

Researchers discover new mechanism in adrenal gland tumors

August 28 2015

Scientists at the Helmholtz Zentrum München have elucidated a mechanism that is responsible for the development of adrenal gland tumors. They discovered that the BMP7 protein plays a key role in this process and that it could be a possible target for future treatments. The results have been published in the journal *Oncotarget*.

Specifically, the team headed by Dr. Natalia Pellegata of the Institute of Pathology (PATH) at the Helmholtz Zentrum München conducted a study on pheochromocytomas (PCCs). Pheochromocytomas are active adrenal gland tumors, the majority of which are benign. However, if they become malignant and spread to other tissues, the prognosis for these patients is poor. This is mainly due to the fact that currently the only treatment available for PCCs is their surgical removal. In order to develop new treatment therapies, the researchers initially examined the molecular mechanisms behind this disease.

Particularly high incidence of protein BMP7 in PCC samples

"Our initial data from patient samples shows that the growth factor BMP7 is found frequently overexpressed in samples from PCC patients," recalls first author Ines Leinhäuser. In further studies, the Helmholtz scientists examined the possible consequences of a higher level of this [protein](#). In various functional tests, they were able to prove that elevated levels of BMP7 promote PCC cell division and cell

migration. Conversely, if the protein is targeted for knockdown, this results in less invasive cells.

Active substances that target the BMP7 signaling pathway kill off tumor cells

The researchers identified a particular [signaling pathway](#) as the cause of this effect on the cells. "The PI3K/mTOR pathway is activated by the BMP7 protein and conveys signals for the cells to divide as well as to migrate," explains team leader Pellegata. In order to verify this mechanism and to test potential future treatments, the team used two molecules. One molecule inhibits the signal transmission of BMP7; the other blocks the PI3K/mTOR downstream signaling pathway. "In an animal model of PCC we were able to show that treating the tumors with substances inhibiting BMP signaling can lead to an increase in apoptosis*," Pellegata adds. Although further tests will be needed in order to confirm these results, the cancer researchers hope that they have found a new approach to future treatments.

More information: "Oncogenic features of the bone morphogenic protein 7 (BMP7) in pheochromocytoma," *Oncotarget*.
[www.impactjournals.com/oncotarget ... \[\]=4912&path\[\]=12027](http://www.impactjournals.com/oncotarget/issue/4912/path/12027)

Provided by Helmholtz Association of German Research Centres

Citation: Researchers discover new mechanism in adrenal gland tumors (2015, August 28)
retrieved 6 May 2024 from
<https://medicalxpress.com/news/2015-08-mechanism-adrenal-gland-tumors.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is

provided for information purposes only.