

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

1. Članica UL (*UL member*):

Veterinarska fakulteta

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

Andrej Kirbiš andrej.kirbis@vf.uni-lj.si

3. Raziskovalno področje (*Research field*):

Zdravje živali, okolje in varna hrana

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

Vključuje morebitne dodatne pogoje, ki jih mora izpolnjevati kandidat/ka za mladega raziskovalca/ko, ki niso navedeni v razpisu za mlade raziskovalce.

slo: Na Inštitutu za varno hrano, krmo in okolje Veterinarske fakultete UL med drugim izvajamo različne diagnostične postopke za ugotavljanje prisotnosti mikroorganizmov, kemijskih kontaminantov kakor tudi ostankov zdravil v živilih in krmi. V zadnjem času se intenzivno posvečamo tematiki dobrobiti rejnih živali med transportom v klavnico kakor tudi dobrobiti živali med samim bivanjem v klavnici pred zakolom.

Področje raziskav doktorskega študenta bo raziskovalni program P4-0092 - Zdravje živali, okolje in varna hrana. Raziskovalno delo bo predvidoma vezano na temo dobrobiti rejnih živali. V prvem letu usposabljanja se bo kandidat posvečal študijskim obveznostim, spoznavanju različnih metod in poteku dela v našem laboratoriju ter pričel z zbiranjem vzorcev za doktorsko nalogo.

Za kandidata je zaželeno, da ima:

- izobrazbo biomedicinske smeri
- dobro znanje angleškega jezika kot osnova za pisanje člankov in predstavljanje izsledkov na mednarodnih strokovnih in znanstvenih konferencah
- sposobnost samostojnega in skupinskega dela
- željo po znanstveno-raziskovalnem delu

Kandidate vabimo, da pošljejo kratek življenjepis in motivacijsko pismo na naslov: andrej.kirbis@vf.uni-lj.si

eng: At the Institute for Safe Food, Feed and Environment of the Faculty of Veterinary Medicine UL, we carry out various diagnostic procedures to determine the presence of microorganisms, chemical contaminants as well as drug residues in food and feed. Recently, we have been working intensively on the welfare of farm animals during transportation to the slaughterhouse and on the welfare of animals during their stay in the slaughterhouse before slaughter.

The PhD student's research area will be the research program P4-0092 - Animal Health, Environment and Safe Food. It is expected that the research work will relate to the topic of farm animal welfare. During the first year of training, the candidate will dedicate himself to his study commitments, familiarize himself with the different methods and workflows in our laboratory and start sampling for his PhD thesis.

It is desirable that the candidate has the following

- an education in the field of biomedicine
- good knowledge of the English language as a basis for writing articles and presenting results at international professional and scientific conferences
- the ability to work independently and in a group
- desire for scientific work

Applicants are requested to send a short CV and a letter of motivation to the following address:

andrej.kirbis@vf.uni-lj.si

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

1. Članica UL (UL member):

Veterinarska fakulteta, Gerbičeva 60, 1000 Ljubljana (Veterinary faculty, Gerbičeva 60, 1000 Ljubljana)

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

Valentina Kubale Dvojmoč, valentina.kubale@vf.uni-lj.si

3. Raziskovalno področje (Research field):

4.04. Veterina, Morfologija, fiziologija in reprodukcija živali (4.04. Veterinary medicine, Morphology, physiology and reproduction of animals)

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

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Ozadje raziskovalne naloge: V Sloveniji in po Evropi narašča število eksotičnih hišnih ljubljencev, med katerimi so tudi različne vrste plazilcev. Ta trend vodi do povečanja kliničnih primerov, ki zahtevajo izpopolnjeno znanje veterinarja tudi glede anatomije, histologije in genetskega ozadja plazilcev. Kljub temu pa je težko pridobiti podrobnejše informacije ter obsežnejše študije, ki vključujejo anatomijo, histologijo, genetiko in diagnostiko, saj so redke in se osredotočajo na posamezne organe in sisteme, spregledajo pa celostne pristope. Kraljevi piton in bradata agama ter druge priljubljene vrste plazilcev niso bile vključene v obsežne anatomske in histološke študije, študije razlik med spoloma in podrobnih preiskav srca. Prav tako je pomembno vsa pridobljena znanja povezati z naprednimi diagnostičnimi tehnikami in zgraditi most s kliničnim znanjem za napredek pri zdravljenju plazilcev. To vključuje prepoznavanje optimalnih mest za postopke, kot so odvzem krvi, povezava morfoloških študij s kliničnimi metodami kot so ultrazvok, rentgen, računalniška tomografija (CT), ki dopolnjujejo morfološke in morfometrične metode, mikroCT in genetsko analizo. Razumevanje morfologije plazilcev ne izboljša samo oskrbe v ujetništvu in divjih okoljih, ampak tudi olajša kirurške posege in diagnozo bolezni. Poleg tega plazilci služijo kot modelni organizmi na različnih raziskovalnih področjih, kjer poznavanje njihove morfologije prispeva k globljemu razumevanju njihovih bioloških funkcij in podpira natančnejše raziskave.

Cilji in hipoteze: S predlaganim projektom želimo prispevati k bolj poglobljenemu znanju anatomske in histološke zgradbe različnih vrst plazilcev, s poudarkom na kraljevem pitonu in bradati agami. Pri njih (in glede na pridobljene vzorce še kakšne druge vrste) želimo podrobno opisati histološko in anatomsko zgradbo, razlike med spoloma ter se podrobneje posvetiti zgradbi srca in srčnemu skeletu ter ugotoviti kateri geni so vključeni v razvoj srčnega skeleta, pri čemer bomo vzporednice potegnili še z drugimi vrstami plazilcev, ki jih bomo imeli na voljo. Ugotovitve želimo povezati še s klinično morfologijo, pomembno za klinično delo s plazilci.

Metode dela: Mladi raziskovalec bo uporabljal različne tehnike na tkivih različnih skupin plazilcev. Na področju veterinarske morfologije bomo izvajali makroskopska in mikroskopska opazovanja ter morfometrične meritve. Mladi raziskovalec bo sodeloval v vseh fazah priprave histoloških preparatov in uporabljal različne tehnike barvanja (hematoksilin-eozin kot tudi posebna histološka barvanja, kot so barvanje po Goldnerju oz. trikromnobarvanje po Massonu, barvanje Picro-sirius, srebrenje, barvanje von Kossa in druga, kakor tudi imunohistokemične postopke z ustreznimi razpoložljivimi protitelesi) in pripravljene preparate opazoval predvsem na nivoju svetlobne, pa tudi polarizacijske svetlobe. Uporabljena bo tudi 3D-rentgenska mikroskopija (mikro računalniška tomografija oz. mikro-CT) za slikanje notranje 3D-strukture vzorcev. Poleg omenjenih metod bomo temeljito preiskali razpoložljivo literaturo in morfološke opise dopolnili še s kliničnimi tehnikami kot so ultrazvok, rentgen in CT. Za raziskovanje genetskega ozadja vezanega na nastanek srčnega skeleta želimo uporabiti metodo prostorske transkriptomike – tehnologijo 10x genomics oz. platformo Xenium (izražanje genov *in situ*) za določanje ekspresije genov posamezne celice na nivoju histoloških rezin.

Vpetost v projekte in programe: Mladi raziskovalec se bo usposabljal na Inštitutu za predklinične vede, Enoti za anatomijo, histologijo z embriologijo (IPV, EAHEC) v okviru interdisciplinarnega doktorskega programa Biomedicina, znanstveno področje Veterina. Raziskovalno delo bo potekalo v okviru raziskovalnega programa P4-0053 »Endokrini, imunski in encimski odzivi pri zdravih in bolnih živalih«. Mladi raziskovalec bo poleg tega v celoti vključen v izobraževalni program Univerze v Nottinghamu in bo imel popolni dostop do njihovih laboratorijskih kapacitet, usposabljanja in mentorstva ter se bo lahko udeleževal anatomskih in histoloških simpozijev in konferenc.

Druge zahteve: Del doktorske naloge bo izveden na Veterinarski fakulteti, Univerze v Nottinghamu, Velika Britanija, skupaj s somentorico iz Univerze v Nottinghamu, zato je aktivno znanje angleškega jezika bistvenega pomena, kot tudi navdušenje in pripravljenost za izvajanje dela raziskovanja v tujini. Izkušnje z delom v histološkem

laboratoriju so prednost. Od kandidata pričakujemo zainteresiranost za znanstvenoraziskovalno delo, komunikativnost ter pripravljenost na timsko delo. Zainteresiranost za pedagoško delo je prav tako prednost.

Background of the research project: In Slovenia and throughout Europe, the number of exotic pets, including various reptiles, is increasing. This trend leads to more clinical cases that require increased veterinary expertise in the anatomy, histology and genetic background of reptiles. However, detailed information, especially comprehensive studies integrating anatomy, histology, genetics and diagnostics, is scarce and focuses on individual organs and systems, neglecting holistic approaches. The ball python and bearded dragon, as well as other popular reptile species, lack comprehensive anatomical and histological studies, studies on sex differences and detailed cardiac examinations. It is important that all knowledge gained is combined with advanced diagnostic techniques and builds a bridge to clinical knowledge in order to advance the treatment of reptiles. This includes identifying optimal locations for procedures such as blood sampling, ultrasound, X-rays, CT to complement morphological and morphometric methods, micro-CT scans and genetic analysis. Understanding the morphology of reptiles not only improves care in captivity and in the wild, but also facilitates surgical interventions and the diagnosis of diseases. In addition, reptiles serve as model organisms in various fields of research, where knowledge of their morphology contributes to a deeper understanding of their biological functions and enables more accurate research.

Goals and hypothesis: With the proposed project, we aim to contribute to a deeper knowledge of the anatomical and histological structure of different reptile species, focusing on the ball python and the bearded dragon. We want to describe in detail the histological and anatomical structure, the differences between the sexes and the structure of the heart and cardiac skeleton and find out which genes are involved in the development of the cardiac skeleton, drawing parallels with other available reptile species. We also aim to relate the results to clinical morphology, which is important for clinical work with reptiles.

Research methods: The young researcher will apply various techniques to the tissues of different groups of reptiles. In the field of veterinary morphology, we will perform macroscopic and microscopic observations and morphometric measurements. The young researcher will be involved in all stages of preparation of histological slides and will apply different staining techniques (hematoxylin-eosin as well as special histological stains such as Goldner, Picrosirius, Masson trichrome, silver nitrate, von Kossa staining and immunohistochemical staining with relevant available antibodies) and will observe the slides mainly with light microscopy and also with polarisation microscopy. In addition, 3D X-ray microscopy (micro-computed tomography or micro-CT) will be used to visualise the internal 3D structure of the specimens. We aim to complement morphological techniques with clinical techniques such as ultrasound, X-ray and CT as well as basic literature searches and reviews. To investigate the genetic background, in particular the genes involved in cardiac skeletal development, we plan to use the spatial transcriptomics method – 10x genomics technology or the Xenium platform (gene expression *in situ*) to determine the gene expression of individual cells at the level of histological sections.

Incorporation in existing programmes and projects: The young researcher will be trained at the Institute of Preclinical sciences, Department for Anatomy, histology and embryology (IPV, EAHEC) within the interdisciplinary PhD programme in biomedicine, the scientific field of veterinary medicine. The research work will be carried out as part of the research programme P4-0053 "Endocrine, immunological and enzymatic reactions in healthy and diseased animals". The young researcher will additionally be fully integrated into the University of Nottingham training programme and have access to their Researcher Academy training in addition to laboratory facilities, and training and mentorship and will be able to attend anatomical and histological symposia and conferences.

Special requirements: Part of the PhD will be carried out at the School of Veterinary Medicine, University of Nottingham, UK, with a co-mentor from the University of Nottingham. Therefore, an active knowledge of English is essential, as is enthusiasm and a willingness to carry out part of the research abroad. Experience of working in a histology laboratory is an advantage. We expect the candidate to be interested in scientific research work, communicative, and ready to work in a team. Interest in being involved in teaching is also an advantage.

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Veterinarska fakulteta, *Veterinary Faculty*

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

Doc.dr. Katerina Tomsič, dr.vet.med/Assist prof. *Katerina Tomsič*, DVM, katerina.tomsic@vf.uni-lj.si

3. Raziskovalno področje (*Research field*):

Veterinarska medicina, *Veterinary medicine*

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

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Mladi raziskovalec se bo priključil raziskovalnemu programu P4-0053 Endokrini, imunski in encimski odzivi pri zdravih in bolnih živalih, ki se izvaja na Veterinarski fakulteti Univerze v Ljubljani. Usposabljanje mladega raziskovalca bo potekalo na Oddelku za anesteziologijo Klinike za male živali Veterinarske fakultete. Kandidat bo vpisan na doktorski študijski program Biomedicina.

Mladi raziskovalec bo proučeval farmakokinetiko ter hemodinamski in analgetični učinek levobupivakaina v kombinaciji z adjuvantnim analgetikom deksmedetomidinom pri medfascijskih področnih blokih trebušne votline pri psih, pri katerih bomo opravili ovariektomijo. Mladi raziskovalec bo v okviru doktorske naloge sodeloval pri pripravi protokola študije, pridobival in vključeval psice v raziskavo, poskrbel za anestezijo psic ter za operacijsko oskrbo in ocenjevanje bolečine po posegu. V okviru raziskave bo poskrbel za preanalitično obdelavo vzorcev za farmakokinetične analize. Tekom usposabljanja bo pridobil praktično in teoretično znanje s področja anestezije psov s poudarkom na področni anesteziji.

Od kandidata pričakujemo:

- Zainteresiranost za znanstvenoraziskovalno delo
- Aktivno znanje vsaj enega tujega jezika
- Komunikativnost in občutek za timsko delo
- Sodelovanje pri pripravi znanstvenoraziskovalnih člankov in podobnih objav
- Veterinarsko licenco za opravljanje veterinarske dejavnosti.

Zelo zaželene so izkušnje na področju anestezije psov, poznavanje osnov področne anestezije in izkušnje z uporabo ultrazvoka. Zaželene so tudi izkušnje na področju znanstvenoraziskovalnega dela.

The young researcher will join the research programme P4-0053 Endocrine, immune and enzyme responses in healthy and sick animals, which is carried out at the Veterinary Faculty of the University of Ljubljana. The training of the young researcher will take place in the Department of Anaesthesiology of the Small Animal Clinic of the Veterinary Faculty. The candidate will be enrolled in the Biomedicine doctoral programme.

The young researcher will study the pharmacokinetics as well as the haemodynamic and analgesic effects of levobupivacaine in combination with the adjuvant analgesic dexmedetomidine in interfascial regional blocks of the abdominal cavity in dogs undergoing ovariectomy. As part of his doctoral thesis, the young researcher will be involved in the preparation of the study protocol, recruiting and enrolling dogs and involving them in the research, taking care of the anaesthesia of the dogs and the post-operative care and pain assessment after the procedure. As part of the research, he will be responsible for the pre-analytical processing of samples for pharmacokinetic analyses. During the training, he will

acquire practical and theoretical knowledge in the field of canine anaesthesia, with an emphasis on regional anesthesia.

What we expect from the applicant:

- Interest in the scientific research work*
- Active knowledge of at least one foreign language*
- Good communication skills and a sense of teamwork*
- Collaboration in the preparation of scientific research articles and similar publications*
- Licenced doctor of veterinary medicine.*

Experience in the field of canine anaesthesia, knowledge of the basics of regional anaesthesia and experience with ultrasound are highly desirable. Experience in the field of scientific research is also desirable.