Olerup SSP® – Facilitating in HLA Typing Low frequency of typing ambiguities with Olerup SSP® kits

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Introduction:

Currently more than 5,000 HLA alleles are recognized and the rate of discovery of new alleles has been very high during the two last years with on average of 3 new HLA alleles being reported each day. The SSP typing technique is not only the fastest of the available HLA typing methods as the discrimination between alleles takes place during the PCR cycling process, but also the technique that gives the highest resolution as each primer pair defines two sequence motifs on the same chromosome, i.e. located in cis. With the SSP technique it is also easy to add reagents for polymorphisms in other locations than exons 2 and 3 for HLA Class I and exon 2 for HLA Class II, which further increases the resolution compared to the SSOP and SBT methods.

The aims of the present study, conducted July 2010, were to investigate the frequency of typing ambiguities for low and high resolution SSP typings in two sets of samples.

Materials and Methods:

DNAs from 102 randomly selected Swedish blood donors and also 102 consecutive UCLA Exchange DNAs were included. All samples were typed by the most current lots of low and high resolution *Olerup* SSP® kits for HLA-A, -B, -C, DRB, DQA1, DQB1, DPA1 and DPB1. The typing data were analyzed by the SCORE™ software using the allele databases valid when the different lots were produced, with an allele database 12 months old (2.27.0) and with the most current database (3.0.0).

Results:

Low resolution: In the whole group of 204 DNA samples the frequencies of low resolution typing ambiguities were 8.3% for HLA-A, 11.8% for HLA-B, 0.5% for HLA-C and 2.5% for DRB when using the allele databases tied to the different lots. The frequencies were lower for the randomly selected DNA samples and higher for the UCLA Exchange DNAs. Ambiguity frequencies comparable to the above were obtained when analyzing the samples with the 2.27.0 database, whereas using the 3.0.0 database resulted in higher frequencies due to new alleles.

High resolution: For the whole sample group the ambiguity frequencies for high resolution typings were 10.2% for HLA-A, 4.9% for HLA-B, 3.9% for HLA-C, 1.5% for DRB, 0.5% for DQA1, 1.0% for DQB1, 0% for DPA1 and 6.4 % for DPB1. The ambiguity frequencies were lower for the randomly selected DNAs compared to the UCLA exchange DNAs. The low ambiguity frequencies when using the allele database linked to the different lots increased considerably when analyzing the data with the 2.27.0 and 3.0.0 allele databases.

Discussion:
When analyzing the typings using the allele databases valid when the different lots of the *Olerup* SSP® kits were produced then 88 to 99% of samples were possible to resolve at a low resolution level for the different loci and 90 to 100% at a high resolution level. As expected the ambiguity frequencies were lower in randomly selected samples compared to UCLA Exchange DNAs. The ambiguity frequencies increased, especially for high resolution typings, when using either the 2.27.0 or the 3.0.0 allele databases.

Conclusion:
The *Olerup* SSP® kits give excellent resolution for low and high resolution HLA typings with low ambiguity frequencies, but the kits have to be constantly and frequently up-dated for new HLA alleles in order to maintain this level of resolution.

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