

Researchers show growth hormone signalling increases cancer risk

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Cancer cell during cell division. Credit: National Institutes of Health

University of Queensland researchers have unravelled the cellular process which may help to explain why tall people are at increased risk of several types of cancer.

A team, led by Dr Andrew Brooks from UQ's Diamantina Institute and Institute for Molecular Bioscience, showed how a variant in the gene which encodes the [growth hormone](#) receptor promotes [lung cancer](#) progression across individuals of different ethnicities.

Dr Brooks said the finding is likely to apply to other cancers, and could eventually lead to new drugs to inhibit the spread of the disease.

"The signalling from growth [hormone](#) receptors regulates factors including a person's height, intelligence, fertility, metabolism and immunity," Dr Brooks said.

"Previous genomic studies suggested this [gene variant](#) inferred increased [lung](#) cancer risk, and other research has shown that when growth hormone signalling is deficient, people may be shorter, but they have not developed cancer."

"Our study has found the mechanism by which this growth hormone receptor gene variant enhances and prolongs signalling, making cells hypersensitive to growth hormone."

"We do not think this variant is causing the lung cancer, but if you develop carcinogenic mutations this growth hormone receptor variant would promote the development of cancer."

Dr Yash Chhabra carried out much of the research in the Brooks lab, and said smokers should be aware that having the gene variant would amplify their already increased risk of lung cancer.

"Now that we have shown how this gene variant is involved with progressing lung cancer, we would expect it to be included in genetic tests available to those people who wish to investigate disease risk," Dr Chhabra said.

Health authorities estimate 9000 Australians will die of lung cancer this year.

"Of the estimated 12,400 patients diagnosed in 2017, only 16 per cent will survive for five years, so the need for new treatment approaches is urgent," Dr Brooks said.

"We are currently working to develop drugs which will specifically inhibit growth hormone signalling, and we have a few candidates which appear to work in preliminary studies using cultured cells.

"We are excited about taking these candidates further, in the hope they can be developed into new effective therapeutic molecules."

"If [lung cancer patients](#) have this [growth hormone receptor](#) variant we would expect such drugs to reduce their lung [cancer](#) progression, but of course that will be dependent on a long process of clinical trials to validate the effectiveness of this approach."

The research involved collaborators from UQ's Centre for Clinical Research and Queensland Brain Institute, QUT and University of Copenhagen.

It is published in *Oncogene*.

More information: Y Chhabra et al. A growth hormone receptor SNP promotes lung cancer by impairment of SOCS2-mediated degradation, *Oncogene* (2017). [DOI: 10.1038/onc.2017.352](https://doi.org/10.1038/onc.2017.352)

Provided by University of Queensland

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