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

1. Članica UL (*UL member)*:

Medicinska fakulteta

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

Jure Derganc, jure.derganc@mf.uni-lj.si

3. Raziskovalno področje (*Research field*):

Biofizika

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: Na Inštitutu za biofiziko Medicinske fakultete iščemo mladega raziskovalca ali mlado raziskovalko z diplomo ali magisterijem iz fizike, ki ima željo raziskovati na področju ved o življenju. Naše raziskovalne tematike so povezane z razumevanjem delovanja celičnih toksinov, z uporabo umetnih celičnih membran v sintezni biologiji ter z analizo in manipulacijo velikega števila posameznih sesalskih celic, kar postaja vse pomembnejše pri personalizirani medicini in sodobnih celičnih terapijah. Vsebina naloge bo prilagojena predznanju in interesom kandidatke oz. kandidata. Pri raziskavah bomo uporabljali najnovejše mikroskopske tehnike, optično pinceto, sodobne metode za strojno razpoznavanje slik ter razvijali nove mikrofluidične metode za uporabo v biomedicini. Več informacij o naših raziskavah je na naslovu https://biophysics.splet.arnes.si/jure-derganc/

Eng: We are looking for an open-minded student with a BSc MSc in Physics who is interested in doing research at the intersection between biophysics and medicine. Our research topics include the study of cellular toxins, artificial cell membranes in synthetic biology, and high-throughput analysis of individual mammalian cells, which is becoming increasingly important for personalized medicine and advanced cell therapies. The PhD topic will be adapted to the candidate's interests and prior expertise. We will use the latest microscopic techniques, optical tweezers, advanced machine image recognition methods, and develop new biomedical microfluidic methods. For more information about our research, visit https://biophysics.splet.arnes.si/jure-derganc/

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

1. Članica UL (*UL member)*:

Univerza v Ljubljani, Medicinska fakulteta (University of Ljubljana, Faculty of Medicine)

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

Vita Dolžan, vita.dolzan@mf.uni-lj.si

3. Raziskovalno področje (*Research field*):

Naravoslovje - Biokemija in molekularna biologija (Natural sciences - Biochemistry and molecular biology)

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.

Mladi raziskovalec se bo vključil v raziskave na področju farmakogenomike in bo imel ključno vlogo pri prehodu iz dosedanjih analiz posameznih pogostih funkcionalnih sprememb v tarčnih farmakogenih na analize celotnega genoma. Sodeloval bo predvsem pri razvoju pristopov za pridobivanje farmakogenomskih informacij iz podatkov sekvenciranja celotnega genoma in dolgih branj, ki omogočajo identifikacijo farmakogenomskih podatkov tudi iz intronskih področij in kompleksnih genomskih regij z visoko stopnjo strukturne variabilnosti (na primer CYP2D6). Kandidat bo preverjal hipotezo, da farmakogenetski podatki, pridobljeni s sekvenciranjem celotnega genoma in dolgimi branji omogočajo boljšo napoved učinkovitosti in varnosti zdravljenja z izbranimi zdravili, kot dosedanji pristop, ki temelji na analizi pogostih genetskih sprememb v tarčnih farmakogenih. Preverjanje hipoteze bo potekalo v okviru kliničnih raziskav in zanimivih kliničnih primerov s področja psihiatrije, imunosupresivnega zdravljenja in družinske medicine.
Raziskovalno delo bo potekalo v sodelovanju med Laboratorijem za farmakogenetiko Inštituta za biokemijo in molekularno genetiko na UL, Medicinska fakulteta, kjer bo kandidat spoznal področje farmakogenetike in različne molekularno genetske metode za tarčne analize nukleinskih kislin in se vključil v klinične študije, ter Oddelkom za genomiko Kliničnega inštituta za specialno laboratorijsko diagnostiko na Pediatrični kliniki UKC, s katerim bomo sodelovali pri analizi in interpretaciji farmakogenomskih podatkov, pridobljenih s tehnologijo sekvenciranja celotnega genoma in s tehnologijo dolgih branj. Kandidat se bo vključil tudi v EU projekt PharmGenHub in se redno udeleževal strokovnih in raziskovalnih srečanj in izpopolnjeval doma in v tujini, zato je zaželeno aktivno znanje angleškega jezika. Prednost pri izbiri bodo imeli kandidati z boljšim poznavanjem bioinformacijskih orodij.

The candidate will be involved in research in the field of pharmacogenomics and will play a key role in the transition from the previous analyses of common functional variants in target pharmacogenes to the analyses of the entire genome. The candidate will mainly participate in the development of approaches for obtaining pharmacogenomic information from whole genome sequencing data and long reads, which enable the identification of pharmacogenomic data also from intronic regions and complex genomic regions with a high degree of structural variability (for example, *CYP2D6*).
The candidate will test the hypothesis that pharmacogenetic data obtained by whole-genome sequencing and long reads enable better prediction of the efficacy and safety of treatment with selected drugs than the current approach, which is based on the analysis of common genetic variants in target pharmacogenes. This hypothesis will be tested within the framework of clinical studies and interesting clinical cases from the fields of psychiatry, immunosuppressive treatment, and family medicine.
Research will be performed in collaboration between the Pharmacogenetics Laboratory of the Institute of Biochemistry and Molecular Genetics at UL, Faculty of Medicine, where the candidate will become familiar with the field of pharmacogenetics and various molecular genetic methods for targeted molecular genetic analyses and participate in clinical studies, and the Department of Clinical Genomics of the Institute for Special Laboratory Diagnostics at the Children's Hospital, UKC Ljubljana, where the analysis and interpretation of pharmacogenomic data obtained by whole genome sequencing and long read technology will take place. The candidate will also participate in the EU project PharmGenHub and at the national and international research and professional meetings and training courses, therefore active knowledge of the English language is required. Preference will be given to candidates with better knowledge of bioinformatics tools.

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

1. Članica UL (*UL member*):

Medicinska fakulteta

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

Andrej Kastrin, andrej.kastrin@mf.uni-lj.si

3. Raziskovalno področje (*Research field*):

statistika, računsko-intenzivne metode in aplikacije, mikrobiologija

4. Opis delovnega mesta mladega raziskovalca/ke (*Description 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.

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slo: Inštitut za biostatistiko in medicinsko informatiko (IBMI) se uvršča med vodilne raziskovalne in izobraževalne institucije na področju statistike v Sloveniji ter v Jugovzhodni Evropi. Naš cilj je razvoj vrhunskih raziskav in aplikacij s področij podatkovnih znanosti (npr. analiza preživetja), tehnologij znanja (npr. strojno učenje) in drugih področij, ki se ukvarjajo z upravljanjem, analizo, modeliranjem in uporabo podatkov in znanja. Raziskovalci IBMI so avtorji odmevnih znanstvenih prispevkov in so sodelovali pri organizaciji številnih mednarodnih znanstvenih konferenc in delavnic.

Usposabljanje mladega raziskovalca (m/ž) (v nadaljevanju: MR) bo potekalo na interdisciplinarnem področju podatkovnih znanosti in tehnologij znanja, s poudarkom na uporabi v biomedicini. Temo doktorske naloge bomo oblikovali v dogovoru s kandidatom, odvisno od kompetenc kandidata, njegovih preferenc in trenutnih raziskovalnih prioritet IBMI. Po identifikacija ožjega raziskovalnega področja se bo kandidat aktivno vključil v delo programske skupine in spoznal različne faze in procese raziskovalnega dela. V okviru usposabljanja bo MR spoznal delo sorodnih raziskovalnih skupin, s katerimi tudi sicer intenzivno sodelujemo. Pričakujemo, da bo MR s področja obravnavanega problema objavil dva izvirna znanstvena prispevka.

Od kandidata pričakujemo visoko stopnjo motiviranosti in delovne vneme. Kandidat naj izpolnjuje pogoje za vpis na doktorski študijski program Računalništvo in informatika (UL FRI), Matematika in fizika (UL FMF) ali Interdisciplinarni doktorski študijski program Statistika (UL). Po dogovoru z mentorjem je možen tudi vpis na drug študijski program.

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eng: The Institute of Biostatistics and Medical Informatics (IBMI) is one of the leading statistical research and training institutions in Slovenia and South-Eastern Europe. Our aim is to advance research and develop cutting-edge applications in data science (e.g., survival analysis), knowledge technologies (e.g., machine learning), and other areas dealing with the management, analysis, modeling, and use of data and knowledge. IBMI researchers have authored high-impact publications and have co-organized numerous international scientific conferences and workshops.

The doctoral candidate will get training in the interdisciplinary fields of statistics, data science, and knowledge technologies, specifically emphasizing their applications in the domain of biomedicine. The field of study of the PhD thesis will be determined collaboratively with the candidate, taking into consideration the candidate's skills, preferences, and the current research goals of IBMI. After identifying a more specific research area, the candidate will actively participate in the program team's work and gain knowledge of the various stages and procedures involved in research. As part of the training, the PhD candidate will work closely with our recognized research partners. The candidate will write and publish two original scientific papers on the subject under study. The PhD

candidate will author and publish two original scientific papers.

We expect the candidate to be highly motivated and with a high level of grit. The candidate should meet the requirements for admission to the PhD program in Computer and Information Science (UL FRI), Mathematics and Physics (UL FMF), or the Interdisciplinary Doctoral Study Programme in Statistics (UL). In consultation with the supervisor, enrollment in another program with similar content is also possible.