

Opis raziskovalnega dela (Research work description)

1. Članica UL (UL member):

Medicinska fakulteta

2. Ime, priimek in elektronski naslov mentorja/ice (Mentor's name, surname and email):

Mateja Erdani Kreft, mateja.erdani@mf.uni-lj.si

3. Raziskovalno področje (Research field):

Celična biologija

4. Opis raziskovalnega dela (Research work description):

Vključuje morebitne dodatne pogoje, ki jih mora izpolnjevati kandidat/ka za mladega raziskovalca/ko, ki niso navedeni v razpisu za mlade raziskovalce (It includes any additional conditions that the candidate for a young researcher must meet, which are not listed in the call to tender for young researchers.).

Slov.: Rak sečnega mehurja je ena najpogostejših malignih bolezni z naraščajočo incidenco v Evropi. Pogosteje prizadene moške, a ženske imajo pogosto slabšo prognozo. Človeška amnijska membrana (hAM) izkazuje imunomodulatorne in protitumorske lastnosti. Nedavne raziskave so pokazale, da njeni pripravki selektivno zavirajo proliferacijo rakavih celic mehurja, ne da bi vplivali na zdrave celice. Delujejo na signalno pot FAK/PI3K/Akt/mTOR, zavirajo epitelno-mezenhimski prehod (EMT) ter omejujejo migracijo in invazijo rakavih celic. Namen doktorskega dela bo preučiti celično-biološke mehanizme protitumorskega delovanja pripravkov hAM in njihovo uporabo pri zdravljenju raka mehurja. Raziskava bo osredotočena na vpliv hAM na avtofagijo in makropinocitozo ter oceno učinka kombinacije hAM z molekularnimi inhibitorji. Uporabljeni bodo biomimetični in vitro modeli urotelija sečnega mehurja, tumorski eksplantati in organoidi raka sečnega mehurja iz pacientov, različne mikroskopske metode ter tehnike molekularne biologije in funkcionalne analize. Rezultati raziskave bodo prispevali k razumevanju protirakavih mehanizmov delovanja hAM, kar bo omogočilo ne le iskanje novih terapevtskih tarč, temveč tudi boljše razumevanje celično-bioloških mehanizmov raka sečnega mehurja. Pri kandidatu/kandidatki za mladega raziskovalca/ko se pričakuje izkušnje z delom s celičnimi kulturami ter osnovne izkušnje s svetlobno in elektronsko mikroskopijo.

Eng.: Bladder cancer is one of the most common malignancies with a rising incidence in Europe. It more frequently affects men, but women often have a poorer prognosis. The human amniotic membrane (hAM) exhibits immunomodulatory and antitumor properties. Recent studies have shown that its preparations selectively inhibit the proliferation of bladder cancer cells without affecting healthy cells. They act on the FAK/PI3K/Akt/mTOR signaling pathway, suppress epithelial-mesenchymal transition (EMT), and limit the migration and invasion of cancer cells. The aim of the doctoral research will be to investigate the cell biological mechanisms underlying the antitumor effects of hAM and its potential use in bladder cancer treatment. The study will focus on the effects of hAM on autophagy and macropinocytosis, as well as the evaluation of the combined effects of hAM with molecular inhibitors. Biomimetic in vitro models of the bladder urothelium, tumor explants, and patient-derived bladder cancer organoids will be used, along with various microscopic methods, molecular biology techniques, and functional analyses. The research findings will contribute to the understanding of the antitumor mechanisms of hAM, which will not only facilitate the identification of new therapeutic targets but also improve the understanding of the cell biological mechanisms of bladder cancer. Candidates for the young researcher position are expected to have experience in cell culture work and basic experience in light and electron microscopy.

5. Priloge, ki jih kandidat priloži k prijavi (Documents that the candidate submits with the application):

☒ **diplomska listina/potrdilo o zaključku študijskega programa** (diploma certificate for study programme, with which the candidate has enrolled/ will enroll in a doctoral degree programme)

☒ **priloga k diplomii/ potrdilo o opravljenih obveznostih** (official transcript of all the grades for study programme, with which the candidate has enrolled/will enroll in a doctoral degree programme)

☒ **potrdilo o do sedaj opravljenih obveznostih z ocenami študijskega programa, s katerim se bo kandidat prijavil na študij** (official transcript of all the grades the candidate has received so far for the study programme, with which the candidate will enroll to a doctoral degree programme)

☒ **nagrade** (awards (e.g. Prešeren Prize of the University of Ljubljana, Prešeren Prize of a University of Ljubljana member and/or another equivalent award))

☒ **bibliografija** (bibliography)

☒ **življenjepis** (CV)

☒ **motivacijsko pismo** (motivation letter)