The aim of the project is to evaluate FGFR2 (Fibroblast Growth Factor Receptor 2) role in breast cancer initiation. During organogenesis of mammary gland a well-organized system of milk-secreting alveoli and ducts is formed. Physiological function of these structures is determined by their morphology, i.e. the occurrence of lumen, enclosed by inner layer of epithelial (luminal) cells surrounded by external layer of myoepithelial (basal) cells. This composition is maintained by precise communication of epithelial cells with the surrounding microenvironment, based on growth factors and extracellular matrix proteins binding. Disruption of this interplay may lead to initiation of tumourigenesis observed as mammary gland dedifferentiation. FGFR2, as a mediator of cell interaction with microenvironment, regulates many biological processes, including breast embryonic development. In addition to its important physiological functions, FGFR2 may also contribute to the progression of aggressive forms of cancer, including breast cancer.
Our preliminary experiments show that FGFR2 regulates expression level of integrins i.e. major receptors for extracellular matrix proteins. Therefore we address a questions: - whether FGFR2/integrins interdependence is involved in maintenance of mammary gland structure?, - what is the mechanism of FGFR2-dependent integrins expression?, – what is the role of FGFR2 in breast cancer initiation?

The presented project involves *in vitro* studies with epithelial cell line models, which results will be verified by analyses of clinical material derived from patients with pre-invasive breast cancer (DCIS). Firstly, epithelial cells will be modified to express increased or decreased level of FGFR2. Then these cell lines models we will used to investigate: i) mechanisms driving FGFR2-dependent regulation of integrins expression, ii) FGFR2 role in formation and maintenance of characteristic spherical acini-like structures (in three-dimensional cultures which resemble *in vivo* environment for growth), iii) FGFR2/integrins contribution to cell adhesion and migration. In the last stage of the project, we will evaluate FGFR2 and integrins expression in clinical samples which will be correlated with tumor size and differentiation. This approach will verify potential prognostic value of our study.

Breast cancer is the most commonly diagnosed malignancy among women worldwide and the second cause of death among cancer patients. Despite having more effective therapies and increasing survival of patients, the incidence rate of this cancer grows continuously. Therefore mechanisms governing initiation of oncogenesis require further studies.