

Scientists describe the role of a p53 target gene in lymphoma and lung cancer development

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Credit: Universitat Pompeu Fabra - Barcelona

A new study from the UPF and WEHI (the Walter and Eliza Hall Institute of Medical Research) in Melbourne, Australia, has described

the role of p53 target gene Zmat3 in lymphoma and lung cancer development. The study, conducted in pre-clinical mice models, has been led by Ana Janic, laboratory head of the Cancer Biology group at UPF and Kate Sutherland, laboratory head in the Cancer Biology and Stem Cells Division at WEHI. The findings have been published in the journal *Cell Death & Disease*.

The [gene p53](#) is known as the 'guardian of the genome' due to its role in protecting cells from cancer by repairing DNA or by killing cells if they have irreparable damage. More than half the cancers in the world involve mutations in the [p53 gene](#), but how it performs its role remains poorly understood. Importantly, p53 works in combination with other genes, and thus the characterisation of its target genes is essential to contribute to the cancer battle.

Zmat3, one of the p53 target genes, was identified more than 10 years ago and it has been shown to be altered in [human cancers](#). The purpose of this research was to examine whether this protein could have critical functions that p53 uses to prevent cancer. To answer this question, the researchers eliminated Zmat3 to disable the p53-Zmat3 pathway in pre-clinical mice models of lymphomas and [lung cancer](#) in which p53 is known to have critical function.

Ana Janic explains that, to their surprise, "we found that removing ZMAT3 had little impact on the tumor development or severity of malignant disease. Our findings have shifted the focus of how Zmat3 could function in tumor development." She adds that "it is likely that at least in some types of blood and lung cancers, it is not Zmat3 protein alone but several proteins that work together to prevent [cancer](#) formation." Further research to identify these proteins and how their functions are integrated will be an important step towards understanding the tumor-suppressing function of p53. "Ultimately, this knowledge will have therapeutic impact on the identification of novel strategies to

restore p53 function in tumors," Janic concludes.

More information: Sarah A. Best et al, Consequences of Zmat3 loss in c-MYC- and mutant KRAS-driven tumorigenesis, *Cell Death & Disease* (2020). [DOI: 10.1038/s41419-020-03066-9](https://doi.org/10.1038/s41419-020-03066-9)

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