Oncogenic β-catenin signaling networks in colorectal cancer *

S.Y. Fuchs, A.V. Ougolkov, V.S. Spiegelman, T. Minamoto

β-catenin has two distinct functions, namely, maintaining cell-to-cell adhesion and mediating the Wnt/β-catenin signal transduction pathway, which plays pivotal roles in embryogenesis and in malignant transformation of cells. The oncogenic properties of Wnt/β-catenin signaling stem from alteration in phosphorylation-dependent protein degradation and subcellular localization of β-catenin from cell membrane to the nucleus, where it binds to T-cell factor (Tcf) to form a bipartite transcription factor. The β-catenin/Tcf complex facilitates transcription of target genes that encode effectors for activation of cell proliferation and invasion and inhibition of apoptosis, leading to colorectal cancer development. In addition, in the tumor invasion front, stabilized and activated β-catenin interacts with other molecular pathways to facilitate tumor progression. This review highlighted the β-catenin-dependent oncogenic signaling network involved in the multi-step process of colorectal tumorigenesis. Wnt signaling evidently regulates stem cells, leading them to differentiate or self-renew. We are addressing roles of oncogenic β-catenin signaling in the microenvironment of the tumor-host interface that determine the individual tumor's malignant potential and in regulation of putative cancer stem or progenitor cells that represent plausible targets for cancer eradication.

*Reference:

Fuchs SY, Ougolkov AV, Spiegelman VS, Minamoto T. Oncogenic β-catenin signaling networks in colorectal cancer. Cell Cycle 4:1522-1539, 2005 (review).