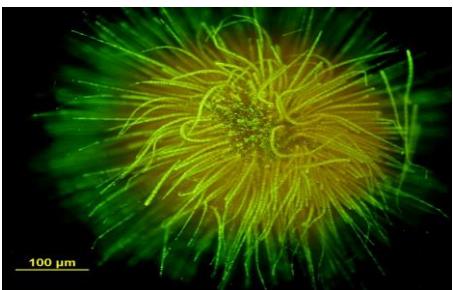
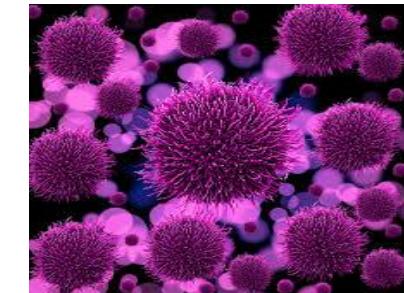


# Grunnleggende mikrobiologi



Monica Holm

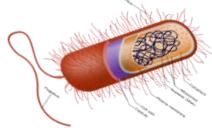
Grunnkurs i dekontaminering 06.06.2024



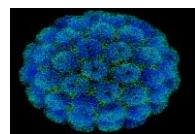
# Mikrobiologi

Vitenskapen om  
mikroorganismer

Bakterier



# Mikroorganismer



Virus

Selvstendige livsformer man  
ikke kan se med det blotte øye

Protozoa



Mikroskopiske sopper



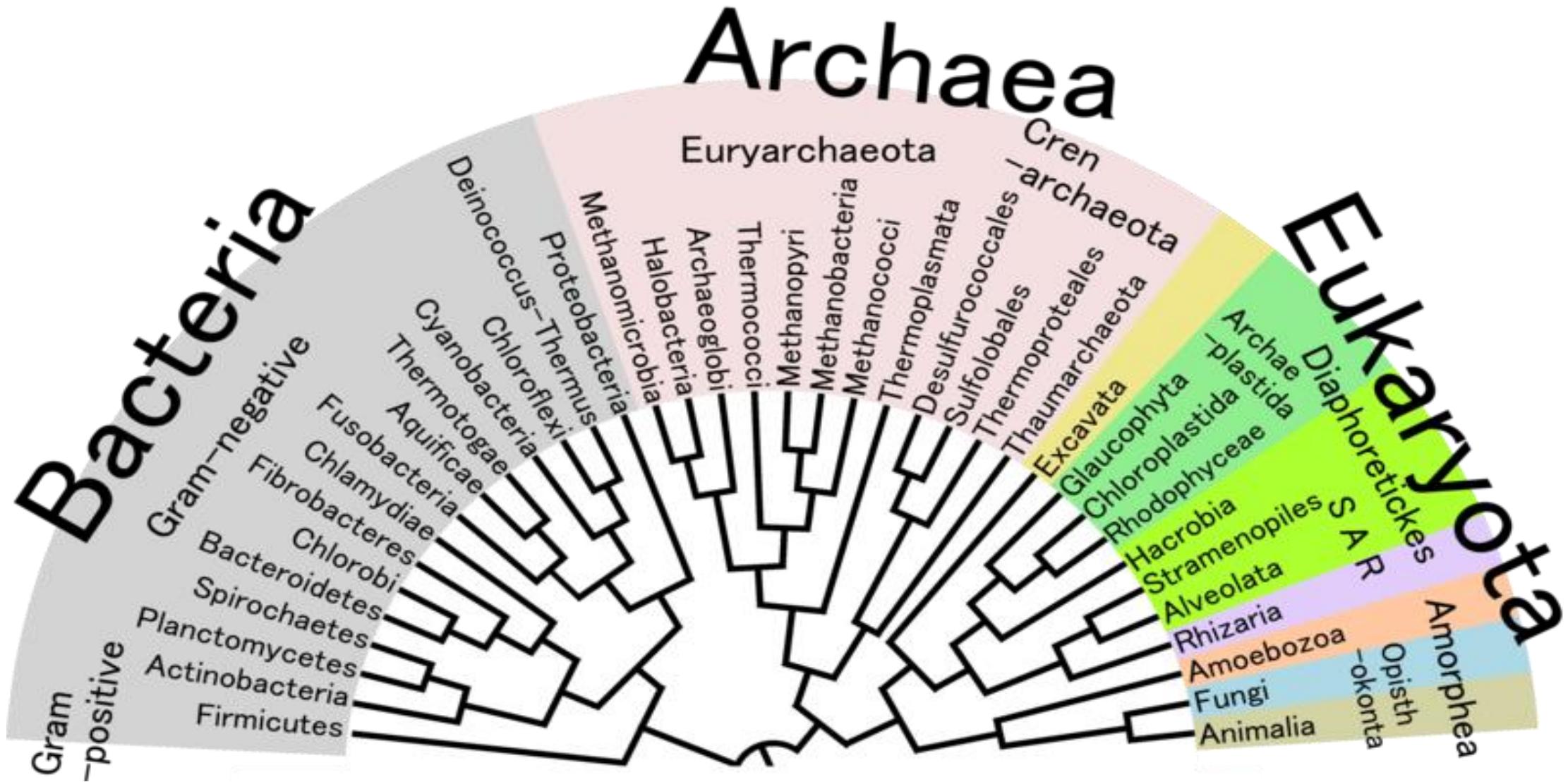
Arkebakterier



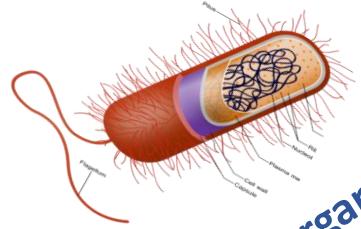
Prioner

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Prokaryote organiser

# Bacteria

Gram-positive  
Gram-negative

Firmicutes  
Actinobacteria  
Planctomycetes  
Spirochaetes  
Bacteroidetes  
Chlorobi  
Fibrobacteres  
Chlamydiae  
Aquificae  
Fusobacteriae  
Cyanobacteria  
Chloroflexi  
Proteobacteria  
Methanomicrobia  
Archaeoglobi  
Halobacteria  
Thermococci  
Deinococcus-Thermus  
Cyanobacteria  
Thermotogae  
Fusobacteriae  
Aquificae  
Chloroflexi  
Proteobacteria  
Methanomicrobia  
Archaeoglobi  
Halobacteria  
Thermococci  
Deinococcus-Thermus

# Archaea

Euryarchaeota

Methanopyri  
Archaeoglobi  
Thermococci  
Deinococcus-Thermus

Methanobacteria  
Methanococci  
Thermoplasmata  
Desulfurococcales

Crenarchaeota  
Sulfobales  
Thermoproteales  
Thaumarchaeota

# Eukaryota

Excavata  
Glaucophyta  
Chloroplastida  
Rhodophyceae  
Hacrobia  
Stramenopiles  
Alveolata  
Rhizaria  
Amoebozoa  
Fungi  
Animalia

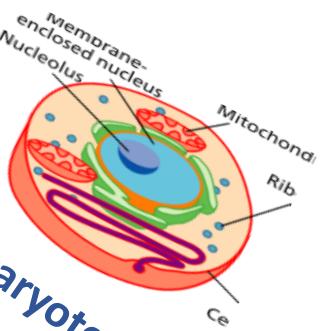
S A R

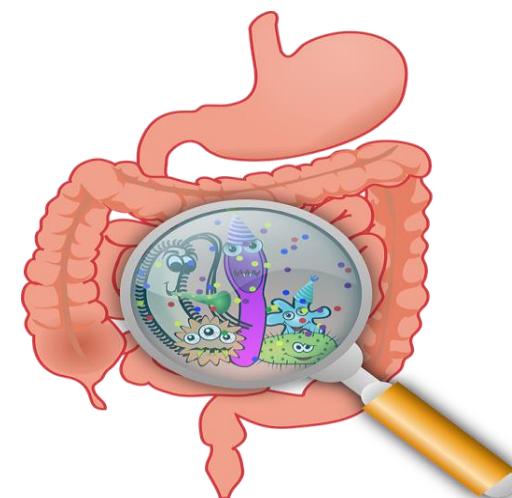
Amorpheaa  
Opisthokonta

Diaphoretickes

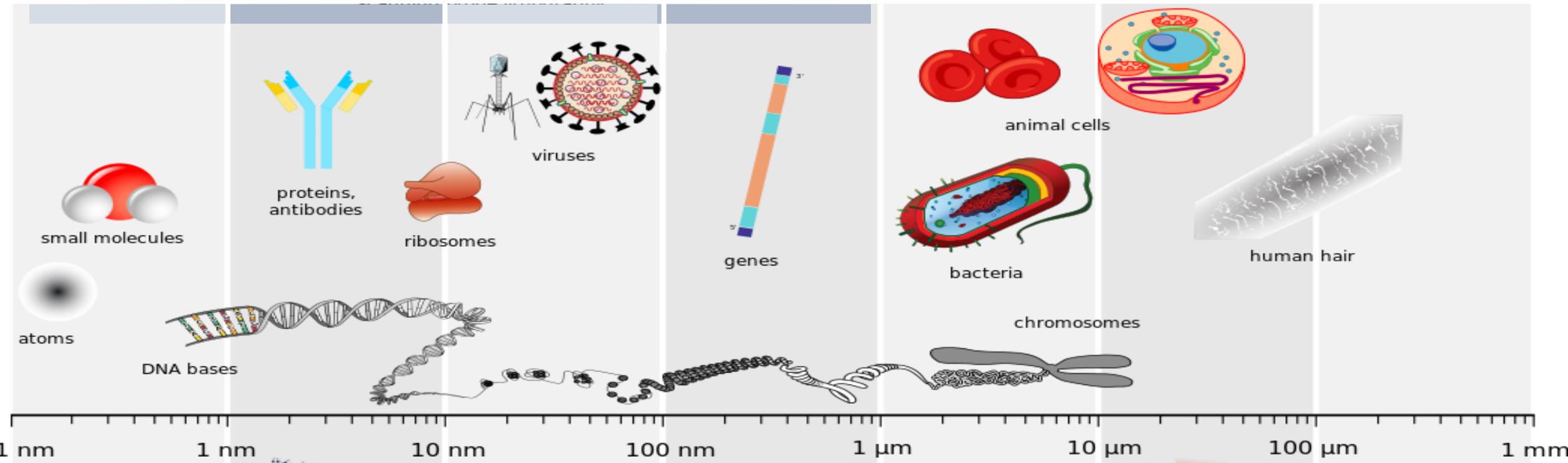
Archaeplastida

Eukaryote organiser

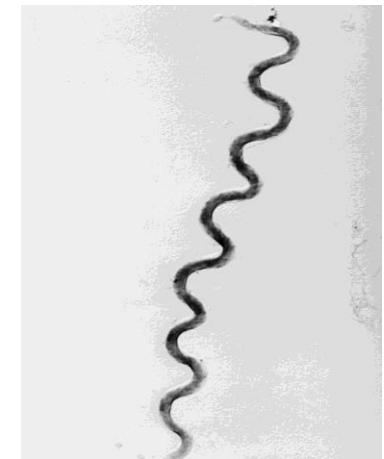
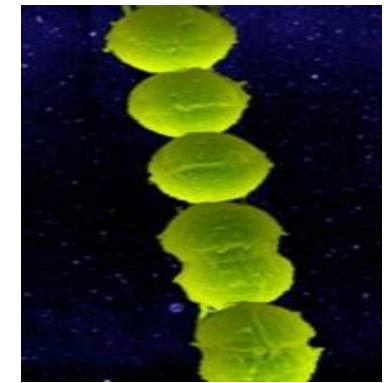
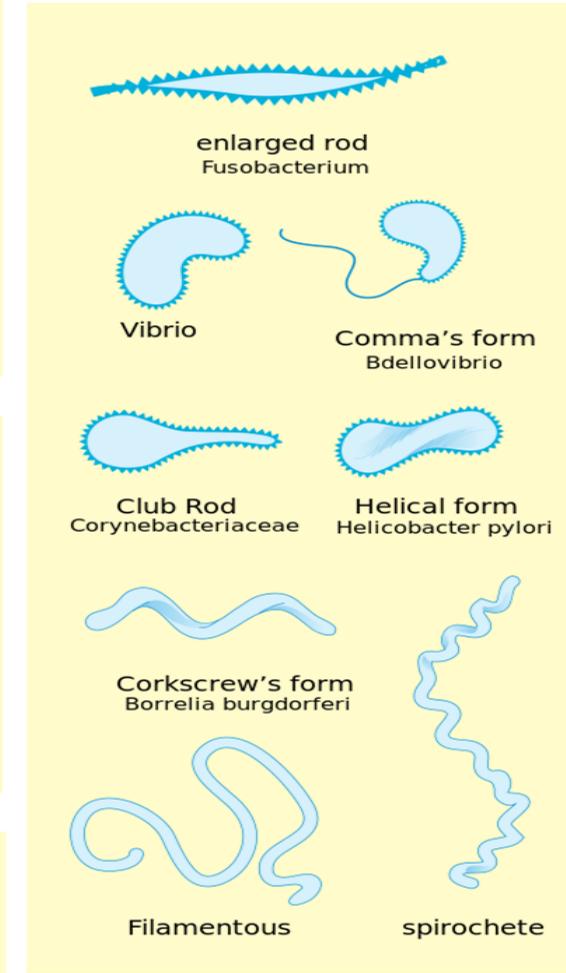
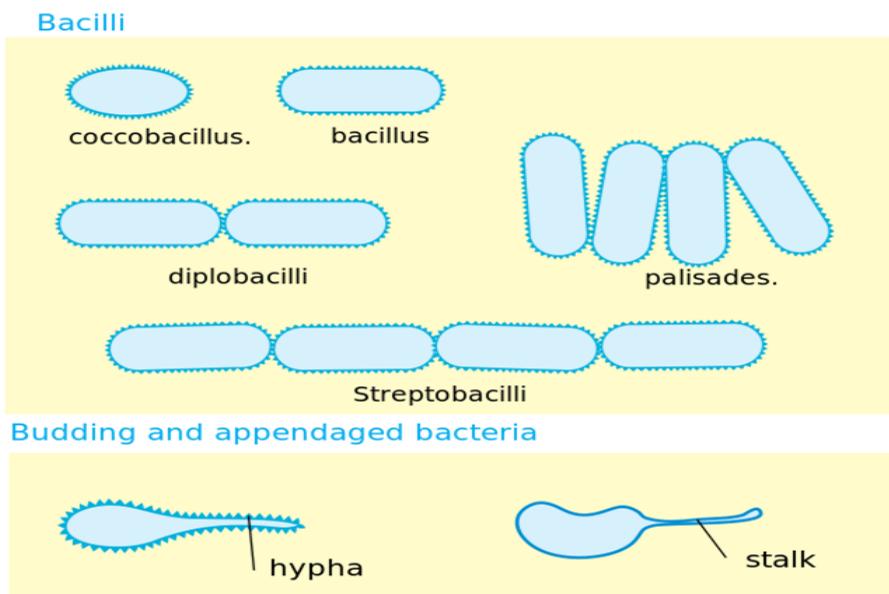
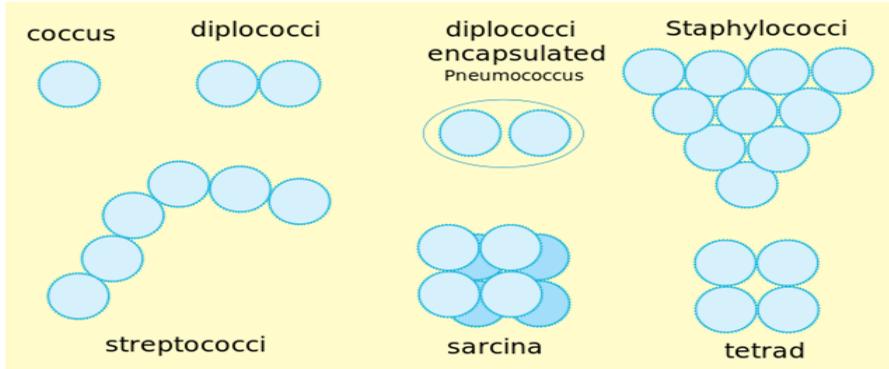
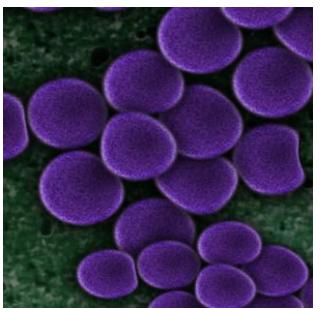
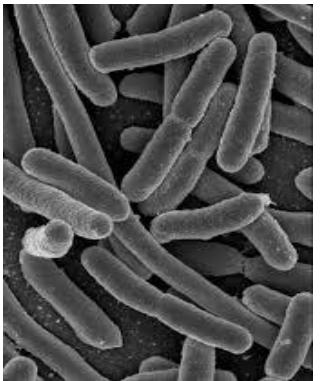




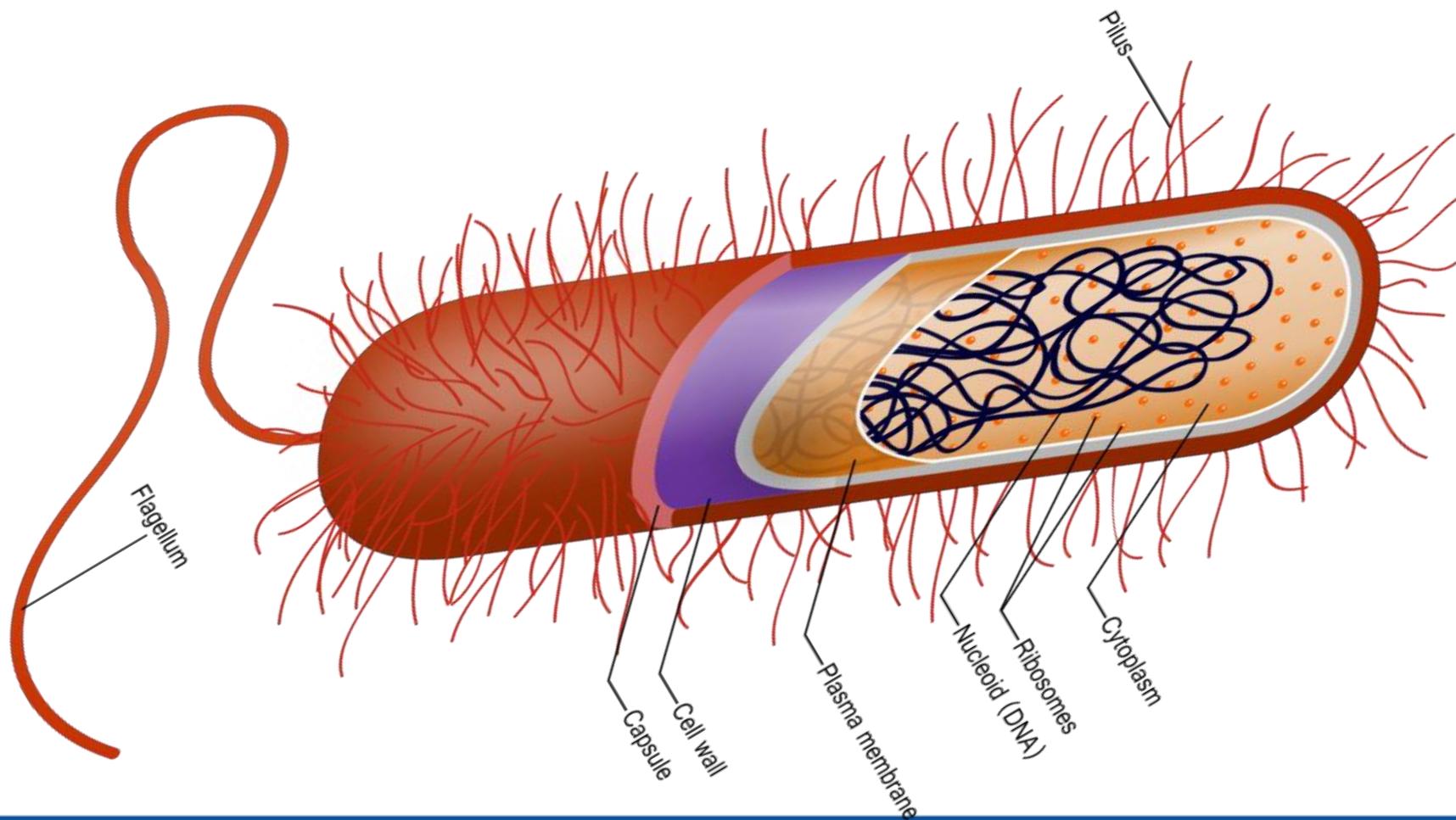
# Størrelse



# Struktur

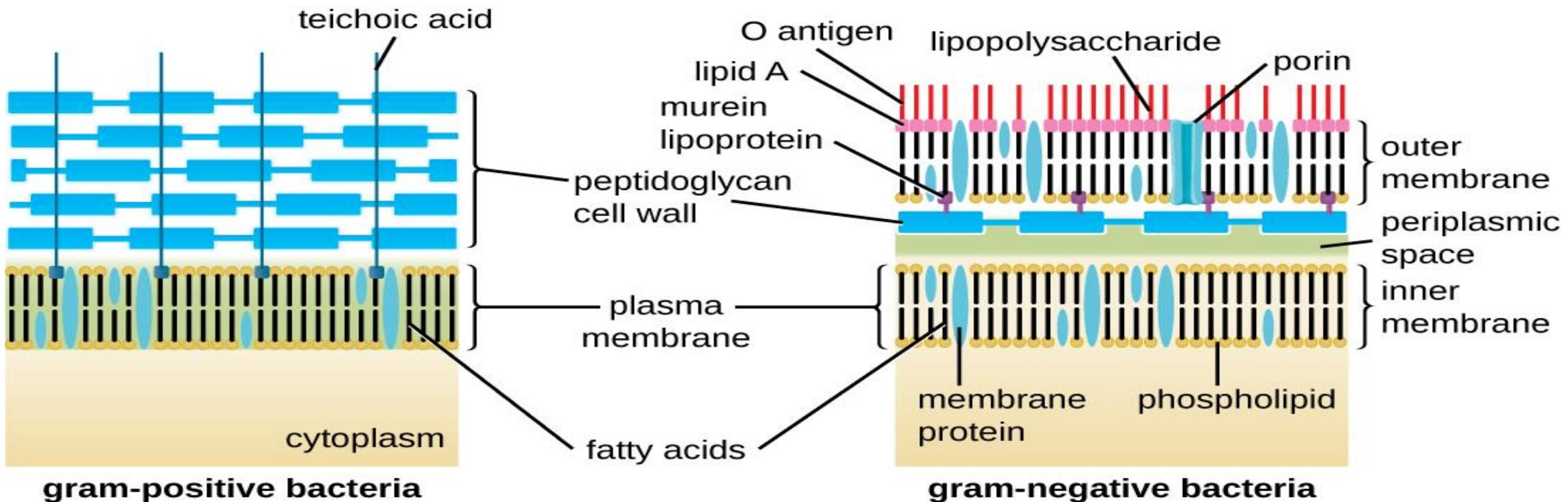


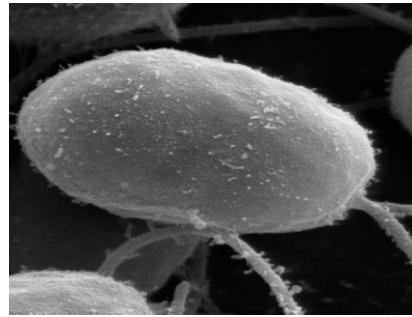
# Struktur



This vector image is completely made by Ali Zifan - Own work; used information from Biology 10e Textbook (chapter 4, Pg: 63) by: Peter Raven, Kenneth Mason, Jonathan Losos, Susan Singer · McGraw-Hill Education., CC BY-SA 4.0, <https://commons.wikimedia.org/w/index.php?curid=44194140>

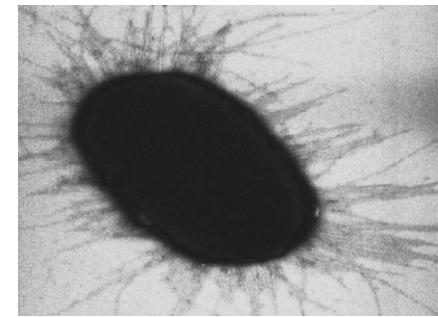
# Cellevegg



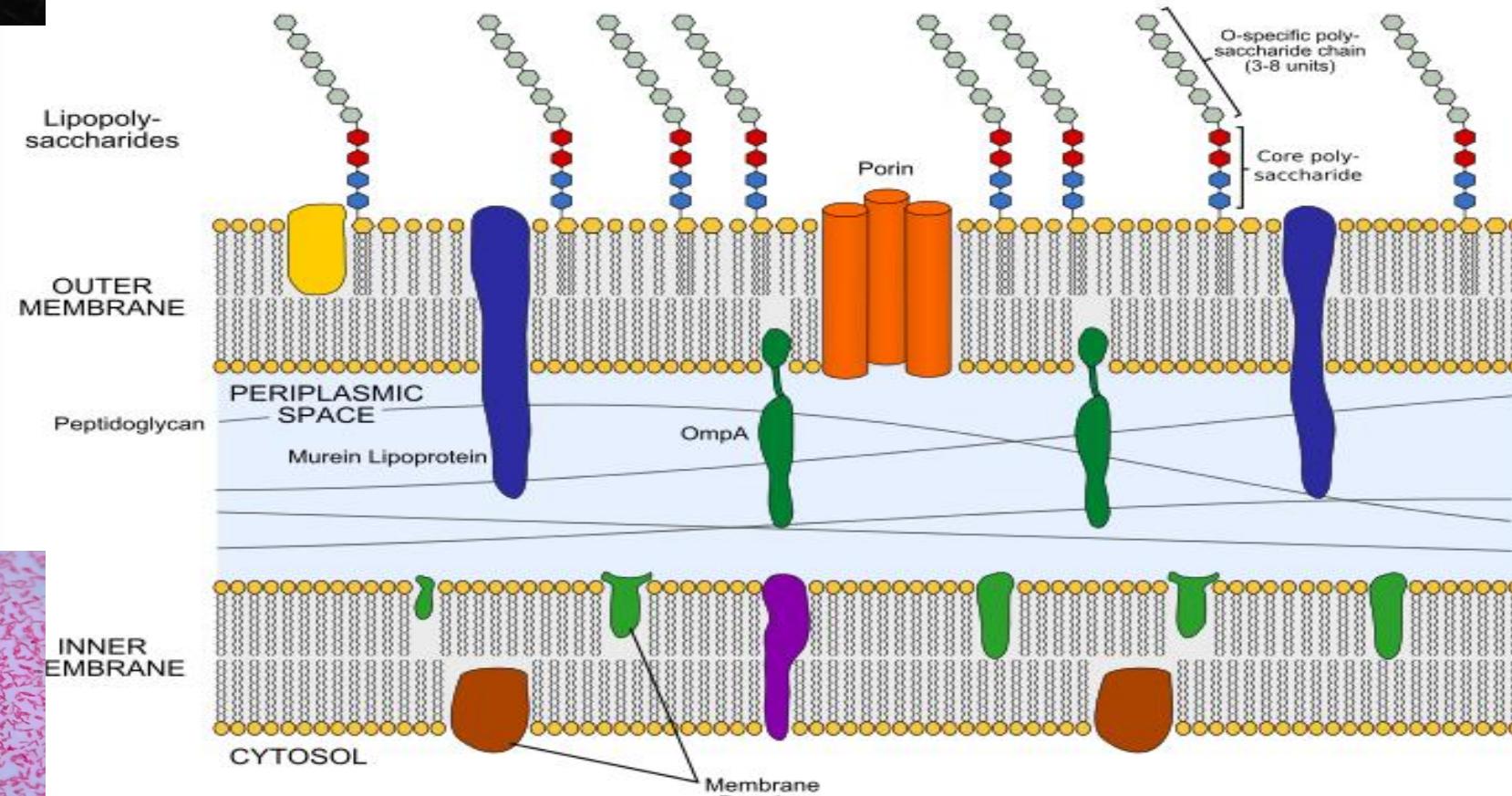


Flagell

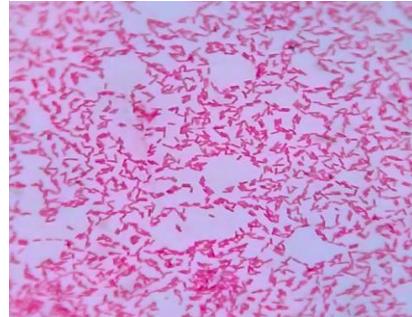
# Cellevegg



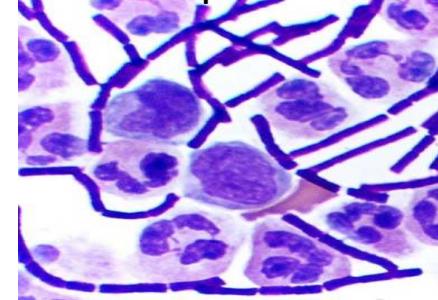
Pilier



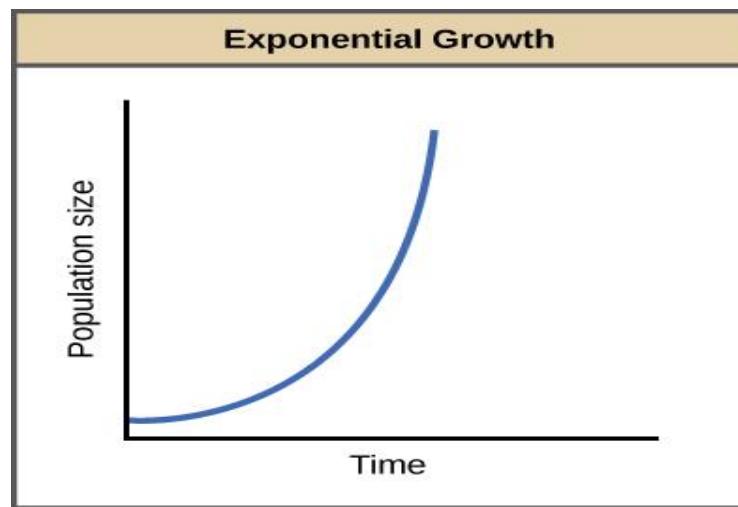
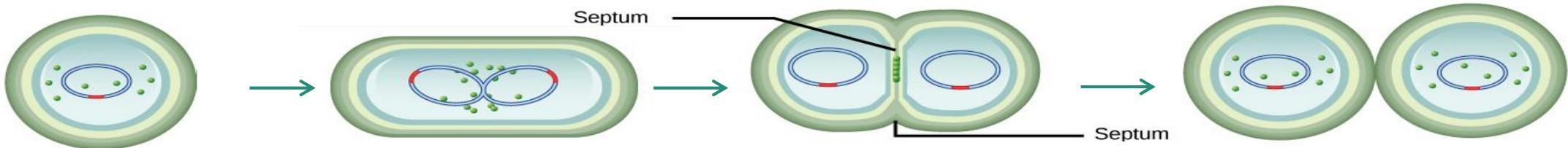
Gram-negativ



Gram-positiv

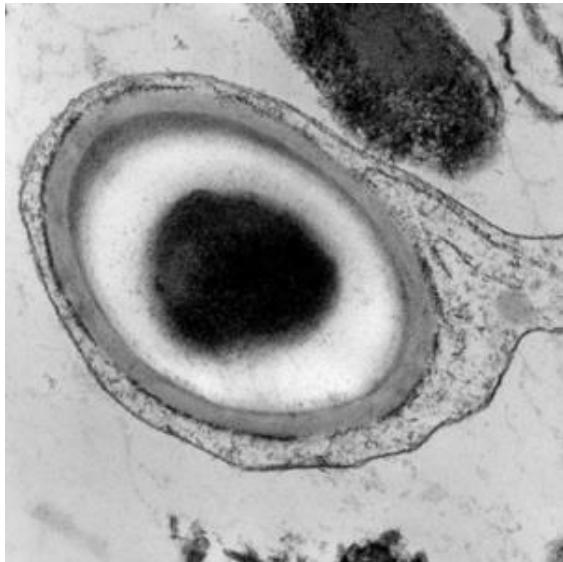


# Formering



# Bakteriers overlevelsesmekanismer

Biofilm



Sporedannelse

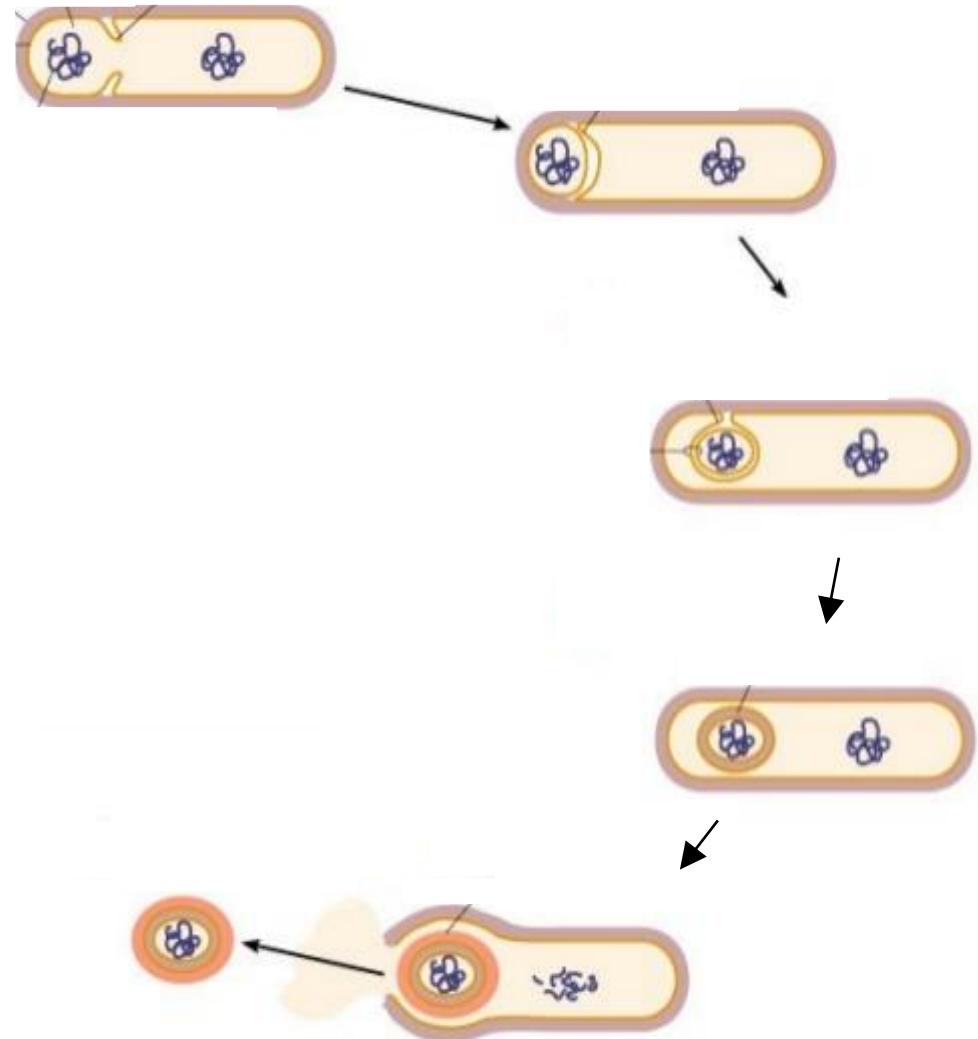


Antibiotikaresistens



# Bakteriesporer

- Enkelte bakterier kan danne sporer når vekstforholdene blir dårlige
- Ekstremt motstandsdyktige mot tørke, varme, stråling og giftstoffer – inkludert noen desinfeksjonsmidler
- Kan overleve i årevis uten noen form for næring



<https://en.wikipedia.org/wiki/>

# Biofilm

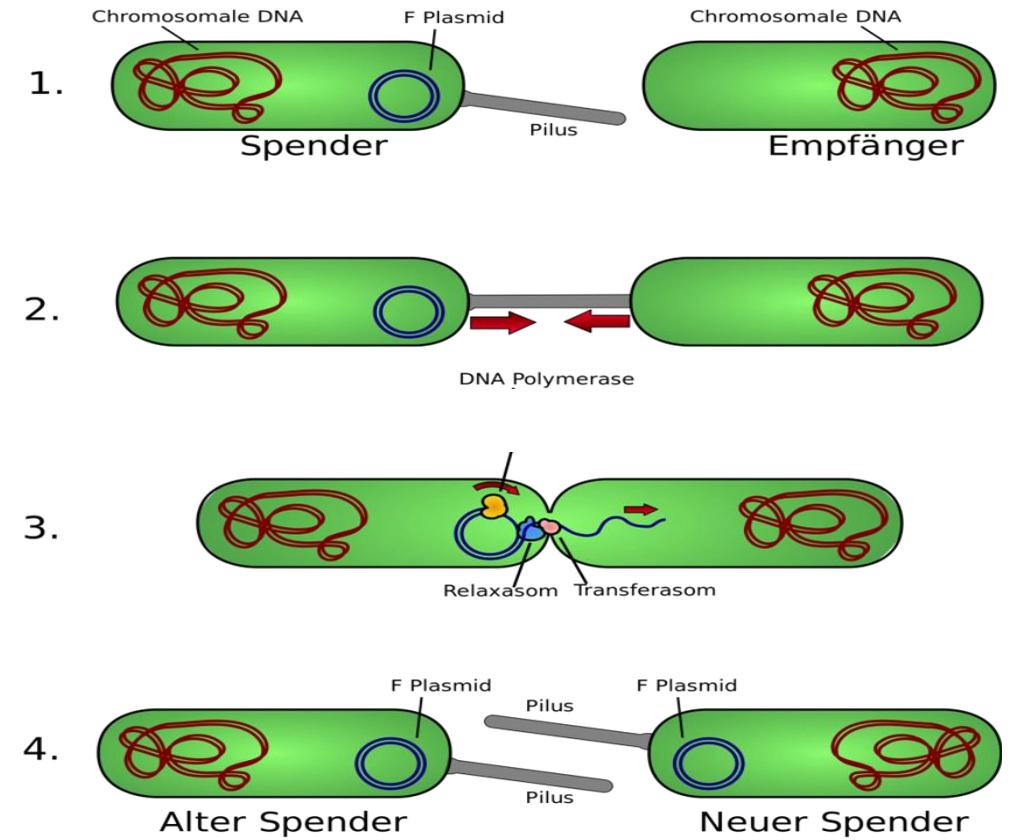
- Belegg av mange forskjellige typer bakterier som fester seg til underlag og danner en glatt overflate
- Kan dannes på medisinsk utstyr som katetre og endoskop, i vannrør, kjøletårn osv.
- Mikroorganismene festes tett sammen i en matriks som gjør at biofilmen blir svært vanskelig å fjerne med desinfeksjonsmidler, må derfor ofte fjernes mekanisk



By Ustil (Own work) [CC BY-SA 3.0 de (<https://creativecommons.org/licenses/by-sa/3.0/de/deed.en>)], via Wikimedia Commons

# Antibiotikaresistens

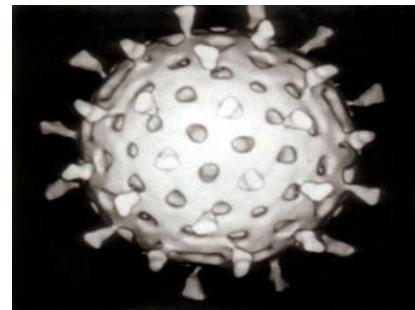
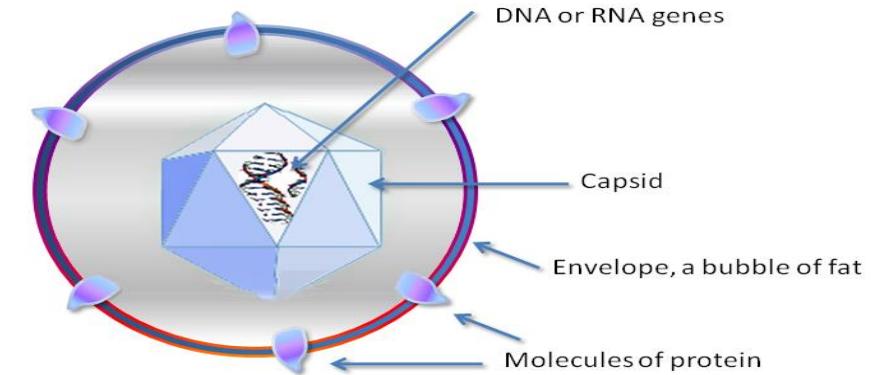
- Bakterier som motstår virkningen av antibiotika
- Antibiotikaresistens kan oppstå:
  - Naturlig
  - Ervervet
    - Genoverføring
    - Mutasjoner



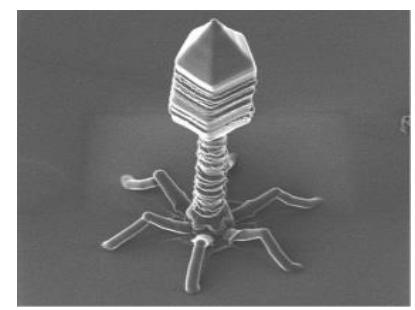
[https://de.wikipedia.org/wiki/Horizontaler\\_Gentransfer](https://de.wikipedia.org/wiki/Horizontaler_Gentransfer)

# Virus

- Kan infisere alle livsformer
- Størrelse: 0,02- 0,3 µm
- Kan ikke sees i vanlig lysmikroskop
- Enkel struktur:
  - DNA/RNA
  - Proteinkapsel
  - (Lipidkappe)
- Virus er avhengig av en levende celle for å formere seg
- Virus uten lipidkappe er vanskeligere å inaktivere



Rotavirus

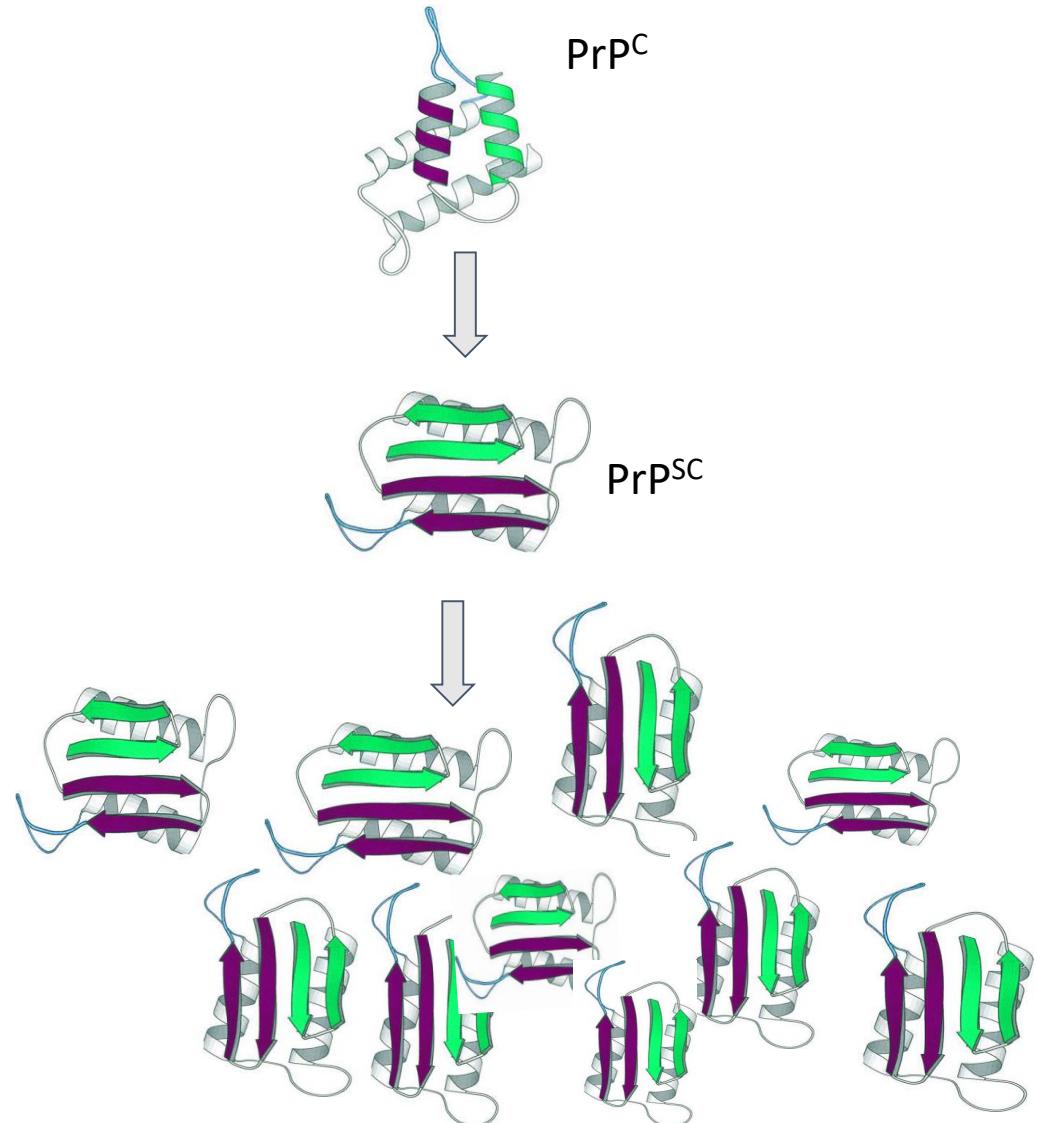


Bakteriofag

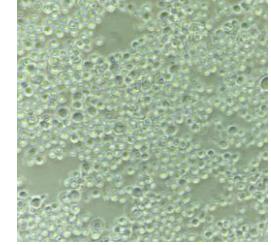
[https://en.wikipedia.org/wiki/File:Virus\\_stucture\\_simple.png#filelinks](https://en.wikipedia.org/wiki/File:Virus_stucture_simple.png#filelinks)

# Prioner

- Proteiner som finnes hos organismer med cellekjerne
- Er kun farlig i «unormal» form
- Kan oppstå spontant, arves og overføres
- Kan ikke ødelegges med tradisjonelle steriliseringsmetoder



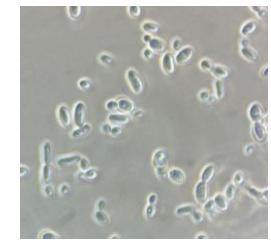
# Mikroskopiske sopper



- Overflatiske soppinfeksjoner – dermatofytter og gjærsopp
- Subkutane soppinfeksjoner
- Sopper som gir dype infeksjoner

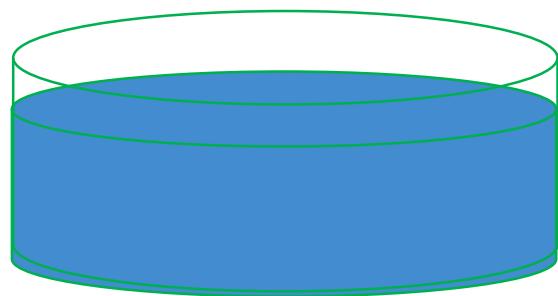
Inhalering, hudkontakt eller sår

- Infeksjon i hud og slimhinner
  - Fotsopp, ringorm
- Allergi
- Respiratoriske problemer
- Systemiske soppinfeksjoner
  - Alvorlige lidelser som angriper indre organer, oftest hos immunsupprimerte



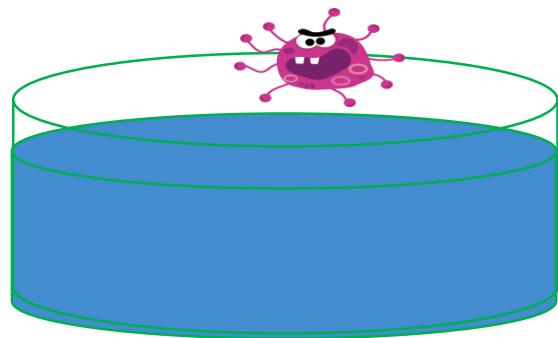
# Én bakterie er vel ikke så farlig?

# Én bakterie er vel ikke så farlig?



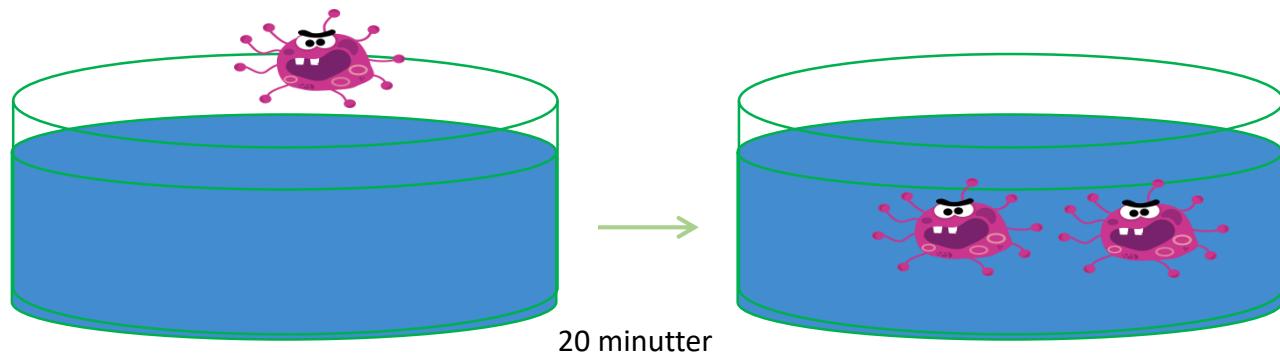
Pixabay.com

# Én bakterie er vel ikke så farlig?



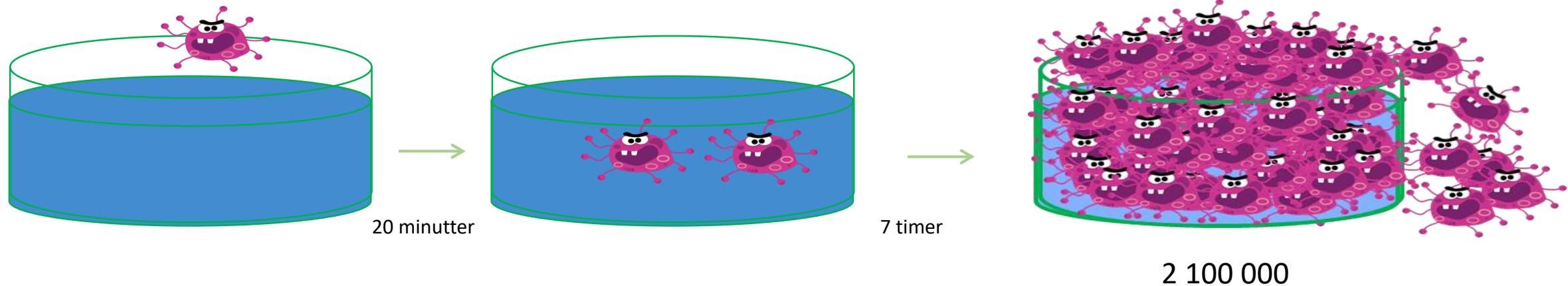
Pixabay.com

# Én bakterie er vel ikke så farlig?



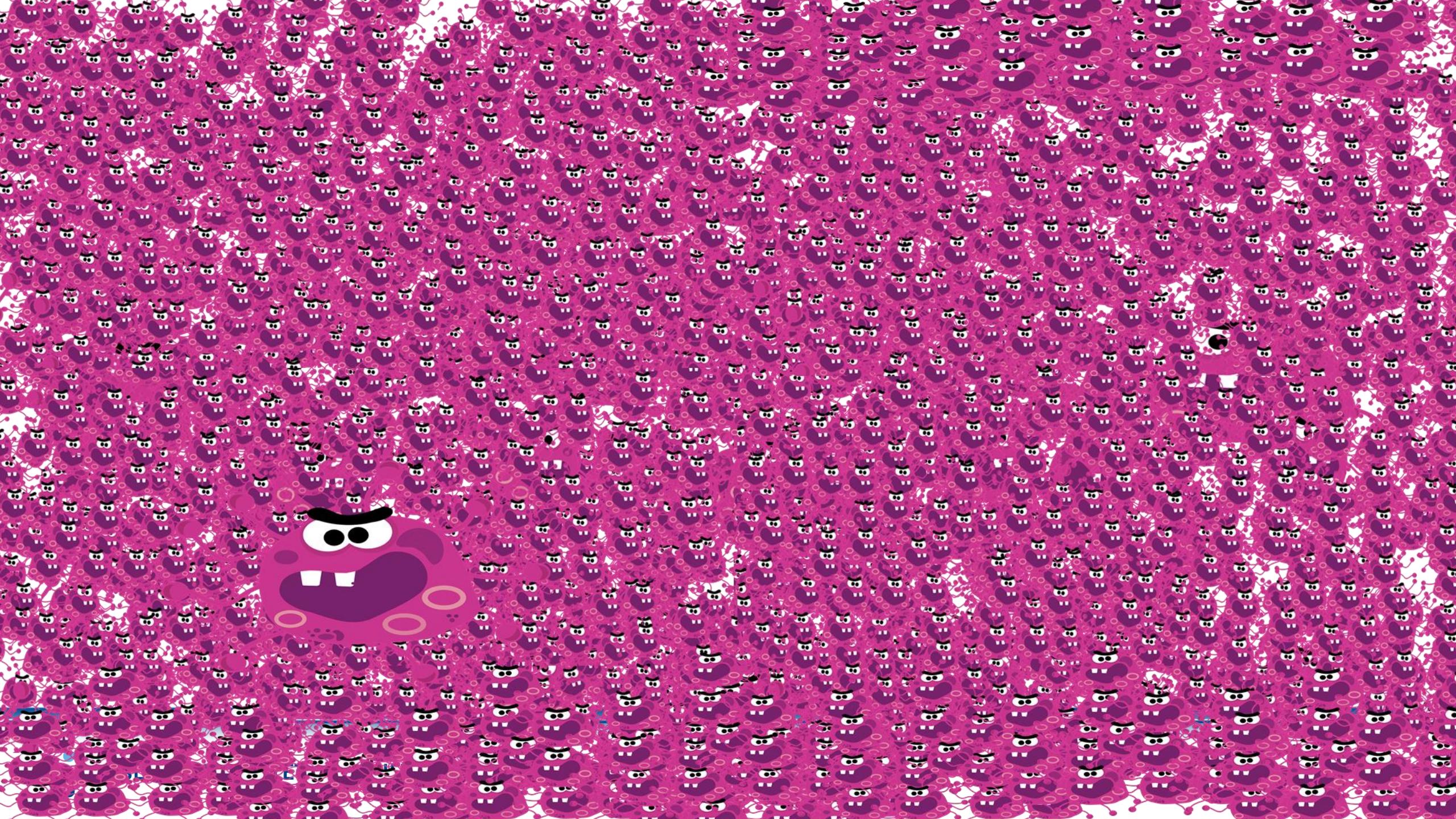
Pixabay.com

# Én bakterie er vel ikke så farlig?



Pixabay.com

# 24 timer senere ...



4 700 000 000 000 000 000



# Korrekt dekontaminering tar knekken på alle mikrober...



Free svg, pixabay, needpix

# Korrekt dekontaminering tar knekken på alle mikrober...



... både «slemme» og «snille»

Free svg, pixabay, needpix