

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

1. Članica UL (*UL member*):

Biotehniška fakulteta

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

NATAŠA ŠTAJNER natasa.stajner@bf.uni-lj.si

3. Raziskovalno področje (*Research field*):

4.06.05 Rastlinska biotehnologija

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:

Mladi raziskovalec bo sodeloval v študijah interakcij rastlina - patogen, ki bodo temeljile na interaktivnem sistemu med virusi in njihovo gostiteljsko rastlino vinsko trto (*Vitis vinifera* L.). Nedavne študije kažejo, da imajo v procesu patogeneze zelo pomembno vlogo male RNA (sRNA; siRNA ali miRNA) patogenov (virusov), saj lahko vplivajo na post-transkripcijsko regulacijo genov pri gostitelju (trti). Dandanes specifične NGS tehnike naslednje generacije sekvenciranja omogočajo analizo malih RNA, ki večinoma izvirajo iz nekodirajočih delov genoma in so dolge le 20-24 nt. 'Small RNA-seq' je tehnika, ki vključuje postopek za obogatitve vzorca z RNA fragmenti dolgimi manj kot 200 nukleotidov in se uporablja za detekcijo sRNA. Na osnovi primerjave sRNA v okuženem in virusov-prostem vzorcu določimo diferencialno izraženost sRNA in s tem opredelimo katere sRNA so vključene v proces patogeneze.

Katedra na kateri bo delal mladi raziskovalec ima dostop do celotne infrastrukture potrebne za eksperimentalno delo mladega raziskovalca. Delovni načrt vključuje postopno izvedbo metodološkega dela naloge (izolacijo malih RNA, pripravo knjižnice in sekvenciranje malih RNA), čemur bodo sledile bioinformacijske analize sRNA (tako virusnih kot gostiteljskih) in tarčnih genov in določanje biološke funkcije na osnovi primerjave z referenco oz. kontrolnim vzorcem. V okviru raziskovalne skupine že imamo ekspertizo na nivoju interakcij rastlina-patogen ter vzpostavljeno tehnično platformo sekvenciranja malih RNA in bioinformacijske analize podatkov in s tem omogočamo podporo mlademu raziskovalcu pri izvedbi naloge. Od kandidata pričakujemo osnovna znanja o domnevnih sistemih imunskega odziva, ki se aktivirajo pri interakciji rastlina-patogen, pričakujemo poznavanje osnovnih molekularnih laboratorijskih tehnik (izolacija RNA in DNA, PCR, qPCR, elektroforeza, kvantifikacija, itd.) in osnovno poznavanje bioinformacijskih orodij in pristopov (pripravljenost za delo z ukazno vrstico (Unix / Linux).

eng:

The young researcher will participate in plant-pathogen interaction studies based on the interactive system between viruses and their host plant, grapevine (*Vitis vinifera* L.). Recent studies show that small RNAs (sRNAs) of pathogens (viruses) play a very important role in the pathogenesis process, as they can influence the post-transcriptional regulation of genes in the host (grapevine). Nowadays, specific next-generation sequencing NGS techniques allow the analysis of small RNAs, which mostly originate from non-coding regions of the genome and are only 20-24 nt long. The technique involves a procedure for enriching a sample with RNA fragments less than 200 nucleotides long. Based on the comparison of sRNAs in infected and virus-free samples, the differential expression of sRNAs can be determined, thereby identifying which sRNAs are involved in the pathogenesis process.

The Chair where the young researcher will work has access to all the infrastructure necessary for the experimental work of a young researcher. The work plan includes the stepwise implementation of the methodological part of the task (isolation of small RNAs, library preparation and sequencing of small RNAs), followed by bioinformatic analyses of miRNAs (both viral and host) and their target genes and the determination of biological function based on comparison with a reference genome. Within the research group, we already have expertise in the field of plant-pathogen interactions and established technical platform for miRNA sequencing and bioinformatics data analysis to support the young researcher in the implementation of the task. The candidate is expected to have basic knowledge of putative immune response systems activated in plant-pathogen interactions, basic knowledge on molecular laboratory techniques (RNA and DNA isolation, PCR, qPCR, electrophoresis, quantification, etc.) and basic knowledge of bioinformatics tools and approaches (willingness to work with command line (Unix/Linux)).