

Overseas Practice on (Field Epidemiology • **Collaborative Research**)2017/7/5 (Year/Month/Day)

report form (For Student)

Name	Md Atqul Islam
Laboratory	Laboratory of Laboratory Animal Science and Medicine, Graduate School of VetMed
Year (Grade)	3 <sup>rd</sup> year (D3)
Place of practice	School of Medicine, Tokai University
Period of practice	from 4 <sup>th</sup> April to 3 <sup>rd</sup> May, 2017
Purpose	To work on a project to learn mouse genome engineering as for example Genome-editing via Oviductal Nucleic Acids Delivery (GONAD), and Efficient additions with ssDNA inserts-CRISPR ( <i>Easi</i> -CRISPR).

Summary of activities (about 800 words, provide photos, tables and figures that clearly show the activities during the period)

I have worked with the direct guidance of Prof. Masato Ohtsuka, aiming to acquire knowledge in advanced genome editing tools using mouse and to learn GONAD method (Genome editing via Oviductal Nucleic Acids Delivery). Prof. Ohtsuka recently developed this method called GONAD that does not require critical steps of transgenesis, such as: isolation of fertilized eggs, microinjection of nucleic acids into them and their subsequent transfer to recipient females, like traditional pronuclear injection-based transgenesis. In case of GONAD a simple *in vivo* electroporation is applied instead of all critical steps. Therefore genome-edited mice can be produced more easily than previously used all of methods. I have also gained some experiences with techniques such as GONAD-related procedure and synthesis of single-stranded DNA; a good understanding of both practical and theoretical aspects of genome editing tools such as CRISPR/Cas. Before being involved in such type experiments, I have attended in training course to get a concept about the rules and regulations of using genetically modified mice at Tokai Medical school and got approval to use the animal laboratory facility. During the tenure of my stay, I was involved to develop a new protocol about performing a GONAD method where we used intraoviductal instillation of fluorescent markers towards the pregnant females on Day 0.7 and *in vivo* electroporation using electrodes. Followingly, the treated females were exposed for isolation of 2-cell embryos. We used fluorescence microscope to see the fluoresced embryos which is the indicator of successful GONAD.



Performing GONAD



Fluoresced embryos.



Lab Members (Tokai Medical School)

(Field Epidemiology • Collaborative Research) Evaluation by supervisor

Institution • Official title • Name	Takashi Agui	印
<p>Describe overall evaluation on the applicant's activity in overseas practice.</p> <p>Dr. Islam learned GONAD method for genome editing at the School of Medicine, Tokai University.</p> <p>This method is very useful for the field of Laboratory Animal Science as well as other all Biomedical Researches.</p> <p>Further, this research training was very valuable for him, because this technique will be useful for his own research.</p>		

※ The Steering Committee of the Leading Program will first confirm the content of this report and the report will be forwarded to the Educational Affairs Committee for credits evaluation.

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