According to the National Cancer Institute:

- 2 Million Americans will be diagnosed with cancer this year
- Costs are predicted at $151 billion per year

The human immune system is under-equipped to successfully combat cancerous cells. Using a viral vector to deliver CRISPR to T-Cells will result in T-Cells that are better able to amplify and identify cancer cells.

Current treatment uses less specific methods of engineering the T-cells, takes multiple weeks.

1. Plasmid is created with a GFP and CRISPR backbone
2. Plasmid with backbone is amplified in E.coli
3. Plasmid is transfected into HEK cells and analyzed for GFP expression
4. qPCR is then used to analyze lentiviral capsid production

We conclude that in order to successfully transfect HEK cells with a plasmid, transfection must be done before passage 12 to ensure cell viability.

Additional Expected Outcomes:
We expect that by imaging HEK cells and finding expression of GFP, successful transfection has occurred in HEK cells.

We also expect that amplification of viral DNA with qPCR will show that viral vectors containing CRISPR were produced by the HEK cells. These vectors will be capable of infecting T cells, using CRISPR to edit the genome to better fight cancer cells.