PHONES & EAR BUDS away Please!

Wed, Dec. 6, 2017

Pick up: DSQ

Today you will:

- Translation Notes
- Replication-Transcription-Translation Practice-Due tomorrow

Homework/Planner:

Complete Practice Activity

Quiz-DNA & Protein Syn-Friday! WS due also!

Translation

Ch. 8.5

Pathway to Making a Protein

DNA

↓

mRNA

↓

tRNA (ribosomes)

↓

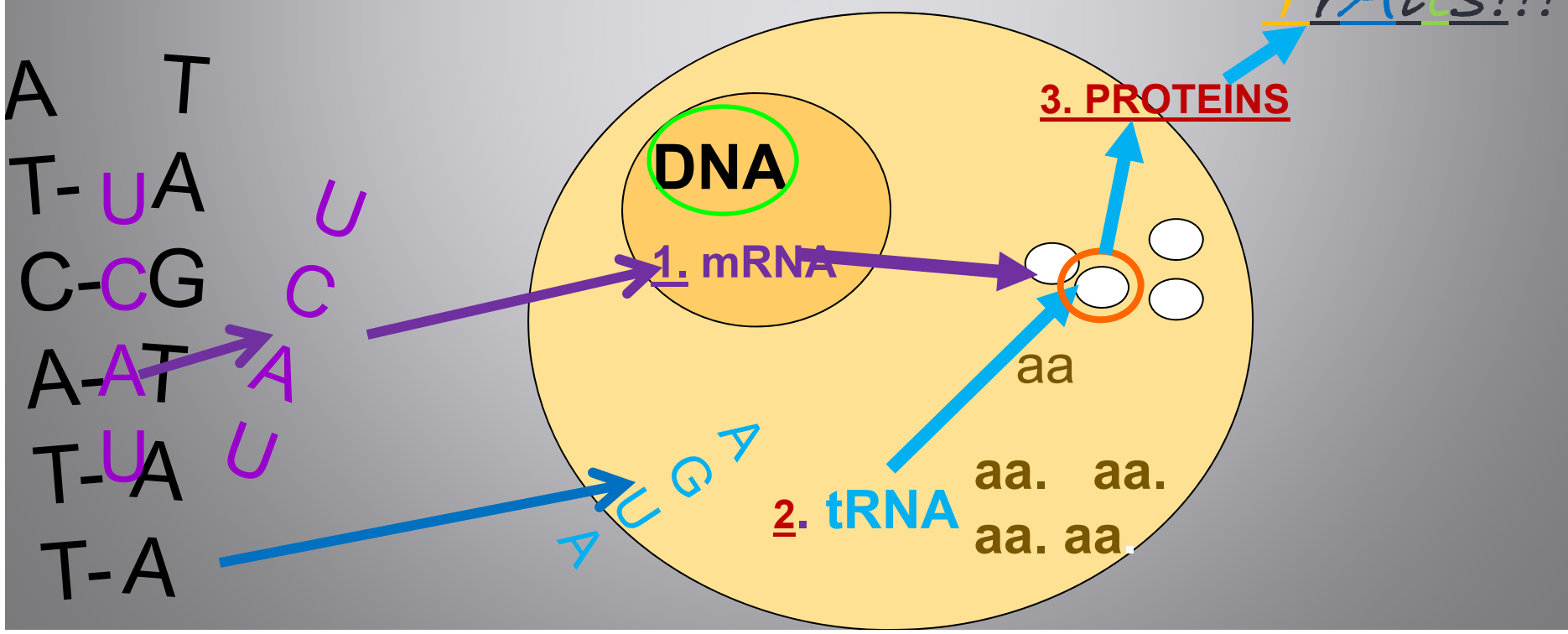
Protein

Transcription

Translation

How DNA uses RNA to tell Ribosomes to make Proteins

1. DNA is in nucleus – too BIG - cannot leave – needs help to get message out to ribosomes to make proteins… RNA is made from DNA - helps deliver message
2. mRNA → interprets DNA's message = called TRANSCRIPTION→ describes which a.a. should be put together to make a protein
3. a.a. in cytoplasm – need help getting over to ribosomes → picked up by tRNA → translates mRNA's message = called TRANSLATION
4. *Amino acids → make up proteins → characteristics!*



Let’s Transcribe!

Let’s transcribe an mRNA molecule from a DNA template strand…

DNA → A C T G G C A A T C G C

mRNA →

Part 2: Translation

- The instructions (mRNA) are read by tRNA, and tRNA joins amino acids in the right order in the ribosome

- Main Goal: make a polypeptide!

Steps of Translation

1) mRNA goes to the ribosome
2) tRNA brings amino acids to the ribosome
3) tRNA "reads" the mRNA instructions and puts the amino acids in the right order
4) Amino acids link together by peptide bonds to make a polypeptide (protein)

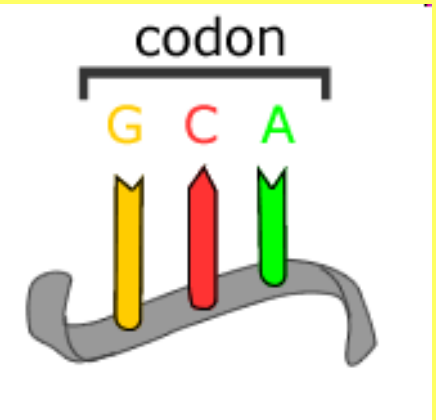
How does tRNA "read" the mRNA instructions?

tRNA…"The Reader"

3 bases on mRNA strand
= codon

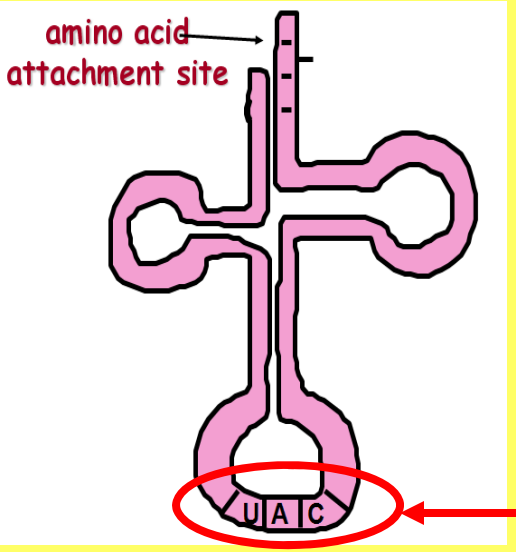
3 bases at bottom of
each tRNA = anticodon

mRNA



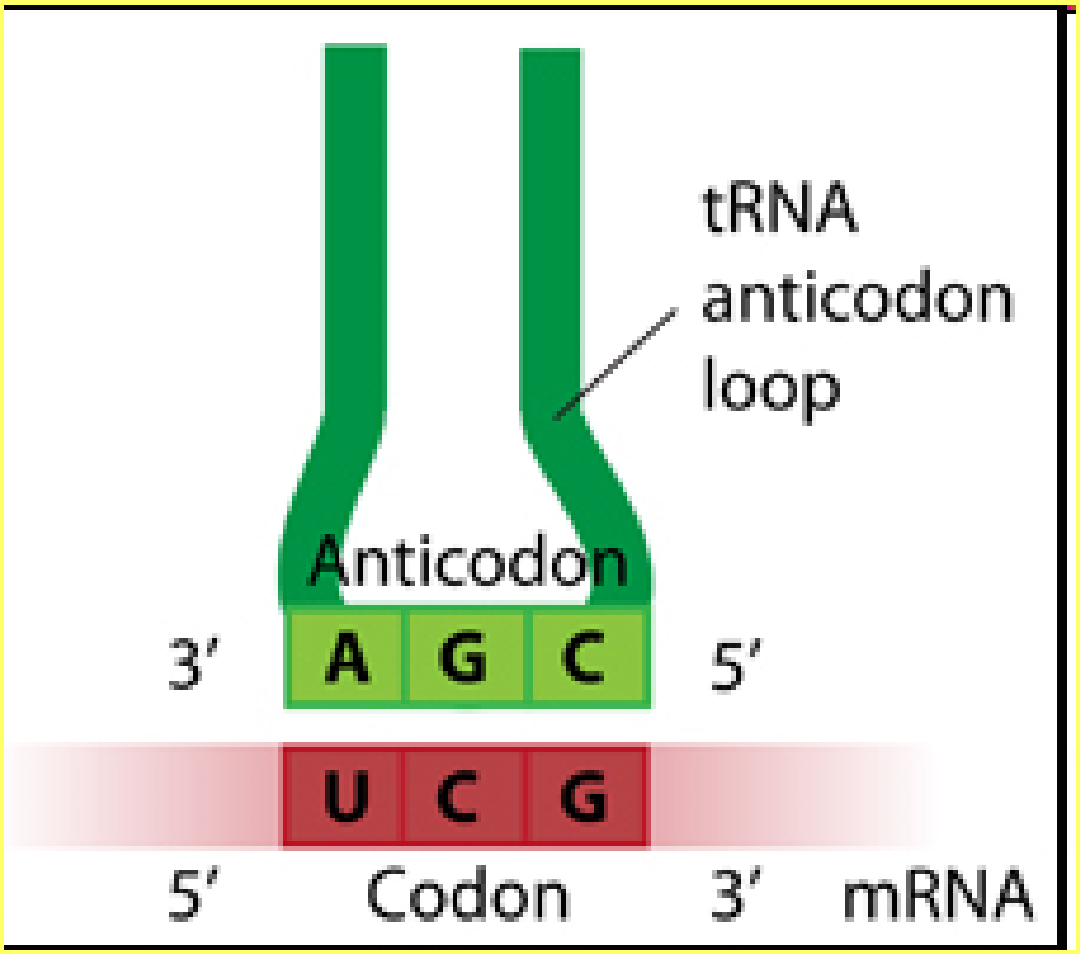
Question: What anticodon matches with these codons?

1) A U C
2) G C A

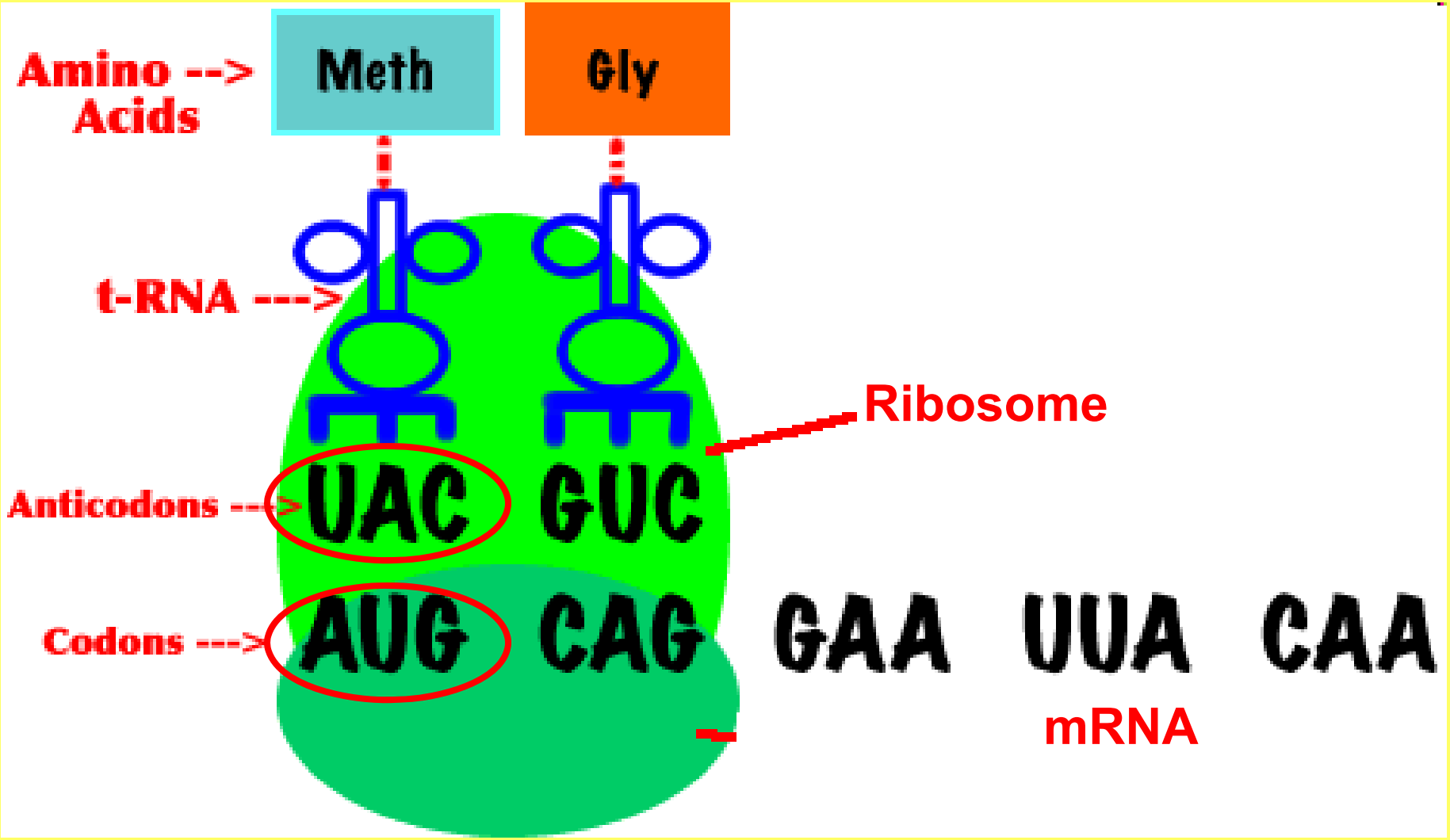


tRNA

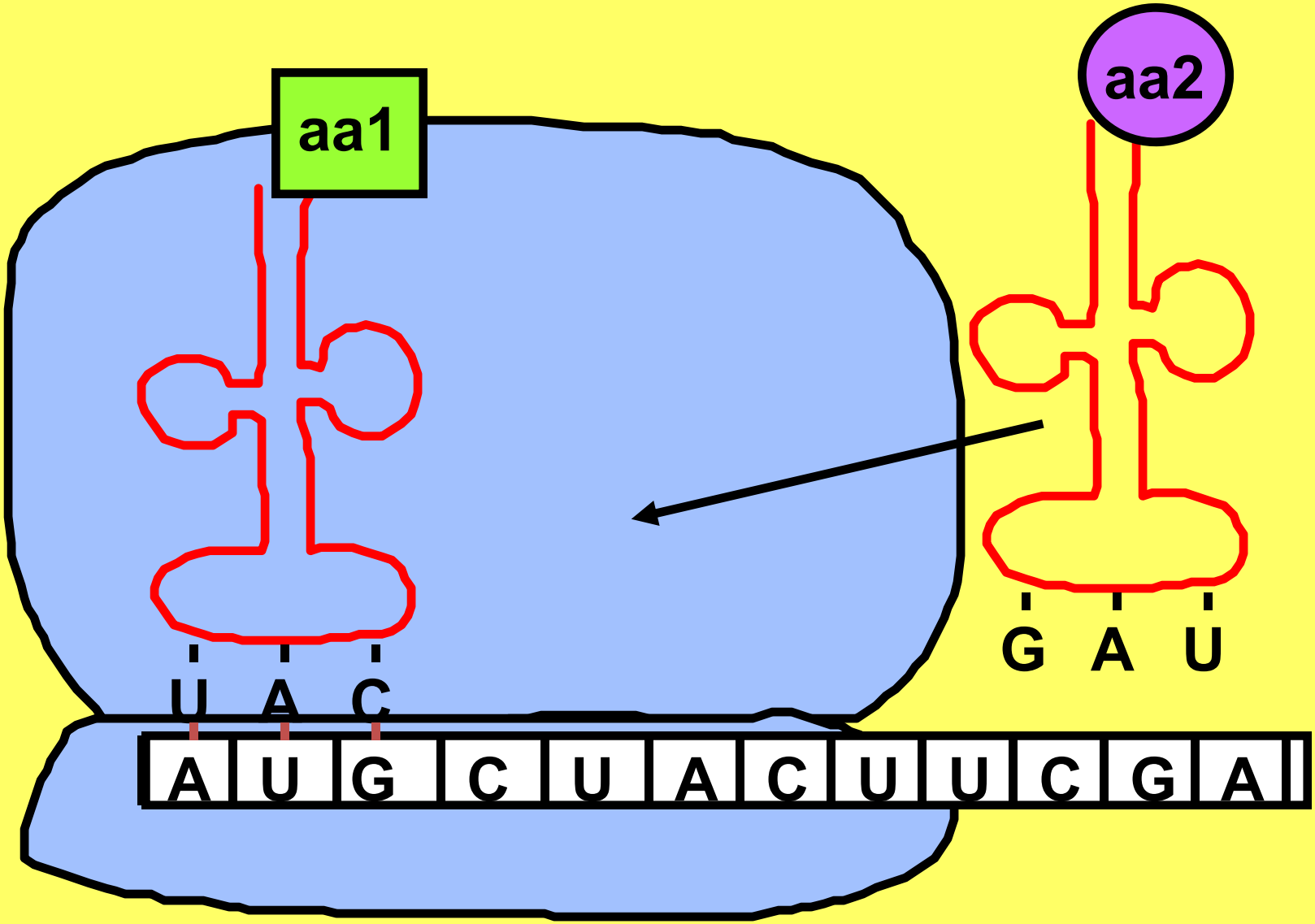
anticodon

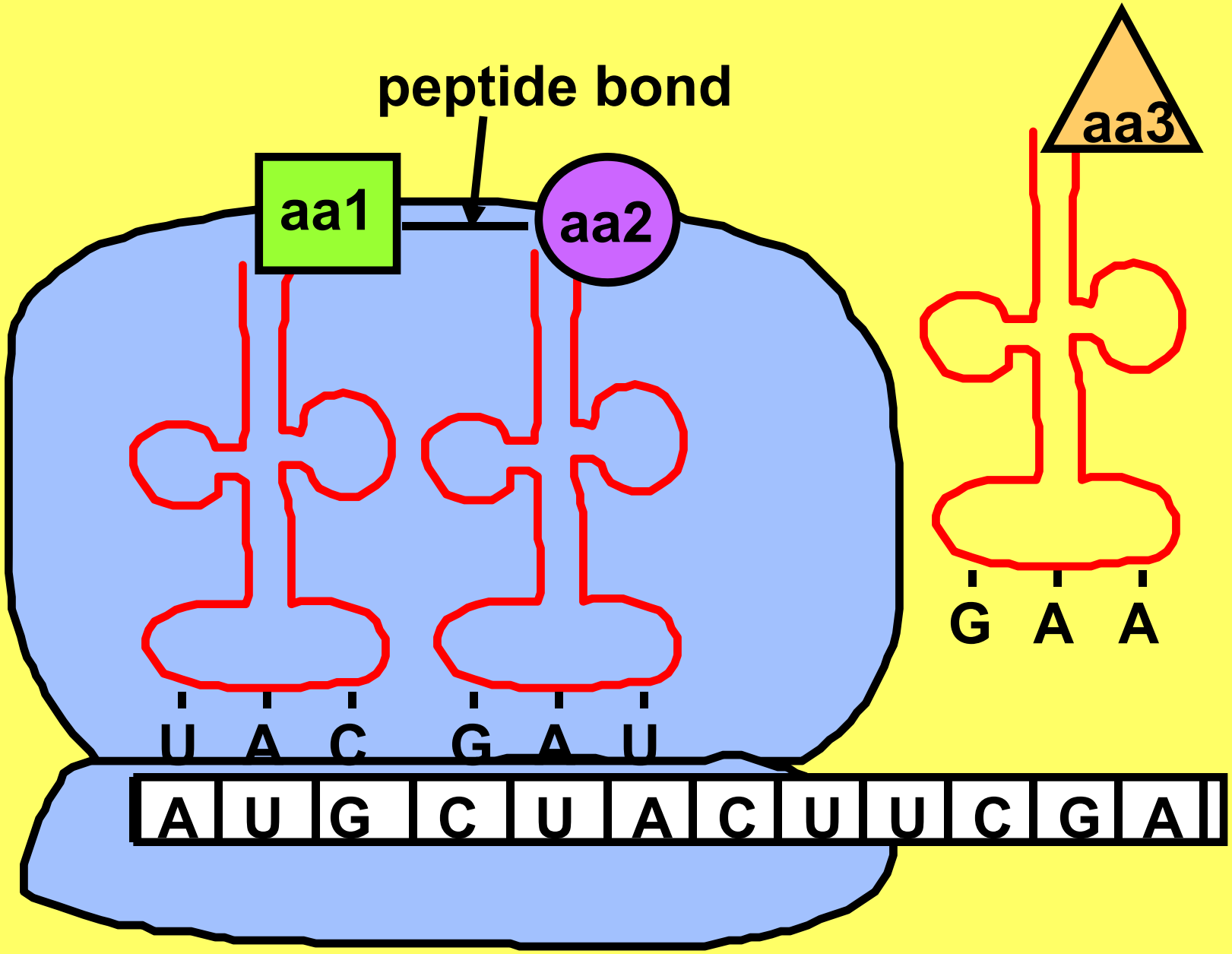


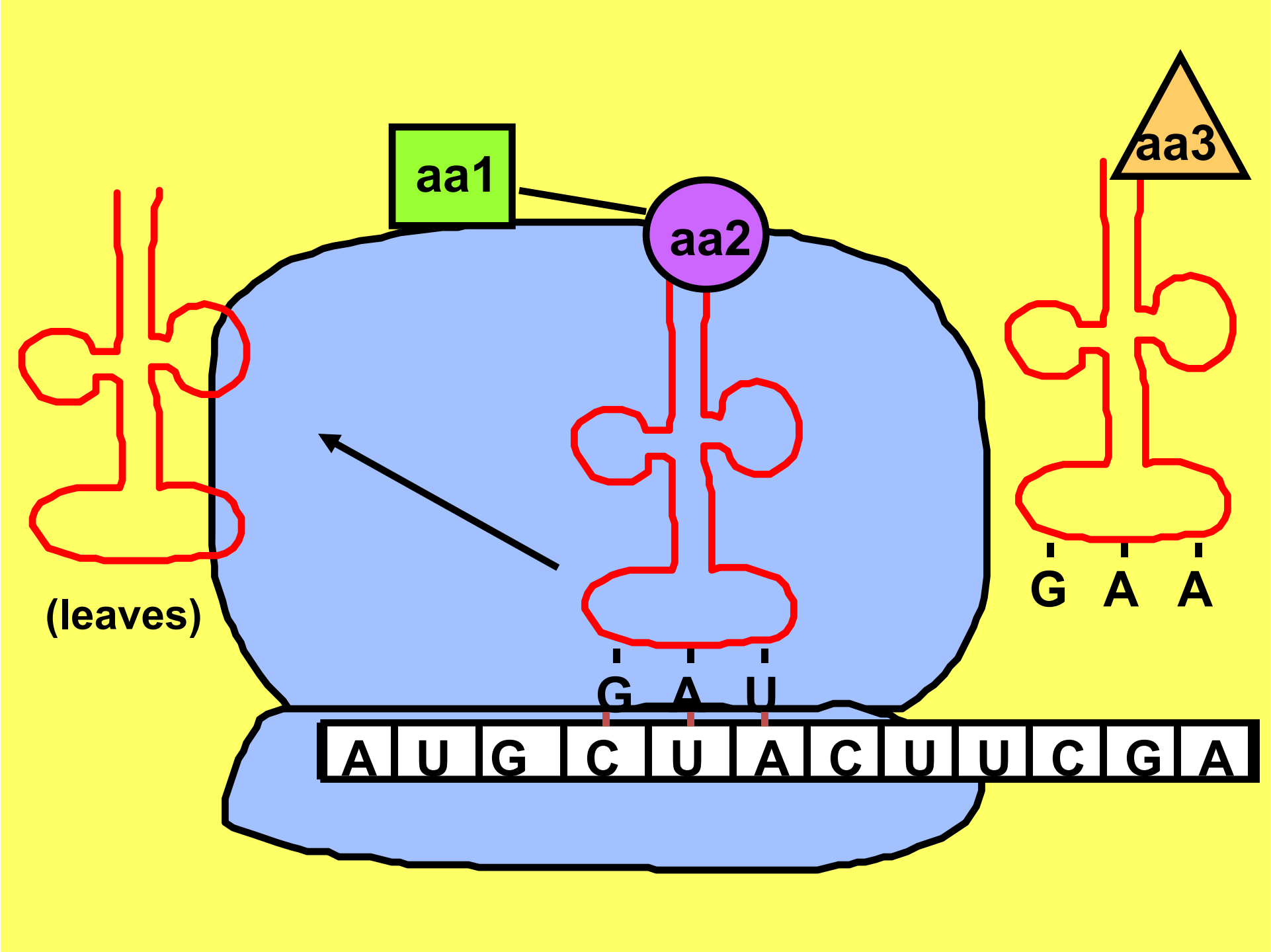
More complementary base pairing…HOW THRILLING!

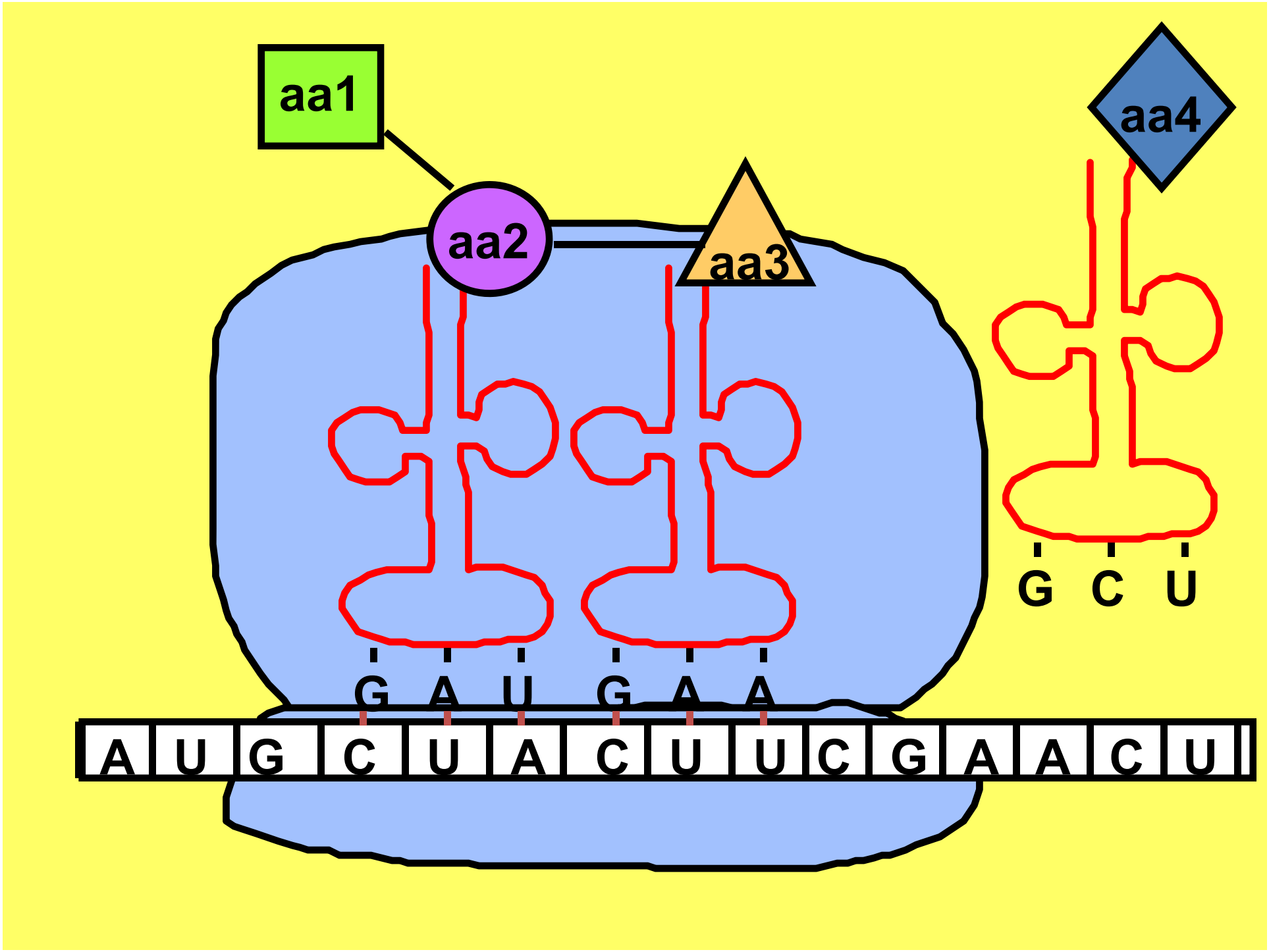

Amino --> Acids
Meth
Gly
t-RNA --->
Ribosome
Anticodons --->
UAC
GUC
Codons --->
AUG
CAG
GAA
UUA
CAA
mRNA

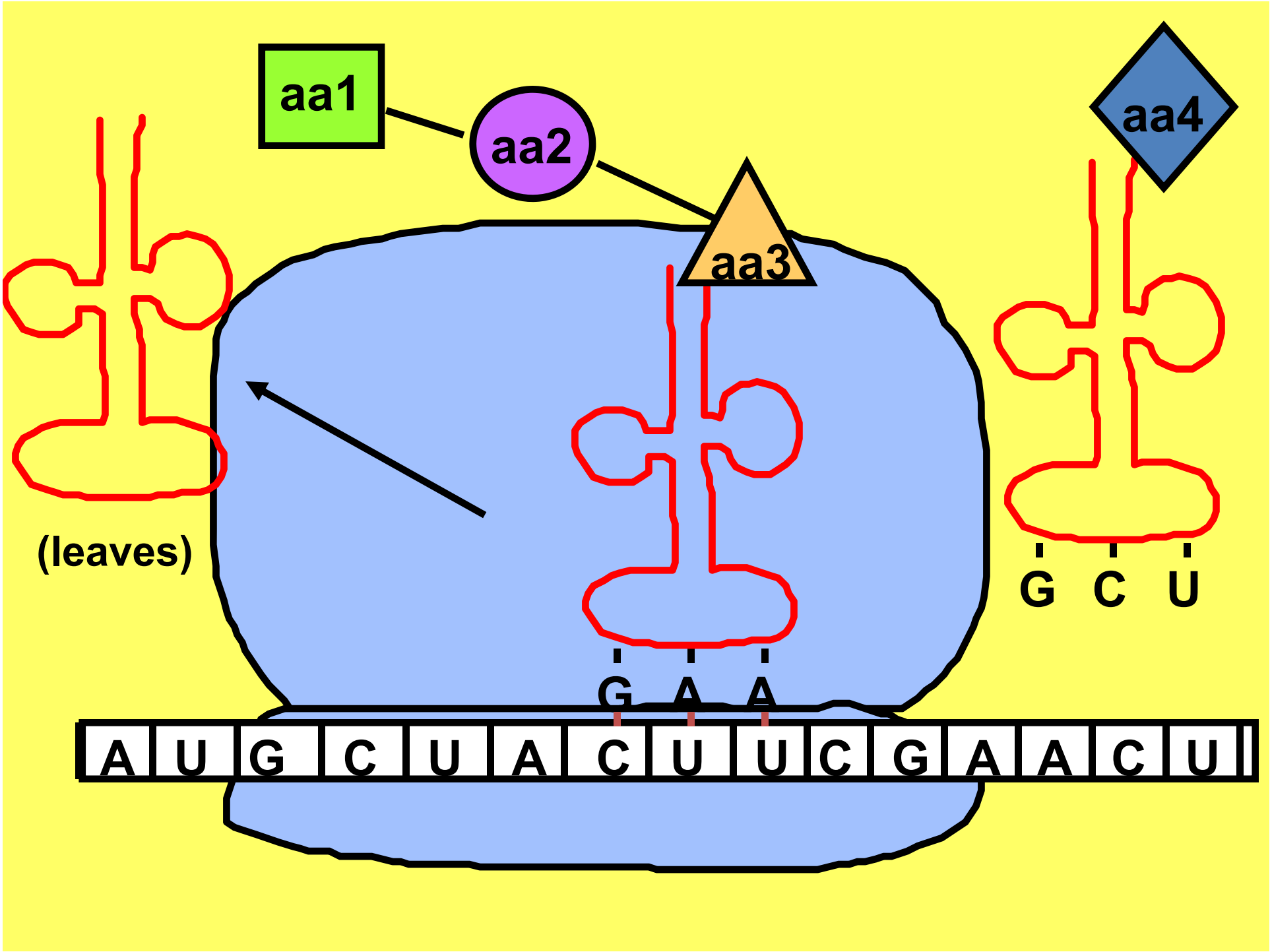
Let's See Translation in Action!

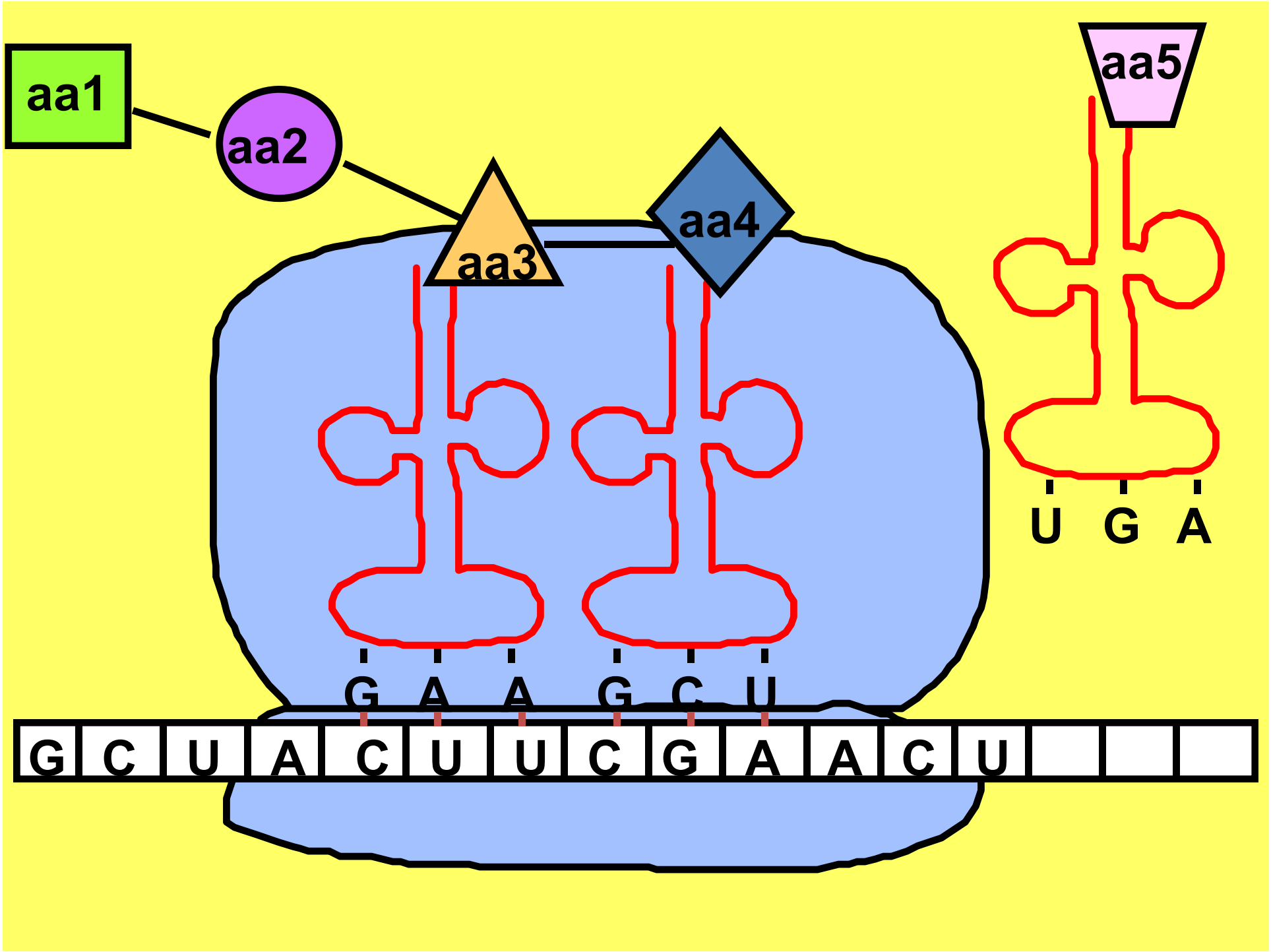


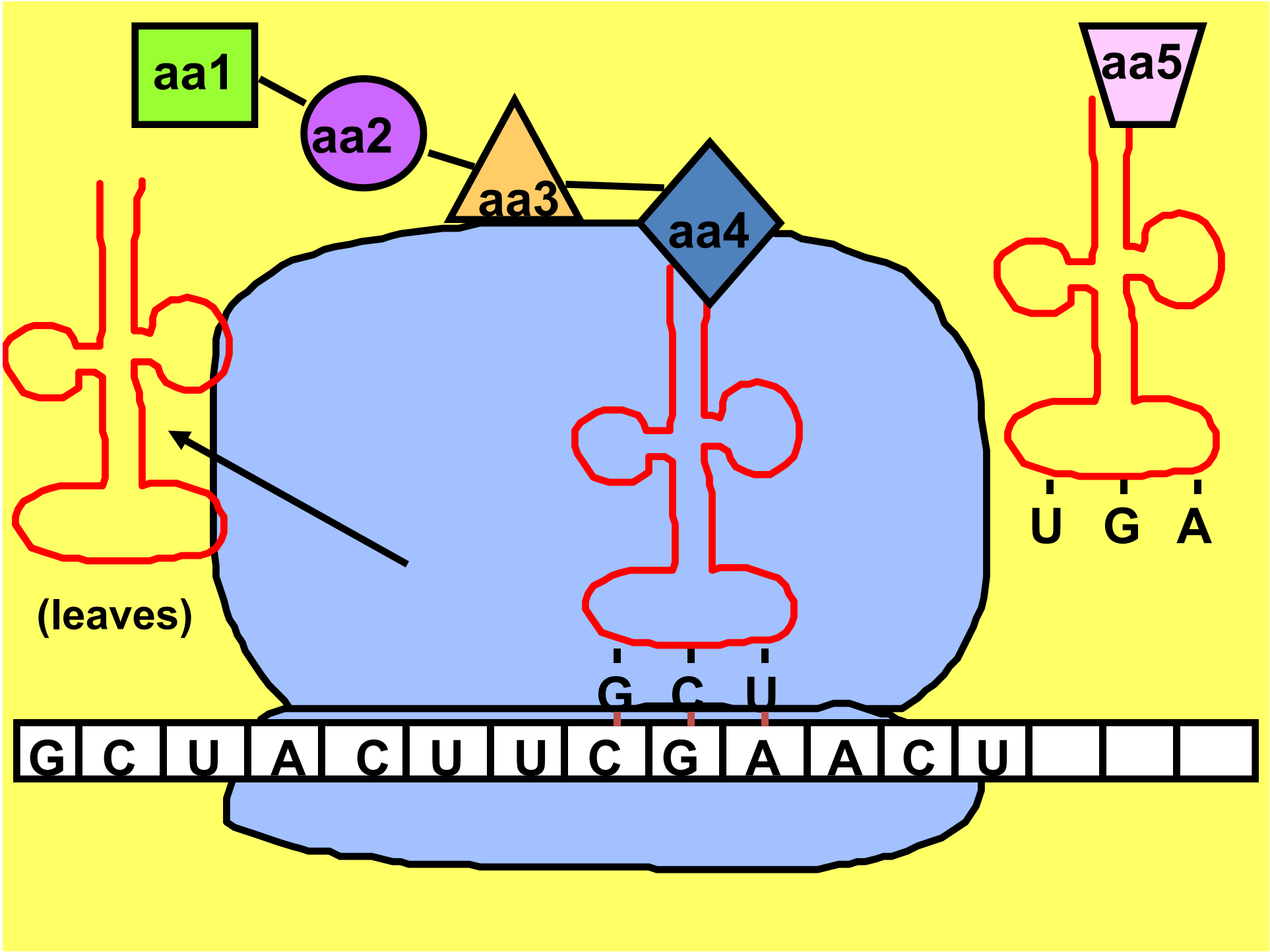

peptide bond
aa1
aa2
aa3
U A C
G A U
G A A
A U G C U A C U U C G A

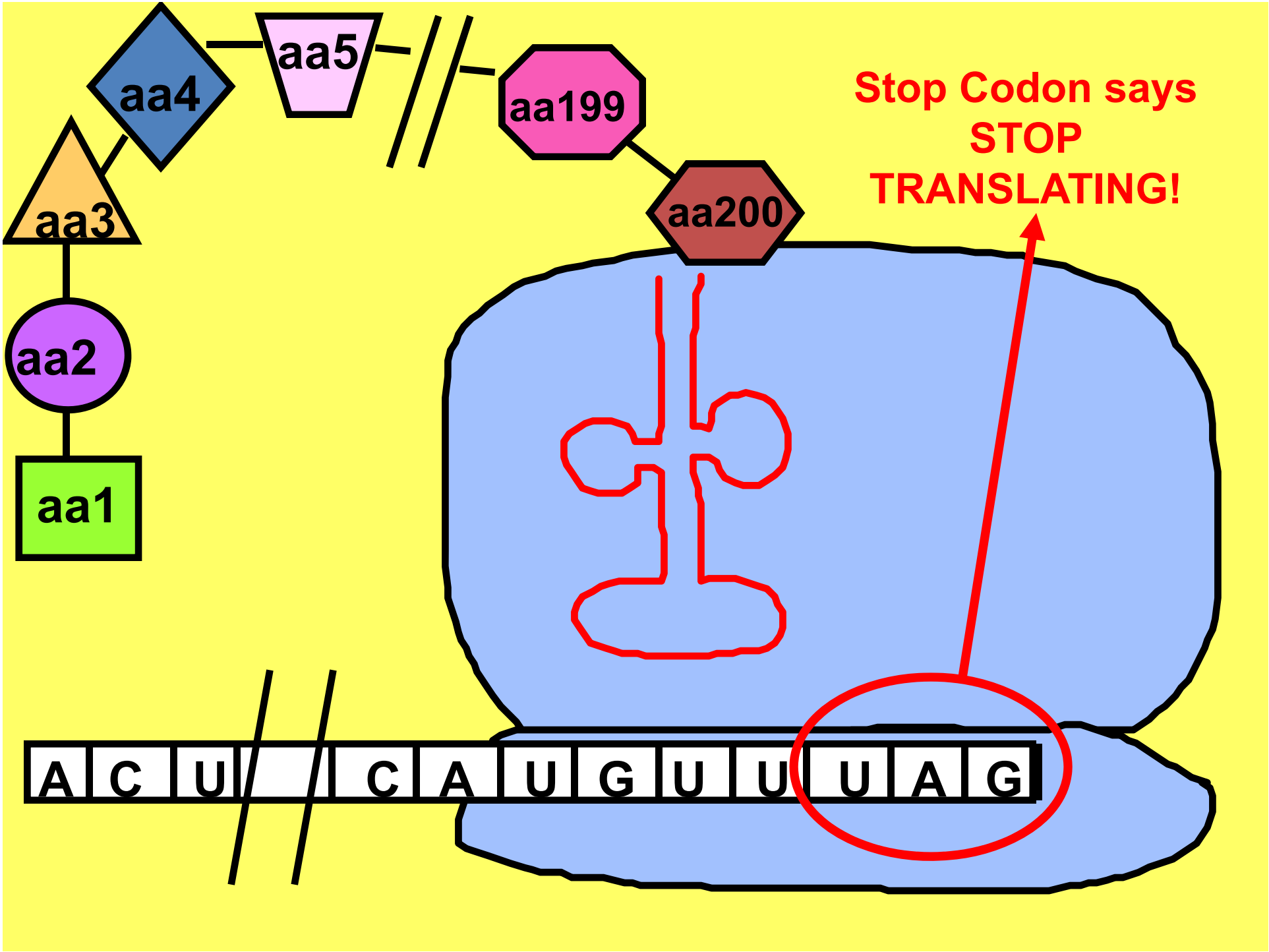

aa1
aa2
aa3
(leaves)
G A A
G A U
A U G C U A C U U C G A


aa1
aa2
aa3
aa4
G A U G A A
G C U
A U G C U A C U U C G A A C U

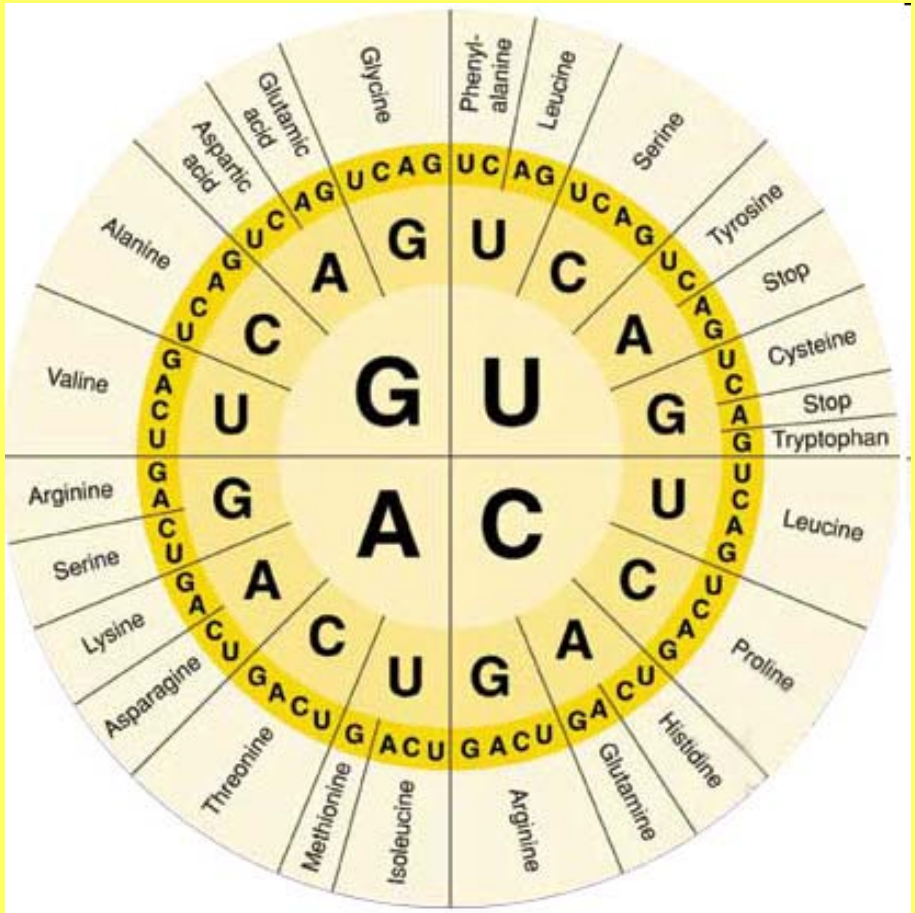

aa1
aa2
aa3
aa4
(leaves)
G C U
G A A
A U G C U A C U U C G A A C U


aa1
aa2
aa3
aa4
aa5
U G A
G A A G C U
G C U A C U U C G A A C U


aa1
aa2
aa3
aa4
aa5
(leaves)
U G A
G C U
G C U A C U U C G A A C U


aa1
aa2
aa3
aa4
aa5
aa199
aa200
Stop Codon says
STOP
TRANSLATING!
A C U C A U G U U U A G

- Scientists can “read” the mRNA by using a “codon” table that matches codons with their amino acids



Start Codon: AUG

Stop Codons: UAA, UAG, UGA

Codon charts can look different from one another but be used for the same thing!

First Letter	Second Letter				Third Letter
	U	C	A	G	
U	phenylalanine	serine	tyrosine	cysteine	U
	phenylalanine	serine	tyrosine	cysteine	C
	leucine	serine	stop	stop	A
	leucine	serine	stop	tryptophan	G
C	leucine	proline	histidine	arginine	U
	leucine	proline	histidine	arginine	C
	leucine	proline	glutamine	arginine	A
	leucine	proline	glutamine	arginine	G
A	isoleucine	threonine	asparagine	serine	U
	isoleucine	threonine	asparagine	serine	C
	isoleucine	threonine	lysine	arginine	A
	(start) methionine	threonine	lysine	arginine	G
G	valine	alanine	aspartate	glycine	U
	valine	alanine	aspartate	glycine	C
	valine	alanine	glutamate	glycine	A
	valine	alanine	glutamate	glycine	G

Use the mRNA strand and codon chart in your notes to make an amino acid chain!

Translation Video Clip

http://www.youtube.com/watch?v=B6O6uRb1D38&list=PL60C69E2C64C29289&safe=active

Which Amino Acid is coded by the sequence CAU codon? TB pg 244

1. Find the 1st base **C** in the left column
2. Find the 2nd base **A** in the top row → find the box where these 2 intersect.
3. Find the 3rd base **U** in the right column →
4. **CAU codes for Histidine (His)**

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

20 most common a.a.

TRY THESE:

Which Amino Acids are coded by the following sequences?

1. **UCG =**
   - **Serine**
2. **AUG =**
   - **Methione**
3. **GAG =**
   - **Glutamic acid**

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