

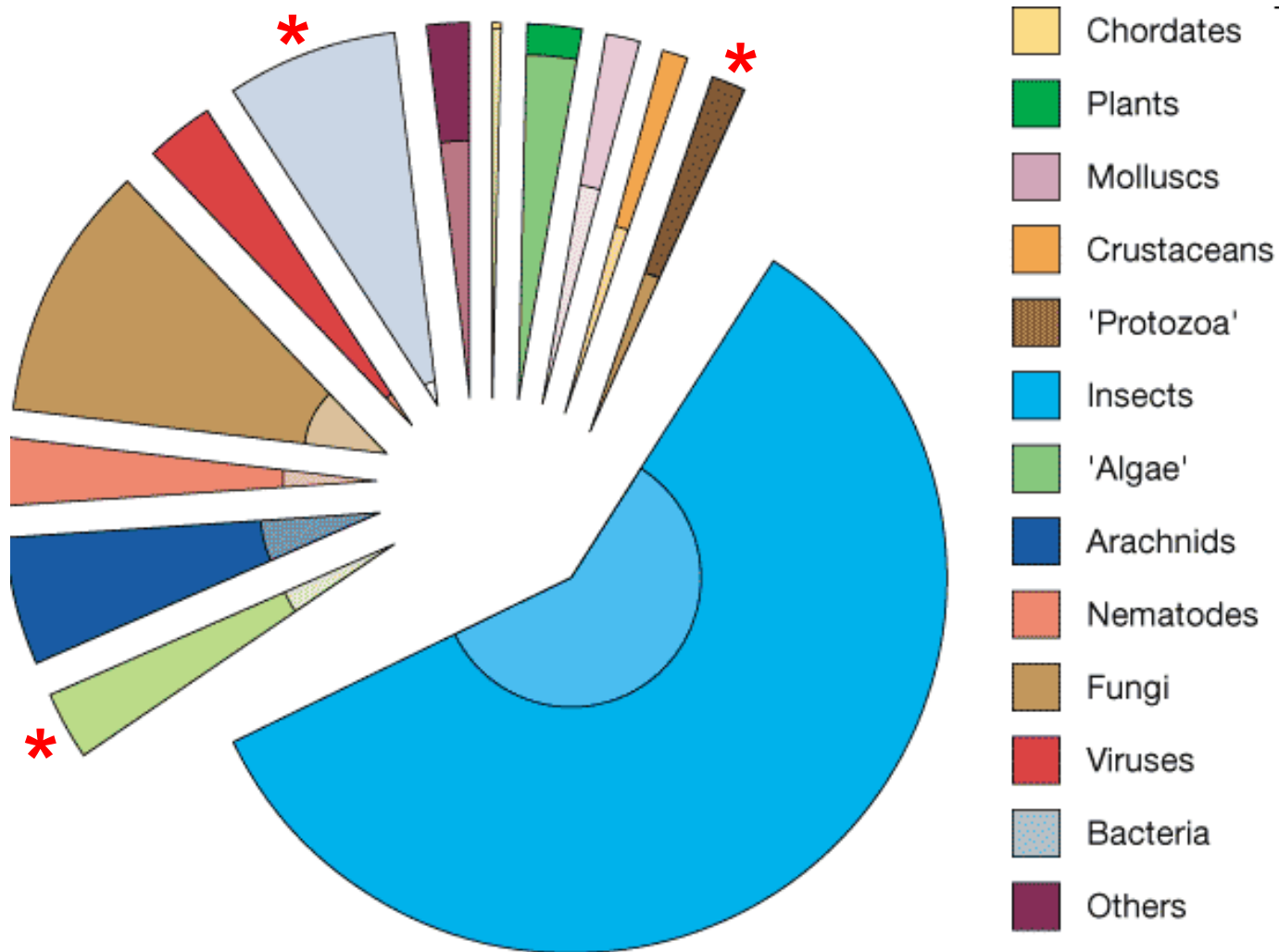
UDLS 30th January, 2009

Debunking Biology: Introduction to Kingdom Protista

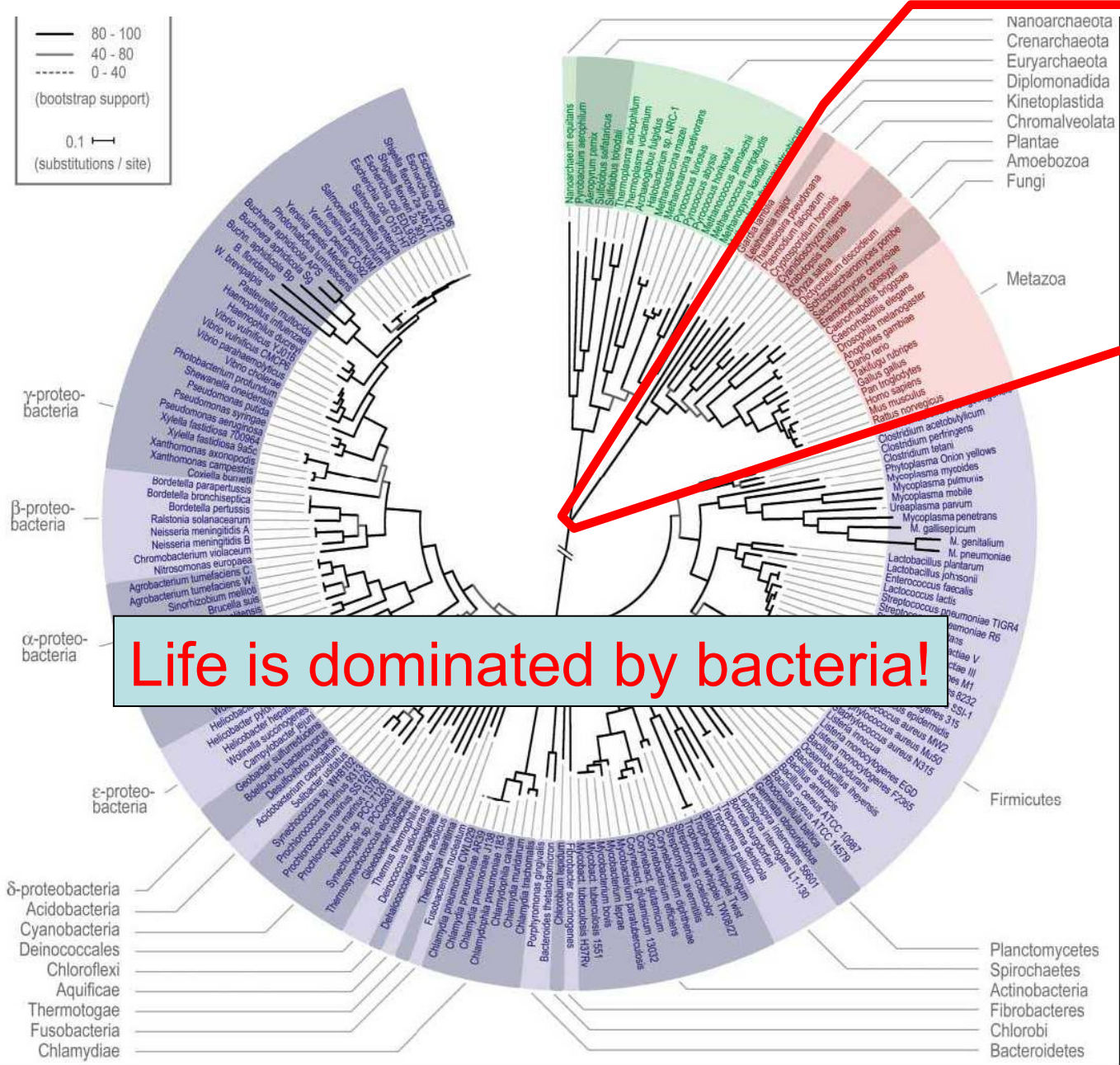
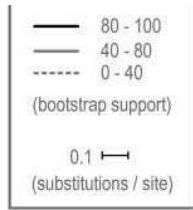
Yana Eglit

Department of Botany

A biodiversity chart

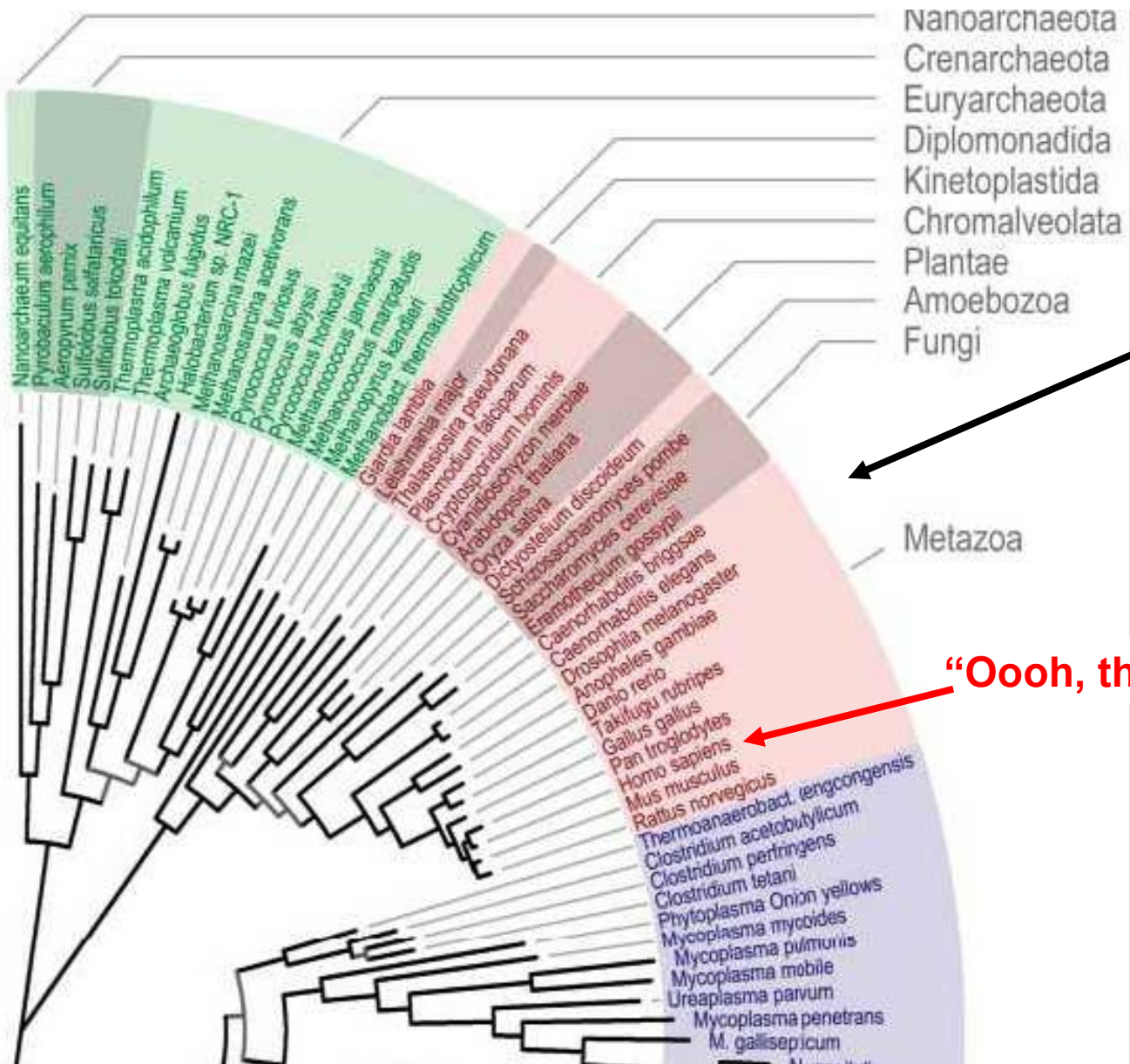


Purvis & Hector 2000 *Nature*;
based on Hawksworth & Kalin-Arroyo in *Global Biodiversity Assessment*



Life is dominated by bacteria!

Us!



Nanoarchaeota
 Crenarchaeota
 Euryarchaeota
 Diplomonadida
 Kinetoplastida
 Chromalveolata
 Plantae
 Amoebozoa
 Fungi

Nuclei
 Cytoskeleton
 Endomembrane sys.
 Phagocytosis

Metazoa

“Oooh, that’s us!”

Let's take a look at some eukaryotes:



(1; ToLWeb)



(2; ToLWeb)



(3; Wikipedia)



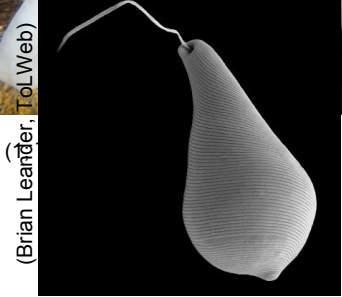
(4)



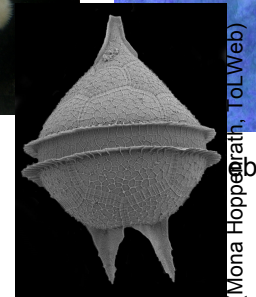
(Brian Leander)



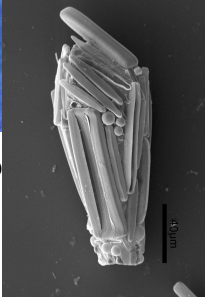
(Robinson 2006 *PLoS Biol.*)



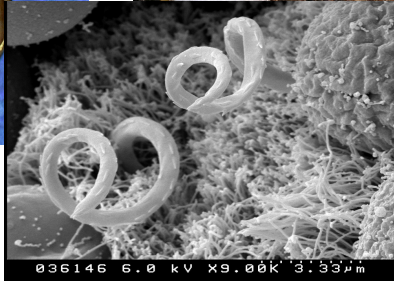
(Brian Leander, ToLWeb)



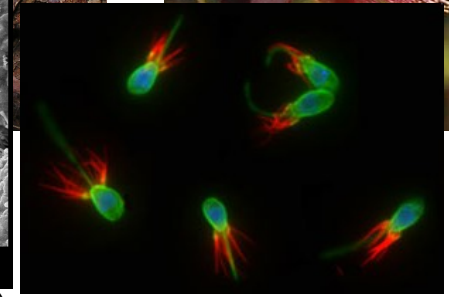
(Mona Hoppegrath, ToLWeb)



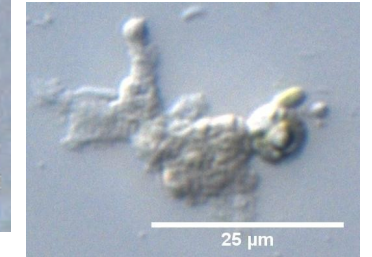
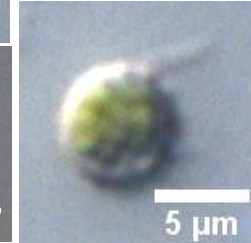
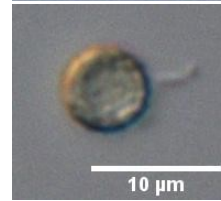
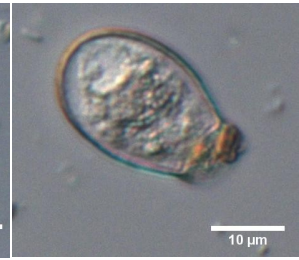
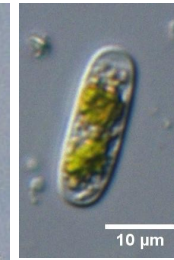
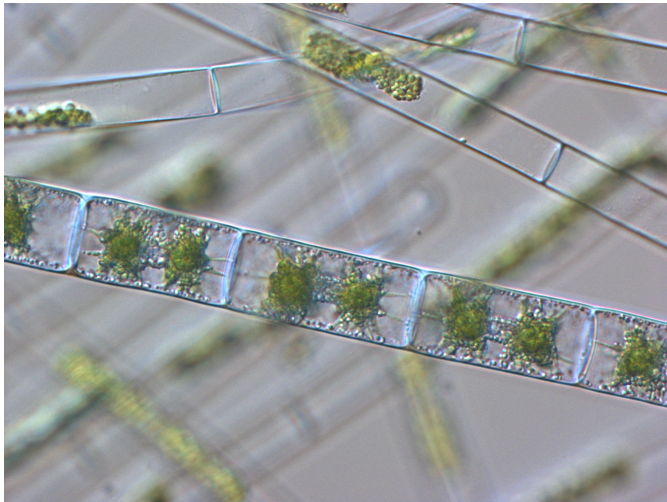
(Ralf Meisterfeld, ToLWeb)



(<http://helicosporidia.ifas.ufl.edu/>)

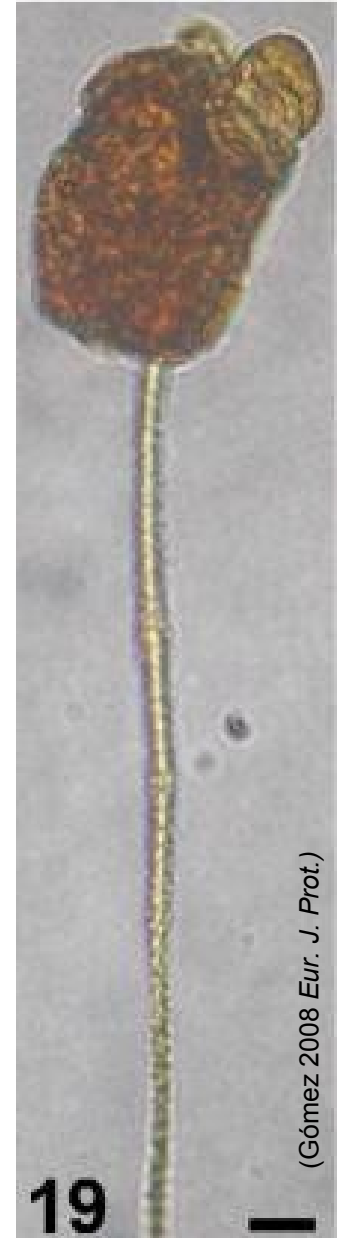
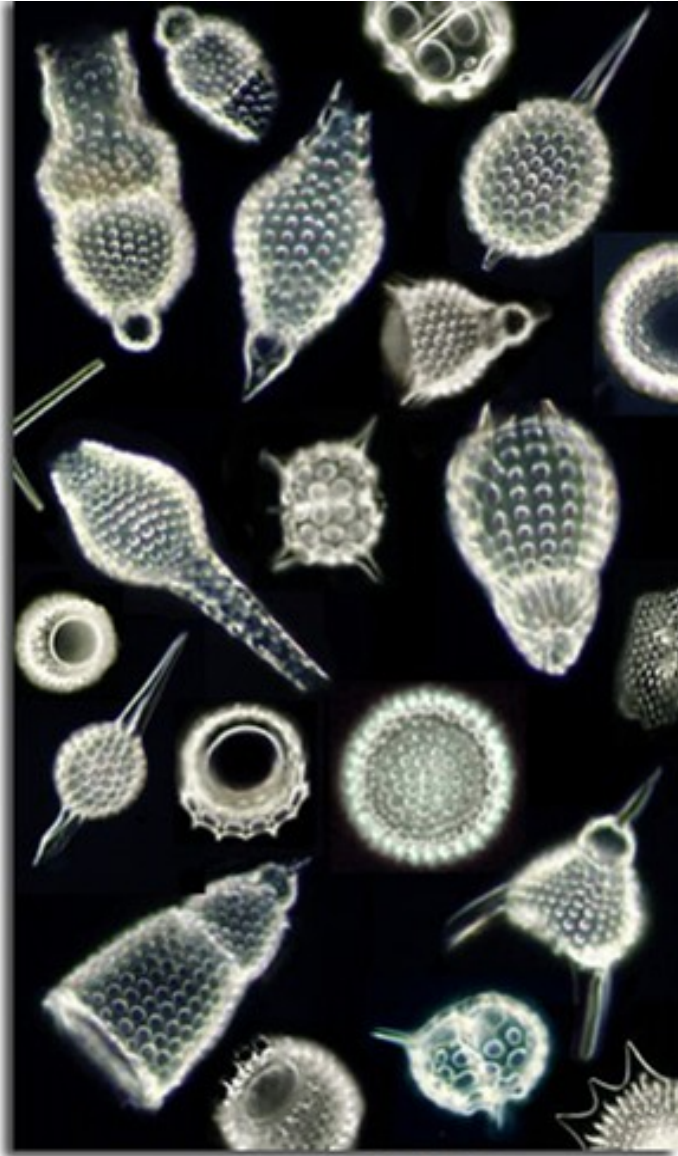


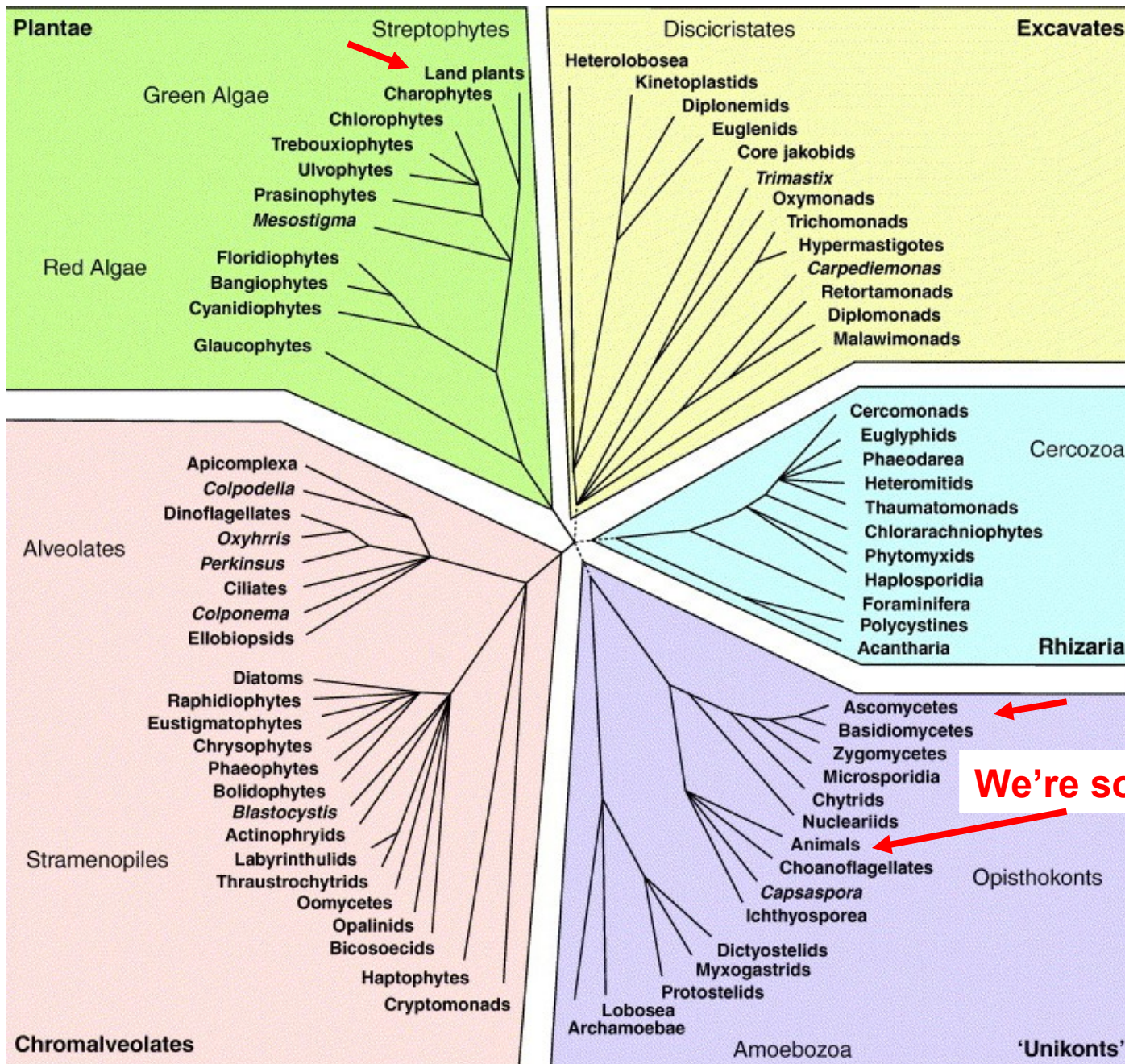
Nicole King Lab, Berkeley



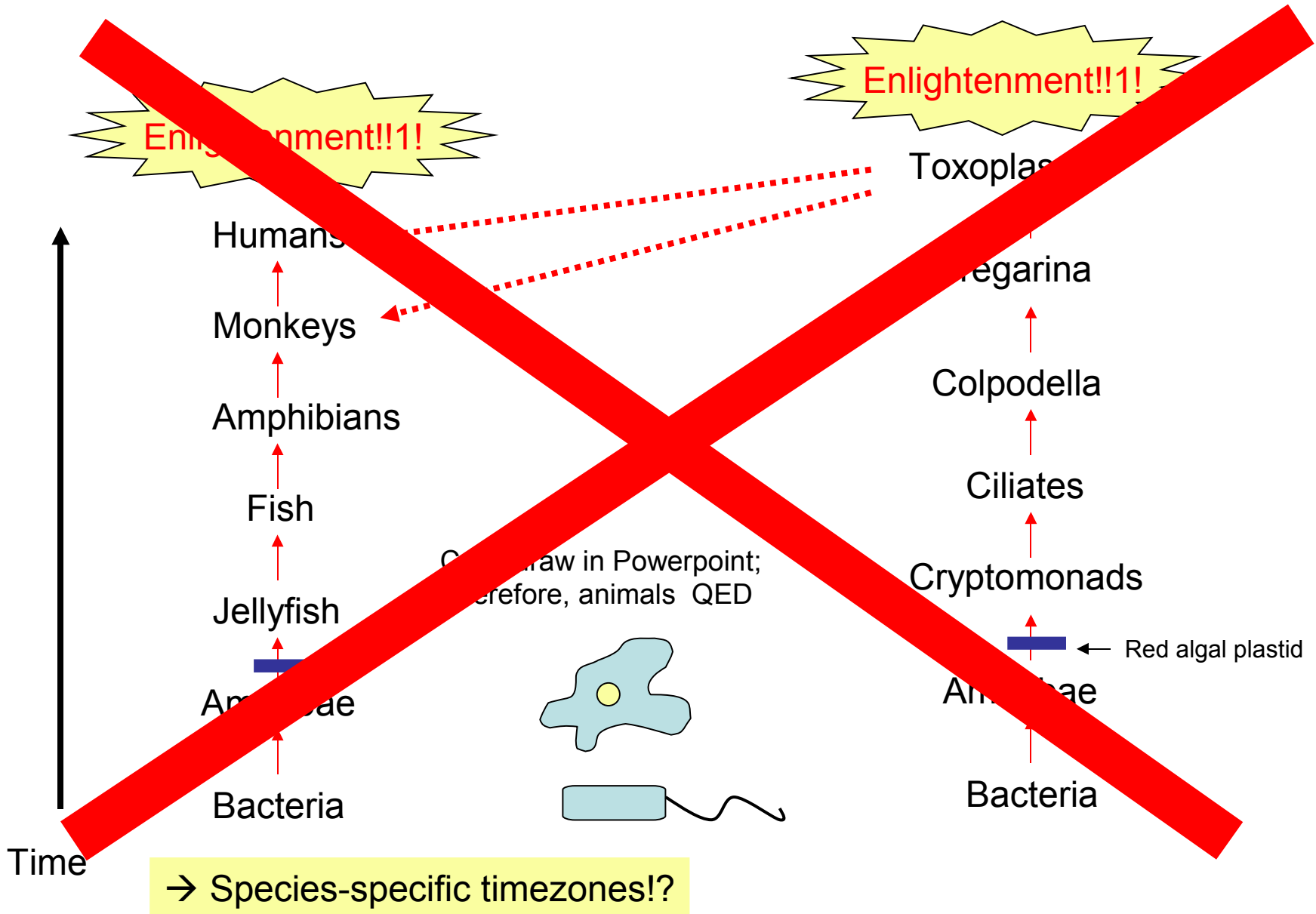
It's hard to stop...!

http://biology.unm.edu/ccouncil/Biology_203/Images/Protists/radiolarians.jpg



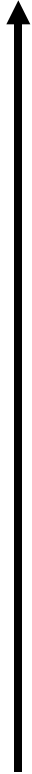


Speaking of phylogeny...

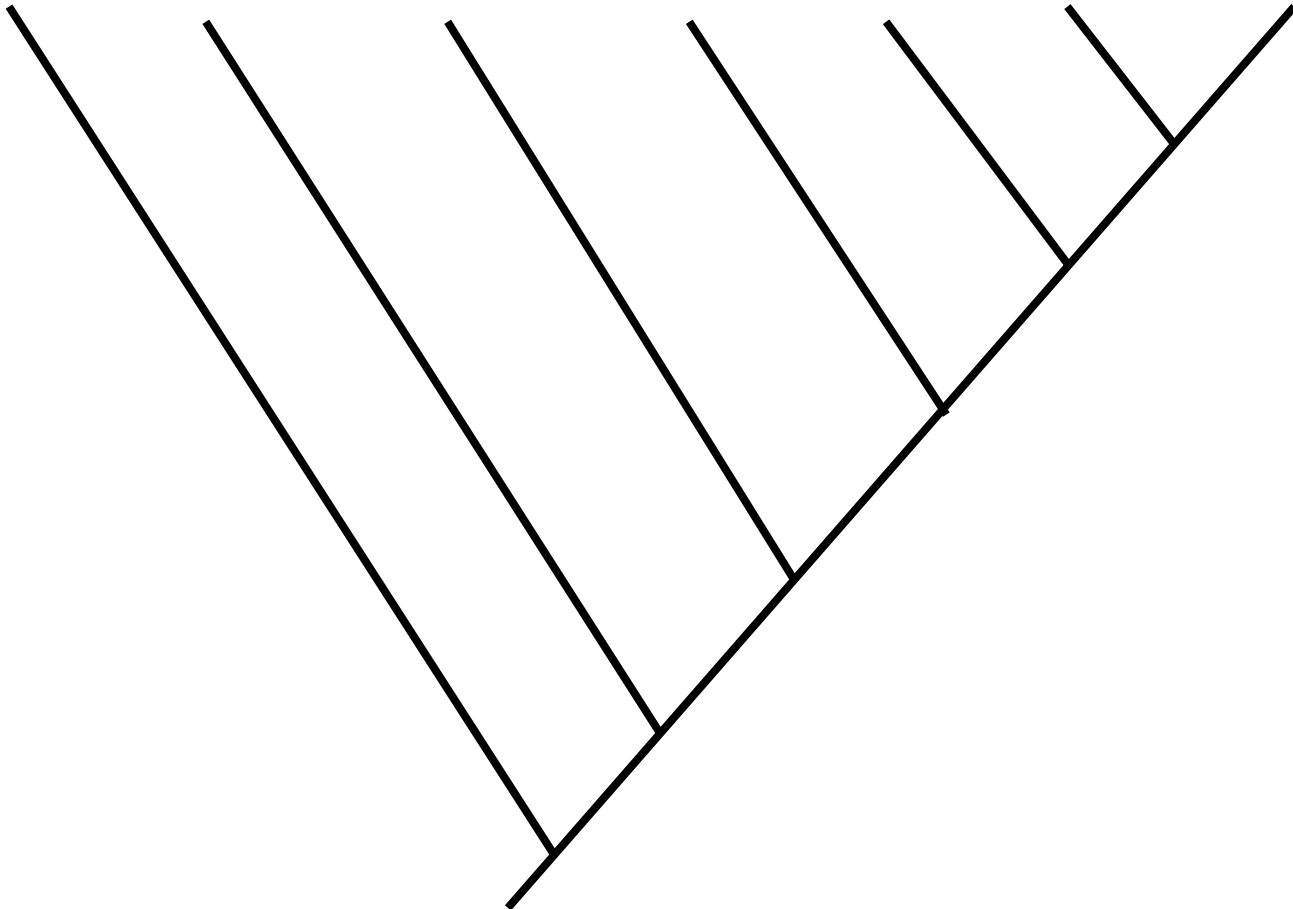


Closer to truth:

Bacteria Amoebae Jellyfish Fish Amphibians Monkeys Humans



Time



Bacteria

Enlightenment!!1!

More like this:

Longer generations → Evolutionary retardation

Amoebae

Jellyfish

Fish

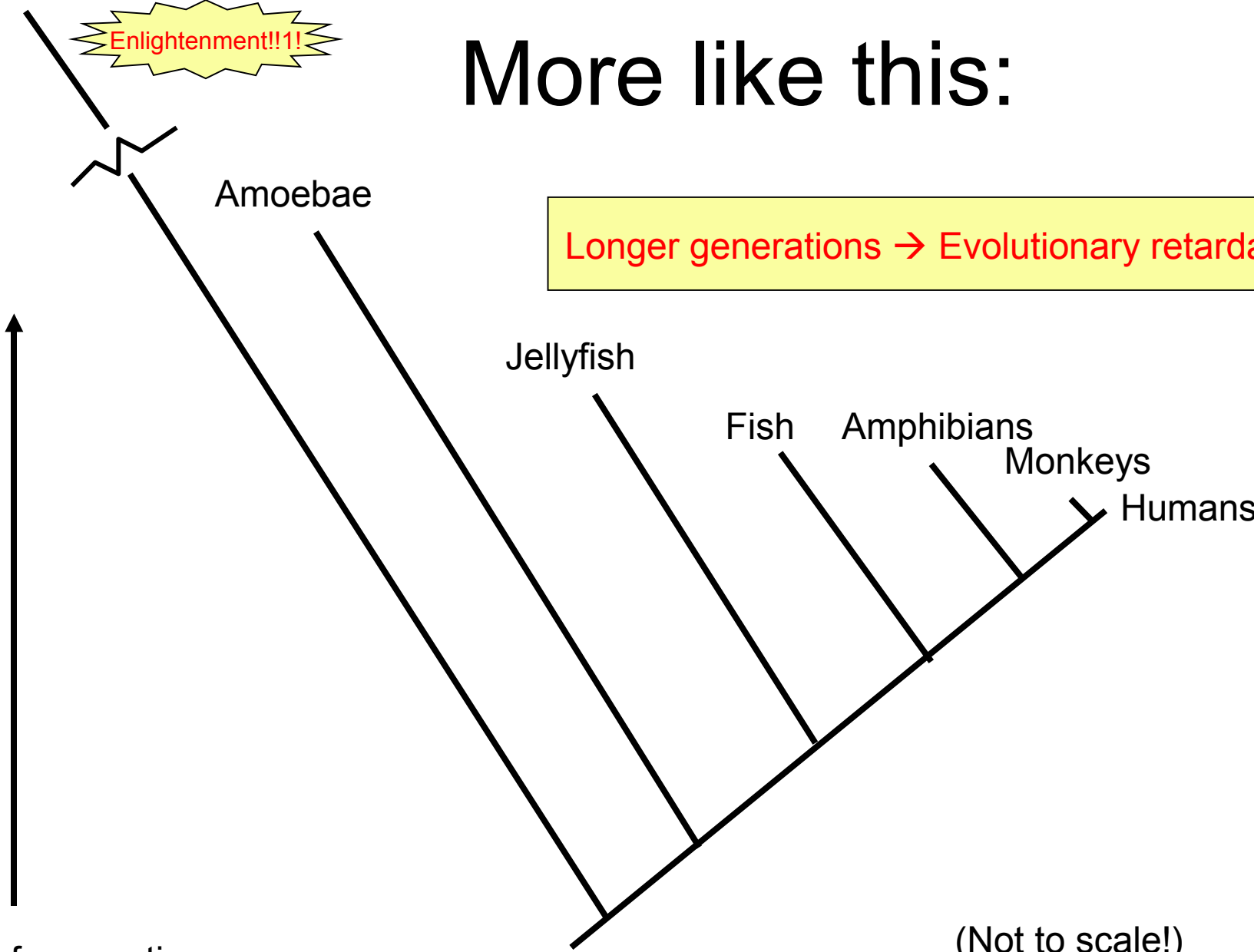
Amphibians

Monkeys

Humans

of generations

(Not to scale!)

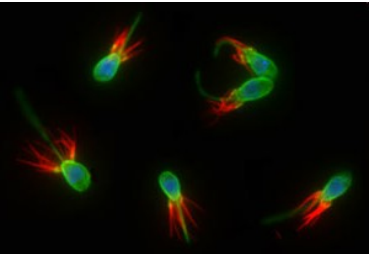


Evolution \neq Increase in complexity!



© Pokemon

Example: Myxosporidia



Nicole King Lab, Berkeley



www.paleos.org



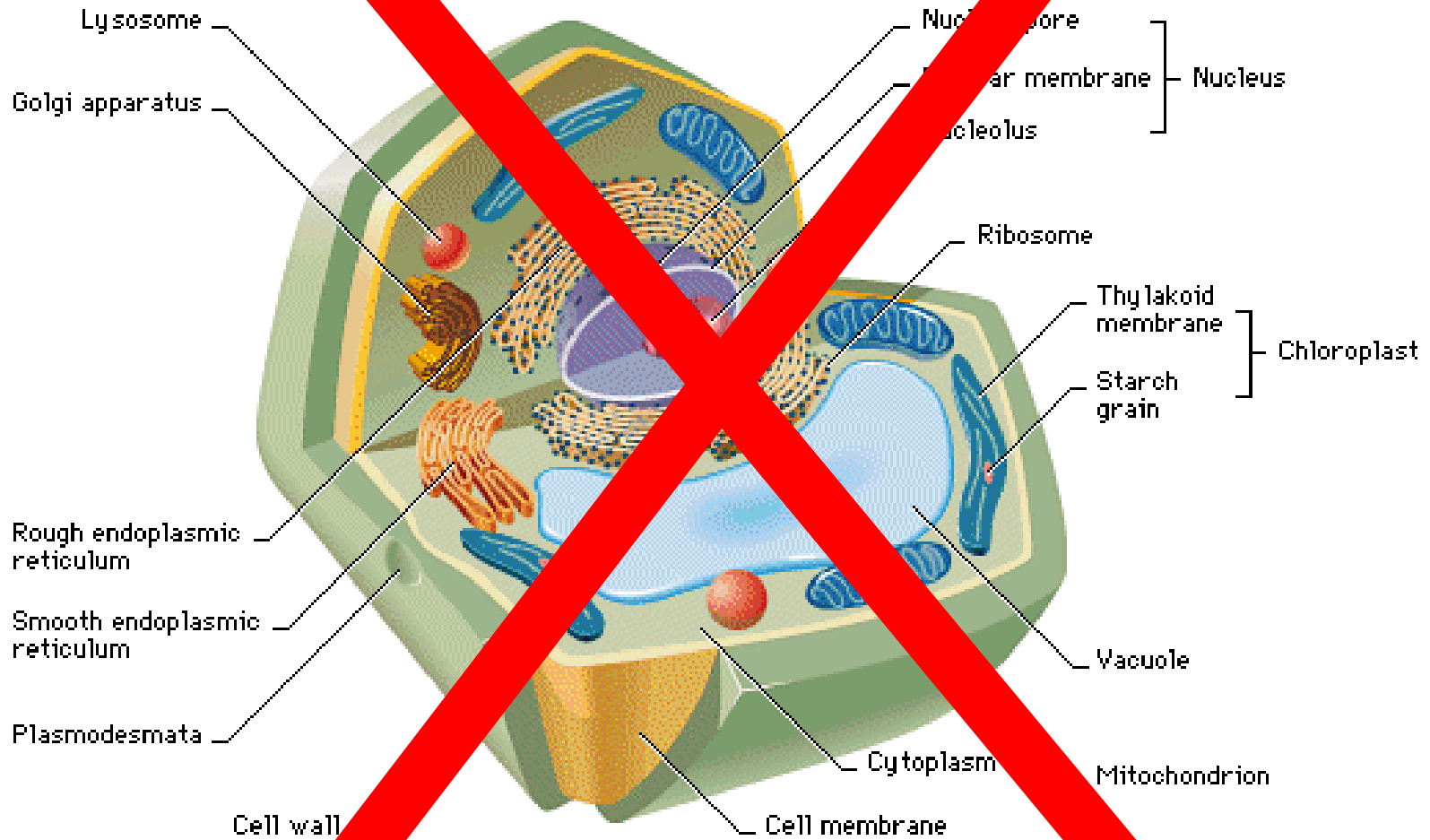
H.sapiens, etc



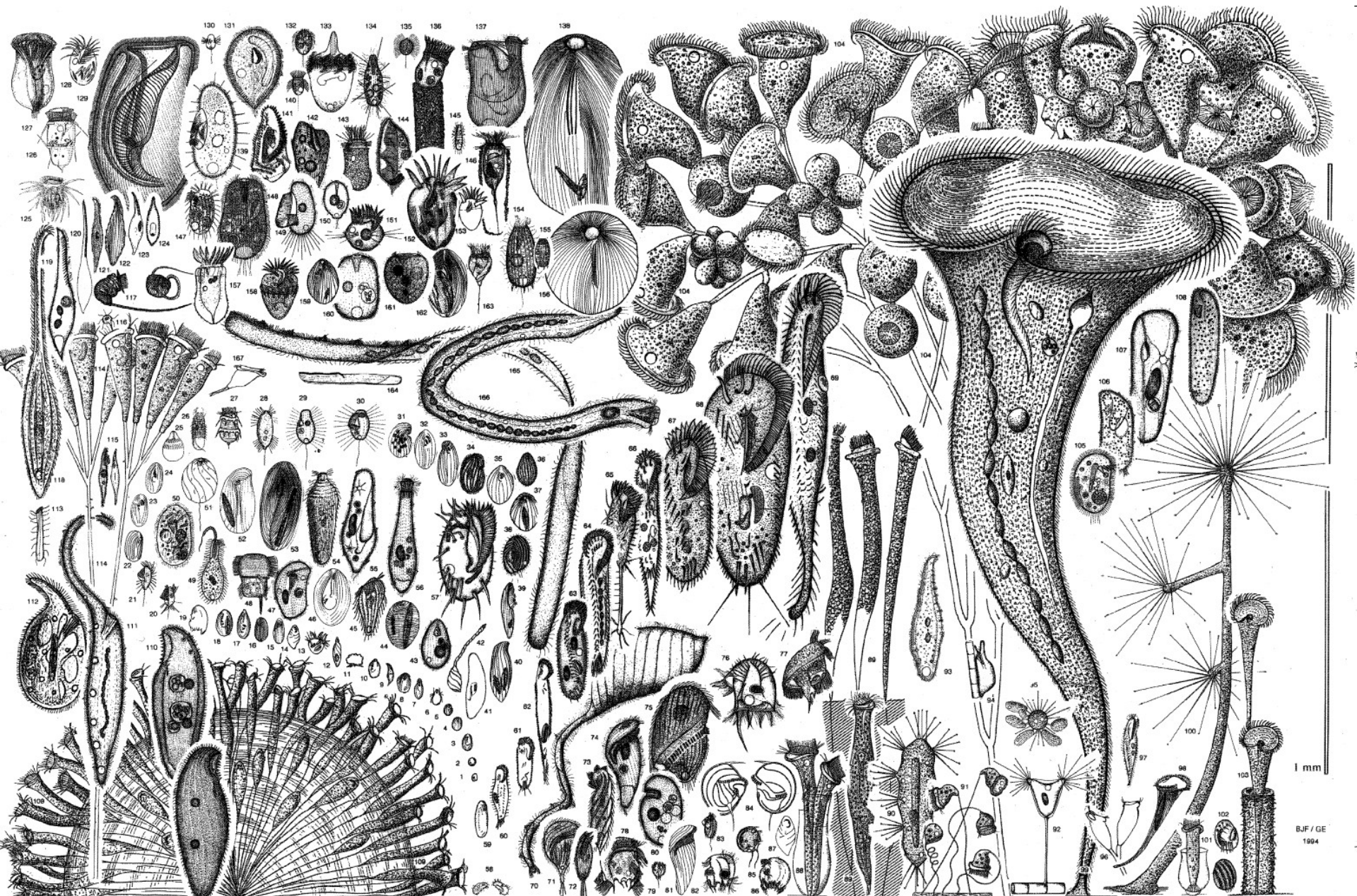
Loss of multicellularity

Multicellularity

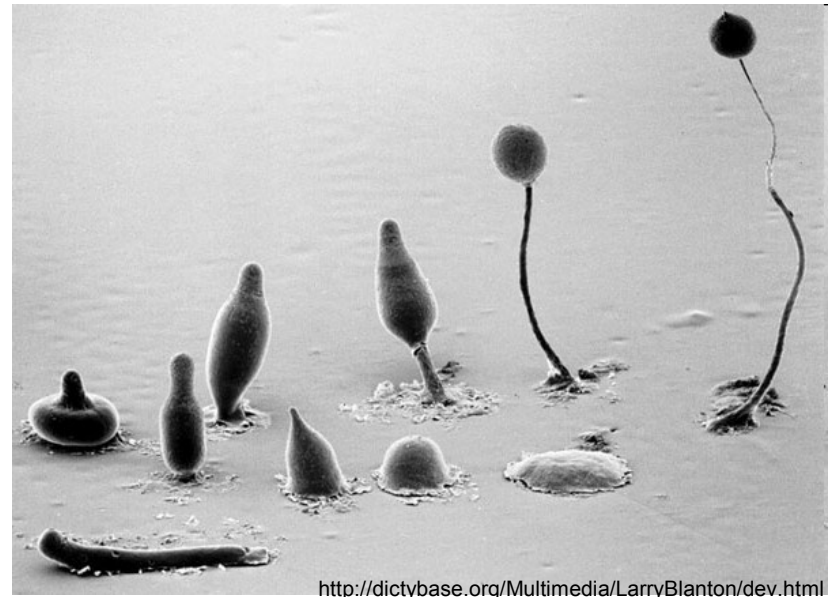
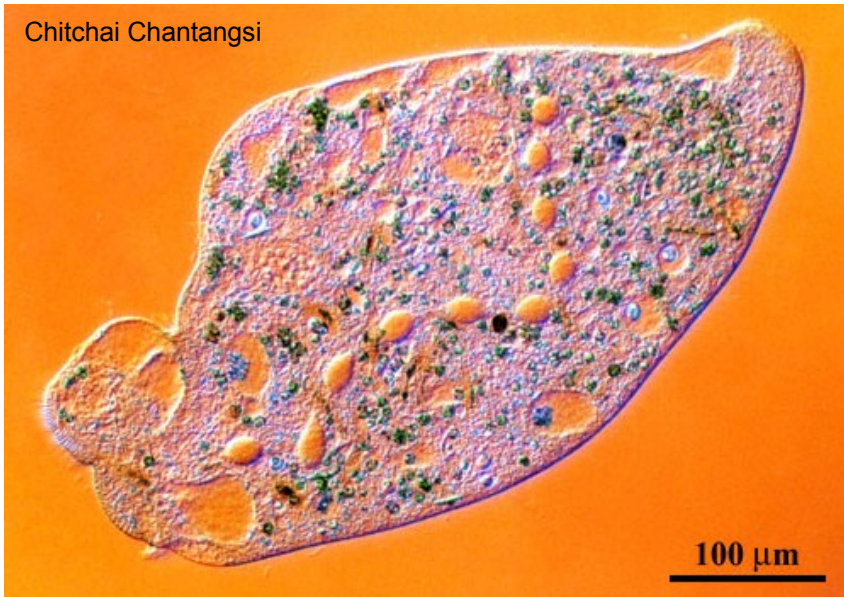
Typical Cell



Cell shape diversity (ciliates)



Chitchai Chantangsi



<http://dictybase.org/Multimedia/LarryBlanton/dev.html>



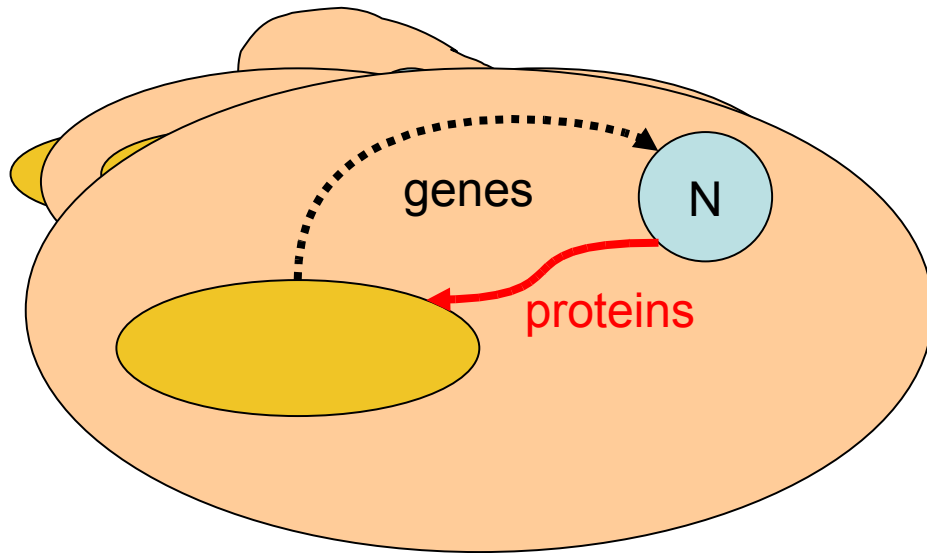
<http://oceanexplorer.noaa.gov/explorations/05lostcity/logs/july27/media/xeno2.html>



<http://www.apnotofungi.com/SlimeMould-Physarum%20polycephalum23-03-07.jpg>

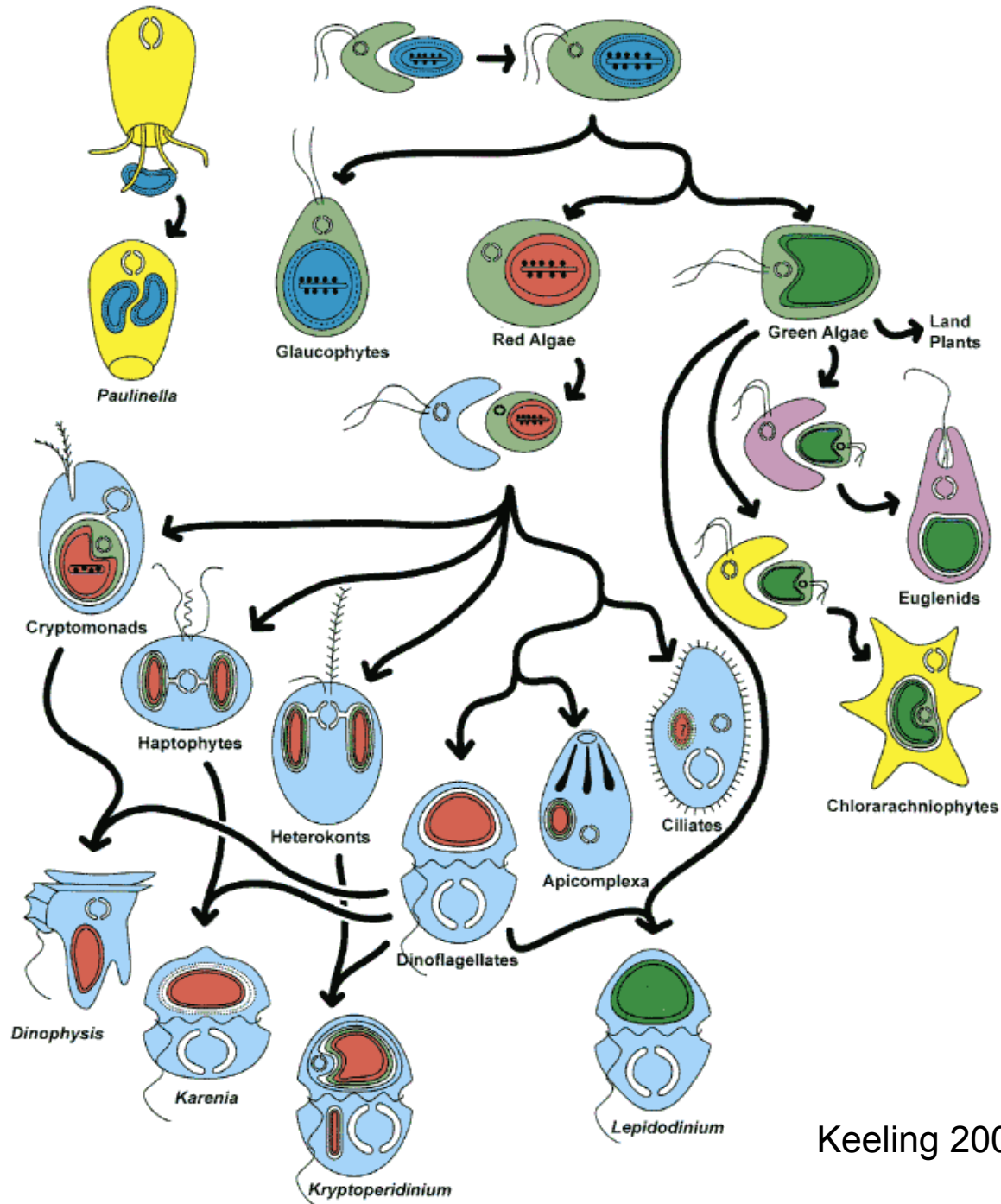
Endosymbiosis

Example: Mitochondria (simplified)



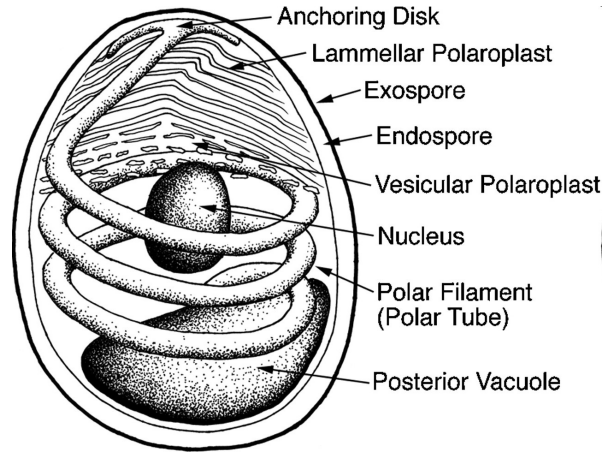
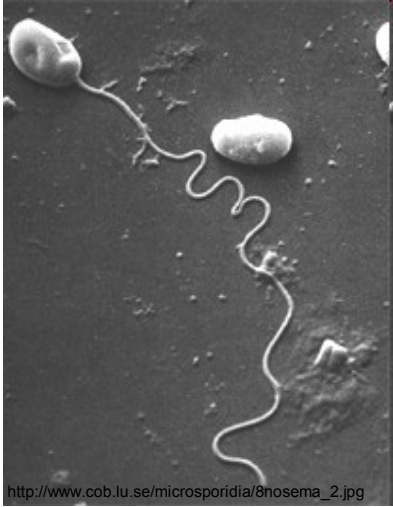
1. Host eats organism
2. Organism can replicate inside host
3. Genes transferred to host
4. Product of those genes targeted back to endosymbiont
5. Organelle!

This can happen recursively: Secondary and Tertiary endosymbiosis...



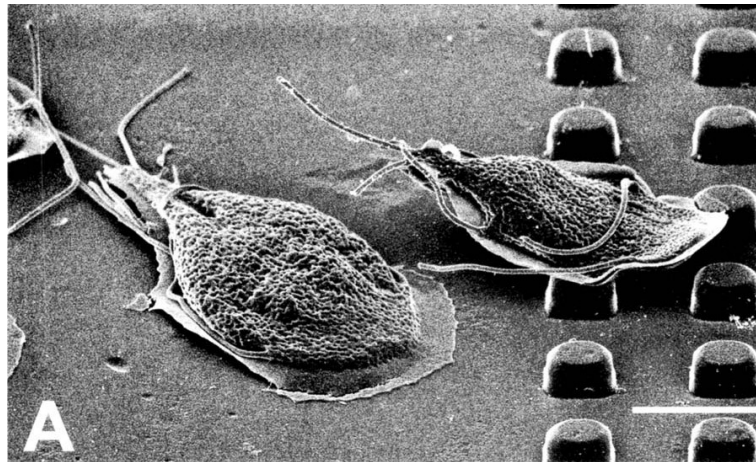
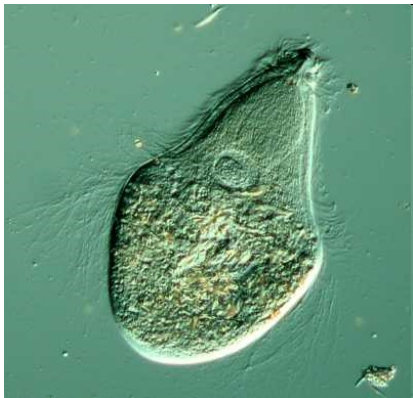
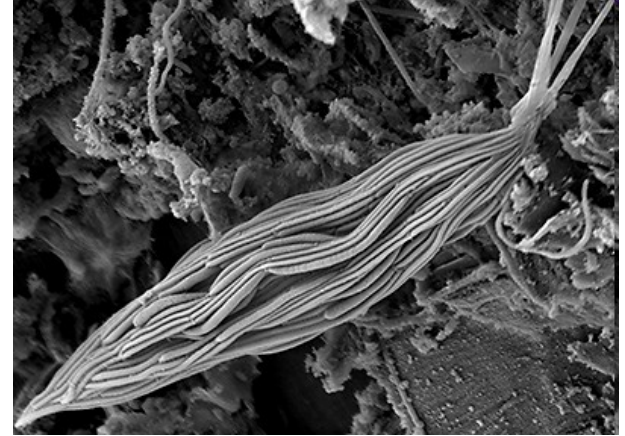
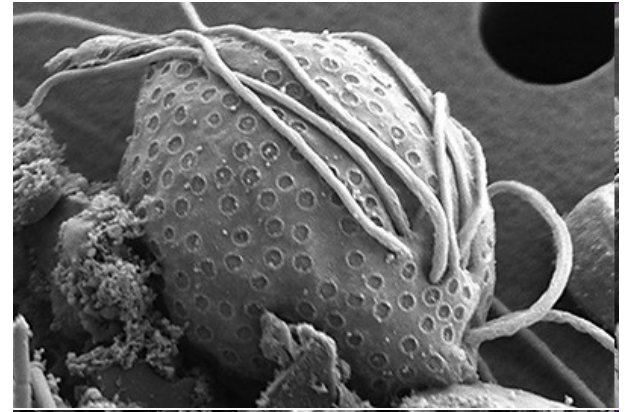
Keeling 2004 *Am J Bot*

“Archaezoa”

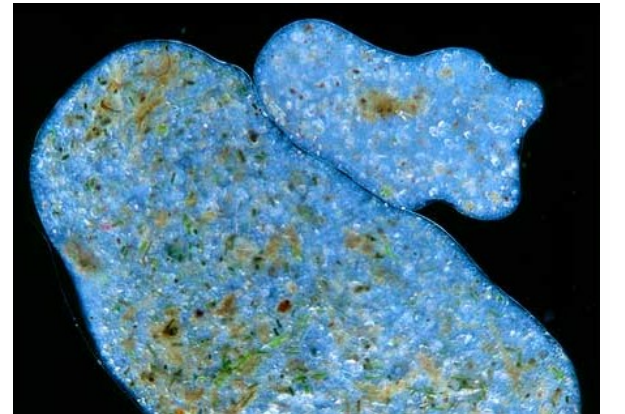


Keeling & Fast 2002 *Annu Rev Microbiol*

Kevin Carpenter, ToLWeb



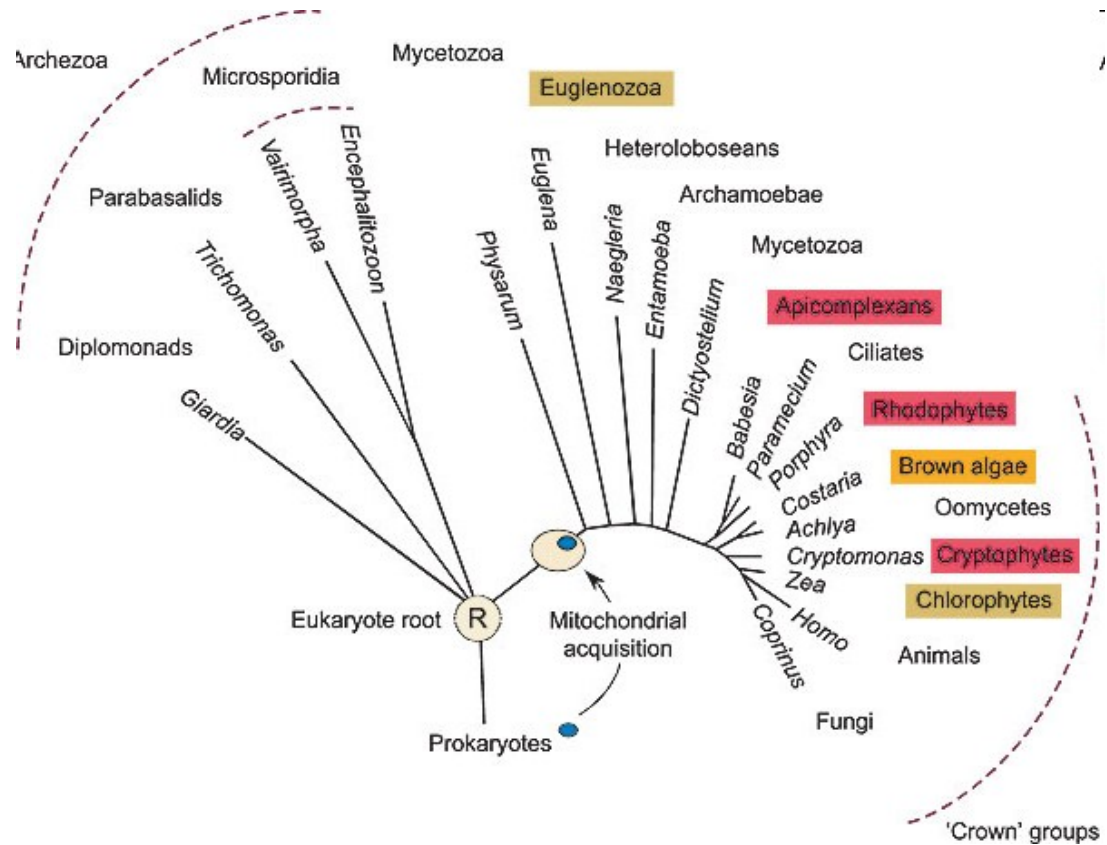
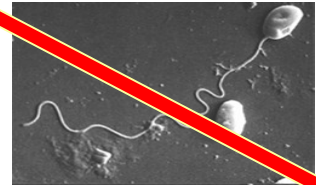
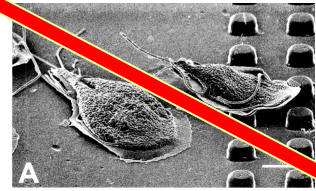
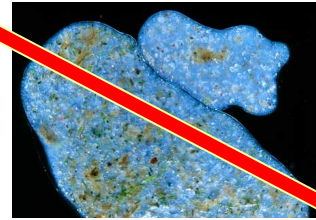
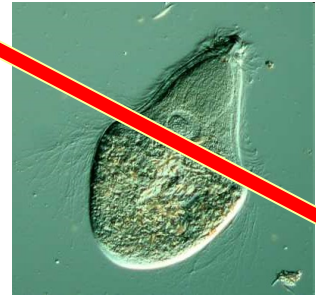
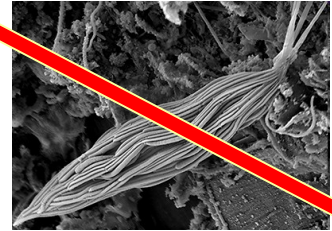
Erlandsen et al. 2004 *J Euk Microbiol*



<http://www.microscopy-uk.org.uk/mag/imgsep01/pelomyxa.jpg>

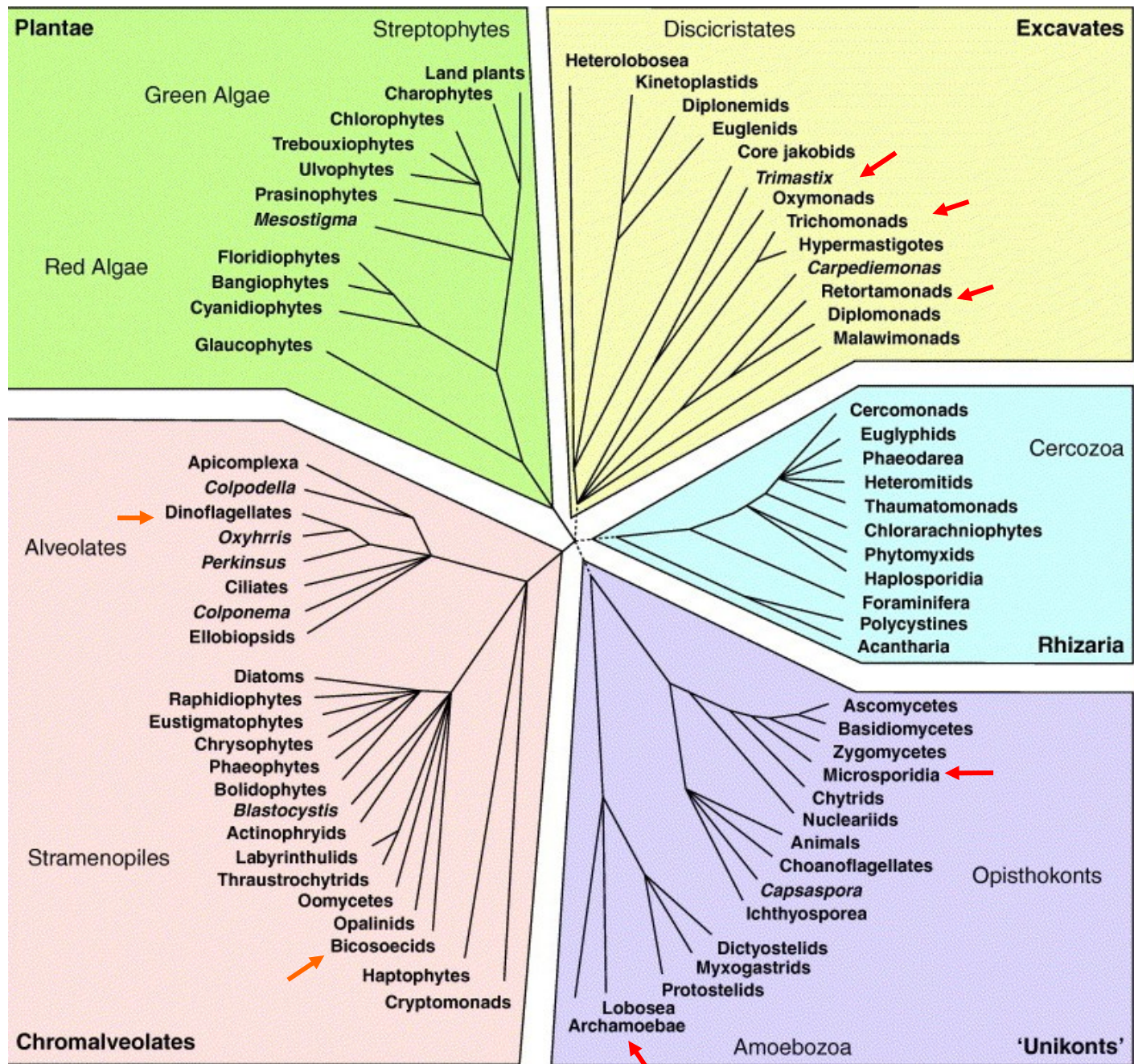
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Archaezoa hypothesis

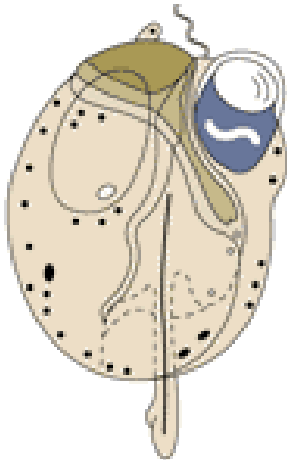
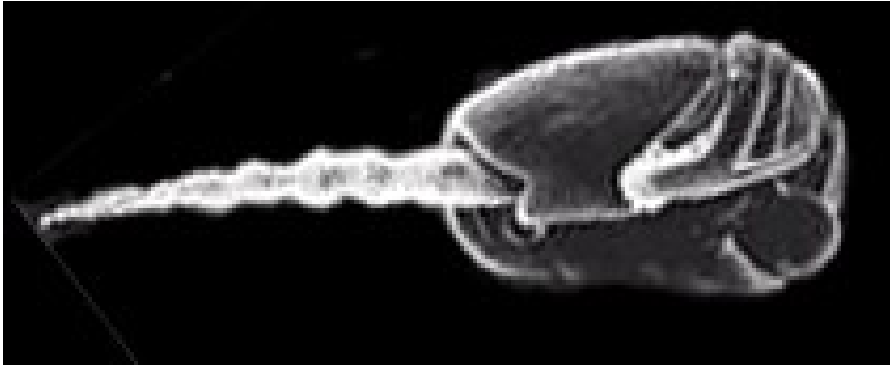


No primarily amitochondriate Eukaryote has been found yet!

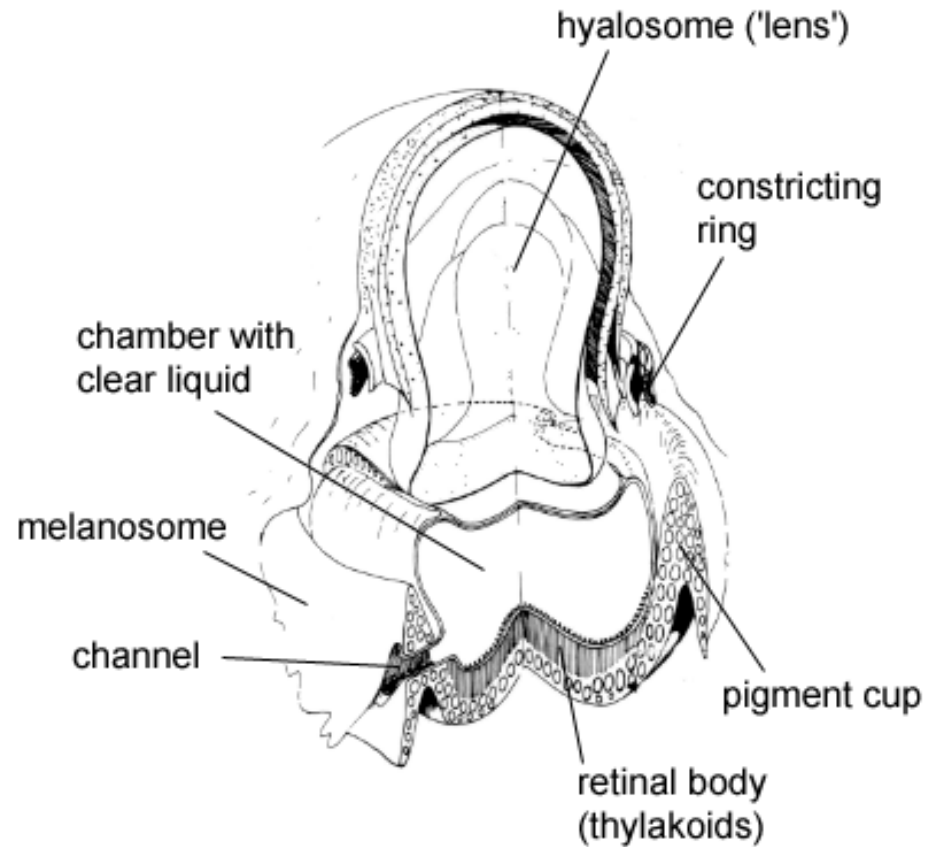
Embley & Martin 2006 *Nature*



Seeing plastids

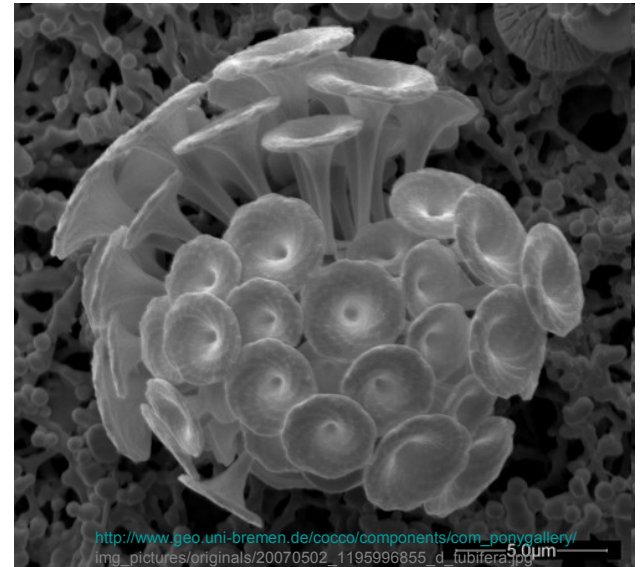
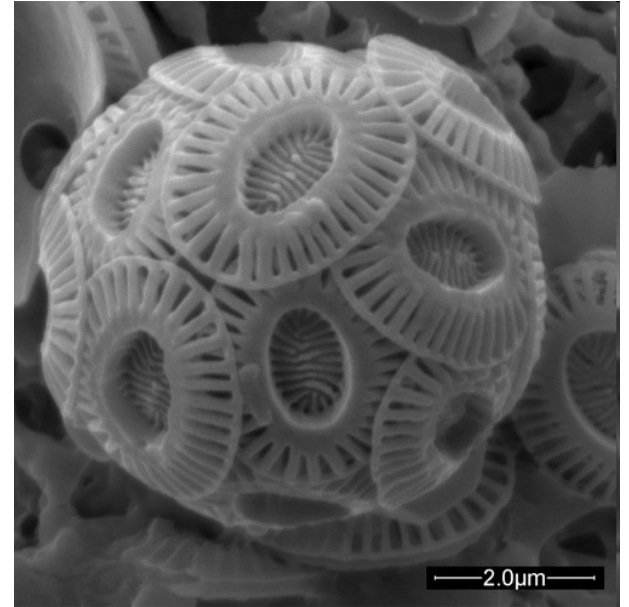


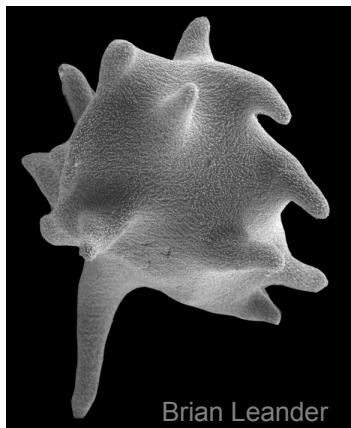
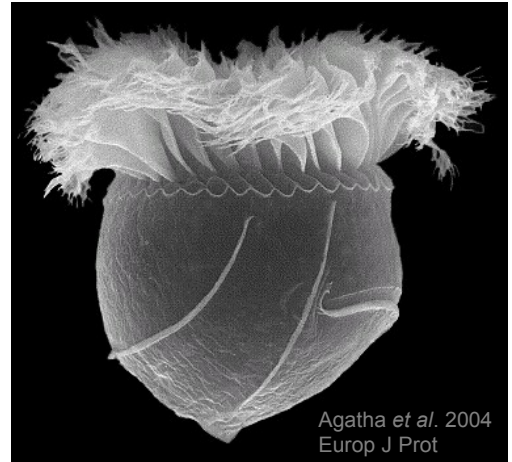
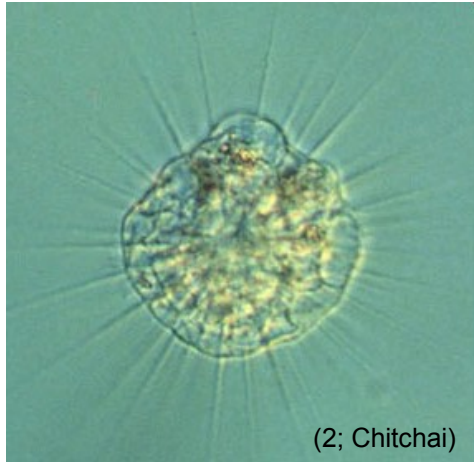
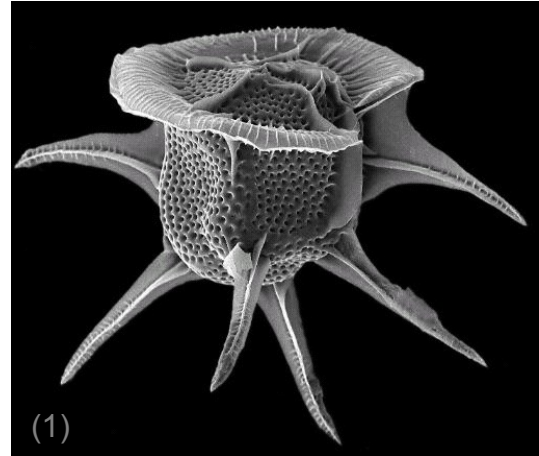
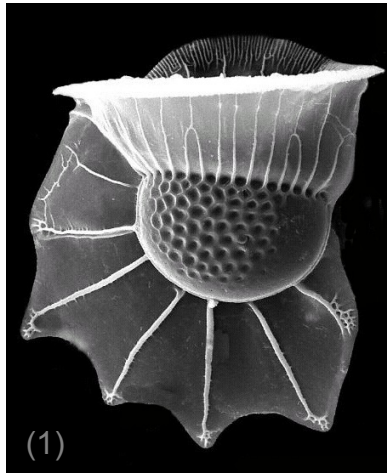
(Amos 2000 *Nature Cell Biol*)

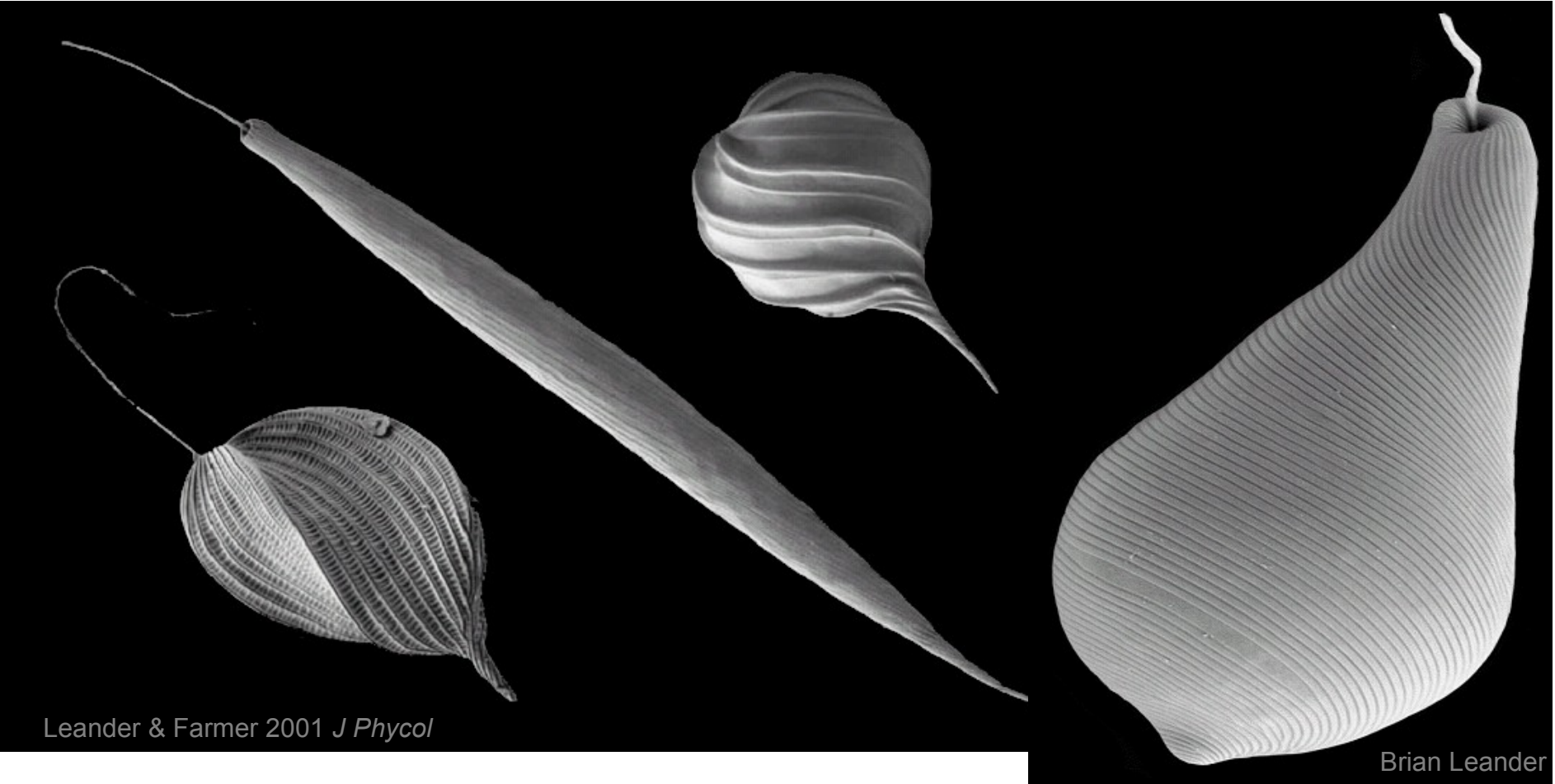


Greuet, C. 1987: Complex organelles. In: Taylor, FJR (ed.): The biology of dinoflagellates. Blackwell Scientific Publications

So tiny, they can be seen from space...



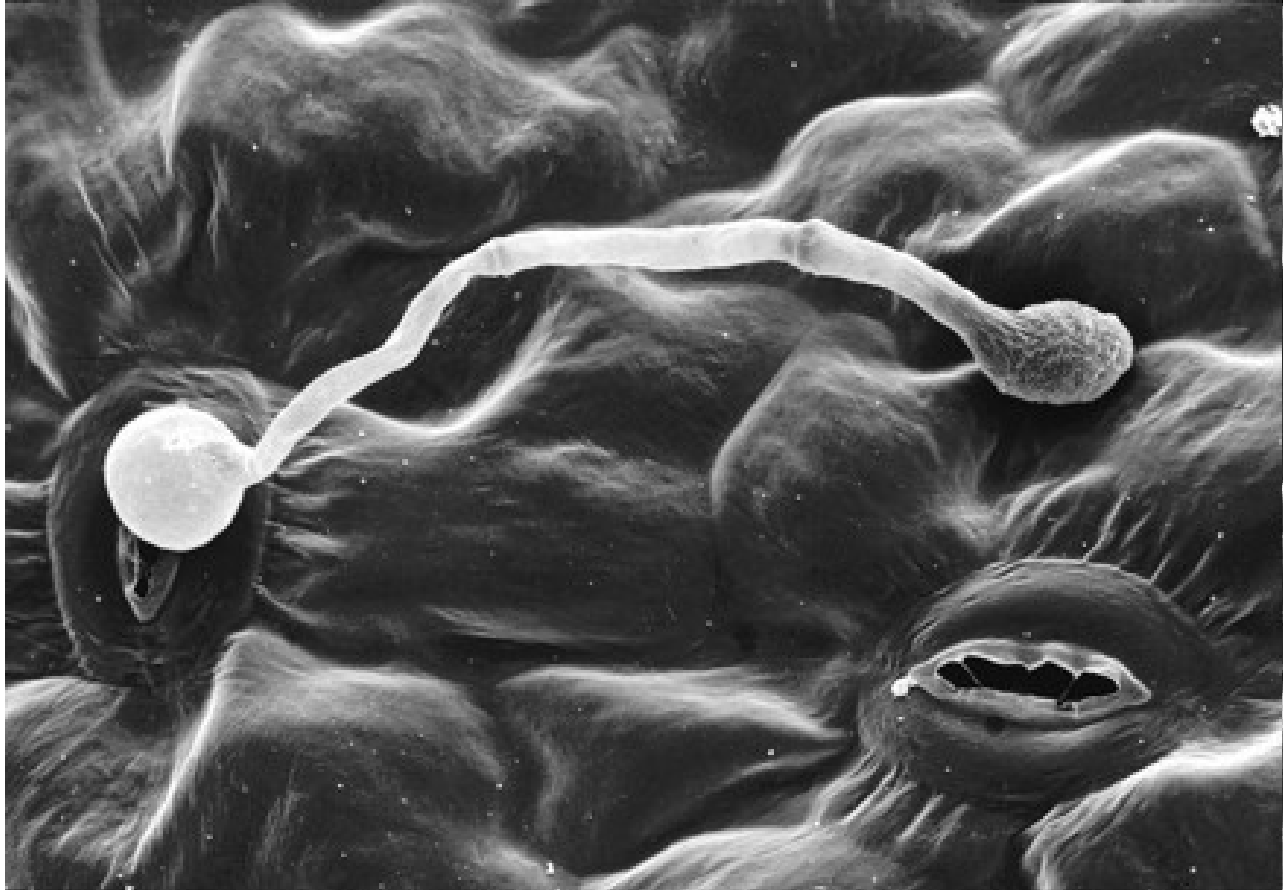




Leander & Farmer 2001 *J Phycol*

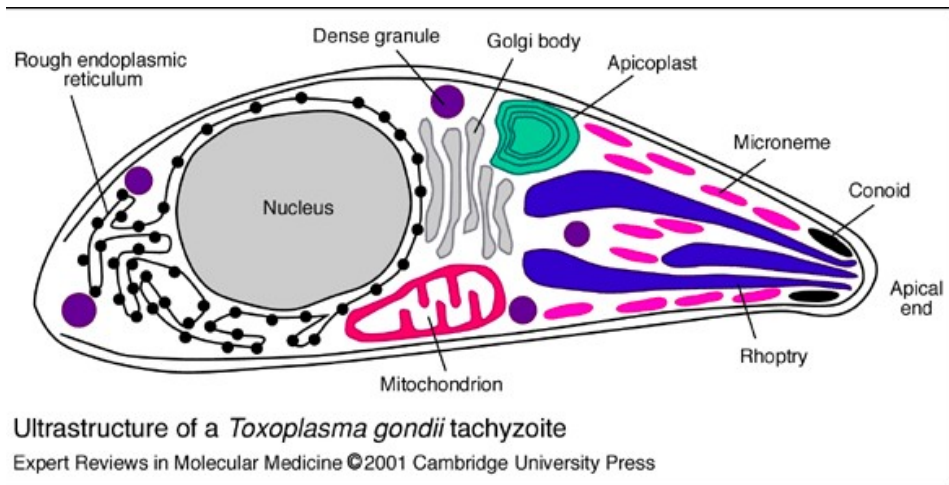
Brian Leander

Phytophthora – potato blight

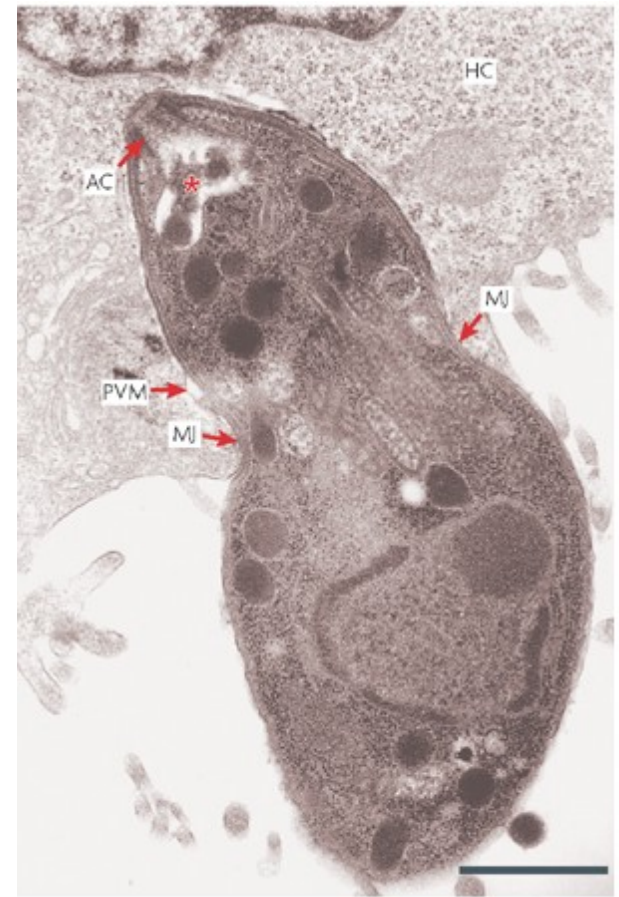


(Grenville-Briggs et al. 2008, *Plant Cell*)

Toxoplasma



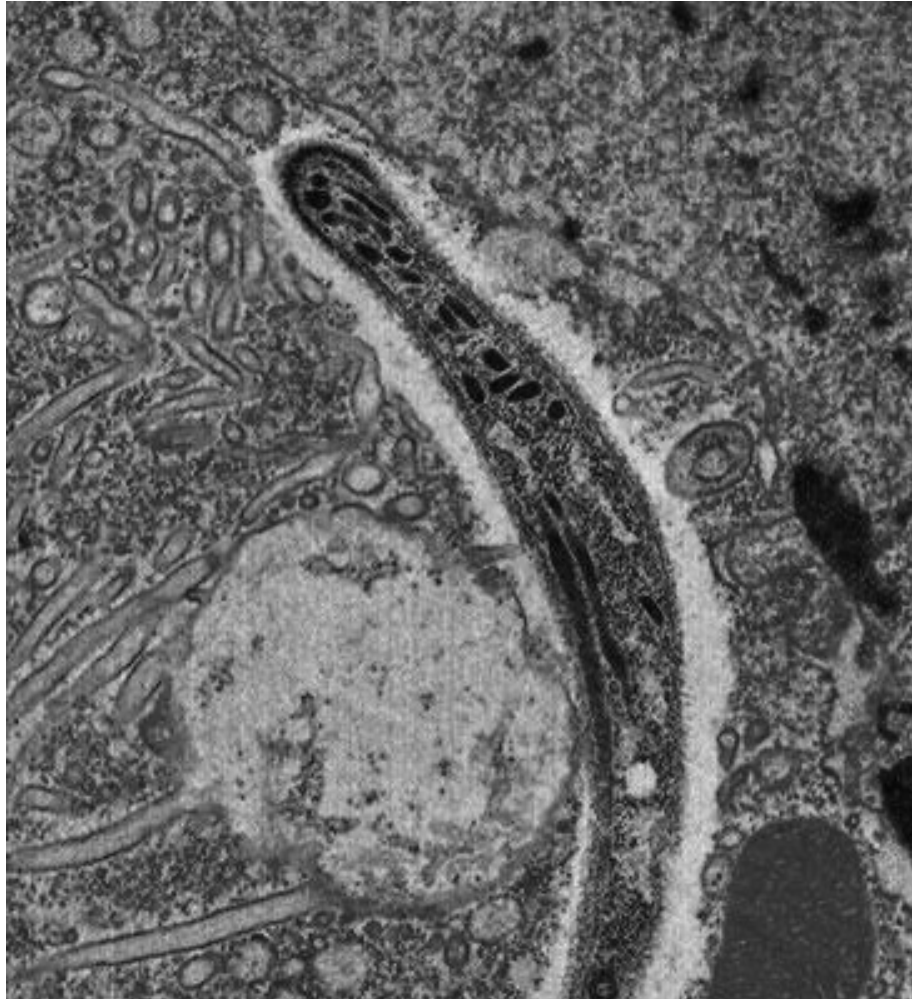
Ajioka *et al.* 2001 *Exp Rev Mol Med*



Nature Reviews | Microbiology

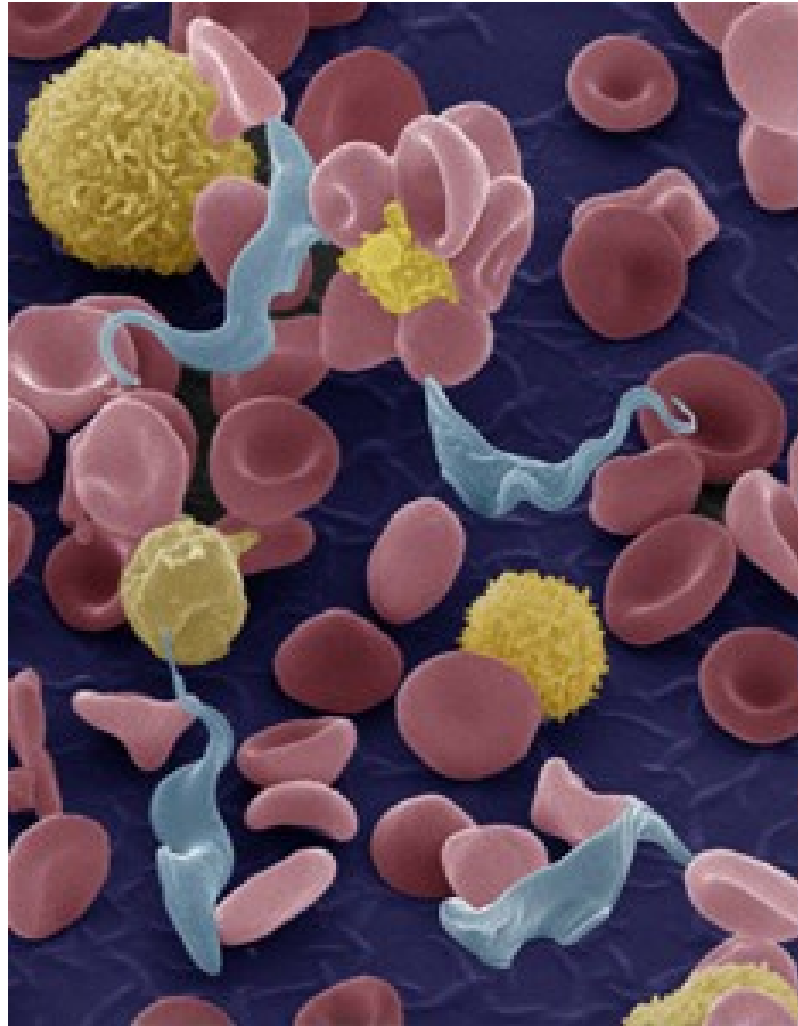
Boothroyd & Dubremetz 2008 *Nature Rev Microbiol*

Plasmodium – Malaria



<http://upload.wikimedia.org/wikipedia/commons/ff1/Malaria.jpg>

Trypanosomes – African Sleeping Sickness, Nagana



Michael Duszenko, University of Tübingen, Germany



Protists and Creation Science



Upon rigorous investigation inspired by
Gillen 2008, *Answers Research Journal* ...

Answers

Research Journal



1:1 powered by
answersingenesis

building the creation model

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Answers Research Journal 1 (2008): 7-10.
www.answersingenesis.org/articles/arj/v1/n1/microbes-days-of-creation

Microbes and the Days of Creation

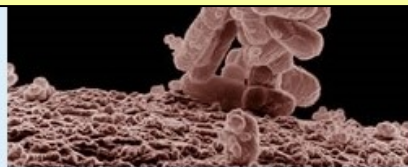
by Alan L. Gillen
January 16, 2008

Abstract

This is real. I wish I were joking...

creation, or were they created later, after the Fall? These are some questions that creation microbiologists have been asking in recent years. Ongoing research, based on the creation paradigm, appears to provide some answers to these puzzling questions. The answers to these questions are not explicit in Scripture, so the answers cannot be dogmatic. However, a reasonable extrapolation from biological data and Scripture can be made about the nature of microbes in a fully mature creation. This article attempts to provide reasonable answers to when microbes were created and is meant to stimulate discussion and further research in this area.

Very little has been written in Bible commentaries or in creation literature on the subject of when microbes were created. Some have postulated that microbes were created on a single day of Creation, such as Day Three—when the plants were made. This is partially due to the "seed-like" characteristics that bacteria and fungi have—therefore classifying microbes as plants. In addition, we observe microbes (such as *Escherichia coli*) isolated in the lab and we tend to think of microbes as individual entities much like birds or fish or animals and, therefore, created on a



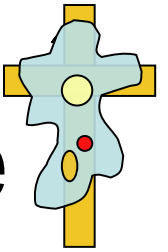
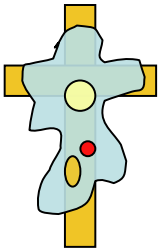
Answers Research Journal

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Answers Research Journal (ARJ) is a professional, peer-reviewed technical journal for the publication of interdisciplinary scientific and other relevant research from the perspective of the recent Creation and the global Flood within a biblical framework.

High-quality papers for *Answers Research Journal*, sponsored by Answers in Genesis, are now invited for submission. Interested authors should download and read the [Instructions to Authors Manual PDF](#) file for all details of requirements, procedures, paper mechanics, referencing style, and the technical review process for submitted papers.

Submit a Paper



Protists and Creation Science

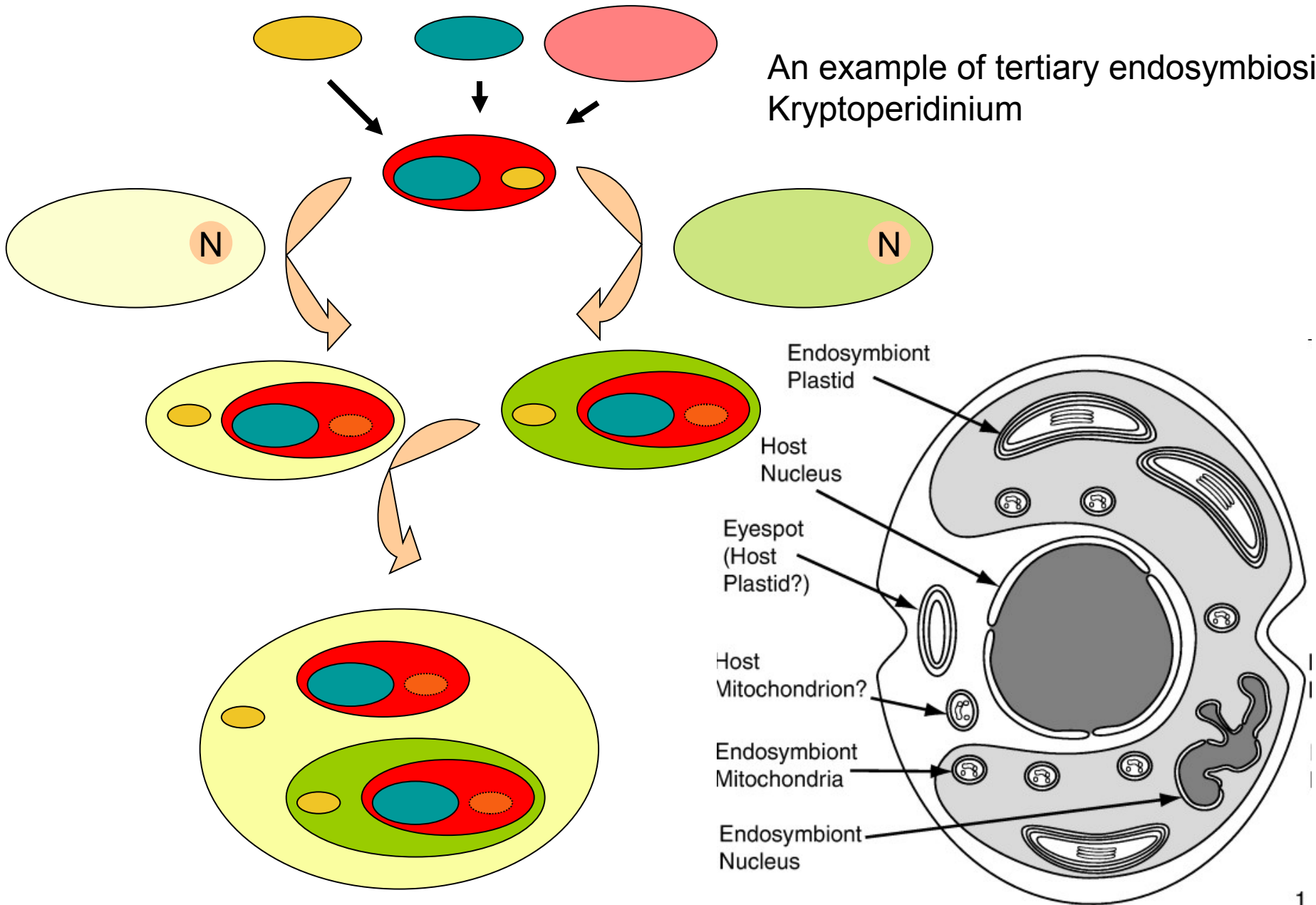
- The Facts:
 - God ‘rests’ on the 7th day. No further info provided. (God 4004 BCE, *Bible*)
 - One must be on crack to design some of those protists!
- The Revelation:
 - Protista was created on Day 7 of Creation.
 - Psychoactive substance use strongly suspected.

Thank you!



Supplimentary Data

An example of tertiary endosymbiosis:
Kryptoperidinium



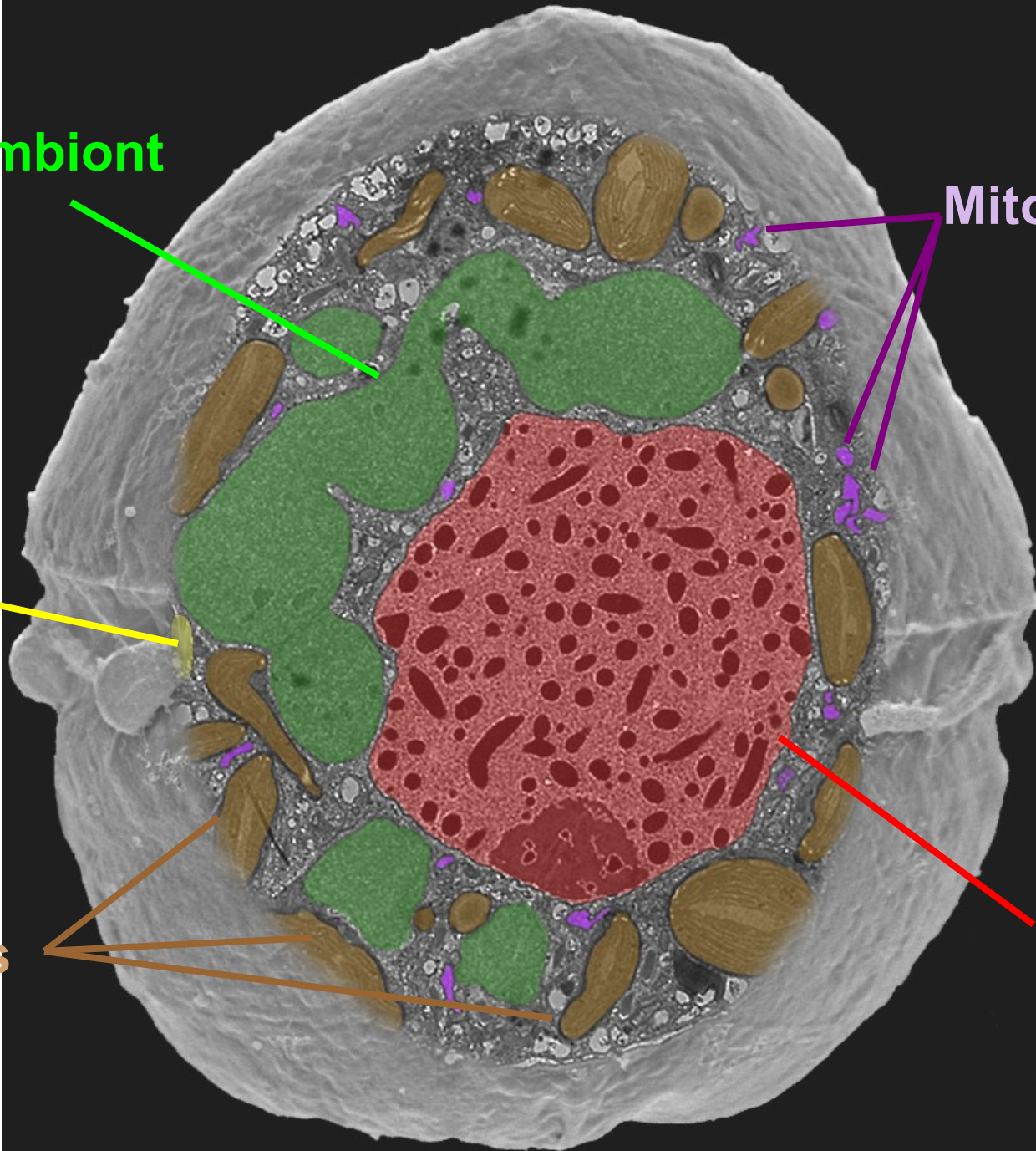
**Endosymbiont
Nucleus**

Mitochondria

Eyespot

Plastids

**Host
Nucleus**



References

- (1) <http://www.tolweb.org/onlinecontributors/app?page=ViewImageData&service=external&sp=34755&state:ImageGallery=ZH4sIAAAAAAAAAAFvzloG1nJeBgYGJgYEtlz8I1TOluliBLyuxLFEvJzEvXc8nP y %2FduvvJhDP9yveZGBi9GFjLEnNKUyuKGAQQivxKc5NSi9rWTJXInvKgG2hURQEDGHDOLRdgYODNTU3JHTOSSwu9swrAZoviNAKFEhNTy0SerRgyffGdgugFZ4wKwoZ6hgYQaYAAPQ8IKiIAAAA>
- (2) <http://www.tolweb.org/onlinecontributors/app?page=ViewImageData&service=external&sp=35542&state:ImageGallery=ZH4sIAAAAAAAAAAFvzloG1nJeBgYGJgYEtlz8I1TOluliBLyuxLFEvJzEvXc8nP y %2FduvvJhDP9yveZGBi9GFjLEnNKUyuKGAQQivxKc5NSi9rWTJXInvKgG2hURQEDGHDOLhdgYODNTU3JHTOSSwu9swrAZoviNAKFEhNTy0SerRgyffGdgugFZ4wKwoZ6hgYQaYAAD8%2FGDulAAAA>
- (3) http://en.wikipedia.org/wiki/File:Phallus_impudicus7_Stinkhorn.jpg
- (4) www.tfts.org/pseudobombax_ellipticum.htm