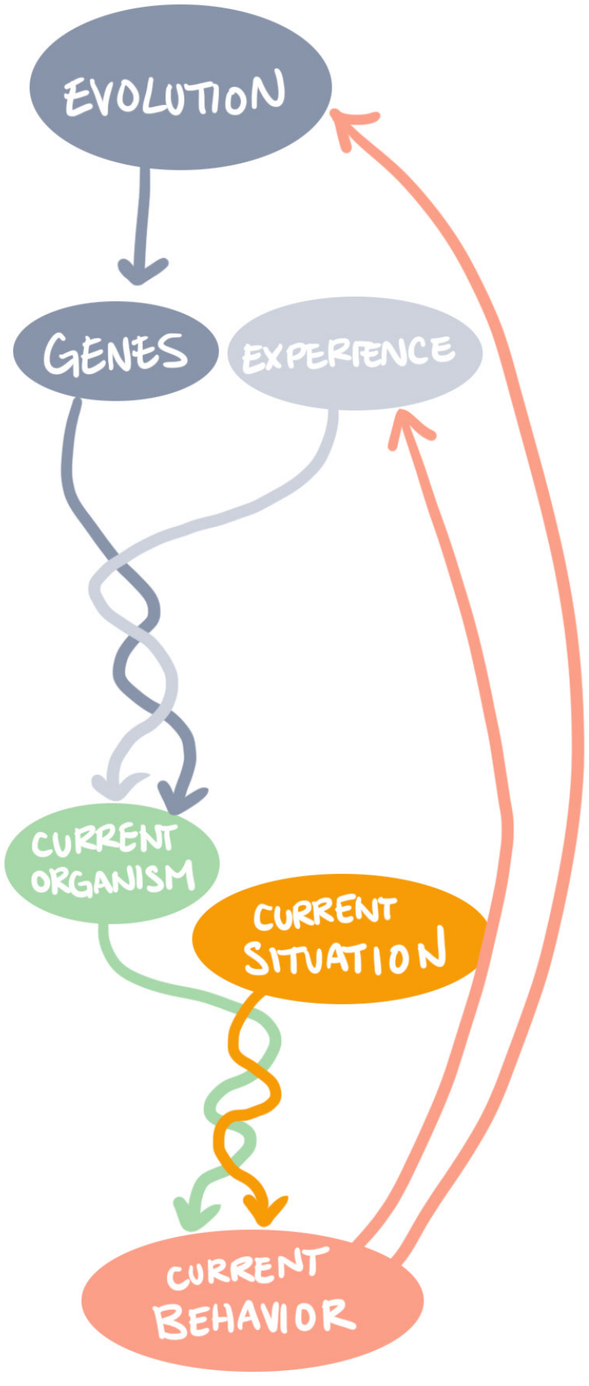
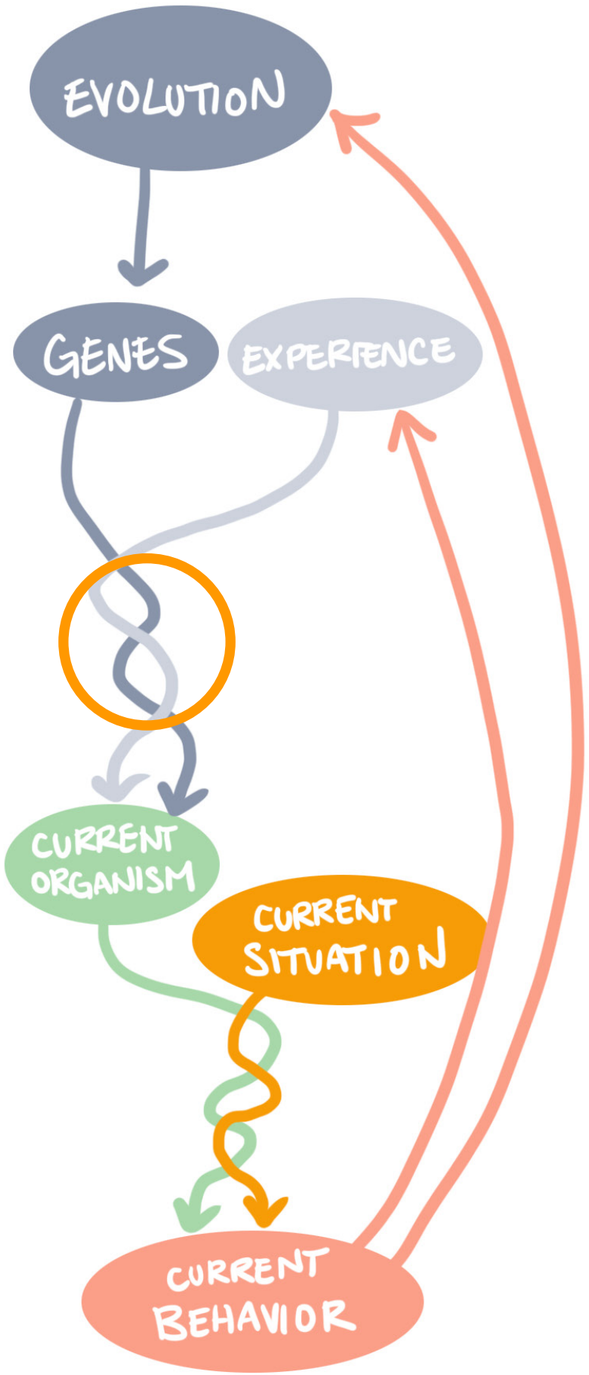

EVOLUTION
GENES
EXPERIENCE
CURRENT ORGANISM
CURRENT SITUATION
CURRENT BEHAVIOR

Epigenetics: Changes in phenotype caused by any means other than changes in the underlying DNA sequence (e.g., DNA methylation, histone modifications).

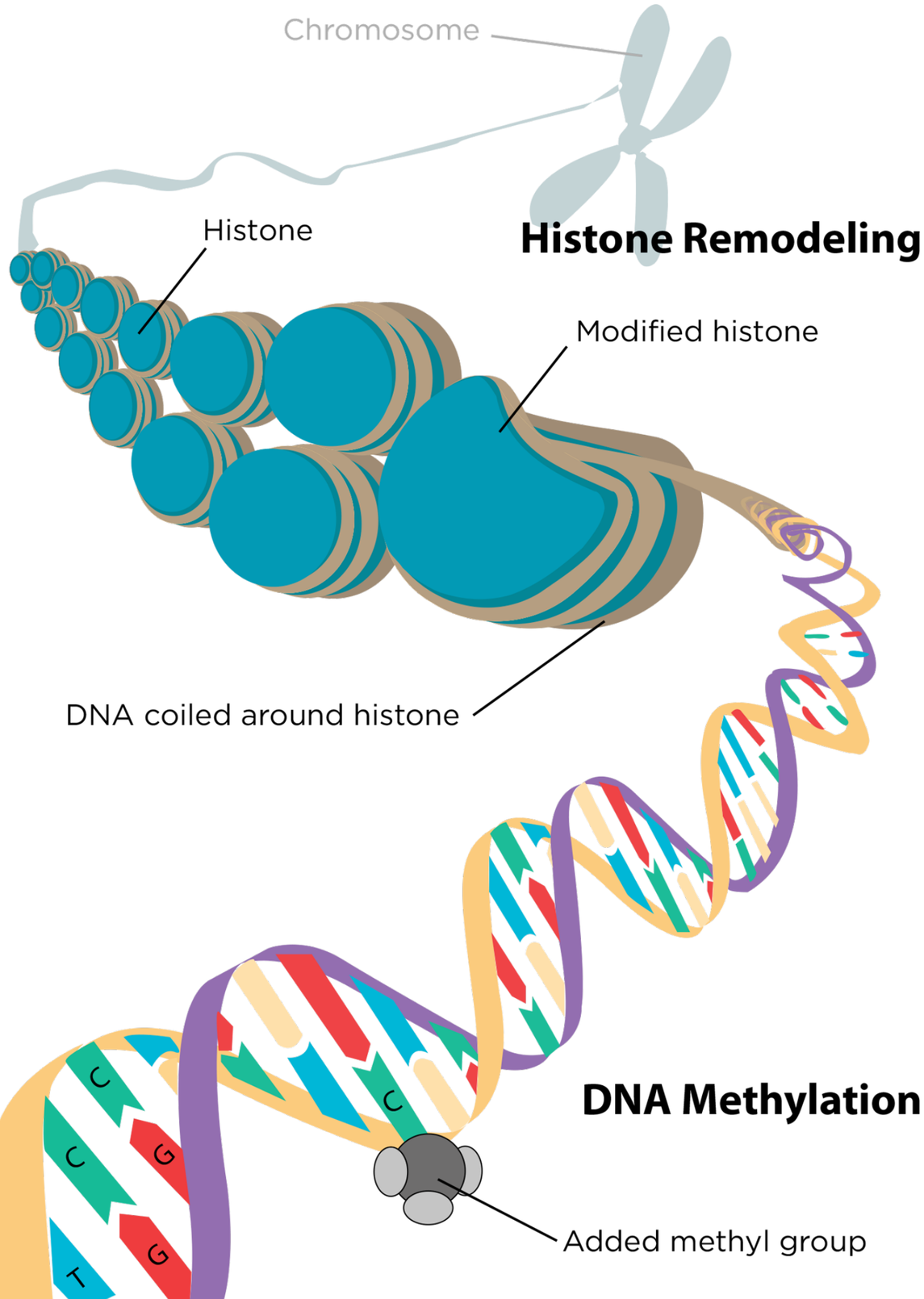


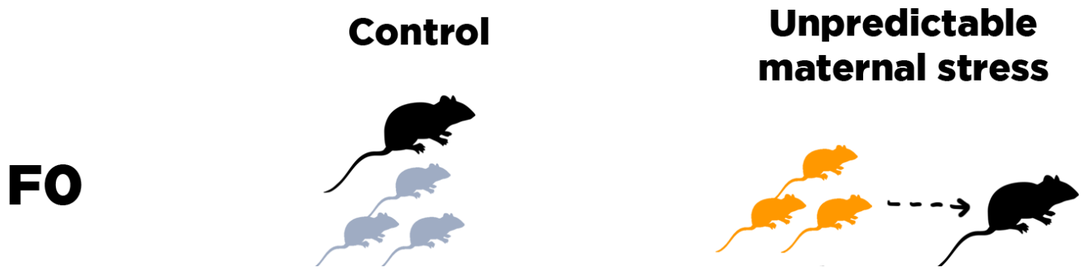
2 (well studied) epigenetic marks:

1. Histone remodelling

2. DNA methylation

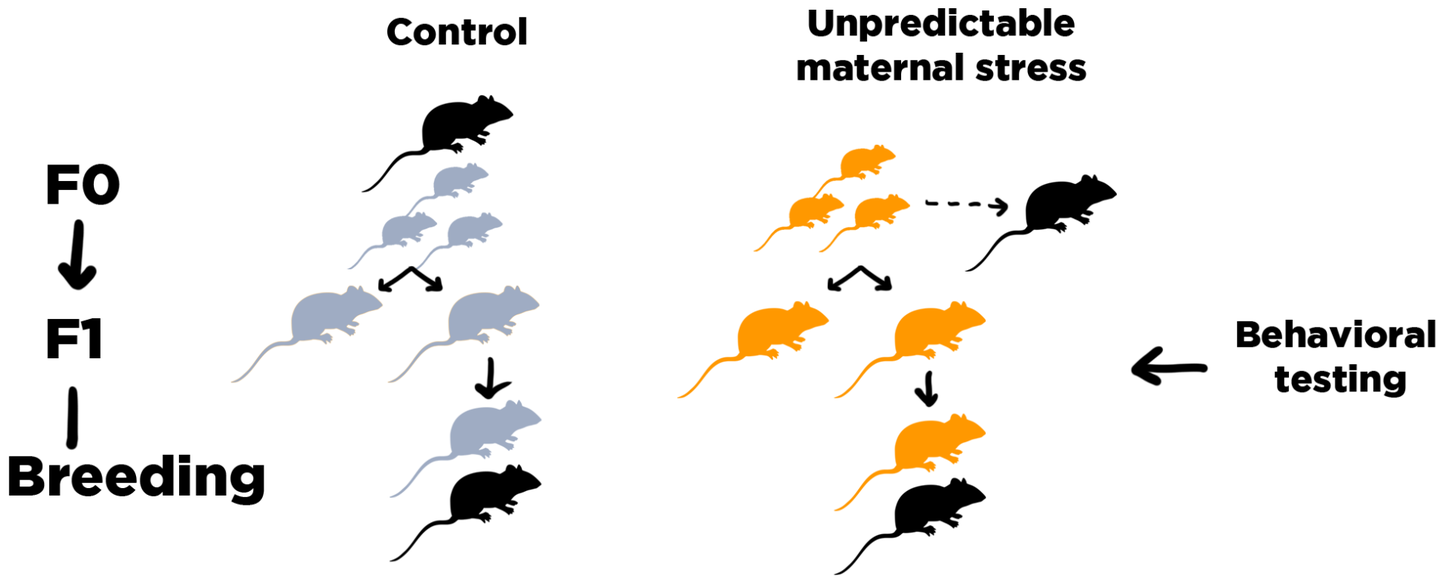
Epigenetics





adapted from Franklin et al., 2010

Transgenerational Epigenetics



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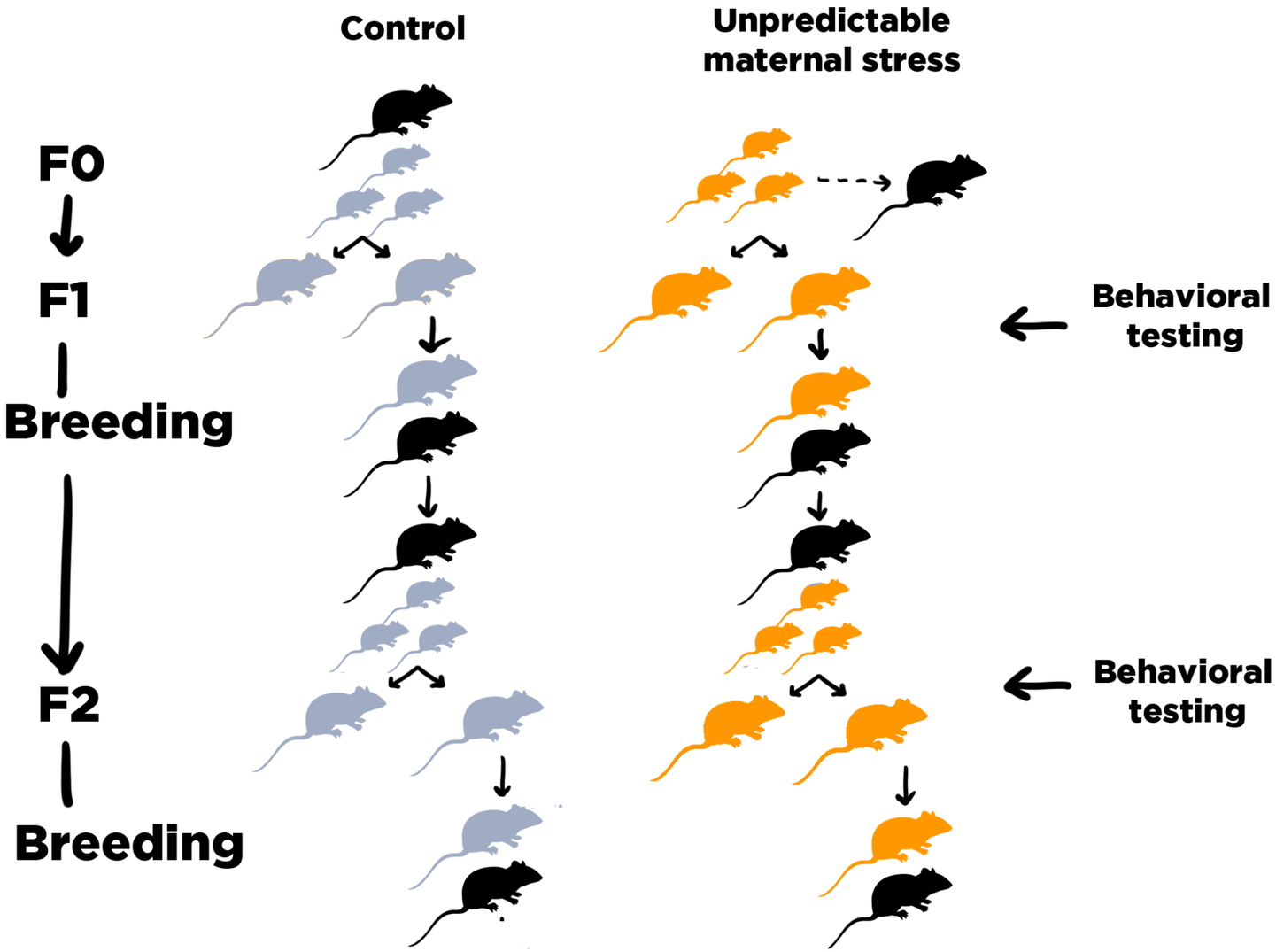
Transgenerational Epigenetics



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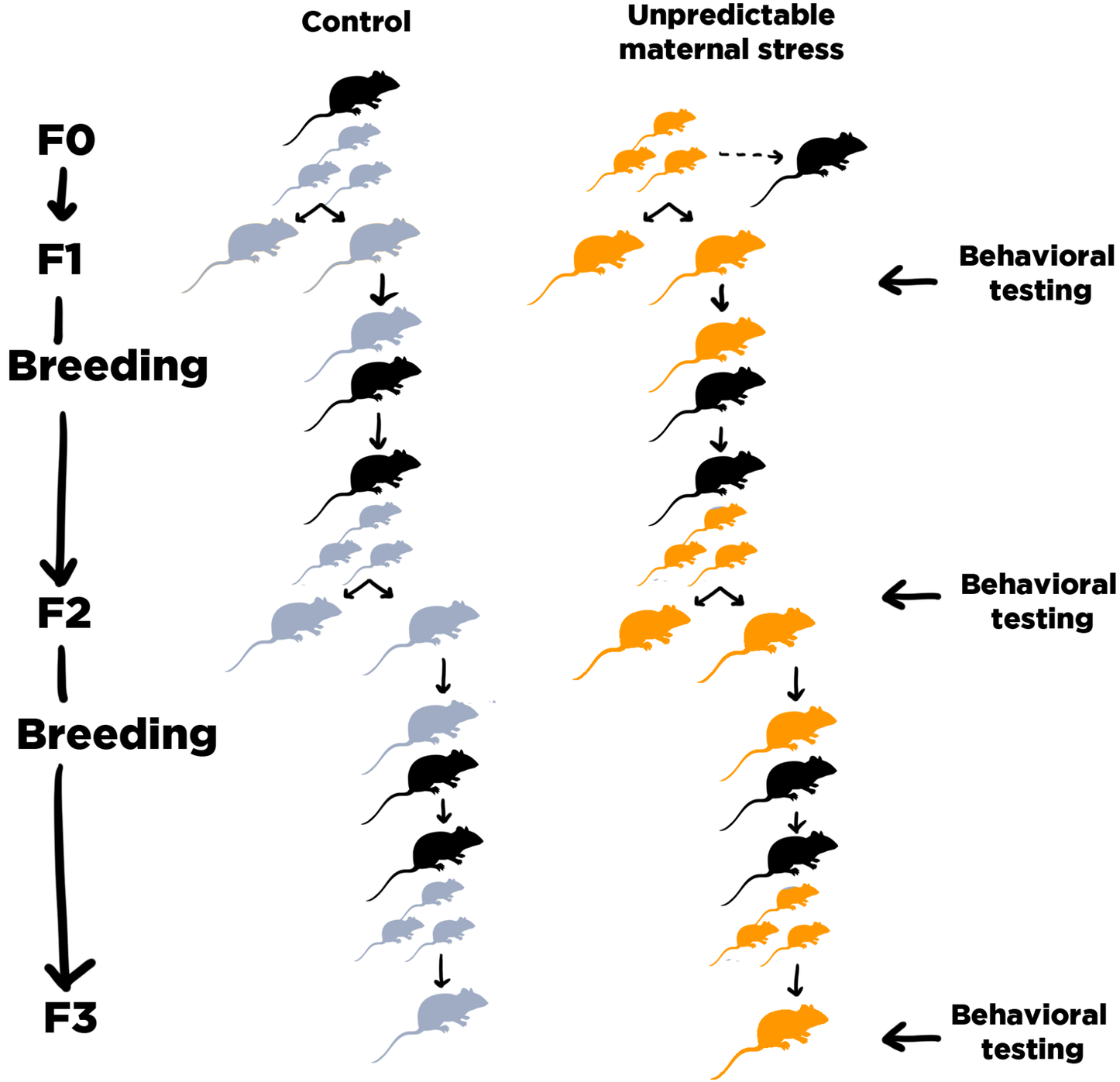
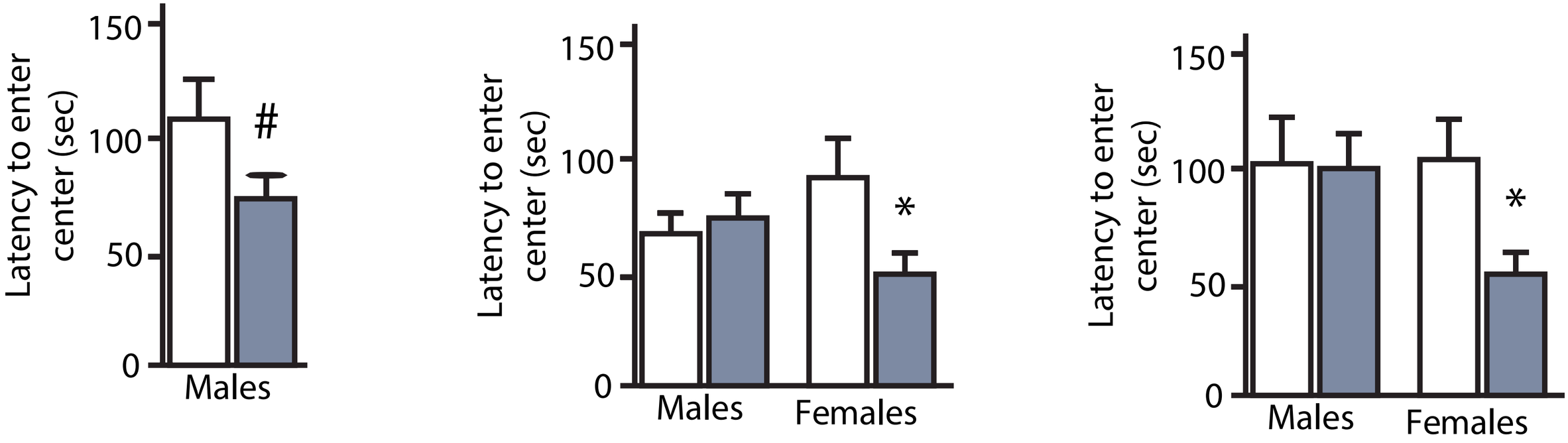
Transgenerational Epigenetics



adapted from Franklin et al., 2010

Transgenerational Epigenetics

Open field



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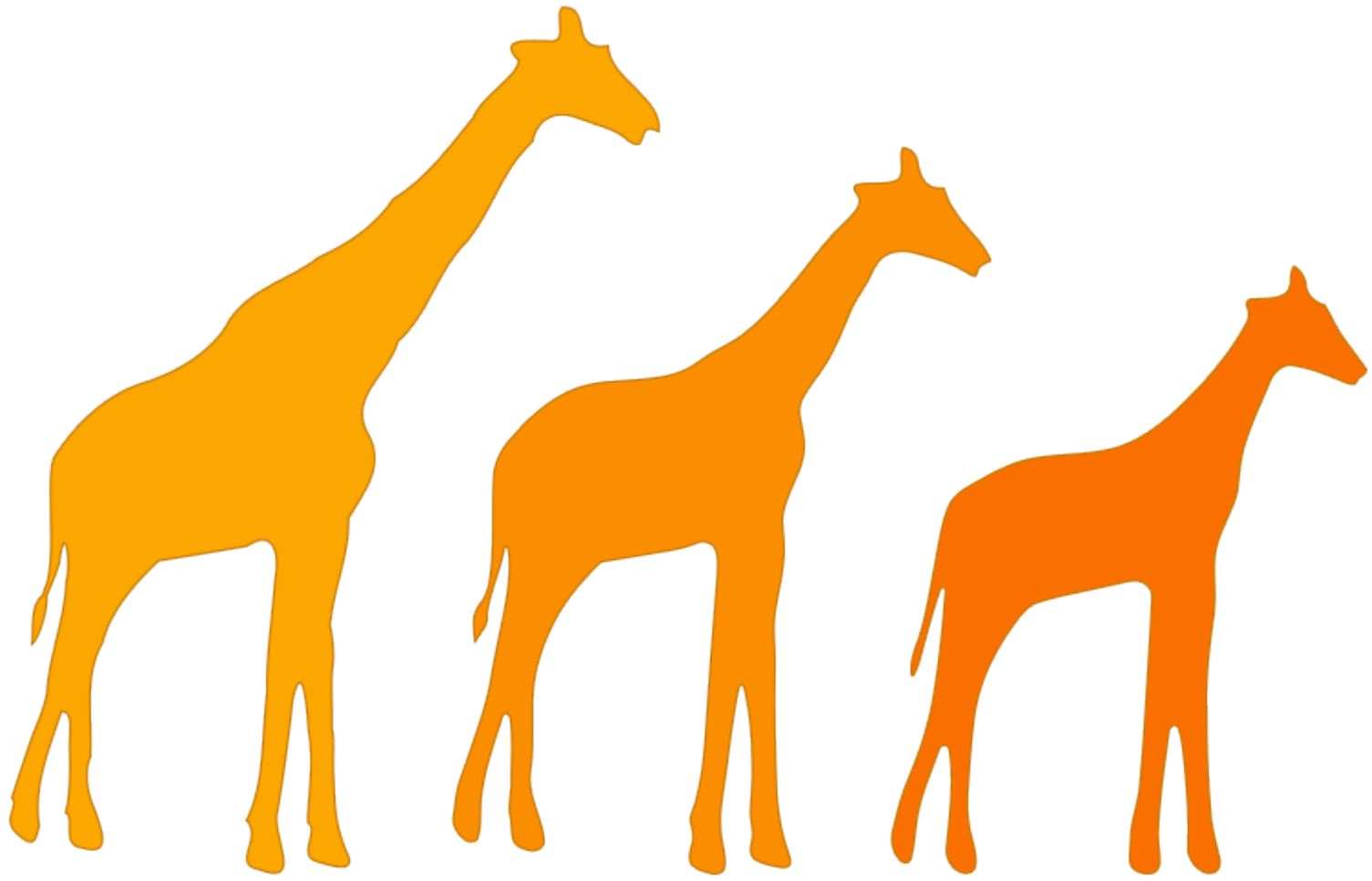
Transgenerational Epigenetics



Lamarckism?