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University of Lethbridge researchers uncover new insights that could impact future cancer research

University of Lethbridge biochemistry researchers, Drs. Trushar Patel and Higor Sette Pereira, in partnership with Dr. Harpreet Singh from The Ohio State University, have gained new insights about a ribonucleic acid (RNA) known as *RMRP* that could lead to improved treatments for cancer patients.



RMRP has emerged as a major factor in cancer biology, with elevated levels found in breast, lung, prostate and colorectal cancers. These elevated levels correlate with poor patient outcomes. In their recent study, published in the [Proceedings of the National Academy of Sciences](#), Patel and Pereira have made important strides in understanding how *RMRP* functions.

RMRP is classified as a long non-coding RNA. Once regarded as cellular "junk," the long non-coding RNAs are now recognized as important regulators of cell function, although the underpinning mechanisms remain poorly understood.

"For the first time, we were able to visualize *RMRP*'s three-dimensional shape and identify new protein-interacting partners that influence its location and function within cells," says Patel, a professor in the Department of Chemistry & Biochemistry and a Canada Research Chair. "We discovered that *RMRP* plays a crucial role in maintaining the health and proper functioning of mitochondria — the powerhouses of our cells."

"We found that when *RMRP* is removed from cells, mitochondria experience stress and produce harmful reactive oxygen species, which can damage cells and contribute to disease," says Singh.

"Our findings help explain why cancer cells with high levels of *RMRP* may have a survival advantage," says Patel. "By keeping mitochondria healthier, these cells may be better

equipped to survive and grow. Understanding this connection provides potential new targets for therapy aimed at constricting *RMRP* function."

Cancer cells are known to rewire their energy production to support rapid growth, making mitochondrial function a critical factor in tumour development and survival.

"By comprehending the basic biology of how *RMRP* operates, we contribute to the foundational knowledge that may, in the long term, support therapeutic strategies," says Sette Pereira. "If we can alternate *RMRP*'s function in cancer cells, we may be able to weaken them and make them more vulnerable to existing therapies."

Because *RMRP* is required for normal mitochondrial RNA processing but is also aberrantly upregulated in many cancers, targeted therapies that dampen its expression in tumour cells could be advantageous.

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Our University's Blackfoot name is Iniskim, meaning Sacred Buffalo Stone. The University is located in traditional Blackfoot Confederacy territory. We honour the Blackfoot people and their traditional ways of knowing in caring for this land, as well as all Indigenous Peoples who have helped shape and continue to strengthen our University community.