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Scientists make major advances important for cancer research

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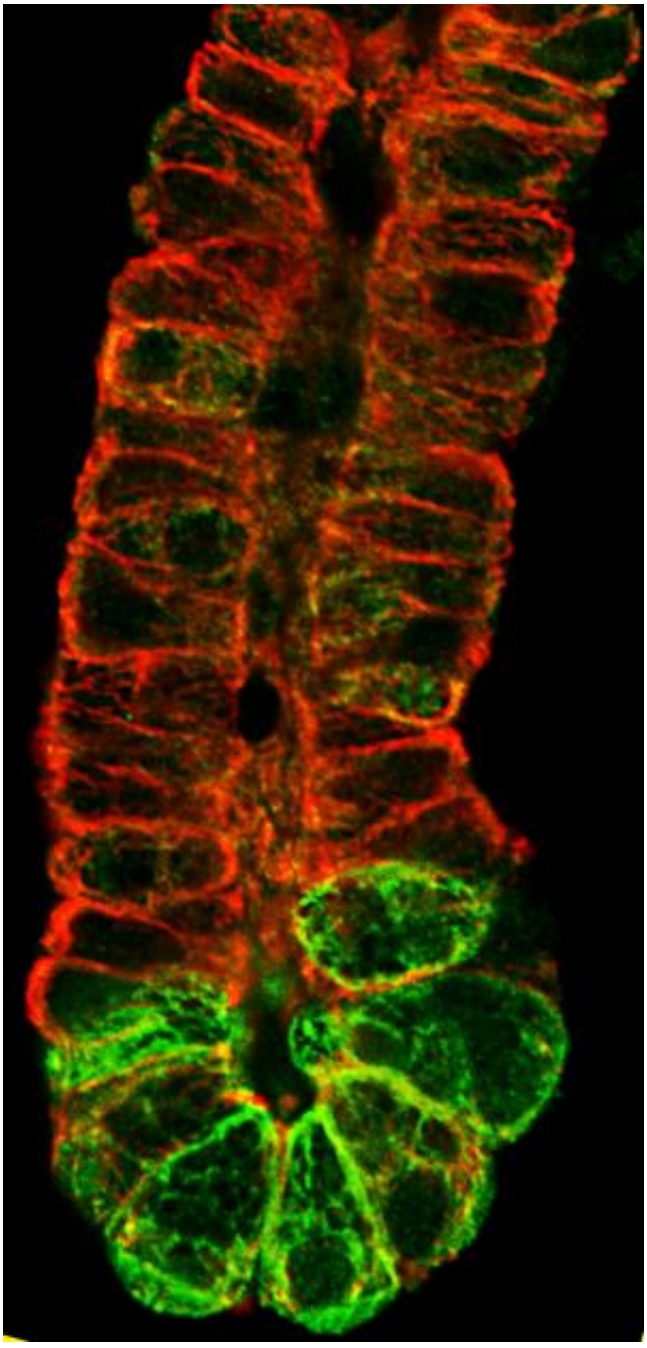

Scientists at the University of East Anglia have shown that the protein EB2 is a key regulator of tube-like structures inside cells and critical for normal tissue development and function. The findings are an important step in the race to find cures for cancers including gut, breast and pancreatic cancer. Microtubules are tubular structures that make up the internal 'skeleton' of cells and perform many essential functions. EB2 belongs to an important group of proteins that influence the behaviour of microtubules. This image shows EB2 (green) expressed in the stem cell region of the gut with microtubules in red. Credit: Deborah Goldspink, University of East Anglia

Scientists at the University of East Anglia have made a major advancement in understanding tissue development that has important implications for cancer.

Findings published today in the *Journal of Cell Science* show how the protein EB2 is a key regulator of tube-like structures inside cells and critical for normal tissue development and function.

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Researchers investigated the microtubule make-up of cells in epithelium tissue, which is one of the four basic types of animal tissue along with connective tissue, muscle tissue and nervous tissue. Epithelial tissues line the cavities and surfaces of structures throughout the body and also form

many glands.

Lead researcher Dr Mette Mogensen, from UEA's school of Biological Sciences, said: "We found that EB2 is a key regulator of microtubule reorganisation which is essential for normal epithelial development and function.

"Our findings represent a major advancement in our understanding of how these cell structures work and change, which not only has implications for the maintenance of a healthy tissue but also for cancer".

"We have also shown that the level of EB2 expression determines the microtubule pattern within cells and therefore how they behave. Low expression of EB2 ensures microtubule stability and promotes bundle formation whereas high expression of EB2 helps to maintain a flexible population of microtubules.

"This is important because the precise pattern that microtubules form within cells directly relates to their function. For example stable bundles of microtubules, promoted by low EB2 expression, enable efficient transport of molecules in and out of cells, which is essential for some cells in the gut.

"On the other hand, unbundled flexible microtubules, promoted by high EB2 expression, are important for normal function of stem cells in the gut."

The research was funded by the Biotechnology and Biological Sciences Research Council (BBSRC) and the cancer charity Big C. The next stage of the research will focus on the regulation of EB2 which is critical for normal epithelial tissue development and function, and for maintaining a non-cancerous state.