

Molecular Biology 4

- iClicker 25A
- mRNA Processing
 - Exons / Introns
 - Splicing
- Genomes
- iClicker 25B

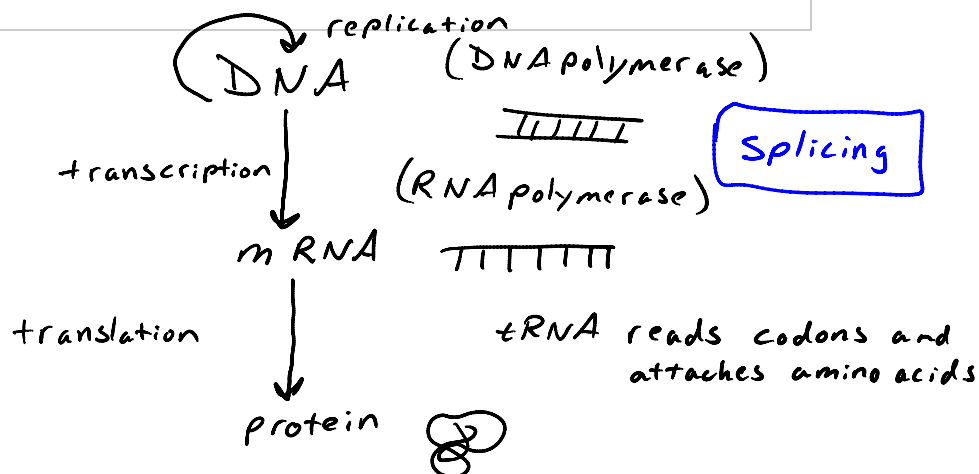
Exam 2

avg.	68
A	80 - 101
B	70 - 79
C	60 - 69
D	50 - 59
F	0 - 49

- Due in Lab this week
 - Pre-lab 9
 - No lab next week (Thanksgiving)

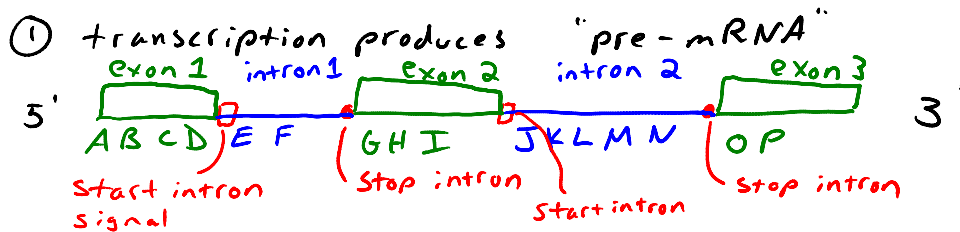
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Review

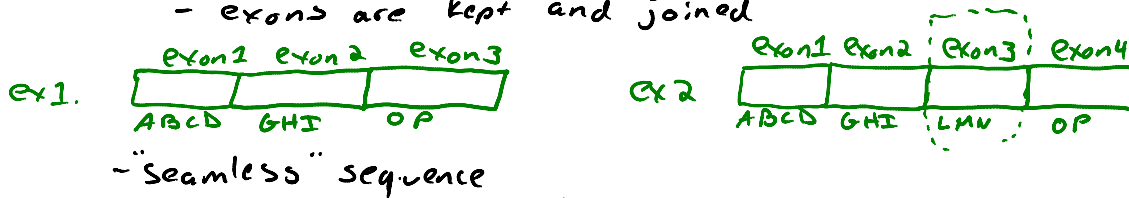


Exons and Introns → during mRNA processing
only in eukaryotes → humans, plants, etc. but not bacteria

Steps of Transcription



- ② Splicing - based on signal sequence
- introns are removed, depolymerized and recycled
 - exons are kept and joined



alternative splicing
- codes for protein isomers

- ③ add a cap at 5'-end
add a tail at 3'-end } to make mRNA last a little longer in the cell



- ④ mature mRNA exported from nucleus to cytoplasm
- ⑤ mature mRNA is translated

Control Sequences

<u>process</u>	<u>control seq.</u>	<u>conserved?</u>
transcription	promoter/terminator	NO
splicing	start/end introns	NO
translation	start/stop codons genetic code	Yes

Human Genes / Genome

1 Kb = 1,000 base-pairs
= 1,000 nucleotides

gene disease Size of gene # of exons mature mRNA % of gene that is

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<u>gene</u>	<u>disease</u>	<u>Size of gene</u>	<u># of exons</u>	<u>mature mRNA</u>	<u>% of gene that is exon</u>
β -globin	Hb christchurch	2 kb	3	0.5 kb	25%
PAH	PKU	90 kb	13	2.4 kb	2.6%
dystrophin	muscular dystrophy	2300 kb	79	14 kb	0.6%

	<u># nucleotides</u>	<u># genes</u>
Human	2.9 billion	23,000
fruit fly	120 million	13,600
e.coli	4.1 million	4,800
arabidopsis (plant)	125 million	25,000
amoeba dubia protozoa	670 billion	?
rice	?	> 46,000