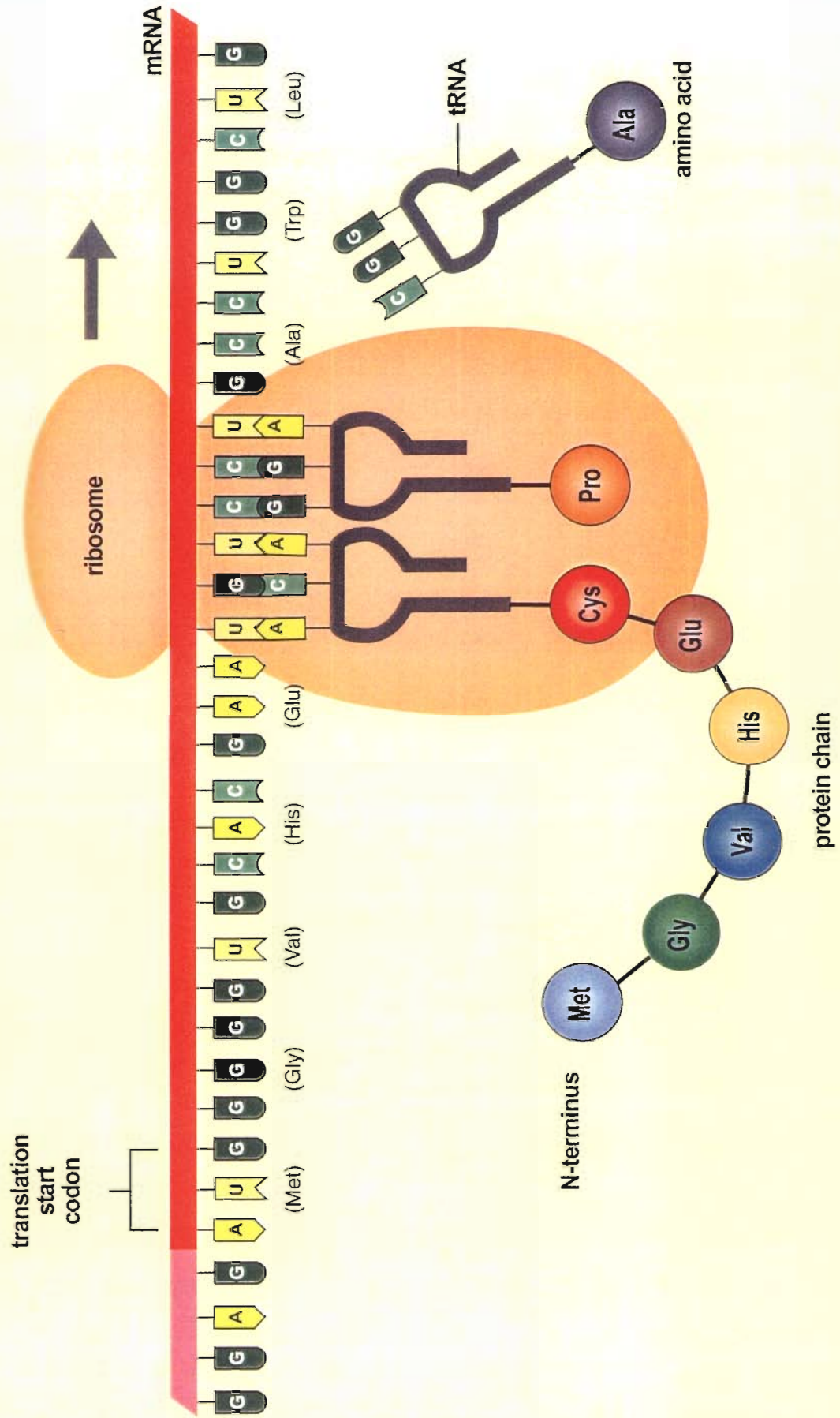


**LODISH DECLARATION
EXHIBIT B
PART 2 OF 2**

Lodish Tutorial

mRNA Translation



Lodish Tutorial

The Messenger RNA (mRNA) Code

Figure 6 Sequence

| mRNA sequence | -27 | -24 | -23 | -20 | ... |
|---------------|------|-----|-----|-----|-----|
| ... | GGAG | AUG | GAG | UUA | ... |
| Met | Met | His | Glu | Pro | Ala |
| Gly | Val | Cys | Gly | Cys | GCC |
| Gly | GUG | CAC | GAA | UGU | ... |
| Ala | Arg | Asn | Asp | Cys | Gln |
| GCU | CGU | AAU | GAU | UGU | CAA |
| GCC | CGC | AAC | GAC | UGC | CAG |
| GCA | CGA | | | | |
| GCG | CGG | | | | |
| | AGA | | | | |
| | AGG | | | | |
| Leu | Lys | Met | Phe | Pro | Ser |
| UUA | AAA | AUG | UUU | CCU | UCU |
| UUG | AAG | | UUC | CCC | UCC |
| CUU | | | | CCA | UCA |
| CUC | | | | CCG | UCG |
| CUA | | | | | AGU |
| CUG | | | | | AGC |
| | | | | | Thr |
| | | | | | ACU |
| | | | | | ACC |
| | | | | | ACA |
| | | | | | ACG |
| | | | | | Trp |
| | | | | | UGG |
| | | | | | Tyr |
| | | | | | UAU |
| | | | | | UAC |
| | | | | | Val |
| | | | | | GUU |
| | | | | | GUC |
| | | | | | GUA |
| | | | | | GUG |
| | | | | | Ile |
| | | | | | AUU |
| | | | | | AUC |
| | | | | | AUA |
| | | | | | His |
| | | | | | CAU |
| | | | | | CAC |
| | | | | | Gly |
| | | | | | GGU |
| | | | | | GGC |
| | | | | | GGA |
| | | | | | GGG |

Lodish Tutorial

DNA Encoding EPO (Figure 6)

FIG.6A

AAGCTTCTGGGCTTCCAGACCCAGCTACTTTGCGGAACTCAGCAACCCAGGCATCTCTGAGTCTCCGCCCA
 AGACCGGGATGCCCCCAGGGGAGGTGTCCGGGAGCCCAGCCTTTCCAGATAGCACGCTCCGCCAGTCCC
 AAGGGTGCACAACCGGCTGCACCTCCCCTCCCGGACCCAGGGCCCGGGAGCAGCCCCCATGACCCACACGC
 ACGTCTGCAGCAGCCCCGCTCAGCCCCGGCGAGCCTCAACCCAGGCGTCTGCCCCCTGCTCTGACCCCGG
 GTGGCCCCCTACCCCTGGCGACCCCTCAGGCACACAGCCTCTCCCCACCCCCACCCGCGCACGCACACATG
 CAGATAACAGCCCCGACCCCCGGCCAGAGCCGXAGAGTCCCTGGGCCACCCCGGCCGCTCGCCTGCCGCTG
 CGCCGCACCGCGCTGTCTCCCGGAGCCGGACCGGGGCCACCGCGCCXGCTCTGCTCCGACACCGCGCCC
 CTTGGACAGCCGCCCTCTCCTCTAGGCCCGTGGGGCTGGCCCTGCACCGCCGAGCTTCCCGGGATGAGGIX
 CCCGGTGACCGGCGCGCCCCAAGTCGCTGAGGGACCCCGGCCAAGCGCGGAG **Met Gly Val His**
ATG GGG GTG CAC G
 GTGAGTACTCGCGGGCTGGGCGCTCCCGGCGGCCGGGTTCTGTTTTGAGCGGGGATTTAGCGCCCCGGCT

Sheet 8 of 27

FIG.6B

ATTGGCCAAGAGGTGGCTGGGTTCAAGGACCGGCGACTTGTCAAGGACCCCGAAGGGGGAGGGGGGTGGG
 GCAGCCTCCACGTGCCGCGGGGACTTGGGGGAGTTCTTGGGGATGGCAAAAACCTGGCCTGTTGAGGGGCA
 CAGTTTGGGGTTGGGGAGGAGGTTTGGGGTTCTGCTGTGCAGTTGTGTGTTGTCAGTGTCTCG [I · S ·]
 TTGCACACGCACAGATCAATAAGCCAGAGGCAGCACCTGAGTGCTTGCATGGTTGGGACAGGAAGGACGAG
 CTGGGGCAGAGACGTGGGGATGAAGGAAGCTGTCTTCCACAGCCACCCTTCTCCCCCCCCGCTGACTCT
 CAGCCTGGCTATCTGTTCTAG **Glu Cys Pro Ala Trp Leu Trp Leu Leu Leu Ser Leu**
AA TGT CCT GCC TGG CTG TGG CTT CTC CTG TCC CTG
Leu Ser Leu Pro Leu Gly Leu Pro Val Leu Gly Ala Pro Pro Arg Leu Ile Cys
CTG TCG CTC CCF CTG GGC CTC CCA GTC CTG GGC GCC CCA CCA CGC CTC ATC TGT
Asp Ser Arg Val Leu Glu Arg Tyr Leu Leu Glu Ala Lys Glu Ala Glu Asn Ile
GAC AGC CGA GTC CTG GAG AGG TAC CTC TTG GAG GCC AAG GAG GCC GAG AAT ATC
26
Thr
ACG GTGAGACCCCTTCCCCAGCACATTCCACAGAACTCACGCTCAGGGCTTCAGGGAACTCCTCCCAGAT
 CCAGGAACCTGGCACTTGGTTTTGGGGTGGAGTTGGGAAGCTAGACACTGCCCCCTACATAAGAATAAGTC

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Lodish Tutorial

DNA Encoding EPO (Figure 6)

FIG.6C

TGGTGGCCCCAAACCATACCTGAAACTAGGCAAGGAGCAAAGCCAGCAGATCCTACGCCTGTGGGCCAGGG

CCAGAGCCTTCAGGGACCCTTGACTCCCCGGGCTGTGTGCATTTAG 27 30
Thr Gly Cys Ala Glu
ACG GGC TGT GCT GAA

* 40

His Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe Tyr
CAC TGC AGC TTG AAT GAG AAT ATC ACT GTC CCA GAC ACC AAA GTT AAT TTC TAT

50 55
Ala Trp Lys Arg Met Glu
GCC TGG AAG AGG ATG GAG GTGAGTTCCTTTTTTTTTTTTTTTTTCCTTCTTTTGAGGAATCTCATT

TGCGAGCCTGATTTTGGATGAAAGGGAGAAATGATCGGGGGAAAGGTAAATGGAGCAGCAGAGATGAGGCT
GCCTGGGCGCAGAGGCTCACGTCTATAATCCAGGCTGAGATGGCCGAGATGGGAGAATTGCTTGAGCCCT
GGAGTTTACAGACCAACCTAGGCAGCATAGTGAGATCCCCATCTCTACAAACATTTAAAAAATTAGTCAG
GTGAAGTGGTGCATGGTGGTAGTCCCAGATATTTGGAAGGCTGAGGCGGGAGGATCGCTTGAGCCCAGGAA
TTTGAGGCTGCAGTGAGCTGTGATCACACCACTGCACTCCAGCCTCAGTGACAGAGTGAGGCCCTGTCTCA

Sheet 10 of 27

FIG.6D

AAAAAGAAAAAGAAAAAGAAAAATAATGAGGGCTGTATGGAATACATTATTATTCACTCACTCACT
CACTCATTCACTCATTCACTCATTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACT
GGCTGCTGAGGGGCAGGAGGGAGAGGGGTGACATGGGTCACTCGACTCCAGAGTCCACTCCCTGTAG

56 60 70
Val Gly Gln Gln Ala Val Glu Val Trp Gln Gly Leu Ala Leu Leu Ser Glu Ala
GTC GGG CAG CAG GCC GTA GAA GTC TGG CAG GGC CTG GCC CTG CTG TCG GAA GCT

80 * 90

Val Leu Arg Gly Gln Ala Leu Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu
GTC CTG CGG GGC CAG GCC CTG TTG GTC AAC TCT TCC CAG CCG TGG GAG CCC CTG

100

Gln Leu His Val Asp Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu
CAG CTG CAT GTG GAT AAA GCC GTC AGT GGC CTT CGC AGC CTC ACC ACT CTG CTT

110 115
Arg Ala Leu Gly Ala Gln
CGG GCT CTG GGA GCC CAG GTGAGTAGGAGCGGACACTTCTGCTTGCCTTTCTGTAAAGAAGGGGA

GAAGGGTCTTGCTAAGGAGTACAGGAACTGTCCGTAATTCCTTCCCTTTCTGTGGCACTGCAGCCACCTCCT

116 120

Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
GTTTTCTCCTTGGCAG AAG GAA GCC ATC TCC CCT CCA GAT GCG GCC TCA GCT GCT

Sheet 11 of 27

Lodish Tutorial

DNA Encoding EPO (Figure 6)

FIG.6E

130 140
 Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val Tyr Ser
 CCA CTC CGA ACA ATC ACT GCT GAC ACT TTC CGC AAA CTC TTC CGA GTC TAC TCC

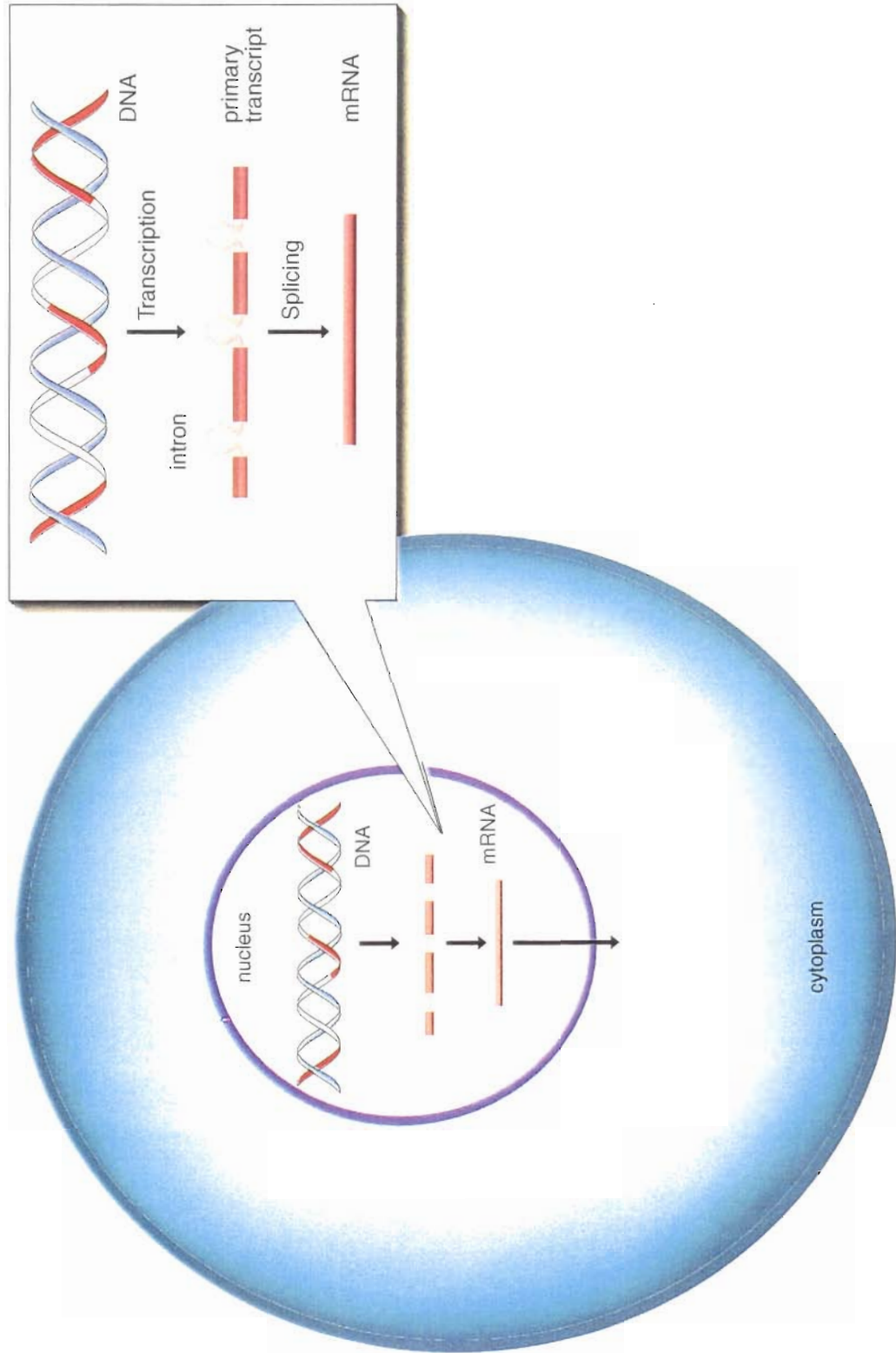
150 160
 Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala Cys Arg Thr Gly
 AAT TTC CTC CGG GGA AAG CTG AAG CTG TAC ACA GGG GAG GCC TGC AGG ACA GGG

166
 Asp Arg OP
 GAC AGA TGA CCAGGTGTGTCCACCTGGGCATATCCACCACCTCCCTCACCAACATTGCTTGTGCCACA
 CCCTCCCCCGCCACTCCTGAACCCCGTCGAGGGGCTCTCAGCTCAGCGCCAGCCTGTCCCATGGACTCC
 AGTGCCAGCAATGACATCTCAGGGGCCAGAGGAACTGTCCAGAGAGCAACTCTGAGATCTAAGGATGTCAC
 AGGGCCAACTTGAAGGGCCCAGAGCAGGAAGCATTGAGAGAGCAGCTTTAAACTCAGGGACAGAGCCATGC
 TGGGAAGACGCCTGAGCTCACTCGGCACCCTGCAAATTTGATGCCAGGACACGCTTTGGAGGCGATTTAC
 CTGTTTTTCGCACCTACCATCAGGGACAGGATGACCTGGAGAACTTAGGTGGCAAGCTGTGACTTCTCCAGG
 TCTCACGGGCATGGGCACTCCCTTGGTGGCAAGAGCCCCCTTGACACCGGGGTGGTGGGAACCATGAAGAC
 AXGATXGGGGCTGGCCTCTGGCTCTCATGGGGTCCAAGTTTTGTGTATTCTCAACCTATTGACAGACTGAA
 ACACAATATGAC

Sheet 12 of 27

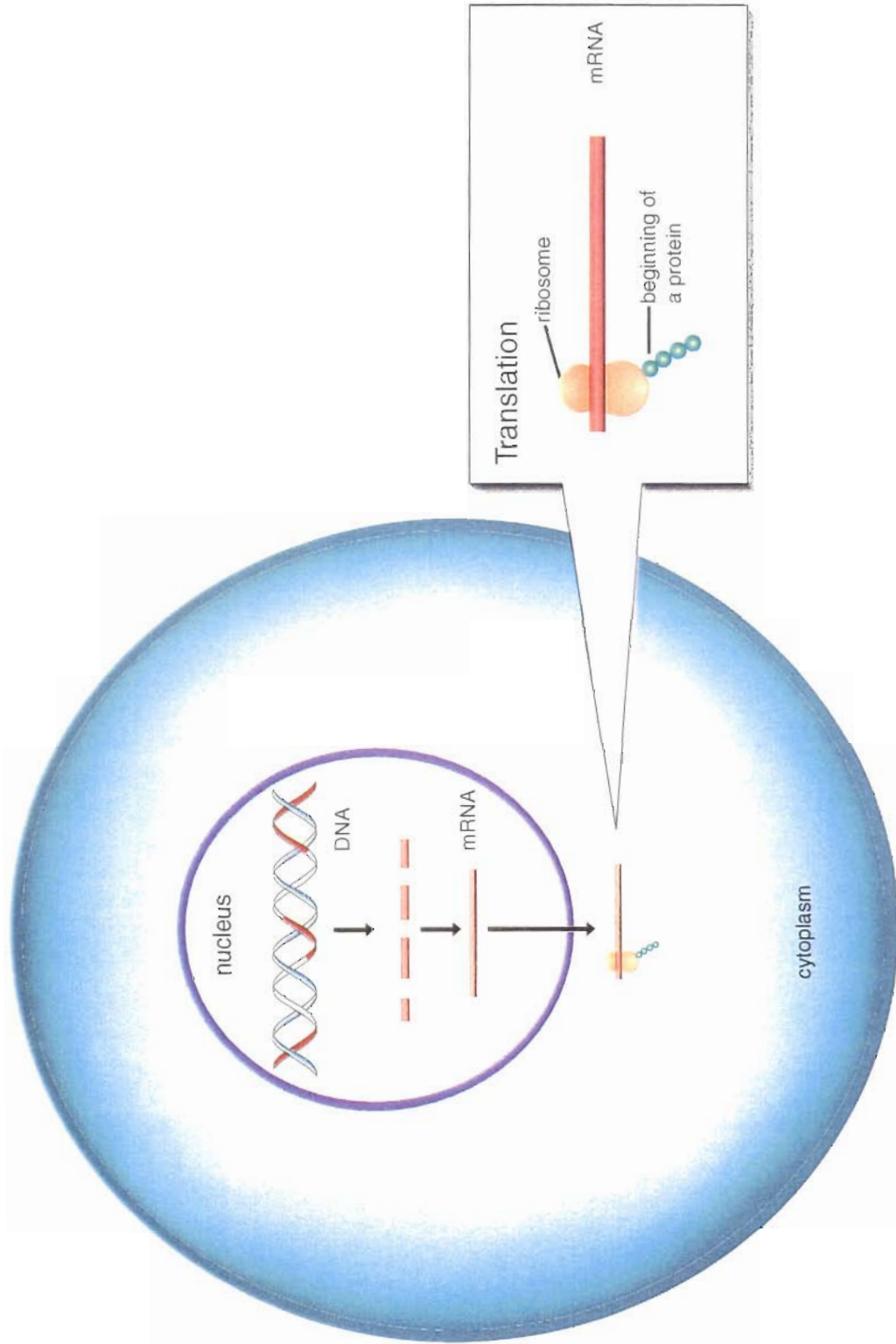
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Transcription



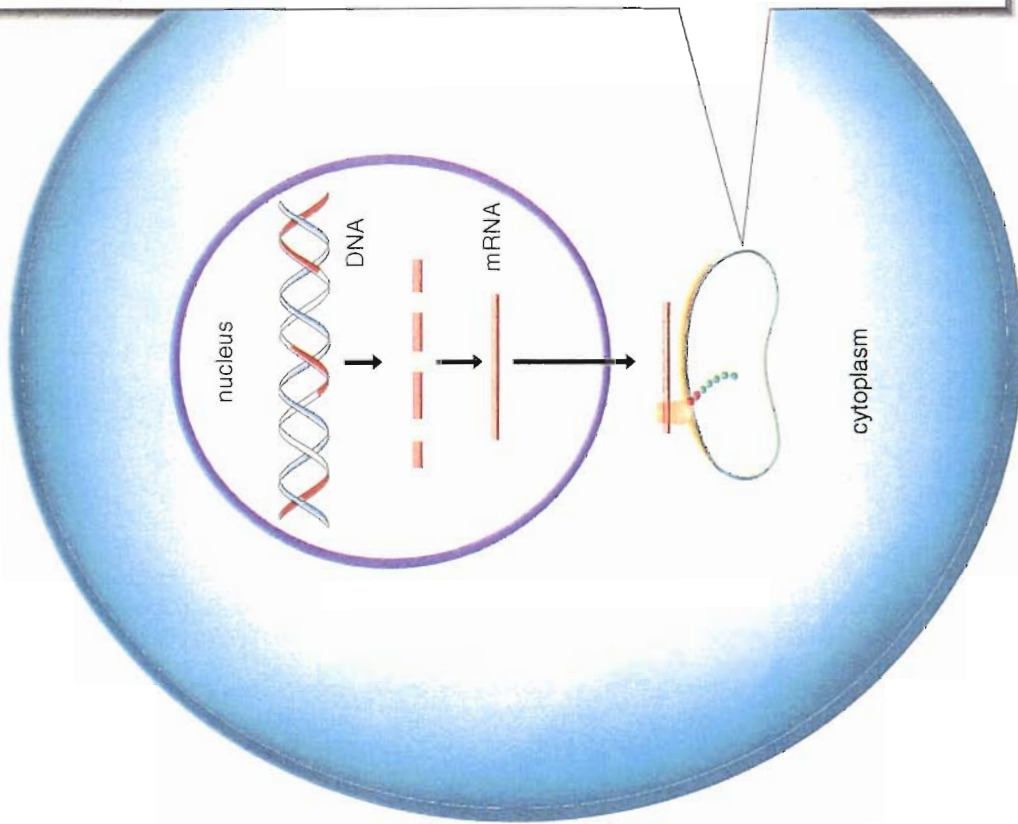
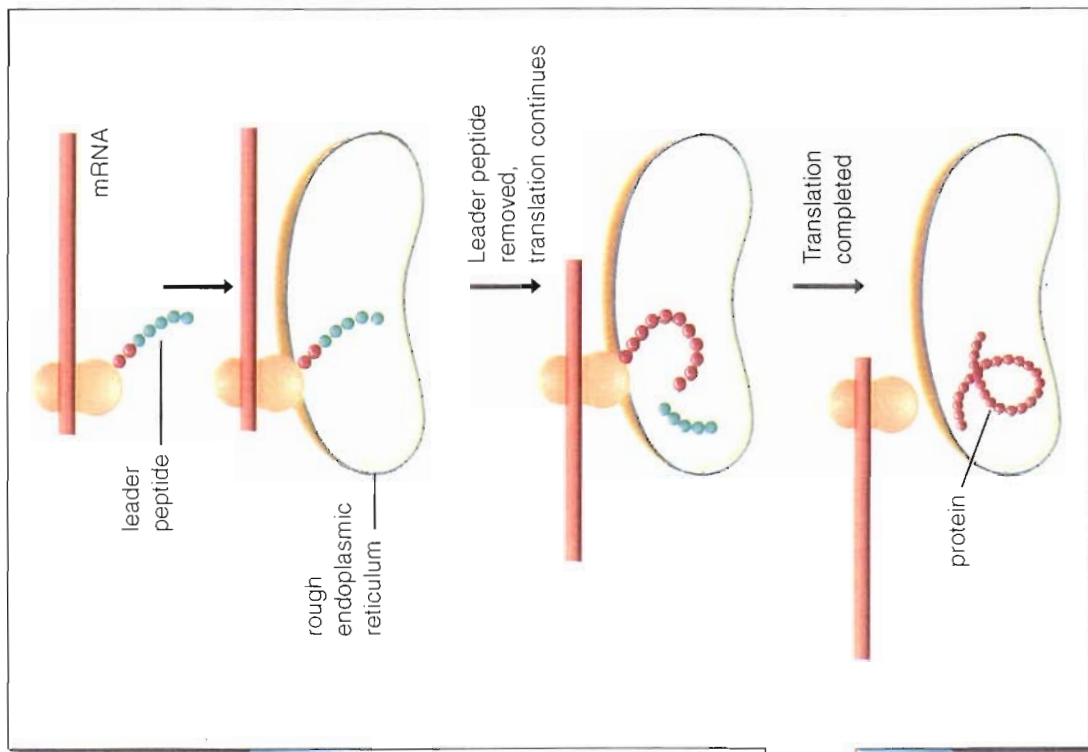
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Translation



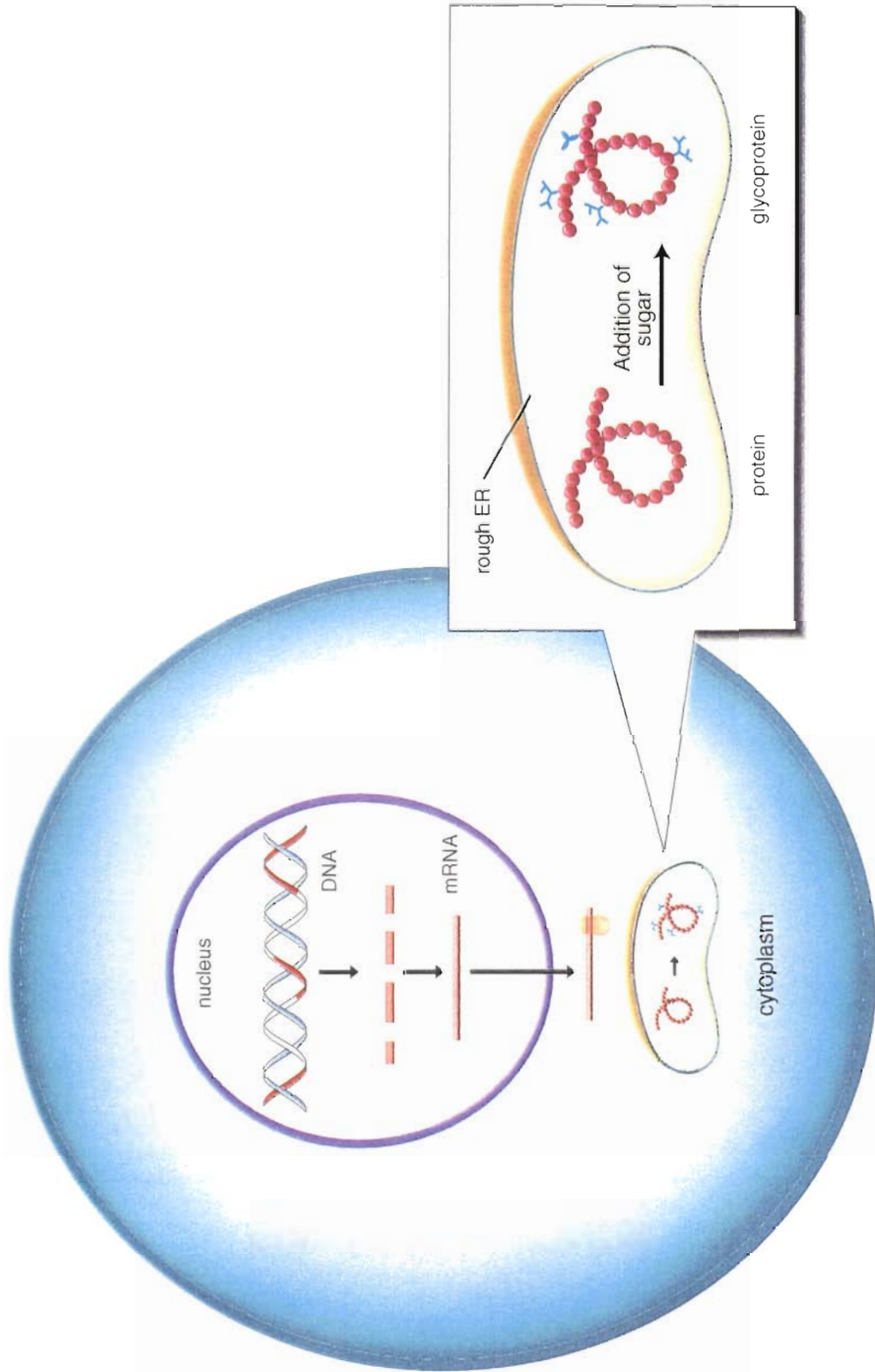
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Post-Translational Removal of Leader Peptide



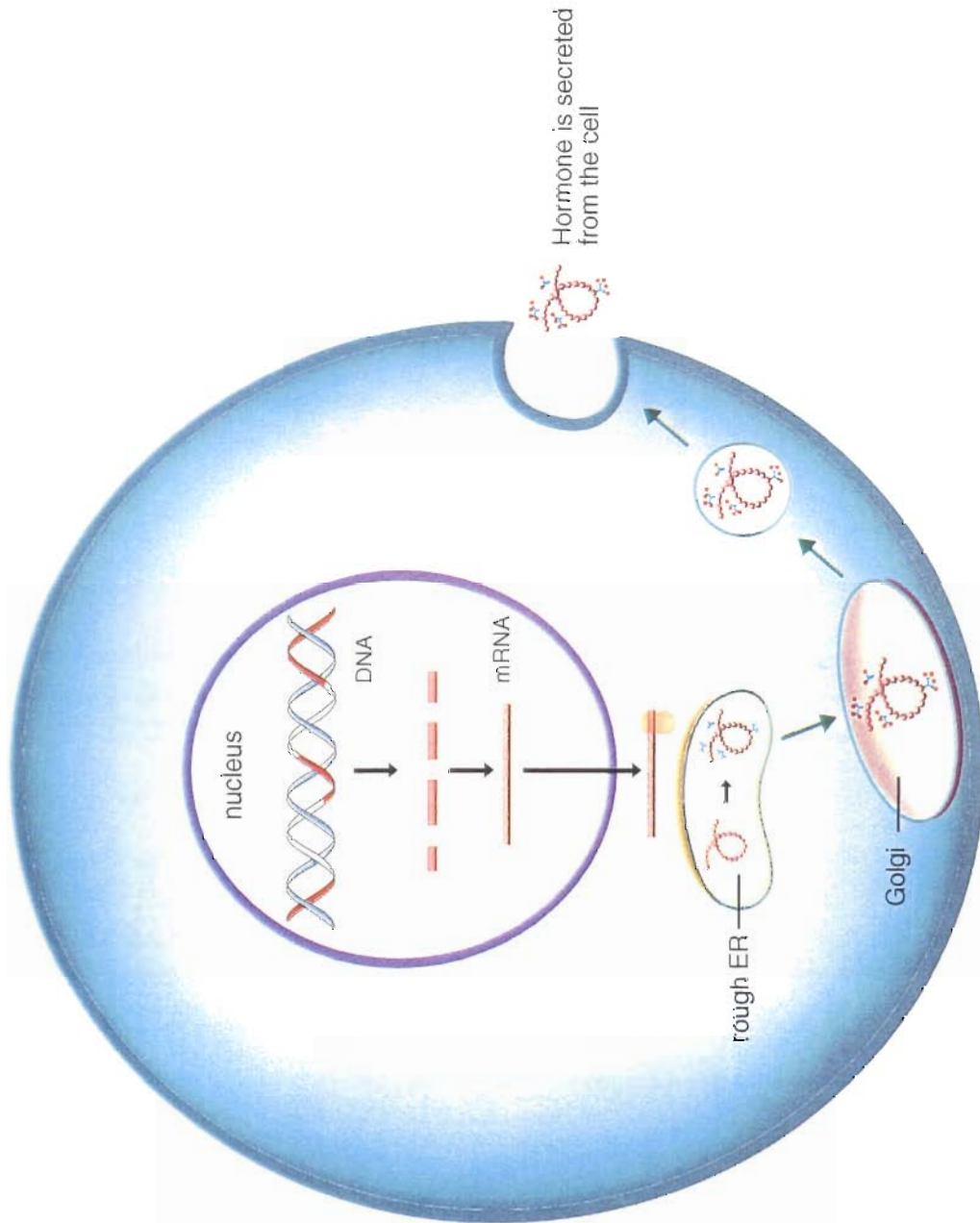
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Post-Translational Glycosylation



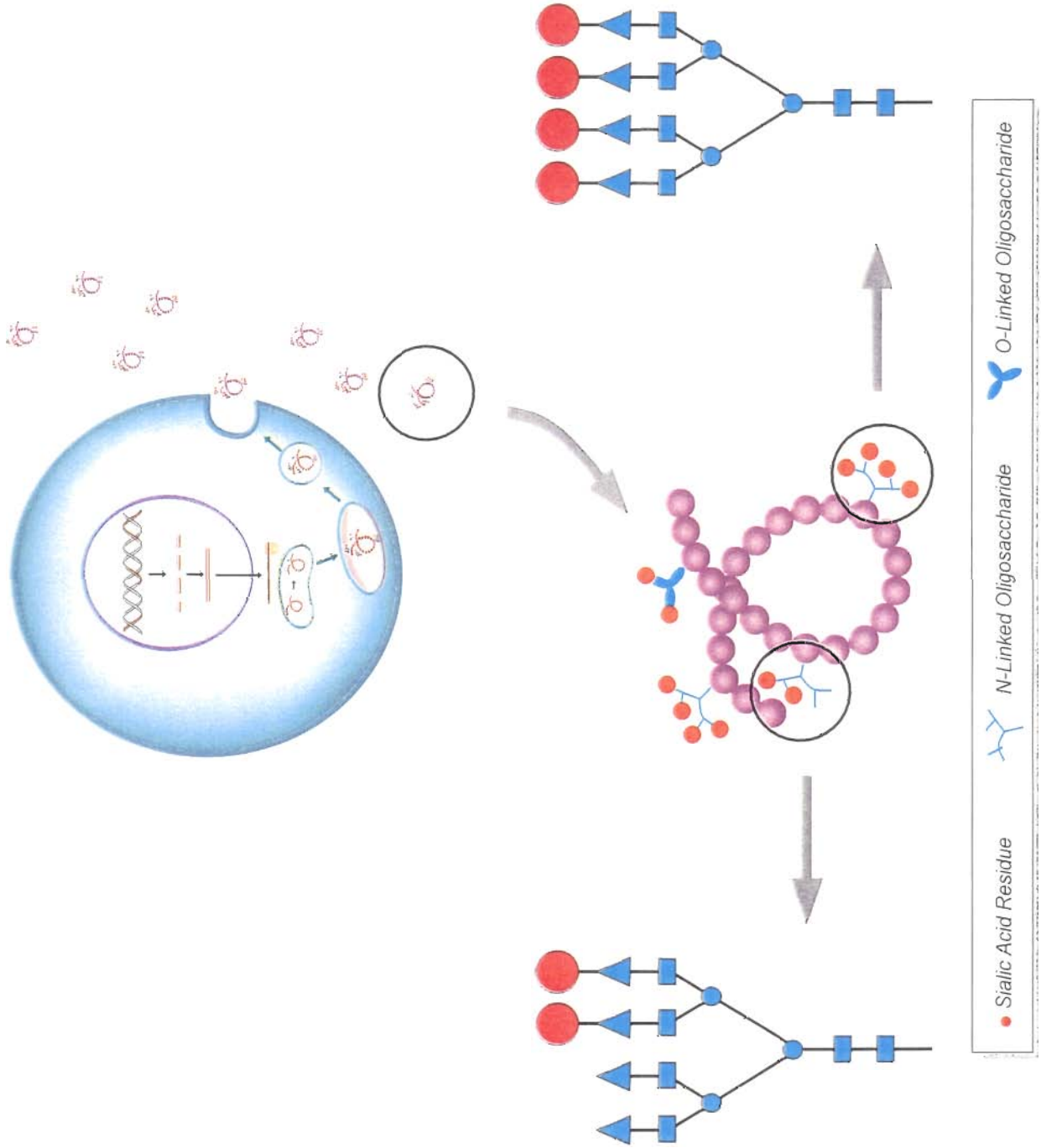
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Completion of Glycosylation and Secretion



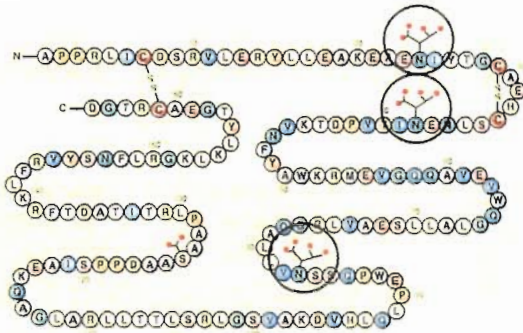
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Oligosaccharides

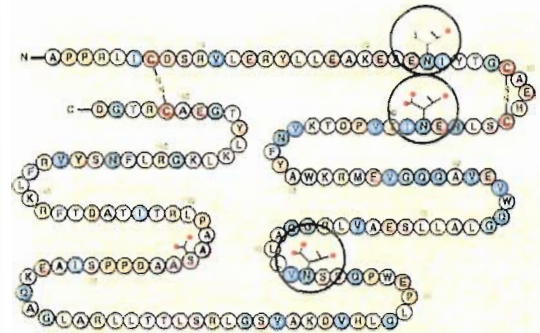


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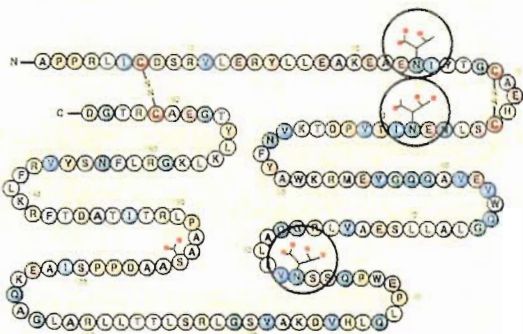
EPO Isoforms



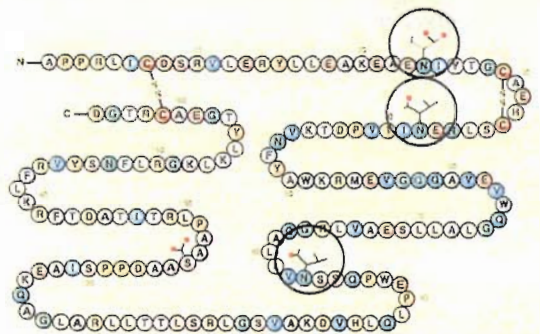
14 sialic acid residues



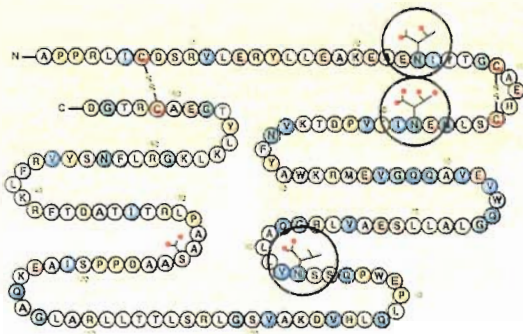
9 sialic acid residues



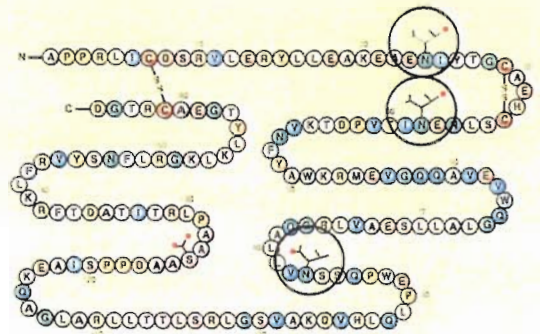
12 sialic acid residues



6 sialic acid residues



10 sialic acid residues



5 sialic acid residues

