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

1. Članica UL (*UL member)*:

Biotehniška fakulteta/Biotechnical Faculty

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

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 (D*escription of the Young Researcher's position)*:
Vključuje morebitne dodatne pogoje, ki jih mora izpolnjevati kandidat/ka za mladega raziskovalca/ko, ki niso navedeni v razpisu za mlade raziskovalce.

slo: V okviru doktorskega usposabljanja mladega raziskovalca bomo proučeval 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 osmolite, 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 proučeval tudi druge potencialne aplikacije termolitov kot so preprečevanje agregacije proteinov ter določali tudi antioksidativni potencial ter druge biološke aplikacije termolitov. Mladi raziskovalec bo vpisal podpiplomski študij Biomedicine ali Bioznanosti. Mladi raziskovalec mora imeti zaključen magistrski študij naravoslovno tehniških fakultet (biokemija, kemija, biotehnologija, molekularna biologija 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 developing at such extreme temperatures by organic molecules (thermolites). As part of his doctoral research, MR will identify the thermolytes 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 thermoliths 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 thermoliths, such as preventing protein aggregation, and also determine the antioxidant potential and other biological applications of thermoliths.

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