

CSIR NET UNIT 5 Syllabus

DEVELOPMENTAL BIOLOGY

CSIR NET UNIT 5 explores basic concepts of development, including potency, commitment, and differentiation, along with topics like gametogenesis, fertilization, early development, morphogenesis, organogenesis in animals and plants. The unit also covers programmed cell death, aging, and senescence.

CSIR NET UNIT 5	Topics
A) Basic Concepts of Development	<ul style="list-style-type: none">- Potency, commitment, specification, induction, competence, determination, and differentiation- Morphogenetic gradients- Cell fate and cell lineages- Stem cells- Genomic equivalence and cytoplasmic determinants- Imprinting- Mutants and transgenics in the analysis of development
B) Gametogenesis, Fertilization, and Early Development	<ul style="list-style-type: none">- Production of gametes- Cell surface molecules in sperm-egg recognition in animals- Embryo sac development and double fertilization in plants- Zygote formation, cleavage, blastula formation, embryonic fields, gastrulation, and formation of germ layers in animals- Embryogenesis, establishment of symmetry in plants- Seed formation and germination
C) Morphogenesis and Organogenesis in Animals	<ul style="list-style-type: none">- Cell aggregation and differentiation in Dictyostelium- Axes and pattern formation in Drosophila, amphibia, and chick- Organogenesis – vulva formation in Caenorhabditis elegans, eye lens induction, limb development, and regeneration in vertebrates- Differentiation of neurons, post-embryonic development - larval formation, metamorphosis- Environmental regulation of normal development- Sex determination
D) Morphogenesis and Organogenesis in Plants	<ul style="list-style-type: none">- Organization of shoot and root apical meristem- Shoot and root development- Leaf development and phyllotaxy- Transition to flowering, floral meristems, and floral development in Arabidopsis and Antirrhinum
E) Programmed Cell Death, Aging, and Senescence	

Study Tips For CSIR NET UNIT 5: Create concept maps for developmental processes, understand key signaling molecules in gametogenesis, use model organisms for analysis, and relate environmental factors to organogenesis. Practice identifying stages in embryonic development for effective preparation.

BioTechnika