

II. General Microbiology – Sessions 3

D. Microbial Genetics

1. Structure, Function & Replication of Genetic Material

a. Nucleic Acids

- Nucleotides → Genes → Chromosomes
- DNA structure

b. The Central Dogma:

Replication Transcription Translation
DNA → DNA → RNA → Protein

c. DNA Replication

- Components, process, products

d. RNA Synthesis

- Components, process, products

e. Protein Synthesis

- Components, process, products

2. Genetic Variability

a. Genetic Mutations

- Mutagens, genotype and phenotype

b. Genetic recombinations:

- Transformation: Concept, mechanism, significance
- Conjugation: Concept, mechanism, significance
- Transduction: Concept, mechanism, significance

c. Plasmids:

- Definition
- Types: Conjugative, Toxigenic, Metabolic, Resistance

3. Genetic Engineering and Modern Biotechnology

a. Introductory terminology:

- Genetic engineering, Gene cloning,
- Recombinant DNA technology,
- Restriction endonucleases, Vectors

b. The different 'types' of products

c. The basic process: