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Summary

This document contains information needed for each syllabus dot point for HSC Biology: 9.4 The Search for Better Health, as published by the Board of Studies (BOS). It includes definitions and concise information which facilitate learning. Where students are required to gather, process and analyse information from secondary resources, brief and concise information is provided in this document as well. However, students are encouraged to deepen their understanding by carrying out further research, which is an essential skill for any students studying science-related subjects.

In general this document may be useful for,

Year 11 -12 HSC Biology students

Useful for

students as a study material and for revision

Notes about the Exam in General

1. Section 1 contains Part A (Multiple Choice Questions) and Part B (Short and Long Response Questions) carrying 75%. Sections 1 usually only tests on the 3 Core Modules.
2. Section 2 contains questions for the Option that your teacher/you have chosen to study. It carries 25%.

Gather, process and analyse information from secondary sources to describe ways in which drinking water can be treated and use available evidence to explain how these methods reduce the risk of infection from pathogens

Processes	Description
Filtration	Removes large particles that may contain pathogens
Disinfection	Kills or inactivates pathogens
Chlorination	Kills pathogens

3. PASTEUR AND KOCH STIMULATED THE SEARCH FOR MICROBES AS CAUSES OF DISEASE

Describe the contribution of Pasteur and Koch to our understanding of infectious diseases

Pasteur Experiments : Using swan-necked flask and control to show organism in air caused contamination

Results : Showed connection between microbes and disease

Contribution:

1. Principle of immunity – Vaccination
2. Pasteurisation – removing microbes

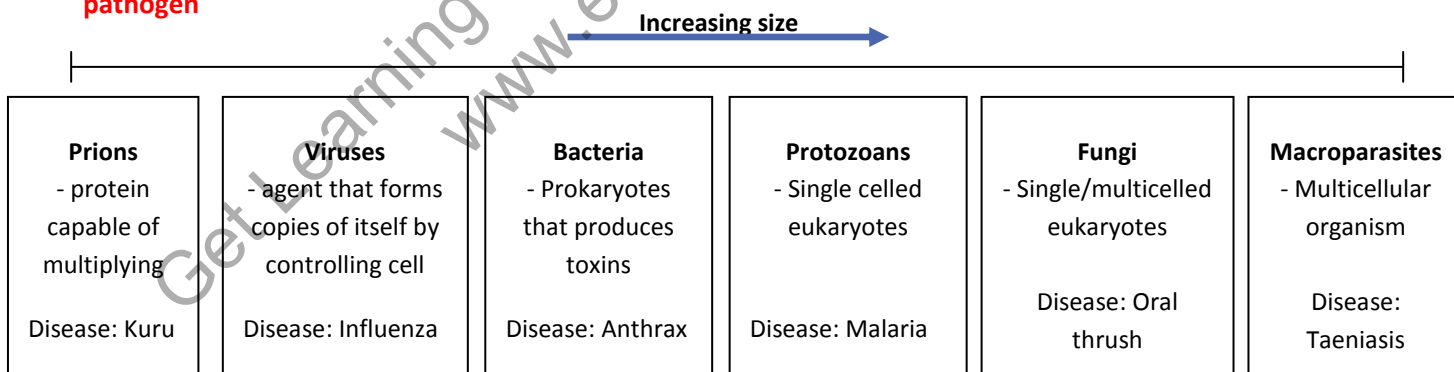
Koch Experiments : Using agar plate technique to grow and isolate anthrax

Results : Showed the isolated anthrax could infect other animals

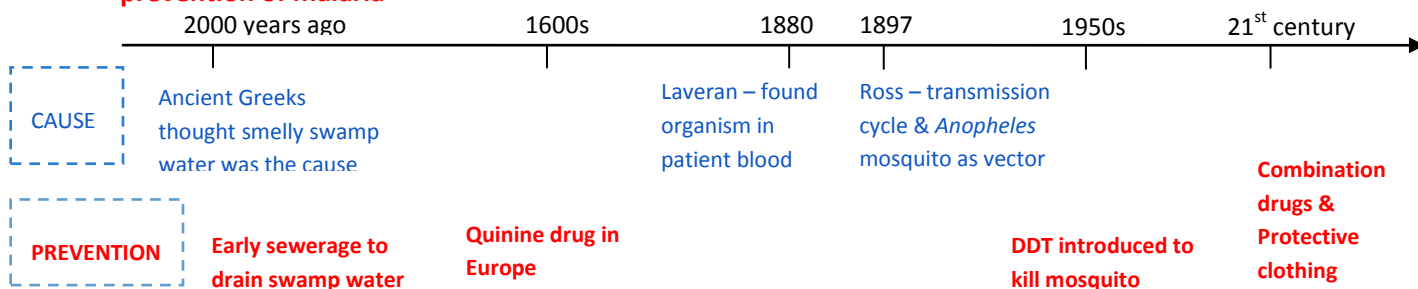
Contribution:

1. **Koch's postulates** [NOTE: Students need to know the 4 postulates]
 - Organisms must always be present when disease occurs
 - Organisms must be isolated from host and grown in pure culture
 - When grown and when organisms are put into healthy hosts, they must cause the disease
 - Organisms must be reisolated, grown in culture and compared to original organism

Distinguish between the following pathogens and name 1 example of a disease caused by each type of pathogen



Gather and process information to trace the historical development of our understanding of the cause and prevention of malaria



Outline the reasons for the suppression of the immune response in organ transplant patients

- Reason : Prevent immune response from being triggered and attack the transplanted organ

Outline the way in which vaccinations prevent infections

- Primary response : Antigen enters for the first time and immune response destroyed it
Specific memory B and T cells produced and remain in body
- Secondary response : If same antigen re-infect body, immune response react more rapidly
- Vaccination : Introduces attenuated microbes with the antigen causing the disease to trigger production of memory B and T cells before the first encounter with the real pathogen carrying that antigen

Process, analyse and present information from secondary sources to evaluate effectiveness of vaccination programs in preventing the spread and occurrence of once common disease including small pox, diphtheria and polio

- 1974 : Expanded Program on Immunisation (EPI) by WHO
- 2006-2015 : Global Immunization Vision and Strategy (GIVS) by WHO

Small pox	Disease globally eradicated in 1979 BUT samples of the virus still kept at research laboratories in USA and Russia → chance of another spread
Diphtheria	Largely been eradicated BUT there are still cases in the 21 st century; total of 3 between 2000 and 2007 (Atkinson et.al 2007)
Polio	Largely been eradicated but disease still found mostly in the African continent

6. EPIDEMIOLOGICAL STUDIES AND THE CAUSAL IDENTIFICATION OF NON-INFECTIOUS DISEASES

Identify and describe the main features of epidemiology using lung cancer as an example

- Epidemiology : Study of diseases and their prevalence in the community
- Main features : Cause, transmission, groups at risk, method of treatment and control, prevention

Gather, process and analyse information to identify the cause and effect relationship of smoking and lung cancer

- Studies have shown that the more you smoke, the greater the risk of lung cancer
- The Cancer Council stated that stopping smoking improves outcomes in early stages of lung cancer