**Aim:** Over time, the study of malignant tumours has concentrated on cancer cells only. However, the important role of the cancer cell microenvironment and cell-extracellular matrix (ECM) interactions is becoming evident. One of the main components of ECM is proteoglycans (PGs) - complex glycosylated molecules, which are expressed on cell surface and in extracellular matrix, and play an important role in cell-cell and cell-matrix interactions and signaling. The aim of our work was to investigate an effect of fibroblasts on proteoglycans expression in morphologically different prostate cancer cells.

**Methods:** Normal human fibroblasts were co-cultured with normal (PNT2) and prostate cancer cells (PC3, LNCaP, DU145) in cells co-culture model in vitro. Expression and localisation of main proteoglycans (Synd-1, Gly-1, Perl, Vers, Brev, NG2, CD44, Sergl, Dec, Agg, Bigl, Lum) were determined in the cell lines before and after magnetic separation of the cells using real-time RT-PCR analysis and immunocytochemical staining.

**Results:** It was shown that co-cultivation with stromal fibroblasts downregulates PGs expression in normal PNT2 cells at total expression level and change their expression pattern. Androgen-dependent non-metastatic LNCaP cells had similar PGs expression level but their response to the fibroblast influence was distorted. Androgen-independent metastatic PC3 and DU145 cells were characterized by significant decrease of PGs expression and the cells were not able to react to the fibroblast influence. However, in spite of the shown similar effects of the fibroblasts to PC3 and DU145 prostate cancer cells at mRNA level, the cell lines revealed differential reaction to fibroblasts at the protein level.

**Conclusions:** Collectively, obtained data show a different ability of aggressive and non-aggressive prostate cancer cells to respond to the stromal fibroblasts, supporting an important role of ECM in prostate carcinogenesis and suggesting proteoglycans as possible microenvironmental biomarkers for prostate tumour diagnosis and treatment.

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