**Supplemetary Figure Legends**

**Supplemetary Figure S1.** Transwell migration (left) and invasion assay (right) performed at xCELLigence system with C33 cells expressing wild type, N346, and T115-mutated CAIX. Representative graphs give mean±SD of the slopes, measured in quadruplicates, reflecting the migration/invasion rate of the cells during chemotactic assay. The significance of differences was assessed by one-way ANOVA with Dunnett’s multiple comparison post-hoc test, denotes \*\*\*p < 0.001.

**Supplemetary Figure S2.** Protein-protein interaction analysis with the BIAcore 2000 system. Collagen was immobilized on CM5 sensor chip under acidic conditions (upper panel). Interaction analysis of CAIX-SBP to collagen after regeneration with 4M MgCl2 (lower panel).

**Supplemetary Figure S3.** ELISA comparing membrane-bound amount of CAIX in live cells and the total amount of CAIX in fixed cells. The graph gives means±SD of membrane/total CAIX ratio measured in three independent experiments in pentaplicates. Possible differences were evaluated by Student´s t-test and found non-significant.

**Supplemetary Figure S4.** Representative images of cell aggregates. MDCK-GAGm cells (lower panel) exhibited diminished cell-cell contacts and formation of smaller aggregates in comparison to MDCK-CAIX cells (upper panel). Images were acquired at Zeiss Axiovert 40 CFL, 10× objective.

**Supplemetary Figure S5.** Adhesion of C33 cells expressing wild type and CAIX-GAGm to collagen. Cell adhesion is expressed as percentage of adhered cells when compared to C33 CAIX (set as 100%). Values are expressed as mean±SD, significance of differences was evaluated by Student´s t-test in comparison to control C33-CAIX cells, \*\*\*p < 0.001.

**Supplemetary Figure S6.** Transwell migration (left) and invasion assay (right) performed at xCELLigence system with MDCK cells expressing wild type and CAIX-GAGm. Slopes illustrate the migration rate of the cells. Values are expressed as mean±SD, significance of differences was evaluated by Student´s t-test in comparison to control C33-CAIX cells, \*\*\*p < 0.001.

**Supplemetary Figure S7.** Shedding of CAIX ectodomain in the culture media of C33-CAIX and GAGm cells determined by ELISA. Data were normalized on total protein concentration and concentration of CAIX. All data represent means±SD, \*p < 0.05, \*\*p < 0.01, \*\*\*p < 0.001 in comparison to control C33-CAIX cells under the same conditions evaluated by Student´s t-test.

**Supplemetary Figure S8.** Impact of inflammatory environment on GAG glycosylation of CAIX. Western blot analysis of CAIX in pancreatic cell lines BxPC3 and Colo357 and C33-CAIX transfectants cultured in inflammatory medium from MUF fibroblasts (+C.M.) and in control DMEM medium (-C.M.). Inflammatory media reduced the amount of GAGs on CAIX protein in hypoxic pancreatic cancer cells BxPC3 (reduction by 15%) and COLO357 (by 45%) compared to their cultivation in DMEM media. Importantly, C33 cells with ectopic CAIX expression show reduced GAG structures on CAIX under hypoxic (reduction by 50%) but not in normoxic conditions.

Human dermal fibroblasts (MUF) were kindly provided by Dr. Jozef Bizik, and inflammatory conditioned media were prepared according to the protocol published in Bizik et al. 2004 [47]. BxPC3, COLO357, and C33 CAIX cells were seeded in DMEM media (600,000 cells/3.5 cm Petri dish), and 24 h after seeding in selected samples control media was exchanged for inflammatory media for 32 h.

**Supplemetary Figure S9.** Western blot analysis of 54/58 kDa form and HMW form CAIX in control fibrosarcoma HT1080 cells (routinely cultured under pH 7.4) and HT1080 cells adapted to low pH of 6.7 cultured in hypoxia for 24 h and 48 h. The blot shows reduced amount of GAG modification in cells cultured under low pH conditions.