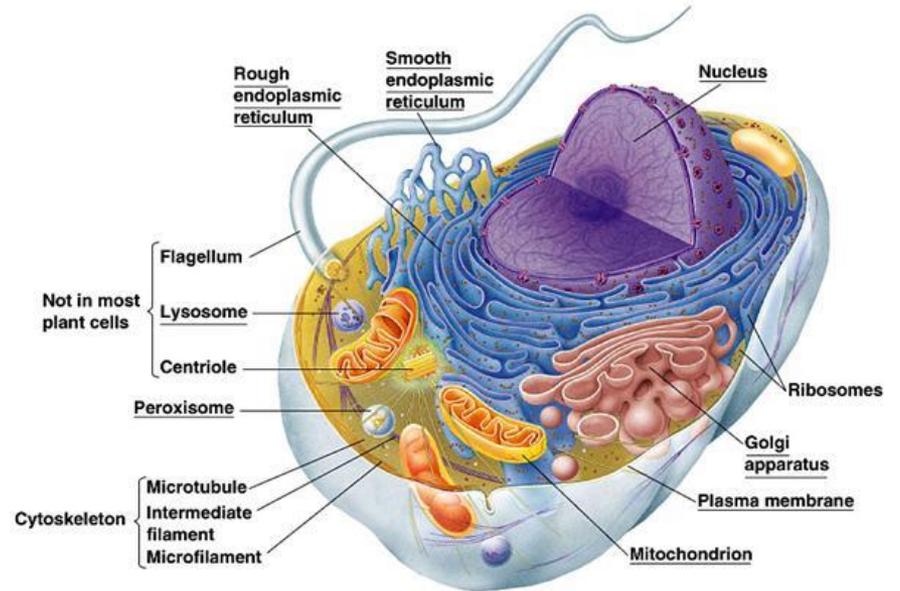
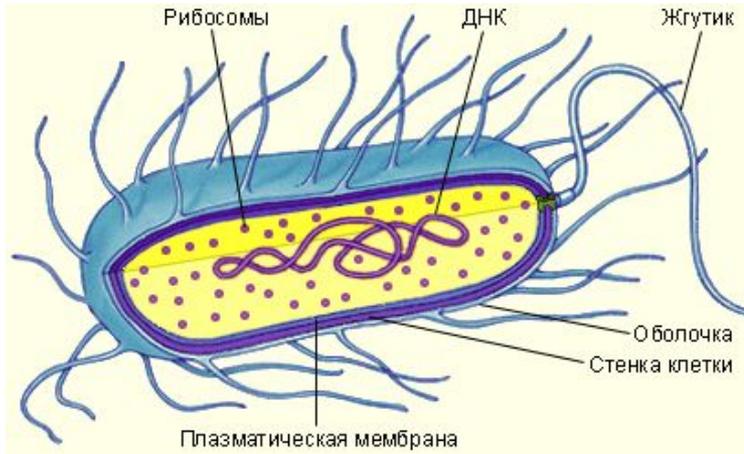


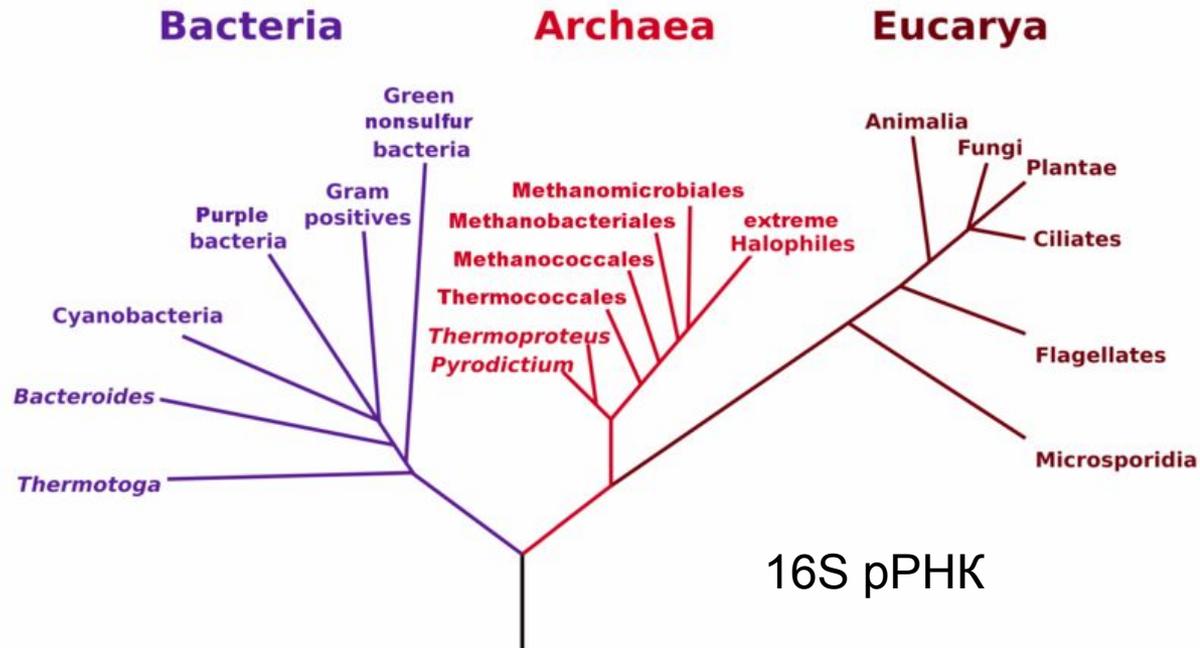
# Прокариотическая и эукариотическая клетки



Copyright © 2003 Pearson Education, Inc., publishing as Benjamin Cummings.

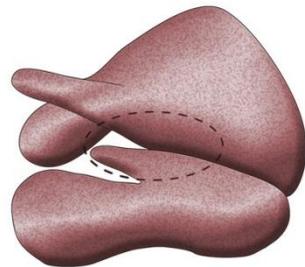
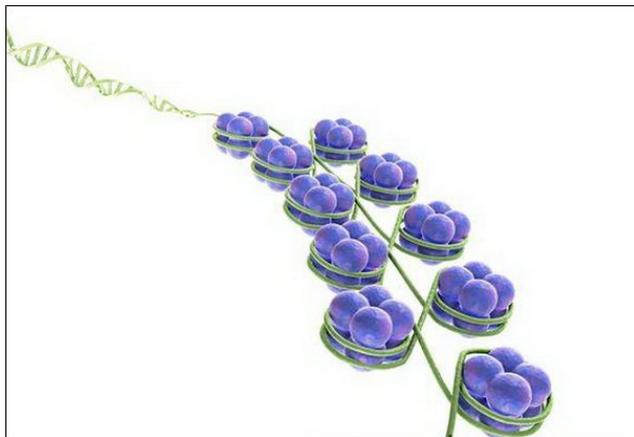
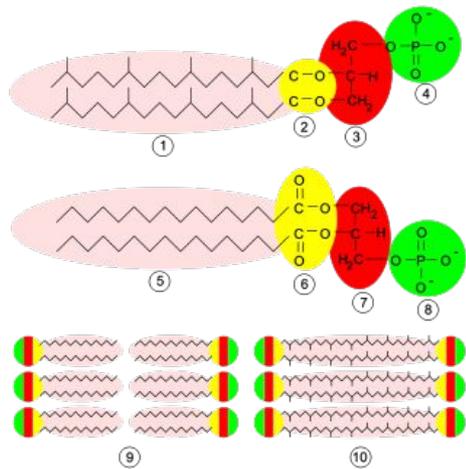


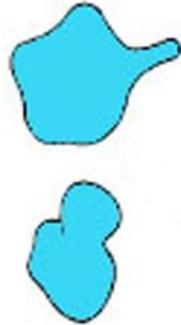
# Phylogenetic Tree of Life



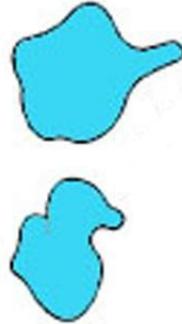
Карл Вёзе и Джорж Фокс  
(1977)

	Bacteria	Archaea	Eucaryota
Ядро	-	-	+
Митохондрии	-	-	+ или -
Деление клетки	прямое	прямое	митоз или мейоз
Организация ДНК	кольцевая	кольцевая	линейная
Синтаза жирных кислот	Тип II	-	Тип I
Муреин	+	- (псевдомуреин)	-
Клеточная мембрана	бислой	би- или монослой	бислой
Липиды клеточной мембраны	со сложной эфирной связью	с простой эфирной связью	со сложной эфирной связью
Гистоны	-	+	+
Рибосома	70S	70S	80S

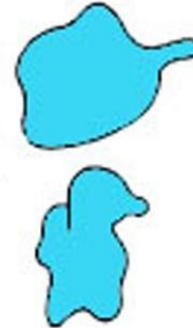




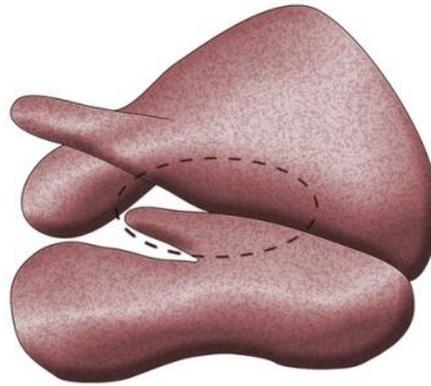
Bacteria



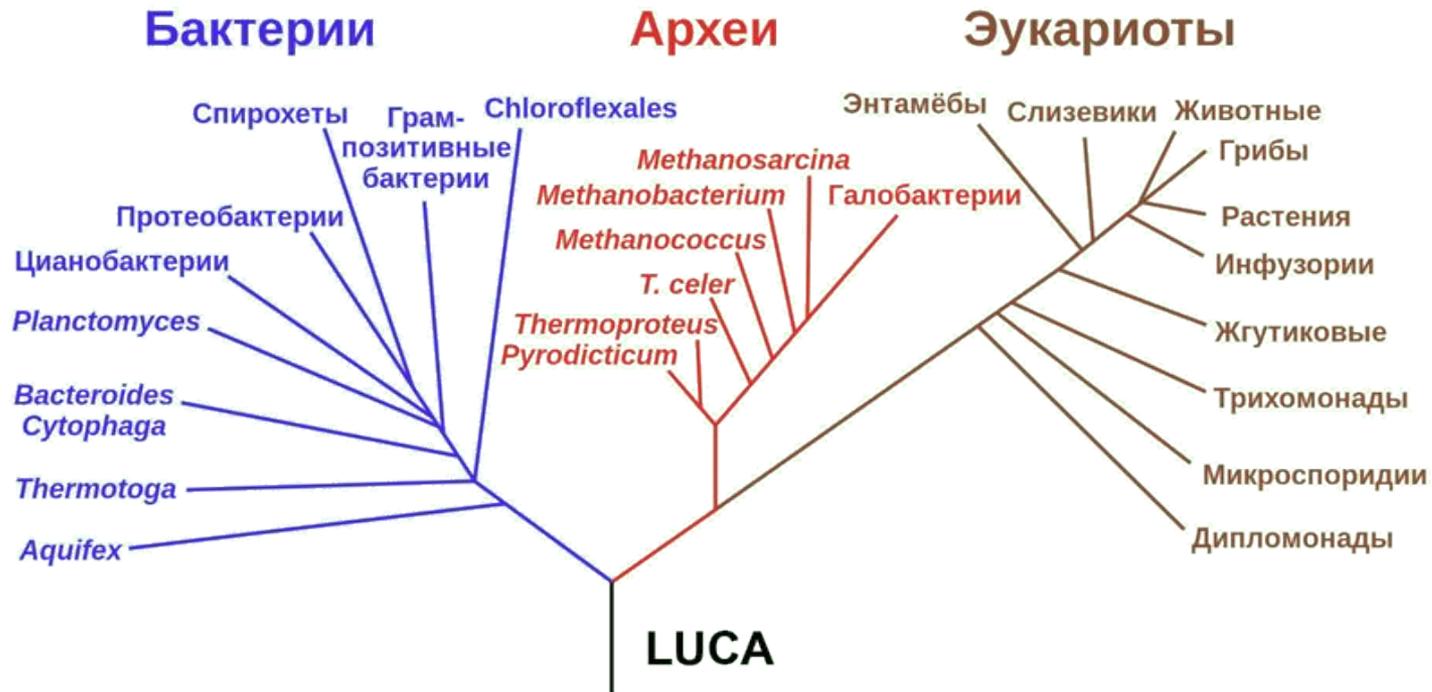
Archaea



Eucaryota



# Последний универсальный общий предок (LUCA)

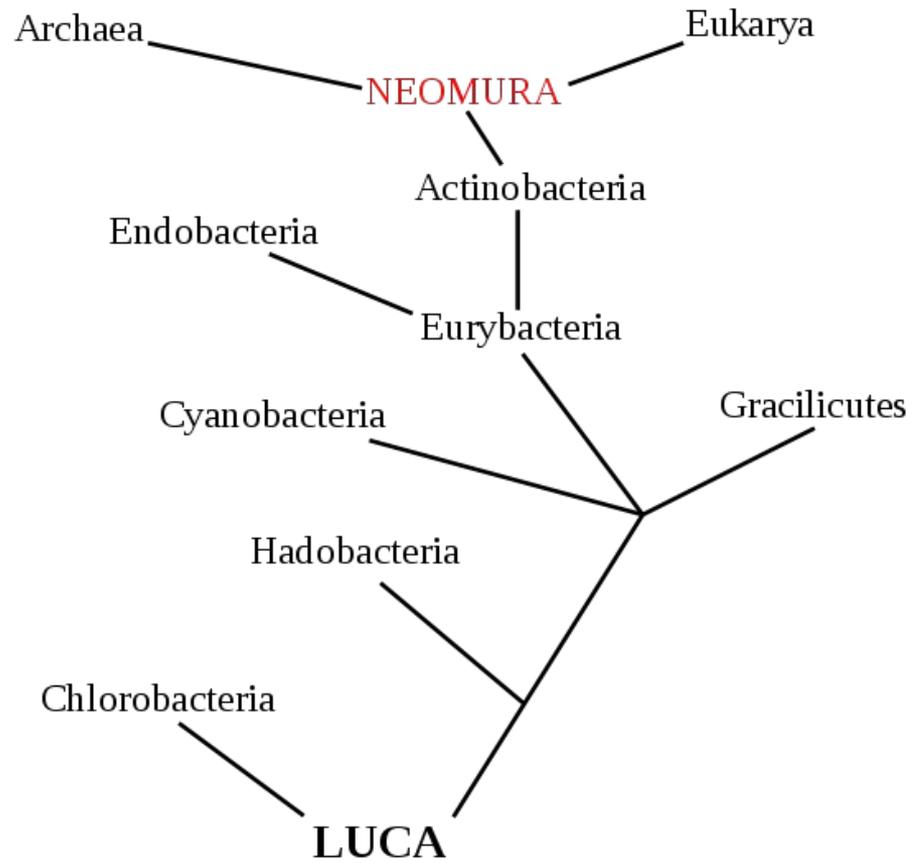


\*Генетическая информация основана на ДНК, которая состоит из двух нитей и 4 нуклеотидов.

\*Используется только 20 аминокислот и только L-изомеры.

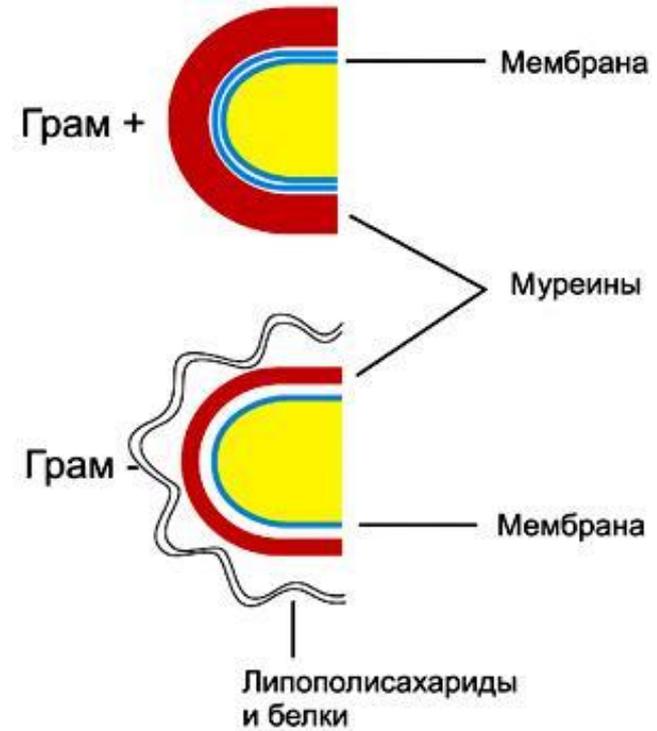
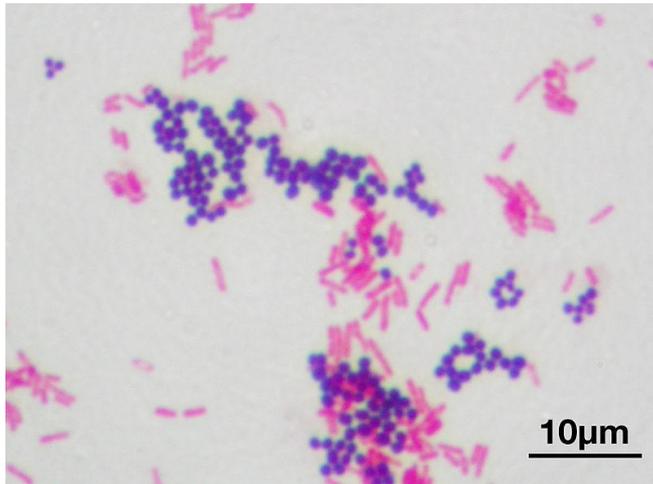
\*АТФ используется как переносчик энергии.

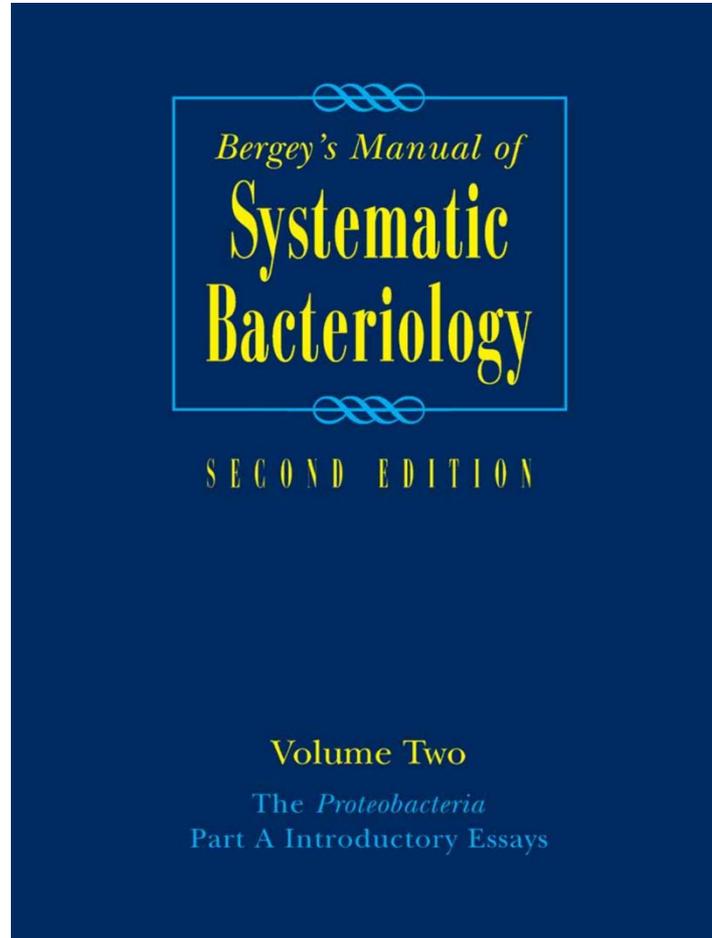
\*Клетка окружена клеточной стенкой состоящей из двойного липидного слоя.





Ганс Кристиан  
Грам

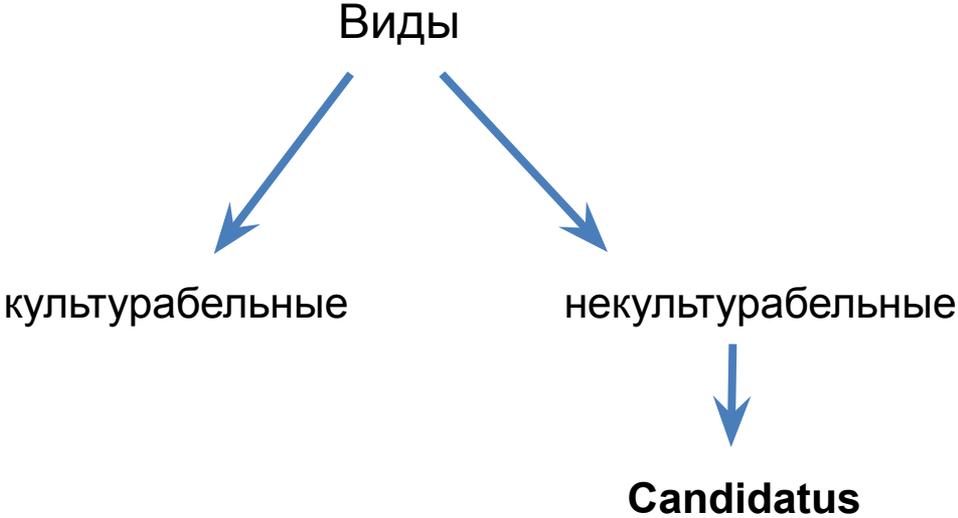
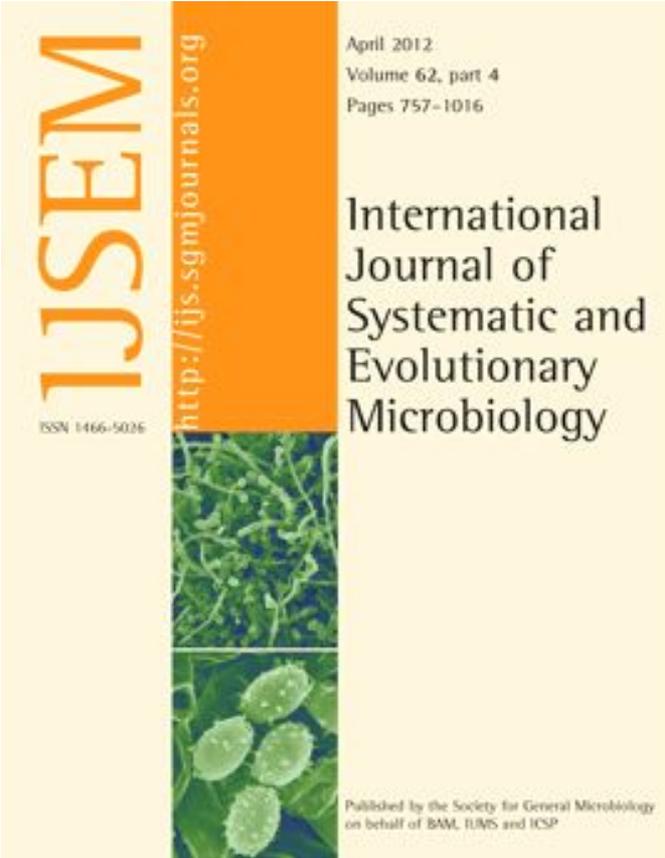




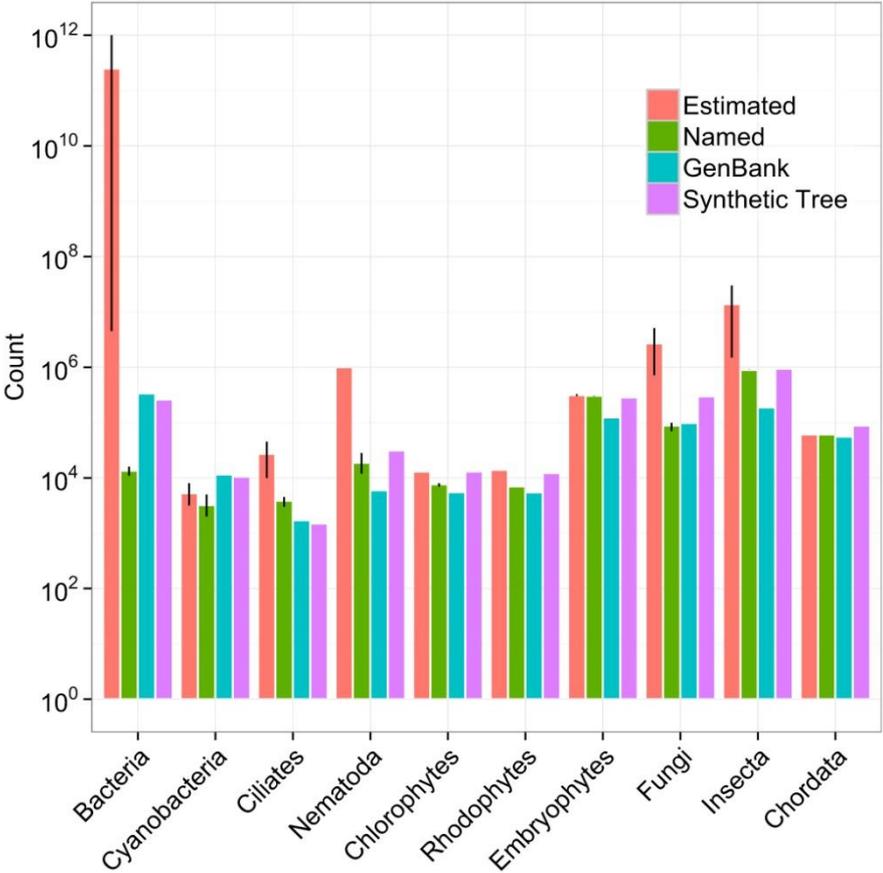
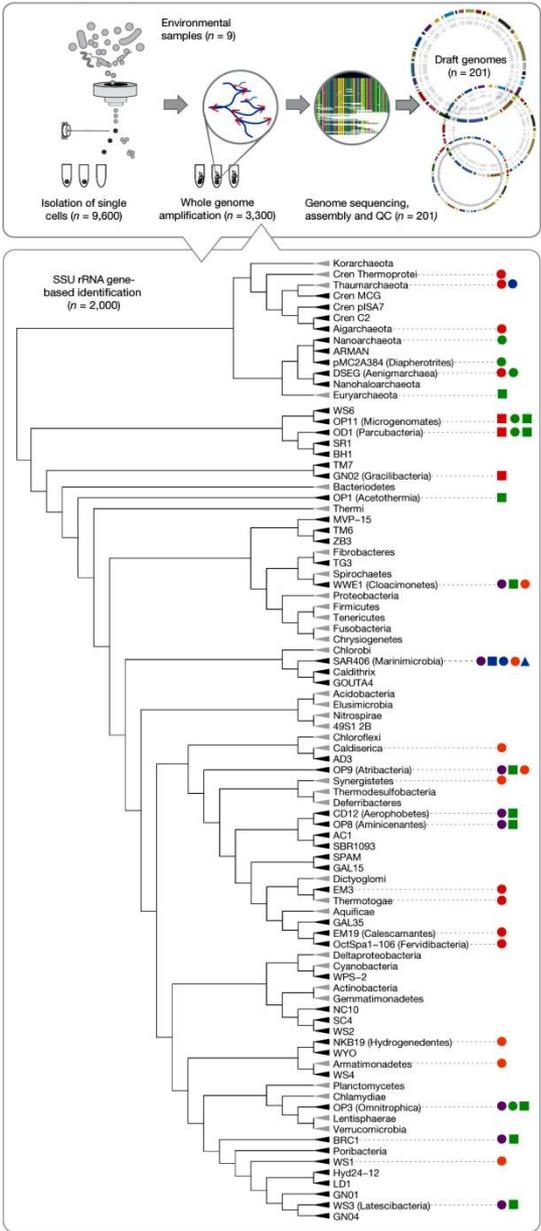
Дэвид  
Берджи

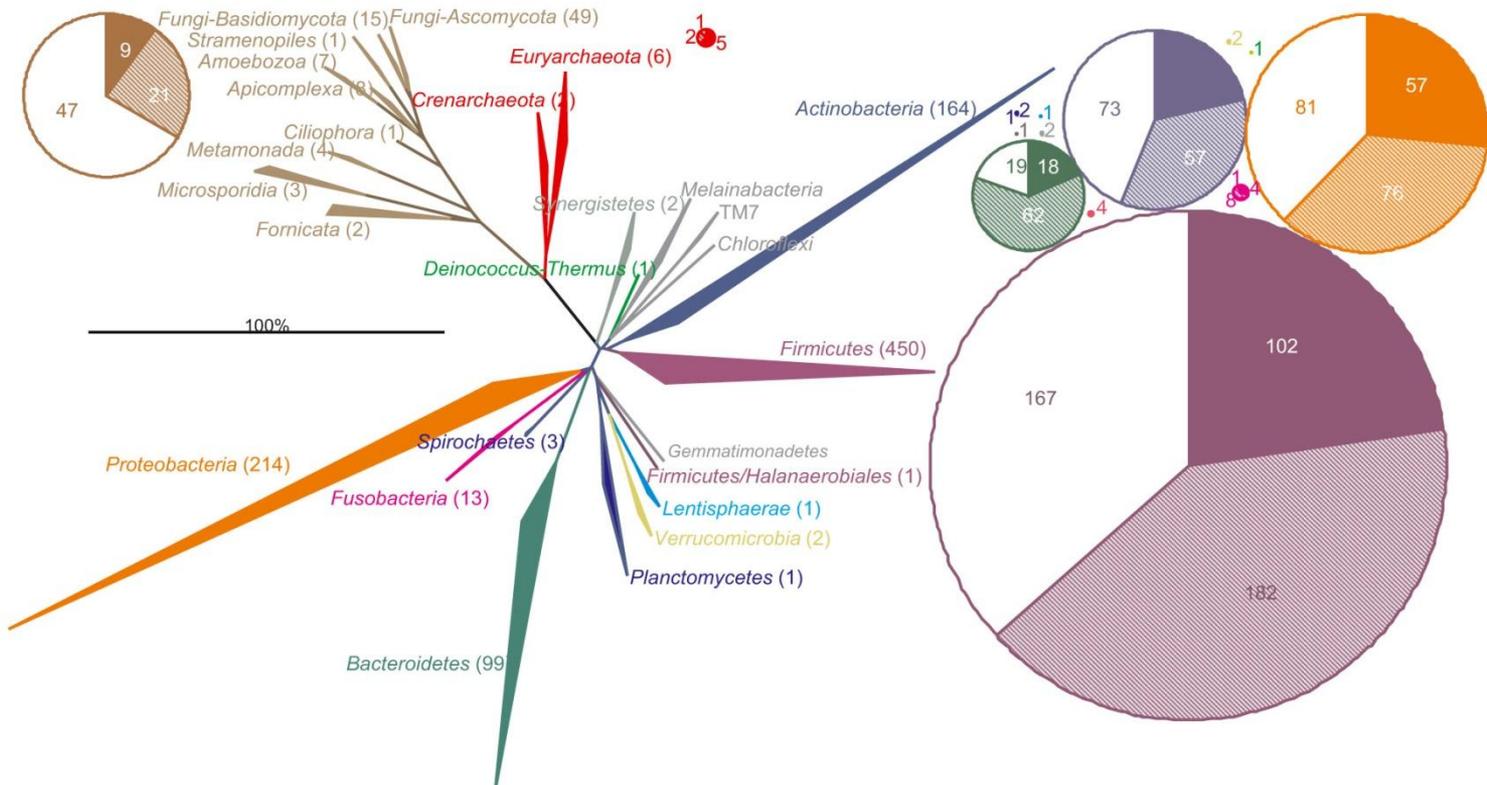
**Справочник Берджи по  
бактериологической систематике  
(С 1923 г.)**

# *International Journal of Systematic and Evolutionary Microbiology*



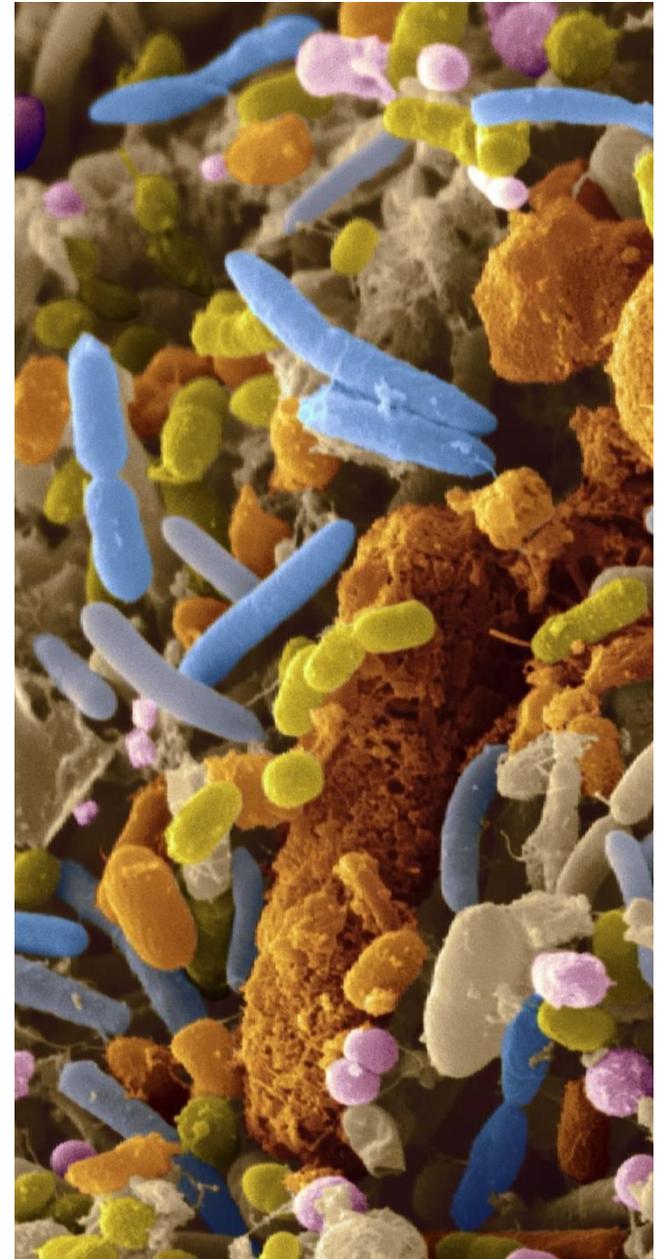
# Single cell sequencing



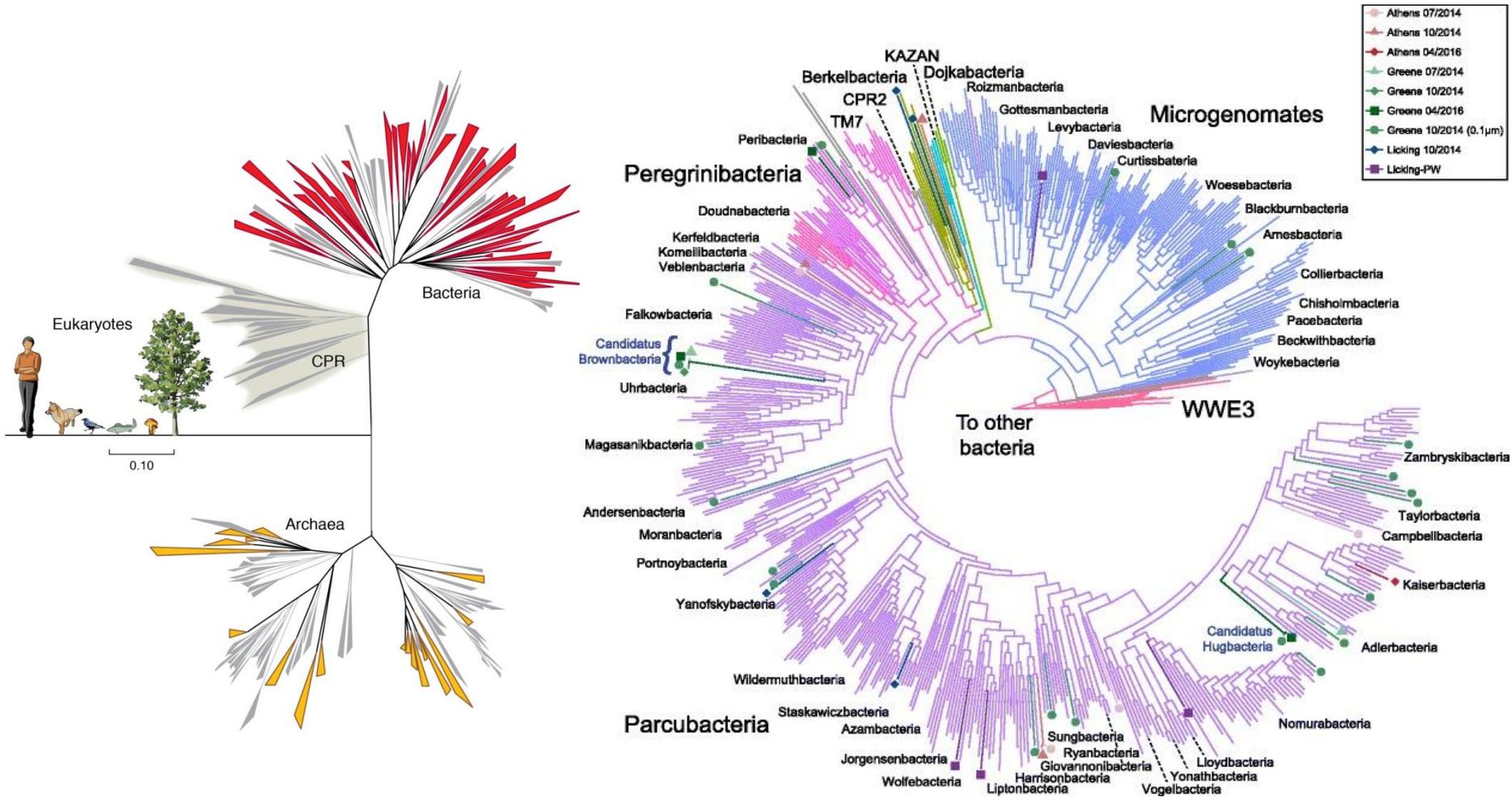


## Домен Bacteria

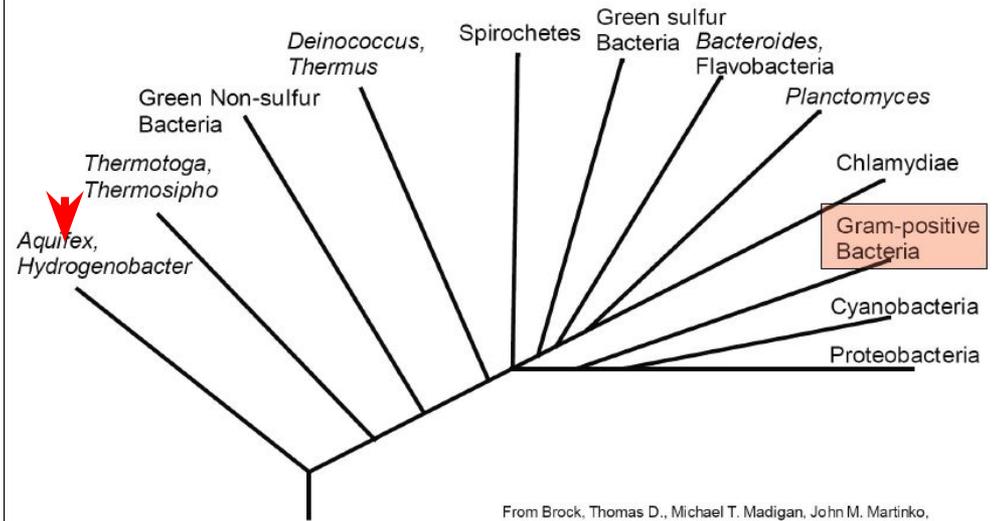
- Тип [Actinobacteria](#)
- Тип [Aquificae](#)
- Тип [Bacteroidetes](#)
- Тип [Caldiseptica](#)
- Тип [Chlamydiae](#)
- Тип [Chloroflexi](#)
- Тип [Chrysiogenetes](#)
- Тип [Cyanobacteria](#)
- Тип [Deferribacteraceae](#)
- Тип [Deinococcus-Thermus](#)
- Тип [Dictyoglomi](#)
- Тип [Elusimicroba](#)
- Тип [Fibrobacteres](#)
- Тип [Firmicutes](#)
- Тип [Fusobacteria](#)
- Тип [Gemmatimonadetes](#)
- Тип [Nitrospirae](#)
- Тип [Planctomycetes](#)
- Тип [Proteobacteria](#)
- Тип [Spirochaetes](#)
- Тип [Synergistetes](#)
- Тип [Tenericutes](#)
- Тип [Thermodesulfobacteria](#)
- Тип [Thermotogae](#)



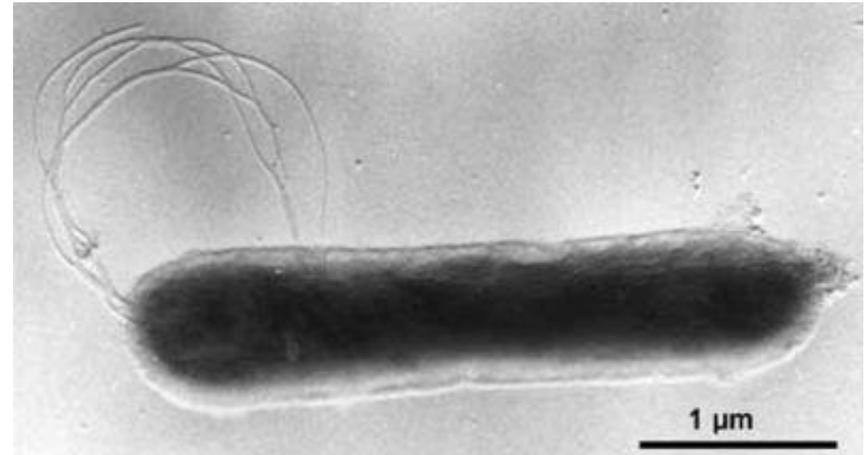
# Группа CPR (candidate phyla radiation)



# Тип Aquificae

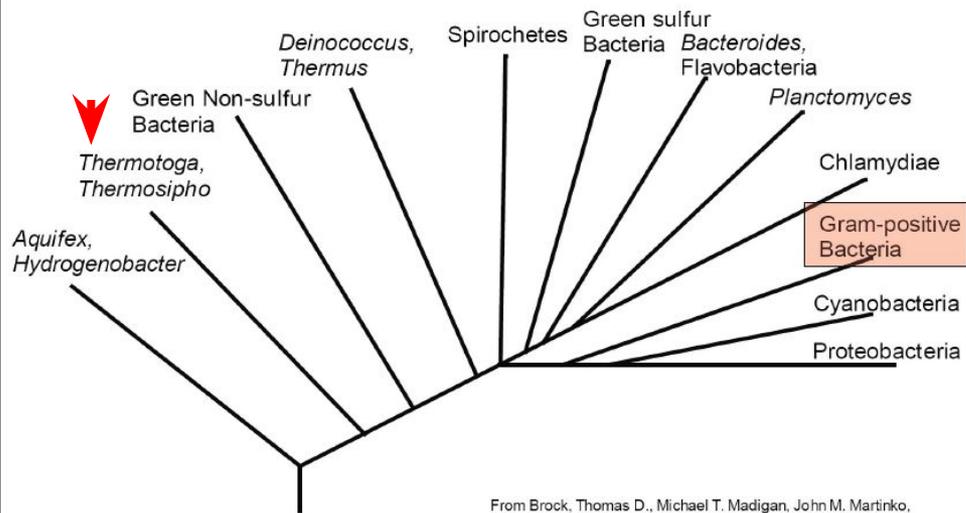


From Brock, Thomas D., Michael T. Madigan, John M. Martinko, & Jack Parker. *Biology of Microorganisms*. 7th ed. Englewood Cliffs NJ: Prentice Hall, 1994, p. 706.



***Aequifex***

# Тип Thermotogae



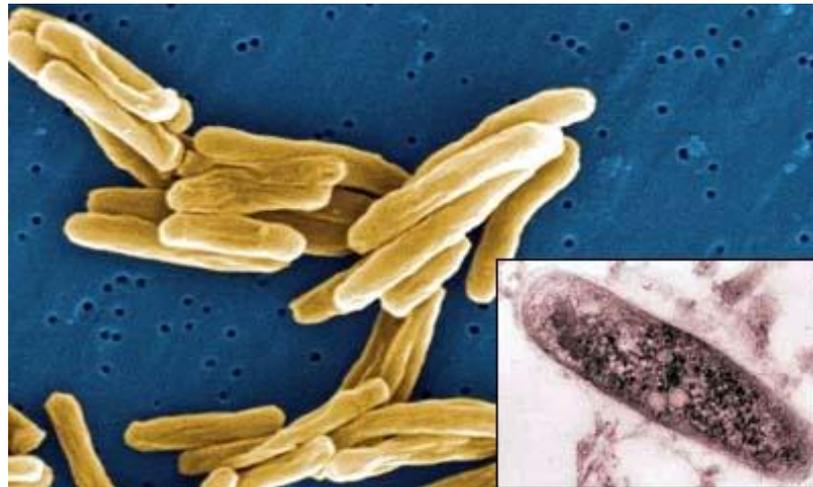
From Brock, Thomas D., Michael T. Madigan, John M. Martinko, & Jack Parker. *Biology of Microorganisms*. 7th ed. Englewood Cliffs NJ: Prentice Hall, 1994, p. 706.



Тип: **Proteobacteria**  
Класс: **Alphaproteobacteria**  
Порядок: **Риккетсии**



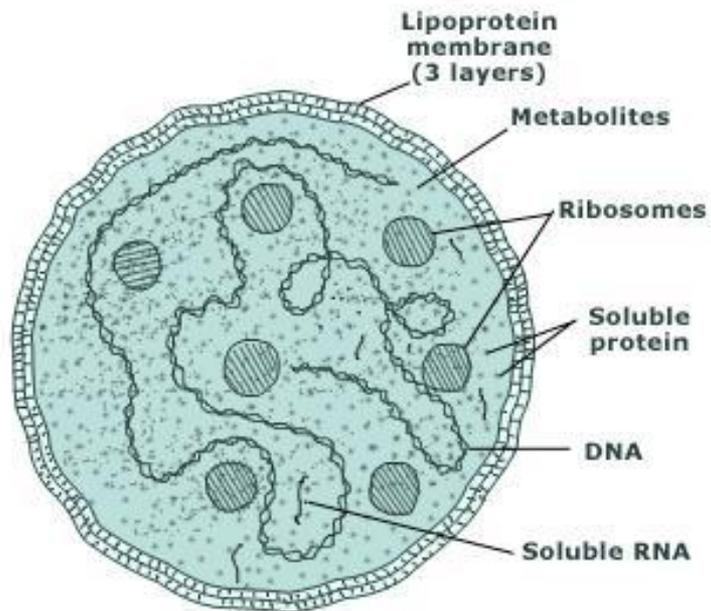
Говард  
Риккетс



*Rickettsia prowazekii*  
0,2—0,6 × 0,4—2,0 мкм

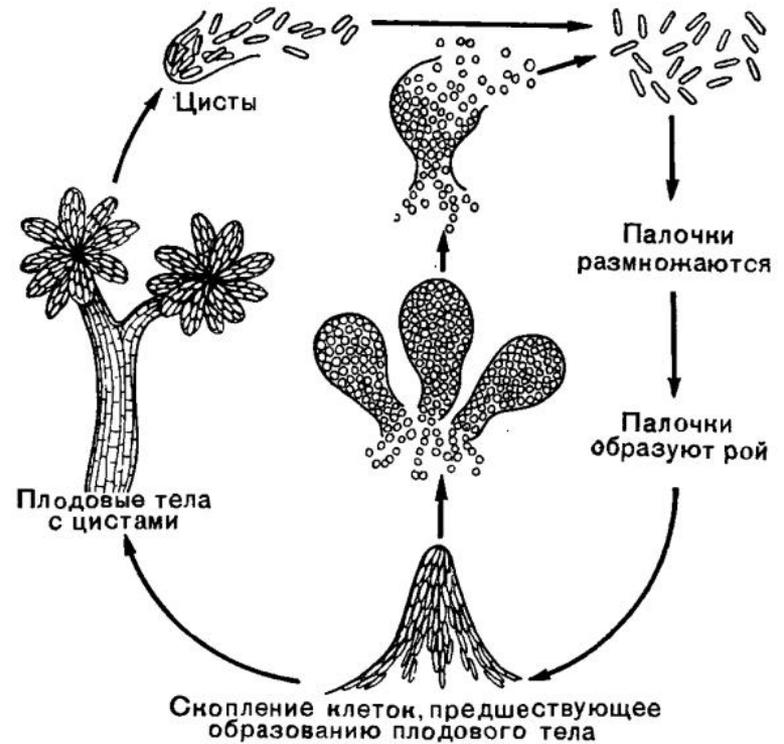
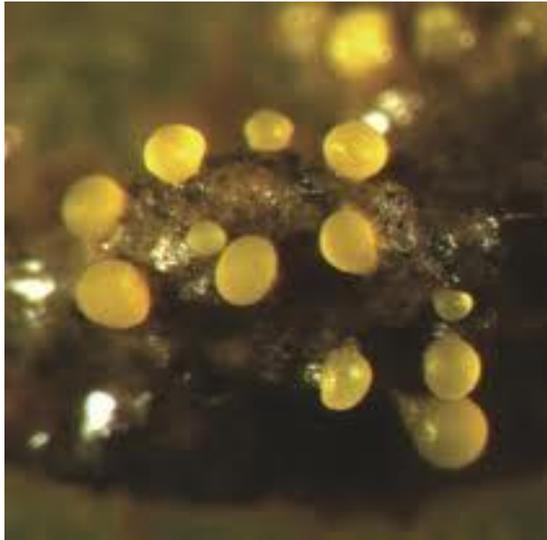
**Тип: Tenericuta**

**Класс: Микоплазмы**

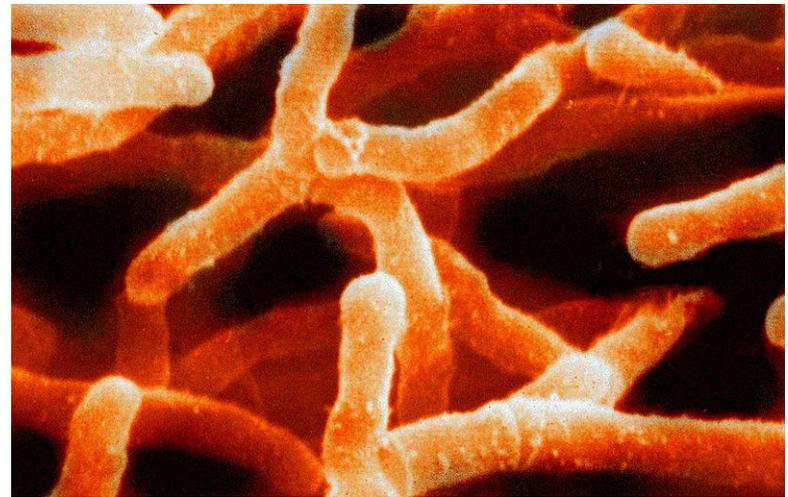


0,15-0,25 мкм

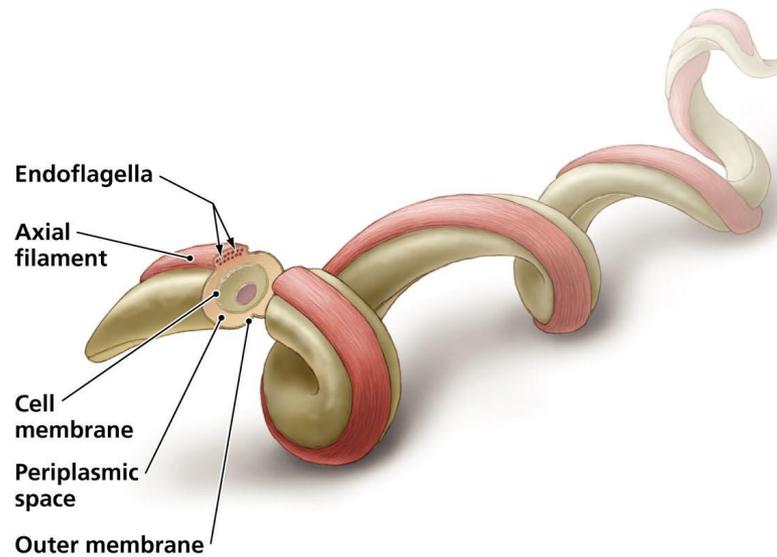
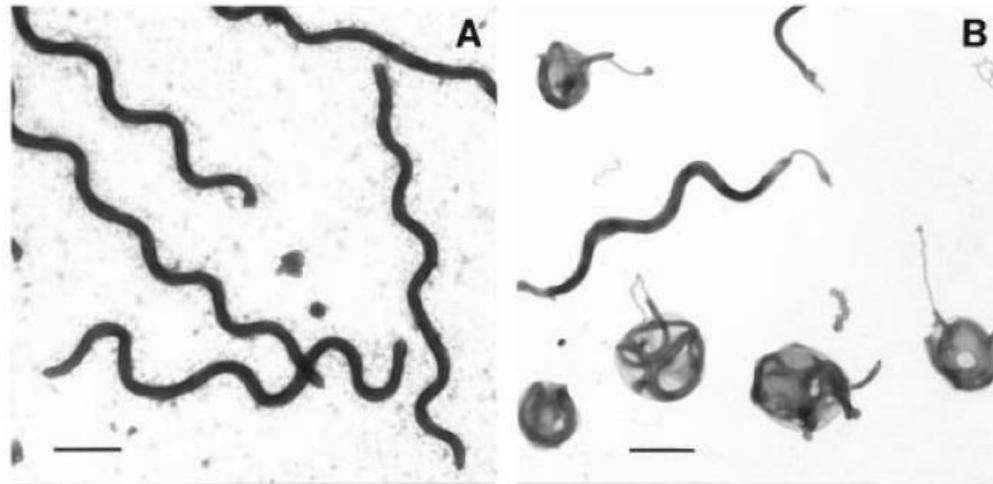
Тип: **Proteobacteria**  
Класс: **Deltaproteobacteria**  
Порядок: **Миксобактерии**



Тип: **Актинобактерии**  
(*Actinobacteria*)

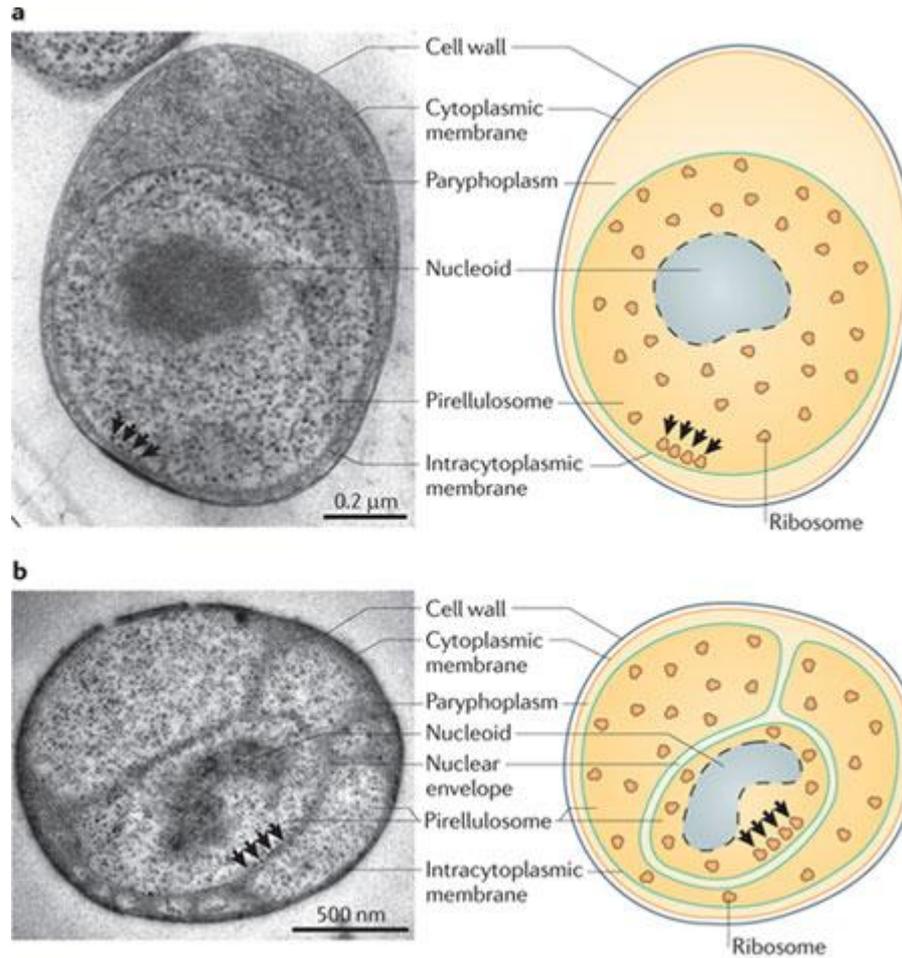


# Тип Spirochaetae - Спирохеты

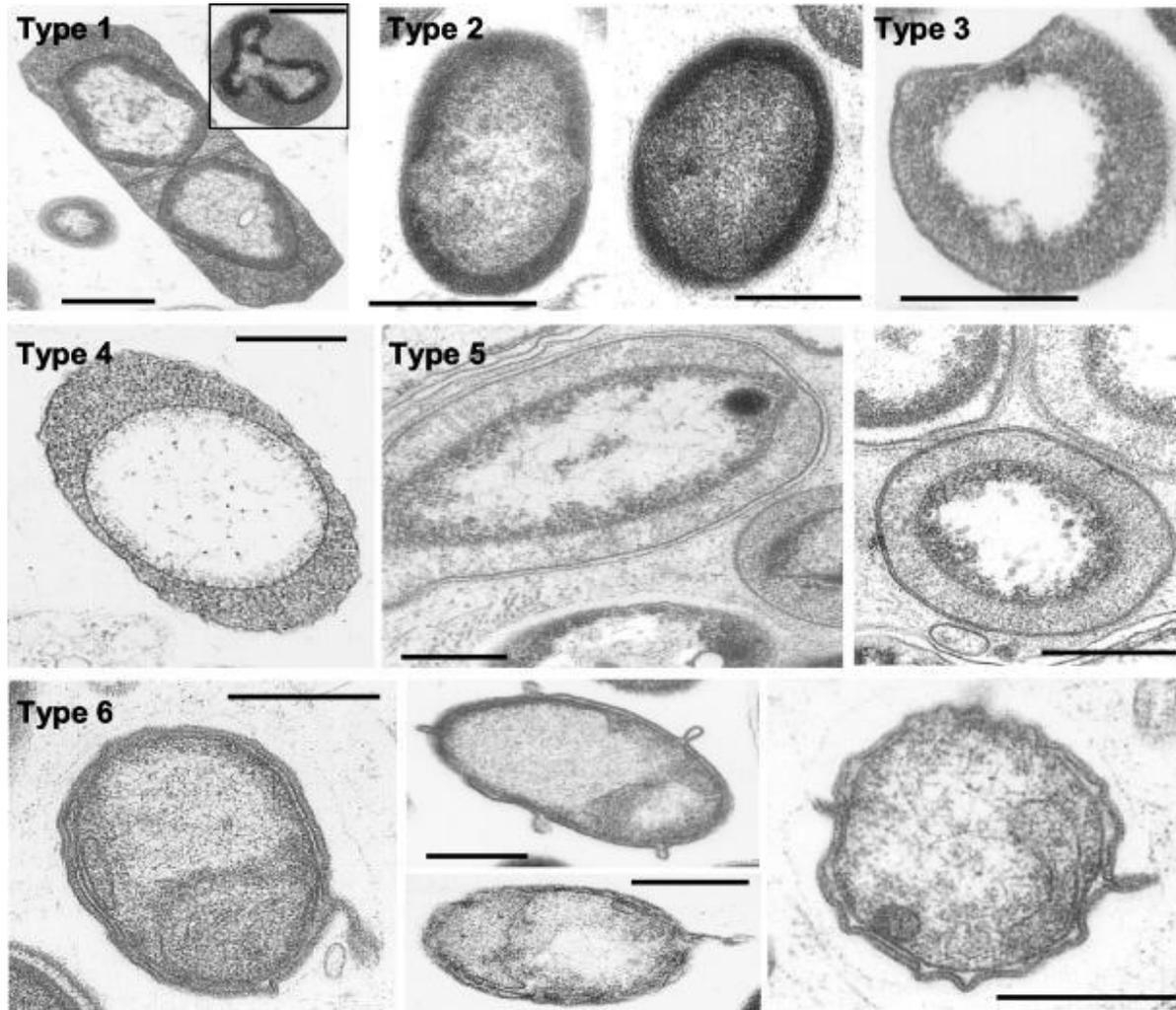


3-500 MKM

# Тип Planctomycetes - Планктомицеты

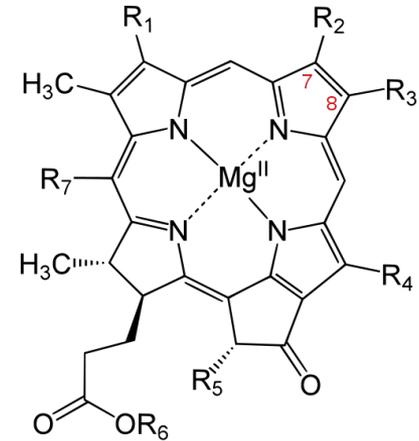


# *Tin candidatus* Poribacteria

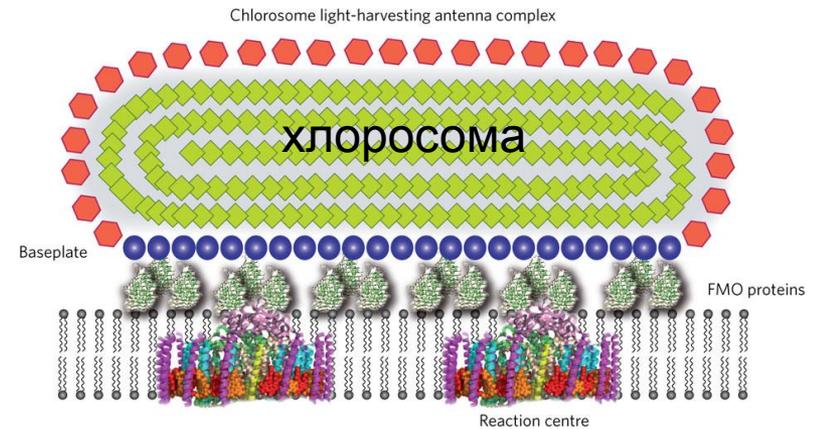


# Тип Chlorobi

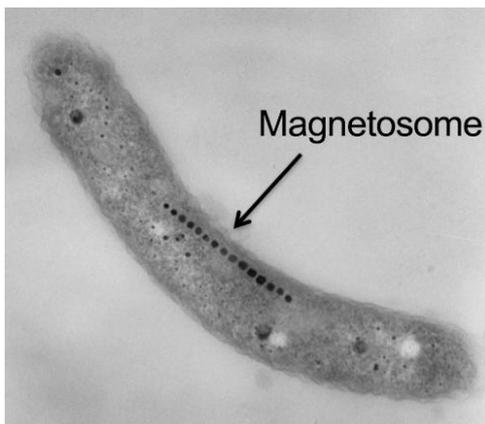
## Зеленые серобактерии



Бактериохлорофилл (a, c, d, e)



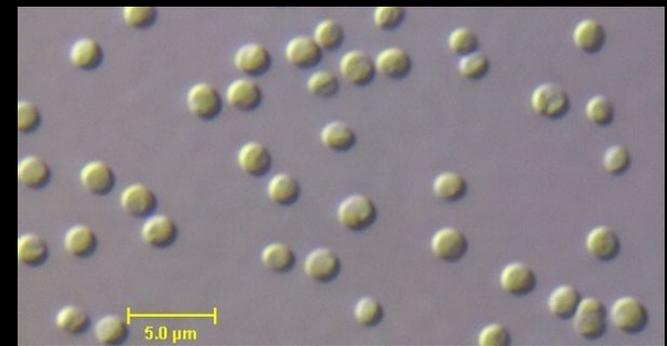
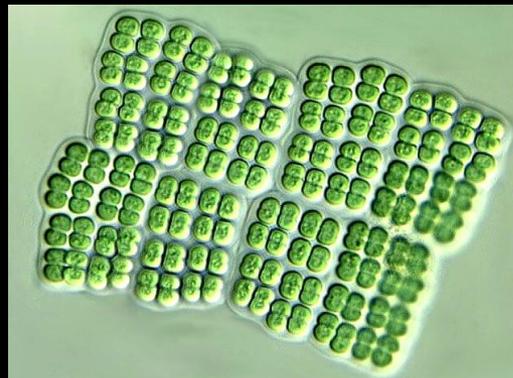
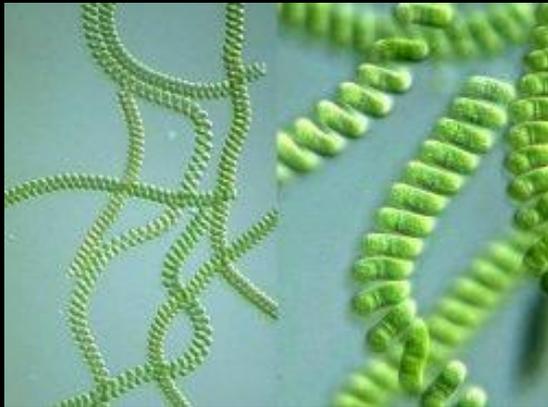
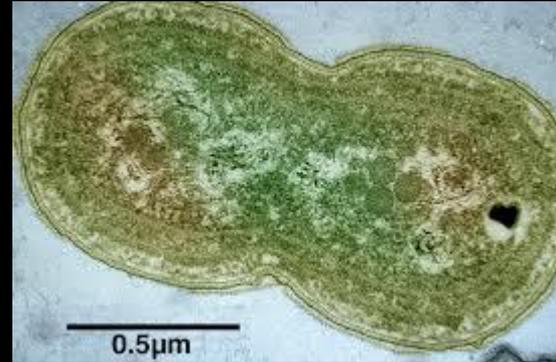
# Пурпурные бактерии (фототрофные протеобактерии)

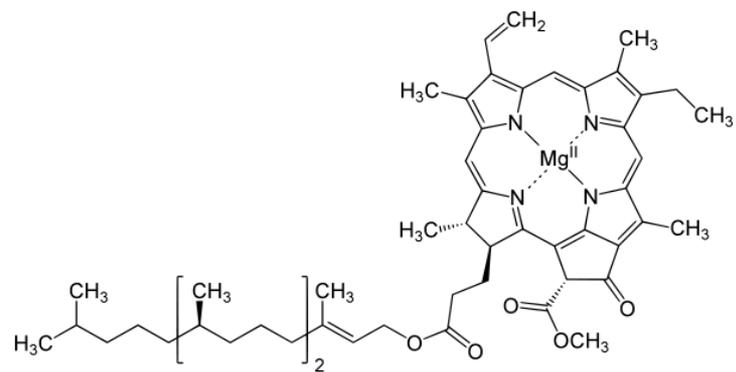
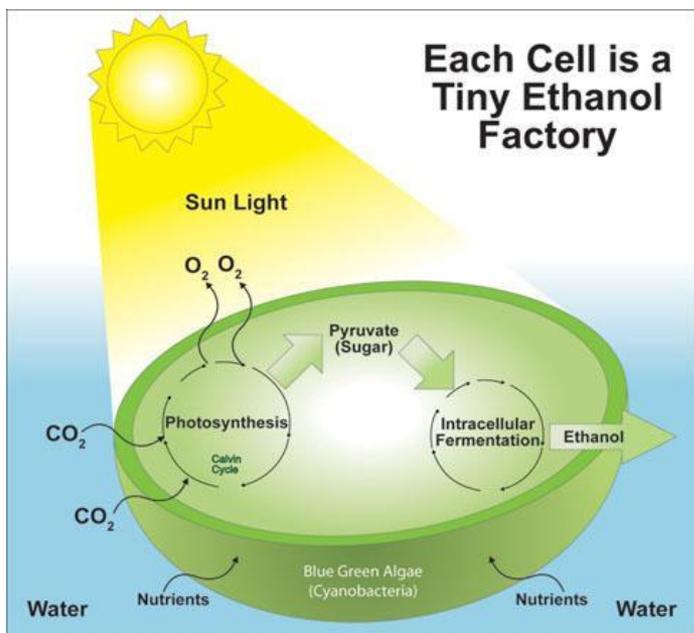


*Magnetospirillum*

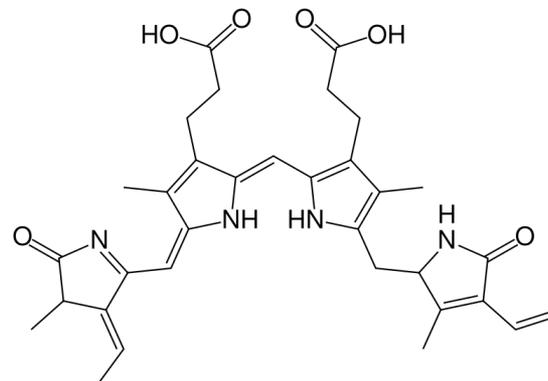
Бактериохлорофилл а и b

**Тип Cyanobacteria  
Цианобактерии (= сине-зеленые  
водоросли)**





## Хлорофилл а + фикобилины



# Строматолиты



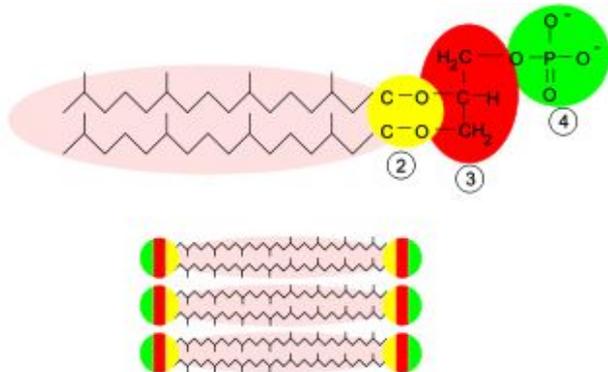
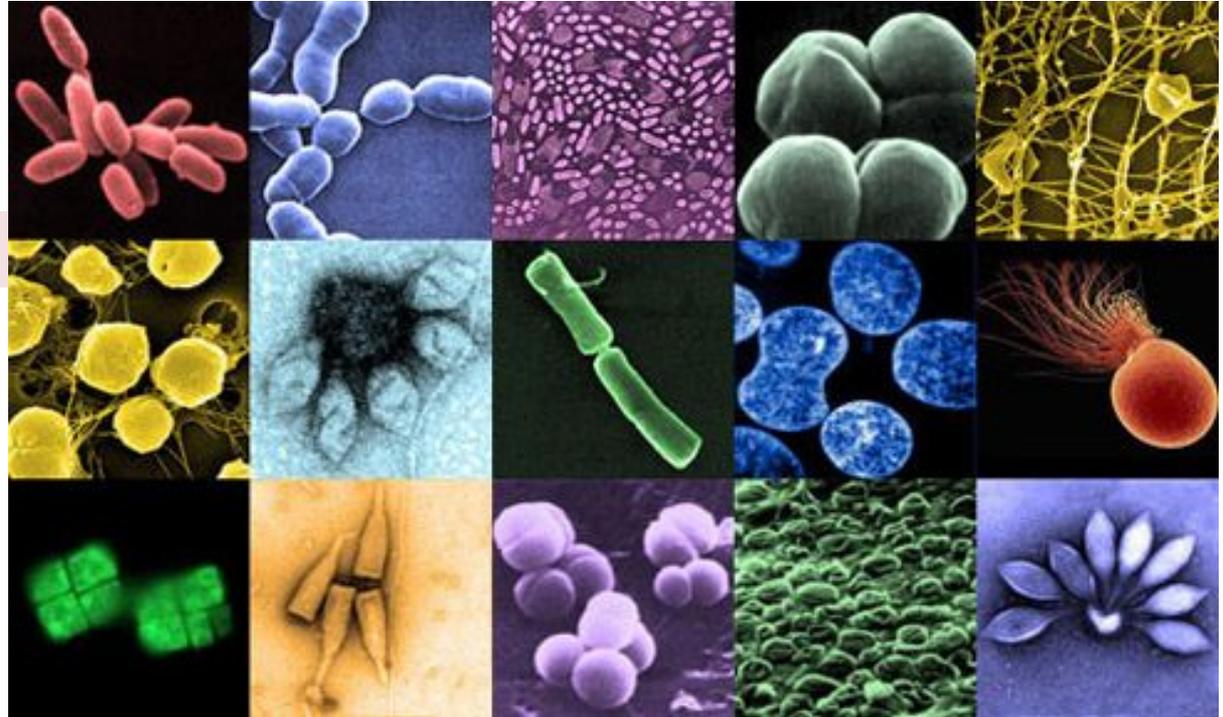




# Домен Archaea

## Царства

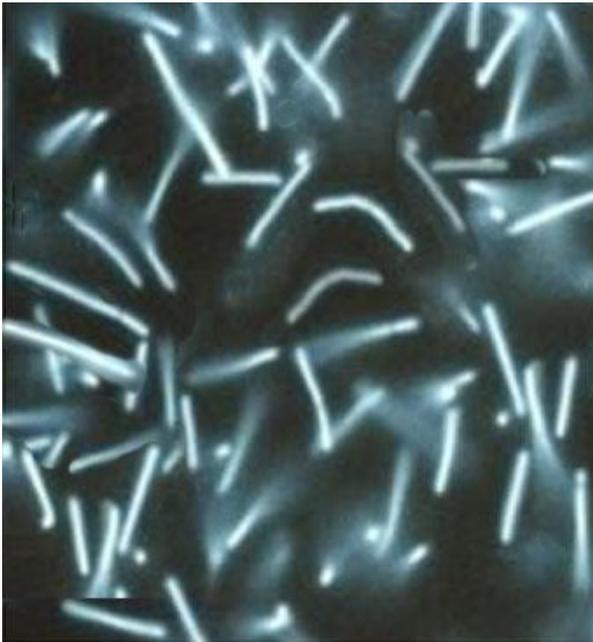
- “Euryarchaeota”
- “DPANN”
- “Proteoarchaeota”



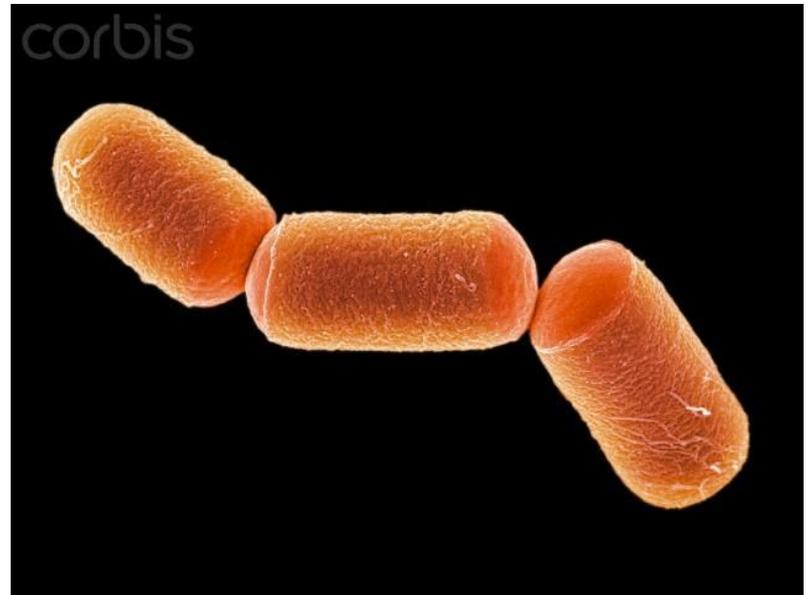
- DPANN:
- Diapherotrites
  - Parvarchaeota
  - Aenigmarchaeota
  - Nanoarchaeota
  - Nanohaloarchaeota

- TACK:
- Thaumarchaeota
  - Aigarchaeota
  - Crenarchaeota
  - Korarchaeota

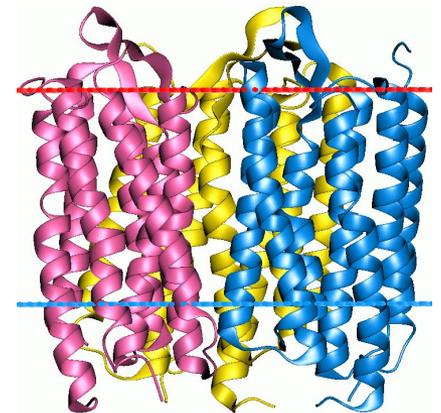
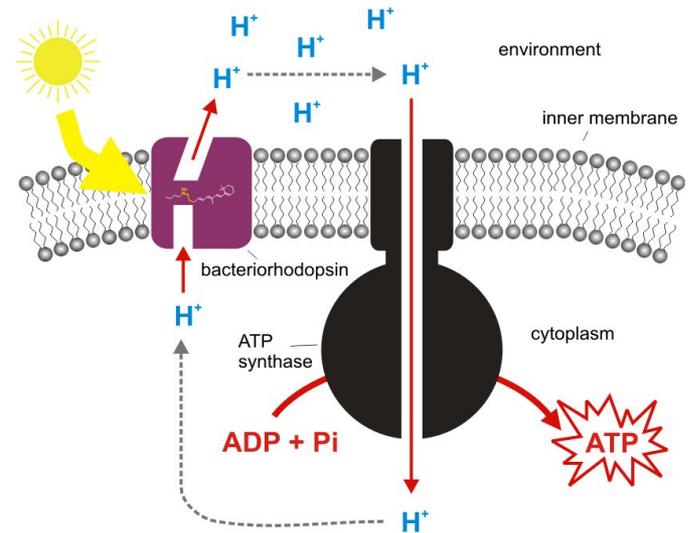
*Methanopyrus kandleri*



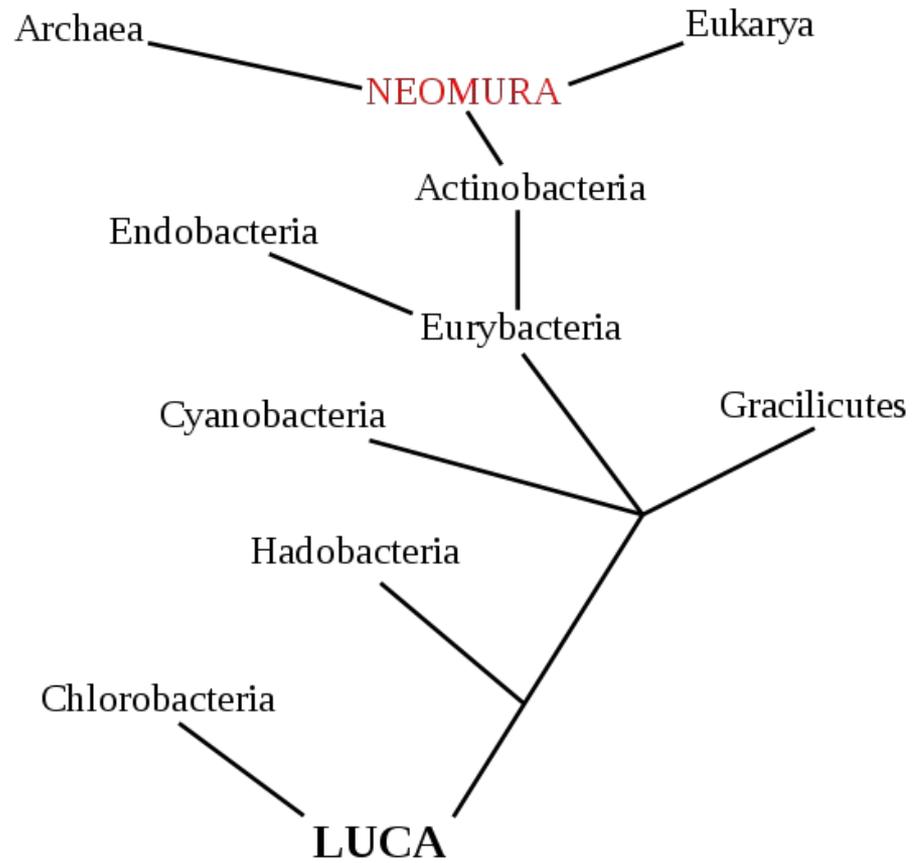
*Methanobrevibacter smithii*

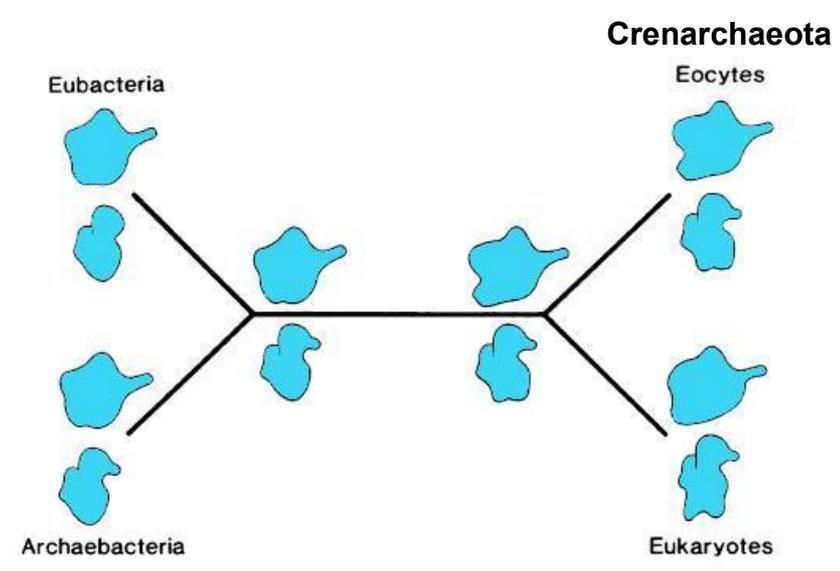
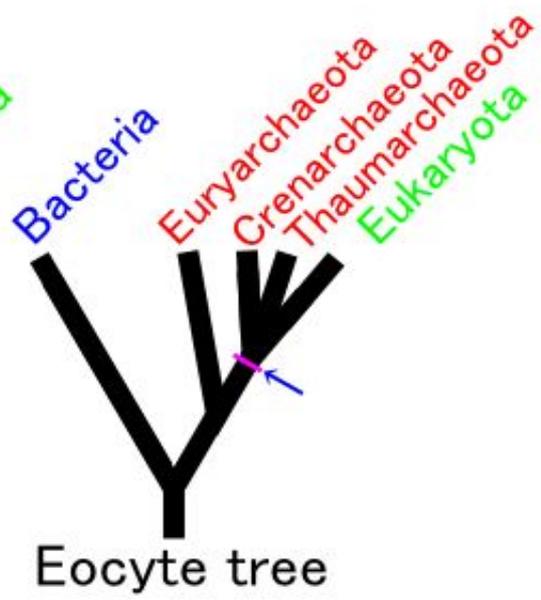
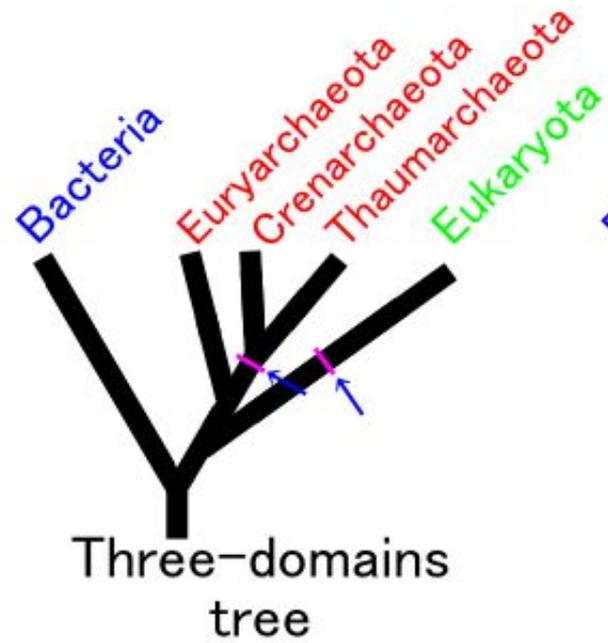


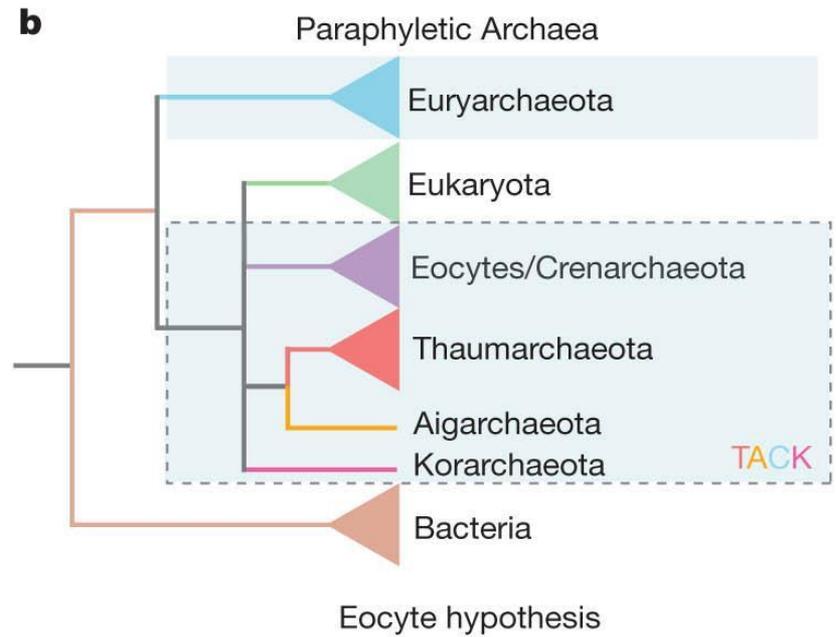
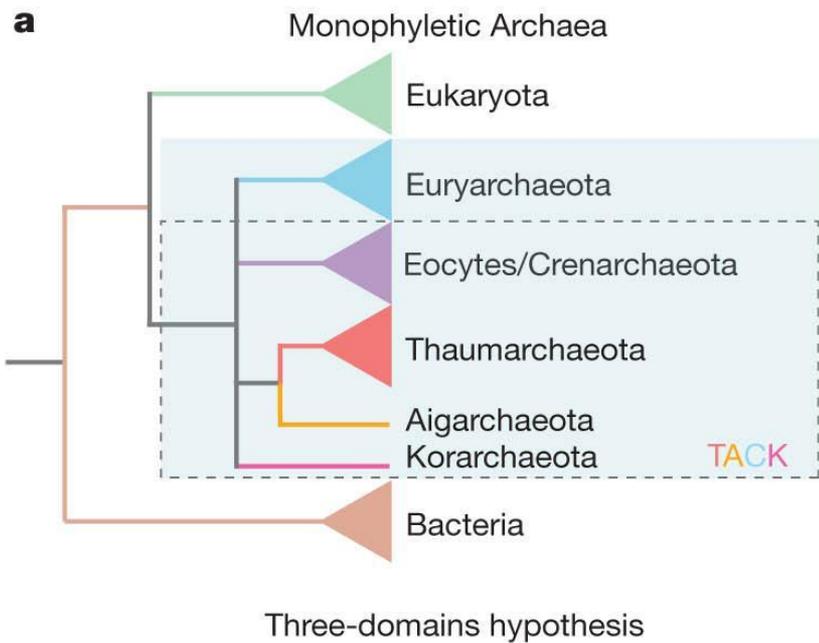
# Галобактерии (фототрофные археи)



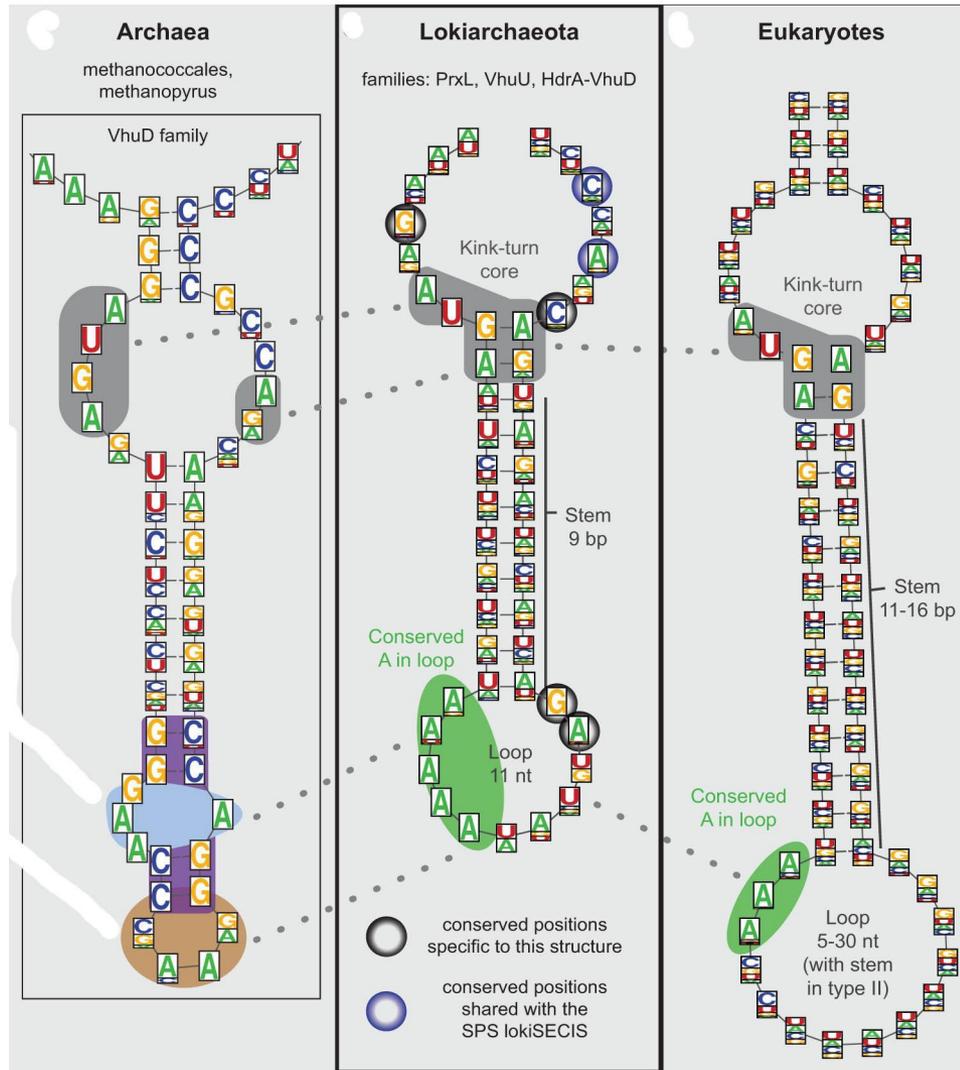
Бактериородопсин



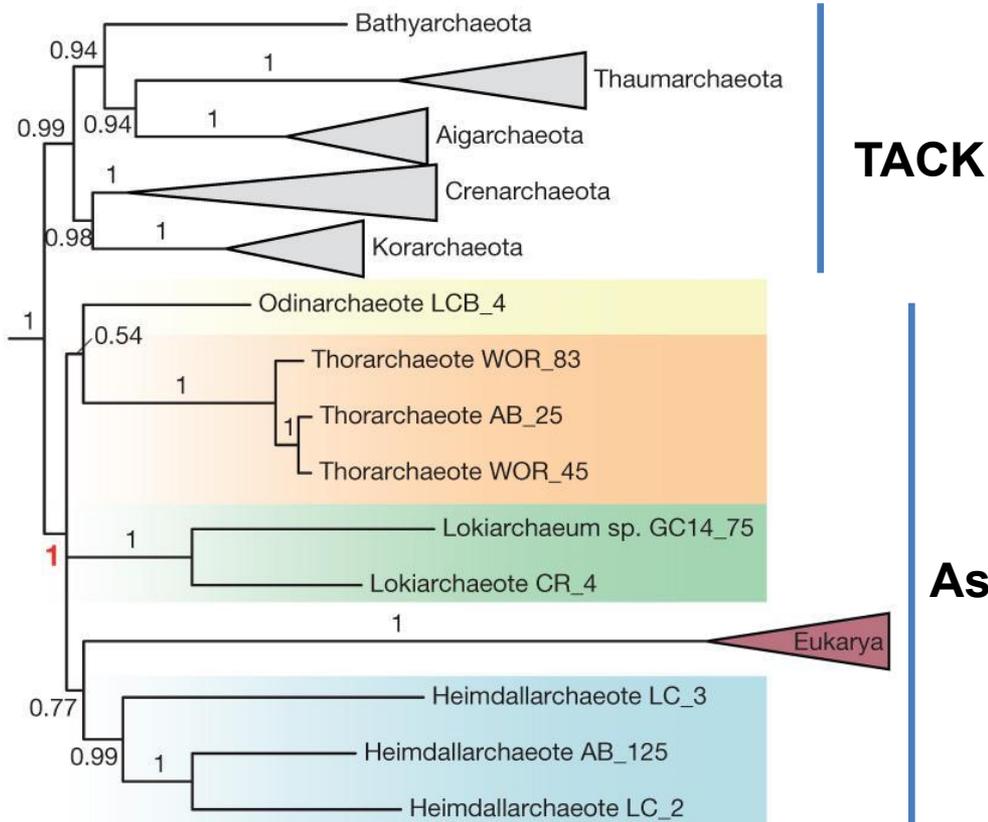








# "Asgard" Katarzyna Zaremba-Niedzwiedzka et al. 2017



Proteoarchaeota



- "[Lokiarchaeota](#)"
- "[Thorarchaeota](#)"
- "[Odinarchaeota](#)"
- "[Heimdallarchaeota](#)"