

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Biotechnology - NOC:Regeneration Biology

Subject Co-ordinator - Prof. Rajesh Ramachandran

Co-ordinating Institute - IISER Mohali

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Basics of Regeneration: Basics and Types
- Lecture 2 - Regeneration, Wound Healing and Scar Formation in Different Regenerative Capacity
- Lecture 3 - Regeneration: In Normal Life and Implications
- Lecture 4 - Tissue Regeneration: Mammalian Context
- Lecture 5 - Liver Regeneration: Signaling Events
- Lecture 6 - Liver Regeneration: Mechanistic Insights
- Lecture 7 - Regeneration: lessons from animal model Hydra
- Lecture 8 - Mechanisms of regeneration in Hydra
- Lecture 9 - Asexual Reproduction - Fragmentation, Morphallaxis, Epimorphosis, lessons from Hydra
- Lecture 10 - Mechanisms of regeneration in Planaria
- Lecture 11 - Planaria regeneration-polarity and gradient in regeneration
- Lecture 12 - Planaria regeneration: Neoblasts and organ formation and Species type and environment
- Lecture 13 - Position control genes and regeneration - Part A
- Lecture 14 - Position control genes and regeneration - Part B
- Lecture 15 - Progenitor targeting and ectopic organs
- Lecture 16 - Tissue dedifferentiation, cellular reprogramming into blastema Cellular types in regeneration. Ne
- Lecture 17 - Totipotency, pluripotency, multipotency and unipotency, in regeneration context
- Lecture 18 - Adult stem cells: Natural and induced and their roles in regeneration-zebrafish
- Lecture 19 - Common cellular events during regeneration, embryonic development, and cancer
- Lecture 20 - Epithelial to mesenchymal transition (EMT) and mesenchymal to epithelial transition (MET) in reg
- Lecture 21 - Organ regeneration: Basics with examples
- Lecture 22 - Zebrafish fin regeneration-in a brief
- Lecture 23 - Zebrafish heart regeneration-in a brief
- Lecture 24 - Zebrafish retina regeneration-in a brief
- Lecture 25 - Spinal cord and brain regeneration-Conclusive mechanisms of regeneration
- Lecture 26 - Cellular, Molecular and Genetic factors involved in retina regeneration
- Lecture 27 - Detailed mechanisms of fin regeneration
- Lecture 28 - Retina regeneration-importance of Shh signaling Roles of epigenetic factors and their involvemen
- Lecture 29 - Importance of regeneration associated gene induction events-Transcription activators and repress

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- Lecture 30 - Roles of different cellular signaling in regeneration: Examples- Wnt signaling
- Lecture 31 - Different cellular signaling during regeneration-Overview
- Lecture 32 - Different cellular signaling during regeneration. Examples- Jak-STAT and Fgf signaling
- Lecture 33 - Different cellular signaling during regeneration-Egf, and Hippo signaling
- Lecture 34 - Roles of Delta-Notch signaling during regeneration
- Lecture 35 - Tgf-beta signaling during regeneration
- Lecture 36 - Organ regeneration: An overview
- Lecture 37 - Accessory limb model of regeneration: lessons from Axolotl and newt
- Lecture 38 - Nerve-dependent regeneration-Axolotl and Newt
- Lecture 39 - Roles of Histone deacetylases in regeneration of vertebrates like fishes and amphibians
- Lecture 40 - Dynamics of immune system in organ regeneration
- Lecture 41 - Extracellular matrix and its roles in tissue regeneration
- Lecture 42 - Induced pluripotency and roles of iPFs during tissue Hox genes and homeotic transformation
- Lecture 43 - Animal cloning: implications in regeneration
- Lecture 44 - Embryonic stem cells, cord blood stem cells and adult stem cells
- Lecture 45 - Ethics of stem cell research in regeneration studies, regenerative medicine and biotechnology
- Lecture 46 - Tissue engineering-Why and how?
- Lecture 47 - History of tissue engineering
- Lecture 48 - Different steps in tissue engineering
- Lecture 49 - Different aspects of organ culture
- Lecture 50 - Major challenges in tissue engineering in practice
- Lecture 51 - Tissue 3D printing and organ culture
- Lecture 52 - Importance of scaffolds in tissue engineering
- Lecture 53 - Stem cells for tissue engineering-Use of CRISPR-Cas9 for genome targeting
- Lecture 54 - Types of adult stem cells and trans-differentiation for tissue engineering
- Lecture 55 - Influence of niches and scaffolds on stem cells: An organ culture perspective
- Lecture 56 - The basics of regeneration put into practice in vitro
- Lecture 57 - Adhesion, migration and aggregation of stem cells
- Lecture 58 - Artificial, liver, kidney and urinary bladder for transplantation in patients
- Lecture 59 - Limbal stem cells and artificial cornea
- Lecture 60 - Xenotransplantation vs organ culture in practice
- Lecture 61 - Future implications of regeneration in mammals
- Lecture 62 - Future implications of Organ culture in patient care