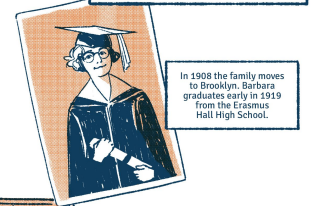
Barbara McClintock

Barbara McClintock was born in Hartford, Connecticut on June 16, 1902 by the name of Eleanor.

She is the third of four children and already from an early age her parents decide to change her name from Eleanor, more delicate and feminine, to Barbara, considered more suitable for her turbulent and independent personality



In 1908 the family moves to Brooklyn. Barbara graduates early in 1919 from the Erasmus Hall High School.

Barbara, I've talked to your mother and with the university. You can enroll at the college of agriculture.

It's 1919 and Barbara is enrolling at Cornell. The university had opened its doors to women in 1870.

Barbara immediately shows her political commitment and joins one of the Students' Union.

Despite the invitation to join a sorority, she declines as she realizes that many of her Jewish friends would not be accepted.

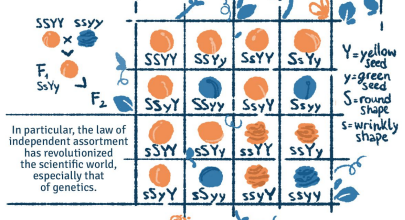
Without caring about causing a scandal, Barbara is the first woman on the Cornell campus to get a "boy haircut".

Her passion for studying is accompanied by that for music: Barbara plays the banjo in a small group that performs in various clubs in the city.

Unfortunately she has to leave the group after a while due to lack of time.

In 1921, Barbara takes a course in genetics taught by C. B. Hutchison.

Only 21 years have passed since Mendel's discoveries.

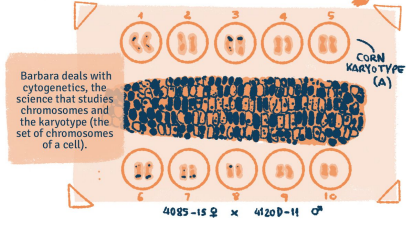


In particular, the law of independent assortment has revolutionized the scientific world, especially that of genetics.

After graduating in botany in 1923, Barbara also receives a doctorate in botany in 1927: at this point, Cornell University forbids women to graduate in genetics.

After her PhD, she remains at Cornell and has her own research group, supported by Rolind A. Emerson.

Barbara deals with cytogenetics, the science that studies chromosomes and the karyotype (the set of chromosomes of a cell).



In particular, her studies use corn plants that Barbara personally takes care of from planting, to growing and pollinating in a specific way.

In case of heavy rain, all plants must be replaced, as pollination can no longer be traced.

Barbara and Harriet work hard and provide definitive proof that genes are really located on the chromosomes...

...demonstrating that gene recombination (the crossing over) occurs through a physical exchange of parts of homologous chromosomes.

PAH!

This discovery required 3 years of work (1929-31), seven days a week. To relax, the two women compete in tennis matches.

POK

You should not be lazy, every moment counts.

In 1933, she receives a Guggenheim research grant to go study in Germany, but has to leave the country early due to the advent of Nazism.

Returning to Cornell with a grant from the Rockefeller Foundation (1934-36), she discovers that the university does not allow women to take the degree of Professor.

In 1936 she is hired at the University of Missouri, where she remaines until 1941. Here, the heavy bureaucracy, discrimination against teachers and the teaching obligations have her dream about more time and freedom for her research.

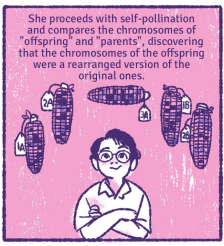
In 1941, she moves to Columbia University in New York, then to the Cold Spring Harbor Laboratory on Long Island the following year.

Here Barbara has complete research freedom.

In 1944, she becomes the third woman to be admitted to the American National Academy of Sciences.

Starting in 1944, Barbara focuses on the relationship between the color scheme on corn plants and the appearance of their chromosomes.

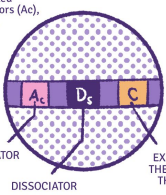
One of the colors that interests me the most is purple: I want to understand the genetic reason for the presence of purple.

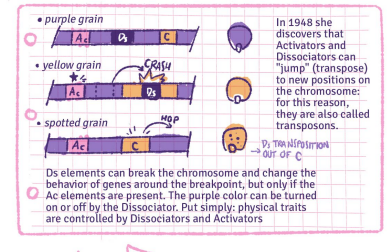


She proceeds with self-pollination and compares the chromosomes of "offspring" and "parents", discovering that the chromosomes of the offspring were a rearranged version of the original ones.

Some parts of the chromosome appear to have been cut and moved to completely different places.

She discovers two precise parts of the chromosome called Dissociators (Ds) and Activators (Ac), responsible for the insertion, deletion and movement of genes on the chromosome: for this reason, we call them "control elements".





In 1948 she discovers that Activators and Dissociators can "jump" (transpose) to new positions on the chromosome: for this reason, they are also called transposons.

Ds elements can break the chromosome and change the behavior of genes around the breakpoint, but only if the Ac elements are present. The purple color can be turned on or off by the Dissociator. Put simply: physical traits are controlled by Dissociators and Activators

Barbara continues to study this phenomenon, without presenting it to the public, until 1950. She chooses secrecy as the current theory treats genes as fixed objects on the chromosome.

In 1951, Barbara presents her results at the Cold Spring Harbor Laboratory annual symposium.

These results must be wrong!

Of course, you realize we just cannot believe you!

By God, either this woman is crazy or she's a genius!

Her colleagues' reaction causes her great distress.

Barbara tries to present her discoveries in the most important American universities, supported by some farsighted colleagues.

I'm sure they'll listen to you this time!

TRANSPOSON

BMC

Discouraged by the total silence of the scientific community towards her work, she stops publishing her discoveries in this field and focuses on a different topic.

In the early 1960s, Francois Jacob and Jacques Monod discover a similiar mechanism in bacteria.

JACQUES MONOD

FRANÇOIS JACOB

Some parallels Between Gene Control Systems in Maize and in Bacteria.

Barbara McClintock

Barbara immediately understands what it is about and writes a paper.

1967

KIMBER PRIZE FOR GENETICS

MORGAN MEDAL TO THE PIONEERS OF GENETICS

Thanks to the experiment on bacteria and the discovery of the double helix structure of DNA, Barbara's theory begins to be accepted and the awards start to flow.

1981

WOLF, LASKER AND MACARTHUR FOR LIFETIME ACHIEVEMENT

In 1983, she is the first woman to receive the Nobel Prize in Physiology or Medicine without sharing it with others.

ENGLISH TRANSLATION BY: CLIO AGRAPIDIS