

Unit 1

Overview of the Immune System

- 1.1 Introduction to basic concepts in immunology
- 1.2 Components of immune system
- 1.3 Principles of innate and adaptive immune system; Haematopoiesis
- 1.4 Cells and organs of immune system

Unit 2

Antigens and antibodies

- 2.1 Basic properties of antigens
- 2.2 B and T cell epitopes, haptens and adjuvants
- 2.3 Structure, classes and function of antibodies, monoclonal antibodies,
- 2.4 Antigen antibody interactions as tools for research and diagnosis

Unit 3

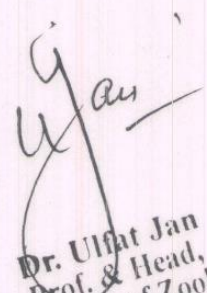
Working of the immune system

- 3.1 Structure and functions of MHC
- 3.2 Exogenous and endogenous pathways of antigen presentation and processing
- 3.3 Basic properties and functions of cytokines
- 3.4 Complement system: Components and pathways.

Unit 4

Immune system in health and disease

- 4.1 Gell and Coombs
- 4.2 Classification and brief description of various types of hypersensitivities
- 4.3 Introduction to concepts of auto immunity and immunodeficiency
- 4.4 Introduction to vaccines


Dr. Ulfat Jan
Prof. & Head,
P.G. Dept. of Zoology
University Of Kashmir

IMMUNOLOGY

PRACTICAL


(CREDITS 2)

1. Demonstration of lymphoid organs
2. Histological study of spleen, thymus and lymph nodes through slides/ photographs
3. Preparation of stained blood film to study various types of blood cells.
4. Ouchterlony's double immuno-diffusion method.
5. ABO blood group determination.

7. Demonstration of
 - a) ELISA
 - b) Immunoelectrophoresis

SUGGESTED READINGS

- Kindt, T. J., Goldsby, R.A., Osborne, B. A. and Kuby, J (2006). *Immunology*, VI Edition. W.H. Freeman and Company.
- David, M., Jonathan, B., David, R. B. and Ivan R. (2006). *Immunology*, VII Edition, Mosby, Elsevier Publication.
- Abbas, K. Abul and Lichtman H. Andrew (2003.) *Cellular and Molecular Immunology*. V Edition. Saunders Publication.
CBCS Undergraduate Program in Zoology


Dr. Ulfat Jan
Prof. & Head,
P.G. Dept. of Zoology
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6th SEMESTER

DISCIPLINE SPECIFIC ELECTIVE (DSE)

OPTION – II

ZOO616DB: ZOOLOGY – REPRODUCTIVE BIOLOGY

CREDITS: THEORY: 4, PRACTICALS: 2

THEORY

Unit 1

Reproductive Endocrinology

- 1.1 Gonadal hormones and mechanism of hormone action,
- 1.2 Steroids, glycoprotein hormones, and prostaglandins,
- 1.3 Regulation of gonadotrophin secretion in male and female;
- 1.4 Mechanism of sex differentiation.

Unit 2

Functional anatomy of male reproduction

- 1.1 Histology of male reproductive system in humans
- 1.2 Spermatogenesis: hormonal regulation;
- 1.3 Androgen synthesis and metabolism
- 1.4 Accessory glands functions;

Unit 3

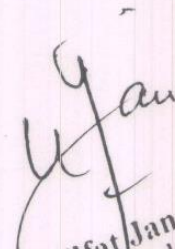
Functional anatomy of female reproduction

- 3.1 Histology of female reproductive system in humans
- 3.2 Ovary: folliculogenesis, ovulation, corpus luteum formation and regression;
Steroidogenesis and secretion of ovarian hormones;
- 3.3 Reproductive cycles and their regulation,
- 3.4 Hormonal control of implantation, gestation, foeto-maternal relationship and lactation

Unit 4

Reproductive Health

- 4.1 Infertility in male: causes, diagnosis and management
- 4.2 Infertility in female: causes, diagnosis and management
- 4.3 Assisted Reproductive Technology: sex selection, sperm banks, frozen embryos
- 4.4 In vitro fertilization, ET, EFT, IUT, ZIFT, GIFT, ICSI, PROST;


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REPRODUCTIVE BIOLOGY

PRACTICAL

(CREDITS 2)


1. Examination of histological sections from photomicrographs/ permanent slides of rat/human: testis, epididymis and accessory glands of male reproductive systems; Sections of ovary, fallopian tube, uterus (proliferative and secretory stages), cervix and vagina.

3. Sperm count and sperm motility in mammal

4. Study of modern contraceptive devices

SUGGESTED READINGS

- Austin, C.R. and Short, R.V. reproduction in Mammals. Cambridge University Press.
- Degroot, L.J. and Jameson, J.L. (eds). Endocrinology. W.B. Saunders and Company.
- Knobil, E. et al. (eds). The Physiology of Reproduction. Raven Press Ltd.
- Hatcher, R.A. et al. The Essentials of Contraceptive Technology. Population Information Programme.


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University Of Kashmir

6th SEMESTER

DISCIPLINE SPECIFIC ELECTIVE (DSE)

OPTION – III

ZOO616DC: ZOOLOGY – INSECT VECTORS AND DISEASES

CREDITS: THEORY: 4, PRACTICALS: 2

Unit 1

Introduction to Insects

- 1.1 Classification of insects upto order level
- 1.2 Morphological features, Head – Eyes,
- 1.3 Types of antennae,
- 1.4 Mouth parts w.r.t. feeding habits

Unit 2

Insects as Vectors

- 2.1 Brief introduction of Carrier and Vectors (mechanical and biological vector),
- 2.2 Reservoirs, Host-vector relationship, Vectorial capacity, Adaptations as vectors,
- 2.3 Host Specificity
- 2.4 Detailed features of orders with insects as vectors – Diptera, Siphonaptera, Siphunculata, Hemiptera

Unit 3

Dipteran as Disease Vectors

- 3.1 Dipterans as important insect vectors – Mosquitoes, Sand fly, Houseflies;
- 3.2 Study of mosquito-borne diseases – Malaria, Dengue, Chikungunya, Viral encephalitis, Filariasis; control of mosquito
- 3.3 Study of sand fly-borne diseases – Visceral Leishmaniasis, Cutaneous Leishmaniasis, Phlebotomus fever; control of sand fly
- 3.3 Study of housefly as important mechanical vector, Myiasis, control of housefly

Unit 4

Siphonaptera, Siphunculata, Hemiptera as Disease Vectors

- 4.1 Fleas as important insect vectors; Study of Flea-borne diseases – Plague, Typhus fever;
- 4.2 Human louse (Head, Body and Pubic louse) as important insect vectors; Study of louse-borne diseases – Typhus fever, Relapsing fever, Trench fever, Vagabond's disease, Phthiriasis;
- 4.3 Bugs as insect vectors; Blood-sucking bugs; Chagas disease, Bed bugs as mechanical vectors,
- 4.4 Control and prevention measures against diseases caused fleas, louse and bugs

INSECT VECTORS AND DISEASES


(CREDITS 2)

PRACTICAL

1. Study of different kinds of mouth parts of insects
2. Study of following insect vectors through permanent slides/ photographs:
Aedes, Culex, Anopheles, Pediculus humanus capitis, Pediculus humanus corporis, Phthirus pubis, Xenopsylla cheopis, Cimex lectularius, Phlebotomus argentipes, Musca domestica, through permanent slides/ Photographs
3. Study of different diseases transmitted by above insect vectors
4. Submission of a project report on any one of the insect vectors and disease transmitted

SUGGESTED READINGS

- Imms, A.D. (1977). *A General Text Book of Entomology*. Chapman & Hall, UK
- Chapman, R.F. (1998). *The Insects: Structure and Function*. IV Edition, Cambridge University Press, UK
- Pedigo L.P. (2002). *Entomology and Pest Management*. Prentice Hall Publication
- Mathews, G. (2011). *Integrated Vector Management: Controlling Vectors of Malaria and Other Insect Vector Borne Diseases*. Wiley-Blackwell


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