OUTLINE 2

- **II. Cell Differentiation**
 - A. What do we know?
 - **B.** The developmental landscape model
 - C. Two hypotheses for how cells become differentiated
 - **1. Nuclear alteration**
 - 2. Nuclear differentiation
 - **D.** Experimental evidence
 - **1. Seward totipotency in carrots**
 - 2. Gurdon nuclear transplantation in toads

Your TAs

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You

Class Fr: 9 So: 147 Jr: 57 Sr: 27

Major Bio: 128 Ex. Phys: 56 Biochem: 16 Chem: 10 Psych: 9

Career

Medicine: 95 Allied Health: 48 Research: 21 Vet med: 12 Other: 6 Undecided: 58 ?

?

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Outline of Lecture 1

I. THE CENTRAL DOGMA A. DNA structure B. DNA Replication C. Chromosomes 1. Prokaryotic 2. Eukaryotic D. RNA Structure

E. Transcription
1. Summary
2. Prokaryotes
3. Eukaryotes

F. Translation

- 1. The genetic code
- 2. Summary of translation

Fig. 17.4

The Genetic Code

Codon - 3 base sequence that codes for one amino acid or is a signal.



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Fig. 17.13

Transfer RNA (tRNA)



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Fig. 17.12

Translation of mRNA into protein



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Fig. 17.25



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Muscle

Intestinal

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Nerve





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Waddington's Developmental Landscape

Undifferentiated cell

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muscle lung brain skin

Nuclear Alteration

Which One?



Fig. 21.5

Seward's carrot experiment



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Nuclear transplantation

Frog embryo or Frog egg cell tadpole (larva) νυ Nucleus Intestinal cell Nucleus \bigcirc Transplantation Nucleus of nucleus destroyed Eight-cell embryo Tadpole

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Fig. 21.6



Dolly and "mom"



Noah - an endangered guar

Issues related to totipotency



OUTLINE 3

- **III.** Control of Gene Expression in Prokaryotes
 - A. Regulatory proteins
 - **B.** The operon model
 - C. Examples
 - 1. the lac operon (substrate induction)
 - 2. the tryp operon (end product repression)
 - 3. the lac operon (positive control)