- **Programme : B.Sc.(Honours)**
- **Subject : Microbiology**
- **Semester : VI**
- **Course Code : MIC 108**
- **Course Title : Immunology**
- **Title of the Unit: Unit 1 – Introduction of Immunology**
- **Module Name: Contributions of following scientists to the development of field of Immunology**
- **Dilecta D'Costa**
- **Associate Professor of Microbiology**
- **Government College of Arts, Science and Commerce, Khandola - Goa**

Notes

Immunology is the study of adaptive immunity and how the immune system responds to specific infectious agents and toxins.

Since 1901 till date there have been 19 Nobel Prizes for immunology-related research.

Edward Jenner (1749 – 1823)

Also known as the "Father of Immunology" Edward Anthony Jenner was an English scientist and is famous for his discovery of the smallpox vaccine. This was the first successful vaccine ever to be developed and remains the only effective preventive treatment for the dreaded smallpox disease. His discovery has saved more lives than any other in history.

Karl Landsteiner (1868 – 1943)

Austrian American immunologist and pathologist received the 1930 Nobel Prize for Physiology or Medicine for his discovery of the major blood groups and the development of the ABO system of blood. Karl Landsteiner discovered human blood groups in 1900 and laid the foundation for the modern medical practice of blood transfusion.

Robert Koch (1843 – 1910)

Koch was a German physician who observed the phenomenon of acquired immunity. Pioneer in immunological research. He won the Nobel prize in 1905 for his work on cellular immunity to tuberculosis. His experimental works provided one of the fundaments on which modern immunology is built.

Paul Ehrlich (1854 – 1915)

German biochemist Paul Ehrlich developed a chemical theory to explain the body's immune response and did important work in chemotherapy. Ehrlich proposed that it could be possible to kill specific pathogenic microbes, without harming the body itself. He named this hypothetical agent as *Zauberkugel*, the magic bullet. Considered by many as the father of chemotherapy, he was awarded the Nobel Prize in Physiology and Medicine in 1908 for his contributions to immunology. He developed an antiserum to combat diphtheria and conceived a method for standardizing therapeutic serums.

Elie Metchnikoff (1845 – 1916)

Russian zoologist Elie Metchnikoff was best known for his pioneering research in Immunology. He is credited with the discovery of phagocytes (macrophages)in 1882 which turned out to be the major defence mechanism in innate immunity. Elie and Paul Ehrlich were jointly awarded the 1908 Nobel prize in Physiology and Medicine in recognition of their work on immunity. Elie established the concept of cell mediated immunity, while Ehrlich established the concept of humoral immunity. Their works are regarded as the foundation of the science of immunology . In immunology, Elie Metchnikoff is given an epithet the "father of natural immunity".

Peter Medawar (1915 – 1987)

Sir Peter Brian Medawar was a Brazilian-born British biologist, whose work on graft rejection and the discovery of acquired immune tolerance was fundamental to the practice of tissue and organ transplants. For his works in immunology he is regarded as the "father of transplantation". Also referred to as "the wittiest of all scientific writers"

MacFarlane Burnet (1899 – 1985)

Sir Frank Macfarlane Burnet, was an Australian virologist best known for his contributions to immunology. He won a Nobel prize in 1960 for predicting acquired immune tolerance and was best known for developing the theory of clonal selection.

Niels K. Jerne (1911 – 1994)

Niels Kaj Jerne was a Danish immunologist. He shared the Nobel prize in Physiology and Medicine in 1984 with Kohler and Milstein for theories concerning the specificity in development and control of the immune system and the discovery of the principle for production of monoclonal antibodies. Jerne is known for three significant ideas:-

1. Instead of the body producing antibodies in response to an antigen, Jerne postulated that the immune system already has the specific antibodies it needs to fight antigens.

2. It was known that the immune system learns to be tolerant to the individual's own self. Jerne postulated that this learning takes place in the thymus.

3. It was known that T cells and B cells communicate with each other.

Rodney Porter (1917 – 1985)

Porter was a British national who worked for the National Institute for Medical Research for eleven years before joining St. Mary's Hospital Medical School, Imperial College, London and becoming the Pfizer Professor of Immunology. Together with Edelman, he won the Nobel prize in Physiology and Medicine in 1972 for elucidating the chemical structure of antibodies

Susumu Tonegawa (1939)

Susumu Tonegawa is a Japanese scientist who was the sole recipient of the Nobel prize in Physiology and Medicine in 1987, for his discovery of the genetic mechanism that produces antibody diversity. Tonegawa's Nobel Prize work elucidated the genetic mechanism of the adaptive immune system, which had been the central question of immunology for over 100 years. Tonegawa showed that genetic material rearranges itself to form millions of antibodies.