

# Meet a Scientist Who Studies How the Environment Affects Our Traits

Alike Maunakea grew up in Hawaii and still lives and works there today. He says, “My great-grandmother was a Native Hawaiian medicine practitioner and whenever I got sick, she would treat me with herbs she grew in our yard.” Maunakea grew up feeling a deep respect for the land and living things around him. When he was only 7 or 8, he used his birthday money to buy a microscope so that he could study the organisms he found in the garden, at the family farm, and on the beach.

Encouraged by his teachers in high school, Maunakea began doing his own science experiments. His first experiment focused on trees called kukui nui that grew in his yard. Maunakea says, “My great-grandmother taught me that kukui nui sap could be used for sore throat, so I ran tests and discovered that the kukui nui sap works because it kills bacteria.” He realized that becoming a scientist meant that he could use his love of nature to help improve people’s health.

Today Maunakea is a biomedical researcher. He studies how the environment, in addition to the genes people inherit, can affect whether people get certain diseases. Genes play an important role in many diseases, because genes provide instructions for cells to make certain proteins. Each cell has two copies of



**Alike Maunakea is a biomedical researcher. He studies how genes and the environment affect whether people get certain diseases.**



**This is a kukui nui tree like the ones Maunakea first studied in high school.**

each gene, and the two copies can be the same version of the gene, or different versions. Different gene versions provide different instructions, causing the cell to make different proteins. Different possible combinations of proteins can lead to variation in traits—including the traits involved in diseases. However, there are other factors, including factors from the environment, that can also affect traits.

One way that these environmental factors can affect traits is by causing chemical changes to your chromosomes that affect whether or not a gene is “turned on” or “turned off” in a cell. Proteins will be made from a gene’s instructions if that gene is “turned on” in a cell. If the gene is “turned off,” proteins will NOT be made from that gene’s instructions, even though the gene is in the cell. If the cell stops making a protein that it needs in order to function, that can lead to disease.

There are many different environmental factors that can affect traits in organisms. For example, Maunakea says, “Having a balanced diet with good nutrition is important for a healthy lifestyle.” We can have a positive effect on our own traits by eating healthy food that nourishes our cells and keeps our body working. In addition, Maunakea’s studies have shown that “certain pollutants in the environment, such as food or water contaminated with pesticides and processed foods containing certain unnatural preservatives, can contribute to diseases.” He and other scientists have examined how the chemicals used to grow and process food end up in our bodies. The more we understand about how the environment affects our traits, the more steps we can take to prevent disease.

Maunakea says, “My great-grandmother used to say that if you take care of the land, the land will take care of you. As a scientist, this simple phrase makes a lot of sense—we are all a part of nature and a product of the environment. Maintaining a healthy environment will help all of us live healthier lives. Our ancestors not only understood this concept but also had ways of incorporating it into daily life. They were certainly scientists themselves and we could learn a lot from them.”