Tumour microenvironment, in addition to cancer cells themselves, represents important structural and functional part of the tumour. Similarly to the normal organs tumour microenvironment comprises several cell types (fibroblasts, immune cells, endothelial cells etc.) and non-cellular components, particularly extracellular matrix. All of them form favourable conditions for the growth, proliferation, protection from the immune system-mediated destruction and nutrition of cancer cells. Cancer associated fibroblasts (CAFs) represent the most abundant cell type of tumour microenvironment. Their origin can be traced to local normal fibroblasts, endothelial cells or epithelial cells and the transition into the CAFs phenotype is influenced with several factors secreted by cancer cells (particularly TGF-β).

In contrast to fibroblasts activated during wound healing newly formed cancer associated fibroblasts expressing α-SMA are not subsequently eliminated from the respective tissue. They persist and produce a number of pro-tumorigenic factors – SDF-1, HGF, IGF-1, IL-6, VEGF, PDGF-C, TGF-β, MMPs etc. CAFs and their secreted factors target several signalling pathways enhancing basic characteristics of the tumour, so called Hallmarks of Cancer. Cancer associated fibroblasts promote proliferation and invasiveness of cancer cells, prevent them from apoptosis, enhance angiogenesis and protect cancer cells from being destructed by immune cells. Moreover they provide cancer cells with energy-rich substrates. CAFs are now considered also as important regulators of the stem phenotype of cancer stem cells. Due to their extensive influence on the tumour progression, CAFs (their activation and CAFs-influenced signaling) represent an important target for new, effective anti-tumour therapies.