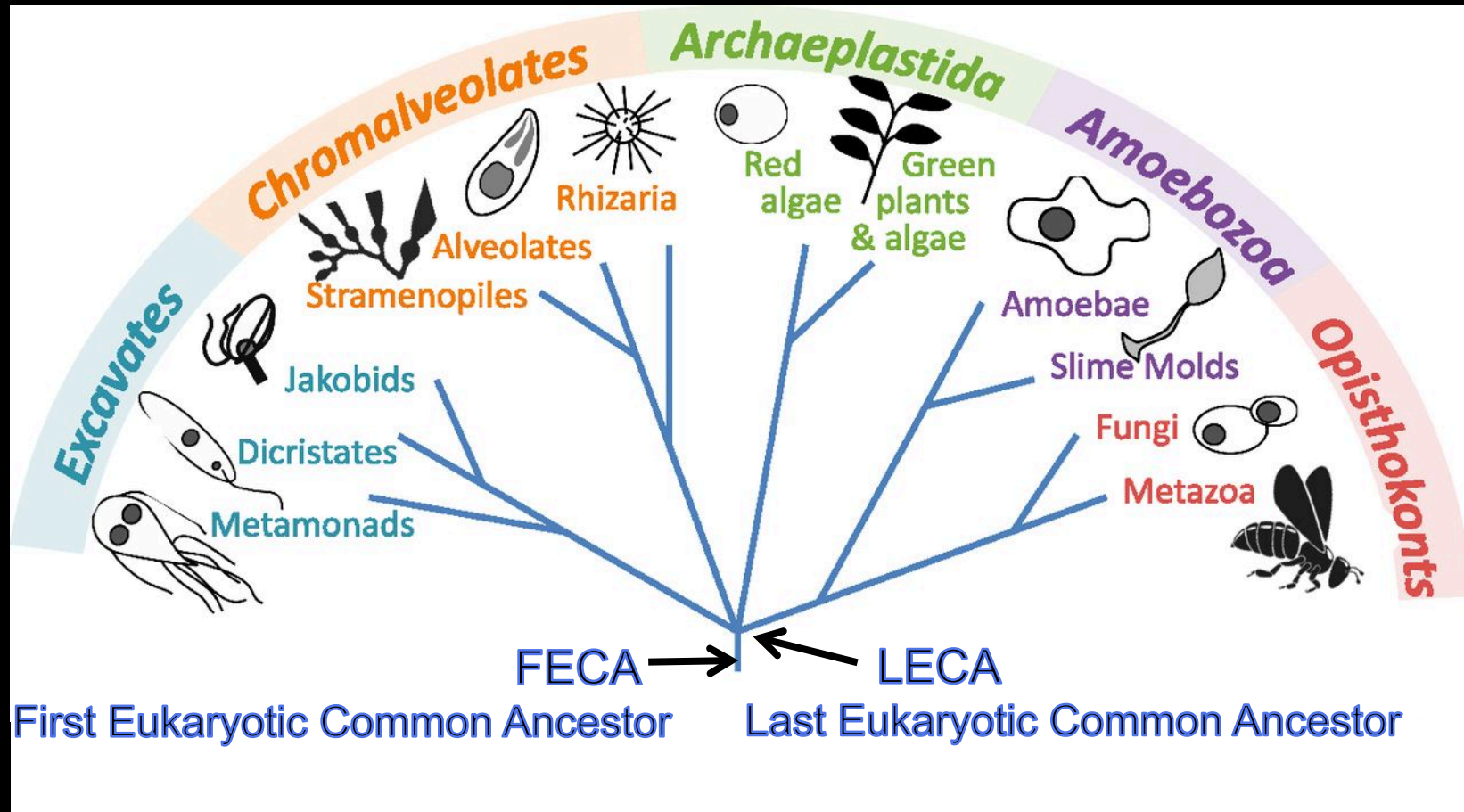


nuclear organization and the evolution of
open and closed mitosis

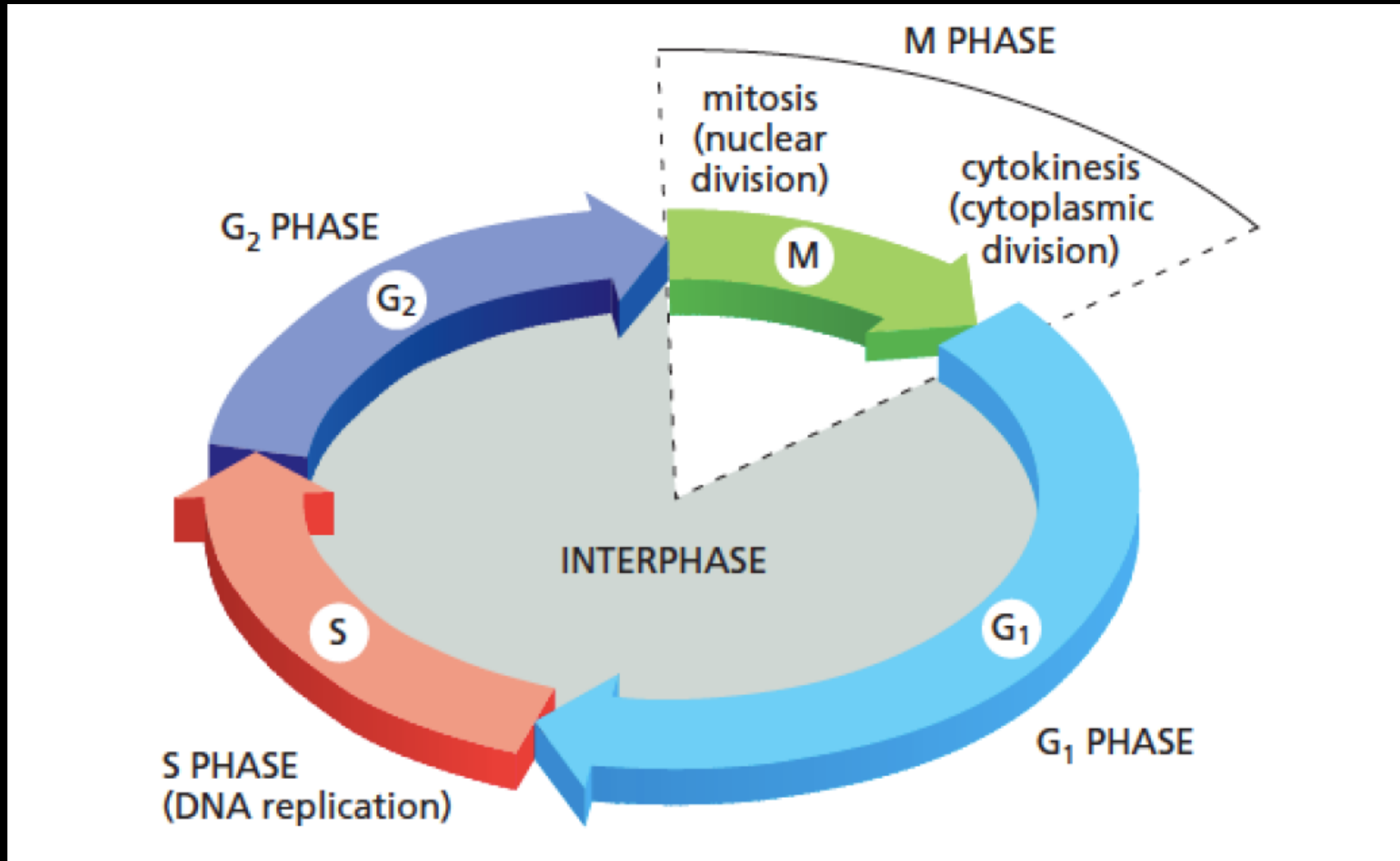
shelley sazer

baylor college of medicine
houston, texas

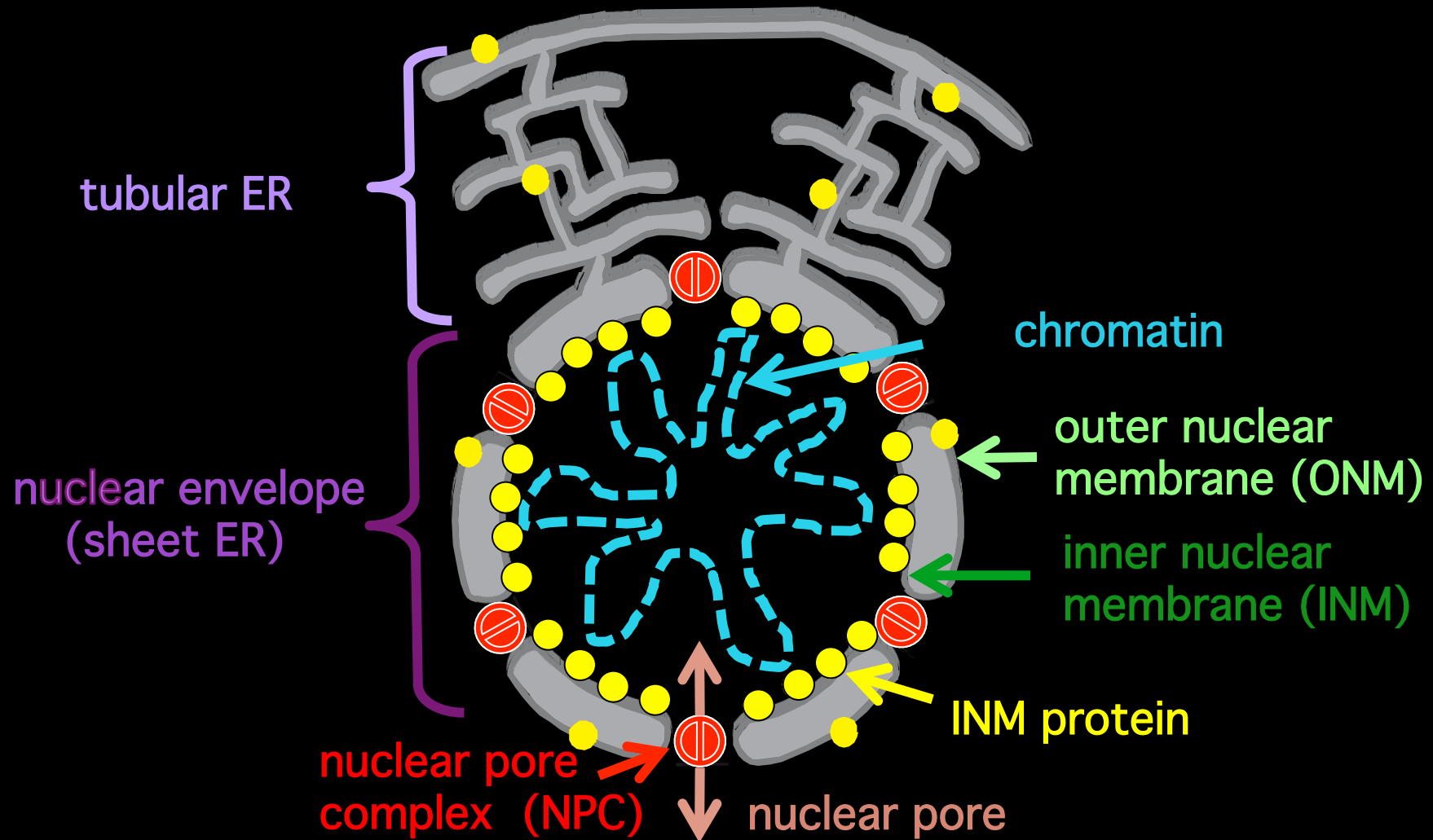
the eukaryotic tree of life: diverse nucleated organisms



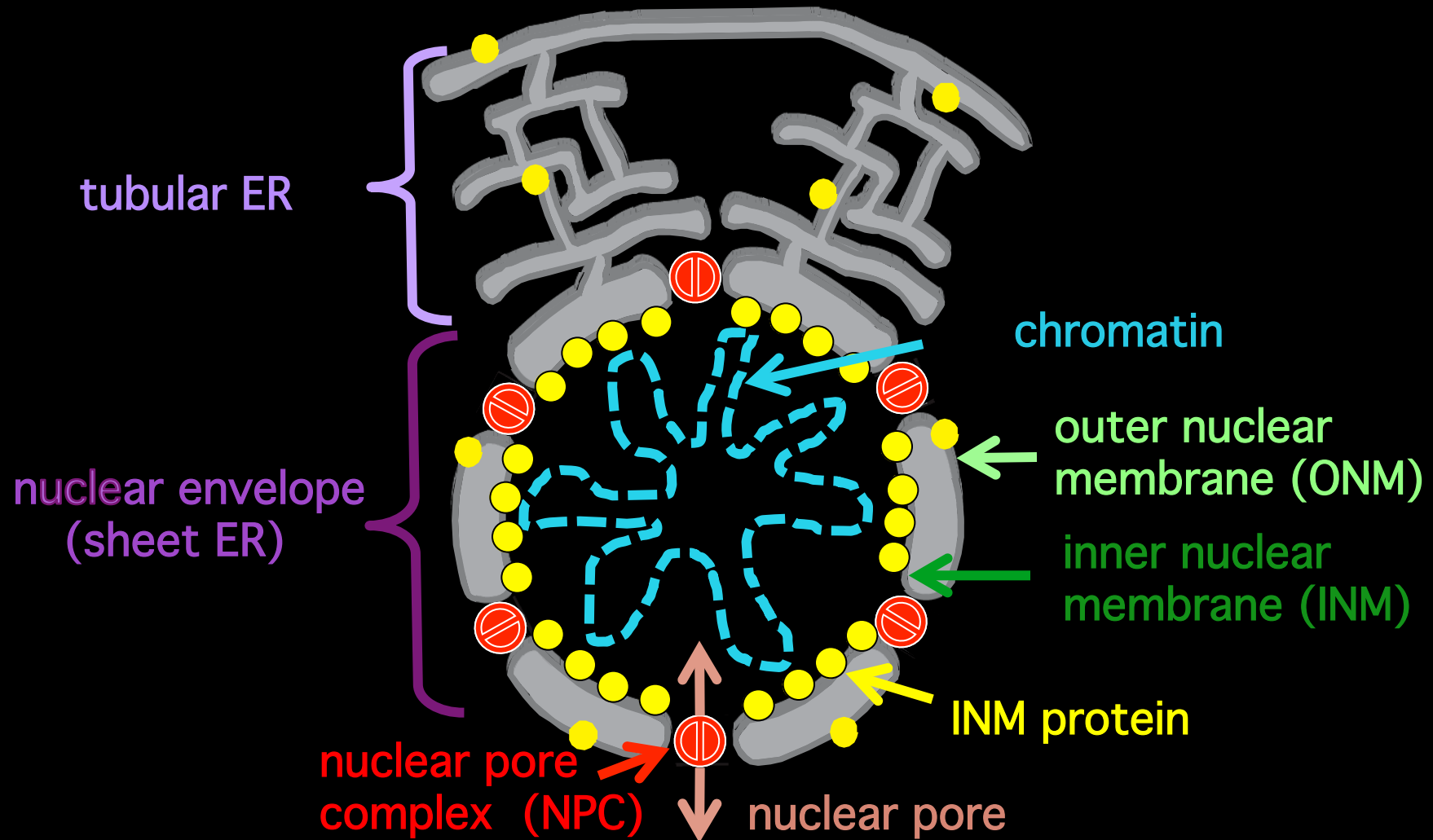
all interphase nuclei are alike; each type of mitotic nucleus is mitotic in its own way



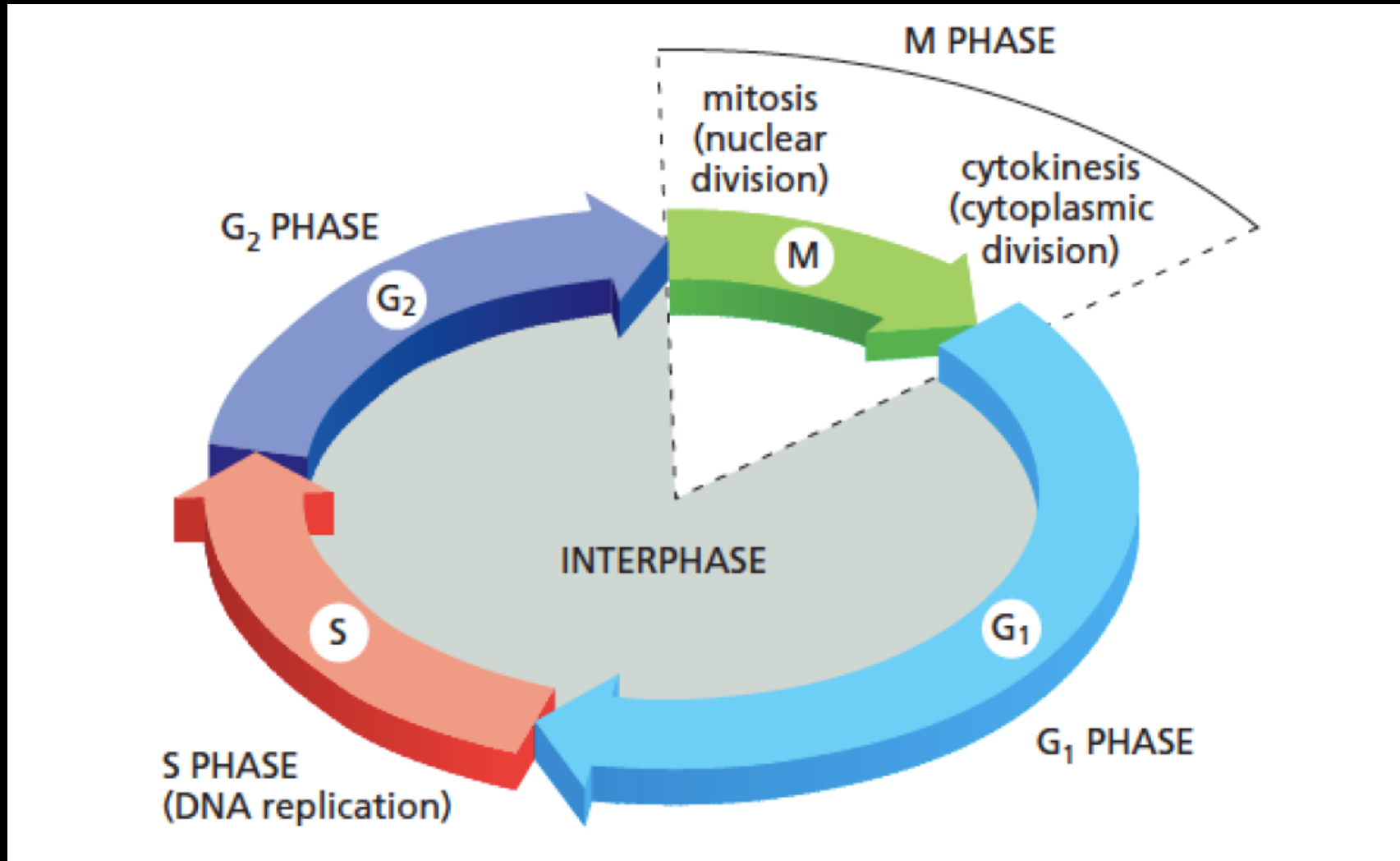
organization of the typical interphase nucleus



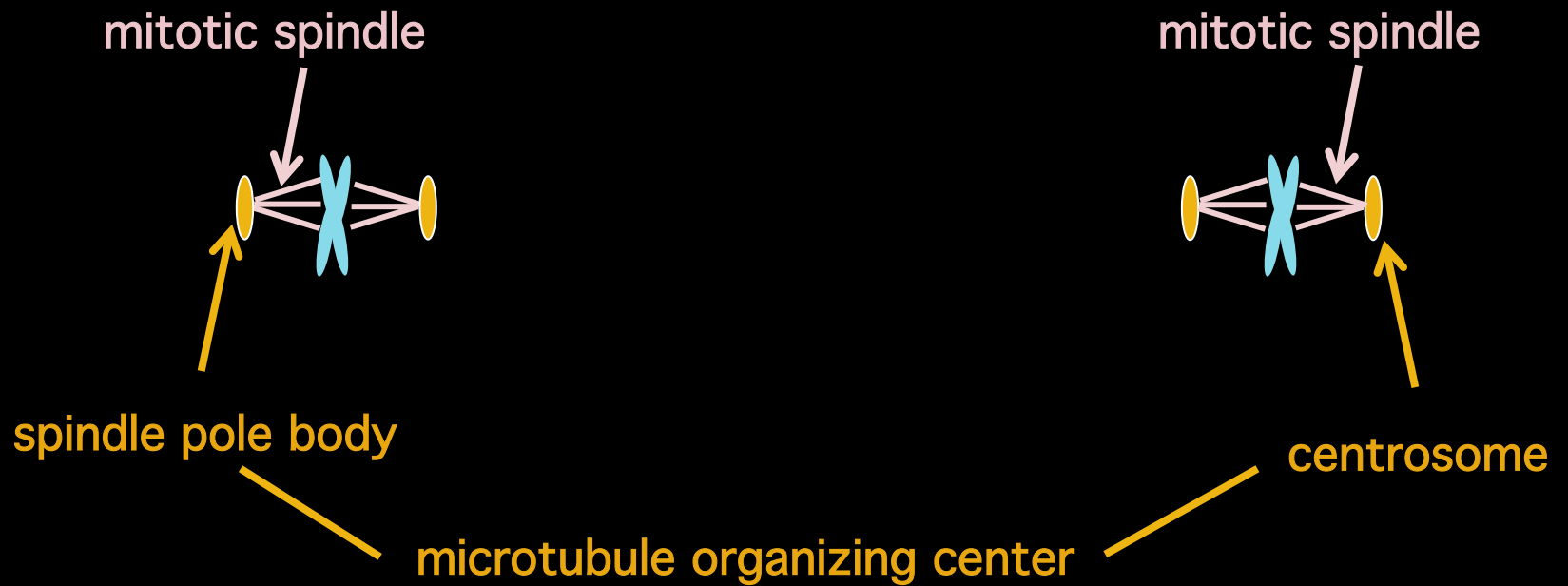
the nuclear envelope is a physical barrier, permeability barrier and organizational scaffold



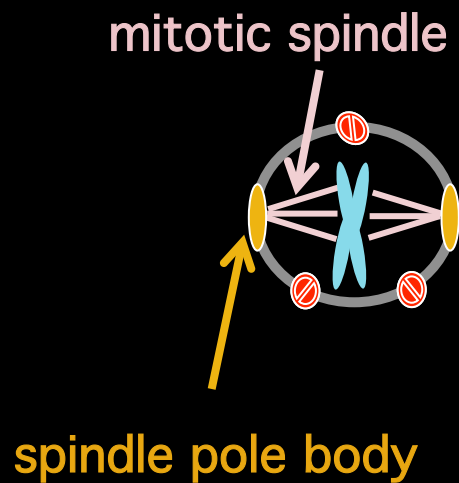
all interphase nuclei are alike; each type of mitotic nucleus is mitotic in its own way



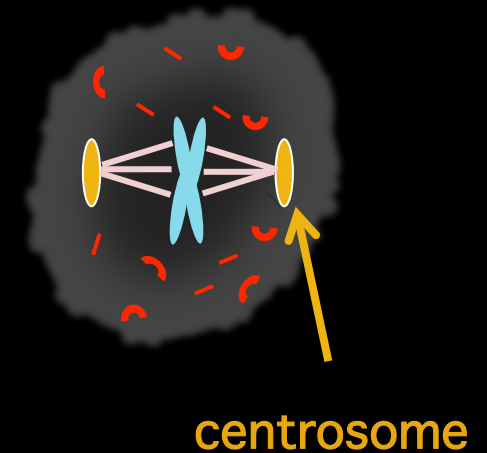
the mitotic apparatus



the mitotic nucleus: open vs closed mitosis

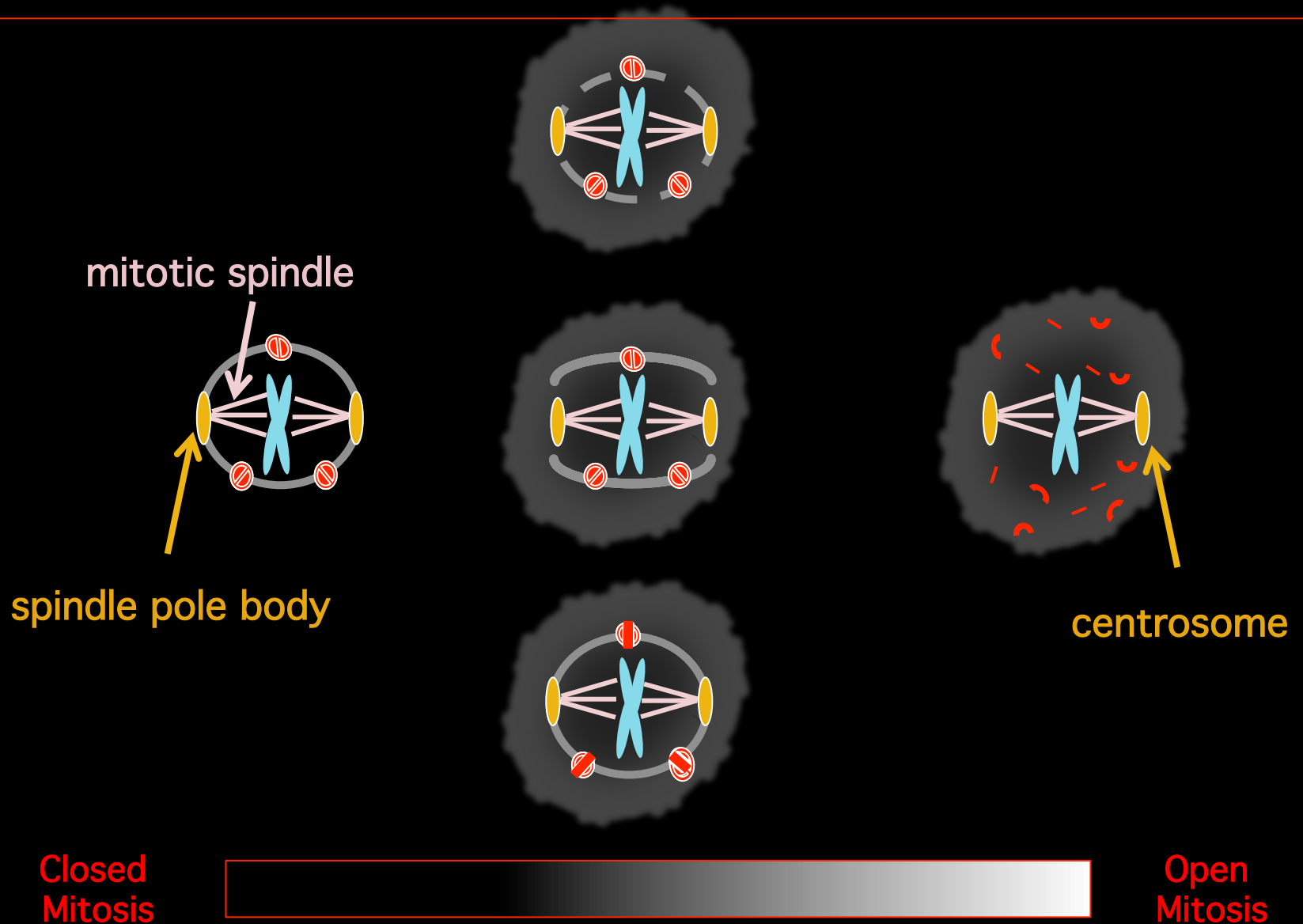


Closed
Mitosis

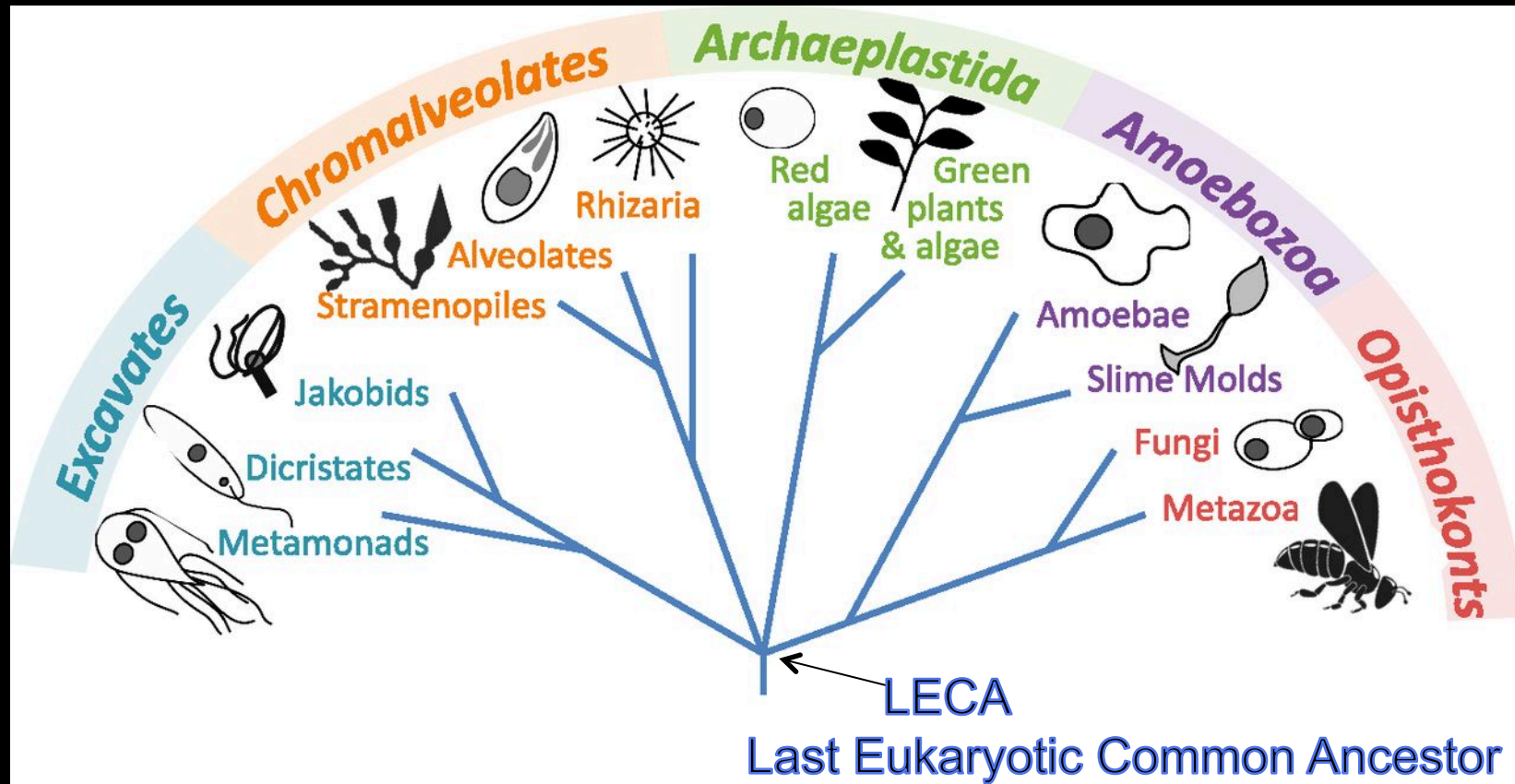


Open
Mitosis

the mitotic nucleus: not just open or closed

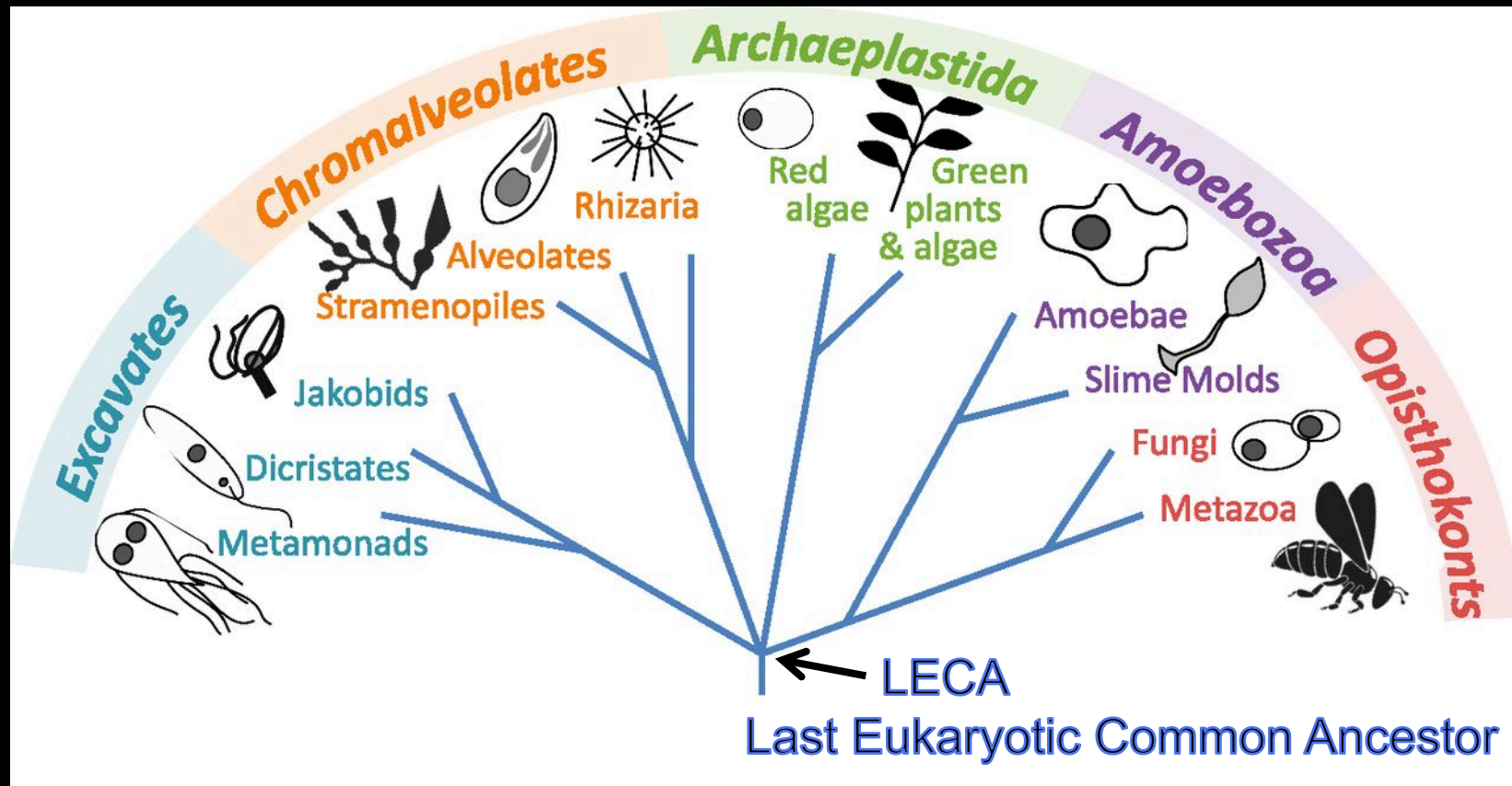


work in progress:
phylogenetic tree of open and closed mitosis



challenges to constructing a phylogenetic tree of open and closed mitosis

- increase diversity of organisms with well characterized phenotypes
- increase diversity of organisms with sequenced genomes
- map genotype and phenotype onto phylogenetic tree



what are the basic organizational principles of the eukaryotic nucleus in interphase and mitosis?

-interphase nucleus

physical barrier between the nucleus and the cytoplasm
permeability barrier between the nucleoplasm and the cytoplasm
organizational scaffold for the nucleus

-mitotic nucleus

why are mitotic nuclei so diverse in structure and function?
what are the physiologically relevant characteristics
that distinguish them?
how did this diversity evolve?
why are these characteristics retained in present-day organisms?

the people who contributed to is work

baylor college of medicine, houston

yanira gonzalez
kristen meerbrey
akira saito
jae min
rachel dam

university of connecticut/KITP
greg huber

RIKEN, tokyo
minoru yoshida (*S. pombe* ORFeome library)

gulbenkian institute, portugal
jose leal pereira (mtoc-explorer)

intellectual collaborators on evolution of open and closed mitosis
mike lynch and dan needleman

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