Profile
ARTICLE

Geneticist: Dr. Spencer Wells

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BY NATIONAL GEOGRAPHIC EDUCATION STAFF

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Spencer is a geneticist. He directs the Genographic Project, which studies prehistoric migration patterns of human populations. Following the clues in our genes, he has traced "humankind's family tree" millions of years back to when the first humans left Africa.

EARLY WORK

Spencer says he always had a "zeal for history and biology," and that his interest in genetics came much later.

One experience that made an impression on Spencer was when he and his family went to see the massive "King Tut" exhibit as it toured the United States in the late 1970s. Spencer lived in Lubbock, Texas, and his family traveled to New Orleans, Louisiana, to see the exhibit. Once they got there, the line was so long, and the exhibit so popular, they had to wait 12 hours in the pouring rain to get in.

"It was worth it, though," says Spencer. "It just blew me away. The artifacts were about 3,500 years old, but they looked so new."

Spencer's interest in biology was encouraged by his mother, who earned her PhD in the subject when Spencer was a boy. "It meant I got to hang out in the lab," he remembers.

Spencer enrolled at the University of Texas at Austin when he was just 16 years old, and earned a degree in biology there. He later earned his PhD in biology from Harvard University in Cambridge, Massachusetts. At Harvard, he began using genetics to trace the migration of humans as they left Africa around 50,000 years ago.

MOST EXCITING PART OF YOUR WORK

"Getting to experience such diversity in the human experience, from Peru to Papua New Guinea."

MOST DEMANDING PART OF YOUR WORK

"Making sense of the data" can be an exhausting and time-consuming process, Spencer says.

HOW DO YOU DEFINE GEOGRAPHY?

“Understanding the world we live in, and who we are as a species.”

GEO-CONNECTION

Spencer and other geneticists study “human populations.” To a geneticist, a human population is a “coherent group of people,” he says. “They can share the same language, culture, or physical closeness. They are also able to interbreed, which is important for my work! That allows us to track genetic lineage and migration patterns.”

One of the most surprising migration patterns that Spencer discovered was the *first* migration pattern. “The thing that still amazes me is how recently we left Africa. It happened only 50,000 years ago—that’s only 2,000 generations.”

Spencer says tracing the routes of prehistoric human migration is important because it “lets us know where we come from.”

It also shows us familiar patterns. Even thousands of years ago, people migrated for the same reasons they migrate today. “They’re either forced to migrate [by politics or conflict], they’re seeking better opportunities, or the climate has changed.”

The data from the Genographic Project has also helped debunk what Spencer calls “inherent racism” in the genetic studies of just a generation ago. As late as the 1970s, scientists were studying human populations and attributing abilities and characteristics to their race.

The Genographic Project and other genetic studies have shown that race is not a genetic marker at all. As fellow Explorer-in-Residence Wade Davis says, “Race is a fiction.”

SO, YOU WANT TO BE A . . . GENETICIST

Spencer encourages students to study computer science and math.

He points to Moore's Law, used to describe the speed at which computer technology advances. Moore’s Law says that that number of transistors that can be placed on a microchip doubles every two years.

“In genetics,” Spencer says, the speed at which data accumulates is “*five times* faster every year.”

GET INVOLVED

Spencer encourages families to understand their own genetic journey—how their ancestors migrated, from where, and when.

VOCABULARY

Term	Part of Speech	Definition
accumulate	*verb*	to gather or collect.
ancestor	*noun*	organism from whom one is descended.
artifact	*noun*	material remains of a culture, such as tools, clothing, or food.

biology	*noun*	study of living things.
characteristic	*noun*	physical, cultural, or psychological feature of an organism, place, or object.
climate	*noun*	all weather conditions for a given location over a period of time.
coherent	*adjective*	logically connected.
computer science	*noun*	study of the design and operation of computer hardware and software, and the applications of computer technology.
conflict	*noun*	a disagreement or fight, usually over ideas or procedures.
culture	*noun*	learned behavior of people, including their languages, belief systems, social structures, institutions, and material goods.
data	*plural noun*	(singular: datum) information collected during a scientific study.
debunk	*verb*	to prove false or wrong.
diversity	*noun*	difference.
exhausting	*adjective*	tiring.
exhibit	*noun*	display, often in a museum.
Explorer-in-Residence	*noun*	pre-eminent explorers and scientists collaborating with the National Geographic Society to make groundbreaking discoveries that generate critical scientific information, conservation-related initiatives and compelling stories.
gene	*noun*	part of DNA that is the basic unit of heredity.
generation	*noun*	time between an organism's birth and the time it reproduces.
geneticist	*noun*	scientist who studies the chemistry, behavior, and purposes of DNA, genes, and chromosomes.
genetic marker	*noun*	gene that is located on a specific place on a chromosome.
genetics	*noun*	the study of heredity, or how characteristics are passed down from one generation to the next.
Genographic Project	*noun*	National Geographic project that uses genealogy to trace the migratory history of the human species.
history	*noun*	study of the past.
interbreed	*verb*	to reproduce with members of a closed population (where genetic material from outside groups is excluded.)
King Tut	*noun*	(1341-1323 BCE) nickname of Egyptian pharaoh Tutankhamun.
lab	*noun*	(laboratory) place where scientific experiments are performed.
language	*noun*	set of sounds, gestures, or symbols that allows people to communicate.
lineage	*noun*	line of descendants of a particular ancestor.
massive	*adjective*	very large or heavy.
math	*noun*	(mathematics) study of the relationship and measurements of quantities using numbers and symbols.
microchip	*noun*	small semiconductor with electrical circuits that carry information.

migration	*noun*	movement of a group of people or animals from one place to another.
migration pattern	*noun*	predictable movements, in time and space, of a group of animals or people.
Moore's law	*noun*	observation that the number of transistors placed on a microchip can double every 18-24 months.
PhD	*noun*	(doctor of philosophy) highest degree offered by most graduate schools.
politics	*noun*	art and science of public policy.
population	*noun*	total number of people or organisms in a particular area.
prehistoric	*adjective*	period of time that occurred before the invention of written records.
race	*noun*	arbitrary grouping of people based on genetics and physical characteristics.
racism	*noun*	government or social system based on the belief that one ethnic group is superior to all others.
route	*noun*	path or way.
species	*noun*	group of similar organisms that can reproduce with each other.
technology	*noun*	the science of using tools and complex machines to make human life easier or more profitable.
time-consuming	*adjective*	taking a long time to finish.
transistor	*noun*	semiconductor that controls the flow of an electric current.
Wade Davis	*noun*	(1953-present) Canadian anthropologist and National Geographic Explorer-in-Residence.
zeal	*noun*	enthusiasm or passion.

For Further Exploration

Websites

- National Geographic: The Genographic Project—The Human Journey: Migration Routes
- National Geographic: The Genographic Project