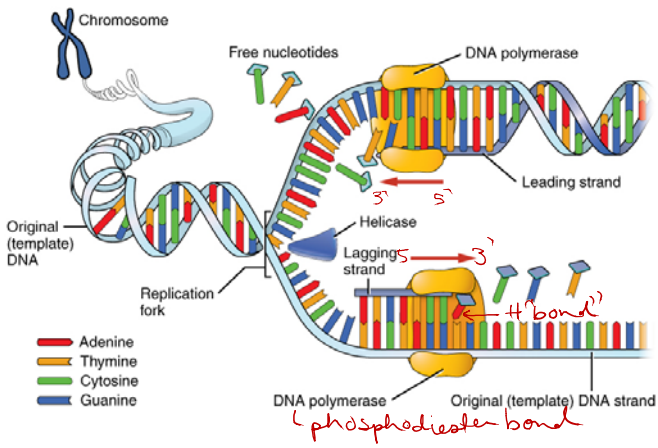
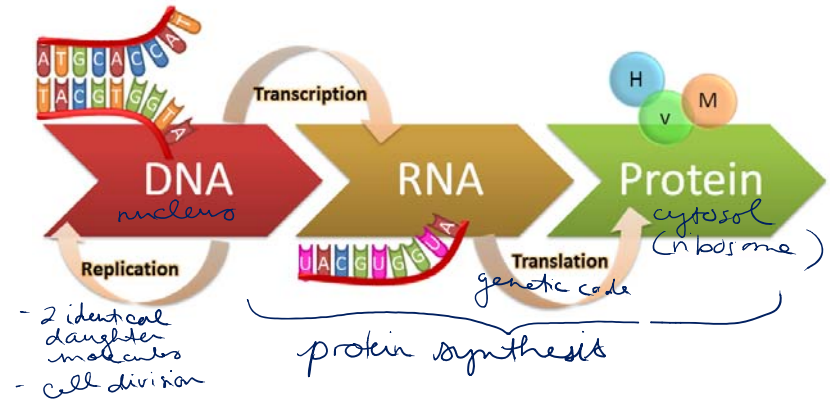
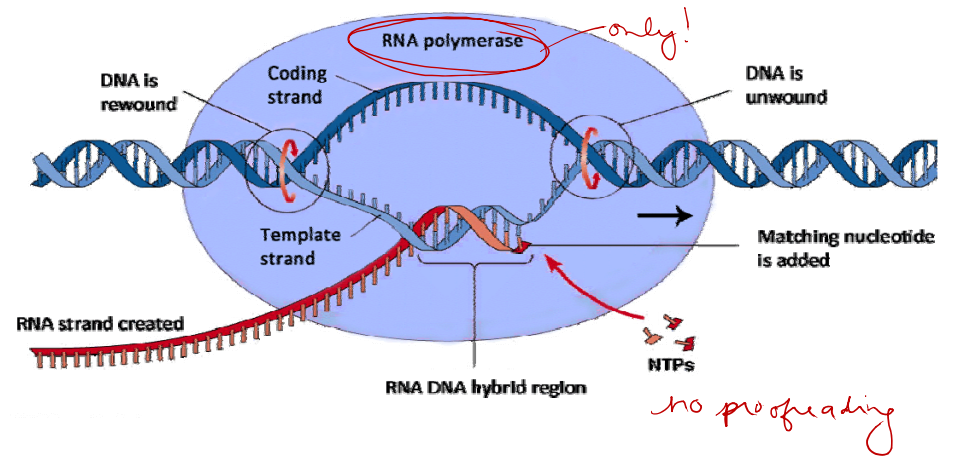


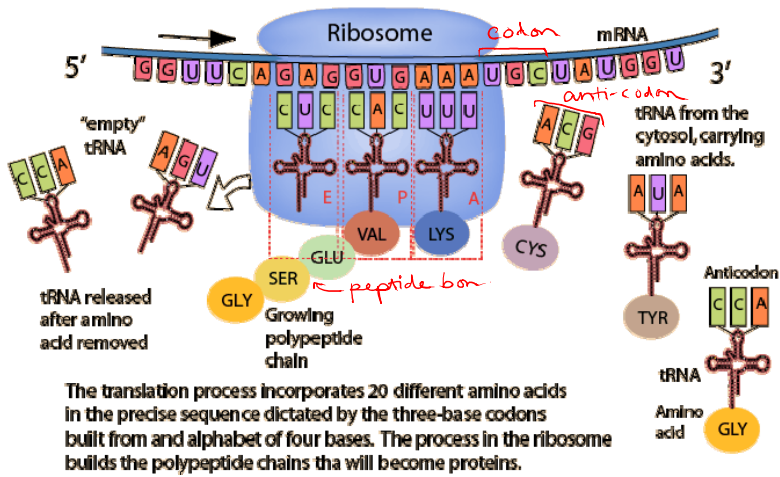
Unit 3 – Molecular Genetics

- Information storage and transfer in cells (the “Central Dogma”)
- DNA replication
- Transcription
- Translation
- Gene regulation
- Biotechnology



- Semi conservative
 - Semi-discontinuous
- ↳ leading strand
↳ lagging strand





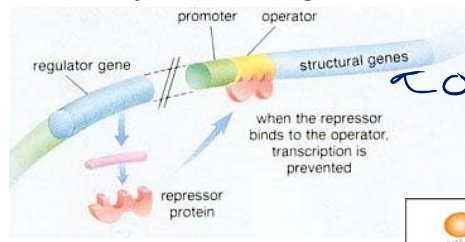
The translation process incorporates 20 different amino acids in the precise sequence dictated by the three-base codons built from an alphabet of four bases. The process in the ribosome builds the polypeptide chains that will become proteins.

		Second letter					
		U	C	A	G		
First letter	U	UUU } Phe UUC } UUA } Leu UUG }	UCU } Ser UCC } UCA } UCG }	UAU } Tyr UAC } UAA Stop UAG Stop	UGU } Cys UGC } UGA Stop UGG Trp	U	C
	C	CUU } Leu CUC } CUA } CUG }	CCU } Pro CCC } CCA } CCG }	CAU } His CAC } CAA } Gln CAG }	CGU } Arg CGC } CGA } CGG }	U	C
	A	AUU } Ile AUC } AUA } AUG Met	ACU } Thr ACC } ACA } ACG }	AAU } Asn AAC } AAA } Lys AAG }	AGU } Ser AGC } AGA } Arg AGG }	U	C
	G	GUU } Val GUC } GUA } GUG }	GCU } Ala GCC } GCA } GCG }	GAU } Asp GAC } GAA } Glu GAG }	GGU } Gly GGC } GGA } GGG }	U	C
						Third letter	
						U	C
						A	G

- universal
Same in all organisms
↳ Common ancestor
↳ recombinant DNA

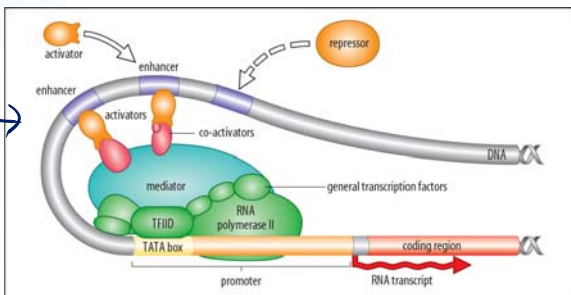
- redundant
many codons = same AA
↳ ↓ errors (no proofreading)

Prokaryotic Gene Regulation

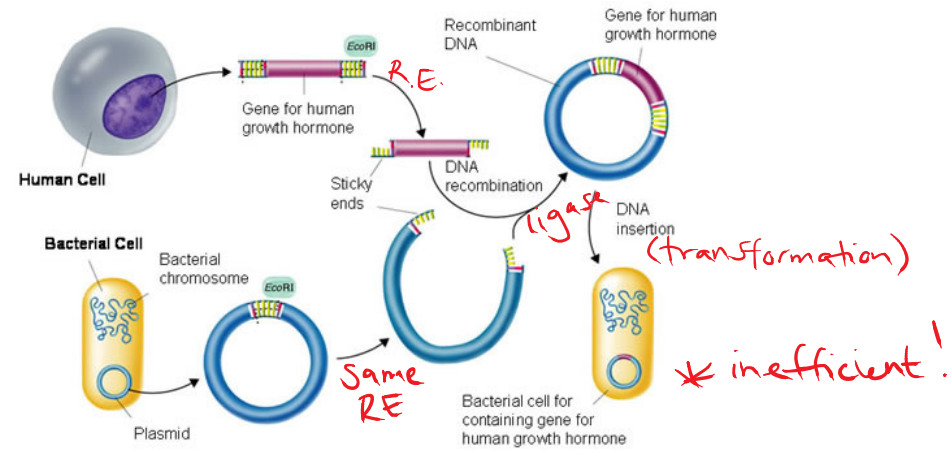


Transcriptional Regulation
Operon — REPRESSIBLE ON → OFF
INDUCIBLE

Eukaryotic Gene Regulation

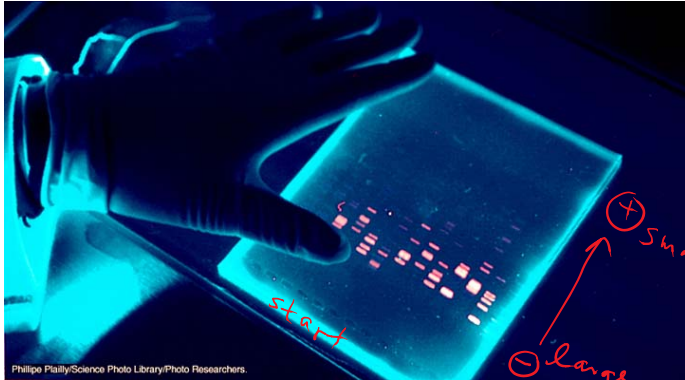


Transcription factors
↑ transcription



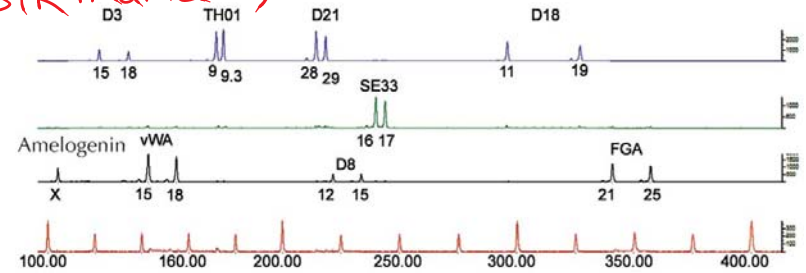
** inefficient!*

- **Gel Electrophoresis:** Principle of the technique: *Size separation*



- **DNA Fingerprinting:** Principle of the technique:

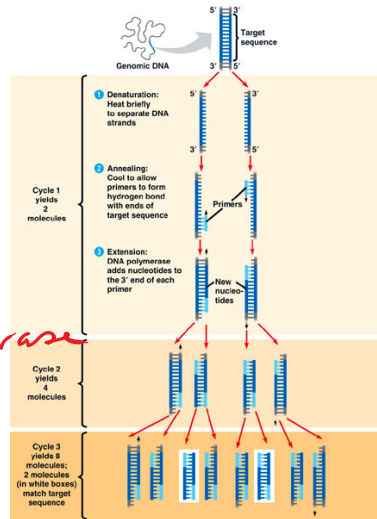
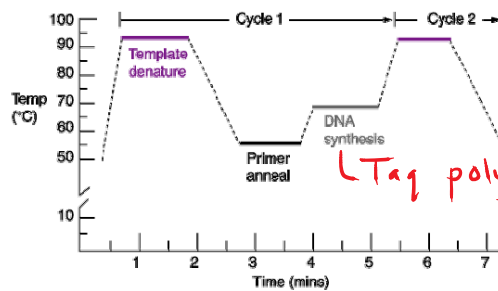
(STR markers)



DNA used to identify an individual

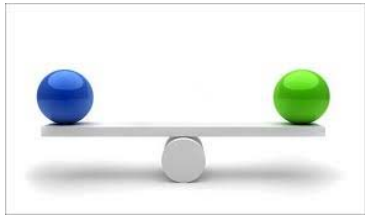
- **PCR:** Principle of the technique:

make many copies



Unit 4 - Homeostasis

- Homeostasis
- Nervous system
- Excretory system
- Endocrine system



- What factors are kept at balance?

pH, temp, sugar etc.

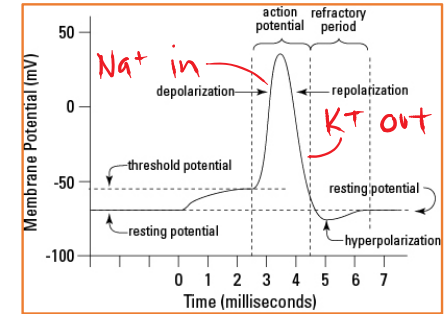
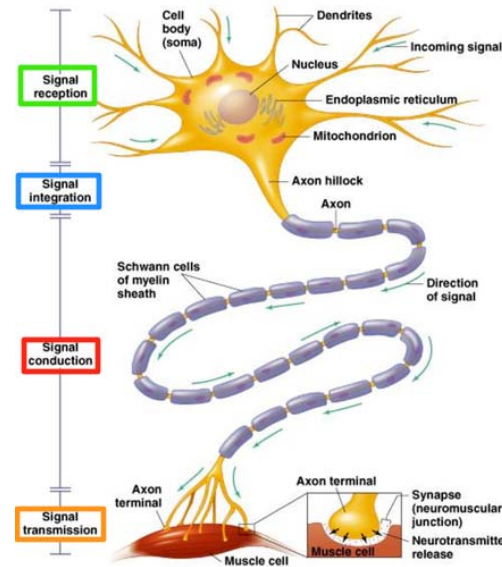


- Systems involved

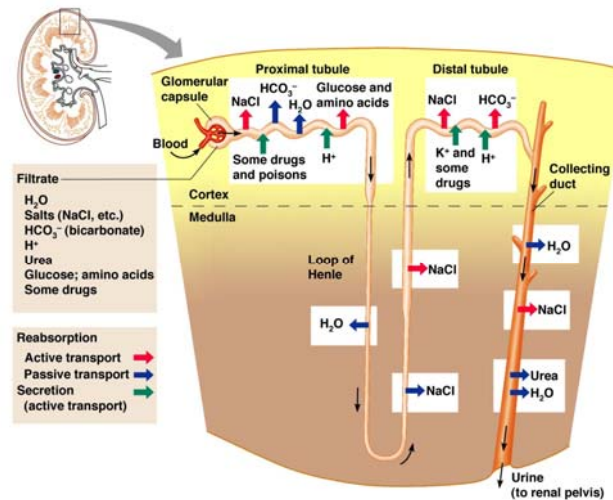
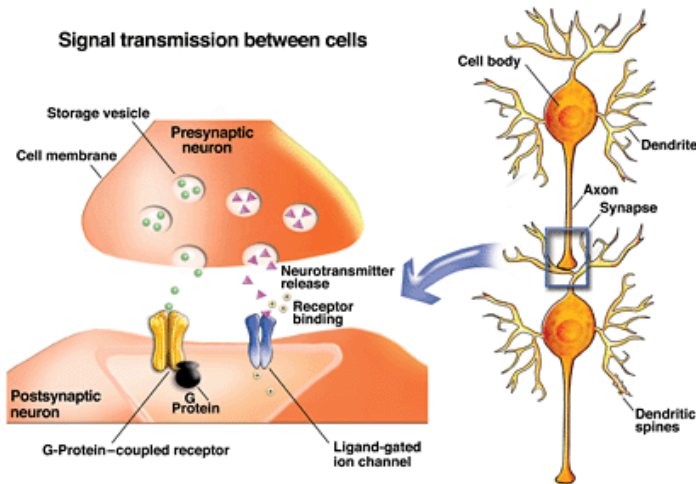
- nervous
- endocrine

- Feedback

*⊖ * **
⊕



Signal transmission between cells



- Structure meets function

- glomerulus
- LoH
- tubules
- C.D.

- Role in multiple processes

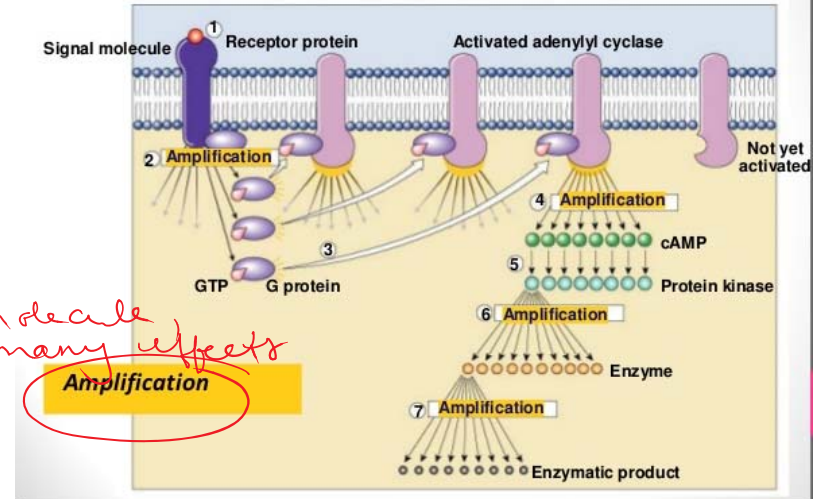
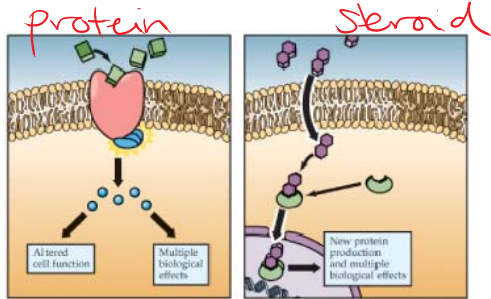
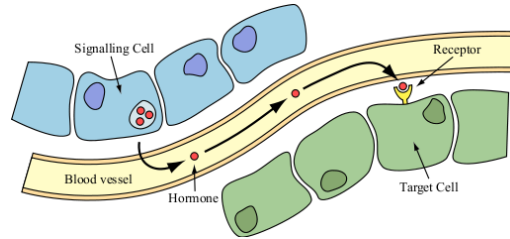
- pH balance
- water-salt balance
- hormone production (*renin*)

Hormones

- target cell specificity

- shape
- receptors

- solubility

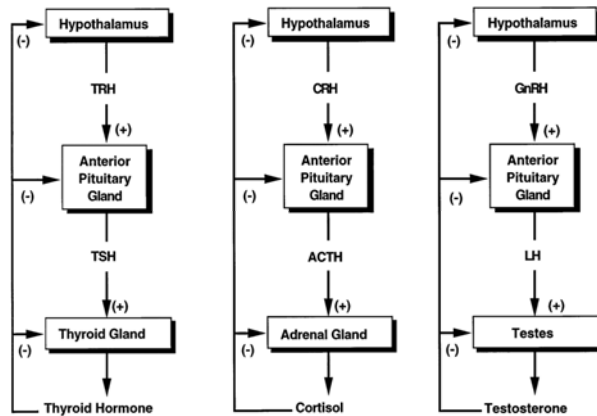


- Typical hormonal signalling pathway

- patterns

- Negative feedback

- examples
- significance



- what makes it?
- what does it do?

