

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

1. Članica UL (*UL member*):

Biotehniška fakulteta/Biotechnical Faculty

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

Prof. dr. Nataša Poklar Ulrih, natasa.poklar@bf.uni-lj.si

3. Raziskovalno področje (*Research field*):

Biofizikalna kemija: Struktura in funkcija proteinov/Biophysical Chemistry: Structure and function of proteins

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:

V okviru doktorskega usposabljanja mladega raziskovalca bomo proučevali mehanizme termične adaptacije proteinov na visoke temperature. Modelni organizem, ki ga v našem laboratoriju proučujemo, je *Aeropyrum pernix*, ki optimalno raste na 92°C. Poleg strukturnih adaptacij so proteini zaščiteni napram razvitju pri tako ekstremnih temperaturah tudi z organskimi molekulami (termoliti). V okviru doktorske naloge bo MR identificiral termolite, ki jih sintetizira *A. pernix* in njihov efekt na stabilnost proteinov. Pri svojem delu bo MR uporabljal tehnike kolonske separacije (LC-MS), NMR za identifikacijo molekul ter kombinacijo spektroskopskih in kalorimetrijskih metod za proučevanje vpliva termolitov na konformacijske prehode izbranih proteinov (npr. pernizin, alfa-sinuklein). V nadaljevanju doktorske naloge bomo proučevali tudi druge potencialne aplikacije termolitov kot so preprečevanje agregacije proteinov ter določali tudi antioksidativni potencial ter druge biološke aplikacije termolitov.

Mladi raziskovalec bo vpisal podiplomski študij Biomedicine ali Bioznanosti.

Mladi raziskovalec mora imeti zaključen magistrski študij naravoslovno tehniških fakultet (biokemija, kemija, biotehnologija, molekularna biologija, živilstvo, prehrana in sorodnih)

eng:

As part of the PhD training of a young researcher, we will study the mechanisms of thermal adaptation of proteins to high temperatures. The model organism studied in our lab is *Aeropyrum pernix*, which grows optimally at 92°C. In addition to structural adaptations,

proteins are also protected from denaturing at such extreme temperatures by organic molecules (thermolites). As part of his doctoral research, MR will identify the thermolites synthesized by *A. pernix* and their influence on protein stability. In his work, MR will use column separation techniques (LC-MS), NMR to identify molecules, and a combination of spectroscopic and calorimetric methods to study the influence of thermolites on the conformational transitions of selected proteins (e.g. pernisine, alpha-synuclein). In the second part of PhD thesis, we will also investigate other potential applications of thermolites, such as preventing protein aggregation, and also determine the antioxidant potential and other biological applications of thermolites.

The young researcher must have earned a master's degree in a science or engineering field (biochemistry, chemistry, biotechnology, biology, food science, nutrition and related fields)