Foundations of Biotech: **Complete Genetic Engineering Sequence** (18–20 class sessions)

Make **Recombinant** Plasmid

Use ligase to make a recombinant plasmid from DNA fragments.

Isolate Gene

Use restriction enzymes to digest a plasmid and isolate the gene of interest (Gol).

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.

Use **Biotech Tools**

Learn how to use biotechnology lab tools.

> Drug Discovery

Research and Development

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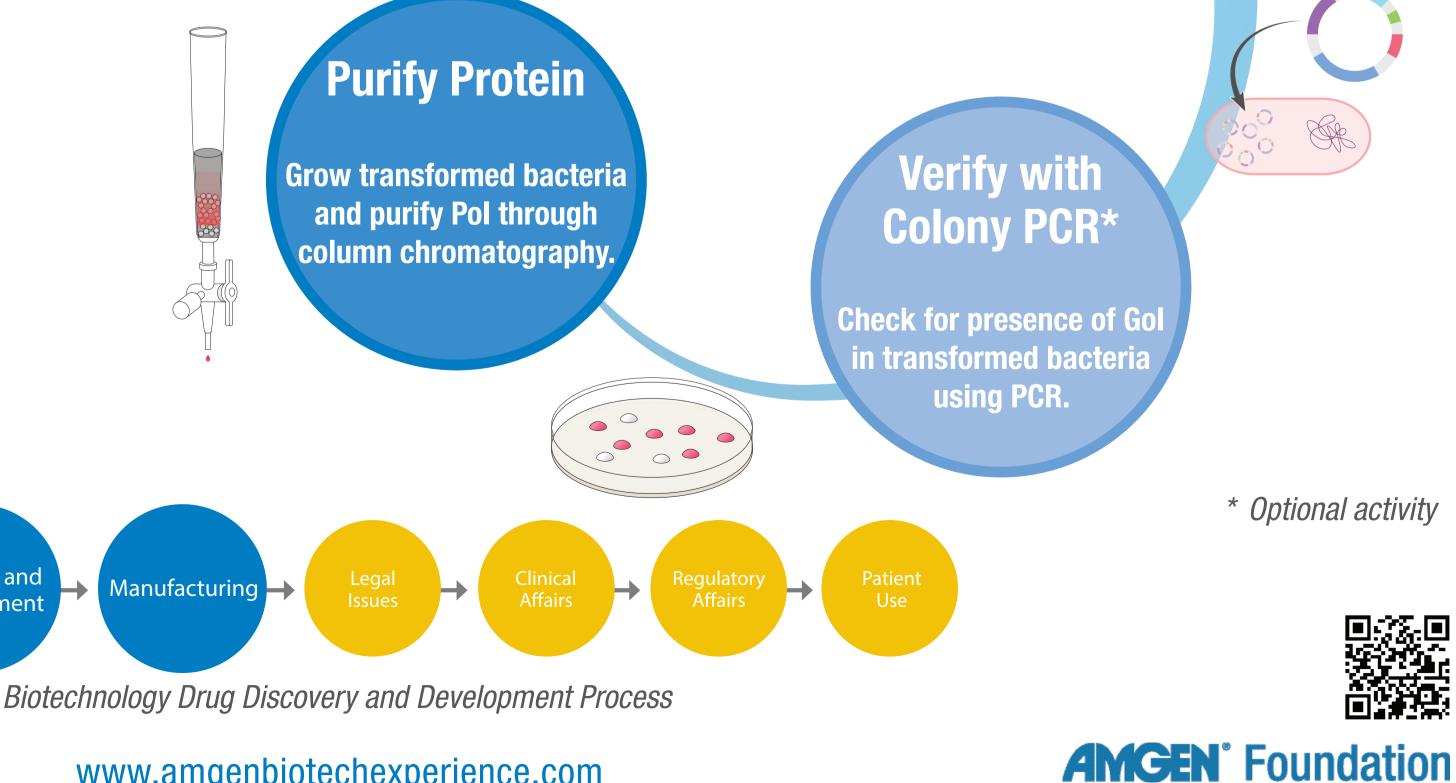
Visualize digestion and ligation reaction products using gel electrophoresis.

THE BIG IDEA

DNA \rightarrow Protein \rightarrow Trait

Produce Protein

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



Foundations of Biotech: **Abridged Genetic Engineering Sequence** (16–18 class sessions)

Nake ecombinan Plasmid

Use ligase to make a recombinant plasmid rom DNA fragments

Isolate Gene

Use restriction enzymes to digest a plasmid and isolate the gene of interest (Gol).

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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.

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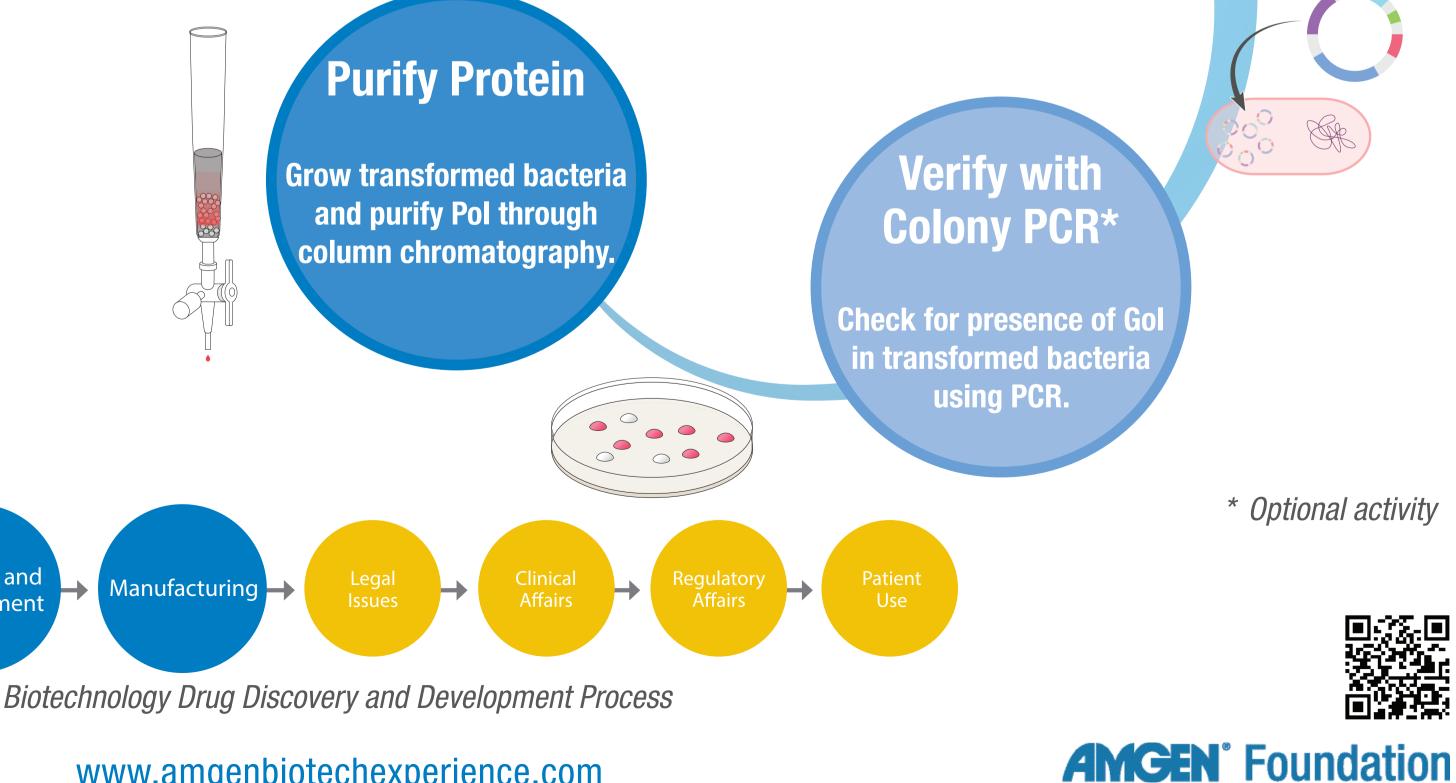
Visualize digestion and ligation reaction products using gel electrophoresis.

THE BIG IDEA

DNA \rightarrow **Protein** \rightarrow **Trait**

Produce Protein

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



Foundations of Biotech: **Focus on Bacteria Sequence** (12–14 class sessions)

solate Gen

Use restriction enzymes to digest a plasmid and isolate the gene of interest (Gol).

EP

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.

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THE BIG IDEA

DNA \rightarrow **Protein** \rightarrow **Trait**

Produce Protein

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

