

HLA-B low resolution
101.501-48/12 – licensed for PCR
101.501-48u/12u – not licensed for PCR
Lot No.: **Y52**

1

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***Olerup SSP™* HLA-B low resolution**

Product number:	101.501-48/12 – licensed for PCR 101.501-48u/12u – <u>not</u> licensed for PCR
Lot number:	Y52
Expiry date:	2009-October-01
Number of tests:	48 tests – Product No. 101.501-48 12 tests – Product No. 101.501-12
Number of tubes per test:	47 + 1
Storage - pre-aliquoted primers:	dark at -20°C
- PCR Master Mix:	-20°C

This Product Description is only valid for Lot No. Y52.

CHANGES COMPARED TO THE PREVIOUS *OLERUP SSP™* HLA-B LOW RESOLUTION LOT

The HLA-B low resolution specificity and interpretation tables have been updated for the HLA-B alleles reported since the previous *Olerup SSP™* HLA-B low resolution lot (**Lot No. X82**) was made.

The HLA-B low resolution primer set is unchanged compared to the previous lot (**Lot No. X82**).

Well **48** contains Negative Control primer pairs, that will amplify more than 95% of the *Olerup SSP™* HLA Class I, DRB, DQB1 and DPB1 amplicons as well as the amplicons generated by control primer pairs.

PCR product sizes range from 75 to 430 base pairs.

Length of PCR product	105	200	105	80	75	80
5'-primer¹	164	340	440	45	45	43
	5'-CAC ^{3'}	5'-Agg ^{3'}	5'-TTA ^{3'}	5'-Tg g ^{3'}	5'-Tg g ^{3'}	5'-Tg g ^{3'}
3'-primer²	231	2nd I	507	59	58	57
	5'-TgC ^{3'}	5'-AAA ^{3'}	5'-TTg ^{3'}	5'-CTC ^{3'}	5'-ggC ^{3'}	5'-CTC ^{3'}
A*	+	+	+			
B*	+	+	+			
Cw*	+	+	+			
DRB1				+	+	
DRB3				+	+	
DRB5				+		
DQB1					+	
DPB1						+

¹The nucleotide position for HLA class I genes and the codon for HLA class II genes, in the 2nd or 3rd exon or the 2nd intron, matching the specificity-determining 3'-end of the primer is given. Nucleotide numbering as in *Tissue Antigens* 1998, 51:II, 417-466. The sequence of the 3 terminal nucleotides of the primer is given.

²The nucleotide position for HLA class I genes and the codon for HLA class II genes, in the 2nd or 3rd exon, matching the specificity-determining 3'-end of the primer is given in the anti-sense direction. Nucleotide numbering as in *Tissue Antigens* 1998, 51:II, 417-466. The sequence of the 3 terminal nucleotides of the primer is given.

PRODUCT DESCRIPTION

HLA-B low resolution SSP typing

CONTENT

The primer set contains 5'- and 3'-primers for grouping the B*0702 to B*8301 alleles into the corresponding serological groups B7 to B81 as well as primer pairs for recognizing the Bw4 and Bw6 sequence motifs.

The primer solutions are pre-aliquoted into 0.2 ml PCR tubes. Each tube in the set contains a dried primer solution consisting of a specific primer mix, i.e. allele- and group-specific primers as well as a **control primer pair** matching non-allelic sequences.

PCR Master Mix complete with Taq, Taq polymerase, nucleotides, buffer, glycerol and cresol red, as well as PCR lids are included in the licensed kit.

PCR Master Mix without Taq, nucleotides, buffer, glycerol and cresol red, as well as PCR lids are included in the unlicensed kit.

47 + 1 PCR reactions with a reaction volume of 10 µl are performed per sample.

Note: The pellets in the tubes may vary in form and colour. This does not affect the performance of the product.

PLATE LAYOUT

Each test consists of 48 PCR reactions in a 48 well cut PCR plate.

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32
33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48

Wells 1 to 47 – HLA-B low resolution primers.

Well 48 – Negative Control.

The 48 well cut PCR plate is marked with 'HLA-B low Y52'.

Well No. 1 is marked with '1'.

The PCR plates are covered with a PCR-compatible foil.

Please note: When removing each 48 well PCR plate, make sure that the remaining plates stay covered. Use a scalpel or a similar instrument to carefully cut the foil between the plates.

INTERPRETATION

Only HLA-B alleles will be amplified by the HLA-B low resolution typing kit, except that primer mix 3 will amplify the HLA-Cw*0305, Cw*0325 and Cw*0327 alleles, the Cw*0746 allele will be amplified by primer mix 8 and primer mix 43 will amplify the Cw*0206 allele. Thus, the interpretation of HLA-B low resolution typings is only influenced by the Cw*0206, Cw*0305, Cw*0325, Cw*0327 and Cw*0746 alleles and not by other alleles of other HLA class I genes.

UNIQUELY IDENTIFIED ALLELES

All the HLA-B alleles recognized by the HLA Nomenclature Committee in October 2007¹ will be amplified by the primers in the HLA-B low resolution SSP kit. The HLA-B alleles will be grouped into their corresponding serological specificities².

¹**Nomenclature for factors of the HLA system, 1998.** *Tissue Antigens* 1999; **53**: 407-446.

HLA-A alleles listed on the IMGT/HLA web page 2007-October-05, release 2.19.0, www.ebi.ac.uk/imgt/hla.

³It is not possible to identify all serological splits and combinations of the B15 group of alleles, as the serological reactivity of several of the B*15 alleles is not known.

The resolution has been updated to fulfill the NMDP medium resolution confirmatory typing requirements effective from February 1st 2001.

DNA-based HLA-B typing resolution required:

B*07xx, B*08xx, B*13xx, B*14xx, B*18xx, B*27xx, B*1522, B*35xx, B*37xx, B*38xx, B*39xx, B*4005, B*41xx, B*42xx, B*44xx, B*45xx, B*46xx, B*47xx, B*48xx, B*49xx, B*50xx, B*51xx, B*52xx, B*53xx, B*54xx, B*55xx, B*56xx, B*57xx, B*58xx, B*59xx, B*67xx, B*73xx, B*78xx, B*81xx, B*82xx,

B*40EJD^a 4001, 4007, 4010, 4012, 4014, 4015, 4016

B*40EJB^b 4002, 4003, 4004, 4006, 4008, 4009, 4011, 4013, 4018, 4019, 4020

B*15EJA^c 1501, 1504, 1505, 1506, 1507, 1520, 1524, 1525, 1526N, 1527, 1528, 1530, 1532, 1533, 1534, 1535, 1536, 1538, 1539, 1540, 1543, 1545

B*15AHM^d 1516, 1517

B*15EHZ^e 1503, 1509, 1510, 1518, 1523, 1529, 1537, 1547

B*15CYP^f 1502, 1508, 1511, 1515, 1521, 1531, 1544

B*15AND^g 1512, 1514, 1519

B*1513^h

^aB60 serologic equivalent cluster.

^bB61 serologic equivalent cluster.

^cB62 serologic equivalent cluster.

^dB63 serologic equivalent cluster.

^eB70 serologic equivalent cluster.

^fB75 serologic equivalent cluster.

^gB76 serologic equivalent cluster.

^hB77 serologic equivalent cluster.

The B*0826 and B*4207 alleles give rise to identical amplification patterns with the HLA-B low resolution primer set. These alleles can be separated by the respective high resolution primer sets.

The B*5504, B*5508, B*5513, B*5527 and B*5615 and B*5619N give rise to identical amplification patterns with the HLA-B low resolution primer set. These alleles can be separated by the respective high resolution primer sets.

The B*5523 and B*5618 give rise to identical amplification patterns with the HLA-B low resolution primer set. These alleles can be separated by the respective high resolution primer sets.

RESOLUTION IN HOMO- AND HETEROZYGOTES

The ambiguous HLA-B homo- and heterozygous combinations of allele groups based on the two first digits of the allele designation are available in the ScoreTM interpretation software. (In most cases these ambiguities can be resolved by the Olerup SSPTM HLA-B high resolution SSP sets.)

LICENSES

101.501-48/12 – licensed for PCR.

Notice to purchaser: Limited License.

The purchase price of this product includes limited, non-transferable rights under U.S. Patents 4,683,202, 4,683,195 and 4,965,188 and their foreign counterparts, owned by Roche Molecular Systems, Inc. and F. Hoffman-La Roche Ltd ("Roche"), to use only this amount of the product to practice the Polymerase Chain Reaction ("PCR") Process described in said patents solely for the HLA Typing applications of the purchaser solely for organ or tissue or bone marrow transplantation, and explicitly excludes analysis of forensic evidence or parentage determination. The rights to use this product to perform and to offer commercial service for HLA Typing for organ or tissue transplantation using PCR, including reporting the results of the purchaser's activities for a fee or other commercial consideration, is also hereby granted. Further information on purchasing licenses to practice PCR may be obtained by contacting in the United States, the Director of Licensing at Roche Molecular Systems, inc., 1145 Atlantic Avenue, Alameda, California 94501, and outside the United States, the PCR Licensing Manager, F. Hoffmann-La Roche Ltd, Grenzacherstr. 124, CH-4070 Basel, Switzerland.

101.501-48u/12u – not licensed for PCR.

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101.501-48/12 and 101.501-48u/12u

These products use ARMSTM technology and is sold under license from Zeneca Limited. ARMS is the subject of European Patent No. 0332435, US Patent No. 5595890 and corresponding world-wide patents. ARMS is a trademark of Zeneca Limited.

GUARANTEE

Olerup SSP AB guarantees that the primers in the HLA-B low resolution typing kit have the specificities given in the Specificity and Interpretation Tables of the product insert and in the GenoVision version of the HELMBERG-SCORETM software.

When stored at –20°C, the dried primers are stable for 22 months from the date of manufacture.

When stored at –20°C, the PCR Master Mix complete with *Taq* and the PCR Master Mix without *Taq* are stable for 24 months from the date of manufacture.

The kit is shipped at ambient temperature.

PROTOCOL

DNA EXTRACTION

Extracted, highly pure DNA is needed for SSP typings. We recommend isolation of DNA using GenoPrep B200 or GenoPrep B350 cartridges on the GenoM™-6 robotic workstation (GenoVision Europe Tel: +43 1 710 15 00 or GenoVision Inc. USA Tel: +1 610 430 88 41; <http://www.genovision.com>). Using GenoM™-6-extracted DNA ACD, EDTA and heparinised blood can be used as starting material. Because of its high purity, GenoM™-6-extracted DNA can be diluted when used in combination with Olerup SSP™ products. The recommended DNA concentration is 15 ng/μl.

Alternatively – BUT DO NOT USE HEPARINISED BLOOD WITH THESE METHODS - the DNA can be extracted using trimethylammoniumbromide salts (DTAB/CTAB) or by salting out. Dissolve the extracted DNA in dH₂O.

IMPORTANT:

Optimal DNA concentration using: GenoM™-6-extracted DNA, 15 ng/μl.

DNA extracted by other methods, 30 ng/μl.

Concentration exceeding 50 ng/μl will increase the risk for nonspecific amplifications and weak extra bands, especially for HLA Class I high resolution SSP typings.

PCR AMPLIFICATION

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For one HLA-B low resolution typing, begin by adding to well No. 48, i.e. the well with the negative control primer pairs:

7 μl dH₂O

3 μl PCR Master Mix complete with *Taq*,

then add at room temperature in a 0.5 ml tube:

52 x 2 μl = 104 μl DNA (30 ng/μl)

52 x 3 μl = 156 μl PCR Master Mix complete with *Taq* – mix well

before taking your aliquot

52 x 5 μl = 260 μl dH₂O

Mix well, dispense 10 μl of the DNA-PCR Master Mix-H₂O mixture into each of wells 1 to 47 of an HLA-B low resolution typing. **Well No. 1 of the 48 well PCR plate is marked with '1'**. Close the 48 well PCR plate with the provided lids.

101.501-48u/12u – not licensed for PCR

For one HLA-B low resolution typing, begin by adding at room temperature in a 0.5 ml tube:

53 x 3 μl = 159 μl PCR Master Mix without *Taq* – mix well before taking your aliquot

4.2 μl *Taq* polymerase (5 units/μl)

Mix well, dispense 3 μl of the PCR Master Mix-*Taq* mixture from the 0.5 ml tube into well No. 48, i.e. the well with the negative control primer pairs. Then add 7 μl dH₂O to well 48.

Then add at room temperature to the 0.5 ml tube containing $159 + 4.2 - 3 = 160,2 \mu\text{l}$ PCR Master Mix-*Taq* mixture:

$$52 \times 2 \mu\text{l} = 104 \mu\text{l DNA (30 ng/}\mu\text{l)}$$

$$52 \times 5 \mu\text{l} - 4,2 \mu\text{l} = 255.8 \mu\text{l dH}_2\text{O}$$

Mix well, dispense $10 \mu\text{l}$ of the DNA-PCR Master Mix-*Taq*-H₂O mixture into each of wells 1 to 47 of an HLA-B low resolution typing. **Well No. 1 of the 48 well PCR plate is marked with '1'**. Close the 48 well PCR plate with the provided lids.

Use a 96 well thermal cycler with a heated lid. The temperature gradient across the heating block should be $< 1^\circ\text{C}$.

PCR cycling parameters:

1. 1 cycle	94°C	2 min	denaturation
2. 10 cycles	94°C	10 sec.	denaturation
	65°C	60 sec.	annealing and extension
3. 20 cycles	94°C	10 sec.	denaturation
	61°C	50 sec.	annealing
	72°C	30 sec.	extension

The same PCR cycling parameters are used for all the Olerup SSP kits.

AGAROSE GEL ELECTROPHORESIS

Prepare a 2% (w/v) agarose gel in 0.5 x TBE buffer. Dissolve the agarose by boiling in a microwave oven. Let the gel solution cool to 60°C . Stain the gel prior to casting with ethidium bromide (10 mg/ml), $5 \mu\text{l}$ per 100 ml gel solution. For maximal ease of handling use our ethidium bromide dropper bottles (Product No. 103.301-10), 1 drop of ethidium bromide solution per 50-75 ml of gel. **Note: Ethidium bromide is a powerful carcinogen.**

Load the PCR products, preferably using an 8-channel pipette. Load a DNA size marker (100 base pair ladder, Product No. 103.201-100) in one well per row.

Run the gel in 0.5 x TBE buffer, without re-circulation of the buffer, for 15-20 minutes at 8-10 V/cm.

DOCUMENTATION AND INTERPRETATION

Put the gel on a UV transilluminator and document by photography.

Record the presence and absence of specific PCR products. The relative lengths of the specific PCR products are helpful in the interpretation of the results.

Record the presence and relative lengths of the internal positive control bands. The differently sized control bands will help in the correct orientation of the typing as well as in kit identification.

Lanes without either control band or specific PCR products should be repeated.

Interpret the typings with the ***lot-specific Interpretation and Specificity Tables***.

INTERPRETATION SOFTWARE

The interpretation software (Product No. 110.101) can be helpful in the interpretation of the typings.

PCR MASTER MIXES

The PCR Master Mix complete with *Taq* contains:

<i>Taq</i> polymerase	0.4 unit per 10 µl SSP reaction
nucleotides	final concentration of each dNTP is 200 µM
PCR buffer	final concentrations: 50 mM KCl, 1.5 mM MgCl ₂ , 10 mM Tris-HCl pH 8.3, 0.001% w/v gelatin
glycerol	final concentration of glycerol is 5%
cresol red	final concentration of cresol red is 100 µg/ml

The same PCR Master Mix complete with *Taq* is used for all the licensed *Olerup* SSP kits.

The PCR Master Mix without *Taq* contains:

nucleotides	final concentration of each dNTP is 200 µM
PCR buffer	final concentrations: 50 mM KCl, 1.5 mM MgCl ₂ , 10 mM Tris-HCl pH 8.3, 0.001% w/v gelatin
glycerol	final concentration of glycerol is 5%
cresol red	final concentration of cresol red is 100 µg/ml

The same PCR Master Mix without *Taq* is used for all the unlicensed *Olerup* SSP kits.

The PCR Master Mix complete with *Taq* and the PCR Master Mix without *Taq* can be shipped at ambient temperature.

When stored at –20°C, the PCR Master Mix complete with *Taq* and the PCR Master Mix without *Taq* are stable for 24 months from the date of manufacture.

Vials with the PCR Master Mixes can be kept at +4°C for 4 weeks, but the PCR Master Mixes are then no longer stable for 24 months.

SPECIFICITY TABLE

HLA-B low resolution SSP typing

Specificities and sizes of the PCR products of the 47 primer mixes used for HLA-B low resolution SSP typing

Primer Mix	Approx. size of spec. PCR product ¹	Size of control band ²	HLA-B serol. ³	Amplified HLA-B ⁴ alleles
1^{5,6}	110 bp	800 bp	7, 15, 37, 40, 41, 42, 48	070201-071802, 0720-0732, 0734-0739, 0741-0747, 0749N, 0750, 0752, 0754-0759, 9538, 3707, 4015, 4016, 4023, 4032, 4108, 420501-420502, 4805, 4808, 4815
2³	215 bp	1070 bp	8, 44	080101-0825, 0827-0834, 4449
3⁷	140, 235 bp	1070 bp	7, 8, 13, 15, 35, 40, 4005, 44, 46, 57	0720, 0724, 0760, 0821, 0825, 1301-1304, 1306-1308Q, 1310-1321, 150106, 1507, 152702, 1536, 1545, 1555, 1568, 1589, 9526, 9535-9537, 9539, 3505, 3516, 3517, 3522, 3530, 3551, 3558, 3572, 4005, 4071, 4408, 4454, 4457, 4611, 4612, 5714, Cw*0305, Cw*0325, Cw*0327
4⁸	130, 265 bp	1070 bp	13, 14, 15, 35, 40, 41, 44, 45, 47, 49, 50	1301-1304, 1306-1313, 1315-1321, 1401-1404, 1407N, 1546, 1553, 9506, 3547, 3563, 400101-400105, 4007, 4010, 401401-4016, 4022N, 4023, 4025, 4030-4034, 4036, 4038, 4042, 4043, 4045, 4047-4049, 4051-4055, 4058-4063, 4065-4067, 4069, 4072, 4073, 4076, 4077, 4101-4108, 44020101-4405, 4409-4439, 4441-4443, 4445-4456N, 4501-4507, 47010101-4705, 4901, 4902, 4904, 4905, 5001, 5002, 5004
5⁹	185, 235 bp	1070 bp	14, 16, 27, 37, 38, 39, 47, 64, 67	1401, 1407N, 2701-270402, 270502-2706, 2708-2710, 2712, 2713, 2716-2718, 2720, 2723, 2726, 2727, 2729, 2731, 2735-2737, 3702, 380101-3803, 3807-3817, 39010101-

				39010102L, 390103-390201, 3903, 3905-390602, 3907 ² , 3908, 3909, 3911, 3914, 3915, 3918, 3922, 3924-3943, 4704, 4705, 670101
6⁹	185 bp	800 bp	14, 35, 38, 39, 65	140201-140602, 3526, 3805, 3904, 3907 ²
7	290 bp	1070 bp	15, 62, 63, 75, 76, 77, 46	15010101-150103, 150106, 1502, 1504-1508, 151101-1515, 15170101-151702, 1519-1521, 1524-152701, 1528, 1530-1536, 1538-1540, 1542-1546, 1548, 1550, 1555-1558, 1560, 1563, 1565, 1566, 1568, 1570, 1571, 1573, 1575-1579N, 1581-1589, 1592, 1594N, 1596, 1597, 9501, 9502, 9504-9507, 9509-9513, 9516-9518, 9520-9522, 9525, 9526, 9528, 9529, 9535-9539, 460101-4612
8	165, 220, 330 bp	1070 bp	8, 15, 37, 40, 41, 42, 44, 45, 51, 56, 57, 70, 71, 72	080101-0805, 0808N-0812, 0815-0819N, 0821-0824, 0826, 0827, 0829-0834, 1503, 1509, 1510, 1518, 1523, 1529, 1537, 1546, 1547, 1549, 1551-1554, 1561, 1562, 1564, 1568, 1569, 1572, 1574, 1580, 1583, 1590, 1591, 1593, 1598, 1599, 9503, 9506, 9508, 9514, 9515, 9519, 9523, 9524, 9527, 9531-9534, 3712, 4012, 4101-410302, 4105-4108, 4201, 4202, 4204-4208, 4414, 4415, 4418, 4420, 4501-4507, 5108, 5120, 5136, 5144N, 5613, 5709, 8201, 8202, Cw*0746
9^{10,11}	165, 390 bp	800 bp	15, 35, 40, 51, 52, 56, 58, 62, 63, 70, 78	150102, 1509, 1516-151702, 1567, 1595, 350402, 4026, 4028, 510101-510103, 510105-510902, 5111N, 5112, 511302, 5114, 5117-5120, 5122, 5123, 5126-5130, 5132, 5133, 5137-5141N, 5143, 5144N, 5146, 5148-5151, 520101-5207, 5209-5211, 560501-5606,

10	180, 395 bp	800 bp	13, 15, 40, 55, 62, 70, 71, 72, 75	5621, 5808, 7801-7805 1301-130204, 1307N-1309, 1311, 1314-1320, 1509, 1510, 1518, 1521, 1523, 1537, 1544, 1551, 1552, 1566, 1572, 1580, 1590, 1593, 1599, 9508, 9514, 9515, 9519, 9524, 9533, 9534, 4048, 5522, 5524, Cw*0206 [?]
11⁶	105, 195 bp	1070 bp	7, 8, 15, 27, 38, 39, 40, 44, 45, 48, 55, 72	0727, 0750, 0804, 0817, 1503, 1547, 1549, 1554, 1561, 1562, 1564, 1568, 1569, 1591, 1598, 9503, 9523, 9527, 9531, 9532, 2718, 2729, 3803, 390201- 390202, 3908, 391301-391302, 3923, 3939, 4012, 4046, 4410, 4415, 4418, 4440, 4444, 4501, 4505-4507, 480101-4805, 4807-4819, 5002, 5518, 8201, 8202
12	275 bp	1070 bp	7, 8, 13, 15, 18, 35, 39, 40, 42, 44, 46, 48, 49, 51, 53, 54, 55, 56, 57, 58, 62, 63, 70, 71, 72, 75, 76, 77	0709, 0711, 0717, 0828, 1304, 1310, 15010101-150104, 150106, 1502-1508, 151101- 1516, 1518-1521, 1523-1529, 1531-1536, 1538-1540, 1543, 1544, 1546, 1547, 1549-1557, 1560-1562, 1564-1572, 1574- 1576, 1578-1582, 1584, 1585, 1587-1589, 1591-1598, 9501- 9529, 9531, 9532, 9534-9536, 9538, 9539, 180101-1815, 1817N-1825, 1827, 350101- 350106, 3505, 3507-350803, 3510, 3511, 351401-3517, 3519-3521, 3523-3530, 3532, 3535, 3537, 3540N-3543, 3545-3554, 3557, 3558, 3561- 3564, 3566-3569, 3571, 3572, 3576-3579, 3582, 3907, 3943, 4003, 4020, 4038, 4052, 4059, 4060, 4209, 4417, 4443, 460101-4610, 4612, 4802, 4814, 4904, 4905, 5137, 5145, 530101-5303, 5305, 5306, 5308-5313, 5406, 5409, 5514, 5523, 5603, 5609, 5618, 570101-570103, 5706, 5708, 5710, 5711, 5713, 5714, 5801, 5802, 5804-5807, 5809-5815

13	195 bp	1070 bp	15, 35, 37, 38, 44, 58, 76	1512, 1514, 1519, 1591, 9531, 3545, 3571, 370101-3709, 3712, 3713, 3817, 4417, 4443, 5807
14⁶	105, 435	1070 bp	7, 15, 41, 42, 59, 62, 63, 77	0704, 0725, 1513, 1516- 151702, 1523, 1524, 1567, 1587, 1595, 4108, 420501- 420502
15⁶	115 bp	1070 bp	18	180101-1815, 1817N-1827
16⁶	80 bp	1070 bp	27, 40, 44	2701-270402, 270502-2721, 2723-2738, 4046, 4440, 4444
17	150 bp	1070 bp	13, 15, 27, 35, 37, 39, 40, 44, 48, 51, 53, 55, 56, 57, 58, 62, 75, 77	1301, 1306, 1307N, 1312, 1313, 1317, 1320, 1502, 1513, 1520, 1521, 1525, 1536, 1544, 1562, 1577, 1580, 1585, 1588, 1589, 9506, 9512, 9521, 9539, 1822, 2719, 2730, 350101- 350402, 3506-350803, 3510- 3517, 3519-3521, 3523-3530, 3533-3536, 3538-3542, 3545- 3550, 3552, 3554-3557, 3559, 3561-3563, 3565Q, 3569-3571, 3574, 3576-3578, 3582, 3583, 370101-370104, 3703N-3706, 3708, 3710, 3711, 3713, 3942, 4028, 44020101-4414, 4416, 4417, 4419N, 4421-4430, 4432-4440, 4442-4446, 4448- 4452N, 4455-4457, 4802, 5104, 5142, 5146, 530101- 5313, 5514, 5609, 5611, 5612, 570101-5710, 5712, 5714, 5801, 5804, 5805, 5809-5815, 8301
18	135 bp	1070 bp	8, 18, 35, 37, 39, 56, 78	0832, 180101-1808, 1810- 1815, 1817N-1827, 350101- 3518, 352001-3524, 3528- 3545, 3548, 3550-3555, 3557- 3562, 3564-3572, 3774-3579, 3582, 3583, 3711, 3919, 5606, 7801-7805
19^{6,11}	245, 400 bp	1070 bp	15, 62, 63, 70, 71, 72, 75, 76, 77, 40, 44	15010101-150104, 150106- 1521, 1523-152701, 1528-1540, 1542-1558, 1560-1599, 9501- 9529, 9531-9539, 4012, 4410, 8201, 8202
20^{6,11}	205 bp	800 bp	7, 8, 15, 18,	0727, 0802, 9515, 1809,

			37, 38	370101-3704, 3705 ^{weakly} , 3706-3710, 3712, 3713, 380201-3804, 3808, 3815, 3817
21	170 bp	800 bp	15, 35, 38, 39, 67	1569, 9536, 3535, 380101-3809, 3811-3817, 39010101-39010102L, 390103-3920, 3922-3924, 3926-3929, 3931, 3935, 3937-3942, 670101-6702
22⁶	110 bp	1070 bp	38	380101-3803, 3805, 3808-3817
23	400 bp	1070 bp	14, 38, 39, 64, 65	1401-1407N, 380101-380202, 3804, 3805, 3808-3817, 39010101-39010102L, 390103-390104, 3903-3907, 3909, 3911, 3912, 3914, 3915, 3918, 3919, 3922, 3924-3938Q, 3940N, 3941
24	430 bp	1070 bp	7, 8, 14, 39, 40, 41, 42, 45, 48, 50, 60, 64, 65, 67, 73	070201-0726, 0728-0735, 0737, 0739-0760, 080101-080105, 0804-0834, 1401-1407N, 39010101-39010102L, 390103-3920, 3922-3941, 400101-400105, 4007, 4009-4011 [?] , 401401-4016 [?] , 4018 [?] , 4021 [?] , 4022N [?] , 4023, 4024-4038 [?] , 4040 [?] , 4042-4046 [?] , 4048-4050 [?] , 4051, 4052-4058 [?] , 4059, 4060, 4061-4069 [?] , 4071-4074 [?] , 4077, 4101-4108, 4201, 4202, 4204-4209, 4501-4507, 480101-4817, 4819, 5001, 5002, 5004, 670101-6702, 7301, 8102
25^{11,12}	175 bp	1070 bp	15, 40, 44, 46, 48, 60	9516, 9524, 400101-400105, 4007, 4010, 4012, 4021-4023, 4025, 4033, 4036, 4038, 4042, 4043, 4046-4049, 4051, 4052, 4054, 4055, 4060-4063, 4065-4067, 4069, 4073, 4074, 4076, 4431, 4606, 480301-480302, 4817
26	130 bp	1070 bp	40, 61	400201-400602, 4008, 4009, 4011, 4013, 4018-4020, 4024, 4026-4029, 4035, 4037, 4039, 4040, 4044, 4050, 4056, 4057, 4064, 4068, 4070, 4071, 4074, 4075, 4078
27^{6,11}	110 bp	1070 bp	7, 8, 41, 42,	0704, 0719, 0725, 080101-

			55	0805, 0807-0812, 0814-0819N, 0821-0824, 0826-0834, 4101-4108, 4201, 4202, 4204-4207, 4209, 5520
28	325 bp	1070 bp	7, 15, 27, 42, 45, 46, 54, 55, 56, 67, 73, 81	070201-070207, 0704-0707, 0709-0712, 0713 ^{weakly} , 0714, 0715 ^{weakly} , 0717-0726, 0728-0731, 0733-0736, 0739-0749N, 0751-0760, 1576, 9501, 2701-270402, 270502-2711, 2713-2715, 2717, 2719-2721, 2724-2728, 2730-2738, 3576, 4201, 4202, 4204-4206, 4208, 4209, 4506, 460101-460102, 4602 ^{weakly} , 4603-4612, 5401-5413, 550101-5505, 5507-5517, 5519-5528, 5601-5616, 5618-5621, 670101-670102, 6702 ^{weakly} , 7301, 8101-8103, 8201, 8202, 8301
29^{6,13}	110, 195, 225, 260 bp	1070 bp	35, 37, 44, 47, 51, 57	3538, 3545, 3571, 370101-370104, 3703N-3706, 3708, 3710-3713, 44020101-4414, 4416, 4417, 4419N-4436, 4438-4457, 5142, 5707, 5709, 8301
30	215 bp	800 bp	8, 12, 15, 41, 42, 44, 45, 51, 52, 53, 55, 56, 58	0809, 1583, 4101, 4105-4107, 4204, 4406, 4415, 4418, 4420, 4501-4507, 510101, 510103-510201, 510203-5104, 5106-510901, 5110-5114, 5116-5124, 5126-5146, 5148, 5149, 5151, 520102, 520104-5203, 520601-520602, 5209, 5306, 5520, 5613, 5808
31	130, 270 bp	1070 bp	18, 35, 37, 40, 46, 51, 53, 57, 58	1822, 3521, 3524, 3704, 4028, 460101-4612, 5104, 5146, 5302, 5306, 5714, 5809
32⁶	90, 410 bp	1070 bp	27, 35, 47, 54, 55, 56, 81	2702-270402, 270502-2711, 2713-2715, 2717, 2719-2721, 2724-2728, 2730-2738, 3576, 47010101-4703, 5401-5413, 550101-5505, 5507-5517, 5519-5528, 5601-5616, 5618-5621, 8101, 8201, 8202, 8301
33⁶	90, 175 bp	1070 bp	15, 27, 35, 40, 48, 62,	1502, 1508, 151101-151103, 1513, 1515, 1521, 1531, 1544,

			75, 77, 81	1555, 1588, 1589, 9512, 9521, 9539, 2724, 3546, 4031, 4045, 480101-480102, 4804, 4806, 4807, 4809, 4811, 4815, 4816, 4818, 4819, 8101-8103
34	145 bp	1070 bp	40, 44, 49	4013, 4019, 4418, 4425, 4450, 4901, 4904, 4905
35⁶	120, 210 bp	800 bp	13, 15, 45, 49, 50, 51, 52, 55, 56, 58, 62, 63, 78	1316, 1516, 1542, 1567, 1595, 9537, 4901-4905, 5001, 5002, 5004, 510101-5103, 5105, 5107-510902, 5111N-5114, 5116-1524, 5126-5141N, 5143, 5144N, 5148-5151, 520101-5211, 550101-550104, 5503, 5505, 5509, 5511, 5515, 5517, 5521, 5524, 5525, 5528, 560501-5606, 5621, 5808, 7801-7805
36	430 bp	1070 bp	27, 40, 44, 45, 51, 52, 53, 57, 58, 59	2702, 2730, 4013, 4019, 4406, 4425, 4450, 510101-5124, 5126-5146, 5148, 5149, 5151, 520101-5211, 530101-5302, 5304-5308, 5310, 570101-5711, 5713, 5714, 5801, 5802, 5804-5815, 5902
37	145 bp	1070 bp	15, 35, 40, 41, 44, 45, 47, 50, 72	1546, 1553, 9506, 3519, 3547, 3563, 400101-4011, 401401-4016, 4018, 4020, 4022N-4040, 4042-4045, 4048-4075, 4077, 4078, 4101-4104, 4105 [?] , 4106-4108, 4409, 4446, 4501-4507, 4702, 5001, 5002, 5004
38⁹	300 bp	1070 bp	7, 8, 13, 15, 18, 27, 35, 37, 38, 39, 40, 41, 44, 45, 46, 47, 48, 49, 50, 52, 55, 57, 58, 62, 72, 76, 78	0754, 0817, 1301-1304, 1306, 1308Q-1321, 15010101-150104, 150106, 1503-1507, 1512, 1514, 1519, 1520, 1524-152702, 1530, 1532-1536, 1538-1540, 1542, 1543, 1545-1550, 1553, 1554, 1556-1558, 1560-1563, 1565, 1566, 1568-1571, 1573-1575, 1577-1579N, 1581-1587, 1591, 1592, 1594N, 1596-1598, 9502-9507, 9509-9511N, 9513, 9516-9518, 9522, 9523, 9525-9529, 9531, 9532, 9535-9538, 1812, 2701-270402, 270502-2721, 2724-2738, 3510, 3513, 3516, 3528,

				3563, 3569, 370101-3707, 3709-3713, 3803, 3804, 390201-390202, 3908, 391301- 391302, 3922, 3923, 400101- 4007, 4009-4016, 4018-4024, 4026-4040, 4042-4067, 4070- 4078, 4101-4108, 44020101- 4405, 4407-4411, 4413-4457, 4501-4505, 4507, 4610-4612, 47010101-4705, 480101-4805, 4807-4815, 4817-4819, 4901- 4905, 5001, 5002, 5004, 520101-5211, 5518, 5712- 5714, 5815, 7805
39	160, 215 bp	1070 bp	15, 37, 44, 54	150104, 370104, 44020101- 440204, 4406, 4408, 4409, 4411, 4412, 4416, 4419N- 4424, 4427, 4433, 4434, 4441, 4444, 4448, 4449, 4451-4453, 4455, 5401-5413, 8301
40⁹	180, 210 bp	1070 bp	13, 15, 18, 35, 39, 40, 54, 55, 56, 59, 78	1306, 1542, 1586, 1804, 3560, 3917, 4058, 5401, 5402, 5405N, 5407, 5408N, 5410, 5412, 5413, 550101-5503, 5505, 5507, 5510-5512, 5515, 5516, 5518, 5519, 5521, 5525, 5526, 560501, 5606, 5610, 5901, 7801, 780202, 7803
41¹⁴	180 bp	1070 bp	13, 15, 40, 44, 45, 46, 49, 50, 51, 54, 56	1303, 1573, 4071, 4410, 4415, 4418, 4501, 4504-4507, 4611, 4901-4903, 5001, 5002, 5004, 5115, 5403, 5601, 5602, 5604, 5607, 5608, 5613, 5614, 5616, 5617, 5620, 8201, 8202
42⁶	90, 240 bp	800 bp	55, 57	5514, 570101-5714
43^{6,15}	90 bp	1070 bp	13, 15, 39, 40, 56, 58	1311, 1573, 3917, 4048, 4071, 5602, 5604, 5610, 5801, 5802, 5804-5815, Cw*0206
44⁶	95 bp	1070 bp	8, 18, 35, 37, 38, 39, 44, 51, 52, 53, 78	0832, 180101-1811, 1813- 1815, 1817N-1827, 350101- 350902, 3511, 3512, 351401- 3515, 3517, 3518, 352001- 3524, 3527, 3529-3545, 3548, 3550-3562, 3564-3568, 3570- 3572, 3574-3579, 3582, 3583, 3708, 3806, 3807, 3919, 4406, 510101-5124, 5126-5146,

				5148-5151, 530101-5313, 7801-7804
45^{6,11}	115, 150 bp	1070 bp	15, 18, 27, 35, 39, 46, 54, 55, 56, 62, 73, 75, 76	15010101-150104, 150106, 1504, 1507, 1508, 151101- 1512, 1514, 1515, 1519, 1524, 1526N-1528, 1530, 1532, 1534, 1535, 1538, 1543, 1545, 1546, 1550, 1553, 1554, 1556- 1558, 1560, 1563, 1566, 1568, 1570, 1571, 1573, 1575-1577, 1579N, 1581, 1582, 1585, 1587, 1592, 1594N, 1596, 1597, 9501, 9502, 9504, 9505, 9509-9511N, 9513, 9517, 9518, 9520, 9522, 9525, 9526, 9528, 9529, 9535, 9537, 1819, 2725, 351401-351402, 3543, 3544, 3562, 3567, 3579, 3918, 3936, 460101-4602, 4604, 4605, 4607N, 4609, 4610, 4612, 5406, 5521, 5603, 7301
46	360 bp	1070 bp	Bw4 ¹⁶	
47	355 bp	1070 bp	Bw6	

¹Alleles are assigned by the presence of specific PCR product(s). However, the sizes of the specific PCR products may be helpful in the interpretation of HLA-B low resolution SSP typings. When the primers in a primer mix can give rise to specific PCR products of more than one length this is indicated if the size difference is 20 bp or more. Size differences shorter than 20 bp are not given. For high resolution SSP kits the length of the specific PCR product(s) of the alleles amplified by these primer mixes are given.

Nonspecific amplifications, i.e. a ladder or a smear of bands, may sometimes be seen. GC-rich primers have a higher tendency of giving rise to nonspecific amplifications than other primers, e.g. the primers in tubes 5, 6, 38, 40.

PCR fragments longer than the control band may sometimes be observed. Such bands can be disregarded and do not influence the interpretation of the SSP typings.

²The internal positive control primer pairs amplify segments of the human growth hormone gene. The two different control primer pairs give rise to either an internal positive control band of 1070 base pairs, for most tubes, or a band of 800 base pairs, for some tubes.

Tube number 1 contains the primer pair giving rise to the shorter, 800 bp, internal positive control band in order to help in the correct orientation of the HLA-B low resolution typing.

In addition, tubes number 6, 9, 10, 20, 21, 30, 35 and 42 contain the primer pair giving rise to the shorter, 800 bp, internal positive control band in order to allow kit identification.

PLEASE NOTE: All the SSP kits, except the B*37, B*41, B*42, B*46, B*47, B*48, B*49, B*50, B*53, B*67, B*78, B*81 and B*82 kits and the Cw*01, Cw*02, Cw*08, Cw*12, Cw*14, Cw*15, Cw*16, Cw*17 and Cw*18 kits, from Olerup SSP AB can be uniquely identified by the number of tubes and the kit-specific pattern of the two differently sized control bands.

In the presence of a specific amplification the intensity of the control band often decreases.

³The serological reactivity of all HLA-B alleles is not known. In this table we used the information published in *Tissue Antigens* 1999: **54**: 409-437, also available at the www.worldmarrow.org web site and also inferred the serological grouping from the naming of the sequence-defined allele.

⁴For several HLA-B alleles only partial nucleotide sequences are available, especially for the 1st exon. In these instances it is not known whether some of the primers of the HLA-B low resolution SSP set are completely matched with the target sequences or not. We assume that unknown sequences are conserved within allelic groups.

The B*0826 and B*4207 alleles give rise to identical amplification patterns with the HLA-B low resolution primer set. These alleles can be separated by the respective high resolution primer sets.

The B*5504, B*5508, B*5513, B*5527, B*5615 and B*5619N alleles give rise to identical amplification patterns with the HLA-B low resolution primer set. These alleles can be separated by the respective high resolution primer sets.

The B*5523 and B*5618 alleles will give rise to identical amplification patterns with the HLA-B low resolution primer set. These alleles can be separated by the respective high resolution primer sets.

⁵Primer mix 1 may give rise to a primer oligomer artifact.

⁶Specific PCR fragments shorter than 125 base pairs have a lower intensity and are less sharp than longer PCR bands.

⁷Primer mix 3 will amplify the Cw*0305, Cw*0325 and Cw*0327 alleles.

⁸Primer mix 4 may yield less specific PCR product than the other HLA-B low resolution primer mixes in B*40, B*41, B*45, B*49 and B*50 alleles.

⁹Primer mixes 5, 6, 38 and 40 have a higher tendency than other primer mixes to give rise to nonspecific amplifications.

¹⁰The B*57 and B*58 alleles might be faintly amplified by primer mix 9.

¹¹Primer mixes 9, 19, 20, 25, 27 and 45 might have a tendency of giving rise a primer oligomer artifact.

¹²The Cw*1701 and Cw*1702 alleles might be faintly amplified by primer mix 25.

¹³Primer mix 29 might generate a false band of about 500 base pairs. This band should be disregarded when interpreting HLA-B low resolution typings.

¹⁴The Cw*0312 allele might be faintly amplified by primer mix 41.

¹⁵The Cw*0206 allele might be weakly amplified by primer mix 43..

¹⁶The Bw4-associated HLA-A specificities A23, A24, A2403, A25 and A32 are not amplified by the primer pair in primer mix 46.

'?', nucleotide sequence information not available for the primer matching sequence.

HLA-B low resolution
101.501-48/12 – licensed for PCR
101.501-48u/12u – not licensed for PCR
Lot No.: **Y52**

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INTERPRETATION TABLE																									
HLA-B low resolution SSP																									
Amplification patterns of the B*0702 to B*8301 alleles ⁶																									
		Tube																							
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Length of spec. PCR product		110	215	140	130	185	185	290	165	165	180	105	275	195	105	115	80	150	135	245	205	170	110	400	430
				235	265	235			220	390	395	195			435					400					
									330																
Length of int. pos. control ¹		800	1070	1070	1070	1070	800	1070	1070	800	800	1070	1070	1070	1070	1070	1070	1070	1070	1070	800	800	1070	1070	1070
5'-primer(s) ²		527	97	209	103	103	103	45	45	45	45	206	419	142	45	161	167	355	206	45	142	409	246	44	44
		5'-TgA ^{3'}	5'-TCg ^{3'}	5'-ggC ^{3'}	5'-CCg ^{3'}	5'-CCT ^{3'}	5'-CCg ^{3'}	5'-ggA ^{3'}	5'-ggA ^{3'}	5'-ggA ^{3'}	5'-ggA ^{3'}	5'-AgA ^{3'}	5'-gTC ^{3'}	5'-TCT ^{3'}	5'-ggA ^{3'}	5'-Cgg ^{3'}	5'-gCT ^{3'}	5'-TCA ^{3'}	5'-gAC ^{3'}	5'-ggA ^{3'}	5'-TCT ^{3'}	5'-ggC ^{3'}	5'-gAA ^{3'}	5'-ggC ^{3'}	5'-ggC ^{3'}
		540		363	361	363			357	435	420	420		419	540					368		420			
		5'-gAC ^{3'}		5'-AgC ^{3'}	5'-AgT ^{3'}	5'-AAT ^{3'}			5'-Tgg ^{3'}	5'-AAA ^{3'}	5'-TTA ^{3'}	5'-TTA ^{3'}		5'-gTC ^{3'}	5'-gAC ^{3'}					5'-gTT ^{3'}		5'-TTA ^{3'}			
									412																
									5'-ATA ^{3'}																
3'-primer(s) ³		605	272	309	193	246	246	165	206	266	272	272	3rd	301	309	234	204	463	302	259	301	544	317	272	301
		5'-gCT ^{3'}	5'-Tgg ^{3'}	5'-gTg ^{3'}	5'-CgT ^{3'}	5'-TAT ^{3'}	5'-TAT ^{3'}	5'-Tgg ^{3'}	5'-CCT ^{3'}	5'-TCC ^{3'}	5'-TgC ^{3'}	5'-Tgg ^{3'}	5'-TAT ^{3'}	5'-gTC ^{3'}	5'-ATC ^{3'}	5'-TCT ^{3'}	5'-TCT ^{3'}	5'-gCT ^{3'}	5'-ggC ^{3'}	5'-gTT ^{3'}	5'-gTC ^{3'}	5'-ggT ^{3'}	5'-ggA ^{3'}	5'-TgC ^{3'}	5'-ggC ^{3'}
			272	559	583	559			538	559	559	572		570	605					266	309				302
			5'-TgA ^{3'}	5'-CAG ^{3'}	5'-gTg ^{3'}	5'-CTC ^{3'}			5'-gTC ^{3'}	5'-CAG ^{3'}	5'-CTC ^{3'}	5'-gCg ^{3'}		5'-CCg ^{3'}	5'-gCT ^{3'}					5'-TCC ^{3'}	5'-gTg ^{3'}				5'-ggT ^{3'}
														572						272					
														5'-gCg ^{3'}						5'-Tgg ^{3'}					
																				292					
																				5'-gTA ^{3'}					
																				572					
																				5'-gCg ^{3'}					
Tube No.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
HLA-B allele ⁴	ser. ⁵																								
*070201-070207, 070501-0707, 0710, 0712, 0714, 071801- 071802, 0721-0723, 0726, 0728-0731, 0734, 0735, 0739, 0741 0747, 0749N, 0752, 0755-0759	B7	+																							+
Tube No.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

INTERPRETATION TABLE																											
HLA-B low resolution SSP																											
Amplification patterns of the B*0702 to B*8301 alleles ⁶																											
Tube																											
25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47					
175	130	110	325	110	215	130	90	90	145	120	430	145	300	160	180	180	90	90	95	115	360	355		Length of spec. PCR product			
				190		270	410	175		210				215	210		240			150							
				225																							
				260																							
1070	1070	1070	1070	1070	800	1070	1070	1070	1070	800	1070	1070	1070	1070	1070	1070	800	1070	1070	1070	1070	1070	1070	Length of int. pos. control ¹			
363	106	540	1 st	355	141	209	41	209	206	357	49	206	1 st	1 st	141	420	209	209	206	165	1 st	1 st	5'-primer(s) ²				
5'-Agg ^{3'}	5'-CCg ^{3'}	5'-gAC ^{3'}	5'-CAG ^{3'}	5'-TCA ^{3'}	5'-ATT ^{3'}	5'-ggC ^{3'}	5'-CTg ^{3'}	5'-ggC ^{3'}	5'-gAA ^{3'}	5'-Tgg ^{3'}	5'-CAG ^{3'}	5'-gAA ^{3'}	5'-CAG ^{3'}	5'-CAG ^{3'}	5'-ATT ^{3'}	5'-TTA ^{3'}	5'-ggC ^{3'}	5'-ggA ^{3'}	5'-gAC ^{3'}	5'-ACC ^{3'}	5'-CAG ^{3'}	5'-CAG ^{3'}					
				418	357	209	368	363						418	420		362	369		463							
				5'-Agg ^{3'}	5'-Tgg ^{3'}	5'-ggg ^{3'}	5'-gTT ^{3'}	5'-AgC ^{3'}						5'-Agg ^{3'}	5'-TTA ^{3'}		5'-ggT ^{3'}	5'-TAC ^{3'}		5'-TgA ^{3'}							
				499		355																					
				5'-TCT ^{3'}		5'-TCA ^{3'}																					
499	193	603	282	538	309	299	282	259	309	435	309	311	259	175	311	559	256	256	259	272	317	311	3'-primer(s) ³				
5'-ggA ^{3'}	5'-CgT ^{3'}	5'-gTg ^{3'}	5'-gCC ^{3'}	5'-gTC ^{3'}	5'-ATC ^{3'}	5'-TCA ^{3'}	5'-gCC ^{3'}	5'-gTT ^{3'}	5'-ATC ^{3'}	5'-TCT ^{3'}	5'-ATC ^{3'}	5'-ggT ^{3'}	5'-CTC ^{3'}	5'-CCg ^{3'}	5'-ggT ^{3'}	5'-CAG ^{3'}	5'-CCC ^{3'}	5'-CCC ^{3'}	5'-gTT ^{3'}	5'-TgC ^{3'}	5'-ggA ^{3'}	5'-ggT ^{3'}					
		610		572	538	583	418	499		527				538	559		559	256		538							
		5'-CTC ^{3'}		5'-gCg ^{3'}	5'-gTC ^{3'}	5'-gTg ^{3'}	5'-gTC ^{3'}	5'-ggA ^{3'}		5'-CCT ^{3'}				5'-gTC ^{3'}	5'-CgT ^{3'}		5'-CgT ^{3'}	5'-CTC ^{3'}		5'-CCA ^{3'}							
																		420									
																		5'-gCT ^{3'}									
25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	ser. ⁵	Tube No.			
																								HLA-B allele ⁴			
			+																		+	B7		*070201-070207, 070501-0707, 0710, 0712, 0714, 071801-071802, 0721-0723, 0726, 0728-0731, 0734, 0735, 0739, 0741 0747, 0749N, 0752, 0755-0759			
25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47		Tube No.			

Lot No.: Y52

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Length of spec.		110	215	140	130	185	185	290	165	165	180	105	275	195	105	115	80	150	135	245	205	170	110	400	430
PCR product				235	265	235			220	390	395	195			435					400					
									330																
Tube No.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
*0703, 0708, 0716, 0732, 0737	B7, B703	+																							+
*0704, 0725	B7	+													+										+
*0709, 0711, 0717	B7	+											+												+
*0713, 0715	-	+																							+
*0719	-																								+
*0720, 0724	-	+		+																					+
*0727	-	+										+								+					
*0733, 0740, 0748, 0751, 0753	-																								+
*0736	-	+																							
*0738	-	+																							
*0750	-	+										+													+
*0754	-	+																							+
*0760	-			+																					+
*080101-080105, 0805, 0808N, 0810-0812, 0815, 0816, 0818, 0819N, 0822-0824, 0827, 0829-0831, 0833, 0834	B8, Null		+						+																+
*0802	B8		+						+											+					
*0803	B8		+						+																
*0804	-		+						+			+													+
*0806, 0813, 0820	B8		+																						+
*0807, 0814	-		+																						+
*0809	-		+						+																+
*0817			+						+			+													+
*0821	-		+	+					+																+
*0825	-		+	+																					+
*0826, 4207	-								+																+
*0828	-		+										+												+
*0832	-		+						+										+						+
*1301, 1317, 1320	B13			+	+						+								+						
*130201-130204, 1308Q, 1315, 1318, 1319	B13			+	+						+														
*1303	-			+	+																				
*1304, 1310	-			+	+								+												
*1306	-			+	+														+						
*1307N	Null			+	+						+								+						
*1309	-				+						+														
*1311	-			+	+						+														
Tube No.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

175	130	110	325	110	215	130	90	90	145	120	430	145	300	160	180	180	90	90	95	115	360	355		Length of spec. PCR product	
				190		270	410	175		210				215	210					150					
				225																					
				260																					
25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47		Tube No.	
																						+	B7, B703	*0703, 0708, 0716, 0732, 0737	
		+	+																			+	B7	*0704, 0725	
			+																			+	B7	*0709, 0711, 0717	
			W																			+	-	*0713, 0715	
		+	+																			+	-	*0719	
			+																			+	-	*0720, 0724	
																					+		-	*0727	
			+																			+	-	*0733, 0740, 0748, 0751, 0753	
			+																			+	-	*0736	
																						+	-	*0738	
																						+	-	*0750	
			+										+									+	-	*0754	
			+																			+	-	*0760	
		+																				+	B8, Null	*080101-080105, 0805, 0808N, 0810-0812, 0815, 0816, 0818, 0819N, 0822-0824, 0827, 0829-0831, 0833, 0834	
		+																			+		B8	*0802	
		+																			+		B8	*0803	
		+																				+	-	*0804	
		+																				+	B8	*0806, 0813, 0820	
		+																				+	-	*0807, 0814	
		+			+																	+	-	*0809	
		+											+									+		*0817	
		+																				+	-	*0821	
		+																				+	-	*0825	
		+																				+	-	*0826, 4207	
		+																				+	-	*0828	
		+																	+			+	-	*0832	
													+								+		B13	*1301, 1317, 1320	
													+									+	B13	*130201-130204, 1308Q, 1315, 1318, 1319	
													+			+						+	-	*1303	
													+									+	-	*1304, 1310	
													+		+							+	-	*1306	
																						+	Null	*1307N	
													+									+	-	*1309	
													+						+			+	-	*1311	
25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47		Tube No.	

Length of spec.		110	215	140	130	185	185	290	165	165	180	105	275	195	105	115	80	150	135	245	205	170	110	400	430
PCR product				235	265	235			220	390	395	195			435					400					
									330																
Tube No.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
*1312, 1313	-			+	+													+							
*1314	-			+							+														
*1316	-			+	+						+														
*1321	-			+	+																				
*1401, 1407N	B64				+	+																	+	+	
*140201-1404	B65				+		+																+	+	
*1405-140602	-						+																+	+	
*15010101- 15010102N, 150103, 1504, 1526N, 152701, 1532, 1534, 1535, 1538, 1550, 1556, 1557, 1560, 1570, 1571, 1575, 1579N, 1581, 1582, 1592, 1594N, 1596, 1597, 9502, 9504, 9505, 9509 9511N, 9513, 9517, 9518, 9522, 9525, 9528, 9529	B62, Null, B15							+					+						+						
*150102	B62							+		+			+							+					
*150104	B62												+							+					
*150106, 1507	B62			+				+					+							+					
*1502, 1588, 9512, 9521	B75							+					+					+		+					
*1503, 1547, 1549, 1561, 1598, 9503, 9523, 9527, 9532	B72								+			+	+							+					
*1505, 1506, 1533, 1539, 1540, 1565, 1578, 1584, 9507	B62, B15							+					+							+					
*1508, 151101-151103, 1515	B75							+					+							+					
*1509	B70								+	+	+									+					
*1510, 1537, 1590, 1599, 9533	B71								+		+									+					
*1512, 1514, 1519	B76							+					+	+						+					
*1513	B77							+					+		+			+		+					
*1516, 1567, 1595	B63									+			+		+					+					
*15170101-151702	B63							+		+					+					+					
*1518, 1551, 1552, 1572, 1593, 9508, 9514, 9519, 9534	B71								+		+		+							+					
Tube No.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

175	130	110	325	110	215	130	90	90	145	120	430	145	300	160	180	180	90	90	95	115	360	355		Length of spec.	
				190		270	410	175		210				215	210						150				PCR product
				225																					
				260																					
25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47		Tube No.	
													+								+		-	*1312, 1313	
													+								+		-	*1314	
										+			+								+		-	*1316	
													+								+		-	*1321	
																						+	B64	*1401, 1407N	
																						+	B65	*140201-1404	
																						+	-	*1405-140602	
													+							+		+	B62, Null, B15	*15010101-15010102N, 150103, 1504, 1526N, 152701, 1532, 1534, 1535, 1538, 1550, 1556, 1557, 1560, 1570, 1571, 1575, 1579N, 1581, 1582, 1592, 1594N, 1596, 1597, 9502, 9504, 9505, 9509 9511N, 9513, 9517, 9518, 9522, 9525, 9528, 9529	
													+							+		+	B62	*150102	
													+	+						+		+	B62	*150104	
													+							+		+	B62	*150106, 1507	
								+														+	B75	*1502, 1588, 9512, 9521	
													+									+	B72	*1503, 1547, 1549, 1561, 1598, 9503, 9523, 9527, 9532	
													+									+	B62, B15	*1505, 1506, 1533, 1539, 1540, 1565, 1578, 1584, 9507	
								+												+		+	B75	*1508, 151101-151103, 1515	
																						+	B70	*1509	
																						+	B71	*1510, 1537, 1590, 1599, 9533	
													+							+		+	B76	*1512, 1514, 1519	
								+													+		B77	*1513	
										+											+		B63	*1516, 1567, 1595	
																					+		B63	*15170101-151702	
																						+	B71	*1518, 1551, 1552, 1572, 1593, 9508, 9514, 9519, 9534	
25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47		Tube No.	

Lot No.: Y52

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Length of spec.		110	215	140	130	185	185	290	165	165	180	105	275	195	105	115	80	150	135	245	205	170	110	400	430
PCR product				235	265	235			220	390	395	195			435					400					
									330																
Tube No.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
*1520, 1525	B62							+					+					+		+					
*1521, 1544	B75							+			+		+					+		+					
*1523	-								+		+		+		+					+					
*1524, 1587	B62							+					+		+					+					
*152702	-			+									+												
*1528	B15							+					+							+					
*1529	B15								+				+							+					
*1530, 1558, 1563	B62,							+												+					
*1531	B75							+					+							+					
*1536	-			+				+					+					+		+					
*1542	-							+												+					
*1543	-							+					+							+					
*1545	B62			+				+												+					
*1546	B72				+			+	+				+							+					
*1548	B62							+												+					
*1553	-				+				+				+							+					
*1554	-								+			+	+							+					
*1555	-			+				+					+							+					
*1562	-								+			+	+					+		+					
*1564	-								+			+	+							+					
*1566	-							+			+	+	+							+					
*1568	-			+				+	+			+	+							+					
*1569	-								+			+	+							+		+			
*1573	-							+												+					
*1574	-								+				+							+					
*1576, 9501	-							+					+							+					
*1577	-							+										+		+					
*1580	-								+		+		+					+		+					
*1583	-							+	+											+					
*1585	-							+					+					+		+					
*1586	-							+												+					
*1589	-			+				+					+					+		+					
*1591, 9531	-								+			+	+	+						+					
*9506	-				+			+	+			+	+					+		+					
*9515	-								+		+		+							+	+				
*9516	-							+				+	+							+					
*9520	-							+				+	+							+					
*9524	-								+		+		+							+					
*9526, 9535	-			+				+					+							+					
*9536	-			+				+					+							+		+			
*9537	-			+				+												+					
*9538	-	+						+					+							+					
*9539	-			+				+					+					+		+					
Tube No.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

175	130	110	325	110	215	130	90	90	145	120	430	145	300	160	180	180	90	90	95	115	360	355		Length of spec. PCR product
				190		270	410		175		210			215	210		240			150				
				225																				
				260																				
25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47		Tube No.
													+									+	B62	*1520, 1525
								+														+	B75	*1521, 1544
																					+		-	*1523
													+							+	+		B62	*1524, 1587
													+							+		+	-	*152702
																				+		+	B15	*1528
																						+	B15	*1529
													+							+		+	B62,	*1530, 1558, 1563
								+														+	B75	*1531
													+								+		-	*1536
										+			+		+							+	-	*1542
													+							+	+		-	*1543
													+							+		+	B62	*1545
												+	+							+		+	B72	*1546
													+									+	B62	*1548
												+	+							+		+	-	*1553
													+							+		+	-	*1554
								+														+	-	*1555
													+									+	-	*1562
																						+	-	*1564
													+							+		+	-	*1566
													+							+		+	-	*1568
													+									+	-	*1569
													+			+	+			+		+	-	*1573
													+									+	-	*1574
			+																	+		+	-	*1576, 9501
													+							+		+	-	*1577
																						+	-	*1580
					+								+									+	-	*1583
													+							+		+	-	*1585
													+		+							+	-	*1586
								+													+		-	*1589
													+									+	-	*1591, 9531
												+	+									+	-	*9506
																					+		-	*9515
+													+									+	-	*9516
																				+		+	-	*9520
+																						+	-	*9524
													+							+		+	-	*9526, 9535
													+									+	-	*9536
										+			+							+		+	-	*9537
													+									+	-	*9538
								+														+	-	*9539
25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47		Tube No.

Length of spec.		110	215	140	130	185	185	290	165	165	180	105	275	195	105	115	80	150	135	245	205	170	110	400	430
PCR product				235	265	235			220	390	395	195			435					400					
									330																
Tube No.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
*180101-1803, 1805-1808, 1810, 1811, 1813, 1815, 1817N, 1818, 1820, 1821, 1823N-1825, 1827	B18												+			+			+						
*1804	-												+			+			+						
*1809	-												+			+				+					
*1812	-												+			+			+						
*1819	-												+			+			+						
*1822	-												+			+		+	+						
*1826	-															+		+	+						
*2701	B27					+											+								
*2702	B27					+											+								
*2703-270402, 270502-2706, 2709, 2710, 2713, 2717, 2720, 2727, 2731, 2735-2737	B27					+											+								
*2707, 2711, 2714, 2715, 2721, 2728, 2732, 2734, 2738	B27																+								
*2708, 2726	B2708					+											+								
*2712	-					+											+								
*2716	-					+											+								
*2718	-					+						+					+								
*2719	-																+	+							
*2723	-					+											+								
*2724	-																+								
*2725	-																+								
*2729	-					+						+					+								
*2730	-																+	+							
*2733	-																+								
*350101-350106, 3507-350803, 3511, 3515, 352001-352002, 3523, 3529, 3540N-3542, 3548, 3550, 3552, 3554, 3557, 3561, 3577, 3578, 3582	B35												+					+	+						
Tube No.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

175	130	110	325	110	215	130	90	90	145	120	430	145	300	160	180	180	90	90	95	115	360	355			Length of spec. PCR product
				190		270	410	175		210				215	210					150					
				225																					
				260																					
25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47			Tube No.
																			+			+	B18		*180101-1803, 1805-1808, 1810, 1811, 1813 1815, 1817N, 1818, 1820, 1821, 1823N- 1825, 1827
															+				+			+	-		*1804
																			+		+		-		*1809
													+									+	-		*1812
																			+	+		+	-		*1819
						+													+			+	-		*1822
																			+			+	-		*1826
			+										+							+			B27		*2701
			+				+				+		+							+			B27		*2702
																					+		B27		*2703-270402, 270502- 2706, 2709, 2710, 2713, 2717, 2720, 2727, 2731, 2735-2737
			+				+						+								+		B27		*2707, 2711, 2714, 2715, 2721, 2728, 2732, 2734, 2738
			+				+						+									+	B2708		*2708, 2726
													+									+	-		*2712
													+								+		-		*2716
													+									+	-		*2718
			+				+						+								+		-		*2719
																					+		-		*2723
			+				+	+					+								+		-		*2724
			+				+						+							+	+		-		*2725
													+								+		-		*2729
			+				+				+		+								+		-		*2730
			+				+						+									+	-		*2733
																			+			+	B35		*350101-350106, 3507- 350803, 3511, 3515, 352001-352002, 3523, 3529, 3540N-3542, 3548, 3550, 3552, 3554, 3557, 3561, 3577, 3578, 3582
25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47			Tube No.

Length of spec.		110	215	140	130	185	185	290	165	165	180	105	275	195	105	115	80	150	135	245	205	170	110	400	430
PCR product				235	265	235			220	390	395	195			435					400					
									330																
Tube No.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
*350201-350401, 3506, 3512, 3533, 3534, 3536, 3539, 3555, 3559, 3565Q, 3570, 3574, 3583	B35																	+	+						
*350402	-									+								+	+						
*3505, 3551, 3558, 3572	B35			+									+						+						
*350901-350902, 3518, 3531, 3575	B35																		+						
*3510, 3528, 3569	-												+					+	+						
*3513	B35																	+	+						
*351401-351402, 3562	B35												+					+	+						
*3516	-			+									+					+	+						
*3517, 3530	B35			+									+					+	+						
*3519	B35												+					+							
*3521, 3524	-												+					+	+						
*3522	-			+															+						
*3525, 3549	-												+					+							
*3526	-					+							+					+							
*3527	B35												+					+							
*3532, 3537, 3553N, 3564, 3566, 3568	-												+						+						
*3535	-												+					+	+			+			
*3538	-																	+	+						
*3543, 3567, 3579	B35												+						+						
*3544	-																		+						
*3545, 3571	-												+	+				+	+						
*3546	-												+					+							
*3547	-				+								+					+							
*3556	-																	+							
*3560	-																		+						
*3563	-				+								+					+							
3576	-												+					+	+						
*370101-370103, 3703N, 3706, 3713	B37, Null													+				+			+				
*370104	-													+				+			+				
*3702	-					+								+							+				
*3704	-													+				+			+				
*3705	-													+				+			W				
*3707	-	+												+							+				
*3708	-													+				+			+				
Tube No.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

175	130	110	325	110	215	130	90	90	145	120	430	145	300	160	180	180	90	90	95	115	360	355			Length of spec. PCR product
				190		270	410	175		210				215	210					150					
				225																					
				260																					
25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47			Tube No.
																			+		+		B35		*350201-350401, 3506, 3512, 3533, 3534, 3536, 3539, 3555, 3559, 3565Q, 3570, 3574, 3583
																			+		+		-		*350402
																			+		+		B35		*3505, 3551, 3558, 3572
																			+		+		B35		*350901-350902, 3518, 3531, 3575
													+								+		-		*3510, 3528, 3569
													+								+		B35		*3513
																			+	+	+		B35		*351401-351402, 3562
													+								+		-		*3516
																			+		+		B35		*3517, 3530
													+								+		B35		*3519
						+													+		+		-		*3521, 3524
																			+		+		-		*3522
																					+		-		*3525, 3549
																					+		-		*3526
																			+		+		B35		*3527
																			+		+		-		*3532, 3537, 3553N, 3564, 3566, 3568
																			+		+		-		*3535
						+													+		+		-		*3538
																			+	+	+		B35		*3543, 3567, 3579
																			+	+	+		-		*3544
						+													+		+		-		*3545, 3571
									+												+		-		*3546
													+								+		-		*3547
																			+		+		-		*3556
															+				+		+		-		*3560
													+	+							+		-		*3563
				+			+												+		+		-		3576
					+								+								+		B37, Null		*370101-370103, 3703N, 3706, 3713
					+								+	+							+		-		*370104
													+								+		-		*3702
					+		+						+								+		-		*3704
					+								+								+		-		*3705
													+								+		-		*3707
					+														+		+		-		*3708
25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47			Tube No.

Length of spec.		110	215	140	130	185	185	290	165	165	180	105	275	195	105	115	80	150	135	245	205	170	110	400	430
PCR product				235	265	235			220	390	395	195			435					400					
									330																
Tube No.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
*3709	-													+						+					
*3710	-																	+		+					
*3711	-																	+	+						
*3712	-								+					+						+					
*380101-380102, 3809, 3811-3814, 3816	B38					+																+	+	+	
*380201-380202, 3808, 3815	B38					+														+		+	+	+	
*3803	B16					+						+								+		+	+		
*3804	-																			+		+		+	
*3805	-						+															+	+	+	
*3806	-																					+			
*3807	-					+																+			
*3810	-					+																	+	+	
*3817	-					+								+						+		+	+	+	
*39010101-39010102L, 390103-390104, 3903, 3905-390602, 3909, 3911, 3914, 3915, 3924, 3926-3929, 3931, 3935, 3937, 3938Q, 3940N, 3941	B3901, B39					+																+		+	+
*390201, 3908	B3902					+						+										+			+
*390202, 391301-391302, 3923	B3902, B39											+										+			+
*3904	B39						+															+		+	+
*3907	-					?	?						+									+		+	+
*3910, 3916, 3920	B39																					+			+
*3912	-																					+		+	+
*3917	-																					+			+
*3918	-					+																+		+	+
*3919	-																		+			+		+	+
*3922	-					+																+		+	+
*3925N, 3930, 3932-3934	-					+																		+	+
*3936	-					+																		+	+
*3939	-					+						+										+			+
*3942	-					+												+				+			
*3943	-					+							+												
*400101-400105, 4007	B60, B40				+																				+
Tube No.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

175	130	110	325	110	215	130	90	90	145	120	430	145	300	160	180	180	90	90	95	115	360	355		Length of spec. PCR product
				190		270	410	175		210				215	210					150				
				225																				
				260																				
25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47		Tube No.
													+								+		-	*3709
				+									+								+		-	*3710
				+									+									+	-	*3711
				+									+								+		-	*3712
																					+		B38	*380101-380102, 3809, 3811-3814, 3816
																					+		B38	*380201-380202, 3808, 3815
													+								+		B16	*3803
													+								+		-	*3804
																					+		-	*3805
																			+		+		-	*3806
																			+		+		-	*3807
																					+		-	*3810
																					+		-	*3817
																					+		B3901 , B39	*39010101-39010102L, 390103-390104, 3903, 3905-390602, 3909, 3911, 3914, 3915, 3924, 3926-3929, 3931, 3935, 3937, 3938Q, 3940N, 3941
													+									+	B3902	*390201, 3908
													+									+	B3902 , B39	*390202, 391301- 391302, 3923
																						+	B39	*3904
																						+	-	*3907
																						+	B39	*3910, 3916, 3920
																						+	-	*3912
															+			+				+	-	*3917
																				+		+	-	*3918
																			+			+	-	*3919
													+									+	-	*3922
																						+	-	*3925N, 3930, 3932- 3934
																				+		+	-	*3936
																					+		-	*3939
																					+		-	*3942
																					+		-	*3943
+													+	+								+	B60, B40	*400101-400105, 4007
25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47		Tube No.

Length of spec.		110	215	140	130	185	185	290	165	165	180	105	275	195	105	115	80	150	135	245	205	170	110	400	430
PCR product				235	265	235			220	390	395	195			435					400					
									330																
Tube No.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
*400201-400203, 4004, 40060101-400602, 4039, 4075, 4078	B61, B40																								
*4003, 4020	B40												+												
*4005	B4005			+																					
*4008	-																								
*4009, 4011, 4018, 4024, 4027, 4029, 4035, 4037, 4040, 4044, 4050, 4056, 4057, 4064	B61, B40																								?
*4010, 4022N, 4033, 4036, 4042, 4043, 4049, 4054, 4055, 4061, 4063, 4065-4067, 4073	Null, B40, B60				+																				?
*4012	-								+			+								+					
*4013, 4019	-																								
*401401-401403, 4030, 4034, 4053, 4072	-				+																				?
*4015, 4016, 4032	B61	+			+																				?
*4021	-																								?
*4023	-	+			+																				+
*4025	-				+																				?
*4026	B21									+															?
*4028	-									+									+						?
*4031, 4045	-				+																				?
*4038, 4052	-				+								+												?
*4046	-											+						+							?
*4047	-				+																				?
*4048	-				+						+														?
*4051	-				+																				+
*4058	-				+																				?
*4059	-				+								+												+
*4060	-				+								+												+
*4068	-																								?
*4069	-				+																				?
*4070	-																								
*4071	-			+																					?
*4074	-																								?
*4076	-				+																				
Tube No.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

175	130	110	325	110	215	130	90	90	145	120	430	145	300	160	180	180	90	90	95	115	360	355		Length of spec. PCR product	
				190		270	410	175		210				215	210						150				
				225																					
				260																					
25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47		Tube No.	
	+											+	+									+	B61, B40	*400201-400203, 4004, 40060101-400602, 4039, 4075, 4078	
	+											+	+									+	B40	*4003, 4020	
	+											+	+									+	B4005	*4005	
	+											+										+	-	*4008	
	+											+	+									+	B61, B40	*4009, 4011, 4018, 4024, 4027, 4029, 4035, 4037, 4040, 4044, 4050, 4056, 4057, 4064	
+												+	+									+	Null, B40, B60	*4010, 4022N, 4033, 4036, 4042, 4043, 4049, 4054, 4055, 4061 4063, 4065-4067, 4073	
+													+									+	-	*4012	
	+								+		+		+									+	-	*4013, 4019	
												+	+									+	-	*401401-401403, 4030, 4034, 4053, 4072	
												+	+									+	B61	*4015, 4016, 4032	
+													+									+	-	*4021	
+												+	+									+	-	*4023	
+												+										+	-	*4025	
	+											+	+									+	B21	*4026	
	+					+						+	+									+	-	*4028	
								+				+	+									+	-	*4031, 4045	
+												+	+									+	-	*4038, 4052	
+													+									+	-	*4046	
+													+								+	-	*4047		
+												+	+					+				+	-	*4048	
+												+	+									+	-	*4051	
												+	+		+							+	-	*4058	
												+	+									+	-	*4059	
+												+	+									+	-	*4060	
	+											+							+			+	-	*4068	
+												+										+	-	*4069	
	+											+	+						+			+	-	*4070	
	+											+	+			+		+				+	-	*4071	
+	+											+	+									+	-	*4074	
+													+										-	*4076	
25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47		Tube No.	

Length of spec.		110	215	140	130	185	185	290	165	165	180	105	275	195	105	115	80	150	135	245	205	170	110	400	430
PCR product				235	265	235			220	390	395	195			435					400					
									330																
Tube No.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
*4077	-				+																				+
*4101, 4106, 4107	B41				+				+																+
*4102-410302	B41				+				+																+
*4104	-				+																				+
*4105	-				+				+																+
*4108	-	+			+				+						+										+
*4201, 4202, 4206	B42								+																+
*4204	-								+																+
*420501-420502	-	+							+						+										+
*4208	-								+																+
*4209	-												+												+
*44020101-440204, 4411, 4416, 4419N, 4421-4424, 4427, 4433, 4434, 4448, 4451, 4452N, 4455	B44, B47, Null				+													+							
*440301-4405, 4413, 4426, 4428-4430, 4432, 4435, 4436, 4438, 4439, 4442, 4445, 4456N	B44				+													+							
*4406	B44																	+							
*4407																		+							
*4408	B44			+														+							
*4409	B12				+													+							
*4410	-				+							+						+		+					
*4412	-				+													+							
*4414	-				+				+									+							
*4415	-				+				+			+													
*4417, 4443	-				+								+	+				+							
*4418	-				+				+			+													
*4420	-				+				+																
*4425	-				+													+							
*4431	-				+																				
*4437	-				+													+							
*4440	-											+					+	+							
*4441	-				+																				
*4444	-											+					+	+							
*4446	-				+													+							
*4447	-				+																				
*4449	-		+		+													+							
*4450	-				+													+							
Tube No.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

175	130	110	325	110	215	130	90	90	145	120	430	145	300	160	180	180	90	90	95	115	360	355		Length of spec. PCR product
				190		270	410	175		210				215	210					150				
				225																				
				260																				
25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47		Tube No.
												+	+									+	-	*4077
		+			+							+	+									+	B41	*4101, 4106, 4107
		+										+	+									+	B41	*4102-410302
		+										+	+									+	-	*4104
		+			+							?	+									+	-	*4105
		+										+	+									+	-	*4108
		+	+																			+	B42	*4201, 4202, 4206
		+	+		+																	+	-	*4204
		+	+																			+	-	*420501-420502
			+																			+	-	*4208
		+	+																			+	-	*4209
					+								+	+								+	B44, B47, Null	*44020101-440204, 4411, 4416, 4419N, 4421-4424, 4427, 4433, 4434, 4448, 4451, 4452N, 4455
					+								+									+	B44	*440301-4405, 4413, 4426, 4428-4430, 4432, 4435, 4436, 4438, 4439, 4442, 4445, 4456N
					+	+					+			+					+		+		B44	*4406
					+								+								+			*4407
					+								+	+							+		B44	*4408
					+							+	+	+								+	B12	*4409
					+								+			+					+		-	*4410
					+										+						+		-	*4412
					+								+								+		-	*4414
						+							+			+					+		-	*4415
					+								+								+		-	*4417, 4443
					+	+			+				+	+		+					+		-	*4418
					+	+							+	+							+		-	*4420
					+				+		+		+								+		-	*4425
+					+								+								+		-	*4431
													+								+		-	*4437
					+								+								+		-	*4440
					+								+	+							+		-	*4441
					+								+	+							+		-	*4444
					+							+	+									+	-	*4446
					+								+								+		-	*4447
					+								+	+							+		-	*4449
					+				+		+		+								+		-	*4450
25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47		Tube No.

Length of spec.		110	215	140	130	185	185	290	165	165	180	105	275	195	105	115	80	150	135	245	205	170	110	400	430
PCR product				235	265	235			220	390	395	195			435					400					
									330																
Tube No.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
*4453	-				+																				
*4454	-			+	+																				
*4457	-			+														+							
*4501, 4505, 4507	B45				+				+			+													+
*4502, 4503	-				+				+																+
*4504	-				+				+																+
*4506	-				+				+			+													+
*460101-460102, 4604, 4605, 4607N, 4609	B46							+					+												
*4602	-							+					+												
*4603, 4608	-							+					+												
*4606	-							+					+												
*4610	-							+					+												
*4611	-			+				+					+												
*4612	-			+				+					+												
*47010101-47010102	B47				+																				
*4702	-				+																				
*4703	-				+																				
*4704, 4705	-				+	+																			
*480101-480102, 4804, 4807, 4809, 4811, 4819	B48											+													+
*4802	-											+	+					+							+
*480301-480302, 4817	B48											+													+
*4805, 4808	B48	+										+													+
*4806	-																								+
*4810, 4812, 4813	-											+													+
*4814	-											+	+												+
*4815	-	+										+													+
*4816	-											+													+
*4818	-											+													
*4901	B49				+																				
*4902	-				+																				
*4903	-																								
*4904, 4905	-				+								+												
*5001, 5004	B50				+																				+
*5002	B45				+							+													+
Tube No.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

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Length of spec.		110	215	140	130	185	185	290	165	165	180	105	275	195	105	115	80	150	135	245	205	170	110	400	430
PCR product				235	265	235			220	390	395	195			435					400					
									330																
Tube No.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
*510101, 510103, 510105-510201, 510203, 5103, 5107, 510901, 5111N, 5112, 511302, 5114, 5117- 5119, 5122, 5123, 5126 5130, 5132, 5133, 5138 5141N, 5143, 5148, 5149, 5151	B51, B5102 , B5103 , Null									+															
*510102, 510202, 5105, 510902	B51									+															
*510104, 511301, 5116, 5121, 5124, 5131, 5134, 5135	B51, B52																								
*5104, 5146	B51									+								+							
*5106	B51									+															
*5108, 5120	B51								+	+															
*5110	-																								
*5115	-																								
*5136	-								+																
*5137	-									+			+												
*5142	-																	+							
*5144N	Null								+	+															
*5145	-												+												
*5150										+															
*520101, 520103, 5204, 5205, 5207, 5210, 5211	B52									+															
*520102, 520104-5203, 520601-520602, 5209	B52									+															
*5208	-																								
*530101-530104, 5305, 5308, 5310	B53												+					+							
*5302	B53												+					+							
*5303, 5309, 5311- 5313	-												+					+							
*5304, 5307	-																	+							
*5306	B53												+					+							
*5401, 5402, 5405N, 5407, 5408N, 5410, 5413	B54																								
Tube No.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

175	130	110	325	110	215	130	90	90	145	120	430	145	300	160	180	180	90	90	95	115	360	355		Length of spec. PCR product
				190		270	410		175		210			215	210					150				
				225																				
				260																				
25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47		Tube No.
					+					+	+								+		+		B51, B5102 , B5103 , Null	*510101, 510103, 510105-510201, 510203, 5103, 5107, 510901, 5111N, 5112, 511302, 5114, 5117- 5119, 5122, 5123, 5126 5130, 5132, 5133, 5138 5141N, 5143, 5148, 5149, 5151
										+	+								+		+		B51	*510102, 510202, 5105, 510902
					+					+	+								+		+		B51, B52	*510104, 511301, 5116, 5121, 5124, 5131, 5134, 5135
					+	+					+								+		+		B51	*5104, 5146
					+						+								+		+		B51	*5106
					+					+	+								+		+		B51	*5108, 5120
					+						+								+		+		-	*5110
											+						+		+		+		-	*5115
					+					+	+								+		+		-	*5136
					+					+	+								+		+		-	*5137
				+	+						+								+		+		-	*5142
					+					+	+								+		+		Null	*5144N
					+						+								+		+		-	*5145
										+									+		+			*5150
										+	+		+								+		B52	*520101, 520103, 5204, 5205, 5207, 5210, 5211
					+					+	+		+								+		B52	*520102, 520104-5203, 520601-520602, 5209
										+	+		+								+		-	*5208
											+								+		+		B53	*530101-530104, 5305, 5308, 5310
						+					+								+		+		B53	*5302
																			+		+		-	*5303, 5309, 5311- 5313
											+								+		+		-	*5304, 5307
					+	+					+								+		+		B53	*5306
			+				+							+	+							+	B54	*5401, 5402, 5405N, 5407, 5408N, 5410, 5413
25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47		Tube No.

Length of spec.		110	215	140	130	185	185	290	165	165	180	105	275	195	105	115	80	150	135	245	205	170	110	400	430
PCR product				235	265	235			220	390	395	195			435					400					
									330																
Tube No.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
*5403	-																								
*5404, 5411	-																								
*5406	-												+												
*5409	-												+												
*5412	-																								
*550101-550104, 5503, 5505, 5511, 5515, 5525	B55																								
*550201-550202, 5507, 5510, 5512, 5516, 5519, 5526	B54, B55																								
*5504, 5508, 5513, 5527, 5615, 5619N	B55																								
*5509, 5517, 5528	-																								
*5514	-												+					+							
*5518	-											+													
*5520	-																								
*5521	-																								
*5522	-											+													
*5523, 5618	-												+												
*5524	-											+													
*5601, 5608, 5614, 5616, 5620	B56																								
*5602, 5604	B56																								
*5603	B22												+												
*560501	-									+															
*560502	-									+															
*5606	B78									+									+						
*5607	-																								
*5609	-												+						+						
*5610	-																								
*5611, 5612	-																		+						
*5613	-								+																
*5617	-																								
*5621	-									+															
*570101-570103, 5706, 5708, 5710	B57												+						+						
*5702-5705	B57																		+						
*5707	-																		+						
*5709	-								+										+						
*5711	-												+												
*5712	-																		+						
*5713	-												+												
Tube No.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

175	130	110	325	110	215	130	90	90	145	120	430	145	300	160	180	180	90	90	95	115	360	355		Length of spec. PCR product		
				190		270	410		175		210			215	210						150					
				225																						
				260																						
25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47		Tube No.		
			+				+							+		+						+	-	*5403		
			+				+							+								+	-	*5404, 5411		
			+				+							+						+		+	-	*5406		
			+				+							+								+	-	*5409		
			+				+							+	+						+		-	*5412		
			+				+			+					+							+	B55	*550101-550104, 5503, 5505, 5511, 5515, 5525		
			+				+								+							+	B54, B55	*550201-550202, 5507, 5510, 5512, 5516, 5519, 5526		
			+				+															+	B55	*5504, 5508, 5513, 5527, 5615, 5619N		
			+				+			+												+	-	*5509, 5517, 5528		
			+				+										+					+	-	*5514		
													+		+							+	-	*5518		
		+	+		+		+															+	-	*5520		
			+				+			+					+					+		+	-	*5521		
			+				+															+	-	*5522		
			+				+															+	-	*5523, 5618		
			+				+			+												+	-	*5524		
			+				+									+						+	B56	*5601, 5608, 5614, 5616, 5620		
			+				+									+		+				+	B56	*5602, 5604		
			+				+								+					+		+	B22	*5603		
			+				+			+					+							+	-	*560501		
			+				+			+												+	-	*560502		
			+				+			+					+							+	B78	*5606		
			+				+									+					+		-	*5607		
			+				+															+	-	*5609		
			+				+								+			+				+	-	*5610		
			+				+															+	-	*5611, 5612		
			+		+		+									+						+	-	*5613		
																+						+	-	*5617		
			+				+			+											+		-	*5621		
											+						+					+	B57	*570101-570103, 5706, 5708, 5710		
											+						+					+	B57	*5702-5705		
				+						+							+					+	-	*5707		
			+							+							+					+	-	*5709		
											+						+					+	-	*5711		
													+				+					+	-	*5712		
											+		+				+					+		*5713		
25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47		Tube No.		

Length of spec.		110	215	140	130	185	185	290	165	165	180	105	275	195	105	115	80	150	135	245	205	170	110	400	430
PCR product				235	265	235			220	390	395	195			435					400					
									330																
Tube No.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
*5714				+									+					+							
*5801, 5804, 5805, 5810N-5814	B58												+					+							
*5802, 5806	B58												+												
*5807	-												+	+											
*5808	-									+															
*5809	-												+					+							
*5815	-												+					+							
*5901	B59																								
*5902	-																								
*670101	B67					+																+			+
*670102	B67																					+			+
*6702	-																					+			+
*7301	B73																								+
*7801, 780202, 7803	B78									+								+							
*780201, 7804	B78									+								+							
*7805	-									+								+							
*8101	B81																								
*8102	-																								+
*8103	-																								
*8201, 8202	-								+			+								+					
*8301	-																	+							
HLA-B allele ⁴	ser. ⁵																								
Tube No.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Cw*0206											?														
Cw*0305, 0325, 0327				+																					
Cw*0746									+																
Tube No.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

¹The internal positive control primer pairs amplify segments of the human growth hormone gene. The two different control primer pairs give rise to either an internal positive control band of 1070 base pairs, for most tubes, or a band of 800 base pairs, for some tubes.

Tube number 1 contains the primer pair giving rise to the shorter, 800 bp, internal positive control band in order to help in the correct orientation of the HLA-B low resolution typing.

In addition, tubes number 6, 9, 10, 20, 21, 30, 35 and 42 contain the primer pair giving rise to the shorter, 800 bp, internal positive control band in order to allow kit identification.

PLEASE NOTE: All the SSP kits, except the B*37, B*41, B*42, B*46, B*47, B*48, B*49, B*50, B*53, B*67, B*78, B*81 and B*82 kits and the Cw*01, Cw*02, Cw*08, Cw*12, Cw*14, Cw*15, Cw*16, Cw*17 and Cw*18 kits, from *Olerup* SSP AB can be uniquely identified by the number of tubes and the kit-specific pattern of the two differently sized control bands.

²The nucleotide position, in the 1st, 2nd or 3rd exon or in the 1st intron, matching the specificity-determining 3'-end of the primer is given. Nucleotide numbering as in *Tissue Antigens* 1998, **51:II**, 417-466. The sequence of the 3 terminal nucleotides of the primer is given.

175	130	110	325	110	215	130	90	90	145	120	430	145	300	160	180	180	90	90	95	115	360	355		Length of spec. PCR product
				190		270	410		175		210			215	210		240			150				
				225																				
				260																				
25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47		Tube No.
					+					+		+					+				+			*5714
											+							+			+		B58	*5801, 5804, 5805, 5810N-5814
											+							+			+		B58	*5802, 5806
											+							+			+		-	*5807
					+					+	+							+			+		-	*5808
						+					+							+			+		-	*5809
											+		+					+			+		-	*5815
															+						+		B59	*5901
											+										+		-	*5902
			+																		+		B67	*670101
			+																		+		B67	*670102
			W																		+		-	*6702
			+																	+	+		B73	*7301
										+					+			+			+		B78	*7801, 780202, 7803
										+								+			+		B78	*780201, 7804
										+			+								+		-	*7805
			+				+	+													+		B81	*8101
			+					+													+		-	*8102
			+					+													+		-	*8103
			+				+									+					+		-	*8201, 8202
			+	+			+							+							+		-	*8301
																							ser. ⁵	HLA-B allele ⁴
25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47		Tube No.
																		+						Cw*0206
																								Cw*0305, 0325, 0327
																								Cw*0746
25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47		Tube No.

³The nucleotide position, in the 2nd, or 3rd exon or the 1st or 3rd introns, matching the specificity-determining 3'-end of the primer is given in the anti-sense direction. Nucleotide numbering as in *Tissue Antigens* 1998, **51:II**, 417-466. The sequence of the 3 terminal nucleotides of the primer is given.

⁴The sequence of the B*0701 allele has been shown to be in error.

The sequence of the B*1305 allele has been shown to be identical to B*1304.

The B*1522 allele has been renamed B*3543.

The sequence of the B*1541 allele has been shown to be identical to B*1539.

The sequence of the B*1816 allele has been shown to be identical to B*1814.

The B*1559 allele has been renamed B*3544.

The sequence of the B*27051 allele has been shown to be identical to B*27052.

The sequence of the B*2722 allele has been shown to be identical to the corrected B*2706 sequence.

The sequence of the B*39012 allele has been shown to be identical to B*39011.
The sequence of the B*3921 allele has been shown to be identical to B*3924.
The sequence of the B*4017 allele has been shown to be identical to B*4016.
The sequence of the B*4041 allele has been shown to be identical to B*4040.
The sequence of the B*4203 allele has been shown to be in error.
The sequence of the B*4401 allele has been shown to be identical to B*4402.
The sequence of the B*5003 allele has been shown to be identical to B*5002.
The sequence of the B*5125 allele has been shown to be identical to B*5122.
The sequence of the B*5506 allele has been shown to be identical to B*5504.
The sequence of the B*5803 allele has never been assigned.
The B*7901 allele has been renamed B*1518.

⁵The serological reactivity of all HLA-B alleles is not known. In this table we used the information published in *Tissue Antigens* 1999: **54**: 409-437, also available at the www.worldmarrow.org web site.

⁶The B*0826 and B*4207 alleles give rise to identical amplification patterns with the HLA-B low resolution primer set. These alleles can be separated by the respective high resolution primer sets.
The B*5504, B*5508, B*5513, B*5527, B*5615 and B*5619N alleles give rise to identical amplification patterns with the HLA-B low resolution primer set. These alleles can be separated by the respective high resolution primer sets.

The B*5523 and B*5618 give rise to identical amplification patterns with the HLA-B low resolution primer set. These alleles can be separated by the respective high resolution primer sets.

‘ser’, serological HLA specificity.

‘w’, might be weakly amplified.

‘?’, nucleotide sequence information not available for the primer matching sequence.

CELL LINE VALIDATION SHEET																				
HLA-B low resolution SSP kit																				
					Tube															
					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
				Prod. No.:	200734301	200734302	200734303	200734304	200734305	200734306	200734307	200734308	200734309	200734310	200734311	200734312	200734313	200734314	200734315	200734316
	cell line	B*																		
1	9001 SA	*0702			+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	9280 LK707	*5201	*7301		-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
3	9011 E4181324	*52011			-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
4	9275 GU373	*1510	*5301		-	-	-	-	-	-	-	+	-	+	-	+	-	-	-	-
5	9009 KAS011	*3701			-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-
6	9353 SM	*3901	*5101		-	-	-	-	+	-	-	-	+	-	-	-	-	-	-	-
7	9020 QBL	*1801			-	-	-	-	-	-	-	-	-	-	-	+	-	-	+	-
8	9007 DEM	*5701			-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
9	9026 YAR	*3801			-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-
10	9107 LKT3	*5401			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	9051 PITOUT	*4403			-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
12	9052 DBB	*5701			-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
13	9067 BTB	*2705			-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	+
14	9071 OLGA	*1501	*1520		-	-	-	-	-	-	+	-	-	-	-	+	-	-	-	-
15	9075 DKB	*4001			-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
16	9037 SWEIG007	*4002			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17	9008 WILJON	*1801			-	-	-	-	-	-	-	-	-	-	-	+	-	-	+	-
18	9257 32367	*1401	*5601		-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-
19	9038 BM16	*1801			-	-	-	-	-	-	-	-	-	-	-	+	-	-	+	-
20	9059 SLE005	*4001			-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
21	9064 AMALA	*1501			-	-	-	-	-	-	+	-	-	-	-	+	-	-	-	-
22	9056 KOSE	*3503			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23	9124 IHL	*4002	*5602		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24	9035 JBUSH	*3801			-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-
25	9049 IBW9	*1402			-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-
26	9285 WT49	*5801			-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
27	9191 CH1007	*0705	*5101		+	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
28	9320 BEL5GB	*4402	*4403		-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
29	9050 MOU	*4403			-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
30	9021 RSH	*4201			-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
31	9019 DUCAF	*1801			-	-	-	-	-	-	-	-	-	-	-	+	-	-	+	-
32	9297 HAG	*4102			-	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-
33	9098 MT14B	*4001			-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
34	9104 DHIF	*3801			-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-
35	9302 SSTO	*4402			-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
36	9024 KT17	*1501	*3501		-	-	-	-	-	-	+	-	-	-	-	+	-	-	-	-
37	9065 HHKB	*0702			+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
38	9099 LZL	*1501			-	-	-	-	-	-	+	-	-	-	-	+	-	-	-	-
39	9315 CML	*0801	*2705		-	+	-	-	+	-	-	+	-	-	-	-	-	-	-	+
40	9134 WHONP199	*1302	*4601		-	-	+	+	-	-	+	-	-	+	-	+	-	-	-	-
41	9055 H0301	*1402			-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-
42	9066 TAB089	*4601			-	-	-	-	-	-	+	-	-	-	-	+	-	-	-	-
43	9076 T7526	*4601			-	-	-	-	-	-	+	-	-	-	-	+	-	-	-	-
44	9057 TEM	*3801			-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-
45	9239 SHJO	*4201	*5001		-	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-
46	9013 SCHU	*0702			+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
47	9045 TUBO	*5101			-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
48	9303 TER-ND	*3501	*4403		-	-	-	+	-	-	-	-	-	-	-	+	-	-	-	-

CELL LINE VALIDATION SHEET																																
HLA-B low resolution SSP kit																																
					Tube																											
					17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32												
				Prod. No.:	200734317	200734318	2005734319	200734320	200734321	200734322	200734323	200734324	200734325	200734326	200734327	200734328	200734329	200734330	200734331	200734332												
	cell line	B*																														
1	9001 SA	*0702			-	-	-	+	-	-	-	+	-	-	-	+	-	-	-	-												
2	9280 LK707	*5201	*7301		-	-	-	-	-	-	-	+	-	-	-	+	-	-	-	-												
3	9011 E4181324	*52011			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-												
4	9275 GU373	*1510	*5301		+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-												
5	9009 KAS011	*3701			+	-	-	+	-	-	-	-	-	-	-	-	+	-	-	-												
6	9353 SM	*3901	*5101		-	-	-	-	+	-	+	+	-	-	-	-	-	+	-	-												
7	9020 QBL	*1801			-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-												
8	9007 DEM	*5701			+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-												
9	9026 YAR	*3801			-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-												
10	9107 LKT3	*5401			-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	+												
11	9051 PITOUT	*4403			+	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-												
12	9052 DBB	*5701			+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-												
13	9067 BTB	*2705			-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	+												
14	9071 OLGA	*1501	*1520		+	-	+	-	-	-	-	-	+	-	-	-	-	-	-	-												
15	9075 DKB	*4001			-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-												
16	9037 SWEIG007	*4002			-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-												
17	9008 WILJON	*1801			-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-												
18	9257 32367	*1401	*5601		-	-	-	-	-	-	+	+	-	-	-	+	-	-	-	+												
19	9038 BM16	*1801			-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-												
20	9059 SLE005	*4001			-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-												
21	9064 AMALA	*1501			-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-												
22	9056 KOSE	*3503			+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-												
23	9124 IHL	*4002	*5602		-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	+												
24	9035 JBUSH	*3801			-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-												
25	9049 IBW9	*1402			-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-												
26	9285 WT49	*5801			+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-												
27	9191 CH1007	*0705	*5101		-	-	-	-	-	-	-	+	-	-	-	+	-	+	-	-												
28	9320 BEL5GB	*4402	*4403		+	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-												
29	9050 MOU	*4403			+	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-												
30	9021 RSH	*4201			-	-	-	-	-	-	-	+	-	-	+	+	-	-	-	-												
31	9019 DUCAF	*1801			-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-												
32	9297 HAG	*4102			-	-	-	-	-	-	-	+	-	-	+	-	-	-	-	-												
33	9098 MT14B	*4001			-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-												
34	9104 DHIF	*3801			-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-												
35	9302 SSTO	*4402			+	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-												
36	9024 KT17	*1501	*3501		+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-												
37	9065 HHKB	*0702			-	-	-	-	-	-	-	+	-	-	-	+	-	-	-	-												
38	9099 LZL	*1501			-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-												
39	9315 CML	*0801	*2705		-	-	-	-	-	-	-	+	-	-	+	+	-	-	-	+												
40	9134 WHONP199	*1302	*4601		-	-	-	-	-	-	-	-	-	-	-	+	-	-	+	-												
41	9055 H0301	*1402			-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-												
42	9066 TAB089	*4601			-	-	-	-	-	-	-	-	-	-	-	+	-	-	+	-												
43	9076 T7526	*4601			-	-	-	-	-	-	-	-	-	-	-	+	-	-	+	-												
44	9057 TEM	*3801			-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-												
45	9239 SHJO	*4201	*5001		-	-	-	-	-	-	-	+	-	-	+	+	-	-	-	-												
46	9013 SCHU	*0702			-	-	-	-	-	-	-	+	-	-	-	+	-	-	-	-												
47	9045 TUBO	*5101			-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-												
48	9303 TER-ND	*3501	*4403		+	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-												

CELL LINE VALIDATION SHEET																												
HLA-B low resolution SSP kit																												
					Tube																							
						33	34	35	36	37	38	39	40	41	42	43	44	45	46	47								
				Prod. No.:		200734333	200734334	200734335	200734336	200734337	200734339	200734339	200734340	200734341	200734342	200734343	200734344	200734345	200734346	200734347								
	cell line		B*																									
1	9001	SA	*0702			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	
2	9280	LK707	*5201		*7301	-	-	+	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	
3	9011	E4181324	*52011			-	-	+	+	-	+	-	-	-	-	-	-	-	-	+	+	+	+	+	+	+	+	
4	9275	GU373	*1510		*5301	-	-	-	+	-	-	-	-	-	-	-	-	+	-	+	+	+	+	+	+	+	+	
5	9009	KAS011	*3701			-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	
6	9353	SM	*3901		*5101	-	-	+	+	-	-	-	-	-	-	-	-	+	-	+	+	+	+	+	+	+	+	
7	9020	QBL	*1801			-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	+	-	-	-	+	-	
8	9007	DEM	*5701			-	-	-	+	-	-	-	-	-	+	-	-	-	-	+	-	-	-	-	+	-	-	
9	9026	YAR	*3801			-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	+	-	-	
10	9107	LKT3	*5401			-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	
11	9051	PITOUT	*4403			-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	
12	9052	DBB	*5701			-	-	-	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	-	-	-	
13	9067	BTB	*2705			-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	
14	9071	OLGA	*1501		*1520	-	-	-	-	-	+	-	-	-	-	-	-	-	+	-	-	+	-	+	-	-	-	
15	9075	DKB	*4001			-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	
16	9037	SWEG007	*4002			-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	
17	9008	WILJON	*1801			-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+	-	-	-	
18	9257	32367	*1401		*5601	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	+	-	-	
19	9038	BM16	*1801			-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+	-	-	-	
20	9059	SLE005	*4001			-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	
21	9064	AMALA	*1501			-	-	-	-	-	+	-	-	-	-	-	-	-	+	-	-	-	-	+	-	+	-	
22	9056	KOSE	*3503			-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+	-	+	-	
23	9124	IHL	*4002		*5602	-	-	-	-	+	+	-	-	+	-	+	-	-	-	-	-	-	-	-	+	-	-	
24	9035	JBUSH	*3801			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	+	-	-	
25	9049	IBW9	*1402			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	
26	9285	WT49	*5801			-	-	-	+	-	-	-	-	-	-	+	-	-	-	+	-	-	+	-	-	-	-	
27	9191	CH1007	*0705		*5101	-	-	+	+	-	-	-	-	-	-	-	+	-	-	+	-	+	+	+	+	+	+	
28	9320	BEL5GB	*4402		*4403	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	
29	9050	MOU	*4403			-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	
30	9021	RSH	*4201			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	
31	9019	DUCAF	*1801			-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	-	
32	9297	HAG	*4102			-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	
33	9098	MT14B	*4001			-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	
34	9104	DHIF	*3801			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	
35	9302	SSTO	*4402			-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	+	-	-	+	-	-	
36	9024	KT17	*1501		*3501	-	-	-	-	-	+	-	-	-	-	-	-	+	+	-	-	+	-	+	-	-	-	
37	9065	HHKB	*0702			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	
38	9099	LZL	*1501			-	-	-	-	+	-	-	-	-	-	-	-	-	-	+	-	+	-	+	-	+	-	
39	9315	CML	*0801		*2705	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	+	-	+	-	+	-	-	
40	9134	WHONP199	*1302		*4601	-	-	-	-	-	+	-	-	-	-	-	-	-	+	+	-	+	+	+	+	+	+	
41	9055	H0301	*1402			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	
42	9066	TAB089	*4601			-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	+	-	+	-	-	-	
43	9076	T7526	*4601			-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	+	-	+	-	-	-	
44	9057	TEM	*3801			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	
45	9239	SHJO	*4201		*5001	-	-	+	-	+	+	-	-	+	-	-	-	-	-	-	-	-	-	-	+	-	-	
46	9013	SCHU	*0702			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	
47	9045	TUBO	*5101			-	-	+	+	-	-	-	-	-	-	-	-	+	-	-	+	-	+	-	+	-	-	
48	9303	TER-ND	*3501		*4403	-	-	-	-	-	+	-	-	-	-	-	-	+	-	+	-	+	-	+	-	+	-	

CERTIFICATE OF ANALYSIS

Olerup SSP™ HLA-B low resolution SSP

Product number: 101.501-48/12 – licensed for PCR
101.501-48u/12u – not licensed for PCR
Lot number: Y52
Expiry date: 2009-October-01
Number of tests: 48 tests – Product No. 101.501-48
12 tests – Product No. 101.501-12
Number of tubes per test: 47 + 1

Tube specifications:

Tube No.	Production No.	Tube No.	Production No.	Tube No.	Production No.
1	2007-343-01	17	2007-343-17	33	2007-343-33
2	2007-343-02	18	2007-343-18	34	2007-343-34
3	2007-343-03	19	2007-343-19	35	2007-343-35
4	2007-343-04	20	2007-343-20	36	2007-343-36
5	2007-343-05	21	2007-343-21	37	2007-343-37
6	2007-343-06	22	2007-343-22	38	2007-343-38
7	2007-343-07	23	2007-343-23	39	2007-343-39
8	2007-343-08	24	2007-343-24	40	2007-343-40
9	2007-343-09	25	2007-343-25	41	2007-343-41
10	2007-343-10	26	2007-343-26	42	2007-343-42
11	2007-343-11	27	2007-343-27	43	2007-343-43
12	2007-343-12	28	2007-343-28	44	2007-343-44
13	2007-343-13	29	2007-343-29	45	2007-343-45
14	2007-343-14	30	2007-343-30	46	2007-343-46
15	2007-343-15	31	2007-343-31	47	2007-343-47
16	2007-343-16	32	2007-343-32		

The specificity of each primer solution of the kit has been tested against 48 well characterized cell line DNAs.

Additional 5'-primers and 3'-primers in primer solutions 2, 3, 8, 10, 11, 14, 19, 20, 31, 40, 42, 43 and 45 were tested by separately adding one additional 3'-primer, respectively one additional 5'-primer. Additional 3'-primers in primer solutions 13, 24, 29 and 35 were tested by separately adding one additional 5'-primer. Additional 5'-primers in primer solutions 21 and 29 were tested by separately adding one additional 3'-primer.

The negative control primer pairs, **Production No. 2006-257-01**, can detect contamination with PCR products diluted 10^{-7} .

Results: No false positive or false negative amplifications were obtained.

Date of approval: 2007-December-21

Approved by:

Quality Control, Supervisor

Declaration of Conformity

Product name: Olerup SSP™ HLA-B low resolution
Product number: 101.501-48/12, 101.501-48u/12u
Lot number: Y52

Intended use: HLA-B low resolution histocompatibility testing

Manufacturer: Olerup SSP AB
Hasselstigen 1
SE-133 33 Saltsjöbaden, Sweden
Phone: +46-8-717 88 27
Fax: +46-8-717 88 18

We, Olerup SSP AB, hereby declare that this product, to which this Declaration of Conformity relates is in conformity with the following Standard(s) and other normative document(s) ISO 9001:2000 and ISO 13485:2003, following the provisions of the 98/79/EC Directive on *in vitro* diagnostic medical devices, Annex II List B, conformity assessed using Annex IV, as transposed into the national laws of the Member States of the European Union.

The Technical Documentation File is maintained at Olerup SSP AB, Hasselstigen 1, SE-133 33 Saltsjöbaden, Sweden.

The Authorized Representative located within the Community is: Olerup SSP AB.

Notified Body: Lloyd's Register Quality Assurance Limited, Hiramford, Middlemarch Office Village, Siskin Drive, Coventry CV3 4FJ, United Kingdom. (Notified Body number: 0088.)

Saltsjöbaden, Sweden
2007-December-21

Olle Olerup
Managing Director

HLA-B low resolution
101.501-48/12 – licensed for PCR
101.501-48u/12u – not licensed for PCR
Lot No.: **Y52**

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HLA-B low resolution
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Lot No.: **Y52**

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WARRANTY

Olerup SSP AB warrants its products to the original purchaser against defects in materials and workmanship under normal use and application. *Olerup* SSP AB's sole obligation under this warranty shall be to replace, at no charge, any product that does not meet the performance standards stated on the product specification sheet.

This warranty applies only to products that have been handled and stored in accordance with *Olerup* SSP AB's recommendations, and does not apply to products that have been the subject of alternation, misuse, or abuse.

All claims under this warranty must be directed to *Olerup* SSP AB in writing and must be accompanied by a copy of the purchaser's invoice. This warranty is in lieu of all other warranties, expressed or implied, including the warranties of merchantability and fitness for a particular purpose. In no case shall *Olerup* SSP AB be liable for incidental or consequential damages.

This product may not be reformulated, repacked or resold in any form without the written consent of *Olerup* SSP AB, Hasselstigen 1, SE-133 33 Saltsjöbaden, Sweden.

Handle all samples as if capable of transmitting disease. All work should be performed wearing gloves and appropriate protection.

Olerup SSPTM is a trademark of *Olerup* SSP AB.
PCRTM is a trademark of F. Hoffmann-La Roche Ltd.
ARMSTM is a trademark of Zeneca Ltd.

HLA-B low resolution
101.501-48/12 – licensed for PCR
101.501-48u/12u – not licensed for PCR
Lot No.: **Y52**

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www.olerup.com

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E-mail: info-ssp@olerup.com

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Fax: +43-1-710 15 00 10

E-mail: support-at@olerup.com

Web page: <http://www.olerup.com>

Olerup Inc., 901 S. Bolmar St., Suite R, West Chester, PA 19382

Tel: 1-877-OLERUP1

Fax: 610-344-7989

E-mail: info.us@olerup.com

Web page: <http://www.olerup.com>

For information on *Olerup* SSP distributors worldwide, contact **Olerup GmbH**.