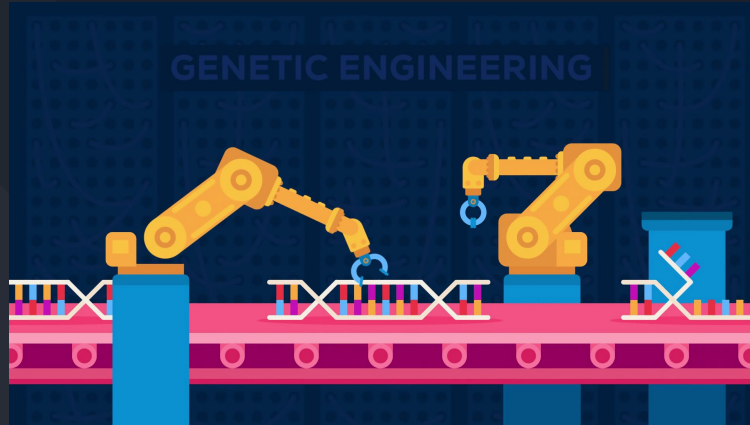


# Can gene-editing treat IBDs?

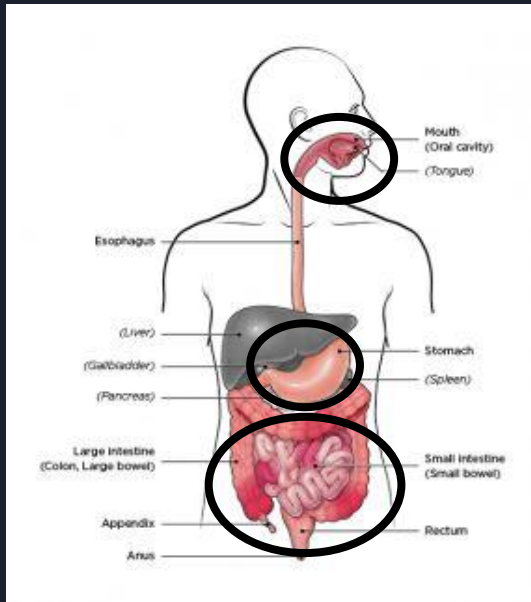
By: Tyler Mangru



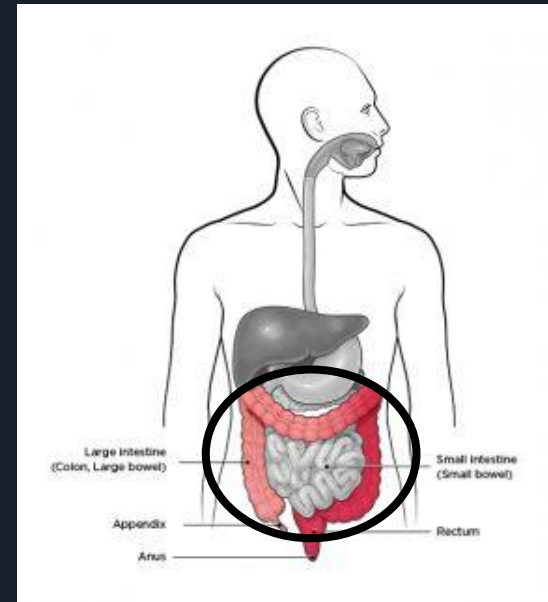
# What is an IBD?

- IBDs (inflammatory bowel diseases) are genetic diseases that cause the patient's immune system to attack their intestines.
- The term IBD refers to two diseases: UC or ulcerative colitis and Crohn's disease
- The difference between these two are the tissue that is effected

Crohn's disease

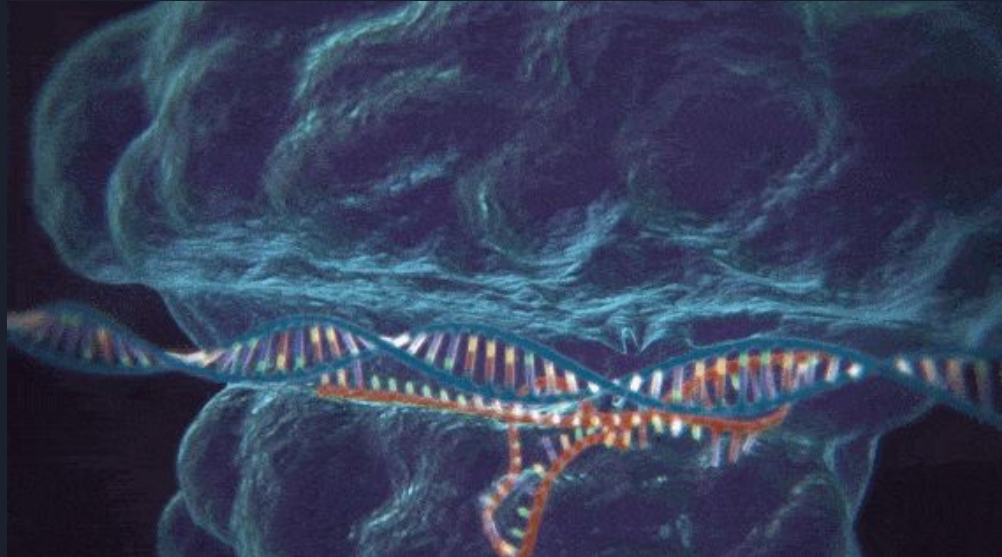


Ulcerative Colitis



# What is gene-editing?

- Gene-editing is when a faulty gene is either removed or repaired through. One example is with CRISPR and Cas9, one of the newer gene editing techniques being tested



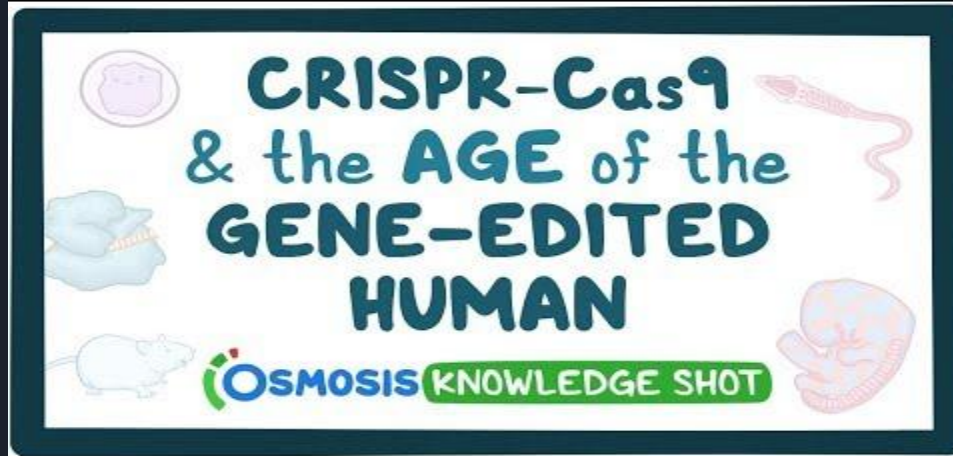
# How does gene-editing work?

Synthetic RNA is combined with a Cas9 protein which is then inserted into the patients DNA. From there a double strand cut is made which is where the new DNA is inserted.

0:23-1:19

CAG  
GUC

CCG



# Has gene-editing worked so far?

- So far gene-editing has been successfully used to treat people with sickle cell.
- They did this in one of two ways: by repairing hemoglobin S, the gene that causes the sickle cell or by replacing it all together with the healthy hemoglobin F

THE CRISPR REVOLUTION

## A Year In, 1st Patient To Get Gene Editing For Sickle Cell Disease Is Thriving

June 23, 2020 · 5:04 AM ET  
Heard on Morning Edition

ROB STEIN

6-Minute Listen



Victoria Gray, who underwent a landmark treatment for sickle cell disease last year, has been at home in Forest, Miss., with her three kids, Jadaia Wash (left), Jamarus Wash (second from left) and Jaden Wash.

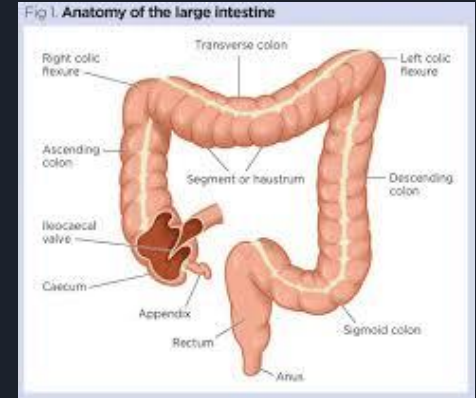
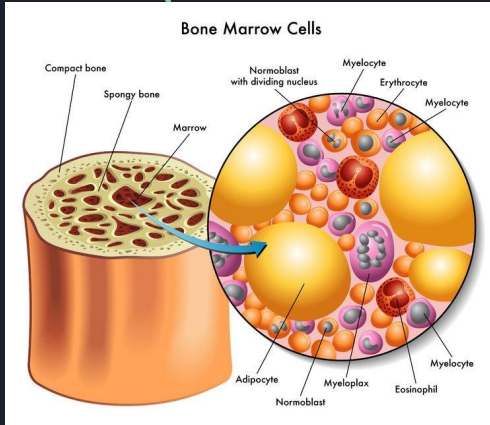
Victoria Gray



# Will this work on IBD?

The specific genes that are affected in IBD are “16p12-q13 (IBD1)...”(Lawrence et al, 2001)

When dealing with IBD the problem is located in two areas: bone marrow where white blood cells are made and the colon. One approach that can be made is to edit the RNA for white blood cells so that the immunoglobulin, the antibody that attacks the colon, does not go in the colon but that may have drawbacks as the immunoglobulin is there to fight bacteria. So the only way to treat IBD with gene editing is to edit the RNA for the cells lining the colon so that they are not attacked any more.



## Why does this interest me?

I have been diagnosed with UC for over a year and it has been a large limiter in life so to know that there is potentially a permanent treatment option interested me enough to want to find information about if there is a possibility of me having a normal intestine once again.



# Why should we focus on IBD patients?

- 1.3% of United States citizens have IBD (3 million)
- On top of that current treatment plans may be ineffective for some patients and other treatment plans like steroids may be harmful with prolonged use.
- Overall the use of gene editing on IBDs has the potential to change millions of lives for good.

