Study on Current Situation of Guide Dog Training and Molecular Genetic Analysis

Abstract

Guide dogs provide helpful support to visually impaired people to expand their participation in social activities, but the number of guide dogs being trained and certified in Japan at present is about 150 annually and this number is considerably small for the number of disabled people who desire to have a guide dog. Until today, for about 50 years since the assistance dog service was launched, guide dogs have always been in short supply.

Therefore, we studied the guide dog training provided by puppy walkers and also conducted genetic analysis of the dog characters for the purpose of objectively analyzing the aptitude of guide dogs in the early stage of their training.

We conducted a survey on the puppy walkers to ascertain if their training condition is relevant to the certification rate of guide dogs. As a result, such criteria as the number of people and generations in the puppy walkers' families and the use of staircases, as well as the "pulling behavior" regarded as a problematic behavior were confirmed as having relevance to the certification rate of guide dogs.

The above results indicated that the dog characters have influence on the certification rate of guide dogs. Consequently, we conducted genetic analysis of the characters. We therefore conducted a series of analyses by using the dog genome samples bred and managed by Kyushu Guide Dog Association: (1) catecholamine-o-methyltrans-ferase (*COMT*) genetic polymorphism analysis, (2) search for unknown genome regions related to guide dog training through genome wide association analysis, and (3) genetic diversity analysis by means of mitochondrial DNA analysis.

The result seems to suggest that the differences in *COMT* (catecholamine-o-methyltrans-ferase) on an individual level have influence on the certification rate of guide dogs based on their characters. It will be possible to gain more useful information for training guide dogs by conducting analyses on other genetic polymorphism.

As demonstrated above, the dog characters can be one key factor that has influence on the certification rate of trained dogs as indicated by the questionnaire survey on the puppy walkers and molecular genetic analyses. It is

deemed necessary to carry out future selection of breeding dogs and training of guide dogs while taking into consideration the genetic background of such dogs.

It is thought that this study is expected to be used to avoid time and economic loss in training guide dogs and to contribute to aptitude assessment in the early stage with a view to increasing the number of certified trained dogs.