



HOKKAIDO UNIVERSITY

Title	Analysis for genetic loci controlling protoscolex development in the Echinococcus multilocularis infection using congenic mice [an abstract of dissertation and a summary of dissertation review]
Author(s)	ISLAM, Md. Atiquel
Degree Grantor	北海道大学
Degree Name	博士(獣医学)
Dissertation Number	甲第13379号
Issue Date	2018-12-25
Doc URL	https://hdl.handle.net/2115/72902
Rights(URL)	https://creativecommons.org/licenses/by-nc-sa/4.0/
Type	doctoral thesis
File Information	Md_Atiquel_ISLAM_abstract.pdf, 論文内容の要旨



学位論文内容の要旨
Abstract of the dissertation

博士の専攻分野の名称：博士（獣医学）

氏名：Md Atiqul Islam
Name

学位論文題名
The title of the doctoral dissertation

Analysis for genetic loci controlling protoscolex development in the *Echinococcus multilocularis* infection using congenic mice

(コンジェニックマウスを用いた多包条虫感染における原頭節形成をコントロールする遺伝子座の解析).

The resistance/susceptibility to *Echinococcus multilocularis* infection in mice are genetically controlled. However, genetic factors responsible for these differences remain unknown. Previous study in genetic linkage analysis has revealed that there is a significant quantitative trait locus (QTL) for the establishment of cyst (*Emcys1*), and a highly significant QTL for development of protoscolex of *E. multilocularis* larvae (*Empsc1*), on mouse chromosomes 6 and 1, respectively. The current study aimed to confirm these QTLs and narrow down the critical genetic region that controls resistance/susceptibility to *E. multilocularis* infection by establishing congenic and subcongenic lines from C57BL/6 (B6) and DBA/2 (D2) mice. For protoscolex development phenotype, two congenic lines, B6.D2-*Empsc1* and D2.B6-*Empsc1* were developed, where responsible QTL, *Empsc1* was introgressed from D2 into B6 background and *vice versa*. For cyst establishment phenotype, two congenic lines, B6.D2-*Emcys1* and D2.B6-*Emcys1* were developed, where responsible QTL, *Emcys1* was introgressed from D2 into B6 background and *vice versa*. Because there was no significant difference in cyst establishment between B6.D2-*Emcys1* and D2.B6-*Emcys1* mice after challenge with *E. multilocularis*, it is suggested that the *Emcys1* does not solely control the cyst establishment in mouse liver. However, infection experiment with B6.D2-*Empsc1* and D2.B6-*Empsc1* mice showed a significant difference in protoscolex development in the cyst. It confirms that the *Empsc1* controls phenotype of the protoscolex development in the cyst. Subsequently, two subcongenic lines, B6.D2-*Empsc1.1* and B6.D2-*Empsc1.2*, from B6.D2-*Empsc1* and one subcongenic line, D2.B6-*Empsc1.1* from D2.B6-*Empsc1* were developed to narrow down the critical region responsible for protoscolex development. From the results of infection experiments with *E. multilocularis* in these subcongenic mice, it is concluded that a gene responsible for protoscolex development is located between *D1Mit290* (68.1 cM) and *D1Mit511* (97.3 cM).