Foundations of Biotech:

Focus on Bacteria Sequence

(12–14 class sessions)

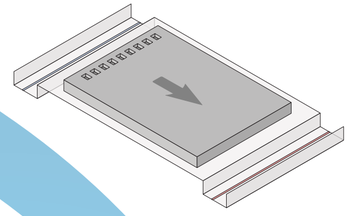
A pre-made plasmid is provided

Make Recombinant Plasmid

Use ligase to make recombinant plasmid from DNA fragments.

Verify

Visualize digestion and ligation reaction products using gel electrophoresis.



Isolate Gene

Use restriction enzymes to digest plasmid and isolate gene of interest (GoI).

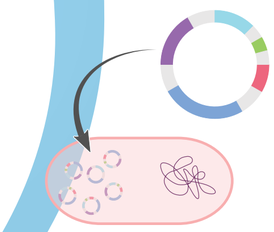
THE BIG IDEA

DNA ➔ Protein ➔ Trait

DNA contains all the information needed by organisms to survive and reproduce. The information in DNA is translated into proteins, which contribute to the traits of an organism. Altered DNA can result in non-functioning proteins and can lead to genetic disease. Biotechnology research and development can provide functional proteins to patients and alleviate the symptoms of certain diseases. Through the *Foundations of Biotech* labs, students will gain hands-on experience in producing a functional protein from genetically modified bacteria.

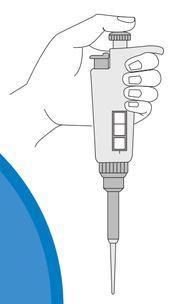
Produce Protein

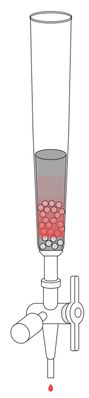
Transform bacteria with recombinant plasmid to produce protein of interest (PoI).



Use Biotech Tools

Learn how to use biotechnology lab tools.



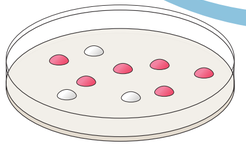


Purify Protein

Grow transformed bacteria and purify PoI through column chromatography.

Verify with Colony PCR

Check for presence of GoI in transformed bacteria using PCR.



Drug Discovery → Research and Development → Manufacturing → Legal Issues → Clinical Affairs → Regulatory Affairs → Patient Use

Biotechnology Drug Discovery and Development Process

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