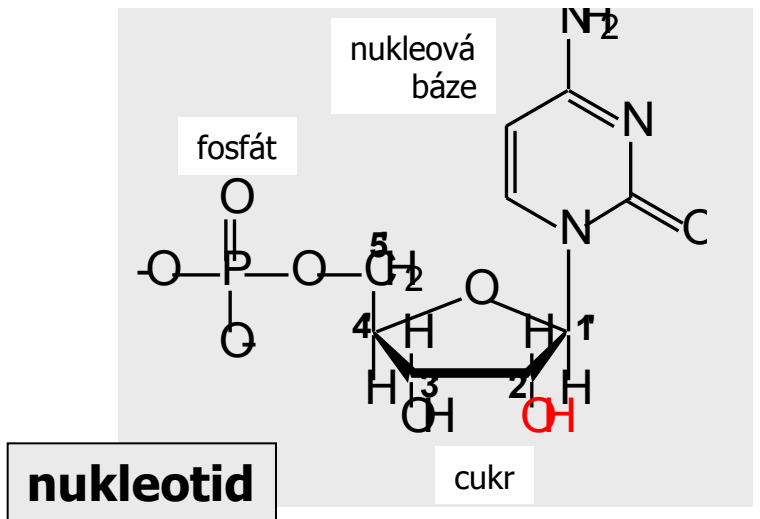
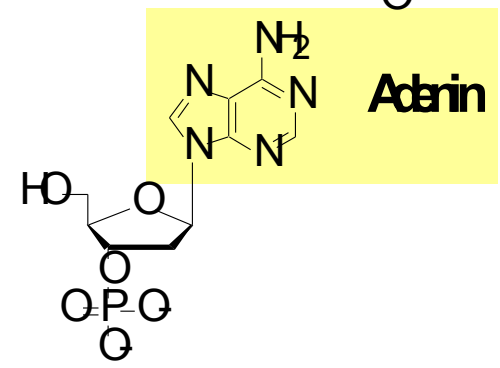
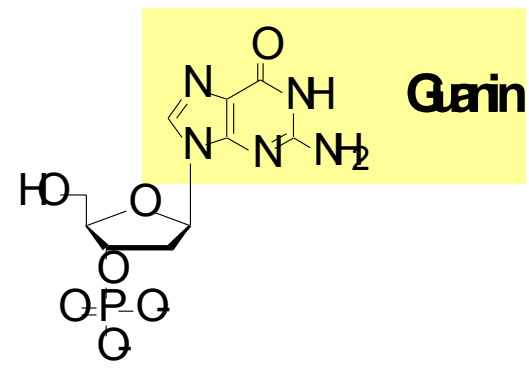
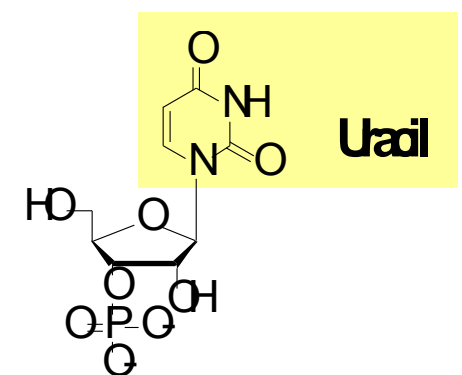
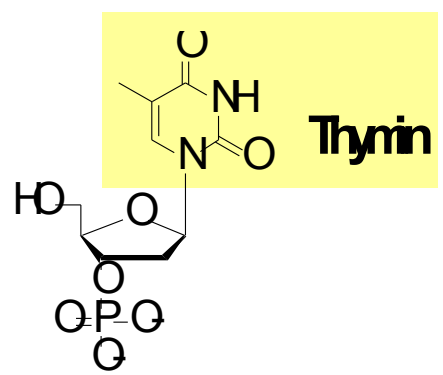
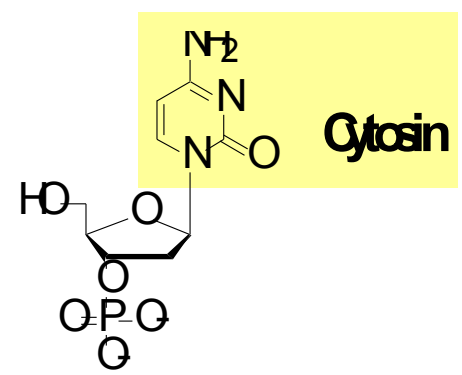
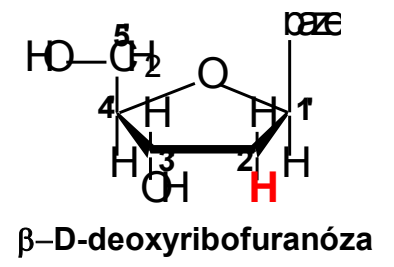
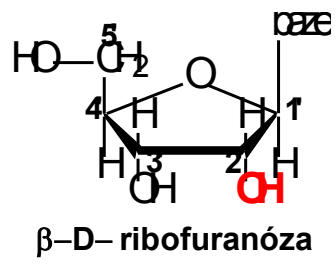
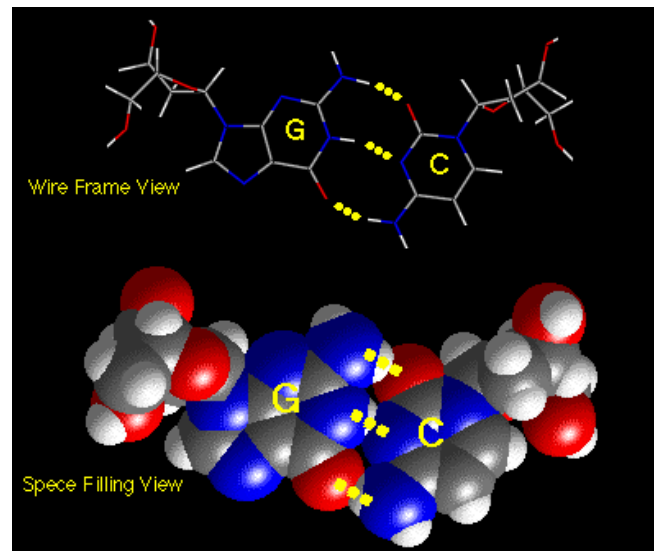
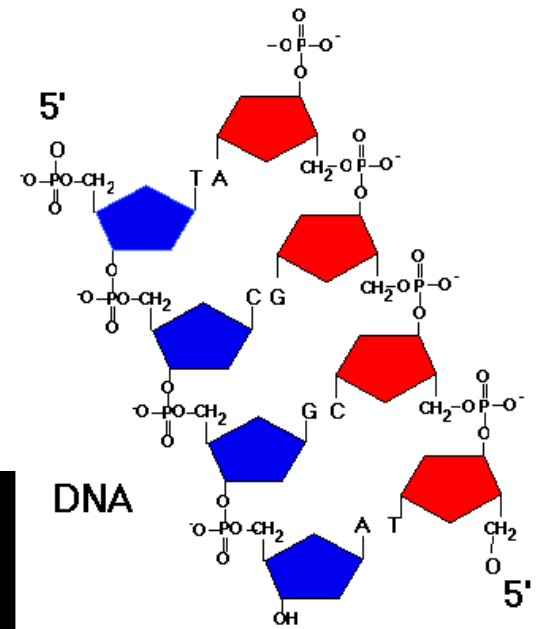
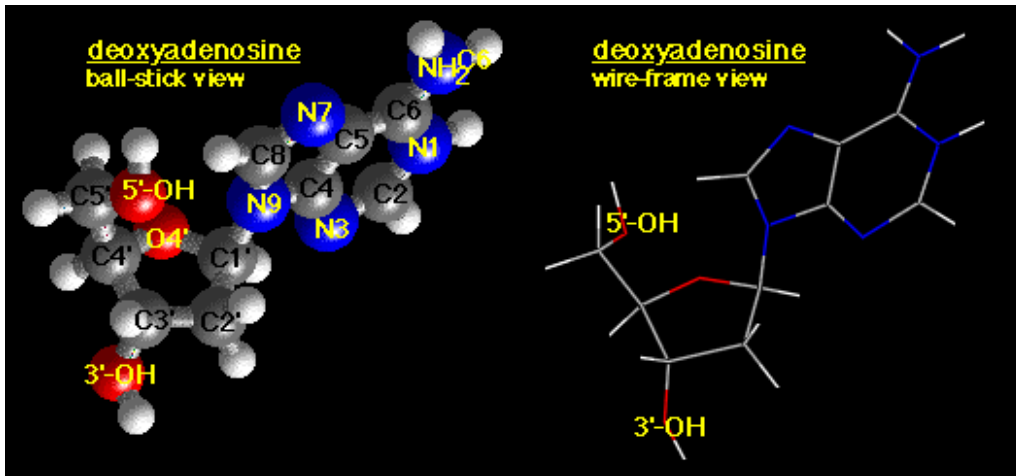


# Nukleové kyseliny

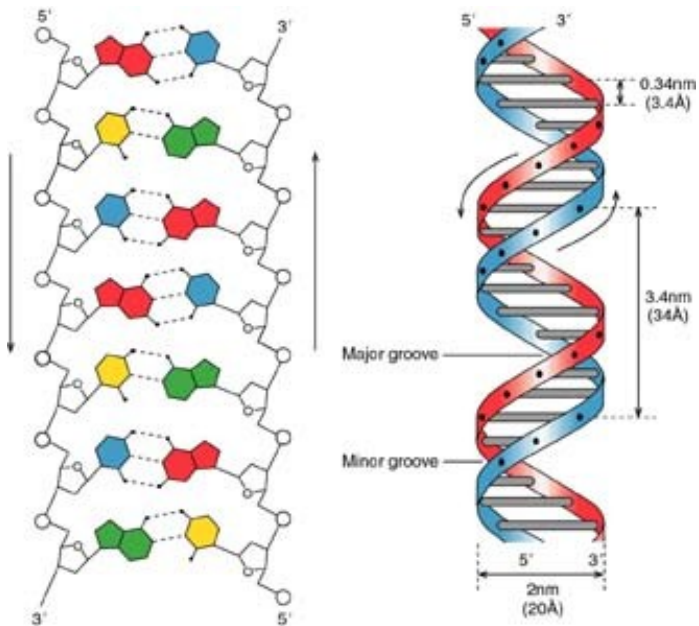


## nukleosidy





# Struktura DNA



Francis Crick



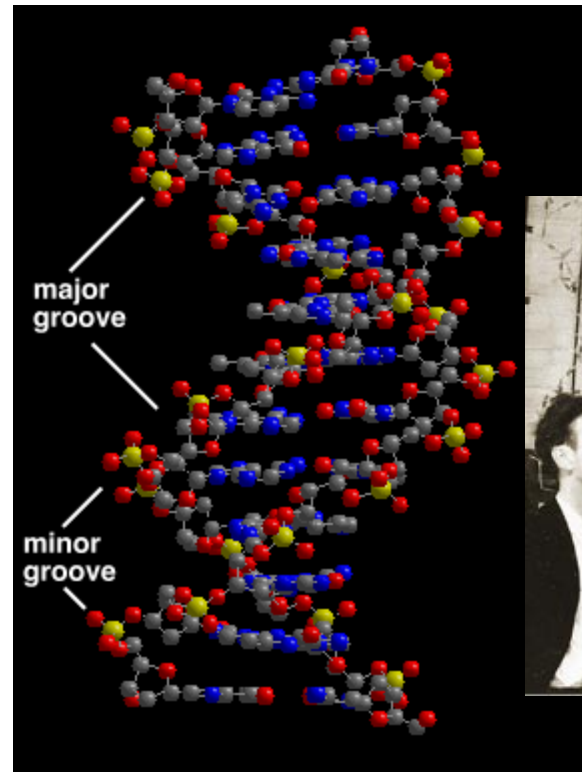
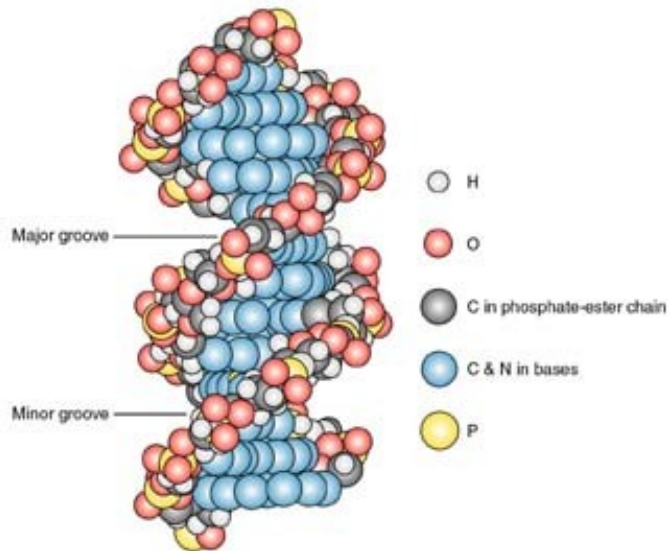
James Watson



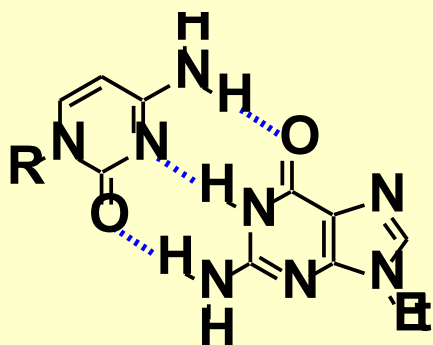
Maurice Wilkins



Rosalind Franklin

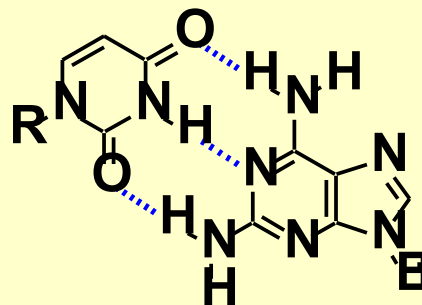
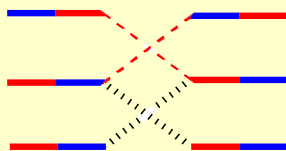


# Vliv dipól-dipólové interakce na stabilitu „duplexů“

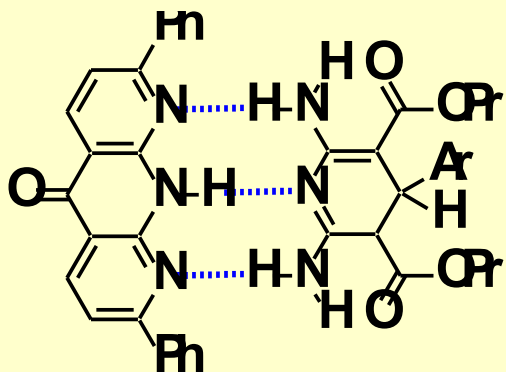
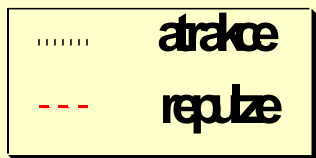
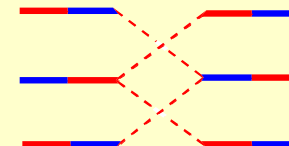


$$K_{\text{ass}} = 10^4 \text{ l/mol}$$

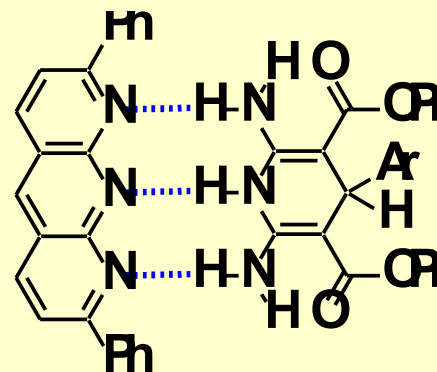
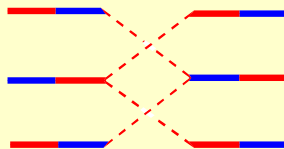
C-G



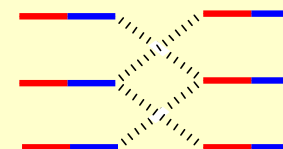
$$K_{\text{ass}} = 170 \text{ l/mol}$$

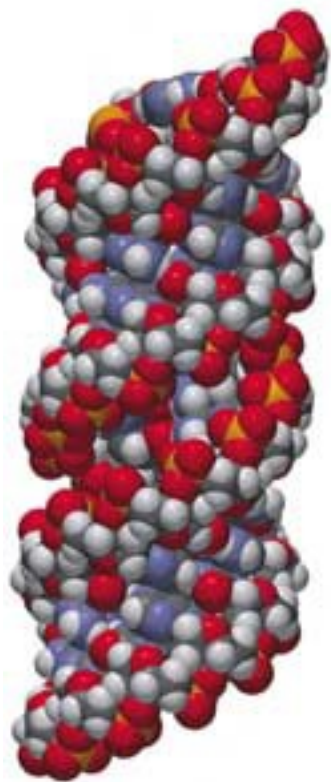


$$K_{\text{ass}} = 78 \text{ l/mol}$$

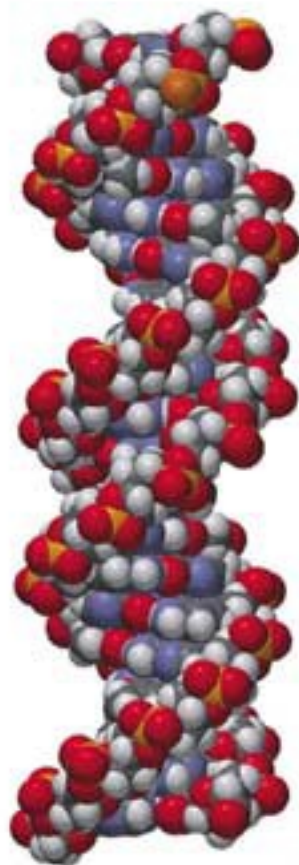


$$K_{\text{ass}} > 10^5 \text{ l/mol}$$

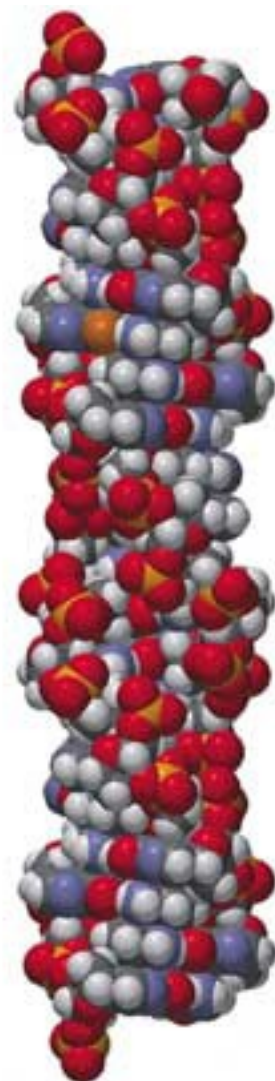




**A-DNA**

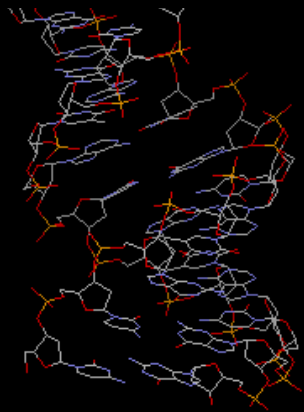
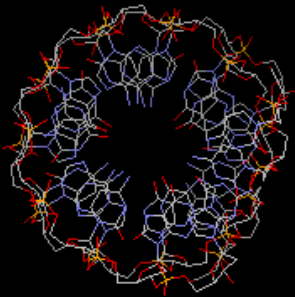


**B-DNA**

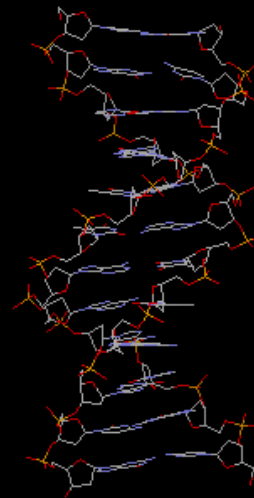
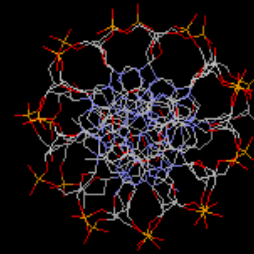


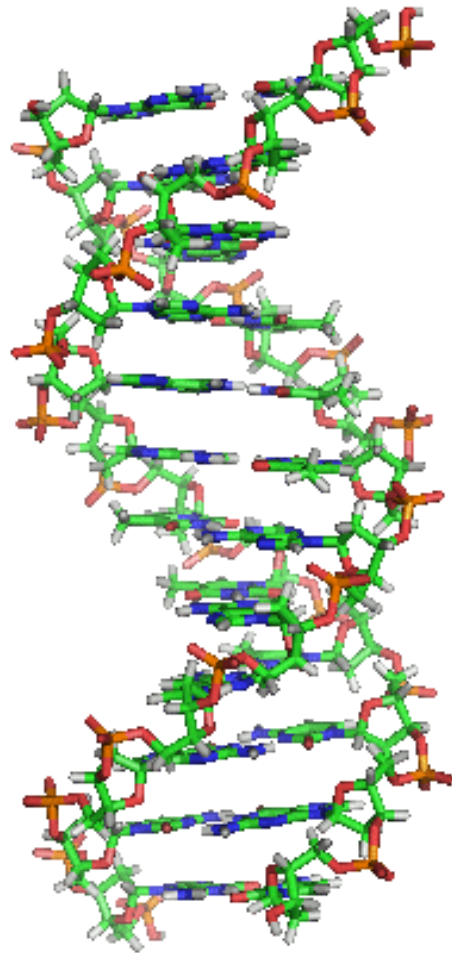
**Z-DNA**

A



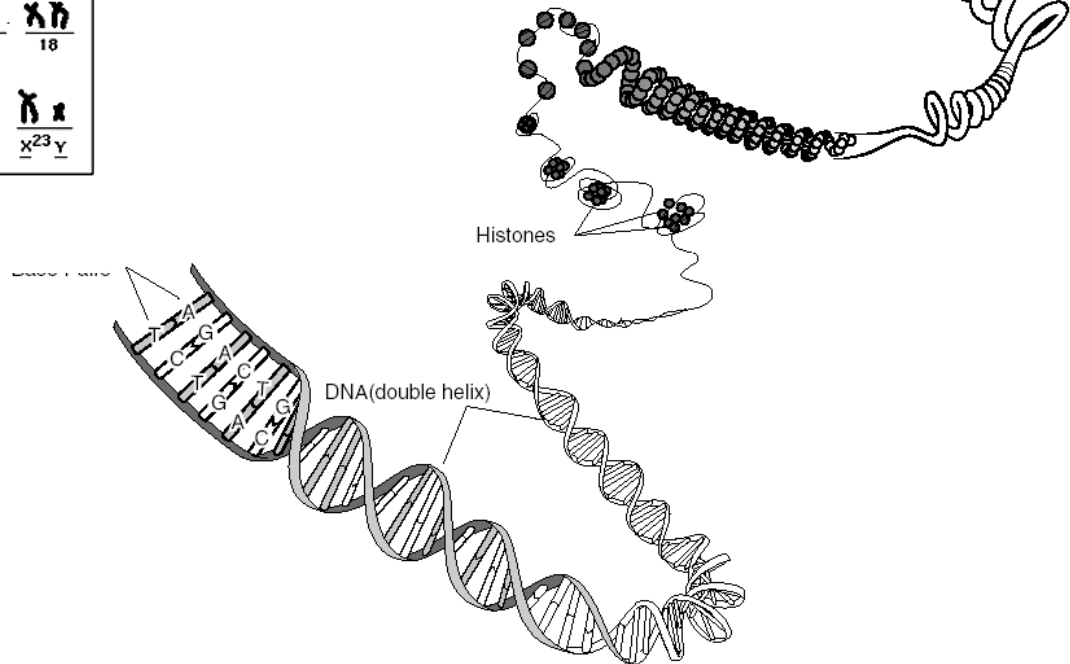
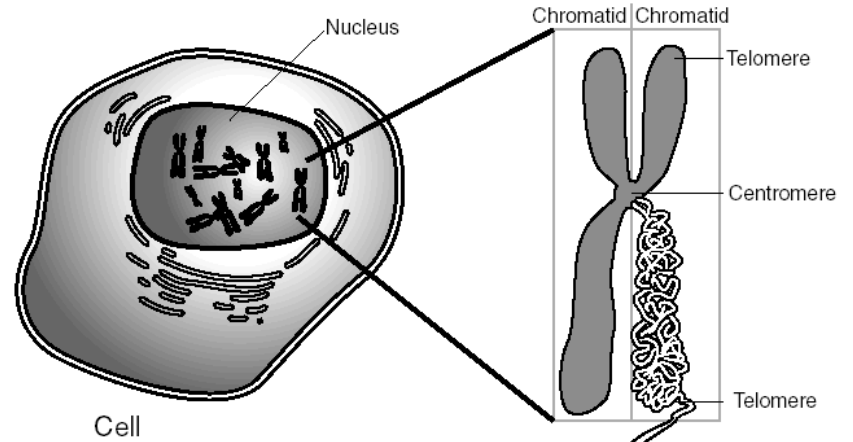
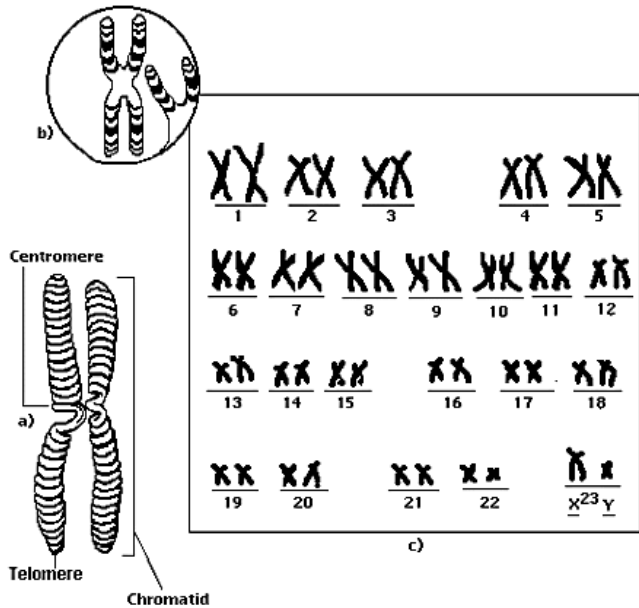
B





[http://en.wikipedia.org/wiki/File:DNA\\_orbit\\_animated.gif](http://en.wikipedia.org/wiki/File:DNA_orbit_animated.gif)

# DNA - Chromozomy

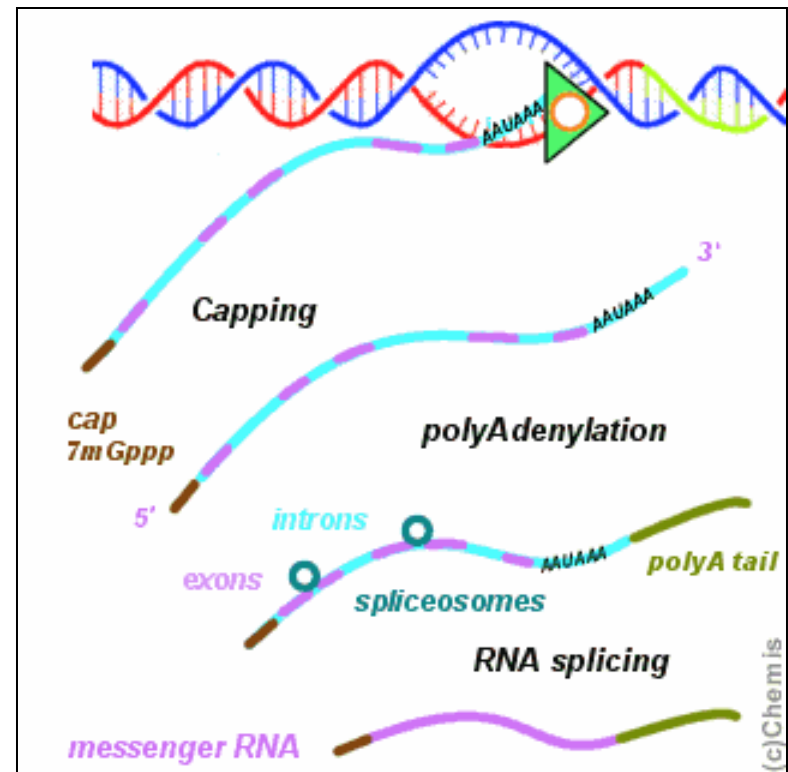
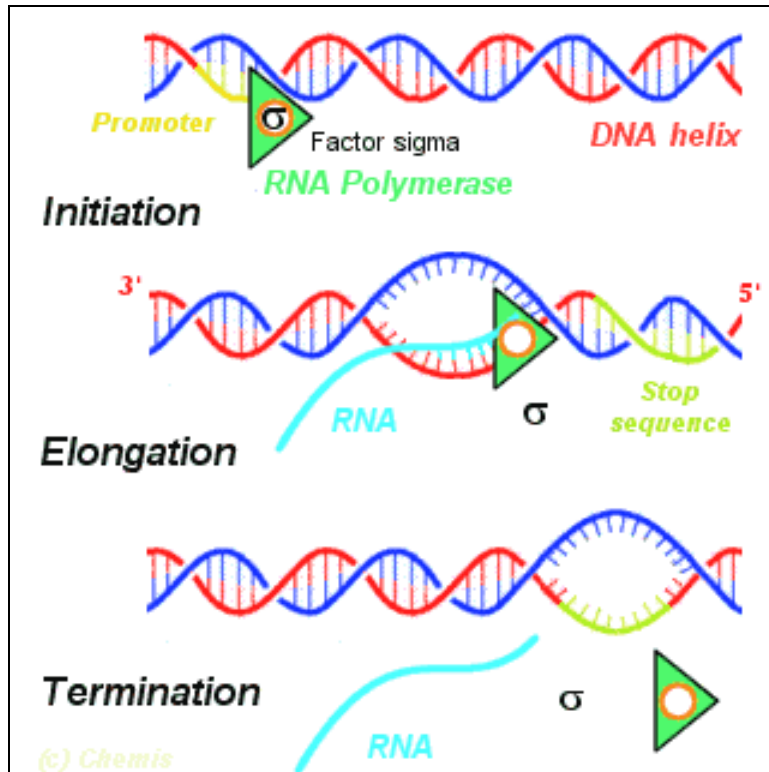
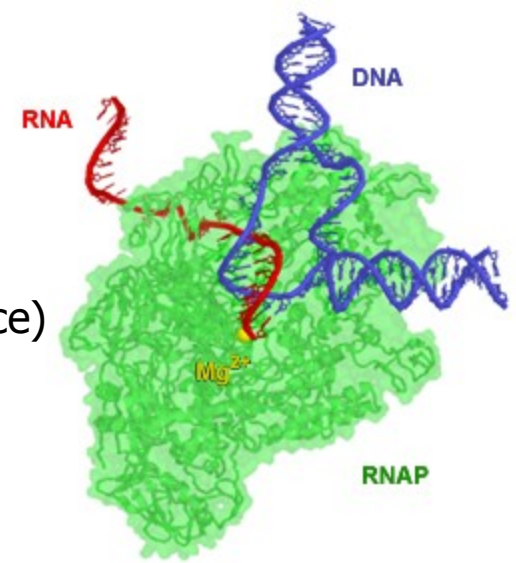




# Ribonukleové kyseliny

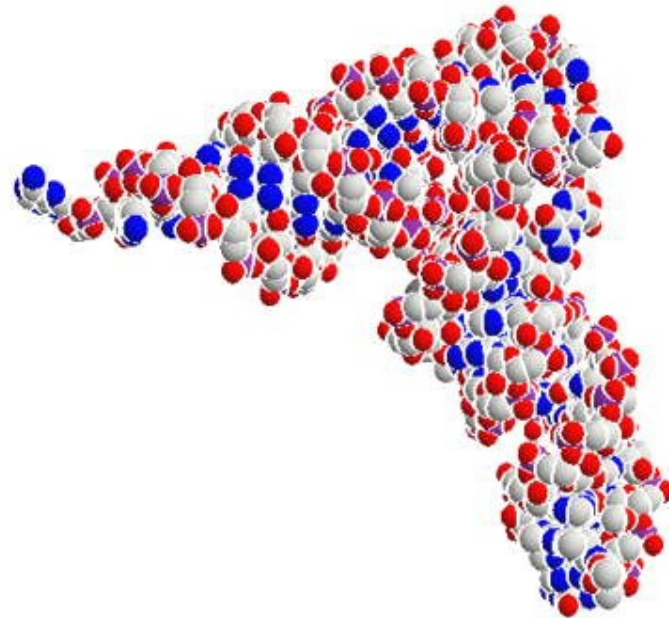
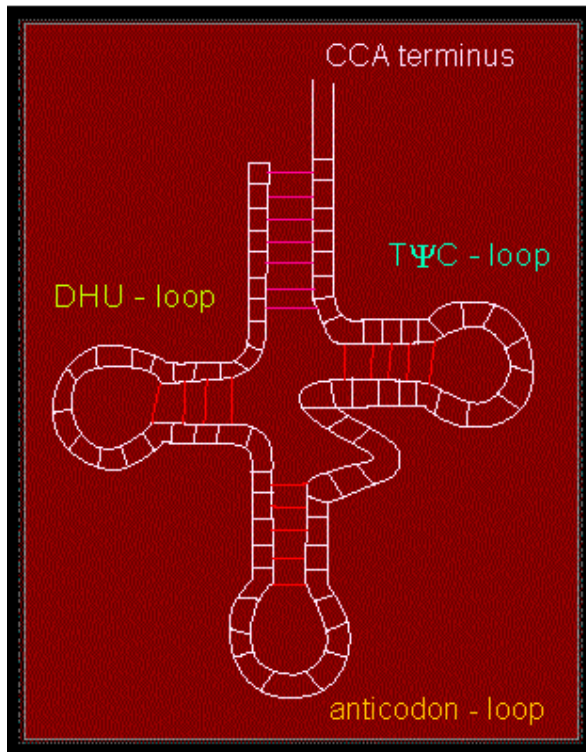
**Mediátorová – mRNA** (messenger)

Heteronukleární – hnRNA (eukariotická transkripce)



# Ribonukleové kyseliny

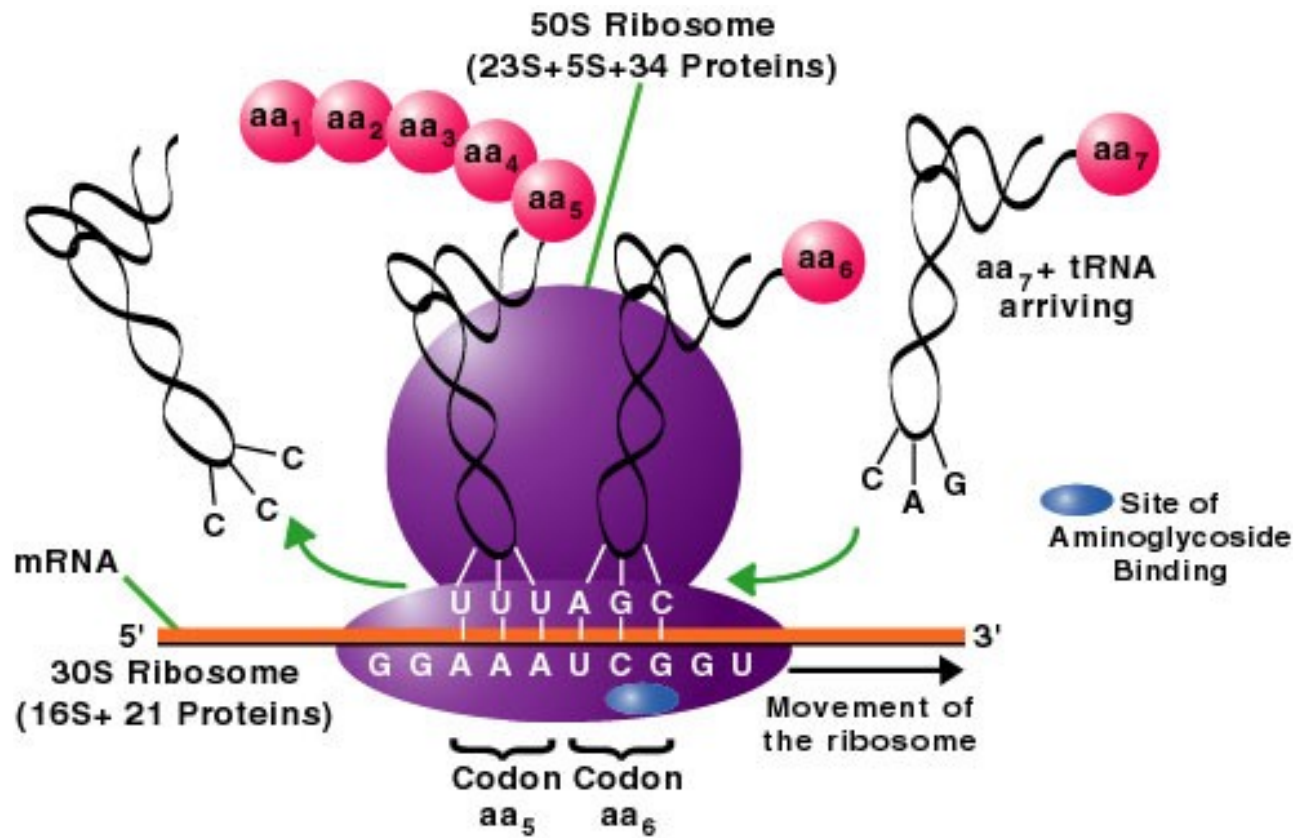
## Transportní – tRNA



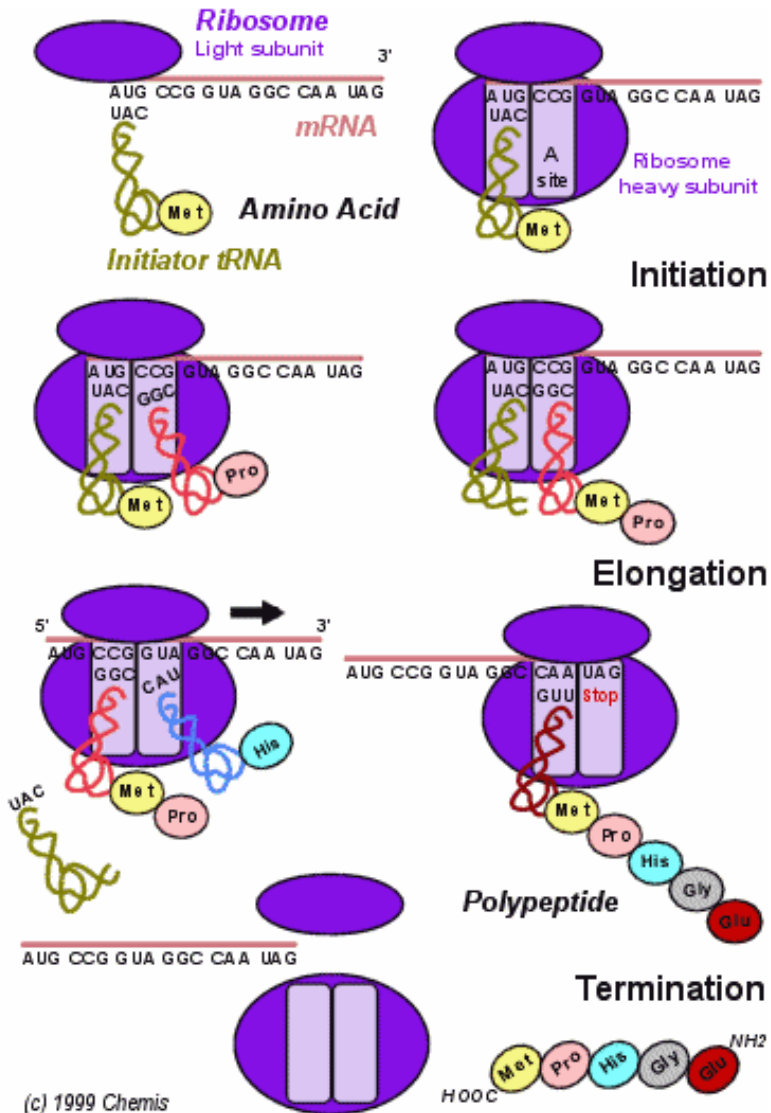
# Ribonukleové kyseliny

## Genetický kód

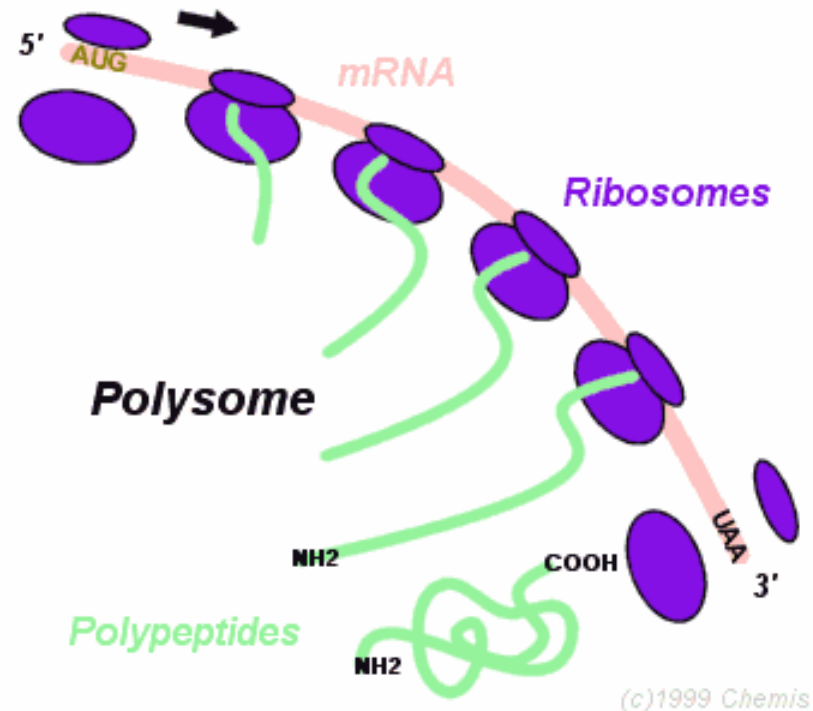
	U	C	A	G				
U	<p>UUU Phenylalanine</p> <p>UUC alanine</p> <p>UUG Leucine</p> <p>UUA Leucine</p>	<p>UCU Serine</p> <p>UCC Serine</p> <p>UCA Serine</p> <p>UCG Serine</p>	<p>UAU Tyrosine</p> <p>UAC Tyrosine</p> <p>UAA Stop</p> <p>UAG Stop</p>	<p>UGU Cysteine</p> <p>UGC Cysteine</p> <p>UGA Stop</p> <p>UGG Tryptophan</p>	U	C	A	G
C	<p>CUU Leucine</p> <p>CUC Leucine</p> <p>CUA Leucine</p> <p>CUG Leucine</p>	<p>CCU Proline</p> <p>CCC Proline</p> <p>CCA Proline</p> <p>CCG Proline</p>	<p>CAU Histidine</p> <p>CAC Histidine</p> <p>CAA Glutamine</p> <p>CAG Glutamine</p>	<p>CGU Arginine</p> <p>CGC Arginine</p> <p>CGA Arginine</p> <p>CGG Arginine</p>	U	C	A	G
A	<p>AUU Isoleucine</p> <p>AUC Isoleucine</p> <p>AUA Isoleucine</p> <p>AUG Methionine</p>	<p>ACU Threonine</p> <p>ACC Threonine</p> <p>ACA Threonine</p> <p>ACG Threonine</p>	<p>AAU Asparagine</p> <p>AAC Asparagine</p> <p>AAA Lysine</p> <p>AAG Lysine</p>	<p>AGU Serine</p> <p>AGC Serine</p> <p>AGA Arginine</p> <p>AGG Arginine</p>	U	C	A	G
G	<p>GUU Valine</p> <p>GUC Valine</p> <p>GUA Valine</p> <p>GUG Valine</p>	<p>GCU Alanine</p> <p>GCC Alanine</p> <p>GCA Alanine</p> <p>GCG Alanine</p>	<p>GAU Aspartic acid</p> <p>GAC Aspartic acid</p> <p>GAA Glutamic acid</p> <p>GAG Glutamic acid</p>	<p>GGU Glycine</p> <p>GGC Glycine</p> <p>GGA Glycine</p> <p>GGG Glycine</p>	U	C	A	G



# Ribonukleové kyseliny



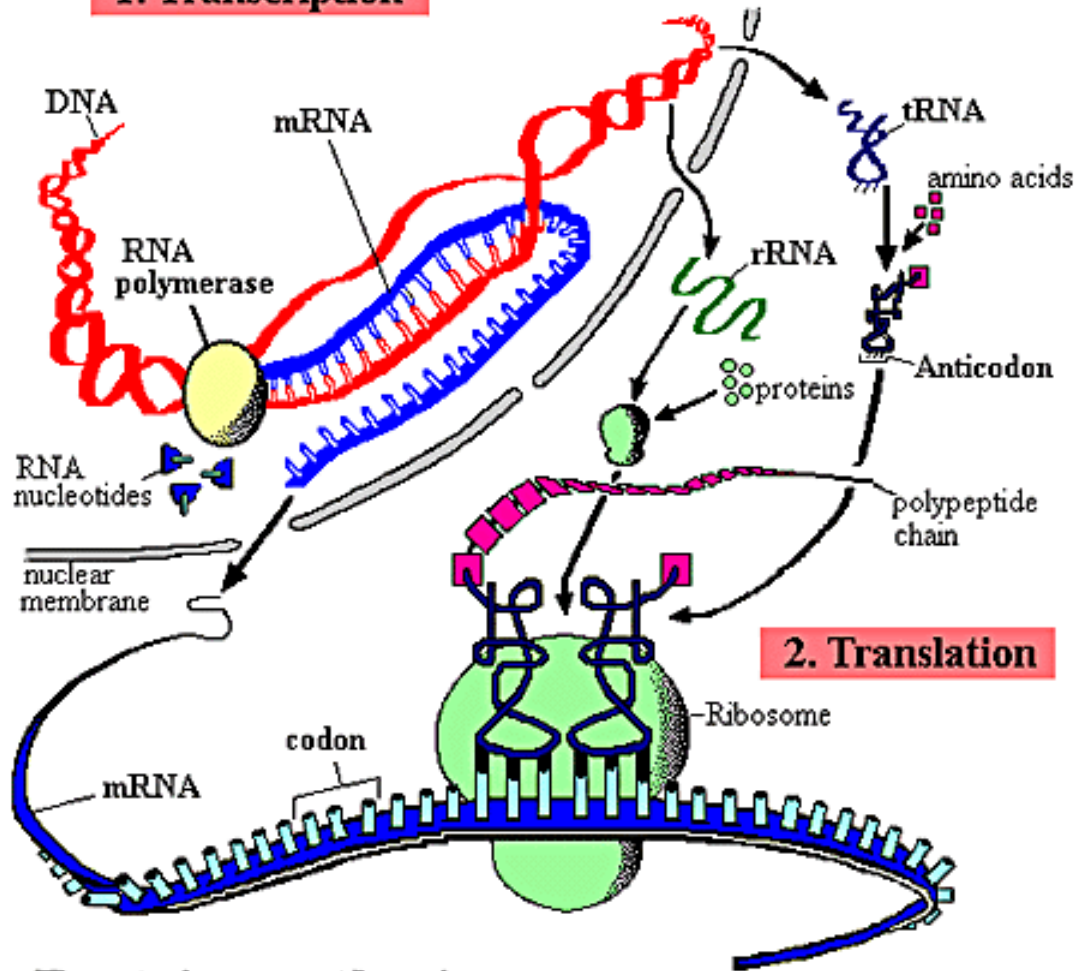
## Proteosyntéza



*Chybné řazení aminokyselin v peptidu !!*

<http://www.proteinsynthesis.org/protein-synthesis-steps/>

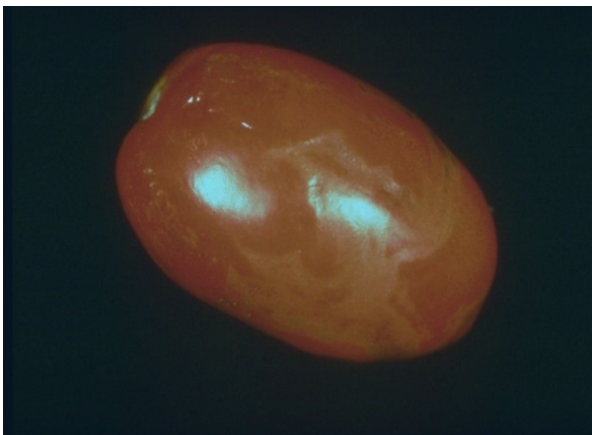
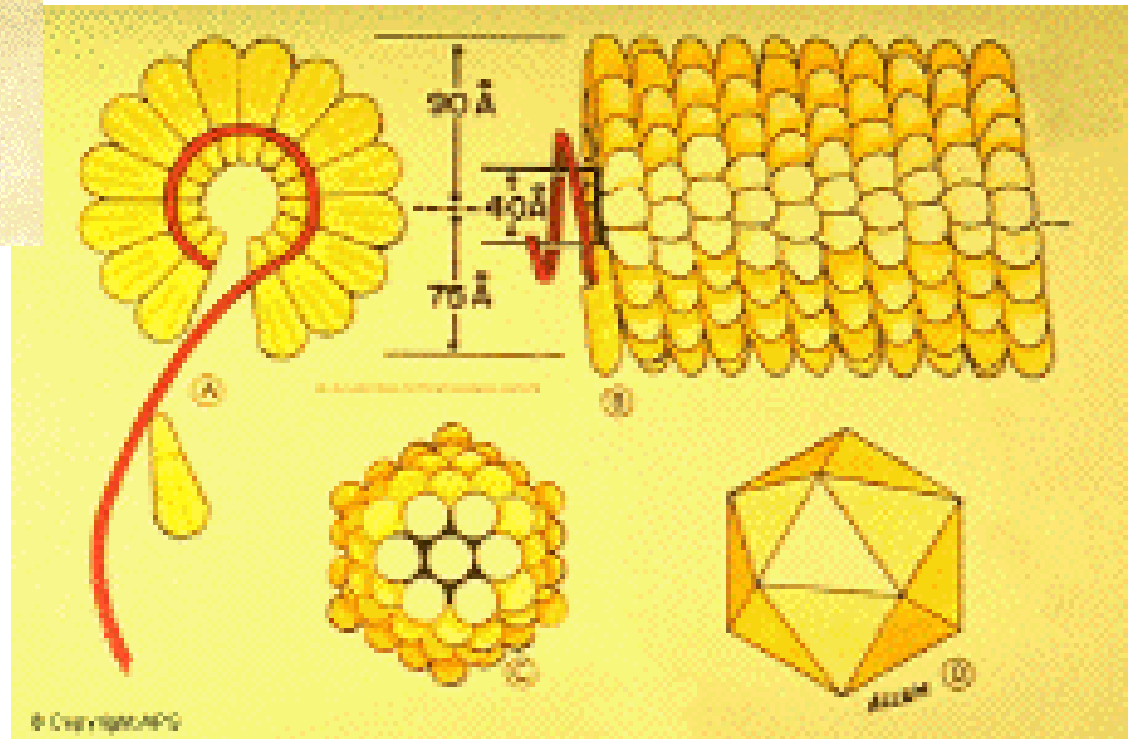
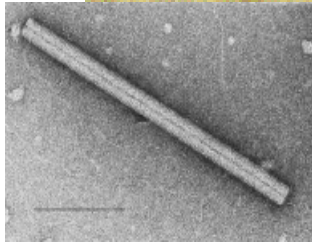
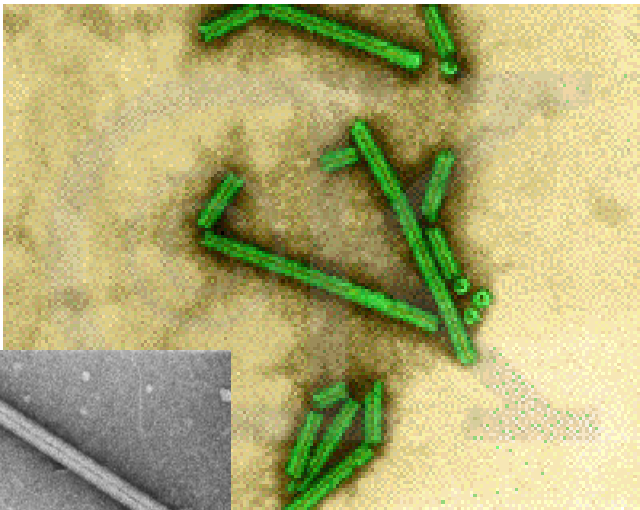
## 1. Transcription



## Protein synthesis

# VIRY

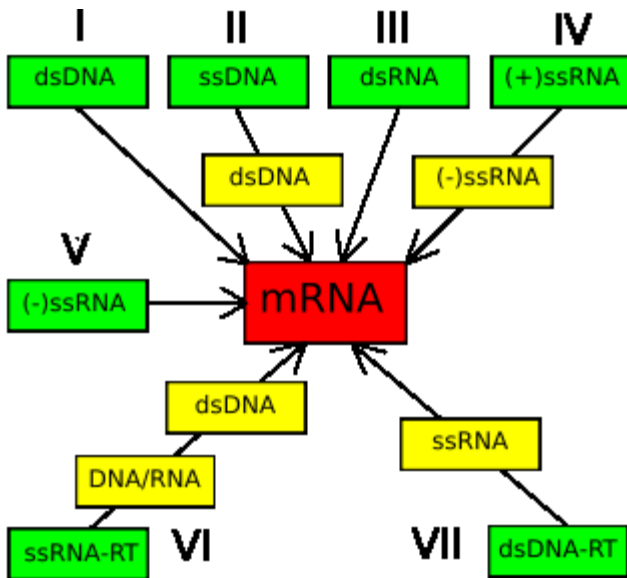
Virus tabákové mozaiky



# VIRY

Nebuněčné organismy. Infekční agens na hranici mezi živými a neživými systémy. Nesou genetickou informaci, ale nejsou schopné reprodukce bez hostitelské buňky. Jsou složeny z nukleové kyseliny doplněné podle typu obalovými bílkovinami, nebo krycími membránami.

## Baltimorova klasifikace virů



## Podle virového genomu

- Třída I** – viry s dvouvláknovou DNA (mRNA je tvořena asymetrickou transkripcí)
- Třída II** – viry s jednovláknovou DNA a stejnou polaritou jako výsledná mRNA
- Třída III** – viry s dvouvláknovou RNA (mRNA je tvořena asymetrickou transkripcí)
- Třída IV** – viry s jednovláknovou RNA (tvořená mRNA je identická s genomem)
- Třída V** – viry s jednovláknovou RNA (tvořená mRNA je komplementární s genomem)
- Třída VI** – retroviry, viry s jednovláknovou RNA, ale v jejich rozmnožovacím cyklu je i stadium DNA
- Třída VII** – dvouvláknová DNA (replikace přes ssRNA)

## Podle hostitele

- bakteriofágy** - viry bakterií
- cyanofágy** - napadají sinice
- fytoviry** - viry rostlin
- mykoviry** - napadají houby
- zooviry** - viry živočichů, dále se dělí na viry bezobratlých a viry obratlovců



# VIRY

## Nejvýznamnější virová onemocnění člověka:

**chřipka** (virus chřipky)

**nachlazení, rýma, katar či zánět horních cest dýchacích** (rhinoviry, koronaviry )

**opary** (herpes virus)

**zarděnky** (rubella virus)

**spalničky**

**obrna** (poliovirus)

**příušnice**

**virový zánět jater**, hepatitida, lidově „žloutenka“ (hepatitis virus A, B, C, D, E, F, G a H - jde o různé viry napadající játra, nejběžnější jsou varianty A, B a C, z nichž typ B může způsobovat rakovinu jater)

**papillomavirové infekce** (bradavice; některé genotypy jsou také příčinou rakoviny děložního čípku)

**vzteklina** (virus vztekliny; pokud není podáno včas antisérum, je 100% smrtelný)

**AIDS** (HIV, syndrom získané imunodeficiency)

**Pravé neštovice** - variola virus

**Plané neštovice** - Herpesvirus HHP-3 způsobuje pásový opar

**mononukleóza**, infekční mononukleosa, EB virosa (virus Epstein-Barr, cytomegalovirus)

**hemoragické horečky** (Ebola, Marburg a další)

**hantavirový plicní syndrom** (hantavirus „Sin nombre“)

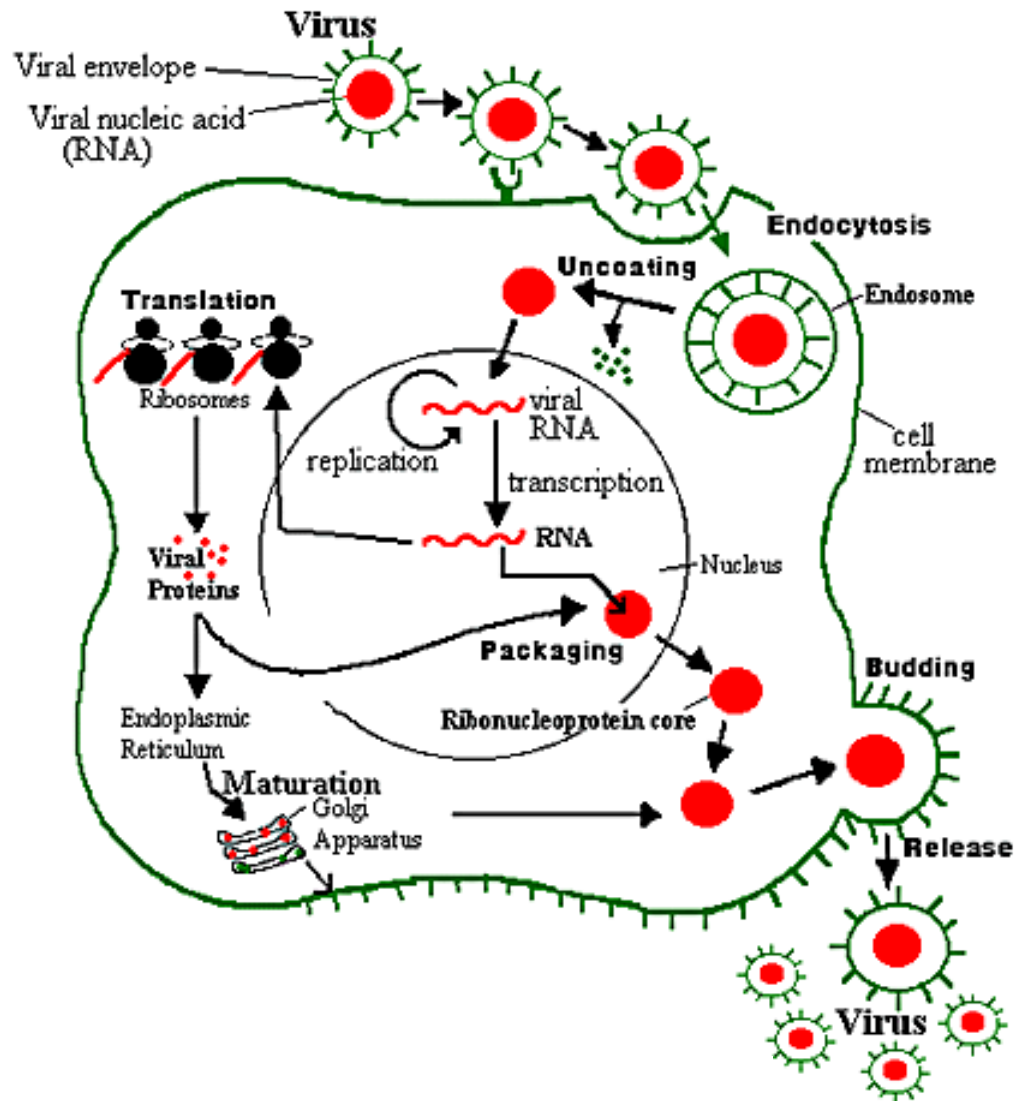
**klíšťová encefalitida**

**SARS**

**gastroenteritida**

# Replikace chřipkového viru

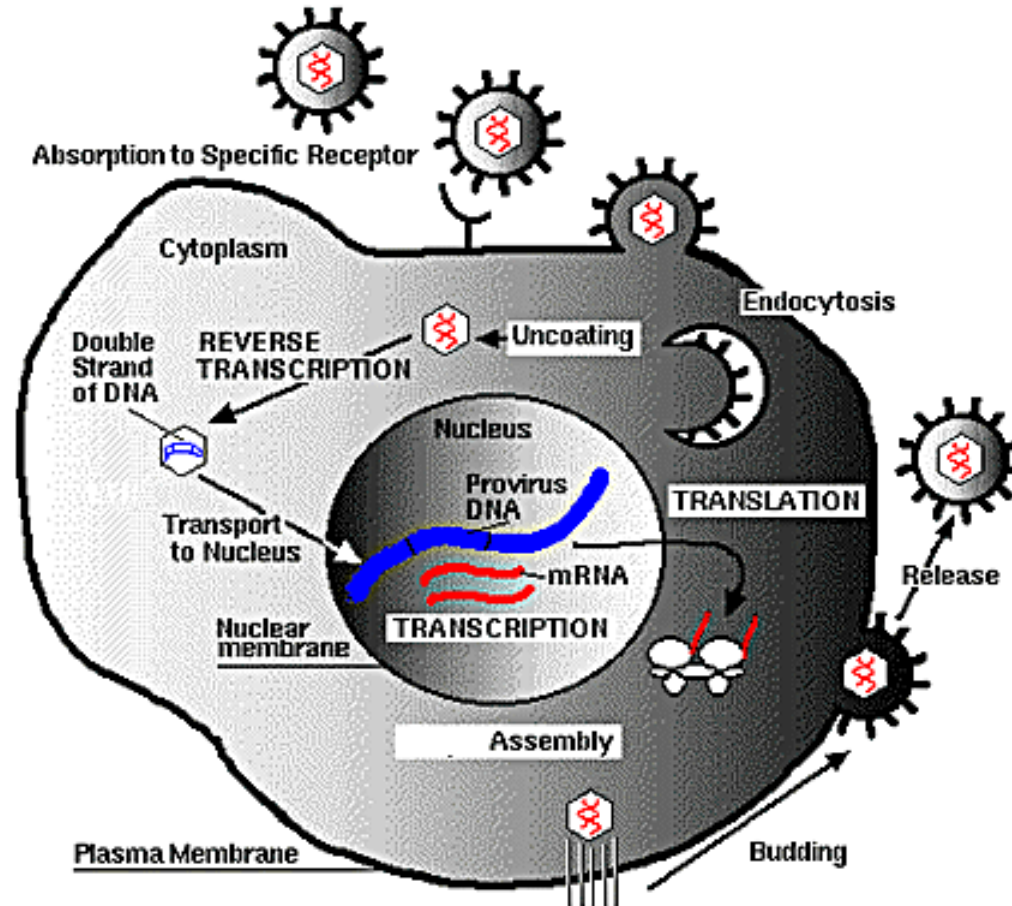
typ V



# Replikace retroviru

typ VI

**Virová RNA  
+ transkriptáza**



**Retrovirus replication**

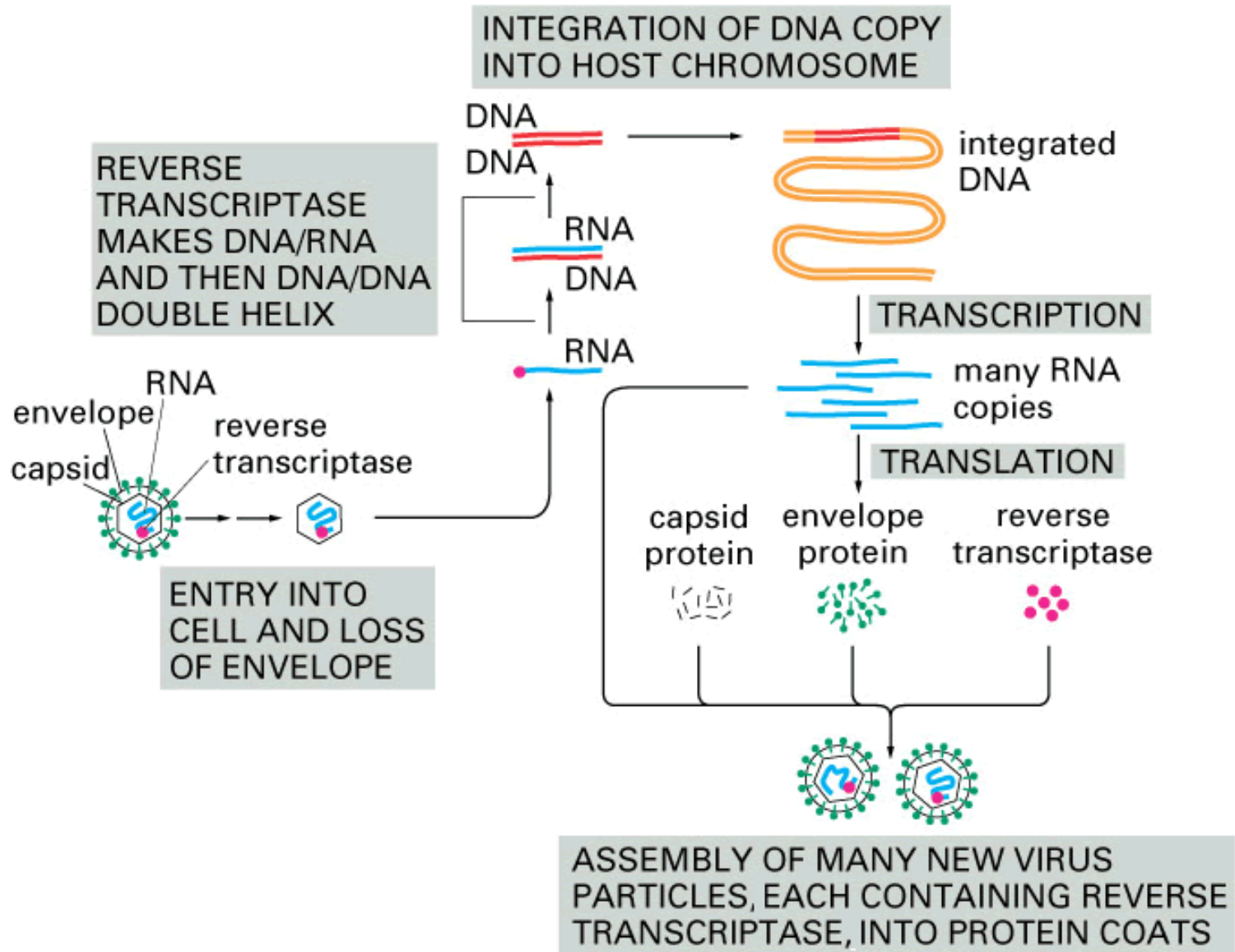


Figure 6-39 Essential Cell Biology, 2/e. (© 2004 Garland Science)

