

**neomura**

**Eukaryota**

26S proteasome

~0.9± 0.1 Gy ago

Archaeobacteria

reverse gyrase  
isoprenoid ether lipids; new flagella

endomembrane system  
NPC, endoskeleton, cilia  
sex, mitochondria

histones

N-linked glycoprotein replaced  
murein and lipoprotein

unimembrana  
(cell envelope has only 1 membrane)

20S proteasome Actinobacteria

phosphatidylinositol

Posibacteria

Endobacteria



murein hypertrophy OM loss; sortases

murein

Eurybacteria

Gracilicutes



flagella

4 protein insertions

Cyanobacteria ~2.8 Gy ago

Negibacteria

lipopolysaccharides; hopanoids

Hadobacteria

HslV protease Omp85

Eobacteria

**eubacteria**

Chlorobacteria

cenancestor ~3.5 Gy ago

outer membrane (OM); murein; lipoprotein; gliding motility