

Supplemental Table 5. DOA alleles. Related to Figures 6 and 7.

| Chrom | Position | RSID | Ref | Alt | Protein Consequence | Transcript Consequence | Annotation | Number of Homozygotes | Allele Frequency |
|-------|----------|-------------|-----|-----|---------------------|------------------------|--------------|-----------------------|------------------|
| 6 | 32975808 | rs11575906 | G | A | p.Arg105Cys | c.313C>T | missense | 23 | 0.01242 |
| 6 | 32977298 | rs144931749 | C | T | p.Gly6Arg | c.16G>A | missense | 19 | 0.008975 |
| 6 | 32975286 | rs34987694 | A | G | p.Phe139Leu | c.415T>C | missense | 7 | 0.004471 |
| 6 | 32974914 | rs141887419 | C | A | p.Gly231Val | c.692G>T | missense | 0 | 0.001788 |
| 6 | 32975885 | rs148303384 | C | T | p.Arg79His | c.236G>A | missense | 1 | 0.001655 |
| 6 | 32974897 | rs114742371 | C | T | p.Val237Ile | c.709G>A | missense | 0 | 0.0007655 |
| 6 | 32975177 | rs150939187 | T | C | p.His175Arg | c.524A>G | missense | 0 | 0.0006018 |
| 6 | 32974966 | rs144962928 | C | T | p.Asp214Asn | c.640G>A | missense | 0 | 0.000554 |
| 6 | 32976012 | rs41541116 | CG | C | p.Ala37ProfsTer26 | c.108delC | frameshift | 0 | 0.0003387 |
| 6 | 32975163 | rs142562508 | C | T | p.Val180Met | c.538G>A | missense | 0 | 0.0002033 |
| 6 | 32975945 | . | G | A | p.Ser59Phe | c.176C>T | missense | 0 | 0.0001465 |
| 6 | 32974980 | rs147947959 | G | A | p.Pro209Leu | c.626C>T | missense | 0 | 0.00008402 |
| 6 | 32975284 | . | G | T | p.Phe139Leu | c.417C>A | missense | 0 | 0.0000777 |
| 6 | 32975187 | . | G | A | p.Arg172Cys | c.514C>T | missense | 0 | 0.00007089 |
| 6 | 32975250 | . | C | G | p.Gly151Arg | c.451G>C | missense | 0 | 0.00006983 |
| 6 | 32977258 | . | C | T | p.Ser19Asn | c.56G>A | missense | 0 | 0.00005399 |
| 6 | 32975352 | . | C | T | p.Val117Met | c.349G>A | missense | 0 | 0.00005237 |
| 6 | 32975255 | . | C | T | p.Arg149His | c.446G>A | missense | 0 | 0.00005225 |
| 6 | 32975319 | . | G | T | p.Pro128Thr | c.382C>A | missense | 0 | 0.00005187 |
| 6 | 32975845 | . | G | C | p.Ile92Met | c.276C>G | missense | 0 | 0.0000431 |
| 6 | 32975874 | . | G | A | p.Gln83Ter | c.247C>T | stop gained | 0 | 0.00004309 |
| 6 | 32975151 | . | C | T | p.Glu184Lys | c.550G>A | missense | 0 | 0.0000352 |
| 6 | 32975337 | . | G | A | p.Arg122Trp | c.364C>T | missense | 0 | 0.00003474 |
| 6 | 32974906 | . | C | T | p.Val234Met | c.700G>A | missense | 0 | 0.00003359 |
| 6 | 32975207 | . | G | A | p.Ser165Phe | c.494C>T | missense | 0 | 0.00002651 |
| 6 | 32975360 | . | C | T | p.Arg114Gln | c.341G>A | missense | 0 | 0.00002628 |
| 6 | 32975336 | . | C | T | p.Arg122Gln | c.365G>A | missense | 0 | 0.00002602 |
| 6 | 32975994 | rs139861642 | C | T | p.Gly43Ser | c.127G>A | missense | 0 | 0.00002599 |
| 6 | 32975315 | . | T | C | p.Asn129Ser | c.386A>G | missense | 0 | 0.00002592 |
| 6 | 32975934 | . | T | C | p.Lys63Glu | c.187A>G | missense | 0 | 0.00002585 |
| 6 | 32974883 | rs142612904 | C | T | p.Met241Ile | c.723G>A | missense | 0 | 0.00002532 |
| 6 | 32977230 | . | A | T | | c.82+2T>A | splice donor | 0 | 0.00001935 |
| 6 | 32975196 | . | G | A | p.His169Tyr | c.505C>T | missense | 0 | 0.0000177 |
| 6 | 32975145 | . | C | T | p.Val186Ile | c.556G>A | missense | 0 | 0.00001757 |
| 6 | 32975232 | . | C | T | p.Gly157Arg | c.469G>A | missense | 0 | 0.00001756 |
| 6 | 32975144 | . | A | G | p.Val186Ala | c.557T>C | missense | 0 | 0.00001755 |
| 6 | 32976024 | . | A | G | p.Ser33Pro | c.97T>C | missense | 0 | 0.0000174 |
| 6 | 32976012 | rs41541116 | C | A | p.Ala37Ser | c.109G>T | missense | 0 | 0.00001737 |
| 6 | 32975264 | . | G | T | p.Thr146Asn | c.437C>A | missense | 0 | 0.00001729 |

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|---|----------|-------------|---------|---|-------------------|----------------|-------------|---|-------------|
| 6 | 32975278 | . | AG | A | p.Pro141LeufsTer2 | c.422delC | frameshift | 0 | 0.00001727 |
| 6 | 32975280 | . | G | C | p.Pro141Ala | c.421C>G | missense | 0 | 0.00001727 |
| 6 | 32975298 | . | C | T | p.Val135Met | c.403G>A | missense | 0 | 0.00001727 |
| 6 | 32975850 | . | C | A | p.Ala91Ser | c.271G>T | missense | 0 | 0.00001724 |
| 6 | 32975958 | rs140147098 | C | T | p.Glu55Lys | c.163G>A | missense | 0 | 0.00001724 |
| 6 | 32975931 | . | T | C | p.Lys64Glu | c.190A>G | missense | 0 | 0.00001723 |
| 6 | 32977310 | . | C | T | p.Ala2Thr | c.4G>A | missense | 0 | 0.00001345 |
| 6 | 32977311 | . | C | T | p.Met1? | c.3G>A | start lost | 0 | 0.00001344 |
| 6 | 32977309 | . | G | T | p.Ala2Asp | c.5C>A | missense | 0 | 0.00001336 |
| 6 | 32977276 | . | G | T | p.Thr13Asn | c.38C>A | missense | 0 | 0.00001252 |
| 6 | 32975186 | . | C | T | p.Arg172His | c.515G>A | missense | 0 | 0.000008875 |
| 6 | 32975175 | . | A | G | p.Tyr176His | c.526T>C | missense | 0 | 0.000008849 |
| 6 | 32975222 | . | T | C | p.Gln160Arg | c.479A>G | missense | 0 | 0.000008802 |
| 6 | 32975223 | . | G | A | p.Gln160Ter | c.478C>T | stop gained | 0 | 0.000008802 |
| 6 | 32975790 | . | C | G | p.Val111Leu | c.331G>C | missense | 0 | 0.000008797 |
| 6 | 32975369 | . | A | T | p.Val111Glu | c.332T>A | missense | 0 | 0.000008794 |
| 6 | 32975148 | . | C | T | p.Asp185Asn | c.553G>A | missense | 0 | 0.000008787 |
| 6 | 32975364 | . | G | T | p.Pro113Thr | c.337C>A | missense | 0 | 0.00000878 |
| 6 | 32975142 | rs145505686 | A | G | p.Tyr187His | c.559T>C | missense | 0 | 0.000008769 |
| 6 | 32975141 | . | T | C | p.Tyr187Cys | c.560A>G | missense | 0 | 0.000008765 |
| 6 | 32975237 | . | G | C | p.Thr155Ser | c.464C>G | missense | 0 | 0.000008761 |
| 6 | 32975361 | . | G | A | p.Arg114Trp | c.340C>T | missense | 0 | 0.000008757 |
| 6 | 32976038 | . | G | C | p.Ala28Gly | c.83C>G | missense | 0 | 0.000008737 |
| 6 | 32975250 | . | C | T | p.Gly151Ser | c.451G>A | missense | 0 | 0.000008728 |
| 6 | 32975124 | . | G | T | p.His193Asn | c.577C>A | missense | 0 | 0.000008723 |
| 6 | 32976030 | . | T | C | p.Met31Val | c.91A>G | missense | 0 | 0.000008715 |
| 6 | 32975120 | . | C | T | p.Trp194Ter | c.581G>A | stop gained | 0 | 0.000008713 |
| 6 | 32975800 | . | T | A | p.Arg107Ser | c.321A>T | missense | 0 | 0.000008708 |
| 6 | 32975256 | . | G | A | p.Arg149Cys | c.445C>T | missense | 0 | 0.000008703 |
| 6 | 32976018 | . | C | T | p.Gly35Arg | c.103G>A | missense | 0 | 0.000008694 |
| 6 | 32975108 | . | G | A | p.Ala198Val | c.593C>T | missense | 0 | 0.000008684 |
| 6 | 32975807 | . | C | T | p.Arg105His | c.314G>A | missense | 0 | 0.000008673 |
| 6 | 32975099 | . | A | G | p.Leu201Pro | c.602T>C | missense | 0 | 0.000008657 |
| 6 | 32975986 | . | CG A | C | p.Ser45GlyfsTer6 | c.133_134delTC | frameshift | 0 | 0.000008654 |
| 6 | 32975987 | . | G | C | p.Ser45Trp | c.134C>G | missense | 0 | 0.000008654 |
| 6 | 32975985 | . | C | G | p.Gly46Arg | c.136G>C | missense | 0 | 0.000008653 |
| 6 | 32975260 | . | C | T | p.Trp147Ter | c.441G>A | stop gained | 0 | 0.00000865 |
| 6 | 32975320 | . | C | A | p.Gln127His | c.381G>T | missense | 0 | 0.000008646 |
| 6 | 32975320 | . | C | G | p.Gln127His | c.381G>C | missense | 0 | 0.000008646 |
| 6 | 32975980 | rs145654970 | C | A | p.Gln47His | c.141G>T | missense | 0 | 0.000008645 |
| 6 | 32975318 | . | G | A | p.Pro128Leu | c.383C>T | missense | 0 | 0.000008643 |
| 6 | 32975978 | . | A | G | p.Phe48Ser | c.143T>C | missense | 0 | 0.000008642 |
| 6 | 32975817 | . | G | A | p.Arg102Cys | c.304C>T | missense | 0 | 0.00000864 |
| 6 | 32975091 | . | A | G | p.Trp204Arg | c.610T>C | missense | 0 | 0.000008635 |

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|---|----------|-------------|-----|---|--------------------|----------------|-------------|---|-------------|
| 6 | 32975279 | rs115076830 | G | A | p.Pro141Leu | c.422C>T | missense | 0 | 0.000008635 |
| 6 | 32975280 | . | G | T | p.Pro141Thr | c.421C>A | missense | 0 | 0.000008634 |
| 6 | 32975302 | . | G | T | p.Cys133Ter | c.399C>A | stop gained | 0 | 0.000008632 |
| 6 | 32975286 | rs34987694 | A | T | p.Phe139Ile | c.415T>A | missense | 0 | 0.000008631 |
| 6 | 32975970 | . | C | G | p.Glu51Gln | c.151G>C | missense | 0 | 0.000008631 |
| 6 | 32975823 | . | C | G | p.Val100Leu | c.298G>C | missense | 0 | 0.00000863 |
| 6 | 32975825 | . | A | G | p.Leu99Pro | c.296T>C | missense | 0 | 0.000008627 |
| 6 | 32975859 | . | C | G | p.Gly88Arg | c.262G>C | missense | 0 | 0.00000862 |
| 6 | 32975886 | . | G | A | p.Arg79Cys | c.235C>T | missense | 0 | 0.000008618 |
| 6 | 32975895 | . | C | T | p.Asp76Asn | c.226G>A | missense | 0 | 0.000008616 |
| 6 | 32975913 | . | G | A | p.Arg70Cys | c.208C>T | missense | 0 | 0.000008616 |
| 6 | 32975897 | . | C | G | p.Gly75Ala | c.224G>C | missense | 0 | 0.000008615 |
| 6 | 32975897 | . | C | T | p.Gly75Asp | c.224G>A | missense | 0 | 0.000008615 |
| 6 | 32975912 | . | C | G | p.Arg70Pro | c.209G>C | missense | 0 | 0.000008615 |
| 6 | 32975914 | . | C | T | p.Trp69Ter | c.207G>A | stop gained | 0 | 0.000008615 |
| 6 | 32975927 | . | C | G | p.Ser65Thr | c.194G>C | missense | 0 | 0.000008615 |
| 6 | 32974857 | . | C | G | p.Arg250Thr | c.749G>C | missense | 0 | 0.000008604 |
| 6 | 32974873 | . | C | T | p.Val245Met | c.733G>A | missense | 0 | 0.000008486 |
| 6 | 32974873 | . | CAT | C | p.Tyr244CysfsTer43 | c.731_732delAT | frameshift | 0 | 0.000008486 |
| 6 | 32974887 | . | A | G | p.Ile240Thr | c.719T>C | missense | 0 | 0.000008427 |
| 6 | 32974891 | . | T | C | p.Ile239Val | c.715A>G | missense | 0 | 0.000008418 |
| 6 | 32974986 | . | T | A | p.Gln207Leu | c.620A>T | missense | 0 | 0.000008406 |
| 6 | 32974985 | . | C | A | p.Gln207His | c.621G>T | missense | 0 | 0.000008405 |
| 6 | 32974978 | . | T | C | p.Ile210Val | c.628A>G | missense | 0 | 0.000008399 |
| 6 | 32974963 | . | C | A | p.Ala215Ser | c.643G>T | missense | 0 | 0.000008394 |
| 6 | 32974954 | . | T | A | p.Thr218Ser | c.652A>T | missense | 0 | 0.000008392 |

All single nucleotide variants found in human HLA-DOA from ExAC. <http://exac.broadinstitute.org/gene/ENSG00000204252>.
Ref, DOA*0101 common allele. RSID, SNP.