



About Science Prof Online PowerPoint Resources

- Science Prof Online (SPO) is a free science education website that provides fully-developed Virtual Science Classrooms, science-related PowerPoints, articles and images. The site is designed to be a helpful resource for students, educators, and anyone interested in learning about science.
- The SPO Virtual Classrooms offer many educational resources, including practice test questions, review questions, lecture PowerPoints, video tutorials, sample assignments and course syllabi. New materials are continually being developed, so check back frequently, or follow us on Facebook (Science Prof Online) or Twitter (ScienceProfSPO) for updates.
- Many SPO PowerPoints are available in a variety of formats, such as fully editable PowerPoint files (.ppt), as well as uneditable versions in smaller file sizes, such as PowerPoint Shows (.pps) and Portable Document Format (.pdf), for ease of printing. The font "Jokerman" is used frequently in titles. It has a microbiology feel to it. If you do not have this font, some titles may appear odd, oversized and off-center. Find free downloads of Jokerman by Googling "download jokerman font microsoft".
- Images used on this resource, and on the SPO website are, wherever possible, credited and linked to their source. Any words underlined and appearing in blue are links that can be clicked on for more information. PPT files must be viewed in *slide show mode* to use the hyperlinks directly.
- Several helpful links to fun and interactive learning tools are included throughout the PPT and on the Smart Links slide, near the end of each presentation. You must be in *slide show mode* to utilize hyperlinks and animations.
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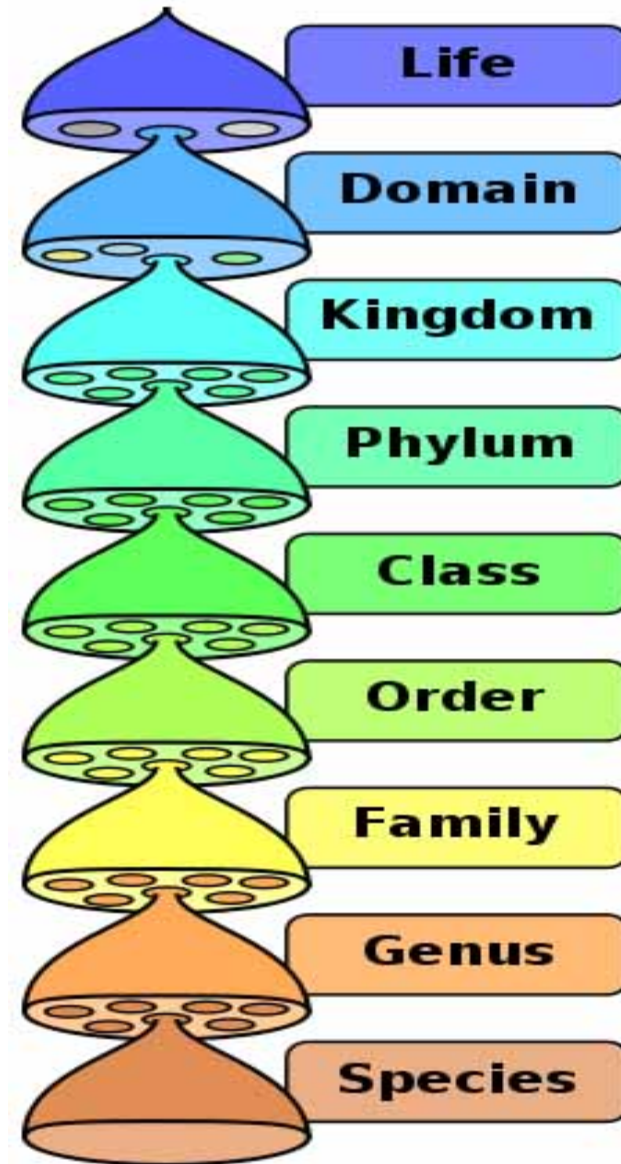
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Biological Classification

The Basics

VIDEO:
[Taxonomy: Life's Filing System](#)
from
Crash Course Biology



Classifying Living Things

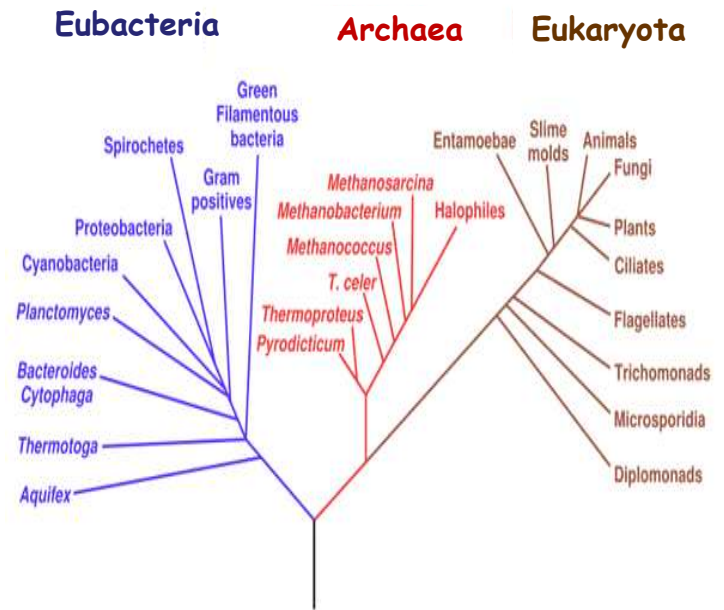
Biological classification provides meaningful groupings of organisms based on evolutionary relationships.

To learn which organisms are most closely related, evidence is gathered from:

- Fossil record
- Comparative homologies
Similarity of anatomy / physiology due to shared ancestry
- Comparative sequencing of genetic material (DNA & RNA) among organisms

Q: Which of these three methods do you think is most reliable in helping us understand the "relatedness" of living things?

Phylogenetic Tree of Life



Classifying Living Things

Three Domains

Eubacteria

- True bacteria
- Prokaryotes

Exs. *Streptococcus pneumoniae*
Escherichia coli

Archaea

- Were thought to be same as Bacteria until recently.
- Prokaryotes

Ex. *Extremophiles*

Eukaryota

- All eukaryotic organisms.

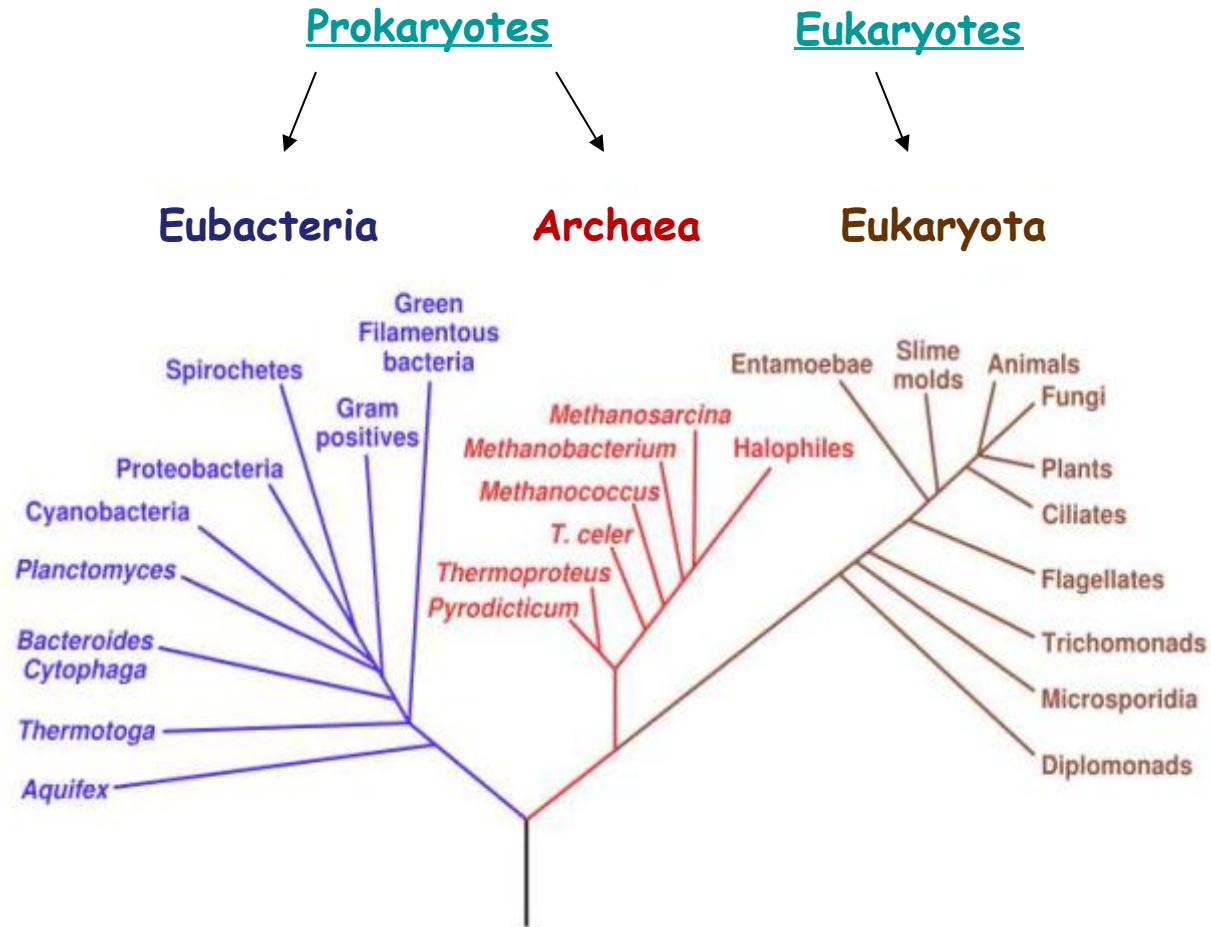
Fall into 4 Kingdoms:

Protista - Ex. *algae*

Fungi - Ex. *mushroom*

Plantae - Ex. *Maple tree*

Animalia - Ex. *you*



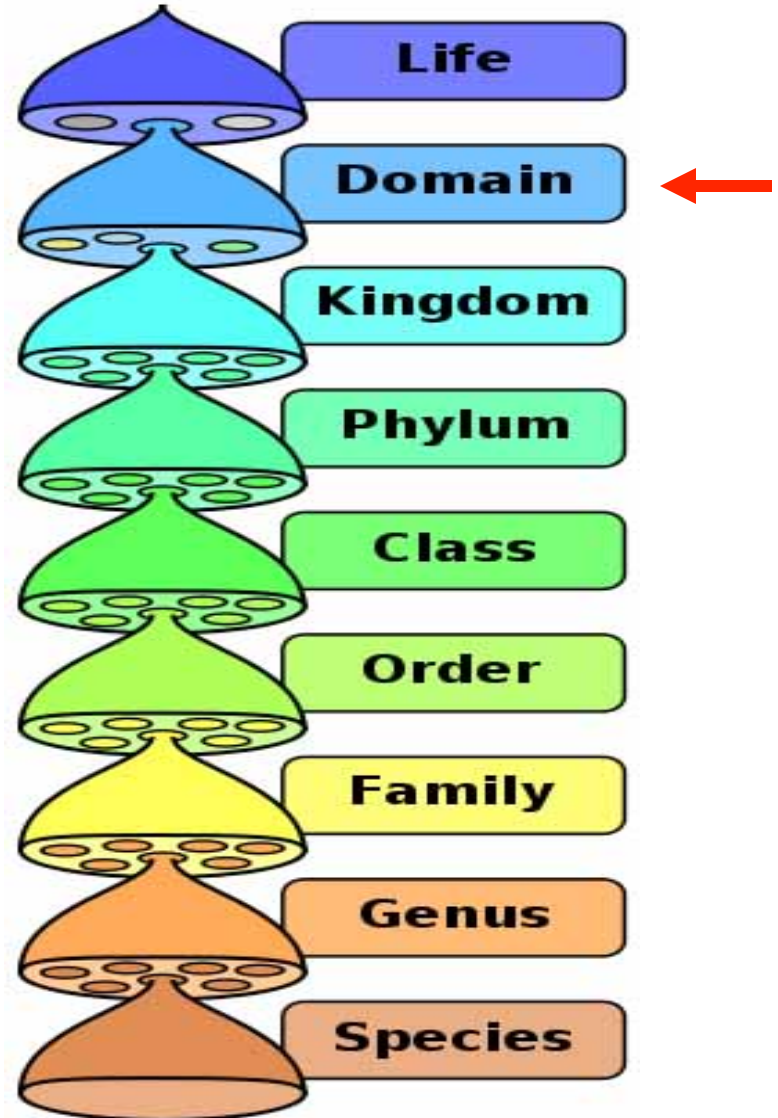
Classifying Living Things

The hierarchy of biological classification has eight major taxonomic ranks which encompass all known life.

How about a trick to help us remember them?

And a little "Classification Rap" to help as well?

Word to your Mat!



Domain: Archaea

- Prokaryotic
- Lack peptidoglycan
- Binary fission
- Many live in extreme environments.
- Not known to cause disease in humans or animals.
- Had been considered bacteria until examination of their unique rRNA sequences.
- Include:
 - Methanogens
 - Extreme halophiles
 - Extreme thermophiles

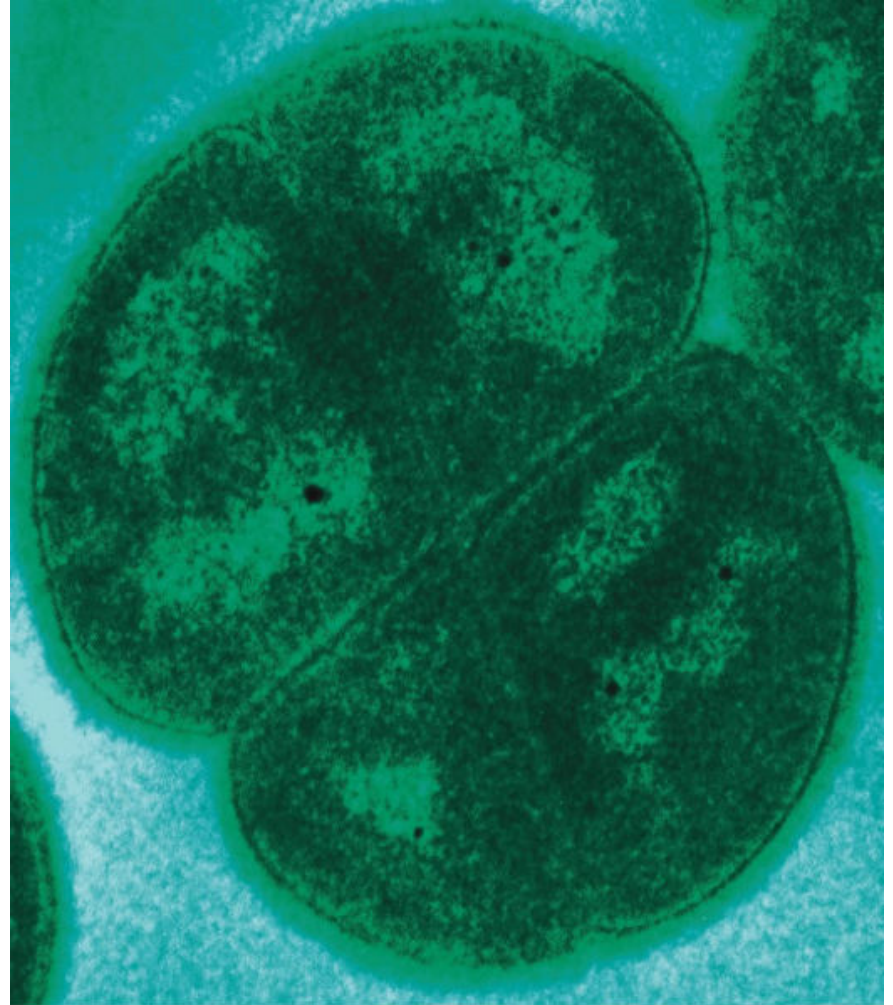
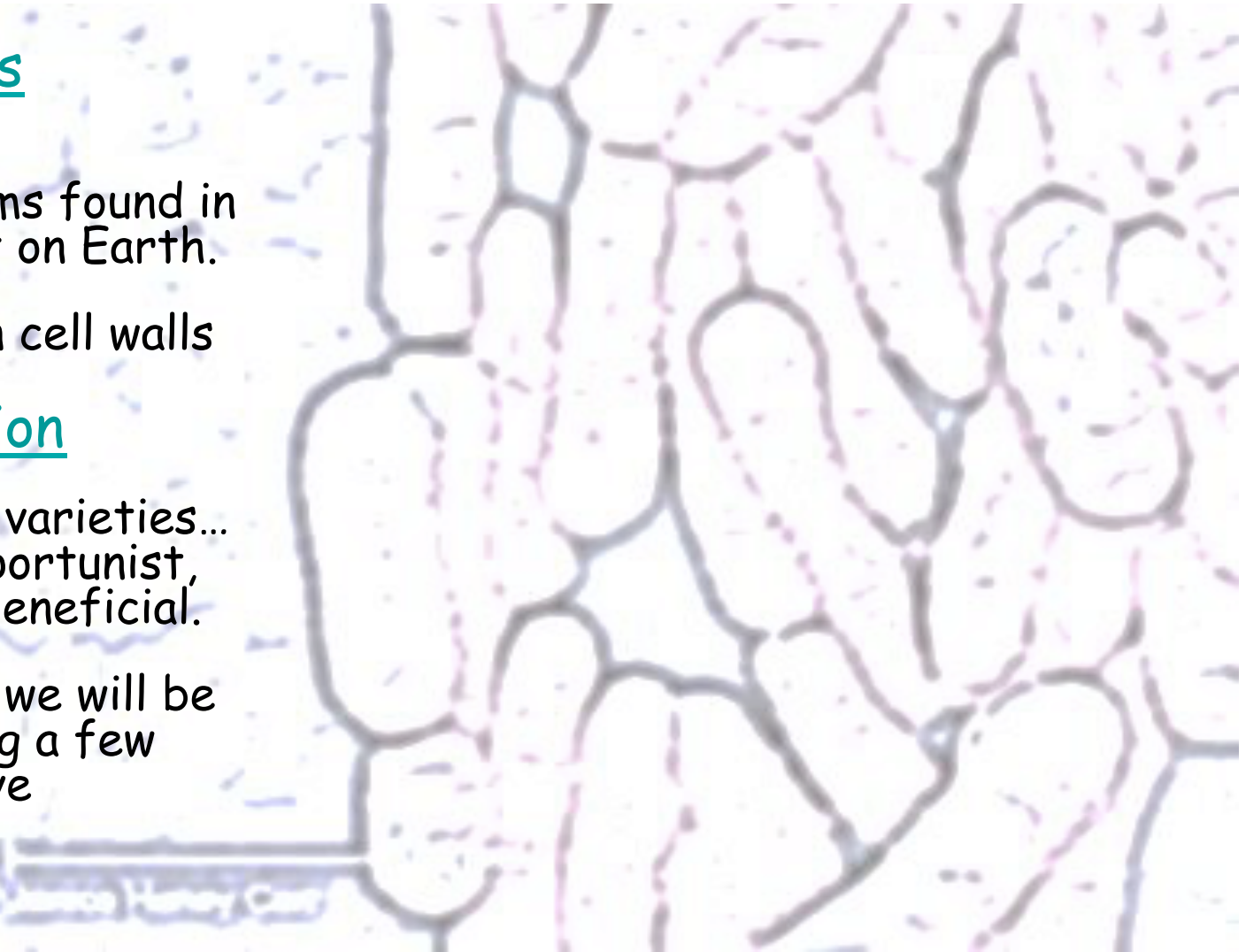


Image Archaea;
Deinococcus radiodurans

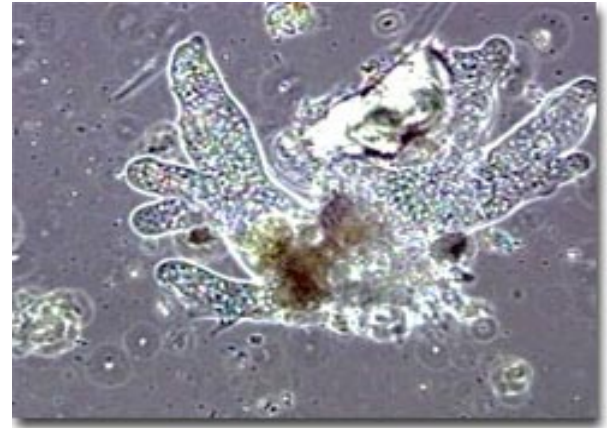
Domain: Eubacteria

- Prokaryotes
- Unicellular microorganisms found in every habitat on Earth.
- Peptidoglycan cell walls
- Binary fission
- There are all varieties... pathogen, opportunist, harmless & beneficial.
- In this class, we will be meeting just a few representative prokaryotes.

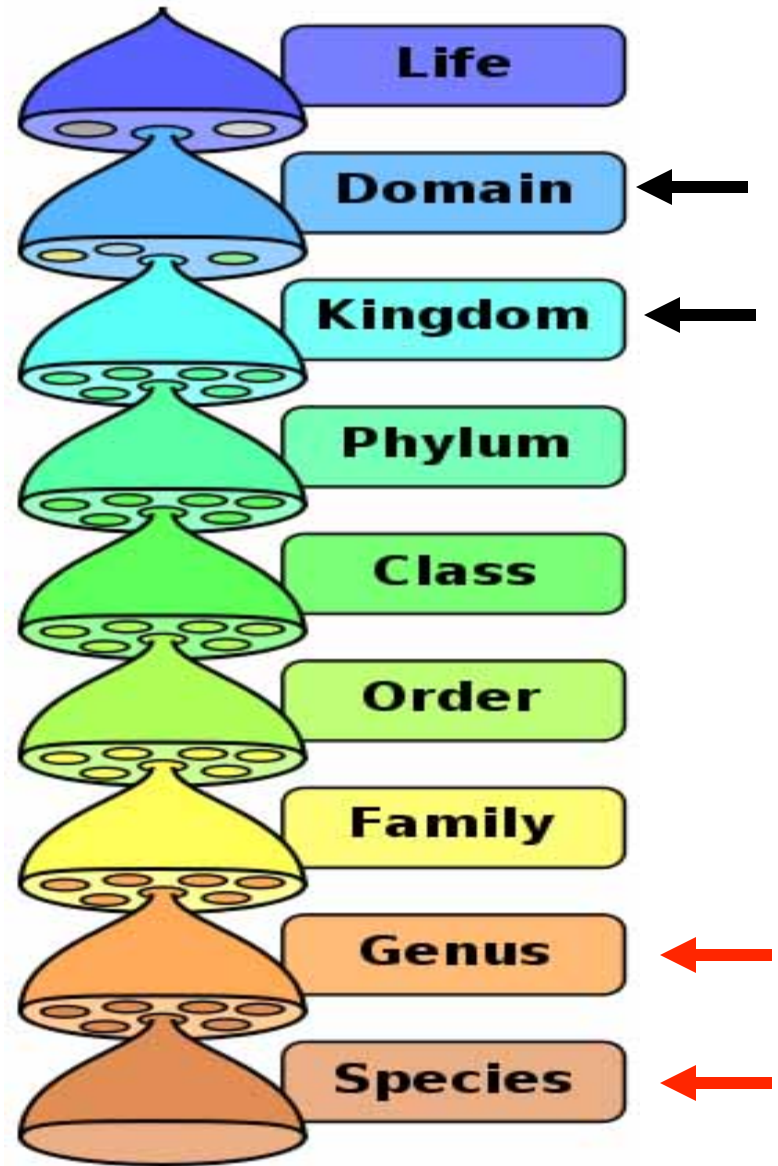


Domain: Eukaryota

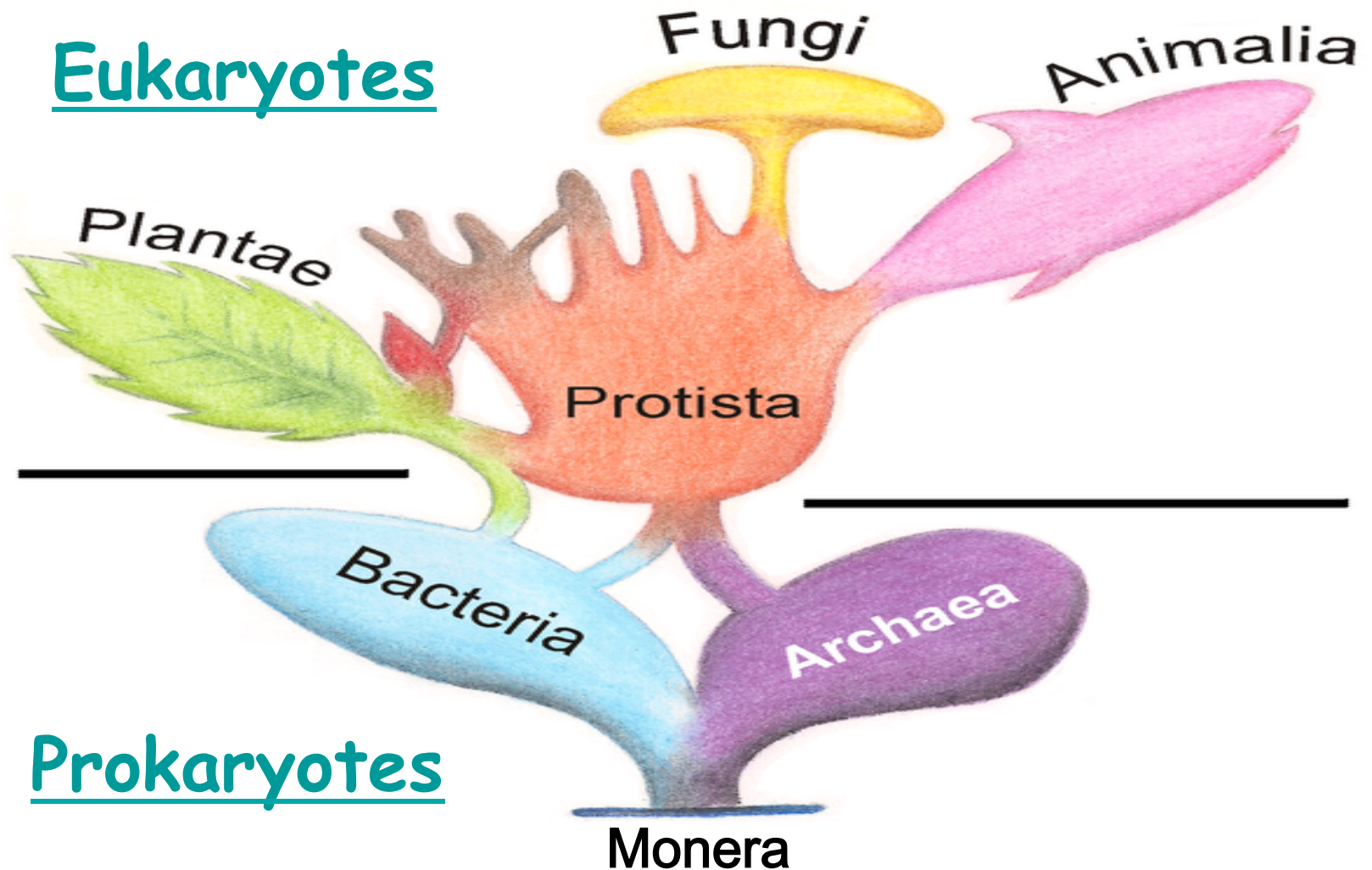
- Five major groups that interest microbiologists:
 - Protozoans
(some can cause infectious disease)
 - Fungi
(some can cause infectious disease)
 - Helminths
(parasitic worms that can cause infectious disease)
 - Algae
(DO NOT cause infectious disease in humans)
 - Slime & Water Molds
(DO NOT cause infectious disease in humans)
- Includes both human pathogens and organisms vital for human life.



Q: What was that clue to help us remember the hierarchy of biological classification?



Classification of Organisms by Kingdom



Classifying Living Things: A Little Name Calling

Binomial nomenclature: A system of naming organisms first proposed in the 1700s by Swedish scientist Carolus Linnaeus.

In binomial nomenclature, each organism is given two Latinized names:

- Generic name (genus, pl. genera)
- Specific name (species)

Genus names are always capitalized; species names are lower case.

Genus and species names are always italicized or underlined when written.

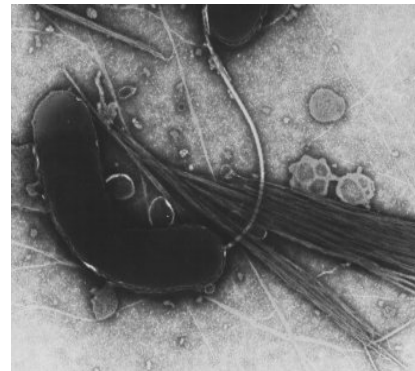
Q: Why does everything need to have a name? And why a universally understood name?



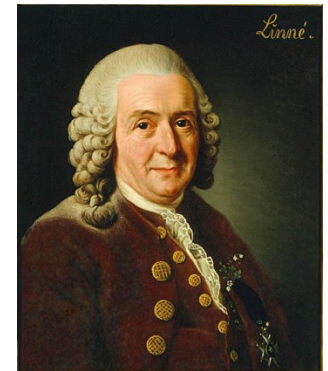
Acer pseudoplatanus



Canis lupus



Vibrio cholerae



Homo sapiens

REVIEW!

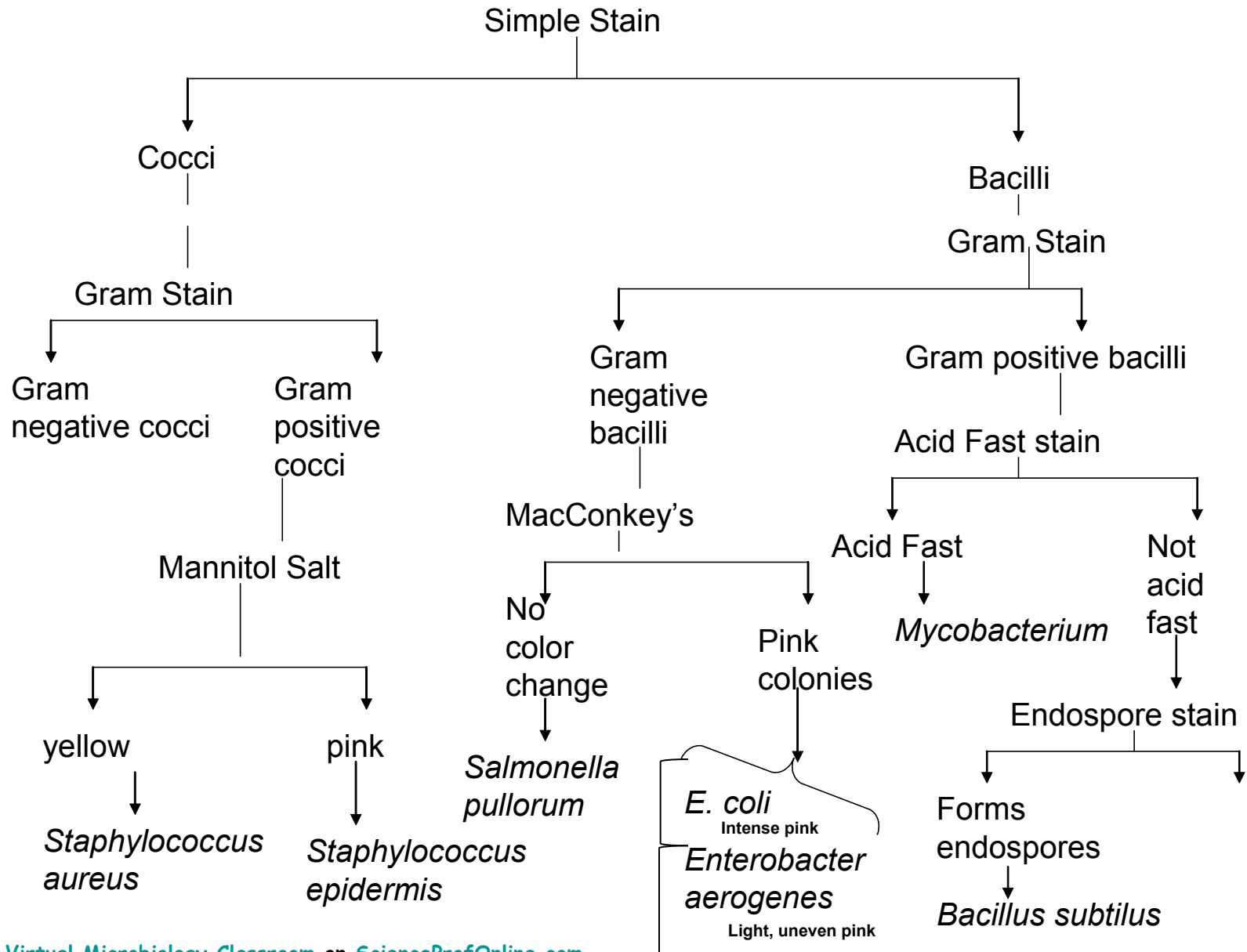
Video lesson on Binomial Nomenclature



Canis lupus

Q: *What are the three rules for writing a scientific name?*

Dichotomous Key



Confused?

Here are links to fun resources that further explain biological classification:

- [Biological Classification](#) section of the science education website Virtual Microbiology Classroom of [Science Prof Online](#).
- ["I've Got a Name"](#) song by Jim Croche.
- [Evolution of the Three Domains](#) animated science tutorial.
- [Classifying Life](#) interactive game from PBS Nova.
- ["Classification Rap"](#) hilarious music video from 1989.
- [Bacterial Pathogen Pronunciation Station](#), a webpage with links to audio files containing the pronunciation of the bacterial names, created by Neal R. Chamberlain, Ph.D.
- [Tree of Life Cladogram](#), an interactive diagram on classification.
- [Biological Classification: Kingdoms](#), video by Invictus1708.

(You must be in PPT slideshow view to click on links.)

Smart Links





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- PowerPoints
- practice test questions
- review questions
- study guides and learning objectives

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