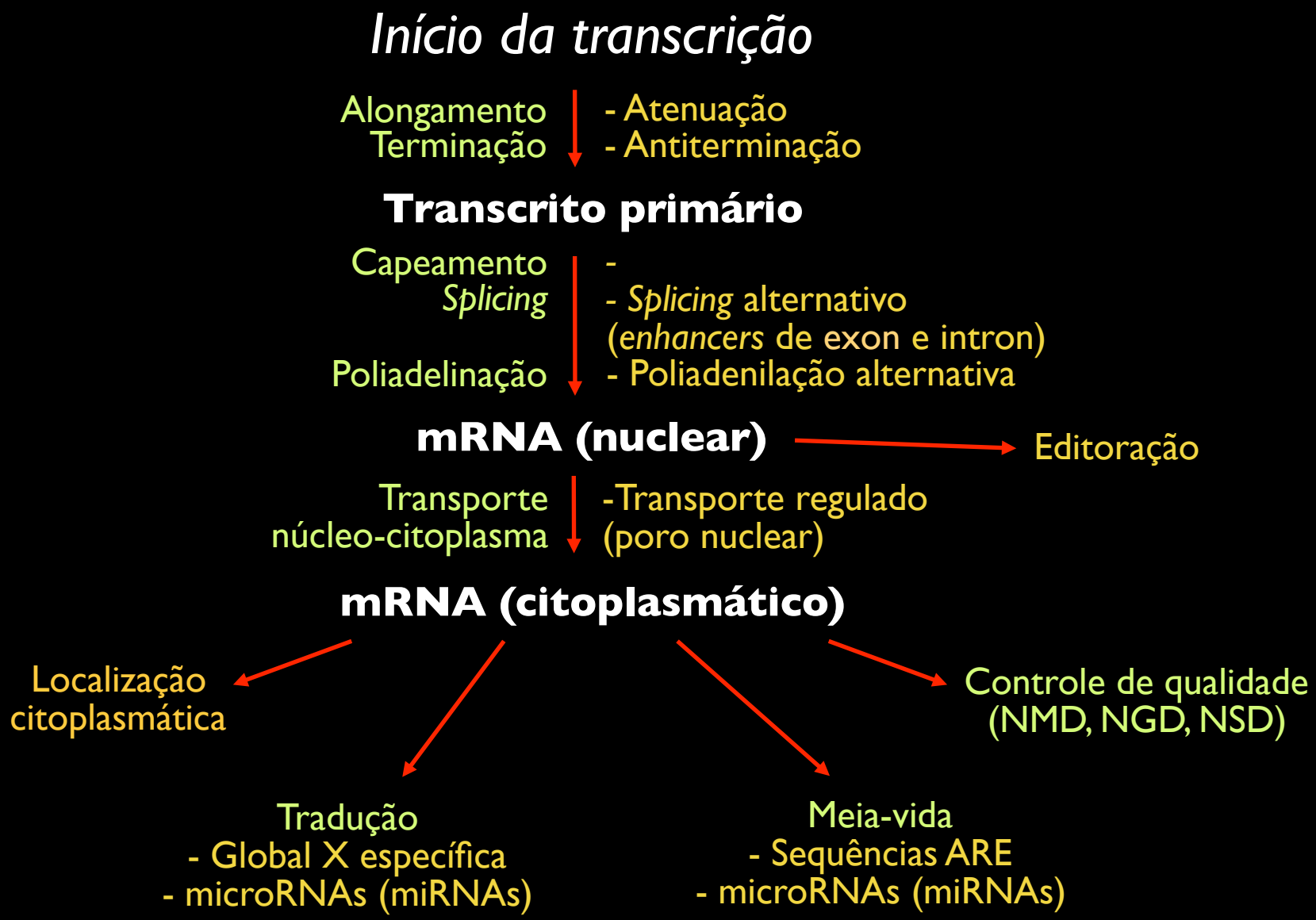
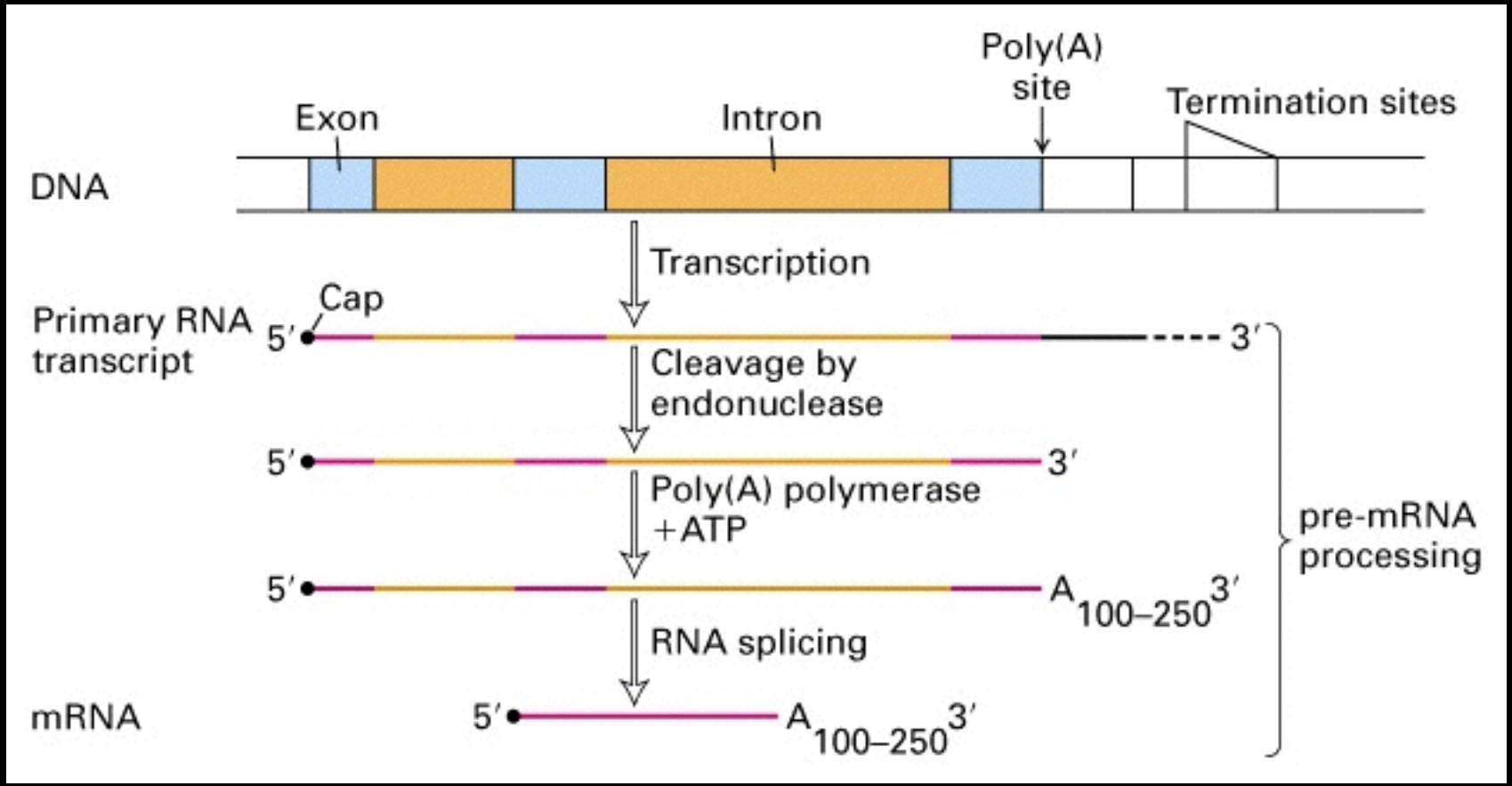
Regulação Pós-Transcricional

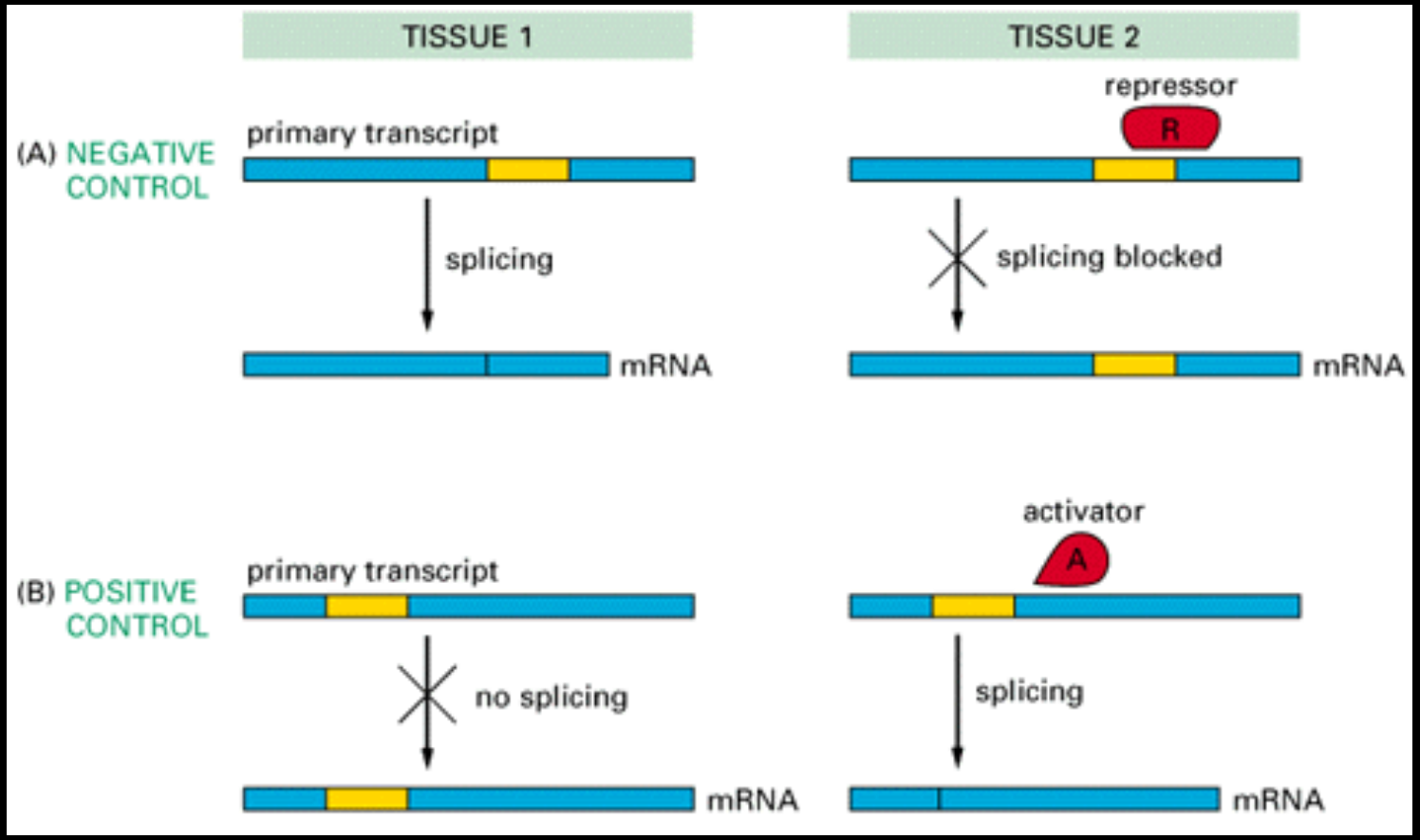
Etapas e tipos de regulação



Processamento do mRNA



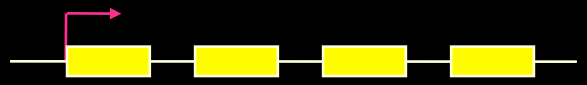
Splicing alternativo



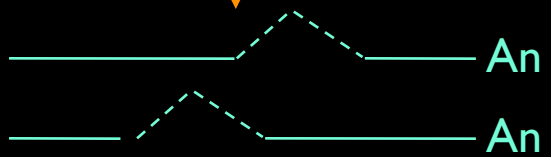
Splicing alternativo

Tipos:
- Funcional ou não
- Produtos diferentes

CONSTITUTIVO



SF2/ASF
ou
SC35

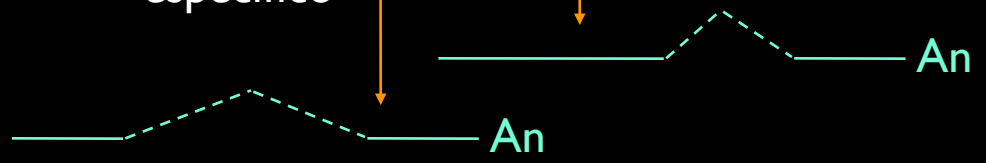


Ex.: transcritos virais

REGULADO

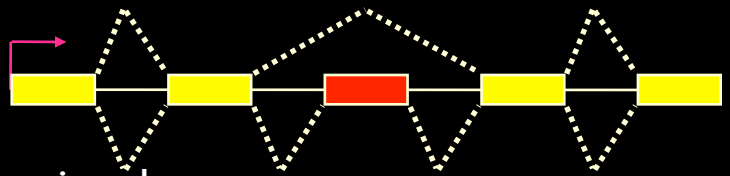
Fator tecido-,
estágio- ou
desenvolvimento-
específico

ou

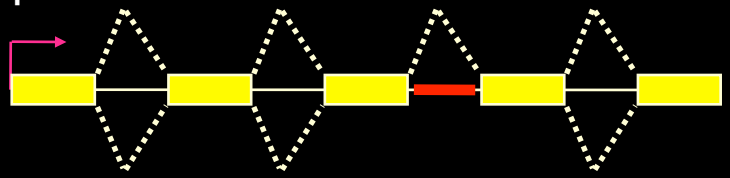


Ex.: determinação de sexo em Drosophila,
fibronectina, tropomiosina

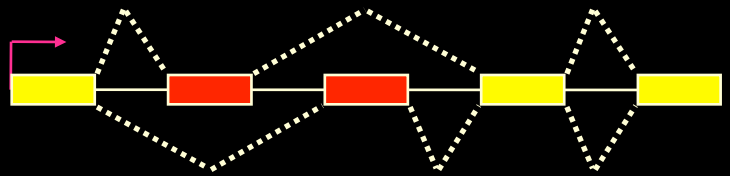
Exon opcional (*exon skipping*)



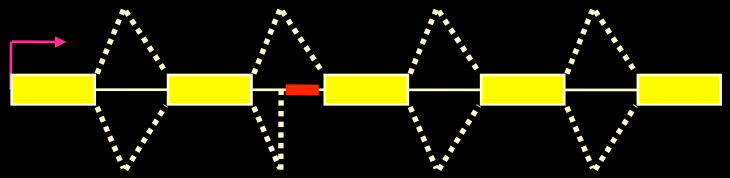
Intron opcional



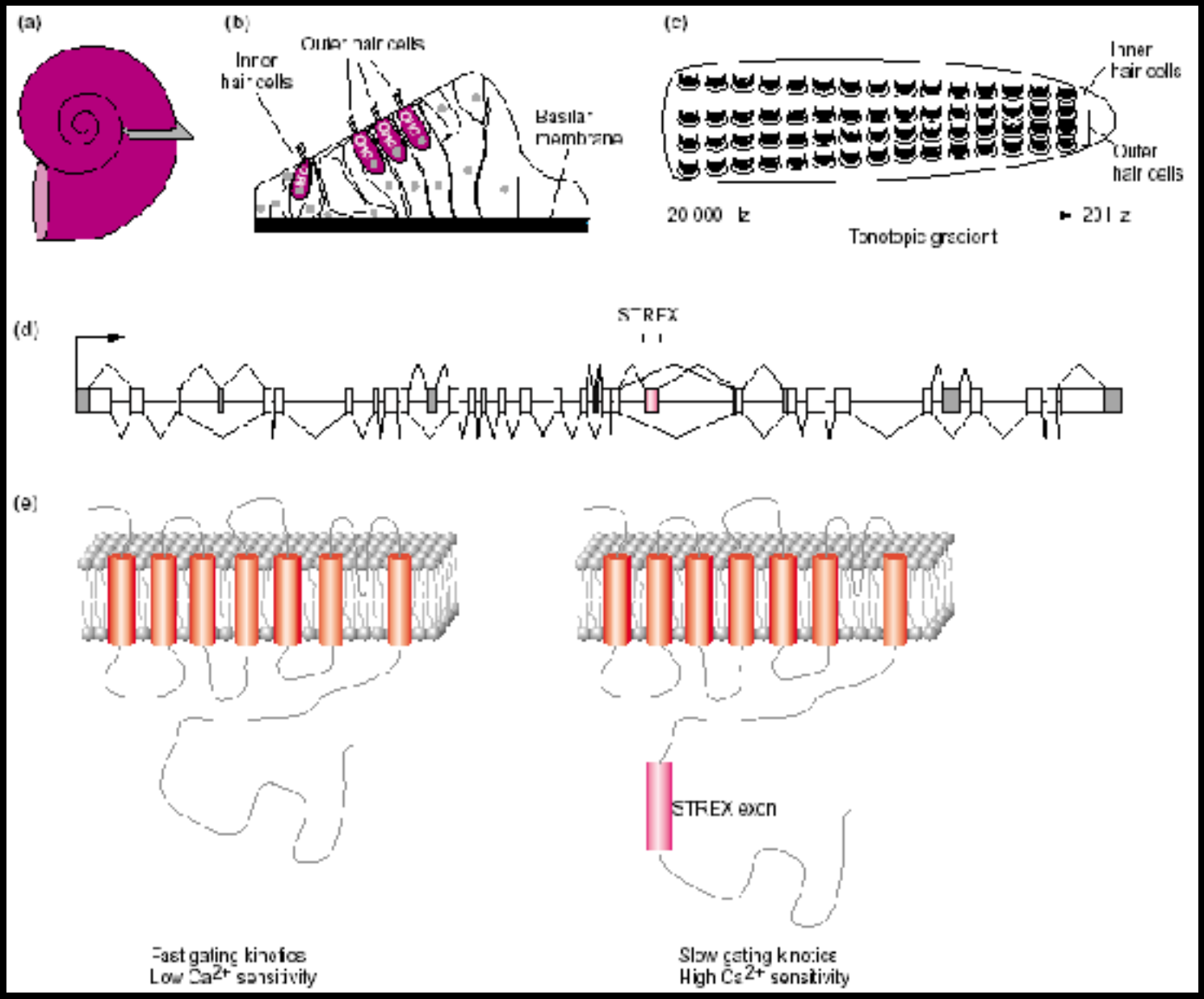
Exons mutuamente exclusivos



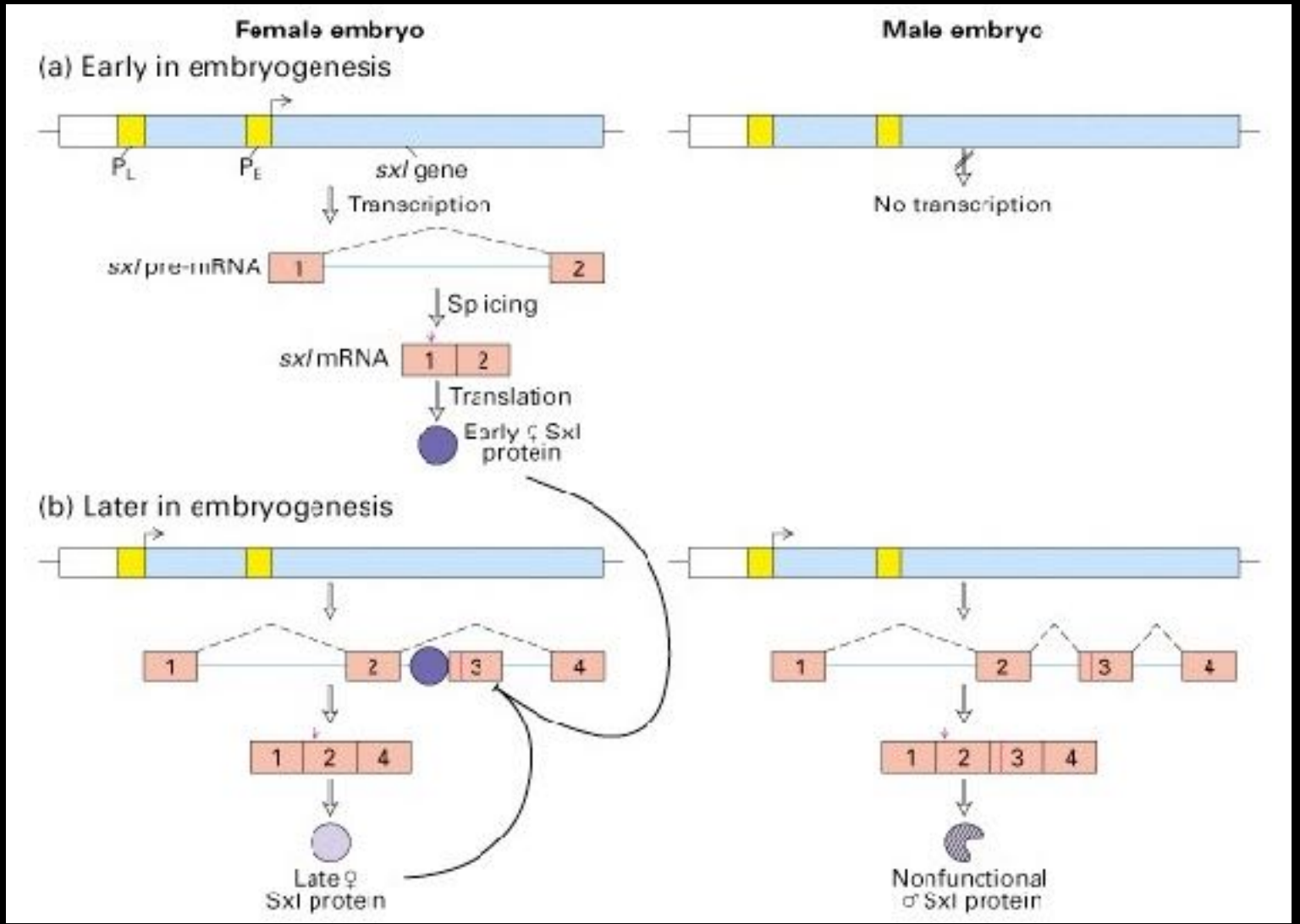
SS interno



Splicing alternativo



Splicing + promotor alternativos



Introns e regulação gênica

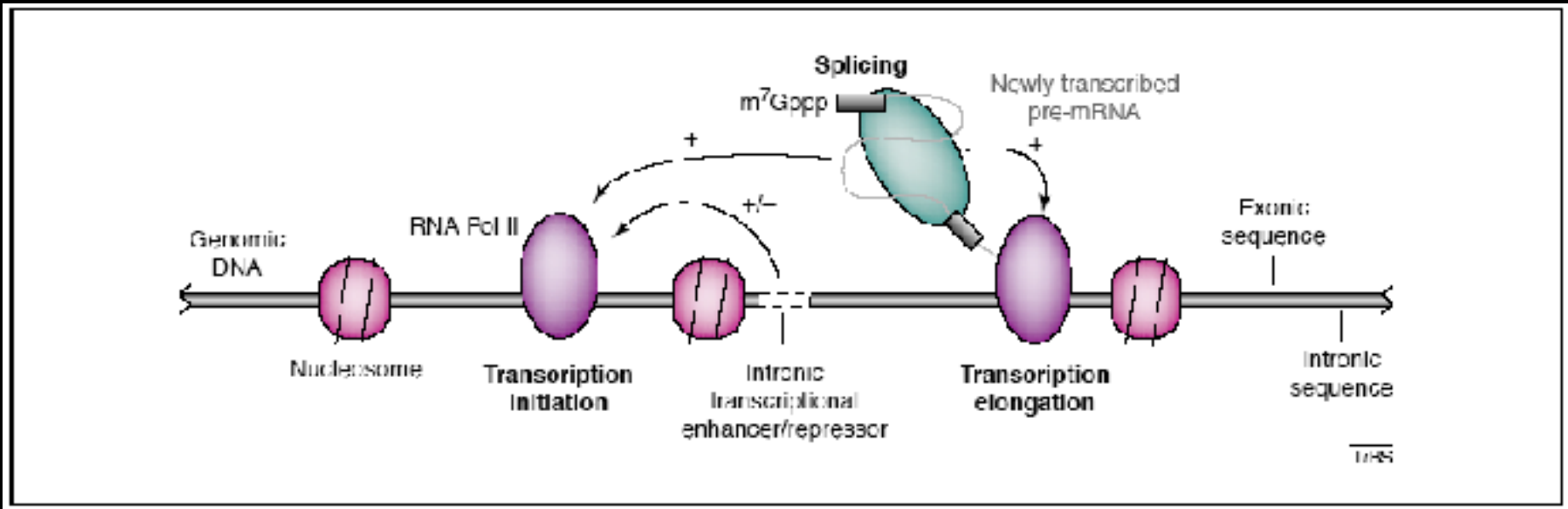
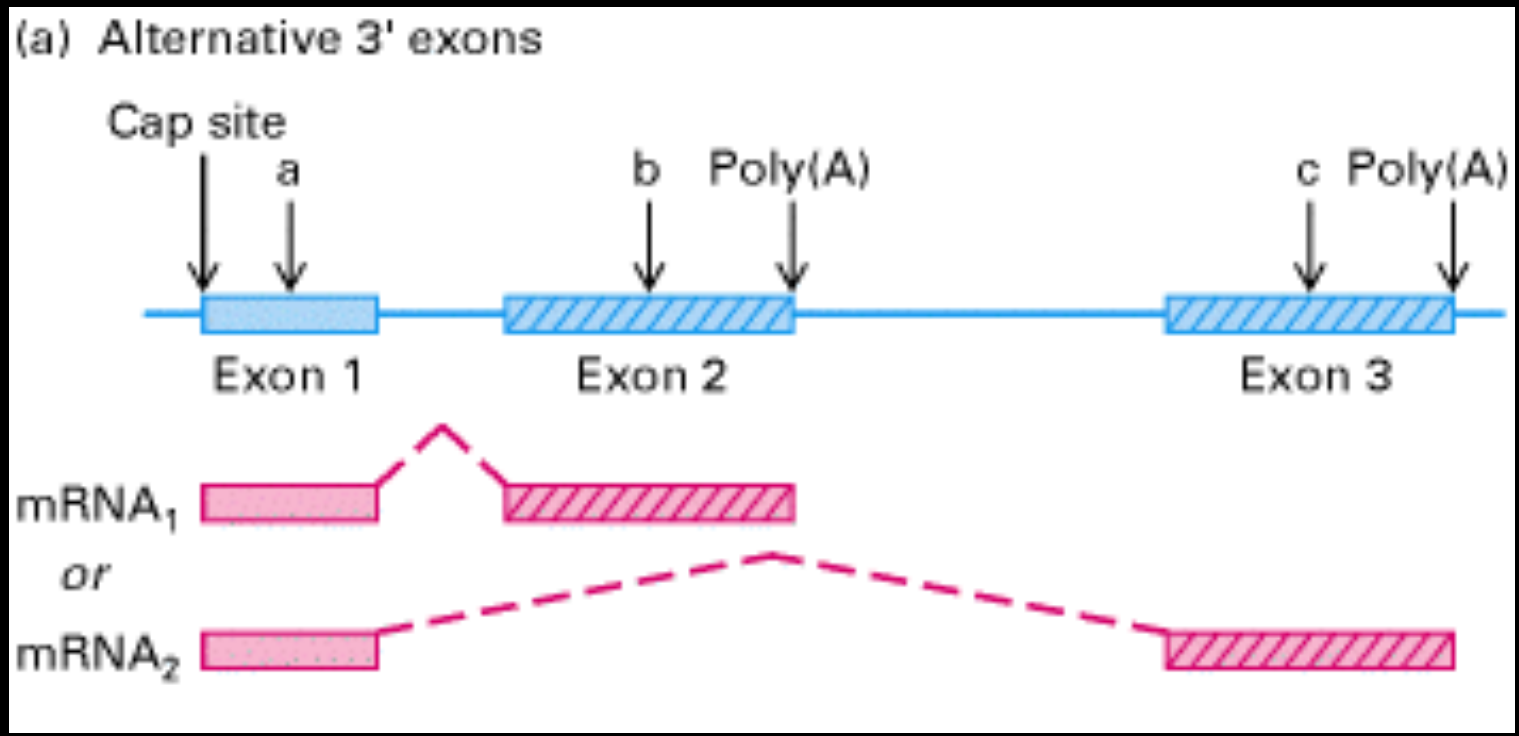
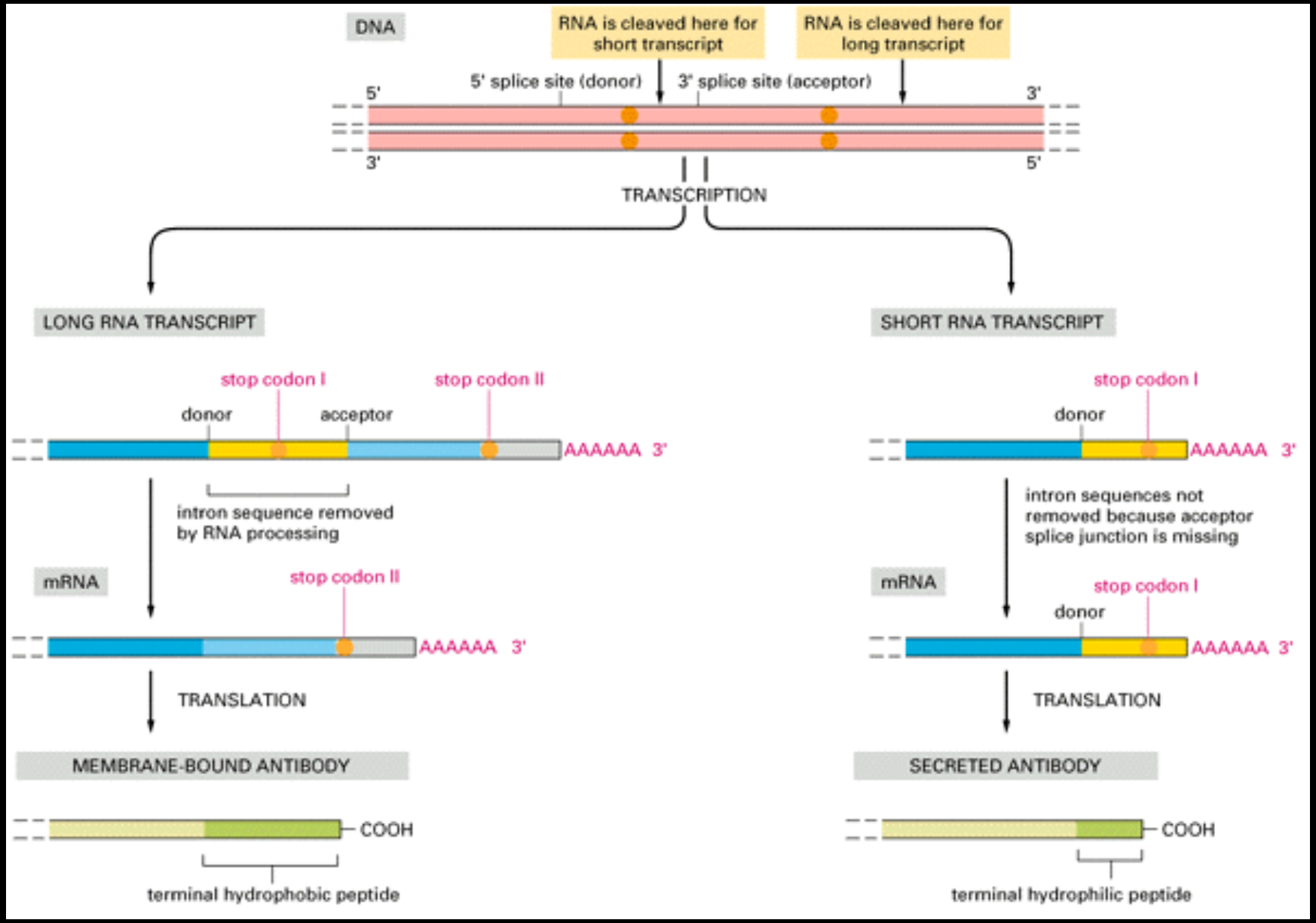


Fig. 1. Introns can affect the efficiency of transcription by several different means. Transcriptional enhancer or repressor, or nucleosome-positioning elements within introns can influence the efficiency of transcription initiation. Spliceosome components (green) assembling on a newly transcribed intron can further enhance transcription at the level of both initiation and elongation.

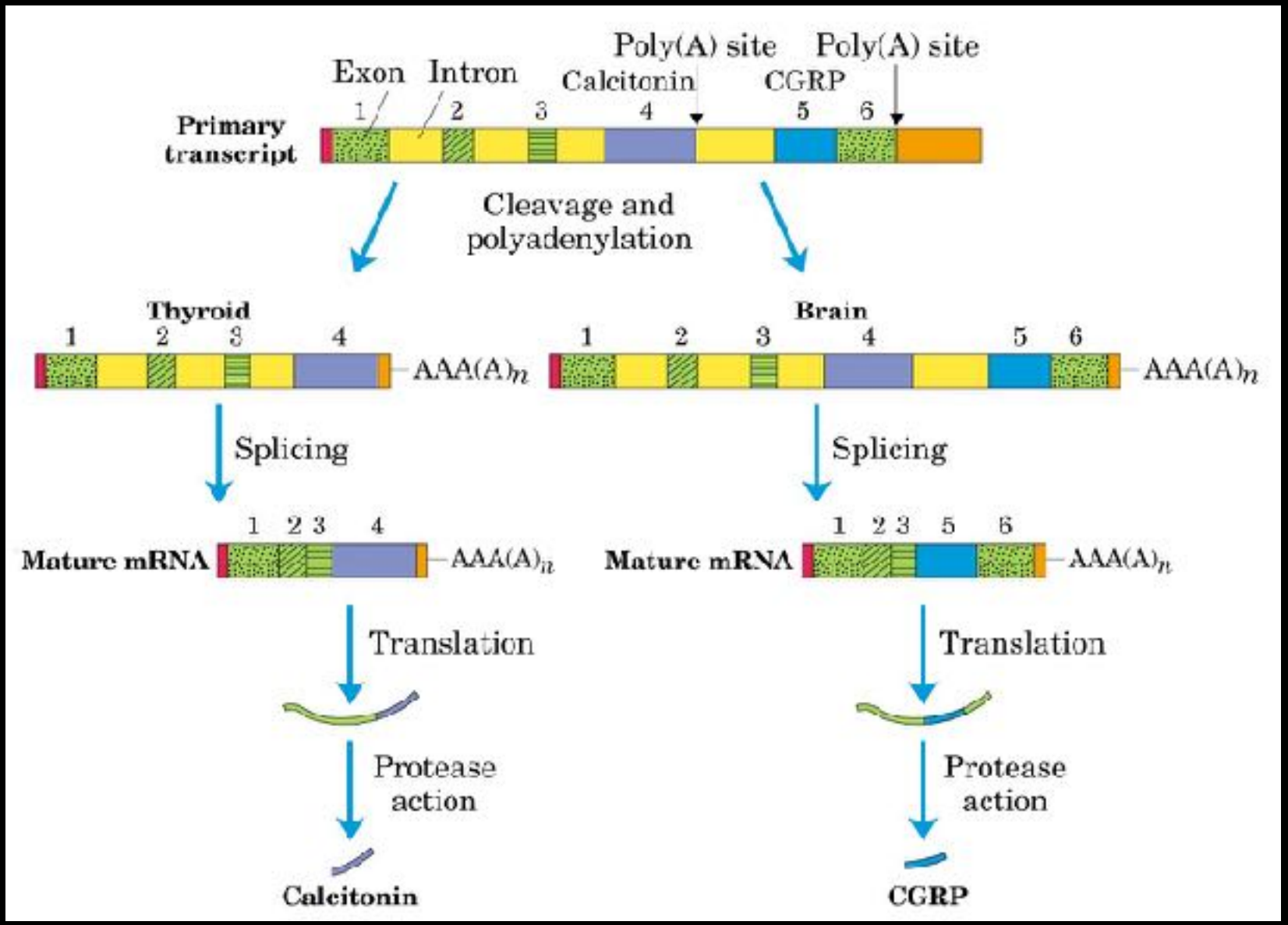
Poliadenilação alternativa



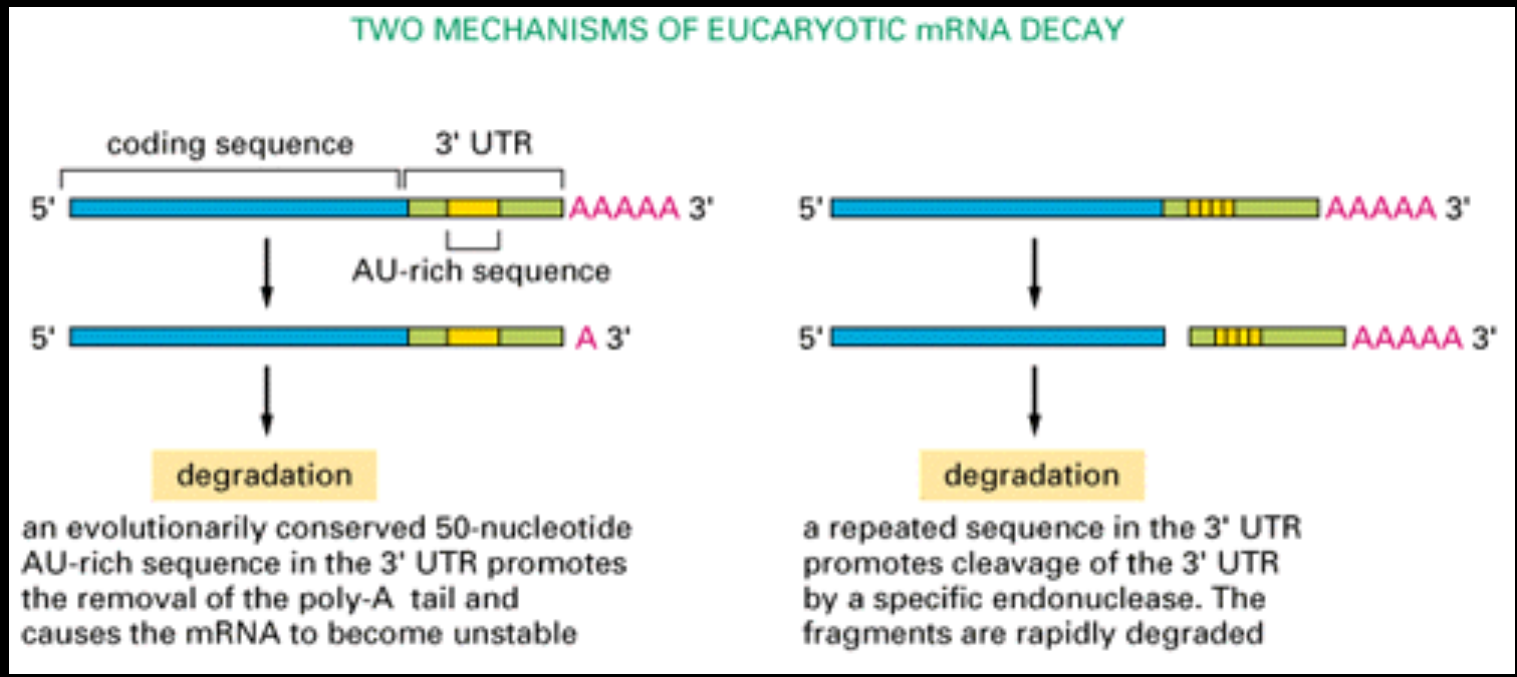
Poliadenilação alternativa



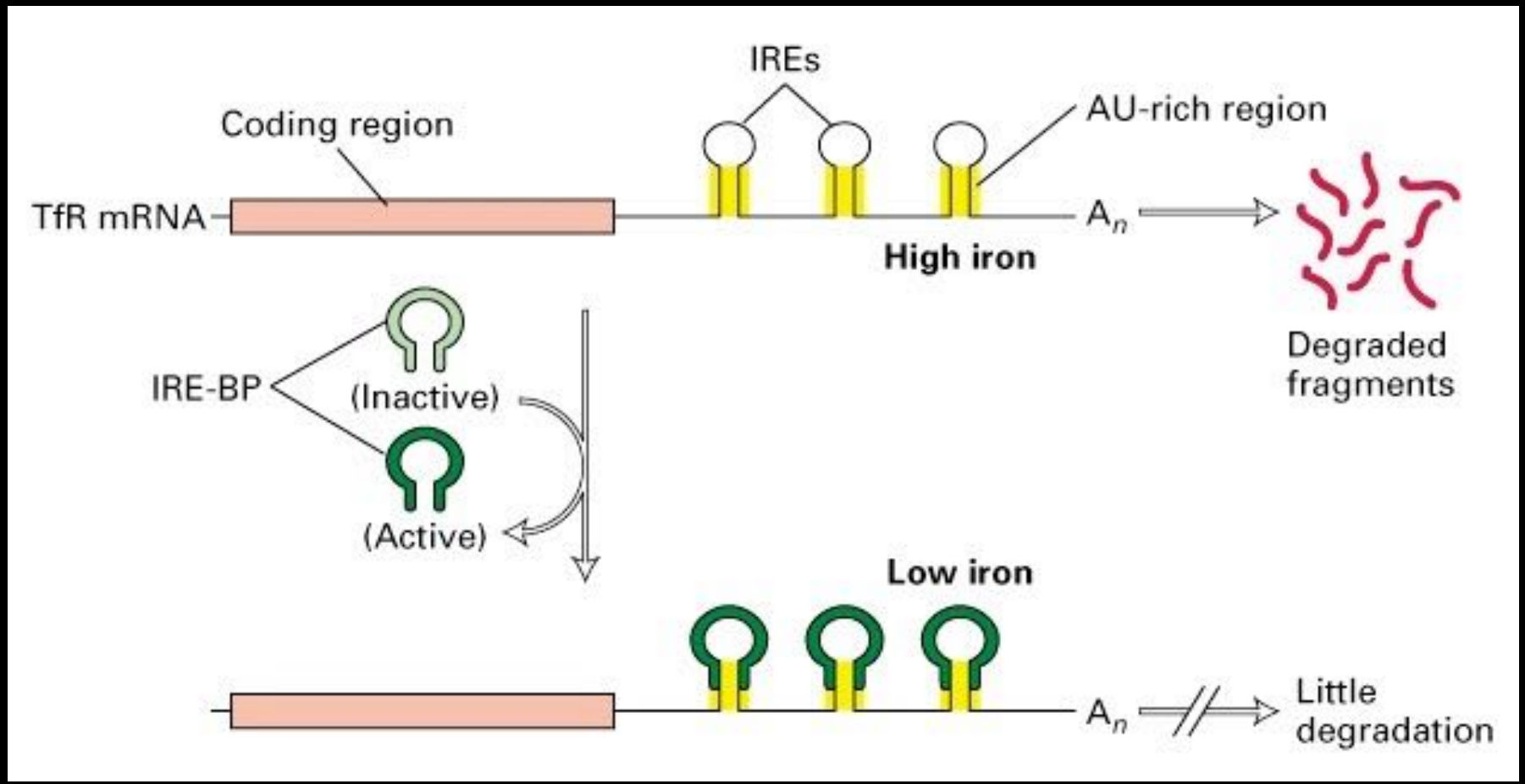
Poliadenilação alternativa



Regulação da estabilidade do mRNA



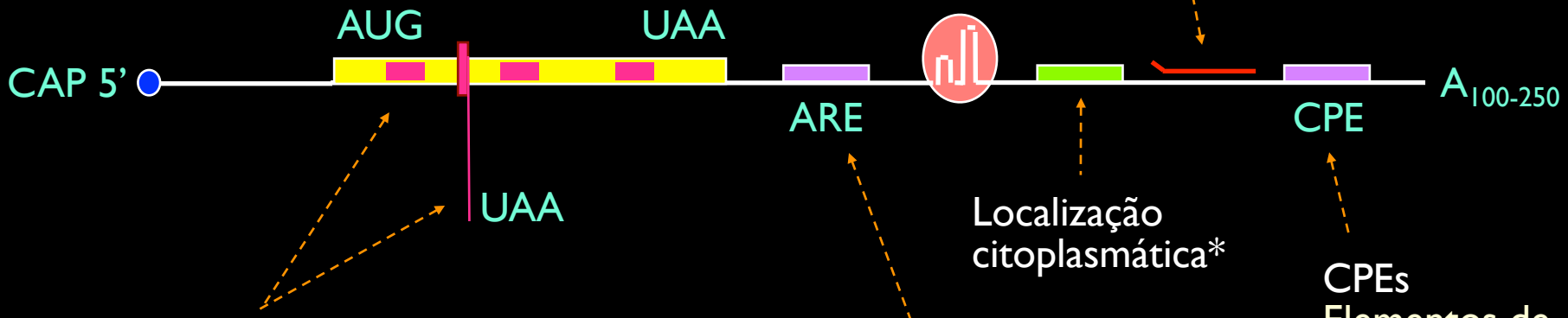
Regulação da estabilidade: TfR



Regulação: estabilidade do mRNA

Proteínas de ligação à estruturas secundárias
Estabilização: bloqueio de clivagem endonucleolítica
Ex.: receptor de transferrina

miRNAs
(*Micro RNAs*)
Degradação do mRNA
[50% dos mRNAs humanos]



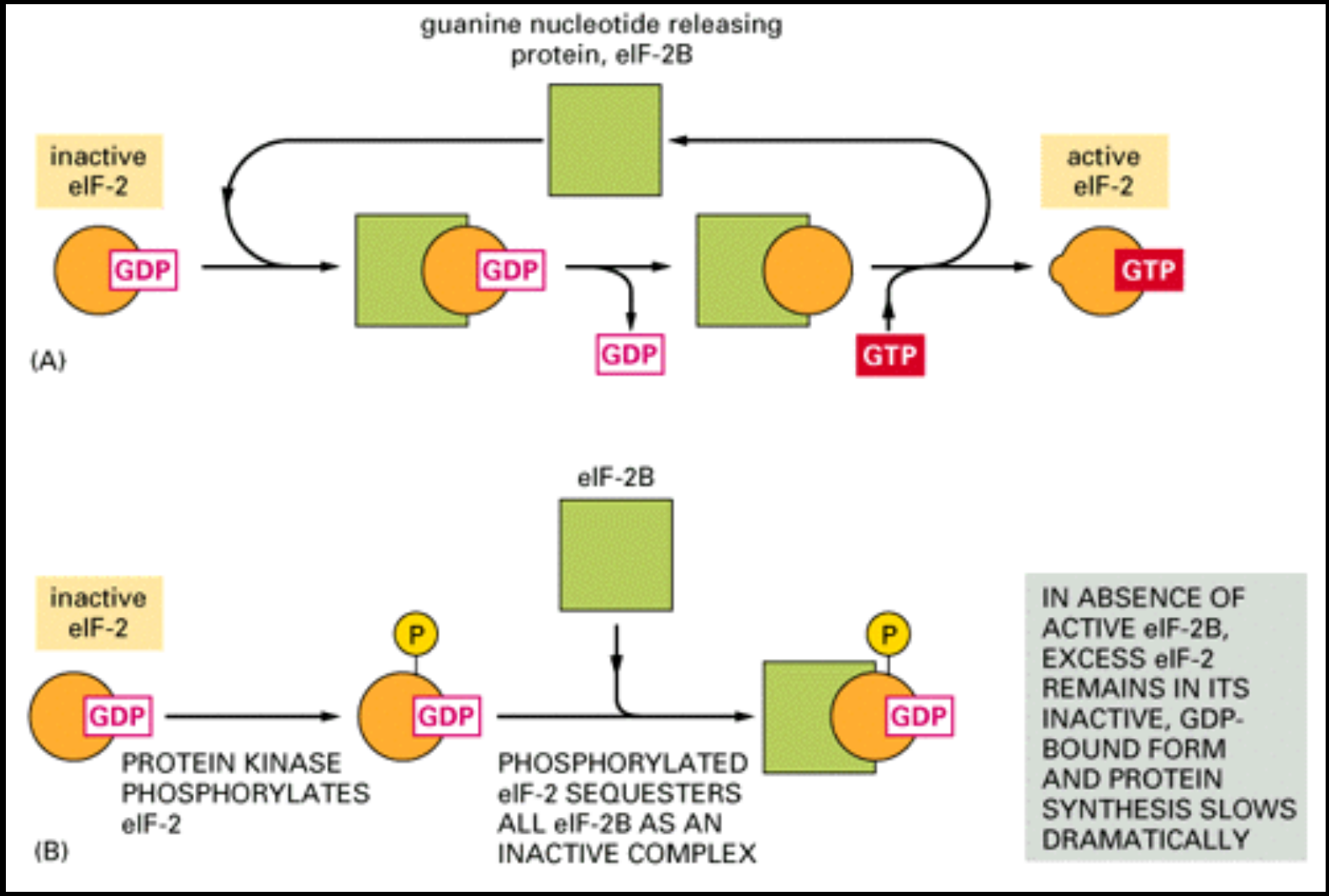
Degradação mediada por nonsense (NMD)
(Vigilância de RNA)
Terminação prematura
Desestabilização: decapeamento e
degradação 5'-3' sem perda de poli(A)

Sequências ricas em AU
(AUUUA)n-(U)n
Desestabilização: perda do poli(A),
decapeamento e degradação 5'-3'
Ex.: c-fos, citocinas, linfocinas
[5%-8% dos mRNAs humanos]

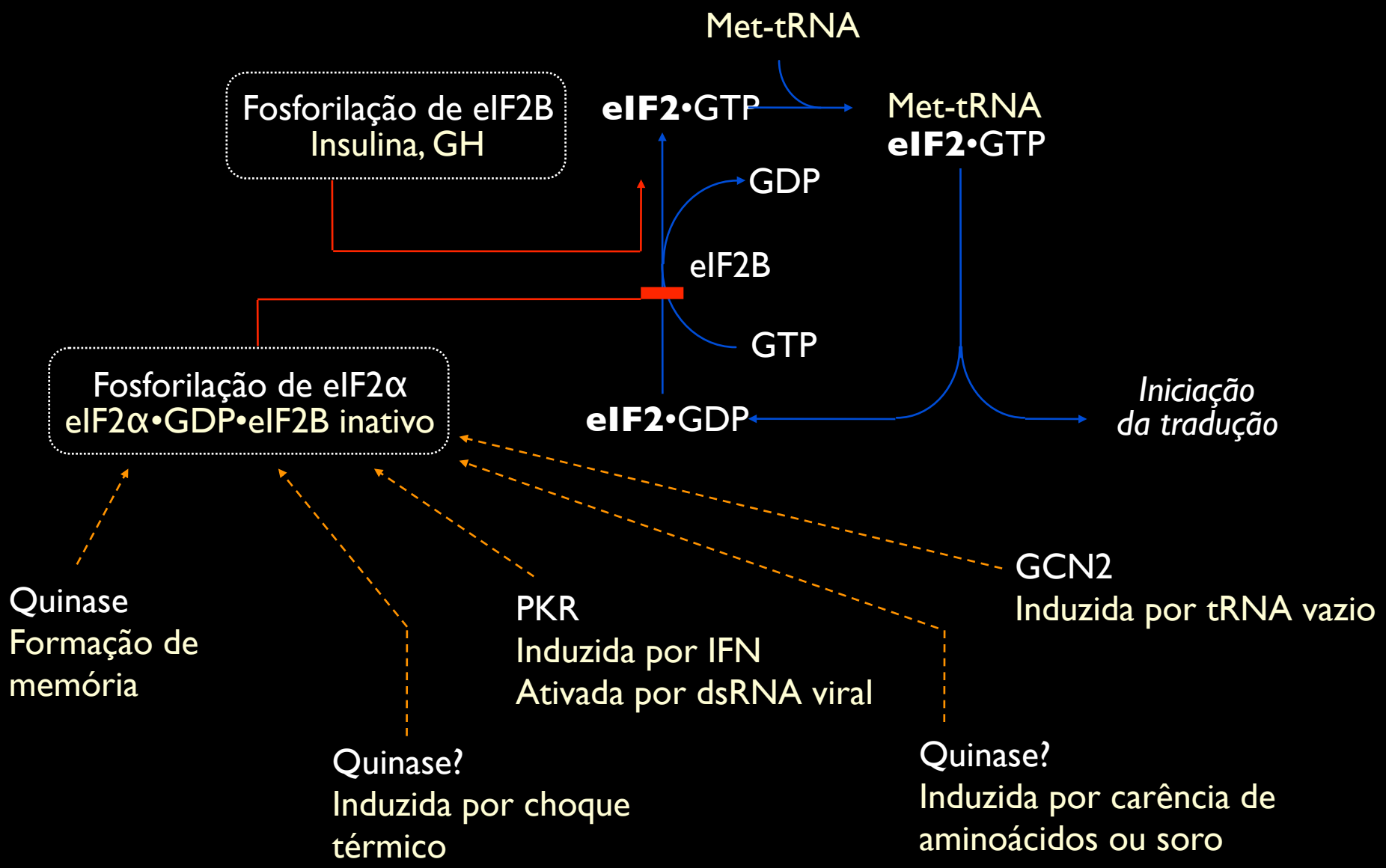
Localização
citoplasmática*

CPEs
Elementos de
poliadenilação
citoplasmáticos

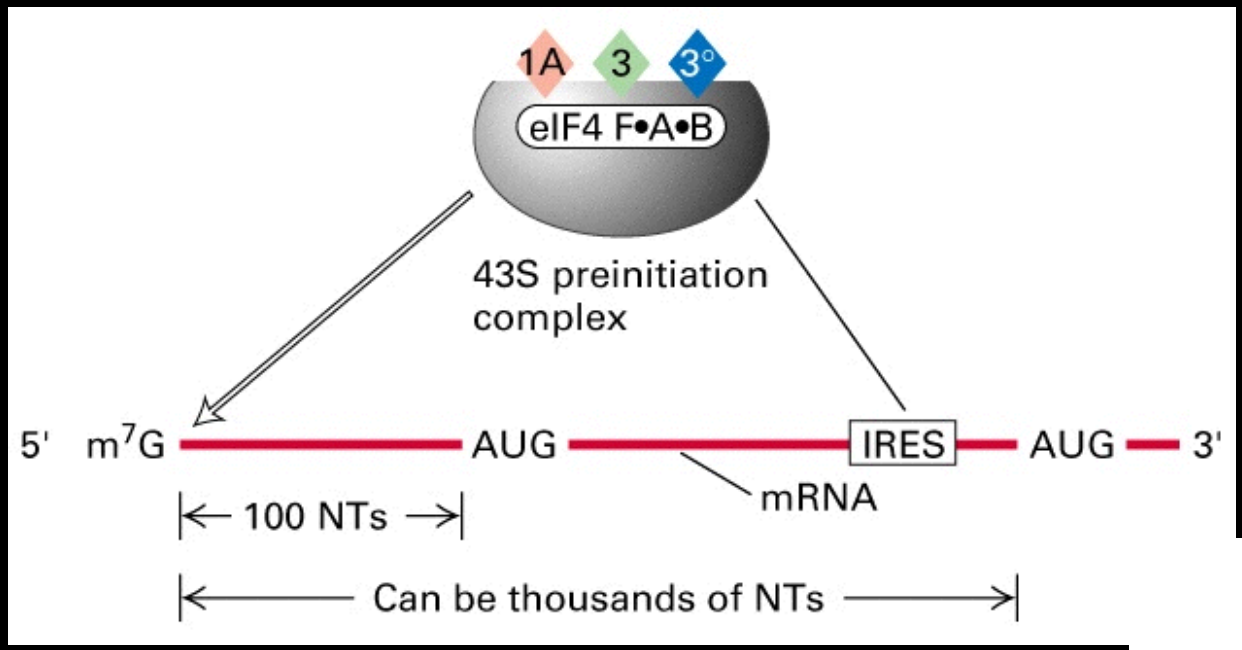
Regulação traducional global

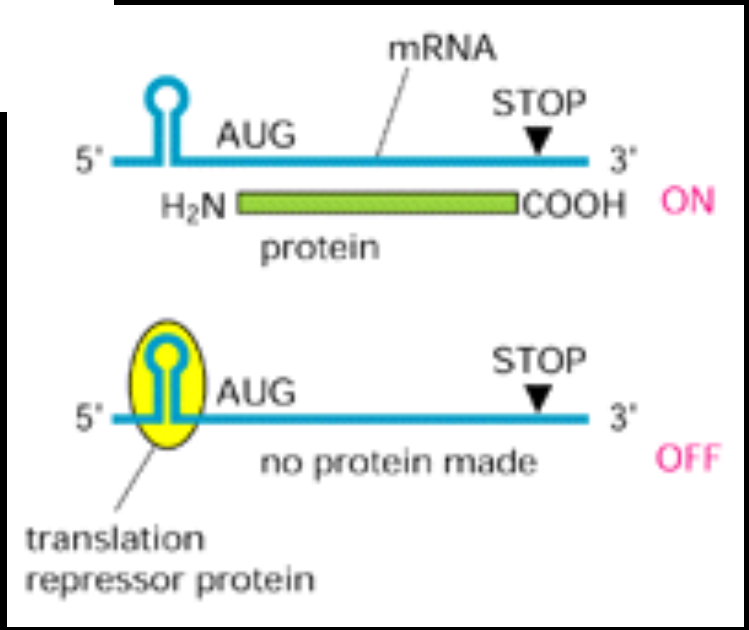


Regulação traducional global

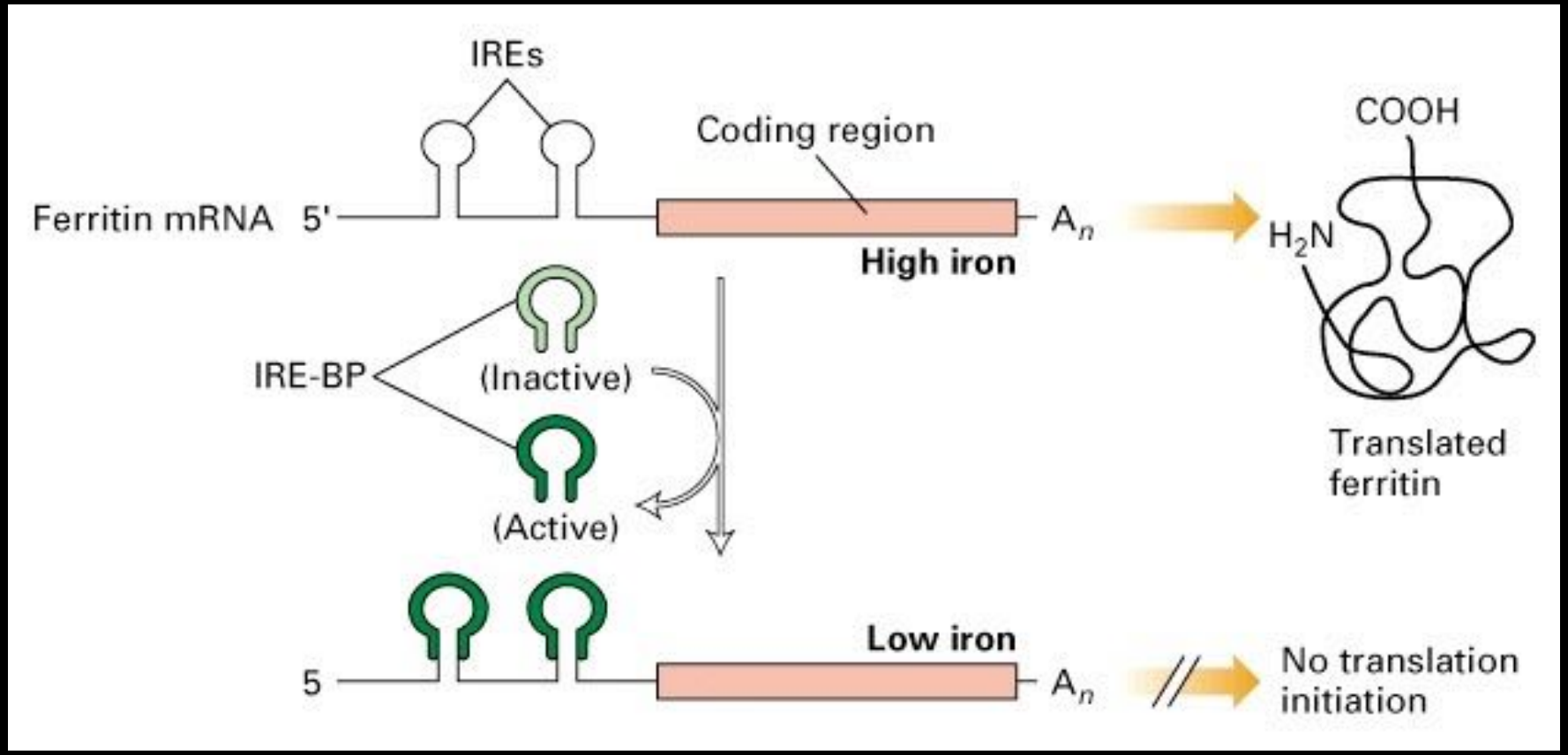


Regulação traducional específica

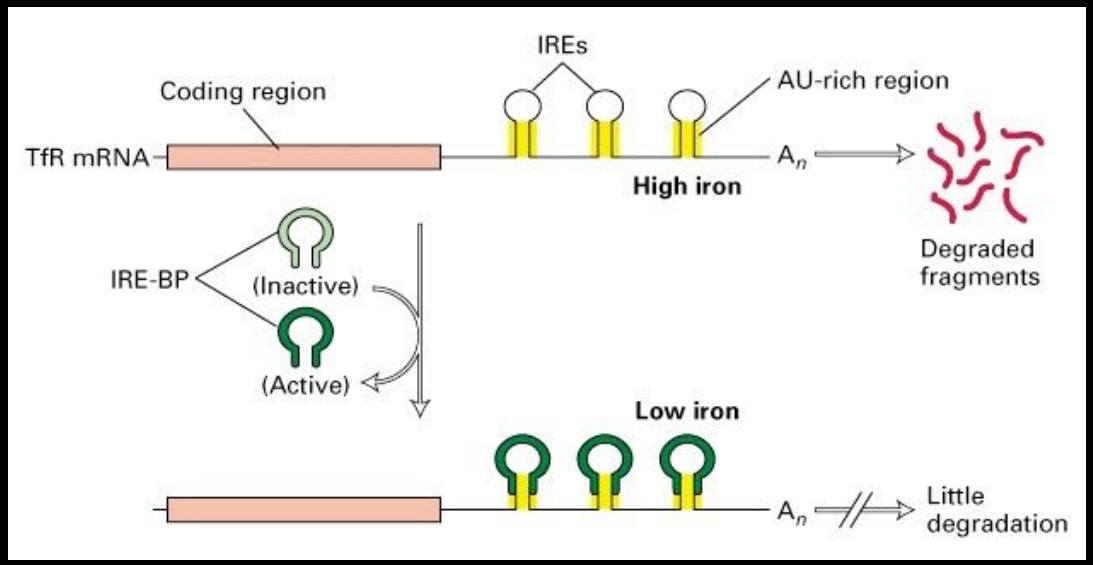


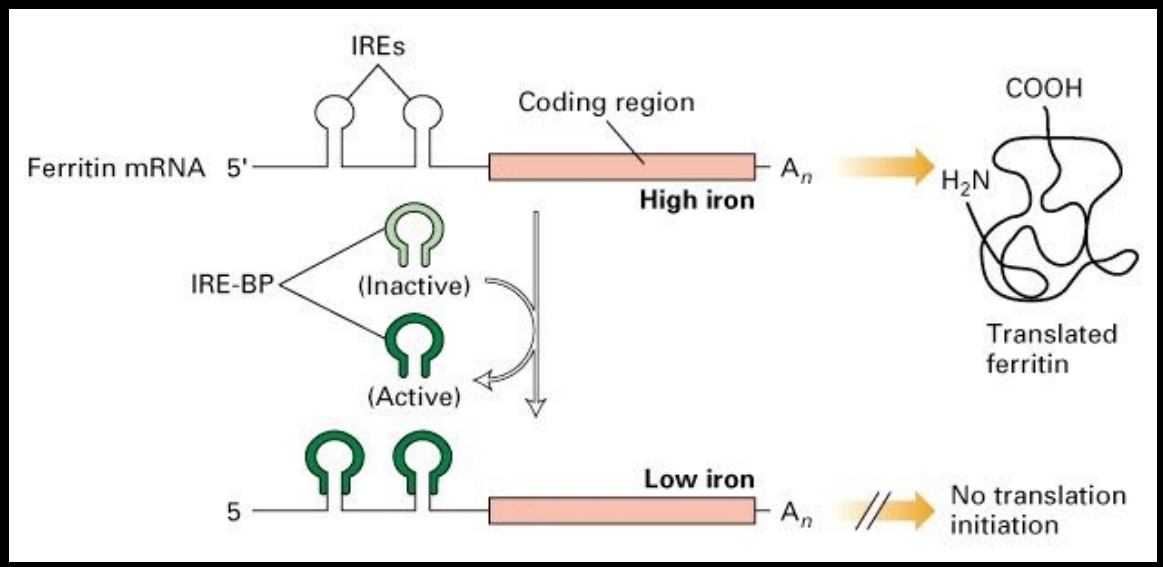


Regulação traducional: ferritina



Integração: estabilidade e tradução





Regulação: tradução do mRNA

Fosforilação de eIF4E
Hormônios, mitógenos, fatores de crescimento

Proteínas de ligação à estruturas secundárias
Bloqueio da ligação do 43S ao CAP
Ex.: ferritina

IRES
Sítios internos de entrada de ribossomo

Teor de eIF4E
Níveis citoplasmáticos regulados

uORFs
ORFs pequenas a 5' da principal
Repressão da tradução
Tradução da ORF principal depende de reiniciação
Ex.: GCN4

CPEs
Elementos de poliadenilação citoplasmáticos

Estrutura secundária
Aumento do requerimento de eIF4s
Bloqueio da ligação ao CAP e/ou varredura do AUG
Ex.: mRNAs que regulam ciclo celular

miRNAs
(*Micro RNAs*)
Bloqueio da tradução do mRNA
[menos comum]

Reg. pós-transcricional coordenada

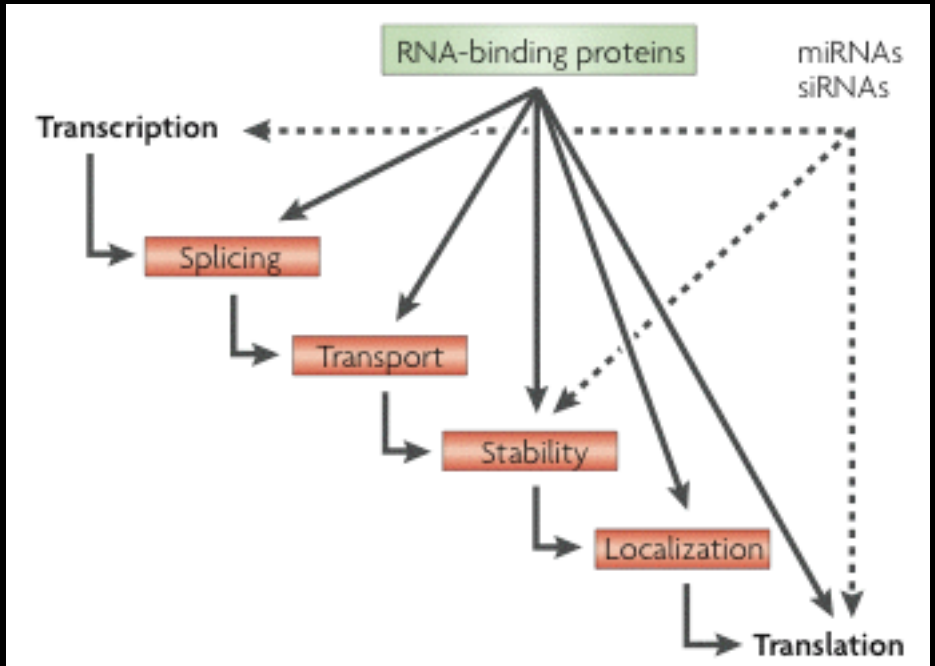


Figure 1 | **Interconnected steps of post-transcriptional regulation and its potential coordination.** In eukaryotic cells, mRNAs undergo several steps of regulation from transcription to translation. The coordination of multiple mRNAs is regulated by RNA-binding proteins and small non-coding RNAs at different levels. miRNAs, microRNAs; siRNAs, small interfering RNAs.