**Supplementary Table 3:** Predicted CTL and HTL epitopes of envelope protein.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Type** | **Epitope** | **Start** | **End** | **Length** | **Antigenic Value** | **Topology** | **No. of HLAs** |
| CTL Epitopes | LLFLAFVVF | 18 | 26 | 9 | 0.8144 | Outside | 81 |
| LTALRLCAY  | 34 | 42 | 9 | 0.2825 | Inside | 81 |
| FLAFVVFLLV | 20 | 29 | 10 | 0.5651 | Outside | 27 |
| RVKNLNSSR | 61 | 69 | 9 | 0.8998 | Inside | 81 |
| FLAFVVFLL | 20 | 28 | 9 | 0.5308 | Outside | 54 |
| LVKPSFYVY | 51 | 59 | 9 | 0.4213 | Outside | 81 |
| LAFVVFLLV | 21 | 29 | 9 | 0.7976 | Outside | 54 |
| TLAILTALR | 30 | 38 | 9 | 0.7223 | Inside | 81 |
| VLLFLAFVV | 17 | 25 | 9 | 0.5677 | Outside | 54 |
| VSLVKPSFY | 49 | 57 | 9 | 0.7476 | Outside | 81 |
| SVLLFLAFV | 16 | 24 | 9 | 0.4765 | Outside | 54 |
| SLVKPSFYV | 50 | 58 | 9 | 0.4140 | Outside | 27 |
| FLLVTLAIL | 26 | 34 | 9 | 0.9645 | Outside | 81 |
| SEETGTLIV | 6 | 14 | 9 | 0.3052 | Outside | 81 |
| FVVFLLVTL | 23 | 31 | 9 | 0.7403 | Outside | 81 |
| VFLLVTLAI | 25 | 33 | 9 | 0.8134 | Outside | 54 |
| ETGTLIVNSV | 8 | 17 | 10 | 0.3003 | Inside | 27 |
| IVNSVLLFL | 13 | 21 | 9 | -0.0239 | Outside | 81 |
| TLIVNSVLLF | 11 | 20 | 10 | -0.0561 | Outside | 27 |
| LIVNSVLLF | 12 | 20 | 9 | -0.0953 | Outside | 27 |
| RLCAYCCNI | 38 | 46 | 9 | 1.1243 | Inside | 81 |
| NSVLLFLAF | 15 | 23 | 9 | 0.4134 | Outside | 54 |
| FVSEETGTLI | 4 | 13 | 10 | 0.3044 | Outside | 27 |
| NIVNVSLVK | 45 | 53 | 9 | 0.9310 | Inside | 81 |
| VTLAILTAL | 29 | 37 | 9 | 0.6140 | Outside | 54 |
| KPSFYVYSR | 53 | 61 | 9 | 0.9740 | Inside | 81 |
| LAILTALRL | 31 | 39 | 9 | 0.8872 | Outside | 54 |
| FVSEETGTL | 4 | 12 | 9 | 0.3864 | Outside | 54 |
| FYVYSRVKNL | 56 | 65 | 10 | 0.8286 | Inside | 27 |
| YVYSRVKNL | 57 | 65 | 9 | 0.7020 | Inside | 54 |
| LLVTLAILTA | 27 | 36 | 10 | 0.5774 | Outside | 27 |
| LFLAFVVFL | 19 | 27 | 9 | 0.4568 | Outside | 27 |
| TGTLIVNSV | 9 | 17 | 9 | 0.2573 | Inside | 54 |
| SFYVYSRVK | 55 | 63 | 9 | 0.8251 | Inside | 81 |
| SSRVPDLLV | 67 | 75 | 9 | 0.5455 | Outside | 54 |
| AYCCNIVNV | 41 | 49 | 9 | 1.0856 | Inside | 81 |
|  | VSEETGTLI | 5 | 13 | 9 | 0.2570 | Outside | 27 |
| AILTALRLCA | 32 | 41 | 10 | 0.1882 | Inside | 27 |
| MYSFVSEETG | 1 | 10 | 10 | 0.3885 | Outside | 27 |
| TLIVNSVLL | 11 | 19 | 9 | -0.0406 | Outside | 54 |
| VYSRVKNLN | 58 | 66 | 9 | 1.0946 | Inside | 54 |
| EETGTLIVN | 7 | 15 | 9 | 0.3631 | Inside | 54 |
| LCAYCCNIV | 39 | 47 | 9 | 0.7349 | Inside | 54 |
| NSSRVPDLL | 66 | 74 | 9 | 0.6086 | Outside | 27 |
| ETGTLIVNS | 8 | 16 | 9 | 0.2951 | Inside | 27 |
| CAYCCNIVN | 40 | 48 | 9 | 1.0526 | Inside | 27 |
| VVFLLVTLA | 24 | 32 | 9 | 0.9374 | Outside | 27 |
| VNVSLVKPSF | 47 | 56 | 10 | 0.7346 | Outside | 27 |
| PSFYVYSRV | 54 | 62 | 9 | 0.6060 | Outside | 27 |
| FYVYSRVKN | 56 | 64 | 9 | 0.8145 | Inside | 27 |
| YCCNIVNVSL | 42 | 51 | 10 | 1.3643 | Inside | 27 |
| LLVTLAILT | 27 | 35 | 9 | 0.5583 | Outside | 27 |
| MYSFVSEET | 1 | 9 | 9 | 0.3428 | Outside | 27 |
| LNSSRVPDL | 65 | 73 | 9 | 0.8553 | Outside | 54 |
| YSFVSEETGT | 2 | 11 | 10 | 0.5995 | Outside | 27 |
| GTLIVNSVL | 10 | 18 | 9 | 0.0475 | Outside | 27 |
| CNIVNVSLV | 44 | 52 | 9 | 1.4201 | Inside | 54 |
| NVSLVKPSF | 48 | 56 | 9 | 0.6836 | Outside | 27 |
| CCNIVNVSL | 43 | 51 | 9 | 1.3710 | Inside | 27 |
| YSFVSEETG | 2 | 10 | 9 | 0.6840 | Outside | 27 |
| LVTLAILTA | 28 | 36 | 9 | 0.5720 | Outside | 27 |
| YSRVKNLNS | 59 | 67 | 9 | 0.5961 | Inside | 54 |
| TALRLCAYC | 35 | 43 | 9 | 0.9356 | Inside | 54 |
| ILTALRLCA | 33 | 41 | 9 | 0.1234 | Inside | 27 |
| IVNVSLVKPS | 46 | 55 | 10 | 0.5729 | Outside | 27 |
| KNLNSSRVPD | 63 | 72 | 10 | 0.4746 | Inside | 27 |
| VNSVLLFLA | 14 | 22 | 9 | 0.1915 | Outside | 27 |
| AILTALRLC | 32 | 40 | 9 | 0.3823 | Inside | 27 |
| KNLNSSRVP | 63 | 71 | 9 | 0.2669 | Inside | 54 |
| ALRLCAYCC | 36 | 44 | 9 | 0.7465 | Inside | 54 |
| NLNSSRVPD | 64 | 72 | 9 | 0.4406 | Outside | 27 |
| VKNLNSSRV | 62 | 70 | 9 | 0.4432 | Inside | 27 |
| AFVVFLLVT | 22 | 30 | 9 | 0.6178 | Outside | 27 |
| LRLCAYCCN | 37 | 45 | 9 | 0.7603 | Inside | 27 |
| IVNVSLVKP | 46 | 54 | 9 | 0.4312 | Outside | 27 |
|  | YCCNIVNVS | 42 | 50 | 9 | 1.3929 | Inside | 27 |
| SRVKNLNSS | 60 | 68 | 9 | 0.9490 | Inside | 27 |
| VKPSFYVYS | 52 | 60 | 9 | 1.0547 | Outside | 27 |
| VNVSLVKPS | 47 | 55 | 9 | 0.5145 | Outside | 27 |
| SFVSEETGT | 3 | 11 | 9 | 0.5596 | Outside | 27 |
| HTL Epitopes | LLFLAFVVFLLVTLA | 18 | 32 | 15 | 0.8122 | Outside | 27 |
| VLLFLAFVVFLLVTL | 17 | 31 | 15 | 0.6386 | Outside | 27 |
| LFLAFVVFLLVTLAI | 19 | 33 | 15 | 0.7471 | Outside | 27 |
| VYSRVKNLNSSRVPD | 58 | 72 | 15 | 0.5993 | Inside | 27 |
| YVYSRVKNLNSSRVP | 57 | 71 | 15 | 0.4492 | Inside | 27 |
| SFYVYSRVKNLNSSR | 55 | 69 | 15 | 0.6291 | Inside | 27 |
| FYVYSRVKNLNSSRV | 56 | 70 | 15 | 0.6103 | Inside | 27 |
| VSEETGTLIVNSVLL | 5 | 19 | 15 | 0.1951 | Outside | 27 |
| KPSFYVYSRVKNLNS | 53 | 67 | 15 | 0.8229 | Inside | 27 |
| LTALRLCAYCCNIVN | 34 | 48 | 15 | 0.8649 | Inside | 27 |
| VKPSFYVYSRVKNLN | 52 | 66 | 15 | 1.2319 | Inside | 27 |
| IVNSVLLFLAFVVFL | 13 | 27 | 15 | 0.2731 | Outside | 27 |
| SVLLFLAFVVFLLVT | 16 | 30 | 15 | 0.5446 | Outside | 27 |
| TALRLCAYCCNIVNV | 35 | 49 | 15 | 0.8876 | Inside | 27 |
| LVKPSFYVYSRVKNL | 51 | 65 | 15 | 0.7311 | Outside | 27 |
| SLVKPSFYVYSRVKN | 50 | 64 | 15 | 0.6514 | Outside | 27 |
| SFVSEETGTLIVNSV | 3 | 17 | 15 | 0.3658 | Outside | 27 |
| YSFVSEETGTLIVNS | 2 | 16 | 15 | 0.3987 | Outside | 27 |
| RVKNLNSSRVPDLLV | 61 | 75 | 15 | 0.7925 | Inside | 27 |
| NSVLLFLAFVVFLLV | 15 | 29 | 15 | 0.4220 | Outside | 27 |
| PSFYVYSRVKNLNSS | 54 | 68 | 15 | 0.7986 | Inside | 27 |
| VNSVLLFLAFVVFLL | 14 | 28 | 15 | 0.3985 | Outside | 27 |
| FLAFVVFLLVTLAIL | 20 | 34 | 15 | 0.7476 | Outside | 27 |
| MYSFVSEETGTLIVN | 1 | 15 | 15 | 0.2951 | Outside | 27 |
| LRLCAYCCNIVNVSL | 37 | 51 | 15 | 1.0896 | Inside | 27 |
| VSLVKPSFYVYSRVK | 49 | 63 | 15 | 0.7974 | Outside | 27 |
| VNVSLVKPSFYVYSR | 47 | 61 | 15 | 0.7513 | Outside | 27 |
| NVSLVKPSFYVYSRV | 48 | 62 | 15 | 0.6449 | Outside | 27 |
|  | RLCAYCCNIVNVSLV | 38 | 52 | 15 | 1.2823 | Inside | 27 |
| ALRLCAYCCNIVNVS | 36 | 50 | 15 | 0.9857 | Inside | 27 |
| ILTALRLCAYCCNIV | 33 | 47 | 15 | 0.7427 | Outside | 27 |
| FVSEETGTLIVNSVL | 4 | 18 | 15 | 0.1704 | Outside | 27 |
| YSRVKNLNSSRVPDL | 59 | 73 | 15 | 0.7705 | Inside | 27 |
| LIVNSVLLFLAFVVF | 12 | 26 | 15 | 0.2925 | Outside | 27 |
| LAFVVFLLVTLAILT | 21 | 35 | 15 | 0.8229 | Outside | 27 |
| FVVFLLVTLAILTAL | 23 | 37 | 15 | 0.5738 | Outside | 27 |
| AILTALRLCAYCCNI | 32 | 46 | 15 | 0.7040 | Outside | 27 |
| CNIVNVSLVKPSFYV | 44 | 58 | 15 | 0.8081 | Inside | 27 |
| SRVKNLNSSRVPDLL | 60 | 74 | 15 | 0.7404 | Inside | 27 |
| LCAYCCNIVNVSLVK | 39 | 53 | 15 | 0.8552 | Inside | 27 |
| CCNIVNVSLVKPSFY | 43 | 57 | 15 | 0.8879 | Inside | 27 |
| IVNVSLVKPSFYVYS | 46 | 60 | 15 | 0.6373 | Outside | 27 |
| NIVNVSLVKPSFYVY | 45 | 59 | 15 | 0.7680 | Inside | 27 |
| CAYCCNIVNVSLVKP | 40 | 54 | 15 | 0.8337 | Inside | 27 |
| SEETGTLIVNSVLLF | 6 | 20 | 15 | 0.1882 | Outside | 27 |
| GTLIVNSVLLFLAFV | 10 | 24 | 15 | 0.3383 | Outside | 27 |
| AYCCNIVNVSLVKPS | 41 | 55 | 15 | 0.8053 | Inside | 27 |
| LVTLAILTALRLCAY | 28 | 42 | 15 | 0.4070 | Outside | 27 |
| TLAILTALRLCAYCC | 30 | 44 | 15 | 0.7304 | Outside | 27 |
| VVFLLVTLAILTALR | 24 | 38 | 15 | 0.7559 | Outside | 27 |
| LAILTALRLCAYCCN | 31 | 45 | 15 | 0.7009 | Outside | 27 |
| VTLAILTALRLCAYC | 29 | 43 | 15 | 0.8599 | Outside | 27 |
| TGTLIVNSVLLFLAF | 9 | 23 | 15 | 0.3354 | Outside | 27 |
| VFLLVTLAILTALRL | 25 | 39 | 15 | 0.7218 | Outside | 27 |
| TLIVNSVLLFLAFVV | 11 | 25 | 15 | 0.2903 | Outside | 27 |
| YCCNIVNVSLVKPSF | 42 | 56 | 15 | 0.9396 | Inside | 27 |
| FLLVTLAILTALRLC | 26 | 40 | 15 | 0.6311 | Outside | 27 |
| LLVTLAILTALRLCA | 27 | 41 | 15 | 0.3840 | Outside | 27 |