

VALUE ADDED COURSE

On

Development of Recombinant Protein Vaccines (PHV-E7)



Instead of introducing an entire pathogen to elicit an immune response, subunit vaccines, also known as acellular vaccines, consist of purified components carefully chosen for their ability to stimulate immune cells. These components lack the capacity to cause disease, making subunit vaccines highly safe. Various types of subunit vaccines exist: protein subunit vaccines contain specific isolated proteins from viral or bacterial pathogens, polysaccharide vaccines contain chains of sugar molecules (polysaccharides) found in the cell walls of certain bacteria, and conjugate subunit vaccines combine a polysaccharide chain with a carrier protein to enhance the immune response. Currently, only protein subunit vaccines are being developed for the COVID-19 virus.

Recombinant protein vaccines, alternatively known as recombinant subunit vaccines, utilize specific



protein antigens produced through heterologous expression systems. The choice of expression system depends on the antigen in question, with options ranging from bacteria, yeasts, insect cells, mammalian cell lines, to plants. Currently, a significant challenge for the industry lies in scaling up these diverse expression systems and developing customized downstream processes that cater to disease-specific antigens.

In recent decades, the field of recombinant protein technology has made significant advancements, resulting in enhanced efficiency, affordability, and widespread availability. This progress has facilitated the cost-effective production of recombinant proteins using various expression host systems, including microbial systems. One notable advantage is that recombinant protein vaccines do not replicate and lack the infectious components present in attenuated viral particles, making them a safer alternative to vaccines derived from live viruses. Extensive testing of this technology has demonstrated that these vaccines generally induce only minimal side effects. As a result, numerous recombinant protein vaccines are now being used in clinical settings globally.

Keeping this in view, the current online course is designed to give the learners foundational coursework on Recombinant Protein Vaccine for both undergraduate and postgraduate level programs. With this course, the enrolled candidates shall receive conceptual knowledge on basic and advanced aspects of vaccine development with specific emphasis on Protein subunit vaccine.

This course is created by expert instructors of Faculty of Pharmacy, Integral University who will help you understand basic concepts, design, methodologies associated with Recombinant Protein Vaccine development.

Upon successful completion of the course, each candidate shall receive a **certificate**.

- **This is an online course. Lectures shall be conducted during weekends, on Saturdays and Sundays.**
- **Course Platform** : **ILI-LMS**
- **Conduct of sessions** : **Google Meet**
- **Duration** : **30 hours**
- **Course Commencement** : **22-03-2025**
- **End of Course** : **27-04-2025**

Key USPs

- An extensive course focused on explaining the terms and terminologies used in Vaccine production.
- Specially designed for science graduates with flexible deadlines and access to course content from anywhere.
- Avail quizzes to learn and enhance your skills related to pharmaceutical biotechnology.

Learning outcomes (PO-1, PO-2, PO-3, PO-4, PO-6, PO-9, PO-11)

After the successful course completion, participants will develop the following attributes:

- Understand basic concepts vaccination.
- Discuss different aspects vaccines.
- Analyze problems related to vaccine candidate.
- Explain principle of vaccination.
- Apply knowledge of protein vaccine development for identification of new vaccine candidate.



Course Coordinator

Dr. Vaseem A Ansari, Professor, Faculty of Pharmacy, Integral University, Lucknow.

Kindly Contact for Queries: Email: vaseem@iul.ac.in

Name of Instructors:

1. Dr. Vaseem A Ansari, Professor, Faculty of Pharmacy, Integral University, Lucknow.
2. Dr. Mohd. Shariq, Assistant Professor, Faculty of Pharmacy, Integral University, Lucknow.
1. Dr. Aditya Singh, Lecturer, Faculty of Pharmacy, Integral University, Lucknow.
2. Ms. Archita Kapoor, Lecturer, Faculty of Pharmacy, Integral University, Lucknow.
3. Ms. Rabia Aqeel, Lecturer, Faculty of Pharmacy, Integral University, Lucknow.

Course Outline

Module 1, Number of Lectures- 06

- Vaccines, Principles of vaccination, Different types of vaccines, Toxoids, Antisera

Module 2, Number of Lectures- 06

- Recombinant DNA technology, Restriction enzyme, Cloning vectors, Gene cloning, PCR

Module 3, Number of Lectures- 06

- Recombinant protein: About Recombinant protein, steps involved in production, downstream process

Module 4, Number of Lectures- 06

- Recombinant protein vaccine development: Identification of target antigen, construction of gene responsible for target antigen, cloning and expression, transformation/ transfection gene in expression vector

Module 5, Number of Lectures- 06

- Protein expression and purification: fermentation, obtaining desired protein from harvested culture, isolation and purification, quality control and characterization, vaccine formulation and stabilization



Don't miss this opportunity to gain specialized knowledge in a rapidly growing field!
For registration and further details, click the given link or scan QR code.
Looking forward to your enthusiastic participation!

How to Apply: -

Registration Link: <https://forms.gle/vUjhtpwSBYKb2XJk6>

Registration Deadline: 16/03/2025

Course Fee: Nil

Maximum number of Participants: 90

***Fill out the form carefully, paying special attention to your University Enrollment Number and Name to ensure correct inclusion in ILI-LMS and certificate generation.**



Best Regards,

Dr. Vaseem A Ansari,

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Integral University, Lucknow.

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