What was CRISPR first used on? - Lisia

CRISPR was first used on mouse and human cells, by a man named Feng Zhang in 2013. He was the first to successfully adapt CRISPR-Cas9 for genome editing in eukaryotic cells. Zhang and his team made two similar genes
they proved that CRISPR could be programmed to sought out multiple places in the genome, and that this could force cells to repair their DNA using the cell's own repair systems.

Can CRISPR cure cancer - if so, what type of cancer? - Laite

Right now, it's not positive that CRISPR can cure cancer, but one day there's a possibility that they're able to target tumour markers in cancer cells to allow CRISPR to eliminate DNA sequences that lead to tumour growth. One problem with using CRISPR to treat cancer is how to get CRISPR to reach all the cancer cells because..
However, in 2018 a study reported using CRISPR to help treat lung cancer by…
preventing the effect of chemotherapies that might reduce or eliminate them entirely.

Has CRISPR been used yet? If yes when and on what? -Priscilla
There were less that 100 published papers on CRISPR in 2011 however in 2018 this number had massively increased to more than 17,000 and counting with refinements to CRISPR, there were also new techniques for manipulating genes and improvements in precision, and more. In 2018 CRISPR was first used on mice, scientist used it on a embryo that would grow to be living mammals.

If CRISPR were to be used all the time on one person or animal, will it cause any permanent damages? - Jenn

It is easier for CRISPR to be used on an egg, sperm, or zygote to change a gene in the DNA. This is because every single cell of the person or animal will be able to inherit the edited gene for the rest of their life. The gene that is changed will be reproduced every single time the cell makes another copy again and again during.... The changed gene will also be passed on to the next offspring.

If the house of Habsburg were still alive today, could CRISPR be used to modify the negative traits that they inherited from past inbreeding of their family? - Elisha

It would be possible if we knew where the location of the gene for the negative traits, if we have a copy of a healthy version of their traits and if there was only 1 gene that coded for prognathism. In rabbits, it has been identified that prognathism is caused by one gene. But since the exact location gene for prognathism has not been found, modifying the negative traits of the Habsburg family will not be possible for now. The Habsburg family's negative traits (prognathism) will still be passed down from generation to generation.

Could you use CRISPR to change the athletic ability of a person and would their offspring be able to have the same or better abilities too? - Maia

There isn't any specific gene which codes for an athletic trait as there is a broad athletic spectrum. There are traits which help in specific athletic ability such as muscle mass, muscle strength, joint strength and the ability of cells to transport oxygen to cells.

There have already been studies on rodents where they manipulated specific genes which made for increased muscle mass, muscle strength and running endurance. The reviews of this study found that the same genetic mutations found in the rodents could also be used to improve human athletic performance.

What makes this complicated is the fact that most traits are coded for by more than one gene. Different genes work together to build the complex athletic traits.

If CRISPR is used on an egg, sperm, or **zygote** (an egg+sperm) to change a gene in the DNA, it will be in every single cell of the individual, for the rest of their life. The edited gene will even be passed on to their offspring, because all the eggs (or sperm) that person makes will also come from that first zygote cell DNA!

Does CRISPR have a negative effect on people who scientists do it on? - Jeff

- CRISPR may have a negative effect upon people but it can benefit them as well especially those with incurable diseases. It depends on the gene that is being edited, if a gene cause disease then it can be benefit but there might be consequences because scientists don’t understand the interaction between each genes and that’s . As an example from this

HOW does the guide RNA guide? - Danielle (mine, i claim)

Cas 9 can’t bind to DNA but then the gRNA and Cas9 create a complex. This complex can interact with DNA. The spacer region - the end of the gRNA - is free to interact with the DNA. There’s a target area of DNA where the gRNA guides them to and will bind to. Cas9 is the cutter, like scissors, and will cleave the DNA at a given loci (location) only if the spacer is sufficient homology and it has continue to bind.

Would it be possible to prevent cancer cells, harmful viruses or bacteria from spreading in your body by altering, taking away or cutting the DNA associated to the particular gene for it?

If the house of Hapsburg were still alive today, could CRISPR be used to modify the negative traits that they inherited from past inbreeding of their family? - Latanoa

Yes, but only if there was 1 gene that coded for prognathism. In rabbits, prognathism happens because of one gene, because we already know that it's an autosomal (one of the 22 non-sex XX/XY chromosomes) recessive disorder, with the genotype mp/mp. It's exact location has not been found in humans. They did do a QTL using 6,090 knows SNPs and it's thought to be somewhere on chromosome 4. Not knowing the exact location and known DNA sequence, we can not send Cas9 to the right place together with a gRNA to guide it.