

# **General microbiology**

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## **Lecture-14**

### **Microbial diversity and groups**

# Content

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- Archaeobacteria
- Fungi
- Algae
- Viruses

# Archaeobacteria

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# Domain Archaea

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- *Archaea* share many characteristics with both *Bacteria* and *Eukarya*.
- Bioenergetics and metabolism of *Archaea* are similar to those found in *Bacteria*.
- Some major characteristics of *Archaea* include the absence of peptidoglycan in cell walls and the presence of ether-linked lipids.
- *Archaea* are very interesting group of prokaryotes and highly diverse.
- Include rods, cocci and helices but some are very unusual morphology.
- Some are gram-positive , others are gram-negative.
- Some may divide by binary fission , others by fragmentation or budding .

# Domain Archaea

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- Physiologically , archaea are found under extreme environmental conditions and No known pathogenic archaea.
- ***Extremophiles*** they include halophiles , thermophiles and acidophiles
- **Archaea** are split into two major groups:
  - ***Euryarchaeota***
  - ***Crenarchaeota***

# 1- Euryarchaeota

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## **Types of Euryarchaeota:**

- 1. Extremely Halophilic *Archaea*.** Have a requirement for high salt concentrations.
- 2. Methanogenic *Archaea*.** Microbes that produce CH<sub>4</sub>
- 3. *Thermoplasmatales*.** Thermophilic and/or extremely acidophilic, Chemoorganotrophs.

# 1- Euryarchaeota

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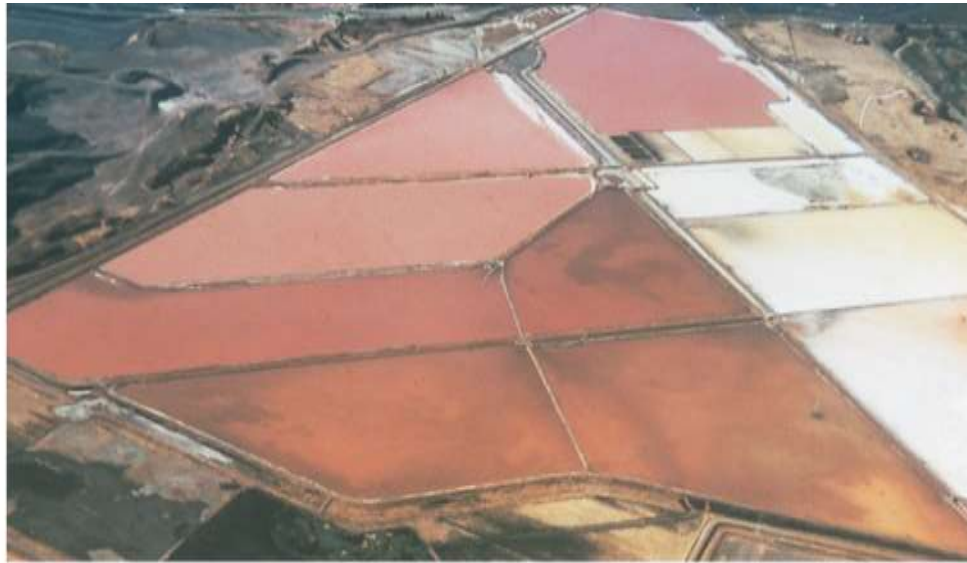
## Types of Euryarchaeota:

4. ***Thermococcales* and *Methanopyrus***. Indigenous to anoxic thermal waters, Highly motile.
5. ***Archaeoglobales***. Hyperthermophilic
6. ***Nanoarchaeum* and *Aciduliprofundum*** One of the smallest cellular organisms (~0.4  $\mu\text{m}$ ), Contains one of the smallest genomes known.

# 1. Extremely Halophilic *Archaea*

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Have a requirement for high salt concentrations. Typically require at least 1.5 M (~9%) NaCl for growth



ALA



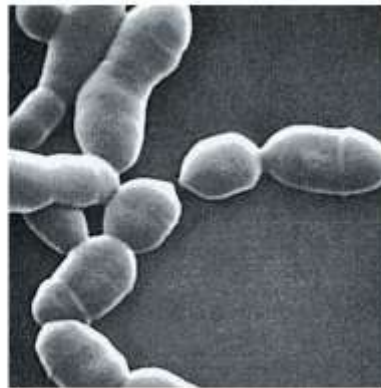
## 2. Methanogenic *Archaea* ميثانوجينيك أركيا

## 3. *Thermoplasmatales* ثيرموبلازماتالس



Alexander Zehnder

(a)



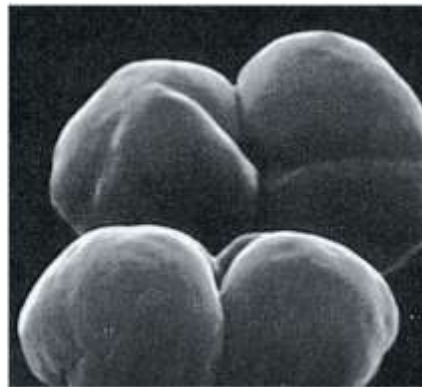
Alexander Zehnder

(b)



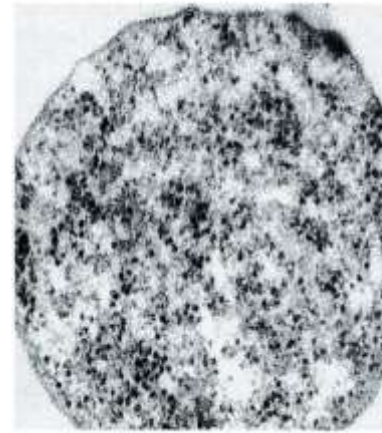
Alexander Zehnder

(c)



Alexander Zehnder

(d)



T. D. Brock

(a)



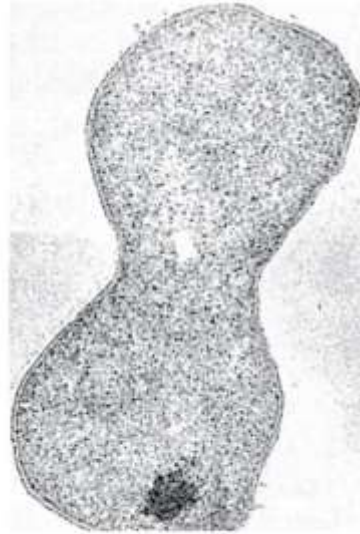
(b)

## 4. *Thermococcales* and *Methanopyrus*

ثيرموكوكالس و ميثانوبيرس



H. König and K. O. Stetter

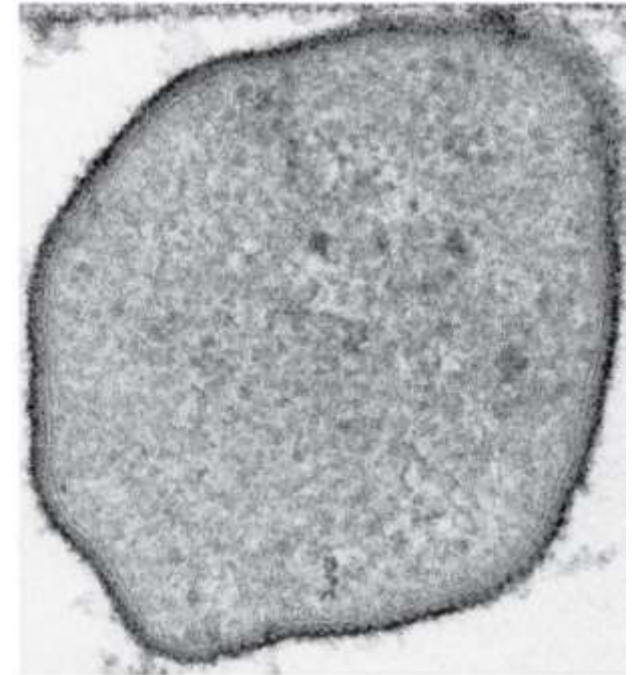


(b)

(a)

## 5. *Archaeoglobales*

أركيوجلوبالس

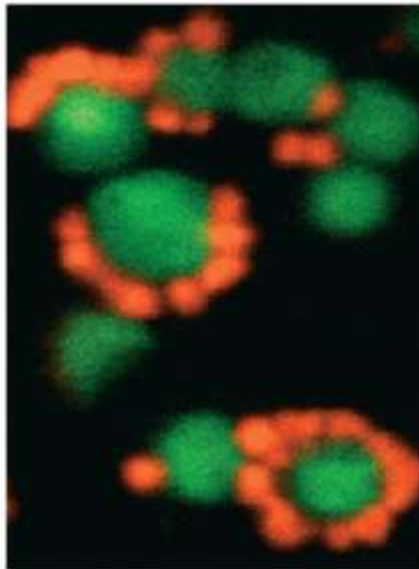


(a)

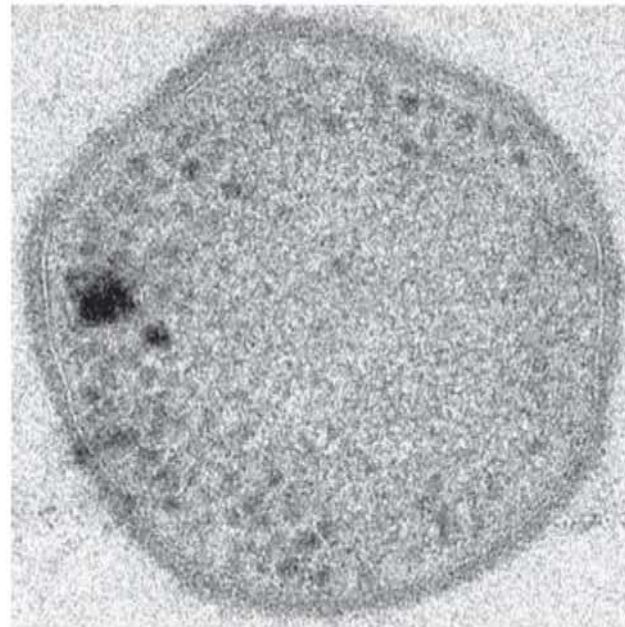
# 6. *Nanoarchaeum* and *Aciduliprofundum*

نانوركيم و أسيدوليبروفندم

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(a)



# *2-Crenarchaeota*

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- Inhabit temperature extremes
- Most cultured representatives are hyperthermophiles
- Found in extreme heat environments, other representatives found in extreme cold environments



T. D. Brock

(a)



T. D. Brock

(b)



T. D. Brock

(c)



T. D. Brock

(d)

ANY  
QUESTIONS  
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