Disease causing micro-organisms

Microbes

- Microbes are not the enemy!
- Less then 1% can directly make us ill
- Microbes that cause disease are called pathogens
- When pathogenic microbes enter the body and reproduce this is an infection
- When the infection cause damage to an organisms function or systems then this is referred to as disease
    - You can have an infection without a disease

- However many microbes can cause other secondary disease such as;
- Gastric cancer (Helicobacter pylori – bacteria),
- Cervical cancer (human papilloma virus),
- Liver cancer (hep C - virus)
- Myocarditis and pericarditis (bacteria or virus causing the heart or surrounding tissue to swell)

History

- Pre 1800's: Widely accepted that disease was caused by supernatural forces.
- 1835: Agostino Bassi proved a fungus was causing disease in silkworms
- 1845: M. J. Berkeley proved that the potato blight was caused by a fungus
- 1861: Louis Pasteur has debunked the idea of spontaneous generation and documented how to keep solution sterile
- 1876: Robert Koch published evidence showing a relationship between anthrax and bacteria (Bacillus anthracis)
- 1881: Louis Pasteur develops first vaccine

Germ theory of disease

- Microorganisms can cause disease
- Microorganism= tiny unseen organism
- Louis Pasteur (Dec 1822 – Sep 1895) French chemist
- Pasteurization (milk, wine)

Koch's Postulates

Robert Heinrich Herman Koch (Dec 1843 – May 1910) German microbiologist

Identified specific causative agents of tuberculosis, cholera, anthrax

Four generalized principles demonstrating microorganisms cause disease

1. The microorganism must be found in abundance in all organisms suffering from the disease, but should not be found in healthy organisms.

2. The microorganism must be isolated from a diseased organism and grown in pure culture.

3. The cultured microorganism should cause disease when introduced into a healthy organism.

4. The microorganism must be re-isolated from the inoculated, diseased experimental host and identified as being identical to the original specific causative agent.