**Ch. 18: Gene Regulation – Part 2**

**How Gene Expression Regulated by Eukaryotes?**

|  |  |
| --- | --- |
| How/why can different cells in the same organism have different functions? |  |

**Key Point:** Gene Expression in Eukaryotes is Regulated at \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Chromatin Structure:

* Tightly bound DNA 🡪 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* **Heterochromatin**:
* **Euchromatin:**
* **DNA methylation**:
* **Histone acetylation**:

1



How does histone acetylation promote transcription?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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| --- | --- |
| What is **Epigenetic Inheritance** | * Modifications on chromatin can be
* Unlike DNA mutations, these changes to chromatin
* Explains differences between \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Eg. DNA methylation (gene silencing), histone acetylation, X chromosome inactivation, heterochromatin (silent chromatin)
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Transcription Initiation:

* Specific transcription factors (activators or repressors) bind to
* **Activators**:
* **Repressors**:

3

2

Regulation of mRNA:

* micro RNAs (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_) and small interfering RNAs (\_\_\_\_\_\_\_\_\_\_\_\_\_\_) can
* RNA processing:
* mRNA degredation:

4

Translation

* Can regulate initiation factors

5

Protein Modification/Processing

**Embryonic Development of Multicellular Organisms**

**CELL DIVISION:**

**CELL DIFFERENTIATION:**

**MORPHOGENESIS:**

**DETERMINATION:**

* **Cytoplasmic Determinants:**



* **Cell to Cell Signals:**
* **Induction:**

**PATTERN FORMATION:**

**MORPHOGENS:**

**HOMEOTIC GENES:**

**Cancer results from genetic changes that affect cell cycle control**

1. **PROTO-ONCOGENE** =
* **ONCOGENE**:
1. **TUMOR-SUPPRESSOR GENE** =

**Genes involved in cancer:**

1. **Ras gene:**
2. **P53 gene:**

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