

seek: students in science



Luke Peterson sometimes gets so involved in an experiment or discussion about how Bluetongue virus kills cancer cells that he is late for class. He is hopeful that the award-winning research he is doing in Dr. Joseph Li's lab will give him an edge when he applies for medical school admission, but he'll also tell you that his research career really started because of Santa Claus.

When Peterson was in the first grade, Santa visited his class and distributed candy canes and some magical advice. He told the children that eating peppermint would help them perform better on tests. Peterson was a believer.

"I was a first grader and he was Santa so, of course, I believed him," Peterson said. "I always ate peppermint before tests because I thought there was some correlation between peppermint and smart people,"

In seventh grade, some teen skepticism prompted Peterson to test the idea for a science fair project using his geometry classmates as subjects. In the end, he found a placebo effect among the group who were given peppermint and told it would improve their test scores. He gave up eating peppermint and hadn't ventured into doing research again until his sophomore year at Utah State University, on a far more serious subject.

Last year Peterson began working in Li's lab where the molecular biology professor and many undergraduate and graduate student researchers have investigated Bluetongue virus (BTV). Structurally and on the molecular level, BTV is among the best understood viruses and Li's lab uses that understanding as the

basis for investigating how it might be used to fight cancer.

Peterson explained that the virus selectively kills some cancer cells, but why and how it does is not known. He and others in the lab have investigated specific cytokines, a group of proteins that are involved in communication among cells. In studying specific cytokines, Peterson found one — vascular and endothelial growth factor (VEGF) — very interesting.

"In a tumor cell this growth factor should be very high, causing it to grow and metastasize," Peterson said. "But after Bluetongue infection, VEGF is dramatically reduced."

He and others in the lab are at work trying to understand how BTV gets inside cancer cells to cause cell death. Their earlier work was the basis for a poster Peterson created, "Cytokine Expression Within Cells During Bluetongue Virus Infection," which won the student competition at a regional American Society of Microbiologists annual meeting.

Peterson said his goal since tenth grade has been to become a doctor. He was told that research experience would be an important addition to his bachelor's degree program and medical school applications. He envisioned getting into a lab where he'd "basically, be washing the dishes" for about a year and then work his way up to getting to run a few assays.

"I never dreamed that after one year in the lab I'd have been in a poster contest where I was up against graduate students and that I'd win, or that I would be writing a grant proposal and having it accepted," Peterson said, referring to two grants he was recently awarded to continue his BTV research.

With funding from the university's Center for Integrated BioSystems, Peterson will work with RNA interference, which inhibits expression of specific genes from viruses, and which may help reveal the BTV genes that are critical in killing cancer cells. In addition, an Undergraduate Research and Creative Opportunities Grant (URCO) will support his investigation of how BTV gets inside cells.

"Part of the funding for the URCO Grant comes from the university's research office, part from the biology department and part from Dr. Li," Peterson said. "It's really nice to feel that all these offices on campus have high hopes for me. Having smart people backing you up and giving you money to keep doing research validates that what you are doing is important."