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Ceske Budejovice, March 10th, 2021


Supervisor evaluation to M.Sc. Sazzad Mahmood

M.Sc. Sazzad Mahmood is currently a Ph.D. student of the University of South Bohemia, Faculty of Science in Ceske Budejovice. He is currently finishing a study program at the Department of Molecular Biology and Genetics. Sazzad has successfully passed the theoretical part of the exam. He is first-author of an article entitled "Identification of tick *Ixodes ricinus* midgut genes differentially expressed during the transmission of *Borrelia afzelii* spirochetes using a transcriptomic approach", which has been recently published in *Frontiers in Immunology*. He is also a co-author of the manuscript "A combined transcriptomic approach to identify candidates for an anti-tick vaccine blocking *B. afzelii* transmission" published in *Scientific Reports*.

Sazzad came to our laboratory after his M.Sc. program in the UK, where he studied plant lipids by using biophysical assays. He has a good theoretical background in molecular biology. The objective in our laboratory was to handle MACE transcriptomes of tick salivary glands and midguts infected with *Borrelia afzelii* and compare them to the uninfected controls to identify new genes stimulated by the *Borrelia* infection (MACE method does not allow identification of *Borrelia* transcripts, other methods will be applied to study transcriptomic dynamics of *Borrelia* expression in the tick midgut during the feeding period). He was able to confirm the overexpression of several genes by qRT-PCR. Then he prepared dsRNA, silenced genes in the infected nymphs, and quantified transmission of *Borrelia* from the tick into the mouse (C3H). The project itself was difficult to coordinate and required several people to be involved in a team. The members communicated very well, shared protocols, skills, knowledge, and methods, so everybody from the team is now able to repeat the techniques. The methods involved: cultivation of *Borrelia*, needle-infection of mice, tick rearing, feeding of a tick on mice, detection and quantification of *Borrelia* infection in the ticks and mice by PCR, qRT-PCR, and ELISA, RNA interference, production of recombinant proteins in *E. coli*, etc. As I mentioned before, Sazzad mainly analyzed in-silico the MACE transcriptome, performed the qRT-PCR validations, synthesised dsRNA, and performed RNAi with transmission experiments. However, I am sure he can quickly adopt the other methods necessary for work with ticks and *Borrelia*.

Sazzad is an easy-going person. We never faced any significant problems. I wish him good luck with his postdoc position and further scientific career. I recommend his thesis for defense.

Sincerely



RNDr. Ondřej Hajdusek Ph.D.
Ph.D. supervisor