

Opis raziskovalnega dela (*Research work description*)

1. Članica UL (*UL member*):

Biotehniška fakulteta (Biotechnical faculty)

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

Tomaž Accetto, tomaz.accetto@bf.uni-lj.si

3. Raziskovalno področje (*Research field*):

Mikrobiologija, genetika, bioinformatika (microbiology, genetics, bioinformatics)

4. Opis raziskovalnega dela (*Research work description*):

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

Slov.: V tej študiji bomo naslovili eno od osnovnih lastnosti sestave mikrobnih združb v črevesu, soobstoj bakterijskih sevov oziroma vrst z na videz prekrivajočimi se adaptacijami/nišami. Najprej bomo razvili genetska orodja za ciljno inaktivacijo genov v bakterijah rodov *Xylanibacter* in *Segatella* (bivši rod *Prevotella*), ki so med najpomembnejšimi bakterijskimi skupinami v prebavnem traktu ljudi, prežvekovalcev in drugih sesalcev. Z njim bomo nato inaktivirali predvidene ključne gene v adaptaciji teh bakterij, gene vpletene v razgrajevanje in uporabo posameznih različnih hemiceluloznih in pektinskih substratov. Za nastale seve bomo nato preverjali rast v čistih kulturah in konkurenčnost v kokulturah na mešanici polisaharidnih substratov. Iz teh podatkov bomo ugotovili, kakšen pomen imajo posamezni substrati, oziroma genski lokusi za njihovo razgradnjo za preučevane bakterije in tudi stopnjo prekrivanja prednostnih substratov, ki kaže na možnost soobstoja.

Literatura:

[10.1186/s12864-024-10421-z](https://doi.org/10.1186/s12864-024-10421-z)

[10.1016/j.anaerobe.2021.102321](https://doi.org/10.1016/j.anaerobe.2021.102321)

[10.1016/j.syapm.2018.10.001](https://doi.org/10.1016/j.syapm.2018.10.001)

doi.org/10.1038/s41579-021-00559-y

<https://doi.org/10.15252/embj.2021108287>

Eng.: In this study, we will address one of the basic characteristics of the bacterial community composition of the intestinal communities, namely the coexistence of bacterial strains with seemingly overlapping adaptations/proposed niches. First, we will develop genetic tools for targeted gene inactivation in the bacterial genera *Xylanibacter* and *Segatella* (formerly genus *Prevotella*) that inhabit and are among the dominant bacterial groups in the digestive tract of humans, ruminants and other mammals. We will then inactivate key genes involved in degradation and use of individual different hemicellulose and pectin substrates. This latter ability is thought to be one of the main contributors in adaptation of these *Xylanibacter* and *Segatella*. For the resulting strains, growth in pure cultures and competitiveness in cocultures on a mixture of polysaccharide substrates will then be checked. From this data, we will determine the importance of individual substrates, or gene loci for their degradation, for the studied bacteria looking for degree of overlap in preferential substrates, an indicator of possible coexistence of strains.

References:

[10.1186/s12864-024-10421-z](https://doi.org/10.1186/s12864-024-10421-z)

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5. Priloge, ki jih je treba priložiti ob prijavi (*Documents required to be submitted with the application*):

potrdilo o doseženi izobrazbi (*proof of completed education*)

- kandidat z zaključenim magistrskim študijskim programom (2. bolonjska stopnja) (*candidate who has completed a Master's degree (2nd Bologna level)*):
 - o diplomska listina / potrdilo o zaključku študijskega programa (*diploma certificate / certificate of completion of the study programme*)
 - o priloga k diplomi / potrdilo o opravljenih obveznostih (*diploma supplement / official transcript of records containing all grades obtained in the study programme*)
- kandidat, ki še ni zaključil študija na 2. stopnji (*candidate who has not yet completed a Master's degree*):
 - o potrdilo o do sedaj opravljenih obveznostih z ocenami magistrskega študijskega programa, s katerim se bo kandidat prijavil na doktorski študij (*official transcript of records listing all courses and grades obtained so far in the Master's degree programme on the basis of which the candidate will apply for enrollment in a doctoral degree programme.*)

nagrade – univerzitetna Prešernova nagrada ali Prešernova nagrada članice Univerze v Ljubljani oz. druga enakovredna nagrada (*awards, e.g. Prešeren Prize of the University of Ljubljana, Prešeren Prize of a University of Ljubljana member and/or another equivalent award*)

bibliografija (*bibliography*)

življenjepis (*CV*)

motivacijsko pismo (*motivation letter*)

opis dosedanjega sodelovanja pri raziskovalnem delu (*description of the candidate's research work*)

osnutek idejne zasnove raziskovalnega dela (*preliminary research proposal*)

priporočilno pismo (*letter of recommendation*)

druge priloge (*other attachments*):

Opis raziskovalnega dela (Research work description)

1. Članica UL (UL member):

Biotehniška fakulteta (Biotechnical Faculty)

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

Iztok Dogša iztok.dogsa@bf.uni-lj.si

3. Raziskovalno področje (Research field):

Mikrobiologija (Microbiology)

4. Opis raziskovalnega dela (Research work description):

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

Slov.: Bakterijski biofilmi so robustne, visoko organizirane strukture, sestavljene iz mikrobnih skupnosti, vgrajenih v lastno proizveden zaščitni zunajcelični matriks, ter predstavljajo prevladujoč način bakterijskega življenja v naravnih, industrijskih in kliničnih okoljih. Biofilmi predstavljajo pomemben izziv v živilsko-predelovalni industriji in zdravstvenih ustanovah, saj njihova strukturna odpornost in rezistenca na konvencionalna čistilna ter protimikrobna sredstva otežujeta njihovo odstranitev, zaradi česar delujejo kot trajni rezervoarji kvarnih in patogenih mikroorganizmov, ki lahko ogrozijo varnost izdelkov in javno zdravje.

Doktorski kandidat bo primarno raziskoval arhitekturo biofilmov in dinamiko njihovega nastajanja pri modelnem organizmu *Bacillus subtilis*, s poudarkom na prepoznavanju in karakterizaciji inovativnih strategij za rušenje in odstranjevanje biofilmov. Ključna raziskovalna vprašanja bodo vključevala molekularne in strukturne dejavnike, ki določajo integriteto biofilma, mehanizme, ki omogočajo odpornost na odstranjevanje, ter identifikacijo novih tarč za intervencijo. Kandidat bo nato validiral in prenesel te ugotovitve na relevantne kvarne ali patogene bakterijske biofilme ter ocenil, ali so strategije, učinkovite proti *B. subtilis*, splošno uporabne ali specifične za posamezne vrste. Za doseg te ciljev bo kandidat uporabil celovit, interdisciplinarni metodološki pristop, ki bo združeval klasične mikrobiološke tehnike — vključno z gojenjem bakterij in standardiziranimi testi tvorbe biofilma — z naprednimi analitskimi in slikovnimi platformami, kot so tekočinska kromatografija visoke ločljivosti (HPLC), konfokalna laserska skenirna mikroskopija (CLSM), pretočna citometrija ter orodja molekularne biologije.

Predhodne izkušnje z navedenimi metodologijami ter poznavanje *B. subtilis* kot modelnega organizma bodo predstavljale prednost pri izboru kandidatov.

Eng.:

Bacterial biofilms are robust, highly organized structures comprised of microbial communities embedded in a self-produced protective extracellular matrix, and represent the predominant mode of bacterial life in natural, industrial, and clinical environments. These biofilms pose a significant challenge in food processing and healthcare-related industries, as their structural resilience and resistance to conventional cleaning and antimicrobial agents make them difficult to eradicate, thereby serving as persistent reservoirs for spoilage and pathogenic microorganisms that can compromise product safety and public health.

The PhD candidate will primarily investigate the biofilm architecture and formation dynamics of the model organism *Bacillus subtilis*, with a focus on identifying and characterizing innovative strategies for biofilm disruption and removal. Key questions will include the molecular and structural determinants of biofilm integrity, the mechanisms underlying resistance to removal, and the identification of novel targets for intervention. The candidate will subsequently validate and translate these findings to relevant spoilage or pathogenic bacterial biofilms, assessing whether strategies effective against *B. subtilis* are broadly applicable or species-specific.

To achieve these goals, the candidate will employ a comprehensive, interdisciplinary methodological approach, combining classical microbiological techniques — including bacterial cultivation and standardized biofilm formation assays — with advanced analytical and imaging platforms such as high-performance liquid chromatography (HPLC), confocal laser scanning microscopy (CLSM), flow cytometry, and molecular biology tools.

Prior experience with the above methodologies and familiarity with *B. subtilis* as a model organism will be considered an advantage during candidate selection.

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(*candidate who has not yet completed a Master's degree*):

- potrdilo o do sedaj opravljenih obveznostih z ocenami magistrskega študijskega programa, s katerim se bo kandidat prijavil na doktorski študij
(*official transcript of records listing all courses and grades obtained so far in the Master's degree programme on the basis of which the candidate will apply for enrollment in a doctoral degree programme.*)

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Biotehniška fakulteta
Biotechnical faculty

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

Anita Jemec Kokalj, anita.jemec@bf.uni-lj.si

3. Raziskovalno področje (*Research field*):

Biologija (Biology), Okoljske znanosti (Environmental Sciences)

4. Opis raziskovalnega dela (*Research work description*):

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Slov.:

K sodelovanju vabimo ambiciozne kandidate, ki jih zanima raziskovanje vplivov onesnažil na okolje. V skupini celostno proučujemo vplive sintetičnih polimerov (plastike) na okolje. Smo del različnih evropskih projektov (<https://www.papillons-h2020.eu/>) in v Sloveniji (<https://www.bf.uni-lj.si/sl/raziskave/raziskovalni-projekti/2023100411583382/>). Mladi raziskovalec bo tako imel priložnost vključevanja v različne projekte, mednarodno sodelovanje in izmenjave.

Plastika, zlasti mikroplastika, predstavlja izjemno kompleksno onesnažilo, ki v okolju vzpostavlja številne interakcije. Med manj raziskanimi vidiki je vpliv kemikalij, ki so plastiki dodane bodisi namerno (kot aditivi), bodisi nastanejo kot stranski produkti sinteze. Kandidat bo v okviru raziskovalnega programa preučeval vpliv najbolj aktualnih sintetičnih polimerov ter njihovih aditivov na kopenske organizme, s poudarkom na nevretenčarjih. Osredotočil se bo na njihove učinke na različne fiziološke procese – od imunskega odziva in metabolnih sprememb do izražanja na ravni proteinov in genov. Njegove naloge bodo obsegale: načrtovanje in izvajanje raziskovalnega dela, upravljanje s podatki ter vnos v ustrezne repozitorije, uvajanje novih metodologij v skladu s kandidatovimi raziskovalnimi interesi, in predstavitev rezultatov na nacionalnih in mednarodnih znanstvenih srečanjih.

Prednost pri izbiri kandidata bodo imeli kandidati s končanim študijem 2. stopnje na področju bioznanosti, predvsem biologije, biokemije, biotehnologije ali sorodnih ved. Zaželene, a ne nujne, so predhodne izkušnje s področja biokemijskih laboratorijskih tehnik, poznavanje biologije nevretenčarjev ter poznavanje problematike mikroplastike. Upoštewane bodo predhodne izkušnje pri raziskovalnem delu v laboratoriju. Od kandidata/-tke pričakujemo samoiniciativnost in delavnost, pa tudi motiviranost za 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.

Eng.:

We invite ambitious candidates interested in the research on the effects of pollutants on the environment. Our team studies the impacts of synthetic polymers (plastics) on the environment in a comprehensive way. We are part of several European projects (<https://www.papillons-h2020.eu/>) and national projects in Slovenia (<https://www.bf.uni-lj.si/sl/raziskave/raziskovalni-projekti/2023100411583382/>). The young researcher will therefore have the opportunity to participate in various projects, engage in international collaboration, and take part in research exchanges.

Plastic, especially microplastics, is an extremely complex pollutant that interacts with the environment in many ways. One of the less explored aspects is the influence of chemicals that are either intentionally added to plastics (as additives) or formed as by-products of synthesis. As part of the research program, the candidate will study the effects of the most relevant synthetic polymers, their additives, and new types of microplastics on terrestrial organisms, with a focus on invertebrates. The research will focus on their effects on various physiological processes—from immune responses and metabolic changes to protein and gene expression. The candidate's tasks will include planning and conducting research work, managing data and entering it into appropriate

repositories, introducing new methodologies in line with their research interests, and presenting results at national and international scientific meetings.

Preference will be given to candidates who have completed a second-cycle degree in the biosciences, especially biology, biotechnology, or biochemistry or similar. Previous experience with biochemical laboratory techniques, knowledge of invertebrate biology, and familiarity with microplastic-related issues are desirable but not required. Prior laboratory research experience will be considered. We expect the candidate to be proactive and diligent, as well as motivated to visit research laboratories abroad. We offer interested candidates a relaxed and inclusive working environment, along with support for professional and scientific development and the ability to conduct independent research.

5. Priloge, ki jih je treba priložiti ob prijavi (*Documents required to be submitted with the application*):

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priporočilno pismo (*letter of recommendation*)

druge priloge (*other attachments*):

Opis raziskovalnega dela (*Research work description*)

1. Članica UL (*UL member*):

Biotehniška fakulteta

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

Matija Klopčič, matija.klopacic@bf.uni-lj.si

3. Raziskovalno področje (*Research field*):

Gozd, gozdarstvo in obnovljivi gozdni viri

4. Opis raziskovalnega dela (*Research work description*):

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

Slov.:

Raziskovalno delo bo potekalo na raziskovalnem področju prirastoslovja. Osnovno področje raziskovanja bo dendrokronologija. Predvideno je interdisciplinarno povezovanje z drugimi področji, kot je uporaba novih tehnologij zbiranja podatkov (npr. terestično lasersko skeniranje) in nove metode obdelav in analiz (dendrokronoloških) podatkov (npr. preizkus novejših obstoječih metod iz dendrokronološkega in drugih področij, razvoj novih metod). Delo bo predvidoma obsegalo odkrivanje zakonitosti vplivanja določenih dejavnikov na rast in razvoj dreves. Raziskovalno delo bo primarno obsegalo osnovno dendrokronološko terensko delo (vrtanje dreves s prirastoslovnim svedrom, obdelava prirastnih izvrtkov) in laboratorijsko delo (npr. snemanje širine branik, osnovno analiziranje prirastnih odzivov, izdelava kronologij, interpretacija rezultatov, sintezno identificiranje vzročno-posledičnih interakcij, ki vplivajo na rast in razvoj dreves in gozdnih sestojev). Glavni fokus raziskovalnega dela bo preučevanje rasti tistih drevesnih vrst, ki jih je gozdarsko-ekološka znanost identificirala kot vrste, ki jih bodo vplivi podnebnih sprememb (najbolj) prizadele, in vrste, ki naj bi zaradi podnebnih sprememb v prihodnosti na različne načine prosperirale. Pri raziskovalnem delu je predvideno povezovanje načel dendroekologije in dendroklimatologije pri analizi vzajemnih vplivov okolja na (debelinsko) rast dreves fokusnih drevesnih vrst. Del raziskovalnega dela bo predvidoma namenjen povezovanju invazivnih načinov pridobivanja podatkov o rasti z drugimi načini zbiranja podatkov in vplivih okoljskih dejavnikov. Tu bomo poskušali povezati terestično lidarsko skeniranje z analizami debelinske rasti dreves in dendrokronologijo. Predvideno je, da bi v raziskavo vključili tudi manualne in avtomatske detektorje (diurnalne) rasti dreves (dendrometre), kar omogoča analizo diurnalne ali periodične (npr. tedenske, mesečne) rasti fokusnih drevesnih vrst v povezavi s klimatskimi in drugimi okoljskimi dejavniki. Raziskovalno delo bo predvidoma usmerjeno tudi analizami odziva dreves na naravne motnje in s tem povezane spremembe v proizvodnih potencialih gozdov. Delno bi se v raziskovalnem delu usmerili tudi v preverjanje novih pristopov k analizi časovnih vrst, ki jih predstavljajo drevesne, lokalne in regionalne kronologije. Predvideno je sodelovanje z raziskovalci in morebitnim somentorjem iz tuje raziskovalne institucije, ki se ukvarja z dendrokronološkimi raziskavami, predvideno je tudi raziskovalno-edukativno gostovanje na tej instituciji v skupnem času trajanja vsaj 3-6 mesecev.

Od kandidata se pričakuje samoiniciativnost, kreativnost, odgovornost na področju izvedbe empiričnega dela raziskave in opravljen voziški izpit B kategorije zaradi izvajanja terenskega zbiranja podatkov. Ker raziskava

obsega tudi preučevanje literature v tujih jezikih, oblikovanje strokovnih ter znanstvenih objav ter gostovanje na tuji instituciji, se zahteva tudi dobra pismenost in ustrezno znanje angleškega jezika (govorno in pisno).

Eng.:

The research will be conducted in the field of growth and yield science, the main research area will be dendrochronology. Interdisciplinary collaboration with other research fields is planned, such as the use of new forest inventory technologies (e.g., terrestrial laser scanning) and new methods of processing and analyzing (dendrochronological) data (e.g., testing new existing methods from dendrochronology and other fields, development of new methods). The research work will focus on studying relationships between growth of trees and various influential factors and will primarily involve basic dendrochronological field work (i.e., coring trees with an increment borer, processing the extracted cores) and laboratory work (e.g., recording ring widths, basic analysis of growth responses, developing chronologies, interpretation of results, synthetic identification of cause-and-effect interactions that influence growth of trees and forest stands). The main focus of the research work will be to study the growth of tree species that forest ecology science has identified as species that will be (mostly) affected by and species that are expected to thrive in various ways in the future due to climate change. The research work is expected to combine the principles of dendroecology and dendroclimatology when analysing the mutual influences of environmental factors on (diameter) growth of trees of the target tree species. Part of the research work will be devoted to combining invasive methods for obtaining tree growth data with other methods of data collection and the effects of environmental factors. Here, we will attempt to combine terrestrial lidar scanning with analyses of tree diameter growth and dendrochronology. We also plan to include manual and automatic tree growth detectors (dendrometers) in the research, which will enable us to analyze the diurnal or periodic (e.g., weekly, monthly) growth of target tree species in relation to climatic and other environmental factors. The research work will also focus on analyzing the response of trees to natural disturbances and the associated changes in the productive potential of forests. Part of the research work might also focus on testing new approaches to the analysis of time series represented by tree, local, and regional chronologies. The cooperation with researchers and a possible co-mentor from a foreign research institution engaged in dendrochronological research is envisaged, as is a research and educational visit to this institution for a total duration of at least 3-6 months.

Candidates are expected to be proactive, creative, and responsible in conducting empirical research, and to have a category B driver's license for the purpose of conducting field data collection. Since the research also includes studying literature in foreign languages, writing professional and scientific publications, and visiting foreign institutions, good literacy and adequate knowledge of English (spoken and written) are required.

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osnutek idejne zasnove raziskovalnega dela (*preliminary research proposal*)

priporočilno pismo (*letter of recommendation*)

druge priloge (*other attachments*):

Opis raziskovalnega dela (*Research work description*)

1. Članica UL (*UL member*):

Biotehniška fakulteta, Oddelek za biologijo

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

Veno Kononenko, veno.kononenko@bf.uni-lj.si

3. Raziskovalno področje (*Research field*):

Biokemija in molekularna biologija (Biochemistry and molecular biology); Toksikologija (Toxicology); Celična biologija (Cell biology)

4. Opis raziskovalnega dela (*Research work description*):

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

Slov.:

Delo mlade raziskovalke/mladega raziskovalca (MR) bo potekalo na Oddelku za biologijo Biotehniške fakultete Univerze v Ljubljani v okviru programske skupine P1-0207 (Toksini in biomembrane). MR bo vključen v interdisciplinarno in mednarodno vpeto raziskovalno skupino za nanobiologijo in nanotoksikologijo (Bionanoteam). Pri svojem delu bo preučeval interakcije bioloških sistemov (zlasti živalskih celic) z izbranimi nanomateriali, naprednimi materiali in/ali mikro- in nanoplastiko.

MR se bo najprej seznanil s širšim področjem toksikologije (humane in okoljske), nato pa izvajal eksperimentalno delo v celičnem laboratoriju z uporabo živalskih/človeških celičnih linij. Pri preučevanju interakcij materiala s celicami bo uporabljal celične monokulture, ko-kulture in/ali organoidne sisteme. Pri laboratorijskem delu bo uporabljal različne toksikološke teste, molekularno-biološke metode, pretočno citometrijo ter mikroskopijo (fluorescenčno in elektronsko). Na voljo bo imel sodobno raziskovalno opremo, ki omogoča poglobljeno raziskovanje toksikoloških učinkov, stresnih odzivov celic in interakcij med celicami in tujimi snovmi. Poleg uporabe ustaljenih metod bo MR uporabljal tudi nove raziskovalne pristope in metode, ki jih bo pred uporabo moral še optimizirati. Pri delu bo imel možnost sodelovanja z drugimi domačimi in tujimi znanstveno-raziskovalnimi institucijami.

Rezultati doktorske raziskave bodo podprli razvoj varnejših in trajnostno zasnovanih novih materialov ter prispevali k izboljšanju ocenjevanja in upravljanja tveganj, povezanih z obstoječo izpostavljenostjo ljudi in živali različnim materialom, ki so že prisotni v okolju in v vsakodnevni uporabi.

Glavne naloge mladega raziskovalca:

- izvajanje doktorskega študija ter samostojno raziskovalno delo v okviru doktorske disertacije,
- vodeno načrtovanje, samostojna organizacija in izvedba eksperimentalnega dela ter analiza in interpretacija rezultatov,
- sodelovanje pri domačih in mednarodnih projektih ter (po potrebi) vključevanje v pedagoško delo,
- priprava znanstvenih objav in predstavitev rezultatov na konferencah,
- usklajevanje lastnega raziskovalnega dela znotraj skupine ter skrb za strokovni razvoj.

Prednost bodo imeli kandidati z izkušnjami v laboratorijskem delu ter ustreznim predznanjem celične biologije in biokemije. Od kandidata se pričakuje samostojnost, proaktivnost, motiviranost za laboratorijsko delo ter sposobnost individualnega dela, kakor tudi timskega sodelovanja. Zaradi mednarodne vpetosti raziskav je potrebno dobro znanje angleškega jezika.

Eng.:

The work of the Young Researcher (YR) will be carried out at the Department of Biology, Biotechnical Faculty, University of Ljubljana, within the framework of the research programme P1-0207 (Toxins and Biomembranes). The YR will be integrated into the interdisciplinary and internationally engaged research group for Nanobiology and nanotoxicology (Bionanoteam). The research will focus on studying the interactions of biological systems (particularly cells) with selected nanomaterials, advanced materials, and micro- and nanoplastics.

The YR will first gain broader knowledge in the field of toxicology (human and environmental), and will subsequently conduct experimental work in a cell culture laboratory using established cell lines. To investigate material-cell interactions, the YR will employ cell monocultures, co-cultures, and/or organoid systems. The research will involve various toxicological assays, molecular biology methods, flow cytometry, and microscopy techniques (fluorescence and electron microscopy). State-of-the-art research equipment will be available, enabling in-depth investigation of toxicological effects, cellular stress responses, and interactions between cells and foreign substances. In addition to established methodologies, the YR will also implement and optimize novel research approaches and methods prior to their application. The position also offers opportunities for collaboration with national and international research institutions.

The results of the doctoral research will support the development of safer, sustainably designed novel materials and contribute to improving the assessment and management of risks associated with the exposure of humans and animals to materials already present in the environment and in everyday use

Main responsibilities of the Young Researcher:

- Pursuing doctoral studies and conducting independent research within the framework of the PhD dissertation,
- Planning, organizing, and carrying out experimental work, as well as analyzing and interpreting results,
- Participating in national and international research projects and, where appropriate, contributing to teaching activities,
- Preparing scientific publications and presenting research results at conferences,
- Coordinating personal research activities within the group and engaging in continuous professional development.

Preference will be given to candidates with laboratory experience and relevant background knowledge in cell biology and biochemistry. The candidate is expected to demonstrate independence, proactivity, motivation, enthusiasm for laboratory work, and the ability to work both independently and as part of a team. Due to the international scope of the research, proficiency in English is required.

5. Priloge, ki jih je treba priložiti ob prijavi (*Documents required to be submitted with the application*):

potrdilo o doseženi izobrazbi (*proof of completed education*)

- kandidat z zaključenim magistrskim študijskim programom (2. bolonjska stopnja) (*candidate who has completed a Master's degree (2nd Bologna level)*):
 - o diplomska listina / potrdilo o zaključku študijskega programa (*diploma certificate / certificate of completion of the study programme*)
 - o priloga k diplomi / potrdilo o opravljenih obveznostih (*diploma supplement / official transcript of records containing all grades obtained in the study programme*)
- kandidat, ki še ni zaključil študija na 2. stopnji (*candidate who has not yet completed a Master's degree*):
 - o potrdilo o do sedaj opravljenih obveznostih z ocenami magistrskega študijskega programa, s katerim se bo kandidat prijavil na doktorski študij (*official transcript of records listing all courses and grades obtained so far in the Master's degree programme on the basis of which the candidate will apply for enrollment in a doctoral degree programme.*)

življenjepis (CV)

motivacijsko pismo (*motivation letter*)

opis dosedanjega sodelovanja pri raziskovalnem delu (*description of the candidate's research work*)

druge priloge po izbiri kandidata, npr. priporočilno pismo, bibliografija, prejete nagrade... (other attachments at the candidate's discretion, such as a letter of recommendation, a bibliography, awards received, etc)

Opis raziskovalnega dela (Research work description)

1. Članica UL (UL member):

BF

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

Miha Krofel, miha.krofel@bf.uni-lj.si

3. Raziskovalno področje (Research field):

Biologija (ekologija)

4. Opis raziskovalnega dela (Research work description):

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

Slov.: Raziskovalno delo bo obsegalo terensko delo na velikih mačkah v odročnih predelih Afrike in Evrazije (odlov živali, telemetrija, popisovanje ostankov plena, spremljanje vedenja živali s pomočjo fotopasti in snemalnikov zvoka), napredne analize zbranih telemetričnih, video in bioakustičnih podatkov ter pisanje znanstvenih publikacij. Zaželeno je, da ima kandidat izkušnje s terenskim delom na velikih zvereh iz Evrope in Afrike (odlov in uspavanje živali, upravljanje s snemalniki zvoka in fotopastmi, vožnja s terenskimi vozili), izkušnje s programskimi orodji R in QGIS/ArcGIS, vsaj dve leti delovnih izkušenj ter (so)avtorstvo pri objavljenih znanstvenih člankih.

Eng.: The research work will include fieldwork on large felids in remote areas of Africa and Eurasia (animal capturing, telemetry, surveys of kill sites, monitoring of animal behavior using camera traps and audio-loggers), advanced analyses of collected data (GPS telemetry, video recordings and bioacoustics) and writing of scientific publications. It is desirable that the candidate has experience with fieldwork on large carnivores in Europe and Africa (capturing and sedating animals, operating sound recorders and camera traps, driving off-road vehicles), is experienced with using R and GIS software, has at least two years of work experience, and (co-)authorship of published scientific articles.

5. Priloge, ki jih je treba priložiti ob prijavi (Documents required to be submitted with the application):

potrdilo o doseženi izobrazbi (proof of completed education)

- kandidat z zaključenim magistrskim študijskim programom (2. bolonjska stopnja) (candidate who has completed a Master's degree (2nd Bologna level)):
 - o diplomska listina / potrdilo o zaključku študijskega programa (diploma certificate / certificate of completion of the study programme)
 - o priloga k diplomi / potrdilo o opravljenih obveznostih (diploma supplement / official transcript of records containing all grades obtained in the study programme)
- kandidat, ki še ni zaključil študija na 2. stopnji (candidate who has not yet completed a Master's degree):
 - o potrdilo o do sedaj opravljenih obveznostih z ocenami magistrskega študijskega programa, s katerim se bo kandidat prijavil na doktorski študij

(official transcript of records listing all courses and grades obtained so far in the Master's degree programme on the basis of which the candidate will apply for enrollment in a doctoral degree programme.)

nagrade – univerzitetna Prešernova nagrada ali Prešernova nagrada članice Univerze v Ljubljani oz. druga enakovredna nagrada (*awards, e.g. Prešeren Prize of the University of Ljubljana, Prešeren Prize of a University of Ljubljana member and/or another equivalent award*)

bibliografija (*bibliography*)

življenjepis (*CV*)

motivacijsko pismo (*motivation letter*)

opis dosedanjega sodelovanja pri raziskovalnem delu (*description of the candidate's research work*)

osnutek idejne zasnove raziskovalnega dela (*preliminary research proposal*)

priporočilno pismo (*letter of recommendation*)

druge priloge (*other attachments*):

Opis raziskovalnega dela (*Research work description*)

1. Članica UL (*UL member*):

Biotehniška fakulteta

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

Aleš Kuhar ales.kuhar@bf.uni-lj.si

3. Raziskovalno področje (*Research field*):

Ekonomika prehranskega sistema

4. Opis raziskovalnega dela (*Research work description*):

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

Slov.:

Univerza v Ljubljani, Biotehniška fakulteta, razpisuje doktorsko usposabljanje v okviru raziskovalne skupine Ekonomika agroživilstva in naravnih virov (P4-0022). Raziskava bo obravnavala sodobne izzive ekonomike prehranskega sistema ter povezovala ekonomijo, poslovne vede, potrošniško vedenje in politike na področjih gospodarstva, kmetijstva in javnega zdravja.

Osrednje raziskovalno vprašanje je, kako spremembe v tržni strukturi agroživilskega sistema vplivajo na dejavnike prehranskega okolja ter prek njih na potrošne in prehranske izide (Schneider et al., 2023). Obstoječe raziskave kažejo, da tržna dominacija v prehranski verigi ustvarja neenakopravno prehransko okolje, zlasti za skupine z nižjimi dohodki, ter prispeva k večjemu tveganju za slabo prehranjenost in nenalezljive kronične bolezni (Struben et al., 2025). Konsolidacija in globalizacija krepi tržno moč akterjev, vplivata na oblikovanje cen in ponudbe ter zmanjšujeta dostopnost zdravih živil, kar negativno vpliva na zdravstvene izide prebivalstva (Wood et al., 2021; Swinburn et al., 2019). Razumevanje teh mehanizmov je ključno za razvoj učinkovitih politik.

Raziskava bo empirično proučila, kako kazalniki tržne strukture (koncentracija po členih verige, IDR, Grubel-Lloyd, RCA, GVC ter lastniške strukture) oblikujejo prehransko okolje – razpoložljivost, dostopnost, kakovost in prehranski profil živil – ter kako to vpliva na potrošno vedenje v različnih družbeno-ekonomskih skupinah. Prehransko okolje opredeljujemo kot fizični, ekonomski in informacijski prostor, v katerem potrošniki sprejemajo odločitve o nakupu hrane (Glanz et al., 2007). Posebna pozornost bo namenjena dostopnosti prehransko ustreznih živil, relativnim cenam ter prostorskim razlikam (prehranske puščave/močvirja), ocenjenim z GIS-metodami. Informacijsko dimenzijo bomo preučevali glede dostopnosti, uporabe in kredibilnosti virov, pri čemer nas zanimajo tudi razlike med socialno-ekonomskimi sloji ter vpliv digitalnih virov v primerjavi s tradicionalnimi.

Uporabljene bodo kvantitativne metode: izračun indeksov koncentracije in kazalnikov mednarodne menjave; ocena prehranskega okolja z metodami MFDI in NEMS-S; GIS-analize dostopa; analiza relativnih cen; ter anketne metode za merjenje informacijskih virov in prehranskih izidov. Rezultati bodo povezali ekonomske analize, kvantitativne ocene prehranskega okolja in vedenjske podatke ter omogočili priporočila za preoblikovanje prehranskega sistema v Sloveniji v smeri večje trajnosti in pravičnosti.

Doktorsko usposabljanje bo raziskovalcu omogočilo pridobitev ključnih kompetenc za samostojno raziskovanje, pripravo znanstvenih publikacij, sodelovanje pri projektih ter udeležbo na mednarodnih konferencah. Raziskava bo prispevala k boljšemu razumevanju vplivov tržnih struktur na prehranske izbire in zdravstvene izide ter k razvoju

dokazno podprtih politik za povečanje odpornosti, konkurenčnosti in trajnosti slovenskega in evropskega prehranskega sistema.

Eng.:

The University of Ljubljana, Biotechnical Faculty, is announcing a doctoral training programme within the research group Economics of Agri-Food and Natural Resources (P4-0022). The research will address contemporary challenges in the economics of the food system, linking economics, business sciences, consumer behaviour, and policies in the fields of economics, agriculture, and public health.

The central research question is how changes in the market structure of the agri-food system affect factors in the food environment and, through them, consumer and nutritional outcomes (Schneider et al., 2023). Existing research shows that market dominance in the food chain creates an unequal food environment, especially for lower-income groups, and contributes to a higher risk of malnutrition and non-communicable chronic diseases (Struben et al., 2025). Consolidation and globalisation strengthen the market power of actors, influence pricing and supply, and reduce the availability of healthy foods, which negatively affects the health outcomes of the population (Wood et al., 2021; Swinburn et al., 2019). Understanding these mechanisms is key to developing effective policies.

The study will empirically examine how market structure indicators (concentration by chain link, IDR, Grubel-Lloyd, RCA, GVC, and ownership structures) shape the food environment – availability, accessibility, quality, and nutritional profile of foods – and how this affects consumption behaviour across different socioeconomic groups. The food environment is defined as the physical, economic, and informational space in which consumers make food purchasing decisions (Glanz et al., 2007). Special attention will be paid to the availability of nutritionally adequate foods, relative prices, and spatial differences (nutritional deserts/swamps) assessed using GIS methods. The information dimension will be examined in terms of the availability, use, and credibility of sources, focusing on differences between socioeconomic strata and the influence of digital sources compared to traditional ones. Quantitative methods will be used: calculation of concentration indices and international exchange indicators; assessment of the food environment using MFDI and NEMS-S methods; GIS access analyses; relative price analysis; and survey methods to measure information sources and dietary outcomes. The results will combine economic analyses, quantitative assessments of the food environment, and behavioural data, enabling recommendations for transforming the food system in Slovenia towards greater sustainability and equity.

The doctoral training will enable the researcher to acquire key competencies for independent research, preparation of scientific publications, participation in projects, and attendance at international conferences. The research will contribute to a better understanding of the impact of market structures on food choices and health outcomes, and to the development of evidence-based policies to increase the resilience, competitiveness, and sustainability of the Slovenian and European food systems.

5. Priloge, ki jih je treba priložiti ob prijavi (*Documents required to be submitted with the application*):

potrdilo o doseženi izobrazbi (*proof of completed education*)

- kandidat z zaključenim magistrskim študijskim programom (2. bolonjska stopnja) (*candidate who has completed a Master's degree (2nd Bologna level)*):
 - diplomska listina / potrdilo o zaključku študijskega programa (*diploma certificate / certificate of completion of the study programme*)
 - priloga k diplomi / potrdilo o opravljenih obveznostih (*diploma supplement / official transcript of records containing all grades obtained in the study programme*)
- kandidat, ki še ni zaključil študija na 2. stopnji

(candidate who has not yet completed a Master's degree):

- potrdilo o do sedaj opravljenih obveznostih z ocenami magistrskega študijskega programa, s katerim se bo kandidat prijavil na doktorski študij
(official transcript of records listing all courses and grades obtained so far in the Master's degree programme on the basis of which the candidate will apply for enrollment in a doctoral degree programme.)

nagrade – univerzitetna Prešernova nagrada ali Prešernova nagrada članice Univerze v Ljubljani oz. druga enakovredna nagrada *(awards, e.g. Prešeren Prize of the University of Ljubljana, Prešeren Prize of a University of Ljubljana member and/or another equivalent award)*

bibliografija *(bibliography)*

življenjepis *(CV)*

motivacijsko pismo *(motivation letter)*

opis dosedanjega sodelovanja pri raziskovalnem delu *(description of the candidate's research work)*

osnutek idejne zasnove raziskovalnega dela *(preliminary research proposal)*

priporočilno pismo *(letter of recommendation)*

druge priloge *(other attachments):*

Opis raziskovalnega dela (*Research work description*)

1. Članica UL (*UL member*):

Biotehniška fakulteta

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

Tanja Kunej, tanja.kunej@bf.uni-lj.si

3. Raziskovalno področje (*Research field*):

Raziskovalno področje zajema genetiko, molekularno biologijo in bioinformatiko. Poudarek je na epigenetskih mehanizmih uravnavanja genoma, zlasti na metilaciji DNA ter sintezi genomskih podatkov.

4. Opis raziskovalnega dela (*Research work description*):

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

Slov.:

Glavni cilj doktorskega projekta je preučiti vpliv metilacije DNA na nalaganje maščobe pri edinstvenem inbridiranem modelu miši za poligeno obliko debelosti in vitkosti. V okviru projekta bomo izvedli analizo metilacije DNA na ravni celotnega genoma. Pridobljene podatke bomo obdelali ter jih integrirali z genotipom in izražanjem genov za identifikacijo zanesljivejših kandidatnih genov. Za dodatno validacijo kandidatnih genov bomo rezultate primerjali s podatki o prostorski transkriptomiki. Raziskava bo vključevala bioinformacijske analize in laboratorijsko delo. Sintezo genomskih podatkov bomo izvedli z bioinformacijskim pristopom, medtem ko bomo za izbrane kandidatne lokuse eksperimentalno preverili status metilacije ter vzorce izražanja.

Pričakujemo, da bomo identificirali nove kandidatne lokuse, povezane z debelostjo in vitkostjo, ter prispevali k boljšemu razumevanju molekularnih mehanizmov, ki vplivajo na variabilnost fenotipa. Rezultati bodo pomembni za poglobitev znanja o genetskih in epigenetskih dejavnikih, vpletenih v regulacijo telesne mase ter bodo predstavljali osnovo za nadaljnje funkcionalne raziskave.

Eng.:

The main objective of the doctoral project is to investigate the impact of DNA methylation on fat deposition in a unique inbred mouse model of polygenic obesity and leanness. The research will include genome-wide DNA methylation analysis. The obtained data will be processed and integrated with genotype and gene expression data to identify more reliable candidate genes. To further validate the candidate genes, the results will be compared with spatial transcriptomics data. The research will involve both bioinformatic analyses and laboratory work. The synthesis of genomic data will be performed using a bioinformatic approach, while the methylation status and expression patterns of selected candidate loci will be experimentally verified in the laboratory.

We expect to identify novel candidate loci associated with obesity and leanness, contributing to a better understanding of the molecular mechanisms influencing phenotypic variability. The results will be important for expanding knowledge of the genetic and epigenetic factors involved in the regulation of body weight and will serve as a basis for further functional research.

5. Priloge, ki jih je treba priložiti ob prijavi (*Documents required to be submitted with the application*):

potrdilo o doseženi izobrazbi (*proof of completed education*)

– kandidat z zaključenim magistrskim študijskim programom (2. bolonjska stopnja) (*candidate who has completed a Master's degree (2nd Bologna level)*):

- diplomska listina / potrdilo o zaključku študijskega programa (*diploma certificate / certificate of completion of the study programme*)

- priloga k diplomi / potrdilo o opravljenih obveznostih
(*diploma supplement / official transcript of records containing all grades obtained in the study programme*)
- kandidat, ki še ni zaključil študija na 2. stopnji
(*candidate who has not yet completed a Master's degree*):
 - potrdilo o do sedaj opravljenih obveznostih z ocenami magistrskega študijskega programa, s katerim se bo kandidat prijavil na doktorski študij
(*official transcript of records listing all courses and grades obtained so far in the Master's degree programme on the basis of which the candidate will apply for enrollment in a doctoral degree programme.*)

nagrade – univerzitetna Prešernova nagrada ali Prešernova nagrada članice Univerze v Ljubljani oz. druga enakovredna nagrada (*awards, e.g. Prešeren Prize of the University of Ljubljana, Prešeren Prize of a University of Ljubljana member and/or another equivalent award*)

bibliografija (*bibliography*)

življenjepis (*CV*)

motivacijsko pismo (*motivation letter*)

opis dosedanjega sodelovanja pri raziskovalnem delu (*description of the candidate's research work*)

osnutek idejne zasnove raziskovalnega dela (*preliminary research proposal*)

priporočilno pismo (*letter of recommendation*)

druge priloge (*other attachments*):

Opis raziskovalnega dela (*Research work description*)

1. Članica UL (*UL member*):

Univerza v Ljubljani, Biotehniška fakulteta University of Ljubljana, Biotechnical Faculty
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2. Ime, priimek in elektronski naslov mentorja/ice (*Mentor's name, surname and email*):

Boštjan Lesar bostjan.lesar@bf.uni-lj.si
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3. Raziskovalno področje (*Research field*):

4.01 Gozdarstvo, lesarstvo in papirništvo

4. Opis raziskovalnega dela (*Research work description*):

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

<p><i>Slov.:</i> V zadnjih letih se delež objektov z nosilno leseno konstrukcijo v Sloveniji znatno povečuje, s tem pa tudi pomen zanesljivega upravljanja vlage v ovojju stavb. Dolgoročna trajnost lesene gradnje je neposredno odvisna od zagotavljanja nizke in stabilne vlažnosti vgrajenega lesa, saj prekomerna vlaga vodi do razvoja gliv, mehanske degradacije in potrebe po zahtevnih sanacijah ali celo odstranitvi konstrukcijskih elementov. Zaradi kompleksnosti sodobnih lesenih sklopov so tveganja za kondenzacijo in skrite poškodbe večja, dodatne izzive pa predstavljajo tudi težko zaznavna puščanja in vodni izlitki.</p>
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<p>V Sloveniji trenutno ne obstaja predpis, ki bi zahteval izvedbo naprednih higrotermalnih simulacij pri načrtovanju lesenih stavb, čeprav bi te omogočale natančnejše napovedovanje gibanja vlage v konstrukciji in preprečevanje poškodb. Cilj raziskave je zato razviti znanstveno podprt protokol za načrtovanje, spremljanje in zaščito lesenih konstrukcij v slovenskih klimatskih razmerah.</p>

<p>V okviru raziskave bomo identificirali tipične konstrukcijske sklope, uporabili dinamične vremenske podatke ter izvedli urne higrotermalne simulacije z orodji WUFI in COMSOL. Simulacije bomo validirali z in situ meritvami vlažnosti in temperature, ki že potekajo na treh realnih objektih. Po potrebi bomo razvili kalibracijske modele za izboljšanje ujemanja med simulacijami in eksperimentalnimi podatki.</p>

<p>Z uporabo tehnik strojnega učenja bomo razvili napovedne modele za zgodnje odkrivanje tveganj povišane vlage in za optimizacijo sanacijskih ukrepov na osnovi velikih podatkov iz stavbnih sistemov. Poseben poudarek bo na razvoju nedestruktivnih diagnostičnih metod, predvsem na uporabi georadarja (GPR) za zaznavanje vlažnosti v masivnih (CLT, DLT) in okvirnih konstrukcijah. Laboratorijsko razvite metode bomo validirali na dolgoročno izpostavljenih modelih ter testirali na številnih dejanskih objektih.</p>

<p>Rezultat doktorske raziskave bo celovit, znanstveno utemeljen protokol za obvladovanje vlage v lesenih stavbah v Sloveniji, uporaben tudi v drugih evropskih klimatsko primerljivih regijah. V okviru projekta bodo pripravljene znanstveni članki, podatki pa bodo objavljeni skladno z načeli odprte znanosti. Razpoložljiva infrastrukturna oprema Oddelka za lesarstvo omogoča popolno izvedbo načrtovanih raziskav.</p>

<p>Za MR iščemo kandidate biotehniške, tehniške ali naravoslovne smeri.</p>

Eng.: In recent years, the share of buildings with load-bearing timber structures in Slovenia has increased significantly, highlighting the growing importance of reliable moisture management in building envelopes. The long-term durability of timber construction depends on maintaining low and stable moisture levels in the wood, as excessive moisture leads to fungal decay, mechanical degradation, and the need for extensive repairs or, in severe cases, replacement of structural elements. Due to the complexity of modern timber assemblies, the risks of condensation and hidden damage are higher, and additional challenges arise from hard-to-detect leaks and water intrusions.

Slovenia currently lacks regulations requiring advanced hygrothermal simulation during the design process, even though such simulations would enable accurate prediction of moisture transport and prevent damage. The aim of this research is therefore to develop a scientifically based protocol for the design, monitoring, and protection of timber structures under Slovenian climatic conditions.

The project will identify typical timber construction assemblies, integrate dynamic weather datasets, and perform hourly hygrothermal simulations using WUFI and COMSOL. These simulations will be validated with long-term in situ measurements of moisture and temperature currently ongoing on three real buildings. Where necessary, calibration models will be developed to improve agreement between simulations and experimental data.

Using machine learning techniques, we will develop predictive models for early detection of moisture-related risks and for optimizing remediation strategies based on large datasets from building systems. A particular focus will be placed on developing non-destructive diagnostic methods, especially the use of ground-penetrating radar (GPR) for identifying moisture in mass timber (CLT, DLT) and timber-frame assemblies. Methods developed in the laboratory will be validated on long-term field-exposed models and further tested on numerous real buildings.

The doctoral research will result in a comprehensive, scientifically grounded moisture-management protocol for timber buildings in Slovenia, applicable also to climatically comparable regions across Europe. The project will generate a series of complementary scientific publications, with all data shared in accordance with open science principles. The infrastructure at the Department of Wood Science and Technology fully supports the implementation of the planned research.

We invite candidates with backgrounds in biotechnical, technical, or natural sciences to apply.

5. Priloge, ki jih je treba priložiti ob prijavi (*Documents required to be submitted with the application*):

potrdilo o doseženi izobrazbi (*proof of completed education*)

- kandidat z zaključenim magistrskim študijskim programom (2. bolonjska stopnja) (*candidate who has completed a Master's degree (2nd Bologna level)*):
 - o diplomska listina / potrdilo o zaključku študijskega programa (*diploma certificate / certificate of completion of the study programme*)
 - o priloga k diplomi / potrdilo o opravljenih obveznostih (*diploma supplement / official transcript of records containing all grades obtained in the study programme*)
- kandidat, ki še ni zaključil študija na 2. stopnji (*candidate who has not yet completed a Master's degree*):
 - o potrdilo o do sedaj opravljenih obveznostih z ocenami magistrskega študijskega programa, s katerim se bo kandidat prijavil na doktorski študij (*official transcript of records listing all courses and grades obtained so far in the Master's degree programme on the basis of which the candidate will apply for enrollment in a doctoral degree programme.*)

nagrade – univerzitetna Prešernova nagrada ali Prešernova nagrada članice Univerze v Ljubljani oz. druga enakovredna nagrada (*awards, e.g. Prešeren Prize of the University of Ljubljana, Prešeren Prize of a University of Ljubljana member and/or another equivalent award*)

bibliografija (*bibliography*)

življenjepis (*CV*)

motivacijsko pismo (*motivation letter*)

opis dosedanjega sodelovanja pri raziskovalnem delu (*description of the candidate's research work*)

osnutek idejne zasnove raziskovalnega dela (*preliminary research proposal*)

priporočilno pismo (*letter of recommendation*)

druge priloge (*other attachments*):

Opis raziskovalnega dela (Research work description)

1. Članica UL (UL member):

Biotehniška fakulteta

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

Irena Maček, irena.macek@bf.uni-lj.si

3. Raziskovalno področje (Research field):

Ekologija

4. Opis raziskovalnega dela (Research work description):

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

Slov.:

Eden glavnih ciljev raziskav v ekologiji je razumeti dejavnike, ki uravnavajo abundanco vrst znotraj združb. Biodiverzitetata tal je kompleksno in premalo raziskano področje, zato tudi v aktualni Strategiji EU za biotsko raznovrstnost do leta 2030 poudarjajo potrebo po njenem varovanju. **Mikorizne glive so ključna komponenta biodiverzitetata tal in rizosfere**, saj vzpostavljajo simbiotske odnose z večino kopenskih rastlin ter imajo pomembno vlogo pri mineralni prehrani rastlin in stabilizaciji tal (Brundrett & Tedersoo, 2018). Kljub temu je o razširjanju mikoriznih gliv z živalmi znanega zelo malo, še posebej za Evropo. S projektom ARIS J1-70057 (2026–2029) 'Glivni štoparji: razširjanje mikoriznih gliv z živalskimi vektorji', <https://www.bf.uni-lj.si/sl/raziskave/raziskovalni-projekti/2026012614171183/>, si prizadevamo zapolniti to vrzel z raziskovanjem razširjanja mikoriznih gliv s sesalci v Sloveniji in južni Evropi. V okviru tega projekta bo skupaj s projektno skupino deloval tudi mladi raziskovalec ali raziskovalka. Slovenija je idealno raziskovalno območje zaradi velike biodiverzitetata, zdravih populacij kopitarjev in zveri ter obsežnih gozdnih območij. Znotraj projekta bomo proučili tudi potencialno vlogo tujerodnih in invazivnih vrst živali pri razširjanju mikoriznih gliv na nova območja. Mladi raziskovalec ali raziskovalka bo deloval v projektni skupini skupaj z raziskovalci iz različnih disciplin, vključno z ekologijo živali, ekologijo rastlin, ekologijo talnih mikroorganizmov, molekulska ekologija, bioinformatiko in analizo podatkov. Čeprav obstajajo nekateri dokazi, da sesalci uživajo mikorizne glive in raznašajo njihove vitalne spore, je to področje v veliki meri neraziskano (npr. Vašutová et al., 2019; Elliott et al., 2022). **Uporabljene bodo napredne molekulske tehnike, kot so metabarkodiranje DNA in analiza okoljske DNA (eDNA), za identifikacijo glivnih združb, ki jih raznašajo živali.** To bo omogočilo celovito razumevanje vloge sesalcev pri razširjanju mikoriznih gliv in njihovega pomena za ohranjanje zdravih ekosistemov. Zanima nas tudi **prehranski pomen gliv za sesalce ter potencialno kopičenje nevarnih elementov v gobah (trošnjakih gliv), kar lahko predstavlja grožnjo za zdravje živali in ljudi v prehranskih spletih in ekoloških mrežah.** Uporaba najsodobnejših molekulskih tehnik bo omogočila analizo kompleksnih interakcij med vrstami, analizo njihovega pomena v prehranskih spletih in karakterizacijo različnih ekosistemskih funkcij. To znanje bo ključno za upravljanje in varovanje biodiverzitetata tal ter medvrstnih interakcij v luči globalnih sprememb, vključno s podnebnimi spremembami, degradacijo habitatov in premikom območij vrst, npr. od juga proti severu. Projekt in delo mladega raziskovalca ali raziskovalke predstavljata inovativen in interdisciplinaren pristop k proučevanju pomembnosti razširjanja gliv z živalmi v kopenskih ekosistemih.

Cilji doktorske disertacije: (i) karakterizacija združb mikoriznih gliv v živalskih vzorcih (zbiranje vzorcev bo potekalo v sodelovanju z drugimi člani projektne skupine in lovci), (ii) identifikacija živali, ki se prehranjujejo z gobami na podlagi vzorcev eDNA, (iii) sledenje izbranim elementom v glivnih tkivih in iskanje povezav s prehranjevanjem živali z glivami, (iv) modeliranje razširjanja mikoriznih gliv s specifičnimi živalskimi vektorji.

Metode: Glive bomo identificirali z obstoječimi molekulske označevalci z uporabo naprednih molekulskih orodij za analizo DNA in eDNA, vključno z sekvenciranjem naslednjih generacij (metabarkodiranje DNA), bioinformatiko in analizo podatkov, po ustaljenih protokolih in standardih (De Barba et al., 2014; Zinger et al., 2019; Dumbrell et al., 2011; Maček et al., 2019). Za identifikacijo in karakterizacijo profilov mineralov v glivnih in živalskih tkivih bomo uporabili spektrometrične tehnike, npr. ED-XRF (Nečemer et al., 2008) in ICP-MS (Debeljak et al., 2018). Radioizotope bomo analizirali z visoko ločljivostno gama spektrometrijo (Falandysz et al., 2015).

Izbrane reference:

Brundrett & Tedersoo 2018. *New Phytologist* 220: 1108-1115
Vašutová et al. 2019. *Mycorrhiza* 29: 413-434
Elliott et al. 2022. *Fungal Systematics and Evolution* 9: 99-159
De Barba et al. 2023. *Molecular Ecology Resources* e13915
Zinger et al. 2019. *Molecular Ecology* 28: 1-6
Dumbrell et al. 2011. *New Phytologist* 190: 794-804
Maček et al. 2019. *Molecular Ecology* 28: 3445-3458
Nečemer et al. 2008. *Spectrochimica Acta Part B: Atomic Spectroscopy* 63, 1240-1247
Debeljak et al. 2018. *Chemosphere* 212: 1076-1084
Falandysz et al. 2015 *Applied Microbiology and Biotechnology* 99: 8217-24

Eng.:

A central aim in ecology is to understand the factors that regulate the abundance of different species within a community. Soil biodiversity is a complex and under-researched area, and the EU Biodiversity Strategy for 2030 has emphasised the need to protect soil biodiversity. **Mycorrhizal fungi are a key component of soil and rhizosphere diversity**, as they form symbiotic relationships with most terrestrial plants and play an important role in nutrient uptake and soil stabilisation (Brundrett & Tedersoo, 2018). However, little is known about the dispersal of mycorrhizal fungi by animals, especially in Europe. Through the ARIS project J1-70057 (2026–2029) '*Fungal hitchhikers: dispersal of mycorrhizal fungi via animal vectors*', <https://www.bf.uni-lj.si/en/research/research-projects/2026012614171183/>, we aim to address this knowledge gap by studying the dispersal of mycorrhizal fungi by selected mammal species in Slovenia and southern Europe. Slovenia is an ideal study area due to its high biodiversity and healthy populations of ungulates and carnivores. The project will also investigate the potential role of newcomers and invasive species in the dispersal of mycorrhizal fungi in newly invaded areas. The PhD student will work alongside researchers from various disciplines, including wildlife ecology, plant ecology, soil microbiology, molecular ecology, bioinformatics, and data science, to investigate the role of different mammalian species in the dispersal of mycorrhizal fungi within their food webs and ecological networks. While there is some evidence that mammals consume mycorrhizal fungi and disperse their spores, little research has been conducted on this topic (e.g. Vašutová et al., 2019; Elliott et al., 2022). **The PhD student will use advanced molecular techniques such as DNA metabarcoding and environmental DNA (eDNA) analysis to identify the fungal communities that may be dispersed by mammals.** This will provide a comprehensive understanding of the role of mammals in the dispersal of mycorrhizal fungi and their importance in maintaining healthy ecosystems. The PhD student will also **investigate the importance of fungi in mammalian diets and the potential accumulation of hazardous elements in fungal fruiting bodies that may pose a threat to animal and human health within the food web.** The project aims to provide a holistic understanding of the interactions between mammals, mycorrhizal fungi, and plants in terrestrial ecosystems. By using state-of-the-art molecular and spectroscopic techniques, the PhD student will be able to analyse complex species interactions and quantify ecosystem functions. This knowledge will be crucial for the management and protection of soil biodiversity in the face of global change, including climate change, habitat degradation, and species range shifts (e.g. from south to north). Overall, the project represents an innovative and interdisciplinary approach to studying the importance of animal dispersal in terrestrial ecosystems.

The objectives of the doctoral thesis: (i) characterisation of mycorrhizal fungal communities in animal-originated material (material collection will be done in collaboration with other project members and hunters); (ii) identification of animals that consume fungal sporocarps based on eDNA samples; (iii) tracing elements in animal and fungal tissues and correlating them to animal consumption of fungi; (iv) modelling fungal dispersal via specific animal vectors.

Methods: Fungi will be identified using established molecular markers and advanced molecular techniques, including next-generation sequencing methods (DNA metabarcoding), bioinformatics, and data analyses, following previously described protocols and standard practices (De Barba et al., 2014; Zinger et al., 2019; Dumbrell et al., 2011; Maček et al., 2019). Mineral profiles of selected fungal fruiting bodies and animal tissues will be assessed by spectrometric techniques, e.g. ED-XRF (Nečemer et al., 2008) and ICP-MS (Debeljak et al., 2018). Radionuclides will be assessed by high-resolution gamma spectrometry (Falandysz et al., 2015).

Selected references:

Brundrett & Tedersoo 2018. *New Phytologist* 220: 1108-1115
Vašutová et al. 2019. *Mycorrhiza* 29: 413-434
Elliott et al. 2022. *Fungal Systematics and Evolution* 9: 99-159
De Barba et al. 2023. *Molecular Ecology Resources* e13915
Zinger et al. 2019. *Molecular Ecology* 28: 1-6
Dumbrell et al. 2011. *New Phytologist* 190: 794-804
Maček et al. 2019. *Molecular Ecology* 28: 3445-3458
Nečemer et al. 2008. *Spectrochimica Acta Part B: Atomic Spectroscopy* 63, 1240-1247
Debeljak et al. 2018. *Chemosphere* 212: 1076-1084

5. Priloge, ki jih je treba priložiti ob prijavi (*Documents required to be submitted with the application*):

potrdilo o doseženi izobrazbi (*proof of completed education*)

- kandidat z zaključenim magistrskim študijskim programom (2. bolonjska stopnja) (*candidate who has completed a Master's degree (2nd Bologna level)*):
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 - o priloga k diplomi / potrdilo o opravljenih obveznostih (*diploma supplement / official transcript of records containing all grades obtained in the study programme*)
- kandidat, ki še ni zaključil študija na 2. stopnji (*candidate who has not yet completed a Master's degree*):
 - o potrdilo o do sedaj opravljenih obveznostih z ocenami magistrskega študijskega programa, s katerim se bo kandidat prijavil na doktorski študij (*official transcript of records listing all courses and grades obtained so far in the Master's degree programme on the basis of which the candidate will apply for enrollment in a doctoral degree programme.*)

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bibliografija (*bibliography*)

življenjepis (*CV*)

motivacijsko pismo (*motivation letter*)

opis dosedanjega sodelovanja pri raziskovalnem delu (*description of the candidate's research work*)

osnutek idejne zasnove raziskovalnega dela (*preliminary research proposal*)

priporočilno pismo (*letter of recommendation*)

druge priloge (*other attachments*):

Opis raziskovalnega dela (Research work description)

1. Članica UL (UL member):

Biotehniška Fakulteta, Oddelek za krajinsko arhitekturo

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

Tomaž Pipan, tomaz.pipan@bf.uni-lj.si

3. Raziskovalno področje (Research field):

5.08 Urbanizem

4. Opis raziskovalnega dela (Research work description):

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

Slov.: Usposabljanje mladega raziskovalca bo potekalo v okviru doktorskega študija s področja urejanja prostora, s poudarkom na razumevanju krajine kot dinamičnega sistema, v katerem poselitev predstavlja enega najmočnejših in najhitreje delujočih dejavnikov sprememb. Izhodišče raziskave je, da sodobni urbanizacijski procesi ne spreminjajo zgolj oblike in karakterja naselij, temveč predvsem kulturno krajino: razmerja med poselitvijo in ostalo rabo prostora. Posledično se spreminjajo krajinski vzorci, še posebej v podeželskem okolju, kjer sodobna poselitev pogosto preglasi tradicionalne vzorce in značilnosti prostora. Eden glavnih pokazateljev je spreminjanje kvalitete in oblike robov naselij.

Raziskava bo usmerjena v prepoznavanje pomena poselitve kot kompleksne grajene prvine kulturne krajine ter razlago vloge v prostorskih procesih kot pogoja za kakovostno načrtovanje in upravljanje. Mladi raziskovalec bo razvijal analitični okvir, ki povezuje krajinske metode branja prostora (krajinski vzorci, značaj, prepoznavnost) z izbranimi urbanističnimi/morfološki pristopi (členitev poselitve, tipologije, vzorci).

Pričakuje se izobrazba prostorske smeri, sposobnost analize in sinteze, znanje angleščine. Zaželeno je dobro znanje GIS orodij ter izkušnje z delom s prostorskimi podatki. Zaželeno je poznavanje krajinsko arhitekturne, urbanistične in geografske problematike prostora. Naloge mladega raziskovalca vključujejo raziskovalno delo, razvoj in preverjanje metod, sodelovanje pri pedagoškem procesu ter izdelavo in diseminacijo rezultatov (konference, članki).

Eng.: The training of the young researcher will take place within the framework of a doctoral study in the field of spatial planning, with an emphasis on understanding the landscape as a dynamic system, in which settlement represents one of the strongest and fastest-acting factors of change. The starting point of the research is that modern urbanization processes do not only change the shape and character of settlements, but primarily the cultural landscape: the relationship between settlement and other land uses. As a result, landscape patterns are changing, especially in rural environments, where contemporary settlement often overrides traditional patterns and characteristics of space. One of the main indicators is the changing quality and shape of settlement edges.

The research will be focused on recognizing the importance of settlement as a complex built element of the cultural landscape and explaining its role in spatial processes as a condition for quality planning and management. The young researcher will develop an analytical framework that connects landscape methods of reading space (landscape patterns, character, identity) with selected urban/morphological approaches (settlement structure, typologies, patterns).

A degree in spatial studies, the ability to analyse and synthesize, and knowledge of English are expected. Good knowledge of GIS tools and experience working with spatial data is required. Knowledge on landscape architecture, urbanism and geographical issues of space is desirable. The tasks of a young researcher include research work, development and verification of methods, participation in the pedagogical process, and production and dissemination of results (conferences, articles).

5. Priloge, ki jih je treba priložiti ob prijavi (*Documents required to be submitted with the application*):

potrdilo o doseženi izobrazbi (*proof of completed education*)

- kandidat z zaključenim magistrskim študijskim programom (2. bolonjska stopnja) (*candidate who has completed a Master's degree (2nd Bologna level)*):
 - o diplomska listina / potrdilo o zaključku študijskega programa (*diploma certificate / certificate of completion of the study programme*)
 - o priloga k diplomi / potrdilo o opravljenih obveznostih (*diploma supplement / official transcript of records containing all grades obtained in the study programme*)
- kandidat, ki še ni zaključil študija na 2. stopnji (*candidate who has not yet completed a Master's degree*):
 - o potrdilo o do sedaj opravljenih obveznostih z ocenami magistrskega študijskega programa, s katerim se bo kandidat prijavil na doktorski študij (*official transcript of records listing all courses and grades obtained so far in the Master's degree programme on the basis of which the candidate will apply for enrollment in a doctoral degree programme.*)

nagrade – univerzitetna Prešernova nagrada ali Prešernova nagrada članice Univerze v Ljubljani oz. druga enakovredna nagrada (*awards, e.g. Prešeren Prize of the University of Ljubljana, Prešeren Prize of a University of Ljubljana member and/or another equivalent award*)

bibliografija (*bibliography*)

življenjepis (*CV*)

motivacijsko pismo (*motivation letter*)

opis dosedanjega sodelovanja pri raziskovalnem delu (*description of the candidate's research work*)

osnutek idejne zasnove raziskovalnega dela (*preliminary research proposal*)

priporočilno pismo (*letter of recommendation*)

druge priloge (*other attachments*):

Opis raziskovalnega dela (*Research work description*)

1. Članica UL (*UL member*):

Biotehniška fakulteta

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

Tatjana Pirman tatjana.pirman@bf.uni-lj.si

3. Raziskovalno področje (*Research field*):

Prehrana

4. Opis raziskovalnega dela (*Research work description*):

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

Slov.: Raziskave na področju prehrane in zdravja prebavil so ključne tako pri perutnini in drugih rejnih živalih kot tudi pri laboratorijskih modelih, ki omogočajo prenos znanja na človeka. Pri perutnini, zlasti pri piščancih za pitanje in nesnicah, zdrav prebavni trakt neposredno vpliva na izkoriščanje krme, prirast, kakovost jajc ter odpornost proti enteričnim boleznim. Učinkovito delovanje prebavil tako prispeva k večji produktivnosti in hkrati zmanjšuje potrebo po terapevtskih posegih ter okoljski odtis reje. Podobno velja za druge rejne živali, kjer stabilna črevesna mikrobiota in dobro razvita črevesna bariera omogočata boljšo konverzijo krme, manj izgub in večjo trajnost prireje.

Pri oceni zdravja prebavil v perutninarstvu in živinoreji se uporabljajo morfološke analize (višina črevesnih resic, globina kript), funkcionalne analize (prebavljivost hranil, encimska aktivnost, integriteta črevesne bariere) ter mikrobiološke in molekularne metode za opredelitev sestave in aktivnosti črevesne mikrobiote. V zadnjem desetletju so se uveljavile napredne biotehnoške metode, kot so metagenomika, metabolomika in transkriptomika, ki omogočajo celovit vpogled v interakcije med prehrano, mikrobioto in gostiteljem. Integracija teh »-omskih« pristopov z bioinformatiko razkriva nove biomarkerje zdravja prebavil ter potencialne tarče za prehranske intervencije, kot so prilagojene mešanice vlaknin, prebiotiki, probiotiki ali alternativni viri beljakovin.

Pomembno povezovalno vlogo med raziskavami na rejnih živalih in človeku ima mišji model, ki omogoča natančno preučevanje mehanizmov delovanja prehranskih dejavnikov, mikrobiote in genetskega ozadja. Miši se pogosto uporabljajo za raziskovanje presnovnih motenj, vključno z debelostjo, kjer je porušeno ravnovesje črevesne mikrobiote tesno povezano z vnetjem nizke stopnje in inzulinsko rezistenco. Spoznanja, pridobljena na tem modelu, pomagajo razlagati opažanja pri perutnini in drugih rejnih živalih ter obenem služijo kot osnova za razumevanje vpliva prehrane na zdravje ljudi.

Tak integriran pristop – od perutnine in rejnih živali do mišjih modelov in človeka – omogoča celostno razumevanje osi prehrana–mikrobiota–gostitelj ter razvoj učinkovitih, znanstveno podprtih prehranskih strategij za izboljšanje zdravja prebavil in presovnega ravnovesja.

Glavni fokus dela mladega raziskovalca bo razumevanje interakcij med prehrano, črevesno mikrobioto in gostiteljem. Ključni cilj je opredeliti mehanizme, s katerimi prehranski dejavniki vplivajo na strukturo in funkcijo črevesja, presnovo ter imunski odziv.

Poseben poudarek je na identifikaciji biomarkerjev zdravja prebavil ter razvoju ciljno usmerjenih prehranskih intervencij (npr. funkcionalne vlaknine, pre- in probiotiki), ki izboljšujejo učinkovitost izkoriščanja hranil, odpornost proti boleznim ter zmanjšujejo tveganje za presnovne motnje – tako v živinoreji kot kot model za razumevanje zdravja ljudi.

bi bil tako usmerjen v razumevanje povezav med prehrano, črevesno mikrobioto in zdravjem prebavil z uporabo kombinacije klasičnih fizioloških metod, naprednih biotehnoloških analiz in bioinformatike. Poseben poudarek bi bil na preučevanju, kako prehranske strategije vplivajo na zdravje in produktivnost rejnih živali ter kako se lahko spoznanja iz mišjih modelov, zlasti pri preučevanju debelosti, prenesejo v širši kontekst človeškega zdravja.

Eng.: Research in the field of nutrition and gastrointestinal health is essential in poultry and other livestock species, as well as in laboratory models that enable translation of knowledge to humans. In poultry, particularly broilers and laying hens, a healthy gastrointestinal tract directly affects feed efficiency, growth performance, egg quality, and resistance to enteric diseases. Proper gut function therefore contributes to higher productivity while reducing the need for therapeutic interventions and lowering the environmental footprint of production. The same applies to other livestock species, where a stable gut microbiota and well-developed intestinal barrier support improved feed conversion, reduced losses, and more sustainable production systems.

Assessment of gastrointestinal health in poultry and livestock involves morphological analyses (villus height, crypt depth), functional measurements (nutrient digestibility, enzyme activity, intestinal barrier integrity), as well as microbiological and molecular methods to characterize gut microbiota composition and activity. In the past decade, advanced biotechnological approaches such as metagenomics, metabolomics, and transcriptomics have become widely adopted, providing comprehensive insight into the interactions among diet, microbiota, and the host. Integration of these “omics” approaches through bioinformatics enables the identification of novel biomarkers of gut health and potential targets for nutritional interventions, including adapted fibre mixtures, prebiotics, probiotics, and alternative protein sources.

An important translational link between livestock research and human health studies is the mouse model, which allows precise investigation of mechanisms through which diet, microbiota, and genetic background influence physiological outcomes. Mice are frequently used to study metabolic disorders, including obesity, where alterations in gut microbiota are closely associated with low-grade inflammation and insulin resistance. Insights gained from this model help interpret findings in poultry and other livestock species, while also serving as a foundation for understanding the impact of nutrition on human health.

Such an integrated approach—from poultry and livestock to mouse models and humans—enables a comprehensive understanding of the diet–microbiota–host axis and supports the development of scientifically grounded nutritional strategies to improve gastrointestinal health and metabolic balance.

The main focus of young researcher is to understand the interactions between diet, gut microbiota, and the host. The key objective is to elucidate the mechanisms by which dietary factors influence intestinal structure and function, metabolism, and immune responses.

Special emphasis is placed on identifying biomarkers of gut health and developing targeted nutritional interventions (e.g., functional fibres, prebiotics, probiotics) that improve nutrient utilization efficiency,

enhance disease resistance, and reduce the risk of metabolic disorders—both in animal production systems and as translational models for human health.

5. Priloge, ki jih je treba priložiti ob prijavi (*Documents required to be submitted with the application*):

potrdilo o doseženi izobrazbi (*proof of completed education*)

- kandidat z zaključenim magistrskim študijskim programom (2. bolonjska stopnja) (*candidate who has completed a Master's degree (2nd Bologna level)*):
 - o diplomska listina / potrdilo o zaključku študijskega programa (*diploma certificate / certificate of completion of the study programme*)
 - o priloga k diplomi / potrdilo o opravljenih obveznostih (*diploma supplement / official transcript of records containing all grades obtained in the study programme*)
- kandidat, ki še ni zaključil študija na 2. stopnji (*candidate who has not yet completed a Master's degree*):
 - o potrdilo o do sedaj opravljenih obveznostih z ocenami magistrskega študijskega programa, s katerim se bo kandidat prijavil na doktorski študij (*official transcript of records listing all courses and grades obtained so far in the Master's degree programme on the basis of which the candidate will apply for enrollment in a doctoral degree programme.*)

nagrade – univerzitetna Prešernova nagrada ali Prešernova nagrada članice Univerze v Ljubljani oz. druga enakovredna nagrada (*awards, e.g. Prešeren Prize of the University of Ljubljana, Prešeren Prize of a University of Ljubljana member and/or another equivalent award*)

bibliografija (*bibliography*)

življenjepis (*CV*)

motivacijsko pismo (*motivation letter*)

opis dosedanjega sodelovanja pri raziskovalnem delu (*description of the candidate's research work*)

osnutek idejne zasnove raziskovalnega dela (*preliminary research proposal*)

priporočilno pismo (*letter of recommendation*)

druge priloge (*other attachments*):

Opis raziskovalnega dela (*Research work description*)

1. Članica UL (*UL member*):

Biotehniška fakulteta

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

Hubert Potočnik, hubert.potocnik@bf.uni-lj.si

3. Raziskovalno področje (*Research field*):

Prostorska ekologija velikih sesalcev v antropogeni krajini (*Spatial Ecology of big mammals in human dominated landscapes*)

4. Opis raziskovalnega dela (*Research work description*):

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

Slov.: Sodobna evropska krajina je zaradi intenzivnega človekovega poseganja, urbanizacije, gozdarstva, kmetijstva in razvoja prometne infrastrukture močno fragmentirana. Ta fragmentacija neposredno vpliva na prostoživeče velike sesalce, kot so volk, ris, medved ter kopitarji (npr.: srna, navadni jelen, divji prašič), ki za svoje preživetje potrebujejo obsežne, kakovostne in povezane habitate. Raziskovanje rabe habitata, izbire virov ter habitatne povezanosti in fragmentacije prostora je zato ključno za razumevanje ekoloških potreb teh vrst ter za načrtovanje učinkovitih strategij upravljanja in ohranjanja njihovih populacij.

Veliki sesalci živijo v krajini, kjer so naravni procesi prepleteni z vplivi človeka, zato je preučevanje njihovih prostorskih vzorcev neizogibno kompleksno. Raba habitata je odvisna od razpoložljivosti hrane, strukture vegetacije, dostopnosti kritja ter prisotnosti človekovih motenj. Izbira virov se spreminja skozi čas in prostor, saj živali nenehno prilagajajo svoje gibanje in vedenje tako naravnim dejavnikom kot antropogenim vplivom. Fragmentacija krajine z razpršenimi naselji, prometnicami in ograjami ustvarja dodatne omejitve, ki lahko zmanjšujejo funkcionalno povezanost populacij ter preprečujejo naravno disperzijo mladih živali ali selitev odraslih osebkov.

Razumevanje habitatne povezanosti je ključno za dolgoročno stabilnost populacij. Identifikacija ključnih koridorjev, območij visoke prepustnosti ter kritičnih točk, kjer prihaja do prekinitev migracijskih poti, omogoča razvoj ciljnih usmerjenih ukrepov, ki zmanjšujejo tveganja za konflikte med človekom in prostoživečimi živalskimi vrstami ter prispevajo k ohranjanju genetskega pretoka med populacijami.

Napredek metod v prostorski ekologiji pomembno krepi možnost uspešnega raziskovanja. Satelitska telemetrija (GPS/GSM) omogoča natančno spremljanje gibanja posameznikov, droni in daljinsko zaznavanje zagotavljajo podrobne informacije o stanju habitata, fotopasti pa dopolnjujejo podatke o prisotnosti, aktivnosti in specifičnih vedenjskih odzivih vrst. Napredni analitični pristopi, kot so modeli primerne prostora, izbire virov, analize selektivnosti gibanja ter modeli habitatne povezanosti, omogočajo celostno razumevanje prostorskih potreb vrst in vpliva krajinske strukture na njihovo gibanje in razporejanje v prostoru.

Raziskovalno področje zato predstavlja presečišče ekologije, varstva narave, prostorskega modeliranja in podatkovne znanosti, ki jih omogočajo sodobne metode spremljanja, rezultati raziskav pa so neposredno uporabni v varstveni biologiji, prostorskem načrtovanju in upravljanju populacij velikih sesalcev.

Eng.: The contemporary European landscape is heavily fragmented as a result of intensive human activities, including urbanization, forestry, agriculture, and the expansion of transportation infrastructure. This fragmentation directly affects large terrestrial mammals such as wolves, lynx, bears, red deer, roe deer, and wild boar, all of which require extensive, high-quality, and well-connected habitats for their survival. Studying habitat use, resource selection, and the connectivity and fragmentation of habitats is therefore essential for

understanding the ecological requirements of these species and for designing effective management and conservation strategies to maintain their populations.

Large mammals inhabit landscapes where natural processes are deeply intertwined with human influence, making the study of their spatial patterns inherently complex. Habitat use depends on food availability, vegetation structure, access to cover, and the extent of human disturbance. Resource selection varies across space and time, as animals continuously adjust their movements and behaviour in response to both natural factors and anthropogenic pressures. Landscape fragmentation caused by dispersed settlements, road networks, and fences creates additional constraints that can reduce the functional connectivity of populations and hinder the natural dispersal of juveniles or the movements of adult individuals.

Understanding habitat connectivity is crucial for the long-term stability of populations. Identifying key corridors, areas of high landscape permeability, and critical points where migration routes are disrupted enables the development of targeted measures that reduce the risk of conflicts between humans and wildlife while supporting the preservation of genetic exchange among populations.

Recent advances in spatial ecology significantly enhance our ability to study these processes. Satellite telemetry (GPS/GSM) enables precise monitoring of individual movement, drones and remote-sensing techniques provide detailed information on habitat conditions, and camera traps supplement data on species presence, activity patterns, and specific behavioural responses. Advanced analytical approaches—including habitat suitability modelling, resource selection analyses, movement-based selection functions, and habitat connectivity models—allow for a comprehensive understanding of species' spatial requirements and the influence of landscape structure on their movement and distribution.

This research area represents a convergence of ecology, nature conservation, spatial modelling, and data science. Supported by modern monitoring technologies, its findings are directly applicable to conservation biology, spatial planning, and the management of large mammal populations in human-modified environments.

5. Priloge, ki jih je treba priložiti ob prijavi (*Documents required to be submitted with the application*):

potrdilo o doseženi izobrazbi (*proof of completed education*)

- kandidat z zaključenim magistrskim študijskim programom (2. bolonjska stopnja) (*candidate who has completed a Master's degree (2nd Bologna level)*):
 - diplomska listina / potrdilo o zaključku študijskega programa (*diploma certificate / certificate of completion of the study programme*)
 - priloga k diplomi / potrdilo o opravljenih obveznostih (*diploma supplement / official transcript of records containing all grades obtained in the study programme*)
- kandidat, ki še ni zaključil študija na 2. stopnji (*candidate who has not yet completed a Master's degree*):
 - potrdilo o do sedaj opravljenih obveznostih z ocenami magistrskega študijskega programa, s katerim se bo kandidat prijavil na doktorski študij (*official transcript of records listing all courses and grades obtained so far in the Master's degree programme on the basis of which the candidate will apply for enrollment in a doctoral degree programme.*)

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motivacijsko pismo (*motivation letter*)

opis dosedanjega sodelovanja pri raziskovalnem delu (*description of the candidate's research work*)

osnutek idejne zasnove raziskovalnega dela (*preliminary research proposal*)

priporočilno pismo (*letter of recommendation*)

druge priloge (*other attachments*):

Opis raziskovalnega dela (*Research work description*)

1. Članica UL (*UL member*):

Biotehniška fakulteta

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

Ester Stajič, ester.stajic@bf.uni-lj.si

3. Raziskovalno področje (*Research field*):

4.03.00 Biotehnika Rastlinska produkcija in predelava

4. Opis raziskovalnega dela (*Research work description*):

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

Slov.: Usposabljanje mladega raziskovalca oz. raziskovalke bo potekalo na Katedri za genetiko, biotehnologijo, statistiko in žlahtnjenje rastlin Oddelka za agronomijo, Biotehniške fakultete Univerze v Ljubljani, v okviru programske skupine P4-0077 »Kmetijske rastline - genetika in sodobne tehnologije«.

Raziskovalno delo bo umeščeno v proučevanje interakcij med rastlinami in patogeni, s poudarkom na regulatorni vlogi malih RNA. V ospredju bo raziskovanje verticilijske uvelosti hmelja ter razvoj biotehnoloških pristopov za obvladovanje te gospodarsko pomembne bolezni. Doktorsko usposabljanje bo usmerjeno v vzpostavitev in optimizacijo učinkovitih protokolov za analizo malih RNA in identifikacijo njihovih tarč. Delo bo vključevalo uporabo sodobnih molekularnih tehnik (sekvenciranje po Sangerju, RT-qPCR), *in vitro* gojenje rastlin, genske transformacije ter pristope preurejanja genoma.

Iščemo motivirano in samoiniciativno kandidatko ali kandidata, ki ga zanima področje rastlinske biotehnologije in ima izkušnje z laboratorijskim delom ter analizo podatkov. Prednost imajo kandidati z dobrim znanjem angleškega jezika ter zaključeno magistrsko izobrazbo s področja biotehnologije, agronomije, hortikulture, molekularne biologije, mikrobiologije ali sorodnih ved, ki si želijo dela v dinamičnem in interdisciplinarnem raziskovalnem okolju.

Eng.: Training of the young researcher will take place at the Chair of Genetics, Biotechnology, Statistics and Plant Breeding, Department of Agronomy, Biotechnical Faculty, University of Ljubljana, within the research programme group P4-0077 "Genetics and Modern Technologies".

The research work will focus on the study of plant-pathogen interactions, with particular emphasis on the regulatory role of small RNAs. The project will address *Verticillium* wilt in hops and the development of biotechnological approaches for managing this economically important disease. Doctoral training will be aimed at establishing and optimizing efficient protocols for small RNA analysis and identification of their targets. The work will involve the application of modern molecular techniques (Sanger sequencing, RT-qPCR), *in vitro* plant culture, genetic transformation, and genome editing approaches.

We are seeking a motivated and proactive candidate with a strong interest in plant biotechnology and experience in laboratory work and data analysis. Preference will be given to candidates with strong English language skills and a completed Master's degree in biotechnology, agronomy, horticulture, molecular biology, microbiology, or related fields, who are eager to work in a dynamic and interdisciplinary research environment.

5. Priloge, ki jih je treba priložiti ob prijavi (*Documents required to be submitted with the application*):

potrdilo o doseženi izobrazbi (*proof of completed education*)

– kandidat z zaključenim magistrskim študijskim programom (2. bolonjska stopnja)
(*candidate who has completed a Master's degree (2nd Bologna level)*):

○ diplomska listina / potrdilo o zaključku študijskega programa

(diploma certificate / certificate of completion of the study programme)

- priloga k diplomi / potrdilo o opravljenih obveznostih
(diploma supplement / official transcript of records containing all grades obtained in the study programme)
- kandidat, ki še ni zaključil študija na 2. stopnji
(candidate who has not yet completed a Master's degree):
 - potrdilo o do sedaj opravljenih obveznostih z ocenami magistrskega študijskega programa, s katerim se bo kandidat prijavil na doktorski študij
(official transcript of records listing all courses and grades obtained so far in the Master's degree programme on the basis of which the candidate will apply for enrollment in a doctoral degree programme.)

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bibliografija *(bibliography)*

življenjepis *(CV)*

motivacijsko pismo *(motivation letter)*

opis dosedanjega sodelovanja pri raziskovalnem delu *(description of the candidate's research work)*

osnutek idejne zasnove raziskovalnega dela *(preliminary research proposal)*

priporočilno pismo *(letter of recommendation)*

druge priloge *(other attachments):*

Opis raziskovalnega dela (Research work description)

1. Članica UL (UL member):

Biotehniška fakulteta (Biotechnical Faculty)

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

Janja Trček: janja.trcek@bf.uni-lj.si

3. Raziskovalno področje (Research field):

Mikrobiologija in mikrobna biotehnologija / Microbiology and Microbial biotechnology

4. Opis raziskovalnega dela (Research work description):

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

Slov.:

Mlado raziskovalko/ca zaposlimo na raziskovalnem projektu s področja mikrobiologije in molekularne biologije, s poudarkom na mikrobioti čebel (*Apis* spp. in divje čebele) ter vlogi oacetnokislinskih bakterij v njihovem prebavnem traktu. Osrednje naloge bodo vključevale identifikacijo prevladujočih rodov in vrst bakterij v prebavilih različnih vrst čebel z uporabo klasičnih mikrobioloških pristopov in sodobnih molekularnih metod (izolacija DNA, PCR, sekvenciranje 16S rRNA, metagenomske analize). Poseben poudarek bo namenjen oacetnokislinskim bakterijam, njihovi taksonomski opredelitvi ter analizi njihove relativne zastopanosti in raznolikosti glede na vrsto čebele, prehrano in okoljske dejavnike. Raziskovalno delo bo obsegalo tudi izolacijo in kultivacijo bakterijskih sevov iz prebavil čebel, njihovo fenotipsko in genotipsko karakterizacijo ter vzpostavitev zbirke izolatov. Kandidat bo izvajal primerjalne genomske analize izbranih sevov z namenom identifikacije genov, povezanih z metabolizmom ogljikovih hidratov, sintezo organskih kislin in bioaktivnih snovi ter odpornostjo na stresne pogoje v prebavilih. Pomemben del raziskave bo usmerjen v razumevanje metabolnih funkcij oacetnokislinskih bakterij v prebavilih čebel, vključno z njihovo vlogo pri presnovi sladkorjev, tvorbi metabolitov (npr. organskih kislin), vplivu na pH okolja ter potencialnemu prispevku k zdravju in odpornosti čebel proti patogenim mikroorganizmom.

Delo vključuje načrtovanje in izvajanje laboratorijskih poskusov, obdelavo in statistično analizo podatkov, pripravo znanstvenih objav ter sodelovanje na domačih in mednarodnih konferencah. Pričakuje se samostojnost, natančnost, sposobnost timskega dela ter interes za interdisciplinarno raziskovanje na stičišču mikrobiologije, genomike bakterij in biologije čebel.

Mladi raziskovalec se bo predvidoma vpisal na podiplomski študij Bioznanosti, imel pa bo tudi možnost aktivne udeležbe na domačih in tujih znanstvenih konferencah in različnih usposabljanj. Zaželeno so izkušnje s kultivacijo bakterij, z molekularno-biološkimi tehnikami ter poznavanje osnovnih statističnih in bioinformatičnih orodij. Zaželen je magisterij na študijih Mikrobiologije, Biotehnologije, Molekulske in funkcionalne biologije, Biologije, Biokemije ali sorodnih smeri.

Program usposabljanja mladega raziskovalca in natančna vsebina doktorata, kot tudi izbira doktorskega študija bosta dokončno dogovorjena z izbrano/im kandidatko/om.

Eng.:

We invite applications for a young researcher position within a research project in microbiology and molecular biology focusing on the microbiota of honey bees (*Apis* spp.) and wild bees, and the role of acetic acid bacteria in their digestive tract. The main tasks will include the identification of dominant bacterial genera and species in the gastrointestinal tract of different bee species using classical microbiological approaches and modern molecular methods (DNA isolation, PCR, 16S rRNA sequencing, and metagenomic analyses). Special emphasis will be placed on acetic acid bacteria, their taxonomic characterization, and the analysis of their relative abundance and diversity in relation to bee species, diet, and environmental factors. The research will also involve the isolation and cultivation of bacterial strains from bee guts, their phenotypic and genotypic characterization, and the establishment of a strain collection. The candidate will perform comparative genomic analyses of selected strains to identify genes associated with carbohydrate metabolism, the synthesis of organic acids and bioactive compounds, and resistance to stress conditions in the gut environment. An important part of the project will focus on understanding the metabolic functions of acetic acid bacteria in the bee gut, including their role in sugar

metabolism, production of metabolites (e.g., organic acids), influence on environmental pH, and their potential contribution to bee health and resistance against pathogenic microorganisms.

The position includes planning and conducting laboratory experiments, data processing and statistical analysis, preparation of scientific publications, and participation in national and international conferences. Independence, precision, the ability to work in a team, and an interest in interdisciplinary research at the interface of microbiology, bacterial genomics, and bee biology are expected.

The young researcher is expected to enroll in a postgraduate doctoral program in Biosciences and will have the opportunity to actively participate in national and international scientific conferences and various training courses. Experience with bacterial cultivation, molecular biology techniques, and familiarity with basic statistical and bioinformatics tools are desirable. A master's degree in Microbiology, Biotechnology, Molecular and Functional Biology, Biology, Biochemistry, or a related field is preferred.

The training program for the young researcher, the detailed content of the doctoral research, and the selection of the doctoral study program will be finalized in agreement with the selected candidate.

5. Priloge, ki jih je treba priložiti ob prijavi (*Documents required to be submitted with the application*):

potrdilo o doseženi izobrazbi (*proof of completed education*)

- kandidat z zaključenim magistrskim študijskim programom (2. bolonjska stopnja) (*candidate who has completed a Master's degree (2nd Bologna level)*):
 - o diplomska listina / potrdilo o zaključku študijskega programa (*diploma certificate / certificate of completion of the study programme*)
 - o priloga k diplomi / potrdilo o opravljenih obveznostih (*diploma supplement / official transcript of records containing all grades obtained in the study programme*)
- kandidat, ki še ni zaključil študija na 2. stopnji (*candidate who has not yet completed a Master's degree*):
 - o potrdilo o do sedaj opravljenih obveznostih z ocenami magistrskega študijskega programa, s katerim se bo kandidat prijavil na doktorski študij (*official transcript of records listing all courses and grades obtained so far in the Master's degree programme on the basis of which the candidate will apply for enrollment in a doctoral degree programme.*)

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bibliografija (*bibliography*)

življenjepis (*CV*)

motivacijsko pismo (*motivation letter*)

opis dosedanjega sodelovanja pri raziskovalnem delu (*description of the candidate's research work*)

osnutek idejne zasnove raziskovalnega dela (*preliminary research proposal*)

priporočilno pismo (*letter of recommendation*)

druge priloge (*other attachments*):

Opis raziskovalnega dela (Research work description)

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):

Tilen Zamljen, tilen.zamljen@bf.uni-lj.si

3. Raziskovalno področje (Research field):

4.03 Rastlinska produkcija in predelava

4. Opis raziskovalnega dela (Research work description):

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

Slov.: Raziskovalno delo mlade/ga raziskovalca/ke bo potekalo v okviru doktorskega študija Bioznanosti na raziskovalnem področju hortikultura. Osrednja tema doktorske disertacije bo preučevanje kapsaicinoidne in kapsinoidne metabolne poti pri čilijih ter vpliva okoljskih dejavnikov in biostimulantov na kemijsko sestavo in kakovost pridelka.

Raziskave bodo usmerjene v razumevanje nastajanja in uravnavanja sekundarnih metabolitov, ki določajo senzorične lastnosti in stabilnost kakovosti čilijev. Kandidat/ka bo preučeval/a spremembe v metabolnem profilu rastlin v različnih rastnih pogojih ter ob uporabi blagih stresnih dejavnikov in biostimulantov. Poseben poudarek bo na spremljanju sestave kapsaicinoidov in kapsinoidov, aminokislinske sestave ter značilnosti dušikovega metabolizma in njihovih medsebojnih povezav. Raziskovalno delo bo vključevalo načrtovanje in izvajanje poskusov, analizo vzorcev, obdelavo in statistično interpretacijo podatkov ter povezovanje metabolnih sprememb s parametri kakovosti pridelka.

Mladi/a raziskovalec/ka bo sodeloval/a pri pripravi znanstvenih objav, predstavitev rezultatov na konferencah in pri drugih oblikah diseminacije rezultatov. Sodeloval/a bo tudi pri raziskovalnem delu programske skupine Hortikultura ter po potrebi pri pedagoškem procesu. Del raziskav lahko poteka v sodelovanju z drugimi raziskovalnimi institucijami doma ali v tujini.

Od kandidata/ke pričakujemo zaključen magistrski študij s področja hortikulture ali agronomije oziroma sorodnih ved, osnovne izkušnje z laboratorijskim in eksperimentalnim delom ter sposobnost samostojnega in timskega raziskovalnega dela. Zaželeno je znanje statistične obdelave podatkov in uporabe ustreznih programskih orodij ter odlično znanje angleškega jezika. Pričakujemo motiviranost za raziskovalno delo, natančnost in pripravljenost na delo v laboratoriju, rastlinjaku in na terenu ter na raziskovalne obiske v tujini.

Eng.: The research work of the young researcher will be carried out within the doctoral study programme Biosciences in the research field of horticulture. The central topic of the doctoral dissertation will be the study of the capsaicinoid and capsinoid metabolic pathways in chili peppers and the influence of environmental factors and biostimulants on the chemical composition and quality of the yield.

The research will focus on understanding the formation and regulation of secondary metabolites that determine the sensory properties and stability of chili pepper quality. The candidate will investigate changes in the metabolic

profile of plants under different growing conditions and with the application of mild stress factors and biostimulants. Special emphasis will be placed on monitoring the composition of capsaicinoids and capsinoids, amino acid composition, characteristics of nitrogen metabolism, and their interrelationships. The research work will include designing and conducting experiments, sample analysis, data processing and statistical interpretation, and linking metabolic changes with crop quality parameters.

The young researcher will participate in preparing scientific publications, presenting results at conferences, and other forms of dissemination of results. They will also collaborate in the research work of the Horticulture programme group and, if necessary, in the teaching process. Part of the research may be conducted in cooperation with other research institutions in Slovenia or abroad.

Applicants are expected to have completed a master's degree in horticulture, agronomy, or related fields, basic experience with laboratory and experimental work, and the ability to conduct independent as well as teamwork-based research. Knowledge of statistical data analysis and the use of relevant software tools is desirable, along with excellent command of English. We expect motivation for research work, precision, and willingness to work in the laboratory, greenhouse, and field, as well as readiness for research visits abroad.

5. Priloge, ki jih je treba priložiti ob prijavi (*Documents required to be submitted with the application*):

potrdilo o doseženi izobrazbi (*proof of completed education*)

- kandidat z zaključenim magistrskim študijskim programom (2. bolonjska stopnja) (*candidate who has completed a Master's degree (2nd Bologna level)*):
 - o diplomska listina / potrdilo o zaključku študijskega programa (*diploma certificate / certificate of completion of the study programme*)
 - o priloga k diplomi / potrdilo o opravljenih obveznostih (*diploma supplement / official transcript of records containing all grades obtained in the study programme*)
- kandidat, ki še ni zaključil študija na 2. stopnji (*candidate who has not yet completed a Master's degree*):
 - o potrdilo o do sedaj opravljenih obveznostih z ocenami magistrskega študijskega programa, s katerim se bo kandidat prijavil na doktorski študij (*official transcript of records listing all courses and grades obtained so far in the Master's degree programme on the basis of which the candidate will apply for enrollment in a doctoral degree programme.*)

nagrade – univerzitetna Prešernova nagrada ali Prešernova nagrada članice Univerze v Ljubljani oz. druga enakovredna nagrada (*awards, e.g. Prešeren Prize of the University of Ljubljana, Prešeren Prize of a University of Ljubljana member and/or another equivalent award*)

bibliografija (*bibliography*)

življenjepis (*CV*)

motivacijsko pismo (*motivation letter*)

opis dosedanjega sodelovanja pri raziskovalnem delu (*description of the candidate's research work*)

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