

**Title: Animal Biotechnology [3-0-0-3]**

**Content :**

Animal cell culture:

- History of animal cell culture, cell culture media formulations and methodologies of cell culture
- Behaviour of cells in culture: Hayflick limit, contact inhibition etc
- Types of cell culture: primary culture, secondary culture, continuous cell lines, suspension cultures, spheroids, animal organoid and embryoid body cultures etc
- Application of animal cell culture for virus isolation and in vitro testing of drugs,
- Application of cell culture technology in production of human and animal viral vaccines and pharmaceutical proteins
- Case studies of animal cell culture for impactful advances in human health sector: e.g insulin etc.

Animal reproductive biotechnology:

- Diversity of structure of sperm and ova in animals, cryopreservation of sperm and ova of livestock, artificial insemination, super ovulation
- Embryo recovery and in vitro fertilization
- Culture of embryos, cryopreservation of embryos, embryo transfer technology
- Transgenic manipulation of animal embryos, applications of transgenic animal technology
- Animal cloning - basic concept, cloning for conservation of endangered species
- Stem cell technologies

Vaccinology:

- History of development of vaccines, introduction to the concept of vaccines
- Conventional methods of animal vaccine production
- Recombinant approaches to vaccine production
- Current methods for production of vaccines
- Reverse vaccinology principles

**Texts / References:**

- Culture of Animal Cells: A Manual of Basic Technique and Specialized Applications 7th Edition, by R. Ian Freshney
- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7325846/>
- <https://www.ncbi.nlm.nih.gov/books/NBK27062>
- Additional materials will be from research publications and reviews, which will be provided during the lectures.