Fighting Dry Mouth in Cancer Survivors While Mentoring the Next Generation of Scientists

Kirsten Limesand, professor of nutritional sciences, never expected to study dry mouth for a living, but she's happy with where her career path has taken her.

As a graduate student in Colorado, Limesand explored how insects transmit viruses from one host to another—work that involved dissecting mosquitoes' salivary glands. She cites that skill as one of the biggest reasons she landed her current job in the College of Agriculture and Life Sciences investigating saliva production. If the new hire could dissect a mosquito salivary gland, the reasoning went, she would have no trouble dissecting a mouse salivary gland. The job turned out to be a permanent gig.

"The more time I spent with the project, the more it was clear to me that this was a great research niche," Limesand recalled.

Most people have experienced temporary dry mouth, but for head-and-neck cancer survivors who have completed chemoradiation, it could be a permanent part of life, bringing a host of unpleasant symptoms.

"Most people don't think about saliva being important—until you don't have it," Limesand said. "It's like living in the desert in July all the time."

Head-and-neck cancer patients usually are treated with a combination of chemotherapy and radiation—chemoradiation. Although radiation is crucial for destroying tumors in the head and neck, the salivary gland is sometimes inadvertently damaged. After treatment, the gland might lose its ability to produce saliva, which contains proteins that kick-start the digestion process and protect teeth and gums. Saliva moistens the mouth and makes food easier to swallow. Without it, meals may lose their luster and oral health can take a nosedive.

"Eating no longer is pleasurable," Limesand said. "If I have a mouth full of canker sores and have to go to the dentist all the time so I don't lose my teeth, life is pretty miserable."

Limesand's lab is devoted to finding a cure for post-chemoradiation dry mouth. The research already has led to a clinical trial that is being conducted by the UA Cancer Center. This past summer, lab members published a paper that was recognized with the APSselect award, given by the American Physiological Society to the best articles in physiological research.

In addition to thriving within her research niche, Limesand also is excited to bring her students along for the ride. The award-winning paper's first author is Wen Yu "Amy" Wong, a cancer biology graduate student who investigated why the salivary gland has difficulties healing itself after chemoradiation. Wong did rotations through several laboratories before choosing
the Limesand lab as her home base.

"I wanted to connect with a woman in science who understands the difficulties," Wong said. "She was very easy to talk to, and the people in the lab provide a very nurturing environment. I just knew that was the place for me."

Limesand takes her role as a mentor seriously, and finds it deeply satisfying.

"Hands down, the most rewarding aspect of my career is training students," Limesand said. "I prioritize hiring graduate students. It's like working with a piece of clay? you help start the molding process and help them move down that path."

She enjoys motivating her mentees as they grow from enthusiastic students into prolific scientists.

"You see them start to have a bud, and then blossom," Limesand said. "It's inspirational to nurture that process."

Limesand is also a member of the Bio5 Institute [8] and a professor in the UA Cancer Biology Graduate Interdisciplinary Program [9], which enlists faculty members from a wide range of disciplines to prepare students for careers in cancer research.

"I am in the nutritional sciences department, but I have students from cancer biology and physiological sciences. I've been on committees of genetics students and immunobiology students. So you have all these diverse perspectives," Limesand said. "At the end of the day, these perspectives add to the research we're doing."

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Links
[1] https://nutrition.cals.arizona.edu/people/kirsten-limesand-phd
[2] https://cals.arizona.edu/