

## Genetics Pt 4

### Transcription

- a. making mRNA in nucleus
- b. enzyme RNA pol reads the DNA in 3' to 5' direction and synthesizes complementary mRNA
- c. Ex. 3' to 5' DNA is ATG CAT then the 5' to 3' mRNA made will be UAC GUA
- d. Steps
  - (1) TATA Box where RNA pol binds and begins
  - (2) Transcription Factors (proteins that enhance transcription and help RNA pol into correct shape)
  - (3) Elongation (adding of RNA nucleotides- does not stay attached to DNA)
  - (4) Termination, ends when RNA pol reaches a termination sequence

### mRNA editing

- a. introns are excised (cut out)
- b. exons are joined and spliced together using spliceosomes (snRNP's)
- c. add polyA tail to 3'
- d. add GTP cap to 5'
- e. each 3 are called a codon
- f. go to ribosome (free or in RER)

### Translation

1. mRNA code is read and matched with tRNA (brings amino acids) to construct a polypeptide using the ribosome
2. Ex. mRNA codon is AAA then tRNA anticodon will be UUU and will have a corresponding amino acid for that codon of mRNA
3. Initiation: 5' end of mRNA attaches to small ribosome, tRNA with anticodon UAC attaches to start codon AUG; large ribosomal subunit binds and tRNA is in P site

4. Elongation: new tRNA enters A site; peptide bond forms when a.a. is transferred from tRNA in P site to A site; translocation occurs and tRNA in A site moves to P
5. Termination: Ribosome encounters stop codon (UAA, UAG, UGA)
6. If in ER then: polypeptide is released into ER, then to Golgi complex, vesicle to cell membrane, then exocytosis (may be given signals for exit/delivery)
7. Free ribosomes typically make products for the cell and are not exported