

Oklahoma School of Science and Mathematics
Microbiology
Second Lecture Exam
Outline

CLASSIFICATION

Taxonomy

Phylogenetic relationships

Taxa

Old Groups

Monera

New Method

Archeobacteria

Eubacteria

Nomenclature

Kingdom, Phylum (Division), Class, Order, Family, Genus, Species

Bergey's Manual

Morphological Characteristics

Shape

Size

Grouping

Gram Characteristics

Biochemical Tests

Nutritional Characteristics

Photoautotrophs

Photoheterotrophs

Chemoautotrophs

Chemoheterotrophs

Oxygen Requirements

Obligate aerobes

Obligate anaerobes

Facultative

Aerotolerant anaerobes

Microaerophiles

Capnophiles

MICROBIAL GROWTH

Requirements

Physical

Psychrophiles

Mesophiles

Thermophiles

Shelford's Law of Tolerance

Chemical

Neutrophiles

Acidophiles

Alkalinophiles

Osmotic Pressure

Obligate Halophiles

Facultative Halophiles

Hydrostatic Pressure

Barophiles

GROWTH

Phases

Lag

Log

Stationary

Death

Measuring Growth

Direct Plate Counts

Viable Plate

Membrane Filtration

Microscopic Counts

Electronic Counter

Most Probable Number

Indirect Methods

Metabolic Activity

Dry Weight

Turbidity

Control of Growth

Temperature

Type of Organism

Physiological State

Environment

Action of Control Agents

Disruption of Membrane

Damage to DNA and Proteins

Heat

Thermal Death Point

Decimal Reduction Time

Moist Heat

Pasteurization

Hot Air

Filtration

Refrigeration

Desiccation

Change in Osmotic Pressure

Ionizing Radiation

Non-ionizing Radiation

Disinfectants

Bacteriostatic

Bactericidal

Carbolic Acid

Chlorohexidine

Halogens

Tincture

Alcohols

Heavy Metals

Oligodynamic

Mercuric Chloride

Copper Sulfate

Surfactants

Quaternary Ammonium Salts

Aldehydes

Gases

ETOH

Oxidizers

Anti-microbial Agents

Beta-Lactam

Inhibition of Protein Synthesis

Efficacy

Resistance

Plasmids

EPIDEMIOLOGY

Symbiosis

Mutualism

Commensalisms

Parasitism

Normal Flora

Resident

Transient

Routes of Infection

Skin

Mucus Membrane

Placenta

Adhesions

Manifestations of Disease

Symptoms

Signs

Syndrome

Asymptomatic

Etiology

Koch's Postulates

Communicable Disease

Contagious

Non-communicable

Incidence of Disease

Prevalence

Sporadic

Endemic

Epidemic

Pandemic

Severity

Acute

Chronic

Subacute

Latent

Types of Infections

Local

Systemic

Focal

Bacteremia

Septicemia

Toxemia

Viremia

Primary Infection

Secondary Infection

Carriers

Zoonoses

Nosocomial

Control

Development

 Infection

 Incubation

 Prodromal period

 Acute

 Decline

 Convalescent

Virulence Factors

 Pathogenicity

 Virulence

 Extracellular Enzymes

 Hyaluronidase

 Coagulase

 Kinases

Toxins

 Exotoxins

 Cytotoxins

 Neurotoxins

 Enterotoxins

 Endotoxins

 Lipid-A

Antiphagocytic Factors

- Capsules

- Chemical Factors

Plasmids

- Fertility

- Resistance

- Bacteriocin

- Virulence

- Cryptic

MICROBIAL GENETICS

DNA replication

- Helicase

- Gyrase

- Polymerase

- Ligase

- Replication bubble

- Semi-conservative

- Meselson and Stahl

Transcription

- RNA from DNA

- Bubble

- TATA Box

- Exons

- RNA Polymerase

- Ligase

- Code

Translation

- MRNA to protein

- Ribosome

- Large/small subunit

- A/P/E/ sites

- Peptidyl Transferase

- Stop codons

- Anti-codons

- Amino acids

Regulation of Genes

Operon Models

Inducible

Repressible

Mutations

Mutation event

Mutation Frequency

Point mutation

Base substitution

Base addition/deletion

Transition

Transversion

Silent

Lethal

Mutagens

Physical

Chemical

Biological

Spontaneous mutations

Induced

Tautomers

Transition

Transversion

Frame shift

Conditional mutations

Restrictive

Permissive

Biochemical mutations

Prototrophic

Auxotrophic

Deletion

Duplication

Depurination

Deamination

Oxidation

Induced

Base analogs

Alkylating agents
Intercalating agents
Base damage

Loss of function
Gain of function

Repair

Prevention of errors
Direct reversal
Alkyl transfers
Specific excision

TRANSFER OF GENES

Transformation

Transduction

Conjugation

F-plasmid

HFR

Penicillinase Plasmid

COL Factor

Degradative

Enterotoxin

Transposons