Tokai J Exp Clin Med., Vol. 23, No. 2, p.85, 1998

Screening of HLA-DR-Restricted Helper T-cell Epitopes of MSP1 of *Plasmodium falciparum* in Humans

Nobuo OHTA, Jun FU, Yoshisada YABU, Mariko HATO and Toshio SONE*

Department of Medical Zoology, Medical School, Nagoya City University, Aichi, Japan
**Department of Medical Zoology, Saitama Medical School, Saitama, Japan*

MSP1 is a protein vaccine candidate for erythrocytic stage of the malaria parasite. It is essential to identify helper T-cell epitopes for vaccine development, and HLA-DR molecules are major components of the restricting elements for human helper T-cell response. Because of the extreme genetic polymorphism of the HLA system, there is heterogeneity in the epitope recognition in human beings. This is also an obstacle for the development of protein vaccine for human use. This study was conducted to analyze the HLA-DR-restricted human helper T-cell epitopes (of MSP1 of *Plasmodium falciparum*) by testing a binding of purified HLA-DR molecules (to solid-phase peptides of MSP1). Solid-phase oligopeptides after the sequence of MSP1 of the MAD20 allele were synthesized on filter papers, to which biotinylated HLA-DR molecules were tested for positive bindings. HLA-DR alleles tested were DRB1*0101 (present in both the Oriental and the Caucasian populations), DRB1*0405 and DRB1*1302 (present only in the Orientals). Relatively large number of synthetic peptides bound to HLA-DR, suggesting the possible epitope functions. We observed both HLA-DR allele-specific and -non-specific bindings. There was a tendency that a few epitope-candidates were observed in the conserved region of MSP1 such as block #3 and 17, while numerous binding peptides were present in blocks #6 and 16 those were the dimorphic regions. This suggests the presence of selection by the evolutional pressure from the human immune system to avoid immune attack to the conserved regions. Results in this screening system were compared with human T cell response to MSP1. Not all the peptides which bound to HLA-DR molecules were functioning as helper T-epitopes, however, it seems likely that epitope activities were expressed in oligopeptides which bound to HLA-DR molecules. The data also provide a clue for understanding molecular basis of cross-reaction between MSP1 and other unknown environmental antigens. Considering those data, we discuss about our trial of human helper T-cell mapping and also about interpretation of our results in the screening system.

Nobuo OHTA, Department of Medical Zoology, Medical School, Nagoya City University, Aza-Kawazumi 1, Mizuho-chou, Mizuho-ku, Nagoya-shi, Aichi 467-0001, Japan