

Transcript of Completed Short Study Programme

Student	Last name(s)	First name(s)	Nationality	Sex (M/F)	Date of birth	Field of study
	Hajdu	Bálint	Hungarian	M	1995.02.26.	Chemistry
Sending University	Name, faculty		Contact person name ¹ ; position		Contact person email; phone	
	The University of Szeged, Faculty of Science and Informatics		Gyurcsik Béla Ph.D.; associate professor		gyurcsik@chem.u-szeged.hu ; +36-62-544335	
Receiving Institution/ Organization	Name, department		Contact person name ² ; position		Contact person email; phone	
	Czech Academy of Sciences, Institute of Organic Chemistry and Biochemistry		Milan Kožíšek Ph.D.; researcher		milan.kozisek@uochb.cas.cz ; (+420) 220 183 518	

After the mobility

Certificate issued by the Receiving Institution/Organisation

Start date and end date of the completed short study: from [day/month/year] 05/02/2018 to [day/month/year] 06/03/2018,

Duration: 30 days

Number of working hours per week: 40 hours

Working language: English

Detailed programme of the short study period including tasks carried out by the student:

During the short-term study program, Bálint has learned the theory and practice of Isothermal Calorimetric Titrations (ITC) by performing protein-transition metal ion titrations.

In the first week, we performed control titrations of different type of transition metal ions against EDTA to learn the fundamentals of ITC and the proper use (and maintenance) of the MicroCal Auto ITC 200 system.

During the second week, we performed orientation titrations with apo zinc finger protein-Zn(II) system. The used zinc finger protein consists of 3 zinc finger motifs, each of these binds one Zn(II). We investigated the effect of pH in a different type of buffers. Since some sort of impurity was observed during the titrations we established a new protocol for sample preparation: 8 cycles ultra-centrifugation, 3 cycles dialysis, concentration estimation via UV-Vis spectroscopy & Amino Acid Analysis for exact protein concentration, titration.

In the third week, we did titrations with a different type of proteins using the previously optimized conditions. One of them is a metallothionein which can bind toxic transition metal ions like mercury, cadmium but can interact with Zn(II) as well. The other type of protein was a nuclease which binds one Zn(II) in the active center.

In the 4th week, we performed titrations with a complex protein, in which a zinc finger protein and a nuclease one was fused together. Meanwhile, we analyzed the previously obtained titration curves and calculated the measured stoichiometry, and dissociation constants for the proteins, where we could.

Knowledge, skills (intellectual and practical) and competencies acquired (achieved Learning Outcomes):

I certify that Bálint Hajdu was able to learn techniques of the isothermal titration calorimetry during his stay in our lab in the Institute of Organic Chemistry and Biochemistry, Academy of Sciences of the Czech Republic in Prague. He measured many proteins he brought for their titration with Zn ions. During his stay, he analyzed the concentration of the proteins with HPLC based amino acid analysis.

I consider him as very talented and precise student.

Evaluation of the student:

There is no other way than to highlight his precision working, independence and good communication skills.

Hereby I certify, that the above mentioned student has successfully completed the described Short-Term Study Programme.

Date: 6th March 2018

Name and signature of the Supervisor at the Receiving Institution/Organisation³:



Milan Kožíšek, Ph.D.

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Stamp

The document is valid only if it is completely filled out, as well as signed and stamped or signed and headed.

¹ **Contact person at the sending institution:** this person was responsible for signing the professional recommendation letter, may be the supervisor or head of the department/institute at the sending university.

² **Contact person at the receiving institution:** this person is responsible for supervising the student during the Short Term Study Programme and signing the Transcript of Completed Short Study Programme document, amending it if needed.

³ **Supervisor at the Receiving Institution/Organisation:** The name and email of the Supervisor must be filled in only in case it differs from that of the Contact person mentioned at the top of the document.