

Reading: Chapter 21, just through section 21.3

Transcription continued....

The fate of mRNA in:

1. **Prokaryotes**
2. **Eukaryotes**

**mRNA processing**

- a) **cap**
- b) **poly-A tail**
- c) **RNA Splicing:**

**Exons =**

**Introns =**

**V. Translation =**

**Codons =**

**Features of the genetic code**

**reading frame =**

**The Process of Translation**

- Spliced mRNA moves out of nucleus
- tRNA binds to the ribosome at first codon (AUG)  
**anticodon =**
- the tRNA corresponding to next codon binds to ribosome
- **stop codon**
- polypeptide released and processed

Early ideas about development (before the middle 1800's):

- Spontaneous generation
- Preformation
- Epigenesis

**Development =**

**Model organisms:**

**Development** from an egg cell to a whole organism is

Influenced by **four factors:**

1

2

3

4

Consists of **three processes:**

1

2

3

Based on gradual narrowing of cell fates

**Cell fates =**

**Cell differentiation (determination) =**

**Cell Differentiation**

**Question:** How do you get cells that do wildly different things (and even look different) from a single fertilized egg cell?

**Two competing hypotheses for the mechanism of differentiation**

1. Nuclear alteration =

2. Nuclear differentiation =

**Experiments** used to address these hypotheses:

1. **Carrot experiment** (F. C. Steward & colleagues, 1950s):

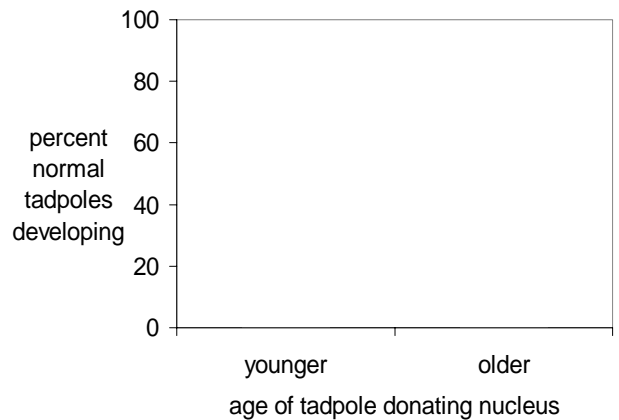
**totipotent** =

Which hypothesis supported?

2. **nuclear transplantation**

**enucleation** =

a) Experiment with African clawed toad (*Xenopus leavis*), (Briggs and King 1953, Gurdon 1968)



Which hypothesis supported?

b) 1997 Scottish scientists use nuclear transplantation on a sheep

Which hypothesis supported?

**What we can conclude from these experiments**