Lec 7 \ Expression Gene

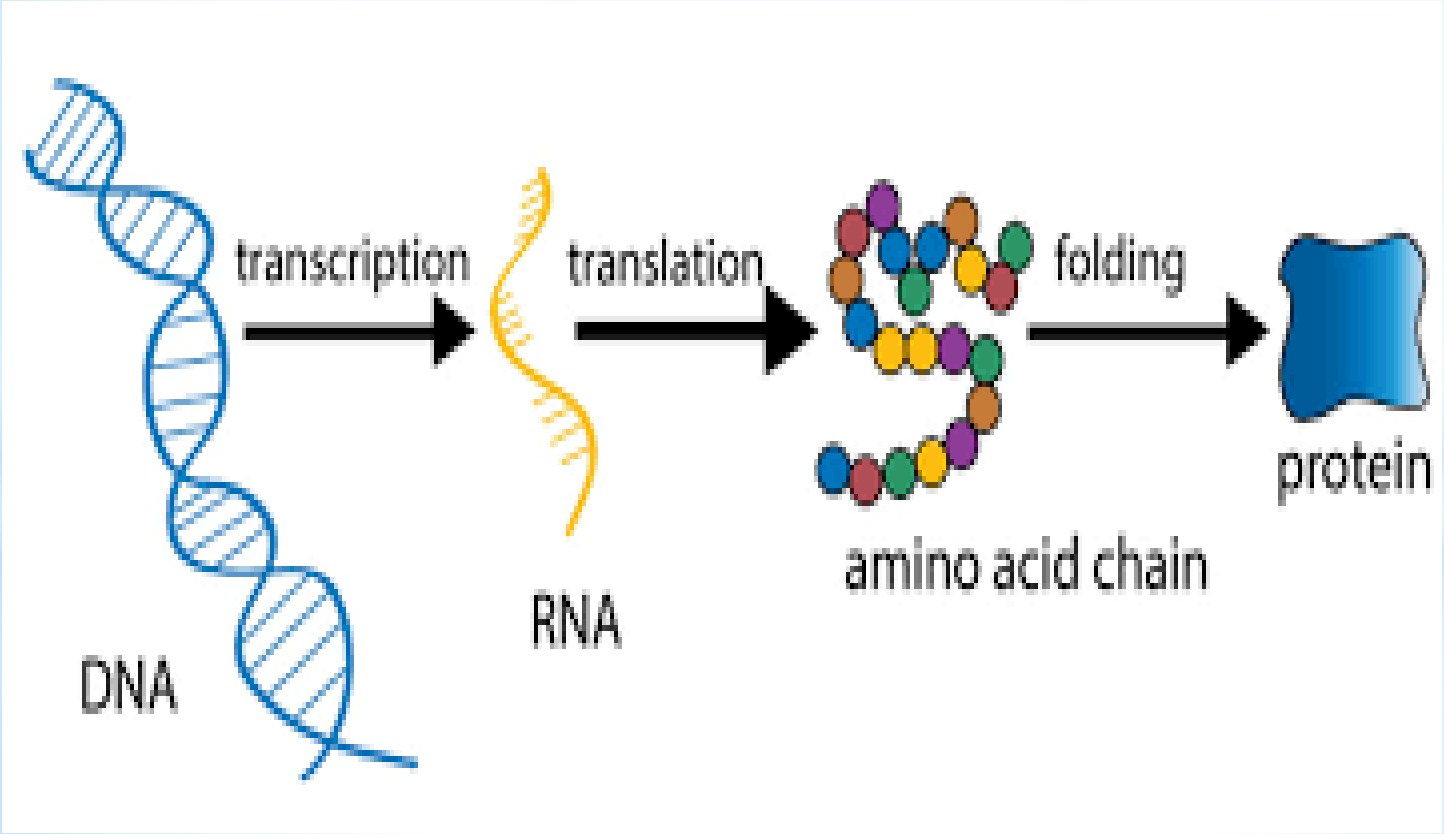
There are two stages involved in the expression:

Transcription : Convert existing information it is encoded in the DNA strand in the nucleus into an RNA strand the messenger travels to the cytoplasm.

*

Translation : It is a transcoding of transcodes The path of the mRNA to a number of amino acids associated with Some of them form protein or parts of it, in Ribosomes with the help of the carrier tRNA.

Expression Gene *



FROM DNA TO PROTEIN

DNA – RNA Polymerase – mRNA – tRNA – Ribosome – Protein

Transcription

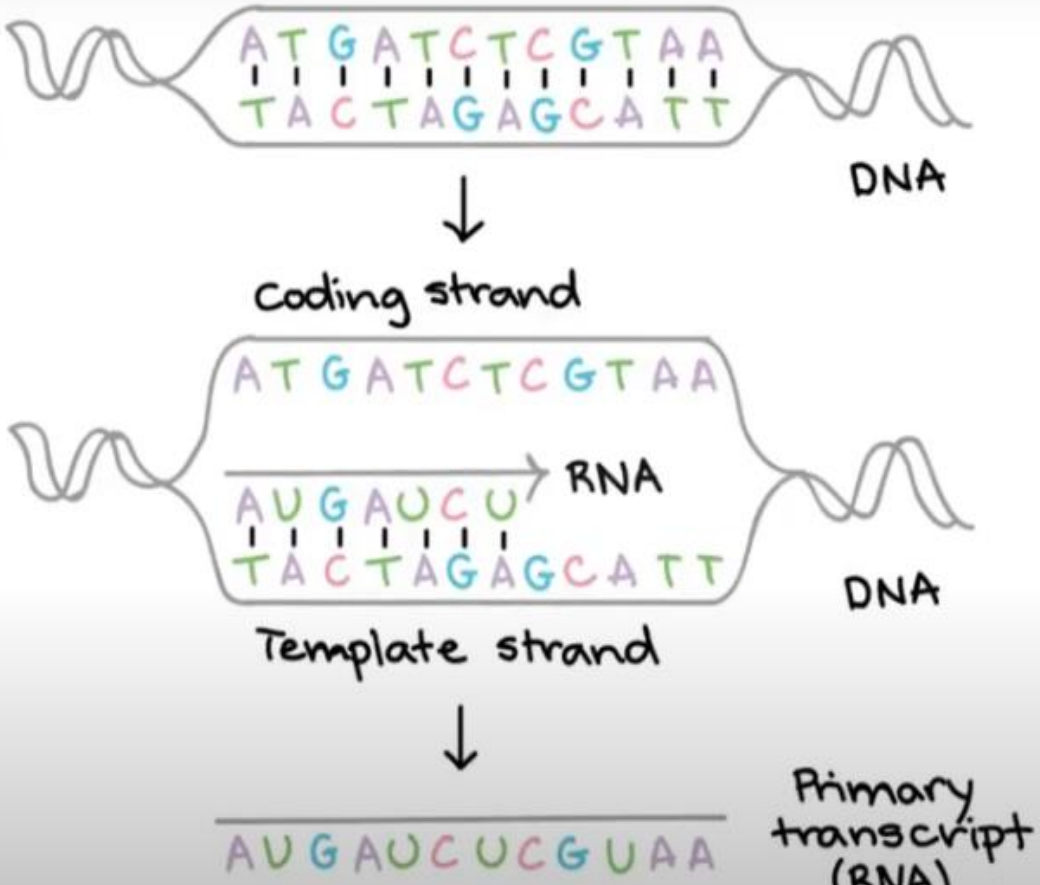
*

The process of cloning occurs in real organisms euokaryotes in the nucleus region, either in prokaryotic organisms, it is it occurs in the cytoplasm.

It is the process of making an RNA copy (in the form of mRNA).
A piece of DNA representing one or more genes (or even part of a gene)

TRANSCRIPTION

This step is called **transcription** because it involves rewriting, or transcribing, the DNA sequence in a similar RNA "alphabet."



Genes

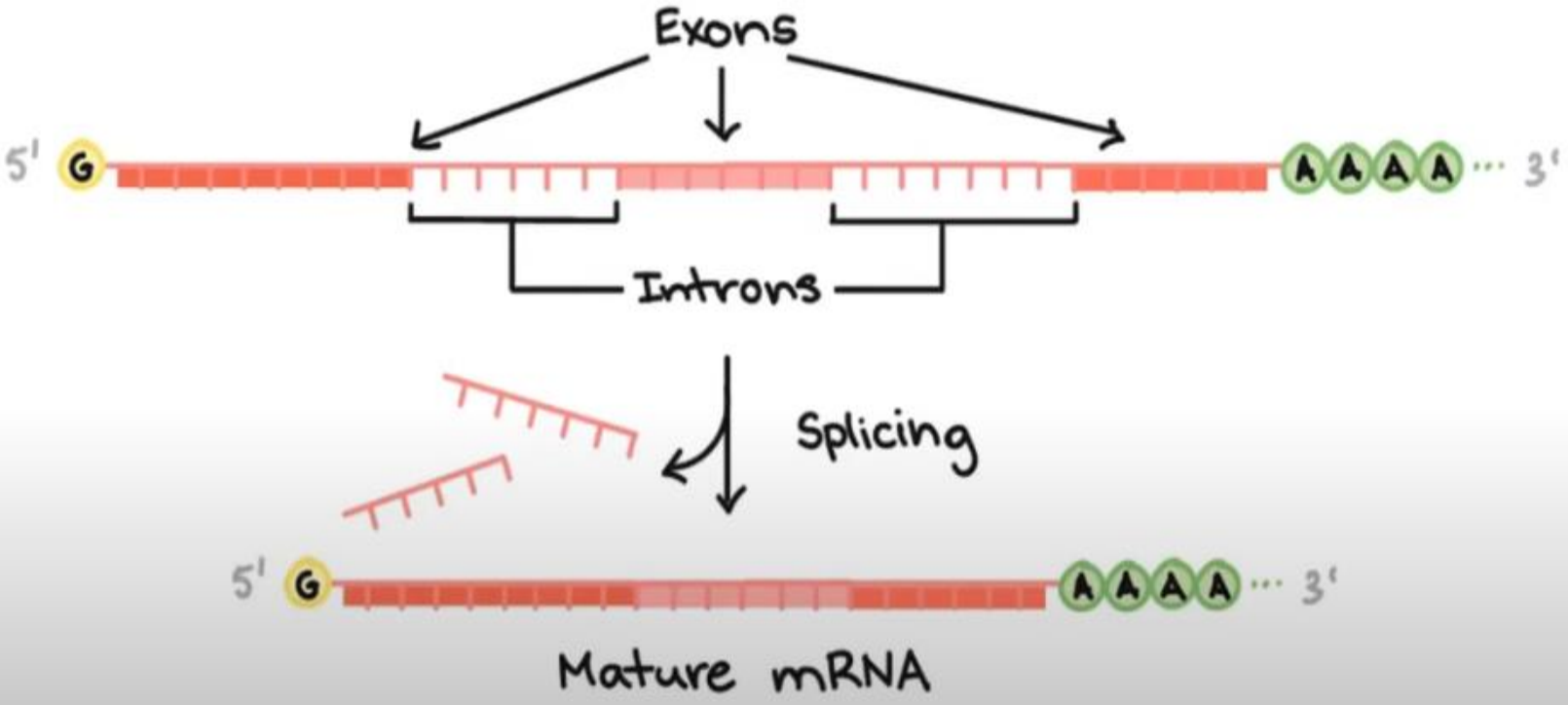
A gene is a piece of DNA that encodes number of amino acids. *

• A gene in eukaryotes consists of coding regions called coding Exon and non-coding regions are called intron, and are exchanged these areas, respectively.

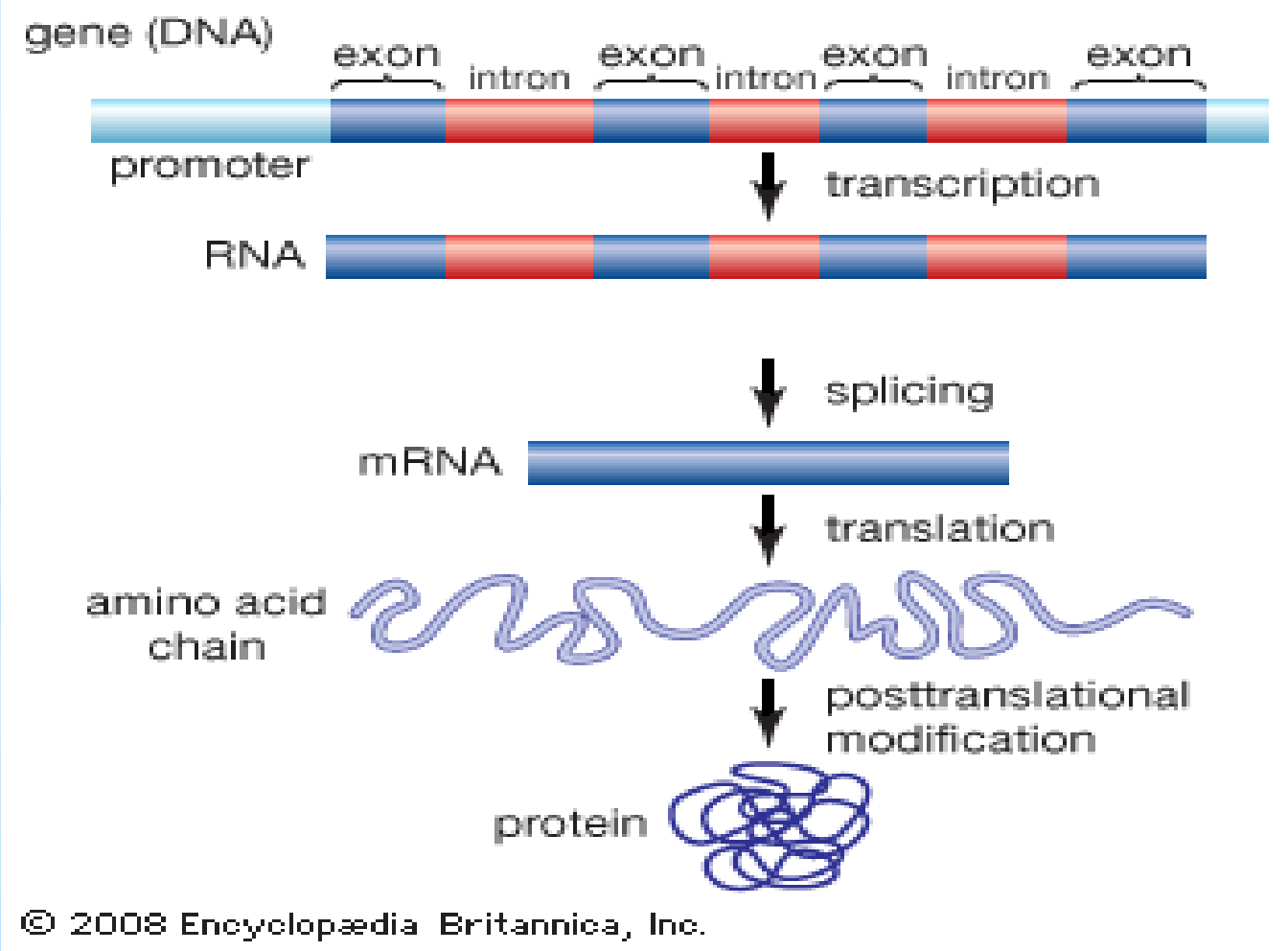
• Every gene begins and ends with an exon.

• In prokaryotes, the gene consists of exons only, there are no other regions encrypted.

SPLICING



Genes *


gene (DNA)
exon
intron
exon
intron
exon
intron
exon
promoter
transcription
RNA
splicing
mRNA
translation
amino acid chain
posttranslational modification
protein
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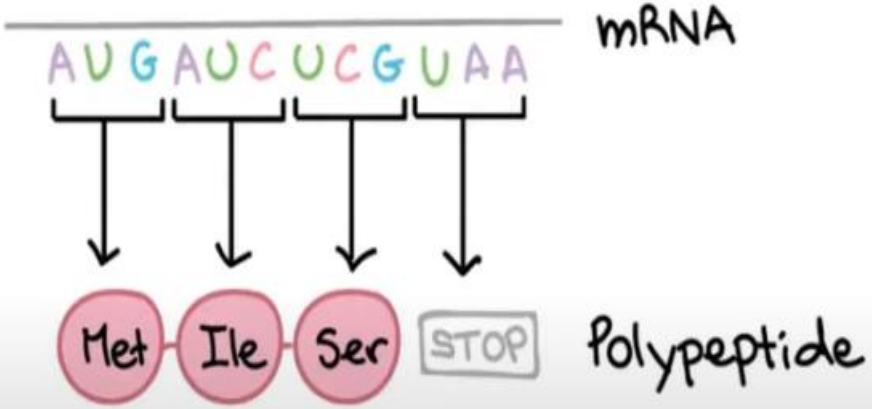
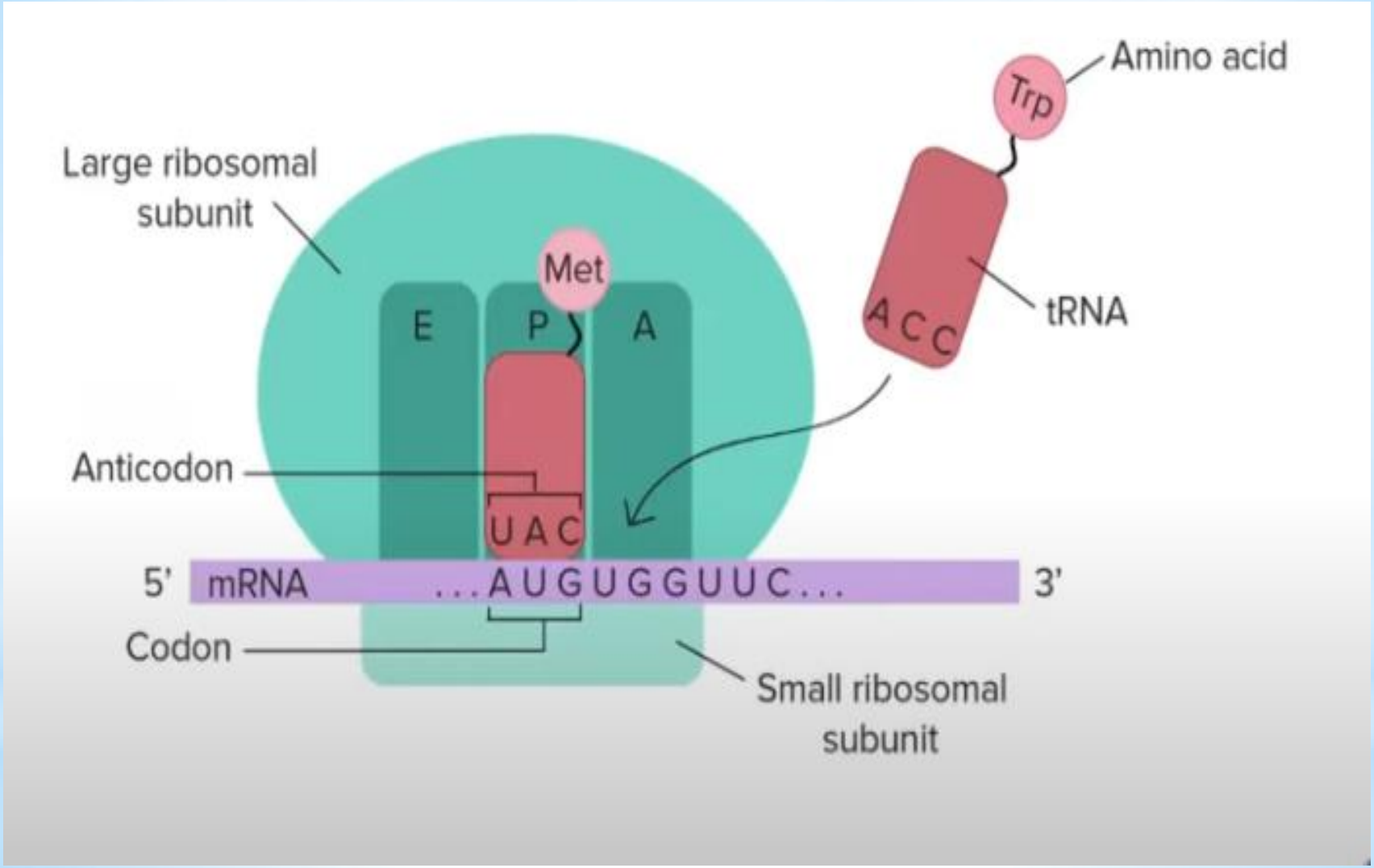
THE GENETIC CODE

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



الترجمه Translation *

The mRNA is transported from the nucleus to ribosomes in the cytoplasm, which is known as a manufacturing center proteins inside the cell where the transcribed code is translated. During the translation process, the mRNA molecule works as a code for the production of a specific protein


Amino acid
Trp
Large ribosomal subunit
Met
E
P
A
A C C
tRNA
Anticodon
U A C
5'
mRNA
. . . A U G U G G U U C . . .
3'
Codon
Small ribosomal subunit

Initiation involves the attachment of the small ribosomal unit to the mRNA and then to the tRNA. The initiation codon, which distinguishes the **start codon found on the mRNA (AUG),** is carried against the codon UAC, where the initiator tRNA carries the histidine **methionine** in eukaryotes.