James Watson Francis Crick Rosalind Franklin	**1953** Three scientists discovered the structure of DNA with the use of x-ray crystallography
Restriction enzymes discovered	**1970** The type of enzymes that help to isolate genes through recognition of DNA sequences; enabled the removal of genes of interest from specific organisms
Recombinant DNA	**1973** Bacterial genes recombined for the first time and replicated
Insulin synthesized by *E. coli*	**1978** Hormone to help control sugar absorption by cells; Bacteria produces human insulin (how we get it today)
Fermentation	**7000–6600 BCE in China** Used in creating beverages such as beer and wine
Gregor Mendel	**1856** The monk who completed pea plant experiments that showed “rules of inheritance” led to study of genetics
Gene therapy	**1984** Retrovirus vector used to insert new DNA into choromosomes

Roundup Ready Soybeans

1995

Seeds that were modified to be resistant to glyphosate (the active ingredient in RoundUp herbicide)

Soybean cultivation

1500–500 BCE

This crop was cultivated in East Asia and Korea

CRISPR discovered

2005

The immune system of bacteria; cuts out “Viral DNA.” Has potential to be used to insert genes more easily

Genetic engineering

1994

1973 (bacteria), 1974 (mice), 1994 (food)

The process of manually adding new DNA to an organism

Hybrid corn

1908

George Harrison Shull determined that when crossed, two pure-bred plants had offspring with higher yields and better vigor

Mutagenic breeding

Crops exposed to radiation **(corn and barley, 1928,** Lewis Stadler), transposons **(corn, 1953,** Barbara McClintock), and chemicals **(rapeseed to canola, 1992),** to generate mutations that resulted in improvements