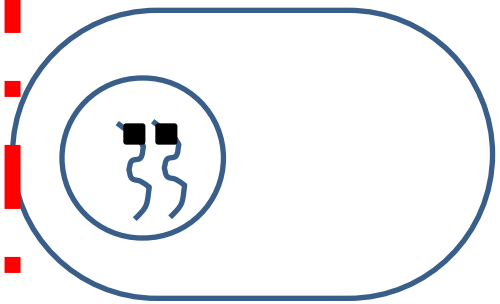
Today's Goals

- Decode DNA to make proteins.
- Describe a process by which the instructions in DNA can be used to make proteins.

How does DNA change the shape of a protein?

DNA (gene)

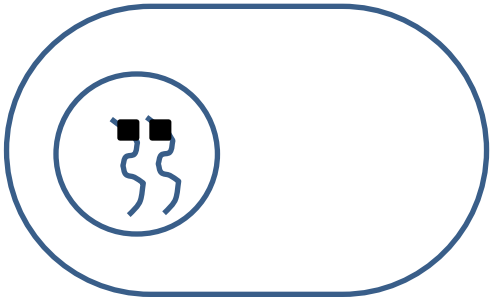


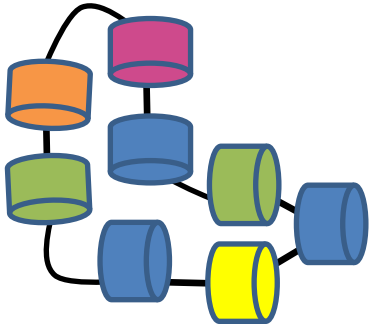
protein

traits

How does DNA change the shape of a protein?

DNA (gene) ⇢ Amino Acids ⇢ protein ⇢ traits



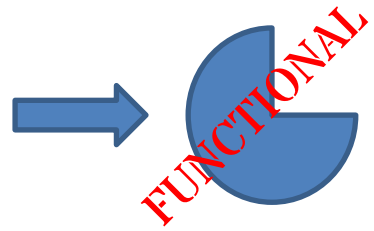


How does DNA code for proteins?

What determines the shape of proteins?

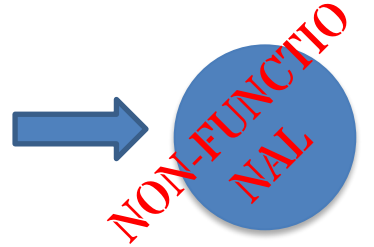
ACGGCTATAGTGCTCATGAT
TGCCGATATCACGAGTATCG

Version 1 of the Gene



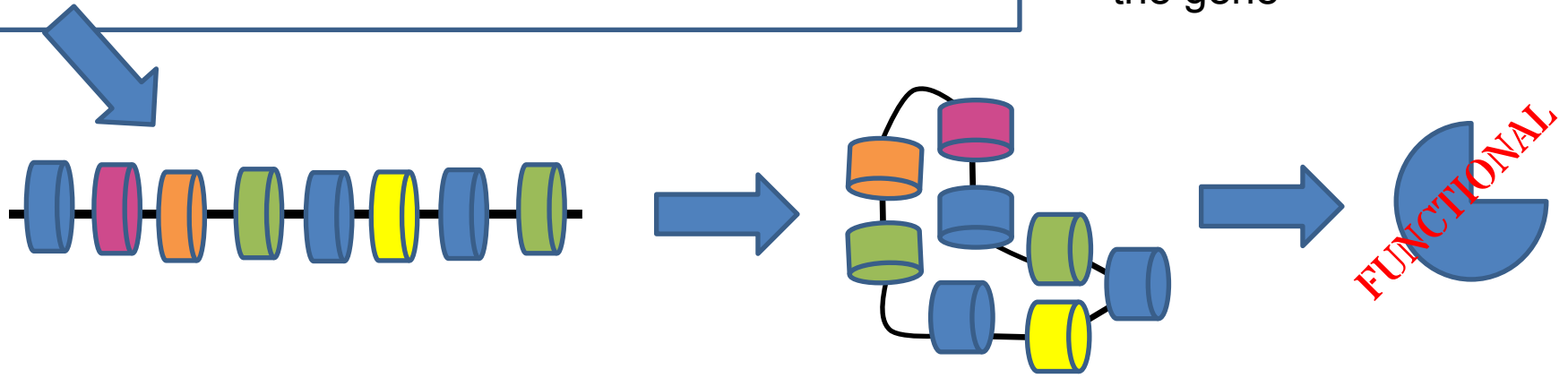
ACGGCTATAGTTCTCATGAT
TGCCGATATCACGAACTATCG

Version 2 of the gene



ACGGCTATAGTGCTCATGAT
TACCGATATCGACGAGTTCA

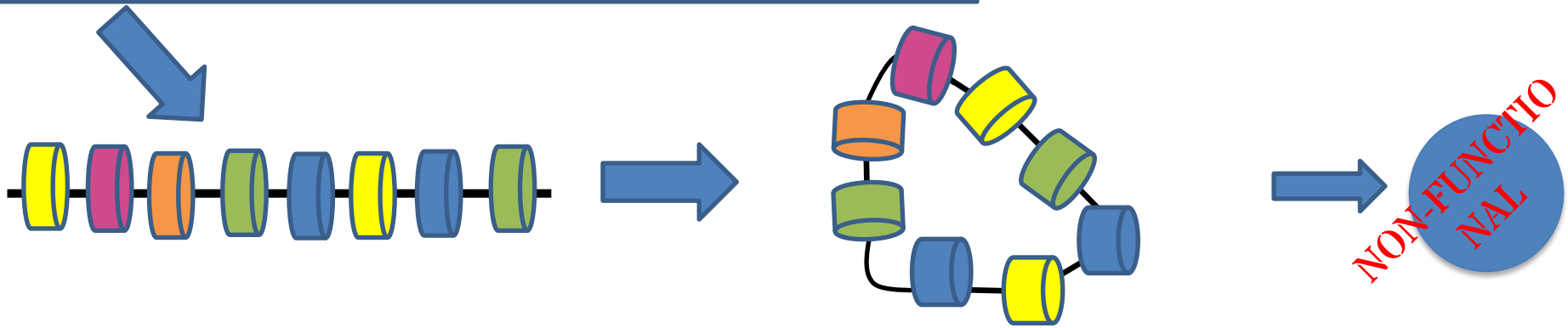
Version 1 of the gene



How does DNA code for amino acids?

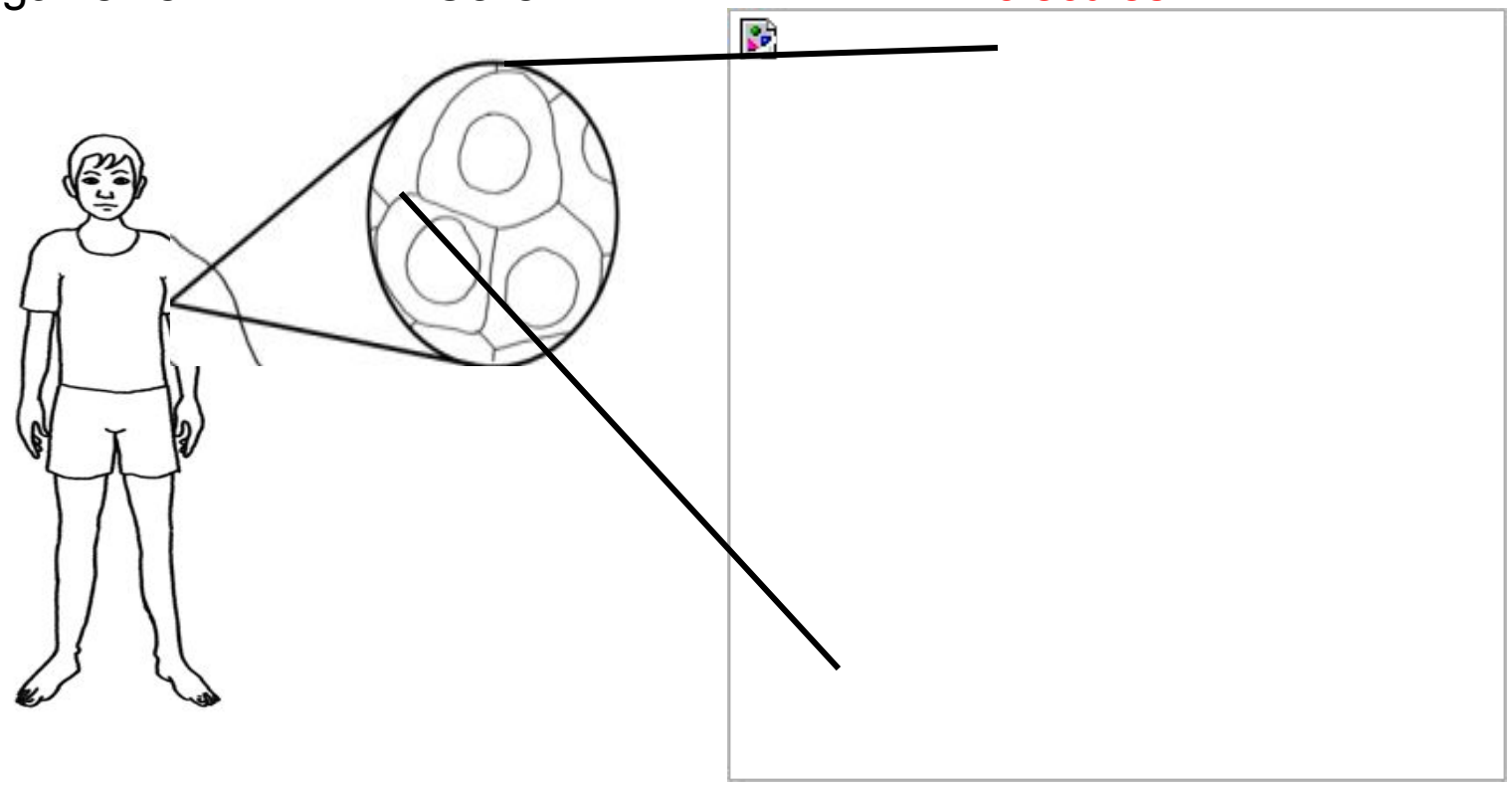
ACGGCTATAGTTCTCATGAT
TACCGATATCGACGAGTTCA

Version 2 of the gene



Zooming in to the molecular level

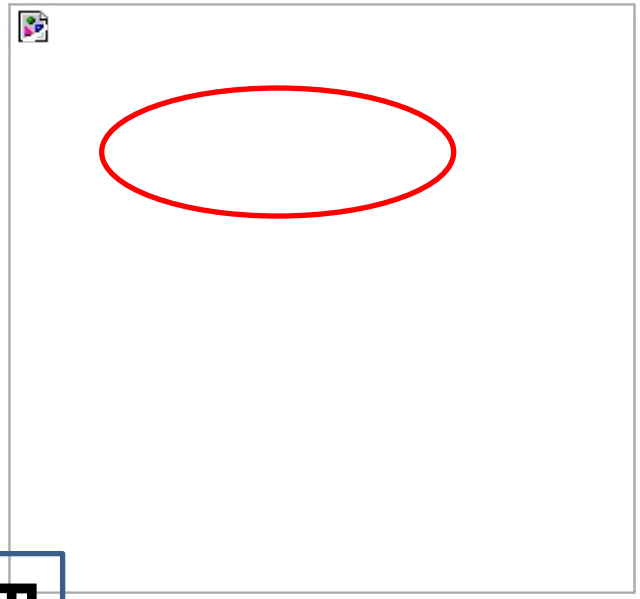
Organisms Cells Molecules



Nova RNAi Video – Watch 1:52-3:20

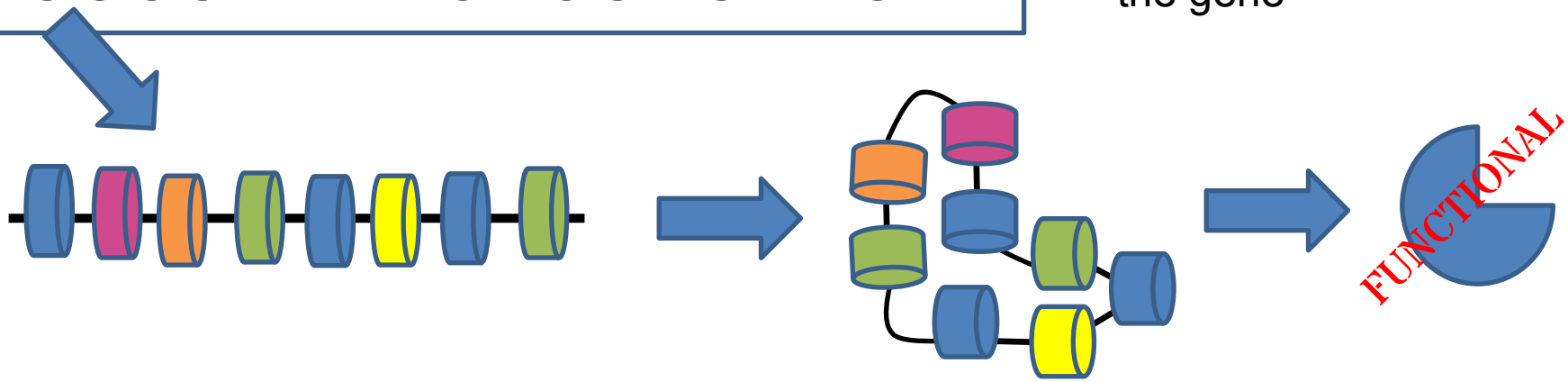
What is this code?

DNA



ACGGCTATAGTGCTCATGAT
TGCCGATATCACGAGTACTA

Version 1 of
the gene

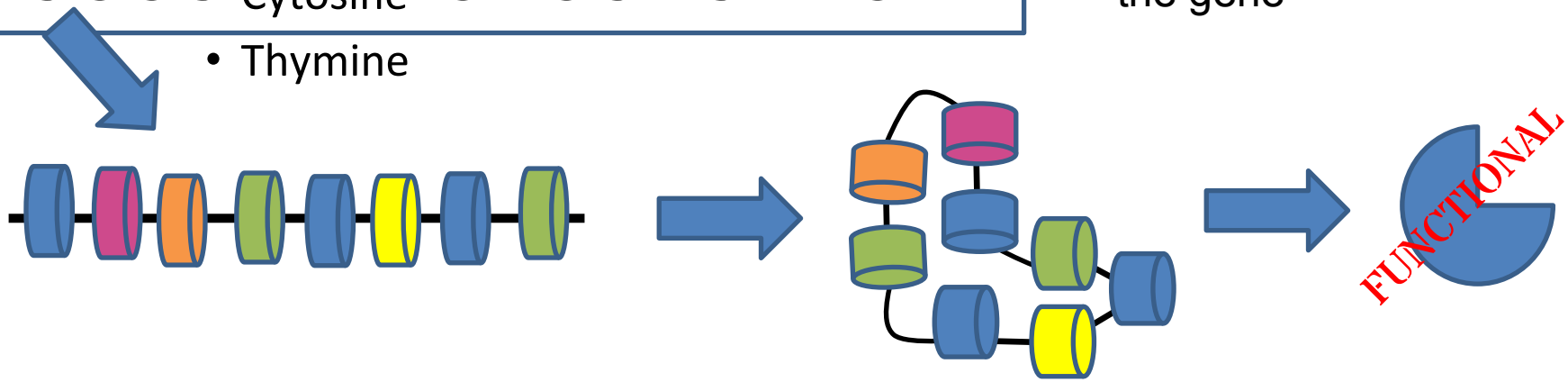


How is the structure of DNA related to its function?

- Function of DNA –
  - Genetic code for the order of amino acids
- Structure of DNA –
  - Genetic code is built from 4 nitrogen bases
    - Adenine
    - Guanine
    - Cytosine
    - Thymine

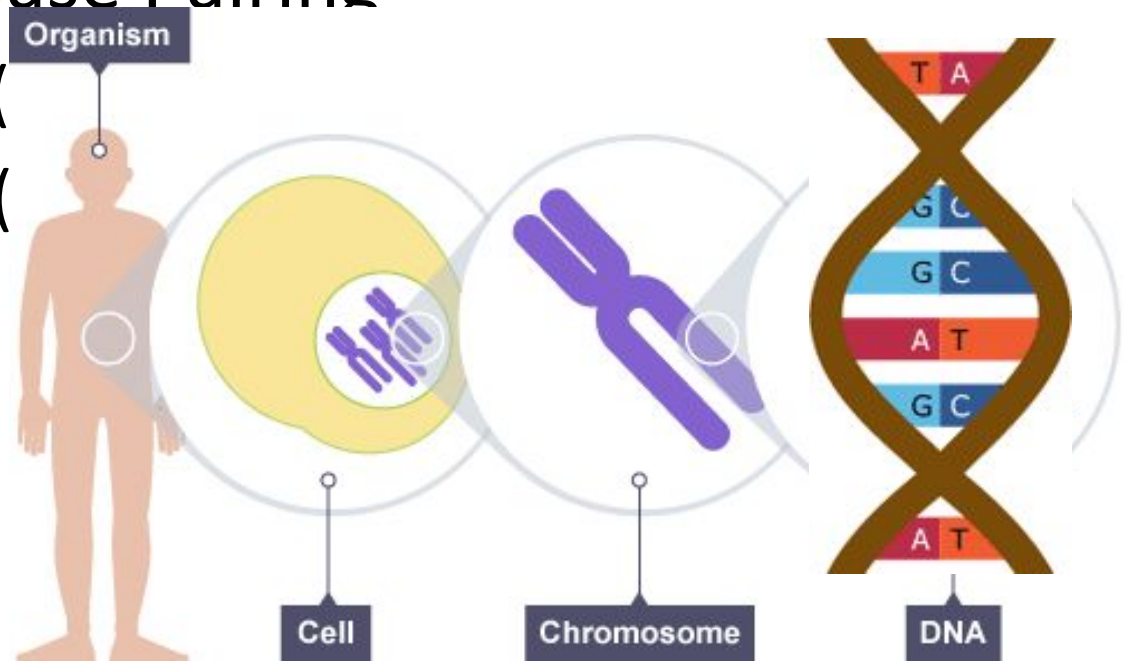
ACGGCTATAGTGCTCATGAT
TGCCGATATCACGAGTACTA

Version 1 of the gene



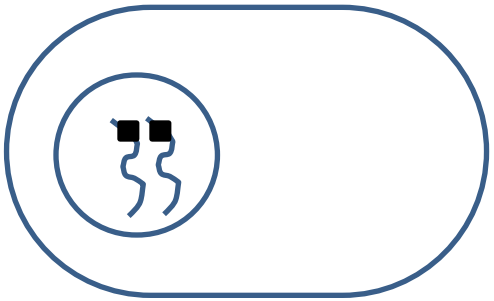
How is the structure of DNA related to its function?

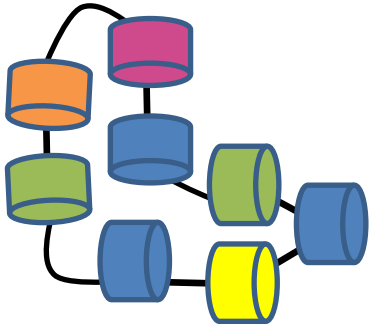
- Genetic code is the same for all organisms
- DNA has 2 strands with Nitrogen Base Pairs
- Nitrogen Base Pairing
  - Adenine (
  - Guanine (



How does DNA code for Amino Acids if it never leaves the nucleus?

DNA (gene) ⇢ Amino Acids ⇢ protein ⇢ traits

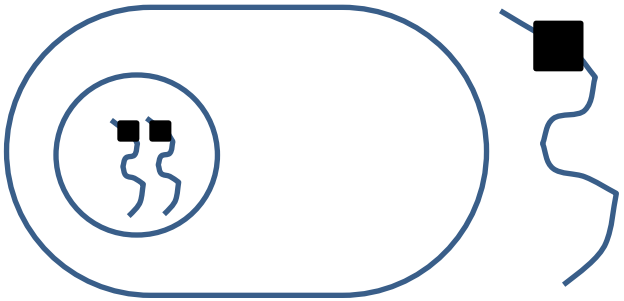




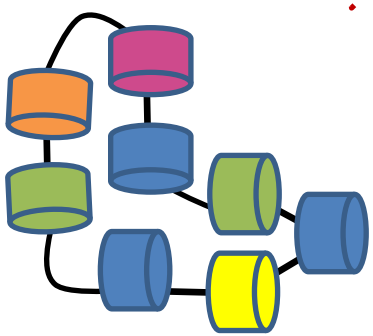
How does DNA code for Amino Acids if it never leaves the nucleus?

DNA (gene)

RNA



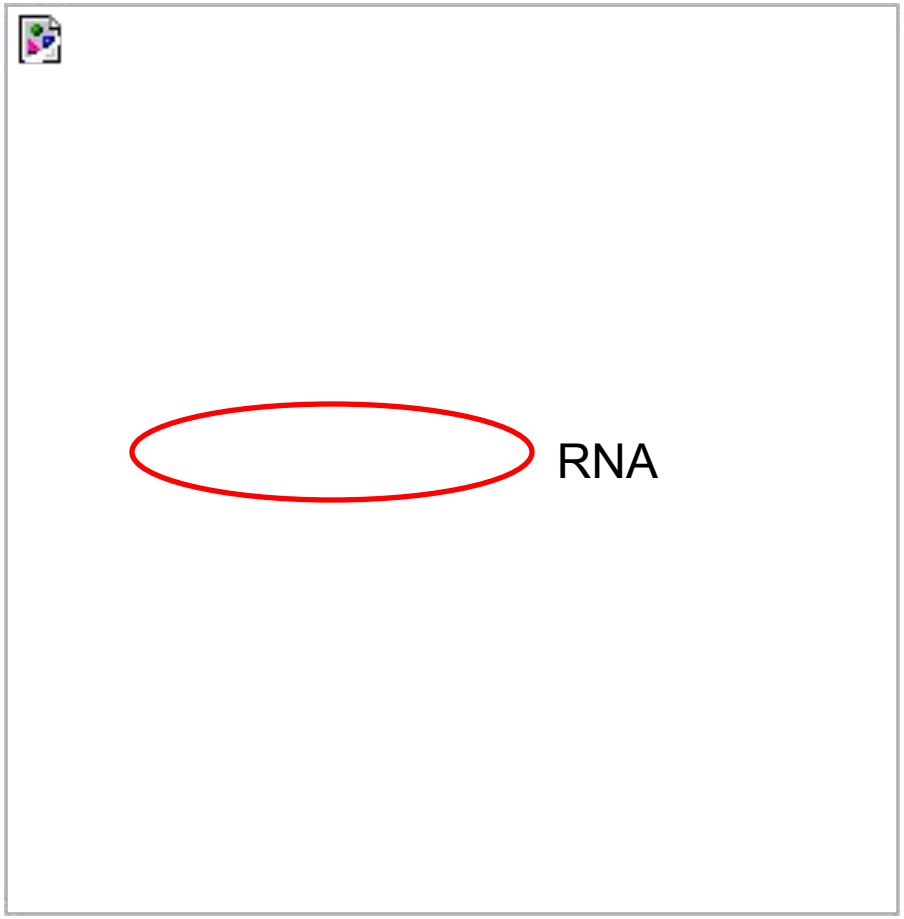
Amino Acids



protein

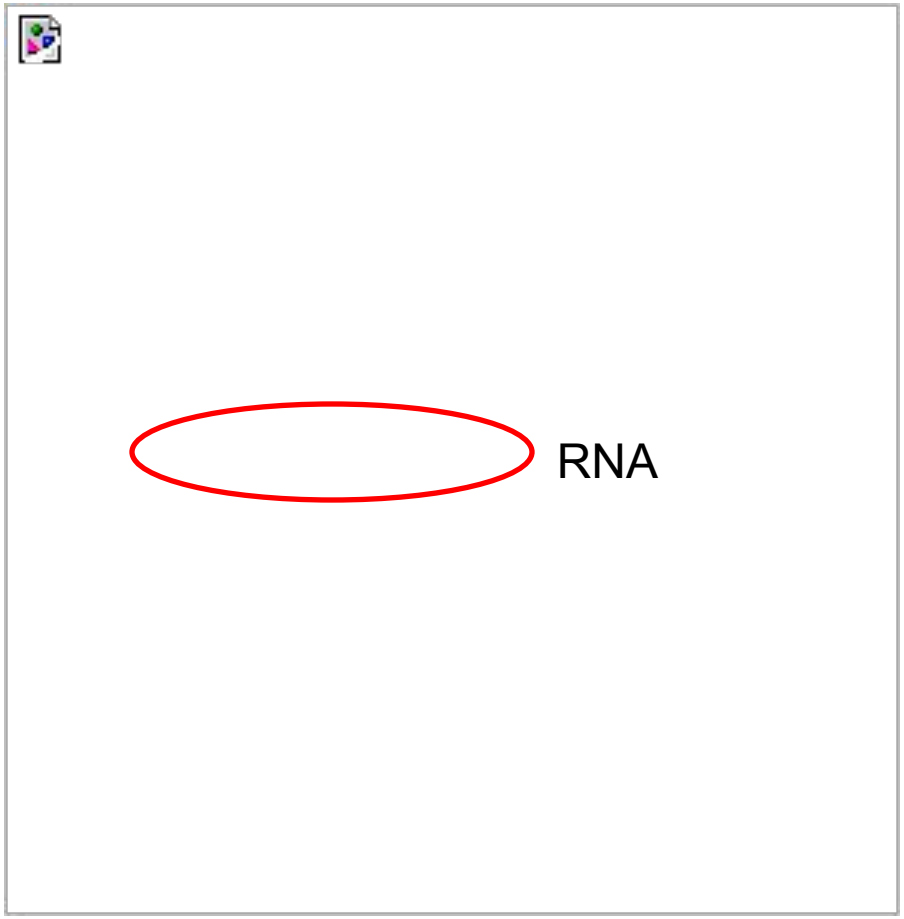
traits

How does DNA code for Amino Acids if it never leaves the nucleus?



- RNA can leave
- RNA code is built from DNA Code

How is the structure of RNA different from DNA?



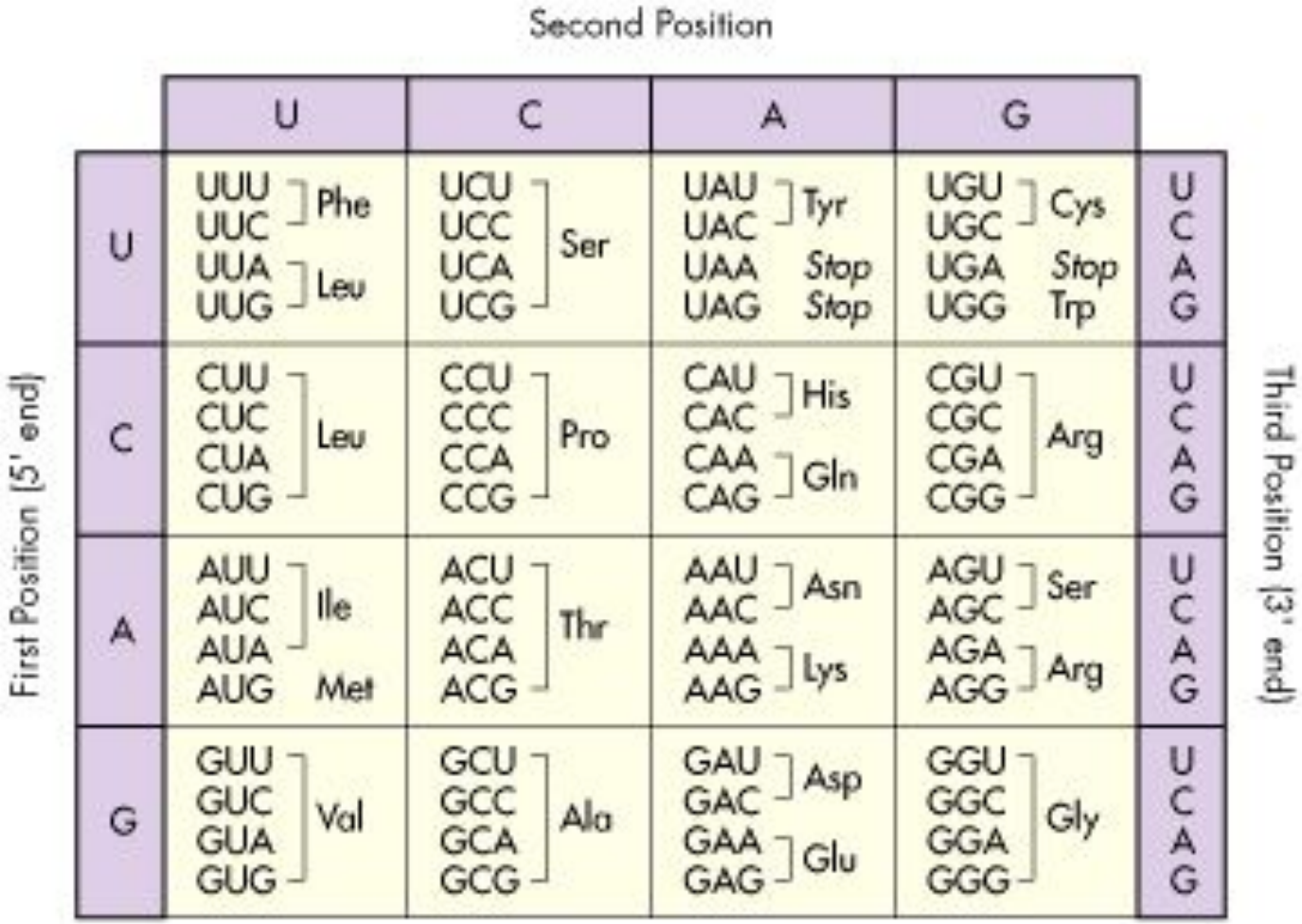
- Single Stranded
- Uracil (U) Replaces Thymine(T)

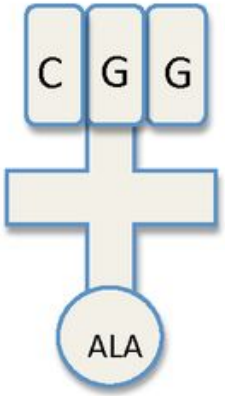
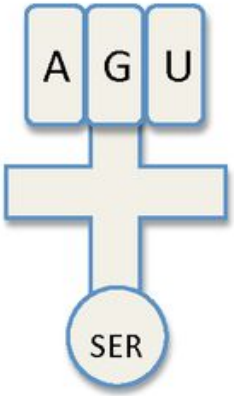
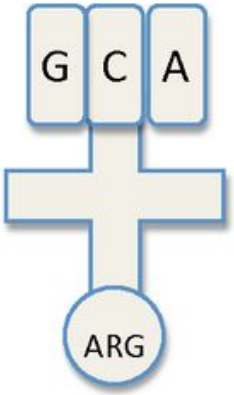
Practice …

DNA	DNA	DNA	DNA
T A C	C G G	A G T	G C A
mRNA	mRNA	mRNA	mRNA

DNA T A C	DNA C G G	DNA A G T	DNA G C A
mRNA A U G	mRNA G C C	mRNA U C A	mRNA C G U

How does RNA code for Amino Acids?



DNA	DNA	DNA	DNA
T A C	C G G	A G T	G C A
mRNA	mRNA	mRNA	mRNA
A U G	G C C	U C A	C G U
tRNA 	tRNA 	tRNA 	tRNA 
Amino Acid	Amino Acid	Amino Acid	Amino Acid
Methionine (Start)	Alanine	Serine	Arginine

Exit Ticket

- Revisit your Human Albinism Explanation
- 1.7 Human Albinism at the Molecular Level
- What questions do we still have?