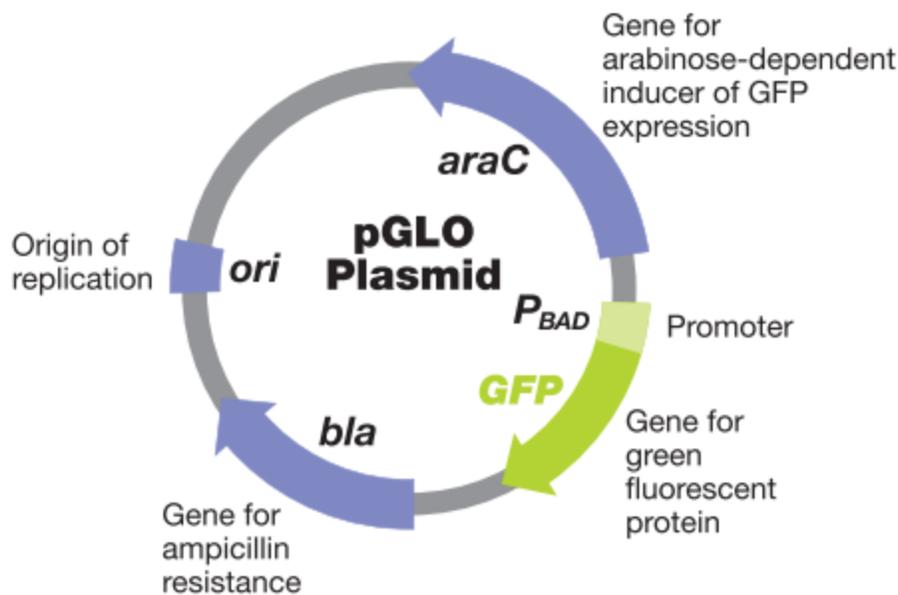


GMO stands for genetically modified organism, an organism that has undergone genetic transformation. Whether we call it genetic modification, genetic transformation, or genetic engineering, it's all one and the same - these terms all refer to the process of manipulating the genes of an organism to cause a change to traits of that organism.

This protocol is used to create a GMO - a bacterium that will glow bright green under ultraviolet (UV) light. We will begin with a plate of bacteria that appear off-white under normal or UV light conditions, and a tube of DNA containing a gene that codes for green fluorescent protein (GFP). The source of this gene is the bioluminescent jellyfish *Aequorea victoria*. We will move the DNA into the bacteria, have the bacteria incorporate the DNA, and induce the bacteria to produce the fluorescent protein, which causes them to glow a brilliant bright green under UV light.



Question 1: Which organism should I choose, and why?

1. To genetically transform an entire organism, the new gene must be in every cell in the organism. Considering this, which organism would be the simplest to work with for total genetic transformation: one composed of many cells, or one composed of a single cell?
2. Scientists often want to know if the genetically transformed organism can pass its new traits on to its offspring and future generations. To get this information, which would be a better candidate for your investigation: an organism that develops each new generation quickly, or one that reproduces more slowly?
3. Safety is another important consideration in choosing an experimental organism. What traits or characteristics should the organism have (or not have) to be sure it will not harm you or the environment?
4. Based on the above considerations, which would be the best choice for a genetic transformation: bacterium, earthworm, fish, or mouse? Describe your reasoning.

Question 2: How can I tell if cells have been genetically transformed?

1. Describe how you could use two LB/agar plates, some *E. coli*, and some ampicillin to determine how *E. coli* cells are affected by ampicillin.
2. What would you expect your experimental results to indicate about the effect of ampicillin on the *E. coli* cells?