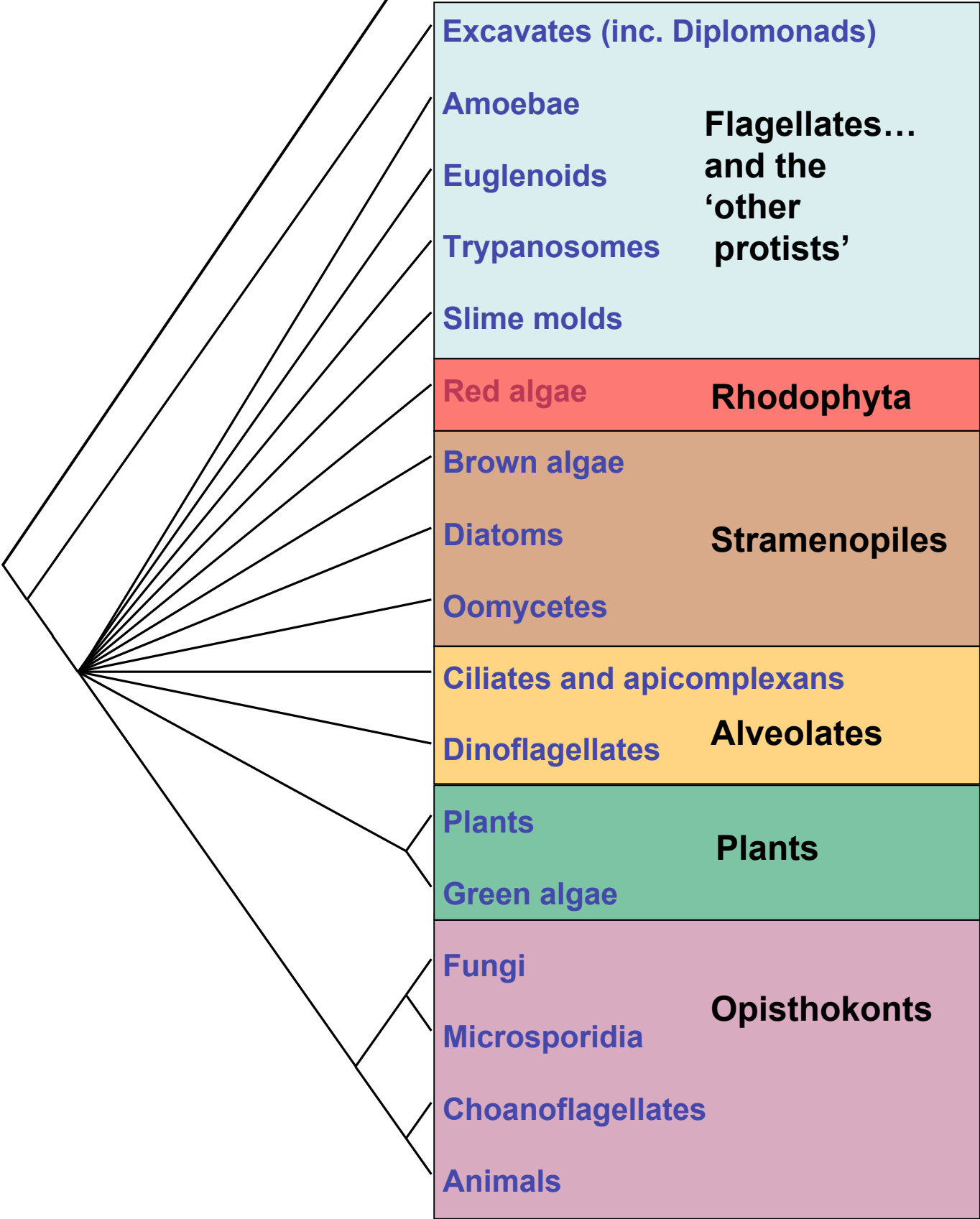
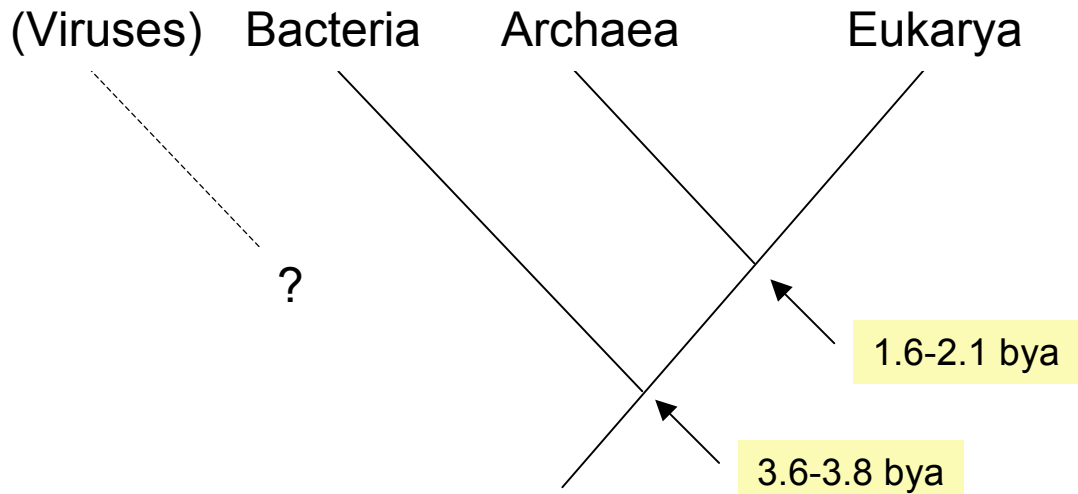


Eukarya

[Archaea]



The domains of life



Acellular life:

Viruses -- perhaps not monophyletic (retroviruses, RNA viruses, DNA viruses)
relationship to the rest of life unclear
obligate: all rely on other organisms for reproduction
not all pathogenic

Cellular life:

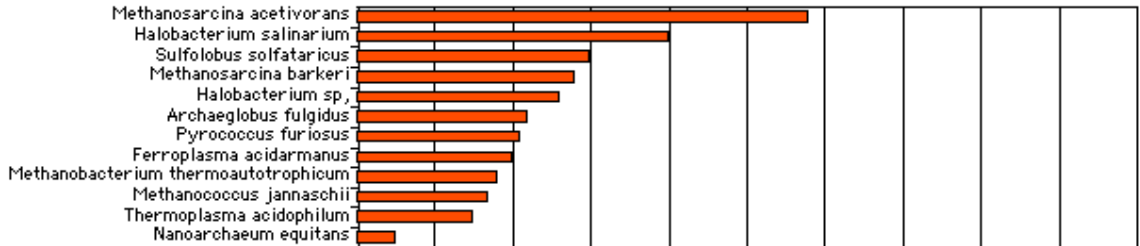
Bacteria -- prokaryotes; sister to Archaea+Eukarya
0.5-5.0um in diameter; various shapes
have cell walls, made of peptidoglycan
distinctive flagellar apparatus
some autotrophic; others heterotrophic; incredibly important ecologically
gave rise to plastids, mitochondria
976 genomes currently under study or completely sequenced

Archaea -- prokaryotes; many live in extreme environments
0.1 - 15um in diameter; various shapes
none engage in photosynthesis with an electron transport chain
two main groups: Euryarchaeota and Crenarchaeota
24 genomes completed/ 23 ongoing

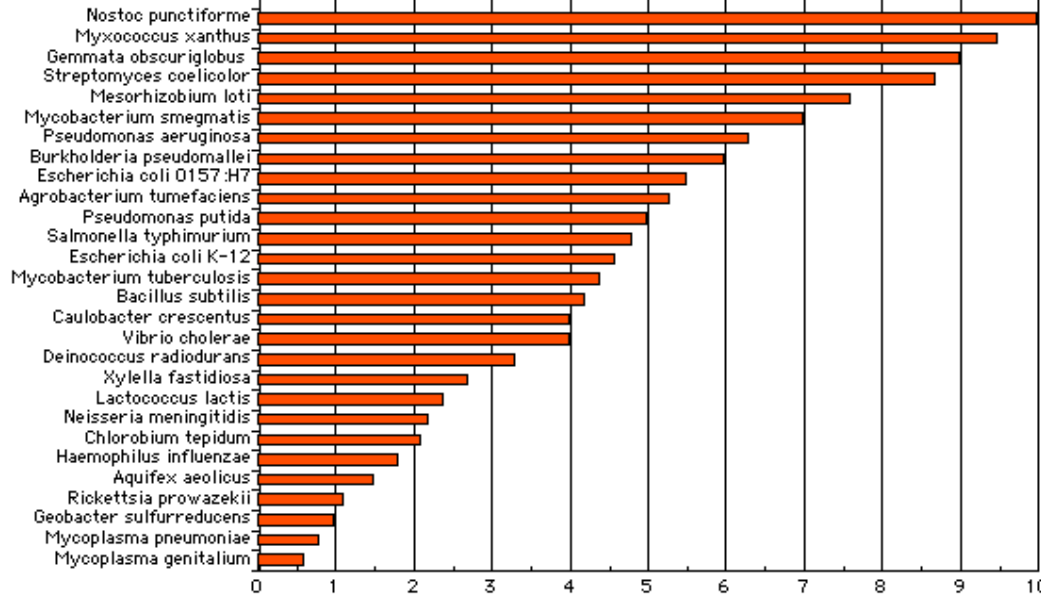
Eukarya -- eukaryotes: protists, algae, plants, fungi, animals
all rely in some way on prokaryotes for energy
some have cell walls (fungi = chitin; plants, oomycetes = cellulose)
include pathogens, parasites, mutualists
629 genomes underway or completely sequenced

Genome sizes

Archaea:

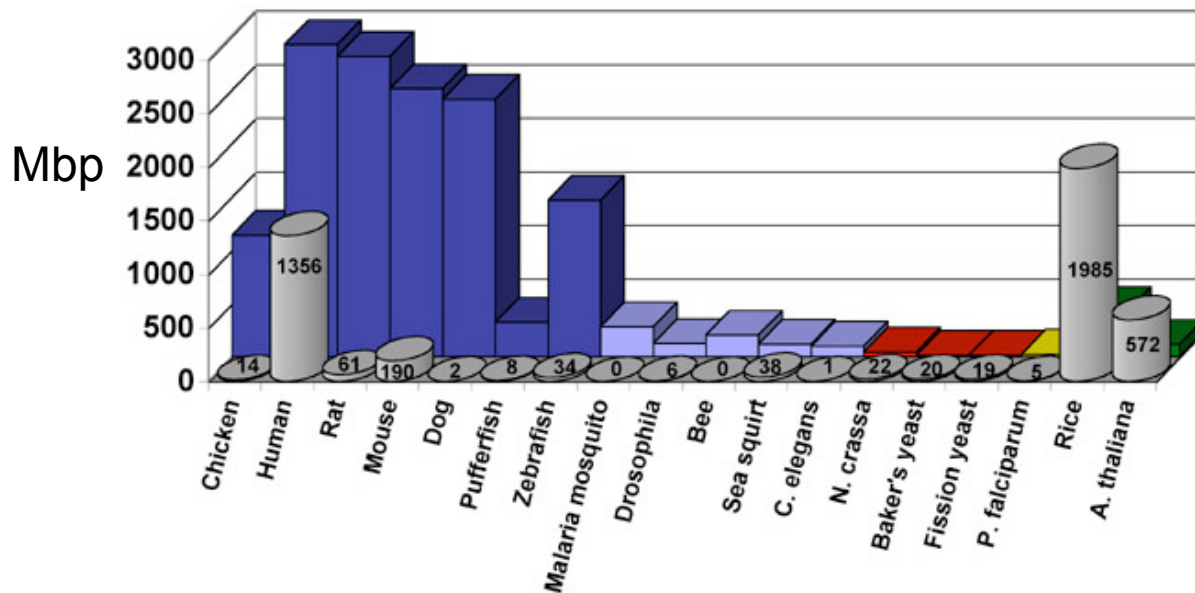


Bacteria:



Genome size (Mbp)

Genome sizes of Eukarya



Phanerozoic (543 - today)			
Cenozoic (65 - today)	Quaternary	1.8 - today	Most modern geological period
	Holocene	11,000 yrs - today	"Age of Man". Man becomes dominant lifeform on Earth, climate stabilises
	Pleistocene	1.8 - 11,000 yrs	Recent ice ages occurred. Dominance of larger mammals such as mammoths and sabre-tooth cats. Evolution of homo sapiens
	Tertiary	65 - 1.8	Following extinction of dinosaurs, this is sometimes known as the "Age of Mammals"
	Pliocene	5.3 - 1.8	Advance of glaciers. Vegetation dominated by grasslands and savannahs. Appearance of grazing mammals
	Miocene	23.8 - 5.3	Major grasslands form. Climate change led to build-up of Antarctic ice
	Oligocene	33.7 - 23.8	Elephants, horses and grasses appear
	Eocene	54.8 - 33.7	Most modern orders of mammals appear
	Paleocene	65 - 54.8	Small and medium-sized mammals dominate
Mesozoic (248 - 65)	Cretaceous	144 - 65	Flowering plants, modern insect, bird and mammal groups
	Jurassic	206 - 144	Pterosaurs and first birds. Dinosaurs roam
	Triassic	248 - 206	First appearance of the dinosaurs
Paleozoic (543 - 248)	Permian	290 - 248	First great mass extinction event. Formation of supercontinent Pangaea
	Carboniferous	354 - 290	Amniote egg. Collision of continents formed mountain chains such as the Urals and Appalachians
	Pennsylvanian	325 - 290	Coal deposits
	Mississippian	354 - 325	Limestone
	Devonian	417 - 354	First arachnids and tetrapods. Insects appear and brachiopods flourish
	Silurian	443 - 417	Climate stabilisation. Glacial ice melting, sea levels rose. Evolution of fishes
	Ordovician	490 - 443	Marine invertebrates and plants
	Cambrian	543 - 490	Major animal groups begin to appear
	Tommotian	530 - 527	Molluscs, echinoderms, brachiopods, trilobites
Precambrian Time (4600 - 543)			
Proterozoic (2500 - 543)	Neoproterozoic	900 - 543	Stromatolites begin to decline and eukaryotes become more prevalent
	Vendian	650 - 543	First soft-bodied lifeforms appear. Continental mass starts to break up
	Mesoproterozoic	1600 - 900	Oxygen increases in atmosphere reducing levels of ammonia and methane
	Paleoproterozoic	2500 - 1600	Continent formation continues over 1 billion year period
Archaean (3800 - 2500)	Cooling of Earth's crust and initial continent formation. Appearance of first life on Earth around 3.5-3.8 billion years ago in the form of bacteria such as stromatolites		
Hadean (4600 - 3800)	Formation of Solar System. Aggregation of matter into planetesimals and then planets. Comets and asteroids formed from remaining material		