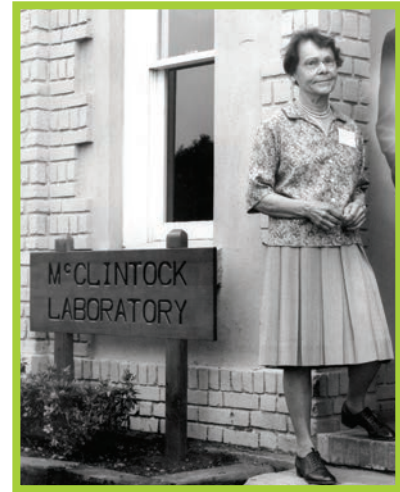


Barbara McClintock

Did you ever believe strongly in something? Even if everyone told you your idea was silly or wrong? A scientist named Barbara McClintock (1902–1992) faced that problem for much of her life. But she never stopped believing in what she knew was true.

Barbara McClintock was born in Hartford, Connecticut. Even when she was little, McClintock liked to do things her own way. She enjoyed all kinds of sports. Her favorite sport was playing baseball with the boys in the neighborhood. McClintock was the only girl on the boys' team. She knew that the boys didn't want her to play with them. But McClintock didn't care what other people thought. She kept on playing because she wanted to play.

McClintock did well in school, where she discovered science. When she graduated from high school, she wanted to go to college. In those days, most women did not go to college. But her father agreed that she should go. In college, McClintock studied plants and how to grow them. She loved college life. She began to focus on her studies in the field of **genetics** and graduated in 1923. She did advanced studies and received her PhD in botany in 1927.



Barbara McClintock

McClintock in her cornfield



McClintock decided to become a geneticist. A geneticist is a scientist who studies how traits are passed on from one **generation** of an organism to the next. McClintock spent most of her time studying the traits of corn. She studied the color, size, and texture of corn. She grew fields of corn and studied the corn kernels (seeds). By studying the kernels, she could tell what traits were passed from one generation to the next through the corn's seeds.

In 1931, McClintock made an important discovery. Scientists already knew that every living thing passes genetic messages to its **offspring**. These messages control what the offspring look like. These messages are called **genes**. Genes are carried by structures called **chromosomes**. Scientists thought a gene located on a certain chromosome would always be there.

McClintock discovered that this was not true. Her experiments showed that genes could cross over, or move, from one chromosome to another. Crossing over meant that a greater variety of traits could exist. She published the first genetic map for corn.



Corn plants in a field

Harvested corn

In 1941, McClintock got a research position at the Cold Spring Harbor Laboratory on Long Island in New York. She worked there for the rest of her life. At the Cold Spring Harbor Laboratory, McClintock was free to do the research she loved. She often worked 80 hours a week.

McClintock presented the results of her research at a meeting in 1951. Most scientists didn't understand what McClintock was talking about. Others simply didn't believe her. At first, McClintock was disappointed and surprised at the reaction she got. But she went back to her research. Once again, she didn't care what others thought. She knew she was right.

Although McClintock won several awards, her work still wasn't widely appreciated. That began to change in the 1970s. By then, scientists were able to use new technology to study McClintock's ideas. They proved what she had known to be true since 1951. It had been more than 25 years since she had first presented her ideas.

Finally, McClintock's theories were accepted by other scientists. In 1983, at the age of 81, she received the Nobel Prize in Physiology or Medicine. She was one of the first scientists to describe how genetic material controls the way an organism develops.



King Gustav of Sweden presents the Nobel Prize to Barbara McClintock.



What Is Genetics?

Genetics is the study of how living things pass certain traits, or qualities, to their offspring. A trait that is passed down from generation to generation is called an **inherited trait**. For example, two parents with brown eyes will probably have a child with brown eyes.

Barbara McClintock continued working until her death in 1992 at the age of 90. She was always very independent and sure of herself. She spoke out about the lack of opportunities for women scientists. And she was never bitter about all the years she was ignored. “If you know you’re right, you don’t care,” she said.

In 2005, the US Postal Service issued the American Scientists stamp series to celebrate the lives of four important scientists. McClintock was one of these scientists. A member of the US Postal Service board introduced the stamps with these words: “These are some of the greatest scientists of our time. Their pioneering discoveries still influence our lives today.”



Thinking about Genetics

1. What does a geneticist study?
2. What is an inherited trait?

Glossary

adaptation any structure or behavior of an organism that allows it to survive in its environment

antenna (plural **antennae**) the thin feeler on the head of an animal like a crayfish, an isopod, or an insect

aquatic referring to water

behavior the actions of an animal in response to its environment

beneficial good or advantageous

biologist a scientist who studies living organisms

camouflage an adaptation that allows an organism to blend into its environment

carapace a hard outer shell that covers the main part of the body of an animal

carnivore an animal that eats only animals

cartilage the smooth, flexible material that connects some bones and gives shape to some body parts

chromosome a structure that carries genes

chrysalis the hard-shelled pupa of a moth or butterfly

contract to become smaller or shorter in length

cotyledon the plant structure that provides the germinated seed with food

crustacean a class of mostly aquatic animals with hard, flexible shells

detrimental harmful or bad

DNA (deoxyribonucleic acid) a material that carries the genetic messages of heredity

dormant inactive or resting

egg the first stage in an animal's life cycle

embryo the undeveloped plant within a seed

endanger to be at risk of becoming extinct

environment everything that surrounds and influences an organism

evidence data used to support claims. Evidence is based on observations and scientific data.

exoskeleton any hard outer covering that protects or supports the body of an animal

fingerprint the ridges in your skin at the tip of your fingers. [Arches](#), [loops](#), and [whorls](#) are fingerprint patterns.

flower a plant structure that grows into fruit

food chain a description of the feeding relationships between all the organisms in an environment

fossil any remains, trace, or imprint of animal or plant life preserved in Earth's crust

fruit a structure of a plant in which seeds form

function an action that helps a plant or an animal survive

gastropod the family of snails

gene a message carried by a chromosome

generation a group of organisms born and living at the same time

genetics the study of how living things pass traits to their offspring

herbivore an animal that eats only plants or algae

hibernate when animals sleep through the winter

inherited trait a characteristic that is passed down from generation to generation

invasive an organism that thrives in a new area but causes problems to the organisms in that ecosystem

joint a place where two bones come together

leaf (plural **leaves**) a plant structure that is usually green and makes food from sunlight, water, and carbon dioxide

life cycle the sequence of changes or stages an organism goes through as it grows and develops

ligament tissue that connects bone to bone

mast year a year when trees produce a lot of seeds

mature fully developed

migrate when animals move from places with cold weather to places with warm weather

molt to shed an outer shell in order to grow

muscle tissue that can contract and produce movement

nutrient a material needed by a living organism to help it grow and develop

offspring a new plant or animal produced by a parent

omnivore an animal that eats both animals and plants

organism any living thing

paleontologist a scientist who studies fossils

parent an organism that has produced offspring

petrify to change into stone over a long period of time

pincer an animal's claw used for grasping

population all organisms of one kind that are living together

predator an animal that hunts and catches other animals for food

prey an animal eaten by another animal

proboscis a long, strawlike mouth

protect to keep safe

pupa the stage of an insect's life cycle between the larva and the adult stages

reproduce to have offspring

riparian along a river or stream

root the part of a plant that grows underground and brings water and nutrients into the plant

sediment pieces of weathered rock such as sand, deposited by wind, water, and ice

sedimentary rock a rock that forms when layers of sediments get stuck together

seed the structure in a fruit that holds the undeveloped plant, or embryo

stem any stalk supporting leaves, flowers, or fruit

structure any identifiable part of an organism

survive to stay alive

swimmeret a small, soft leg under the tail of a crayfish

tendon ropelike tissue that connects muscle to bone

terrestrial referring to land

thrive to grow fast and stay healthy

