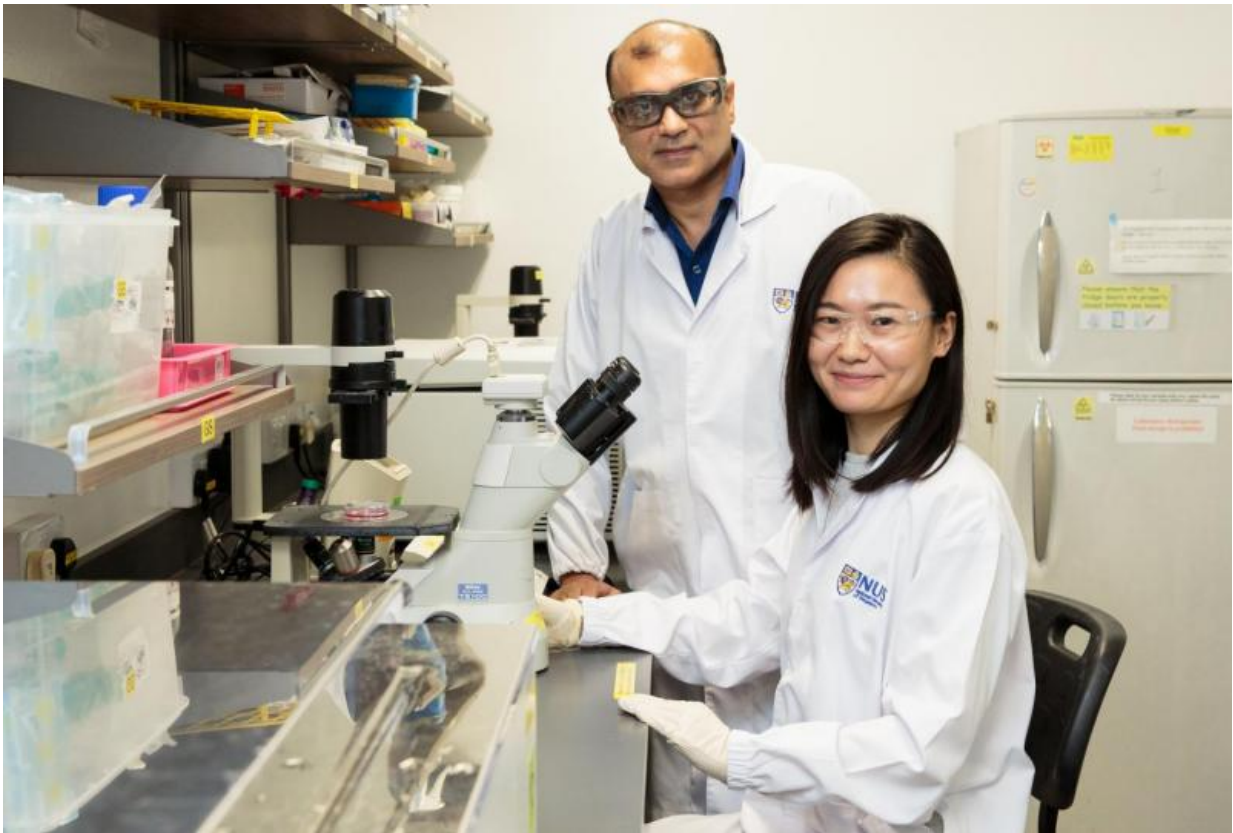


Oral nimbolide reduces prostate tumour size by up to 70%, decreases metastasis 50%

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(From left to right) Principal Investigator Associate Professor Gautam Sethi and NUS PhD candidate Ms Zhang Jingwen from the Department of Pharmacology at the NUS Yong Loo Lin School of Medicine led a research which found that a bioactive compound from the neem plant could significantly suppress development of prostate cancer. Credit: National University of Singapore

A team of international researchers led by Associate Professor Gautam Sethi from the Department of Pharmacology at the Yong Loo Lin School of Medicine at the National University of Singapore (NUS) has found that nimbolide, a bioactive terpenoid compound derived from *Azadirachta indica* or more commonly known as the neem plant, could reduce the size of prostate tumour by up to 70 per cent and suppress its spread or metastasis by half.

Prostate cancer is one of the most commonly diagnosed cancers worldwide. However, currently available therapies for [metastatic prostate cancer](#) are only marginally effective. Hence, there is a need for more novel treatment alternatives and options.

"Although the diverse anti-cancer effects of nimbolide have been reported in different cancer types, its potential effects on prostate cancer initiation and progression have not been demonstrated in scientific studies. In this research, we have demonstrated that nimbolide can inhibit tumour cell viability - a cellular process that directly affects the ability of a cell to proliferate, grow, divide, or repair damaged cell components - and induce programmed cell death in [prostate cancer cells](#)," said Assoc Prof Sethi.

Nimbolide: promising effects on prostate cancer

Cell invasion and migration are key steps during tumour metastasis. The NUS-led study revealed that nimbolide can significantly suppress cell invasion and migration of prostate cancer cells, suggesting its ability to reduce tumour metastasis.

The researchers observed that upon the 12 weeks of administering nimbolide, the size of prostate cancer tumour was reduced by as much as 70 per cent and its metastasis decreased by about 50 per cent, without exhibiting any significant adverse effects.



(From left to right) Ms Zhang Jingwen and Associate Professor Gautam Sethi seen here with a neem plant leafstalk. Credit: National University of Singapore

"This is possible because a direct target of nimbolide in prostate cancer is glutathione reductase, an enzyme which is responsible for maintaining the antioxidant system that regulates the STAT3 gene in the body. The activation of the STAT3 gene has been reported to contribute to prostate tumour growth and metastasis," explained Assoc Prof Sethi. "We have found that nimbolide can substantially inhibit STAT3 activation and thereby abrogating the growth and metastasis of [prostate tumour](#)," he added.

The findings of the study were published in the April 2016 issue of the

scientific journal *Antioxidants & Redox Signaling*. This work was carried out in collaboration with Professor Goh Boon Cher of Cancer Science Institute of Singapore at NUS, Professor Hui Kam Man of National Cancer Centre Singapore and Professor Ahn Kwang Seok of Kyung Hee University.

Neem - The medicinal plant

The neem plant belongs to the mahogany tree family that is originally native to India and the Indian sub-continent. It has been part of traditional Asian medicine for centuries and is typically used in Indian Ayurvedic medicine. Today, neem leaves and bark have been incorporated into many personal care products such as soaps, toothpaste, skincare and even dietary supplements.

Future Research

The team is looking to embark on a genome-wide screening or to perform a large-scale study of proteins to analyse the side-effects and determine other potential molecular targets of nimbolide. They are also keen to investigate the efficacy of combinatory regimen of nimbolide and approved drugs such as docetaxel and enzalutamide for future [prostate cancer](#) therapy.

More information: Jingwen Zhang et al. Nimbolide-Induced Oxidative Stress Abrogates STAT3 Signaling Cascade and Inhibits Tumor Growth in Transgenic Adenocarcinoma of Mouse Prostate Model, *Antioxidants & Redox Signaling* (2016). [DOI: 10.1089/ars.2015.6418](#)

Provided by National University of Singapore

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