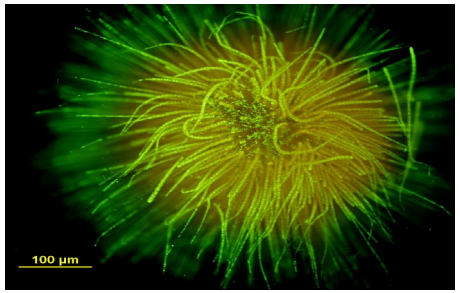
Grunnleggende mikrobiologi



Line Nateland

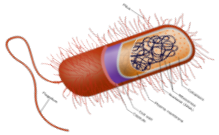
Grunnkurs i dekontaminering 21.11.2024

Mikrobiologi

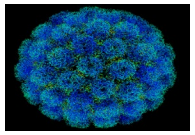
Vitenskapen om mikroorganismer

Mikroorganismer

Bakterier

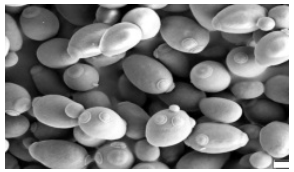


Protozoa



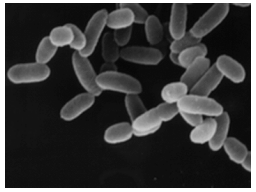
Virus

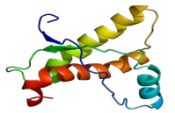
Selvstendige livsformer man ikke kan se med det blotte øye



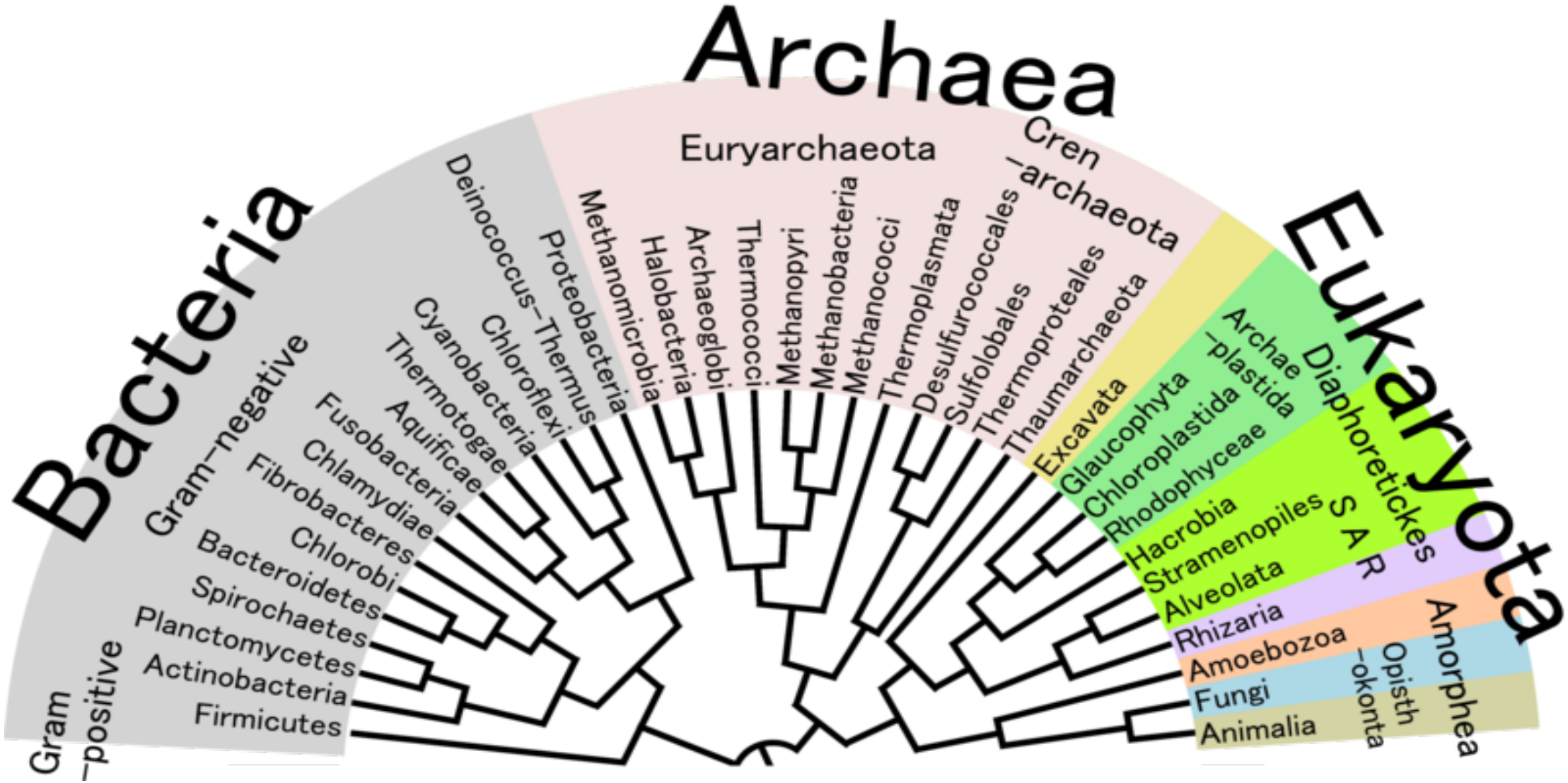
Mikroskopiske sopper

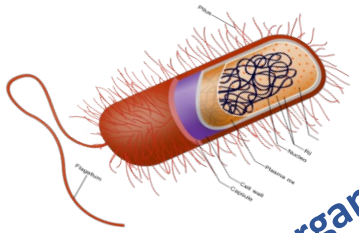
Arkebakterier



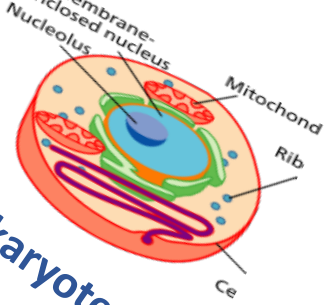


Prioner





Prokaryote organismer



Eukaryote organismer

Archaea

Euryarchaeota

Cren
-archaeota

Bacteria

Gram
-positive

Gram-negative

Deinococcus–Thermus

Proteobacteria

Methanomicrobia

Halobacteria

Archaeoglobi

Thermococci

Methanopyri

Methanobacteria

Methanococci

Thermoplasmata

Desulfurococcales

Sulfolobales

Thermoproteales

Thaumarchaeota

Chloroflexi

Cyanobacteria

Thermotogae

Aquificae

Fusobacteria

Chlamydiae

Fibrobacteres

Chlorobi

Bacteroidetes

Spirochaetes

Planctomycetes

Actinobacteria

Firmicutes

Eukaryota

Excavata

Archae
-plastida

Glaucophyta

Chloroplastida

Rhodophyceae

Diaphoretickes

S A R

Hacrobia

Stramenopiles

Alveolata

Rhizaria

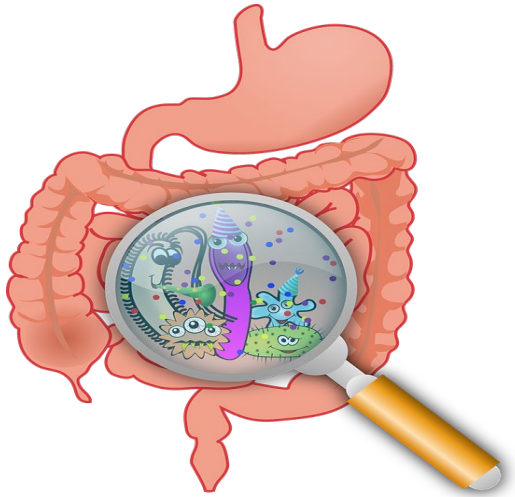
Amoebozoa

Amorphea

Opisth
-okonta

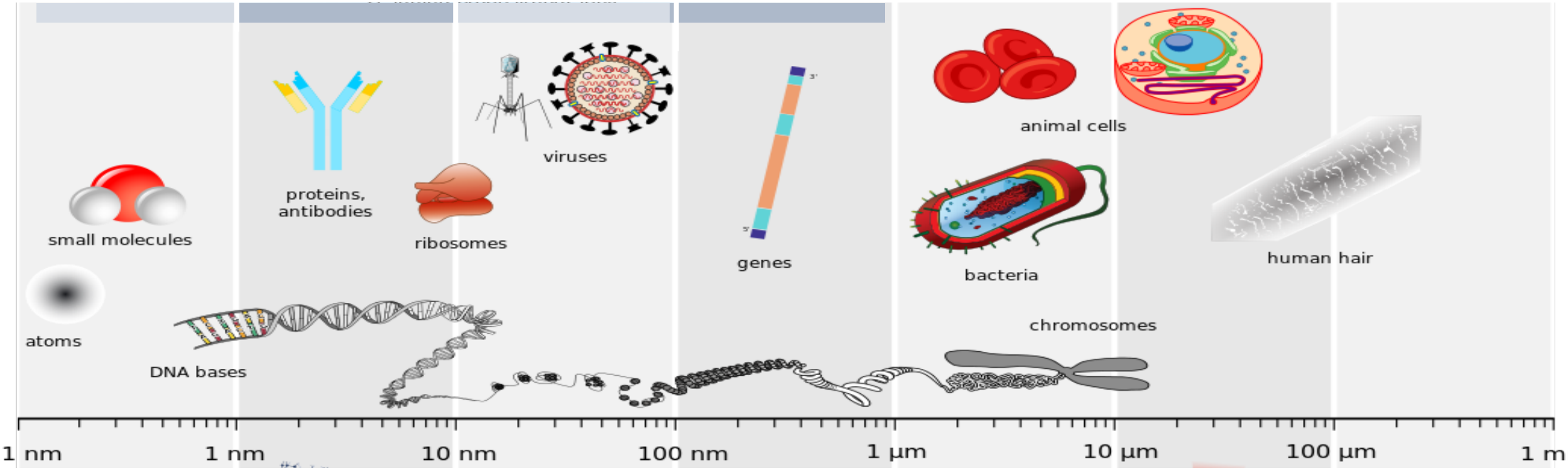
Fungi

Animalia

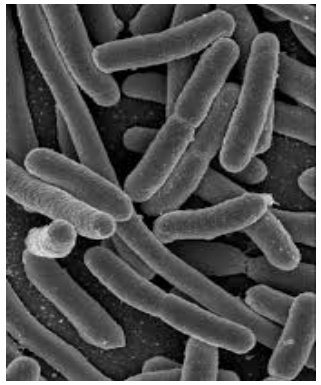


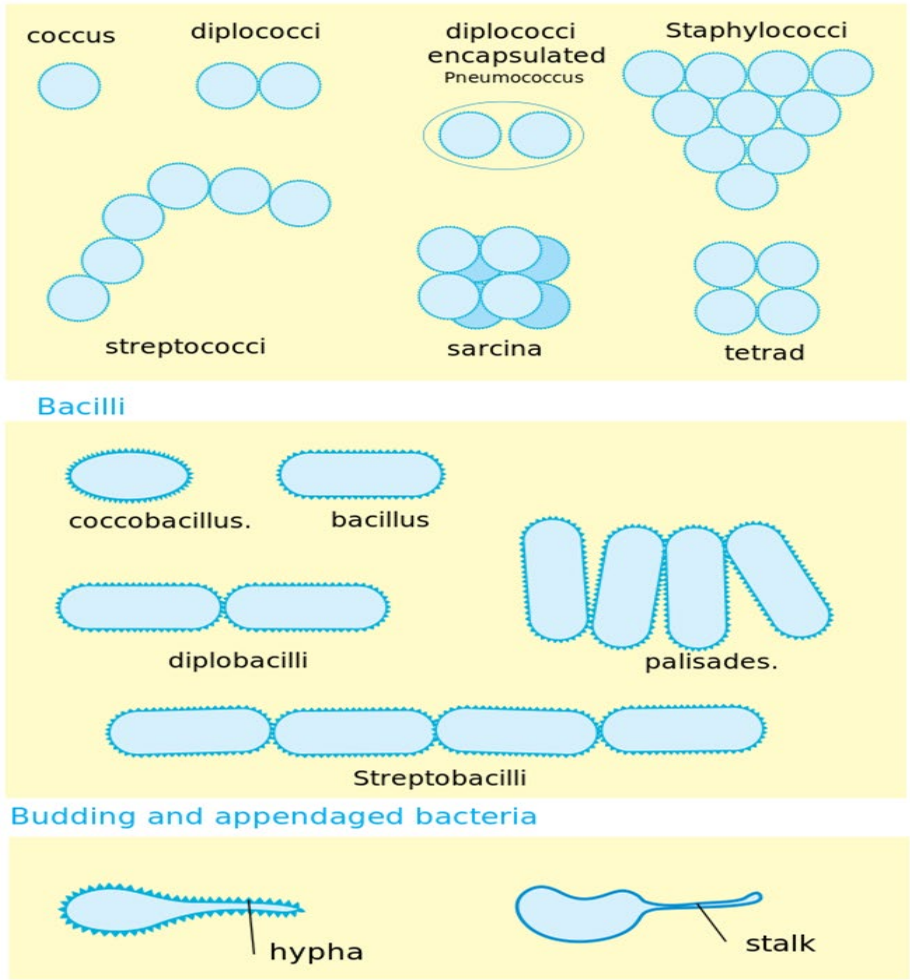
Flickr.com: Beer sampler – Quinn Dombrowski, Wholemeal bread | by treehouse1977 , 02 sauerkraut | by jasonlam , pixabay.com, medicalgraphics.de, commons.wikimedia.org

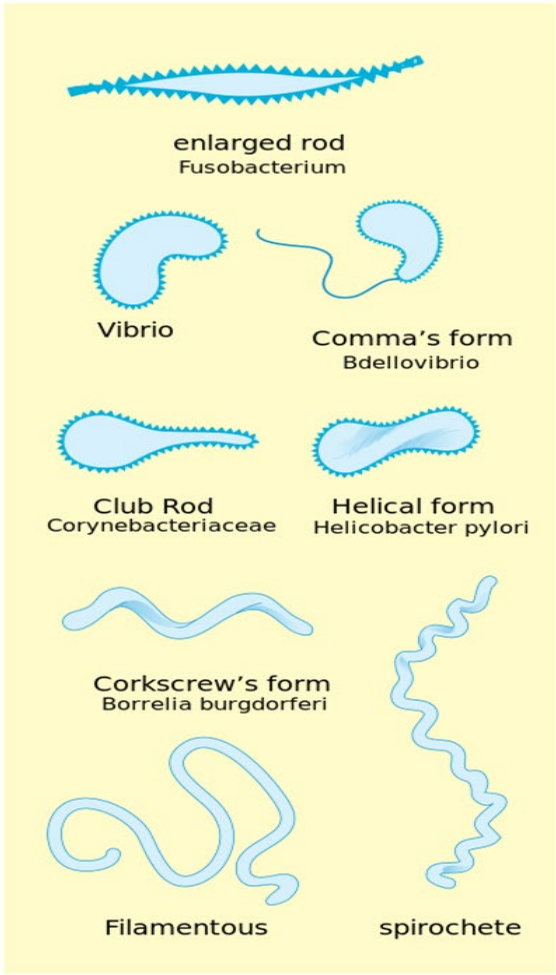
Størrelse

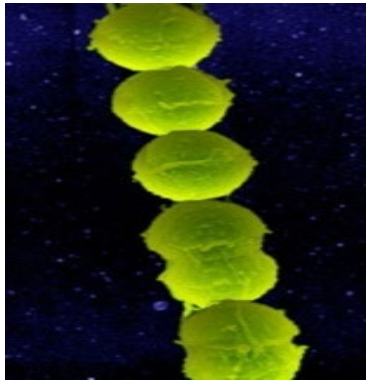

small molecules
proteins, antibodies
ribosomes
viruses
genes
animal cells
bacteria
human hair
atoms
DNA bases
chromosomes
0.1 nm
1 nm
10 nm
100 nm
1 µm
10 µm
100 µm
1 mm

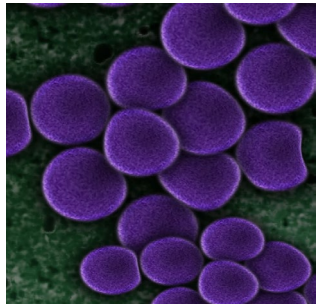
Struktur

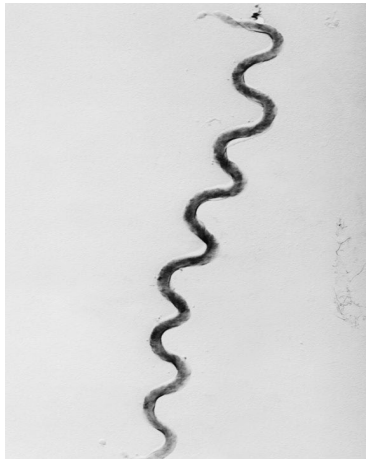






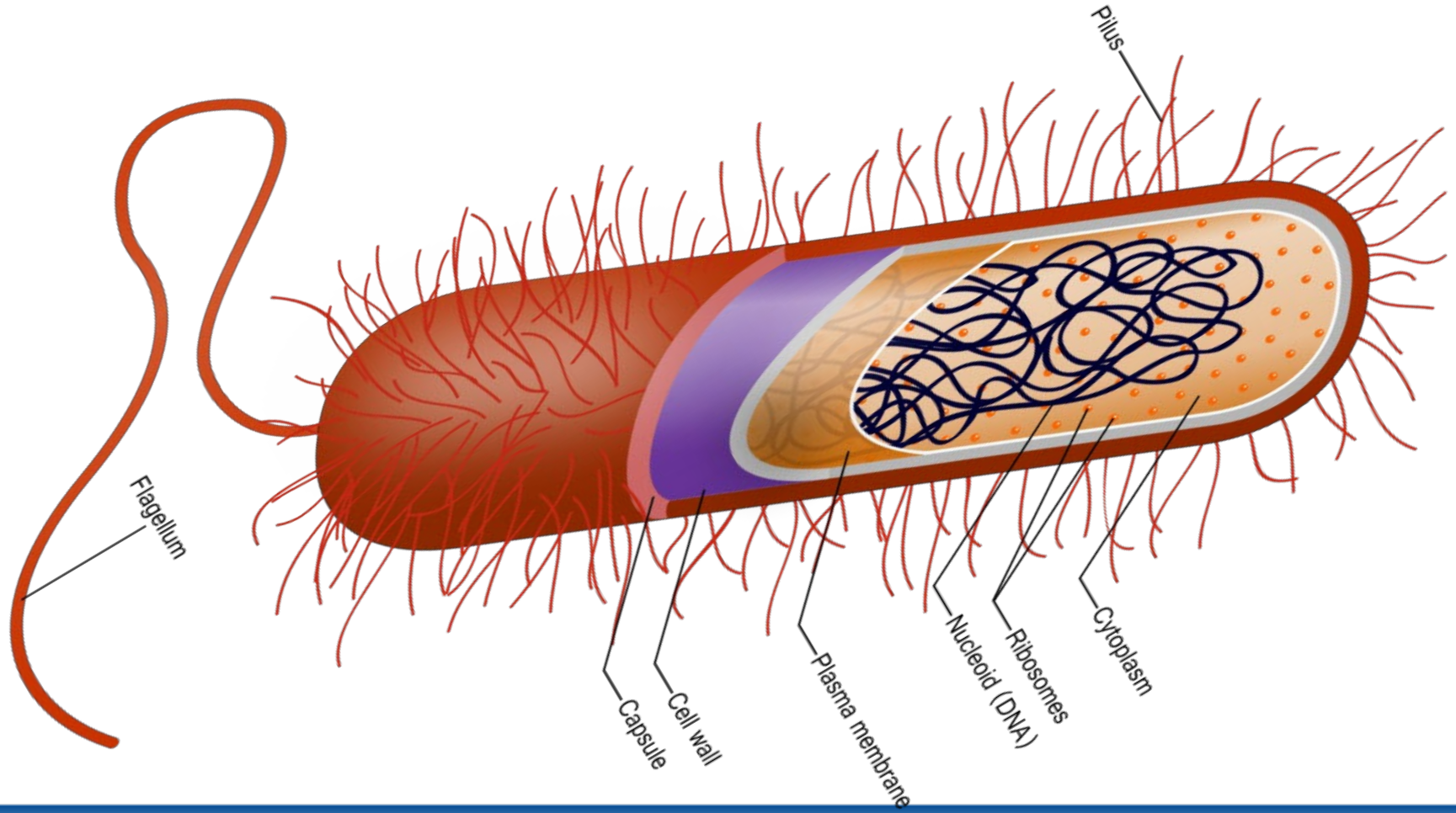




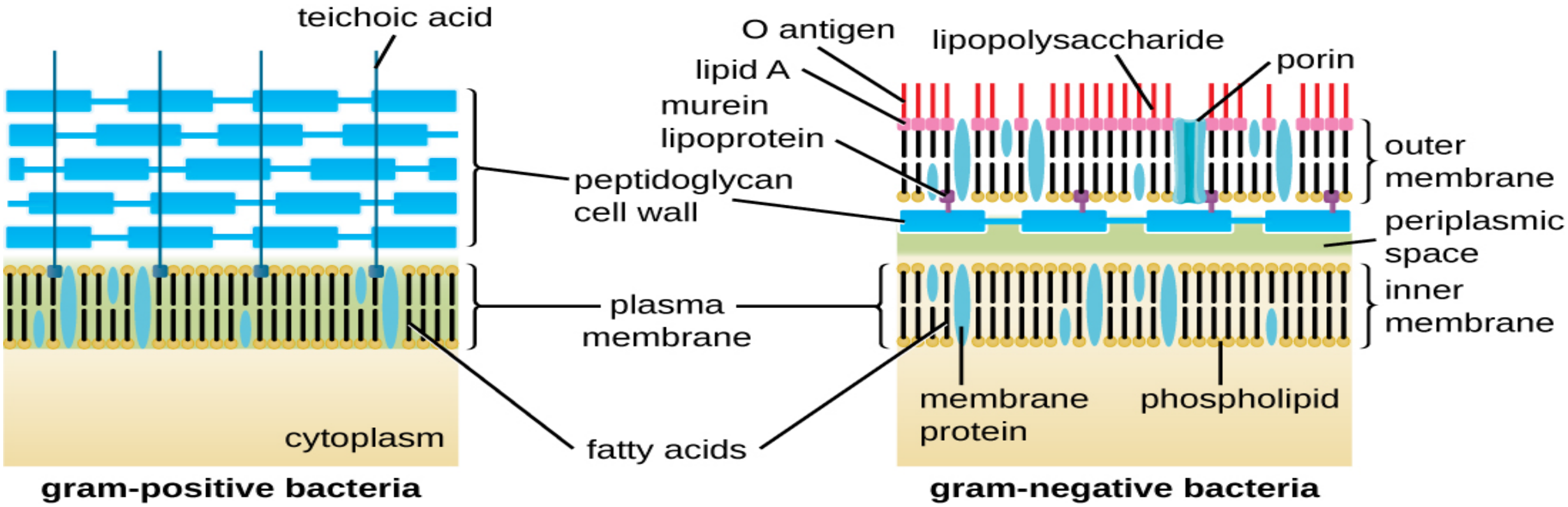


https://en.wikipedia.org/wiki/Bacterial_cellular_morphologies, flickr.com, pixabay

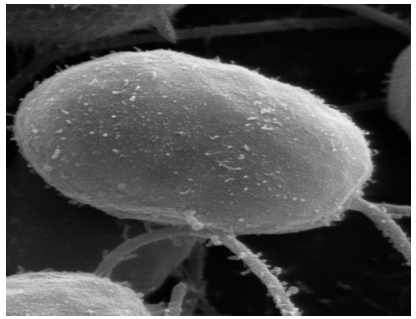
Struktur



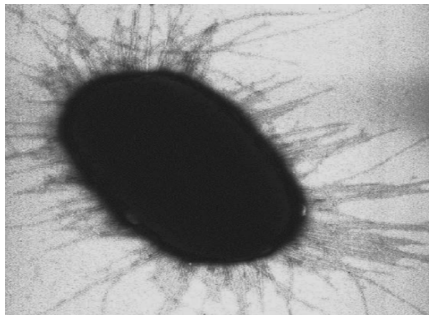
Cellevegg



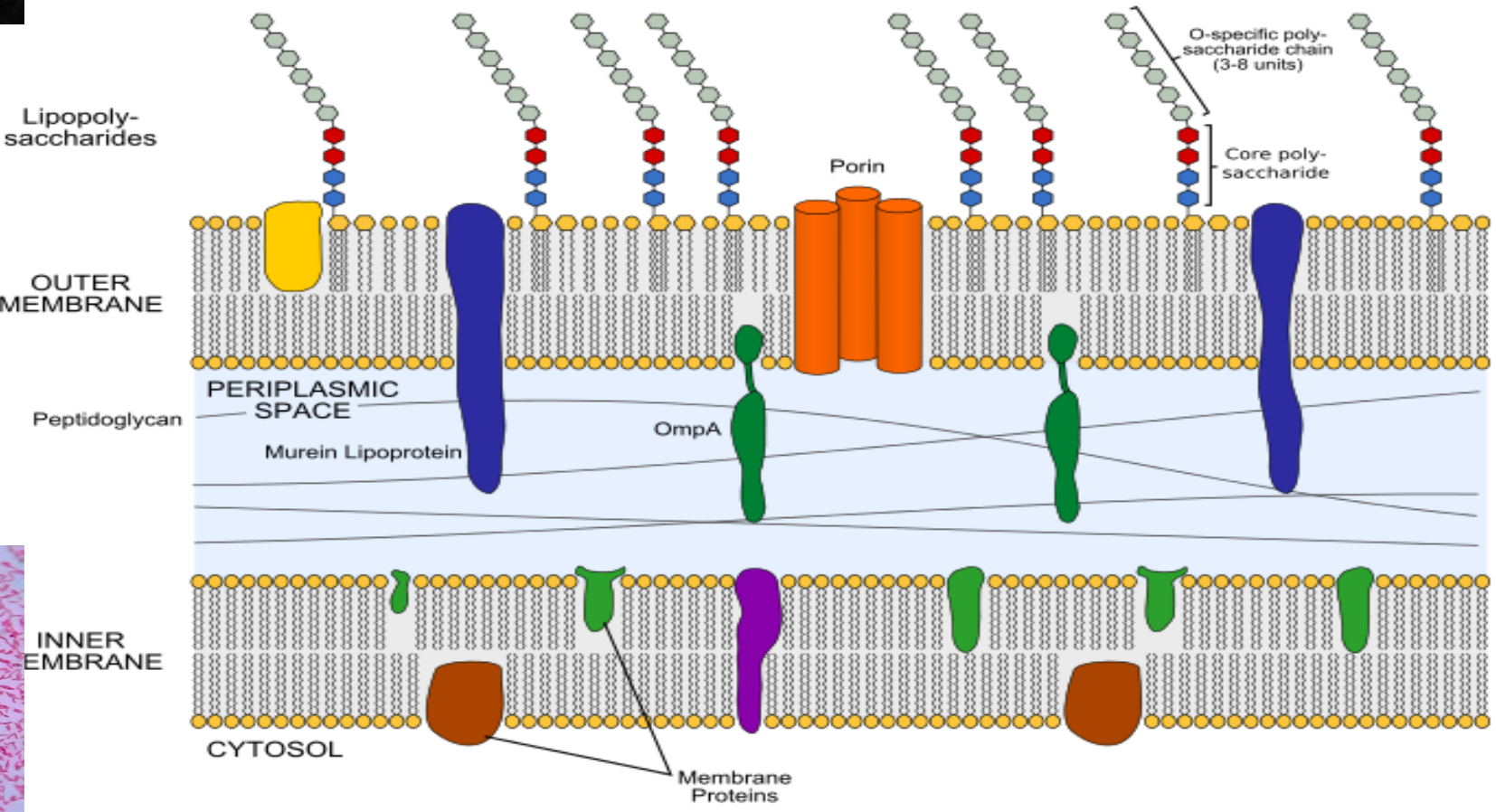
Cellevegg



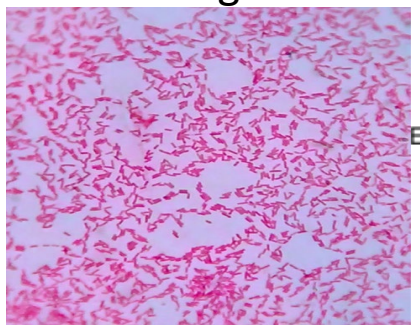
Flagell



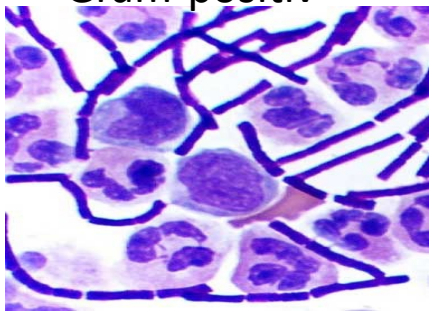
Pilier



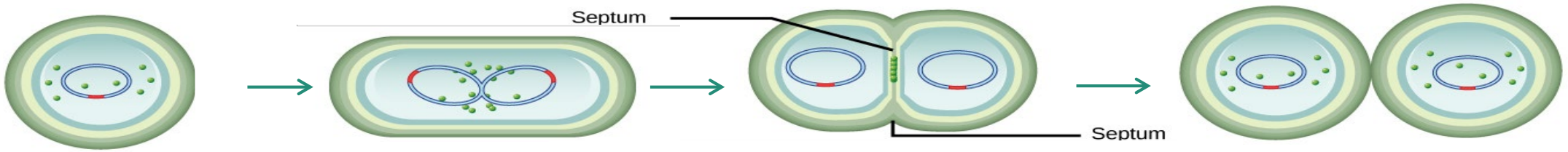
Gram-negativ

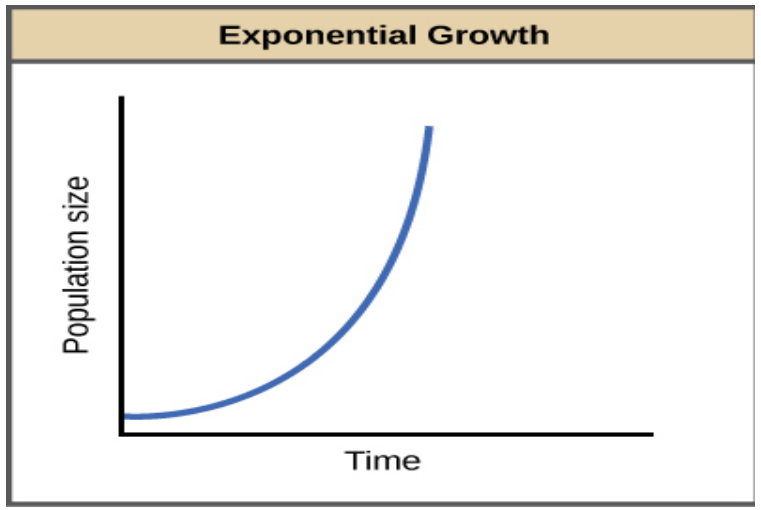


Gram-positiv



Formering

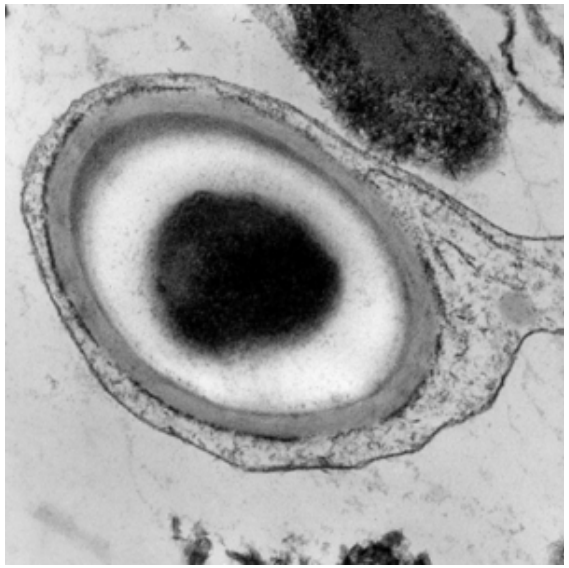




By CNX OpenStax [CC BY 4.0 (http://creativecommons.org/licenses/by/4.0)], via Wikimedia Commons, By CNX OpenStax [CC BY 4.0 (http://creativecommons.org/licenses/by/4.0)], via Wikimedia Commons

Bakteriers overlevelsesmekanismer

Biofilm

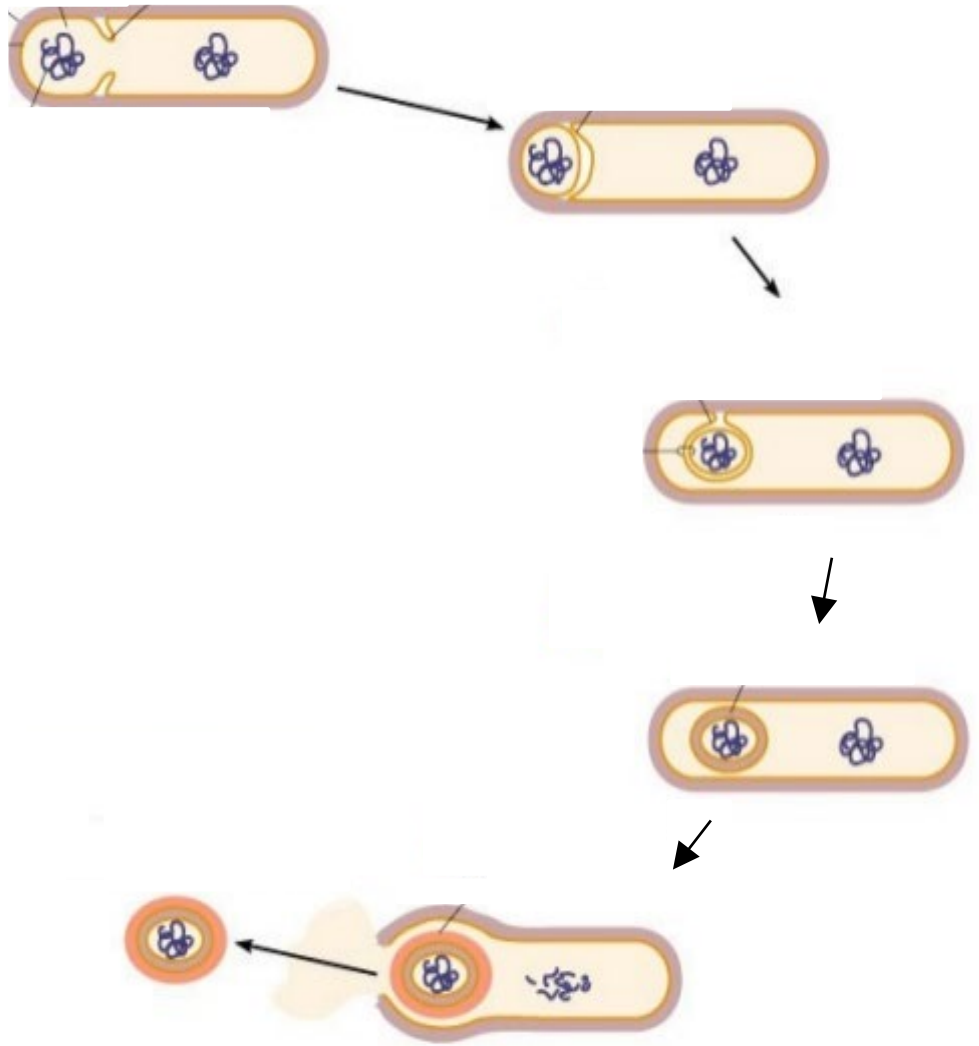


Sporedannelse

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



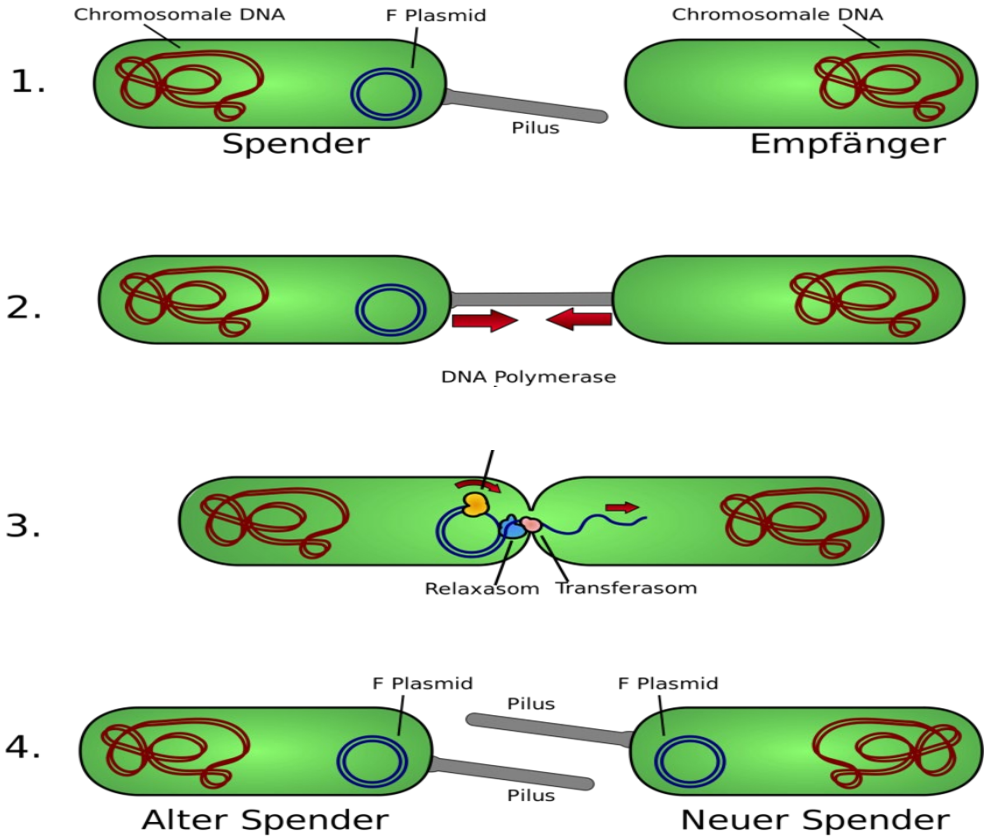
https://en.wikipedia.org/wiki/

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

Antibiotikaresistens

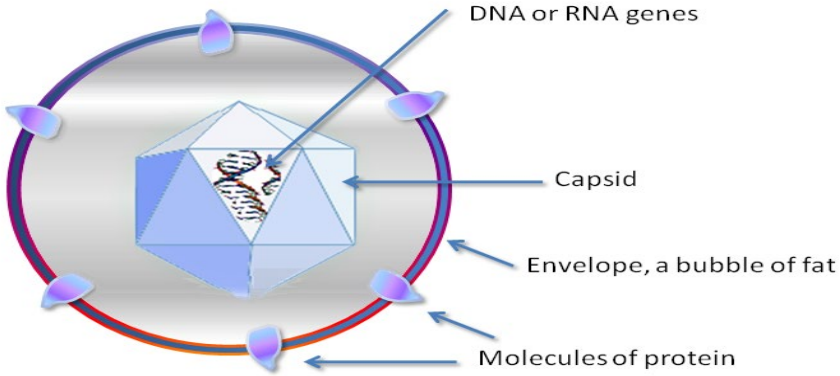
- Bakterier som motstår virkningen av antibiotika
- Antibiotikaresistens kan oppstå:
  - Naturlig
  - Ervervet
    - Genoverføring
    - Mutasjoner

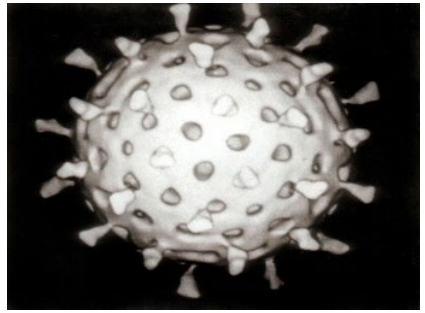


https://de.wikipedia.org/wiki/Horizontaler_Gentransfer

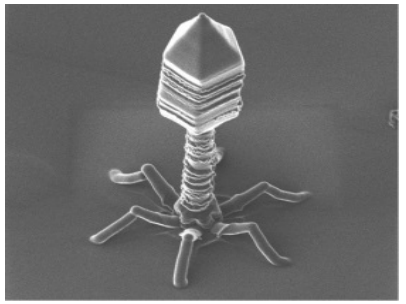
Virus

- 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

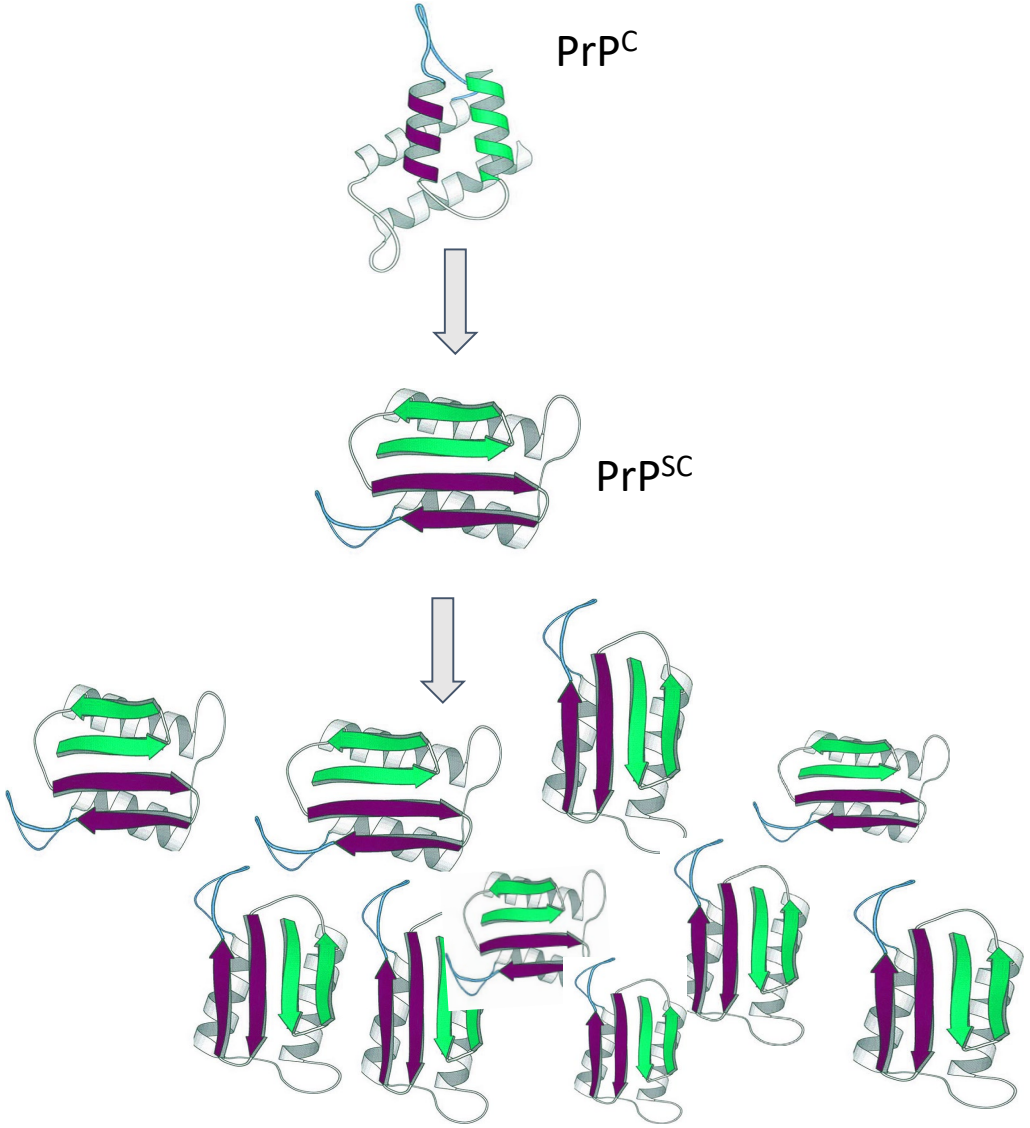


Bakteriofag

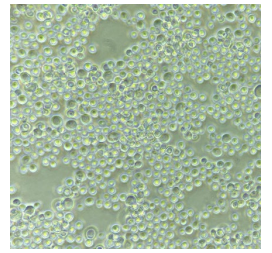
https://en.wikipedia.org/wiki/File:Virus_stucture_simple.png#filelinks

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



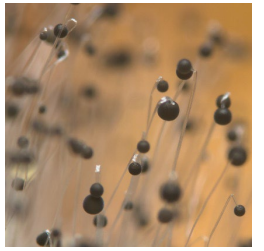
Mikroskopiske sopper

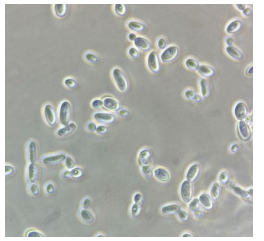


- Overflatiske soppinfeksjoner – dermatofytter og gjærsopp
- Subkutane soppinfeksjoner
- Sopper som gir dype infeksjoner

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





https://commons.wikimedia.org/wiki/File:Sporangia_of_mucor.jpg, <a title="Michael Antoni, CC BY-SA 4.0 <https://creativecommons.org/licenses/by-sa/4.0>, via Wikimedia Commons" href="https://commons.wikimedia.org/wiki/File:Sporangia_of_mucor.jpg"><img width="512" alt="Sporangia of mucor" src="https://upload.wikimedia.org/wikipedia/commons/thumb/2/25/Sporangia_of_mucor.jpg/512px-Sporangia_of_mucor.jpg">

Korrekt dekontaminering tar knekken på alle mikrober…

Free svg, pixabay, needpix

Korrekt dekontaminering tar knekken på alle mikrober…

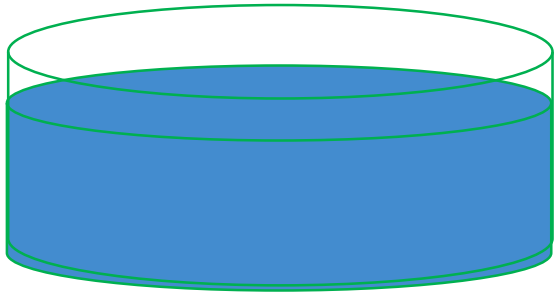
… både «slemme» og «snille»

Free svg, pixabay, needpix

Én bakterie er vel ikke så farlig?

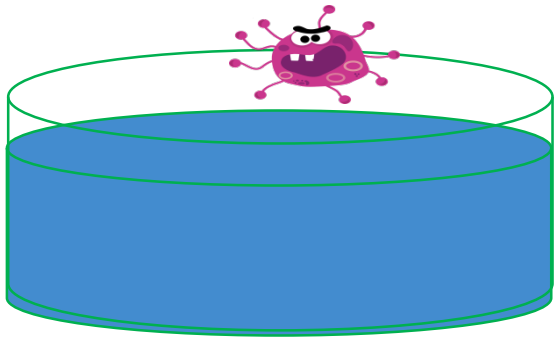
Pixabay.com

Én bakterie er vel ikke så farlig?



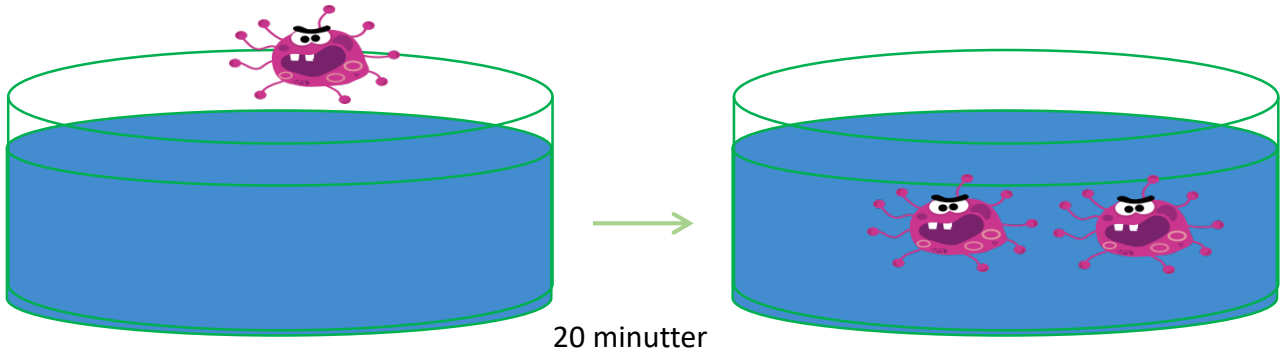
Pixabay.com

Én bakterie er vel ikke så farlig?



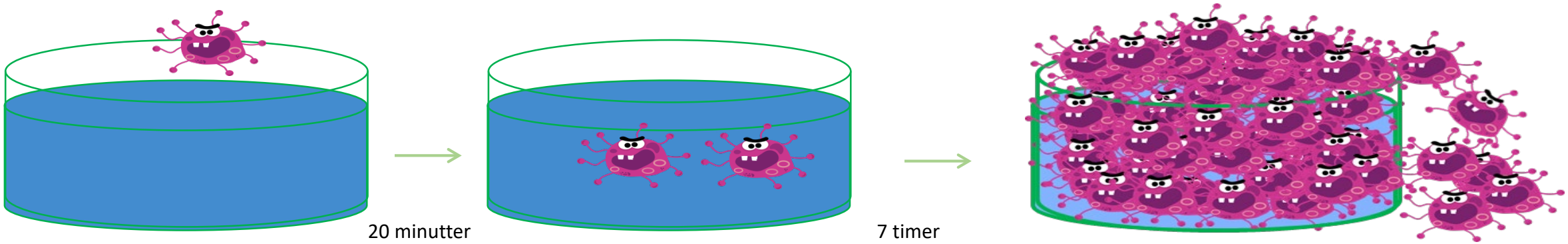
Pixabay.com

Én bakterie er vel ikke så farlig?



Pixabay.com

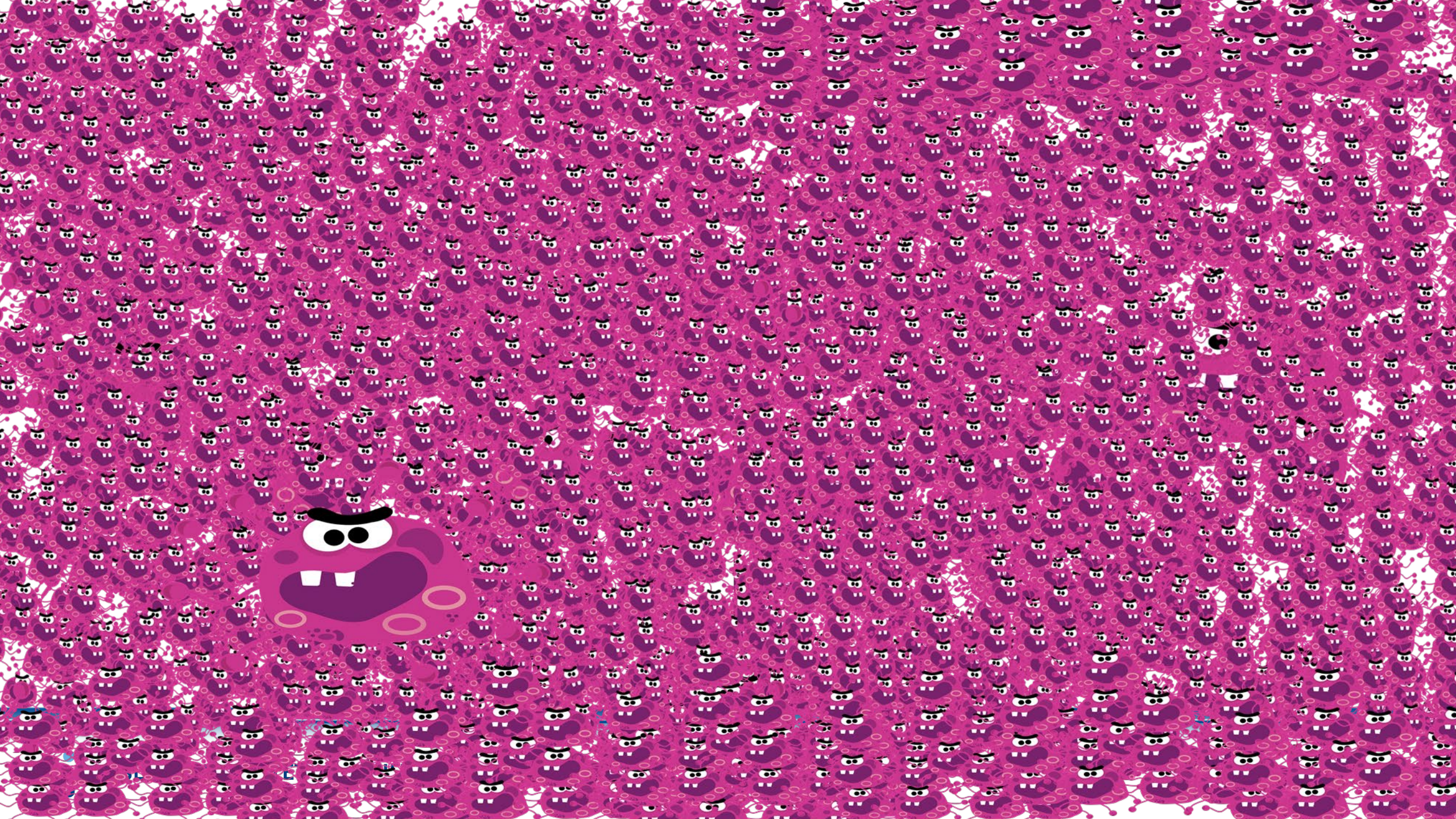
Én bakterie er vel ikke så farlig?

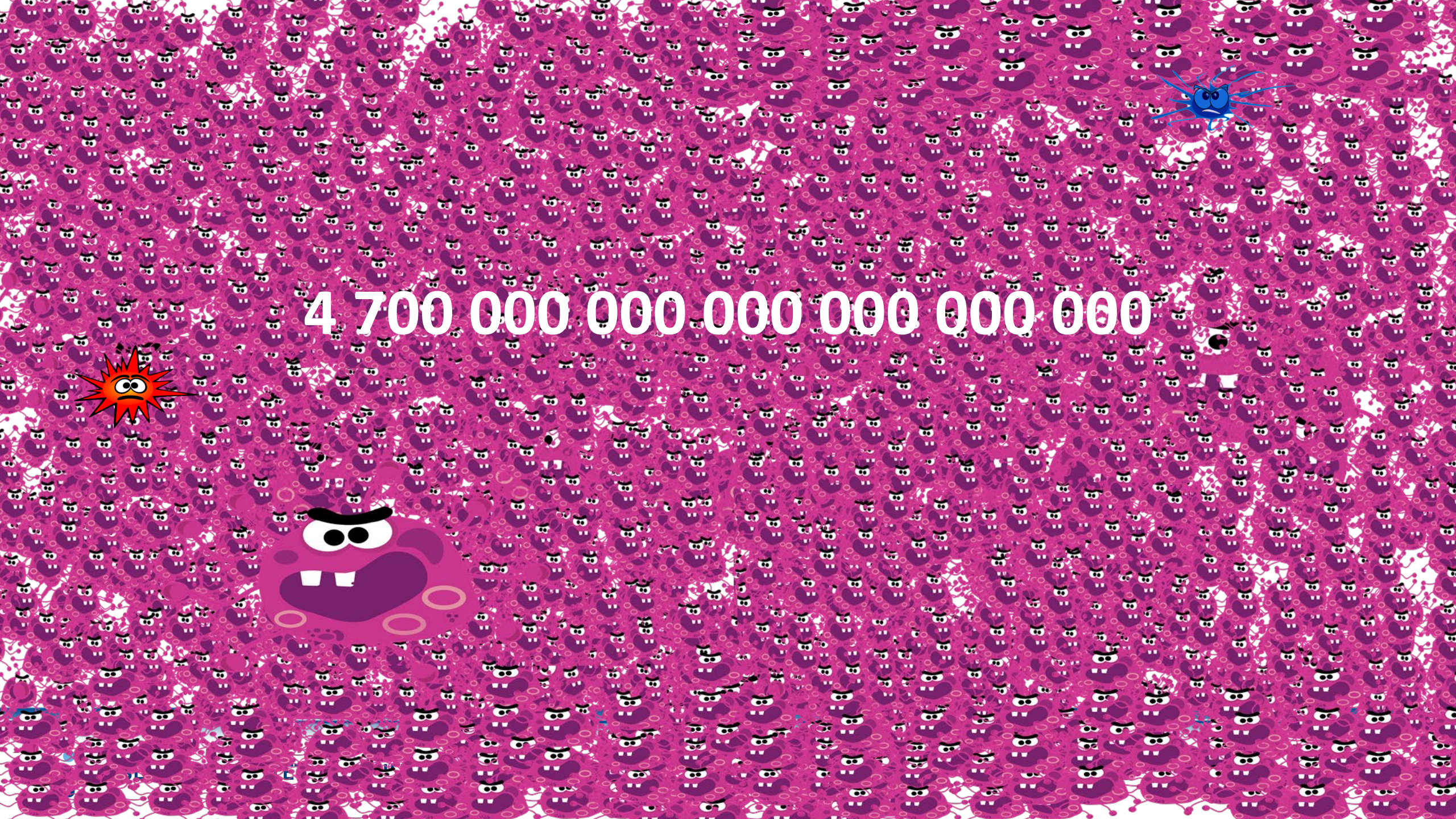


2 100 000

Pixabay.com

24 timer senere …




4 700 000 000 000 000 000 000