

HIV CTL Epitope Alignments

CTL

Protease Epitope 1

| Epitope # | HLA |
|--------------------|------------------|
| 1 | ITLWQRPLV |
| A*6802,A*7401,A19 | |
| B.FR.HXB2 | VTLWQRPLV |
| CONSENSUS-A | I----- |
| A.KE.Q23-CXC-CG | I----- |
| A.SE.SE6594 | I----- |
| A.SE.SE7253 | I----- |
| A.SE.SE7535 | I----- |
| A.SE.SE8131 | I-----I- |
| A.SE.SE8538 | I----- |
| A.SE.SE8891 | I-F----- |
| A.UG.92UG037 | I----- |
| A.UG.U455 | I----- |
| AC.ET.E3099G | I-----x- |
| AC.IN.21301 | I----- |
| AC.RW.92RW009 | I----- |
| AC.SE.SE9488 | I----- |
| AC.ZM.ZAM184 | I----- |
| ACD.SE.SE8603 | I----- |
| AD.SE.SE6954 | I----- |
| AD.SE.SE7108 | I----- |
| ADU.CD.MAL | I-----V- |
| AG.NG.G3 | I----- |
| AG.SE.SE7812 | I----- |
| AGHU.GA.VI354 | I----- |
| AGHU.NO.NOGIL3 | I-----V- |
| AGJ.AU.BFP90 | I----- |
| AGJ.ML.95ML8 | I----- |
| AGU.CD.Z321 | I-----I- |
| CRF01_AE.CF.90CF40 | I----- |
| CRF01_AE.TH.93TH25 | I----- |
| CRF01_AE.TH.CM240 | I----- |
| CRF01_AE.TH.PAT-SC | I----- |
| CRF01_AE.TH.TH022 | I----- |
| CRF01_AE.TH.TH047 | I----- |
| CRF02_AG.FR.DJ263 | I----- |
| CRF02_AG.FR.DJ264 | I----- |
| CRF02_AG.NG.IBNG | I----- |
| CRF03_AB.RU.KAL153 | I----R---- |
| CRF04_CPX.CY.94CY0 | I----- |
| CRF04_CPX.GR.97PVC | I----p---- |
| CRF04_CPX.GR.97PVM | I----- |
| CONSENSUS-B | i----- |
| B.-.NL43E9 | I----- |
| B.AU.MBC18 | I----- |
| B.AU.MBC200 | I----- |
| B.AU.MBC925 | I----- |
| B.AU.MBCC54 | I----- |
| B.AU.MBCC98 | I----- |

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|--------------------|---------------|
| B.AU.MBCD36 | I----- |
| B.CN.RL42 | I----- |
| B.DE.D31 | I----- |
| B.DE.HAN | I----- |
| B.FR.HXB2 | ----- |
| B.GA.OYI | I-----I- |
| B.GB.CAM1 | I----- |
| B.GB.MANC | T----- |
| B.NL.3202A21 | I----- |
| B.TW.LM49 | I----- |
| B.US.AD8 | I-----I- |
| B.US.BC | I----- |
| B.US.DH123 | I----- |
| B.US.JRCSF | I----- |
| B.US.JRFL | I----- |
| B.US.MNCG | I-----I- |
| B.US.NY5CG | I----- |
| B.US.P896 | I----- |
| B.US.RF | I-----I- |
| B.US.SF2 | I----- |
| B.US.WEAU160 | I----- |
| B.US.WR27 | I--C----- |
| B.US.YU2 | I----- |
| BF.BR.93BR029.4 | I----- |
| CONSENSUS-C | I----- |
| C.BR.92BR025 | I----- |
| C.BW.96BW01B03 | I----- |
| C.BW.96BW0402 | I----- |
| C.BW.96BW0502 | I----- |
| C.BW.96BW1104 | I----- |
| C.BW.96BW1210 | I----- |
| C.BW.96BW15B03 | I----- |
| C.BW.96BW1626 | I----- |
| C.BW.96BW17A09 | I----- |
| C.ET.ETH2220 | I----- |
| C.IN.21068 | I----- |
| C.IN.301904 | I----- |
| C.IN.301905 | I----- |
| C.IN.301999 | I----- |
| C.IN.94IN11246 | I----- |
| CONSENSUS-D | I----- |
| D.CD.84ZR085 | I-----V- |
| D.CD.ELI | I----- |
| D.CD.NDK | I----- |
| D.CD.Z2Z6 | I----- |
| D.UG.94UG1141 | I-----V- |
| DF.CD.VI961 | I-F-----V- |
| CONSENSUS-F | I----- |
| F1.BE.VI850 | I----- |
| F1.BR.93BR020.1 | I----- |
| F1.FI.FIN9363 | I----- |
| F1.FR.MP411 | I-F----- |

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| F2.CM.MP255 | I----- |
| F2.CM.MP257 | I-----V- |
| CONSENSUS-G | I----- |
| G.BE.DRCBL | I-----I- |
| G.FI.HH8793 | I----- |
| G.NG.92NG083 | I----- |
| G.SE.SE6165 | I----- |
| CONSENSUS-H | I----- |
| H.BE.VI991 | I-----I- |
| H.BE.VI997 | I----- |
| H.CF.90CF056 | I----- |
| CONSENSUS-J | I----- |
| J.SE.SE9173 | I----- |
| J.SE.SE9280 | I----- |
| CONSENSUS-K | I-----?- |
| K.CD.EQTB11C | I-----V- |
| K.CM.MP535 | I-----I- |
| CONSENSUS-N | I-----VI |
| N.CM.YBF30 | I-----VI |
| CONSENSUS-O | IP--D--I- |
| O.CM.ANT70C | IP--D--I- |
| O.CM.MVP5180 | IP--D--I- |
| CONSENSUS-U | I-----I- |
| U.CD.VI1126 | I-----I- |
| CONSENSUS-CPZ | I-----? |
| CPZ.CD.CPZANT | IP-----MM |
| CPZ.GA.CPZGAB | I-----I |
| CPZ.US.CPZUS | I-----L |

Protease Epitope 2

| | | |
|--------------------|------------------|--------|
| Epitope # | | HLA |
| 2 | DTVLEEMNL | A*6802 |
| B.FR.HXB2 | DTVLEEMSL | |
| CONSENSUS-A | -----DIN- | |
| A.KE.Q23-CXC-CG | -----DIN- | |
| A.SE.SE6594 | -----DIN- | |
| A.SE.SE7253 | -----DIN- | |
| A.SE.SE7535 | -----DIN- | |
| A.SE.SE8131 | -----DIN- | |
| A.SE.SE8538 | -----DIN- | |
| A.SE.SE8891 | -----DIN- | |
| A.UG.92UG037 | -----DIN- | |
| A.UG.U455 | -----DIN- | |
| AC.ET.E3099G | -----IN- | |
| AC.IN.21301 | -----IN- | |
| AC.RW.92RW009 | -----IN- | |
| AC.SE.SE9488 | -----DIN- | |
| AC.ZM.ZAM184 | -----DIN- | |
| ACD.SE.SE8603 | -----DIN- | |
| AD.SE.SE6954 | -----IN- | |
| AD.SE.SE7108 | -----DIN- | |
| ADU.CD.MAL | -----IN- | |
| AG.NG.G3 | -----QIN- | |
| AG.SE.SE7812 | -----IN- | |
| AGHU.GA.VI354 | -----IN- | |
| AGHU.NO.NOGIL3 | -----D-N- | |
| AGJ.AU.BFP90 | -----DIN- | |
| AGJ.ML.95ML8 | -----DIN- | |
| AGU.CD.Z321 | -----IK- | |
| CRF01_AE.CF.90CF40 | -----DIN- | |
| CRF01_AE.TH.93TH25 | -----DIN- | |
| CRF01_AE.TH.CM240 | -----DIN- | |
| CRF01_AE.TH.PAT-SC | -----DIN- | |
| CRF01_AE.TH.TH022 | -----DIN- | |
| CRF01_AE.TH.TH047 | -----DIN- | |
| CRF02_AG.FR.DJ263 | -----IN- | |
| CRF02_AG.FR.DJ264 | -----IN- | |
| CRF02_AG.NG.IBNG | -----DIN- | |
| CRF03_AB.RU.KAL153 | -----DIN- | |
| CRF04_CPX.CY.94CY0 | -----IN- | |
| CRF04_CPX.GR.97PVC | -----DIN- | |
| CRF04_CPX.GR.97PVM | -----IN- | |
| CONSENSUS-B | -----n- | |
| B.-.NL43E9 | -----N- | |
| B.AU.MBC18 | -----D-H- | |
| B.AU.MBC200 | ---V---N- | |
| B.AU.MBC925 | -----N- | |
| B.AU.MBCC54 | -----N- | |
| B.AU.MBCC98 | -----A- | |
| B.AU.MBCD36 | -----K-N- | |

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| B.CN.RL42 | -----D-N- |
| B.DE.D31 | ----- |
| B.DE.HAN | ---V----- |
| B.FR.HXB2 | ----- |
| B.GA.OYI | -----N- |
| B.GB.CAM1 | -----N- |
| B.GB.MANC | -----N- |
| B.NL.3202A21 | -----N- |
| B.TW.LM49 | -----N- |
| B.US.AD8 | -----D-N- |
| B.US.BC | -----N- |
| B.US.DH123 | -----IN- |
| B.US.JRCSF | -----D-D- |
| B.US.JRFL | -----D-D- |
| B.US.MNCG | ----G--N- |
| B.US.NY5CG | -----N- |
| B.US.P896 | -----D--- |
| B.US.RF | -----N- |
| B.US.SF2 | -----N- |
| B.US.WEAU160 | -----D-N- |
| B.US.WR27 | ----- |
| B.US.YU2 | -----N- |
| BF.BR.93BR029.4 | -----IN- |
| CONSENSUS-C | -----in- |
| C.BR.92BR025 | -----IK- |
| C.BW.96BW01B03 | -----IN- |
| C.BW.96BW0402 | -----DIN- |
| C.BW.96BW0502 | N-----IN- |
| C.BW.96BW1104 | -----IN- |
| C.BW.96BW1210 | -----DIN- |
| C.BW.96BW15B03 | ----- |
| C.BW.96BW1626 | -----IN- |
| C.BW.96BW17A09 | -A---DIN- |
| C.ET.ETH2220 | -----IN- |
| C.IN.21068 | -----V-- |
| C.IN.301904 | -----VN- |
| C.IN.301905 | -----VN- |
| C.IN.301999 | -----VN- |
| C.IN.94IN11246 | -----VN- |
| CONSENSUS-D | -----in- |
| D.CD.84ZR085 | -----DIN- |
| D.CD.ELI | -----N- |
| D.CD.NDK | -----IN- |
| D.CD.Z2Z6 | -----N- |
| D.UG.94UG1141 | -----IN- |
| DF.CD.VI961 | -----N- |
| CONSENSUS-F | -----Din- |
| F1.BE.VI850 | -----DIN- |
| F1.BR.93BR020.1 | -----DVN- |
| F1.FI.FIN9363 | -----DIN- |
| F1.FR.MP411 | -----DID- |
| F2.CM.MP255 | -----DIN- |

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| F2.CM.MP257 | -----DIN- |
| CONSENSUS-G | -----In- |
| G.BE.DRCBL | -----ID- |
| G.FI.HH8793 | -----DIK- |
| G.NG.92NG083 | -----GIN- |
| G.SE.SE6165 | -----IN- |
| CONSENSUS-H | -----IN- |
| H.BE.VI991 | -----DIN- |
| H.BE.VI997 | -----IN- |
| H.CF.90CF056 | -----IN- |
| CONSENSUS-J | -----?ID- |
| J.SE.SE9173 | -----ID- |
| J.SE.SE9280 | -----DID- |
| CONSENSUS-K | -----IN- |
| K.CD.EQTB11C | -----IN- |
| K.CM.MP535 | -----IN- |
| CONSENSUS-N | ---I--LQ- |
| N.CM.YBF30 | ---I--LQ- |
| CONSENSUS-O | -----NNIQ- |
| O.CM.ANT70C | -----NNIQ- |
| O.CM.MVP5180 | -----NNIQ- |
| CONSENSUS-U | -----DIN- |
| U.CD.VI1126 | -----DIN- |
| CONSENSUS-CPZ | ---?-?Iq- |
| CPZ.CD.CPZANT | ---V-GIH- |
| CPZ.GA.CPZGAB | ---I-RIQ- |
| CPZ.US.CPZUS | ----DNIQI |

HIV CTL Epitope Alignments

CTL

Protease Epitope 3

| | | |
|--------------------|-------------------|--------|
| Epitope # | VLVGPTPVNI | HLA |
| 3 | VLVGPTPVNI | A*0201 |
| B.FR.HXB2 | VLVGPTPVNI | |
| CONSENSUS-A | ----- | |
| A.KE.Q23-CXC-CG | ----- | |
| A.SE.SE6594 | ----- | |
| A.SE.SE7253 | ----- | |
| A.SE.SE7535 | ----- | |
| A.SE.SE8131 | ----- | |
| A.SE.SE8538 | ----- | |
| A.SE.SE8891 | ----- | |
| A.UG.92UG037 | ----- | |
| A.UG.U455 | ----- | |
| AC.ET.E3099G | ----- | |
| AC.IN.21301 | ----- | |
| AC.RW.92RW009 | -----S--- | |
| AC.SE.SE9488 | ----- | |
| AC.ZM.ZAM184 | ----- | |
| ACD.SE.SE8603 | ----- | |
| AD.SE.SE6954 | ----- | |
| AD.SE.SE7108 | ----- | |
| ADU.CD.MAL | I----- | |
| AG.NG.G3 | -----I-- | |
| AG.SE.SE7812 | ----- | |
| AGHU.GA.VI354 | -----I-- | |
| AGHU.NO.NOGIL3 | --A----- | |
| AGJ.AU.BFP90 | -----I-- | |
| AGJ.ML.95ML8 | ----- | |
| AGU.CD.Z321 | -----I-- | |
| CRF01_AE.CF.90CF40 | ----- | |
| CRF01_AE.TH.93TH25 | ----- | |
| CRF01_AE.TH.CM240 | ----- | |
| CRF01_AE.TH.PAT-SC | ----- | |
| CRF01_AE.TH.TH022 | ----- | |
| CRF01_AE.TH.TH047 | ----- | |
| CRF02_AG.FR.DJ263 | ----- | |
| CRF02_AG.FR.DJ264 | ----- | |
| CRF02_AG.NG.IBNG | ----- | |
| CRF03_AB.RU.KAL153 | ----- | |
| CRF04_CPX.CY.94CY0 | ----- | |
| CRF04_CPX.GR.97PVC | ----- | |
| CRF04_CPX.GR.97PVM | -----A-- | |
| CONSENSUS-B | ----- | |
| B.-.NL43E9 | ----- | |
| B.AU.MBC18 | ----- | |
| B.AU.MBC200 | ----- | |
| B.AU.MBC925 | ----- | |
| B.AU.MBCC54 | ----- | |
| B.AU.MBCC98 | ----- | |
| B.AU.MBCD36 | ----- | |

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|--------------------|----------|
| B.CN.RL42 | ----- |
| B.DE.D31 | ----- |
| B.DE.HAN | ----- |
| B.FR.HXB2 | ----- |
| B.GA.OYI | ----- |
| B.GB.CAM1 | ----- |
| B.GB.MANC | ----- |
| B.NL.3202A21 | ----- |
| B.TW.LM49 | ----- |
| B.US.AD8 | ----- |
| B.US.BC | ----- |
| B.US.DH123 | ----- |
| B.US.JRCSF | ----- |
| B.US.JRFL | ----- |
| B.US.MNCG | ----- |
| B.US.NY5CG | ----- |
| B.US.P896 | ----- |
| B.US.RF | ----- |
| B.US.SF2 | ----- |
| B.US.WEAU160 | ----- |
| B.US.WR27 | ----- |
| B.US.YU2 | ----- |
| BF.BR.93BR029.4 | ----- |
| CONSENSUS-C | ----- |
| C.BR.92BR025 | ----- |
| C.BW.96BW01B03 | ----- |
| C.BW.96BW0402 | ----- |
| C.BW.96BW0502 | ----- |
| C.BW.96BW1104 | ----- |
| C.BW.96BW1210 | ----- |
| C.BW.96BW15B03 | --I----- |
| C.BW.96BW1626 | ----- |
| C.BW.96BW17A09 | ----- |
| C.ET.ETH2220 | ----- |
| C.IN.21068 | ----- |
| C.IN.301904 | ----- |
| C.IN.301905 | ----- |
| C.IN.301999 | ----- |
| C.IN.94IN11246 | ----- |
| CONSENSUS-D | ----- |
| D.CD.84ZR085 | ----- |
| D.CD.ELI | ----- |
| D.CD.NDK | ----- |
| D.CD.Z2Z6 | ----- |
| D.UG.94UG1141 | ----- |
| DF.CD.VI961 | ----- |
| CONSENSUS-F | ----- |
| F1.BE.VI850 | ----- |
| F1.BR.93BR020.1 | ----- |
| F1.FI.FIN9363 | ----- |
| F1.FR.MP411 | ----- |
| F2.CM.MP255 | ----- |

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|----------------------|------------|
| F2.CM.MP257 | ----- |
| CONSENSUS-G | -----I-- |
| G.BE.DRCBL | -----I-- |
| G.FI.HH8793 | -----I-- |
| G.NG.92NG083 | -----I-- |
| G.SE.SE6165 | I-----I-- |
| CONSENSUS-H | ----- |
| H.BE.VI991 | ----- |
| H.BE.VI997 | ----- |
| H.CF.90CF056 | ----- |
| CONSENSUS-J | --I----- |
| J.SE.SE9173 | --I----- |
| J.SE.SE9280 | --I----- |
| CONSENSUS-K | ----- |
| K.CD.EQTB11C | ----- |
| K.CM.MP535 | ----- |
| CONSENSUS-N | ----- |
| N.CM.YBF30 | ----- |
| CONSENSUS-O | ----- |
| O.CM.ANT70C | ----- |
| O.CM.MVP5180 | ----- |
| CONSENSUS-U | ----- |
| U.CD.VI1126 | ----- |
| CONSENSUS-CPZ | ----- |
| CPZ.CD.CPZANT | --L--N---- |
| CPZ.GA.CPZGAB | ----- |
| CPZ.US.CPZUS | ----- |