of tissue culture, which required special laboratory equipment that the students did not have at their schools. Levesque had experience with tissue cultures, Lipski knew all of the necessary scientific techniques, and the University had the right facilities. A collaboration was born.

“When astronauts spend extended periods of time in space, they experience significant bone loss as well as muscle loss,” explains Levesque. “The goal of this experiment is to find out whether there is some way to counteract the effect of microgravity on bone density. It has been shown that parathyroid hormone will increase bone-cell growth [on Earth]. We’re testing to see whether parathyroid hormone will have that same effect in space, in microgravity.”

Because the group was only allowed to send one vial of cells up into space, the students spent several hours a week conducting similar experiments here on Earth with different controls, such as temperature and the presence or absence of parathyroid hormone. Once their vial of cells returns to Earth, they will take the results from space and compare them to the results obtained on campus. This experiment not only has applications for astronauts in space but could also help people on Earth who are suffering from osteoporosis.

Lipski graduated in May. He’s looking forward to stepping aside eventually and letting the younger students take more control.

“It’s their opportunity to shine,” he says. “It’s their opportunity to get this experience.” Levesque agrees. “Research experience is probably the most important part of students’ science education because it’s the one place where they can take everything they’ve learned in the classroom and apply it to solving a new problem,” she says. “That’s why the space experiment is so cool. Not only does it involve the aspect of sending something into space, but it also gives these younger students, as young as eighth-graders, an opportunity to get this kind of research experience early on.”

The students also worked with mentors from Yale University and Hamilton Sundstrand, which provides aircraft and space systems for government and industry customers. The on-orbit educational research opportunity was made possible by the Student Spaceflight Experiments Program, NanoRacks LLC, and the National Center for Earth and Space Science Education. Under a Space Act Agreement, NanoRacks, in partnership with NASA, is working to use the International Space Station as a national laboratory.

To the International Space Station and Back
Students study bone loss in space

Like many of us, Robert Lipski ’12 has dreamed of one day going into space. But Lipski is a step ahead of the rest of us. He had a hand in conducting an experiment that blasted off to the International Space Station (ISS) aboard the SpaceX Dragon capsule. The flight, which was the first commercial flight to the ISS, launched from Cape Canaveral, Fla., in May.

Lipski, a biology major, and Aime Levesque, assistant professor of biology in the College of Arts and Sciences, spent the spring semester working with a small group of students from the University High School of Science and Engineering on campus and the Annie Fisher STEM Magnet School in Hartford, Conn., on a project to study bone loss in space. The experiment involved the use of tissue culture, which required special laboratory equipment that the students did not have at their schools. Levesque had experience with tissue cultures, Lipski knew all of the necessary scientific techniques, and the University had the right facilities. A collaboration was born.

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