



Bridging the Gap between Science and Business

OBJECTIVES

1. Able to list and explain purpose of different parts of a plasmid and identify its difference from DNA
Key concepts: promoter, gene, antibiotic resistance, cut at restriction sites
2. Learn to apply a synthetic biology solution to a real world problem
3. Able to identify components of a simple business plan and integrate different aspects of the technology

ACTIVITY 1: DNA Extraction

1. *What is DNA:*

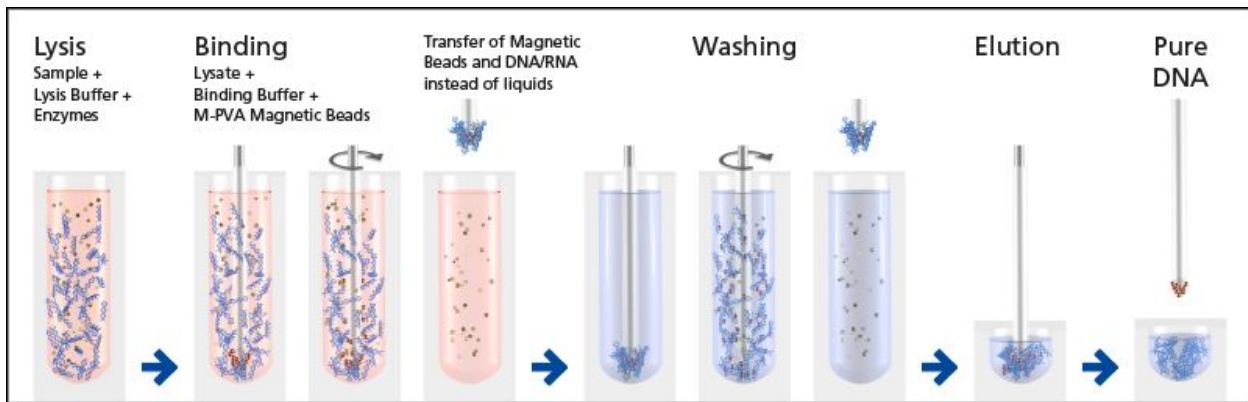
2. *Procedures: Simple DNA extraction from wheat germ*
 - a. Mix detergent and meat tenderizer to help break the cells apart
 - b. Add mixture and some wheat germ in the tube and shake
 - c. Observation:

3. *What is the stringy stuff?*

Your guess:

DNA normally stays dissolved in water, but when salty DNA comes in contact with alcohol it becomes undissolved. This is called precipitation. The physical force of the DNA clumping together as it precipitates pulls more strands along with it as it rises into the alcohol.

Bonus: How to do it more precisely and efficiently



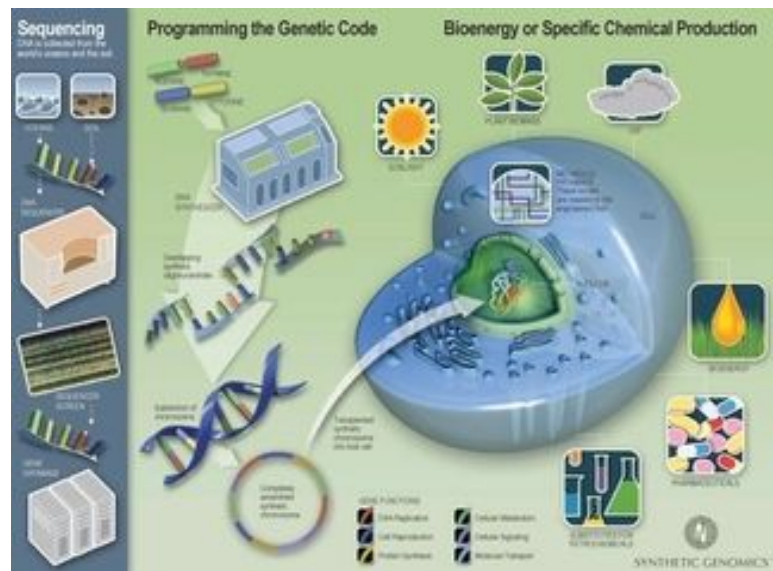
ACTIVITY 2: Design Your Own Bacteria!!

- Before we start: What is synthetic biology?
- To start: what does your bacteria do?
- Design on your POSTER!
- How would you build it? How would you choose and combine them to make your bacteria work?

Promoters: *Gal4* (light-sensitive); *Asr* (promotes at low pH); *T7* (always-on promoter);

Antibiotic Resistance: *Cat* (chloramphenicol resistance);

Genes: *roGFP* (redox-sensitive green fluorescent protein); *cbp4* (sequesters lead); *MtrB* (generates electric current); *Nisin* (bacteriocin); *ngCA* (removes atmospheric CO₂);



- How would you develop your **bacteria business**?
- Consider: What does your product do? Identify the needs
- How is the market?
- Regulations and standards? What are the limits?
- Does it engage the community?
- What would it bring to the society?
- Give it a catchy name!

DESIGN THE POSTER AND PRESENT (2-3 MINUTES) BEFORE THE CLASS