

Abstract

Head and neck squamous cell carcinomas are still challenging despite progress in the oncological treatment. Study of the molecular biology allows to deeply characterize tumor properties and to predict the prognosis for affected patients. Nowadays there are many drugs clinically tested in the group of targeted therapy medicine

Experimental work comprised both *in vitro* and *in situ* assays, being performed thanks to the collaboration between a number of departments of the 1st Faculty of Medicine of the Charles University in Prague, Academy of Sciences of the Czech Republic, Institute of Hematology and Blood Transfusion and Faculty of Veterinary Medicine of the Ludwig-Maximilian University Munich.

Galectin-1 is important inductor of the myofibroblasts/cancer associated fibroblasts. These fibroblasts are regarded as negative prognostic markers thanks to their capability of invasive cancer cells induction.

On the other hand, Galectin-9 is not present in the carcinoma and in the case of dysplasia, its expression indicate aberrant features together with aberrant expression of keratin 14 and 19. Except from galectins using as prognostic markers, we focused on the galectins as a therapeutics instruments as well. Presented work with mutant variants of galectin-2 proved their effect on both pharmacodynamics and pharmacokinetics of the modified galectin. The results showed an extension of the biological degradation of the PEGylated galectin to the detriment of its capability to inhibit proliferation of some tumor colonies (e.g. erythroleucaemia).

Interleukins IL-6, IIL-8, CXCL-1 are important source of the signals in the epithelial-mesenchymal interaction and their influence effects on the decreasing of the epithelial cell differentiation. Influence of the epithelial-mesenchymal interaction (EMI) was studied also in the cancer stem cells, focusing on their properties in case of the different kinds of the environment.

Epithelial-mesenchymal interaction in squamous cell carcinomas is crucial for their behavior. Research of the EMI combined with glycobiology and cancer stem cells provides new insight into the cancer biology with the aim to improve diagnosis, treatment and to support surveillance of the affected patients.

Key words: galectin, cancer associated fibroblasts, tumor stroma, cancer stem cell