CHAPTER V

DISCUSSION

The HLA loci represent highly informative and convenient markers for population genetic studies, due to a high polymorphism. HLA class I and II have been studied in terms of both serological characteristics and molecular structures worldwide (Bodmer et al., 1999). In Thailand, many studies have been reported. These include a Tai-speaking group that comprise present day Thai, Tai Lue and Thai Dam, northeastern Thais, northern Thais and southern Thai-Muslims (Chandanayingyong et al., 1992, Chandanayingyong et al., 1997, Chandanayingyong et al., 1999, Romphruk et al., 1997, Fongsatikul et al., 1997, Chiewsilp et al., 1997). The mainland China groups (south China, mid China and north China) (Shaw et al., 1999), which is one of the Asian population, and the non Tai-speaking southeast Asian population in areas neighboring Thailand (southern Han, Buyi, Miao, Vietnamese and Singapore Chinese) (Imanishi et al., 1992), were also studied for HLA class I and II. Variation in HLA frequencies have been observed in different parts of Thailand, China and mainland southeast Asia. As presented, of the most frequent HLA-A antigens, HLA-A2, A9, A11.1 and A11.2 were determined in this study by carefully selecting three ethnic groups that were not mixed and still bore their authenticity.

HLA-A antigens: HLA-A2, A9, A11.1 and A11.2, were seen in 3 ethnic groups among northern Thai populations. Khon Muang, which represents the native northern Thai population, showed closely related frequencies in all HLA alleles tested with Khon Yawng, but they were significantly different when compared with Karen. Focusing on the Khon Muang and Khon Yawng, the difference in HLA-A11 (11.1, 11.2) were also seen. A

dominantly high HLA-A11.2 prevalence was found among Khon Yawng and a quite high HLA-A11.1 one was evident among Khon Muang.

Comparing the gene frequency of Khon Muang and the Tai-speaking group, HLA-A2 was dominantly high in Tai Dam, while HLA-A11.2 was specifically high in Tai Lue. It should be noted that present day Thai and Khon Muang were significantly different in HLA-A2 and A9, and the dominantly high HLA-A2 among Khon Muang was significantly different compared to the quite high HLA-A9 prevalence among present day Thai. The reason for this was the massive migration of Chinese, which was widespread during the fourteenth to nineteenth centuries (Chandanayingyong et al., 1992). Intermarriages between Thais and Chinese occurred, which resulted in an almost complete admixture of the two populations, especially in city areas. The mixture of these groups represented the gene frequency of present day Thais. The gene frequency of HLA-A9 in southern Chinese, southern Han, and present day Thais was 19.76%, 19.9%, and 20.27%, respectively. These may be supported by the difference between Khon Muang and present day Thais. The data showed the biological difference among races, which can be explained by the variation in HLA gene frequencies.

The background of Khon Yawng was recorded in the stone inscription, as found in the Phaya Tilokaraj region around 550 years ago. The Khon Yawng migrated from Mong Yawng in Shan State, Myanma and was resettled as spoils of war. The migration occurred several times. The most important movement was in the Phya Kawila era. Although they settled in the latter region for approximately 200 years, and mixed with the local population, the Khon Yawng's original HLA alleles can still be detected today. The result in this study showed that the gene frequencies of HLA-A11.2 was greater among Khon Yawng when compared to Khon Muang by 7.05% and 3.32%, respectively. A

previous research (Chandanayingyong et al., 1992) revealed that gene frequencies of HLA-A11.2 were 7.58% among the Tai Lue who migrated from Mong Yawng and have settled in the Chiang Mai area over the last 30 years.

The physical features of Karen are similar to all Tai-speaking groups, but their cultural style, architecture, agricultural practice and language are unique. Table 4.5 showed a clear difference in HLA antigens, especially in HLA-A11.1. A very high gene frequency of HLA-A11.1 (52.96%) was detected and HLA-A11.2 did not exist in Karen. Thus, these results reveal why the Karen looks different to other ethnic groups.

The molecular typing of HLA-A11 subtypes was the point of this study. Table 4.15 shows the molecular analysis of HLA-A11 subtypes in Khon Muang, Khon Yawng and Karen. It was noticed that the molecular typing of HLA-A*1101 and A*1102 in Khon Muang and Khon Yawng were complementary with the serological typing of HLA-A11.1 and A11.2, while HLA-A11.1, which was frequently found in Karen, differed with molecular typing. This finding was interesting, especially when HLA-A*1103 was present only in Karen while absent in both Khon Muang and Khon Yawng. Also, the absence of HLA-A*1102 coincided with the absence of HLA-A11.2 in Karen.

HLA-A11 was commonly found in Asian populations, especially subtype A*1101, and it had a very high allele frequency in Karen. This may have resulted from marriages within their own groups, which occurred because of cultural reasons. So, the distribution of HLA alleles was limited and the homozygous HLA frequently occurred, as seen in the HLA-DNA typing of Karen 62 and 151 in Karen family 1, and Karen 23, 140, 142 and 155 in Karen family 2.

In addition, HLA-A*1102 was present, but with a higher frequency in Khon Yawng than Khon Muang, while HLA-A*1101 was more frequently found in Khon

Muang than Khon Yawng. These results showed that the genetics between Khon Muang and Khon Yawng are different. Although they look the same physically, they speak a different dialect, even in the Tai-speaking group.

In conclusion, the distribution of HLA antigen frequency in Khon Muang, Khon Yawng and Karen was significantly different when looking at the 4 most frequent antigens. The results showed a more dominant difference between racial groups when using molecular typing, as shown in the study of HLA-A11 subtypes in northern Thai populations. If more antigens had been detected by using a DNA based technique, it may have been clearly defined among ethnic groups. These results provide the basic data of HLA-A11 at DNA level, which will be useful for further studies in anthropology, organ transplantation, bone marrow transplantation and disease association in northern Thais.