Kratek opis usposabljanja mladega raziskovalca (*Short description of the Young Researcher's training)*

1. Raziskovalna organizacija (*Research organisation)*:

Univerza v Ljubljani, Fakulteta za kemijo in kemijsko tehnologijo University of Ljubljana, Faculty of Chemistry and Chemical Technology

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

Martin Gazvoda, martin.gazvoda@fkkt.uni-lj.si

3. Šifra in naziv raziskovalnega področja (*Research field*):

1.04 Kemija (1.04.04 Organska kemija) 1.04 Chemistry (1.04.04 Organic chemistry)

4. Kratek opis usposabljanja mladega raziskovalca (*Short description of the Young Researcher's training)*:

slo: Reakcije spajanja so spremenile sintezno kemijo, saj so omogočile pripravo različnih zdravilnih učinkovin, agro-kemikalij in materialov, ki jih ni mogoče pripraviti s tradicionalnimi sinteznimi postopki. Kljub široki uporabnosti pa imajo trenutno znane reakcije spajanja svoje pomanjkljivosti in omejitve. Ena največjih omejitev je sinteza strukturno zapletenih molekul, ki jih s trenutno znanimi reakcijami še vedno ni mogoče pripraviti, a je po njih vse večje povpraševanje na področjih napredne medicine in tehnologije. Mladi raziskovalec bo v sklopu raziskovalnega dela razvijal nove sintezne metode za tvorbo vezi ogljik-ogljik in ogljik-heteroatom, ki bodo temeljile na uporabi organokovinskih katalizatorjev. Razvoj sinteznih metod bo izhajal iz mehaničnega razumevanja transformacij, pri tem bodo osnovo za načrtovanje predstavljali trenutno priznani reakcijski mehanizmi. Eden glavnih ciljev raziskovalnega dela bo razvoj novih metod, ki bodo omogočale selektivne modifikacije in spajanje strukturno kompleksnih molekul pri blagih reakcijskih pogojih. Raziskovalno delo bo vključevalo sintezo organokovinskih spojin/katalizatorjev, izvajanje katalitskih reakcij in analizo reakcijskih mehanizmov. Mladi raziskovalec bo pri eksperimentalnem delu uporabljal najsodobnejšo laboratorijsko opremo in tehnike. Za analizo molekul, reakcij in mehanizmov bo uporabljal različne spektroskopske in analitske metode. Zaželeno je, da ima kandidat/kandidatka za mladega raziskovalca izkušnje z raziskovalnim delom, zlasti s sintezo organskih oziroma organokovinskih molekul. Od kandidata/kandidatke se pričakuje aktivno znanje angleškega jezika.

eng: Cross-coupling reactions have transformed the art of synthetic chemistry by enabling new methods for the preparation of various medicines, agrochemicals, and materials that are inaccessible by pre-existing synthetic protocols. However, cross-coupling reactions still have several drawbacks and limitations, the major one being lack of protocols for coupling of structurally complex molecules. Advancing medicine and technology still require novel synthetic approaches to adhere requirements for new and more complex pharmaceuticals and materials, raising high demand for novel, even more powerful synthetic methodologies.

Young researcher will work on development of efficient synthetic methodologies employing transition-metal catalysts for carbon-carbon and carbon-heteroatom bond formation. The development of methodologies will be based on the mechanistic understanding of these transformations. The research work will include synthesis of organometallic compounds/catalysts, performing catalytic reactions as well as analysis of the reaction mechanisms. The overreaching goal will be to develop novel synthetic protocols that will enable selective modifications of complex molecules under mild reaction conditions. For this, young research will use state of the art laboratory equipment and employ modern spectroscopic as well as analytical techniques.

It is desirable that the candidate has experience with research work, preferably in the fields of organic and/or organometallic chemistry. The candidate should be fluent in English.