

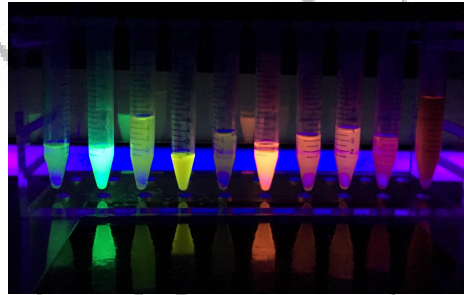
GENETICALLY ENGINEERING A GREEN FLUORESCENT YEAST

Via the CRISPR system

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BACTERIAL IMMUNE RESPONSE:

When a virus infects a cell, they inject their DNA in the host. In attempts to combat the invasion, the bacterial CRISPR system will act as an immune response and will cut the invading DNA, disabling it from reproducing. The system will fragment the invading DNA, take a section, and integrate it into its CRISPR locus, like a "memory". Bacteria will then record, over time, the viruses they have been exposed to, so that they are protected during future attacks.



https://commons.wikimedia.org/wiki/File%3AFluorescence_from_Fluorescent_Proteins.jpg

HOW IT WORKS:

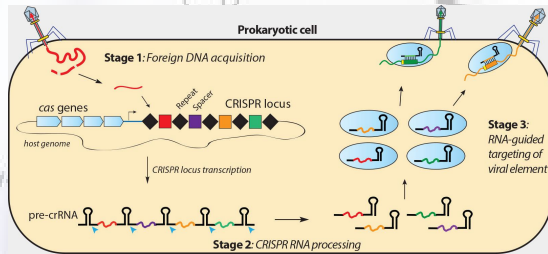
The CRISPR system is a combination of a protein, that acts as a molecular pair of scissors, and a guide RNA sequence, that acts as a GPS. This protein complex hunts and cuts the desired DNA strand. Because cells have an innate ability to repair themselves, it will attempt to repair the damaged DNA using an introduced strand, reflecting the desired sequence edits. In our case this is the green fluorescent protein gene. Essentially, we are providing the yeast cell with the tools to cut and repair its own DNA, in the same way bacteria will disarm invading DNA. In this case, after the DNA repair, the yeast will fluoresce green under blue light.

GENETIC ENGINEERING AND THE MEDICAL WORLD:

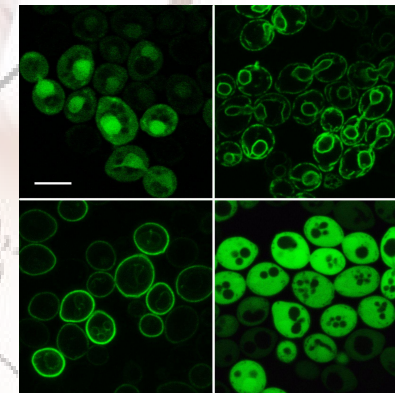
This genetic engineering method has revolutionized potential cancer treatments. Car T-cell therapy is one of the treatment that came about because of the CRISPR system. A cancer patient's t-cells are genetically engineered, via CRISPR, to target only cancer cells making this a highly specific cancer treatment.

References:

<https://www.junotherapeutics.com/the-science/car-technology/>
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