GERMAN CANCER RESEARCH CENTER
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**Better Two – Than Three or Four!**

**Scientists of the German Cancer Research Center (Deutsches Krebsforschungszentrum, DKFZ) have discovered a new protein which plays an important role in cell division. It regulates duplication of the centrosomes, which, in turn, distribute the duplicated genetic material evenly to the newly formed daughter cells. This important step of cell division is often disrupted in cancer cells. A better understanding of how this part of the cell cycle is regulated may also become a starting point for developing new cancer treatments. The group led by Associate Professor (PD) Dr. Ingrid Hoffmann has now published its results in the *Journal of Cell Biology*.**

A basic prerequisite for an organism's growth and life is the ability of its cells to divide. "The process of cell division must be strictly regulated, because uncontrolled divisions can lead to tumors," says PD Dr. Ingrid Hoffmann describing her research field at DKFZ. In the course of the cell cycle, a cell's chromosomes are first duplicated and then distributed to the two daughter cells. In this process, an important role is played by the two centrosomes. From these polar bodies in the cytoplasm, protein fibers are formed and these correctly distribute the duplicated chromosome set to the newly forming daughter cells. Before a cell starts dividing, its centrosome is duplicated. Cancer cells, however, often have more than two centrosomes. As a result, the chromosomes are distributed unevenly and, in addition, tend to be unstable – a typical characteristic.

Earlier reports have shown that an enzyme called Plk4 plays a critical role for centrosome duplication. If Plk4 levels are too high, such as in most cancer cells, additional centrosomes are formed. In its absence, on the other hand, the cell is unable to form any centrosomes. What scientists do not yet understand is how this key enzyme is regulated. In order to learn more about these mechanisms, researchers headed by PD Dr. Ingrid Hoffmann have been searching for proteins which interact with Plk4. Jointly with scientists of the European Molecular Biology Laboratory (EMBL), they discovered a previously unknown protein, Cep152. "We were able to show that this protein binds to the Plk4 enzyme and recruits it to the centrosome. Plk4 must have arrived at the centrosome before it can induce duplication," Ingrid Hoffmann explained. These new findings might result in new ideas for targeted intervention in the cell cycle of transformed cells. Thus, blocking the Plk4 enzyme – possibly using the newly discovered Cep152 protein – is a new approach in cancer treatment.

Parallel to this article, there are two other publications on this topic. Research groups from the renowned universities of Stanford, USA and Cambridge, England have published reports which also prove the importance of Cep152 for centrosome duplication. This shows that this is a highly competitive research field and that the working group headed by PD Dr. Ingrid Hoffmann has a place in international high-end research.

Onur Cizmecioglu, Marc Arnold, Ramona Bahtz, Florian Settele, Lena Ehret, Uta Haselmann-Weiß, Claude Antony and Ingrid Hoffmann: Cep152 acts as a scaffold for recruitment of Plk4 and CPAP to the centrosome. Journal of Cell Biology, DOI:10.1083/jcb.201007107

information about the widespread disease of cancer for patients, their families, and the general public. The Center is funded by the German Federal Ministry of Education and Research (90%) and the State of Baden-Württemberg (10%).

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