Opis delovnega mesta mladega raziskovalca/ke (D*escription of the Young Researcher's position)*

1. Članica UL (*UL member)*:

Univerza v Ljubljani, Fakulteta za farmacijo (*University of Ljubljana, Faculty of Pharmacy*)

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

Iztok Grabnar, iztok.grabnar@ffa.uni-lj.si

3. Raziskovalno področje (*Research field*):

1.09 Farmacija (*Pharmacy*)

4. Opis delovnega mesta mladega raziskovalca/ke (D*escription of the Young Researcher's position)*:
Vključuje morebitne dodatne pogoje, ki jih mora izpolnjevati kandidat/ka za mladega raziskovalca/ko, ki niso navedeni v razpisu za mlade raziskovalce.

slo: Področje usposabljanja mladega raziskovalca je razvoj farmakometričnih metod za raziskovanje dinamičnih odnosov med napredovanjem bolezni, režimom zdravljenja in odzivom na zdravila ter biomarkerji, da bi ugotovili vzročne povezave in variabilnost kliničnih izidov (varnost in učinkovitost). Z integracijo predkliničnih podatkov na več ravneh s kliničnimi podatki si prizadevamo določiti pravi odmerek, odmerni interval in trajanje zdravljenja, kar bi lahko zagotovilo nove, natančne in prilagojene možnosti zdravljenja za bolnike z različnimi boleznimi. Znotraj širokega področja odkrivanja in razvoja zdravil z uporabo računalniških metod se bo ta raziskava osredotočila na razvoj nelinearnih modelov mešanih učinkov populacijske farmakokinetike in farmakodinamike, raziskovanje odnosov s sočasnimi spremenljivkami in vključevanje predhodnega znanja v analizo. Raziskovalno delo bo potekalo v raziskovalni skupini Katedre za biofarmacijo in farmakokinetiko Fakultete za farmacijo Univerze v Ljubljani in raziskovalnega programa Farmacevtska tehnologija: od dostavnih sistemov učinkovin do terapijskih izidov zdravil pri otrocih in starostnikih (P1-0189). Zahtevano je dobro znanje angleškega jezika, farmakologije in statistike. Zaželeno je osnovno poznavanje programskega okolja R.

eng: This research position of the Young researcher is in the field of pharmacometric methods to investigate the dynamic relationships between disease progression, treatment regimen and response to drugs and biomarkers in order to determine the causal relationships and underlying variability in clinical outcomes (safety and efficacy). By integrating preclinical data at multiple levels with clinical data, we aim to determine the right dose, schedule and duration of treatment, potentially providing new, precise and personalized treatment options for patients with different diseases. Within the broad field of drug discovery and development using computational methods, this research will focus on developing nonlinear mixed-effects models of population pharmacokinetics and pharmacodynamics, exploring covariate relationships, and incorporating prior knowledge into the analysis. The research work will be performed in the research group of the Department of Biopharmaceutics and Pharmacokinetics, Faculty of Pharmacy, University of Ljubljana and in the research programme Pharmaceutical Technology: from drug delivery systems to therapeutic outcomes of medicines in children end elderly (P1-0189). A good knowledge of English language, pharmacology and statistics is required. Basic knowledge of the R software environment is desirable.

Opis delovnega mesta mladega raziskovalca/ke (D*escription of the Young Researcher's position)*

1. Članica UL (*UL member)*:

Fakulteta za farmacijo (Faculty of Pharmacy)

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

Martina Hrast Rambaher, martina.hrast-rambaher@ffa.uni-lj.si

3. Raziskovalno področje (*Research field*):

Farmacija

4. Opis delovnega mesta mladega raziskovalca/ke (D*escription of the Young Researcher's position)*:
Vključuje morebitne dodatne pogoje, ki jih mora izpolnjevati kandidat/ka za mladega raziskovalca/ko, ki niso navedeni v razpisu za mlade raziskovalce.

slo: Protimikrobna odpornost je eden izmed desetih največjih svetovnih javnozdravstvenih problemov. Za reševanje te nastajajoče zdravstvene krize je bistveno, da razvijamo nove načine zdravljenja, ki bodo obogatili ali ohranili obstoječi arzenal antibiotikov. Ena od strategij za boj proti naraščajoči protimikrobni odpornosti je ciljanje na mehanizme odpornosti patogenih bakterij, kot je proizvodnja biofilmov. Usposabljanje mladega raziskovalca ali raziskovalke bo potekalo na Katedri za farmacevtsko kemijo, na kateri že vrsto let odkrivamo in razvijamo nove zaviralce bakterijskih encimov (penicilin vezoči proteini, bakterijske ligaze, InhA reduktaza, bakterijske topoizomeraze…). Odkrivanje novih zaviralcev bo temeljilo na različnih metodah. Novo zaviralce bomo poskusili identificirati z rešetanjem knjižnice spojin Fakultete za farmacijo na širok spekter bakterij, ki tvorijo biofilme, poleg tega pa bomo poskusili zaviralce najti tudi z različnimi računalniškimi metodami, kot je npr. virtualno rešetanje. Na podlagi dobljenih zadetkov bomo kupili ali sintetizirali različne derivate spojin, z namenom dobiti informacijo o odnosu med strukturo in delovanjem. Dobljene spojine zadetke bomo biokemijsko, mikrobiološko ter toksikološko ovrednotili. Drug pristop pa bo sinteza konjugatov med že znanimi protibakterijskimi učinkovinami in znanimi zaviralci biofilmov. Kot znane antibiotike bomo vzeli npr. monociklične β-laktame, nove zaviralce bakterijskih topoizomeraz (NBTI) ali druge, katerih načrtovanje in sinteza je v našem laboratoriju že dobro vzpostavljena. Zaviralce biofilmov bomo pripeli na osnovne antibiotike preko različnih distančnikov, katerega dolžino bomo variirali in izbrali najbolj optimalno glede na rezultate bioloških testov. Proces bo iterativen, saj bodo rezultati biološkega testiranja vplivali na načrtovanje zaviralcev z izboljšanimi lastnostmi. Pričakujemo, da bomo odkrili več spojin zadetkov in razvili nekaj spojin vodnic, ki bodo imele dobro protibakterijsko delovanje in bodo zavirale nastanek bakterijskih biofilmov. Zaželeno je, da ima kandidat/kandidatka za mladega raziskovalca predhodno praktično znanje s področja farmacevtske kemije/organske kemije ter interes za učenje biokemijska in mikrobiološkega vrednotenja spojin.

eng: Antimicrobial resistance (AMR) is one of the top ten global public health challenges. Addressing this emerging health crisis is crucial, necessitating the development of new treatment modalities to enrich or preserve the existing arsenal of antibiotics. One strategy to combat rising antimicrobial resistance involves targeting the resistance mechanisms of pathogenic bacteria, such as production of biofilms. The training of a young researcher will take place at the Department of Pharmaceutical Chemistry, where for several years we have been discovering and developing new inhibitors of bacterial enzymes (penicillin binding proteins, Mur ligases, InhA reductase, bacterial

topoisomerases...). The discovery of new inhibitors will rely on various methods. We will attempt to identify new biofilm inhibitors via high-throughput screening of our in-house compound library against biofilm-forming bacteria using the high-throughput screening methods. Additionally, we will employ various computer-based methods, such as virtual screening, to find novel inhibitors. Based on the obtained hits, we will purchase or synthesize various compound derivatives to gain insights into structure-activity relationships. The identified hit compounds will be biochemically, microbiologically, and toxicologically evaluated. Another approach will involve the synthesis of conjugates between known antibacterial agents and known biofilm inhibitors. Known antibiotics such as monocyclic β-lactams, novel bacterial topoisomerase inhibitors (NBTIs), or others, whose design and synthesis are well-established in our laboratory, will be used. Biofilm inhibitors will be attached to starting antibiotics via various linkers, the length of which will be varied and optimized based on the results of biological tests. The process will be iterative, as the results of biological testing will influence the design of inhibitors with improved properties. We anticipate discovering of multiple hit compounds and developing lead compounds with potent antibacterial activity that inhibit the formation of bacterial biofilms.

It is desirable for the candidate to have prior practical knowledge in the field of pharmaceutical chemistry/organic chemistry and an interest in learning biochemical and microbiological evaluation of compounds.

Opis delovnega mesta mladega raziskovalca/ke (D*escription of the Young Researcher's position)*

1. Članica UL (*UL member)*:

Fakulteta za farmacijo *(Faculty of Pharmacy)*, UL FFA

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

izr. prof. dr. Janez Mravljak, janez.mravljak@ffa.uni-lj.si

3. Raziskovalno področje (*Research field*):

1.09.00 Naravoslovje Farmacija (Pharmacy)

4. Opis delovnega mesta mladega raziskovalca/ke (D*escription of the Young Researcher's position)*:
Vključuje morebitne dodatne pogoje, ki jih mora izpolnjevati kandidat/ka za mladega raziskovalca/ko, ki niso navedeni v razpisu za mlade raziskovalce.

slo: Kandidat/ka bo vključen/a v raziskovanje spojin rastlinskega izvora, ki zavirajo izbrane encime. Delo obsega pridobivanje ekstraktov in izolacijo bioaktivnih spojin, nato pa njihovo analizno in biološko vrednotenje ter kemijsko modifikacijo spojin zadetkov. Zaželene so izkušnje s področja ekstrakcij rastlinskih drog in fitokemijske karakterizacije ter izkušnje z delom v sinteznem laboratoriju. Zahtevano je dobro znanje angleškega jezika, med pričakovane veščine in lastnosti kandidata/kandidatke sodijo tudi znanstvena pismenost, samoiniciativnost, vedoželjnost, samostojnost, motiviranost za delo in delovna etika.

eng: The candidate will be involved in the research of compounds of plant origin that inhibit selected enzymes. The work includes extraction and isolation of bioactive compounds, followed by their analytical and biological evaluation and chemical modification of hit compounds. Experience in the field of herbal drug extraction and phytochemical characterization as well as experience working in a synthesis laboratory is desirable. A good knowledge of the English language is required. The expected skills and qualities of the candidate include scientific literacy, self-initiative, curiosity, independence, motivation for work and work ethic.

Opis delovnega mesta mladega raziskovalca/ke (D*escription of the Young Researcher's position)*

1. Članica UL (*UL member)*:

Fakulteta za farmacijo

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

doc. dr. Urša Pečar Fonović, ursa.pecarfonovic@ffa.uni-lj.si

3. Raziskovalno področje (*Research field*):

1.09.00 Naravoslovje Farmacija

4. Opis delovnega mesta mladega raziskovalca/ke (D*escription of the Young Researcher's position)*:
Vključuje morebitne dodatne pogoje, ki jih mora izpolnjevati kandidat/ka za mladega raziskovalca/ko, ki niso navedeni v razpisu za mlade raziskovalce.

slo: **Vloga proteinov APOBEC v kancerogenezi**
Doktorski študent se bo vključil v raziskave raka, natančneje v raziskave vloge proteinov APOBEC v kancerogenezi. Proteini APOBEC so družina encimov, ki editirajo nukleinske kisline (DNA in RNA). Proteini APOBEC3 imajo pomembno vlogo v prirojeni imunosti kot zaviralci okužb z virusi in retroelementi. Zadnja leta so raziskave pokazale, da imajo ključno vlogo pri nastanku raka. Analiza mutacij pri pacientih z različnimi vrstami raka je pokazala, da imajo pacienti izrazito povišano število mutacij, ki jih povzročajo proteini APOBEC3, pojav mutacij pa je sorazmeren s povišanim izražanjem teh proteinov. Kakšen je proces nastanka teh mutacij in kako pride do povišanega izražanja proteinov A3 še ni znano. Še posebej nas zanimajo vprašanja, kako pride do aktivacije proteinov APOBEC3 v celici, ali proteini APOBEC3 tekom transformacije celic povzročajo editiranje RNA in ali povzročajo epigenetske spremembe v promotorskih regijah različnih tarčnih genov. Izrazito povšano izražanje APOBEC3A in APOBEC3B pri številnih rakih kaže na to, da sta proteina odlični tarči za terapijo raka in omejevanje rezistence na trenutne terapije. Del doktorske disertacije bo vključil tudi iskanje potencialnih inhibitorjev teh proteinov.
Doktorski študent bo znanstvena vprašanja raziskoval iz različnih zornih kotov, za kar bo uporabljal najmodernejše metode molekularne in celične biologije. Delo bo vključevalo tehnike rekombinantne DNA, delo s celičnimi kulturami, delo s primarnimi celicami, CRISPR/Cas9 editiranje, biokemijske metode kot tudi novejše pristope v NGS, bioinformatična orodja, analizo sekveniranja posamezne celice, tehnike mikroskopiranja in uporabo kliničnih podatkov. Raziskava bo potekala v sodelovanju tudi z drugimi laboratoriji iz Slovenije in tujine.
Od doktorskega študenta pričakujemo visoko motiviranost za znanstvenoraziskovalno delo.

eng: **The role of APOBEC proteins in carcinogenesis**
PhD student will focus on cancer research, in particular on the role of APOBEC proteins in carcinogenesis. APOBEC proteins are a family of enzymes that edit nucleic acids (DNA and RNA). APOBEC3 proteins play an important role in innate immunity as inhibitors of viral infections and retroelements. In recent years, however, research has shown that they play a key role in the development of cancer. Analysis of mutations in patients with different types of cancer has revealed a significantly increased number of APOBEC3 mutations, which is proportional to the increased expression of these proteins. How these mutations arise and how the increased expression of the APOBEC3 proteins comes about is not yet known. We are particularly interested in the question of how APOBEC3 proteins are activated in the cell, whether APOBEC3 proteins promote RNA editing during cell transformation or cause epigenetic changes in the promoter regions of various target genes. The significantly increased expression of APOBEC3A and APOBEC3B in many cancers suggests that the proteins are excellent targets for cancer therapy and limiting resistance to current therapies. Part of the PhD research will also involve searching for potential inhibitors of these proteins. The PhD student will explore scientific questions from different perspectives using the most advanced methods in molecular and cell biology.
PhD student's work will include recombinant DNA techniques, working with cell cultures and primary cells, CRISPR/Cas9 editing, biochemical methods as well as newer approaches in NGS, bioinformatics tools, single cell sequencing analysis, microscopy techniques and the use of clinical data. Research will also be conducted in collaboration with other laboratories from Slovenia and abroad.
PhD student is expected to be highly motivated for scientific research work.

Opis delovnega mesta mladega raziskovalca/ke (D*escription of the Young Researcher's position)*

1. Članica UL (*UL member)*:

UL FFA

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

Lucija Peterlin Mašič; lucija.peterlin@ffa.uni-lj.si

3. Raziskovalno področje (*Research field*):

toksikologija

4. Opis delovnega mesta mladega raziskovalca/ke (D*escription of the Young Researcher's position)*:
Vključuje morebitne dodatne pogoje, ki jih mora izpolnjevati kandidat/ka za mladega raziskovalca/ko, ki niso navedeni v razpisu za mlade raziskovalce.

slo: Bisfenol A je znan motilec endokrinega sistema, katerega uporabo zaradi toksičnosti omejujejo. V številnih izdelkih ga zamenjujejo z analogi bisfenola A, ki so s stališča varnosti neraziskani in postavlja se vprašanje ali predstavljajo bolj varno zamenjavo za bisfenol A. V tem okviru v raziskovalni skupini raziskujemo **mehanizme toksičnosti novih nadomestkov za bisfenol A, vpliv metabolizma na aktivnost nadomestkov bisfenola A, razgradne produkte nadomestkov bisfenola A ter učinke mešanic bisfenolov, naravnih in sinteznih hormonov**. Število kemikalij in njihovih mešanic, ki povzročajo endokrine motnje in smo jim nenehno izpostavljeni preko hrane, pijače in okolja, je potencialno ogromno. Zato **vrednotenje mešanic kemikalij predstavlja bolj realistično in zanesljivo napoved za oceno tveganja za zdravje** kot ocena posameznih kemikalij. Pri vrednotenju mešanic motilcev endokrinega sistema, čeprav so v mešanicah prisotni v koncentracijah pod pragom učinka, smo dokazali, da imajo take mešanice lahko toksične učinke.

Delo kandidat/kandidatka za mladega raziskovalca bo vključevalo proučevanje mehanizmov toksičnosti najnovejših zamenjav za bisfenol A z uporabo različnih celičnih linij, proučevanje metabolizma in vitro ter identifikacija metabolitov, ki nastanejo in njihovo testiranje v različnih celičnih linijah ter testiranje mehanizmov toksičnosti različnih mešanic. Delo bo interdisciplinarno in bo potekalo v sodelovanju z drugimi raziskovalnimi inštitucijami doma in v tujini. Kandidatu/kandidatki priporočam, da ga področje zanima, mu predstavlja izzive in si želi pridobiti znanja in veščine na področju toksikologije, ocen tveganj in varnosti za zdravje ljudi. Po končanem doktoratu so zaposlitvene možnosti široke od raziskovalnih inštitucij in do farmacevtske industrije.

eng: Bisphenol A is a known endocrine disrupting chemical whose use is restricted due to its toxicity. In many products it is substituted with analogues of bisphenol A, which have not been studied from a safety point of view, and the question arises as to whether they are a safer alternative for bisphenol A. In this context, the research group is investigating the mechanisms of toxicity of new substitutes for bisphenol A, the influence of metabolism on the activity of bisphenol A substitutes, degradation products of bisphenol A substitutes and the effects of mixtures of bisphenols, natural and synthetic hormones. The number of chemicals and their mixtures that cause endocrine disruption and to which we are constantly exposed through food, beverages and the environment is potentially enormous. Therefore, the assessment of mixtures of chemicals is a more realistic and reliable predictor of health risks than the assessment of individual chemicals. In the assessment of mixtures of endocrine disruptors, we have shown that such mixtures can have toxic effects even though they are present in the mixtures in concentrations below the effect threshold.

The work of the young researcher will involve studying the toxicity mechanisms of the latest substitutes for bisphenol A using different cell lines, studying metabolism in vitro and identifying the metabolites formed and testing them on different cell lines, and testing the toxicity mechanisms of different mixtures. The work will be interdisciplinary and in collaboration with other research institutions in Slovenia and abroad. I recommend that the applicant has an interest in the field, is willing to face challenges and wants to acquire knowledge and skills in the field of toxicology, risk assessment and human health safety. After the doctorate, there are a variety of employment opportunities ranging from research institutions to the pharmaceutical industry.

Opis delovnega mesta mladega raziskovalca/ke (D*escription of the Young Researcher's position)*

1. Članica UL (*UL member)*:

Univerza v Ljubljani, Fakulteta za farmacijo (University of Ljubljana, Faculty of Pharmacy)

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

Anja Pišlar (anja.pislar@ffa.uni-lj.si)

3. Raziskovalno področje (*Research field*):

4.06 Biotehnologija (Biotechnology), 1.09. Farmacija (Pharmacy)

4. Opis delovnega mesta mladega raziskovalca/ke (D*escription of the Young Researcher's position)*:
Vključuje morebitne dodatne pogoje, ki jih mora izpolnjevati kandidat/ka za mladega raziskovalca/ko, ki niso navedeni v razpisu za mlade raziskovalce.

slo: Nevrodegenerativne bolezni prizadenejo različne predele možganov in posamezna oblika bolezni povzroči značilno izražen fenotip, ki se odraža v selektivno progresivni izgubi senzorično-motoričnih in kognitivnih funkcij. Pri proučevanju posamezne nevrodegenerativne bolezni so opazili spremembe v izražanju nevrotrofičnih dejavnikov, kar je privedlo do obsežnih prizadevanj za razjasnitev njihove vloge v patologiji teh bolezni. Po drugi strani so nevrodegenerativne bolezni povezane s patološko spremenjenimi proteini, ki se odlagajo v možganih v centralno živčnem sistemu kot tudi v perifernih organih, ali pa gre za proteine, ki so povezani z vnetnimi procesi, posredovanimi preko nevroglije. Ti proteini in biokemijske spremembe so lahko potencialna tarča za načrtovanje strategij zdravljenja teh bolezni, ali pa se uporabljajo le kot označevalci bolezni. Mednje sodijo tudi cisteinski katepisini. Dosedanji izsledki raziskav močno nakazujejo na pomembno vlogo cisteinskih katepsinov v nevrodegeneraciji spodbujeni z vnetnimi procesi, vendar pa natančnem mehanizem delovanja teh peptidaz in njihovih tarč v možganskih celicah ostaja nepojasnjen. Zato je glavni cilj nadaljnjih raziskav opredeliti spremembe v izražanju ter določiti natančno vlogo cisteinskih katepsinov ter hkrati identificirati in opredeliti raven izražanja in vlogo njihovih tarč v možganskih celicah. Kandidat/ka za mladega/o raziskovalca/o se bo osredotočil/a na proučevanje ravni izražanja in aktivnosti cisteinskih katepsinov tekom diferenciacije v posamezen podtip nevronov, katerega propad je značilen za določeno nevrodegenerativno bolezen, hkrati bo kandidat/ka opredelil/a njihove tarče v možganskih celicah. Nadalje bo ovrednotil/a nivo izražanja in aktivnosti cisteinskih katepsinov ter njihovih tarč v diferenciranih nevronskih celicah in celicah glije, podvrženim degenerativnim dražljajem, in ob tem opredelil/a pomen uravnavanja s cisteinskimi katepsini. Nenazadnje bo opredelil/a pomen uravnavanja tarč cisteinskih katepsinov s ciljno usmerjenim delovanjem proti peptidazam na potek nevrodegenerativnih procesov, povezanih z vnetjem. Postavljene *in vitro* napredne celične modele nevrodegeneracije in nevrovnetja bo uporabil/a za vrednotenje zaviralcev cisteinskih peptidaz kot tudi zaviralcev drugih proteinov, udeleženih v procese nevrodegeneracije in nevrovnetja. Za kvalitetno usposabljanje mladega/e raziskovalca/e je zaželeno, da ima kandidat/ka znanje angleškega jezika ter predhodno metodološko znanje s področja biokemije in biotehnologije.

eng: Neurodegenerative diseases affect different brain areas, and each form of the disease causes a characteristically expressed phenotype, which is reflected in a selectively progressive loss of sensory-motor and cognitive functions. When studying individual neurodegenerative diseases, changes in the expression of neurotrophic factors were observed, which led to extensive efforts to clarify their role in the pathology of these diseases. On the other hand, neurodegenerative diseases are associated with pathologically modified proteins that are deposited in the brain in the central nervous system as well as in peripheral organs, or they are proteins that are associated with inflammatory processes mediated through neuroglia. These proteins and biochemical changes can be potential targets for designing treatment strategies for these diseases, or they can only be used as disease markers. Among them

are also cysteine cathepsins. Current research findings strongly suggest the important role of cysteine cathepsins in neurodegeneration induced by inflammatory processes, but the exact mechanism of action of these peptidases and their targets in brain cells remains unclear. Therefore, the main goal of further research is to define changes in protein expression and activities and to determine the exact role of cysteine cathepsins, as well as to identify and define the level of expression and the role of their targets in brain cells.

The candidate will define the levels of expression and activity of cysteine cathepsins during differentiation into a single subtype of neurons that are affected in certain neurodegenerative disease, and define their targets in brain cells. The candidate will further evaluate the levels of expression and activity of cysteine cathepsins and their targets in differentiated neuronal and glial cells affected by degenerative stimuli. Further, the candidate will define the importance of regulating the targets of cysteine cathepsins by peptidase targeting on the course of neurodegenerative processes associated with inflammation. The established advanced *in vitro* cell models of neurodegeneration and neuroinflammation will be further used to evaluate inhibitors of cysteine peptidases as well as inhibitors of other proteins involved in the processes of neurodegeneration and neuroinflammation.

For quality training of a Young Researcher, it is desirable that the candidate has knowledge of English language and has prior knowledge in the field of biochemistry and biotechnology.

Opis delovnega mesta mladega raziskovalca/ke (D*escription of the Young Researcher's position)*

1. Članica UL (*UL member)*:

UL FFA

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

Izr. prof. dr. Alenka Zvonar Pobirk, alenka.zvonar-pobirk@ffa.uni-lj.si

3. Raziskovalno področje (*Research field*):

Farmacija

4. Opis delovnega mesta mladega raziskovalca/ke (D*escription of the Young Researcher's position)*:
Vključuje morebitne dodatne pogoje, ki jih mora izpolnjevati kandidat/ka za mladega raziskovalca/ko, ki niso navedeni v razpisu za mlade raziskovalce.

Na Katedri za farmacevtsko tehnologijo (FT) se ukvarjamo z razvojem pacientom prijaznih dostavnih sistemov učinkovin, pri čemer dajemo poudarek tudi vidikom okoljske trajnosti. Raziskovalno delo se izvaja tudi v okviru raziskovalnega programa P1-0189. *V okviru doktorskega študija bo mladi raziskovalec (ž / m) podrobneje proučil izbrano industrijsko uporabno tehnologijo kot metodo izdelave trdnih samo-mikroemulgirajočih prahov/ zrnc na osnovi (mezoporoznih) trdnih nosilcev, ki v porah vključujejo samo-mikroemulgirajoči sistem (SMEDDS) ali trdno disperzijo s slabo vodotopno zdravilno učinkovino. Da bi preprečili obarjanje zdravilne učinkovine, do katerega lahko pride v prebavnem traktu med redčenjem in prebavo tovrstnih sistemov, bo v formulacijo vključil različne inhibitorje precipitacije (predvsem različne polimere - npr. PVP, HPMC) in proučil njihovo delovanje. Za vrednotenje in optimizacijo procesa in formulacije bo uporabljal sodobne pristope, kot je načrtovanje eksperimentov (DoE) in napredne analizne metode (npr. Ramanska spektroskopija in metode termične analize). Z uporabo na lipidih/ talinah osnovanih tehnologij lahko izboljšamo topnost in biološko uporabnost slabo vodotopnih zdravilnih učinkovin. Izognemo se tudi uporabi organskih topil, kar je v skladu s trajnostnimi načeli sodobnega razvoja zdravil. Rezultati bodo predstavljeni na domačih in mednarodnih znanstvenih konferencah in objavljeni v uglednih revijah z dejavnikom vpliva SCI.* Mladi raziskovalec (ž/m) naj ima poglobljen interes za farmacevtsko tehnologijo in sodobne analizne metode. Mladi raziskovalec bo pridobil širok nabor kompetenc s področja farmacije, kar mu bo omogočalo kvalitetno nadaljevanje karierne poti v akademskem ali industrijskem okolju.

At the Department of Pharmaceutical Technology (FT) we are focusing on the development of patient friendly delivery systems, with an attention given also on incorporating environmental sustainability in pharmaceutical development. Research work is also carried out within the Research program P1-0189. *As part of the doctoral study, the young researcher (f / m) will systematically investigate a selected industrially applicable technology as a method for producing solid self-microemulsifying powders or granules based on (mesoporous) solid carriers that incorporate liquid self-microemulsifying drug delivery system (SMEDDS) or solid dispersion with a chosen active pharmaceutical ingredient. To prevent precipitation of the active pharmaceutical ingredient, which can occur dispersion and digestion of such delivery systems in the gastrointestinal tract, various precipitation inhibitors will be included in the formulation (primarily using different polymers, e.g., PVP, HPMC) and studied. To evaluate and optimize the production process and formulation, modern approaches such as Design of Experiments (DoE) and advanced analytical methods (such as Raman spectroscopy and thermal analysis) will be employed. By utilizing lipid- or melt-based technologies, we can enhance the solubility and bioavailability of poorly water-soluble active pharmaceutical ingredients. Additionally, we can avoid the use of organic solvents, which is in line with the principles of green and sustainable pharmacy.* The results will be presented at domestic and international scientific conferences and published in reputable journals with SCI impact factor. The young researcher (f / m) should have deep interest in pharmaceutical technology and modern analytical methods. The young researcher will acquire a wide range of competencies in the field of pharmacy, which will enable him/her to continue his/her career in an academic or industrial environment.