Abstrakt v anglickom jazyku

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Name of the work: In vitro saturation study of ^{99m}Tc-HYNIC-ramucirumab on SKOV3 cell line.

The passive immunotherapy is based on the use of already active immune system components (monoclonal antibodies), which play an important role in cancer cells elimination in the organism. The active immunotherapy tries to stimulate an active anticancer response via an appropriate form of an immunization. When monoclonal antibodies bind to cancer cells, those cells become a selected target for the following removal. The enhancement of the anti-cancer affect of monoclonal antibodies is possible due to the attachment of therapeutic agents like cytostatics, toxins and radionuclides.

This presented master thesis is focused on the radiolabeling of the monoclonal antibody ramucirumab, which is directed against the vascular endothelial growth factor type 2 (VEGFR 2), which is often present in cells of some types of cancerous diseases. Within the experimental work, at first, there was a conjugation of chelating agent succinimidyl-6-hydrazino-nicotinamide (HYNIC) on the monoclonal antibody. After this step, radionuclide ^{99m}Tc was attached on the previously prepared immunoconjugate chelator-antibody and this prepared radiopharmaceutical ^{99m}Tc-HYNIC-ramucirumab was further tested. The radiochemical purity of the radioharmaceutical and the quality of the radioactive labeling was measured with the employment of the methods HPLC and iTLC. The functionality of the radiolabeled antibody to bind to the targeted VEGFR-2 was scrutinized *in vitro* with the help of the case studies using either the manual saturation technique or with the help of the automated real-time radioimmunoassay, where in the both cases the equilibrium dissociation constant K_D was determined.

The radiochemical purity of the prepared radioimmunoconjugate was always more than 95 %. The resulting K_D values of ^{99m}Tc-HYNIC-ramucirumab were 3.52 nM for the automated real-time radioimmunoassay and 11.23 nM for the manual technique.

The found results confirmed the suitability of the employed radiolabeling method of the monoclonal antibody ramucirumab with the used radionuclide. The prepared radiopharmaceutical could be intended for the VEGFR-2 positive cancer disease imaging in the case of successful results for its *in vivo* testing.