

Protein Synthesis

DNA-->RNA-->Protein-->Trait

One Gene one Protein

- Beadle and Tatum
 - Worked with the Mold Neurospora.
 - Looked at metabolic pathway to synthesize the amino acid Arginine

Beadle and Tatum

- This may not be totally accurate.

Fig 17.1 The one gene-one enzyme hypothesis (Beadle and Tatum)



RNA vs DNA

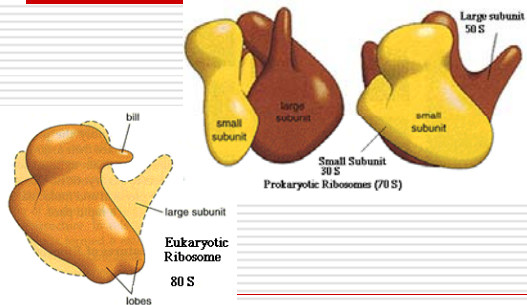
Differences between the two nucleotides

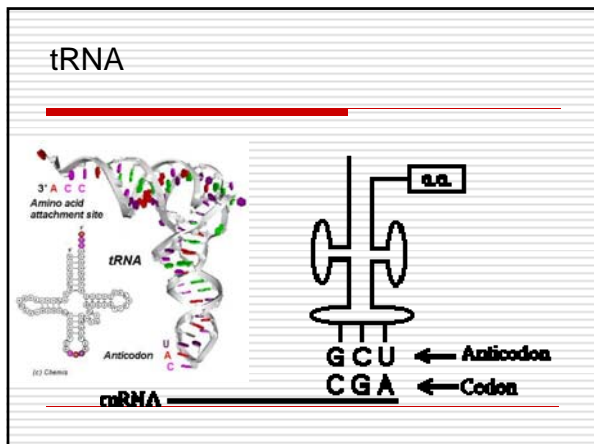
- Sugar
 - Ribose instead of deoxyribose
- Nitrogenous bases
 - Uracil instead of Thymine

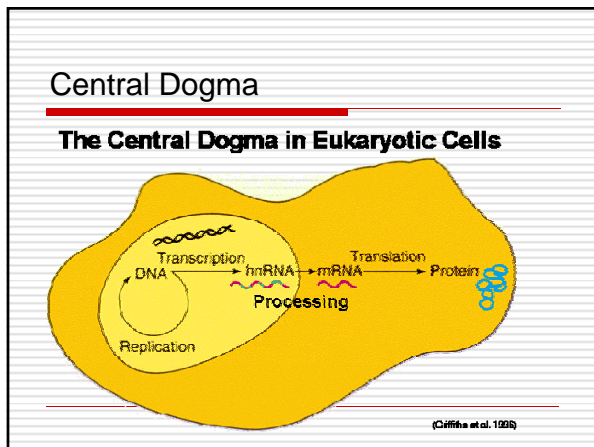
Types of RNA

- rRNA
 - Ribosomes are made of rRNA and Proteins
- tRNA
 - Folded into the "t" shape and carry an amino acid on the end
- M-RNA
 - Single Stranded
- HnRNA
 - SNRPs

rRNA and Proteins







- ### Transcription vs Translation
- Transcription (DNA to RNA)
 - Copying mRNA from DNA
 - Promotor sequence
 - Some are modified before leaving nucleus (Eukaryotes)
 - Prokaryotes are not modified
 - Translation (RNA to Amino Acid)
 - Initiation
 - Elongation
 - Termination

Transcription

☐ Sense vs Antisense.

- Sense strand is the coding strand and would have the same sequence as the mRNA with U's replacing T's.
- The Antisense strand is the strand that is transcribed.

Transcription

☐ Promotor

- Site that the RNA polymerase recognizes and binds to begin the process of Transcription

☐ RNA Polymerase

- Enzyme that reads 3'5' and writes a 5'3' mRNA

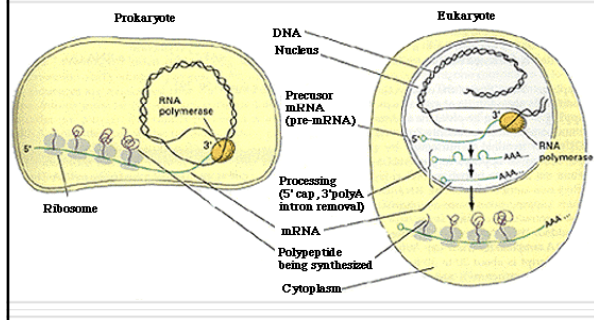
☐ Nucleoside Triphosphates

- The nucleotides that are put in by the polymerases

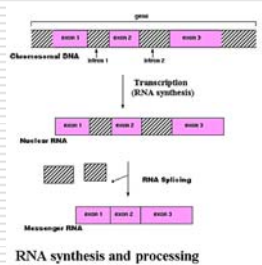
☐ Terminator

- Sequence that will code for a releasing factor

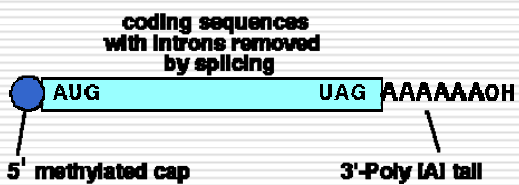
Processing or not

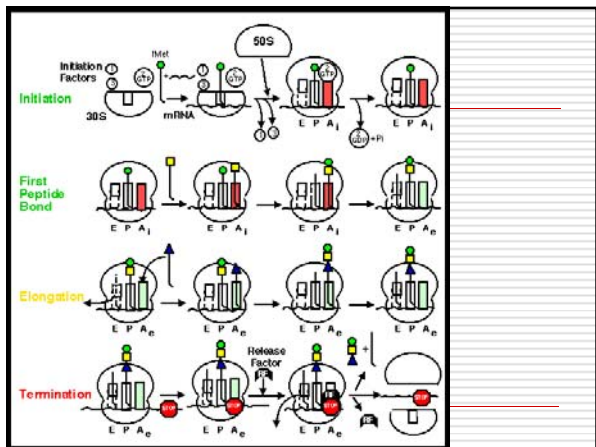


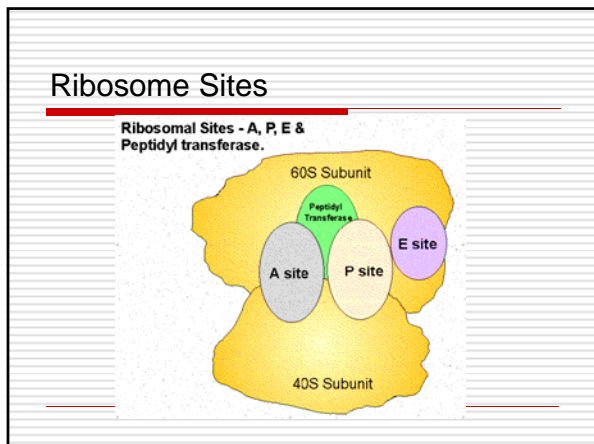
Splicing (Eukaryotes)

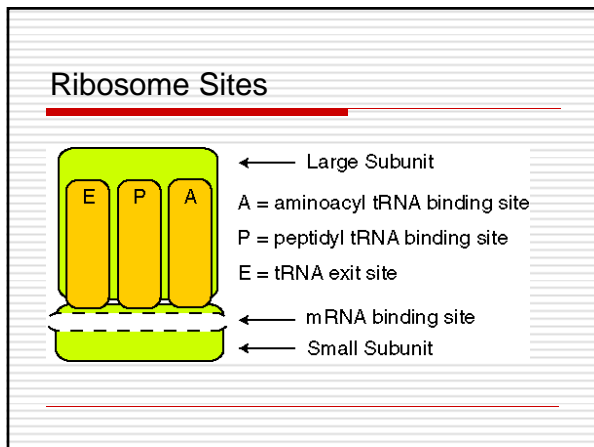


Cap and Tail









mRNA codes for AA

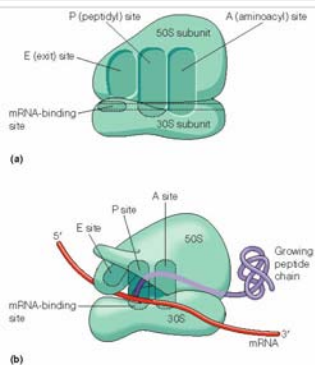
Degenerate Code

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

Translation

- T-RNA molecules are matched to the proper amino acid by an enzyme.
- Initiation, elongation, and translocation, and termination
- Location and Process

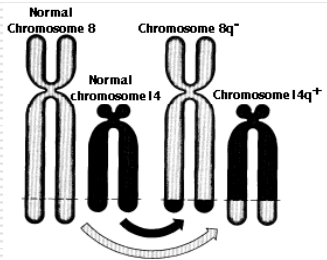
Ribosome



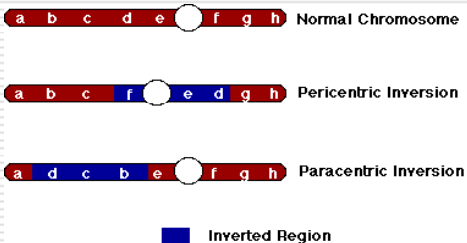
Mutations and Protein Synthesis

- Can produce new alleles
 - Must be in the gametes to be passed on
- Types of Mutations
 - Point
 - Can be harmless because of redundancy (Degenerate) of code
 - Chromosomal
 - Duplication
 - Inversion
 - Translocation
 - Deletion

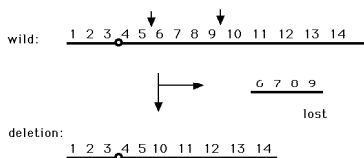
Translocation



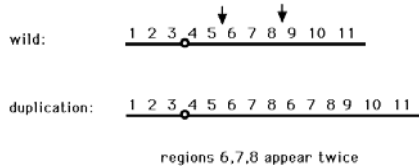
Inversion

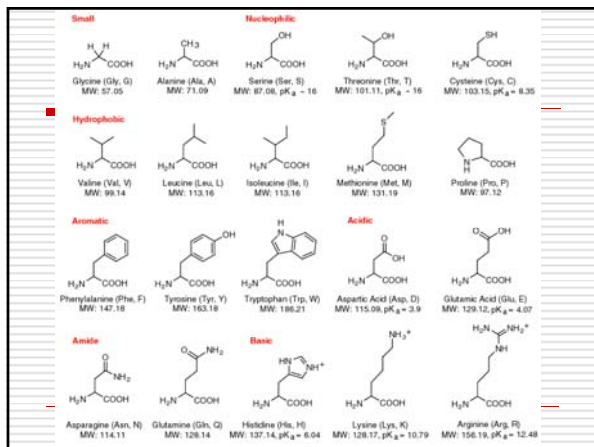


Deletion



Duplication





Ribosome with tRNA and Amino Acids

