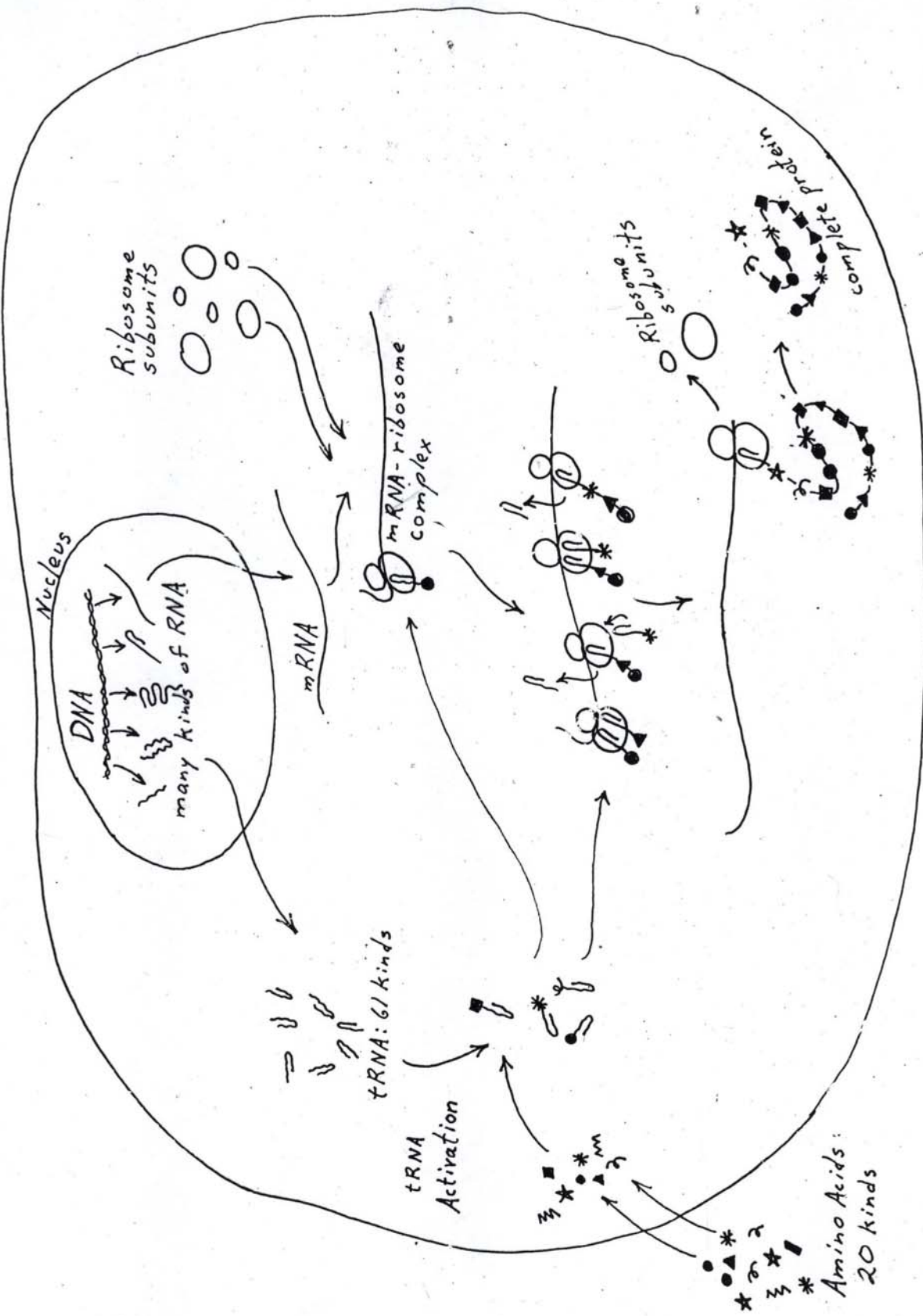
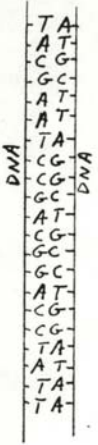


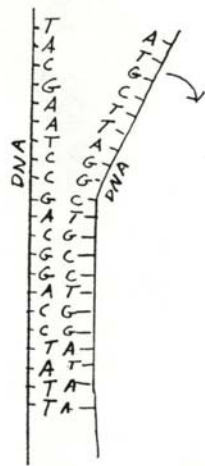
Overview of Protein Assembly



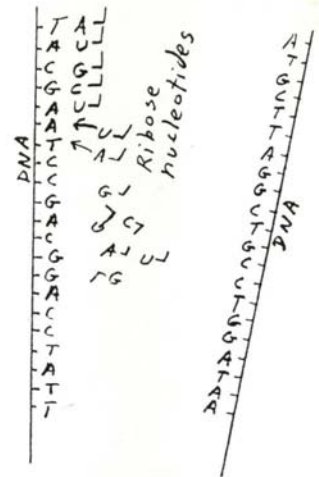
① DNA



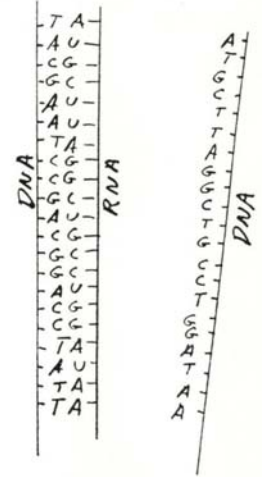
② DNA unzips



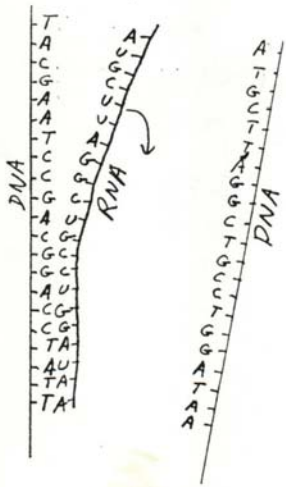
③ Transcription



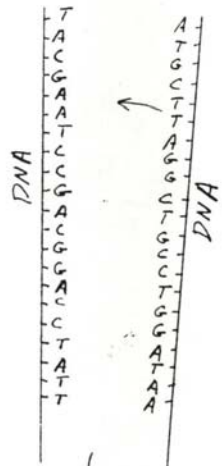
④ Transcription completed



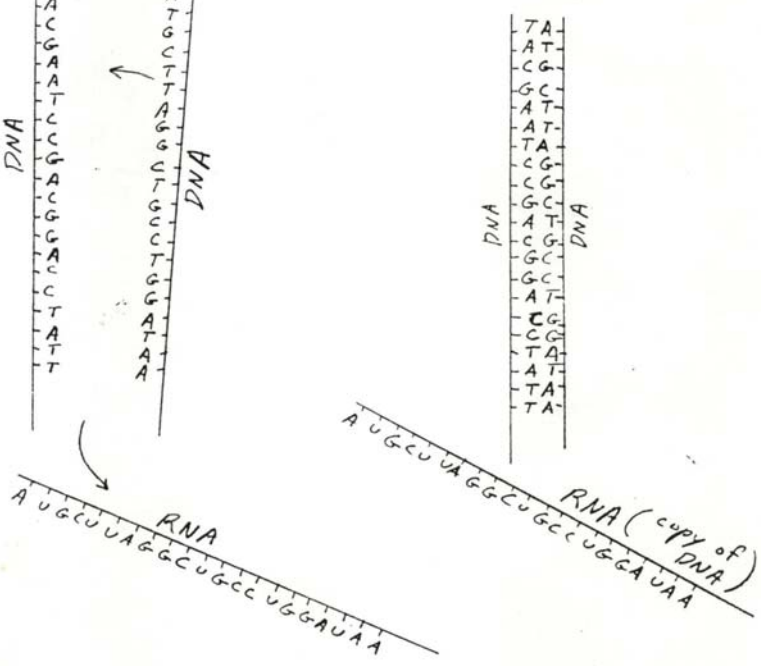
⑤ RNA unzips

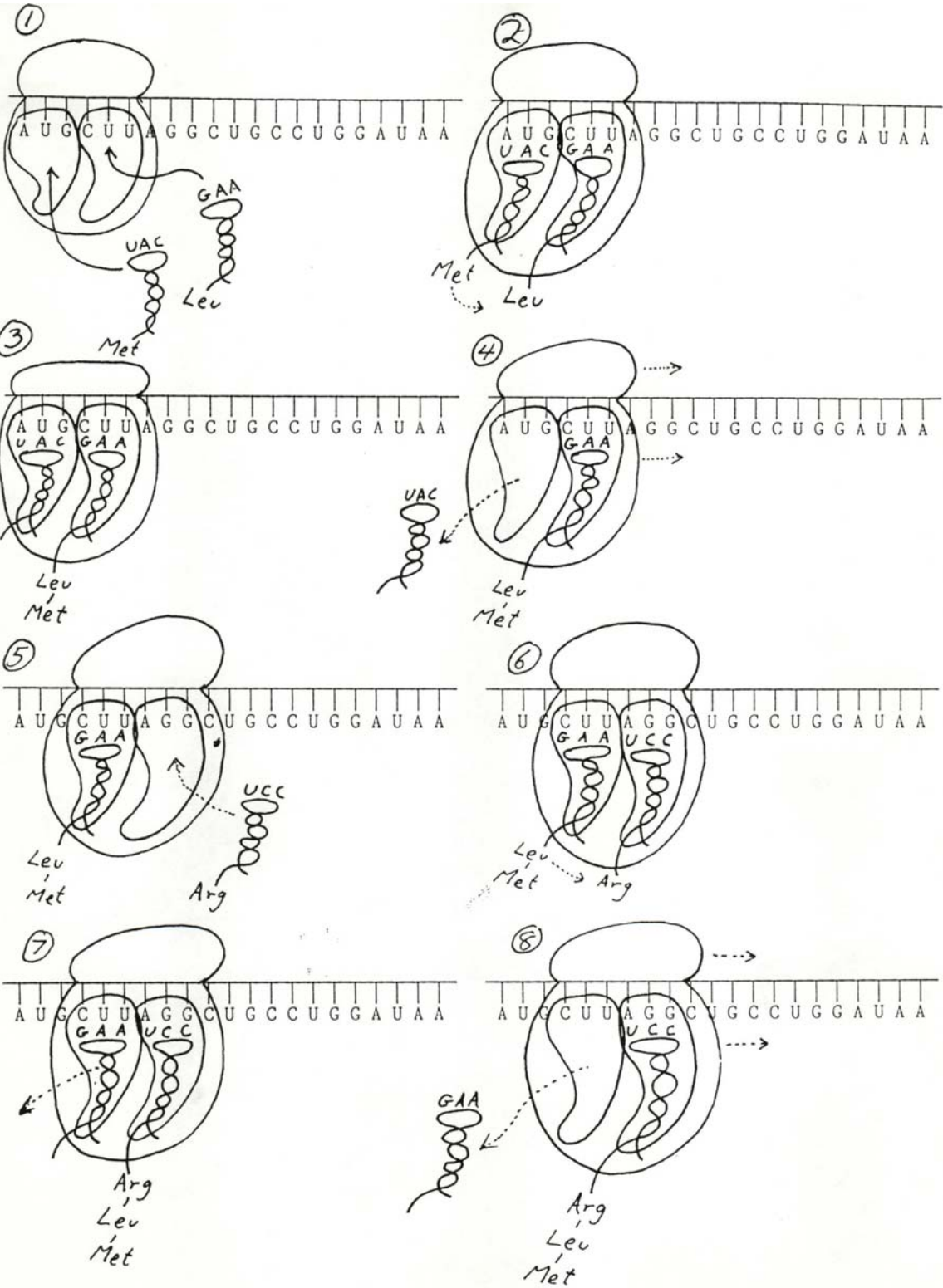


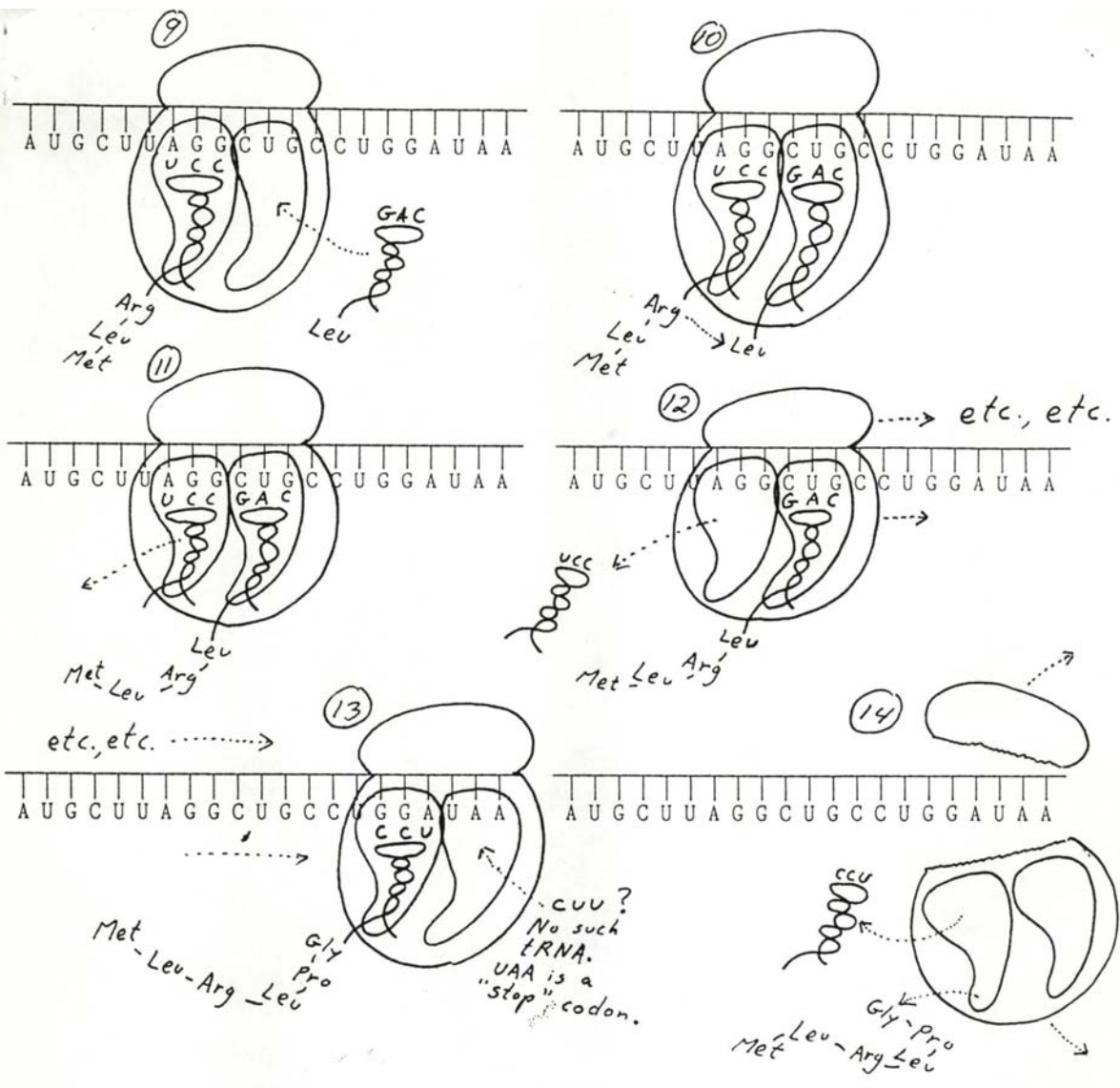
⑥ DNA strands recombine



⑦ DNA is unchanged







3.

The Genetic Code

Codon	Anticodon	Amino Acid	Abbrev.	Codon	Anticodon	Amino Acid	Abbrev.
UUU	AAA	phenylalanine	phe	AUU	UAA	isoleucine	ile
UUC	AAG	phenylalanine	phe	AUC	UAG	isoleucine	ile
UUA	AAU	leucine	leu	AUA	UAU	isoleucine	ile
UUG	AA	leucine	leu	AUG	UA	Methionine (start)	met
UCU	AGA	serine	ser	ACU	UGA	threonine	thr
UCC	AGG	serine	ser	ACC	UGG	threonine	thr
UCA	AGU	serine	ser	ACA	UGU	threonine	thr
UCG	AGC	serine	ser	ACG	UGC	threonine	thr
UAU	AUA	tyrosine	tyr	AAU	UUA	asparagine	asn
UAC	AUG	tyrosine	tyr	AAC	UUG	asparagine	asn
UAA	AUU	stop		AAA	UUU	lysine	lys
UAG	AUC	stop		AAG	UUC	lysine	lys
UGU	ACA	cysteine	cys	AGU	UCA	serine	ser
UGC	ACG	cysteine	cys	AGC	UCG	serine	ser
UGA	ACU	stop		AGA	UCU	arginine	arg
UGG	ACC	tryptophan	trp	AGG	UCC	arginine	arg
CUU	GAA	leucine	leu	GUU	CAA	valine	val
CUC	GAG	leucine	leu	GUC	CAG	valine	val
CUA	GAU	leucine	leu	GUA	CAU	valine	val
CUG	GAC	leucine	leu	GUG	CAC	valine	val
CCU	GGA	proline	pro	GCU	CGA	alanine	ala
CCC	GGG	proline	pro	GCC	CGG	alanine	ala
CCA	GGU	proline	pro	GCA	CGU	alanine	ala
CCG	GGC	proline	pro	GCG	CGC	alanine	ala
CAU	GUA	histidine	his	GAU	CUA	aspartic acid	asp
CAC	GUG	histidine	his	GAC	CUG	aspartic acid	asp
CAA	GUU	glutamine	gln	GAA	CUU	glutamic acid	glu
CAG	GUC	glutamine	gln	GAG	CUC	glutamic acid	glu
CGU	GCA	arginine	arg	GGU	CCA	glycine	gly
CGC	GCG	arginine	arg	GGC	CCG	glycine	gly
CGA	GCU	arginine	arg	GGA	CCU	glycine	gly
CGG	GCC	arginine	arg	GGG	CCC	glycine	gly

The first step in the process of gene expression is transcription.

In this step, DNA is used as the template for synthesis of RNA (mRNA).

Base pairing between one strand of DNA and RNA bases, following the rules of complimentary base pairing, defines the base sequence of mRNA.

The enzyme RNA polymerase is required for mRNA synthesis.

In the next step, known as translation, mRNA bases pair with transfer RNA molecules (tRNA).

Each mRNA contains many 3-base units called codons; each tRNA has a unique 3-base unit called an anticodon.

Each tRNA carries a particular amino acid.

As the tRNAs line up along the mRNA in the order defined by codon/anticodon recognition, they define the sequence of amino acids in the protein.

The amino acids detach from their tRNAs and link together via dehydration synthesis to form a protein.

A string of amino acids makes up a protein, and proteins give organisms their distinguishing characteristics.