Model Organisms Cheat Sheet

Version 3.0

***Bolded** terms appear frequently in questions.*

Model organisms are species whose biology is easy to study. A number of factors may make an organism a good model. Short life cycles and/or high birth rate may make study more efficient. A fully-sequenced genome with a relatively small number of base pairs may simplify genetic analysis and manipulation. Relative similarity to humans may allow results to be compared to humans without testing on human subjects.

Organism	Details
Arabidopsis thaliana	small, annual flowering weed; has only 135 million base pairs in its genome and five chromosomes total; was studied to create the **ABC model** of flower development
C. elegans Caenorhabditis elegans	millimeter-long transparent **roundworm** (or **nematode**); has about 100 million base pairs; adult males have exactly 1033 cells believed to be 1031 prior to the discovery of two neurons in 2015), but most specimens are hermaphroditic with 959 cells; undergoes apoptosis, or programmed cell death, 131 times during its development
Drosophila melanogaster	**fruit flies**; roughly 140 million base pairs and four pairs of chromosomes; extensively studied by **Thomas Hunt Morgan** in his "Fly Room" at Columbia University; Morgan discovered the concept of **sex-linked** traits by studying their normally red, but sometimes white, eyes
E. coli Escherichia coli	**gram-negative**, rod-shaped bacteria that lives in lower intestines of many warm-blooded animals; studied in the **Hershey-Chase** experiment, which proved that DNA carries genetic material, and the **Meselson-Stahl** experiment, which proved that DNA replication is semi-conservative; its O157:H7 strain can produce **Shiga** toxin, a common cause of food poisoning
mouse	mouse; has 2.7 billion base pairs in its genome, compared to 3.2 billion in humans; most common mammalian model organism due to their similarity to humans and high birth rate; used by **William Harvey** in his study of the circulatory system
S. cerevisiae Saccharomyces cerevisiae	yeast commonly used in baking, brewing, and general fermentation, in which they generate ethanol and carbon dioxide; roughly 12 million base pairs in its genome, which was the first **eukaryote** genome to be sequenced;