A.S.D GOVT. DEGREE COLLEGE FOR WOMEN (A)

(Re- Accredited by NAAC with B Grade)
Jagannaickpur, Kakinada, East Godavari, AP-533002

DEPARTMENT OF ZOOLOGY & AQUACULTURE TECHNOLOGY

2021-2022

Guest lecture

by

B. Chakravarthy, HOD of Zoology & Aquaculture Department, PRGC (A) Kakinada

on

IMMUNOLOGY

A.S.D GOVT. DEGREE COLLEGE FOR WOMEN (A)

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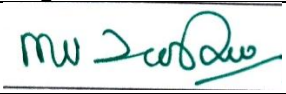
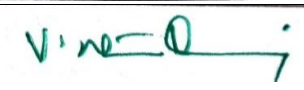
Jagannaickpur, Kakinada - 533002, East Godavari, AP.

Guest Lecture Register 2021-2022

Date	**20/06/2022**
Conducted through (DRC/JKC/NCC/NSS/Department)	**Department of Zoology and Aquaculture Technology**
Nature of Activity (Seminar/Workshop/Extn. Lecturer etc.)	**Guest lecture**
Title of the Activity	**Immunology**
Name of the Department/Committee	**Department of Zoology and Aquaculture Technology**
Details of Resource Persons (Name. Designation etc.)	**B. Chakravarthi, HOD in Zoology, P.R Govt. Degree College, Kakinada.**
No. of Students Participated	**50**
Brief Report on the Activity	**Students can acquire the knowledge of current researches ongoing in the field of Immunology**
Name of the Lecturers who Planned & Conducted the Activity	**M. Vasantha Lakshmi** **HOD in Zoology** **S. Madhavi** **Lecturer in Zoology** **N. Veera Chanti Guest Faculty in Aquaculture Technology**
Signature of the in Charge	
Signature of the Principal	
Remarks	

ASD GOVT DEGREE COLLEGE FOR WOMEN (A), KAKINADA

DEPARTMENT OF ZOOLOGY AND AQUACULTURE TECHNOLOGY

Guest Lecture

The Department of Zoology & Aquaculture Technology has conducted the Guest Lecture on 20-06-2022. The resource person Sri B. Chakravarthy, HOD of Zoology & Aquaculture Department, PRGC (A), Kakinada has enlightened the students on the topic "Immunology". 50 students have participated in the programme and are equipped with knowledge of importance of immunity in the present Covid pandemic.

Guest Lecture by Sri B. Chakravarthy, HoD of Zoology, PRGC (A), Kakinada on **"Immunology"-** 20-06-2022

Immunology:

Immunology is a branch of biology and medicine that covers the study of immune systems in all organisms.

Immunology charts, measures, and contextualizes the physiological functioning of the immune system in states of both health and diseases; malfunctions of the immune system in immunological disorders (such as autoimmune diseases, hypersensitivities, immune deficiency, and transplant rejection and the physical, chemical, and physiological characteristics of the components of the immune system *in vitro*, *in situ*, and *in vivo*. Immunology has applications in numerous disciplines of medicine, particularly in the fields of organ transplantation, oncology, rheumatology, virology, bacteriology, parasitology, psychiatry, and dermatology.

The term was coined by Russian biologist Ilya Ilyich Mechnikov, who advanced studies on immunology and received the Nobel Prize for his work in 1908 with Paul Ehrlich "in recognition of their work on immunity". He pinned small thorns into starfish larvae and noticed unusual cells surrounding the thorns. This was the active response of the body trying to maintain its integrity. It was Mechnikov who first observed the phenomenon of phagocytosis, in which the body defends itself against a foreign body. Ehrlich accustomed mice to the poisonous ricin and abrin. After feeding them with small but increasing dosages of ricin he ascertained that they had become "ricin-proof". Ehrlich interpreted this as immunization and observed that it was abruptly initiated after a few days and was still in existence after several months.

Prior to the designation of immunity, from the etymological root *immunis*, which is Latin for 'exempt', early physicians characterized organs that would later be proven as essential components of the immune system. The important lymphoid organs of the immune system are the thymus, bone marrow, and chief lymphatic tissues such as spleen, tonsils, lymph vessels, lymph nodes, adenoids, and liver. However, many components of the immune system are cellular in nature, and not associated with specific organs, but rather embedded or circulating in various tissues located throughout the body.

Classical immunology:

Classical immunology ties in with the fields of epidemiology and medicine. It studies the relationship between the body systems, pathogens, and immunity. The earliest written mention of immunity can be traced back to the plague of Athens in 430 BCE. Thucydides noted that people who had recovered from a previous bout of the disease could nurse the sick without contracting the illness a second time. Many other ancient societies have references to this phenomenon, but it was not until the 19th and 20th centuries before the concept developed into scientific theory.

The study of the molecular and cellular components that comprise the immune system, including their function and interaction, is the central science of immunology. The immune system has been divided into a more primitive innate immune system and, in vertebrates, an acquired or adaptive immune system. The latter is further divided into humoral (or antibody) and cell-mediated component.

The immune system has the capability of self and non-self-recognition. An antigen is a substance that ignites the immune response. The cells involved in recognizing the antigen are Lymphocytes. Once they recognize, they secrete antibodies. Antibodies are proteins that neutralize the disease-causing microorganisms. Antibodies do not directly kill pathogens, but instead, identify antigens as targets for destruction by other immune cells such as phagocytes or NK cells.

The (antibody) response is defined as the interaction between antibodies and antigens. Antibodies are specific proteins released from a certain class of immune cells known as B lymphocytes, while antigens are defined as anything that elicits the generation of antibodies (**anti**body **gen**erators).

Immunology rests on an understanding of the properties of these two biological entities and the cellular response to both.

It is now getting clear that the immune responses contribute to the development of many common disorders not traditionally viewed as immunologic, including metabolic, cardiovascular, cancer, and neurodegenerative conditions like Alzheimer's disease. Besides, there are direct implications of the immune system in the infectious diseases (tuberculosis, malaria, hepatitis, pneumonia, dysentery, and helminth infestations) as well. Hence, research in the field of immunology is of prime importance for the advancements in the fields of modern medicine, biomedical research, and biotechnology.

Diagnostic immunology

The specificity of the bond between antibody and antigen has made the antibody an excellent tool for the detection of substances by a variety of diagnostic techniques. Antibodies specific for a desired antigen can be conjugated with an isotopic (radio) or fluorescent label or with a color-forming enzyme in order to detect it. However, the similarity between some antigens can lead to false positives and other errors in such tests by antibodies cross-reacting with antigens that are not exact matches.

Immunotherapy

The use of immune system components or antigens to treat a disease or disorder is known as immunotherapy. Immunotherapy is most commonly used to treat allergies, autoimmune disorders such as Crohn's disease, Hashimoto's thyroiditis and rheumatoid arthritis, and certain cancers. Immunotherapy is also often used for patients who are immunosuppressed (such as those with HIV) and people with other immune deficiencies. This includes regulating factors such as IL-2, IL-10, GM-CSF B, IFN-α.

Clinical immunology

Clinical immunology is the study of diseases caused by disorders of the immune system (failure, aberrant action, and malignant growth of the cellular elements of the system). It also involves diseases of other systems, where immune reactions play a part in the pathology and clinical features.

The diseases caused by disorders of the immune system fall into two broad categories:

- immunodeficiency, in which parts of the immune system fail to provide an adequate response (examples include chronic granulomatous disease and primary immune diseases);
- autoimmunity, in which the immune system attacks its own host's body (examples include systemic lupus erythematosus, rheumatoid arthritis, Hashimoto's disease and myasthenia gravis).

Other immune system disorders include various hypersensitivities (such as in asthma and other allergies) that respond inappropriately to otherwise harmless compounds.

The most well-known disease that affects the immune system itself is AIDS, an immunodeficiency characterized by the suppression of CD4+ ("helper") T cells, dendritic cells and macrophages by the human immunodeficiency virus (HIV).

Clinical immunologists also study ways to prevent the immune system's attempts to destroy allografts (transplant rejection).

Clinical immunology and allergy is usually a subspecialty of internal medicine or pediatrics. Fellows in Clinical Immunology are typically exposed to many of the different aspects of the specialty and treat allergic conditions, primary immunodeficiencies and systemic autoimmune and autoinflammatory conditions. As part of their training fellows may do additional rotations in rheumatology, pulmonology, otorhinolaryngology, dermatology and the immunologic lab.