

History of microbiology

Microbiology

Microbiology is a science that deals with the study of living organisms that cannot be seen by the naked eye. These can be seen with the aid of microscopes, which magnify objects. Many scientists contributed to the science of microbiology.

Louis Pasteur.

Louis Pasteur was a French chemist and a crystallographer. His Contribution to microbiology is so great that he is considered to be the father of microbiology.

Contribution to modern microbiology

Pasteur disproved the theory of spontaneous generation. He disproved the theory proposed that living organisms originated spontaneously particularly from the decaying organic matter he disproved it.

Swan neck experiment

Pasteur poured meat infusions in the flask and then drew the top of each flask into a long curved neck that would admit air but not dust. He found that if the infusions were heated they remained sterile until they were exposed to dust. He opened them one on a dusty road and received them and demonstrated the growth of microorganisms in all the flask. The unopened flask were sterile.

Thus he disproved theory of spontaneous generation.

He coined the terms aerobic to describe those organisms requiring air and anaerobic to describe organisms which do not require air for their growth. He found out that large amounts of lactic acid production was due to the presence or contamination of rod shaped bacteria. And he discovered that alcohol production from grape juice was due to yeast.

Edward Jenner

It was an ancient observation that person who had suffered from a specific disease such as smallpox or mumps resisted the infection on subsequent exposure. They rarely contracted it second time. Close on acquired resistance is specific. Edward Jenner is a country doctor in England noted a pustular disease on hooves of horses called the grease. This was shared by farm workers to the nipples of cows. They got inflamed spots on the hands and wrists. Who got this cowpox were protected from smallpox. Workers who had recovered from cowpox were resistant to smallpox infection.

He took the material from the cowpox inoculated into the cut of an 8 year old boy on 14 May 1796. Two months later he inoculated the same boy with material taken from smallpox patients. This was dangerous but accepted procedure of that time and the procedure was called variolation. The boy was protected against smallpox. Exposure to the mild disease cowpox made him immune to the disease smallpox. In this manner Edward Jenner began the science, of immunology, study of the body response to the foreign substance.

Robert Koch

German physician

- 1) For the first time he showed evidence that a specific germ was the cause of a specific disease.
- 2) He established that a specific germ can cause a specific disease and introduced scientific approach in microbiology
- 3) He discovered *Bacillus anthracis*, *bacterium tuberculosis* and *vibrio cholerae*.
- 4) He modified Zeihl-Neelsen acid fast staining procedure which was introduced by Erlich.
- 5) He Devised medium to grow the microorganism to get single colonies
- 6) he introduced Koch thread method to find out the efficiency of disinfectants..
- 7) He established certain rules that must be followed establish a cause and effect between microorganism disease they are known as postulates
- 8) Also describe the Koch phenomenon .

Koch postulates

The need for Koch postulates

Robert Koch developed powerful method to isolate organisms in pure culture from this is the tissue he also performed the techniques of identification of the isolated bacteria.

- 1) the organism should be regularly seen in the lesions of the disease
- 2) It should be isolated in pure culture on artificial media
- 3) Inoculation of this culture should produce a similar disease in experimental animals
- 4) The organism must be removed or recovered from the lesions from these animals
- 5)

Postulate 1

All the causative agents of the disease are seen in particular disease if we take pneumococcal as example they are seen in all the pneumonia cases

Postulate 2

Pneumococci are grown in solid media and are isolated from the disease. Some organism do not grow on solid media

Postulate 3

The organism should produce the exact disease in experimental animals. Almost all the organisms produce the same disease in experimental animals usually rats mice rabbits.

Postulate 4

It should be isolated from the deceased animal also.

Modern addition to Koch postulates

Today recognised we recognised additional criteria of casual relation between organism and disease. The important one is the demonstration of abnormally high concentration of specific circulating antibodies to the organisms in in the infected host

Imitations some organisms have not yet been grown in artificial culture media.

usefulness of Koch postulates

- 1) It is useful in determining pathogenic organism.
- 2) To differentiate pathogenic and non pathogenic microorganism
- 3) For the classification of organism
- 4) To detect the susceptibility resistance of the lab animal is

made him Ritz sandwich Carried by Greece who's who's who's of close on whose who's of a first year
disease a first call The Greece check your resistance is specific