UNIVERSIDADE ESTADUAL DE MARINGÁ

PROGRAMA DE PÓS-GRADUAÇÃO EM BIOSCIÊNCIAS E FISIOPATOLOGIA

PROGRAMA DA DISCIPLINA

CÓDIGO: DAB4066				
NOME: Recombinant DNA technology applied to drug discovery and vaccinology				
CRÉDITOS			CARGA HORÁRIA TOTAL:	ANO
TOTAL: 1	PRÁTICOS: 0	TEÓRICOS: 1	Horas: 15h	2025
PRÉ-REQUISITOS:			CO-REQUISITOS:	
PROFESSORES RESPONSÁVEIS				
Prof. Dr. Alfredo Castañeda Garcia				
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EMENTA:

Fundamentals of recombinant DNA technology and its application in drug and vaccine development. Methods of cloning, expression, and purification of recombinant proteins. Production of antigens for immunization. Screening assays for therapeutic targets based on genetic engineering. Applications of recombinant RNA in biomedicine. Development of recombinant and vectorized vaccines. Advances and challenges in the use of recombinant DNA in *drug discovery* and vaccinology.

PROGRAMA:

1. Introduction to Recombinant DNA Technology

- History and basic concepts
- o Cloning methods and expression vectors
- Genetic manipulation techniques

2. Expression and Purification of Recombinant Proteins

- Expression systems in bacteria, yeasts, and mammalian cells
- o Purification and characterization methods
- o Applications in drug discovery

3. Screening of Therapeutic Targets Based on Recombinant DNA

- Gene expression libraries
- Phenotypic and genotypic screening
- Genetic engineering for the discovery of new bioactive molecules

4. Applications of Recombinant DNA Technology in Vaccinology

- o Development of recombinant vaccines
- Use of viral vectors and DNA/RNA vaccines

• Preclinical and clinical models

5. Recombinant RNA and Its Biomedical Application

- Messenger RNA (mRNA) for vaccines
- Applications in gene therapies
- New approaches to immunotherapy

6. Advances and Challenges in the Use of Recombinant DNA Technology in Health

- o Biotechnology applied to the development of new drugs
- o Bioethics and regulation in the use of recombinant technology
- o Future perspectives in biomedical research

BIBLIOGRAFIA:

- BROWN, T. A. Gene Cloning and DNA Analysis: An Introduction. Wiley-Blackwell, 2020.
- MURRAY, J. D. Recombinant DNA: Principles and Methods. Springer, 2021.
- PASTERNAK, J. J. An Introduction to Genetic Engineering. Cambridge University Press, 2018.
- WHO. *Guidelines on Recombinant DNA Research and its Applications*. World Health Organization, 2023.

SPECIALIZED JOURNALS ON THE SUBJECT:

- Nature Biotechnology
- Trends in Biotechnology
- Vaccine
- Journal of Molecular Biology
- Molecular Therapy
- Current Opinion in Biotechnology

Aprovado na 290ª Reunião do Conselho Acadêmico do Programa de Pósgraduação em Ciências da Saúde, realizada em 25 de março de 2025

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