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Misoriented mitosis in oncogenesis

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Stem cells are recruited to refill cells and tissues that are worn out, or to repair injuries. The homeostasis of an organism depends on reliable maintenance of the stem cell pool. Stem cells undergo symmetric cell divisions for stem cell maintenance, and asymmetric division to obtain one differentiating daughter cell and one daughter with stem cell property. Misregulation of this delicate decision between symmetric vs asymmetric division causes severe consequences: Elevated asymmetric divisions cause in case of neural stem cells microcephaly, in case of spermatogonia infertility. We report here on a regulatory molecule, RHAMM, that functions in the proper assembly of centrosomes and in the regulation of spindle orientation which determines the type of stem cell division. Mouse mutants in the *RHAMM* gene suffer from reduced fertility and development of seminoma (testicular germ cell tumor). All of 40 human seminomas showed reduced RHAMM expression. Although the *RHAMM* gene is located in only one of several seminoma susceptibility loci, RHAMM appears to be a master gene downstream of other genes determining germ cell tumors. The talk will try to derive a general scheme how spindle orientation regulation affects normal and cancer initiating stem cells.

Biography

Peter Herrlich has studied tumor molecular biology for more than 30 years, during which time he has authored more than 300 peer-reviewed reports. He has served on the editorial boards for the *International Journal of Cancer* and *Molecular Carcinogenesis* for which he also served as editor. He was Scientific Director of the Leibniz Institute for Age Research and is currently an Emeritus at the same location.

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