# Student has all the write stuff for cell paper

By SUE HOFFMAN

A promising young scientist from Gilmour Academy in Gates Mills, planning a future career in medicine, has co-authored an important scientific paper about cell survival.


Brooke Boyer

Brooke Boyer, a senior from Bainbridge, is listed as a co-author of a paper in the journal RNA called "Microtubule Disruption Stimulates P-body Formation," published online in February. Brooke spent six weeks last summer at Case Western Reserve University's Center for RNA Molecular Biology helping to unravel some of the mysteries of the structure and function of subcellular processing bodies called P-bodies.

"We tried to figure out how P-bodies form in cells," Brooke said. "P-bodies form when the cells are under stress. We were able to tag certain proteins in the cell microtubules, which are structures in the cell providing support and transportation. When the microtubules were destabilized, we were able to track where the proteins went throughout the cell. They collected to form P-bodies."

The appearance and disappearance of the newly discovered subcellular structures relate to changes in RNA metabolism, she said. RNA, or ribonucleic acid, is the site of protein synthesis in living cells and is essential for cell survival.

"If RNA is not degraded, it will continue to make unneeded proteins and waste cellular energy," said Deanne Nowak, department chair of science in Gilmour's upper school.

Brooke worked with Jeffrey Coller, assistant professor in the CWRU center, and Kristian Baker, an instructor in the center. Her externship was part of Gilmour's Catalyst program, which pairs students with professional mentors to gain real-world research experience.

Brooke, who looked at P-bodies in yeast cells and performed numerous experiments, said that she has always had a passion for science and was grateful for the opportunity to have hands-on experience in a research laboratory. With plans to become a pediatric surgeon, she believes the exposure will help with the scientific lab work she expects to encounter in the future, she said.

"In the Catalyst program, I learned not only about science but about myself," Boyer said. "I discovered that science requires patience, and that the results of an experiment often bring about a new set of experiments that must be completed and P-bodies proved to be no exception."

A member of the Gilmour volleyball team and several school clubs, Brooke said she was elated to be listed as the second author on the paper. Although her lab work was incredibly hard, she said she was happy to be able to share in the joy of publication with her mentors.

"This is an extraordinary accomplishment for an undergraduate let alone a high school student," said Dr. Nowak, who holds a Ph.D. in organic chemistry and is director of Gilmour's Catalyst program. "We are proud of Brooke's work and are thrilled that her contributions were significant enough to merit inclusion as an author on the paper."

Dr. Nowak, who taught Brooke chemistry, was struck by her student's collaboration and communications skills and her ability to think critically, she said. She also praised the two CWRU researchers for their patience, enthusiasm and creativity in providing the intellectual atmosphere "to introduce a budding young scientist to the research world." The researchers have agreed to mentor two Gilmour students this summer.