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

1. Članica UL (*UL member)*:

Biotehniška fakulteta (*Biotechnical faculty*)

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

Damjana Drobne, damjana.drobne@bf.uni-lj.si

3. Raziskovalno področje (*Research field*):

nanoznanosti, znanosti o materialih, biologija stresa (*Nanosciences, materials science, stress 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.

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*Opis*:
Iščemo ambicioznega doktorskega kandidata, ki bi se pridružil naši raziskovalni skupini Raziskovalna skupina za nanobiologijo in nanotoksikologijo, https://www.bionanoteam.com/ ) na področju raziskav uporabe, varnosti in trajnosti nano-, mikro-, hibridnih in naprednih materialov. Skupina proučuje interakcijami med materiali in biološkimi sistemi na različnih nivojih biološke kompleksi od molekularnega do organizemskega nivoja. Skupina je partner v EU projektu, ki preučujejo usodo in učinke mikro- in nano-plastike na zdravje ljudi (PlasticsFatE, https://www.plasticsfate.eu/ ), v dveh EU projektih o inovacijah novih kompozitov, ki vsebujejo nanomateriale (NOVA, https://eu-nova.eu/ in REPOXYBLE (https://www.repoxyble.eu/ ), in vodi EU projekt o celostni karakterizaciji 2D nanomaterialov (ACCORDs https://accordsproject.com/ ). Skupina se ukvarja tudi z zdravstvenimi posledicami izpostavljenosti materialom z uporabo slikovnih tehnik in prispeva k preučevanju vnetij in k raziskavam raka.
Kot del naše skupine bo imel mladi raziskovalec priložnost za široko mednarodno sodelovanje in izmenjavo prek vključevanja v nacionalne in mednarodne projekte.

*Odgovornosti mladega raziskovalca*:
 1. Izpolnjevanje obveznosti doktorskega študijskega programa
 2. Izvajanje poglobljenih pregledov literature
 3. Načrtovanje in izvajanje poskusov
 4. Analiza in interpretacija podatkov
 5. Sodelovanje in timsko delo
 6. Objava in razširjanje dobljenih rezultatov v domačem in mdnarodnem okolju

*Kvalifikacije (niso obvezne)*:
 1. Magistrska izobrazba na ustreznem področju, kot so molekularna biologija, biokemija, biologija ali sorodne stroke.
 2. Izkušnje pri izvajanju laboratorijskih poskusov (delo s celičnimi kulturami *in vitro*, osnovno znanje o mikroskopiji).
 3. Osnovno znanje o analizi podatkov z uporabo statističnih in računalniških orodij.
 4. Pisne in ustne komunikacijske spretnosti.
 5. Sposobnost sodelovanja v multidisciplinarnem in mednarodnem raziskovalnem okolju.

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*Description*:
We are seeking an ambitious doctoral candidate to join our cutting-edge research team (Research group for nanobiology and nanotoxicology, https://www.bionanoteam.com/ ) in the field of nano-, micro- and advanced materials innovation, safety and sustainability research. Our group studies interactions between materials and biological systems at different levels of the biological complex, from the

molecular to the organismal level. The team is partner in a project studding the fate and effects of micro- and nano-plastics on human health  (PlasticsFatE, https://www.plasticsfate.eu/ ), two projects on innovation of new composites (NOVA**,** https://eu-nova.eu/ and REPOXYBLE (https://www.repoxyble.eu/**),** and is leading a project on holistic characterization of 2D nanomaterials (ACCORDs https://accordsproject.com/). We are working also on health implications of material exposure by using imaging techniques to study inflammation and contribute to cancer research.

As a part of our team, a young researcher will have a chance for a broad international collaboration and exchange via involvement in national and international projects.

*Responsibilities of doctoral candidate*:
1. Fulfilling requirements of PhD study program
2. Conducting In-Depth Literature Reviews
3. Experimental Design and Execution
4. Data Analysis and Interpretation
5. Collaboration and Teamwork
6. Publication and Dissemination

*Qualifications (not mandatory):*
1. A master degree in a relevant field such as molecular biology, biochemistry, biology, or a related discipline.
2. Experience in conducting laboratory experiments (work with *in vitro* cell cultures, basic knowledge on microscopy).
3. Basic knowledge in data analysis using statistical and computational tools.
4. Communication skills, both written and verbal.
5. Ability to work collaboratively in a multidisciplinary and international research environment.

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

1.  Članica UL (*UL member)*:

| |
|---|
| Univerza v Ljubljani, Biotehniška fakulteta |
| University of Ljubljana, Biotechnical Faculty |

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

| |
|---|
| Gordana Glavan, gordana.glavan@bf.uni-lj.si |

3.  Raziskovalno področje (*Research field*):

| |
|---|
| 1.03 Biologija |
| 1.03 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.

*slo:* Od kandidata/-tke pričakujemo, da bo imel(a) zaključen magistrski študij smeri biokemija, biologija, biotehnologija, veterina in sorodnih smeri. Osnovno področje raziskovalnega programa mladega raziskovalca bo zajemalo fiziologijo in vedenje medonosnih čebel. Raziskave bodo usmerjene v preučevanje vpliva različnih tujih snovi-ksenobiotikov (pesticidov, čebelarskih akaricidov ipd.), ki pomembno vplivajo na preživetje čebel. Kandidat/-ka bo preučeval(a) njihov vpliv na imunski sistem, na mehanizme oksidativnega stresa, energetski metabolizem, na sisteme za detoksifikacijo in živčni sistem. Pri raziskavah bo mladi/-a raziskovalec/-ka uporabljal(a) različne molekularne ter histološke metode za ugotavljanje aktivnosti različnih encimov, pomembnih za detoksifikacijo ter delovanje živčnega sistema. Spremljal(a) bo tudi različne komponente imunskega sistema čebel. Ugotavljal-a bo tudi interakcije med socialnostjo čebel ter vplivom ksenobiotikov na imunski sistem. Vedenjski del raziskave bo vključeval specifične tehnike preučevanja sposobnosti učenja čebel ter splošno vedenjsko analizo. Zaželena je spretnost pri uporabi različnih programskih orodjih za videoanalizo ter statistično analizo, pa tudi kvalitetno znanje angleškega jezika. Upoštevane bodo predhodne izkušnje pri raziskovalnem delu v laboratoriju. Od kandidata/-tke pričakujemo samoiniciativnost in delavnost, pa tudi motiviranost za študijske obiske v raziskovalnih laboratorijih v tujini. Zainteresiranim kandidatom nudimo sproščeno in vključujoče delovno okolje in spodbujanje strokovnega in znanstvenega razvoja ter sposobnosti samostojnega raziskovalnega dela. Natančna vsebina programa za doktorsko disertacijo bo dogovorjena z izbranim/-no kandidatom/-tko.

*eng:* The young researcher must have earned a master's degree in biochemistry, biology, biotechnology, veterinary medicine or related fields. The research program will focus on studying the physiology and behavior of honey bees, with a specific emphasis on the combined effects of various exogenous chemicals, such as pesticides and acaricides, on their survival. The candidate will examine the impact of these chemicals on the immune system, oxidative stress mechanisms, energy metabolism, detoxification systems, and nervous system. Different molecular and histological methods will be used to determine the activity of various enzymes important for detoxification and the functioning of the nervous system. The candidate will also monitor the various components of the bee's immune system. The effects of xenobiotics on the immune system and bee sociality will also be examined. The behavioral aspect of the research will include

specific techniques for studying bee learning abilities and general behavioral analysis. Knowledge of various software tools for video analysis and statistical analysis would be appreciated, as well as proficiency in English. Prior experience in laboratory research work will be taken into account. Self-initiative and hard work are expected, as well as a willingness to travel to research laboratories abroad for study visits. We provide a supportive and inclusive work environment that encourages the professional and scientific development of young researchers, as well as their research independence. The exact content of the thesis program will be agreed upon with the selected candidate.

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


1. Članica UL (*UL member)*:

Biotehniška fakulteta


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

Mojca Golobič  mojca.golobic@bf.uni-lj.si


3. Raziskovalno področje (*Research field*):

Urejanje krajine


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:* Usposabljanje mladega raziskovalca/raziskovalke bo potekalo v okviru doktorskega študija bio-znanosti, smer krajinska arhitektura, ali drugega primerljivega študiju na področju urejanja prostora. Vsebina raziskovalnega dela se bo navezovala na raziskovalno delo na Oddelku za krajinsko arhitekturo BF, zlasti na rezultate potekajočega projekta CRP (prenova Regionalne razdelitve krajinskih tipov Slovenije in izjemnih krajin ter njihova digitalizacija). Z raziskavo bodo zajeti podatki o krajinah v Sloveniji nadgrajeni in uporabljeni za pridobivanje izvirnih spoznanj o krajini in njenih spremembah. Cilji raziskave so prispevati k teoriji na področju vzročno posledičnih povezav v spreminjanju krajine ter oblikovanja krajinske identitete in prepoznavnosti krajin. Namen raziskave je tudi odgovoriti, ali merila in modeli varovanja in upravljanja krajin ustrezajo sodobni interpretaciji vrednosti krajin, in ali ohranjajo vlogo krajin kot ključnih gradnikov identitete. S tem bodo rezultati raziskave pripomogli k sodobnejšim, ustreznejšim in bolj učinkovitim pristopom k varstvu, upravljanju in načrtovanju krajin.

Poleg doktorskega študija delo vključuje:
- Sodelovanje pri raziskovalnem delu v skupini, predvsem na nalogah, ki se povezujejo s temo doktorske naloge,
- Sodelovanje pri pedagoškem delu,
- Predstavitve rezultatov raziskav na domačih in tujih konferencah in v publikacijah ter druge naloge pri diseminaciji in promociji raziskovalnega dela.

Kandidat/ka mora imeti ustrezno predizobrazbo prostorske smeri, vsaj osnovno znanje uporabe GIS in statističnih programov ter sposobnost samostojnega in timskega dela.


*eng:* The training of the young researcher will follow the doctoral study program Bio-science, field of landscape architecture, or other comparable study in the field of spatial planning. The content of the doctoral research will relate to research work at the Department of Landscape Architecture at Biotechnical faculty, in particular the results of the ongoing applied project (Renovation of the Regional distribution of landscape types and exceptional landscapes of Slovenia and their digitalization). The research will upgrade the data on landscapes in Slovenia and be used to obtain original knowledge about the landscape and its changes. The objectives of the research are to contribute to theory in the field of landscape change and landscape identity. The purpose of the research is also to answer whether the criteria and models of landscape protection and management correspond to a modern interpretation of landscape value, and whether they preserve the landscapes as key building blocks of identity. In this way, the results of the research will contribute to more modern, appropriate and effective approaches to the protection, management and planning of landscapes.
In addition to doctoral studies, the work tasks include:
- Participation in research work of the research team, especially in tasks related to the topic of the doctoral thesis,
- Participation in teaching,
- Presentation of research results at conferences and publications and other tasks in the dissemination and promotion of research work.
The candidate must have an appropriate pre-education in field related to spatial planning, at least basic knowledge of the use of GIS and statistical programs, and the ability to work independently and in a team.

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


1. Članica UL (*UL member)*:

Biotehniška fakulteta, Odd. Biologija


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

Nina Gunde – Cimerman Email: nina.gunde-cimerman@bf.uni-lj.si


3. Raziskovalno področje (*Research field*):

Mikrobiologija ekstremofilnih gliv


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: Raziskovalna skupina za Biologijo mikroorganizmov, ki jo vodi predvidena mentorica, se ukvarja z biologijo ekstremofilnih gliv, zlasti tistih, ki so prilagojene na nizko vodno aktivnost na račun visokih koncentracij soli ali ledu. V lanskem letu smo vzorčili Salar Uyuni, največje slano jezero na svetu, ki se nahaja v Boliviji na visoki andski planoti na višini 4ooo m in vsebuje 7% svetovnih zalog litija (v obliki LiCl2). V okviru doktorske disertacije bo mladi raziskovalec/ka s sekvenciranjem nove generacije DNA analiziral celokupno DNA vzorcev vode in soli osamljenih na tem področju in preko ITS določil diverziteto gliv. Med kulturami gliv, ki so bile osamljene na tem področju bo izbrana na osnovi presevnih testov ekstremotolerance ena vrsta kvasovk, ki jo bo gojil tako na kozmotropnih kot tudi na kaotropnih soleh, s poudarkom na Litiju. Določal bo rastne krivulje, sekvenciral in analiziral genom in transkriptom pri pogojih visoke slanosti (NaCl v primerjavi z LiCl2) oz. brez soli. Identificiral bo gene, ki sediferencialno izražajo. Izbrani tarčni gen bo prenesel v pivsko kvasovko in potencialno povečal njeno toleranco tako na Li kot tudi na Na ione. Ta naloga pokriva pionirsko, skoraj povsem neraziskano področje, ki pa ima izjemen aplikativni pomen zaradi naraščanja onesnaženja v okolju z Li, v povezavi z baterijami in potrebi po njegovi ponovni uporabi. .*


*eng: Research group for the biology of Microorganisms, lead by N. Gunde – Cimerman, is focused on the biology of extremophilic fungi, in partiicular those adapted to low water activity due to either high salt or ice. Last year we sampled Salar Uyuni, the biggest salt lake in the world,, situated in Bolivian high Andean plateau, at 4000m. It contains 7% of global reserves of LiCl2. In the frame of the Ph.D. the young researcher will sequence the total DNA isolated from samples of salt and brine from the area and will determine the fungal diversity using amplicon sequencing of ITS. Among cultures of fungi isolated from the samples from this area a yeast species will be selected for further analyses. This yeast will be cultivated on different kosmotropic and chaotropic salts. The empahsis will be on it's ability to grow on Lithium salts. He/she will determine growth curves, sequence the genome of the species, analyse it and determine the transcriptome at high salinity (NaCl in comparison with Li2) and in comparison with conditions without any added salt. He/she will identify the most differentially expressed genes. Selected target gene will be selected to be used for transformation of S.cerevisiae and it's potential increase in halotolerance will be determined. This research theme represent an almost totally unexplored field, which has a very high potential applied impact, due to increased environmental pollution with lithium related to batteries and need to reuse it.*

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

1. Članica UL (*UL member)*:

| |
|---|
| Biotehniška fakulteta, Jamnikarjeva 101, 1000 Ljubljana |

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

| |
|---|
| Simon Horvat simon.horvat@bf.uni-lj.si |

3. Raziskovalno področje (*Research field*):

| |
|---|
| genetika |

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:* Mladega raziskovalca (MR) bi vključili v tekoče delo programske skupine P4 0220 na področju genetike kompleksnih lastnosti, kot je debelost. Vključili bi ga tudi v projekt, ki ga prijavljamo na razpisu Agencije za raziskovalno dejavnost in inovacije republike Slovenije (ARIS) skupaj s češko agencijo GA ČR (oddajni rok april 2024). Tudi če pri slednjem projektnem razpisu ne bi bili uspešni, se bo sodelovanje z člani te projektne skupine začelo v manjšem obsegu in financiralo iz sredstev MR ter obeh programov na naši inštituciji ter programske skupine čeških sodelavcev.

Debelost postaja glavna svetovna epidemija, povezana z več metaboličnimi zapleti in povečanim tveganjem za povezane bolezni. Skeletna mišica predstavlja 40-50% telesne mase in je eden od najpomembnejših organov za presnovo in porabo energije. Fenotip skeletne mišice pri debelosti posreduje kompleks okoljskih in genetskih dejavnikov, vendar so specifični učinki obeh dejavnikov na strukturne, biokemične in funkcionalne spremembe v skeletnih mišicah, ki prispevajo k celotni metabolični deregulaciji, še vedno slabo razumljeni. V tem kontekstu je identifikacija novih genetskih dejavnikov, ki regulirajo fenotip skeletne mišice, potrebna za boljše razumevanje osnovnih mehanizmov genetske kontrole debelosti in metaboličnega zdravja ter omogoča identifikacijo novih tarč za prihodnje terapevtske posege. Za celovito razumevanje genetske osnove debelosti je potreben premik onkraj kartiranja genov za debelost k funkcionalno-genetskim študijam, ki neposredno naslavljajo vzročnost, kar je glavni namen raziskovalnega programa MR.

Glavni genetski model, ki ga bo MR uporabljal je edinstven mišji model, selektivno vzrejen za debelost (linija Fat) in vitkost (linija Lean). Ta model nudi možnost identifikacije genov, relevantnih za človeško poligeno debelost. Naša prejšnja raziskava s tem modelom je z genetskim kartiranjem in študijo izražanja identificirala fosfolipazo A2 skupine IVE (*Pla2g4e*) kot potencialni gen za debelost, ki deluje v skeletni mišice. Vzorci različnih skeletnih mišici in drugih tkiv so že izbrani in predhodne študije na tem živalskem modelu.
MR bo s svojim projektom testiral hipotezo, da je prekomerno izražanje *Pla2g4e* v mišičnih vlaknih gonilni dejavnik za fenotip debelosti v skeletnih mišicah preko modifikacije sestave mišičnih vlaken in poslabšanjem mitohondrijske funkcije. Tako bodo glavni cilji predlaganega MR projekta 1) karakterizirati izražanje *Pla2g4e* v skeletni mišici na RNA in proteinski ravni v mišjem modelu debelosti/vitkosti 2) analizirati polimorfizme promotorja *Pla2g4e*, ki so vzročni za diferencialno izražanje z uporabo luciferaznega promotorskega poročevalskega testa 3) sodelovanje pri analizi izražanja različnih mišičnih skupin z novo tehnologijo prostorske transkriptomike (angl. Spatial transcriptomics) ter pri potrjevanju nekaterih rezultatov iz mišjega modela v človeškem skeletnem mišičnem tkivu na vzorcih avtopsij debelih in kontrolnih ljudi. Z integracijo genetskih, molekularnih, in naprednih analitičnih tehnik kot je prostorska transkriptomika, bo predlagana raziskava prispevala

k širšemu razumevanju genetike debelosti in bi lahko vodila do novih personaliziranih zdravljenj debelosti, ki ciljajo specifične genetske poti v skeletnih mišicah.

Prednost pri izbiri kandidata za ta projekt bodo imeli kandidati s končanim študijem 2. stopnje na področju bioznanostih, predvsem biotehnologije ali biokemije. Zaželene so predhodne izkušnje s področja molekularne biologije, genetike in bioinformatike.

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*eng:* The young researcher (MR) would be involved in the ongoing work of the program group P4 0220 in the field of genetics of complex traits, such as obesity. MR would also be included in the project that we are applying at the call of the Agency for Research and Innovation of the Republic of Slovenia (ARIS) together with the Czech agency GA ČR (submission deadline April 2024). Even if we are not successful in the latter project call, cooperation with members of this project group will start on a smaller scale and will be funded from the resources of MR project and both programs at our institution and the program group of Czech colleagues.

Obesity is becoming the main global epidemic, associated with several metabolic complications and an increased risk for related diseases. Skeletal muscle represents 40-50% of body mass and is one of the most important organs for regulating metabolism and energy expenditure. The phenotype of skeletal muscle in obesity mediates a complex of environmental and genetic factors, but the specific effects of both factors on structural, biochemical, and functional changes in skeletal muscles, contributing to overall metabolic deregulation, are still poorly understood. In this context, the identification of new genetic factors that regulate the phenotype of skeletal muscle is necessary for a better understanding of the basic mechanisms of genetic control of obesity and metabolic health and allows for the identification of new targets for future therapeutic interventions. A comprehensive understanding of the genetic basis of obesity requires a shift beyond mapping genes for obesity to functional-genetic studies that directly address causality, which is the main purpose of the MR research program.

The main genetic model to be used by MR is a unique mouse model, selectively bred for obesity (Fat line) and leanness (Lean line). This model offers the possibility to identify genes relevant for human polygenic obesity. Our previous research with this model has identified phospholipase A2 group IVE (*Pla2g4e*) as a potential obesity gene, which acts in skeletal muscle, through genetic mapping and expression study. Samples from various skeletal muscles and other tissues have already been collected in preliminary studies on this animal model. MR will test the hypothesis that the overexpression of *Pla2g4e* in muscle fibers is a driving factor for the obesity phenotype in skeletal muscles through modification of muscle fiber composition and reducing mitochondrial function. Thus, the main objectives of the proposed MR project are 1) to characterize the expression of *Pla2g4e* in skeletal muscle at the RNA and protein levels in the mouse model of obesity/leanness 2) to analyze the promoter polymorphisms of *Pla2g4e* that are causal for differential expression using a luciferase promoter reporter assay 3) to collaborate in the analysis of expression of different muscle groups with new spatial transcriptomics technology and in confirming some results from the mouse model in human skeletal muscle tissue from autopsy samples of obese and control individuals.
By integrating genetic, molecular, and advanced analytical techniques such as spatial transcriptomics, the proposed research will contribute to a broader understanding of obesity genetics and could lead to new personalized obesity treatments targeting specific genetic pathways in skeletal muscles.
Preference in selecting a candidate for this project will be given to candidates with a completed 2nd level degree in the field of biosciences, especially biotechnology or biochemistry. Previous experience in the field of molecular biology, genetics, and bioinformatics is desirable.

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


1. Članica UL (*UL member)*:

Biotehniška fakulteta, Biotechnical Faculty


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

Miha Humar; miha.humar@bf.uni-lj.si


3. Raziskovalno področje (*Research field*):

Lesarstvo / Wood Science and Technology


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:*
*Les je eden izmed najpomembnejših gradbenih materialov, ki je kot material biološkega izvora izpostavljen širokemu spektru abiotskih in biotskih dejavnikov razkroja. V naravi so ti procesi zaželeni, kadar pa les uporabljamo v komercialne namene, želimo te procese čim bolj upočasniti. V preteklosti smo v ta namen uporabljali predvsem biocide, danes želimo procese razgradnje upočasniti s postopki ne-biocidne zaščite. Sodobni pristopi ne-biocidne zaščite temeljijo na modifikaciji lesa in konstrukcijske zaščite.*

*Ideja modifikacije lesa temelji na fizikalnih in kemijskih postopkih, s katerimi spremenimo strukturo lesa tako, da ne absorbira vode, oziroma ga glive ne prepoznajo, kot vir hrane. Primerljiva so tudi izhodišča konstrukcijske zaščite lesa, ko želimo da se les med padavinskimi dogodki čim manj navlaži, oziroma se čim hitreje posuši. Zato želimo razviti metode, za čim bolj časovno učinkovito spremljanje vlažnosti lesa.*

*Eden od načinov spremljanja dinamike navlaževanja je hiperspektralno slikanje. S hiperspetralnim oslikovanjem lahko hitro pridemo do podatkov o porazdelitvi vlažnosti po površini, oziroma preseku lesa. Hiperspektralno slikanje zbira in obdeluje informacije iz celotnega elektromagnetnega spektra. Cilj hiperspektralnega slikanja je pridobiti spekter za vsak piksel na sliki prizora z namenom iskanja predmetov, identifikacije materialov ali odkrivanja procesov. Medtem ko človeško oko vidi barvo vidne svetlobe večinoma v treh pasovih (dolge valovne dolžine - zaznavamo jih kot rdečo, srednje valovne dolžine - zaznavamo jih kot zeleno in kratke valovne dolžine - zaznavamo jih kot modro), spektralno slikanje razdeli spekter na veliko več pasov. To tehniko delitve slik na pasove je mogoče razširiti tudi zunaj vidnega spektra. Pri hiperspektralnem slikanju imajo posneti spektri fino ločljivost valovne dolžine in pokrivajo širok razpon valovnih dolžin.*

Tema usposabljanja mladega raziskovalca bo povezana z aplikacijo hiperspektralne analize v lesarstvu. Mladi raziskovalec bo analiziral dinamiko vlaženja in sušenja lesa in te analize apliciral na modificiran les, les obdelan s hidrofobnimi pripravki, kulturno dediščino, star les …


*eng:*
Wood is one of the most important building materials and, as a material of biological origin, is exposed to a wide range of abiotic and biotic decomposition factors. These processes are desirable in nature, but when wood is used commercially, we want to slow them down as much as possible. In the past, biocides were mainly used for this purpose, but today, we want to slow down the decomposition processes by using non-biocide protection processes. Modern approaches to non-biocide protection are based on wood modification and structural protection.

The idea of wood modification is based on physical and chemical processes that change the structure of the wood so that it does not absorb water or is not recognised by fungi as a food source. The starting points of structural wood protection are also comparable, where we want the wood to get as little wet as possible during rainfall events or to dry as quickly as possible. Therefore, we want to develop methods to monitor wood moisture as efficiently as possible over time.

One way to monitor the dynamics of wetting is through hyperspectral imaging. With hyperspectral imaging, we can quickly obtain information on the moisture distribution across the surface, or cross-section, of the wood.

Hyperspectral imaging collects and processes information from the entire electromagnetic spectrum. The aim of hyperspectral imaging is to obtain a spectrum for each pixel in the image of a scene to search for objects, identify materials or detect processes. While the human eye sees the colour of visible light mainly in three bands (long wavelengths - perceived as red, medium wavelengths - perceived as green, and short wavelengths - perceived as blue), spectral imaging divides the spectrum into many more bands. This technique of dividing images into bands can be extended beyond the visible spectrum. In hyperspectral imaging, the spectra recorded have fine wavelength resolution and cover a wide range of wavelengths.

The topic of the young researcher's training will be related to the application of hyperspectral analysis in the wood industry. The young researcher will analyse the dynamics of wood wetting and drying and apply these analyses to modified wood, wood treated with hydrophobic preparations, cultural heritage, old wood, etc.

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

1.  Članica UL (*UL member)*:

Biotehniška fakulteta / Biotechnical faculty

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

Jernej, Jakše; jernej.jakse@bf.uni-lj.si

3.  Raziskovalno področje (*Research field*):

Klasifikacija ARIS
4.03.01 Biotehnika       Rastlinska produkcija in predelava  Kmetijske rastline
4.06.05 Biotehnika       Biotehnologija      Rastlinska biotehnologija
Klasifikacija CERIF
B006      Biomedicinske vede          Agronomija
Klasifikacija FORD
4.01      Kmetijske vede in veterina          Kmetijstvo, gozdarstvo in ribištvo
4.04      Kmetijske vede in veterina          Kmetijska biotehnologija

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:*
**Interakcije pri odzivu rastlin na patogene: celostni pogled na obrambne mehanizme**
Raziskovalna naloga oziroma delovno mesto mladega raziskovalca bo tematsko povezano z aktualnim raziskovalnim programom P4-0077 – "Kmetijske rastline, genetika in sodobne tehnologije". Med programskimi aktivnostmi posebno mesto zavzema preučevanje interakcij med rastlinami in patogenimi organizmi, področje, na katerem se bo angažiral mladi raziskovalec. Temeljni cilj raziskav na tem področju je razumeti interakcije med rastlinami in patogeni, s praktičnimi cilji pa želimo izboljšati zdravstveno stanje rastlin s pomočjo alternativnih pristopov in prispevati k prehranski varnosti. V ospredju naših raziskav sta dva glavna patogena organizma: verticilijska uvelost in viroidi, pri čemer kot raziskovalno rastlino uporabljamo hmelj. Raziskave lahko razširimo tudi na modelne rastline, kot sta tobak in *Arabidopsis*. Interakcije preučujemo na celovitem nivoju – epigenoma, genoma, transkriptoma in proteoma. Metodologija vključuje visoko prepustno sekvenciranje nukleinskih kislin in nadaljnje bioinformatske analize. Rezultate verificiramo z uporabo alternativnih metodoloških pristopov in funkcionalnih študij. Naš laboratorij je opremljen z obsežnim naborom metod in opreme, ki jih po potrebi dopolnjujemo s sodelovanjem z domačimi in tujimi raziskovalnimi skupinami.

Dodatni zaželeni pogoji vključujejo zanimanje za gojenje rastlin, zaključen dodiplomski študijski program s pridobljenimi osnovnimi veščinami v tehnikah rekombinantne DNA (kloniranje, PCR, qPCR, sekvenciranje), osnovne veščine uporabe Linux okolja in bioinformatskih orodij ter osnovno poznavanje statistike.

*eng:*
**Interactions in Plant Responses to Pathogens: A Comprehensive View on Defense Mechanisms**
The research task or position of a young researcher will be thematically related to the current research program P4-0077 - "Agricultural Crops, Genetics, and Modern Technologies." Among the program activities, a special focus is on studying the interactions between plants and pathogenic organisms, an area in which the young researcher will engage. The fundamental goal of research in this area is to understand the interactions between plants and pathogens, with practical objectives aimed at improving the health of plants through alternative approaches and contributing to food security. The main two pathogenic organisms under investigation are Verticillium wilt and viroids, with hops being used as the research plant. The research can also extend to model plants, such as tobacco and *Arabidopsis*. Interactions are studied at a comprehensive level – epigenome, genome, transcriptome, and proteome. The methodology includes high-throughput sequencing of nucleic acids and further bioinformatic analyses. Results are verified using alternative methodological approaches and functional studies. Our laboratory is equipped with a wide range of methods and equipment, which we can supplement as needed through collaboration with domestic and international research groups.

Additional desirable conditions include an interest in plant cultivation, completion of an undergraduate program with acquired basic skills in recombinant DNA techniques (cloning, PCR, qPCR, sequencing), basic skills in using the Linux environment and bioinformatics tools, and a basic understanding of statistics.

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


1. Članica UL (*UL member)*:

| Biotehniška fakulteta |
|---|


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

| Kristjan Jarni, kristjan.jarni@bf.uni-lj.si |
|---|


3. Raziskovalno področje (*Research field*):

| Gozdarstvo, lesarstvo in papirništvo |
|---|


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.

Usposabljanje mladega raziskovalca bo potekalo na Katedri za gojenje gozdov Oddelka za gozdarstvo in obnovljive gozdne vire Biotehniške fakultete Univerze v Ljubljani.

Program usposabljanja bo s področja dendrologije, žlahtnjenja gozdnega drevja in gozdne/populacijske genetike. Delo bo vključevalo raziskovanje raznolikosti in genetske strukture populacij lesnatih vrst ter njihove odzive na okoljske spremembe. Proučevanje genetske variabilnosti znotraj in med populacijami bo prispevalo k razumevanju vpliva genetske variabilnosti na adaptacijo vrste na okolje in izboljšanju prilagodljivosti na prihodnje klimatske razmere. Raziskave bodo vključevale zbiranje vzorcev v naravi, laboratorijske analize, uporabo bioinformacijskih orodij za analizo podatkov… Mladi raziskovalec bo predstavljal svoje ugotovitve na domačih in mednarodnih konferencah in v objavah v znanstvenih revijah.

Kandidat za prijavo na delovno mesto mladega raziskovalca mora imeti predhodno izobrazbo gozdarske ali primerljive ekološke smeri. Mladi raziskovalec se vpiše na doktorski študij Bioznanosti – smer Upravljanje gozdnih ekosistemov. Od kandidata pričakujemo aktivno znanje slovenskega in angleškega jezika, zaželene so izkušnje za delo v laboratoriju, smisel za delo v skupini ter veselje do znanstvenega dela.

Glavne naloge kandidata bodo poleg doktorskega študija še:
- sodelovanje pri raziskovalnem delu, ki se povezuje s kandidatovo temo doktorske naloge,
- sodelovanje pri pedagoškem delu,
- predstavitve rezultatov doktorske raziskave na domačih in tujih konferencah in v publikacijah.


The young researcher will be trained at the Chair of Forest Silviculture, Department of Forestry and Renewable Forest Resources, at the Biotechnical Faculty, University of Ljubljana.

The focus of the training programme is on dendrology, forest tree breeding and forest/population genetics. The work includes research into the diversity and genetic structure of populations of woody species and their responses to environmental changes. The study of genetic variability within and between populations will help to understand how genetic variability influences the adaptation of species to their environment and how this adaptability can be improved in the face of future challenges such as climate change. Research will involve collecting samples in the field, laboratory analyses and the use of bioinformatics tools to analyse data. The young researcher will present his/her results at national and international conferences and in scientific journals.

Applicants for the young researcher position must have a background in forestry or a comparable ecological field. The young researcher will enrol in the PhD programme Biosciences - direction Forest Ecosystem Management. We expect the applicant to have an active knowledge of Slovenian and English. Experience of working in a laboratory, a sense of teamwork and a passion for scientific work are desirable.

The main tasks of the applicant, in addition to the doctoral studies, will be:
- participating in research related to the topic of the doctoral thesis,
- participation in teaching activities,
- presenting the results of the dissertation at national and international conferences and publications.

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


1. Članica UL (*UL member)*:

Biotehniška fakulteta


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

Luka Juvančič, luka.juvancic@bf.uni-lj.si


3. Raziskovalno področje (*Research field*):

Ekonomika naravnih virov


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:*
V Evropski uniji kmetijstvo danes predstavlja najpomembnejši vir pritiska na kopenske ekosisteme. Rezultati monitoringov vrst in habitatnih tipov v Evropski uniji in Sloveniji kažejo na slabo stanje ohranjenosti tako na območjih Natura 2000 kot izven njih. Ključna dejavnika, ki povzročata zmanjševanje biotske pestrosti sta spremembe v rabi, ki so povezane z intenzifikacijo kmetijske pridelave, in zaraščanje kmetijske krajine zaradi opuščanja kmetovanja. Po drugi strani je kmetijstvo v zadnjih desetletjih pod izjemnim pritiskom dohodkovnega vprašanja. Izrazit tehnološki napredek, počasna mobilnost proizvodnih dejavnikov in omejene možnosti za povečanje povpraševanja po hrani vodijo v trajen pritisk na cene, ki silijo kmetijska gospodarstva v prilagajanje, strukturne spremembe in pritisk po podpornih ukrepih kmetijske politike. Doseganje naravovarstvenih ciljev v kmetijski krajini tako zahteva razvoj ustreznih sodobnih poslovnih in proizvodnih modelov, saj pretekli modeli kmetovanja pogosto niso več realno izvedljivi, ekonomsko vzdržni ali socialno sprejemljivi. V podporo temu prehodu agroživilskih sistemov bo treba preizkusiti in uveljaviti primerne podporne instrumente javnih politik in poiskati strategije za valorizacijo dodane vrednosti njihovih proizvodov na trgu. Uvedba novih pristopov v praksi pa zahteva tudi razumevanje preferenc, pričakovanj in vedenja različnih skupin kmetov, potrošnikov in drugih deležnikov v agroživilski verigi.

Doktrosko usposabljanje mladega raziskovalca bo potekalo v okviru programske skupine P4-0022 (B) Ekonomika agroživilstva in naravnih virov na Katedri za agrarno ekonomiko, politiko in pravo Oddelka za zootehniko na Biotehniški fakulteti Univerze v Ljubljani. Doktorska naloga bo potekala na področju agrarne ekonomike in varstvene biologije. Usmerjena bo v raziskave preferenc, odločanja in vedenja kmetov in potrošnikov na področju ohranjanja in obnove narave v kmetijskih ekosistemih ter v eksperimentalno vrednotenje učinkov kmetijske in naravovarstvene politike. Predviden je vpis na doktorski študij Bioznanosti – smer Ekonomika naravnih virov. Delo bo vključevalo zasnovo in izvedbo intervjujev in anket z različnimi deležniki, kvalitativne in statistične analize zbranih podatkov, pripravo znanstvenih objav in predstavitev prispevkov na znanstvenih in strokovnih srečanjih ter sodelovanje pri izvajanju raziskovalnih in strokovnih nalog, ki so v podporo usposabljanju mladega raziskovalca.

Od kandidatov pričakujemo:
- ustrezno stopnjo izobrazbe s področja kmetijskih znanosti, biologije, ekonomije, družboslovnih znanosti, geografije ali drugih sorodnih študijev,
- visoko motiviranost in zanimanje za raziskovalno delo, trajnostni razvoj kmetijstva in reševanje biodiverzitetne krize,
- dobre metodološke osnove iz statistike in/ali kvalitativnih metod analize,
- tekoče znanje angleškega jezika,
- dobre komunikacijske in timske veščine ter sposobnost samostojnega dela.


*eng:*
In the European Union, agriculture today represents the most important source of pressure on terrestrial ecosystems. The results of monitoring of species and habitat types in the European Union and Slovenia indicate their unfavourable conservation state both in the Natura 2000 areas and outside them. The key factors that cause the biodiversity decline are changes in land use and agricultural practices due the intensification of agricultural production, and the overgrowth of the agricultural landscapes due to the abandonment of farming. On the other hand, agriculture has been under tremendous economic pressure in recent decades. Pronounced technological

progress, slow mobility of production factors and limited opportunities to increase the demand for food have led to permanent pressure on prices, which caused changes in farming, structural changes and political pressure for agricultural policy support. Achieving nature conservation goals in agricultural landscapes thus requires the development of appropriate business and production models, as past farming models are often no longer realistically feasible, economically sustainable or socially acceptable. In order to enable this transition of agri-food systems, it will be necessary to test and implement suitable policy instruments and to find strategies for valorising the added value of their products on the market. The introduction of new approaches in practice also requires understanding the preferences, expectations and behaviour of different groups of farmers, consumers and other stakeholders in the agri-food chain.

The doctoral training of the young researcher will take place within the research programme P4-0022 (B) Agro-food and natural resources economics at the Chair of Agricultural Economics, Policy and Law, Department of Animal Science, Biotechnical faculty, University of Ljubljana. The PhD thesis will be conducted in the field of agricultural economics and conservation biology. It will be focused on the farmers' and consumers' preferences, decision-making and behaviour in the context of biodiversity conservation and restoration in agricultural ecosystems, and experimental and policy evaluations of agricultural and conservation biology. The candidate will enroll in the doctoral study program Biosciences – scientific field Economics of natural resources. The work will include the research design and implementation of interviews and surveys with various stakeholders, qualitative and statistical analyses of the collected data, preparation of scientific publications and presentation of contributions at scientific and professional meetings, as well as cooperation in the research and professional tasks that support the training of the young researcher.

We expect candidates to have:
• an appropriate level of education in the field of agricultural sciences, biology, economics, social sciences, geography or other relevant studies,
• high motivation and interest in research work, sustainable development of agriculture and solving the biodiversity crisis,
• good methodological foundations in statistics and/or qualitative methods,
• fluency in English language,
• good communication and team skills and the ability to work independently.

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


1. Članica UL (*UL member)*:

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|---|
| Biotehniška fakulteta |


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

| |
|---|
| Ines Mandić Mulec, ines.mandicmulec@bf.uni-lj.si |


3. Raziskovalno področje (*Research field*):

| |
|---|
| Mikrobiologija |


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.

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*slo:*
*Mladi raziskovalec/raziskovalka bo imel priložnost sodelovati v dinamičnem, interdisciplinarnem in mednarodno vpetem timu, ki deluje v okviru Katedre za mikrobno ekologijo in fiziologijo, Oddelka za mikrobiologijo, Biotehniške fakultete, kjer raziskujemo »socialne« interakcije mikroorganizmov v večceličnih skupnostih- biofilmih. Naš cilj je razumeti molekularne mehanizme, ekologijo in evolucijo mikrobnega komuniciranja, sodelovanja, tekmovanja, mikrobnih vojn in posledično morebitnega razvoj odpornosti na napad. V programski skupini je na voljo vrhunska raziskovalna oprema, ki omogoča poglobljeno raziskovanje medceličnih interakcij: nor konfokalna in super resolucijska mikroskopija, pretočna citrometrija, fluorometrija, celično sortiranje, meritve v večnamenskih čitalcih (npr, OD, fluoroescence), metode genetike, rekombinatne DNK, mikrofluidike, znanja bioinformatike, primerjalne genomike. Na voljo je tudi bogata zbirka mikroorganizmov, rekombinatnih sevov ter eksperimentalnih modelnih sistemov za študij mikrobne socialnosti. Raziskujemo socialne odnose mikroorganizmov na nivoju molekul, posamezne celice, populacije in združbe. Rezultate objavljamo v vrhunskih znanstvenih revijah ter razvijamo temeljna in uporabna znanja na področju mikrobiologije.*

*Kratka vsebina projekta mladega raziskovalca: Eden največjih problemov današnjega časa je razvoj odpornosti na antibiotike patogenih mikroorganizmih, ki jo spodbujamo s prekomerno uporabo antibiotikov. Zato danes iščemo nove rešitve tega problema med katere uvrščamo tudi probiotike (koristne mikroorganizme), ki so vse več v uporabi kot prehranski dodatki za ljudi in živali. Ali in kako probiotiki vplivajo na prenos/razvoj odpornost na antibiotike pri patogenih bakterijah in kako patogene bakterije vplivajo na produkcijo antibiotikov pri probiotiku, je slabo raziskano. Glavni cilj doktorske naloge bo raziskati s pristopi eksperimentalne evolucije kako dolgotrajna kokultivacija probiotika (Bacillus subtilis) in patogena ( npr. iz rodu Salmonella, Campylobacter) vpliva na socialne odnose dveh bakterij. Mladi raziskovalec bo sledil spremembam obeh bakterijskih vrst v kokulturi oz monokulturi skozi čas in to na nivoju genoma in različnih fenotipov: npr izražanja genov, virulence, biofilma, vpliva na črevesni epitel (tkivna kultura) in drugih relevantnih fenotipov.*

*Prednosti bodo imeli kandidati/kandidatke, ki imajo izkušnje na področju bioinformatike, odlično znanje angleškega jezika in izkušnje z relevantnimi metodami.*

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*eng: The young researcher will be a member of a dynamic, interdisciplinary and internationally integrated team that works within the Department of Microbial Ecology and Physiology, Department of Microbiology, Faculty of Biotechnology. We investigate the "social" interactions of microorganisms in multicellular communities - biofilms. Our goal is to understand the molecular mechanisms, ecology and evolution of microbial communication, cooperation, competition and antagonism. In the program group, top-notch research equipment is available, which enables the in-depth research of molecular mechanisms driving mircobial sociality. Laboratories are equiped with*

*confocal and super-resolution microscopy, flow cytometry, cell sorting, multimode readers (for OD and fluroecence measurments etc), We apply methods of genetics, recombinant DNA, microfluidics, bioinformatics - comparative genomics. In addition a rrich collection of microorganisms including recombinat strains and models based on tisse cultures are availbe. Hence we are able to experimentaly aderss microbial sociality at the level of molecules, individual cells, populations and communities. We publish the results in top scientific journals and develop fundamental and useful knowledge in the field of microbiology.*

*Brief content of the young researcher's project: One of the biggest problems of today is the development of antibiotic resistance in pathogenic bacteria, which is encouraged by the excessive use of antibiotics. That is why new solutions are uregently needed and application of probiotics (beneficial microorganisms) is offering a potential solution. Probiotics are increasingly being used as nutritional supplements for humans and animals. However, whether and how probiotics affect the transmission/development of antibiotic resistance in pathogenic bacteria and how pathogenic bacteria affect antibiotic production by the probiotic strains is poorly understood. The main goal of the doctoral thesis will be to investigate how long-term co-cultivation of a probiotic (Bacillus subtilis) and a pathogen (e.g. from the genus Salmonella or Campylobacter) influence social traits including antibiotic resistance. The PhD candidate will apply methods of experimental evolution and and various experimental model system that are used in the group to describe relevant genotypes and phenotypes in evolved bacteria.*

*Candidates with experience in the field of bioinformatics and experience with relevant methods will have advantages. Excellent knowledge of the English language is a must.*

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


1.  Članica UL (*UL member)*:

Bitehniška fakulteta / Biotechnical faculty


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

Tomaž Polak; tomaz.polak@bf.uni-lj.si


3.  Raziskovalno področje (*Research field*):

4.02; Biotehnika; Živalska produkcija in predelava; Mikotoksini
4.02; Biotechnical sciences; Animal production; Mycotoxins


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:*
Mladi raziskovalec/ raziskovalka se bo vključil(a) v raziskave na področju **proučevanja mikotoksinov v modelnih sistemih in mesnih izdelkih**. Študija bo obravnavala več ciljev trajnostnega razvoja, ki so tudi del nekaterih globalnih ciljev, določenih pri Združenih narodih; Cilj 2 – Odprava lakote: Raziskave mikotoksinov in njihovega vpliva na mesne izdelke so neposredno povezane z varnostjo hrane. Razumevanje in ublažitev kontaminacije z mikotoksini bo prispevalo k zagotavljanju varnejše in hranljive hrane. Cilj 3 – Zdravje in dobro počutje: Besedilo poudarja potencialne učinke mikotoksinov na zdravje ljudi in živali. Raziskovanje in zmanjšanje tvorbe mikotoksinov v mesnih izdelkih je v skladu s ciljem spodbujanja dobrega zdravja in počutja. Cilj 12 – Odgovorna poraba in proizvodnja: Cilj študije je razviti modele in strategije za zmanjšanje prisotnosti mikotoksinov v mesnih izdelkih, kar je v skladu z zagotavljanjem trajnostnih vzorcev potrošnje in proizvodnje. Cilj 13 – Podnebni ukrepi: Raziskava omenja podnebne spremembe, ki so posledica globalnega segrevanja in vplivajo na razvoj toksigenih plesni. Razumevanje omenjenih vplivov lahko prispeva k obravnavi podnebnih sprememb. Z izvedeno študijo bomo pomembno prispevali k bolj trajnostni in odporni verigi preskrbe s hrano. Večina raziskovalnega dela bo potekala v laboratoriju.
Prednost bodo imeli kandidati s predznanjem na področju živilske tehnologije, ki je temelj raziskav. Zaželeno je znanje tekočinske kromatografije.


*eng:*
The young researcher will be involved in research in the field of studying mycotoxins in model systems and meat products. Present study addresses several Sustainable Development Goals (SDGs), which are a set of global goals established by the United Nations; Goal 2 - Zero Hunger: The research on mycotoxins and their impact on meat products is directly related to food safety and security. Understanding and mitigating mycotoxin contamination contribute to ensuring safe and nutritious food. Goal 3 - Good Health and Well-being: The text highlights the potential health effects of mycotoxins on humans and animals. Investigating and minimizing mycotoxin formation in meat products aligns with the goal of promoting good health and well-being. Goal 12 - Responsible Consumption and Production: The project aims to develop models and strategies to reduce the presence of mycotoxins in meat products. This aligns with the goal of ensuring sustainable consumption and production patterns. Goal 13 - Climate Action: The study mentions climate changes caused by global warming affecting the developmental stages of toxigenic fungi. Understanding these climate-related impacts contributes to addressing climate change concerns. By addressing these goals, the research aims to contribute to a more sustainable and resilient food supply chain.
Preference will be given to candidates with prior knowledge in the field of food science and technology, which is the basis of research. Knowledge of liquid chromatography preferred.

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

1. Članica UL (*UL member)*:

| |
|---|
| Univerza v Ljubljani, Biotehniška fakulteta<br>University of Ljubljana, Biotechnical Faculty |

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

| |
|---|
| Denis Rusjan, denis.rusjan@bf.uni-lj.si |

3. Raziskovalno področje (*Research field*):

| |
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| 4.03 Rastlinska produkcija in predelava |

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:*
Rastlinska pridelava oziroma pridelava rastlinske hrane se sooča s kompleksnimi izzivi, ki jih povzročajo spreminjajoče se podnebne, ekonomske, naravovarstvene in družbene razmere. Edino sprejemljiva je trajnostna pridelava, ki ne zagotavlja samo okoljske, ampak tudi ekonomske in socialno-družbene stabilnosti, kar je nujno za nacionalno prehransko samooskrbo in družbeno neodvisnost. Na prehodu v zeleno, digitalno in podnebno nevtralno rastlinsko pridelavo, morajo pridelovalci hrane čim hitreje prilagoditi tehnologije pridelave, ki vključujejo digitalna orodja in obenem naravi sprejemljivejše ukrepe, s katerimi na kmetijskem gospodarstvu zagotavljajo ustrezno ekonomsko varnost. Družbeno zavedanje o okoljskih vprašanjih narašča, kar postavlja pritisk na pridelovalce hrane, da sprejmejo ukrepe, ki vključujejo zmanjšanje uporabe pesticidov in mineralnih gnojil in obenem uporabo obnovljivih virov energije, ohranjanje biotske raznovrstnosti ter skrb za ohranjanje zdravih kmetijskih ekosistemov. Z znanstvenega in strokovnega stališča vidimo velike možnosti v uporabi biostimulantov tudi v trajnih nasadih. Biostimulanti so raznolika skupina naravnih ali sintetičnih snovi, ki spodbujajo rast, razvoj, odpornost in kakovost rastlin. Njihova uporaba v vinogradništvu postaja vse bolj priljubljena, saj lahko prinašajo več prednosti, kot so povečana odpornost na stres, izboljšana kakovost pridelka in zmanjšana uporaba pesticidov. Biostimulante lahko uporabljajo v vinogradništvu za:
(i) spodbujanje koreninskega razvoja, saj pričakujemo povečano absorpcijo vode in hranil, kar rastlinam pomaga bolje prenesti sušo in druge stresne razmere;
(ii) povečanje tolerance na bolezni, škodljivce in abiotične stresne dejavnike, kot so ekstremne temperature, vročinski valovi, pomanjkanje vode itn.;
(iii) izboljšanje količine, kot tudi kakovosti grozdja in vina, tako na primernem kot tudi sekundarnem metabolizmu (topna suha snov, organske kisline, fenolne in aromatične spojine);
(iv) hitrejše okrevanje po sušnem, vročinskem ali vodnem stresu, saj številni biostimulanti pomagajo rastlinam hitreje okrevati in zmanjšati škodo;

(v) zmanjšanje uporabe pesticidov in gnojil, kar prispeva k zmanjšanju vpliva na okolje in nenazadnje

(vi) izboljšanje trajnosti, saj zmanjšajo potrebo po uporabi pesticidov, povečajo učinkovitost hranjenja in povečajo odpornost rastlin na ekstremne pogoje.

Pri uporabi biostimulantov je pomembno upoštevati pravilno doziranje in uporabiti izdelke, ki so primerni za specifične potrebe vinograda in okolja. Prav tako je pomembno slediti navodilom proizvajalca ter upoštevati lokalne zakonodajne zahteve in smernice za uporabo takšnih izdelkov.

Mlad(i/a) raziskoval(ec/ka) se bo najprej lotil(a) zasnove raziskovalnega načrta, ki bo omogočil sistematično in znanstveno analizo vpliva biostimulantov na rast in razvoj trte, ter na kakovost grozdja in vina. Ta načrt bo upošteval več dejavnikov, kot so izbira biostimulantov, metode aplikacije, časovni okvir študije in parametri za oceno rasti, razvoja ter kakovosti grozdja in vina, na nivoju primarnega in sekundarnega metabolizma. Mlad(a/i) raziskoval(ec/ka) bo moral(a) voditi natančne in dosledne zapise ter zagotoviti ustrezno ponovljivost eksperimentov, da bo lahko zanesljivo potrdil(a) ali ovrgel(a) hipoteze o vplivu biostimulantov na rast in razvoj trte ter na kakovost grozdja in vina. Končni cilj je prispevati k boljšemu razumevanju uporabe biostimulantov v vinogradništvu in njihovemu potencialu za izboljšanje trajnosti ter kakovosti pridelka in obenem k oblikovanju tehnoloških navodil za vinogradnike.

V okviru delovnega mesta bodo za opravljanje vseh potrebnih študij, poleg celotne raziskovalne opreme, na voljo tudi ustrezni infrastrukturni objekti, ki so na razpolago v okviru Hortikulturnega centra BF ter Ampelografskega vrta.

Od kandidat(a/ke) se pričakuje dobro poznavanje (i) tehnoloških praks in ukrepov v vinogradu in (ii) fizioloških in biokemijskih procesov ter (iii) metabolizmov v rastlin, kar kandidat(ka) dokazuje z opravljenimi ustreznimi izpiti na BSc in MSc stopnji. Zaželene so izkušnje z delom v laboratoriju, sodelovanje pri raziskovalnem delu in dobro znanje angleškega jezika.

*eng:*

Plant food production is facing complex challenges caused by changing climate, economic, environmental, and social conditions. The only acceptable approach is sustainable production, which ensures not only environmental but also economic and socio-cultural stability, which is necessary for national food self-sufficiency and social independence. In transitioning to green, digital, and climate-neutral plant production, food producers must quickly adapt production technologies, including digital tools, and at the same time implement nature-friendly measures to ensure adequate economic security on agricultural farms. Social awareness of environmental issues is increasing, putting pressure on food producers to take measures that include reducing the use of pesticides and mineral fertilizers, as well as using renewable energy sources, preserving biodiversity, and ensuring the maintenance of healthy agricultural ecosystems. From a scientific and professional standpoint, we see great potential in the use of biostimulants in perennial plantations as well. Biostimulants are a diverse group of natural or synthetic substances that promote the growth, development, resistance, and quality of plants. Their use in viticulture is becoming increasingly popular as they can bring several advantages, such as increased stress resistance, improved crop quality, and reduced pesticide use. Biostimulants can be used in viticulture and grapevine nursery to:

(i) promote root development, as increased water and nutrient absorption is expected, which helps plants better withstand drought and other stressful conditions;

(ii) increase tolerance to diseases, pests, and abiotic stress factors such as extreme temperatures, heatwaves, water scarcity, etc.;

(iii) improve the quantity and quality of grapes and wine, both in primary and secondary metabolism (soluble solids, organic acids, phenolic and aromatic compounds);

(iv) facilitate faster recovery from drought, heat, or water stress, as many biostimulants help plants recover more quickly and reduce damage;

(v) reduce the use of pesticides and fertilizers, contributing to environmental impact reduction, and ultimately

(vi) enhance sustainability by reducing the need for pesticides, increasing feeding efficiency, and enhancing plant resilience to extreme conditions.

When using biostimulants, it is important to consider proper dosing and use products suitable for the specific needs of the vineyard and environment. It is also important to follow manufacturer's instructions and comply with local regulatory requirements and guidelines for the use of such products.

The young researcher will first embark on designing a research plan enabling systematic and scientific analysis of the impact of biostimulants on vine growth and development, as well as grape and wine quality. This plan will consider various factors such as biostimulant selection, application methods, study timeframe, and parameters for assessing vine growth, development, and grape and wine quality, at both primary and secondary metabolism levels. The young researcher will need to maintain accurate and consistent records and ensure experiment repeatability to reliably confirm or refute hypotheses regarding the influence of biostimulants on vine growth and development, as well as grape and wine quality. The ultimate goal is to contribute to a better understanding of biostimulant use in viticulture and their potential to enhance sustainability and crop quality and at the same time to introduction of technological instructions for grape producers.

For the complex research study, all necessary research equipment is available, as well as suitable infrastructure facilities within the Horticultural Centre of BF and the Ampelographic Garden.

Candidate is expected to have a good understanding of (i) technological practices and measures in the vineyard, (ii) physiological and biochemical processes, and of (iii) plant metabolism, demonstrated through relevant examinations at the BSc and MSc levels. Experiences in laboratory work and research activities, but also good knowledge of the English language are welcome and expected.

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


1.  Članica UL (*UL member)*:

Biotehniška fakulteta (Biotechnical faculty)


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

Primož Treven; Primoz.Treven@bf.uni-lj.si


3.  Raziskovalno področje (*Research field*):

Mikrobiologija in mikrobna biotehnologija / Microbiology and Microbial biotechnology


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.

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*slo:*
Mikroplastika (MP) vključuje vse sintetične trdne delce ali polimerne spojine, ki so topni ali netopni v vodi in so velikosti od 1 µm do 5 mm, kar zajema različne oblike, odvisno od izvora in uporabe. Poznamo primarno MP, ki jo najdemo v kozmetiki in industrijskih peletih, ter sekundarno MP, ki nastane pri razgradnji večje plastike. Slednja predstavlja velik okoljski izziv, zlasti v smislu kopičenja v ekosistemih in vstopa v prehransko verigo. Kako MP vpliva na človeški organizem, je v veliki meri še neznanka. MP lahko neposredno vpliva na človeške celice, lahko so na MP vezani različni toksini in onesnaževala, lahko pa se nanjo vežejo bakterije, ki tvorijo biofilm (plastisfera), in tako vplivajo na človeške celice ali na obstoječo mikrobioto.

Usposabljanje mladega raziskovalca bo osredotočeno na proučevanje potencialnih vplivov MP na mikrobiom humanega mleka in posledično vplivov na celice mlečne žleze ter celice črevesnega epitelija. Tako bomo poskušali raziskati potencialne vplive MP na zdravje mlečne žleze kakor tudi na zdravje dojenčkov. Delo bo obsegalo postavitev metod priprave standardnih vzorcev MP, metod gojenja bakterijskih biofilmov na MP in proučevanjem vplivov teh delcev na mikrobiom in na sesalske celice (mlečne žleze, črevesni epitelij). Mladi raziskovalec bo poskušal odgovoriti na vprašanji, ali lahko biofilmi, povezani z MP, delujejo kot vir živih bakterij za razvijajočo se črevesno mikrobioto dojenčka in ali lahko tovrstni biofilmi vplivajo na zdravje mlečne žleze. Mladi raziskovalec se bo vključil v raziskovalno delo programske skupine Prehrana in mikrobna ekologija prebavil (P4-0097), ki se ukvarja s proučevanjem mikrobnih združb, ki so v širšem pomenu povezane s prebavili, med drugim tudi z mikrobioto materinega mleka.

Mladi raziskovalec bo med usposabljanjem osvojil različne *in vitro* metode, kot so kultivacija bakterij, kultivacija različnih celičnih kultur (epitelne celice, imunske celice), gojenje celic na polprepustnih membranah Transwell ter simulacija prebave. Poleg tega se bo mladi raziskovalec seznanil z različnimi pristopi detekcije MP, detekcije celičnega odziva ter detekcije mikrobiomov. Delo bo potekalo v tesnem sodelovanju z drugimi raziskovalnimi skupinami doma in v tujini, zato je zaželeno, da se je kandidat pripravljen usposabljati v drugih laboratorij, tudi v tujini. Program usposabljanja mladega raziskovalca in natančna vsebina doktorata, kot tudi izbira doktorskega študija bosta dokončno dogovorjena z izbrano/im kandidatko/om.

Mladi raziskovalec se bo vpisal na podiplomski študij Bioznanosti ali Biomedicina, imel pa bo tudi možnost aktivne udeležbe na domačih in tujih znanstvenih konferencah in različnih usposabljanj. Zaželene so izkušnje s kultivacijo bakterij in celičnih kultur, z molekularno-biološkimi tehnikami ter poznavanje osnovnih statističnih in bioinformacijskih orodij. Zaželen je magisterij na študijih mikrobiologije, biotehnologije, živilstva in prehrane, biologije, biokemije ali sorodnih smeri.

*eng:*

Microplastics (MP) include all synthetic solid particles or polymeric compounds that are soluble or insoluble in water and range in size from 1 μm to 5 mm, covering a variety of shapes depending on origin and use. Primary MP is found in cosmetics and industrial pellets, while secondary MP is produced during the breakdown of larger plastics. The latter represents a major environmental challenge, especially in terms of accumulation in ecosystems and entry into the food chain. How MP affects the human organism is still largely unknown. MP can directly affect human cells, various toxins and pollutants can be bound to MP, and biofilm-forming bacteria (plastisphere) can bind to it, thereby affecting human cells or resident microbiota.

The training of the young researcher will be focused on studying the potential effects of MP on the microbiome of human milk and the subsequent effects on the cells of the mammary gland and the cells of the intestinal epithelium. Thus, we will try to investigate the potential effects of MP on the health of the mammary gland as well as on the health of infants. The work will include setting up methods for preparing standard MP samples, methods for growing bacterial biofilms on MP and studying the effects of these particles on the microbiome and mammalian cells (mammary glands, intestinal epithelium). The young researcher will try to answer the question of whether biofilms associated with MP can act as a source of live bacteria for the developing intestinal microbiota of an infant and whether such biofilms can affect the health of the mammary gland. The young researcher will be involved in the research work of the program group Nutrition and microbial ecology of the gastrointestinal tract (P4-0097), which deals with the study of microbial communities that are broadly related to the gastrointestinal tract, including human milk. The topic of doctoral training will be adapted to the profile of the selected candidate and in accordance with the development of ongoing projects.

During the training, the young researcher will master various *in vitro* methods, such as the cultivation of bacteria, the cultivation of different cell cultures (epithelial cells, immune cells), the cultivation of cells on Transwell, and the simulation of digestion. In addition, the young researcher will learn about different approaches of MP detection, cell response detection and microbiome detection. The work will be carried out in close cooperation with other research groups at home and abroad, so it is desirable that the candidate has the desire and possibility to visit foreign institutions.

The young researcher will enrol in a postgraduate study in Biosciences, and will also have the opportunity to actively participate in domestic and foreign scientific conferences and trainings. Experience with the cultivation of bacteria and cell cultures, with molecular biological techniques and knowledge of basic statistical and bioinformatics tools is desirable. A master's degree in microbiology, biotechnology, food and nutrition, biology, biochemistry or related fields is preferred.

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

1.  Članica UL (*UL member)*:

Biotehniška fakulteta, Oddelek za lesarstvo

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

Viljem Vek, viljem.vek@bf.uni-lj.si

3.  Raziskovalno področje (*Research field*):

4.01.02 - Biotehnika/Gozdarstvo, lesarstvo in papirništvo/Lesarstvo

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: Mlada raziskovalka/mladi raziskovalec (MR) bo deloval na Katedri za kemijo lesa in drugih lignoceluloznih materialov Oddelka za lesarstvo. V kontekstu podnebnih sprememb in adaptacije verig vrednosti gozdno-lesne industrije na pričakovan vstop tujerodnih drevesnih vrst, se bo MR s svojimi raziskavami osredotočil na pridobivanje in uporabo naravnih bioaktivni spojin (imenujemo jih tudi ekstraktivi) iz drevesne biomase tujerodnih in podnebno odpornejših drevesnih vrst. MR bo pozornost namenili trajnostnemu ravnanju z naravnimi viri, v tem duhu bo poskušal najti način za učinkovito zbiranje zadostnih količin lesa in skorje za ekstrakcijo. Program usposabljanja MR predlaga razvoj okolju prijaznega protokola za enostavno in učinkovito ekstrakcijo polifenolov iz manjvrednega lesa in skorje. MR bo razvijal naravni zaščitni pripravek za les, ki bo predstavljal zeleno alternativo nevarnim sintetičnim zaščitnim sredstvom. V »zelenih« pripravkih za zaščito lesa bomo združili več naravnih komponent, ki bodo v testnih formulacijah opravljale različno funkcijo (biocidno, zadrževalno in hidrofobno). Z bio-osnovanimi pripravki bo MR impregniral vzorce manj obstojnega lesa iglavcev in listavcev ter jih testirali na biološko obstojnost in estetiko s terenskimi testi. Program usposabljanja MR predlaga tudi purifikacijo surovih hidrofilnih ekstraktov do čistih polifenolnih frakcij. Bioaktivni naravni polifenoli izkazujejo velik aplikativni potencial tudi na področju prehranskih dopolnil in naravnih baktericidnih/bakteriostatični sredstev. Ciljne spojine, to so flavonoidi, bo MR poskušal iz ekstraktov ločiti z naprednimi ekstrakcijskimi in separacijskimi metodami. Očiščene flavonoidne frakcije bo nato analiziral na antioksidativne in antibakterijske lastnosti. Program usposabljanja MR je podprt s sodobnimi analitskimi tehnikami (SEM, CLSM, (U)HPLC-PDA, ASE, PuriFlash CC, HS-GC-MSD, itn.). MR bo deloval v sodobnem raziskovalnem okolju, tekom usposabljanja bomo spodbujali individualno raziskovalno delo. Program usposabljanja MR bo povezoval znanja različnih področij, zagotovo lesarstvo, gozdarstvo in kemijo. K oddaji prijave za mesto MR vabimo kandidatke in kandidate z lesarsko izobrazbo ali izobrazbo sorodne smeri (gozdarstvo, kemija, biotehnologija, ipd.). Poleg kriterijev in meril za MR, ki jih na svoji spletni strani navaja Javna agencija za znanstvenoraziskovalno in inovacijsko dejavnost (ARIS), mora biti MR usposobljen za varno delo v laboratoriju, zaželene so izkušnje z izvajanjem raziskovalnih nalog v laboratorijskem okolju. Program usposabljana MR predvideva tudi delo na terenu. Pogoj je znanje angleškega jezika (pogovorno in pisno). Program usposabljana MR z vsebino doktorata ter potek samega doktorskega študija bosta natančno definirana in dorečena skupaj z izbranim MR.*

*eng: The young researcher (MR) will work at the Chair of Chemistry of Wood and Other Lignocellulosic Materials in the Department of Wood Science and Technology. Against the background of climate change and the adaptation of the value chains of the wood processing industry to the expected introduction of non-native tree species, MR will focus his research on the extraction and utilization of natural bioactive compounds (also called extractives) from the tree biomass of non-native and climate-resilient tree species. MR will also look at the sustainable management of natural resources and in this sense try to find a way to efficiently collect sufficient quantities of wood and bark for extraction. The MR program proposes the development of an environmentally friendly protocol for the fast and efficient extraction of polyphenols from low-value wood and bark. MR will develop a natural wood preservative that is an environmentally friendly alternative to hazardous synthetic preservatives. In these "green" wood preservatives, we will combine several natural components that fulfill different functions in the test formulations (biocidal, retaining and hydrophobic). MR will impregnate wood samples of less durable softwood and hardwood species with the prepared preservative solutions and test them in field trials for biological durability and esthetics. The MR program also provides for the purification of hydrophilic crude extracts into purified polyphenolic fractions. Bioactive natural polyphenols also have great application potential in the field of dietary supplements and natural bactericidal/bacteriostatic agents. MR will attempt to separate the targeted compounds, i.e. the flavonoids, from the extracts using advanced extraction and separation techniques. The purified flavonoid fractions*

will then be analyzed for antioxidant and antibacterial properties. The MR program is supported by modern analytical techniques (SEM, CLSM, (U)HPLC-PDA, ASE, PuriFlash CC, HS-GC-MSD etc.).

The MR work in a modern research environment, during the training we will support individual research work. The MR program will combine knowledge from different fields, especially wood science and technology, forestry and chemistry. We invite candidates with an education in wood science and technology or an education in a related field (forestry, chemistry, biotechnology, etc.) to apply for the MR position. In addition to the criteria and requirements for MR stated by the Slovenian Research and Innovation Agency (ARIS) on its website, the MR must be qualified to work safely in a laboratory; experience in performing research tasks in a laboratory environment is desirable. The MR program also provides for field work. Proficiency in English (written and spoken) is required. The MR program with the contents of the doctorate and the course of the doctoral studies itself will be precisely defined and determined together with the chosen MR.

**Kratek opis usposabljanja mladega raziskovalca** (*Short description of the Young Researcher's training*)


1. Raziskovalna organizacija (*Research organisation*):

| |
|---|
| Univerza v Ljubljani, Biotehniška fakulteta<br>University of Ljubljana, Biotechnical Faculty |


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

| |
|---|
| Katarina Vogel-Mikuš, katarina.vogelmikus@bf.uni-lj.si |


3. Šifra in naziv raziskovalnega področja (*Research field*):

| |
|---|
| 1.03. Biologija<br>1.03. Biology |


4. Kratek opis usposabljanja mladega raziskovalca (*Short description of the Young Researcher's training*):

Navedite tudi morebitne druge zahteve, vezane na usposabljanje mladega raziskovalca (npr. znanje angleškega jezika, izkušnje z laboratorijskim delom, potrebne licence za usposabljanje…).

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| *slo:*<br>Usposabljanje kandidata bo potekalo v mednarodno vpeti raziskovalni skupini Katedre za botaniko in fiziologijo rastlin, Oddelka za biologijo, BF, na področju interdisciplinarnih raziskav. Delo bo usmerjeno v študije mehanizmov interakcij delcev mikroplastike različne sestave z izbranimi kulturnimi rastlinami na organizemski, organski, tkivni in celični ravni z uporabo različnih molekularnih, spektroskopskih, mikroskopskih in slikovnih tehnik. Preučevali bomo tudi interakcije delcev mikroplastike s talnim mikrobiomom, raziskave pa bodo vključevale moderne molekularne pristope. Kandidat bo vključen v razvoj novih pristopov slikanja porazdelitve molekul v rastlinskih tkivih in celicah s spektroskopskimi tehnikami, kot sta SIMS in FTIR v okviru programske skupine »Biologija rastlin«, ARIS in mednarodnih projektov.<br>Od kandidata poleg osnovnih pogojev pričakujemo zaključen študij 2. stopnje naravoslovnih smeri (biologija, biotehnologija, mikrobiologija, kemija, biokemija, fizika,…), komunikativnost, motiviranost za raziskovalno delo v skupini, delavnost, natančnost, aktivno znanje angleškega jezika in poznavanje osnovnih računalniških orodij za obdelavo besedil in podatkov. Zaželeno je poznavanje programskega jezika za statistično računalništvo in vizualizacijo podatkov »R«. |

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| *eng:*<br>The training of the young researcher will be carried out within internationally involved research group of the Laboratory for Plant Physiology, Department of Biology, BF, in the field of interdisciplinary research. The work will be focused on studies of the mechanisms of interactions of microplastic particles of different composition with selected cultivated plants at the organismal, organic, tissue and cellular level using various molecular, spectroscopic, microscopic and imaging techniques. We will also study the interactions of microplastic particles with the soil microbiome, and the research will include modern molecular approaches. The candidate will be involved in the development of new approaches for imaging the distribution of molecules in plant tissues and cells using spectroscopic techniques such as SIMS and FTIR within the |

program group "Plant Biology", ARIS and international projects.
In addition to the basic requirements, we expect the candidate to have completed the 2nd-level course in natural sciences (biology, biotechnology, microbiology, chemistry, biochemistry, physics, etc.), communicative skills, motivation for research work in a group, diligence, accuracy, active knowledge of the English language and knowledge of basic computer skills tools for processing texts and data. Knowledge of the programming language for statistical computing and data visualization "R" is desirable.

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


1. Članica UL (*UL member)*:

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| Biotehniška fakulteta |


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

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| Vesna Zupanc     vesna.zupanc@bf.uni-lj.si |


3. Raziskovalno področje (*Research field*):

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| 4.03 Rastlinska produkcija in predelava, 1.08.00 Varstvo okolja |


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:* Mladi raziskovalec oziroma mlada raziskovalka (MR) se bo usposabljal z raziskovalnim delom v okviru raziskovalnega programa P4-0085 Agroekosistemi. Program pokriva biotehnične in naravoslovne vsebine, povezane s tlemi, vodo in agroekosistemi. V okviru dela na doktorski disertaciji in študijem na 3. stopnji bo MR sodeloval pri aktivnostih Centra za agrohidrologijo in urejanje kmetijskega prostora ter bo vključen v mednarodne in domače raziskovalne projekte ter strokovne naloge. Doktorska disertacija bo v dogovoru s kandidatom oz. kandidatko usmerjena v raziskovanje vodozadrževalnih lastnosti tal, ki so povezane s hidrološkimi procesi vrhnjega sloja vodonosnikov ter kakovostjo podzemne vode, skladno s predznanji kandidata ali kandidatke. Pogoj je zaključena magistrska stopnja bolonjskega študija (MSc), prednostno s področja agronomije ali drugih inženirskih znanosti (npr. vodarstvo, okoljsko gradbeništvo) ali naravoslovja (npr. geologija, hidrogeologija). Prednost pri izbiri bodo imeli kandidati s poglobljenim znanjem s širšega področja tal in agrohidrologije ter željo po izvajanju eksperimentalnega dela (laboratorij ali/in terensko delo) na tem področju. MR naj bi imel izkazano sposobnost za samostojno delo (samoiniciativnost), odlično znanje angleškega jezika (tako pisanje kot branje) in zanimanje za raziskovalno delo v naravi in/ali laboratoriju. Zaželeno je predznanje programskega jezika R (ali podobnih jezikov) in izkušnje z GIS orodji. MR bo deloval v krogu drugih mladih raziskovalnih sodelavcev in spoznal različne raziskovalne tehnike. Predviden je vpis ali na doktorski študijski program Bioznanosti.


*eng:* The young researcher (MR) will be involved in research work as part of the research program P4-0085 Agroecosystems. The program covers biotechnical and scientific topics related to soil, water and agroecosystems. As part of the dissertation work and 3rd level studies, MR will participate in the activities of the Center for Agrohydrology and Agricultural Land Management and will be involved in international and national research projects. The dissertation, in consultation with the candidate, will focus on soil water retention properties related to the hydrological processes of the upper layer of aquifers and groundwater quality, in accordance with the candidate's prior knowledge.
Expected MR profile is an MSc degree, preferably in the field of agronomy or other engineering (e.g. water resources management, environmental engineering) or natural sciences (e.g. hydrogeology). Preference will be given to applicants with a sound knowledge of soil and agrohydrology and a desire to carry out experimental work (laboratory and/or field work) in this area. MR should have a proven ability to work independently, an excellent command of English (written and spoken) and an interest in conducting research in the field and/or laboratory. Prior knowledge of the programming language R (or similar languages) and experience with GIS tools are desirable. MR will work in with other young researchers and learn about different research techniques. Enrollment in the doctoral program in Biosciences is planned*.*