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Contact: Kari Alitalo

[kari.alitalo@helsinki.fi](mailto:kari.alitalo@helsinki.fi)

358-505-003-572

[University of Helsinki](#)

## **Discovery of a novel mechanism for the development of colon cancer**

Recent work from the Finnish Academy Center of Excellence on Cancer Biology at the University of Helsinki, Finland, has shed light on the mechanisms of colon tumor development and may help to design better treatment for this disease.

Colon cancer is one of the most common malignancies in Western countries: both men and women face a lifetime risk of nearly 6% for the development of invasive colorectal cancer. Epidemiologic studies have shown that several factors contribute to the development of this disease, such as high fat, red-meat diet, obesity and lack of vegetables and fibre in the diet.

In the great majority of cases, colorectal cancer arises from an initially benign overgrowth of colonic lining, a so-called adenomatous polyp (Fig. 1), which acquires with time harmful mutations and transforms into a dangerous colonic carcinoma. Observational studies suggest that the adenoma-to-carcinoma sequence takes up to 10 years. Although nearly half of Western population may harbor adenomatous polyps by the age of 50, it is estimated that only a few percent of adenomas will progress to cancer.

The study published as an advance online publication of Cancer Cell, describe a mechanism by which harmless colon polyps acquire the ability to form malignant tumors. Researchers from the University of Helsinki discovered that PROX1, a protein that in embryos controls formation of normal organs, such as liver or eye, becomes abnormally overproduced at early stages of carcinoma development. PROX1 allows tumor cells to grow even in the absence of stimulating signals from surrounding normal tissues, which leads to dangerous overgrowth and development of advanced tumors.

Removal of PROX1 from cancer cells reverses their malignant behaviour, suggesting that PROX1 is a promising target for the development of future therapies for colon cancer.

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The study was led by the Academy of Finland Research Fellow, Dr. Tatiana Petrova and the Academy Professor, Dr. Kari Alitalo, who jointly supervised the work of a graduate student of Helsinki University Antti Nykänen. The research is a result of collaboration between cancer and developmental biologists, pathologists, geneticists and bioinformaticians from Finland, USA, France, UK and Austria.

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