

Understanding Diversity

Packet #1



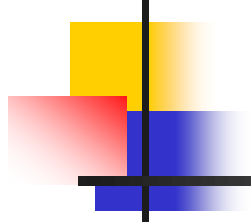
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Diversity

- How are organisms related?
- How are organisms different?
- How and why do we divide organisms into groups?



CLASSIFICATION & TAXONOMY

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Introduction

- Biodiversity
 - The variety of living organisms and the ecosystems they form.
- Taxonomy
 - The science of naming organisms and assigning them to groups.



The Microbiology Connection

The Early Years of Microbiology

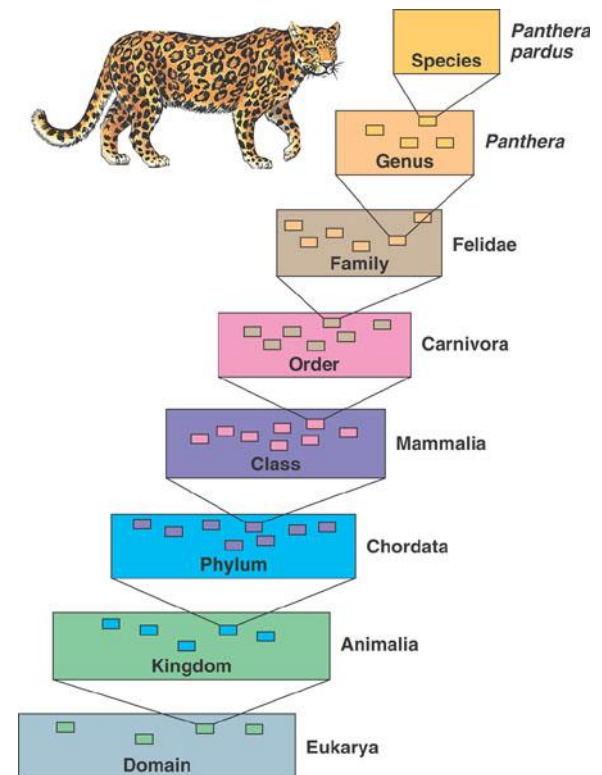
- **How Can Microbes Be Classified?**
 - Carolus Linnaeus developed a taxonomic system for naming plants and animals and **grouping** similar organisms together.
 - The groups, into which organisms were placed, were called **taxons**.

Taxonomic Categories

■ Taxons

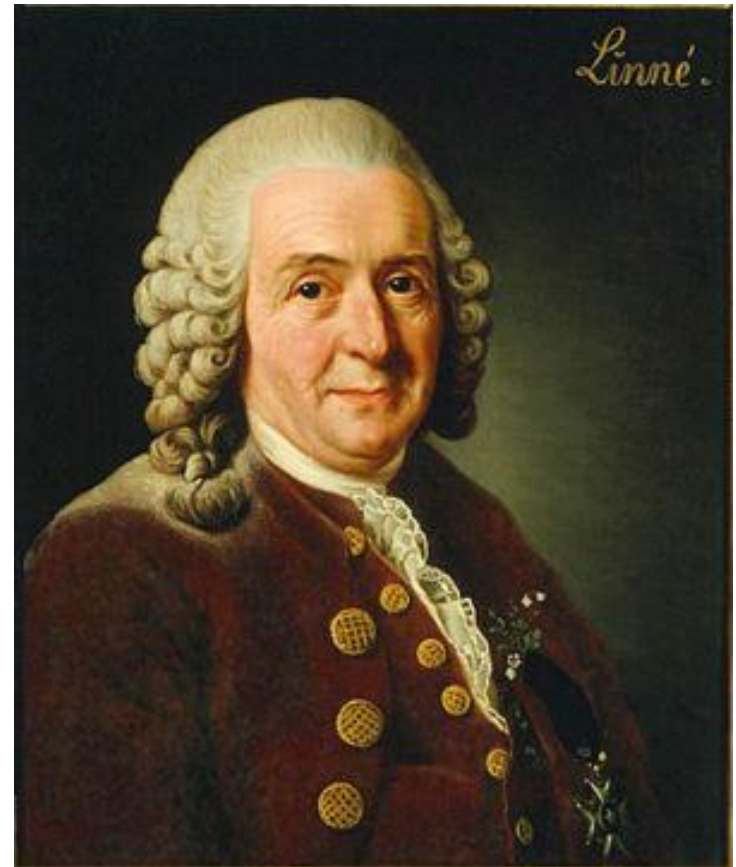
- The “formal” grouping at a particular level

- Domain
- Kingdom
- Phylum
- Class
- Order
- Family
- Genus
- Species



Binomial Nomenclature

- The system, developed by Carolus Linnaeus, is also used in the naming of organisms.
 - The specific name of organisms is accomplished via *binomial nomenclature*.
 - This system uses the genus and species, from the classification/taxonomy table, to name an organism



Binomial Nomenclature II

- Most names are based on Latin and/or Greek words.
- The cockroach
 - *Periplaneta americana*





Domains & Kingdoms

TAXONOMY

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Three Domain Classification System

- Domains are based on fundamental and molecular differences among eubacteria, archaebacteria and eukaryotes
- Domains
 - Archaea
 - Eubacteria
 - Eukarya



Domains II

- Archae vs. Eubacteria
 - Absence of peptidoglycyn in the cell walls of Archae
 - Archae lacks enzyme RNA polymerase characteristic of eubacteria
- Archae & Eukarya
 - Archae has combination of bacteria-like and eukaryotic-like genes



The Six-Kingdom Classification System

- Archaeobacteria
- Eubacteria
- Protista
- Fungi
- Plante
- Animalia