

**Supplementary File 4.** Genotype Analysis of 2-digit six HLA loci

**TABLE S1.** Genotype Analysis of 2-digit HLA-A\*.

| HLA A*: HLA A* | Observed | Expected | Chi-square | p-value  |
|----------------|----------|----------|------------|----------|
| 01:01          | 102      | 76.59    | 8.43       | 0.0037** |
| 01:02          | 325      | 342.09   | 0.85       | 0.3556   |
| 01:03          | 172      | 156.42   | 1.55       | 0.2129   |
| 01:11          | 90       | 103.98   | 1.88       | 0.1703   |
| 01:23          | 47       | 45.72    | 0.04       | 0.8494   |
| 01:24          | 194      | 203.82   | 0.47       | 0.4917   |
| 01:25          | 7        | 14.57    | 3.93       | 0.0474*  |
| 01:26          | 62       | 79.11    | 3.70       | 0.0544   |
| 01:29          | 21       | 27.79    | 1.66       | 0.1978   |
| 01:30          | 34       | 45.27    | 2.80       | 0.0940   |
| 01:31          | 18       | 21.29    | 0.51       | 0.4759   |
| 01:32          | 49       | 64.76    | 3.84       | 0.0501   |
| 01:33          | 45       | 39.22    | 0.85       | 0.3558   |
| 01:66          | 10       | 6.84     | 1.47       | 0.2260   |
| 01:68          | 74       | 52.33    | 8.98       | 0.0027** |
| 01:69          | 12       | 9.30     | 0.78       | 0.3760   |
| 02:02          | 431      | 382.00   | 6.29       | 0.0122*  |
| 02:03          | 341      | 349.34   | 0.20       | 0.6553   |
| 02:11          | 215      | 232.23   | 1.28       | 0.2583   |
| 02:23          | 93       | 102.10   | 0.81       | 0.3678   |
| 02:24          | 436      | 455.20   | 0.81       | 0.3682   |
| 02:25          | 34       | 32.53    | 0.07       | 0.7969   |
| 02:26          | 173      | 176.67   | 0.08       | 0.7823   |
| 02:29          | 67       | 62.06    | 0.39       | 0.5307   |
| 02:30          | 96       | 101.10   | 0.26       | 0.6120   |
| 02:31          | 54       | 47.55    | 0.88       | 0.3493   |
| 02:32          | 134      | 144.64   | 0.78       | 0.3762   |
| 02:33          | 81       | 87.59    | 0.50       | 0.4816   |
| 02:66          | 13       | 15.27    | 0.34       | 0.5621   |
| 02:68          | 111      | 116.86   | 0.29       | 0.5875   |
| 02:69          | 16       | 20.77    | 1.10       | 0.2952   |
| 03:03          | 79       | 79.87    | 0.01       | 0.9225   |
| 03:11          | 109      | 106.19   | 0.07       | 0.7849   |
| 03:23          | 65       | 46.69    | 7.18       | 0.0074** |
| 03:24          | 181      | 208.14   | 3.54       | 0.0599   |
| 03:25          | 19       | 14.88    | 1.14       | 0.2849   |
| 03:26          | 72       | 80.78    | 0.96       | 0.3284   |
| 03:29          | 31       | 28.38    | 0.24       | 0.6225   |
| 03:30          | 53       | 46.23    | 0.99       | 0.3193   |
| 03:31          | 27       | 21.74    | 1.27       | 0.2594   |

**Supplementary File 4.** Genotype Analysis of 2-digit six HLA loci

**TABLE S1.** Continued

| HLA A*: HLA A* | Observed | Expected | Chi-square | p-value  |
|----------------|----------|----------|------------|----------|
| 03:32          | 61       | 66.14    | 0.40       | 0.5275   |
| 03:33          | 45       | 40.05    | 0.61       | 0.4340   |
| 03:66          | 3        | 6.98     | 2.27       | 0.1320   |
| 03:68          | 48       | 53.44    | 0.55       | 0.4570   |
| 03:69          | 10       | 9.50     | 0.03       | 0.8704   |
| 11:11          | 50       | 35.29    | 6.13       | 0.0133*  |
| 11:23          | 27       | 31.3     | 0.52       | 0.4689   |
| 11:24          | 148      | 138.36   | 0.67       | 0.4126   |
| 11:25          | 16       | 9.89     | 3.78       | 0.0520   |
| 11:26          | 38       | 53.70    | 4.59       | 0.0321*  |
| 11:29          | 20       | 18.86    | 0.07       | 0.7937   |
| 11:30          | 33       | 30.73    | 0.17       | 0.6822   |
| 11:31          | 16       | 14.45    | 0.17       | 0.6840   |
| 11:32          | 49       | 43.97    | 0.58       | 0.4477   |
| 11:33          | 27       | 26.62    | 0.01       | 0.9417   |
| 11:68          | 36       | 35.52    | 0.01       | 0.9362   |
| 11:69          | 2        | 6.31     | 2.95       | 0.0860   |
| 23:23          | 9        | 6.82     | 0.70       | 0.4044   |
| 23:24          | 65       | 60.83    | 0.29       | 0.5931   |
| 23:26          | 15       | 23.61    | 3.14       | 0.0764   |
| 23:29          | 7        | 8.29     | 0.20       | 0.6533   |
| 23:30          | 11       | 13.51    | 0.47       | 0.4946   |
| 23:31          | 4        | 6.35     | 0.87       | 0.3504   |
| 23:32          | 12       | 19.33    | 2.78       | 0.0955   |
| 23:33          | 19       | 11.70    | 4.55       | 0.0330*  |
| 23:68          | 14       | 15.62    | 0.17       | 0.6823   |
| 24:24          | 161      | 135.60   | 04.76      | 0.0292*  |
| 24:25          | 19       | 19.38    | 0.01       | 0.9307   |
| 24:26          | 119      | 105.26   | 1.79       | 0.1806   |
| 24:29          | 34       | 36.98    | 0.24       | 0.6245   |
| 24:30          | 53       | 60.24    | 0.87       | 0.3512   |
| 24:31          | 20       | 28.33    | 2.45       | 0.1176   |
| 24:32          | 90       | 86.18    | 0.17       | 0.6806   |
| 24:33          | 49       | 52.18    | 0.19       | 0.6593   |
| 24:66          | 8        | 9.10     | 0.13       | 0.7165   |
| 24:68          | 67       | 69.63    | 0.10       | 0.7527   |
| 24:69          | 13       | 12.38    | 0.03       | 0.8590   |
| 25:26          | 9        | 7.52     | 0.29       | 0.5902   |
| 25:32          | 4        | 6.16     | 0.76       | 0.3843   |
| 26:26          | 33       | 20.43    | 7.74       | 0.0054** |

**Supplementary File 4.** Genotype Analysis of 2-digit six HLA loci

**TABLE S1.** Continued

| HLA A*: HLA A* | Observed | Expected | Chi-square | p-value     |
|----------------|----------|----------|------------|-------------|
| 26:29          | 15       | 14.35    | 0.03       | 0.8641      |
| 26:30          | 21       | 23.38    | 0.24       | 0.6227      |
| 26:31          | 4        | 11.00    | 4.45       | 0.0349*     |
| 26:32          | 48       | 33.45    | 6.33       | 0.0119*     |
| 26:33          | 18       | 20.25    | 0.25       | 0.6165      |
| 26:68          | 36       | 27.2     | 2.98       | 0.0843      |
| 29:30          | 8        | 8.21     | 0.01       | 0.9409      |
| 29:32          | 10       | 11.75    | 0.26       | 0.6098      |
| 29:33          | 8        | 7.11     | 0.11       | 0.7400      |
| 29:68          | 6        | 9.49     | 1.29       | 0.2569      |
| 30:30          | 19       | 6.69     | 22.66      | 0.0000***** |
| 30:31          | 9        | 6.29     | 1.17       | 0.2803      |
| 30:32          | 22       | 19.14    | 0.43       | 0.5133      |
| 30:33          | 8        | 11.59    | 1.11       | 0.2916      |
| 30:68          | 7        | 15.46    | 4.63       | 0.0314*     |
| 31:32          | 5        | 9.00     | 1.78       | 0.1823      |
| 31:33          | 2        | 5.45     | 2.18       | 0.1394      |
| 31:68          | 5        | 7.27     | 0.71       | 0.3993      |
| 32:32          | 28       | 13.69    | 14.95      | 0.0001***   |
| 32:33          | 15       | 16.58    | 0.15       | 0.6977      |
| 32:68          | 17       | 22.13    | 1.19       | 0.2759      |
| 33:33          | 6        | 5.2      | 0.19       | 0.6620      |
| 33:68          | 11       | 13.40    | 0.43       | 0.5125      |
| 68:68          | 10       | 8.94     | 0.13       | 0.7224      |
| Total          | 5995     | 6010.85  |            |             |

#### Supplementary File 4. Genotype Analysis of 2-digit six HLA loci

**TABLE S2.** Genotype Analysis of 2-digit HLA-B\*

| HLA-B*:HLA-B* | Observed | Expected | Chi-square | p-value     |
|---------------|----------|----------|------------|-------------|
| 07:07         | 16       | 16.58    | 0.02       | 0.8872      |
| 07:08         | 21       | 25.13    | 0.68       | 0.4103      |
| 07:13         | 21       | 22.99    | 0.17       | 0.6781      |
| 07:14         | 8        | 14.86    | 3.17       | 0.0752      |
| 07:15         | 26       | 22.57    | 0.52       | 0.4707      |
| 07:18         | 40       | 38.26    | 0.08       | 0.7790      |
| 07:27         | 20       | 20.80    | 0.03       | 0.8607      |
| 07:35         | 102      | 119.48   | 2.56       | 0.1097      |
| 07:37         | 15       | 9.7      | 3.88       | 0.0490*     |
| 07:38         | 34       | 28.31    | 1.14       | 0.2846      |
| 07:39         | 10       | Eki.22   | 0.00       | 0.9457      |
| 07:40         | 24       | 24.71    | 0.02       | 0.8864      |
| 07:41         | 18       | 15.64    | 0.36       | 0.5506      |
| 07:44         | 38       | 47.07    | 1.75       | 0.1860      |
| 07:49         | 16       | 25.60    | 3.60       | 0.0579      |
| 07:50         | 23       | 21.37    | 0.12       | 0.7250      |
| 07:51         | 95       | 79.97    | 2.83       | 0.0928      |
| 07:52         | 24       | 19.39    | 1.9        | 0.2955      |
| 07:55         | 25       | 21.63    | 0.52       | 0.4693      |
| 07:57         | 15       | Kas.16   | 1.32       | 0.2498      |
| 07:58         | 17       | Eki.58   | 3.89       | 0.0485*     |
| 08:08         | 17       | 9.52     | 5.87       | 0.0154*     |
| 08:13         | 18       | 17.42    | 0.02       | 0.8901      |
| 08:14         | 13       | 11.26    | 0.27       | 0.6040      |
| 08:15         | 19       | 17.11    | 0.21       | 0.6472      |
| 08:18         | 30       | 29.00    | 0.03       | 0.8525      |
| 08:27         | 13       | 15.76    | 0.48       | 0.4864      |
| 08:35         | 72       | 90.55    | 3.80       | 0.0512      |
| 08:37         | 9        | 6.87     | 0.66       | 0.4175      |
| 08:38         | 14       | 21.45    | 2.59       | 0.1076      |
| 08:39         | 7        | 7.74     | 0.07       | 0.7893      |
| 08:40         | 17       | 18.73    | 0.16       | 0.6899      |
| 08:41         | 10       | 11.85    | 0.29       | 0.5905      |
| 08:44         | 33       | 35.68    | 0.20       | 0.6542      |
| 08:49         | 26       | 19.40    | 2.25       | 0.1339      |
| 08:50         | 16       | 16.20    | 0.00       | 0.9607      |
| 08:51         | 54       | 60.61    | 0.72       | 0.3962      |
| 08:52         | 18       | 14.70    | 0.74       | 0.3889      |
| 08:55         | 23       | 16.40    | 2.66       | 0.1029      |
| 08:57         | 22       | 8.45     | 21.70      | 0.0000***** |

**Supplementary File 4.** Genotype Analysis of 2-digit six HLA loci

**TABLE S2.** Continued

| HLA-B*:HLA-B* | Observed | Expected | Chi-square | p-value    |
|---------------|----------|----------|------------|------------|
| 08:58         | 5        | 8.2      | 1.14       | 0.2862     |
| 13:13         | 19       | 7.97     | 15.26      | 0.0001**** |
| 13:14         | 6        | 10.30    | 1.80       | 0.1801     |
| 13:15         | 18       | 15.65    | 0.35       | 0.5528     |
| 13:18         | 15       | 26.53    | 5.1        | 0.0252*    |
| 13:27         | 12       | 14.42    | 0.41       | 0.5235     |
| 13:35         | 84       | 82.85    | 0.02       | 0.8995     |
| 13:37         | 3        | 6.29     | 1.72       | 0.1896     |
| 13:38         | 23       | 19.63    | 0.58       | 0.4466     |
| 13:39         | 3        | 7.8      | 2.36       | 0.1249     |
| 13:40         | 21       | 17.13    | 0.87       | 0.3503     |
| 13:41         | 12       | 10.84    | 0.12       | 0.7256     |
| 13:44         | 29       | 32.64    | 0.41       | 0.5239     |
| 13:49         | 17       | 17.75    | 0.03       | 0.8590     |
| 13:50         | 9        | 14.82    | 2.29       | 0.1306     |
| 13:51         | 49       | 55.45    | 0.75       | 0.3864     |
| 13:52         | 15       | 13.45    | 0.18       | 0.6719     |
| 13:55         | 17       | 15.00    | 0.27       | 0.6058     |
| 13:57         | 11       | 7.74     | 1.38       | 0.2405     |
| 13:58         | 7        | 7.34     | 0.02       | 0.9007     |
| 14:15         | 12       | 10.12    | 0.35       | 0.5534     |
| 14:18         | 16       | 17.15    | 0.08       | 0.7818     |
| 14:27         | 10       | 9.32     | 0.05       | 0.8240     |
| 14:35         | 53       | 53.54    | 0.01       | 0.9409     |
| 14:38         | 14       | 12.68    | 0.14       | 0.7119     |
| 14:40         | 6        | 11.7     | 2.32       | 0.1274     |
| 14:41         | 6        | 7.1      | 0.15       | 0.7033     |
| 14:44         | 18       | 21.9     | 0.45       | 0.5004     |
| 14:49         | 10       | 11.47    | 0.19       | 0.6642     |
| 14:50         | 10       | 9.58     | 0.02       | 0.8915     |
| 14:51         | 35       | 35.84    | 0.02       | 0.8890     |
| 14:52         | 12       | 8.69     | 1.26       | 0.2615     |
| 14:55         | 11       | 9.69     | 0.18       | 0.6750     |
| 15:15         | 12       | 7.68     | 2.42       | 0.1195     |
| 15:18         | 22       | 26.5     | 0.63       | 0.4274     |
| 15:27         | 17       | 14.16    | 0.57       | 0.4506     |
| 15:35         | 92       | 81.35    | 1.40       | 0.2376     |
| 15:37         | 3        | 6.18     | 1.63       | 0.2013     |
| 15:38         | 20       | 19.27    | 0.03       | 0.8683     |
| 15:39         | 4        | 6.96     | 1.26       | 0.2623     |

**Supplementary File 4.** Genotype Analysis of 2-digit six HLA loci

**TABLE S2.** Continued

| HLA-B*:HLA-B* | Observed | Expected | Chi-square | p-value |
|---------------|----------|----------|------------|---------|
| 15:40         | 20       | 16.82    | 0.60       | 0.4386  |
| 15:41         | 8        | 10.65    | 0.66       | 0.4172  |
| 15:44         | 35       | 32.05    | 0.27       | 0.6022  |
| 15:49         | 9        | 17.43    | 4.7        | 0.0435* |
| 15:50         | 9        | 14.55    | 2.12       | 0.1456  |
| 15:51         | 54       | 54.44    | 0.00       | 0.9520  |
| 15:52         | 10       | 13.20    | 0.78       | 0.3781  |
| 15:55         | 13       | 14.73    | 0.20       | 0.6523  |
| 15:57         | 8        | 7.60     | 0.02       | 0.8832  |
| 15:58         | 3        | 7.20     | 2.45       | 0.1172  |
| 18:18         | 24       | 22.8     | 0.17       | 0.6829  |
| 18:27         | 29       | 24.1     | 1.4        | 0.3080  |
| 18:35         | 155      | 137.90   | 2.12       | 0.1452  |
| 18:37         | 7        | 10.47    | 1.15       | 0.2837  |
| 18:38         | 27       | 32.67    | 0.98       | 0.3213  |
| 18:39         | 11       | 11.79    | 0.05       | 0.8176  |
| 18:40         | 19       | 28.52    | 3.18       | 0.0747  |
| 18:41         | 23       | 18.5     | 1.36       | 0.2439  |
| 18:44         | 56       | 54.33    | 0.05       | 0.8206  |
| 18:49         | 25       | 29.54    | 0.70       | 0.4035  |
| 18:50         | 19       | 24.67    | 1.30       | 0.2538  |
| 18:51         | 97       | 92.29    | 0.24       | 0.6240  |
| 18:52         | 29       | 22.38    | 1.96       | 0.1618  |
| 18:55         | 23       | 24.97    | 0.16       | 0.6937  |
| 18:57         | 15       | 12.88    | 0.35       | 0.5537  |
| 18:58         | 12       | 12.21    | 0.00       | 0.9513  |
| 27:27         | 11       | 6.52     | 3.7        | 0.0798  |
| 27:35         | 77       | 74.96    | 0.06       | 0.8137  |
| 27:37         | 4        | 5.69     | 0.50       | 0.4785  |
| 27:38         | 10       | 17.76    | 3.39       | 0.0656  |
| 27:39         | 10       | 6.41     | 2.1        | 0.1562  |
| 27:40         | 17       | 15.50    | 0.14       | 0.7036  |
| 27:41         | 14       | 9.81     | 1.79       | 0.1812  |
| 27:44         | 33       | 29.53    | 0.41       | 0.5234  |
| 27:49         | 17       | 16.6     | 0.06       | 0.8142  |
| 27:50         | 10       | 13.41    | 0.87       | 0.3519  |
| 27:51         | 39       | 50.17    | 2.49       | 0.1148  |
| 27:52         | 7        | 12.17    | 2.19       | 0.1386  |
| 27:55         | 13       | 13.57    | 0.02       | 0.8765  |
| 27:57         | 11       | 7.00     | 2.29       | 0.1304  |

**Supplementary File 4.** Genotype Analysis of 2-digit six HLA loci

**TABLE S2.** Continued

| HLA-B*:HLA-B* | Observed | Expected | Chi-square | p-value   |
|---------------|----------|----------|------------|-----------|
| 27:58         | 7        | 6.64     | 0.02       | 0.8886    |
| 35:35         | 240      | 215.30   | 2.83       | 0.0923    |
| 35:37         | 43       | 32.69    | 3.25       | 0.0713    |
| 35:38         | 86       | 102.01   | 2.51       | 0.1129    |
| 35:39         | 42       | 36.82    | 0.73       | 0.3935    |
| 35:40         | 70       | 89.05    | 4.8        | 0.0435*   |
| 35:41         | 56       | 56.36    | 0.00       | 0.9617    |
| 35:44         | 172      | 169.65   | 0.03       | 0.8566    |
| 35:45         | 10       | 6.1      | 2.65       | 0.1038    |
| 35:48         | 5        | 12.21    | 4.26       | 0.0390*   |
| 35:49         | 81       | 92.24    | 1.37       | 0.2417    |
| 35:50         | 82       | 77.03    | 0.32       | 0.5709    |
| 35:51         | 283      | 288.19   | 0.09       | 0.7598    |
| 35:52         | 72       | 69.89    | 0.06       | 0.8005    |
| 35:53         | 13       | 9.96     | 0.93       | 0.3349    |
| 35:55         | 64       | 77.97    | 2.50       | 0.1137    |
| 35:56         | 3        | 8.64     | 3.68       | 0.0550    |
| 35:57         | 40       | 40.20    | 0.00       | 0.9743    |
| 35:58         | 36       | 38.14    | 0.12       | 0.7293    |
| 37:38         | 8        | 7.74     | 0.01       | 0.9268    |
| 37:40         | 3        | 6.76     | 2.9        | 0.1481    |
| 37:44         | 17       | 12.88    | 1.32       | 0.2508    |
| 37:49         | 8        | 7.00     | 0.14       | 0.7063    |
| 37:50         | 5        | 5.85     | 0.12       | 0.7260    |
| 37:51         | 21       | 21.88    | 0.04       | 0.8510    |
| 37:52         | 2        | 5.31     | 2.6        | 0.1513    |
| 37:55         | 2        | 5.92     | 2.59       | 0.1072    |
| 38:38         | 25       | 12.8     | 13.81      | 0.0002*** |
| 38:39         | 5        | 8.72     | 1.59       | 0.2074    |
| 38:40         | 21       | 21.10    | 0.00       | 0.9832    |
| 38:41         | 10       | 13.35    | 0.84       | 0.3589    |
| 38:44         | 36       | 40.19    | 0.44       | 0.5086    |
| 38:49         | 20       | 21.85    | 0.16       | 0.6917    |
| 38:50         | 21       | 18.25    | 0.41       | 0.5195    |
| 38:51         | 77       | 68.28    | 1.11       | 0.2910    |
| 38:52         | 14       | 16.56    | 0.39       | 0.5297    |
| 38:55         | 19       | 18.47    | 0.02       | 0.9020    |
| 38:57         | 14       | 9.52     | 2.10       | 0.1470    |
| 38:58         | 10       | 9.4      | 0.10       | 0.7482    |
| 39:40         | 4        | 7.62     | 1.72       | 0.1902    |

**Supplementary File 4.** Genotype Analysis of 2-digit six HLA loci

**TABLE S2.** Continued

| HLA-B*:HLA-B* | Observed | Expected | Chi-square | p-value     |
|---------------|----------|----------|------------|-------------|
| 39:44         | 16       | 14.51    | 0.15       | 0.6951      |
| 39:49         | 4        | 7.89     | 1.92       | 0.1662      |
| 39:50         | 4        | 6.59     | 1.2        | 0.3135      |
| 39:51         | 29       | 24.64    | 0.77       | 0.3803      |
| 39:52         | 9        | 5.98     | 1.53       | 0.2162      |
| 39:55         | 5        | 6.67     | 0.42       | 0.5185      |
| 40:40         | 9        | 9.21     | 0.00       | 0.9453      |
| 40:41         | 15       | 11.66    | 0.96       | 0.3273      |
| 40:44         | 47       | 35.08    | 4.5        | 0.0442*     |
| 40:49         | 24       | 19.8     | 1.27       | 0.2596      |
| 40:50         | 28       | 15.93    | 9.15       | 0.0025**    |
| 40:51         | 61       | 59.60    | 0.03       | 0.8561      |
| 40:52         | 13       | 14.45    | 0.15       | 0.7023      |
| 40:55         | 14       | 16.12    | 0.28       | 0.5969      |
| 40:57         | 12       | 8.31     | 1.63       | 0.2012      |
| 40:58         | 6        | 7.89     | 0.45       | 0.5016      |
| 41:44         | 19       | 22.20    | 0.46       | 0.4964      |
| 41:49         | 9        | 12.7     | 0.78       | 0.3764      |
| 41:50         | 14       | 10.8     | 1.52       | 0.2172      |
| 41:51         | 33       | 37.72    | 0.59       | 0.4421      |
| 41:52         | 9        | 9.15     | 0.00       | 0.9611      |
| 41:55         | 15       | 10.20    | 2.25       | 0.1333      |
| 41:57         | 0        | 5.26     | 5.26       | 0.0218*     |
| 44:44         | 31       | 33.42    | 0.18       | 0.6757      |
| 44:49         | 40       | 36.34    | 0.37       | 0.5440      |
| 44:50         | 27       | 30.35    | 0.37       | 0.5435      |
| 44:51         | 106      | 113.54   | 0.50       | 0.4791      |
| 44:52         | 24       | 27.53    | 0.45       | 0.5006      |
| 44:55         | 32       | 30.72    | 0.05       | 0.8169      |
| 44:57         | 16       | 15.84    | 0.00       | 0.9678      |
| 44:58         | 24       | 15.3     | 5.36       | 0.0206*     |
| 48:51         | 10       | 8.17     | 0.41       | 0.5228      |
| 49:49         | 28       | 9.88     | 33.23      | 0.0000***** |
| 49:50         | 15       | 16.50    | 0.14       | 0.7118      |
| 49:51         | 55       | 61.74    | 0.74       | 0.3912      |
| 49:52         | 17       | 14.97    | 0.27       | 0.6001      |
| 49:55         | 20       | 16.70    | 0.65       | 0.4197      |
| 49:57         | 6        | 8.61     | 0.79       | 0.3733      |
| 49:58         | 6        | 8.17     | 0.58       | 0.4478      |
| 50:50         | 17       | 6.89     | 14.84      | 0.0001***   |



**Supplementary File 4.** Genotype Analysis of 2-digit six HLA loci

**TABLE S2.** Continued

| HLA-B*:HLA-B* | Observed | Expected | Chi-square | p-value  |
|---------------|----------|----------|------------|----------|
| 50:51         | 48       | 51.55    | 0.24       | 0.6208   |
| 50:52         | 12       | 12.50    | 0.02       | 0.8872   |
| 50:55         | 8        | 13.95    | 2.54       | 0.1113   |
| 50:57         | 0        | 7.19     | 7.19       | 0.0073** |
| 50:58         | 5        | 6.82     | 0.49       | 0.4854   |
| 51:51         | 116      | 96.44    | 3.97       | 0.0464*  |
| 51:52         | 30       | 46.77    | 6.2        | 0.0142*  |
| 51:53         | 6        | 6.66     | 0.07       | 0.7970   |
| 51:55         | 58       | 52.18    | 0.65       | 0.4205   |
| 51:56         | 7        | 5.78     | 0.26       | 0.6131   |
| 51:57         | 21       | 26.91    | 1.30       | 0.2547   |
| 51:58         | 23       | 25.52    | 0.25       | 0.6173   |
| 52:52         | 9        | 5.67     | 1.95       | 0.1622   |
| 52:55         | 16       | 12.65    | 0.88       | 0.3469   |
| 52:57         | 6        | 6.53     | 0.04       | 0.8371   |
| 52:58         | 12       | 6.19     | 5.45       | 0.0195*  |
| 55:55         | 10       | 7.6      | 1.23       | 0.2682   |
| 55:57         | 4        | 7.28     | 1.48       | 0.2242   |
| 55:58         | 6        | 6.91     | 0.12       | 0.7305   |
| Total         | 5823     | 5826.53  |            |          |

**Supplementary File 4.** Genotype Analysis of 2-digit six HLA loci

**TABLE S3.** Genotype Analysis of 2-digit HLA-C\*.

| HLA C*: HLA C* | Observed | Expected | Chi-square | p-value  |
|----------------|----------|----------|------------|----------|
| 01:02          | 3        | 5.7      | 0.85       | 0.3579   |
| 01:03          | 11       | 7.83     | 1.29       | 0.2564   |
| 01:04          | 21       | 28.35    | 1.90       | 0.1677   |
| 01:06          | 12       | 15.37    | 0.74       | 0.3899   |
| 01:07          | 28       | 31.26    | 0.34       | 0.5598   |
| 01:08          | 5        | 5.51     | 0.05       | 0.8282   |
| 01:12          | 25       | 18.33    | 2.43       | 0.1189   |
| 01:14          | 6        | 6.11     | 0.00       | 0.9650   |
| 01:15          | 9        | 10.18    | 0.14       | 0.7114   |
| 01:16          | 9        | 6.3      | 1.46       | 0.2262   |
| 02:03          | 10       | 6.76     | 1.55       | 0.2128   |
| 02:04          | 29       | 24.49    | 0.83       | 0.3620   |
| 02:06          | 9        | 13.28    | 1.38       | 0.2403   |
| 02:07          | 19       | 27.1     | 2.37       | 0.1234   |
| 02:12          | 18       | 15.83    | 0.30       | 0.5858   |
| 02:14          | 5        | 5.28     | 0.01       | 0.9039   |
| 02:15          | 12       | 8.80     | 1.17       | 0.2799   |
| 02:16          | 7        | 5.21     | 0.62       | 0.4324   |
| 03:03          | 6        | 5.22     | 0.12       | 0.7316   |
| 03:04          | 33       | 37.79    | 0.61       | 0.4354   |
| 03:06          | 25       | 20.49    | 0.99       | 0.3196   |
| 03:07          | 34       | 41.68    | 1.42       | 0.2342   |
| 03:08          | 8        | 7.35     | 0.06       | 0.8093   |
| 03:12          | 21       | 24.43    | 0.48       | 0.4873   |
| 03:14          | 6        | 8.14     | 0.56       | 0.4524   |
| 03:15          | 15       | 13.57    | 0.15       | 0.6988   |
| 03:16          | 5        | 8.4      | 1.15       | 0.2839   |
| 04:04          | 94       | 68.45    | 9.53       | 0.0020** |
| 04:05          | 17       | 17.93    | 0.05       | 0.8256   |
| 04:06          | 75       | 74.24    | 0.01       | 0.9297   |
| 04:07          | 138      | 150.99   | 1.12       | 0.2906   |
| 04:08          | 13       | 26.61    | 6.96       | 0.0083** |
| 04:12          | 79       | 88.51    | 1.2        | 0.3121   |
| 04:14          | 25       | 29.50    | 0.69       | 0.4071   |
| 04:15          | 45       | 49.17    | 0.35       | 0.5519   |
| 04:16          | 28       | 29.12    | 0.04       | 0.8360   |
| 04:17          | 17       | 12.73    | 1.43       | 0.2310   |
| 05:06          | 7        | 9.72     | 0.76       | 0.3823   |
| 05:07          | 17       | 19.78    | 0.39       | 0.5323   |
| 05:12          | 10       | 11.59    | 0.22       | 0.6398   |

**Supplementary File 4.** Genotype Analysis of 2-digit six HLA loci

**TABLE S3.** Continued

| HLA C*: HLA C* | Observed | Expected | Chi-square | p-value  |
|----------------|----------|----------|------------|----------|
| 05:15          | 9        | 6.44     | 1.2        | 0.3133   |
| 06:06          | 24       | 20.13    | 0.74       | 0.3882   |
| 06:07          | 85       | 81.87    | 0.12       | 0.7296   |
| 06:08          | 14       | 14.43    | 0.01       | 0.9099   |
| 06:12          | 48       | 47.99    | 0.00       | 0.9993   |
| 06:14          | 17       | 16.00    | 0.06       | 0.8022   |
| 06:15          | 24       | 26.66    | 0.27       | 0.6060   |
| 06:16          | 15       | 15.79    | 0.04       | 0.8426   |
| 06:17          | 2        | 6.90     | 3.48       | 0.0621   |
| 07:07          | 113      | 83.25    | 10.63      | 0.0011** |
| 07:08          | 36       | 29.35    | 1.51       | 0.2194   |
| 07:12          | 83       | 97.61    | 2.19       | 0.1392   |
| 07:14          | 33       | 32.54    | 0.01       | 0.9352   |
| 07:15          | 47       | 54.23    | 0.96       | 0.3264   |
| 07:16          | 26       | 32.11    | 1.16       | 0.2808   |
| 07:17          | 8        | 14.4     | 2.60       | 0.1072   |
| 08:12          | 15       | 17.20    | 0.28       | 0.5953   |
| 08:14          | 10       | 5.73     | 3.17       | 0.0749   |
| 08:15          | 12       | 9.56     | 0.62       | 0.4294   |
| 08:16          | 2        | 5.66     | 2.37       | 0.1240   |
| 12:12          | 43       | 28.61    | 7.24       | 0.0071** |
| 12:14          | 17       | 19.7     | 0.23       | 0.6350   |
| 12:15          | 21       | 31.79    | 3.66       | 0.0557   |
| 12:16          | 25       | 18.82    | 2.3        | 0.1546   |
| 12:17          | 9        | 8.23     | 0.07       | 0.7877   |
| 14:15          | 16       | 10.60    | 2.76       | 0.0969   |
| 14:16          | 8        | 6.27     | 0.47       | 0.4909   |
| 15:15          | 15       | 8.83     | 4.31       | 0.0379*  |
| 15:16          | 8        | 10.46    | 0.58       | 0.4473   |
| Total          | 1741     | 1755.92  |            |          |

**Supplementary File 4.** Genotype Analysis of 2-digit six HLA loci

**TABLE S4.** Genotype Analysis of 2-digit HLA-DRB1\*.

| HLA-DRB1*:HLA-DRB1* | Observed | Expected | Chi-square | p-value  |
|---------------------|----------|----------|------------|----------|
| 01:01               | 40       | 30.24    | 3.15       | 0.0760   |
| 01:03               | 61       | 69.42    | 1.2        | 0.3120   |
| 01:04               | 112      | 126.32   | 1.62       | 0.2028   |
| 01:07               | 73       | 80.27    | 0.66       | 0.4173   |
| 01:08               | 30       | 20.91    | 3.95       | 0.0469*  |
| 01:09               | 11       | 10.84    | 0.00       | 0.9620   |
| 01:10               | 18       | 20.7     | 0.21       | 0.6445   |
| 01:11               | 186      | 180.81   | 0.15       | 0.6997   |
| 01:12               | 18       | 13.24    | 1.71       | 0.1905   |
| 01:13               | 92       | 98.50    | 0.43       | 0.5123   |
| 01:14               | 65       | 54.99    | 1.82       | 0.1771   |
| 01:15               | 67       | 81.46    | 2.57       | 0.1090   |
| 01:16               | 46       | 41.61    | 0.46       | 0.4964   |
| 03:03               | 37       | 39.84    | 0.20       | 0.6523   |
| 03:04               | 125      | 144.99   | 2.76       | 0.0969   |
| 03:07               | 103      | 92.13    | 1.28       | 0.2576   |
| 03:08               | 24       | 24.00    | 0.00       | 0.9994   |
| 03:09               | 13       | 12.45    | 0.02       | 0.8753   |
| 03:10               | 18       | 23.3     | 1.10       | 0.2943   |
| 03:11               | 209      | 207.54   | 0.01       | 0.9195   |
| 03:12               | 16       | 15.19    | 0.04       | 0.8362   |
| 03:13               | 116      | 113.07   | 0.08       | 0.7827   |
| 03:14               | 61       | 63.12    | 0.07       | 0.7896   |
| 03:15               | 118      | 93.51    | 6.41       | 0.0113*  |
| 03:16               | 48       | 47.76    | 0.00       | 0.9728   |
| 04:04               | 162      | 131.90   | 6.87       | 0.0088** |
| 04:07               | 147      | 167.64   | 2.54       | 0.1110   |
| 04:08               | 53       | 43.67    | 1.99       | 0.1582   |
| 04:09               | 30       | 22.65    | 2.39       | 0.1222   |
| 04:10               | 41       | 41.91    | 0.02       | 0.8883   |
| 04:11               | 401      | 377.62   | 1.45       | 0.2290   |
| 04:12               | 30       | 27.65    | 0.20       | 0.6543   |
| 04:13               | 180      | 205.72   | 3.22       | 0.0729   |
| 04:14               | 110      | 114.85   | 0.20       | 0.6512   |
| 04:15               | 159      | 170.14   | 0.73       | 0.3932   |
| 04:16               | 82       | 86.91    | 0.28       | 0.5987   |
| 07:07               | 69       | 53.26    | 4.65       | 0.0311*  |
| 07:08               | 21       | 27.75    | 1.64       | 0.1999   |
| 07:09               | 9        | 14.39    | 2.2        | 0.1553   |
| 07:10               | 27       | 26.63    | 0.01       | 0.9430   |

**Supplementary File 4.** Genotype Analysis of 2-digit six HLA loci

**TABLE S4.** Continued

| HLA-DRB1*:HLA-DRB1* | Observed | Expected | Chi-square | p-value   |
|---------------------|----------|----------|------------|-----------|
| 07:11               | 245      | 239.96   | 0.11       | 0.7449    |
| 07:12               | 19       | 17.57    | 0.12       | 0.7325    |
| 07:13               | 130      | 130.73   | 0.00       | 0.9494    |
| 07:14               | 68       | 72.98    | 0.34       | 0.5600    |
| 07:15               | 101      | 108.11   | 0.47       | 0.4939    |
| 07:16               | 59       | 55.22    | 0.26       | 0.6114    |
| 08:10               | 12       | 6.94     | 3.69       | 0.0546    |
| 08:11               | 50       | 62.52    | 2.51       | 0.1134    |
| 08:13               | 32       | 34.06    | 0.12       | 0.7244    |
| 08:14               | 21       | 19.1     | 0.21       | 0.6486    |
| 08:15               | 18       | 28.17    | 3.67       | 0.0554    |
| 08:16               | 16       | 14.39    | 0.18       | 0.6707    |
| 09:11               | 41       | 32.42    | 2.27       | 0.1316    |
| 09:13               | 9        | 17.66    | 4.25       | 0.0393*   |
| 09:14               | 15       | 9.86     | 2.68       | 0.1015    |
| 09:15               | 7        | 14.60    | 3.96       | 0.0466*   |
| 09:16               | 13       | 7.46     | 4.11       | 0.0425*   |
| 10:11               | 58       | 59.99    | 0.07       | 0.7972    |
| 10:13               | 40       | 32.68    | 1.64       | 0.2005    |
| 10:14               | 14       | 18.24    | 0.99       | 0.3203    |
| 10:15               | 28       | 27.3     | 0.03       | 0.8517    |
| 10:16               | 16       | 13.81    | 0.35       | 0.5549    |
| 11:11               | 273      | 270.27   | 0.03       | 0.8682    |
| 11:12               | 38       | 39.57    | 0.06       | 0.8026    |
| 11:13               | 256      | 294.48   | 5.3        | 0.0249*   |
| 11:14               | 150      | 164.39   | 1.26       | 0.2616    |
| 11:15               | 257      | 243.54   | 0.74       | 0.3884    |
| 11:16               | 130      | 124.40   | 0.25       | 0.6157    |
| 12:13               | 20       | 21.56    | 0.11       | 0.7372    |
| 12:14               | 2        | 12.4     | 8.37       | 0.0038**  |
| 12:15               | 25       | 17.83    | 2.88       | 0.0895    |
| 12:16               | 9        | 9.11     | 0.00       | 0.9717    |
| 13:13               | 112      | 80.21    | 12.60      | 0.0004*** |
| 13:14               | 105      | 89.56    | 2.66       | 0.1028    |
| 13:15               | 136      | 132.68   | 0.08       | 0.7729    |
| 13:16               | 59       | 67.77    | 1.14       | 0.2867    |
| 14:14               | 31       | 25.00    | 1.44       | 0.2300    |
| 14:15               | 72       | 74.07    | 0.06       | 0.8102    |
| 14:16               | 36       | 37.83    | 0.09       | 0.7656    |
| 15:15               | 61       | 54.86    | 0.69       | 0.4073    |

**Supplementary File 4.** Genotype Analysis of 2-digit six HLA loci

**TABLE S4.** Continued

| HLA-DRB1*:HLA-DRB1* | Observed | Expected | Chi-square | p-value |
|---------------------|----------|----------|------------|---------|
| 15:16               | 47       | 56.05    | 1.46       | 0.2268  |
| 16:16               | 15       | 14.31    | 0.03       | 0.8563  |
| Total               | 6074     | 6070.95  |            |         |

**Supplementary File 4. Genotype Analysis of 2-digit six HLA loci**

**TABLE S5.** Genotype Analysis of 2-digit HLA-DQB1\*.

| HLA-DQB1*: HLA-DQB1* | Observed | Expected | Chi-square | p-value |
|----------------------|----------|----------|------------|---------|
| 02:02                | 22       | 17.8     | 1.42       | 0.2342  |
| 02:03                | 83       | 82.83    | 0.00       | 0.9854  |
| 02:04                | 2        | 5.83     | 2.52       | 0.1125  |
| 02:05                | 40       | 44.17    | 0.39       | 0.5307  |
| 02:06                | 36       | 38.00    | 0.11       | 0.7456  |
| 03:03                | 107      | 100.41   | 0.43       | 0.5108  |
| 03:04                | 17       | 14.14    | 0.58       | 0.4473  |
| 03:05                | 102      | 107.08   | 0.24       | 0.6237  |
| 03:06                | 81       | 92.13    | 1.34       | 0.2464  |
| 04:05                | 10       | 7.54     | 0.80       | 0.3705  |
| 04:06                | 4        | 6.49     | 0.95       | 0.3287  |
| 05:05                | 34       | 28.55    | 1.4        | 0.3074  |
| 05:06                | 45       | 49.12    | 0.35       | 0.5565  |
| 06:06                | 31       | 21.13    | 4.61       | 0.0318* |
| Total                | 614      | 614.50   |            |         |

**TABLE S6.** Genotype Analysis of 2-digit HLA-DPB1\*.

| HLA-DPB1*: HLA-DPB1* | Observed | Expected | Chi-square | p-value |
|----------------------|----------|----------|------------|---------|
| 01:04                | 10       | 8.26     | 0.37       | 0.5437  |
| 02:02                | 19       | 18.87    | 0.00       | 0.9759  |
| 02:03                | 16       | 17.66    | 0.16       | 0.6928  |
| 02:04                | 120      | 111.72   | 0.61       | 0.4337  |
| 03:04                | 55       | 52.28    | 0.14       | 0.7073  |
| 04:04                | 158      | 165.39   | 0.33       | 0.5658  |
| 04:05                | 11       | 11.56    | 0.03       | 0.8697  |
| 04:09                | 8        | 8.81     | 0.07       | 0.7860  |
| 04:10                | 10       | 9.91     | 0.00       | 0.9763  |
| 04:13                | 16       | 13.21    | 0.59       | 0.4425  |
| 04:14                | 8        | 8.26     | 0.01       | 0.9291  |
| 04:15                | 10       | 7.15     | 0.13       | 0.2875  |
| 04:17                | 18       | 14.31    | 0.95       | 0.3293  |
| Total                | 459      | 447.38   |            |         |