Taxonomy of Microbes Part 1

- The process of arranging organisms into related groups (taxa) makes them easier to identify during study. This involves 3 interrelated areas:
  - **Identification**
    - The process of characterising an isolate to determine the taxon in which it belongs
  - **Classification**
    - The process of arranging organisms into similar groups for study
  - **Nomenclature**
    - The process of assigning names to organisms
      - The names must include a Latin suffix
      - They also often honour a researcher

- One method of classifying is to use the **Dichotomous key**
  - This involves making a series of choices, such as: “does it have wings?” in order to end up with the organism

- Other ways of classifying bacteria include:
  - **Morphology**, i.e. size and shape
  - **Staining growth**, i.e. Gram positive or negative
  - **Nutrition**
  - **Physiology**, i.e. temperature
  - **Biochemistry**, i.e. antigens
  - **Genetics** (Most important), i.e. percentage of GC ratio

- In the late 1970’s, Carl Woese at the university of Illinois determined the sequence of rRNA in a number of organisms
  - Based on this, they discovered that all prokaryotes could be divided into 2 major groups: **Archaea** and **Bacteria**
  - All eukaryotic organisms are placed in a third domain, **Eukarya**

- To identify microorganisms, many different procedures are used:
  - **Microscopic examination**
  - **Culture characteristics**
  - **Biochemical tests**
  - **Nucleic acid tests**
  - **The patients’ symptoms**

- The **phylogeny** of an organism is its evolutionary relatedness with other organisms. This creates a classification scheme
  - This makes it easier to classify new species
  - It also allows scientists to make predictions about the likelihood of genes being acquired from specific organisms
  - However, it is more difficult to do on microbes compared to plants and animals
    - They have **less differences in size and shape**
    - They do **not undergo sexual reproduction**

- Scientists **often group microorganisms into informal categories** based on one or more distinctive characteristics
  - E.g. the anoxygenic phototrophs, the endospore-formers and the sulphate reducers
  - These may show similar looks and characteristics but may not be genetically related