New research opens door to understanding human tonsil cancer

November 2 2015

Catherine Kang, researcher in Biomedical Physiology and Kinesiology, is studying stem cells in tonsils.

Researchers at Simon Fraser University and the BC Cancer Agency have developed a groundbreaking method to identify and separate stem cells

that reside in the tonsils. Their research, which sheds new light on the fight against oral cancer, is published today in the journal *Stem Cell Reports*.

While stem cells in many other body tissues have been well studied, little is known about these stem cells, says researcher Catherine Kang, a PhD student in the Department of Biomedical Physiology and Kinesiology and lead author of the paper. Ninety per cent of human tonsil cancers show evidence of HPV (human papillomavirus) infection. But little is known about its role in causing these cancers. Researchers suspect it is a key player, as HPV is the major risk factor for cervical cancer.

Kang, who is working with BPK professor Miriam Rosin, director of the BC Oral Cancer Prevention Program, and UBC professor Connie Eaves of the Terry Fox Laboratory, was interested in finding out why the tonsil is particularly susceptible to HPV and wondered if it might have something to do with the stem cells of the tissue that coats the tonsils.

When she purified these cells and made them incorporate a cancer-causing gene normally transmitted by HPV, the cells grew abnormally in a special tissue culture system, and created what one might imagine what the beginning stages of human tonsil cancer would look like.

"This is a very exciting finding, as it is the first stage of human cancer development that researchers need to learn how to detect and eliminate," says Kang. The study shows how it can now be done and then studied at will in a petri dish using cells isolated directly from human tonsils.

Cancer of oropharynx, or the tonsils in particular, is an important health concern with rising incidence worldwide, especially in men. The researchers, including Dr. Raj Kannan of the BC Cancer Agency's Terry Fox Laboratory, say this new method will now allow these next steps to go forward not just here, but around the world, to stop this global trend

in its tracks.

More information: Characterization of Epithelial Progenitors in Normal Human Palatine Tonsils and Their HPV16 E6/E7-Induced Perturbation. *Stem Cell Reports*. DOI: dx.doi.org/10.1016/j.stemcr.2015.09.020