

## Session 7 - Microbial Diversity

Text: Chapter 19, 30, and 20-26  
Anticipated time: 2 class periods  
Basic Objectives: You should be able to discuss contemporary approaches to taxonomy and the characteristics of microorganisms that are used for taxonomic purposes. You should gain insight into the tremendous diversity of mo's and how those organisms interact with each other and their environment. We will not study the detailed taxonomy or classification of mo's.

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### Chapter 19 – Microbial Evolution, Taxonomy, and Diversity

Introduction *Read.*

#### 19.1 Microbial Evolution

Introduction *Read.* How many Kingdoms are there?  
The Origin of Life *Read.* Understand the time frame.  
The RNA World *Read. Review* Fig 19.1. Do you believe? What are Stromatolites? See Fig 19.2.  
Three Domains *Read. Review* Tab 19.1 and understand the significance of Fig 19.3.  
Endosymbiosis *Read,* including fig 19.4 and understand the concept.  
Evolutionary *Read,* and understand the concepts.

#### 19.2 Introduction to Microbial Classification and Taxonomy

Introduction *Read. Define:* Taxonomy.  
Phenetic *Review.*  
Phylogenetic *Read. Define:* Phylogeny.  
Genotypic *Read.*  
Numerical *Skip.*

#### 19.3 Taxonomic Ranks *Review*

#### 19.4 Techniques for Determining Microbial Taxonomy and Phylogeny

Introduction *Read.*  
Classical *Read,* and *Review* Tabs 19.4 & 19.5.  
Molecular *Read very carefully.* Understand the concepts behind protein comparisons, base composition (*Read* Fig 19.8 and *Review* Tab 19.6), nucleic acid hybridization (*Read* Fig 19.9 and Tab 19.7), nucleic acid sequencing, genomic fingerprinting (*Review* Fig 19.11), and amino acid sequencing and how these are used in classifying procaryotes (Fig 19.12).

#### 19.5 Assessing Microbial Phylogeny

Introduction *Review.*  
Molecular *Read carefully.*  
Phylogenetic Trees *Read.*

#### 19.6 The Major Divisions of Life

Introduction *Read carefully.* Fig 19.15: Say what?  
Molecular *Read carefully.*  
Kingdoms *Read,* including Fig 19.16.  
Higher-Level *Read.* So how many kingdoms are there anyway?

#### 19.7 Bergey's Manual of Systematic Bacteriology

*Review.*

#### 19.8 A Survey of Procaryotic Phylogeny and Diversity

*Summarize,* if time permits.

## Chapters 20-26 - The Microbial World

*Summarize.* We will not cover this in class. There is simply not sufficient time to cover this material well. The chapters have a wealth of reference information on specific organisms, and we will discuss the biology of some as we progress through class. You should try to gain some perspective on the tremendous diversity of mo's that make up the procaryotic world. OK - at least look at all the pretty pictures.

## Chapter 30 – Microbial Interactions

Overview This chapter covers the biological nature of microorganisms living in and interacting with their environment, as well as the interactions of microorganisms with each other and with eucaryotic organisms (e.g. humans).

Introduction *Read. Define:* Symbiosis.

### 30.1 Microbial Interactions

Introduction *Read,* including Fig 30.1.  
Mutualism *Read,* including Boxes 30.1 & 30.2, Figs 30.4, 30.5 & 30.6. *Define:* Mutualism.  
Cooperation *Read,* including Figs 30.7 & 30.8. *Review* Figs 30.9, 30.10 & 30.11. *Define:* Cooperation.  
Commensalism *Read. Define:* Commensalism.  
Predation *Read. Review* Fig 30.13. *Define:* Predation. *Vampirococcus* sp.? Ya gotta love it.  
Parasitism *Read. Define:* Parasitism.  
Amensalism *Read. Define:* Amensalism.  
Competition *Read. Define:* Competition.

### 30.2 Human-Microbe Interactions

Introduction *Read carefully* and understand the language.  
Gnotobiotic *Read.* Are they healthy?

### 30.3 Normal Microbiota of the Human Body

Introduction *Read carefully.* Review Fig 30.17.  
Skin *Review* for perspective.  
Nose *Review* for perspective.  
Oropharynx *Review* for perspective.  
Respiratory Tract *Review* for perspective.  
Eye *Review* for perspective.  
External Ear *Review* for perspective.  
Mouth *Review* for perspective.  
Stomach *Review* for perspective.  
Small Intestine *Review* for perspective.  
Large Intestine *Review* for perspective.  
Genitourinary *Review* for perspective.  
Relationship *Read carefully,* including Box 30.3