

Team identify molecule that suppresses melanoma tumors

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Melanoma in skin biopsy with H&E stain — this case may represent superficial spreading melanoma. Credit: Wikipedia/CC BY-SA 3.0

A promising route to develop new treatments for skin cancer has been identified by University of Bath scientists, who have found a molecule that suppresses melanoma tumor growth.

Although the research is at an early stage, the team hope that their work could help develop new ways to combat melanoma and potentially other cancers too.

The team from the University of Bath's Department of Biology & Biochemistry were researching a group of 'long non-coding RNAs' (lncRNAs) with colleagues at the Ludwig Institute for Cancer Research at the University of Oxford, the Wellcome Sanger Institute and University of Lausanne, Switzerland.

lncRNAs are molecules transcribed from our DNA that don't make protein and whose functions remain largely unknown. The particular group of

lncRNAs the team were interested in are thought to be involved in cancer.

From a group of 245 lncRNAs that were associated with melanomas they identified one, called Disrupted In Renal Carcinoma 3 (DIRC3), which acted as a tumor suppressor to block the spread of human melanoma cells when grown in lab experiments.

By using gene-editing to switch off production of DIRC3, the team saw that "anchorage-independent growth"—a hallmark of malignant [cancer](#) spread—drastically increased by between two to eight times.

Furthermore the scientists showed that DIRC3 switches on the key tumor suppressor IGFBP5 gene, revealing that it plays a role in the [complex networks](#) governing the expression of genes important for melanoma growth and spread to other parts of the body.

The researchers used The Cancer Genome Atlas clinical data to link DIRC3 expression to melanoma [patient outcomes](#). They discovered that melanoma patients who produced high levels of DIRC3 had statistically significant increased survival rates compared to patients who expressed low levels.

The study is published in *PLOS Genetics*.

Dr. Keith Vance, from the University of Bath Department of Biology & Biochemistry, said: "Although it's early stages we are excited by the potential of DIRC3 activating drugs to become a new way to treat [skin cancer](#). This research makes vital steps towards any future therapy development.

"Great strides have recently been made in treating melanoma. However, not all patients respond to current therapies and most skin cancers become drug resistant over time, so a new way to treat it could be another tool in combating the disease.

"By investigating how DIRC3 works we can really start to understand how it blocks the spread of [melanoma](#) in detail at the molecular level, and identify druggable interfaces and specific structures that could be targets for medicine."

More information: Elizabeth A. Coe et al, The MITF-SOX10 regulated long non-coding RNA DIRC3 is a melanoma tumour suppressor, *PLOS Genetics* (2019). [DOI: 10.1371/journal.pgen.1008501](#)

Provided by University of Bath

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