SCERT Kerala · Class 10 · Biology

Biology Part 2

PADIKAM
BIOLOGY
PART II
Complete Study Notes | Standard X | English Medium
SCERT Kerala 2025 syllabus coverage
Original explanations, revision tools, exam focus and practice

PADIKAM | CLASS 10 BIOLOGY - PART II
Contents
These chapters explore chemical coordination, health defence and modern biological technology.
Chapter 4 | Chemoreception in Organisms
Chapter 5 | Immunity and Healthcare
Chapter 6 | Biology and Technology
How to use this book
• Read the chapter mission first to understand the learning target.
• Study the core notes and pause at every table, formula or process map.
• Use the exam focus list for last-minute revision.
• Answer the practice questions without looking back, then revise weak areas.
Official textbook links
SCERT Kerala Class 10 PART II
SCERT Kerala Standard 10 textbook catalogue

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CHAPTER 4
Chemoreception in Organisms
Chapter mission: explain how chemical signals coordinate plant and animal functions and how organisms detect chemical stimuli.
Hormones and target cells
• Hormones are chemical messengers produced in small quantities. A hormone affects only cells with suitable receptors.
• Binding forms a hormone-receptor complex that changes cellular activity. Animals usually transport hormones through blood; plants use local transport and vascular tissues.
• Feedback systems keep internal conditions within useful limits, especially for blood glucose, water balance and metabolism.
Plant hormones
Hormone Main effects
auxin cell elongation, apical dominance, tropic responses and rooting
gibberellin stem growth, seed germination and fruit growth
cytokinin cell division, lateral bud growth and delayed ageing
ethylene fruit ripening, ageing and leaf/flower changes
abscisic acid growth inhibition, dormancy and stress responses
Animal endocrine system
• The pituitary coordinates several endocrine glands and also releases hormones involved in growth and water balance.
• Thyroid hormones influence metabolic rate; parathyroid hormone helps regulate calcium.
• Pancreatic insulin lowers elevated blood glucose, while glucagon raises low blood glucose.
• Adrenal hormones support stress responses; gonadal hormones influence reproductive development and

function.
Feedback and disorders
• Negative feedback reverses a deviation: a high level triggers actions that lower it, while a low level triggers actions that raise it.
• Hormone imbalance may result from gland failure, excessive secretion or receptor problems. Diagnosis requires symptoms, clinical examination and tests.
Chemical reception
• Receptors detect specific chemicals in air, water or food. The signal may guide feeding, mating, defence or movement.
• Pheromones act as chemical communication between members of the same species.

• Plants also respond to chemical conditions in soil and within tissues, integrating chemical signals with light, gravity and touch.
Exam focus
• Match each hormone with source, target and effect.
• Use a loop diagram to explain negative feedback.
• Separate chemical communication from general chemical sensitivity.
Practice
1. Explain why every hormone does not act on every cell.
2. Compare insulin and glucagon.
3. Describe two effects of auxin in plants.

CHAPTER 5
Immunity and Healthcare
Chapter mission: describe body defence, immune responses, disease prevention and responsible healthcare choices.
Disease and transmission
• Communicable diseases are caused by pathogens and can spread directly or indirectly. Non-communicable diseases do not spread between people.
• Transmission routes include air droplets, contaminated food or water, body fluids, vectors and contact with infected surfaces.
• Breaking the chain requires hygiene, safe water and food, ventilation, vector control, vaccination and timely treatment.
Defence lines
Defence Examples Nature
barriers skin, mucus, cilia, stomach acid prevent entry
innate internal inflammation, fever, phagocytosis rapid and non-specific
adaptive B cells, T cells, antibodies, memory specific and improves after exposure
cells
Adaptive immunity
• An antigen is a molecule recognised as foreign. Selected lymphocytes multiply and form effector and memory cells.
• B cells can produce antibodies that bind specific antigens. Helper T cells coordinate responses; cytotoxic T cells destroy certain infected cells.
• Memory cells make a later response faster and stronger.
Vaccination and treatment
• A vaccine safely presents antigen information so immune memory develops without the full disease risk.
• Antibiotics act against bacteria, not viruses. Incorrect or incomplete use favours antibiotic resistance.
• Antivirals, antifungals and antiparasitic drugs target other pathogen groups; treatment must follow qualified medical advice.
Healthy living and public health
• Balanced nutrition, physical activity, sleep, clean surroundings and avoiding tobacco or substance misuse lower many disease risks.

• Screening detects some conditions before symptoms become severe. Reliable health information comes from qualified professionals and trusted public-health sources.
• Individual choices and community systems work together: sanitation, surveillance, vaccination programmes and accessible care protect populations.

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Exam focus
• Compare innate and adaptive immunity with examples.
• Explain vaccination through memory cells, not as a medicine that directly kills every pathogen.
• Include prevention, diagnosis and treatment as separate ideas.
Practice
1. How does inflammation help defend the body?
2. Why do antibiotics not cure viral infections?
3. Explain how vaccination can protect a community.

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CHAPTER 6
Biology and Technology
Chapter mission: understand major biotechnologies, their applications and the ethical responsibilities that accompany them.
What biotechnology does
• Biotechnology uses organisms, cells, enzymes or biological information to make useful products and processes.
• Traditional examples include fermentation and selective breeding; modern methods include tissue culture, recombinant DNA, molecular diagnosis and gene editing.
Core tools
Tool Purpose
restriction enzyme cuts DNA at particular sequences
DNA ligase joins DNA fragments
vector carries selected DNA into a host cell
PCR amplifies a chosen DNA region
gel electrophoresis separates DNA fragments mainly by size
CRISPR-Cas supports targeted gene editing
Applications
• Medicine: recombinant proteins, vaccines, molecular tests, gene-based therapies and personalised treatment research.
• Agriculture: tissue culture, disease-resistant crops, improved nutrition and faster identification of useful traits.
• Environment and industry: microbial enzymes, biofuels, waste treatment, bioremediation and biodegradable materials.
• Forensics: DNA profiles can support identification when samples and statistical interpretation are handled carefully.
Cloning and stem cells
• Cloning produces genetically very similar biological material; gene cloning, cell cloning and organism cloning are different processes.
• Stem cells can self-renew and produce specialised cells. Their potential in repair and disease study depends on type, control and safety.
Bioethics and biosafety
• A useful technology must also be assessed for unintended effects, ecological spread, privacy, consent, access and fairness.
• Biosafety uses containment, testing, traceability and regulation to reduce risk.

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• Good decisions compare evidence, benefits, uncertainties and affected groups rather than treating technology as automatically good or bad.
Exam focus

• State the biological tool and what it does before naming an application.
• Distinguish PCR, sequencing and gene editing.
• In ethical questions, give both benefit and risk with a reasoned safeguard.

Practice

1. Outline the steps of recombinant DNA technology.
2. How is PCR useful in diagnosis?
3. Discuss one benefit, one risk and one safeguard for gene editing.

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Final Revision Checklist

• I can explain hormone action and feedback.
• I can organise body defence into barriers, innate response and adaptive response.
• I understand how vaccination and antimicrobials differ.
• I can evaluate biotechnology using evidence and ethics.

Padikam Learning Content

Prepared as an independent learning companion using the SCERT textbook only as the syllabus and notation reference.