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MSX1 - function of the gene in the intestinal epithelium and colorectal cancer

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The canonical Wntsignalling pathway is essential for cell fate decision during embryogenesis and adult tissue homeostasis. Disruption or misregulation of Wntsignalling underlies development of various diseases including colorectal cancer. A key regulator of the pathway is tumor suppressor APC (adenomatous polyposis coli) which is inactivated in approximately 60% of colorectal carcinomas. APC inactivation causes hyperproliferation of intestinal stem cells which subsequently leads to neoplasia formation. In order to identify genes affected by loss of Apc, we performed expression profiling of the intestinal epithelium in mice with the inactivated gene. The transcriptional factor Msx1 (MSH homeobox 1) was among the genes with the most increased expression after Apc inactivation which is in accordance with the fact that MSX1 was previously described as the Wnt target gene. The role of the MSX1 protein in colorectal cancer has not been elucidated yet, although the MSX1 expression in human colorectal adenocarcinoma is remarkably increased. The importance of the Msx1 gene in the mouse intestine was further supported by in situ hybridization of Msx1 RNA which revealed Msx1 expression in both intestinal crypts and tumors. Finally, a gene expression profiling in human colorectal adenocarcinoma cells with decreased level of MSX1 mRNA by RNAi was performed. This experiment revealed changes in expression of many genes as a result of MSX1 knock-down. The outcome of the gene expression profiling will be discussed during poster session.

Biography

Monika Horázná is a first year PhD student at the Faculty of Science, Charles University in Prague and works in the Laboratory of Cell and Developmental Biology at the Institute of Molecular Genetics of the Academy of Sciences of the Czech Republic. So far she has published one paper in a scientific journal.

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