

7th World Congress on

Molecular Pathology

July 25-26, 2016 Melbourne, Australia

Glycoprotein asporin is up-regulated by three-dimensional growth and promotes invasion of breast cancer cells

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Asporin belongs to small leucine rich proteoglycans family and its crucial characteristic is ability to bind collagens and initiate their mineralization. Asporin plays important role in normal development, in particular of cartilage, bone and teeth. Although asporin can now be found in multiple cancer related studies, its role in breast cancer is not clear. We have performed *in silico* search and found; Hs578T breast cancer cell line with asporin expression which we confirmed by quantitative RT-PCR and western blotting. Human dental pulp stem cells were used for validation of asporin antibodies. Out of multiple testing, we found that asporin can be down regulated by bone morphogenetic protein 4 (BMP4) while up-regulation may be facilitated by serum-free cultivation or by three dimensional growth in stiff Alvetex scaffold. Down regulation by shRNA inhibited invasion of Hs578T through collagen type I matrix while adhesion and spheroid growth were not affected. Invasion of asporin-negative MDA-MB-231 and BT549 breast cancer cells through collagen type I was enhanced by recombinant asporin. In line with other studies, we have confirmed asporin expression by RNA scope in situ hybridization in cancer associated fibroblasts in invasive breast cancer. We have not found any reliable antibody for immunohistochemistry. In conclusion, asporin expression may be regulated by different stimuli from tumor microenvironment, such as 3D culture, starvation or BMP4, which may in turn modulate extracellular matrix and invasion of breast cancer.

Biography

Jan Bouchal has graduated as Molecular Biologist from Masaryk University in Brno and completed his PhD from Palacky University in Olomouc, Czech Republic. He pursued his Postdoctoral training at Innsbruck Medical University in Austria and other research institutes in Denmark, United Kingdom and Norway. He has published more than 40 papers in reputed journals, mostly on breast and prostate cancer.

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