Albert and Talar Kiladjian had no idea what was living in their Massachusetts backyard. To their surprise, the siblings discovered their soil is home to tiny viruses that invade and multiply inside bacteria.

As part of their college coursework, the brother and sister isolated and studied two of the strange-looking soil dwellers, known as bacteriophages, with their long tails and bulky heads. Albert named his Winchester, for their hometown, and Talar called hers Lahmajoon, after the style of pizza that is a popular part of the family’s Armenian culture.

Bacteriophages (or phages, for short) flourish anywhere bacteria thrive, which is pretty much everywhere. They are so widespread and diverse, there’s a good chance that phage hunters like Albert and Talar might turn up a never-before-seen specimen.

When Talar arrived at Bucknell University in Lewisburg, Pennsylvania, for her second year, she wasn’t quite prepared. “I actually didn’t realize that I had to bring a soil sample to school,” she confesses. “I had to call my mom and ask her to send one.” Although not the typical care package, a triple-ziplocked, still-moist handful of soil arrived at Bucknell soon after. Mrs. Kiladjian knew what to do because Albert, still at home, had dug up soil of his own just a few days earlier in preparation for his freshman year at Trinity College in Hartford, Connecticut. That’s when the family realized the two would be taking the same year-long research course at their separate schools.

Along with students at the 78 colleges and universities that make up HHMI’s Science Education Alliance, Talar and Albert examined their phages using electron microscopes, tested the effects of the phages on bacterial growth, and compared the genetic makeup with that of phages found by other students. The siblings soon discovered that, although they had started their searches using soil collected beneath the same spruce tree, the phages they isolated were far from identical.

Both students filtered, extracted, and purified their starting material until they had a single type of phage. When they chatted on weekends, the two compared what they had learned. Talar’s class was always a few weeks ahead, so big sis offered the younger Albert previews of experiments to come as both classes grew their phages in the lab, isolated them, and extracted DNA. They also commiserated about the inevitable frustrations they encountered during their research.

Albert and Talar added Winchester and Lahmajoon to the online Mycobacteriophage Database (phagesdb.org), which contains information on more than 450 phages. For now, they’ve set aside their personal phages to focus, along with their classmates, on detailed genetic analysis of a single phage. But they have a new appreciation for the hidden world beneath their childhood tree house.

—Jennifer Michalowski