



Univerzitet u Beogradu
Fakultet veterinarske medicine

Katedra za biologiju

Predmet:
ZOOLOGIJA
2024/2025

Klasifikacije živog sveta. Acelularni i
celularni živi sistemi.
Pet carstava živih organizama

Klasifikacije živog sveta



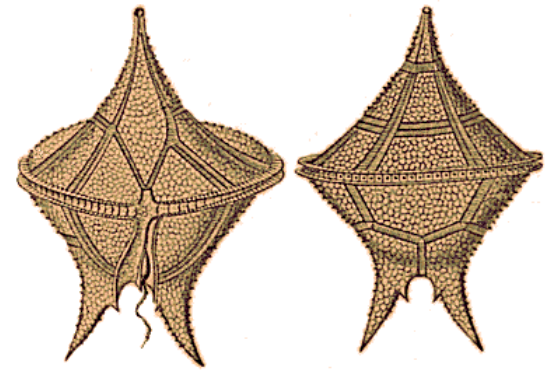
ACELULARNI I CELULARNI ŽIVI SISTEMI

Sve žive sisteme obzirom na složenost i nivo telesne organizacije možemo podeliti u dve grupe:

ACELULARNE i CELULARNE.



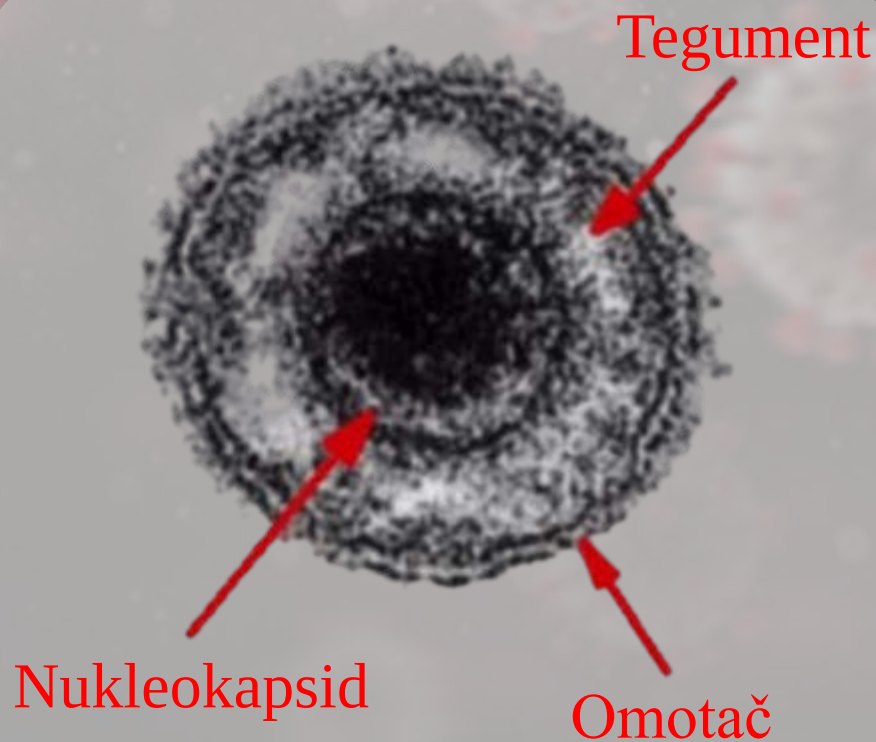
ACELULARNI živi sistemi su oni koji nisu dostigli ćelijski nivo građe.



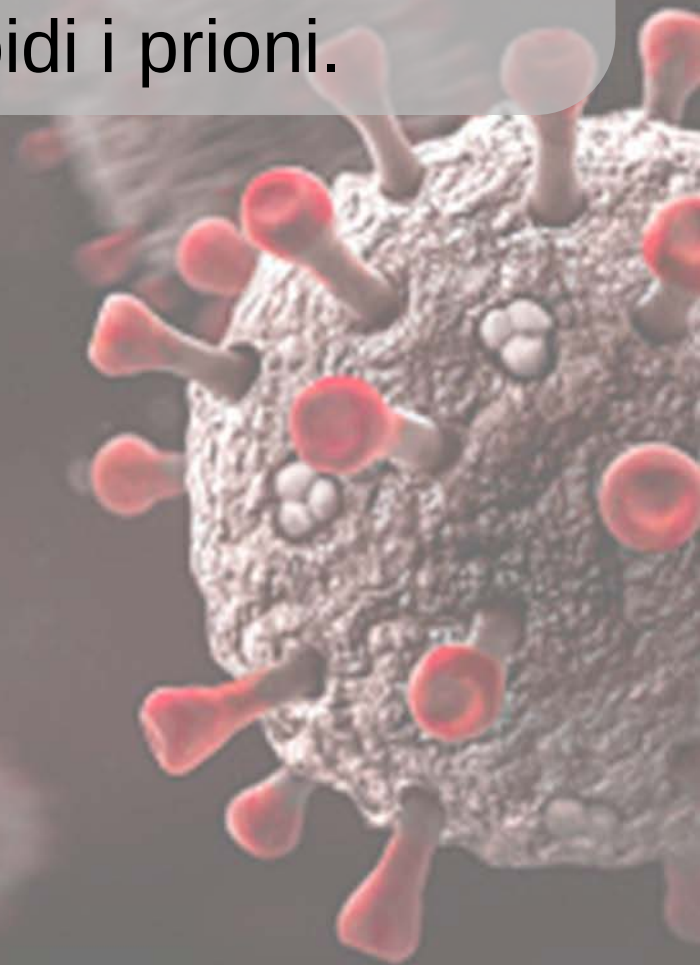
CELULARNI OBLICI

su svi živi sistemi izgrađeni od **ćelija** kao osnovne morfoanatomske, funkcionalne i reproduktivne jedinice.

U **ACELULARNE** forme
svrstavamo sve **viruse**
i **subvirusne čestice**
(virus-sateliti, viroidi,
virusoidi i prioni.

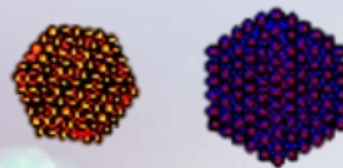


Equine herpesvirus tip 1 (EHV-1) - virion

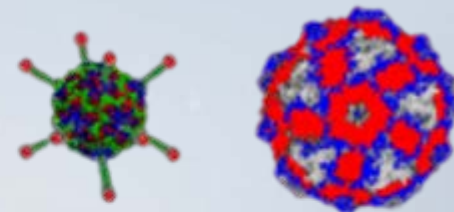


VIRUSI su
biološki aktivni,
ultramikroskopski organizmi
nećelijske građe,
sposobni da se razmnožavaju
samo u živim ćelijama

DNK virusi



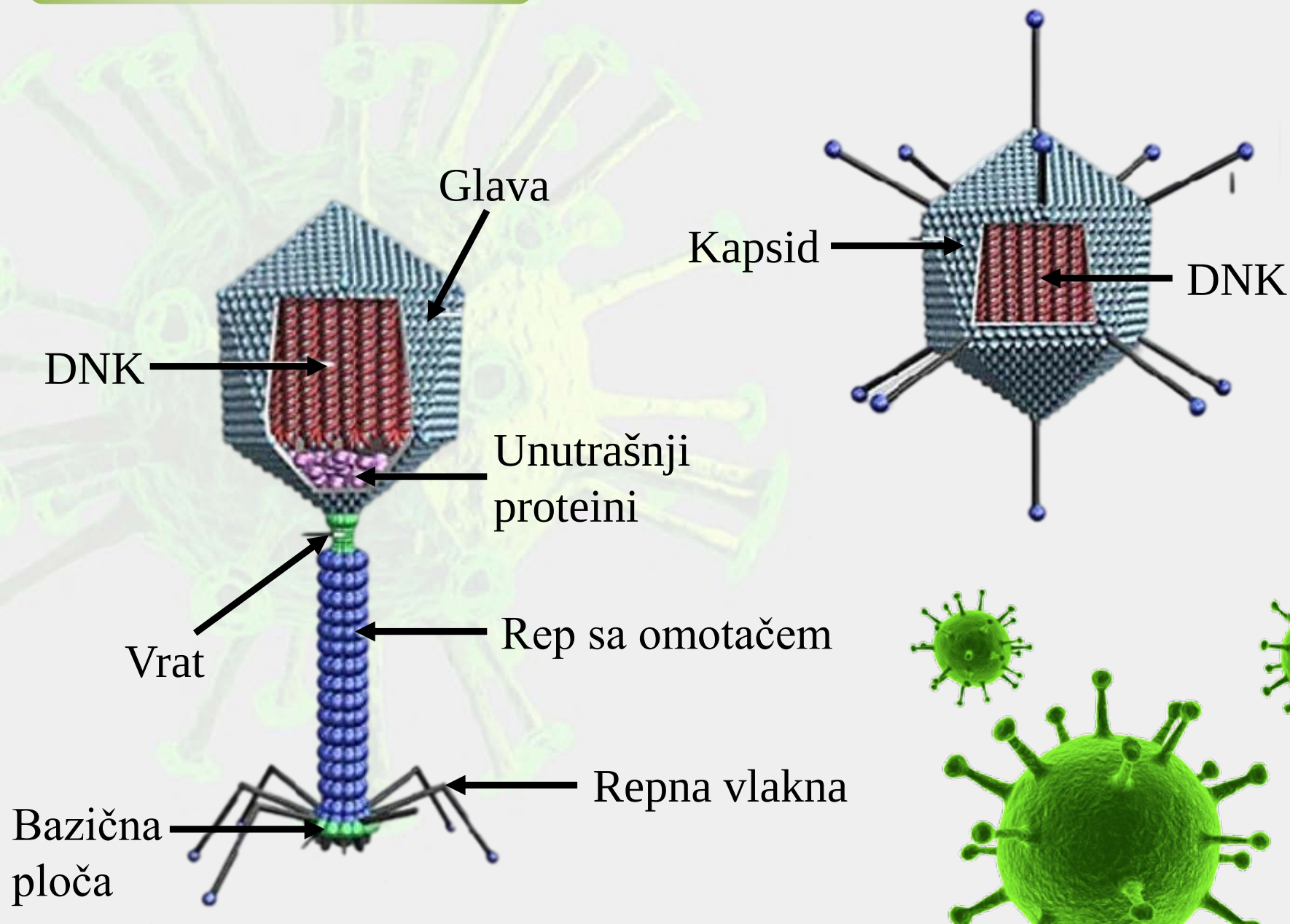
RNK virusi

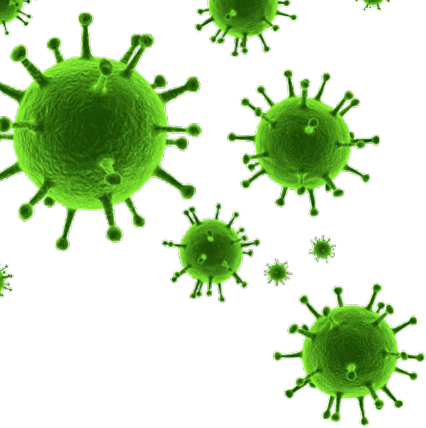


Virusi sa omotačem



GRAĐA VIRUSA

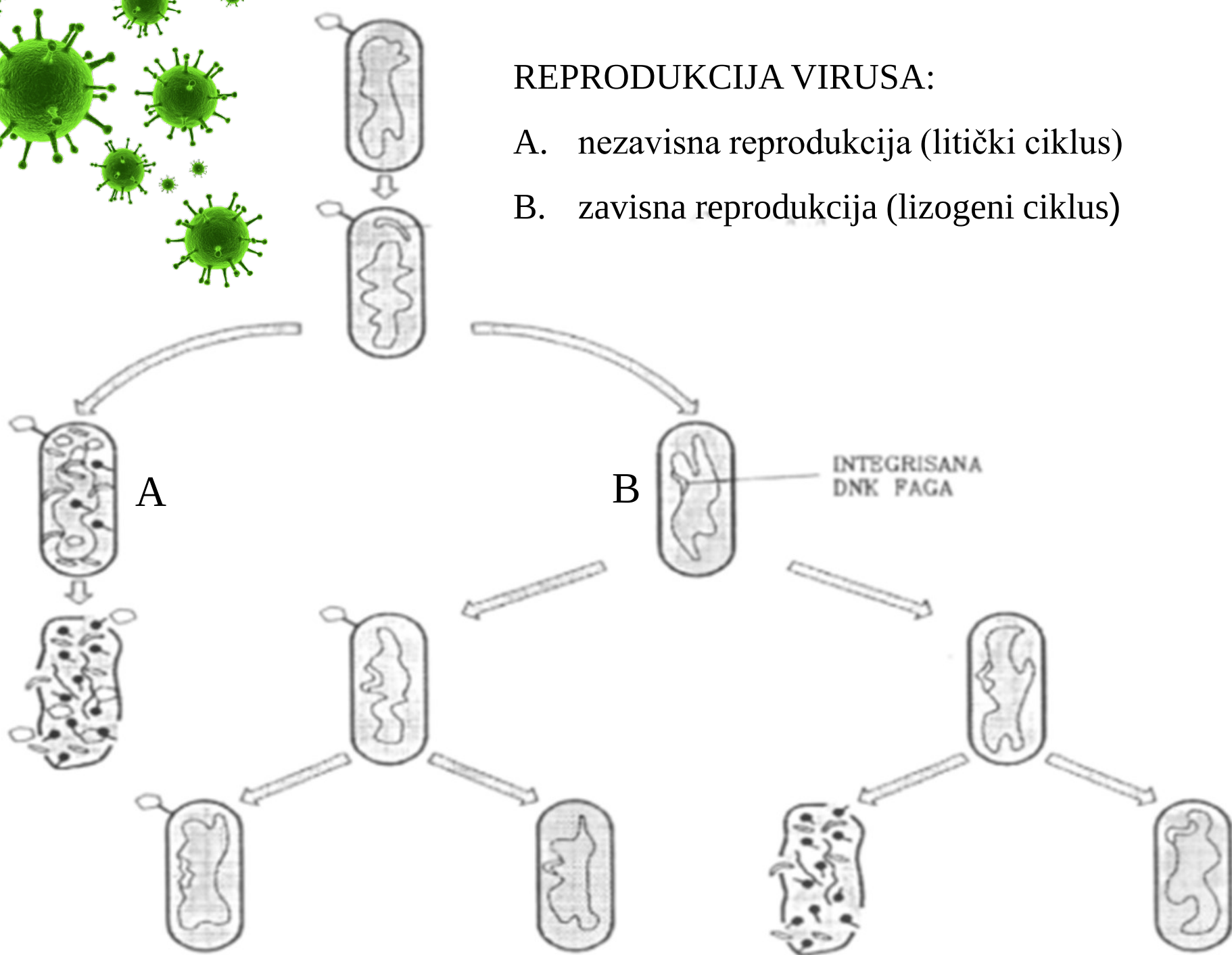




REPRODUKCIJA VIRUSA:

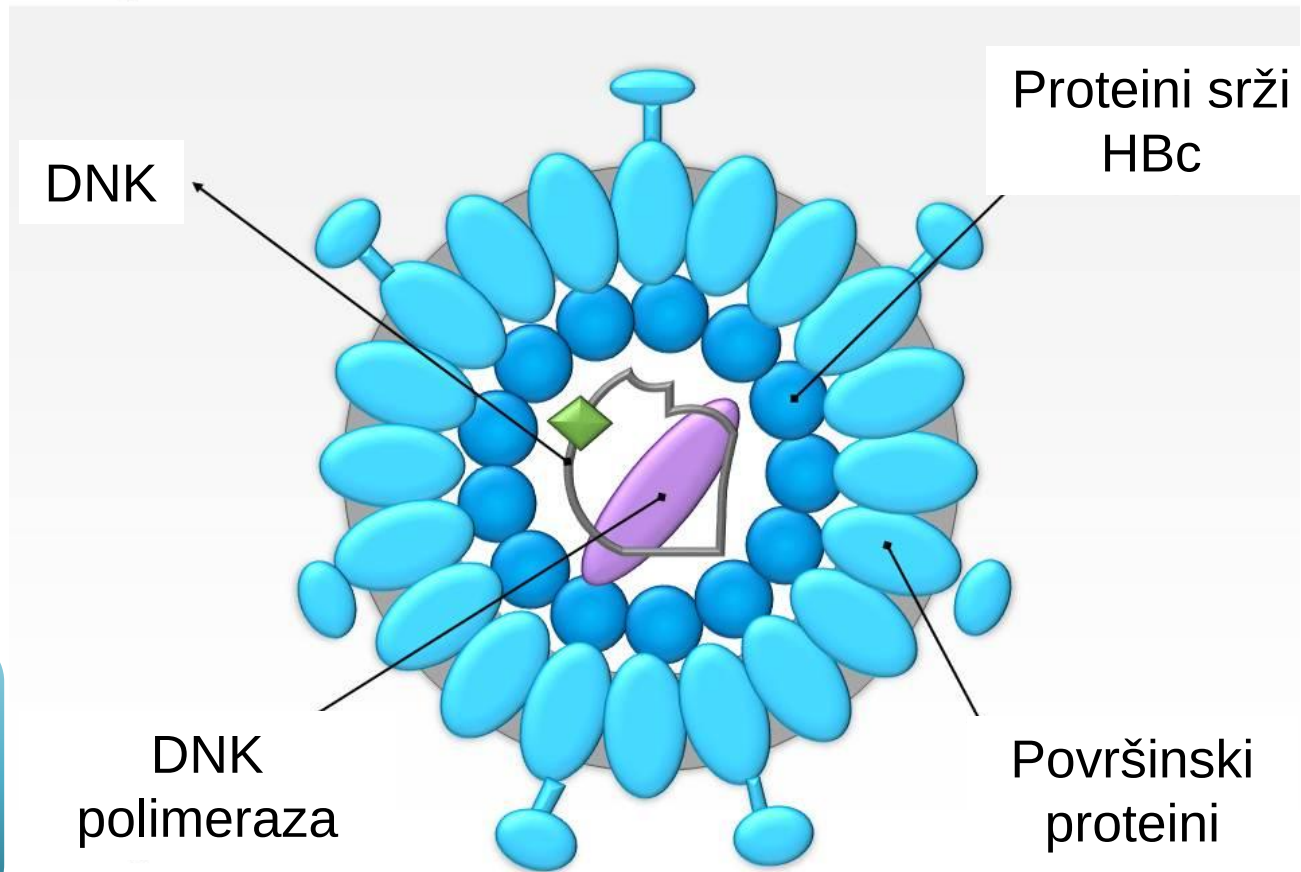
A. nezavisna reprodukcija (litički ciklus)

B. zavisna reprodukcija (lizogeni ciklus)



VIRUS-SATELITI

Hepatitis B Virus



**HEPATITIS B
VIRUS**

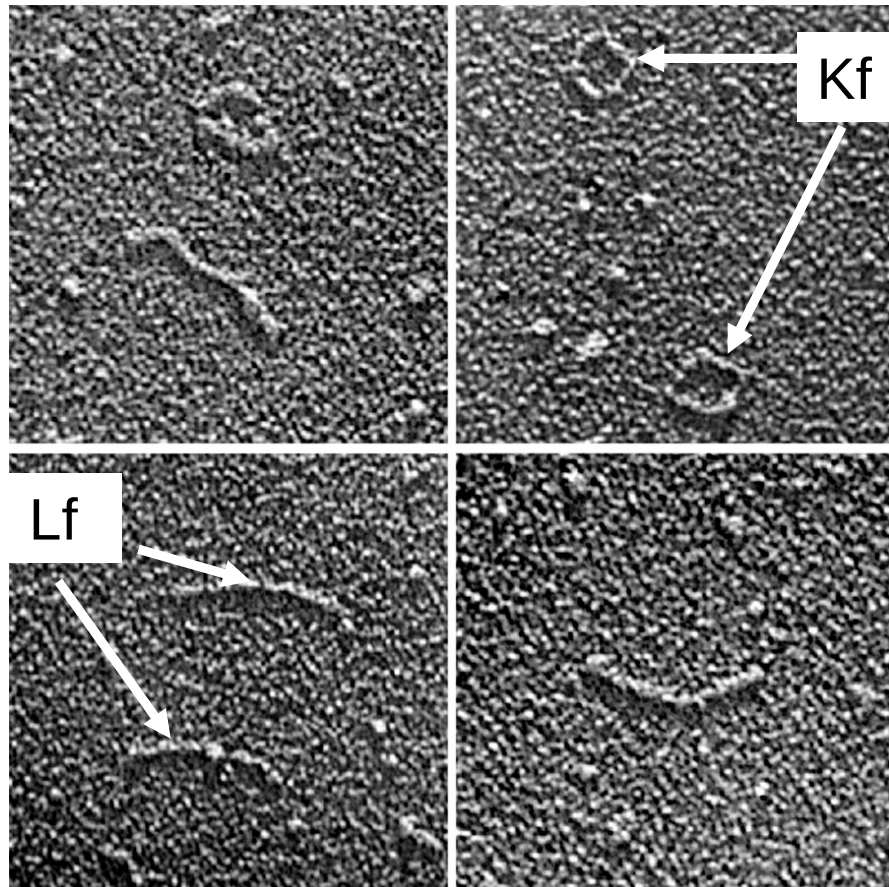
VIROIDI

Krompiri koji su
vretenaste (*spindle*)
forme i manje veličine
od normalnih usled
infekcije „*Potato
Spindle Tuber* viroidom

Normalan
krompir



Kružne (Kf) i linearne forme (Lf)
„*Potato Spindle Tuber Viroid*”
- viroida koji uzrokuje
vretenaste krtole krpompira
(uvećanje 350,000 x)

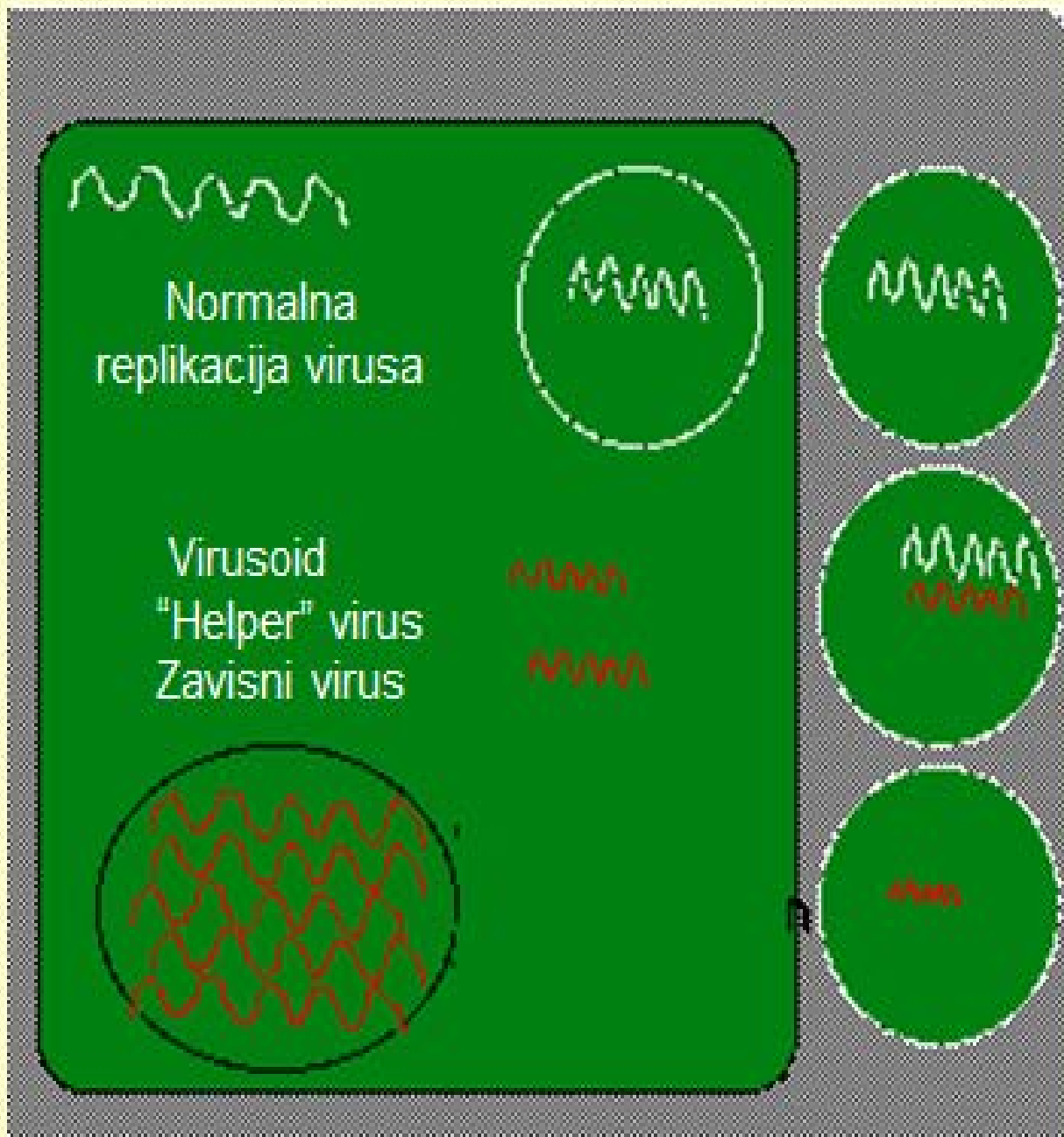


VIROIDI

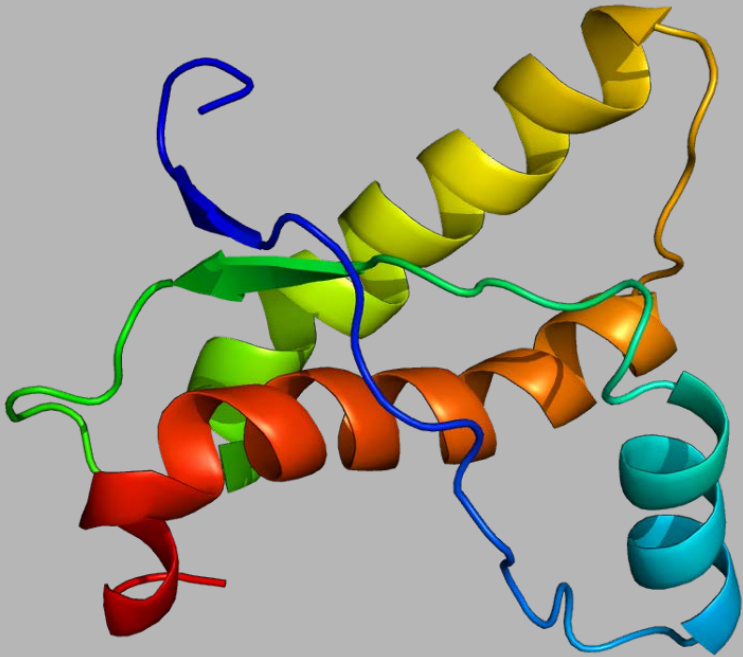
„Apple scar skin“ viroid
na kori ploda jabuke
izaziva pojavu „ožiljaka“
odnosno struktura koje
imaju izgled plute



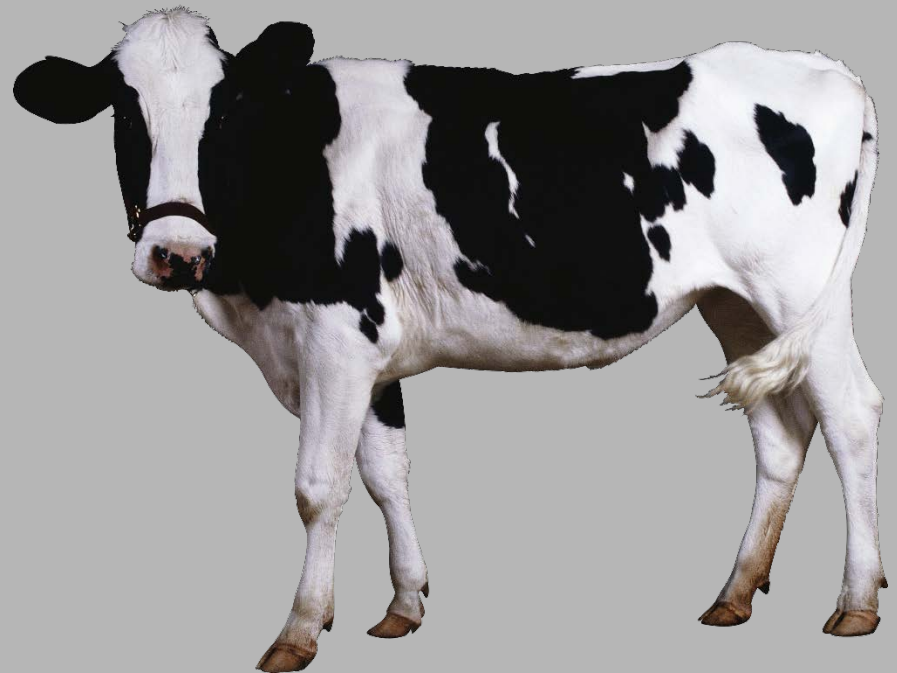
VIRUSOIDI



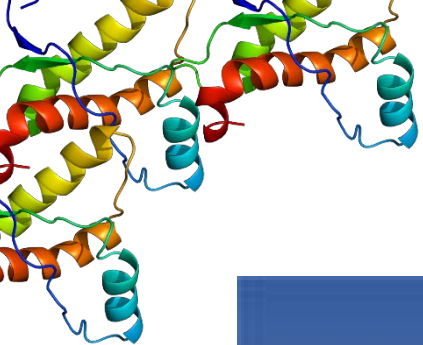
PRIONI



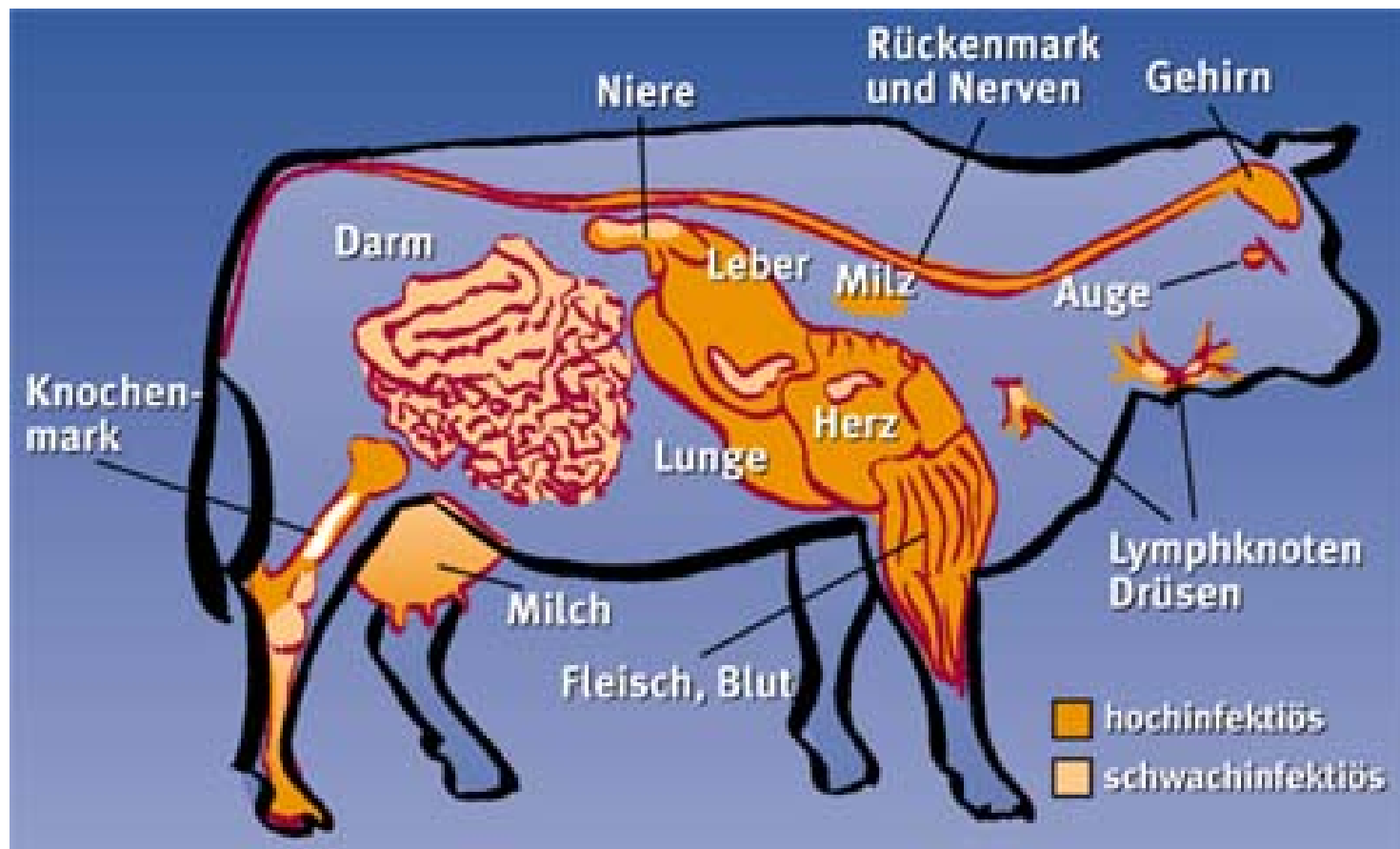
BSE prion



Prion koji izaziva
spongiformnu encefalopatiju goveda
“bovine spongiform encephalopathy –BSE”
(BOLEST “LUDIH KRAVA”)



PRIONI

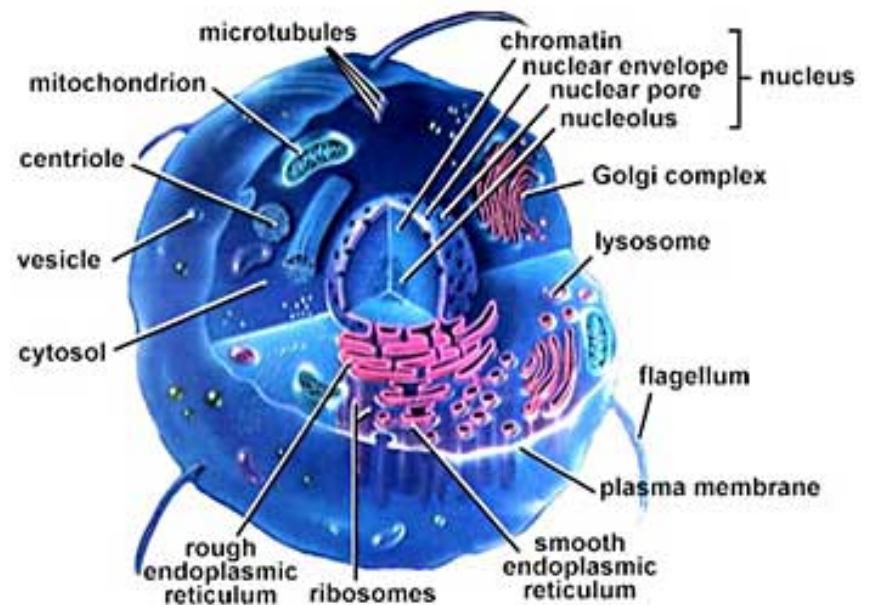
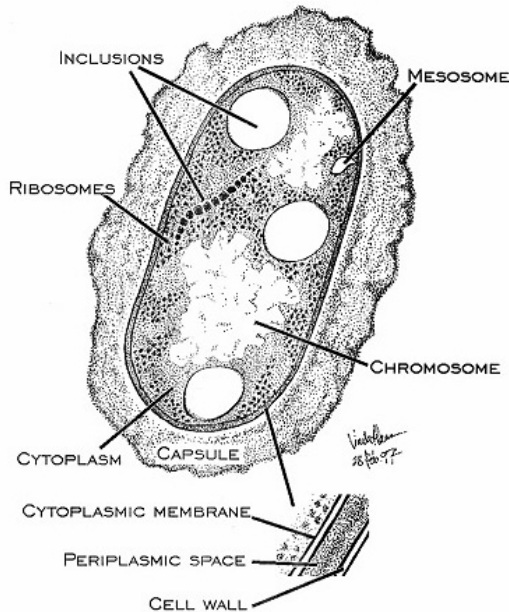


Šematski prikaz promena koje izaziva BSE prion

U **CELULARNE** forme spadaju sva živa bića sa celularnom, tj. ćelijskom građom tela.

Svi celularni oblici se na osnovu nivoa složenosti grade njihove ćelije dele u dve grupe:

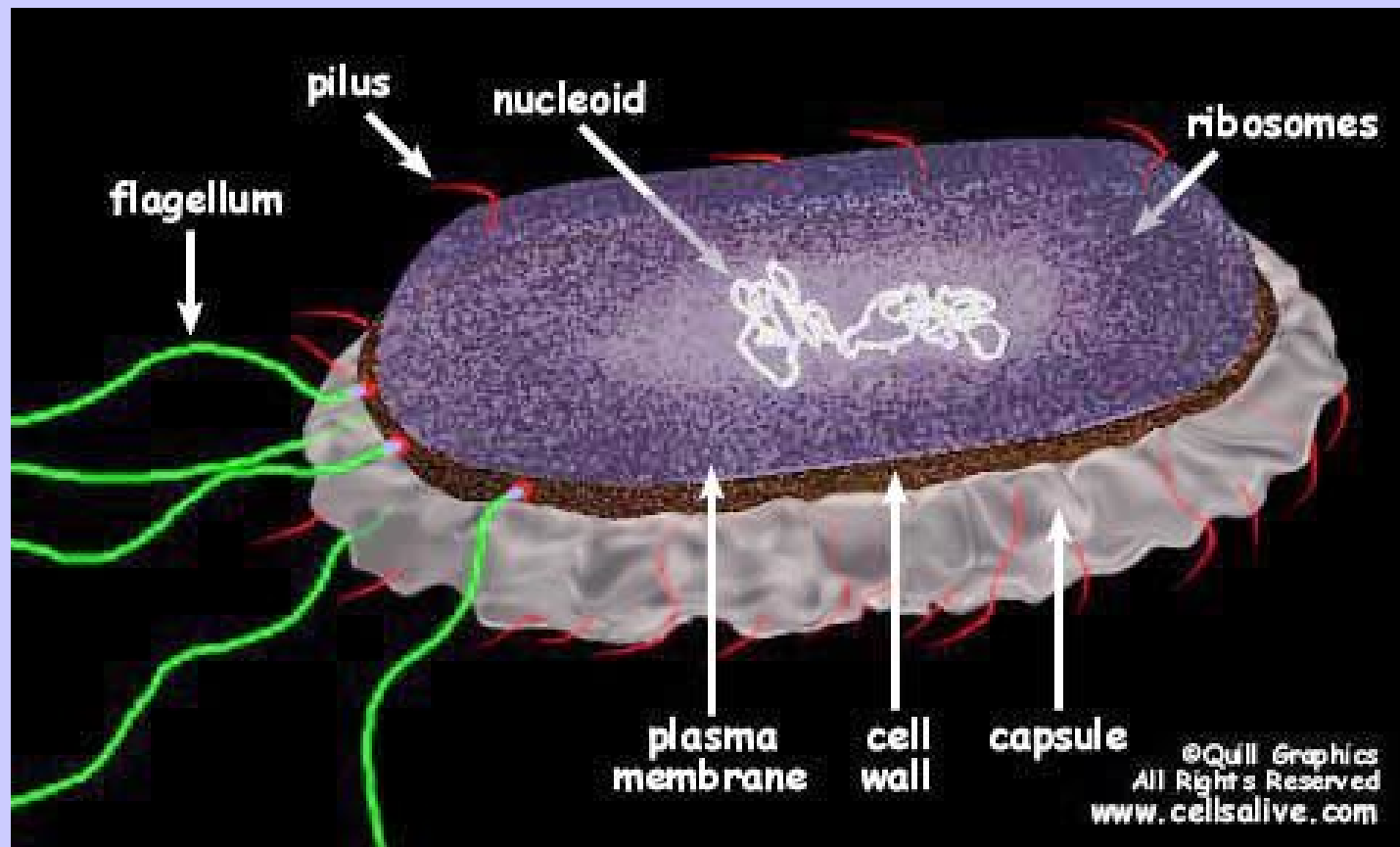
PROKARYOTA i **EUKARYOTA**.



- ***PROKARYOTA*** -

Sve prokaryota svrstane su u
carstvo **MONERA**

Grada prokariotske ćelije

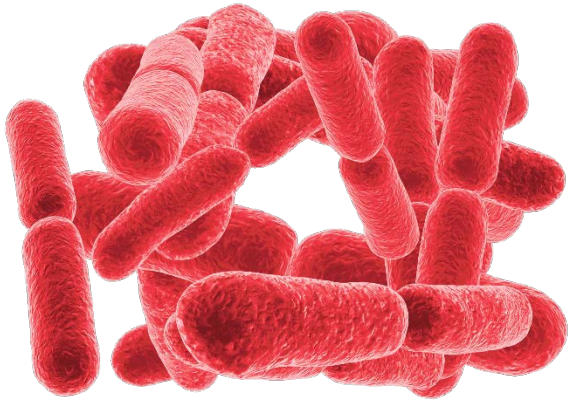


- **PROKARYOTA** – **MONERA**

KLASIFIKACIJA BAKTERIJA

PREVAZIĐENA PODELA
prema morfološkim karakteristikama:

štapicaсти oblici
BACILI



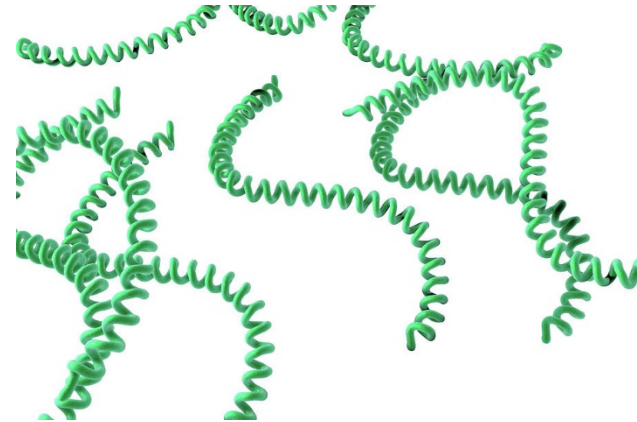
Escherichia coli

sferični oblici
KOKE



Staphylococcus aureus

spiralni oblici
SPIRILI



Leptospira spp.

- *PROKARYOTA* – MONERA

KLASIFIKACIJA BAKTERIJA

**PREVAZIĐENA PODELA
prema tipu metabolizma:**

1. AEROBNE i ANAEROBNE

2. AUTOTROFNE i HETEROTROFNE



FOTOAUTOTROFE

HEMOAUTOTROFE

PROKARIOTSKI ORGANIZMI (MONERA)

BAKTERIJE

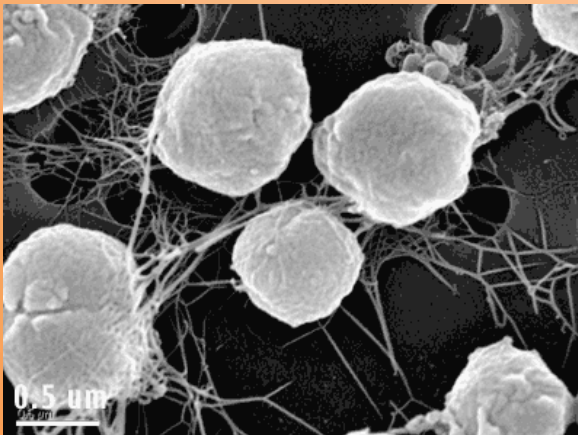
Archaea i Bacteria

MODROZELENE ALGE

Cyanobacteria

Archaea

Metanogene



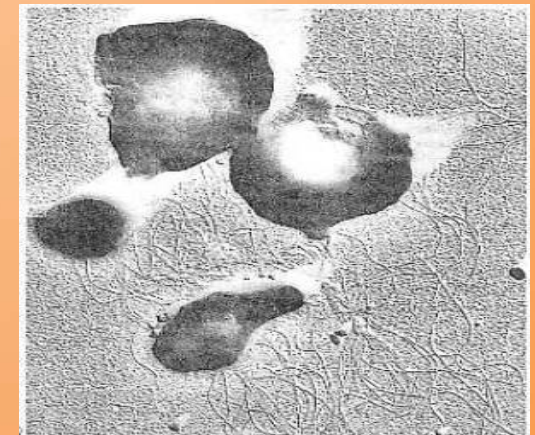
Methanococcus jannaschii

Ekstremno halofitne

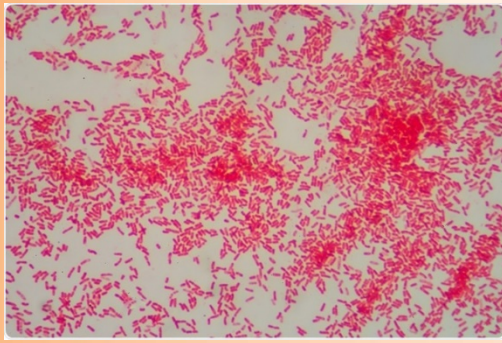


Halobacterium salinarum

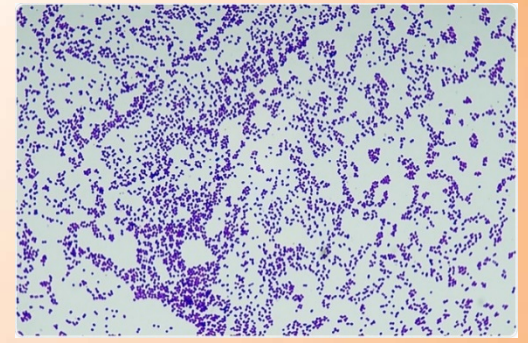
Termoacidofilne



Thermoplasma volcanium



Bacteria



Gram-negativne bakterije



Gram-pozitivne bakterije



Najnoviji sistematski pregled eubakterija, koji se zasniva na komparativnoj analizi njihovih makromolekula, razlikuje sledeće evolutivne pravce u grupi eubakterija:

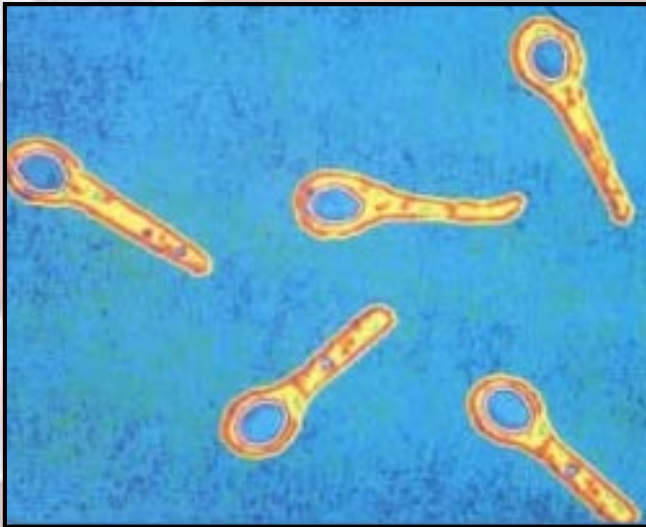
- Gram-pozitivne bakterije
- Spirochaeta
- Myxobacteria
- Rickettsia
- Chlamydia
- Proteobacteria (purpurne bakterije)
- Chlorobi (zelene sumporne bakterije)

- PROKARYOTA – MONERA

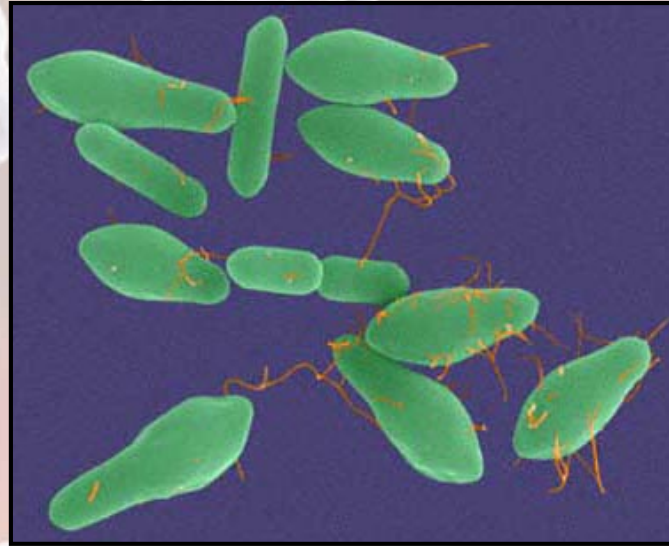
Bacteria

Gram pozitivne
bakterije

grupa **CLOSTRIDIA**



Clostridium tetani



*Clostridium
botulinum*



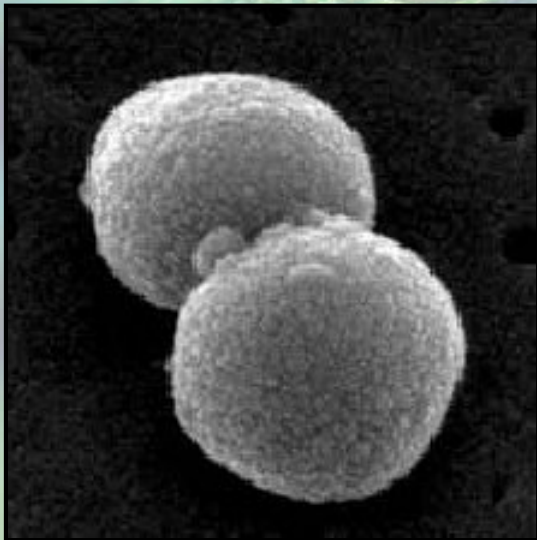
*Clostridium
perfringens*

- PROKARYOTA – MONERA

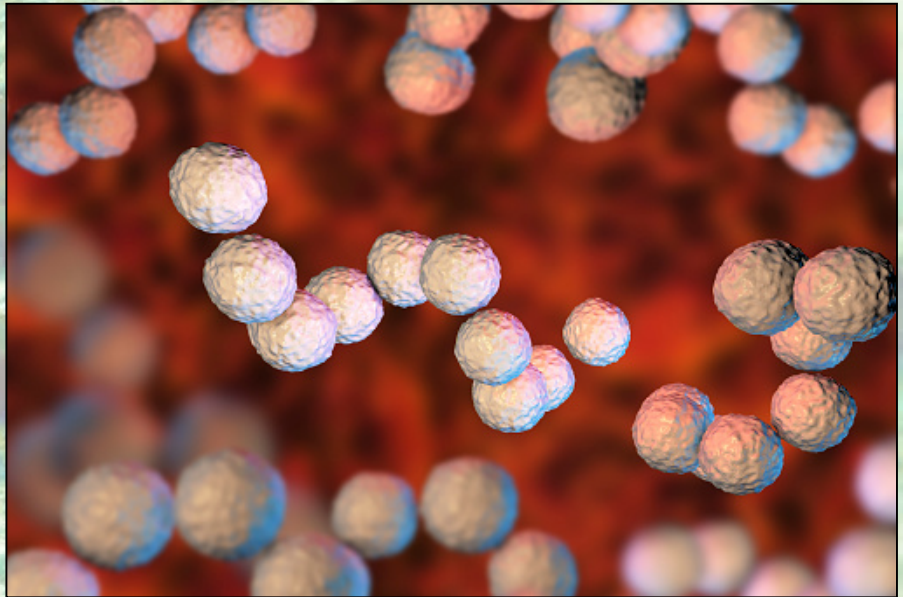
Bacteria

Gram pozitivne
bakterije

grupa **CLOSTRIDIA**



*Streptococcus
pneumoniae*



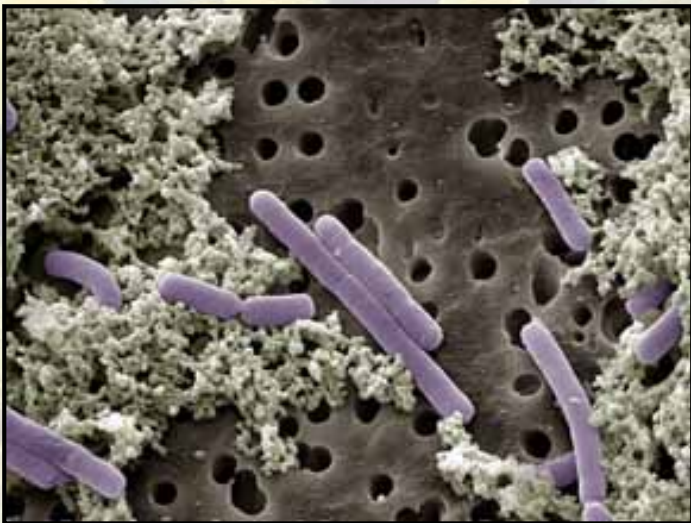
Streptococcus pyogenes

- **PROKARYOTA** - **MONERA**

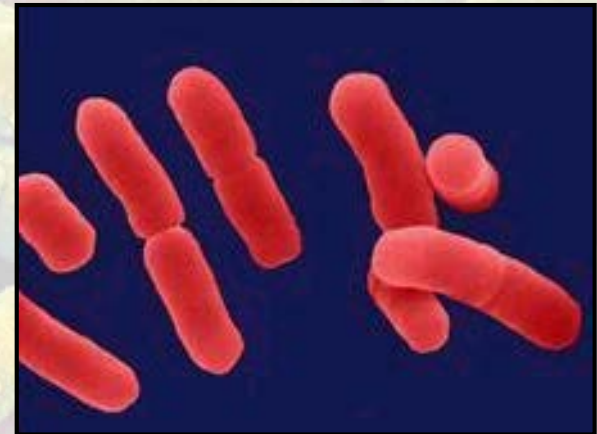
Bacteria

**Gram pozitivne
bakterije**

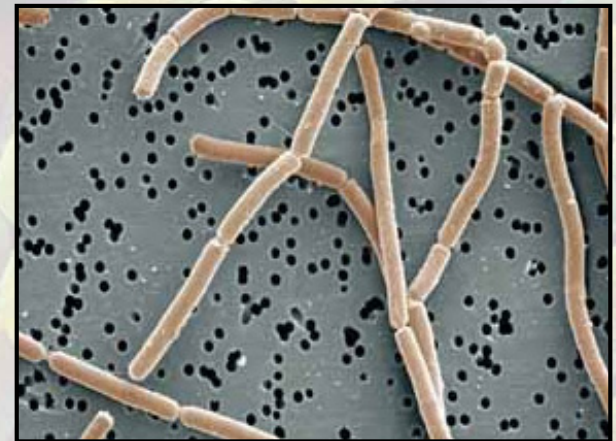
grupa **CLOSTRIDIA**



Lactobacillus casei



Lactobacillus acidophilus



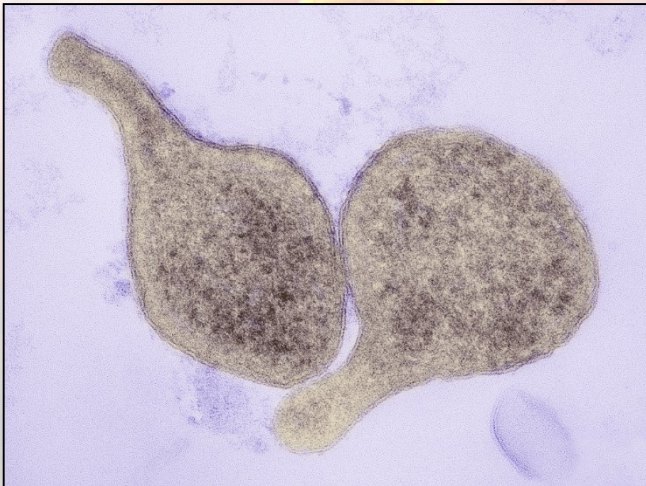
Lactobacillus bulgaricus

- PROKARYOTA - MONERA

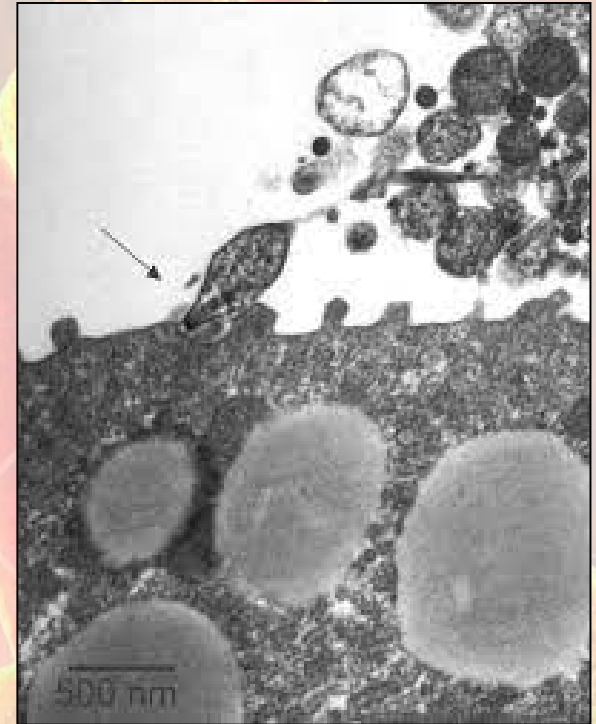
Bacteria

Gram pozitivne
bakterije

Posebna podgrupa
MYCOPLASMA



*Mycoplasma
genitalium*



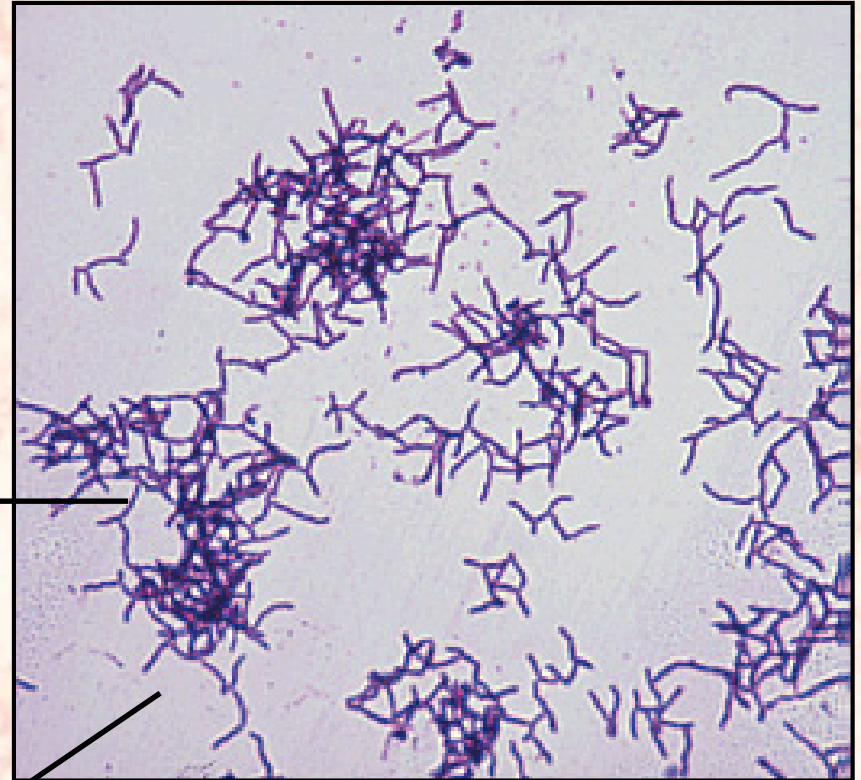
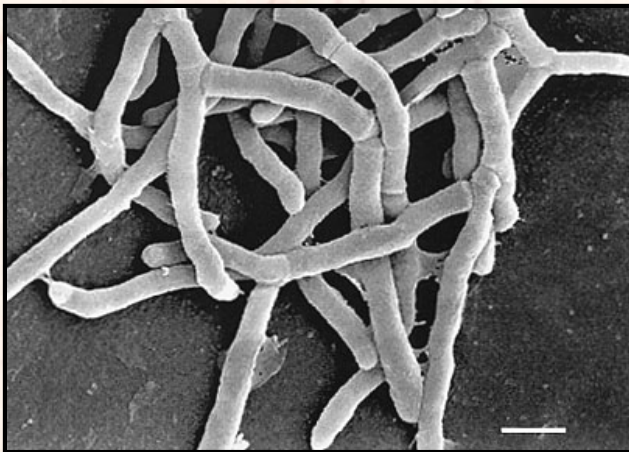
*Mycoplasma
pneumoniae*

- *PROKARYOTA* - MONERA

Bacteria

Gram pozitivne
bakterije

Posebna podgrupa
ACTINOMYCETES



Actinomyces israeli

- PROKARYOTA - MONERA

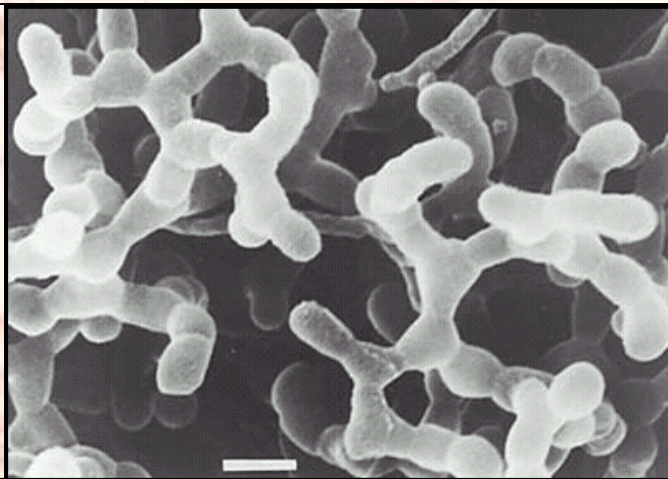
Bacteria

Gram pozitivne bakterije

Posebna podgrupa ACTINOMYCETES

*Streptomyces
triangulata*

produkuje
antiglivični
antibiotik



*Streptomyces
griseus*
produkuje
STREPTOMICIN
antibiotik širokog
spektra
(tuberkulostatik)



- **PROKARYOTA** - **MONERA**

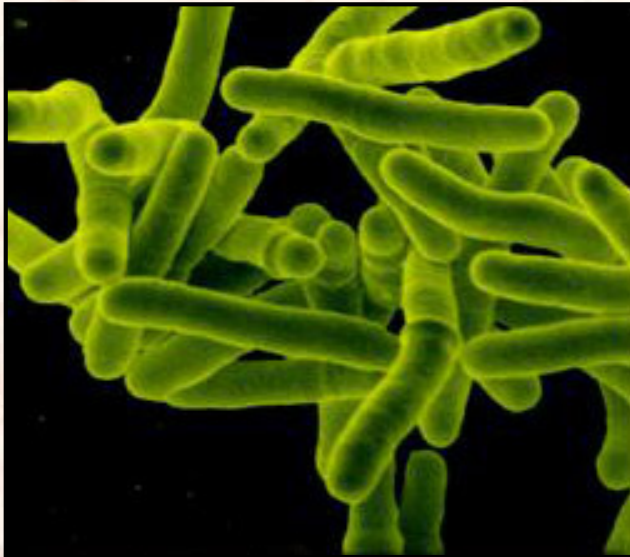
Bacteria

**Gram pozitivne
bakterije**



Corynebacterium diphtheriae

Posebna podrgupa **ACTINOMYCETES**



*Mycobacterium
tuberculosis*



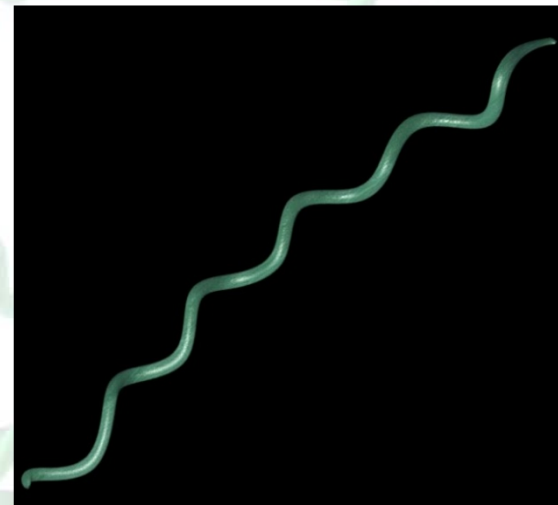
Mycobacterium leprae

- PROKARYOTA - MONERA

Bacteria

Spirochaeta

*Ixodes
ricinus*
prenosilac →
LAJMSKE
BOLESTI
koju izaziva
*Borrelia
burgdorferi*



*Leptospirilla
ichterohemorrhagiae*



Leptospira interrogans



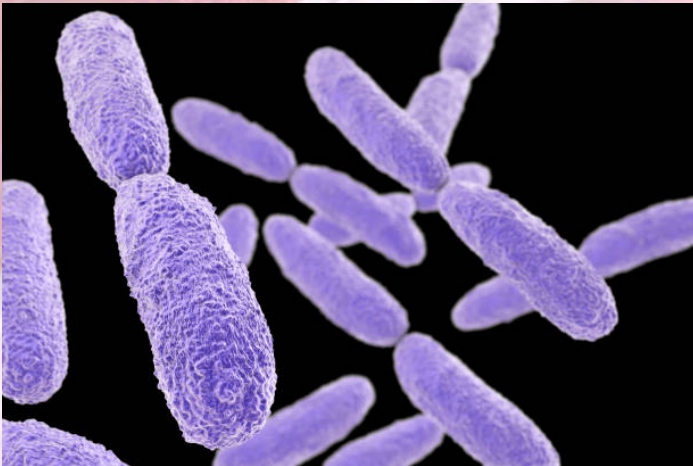
Treponema pallidum
uzročnik SIFILISA

- *PROKARYOTA* – MONERA

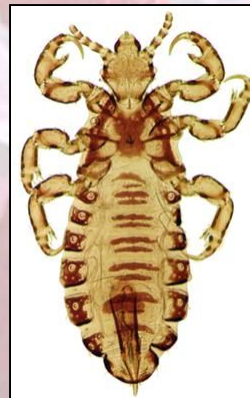
Bacteria

Rickettsia

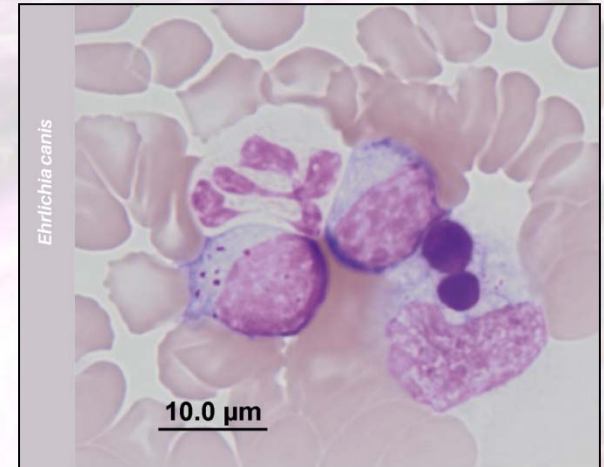
Uzročnik i prenosilac
PEGAVOG TIFUSA



Rickettsia prowazekii (uzročnik)



*Pediculus
humanus* –
čovečija vaš
(prenosilac)



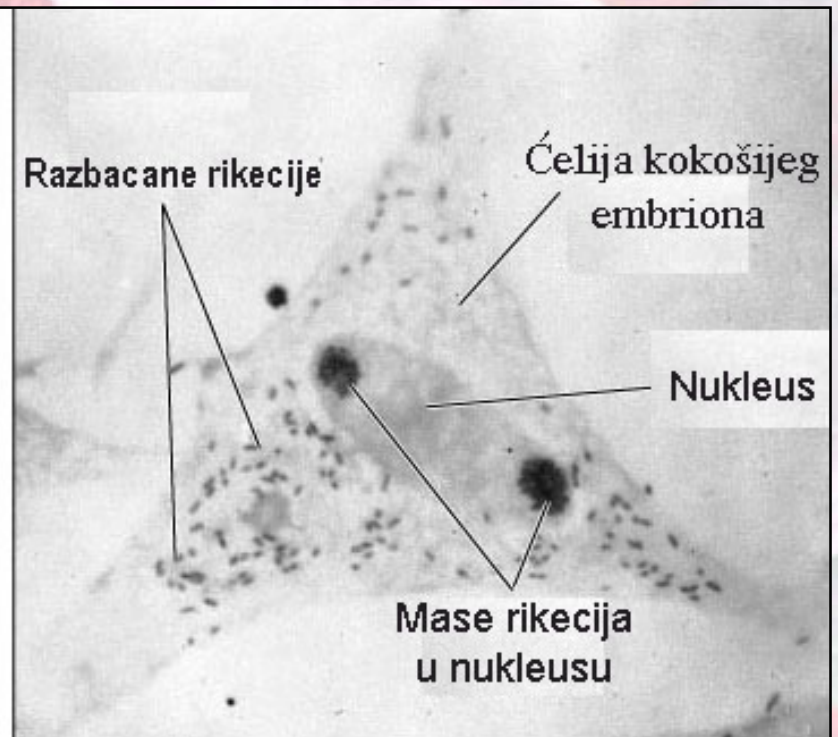
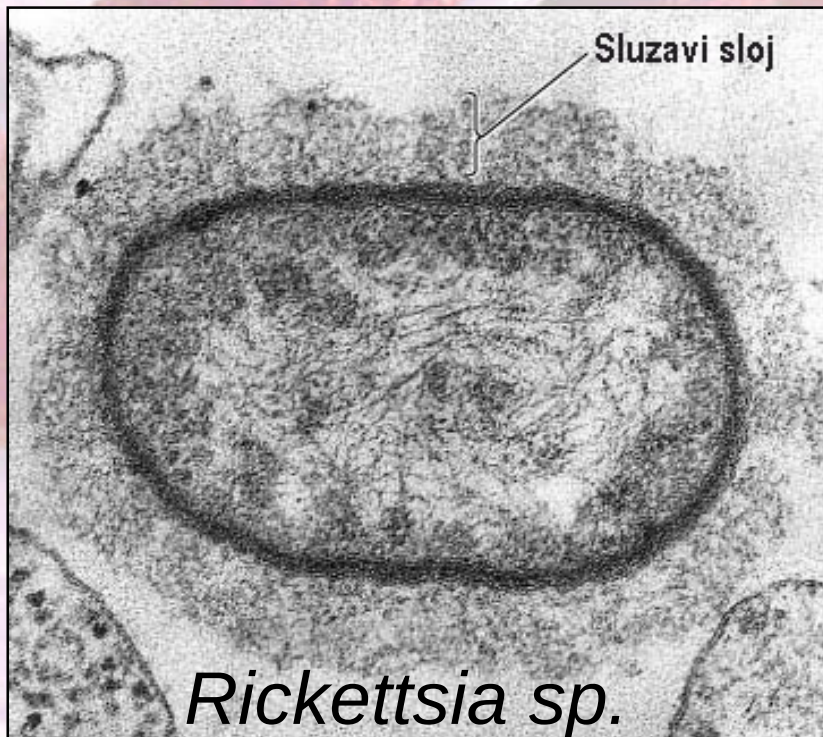
Ehrlichia canis
u agranulocitu
krvi pasa

- **PROKARYOTA** – **MONERA**

Bacteria

Rickettsia

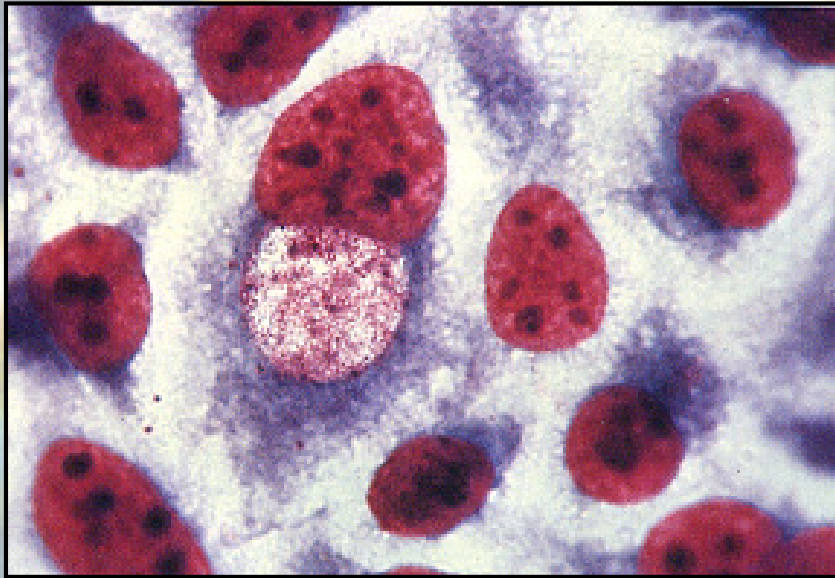
Ćelija kokošijeg embriona
inficirana rikecijama



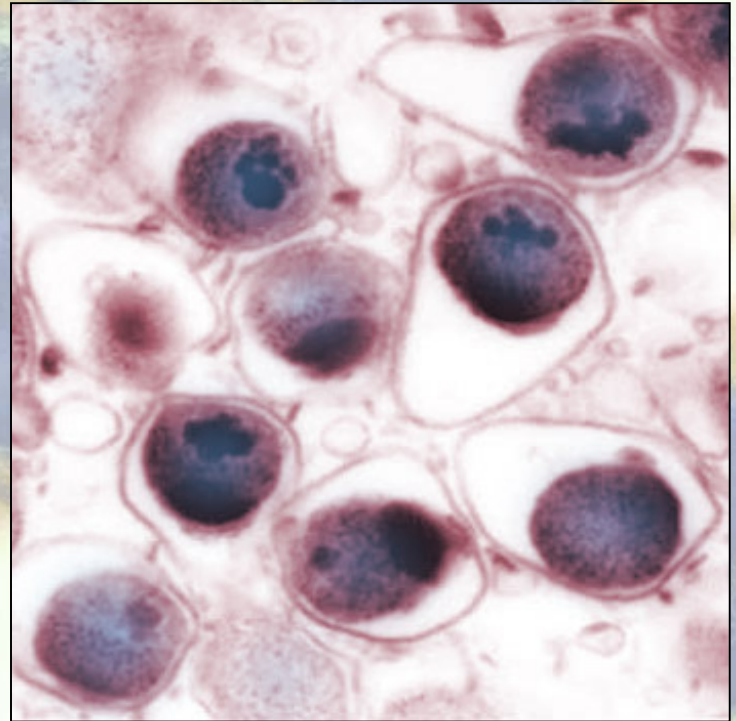
- **PROKARYOTA** –
MONERA

Bacteria

Chlamydia



Chlamydia trachomatis
(intracelularne inkluzije)

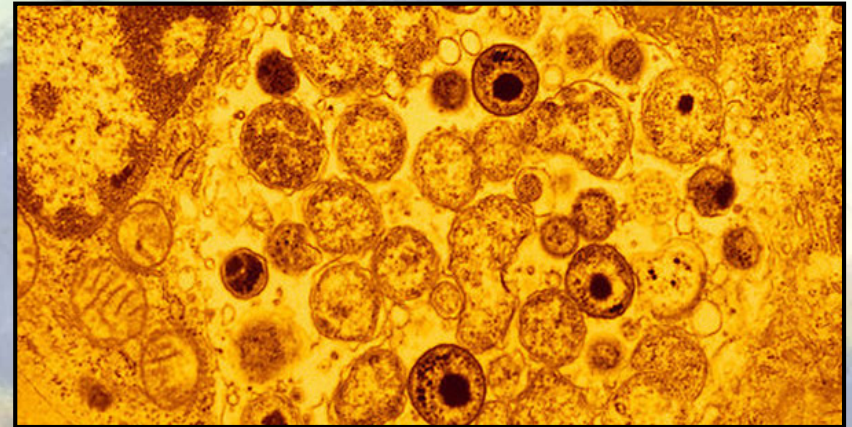


Chlamydia pneumoniae

- PROKARYOTA – MONERA

Bacteria

Chlamydia



Chlamydia psittaci
uzročnik psitakoze



- PROKARYOTA - MONERA

Bacteria

Proteobacteria
(PURPURNÉ BAKTERIJE)

1. AUTOTROFNE

Purpurne nesumporne fotosintetičke bakterije



Rhodospirillum rubrum

Purpurne sumporne bakterije
koje koriste H_2S



Chromatium sp.

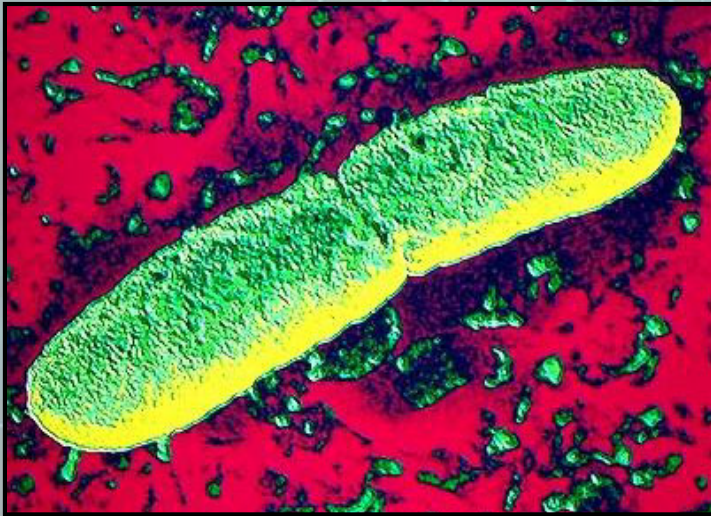
- **PROKARYOTA** - **MONERA**

Bacteria

Proteobacteria

(PURPURNE BAKTERIJE)

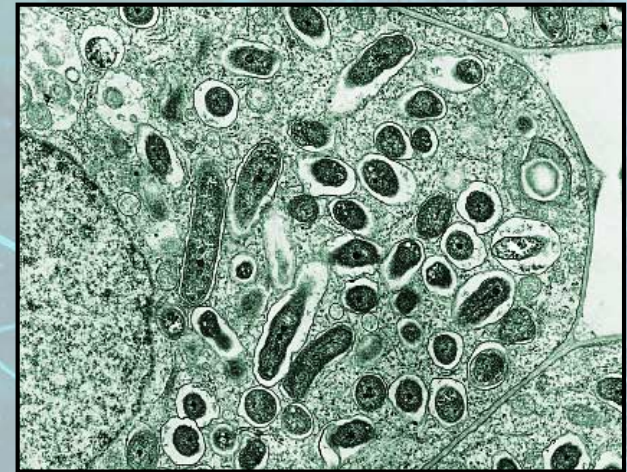
2. HETEROTROFNE



Yersinia pestis



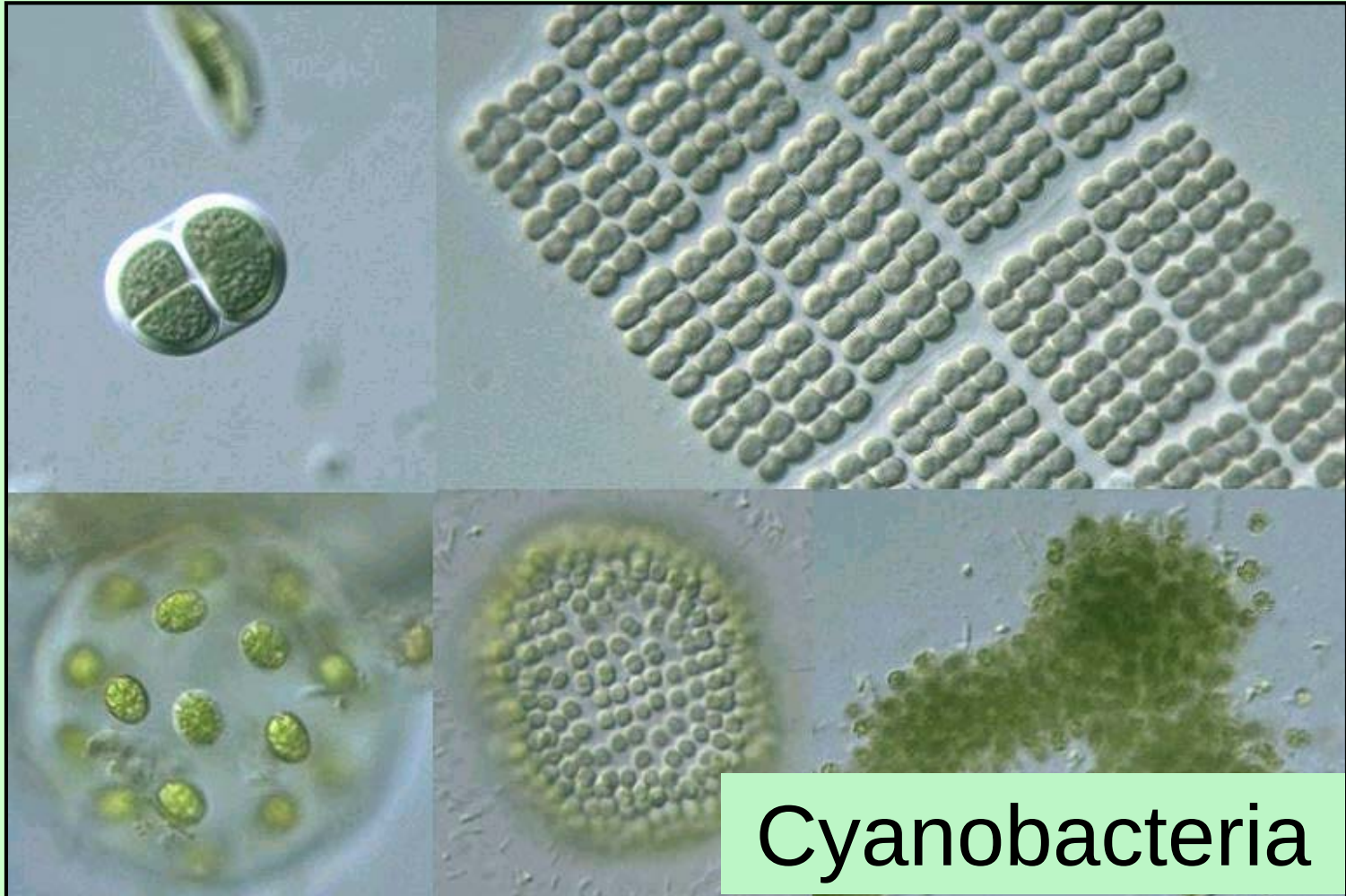
Escherichia coli



***Rhizobium* sp.**
azotofiksirajuća bakterija

- *PROKARYOTA* - MONERA

Modrozelene alge



PET CARSTAVA ŽIVIH ORGANIZAMA

U savremenoj literaturi danas se najčešće koristi klasifikacija svih živih bića u 5 carstava:

MONERA (jednoćelijski prokariotski organizmi)

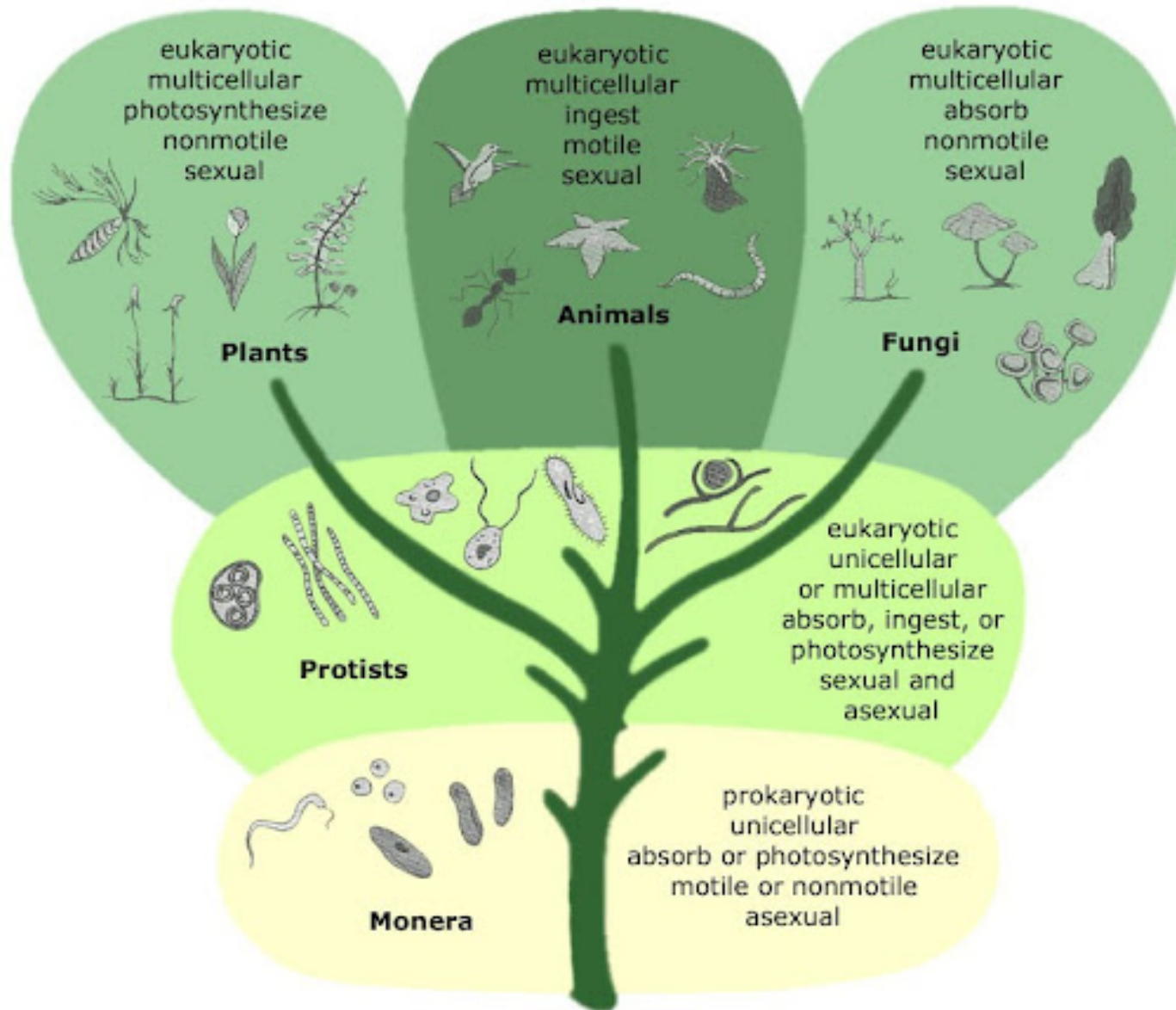
PROTISTA (jednoćelijski eukariotski organizmi)

PLANTAE (biljke)

ANIMALIA (životinje)

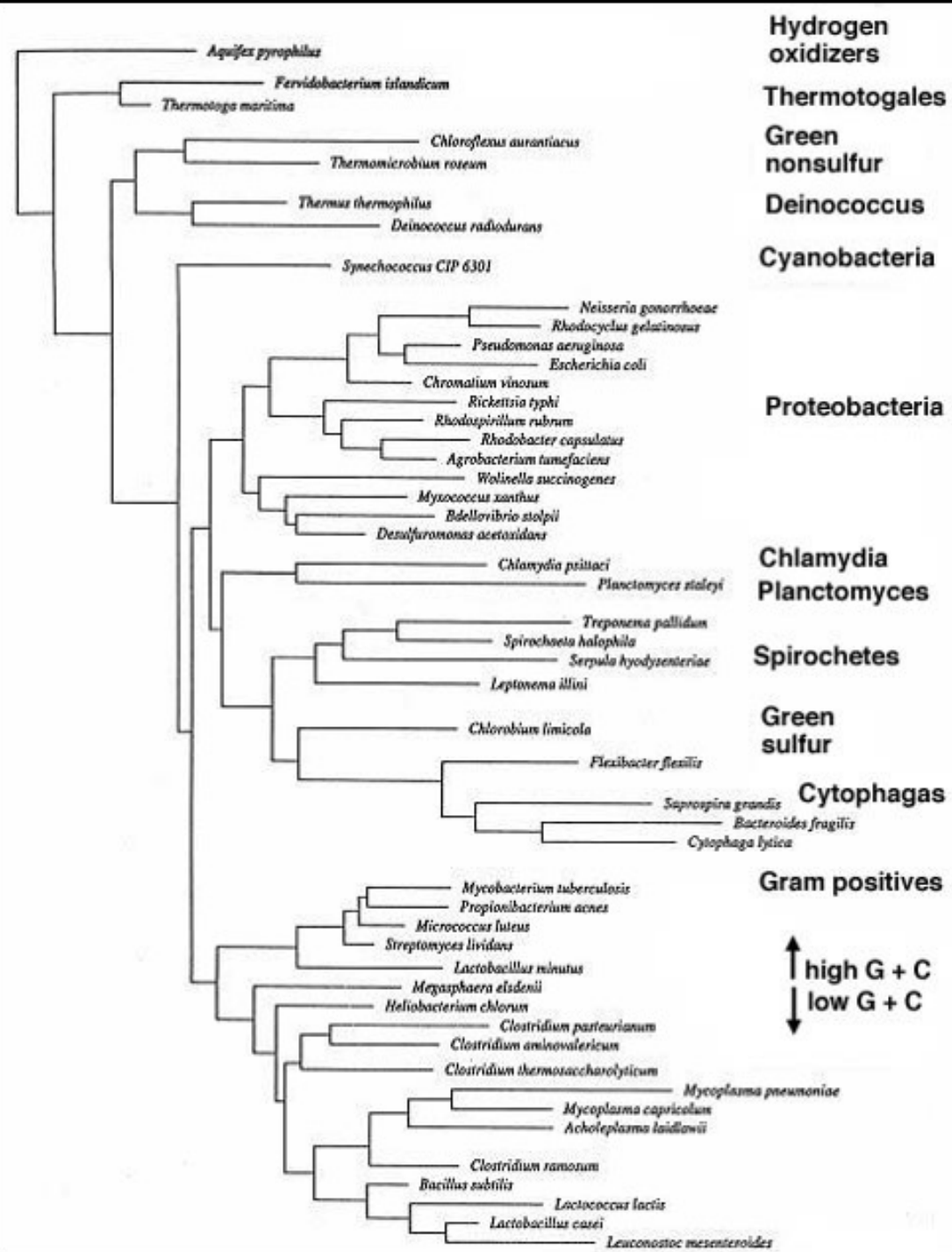
FUNGI (gljive)

Pet carstava živih organizama



A collage of 12 micrographs showing various microorganisms. The images include: a large, branching, reddish-brown structure; a green, filamentous structure; a yellow, rod-shaped bacterium; a green, rod-shaped bacterium; a yellow, rod-shaped bacterium; a green, rod-shaped bacterium; a yellow, rod-shaped bacterium; a green, rod-shaped bacterium; a yellow, rod-shaped bacterium; a green, rod-shaped bacterium; a yellow, rod-shaped bacterium; and a green, rod-shaped bacterium. The images are arranged in a grid-like fashion, with some overlapping. The colors are vibrant and varied, highlighting the diversity of life.

Filogenetsko stablo MONERA



– *EUKARYOTA* –

Eukariotski organizmi
razvrstani su u četiri carstva:

Protista



Plantae



Fungi



Animalia

