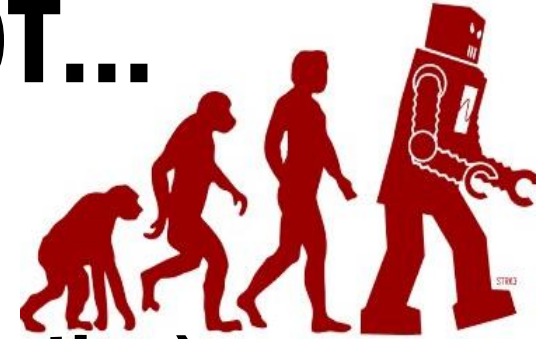


# Major MISCONCEPTIONS about Evolution

WEEK 5: What Evolution IS and what it IS NOT

# **LET'S GET THIS OUT OF THE WAY FROM THE START: The scientific theory of evolution DOES NOT...**

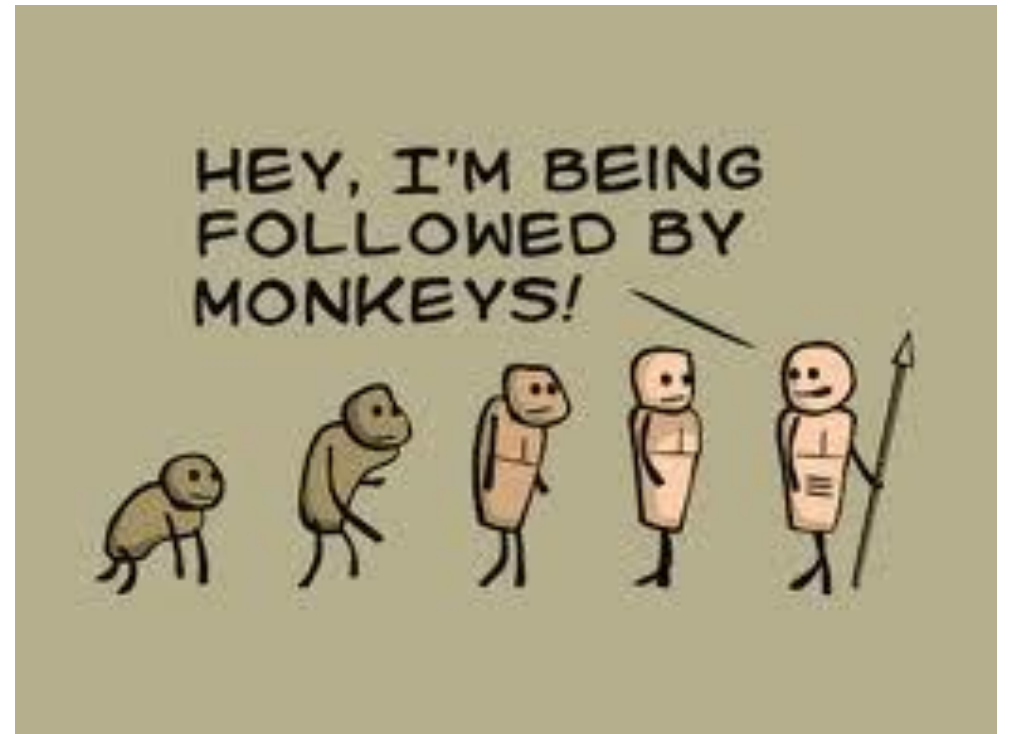
- **discuss the origins of life**
- **result in “progress” (organisms getting “better” each generation)**
- **suggest that individual organisms can evolve during their lifespan**
- **suggest that organisms adapt out of “need-to” or “want-to”**
- **propose that natural selection acts “for the good of the species”**
- **suggest that the “best fit” individuals are always bigger/faster/stronger**
- **suggest that science and religion are incompatible**



# And, MOST OF ALL...

## The scientific theory of evolution DOES NOT...

- say that humans evolved from monkeys
  - This misconception is the source of most of the “controversy” surrounding this topic!



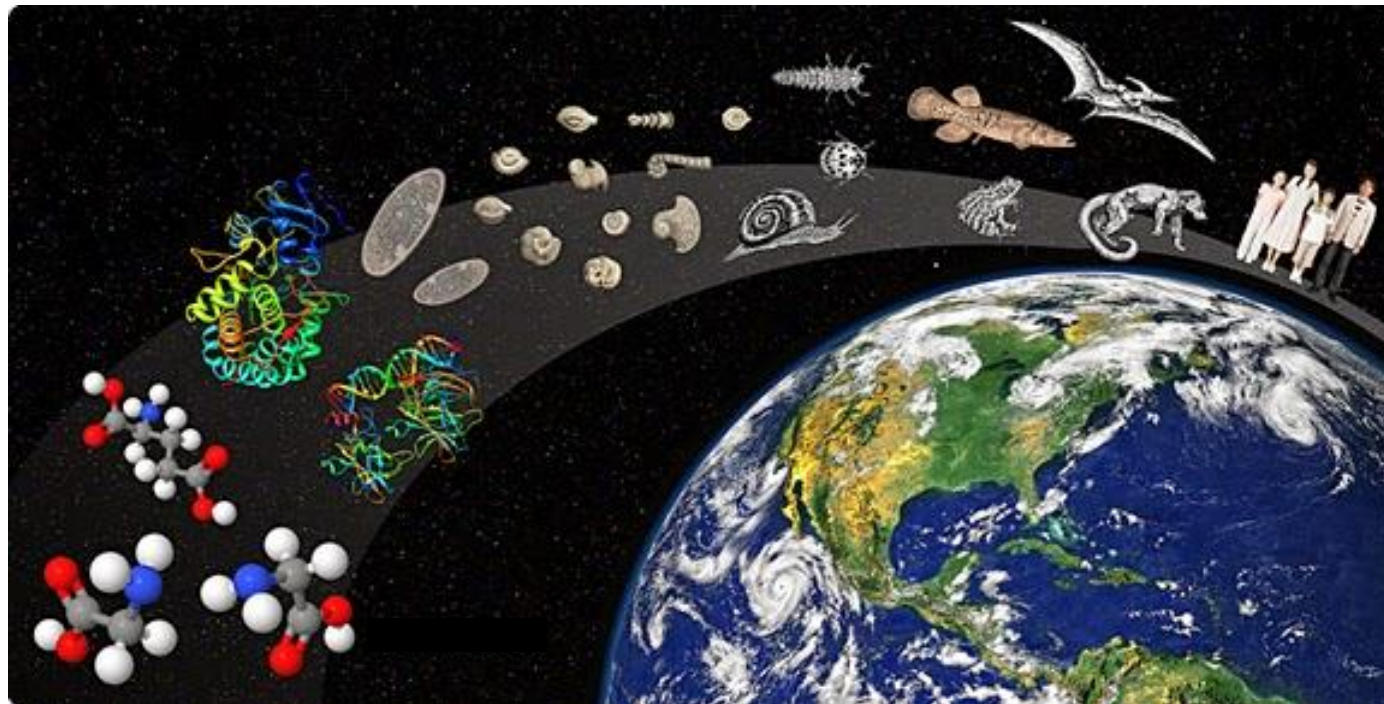
# So what DOES the theory of evolution say?

## MISCONCEPTION

- It tells us about the origins of life.

## The theory of evolution actually says...

- Life forms have changed throughout history, with species branching out and/or dying off
- It does NOT address how life began



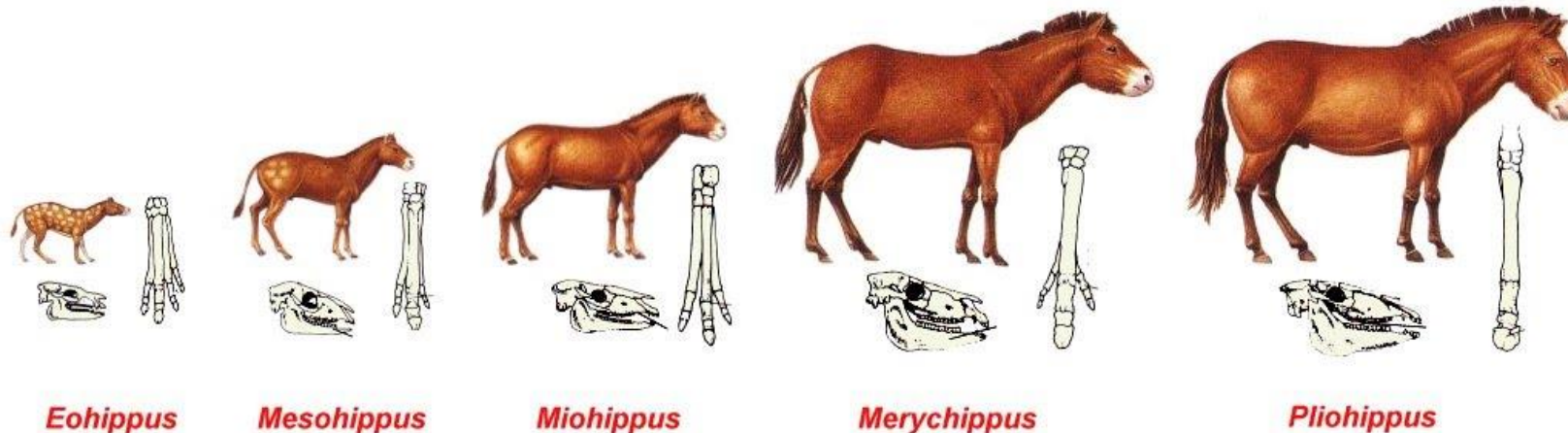
# So what DOES the theory of evolution say?

## MISCONCEPTION

- Evolution results in “progress”.
- Natural selection acts for the “good of the species”

## The theory of evolution actually says...

- Evolution results in gradual changes to characteristics as a result of environmental influences on a species.
- It does not suggest that one version of a species is better/worse than its ancestors...just different
- It is a natural response to environmental factors; it does not occur to protect a species



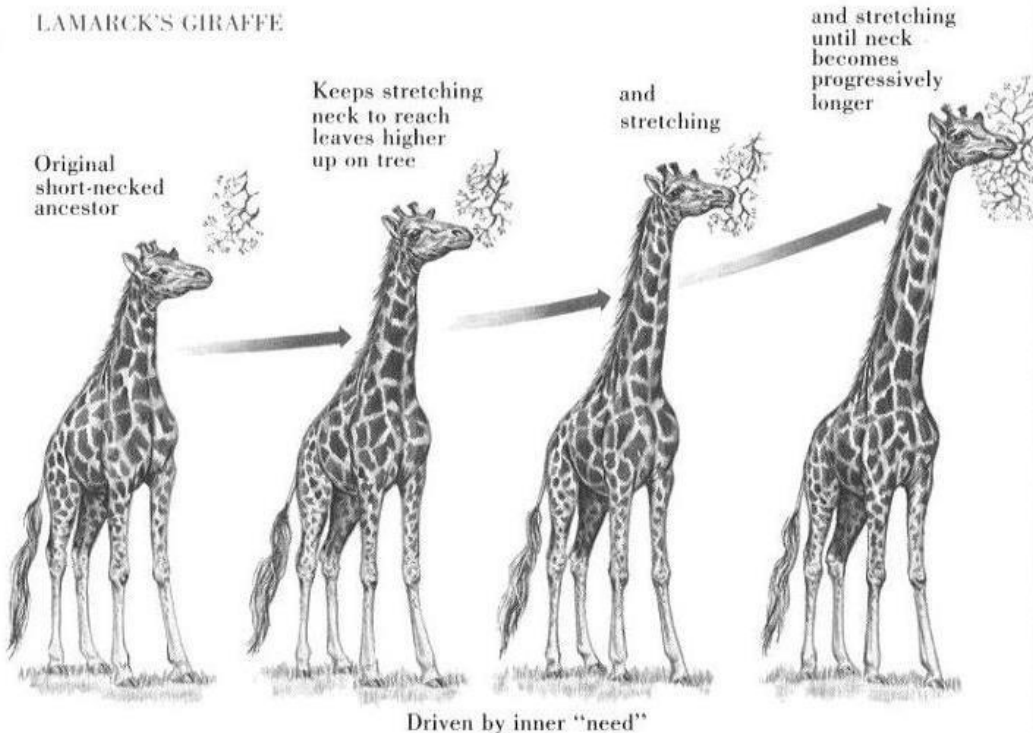
# So what DOES the theory of evolution say?

## MISCONCEPTION

- Evolution suggests that individual organisms evolve over the course of their life-span

## The theory of evolution actually says...

- Evolution does not occur in individuals
- Evolution only occurs in populations of individuals over multiple (usually MANY) generations



This Padaung woman's baby was not born with a long neck just because she stretched her neck out.

# So what DOES the theory of evolution say?

## MISCONCEPTION

- Species adapt because they “need-to” or “want-to”.

## The theory of evolution actually says...

- The only mechanism for adaptation is genetic variation, a result of random mutations in DNA during reproduction.
- If this misconception were true, there would be no such thing as “extinction”.



The Tasmanian Wolf (left) and the Dodo Bird (right) are both animals that once existed but are now classified as extinct. If they were able to adapt because they needed to or wanted to, this would not be the case.



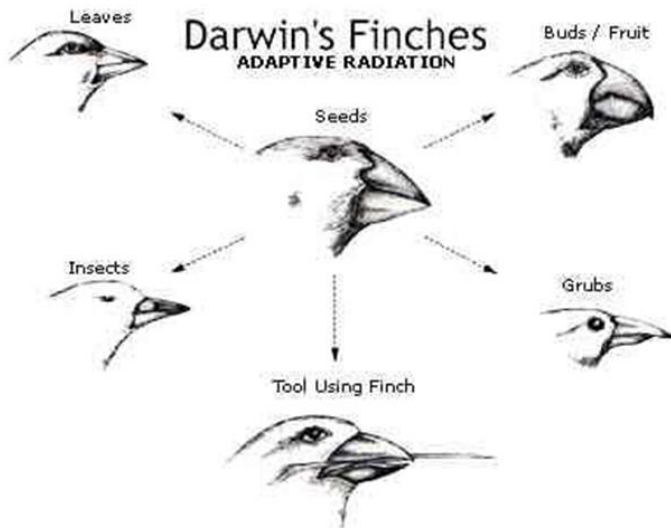
# So what DOES the theory of evolution say?

## MISCONCEPTION

- The individuals who are “best fit” are always the bigger, stronger, faster of the species.

## The theory of evolution actually says...

- “Best fit” does NOT refer to “physical fitness”.
- “Best fit” refers to how well suited an individual’s characteristics are to its environment, specifically its ability to not just survive, but more importantly, to reproduce (and pass on its DNA to the next generation).



Darwin’s finches are a great example of this. Each island developed its own “brand” of finches based on the prevailing food source. Islands with lots of insects hiding in small nooks favored finches with long, skinny beaks. Islands with lots of nuts & seeds favored finches with large, strong beaks.



# So what DOES the theory of evolution say?

## MISCONCEPTION

- One cannot believe in religion if one accepts the scientific theory of evolution, and vice versa.

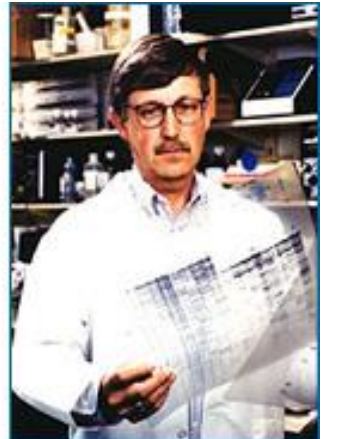
One study found that, while 70% of young adults felt that science and religion conflict with one another, more than half of the scientists surveyed believed in God (or a higher power).

## The theory of evolution actually says...

- Science is not equipped to handle matters of faith. Evolution, as a scientific theory, does not address explanations outside of the natural world.
- The theory of evolution does not address creation (the beginning of life) at all. Those who say it's either evolution or creationism don't understand what the theory of evolution is.

*"One of the greatest tragedies of our time is this impression that has been created that science and religion have to be at war."*

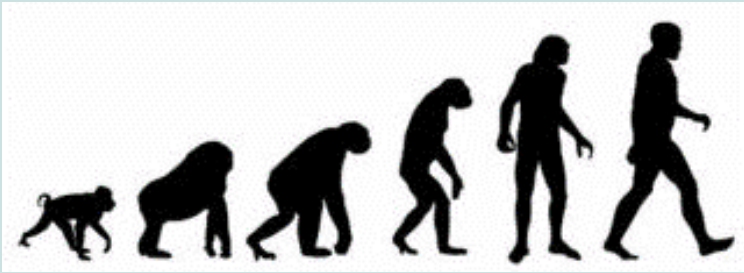
— Francis Collins



# So what DOES the theory of evolution say?

## MISCONCEPTION

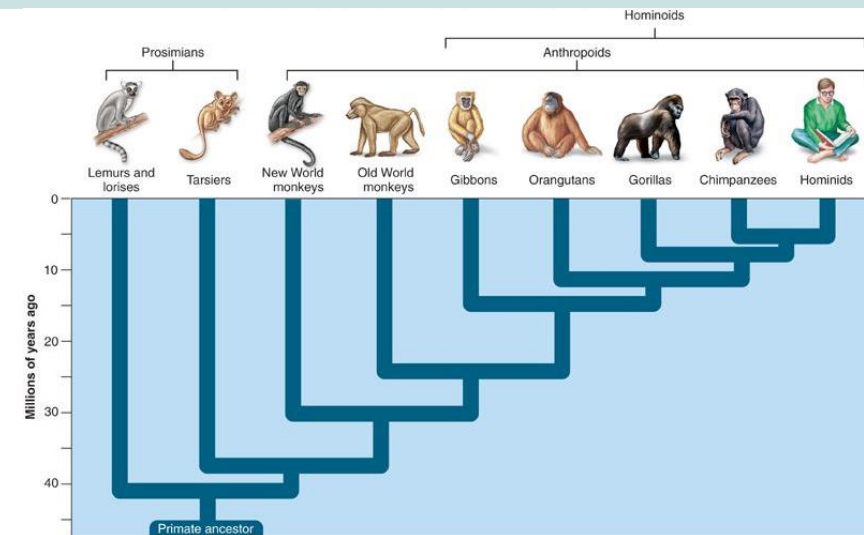
- Evolution tells us that humans evolved from monkeys.



However, if we go farther back in the evolutionary tree, it also says we share a common ancestor with eagles, fish, and even banana trees...(humans and bananas share 50% of their genes).

## The theory of evolution actually says...

- Evolution DOES NOT SAY THAT!!! (*This misconception probably arises from the graphic to the left, which illustrates an incorrect and outdated theory that is NOT evolution.*)
- Evolution says that humans probably share a common ancestor with other primates (*we're more closely related to apes than to monkeys*).



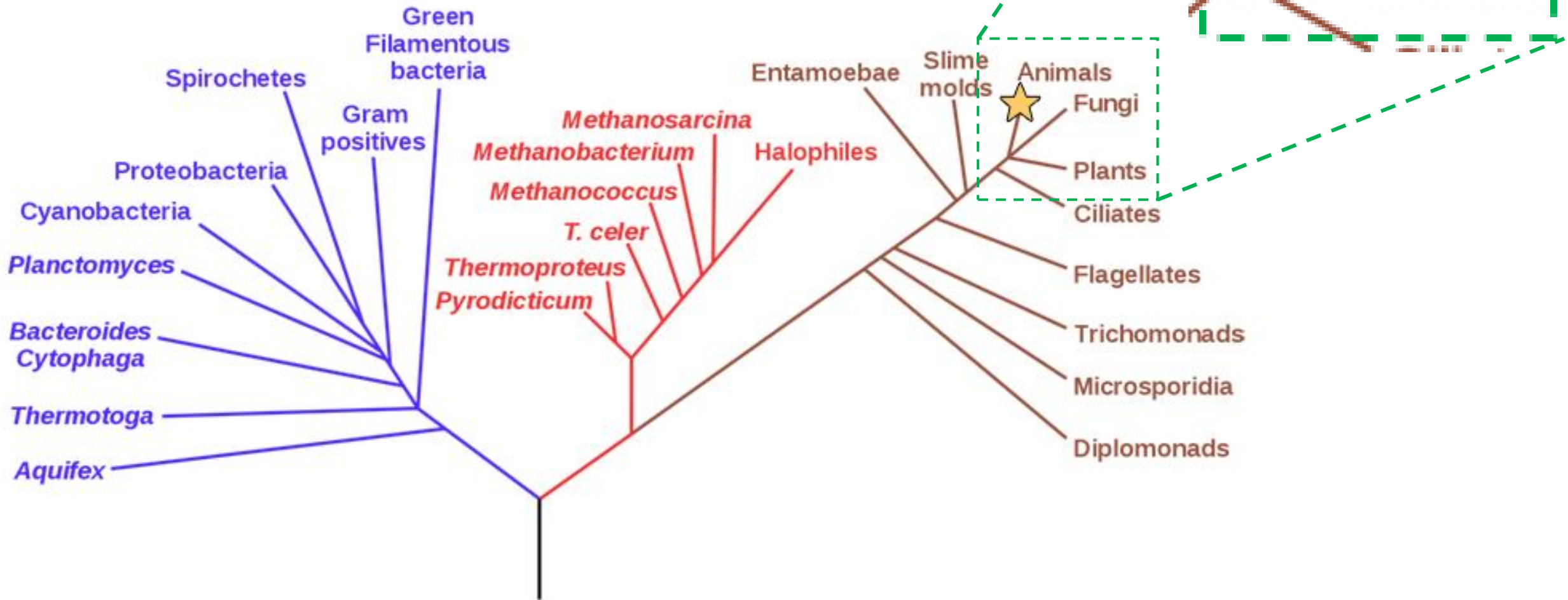
# Phylogenetic Tree of Life

★ = You are here

**Bacteria**

**Archaea**

**Eukarya**



# Phylogenetic Tree: Animal Kingdom → Primates

