



nHLAPred
A neural network based MHC Class-I Binding Peptide Prediction Server

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Antigen Name	Untitled
Scanned on	Fri Feb 5 17:09:55 2010
Length of input sequence	250 amino acids
Number of nonamers from input sequence	242
Threshold setting	.5
Number of alleles in query	67
Number of top scorers to be displayed	4
Number of top scorers to be displayed	4
Proteosome Filter	on at 5 threshold
ImmunoProteosome Filter	on at 5 threshold

ALLELE: HLA-A1				
Threshold for .5 % with score: .5				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
ANNs+QM	1	IFAGGILVA	191	0.420
ANNs+QM	2	AFYLRAKVT	44	0.340
ANNs+QM	3	AAADINYVL	125	0.260
ANNs+QM	4	WAPNAIWKA	210	0.140

ALLELE: HLA-A2				
Threshold for .5 % with score: .5				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
ANNs+QM	1	GMRIAPFVL	80	1.000
ANNs+QM	2	RIAPFVLPL	82	0.990
ANNs+QM	3	VLSTAIAGL	30	0.980
ANNs+QM	4	AAADINYVL	125	0.980

ALLELE: HLA-A*0201				
Threshold for .5 % with score: .5				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
ANNS+QM	1	VLSTAIAGL	30	1.000
ANNS+QM	2	GMRIAPFVL	80	1.000
ANNS+QM	3	LLKGHVTL	160	1.000
ANNS+QM	4	VTLLAPINL	165	1.000

ALLELE: HLA-A*0202				
Threshold for .5 % with score: .5				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
ANNS+QM	1	IVIALAFYL	39	1.000
ANNS+QM	2	VLSTAIAGL	30	0.980
ANNS+QM	3	LLKGHVTL	160	0.980
ANNS+QM	4	LLKSAAADI	121	0.970

ALLELE: HLA-A*0203				
Threshold for .5 % with score: .5				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
ANNS+QM	1	LLKGHVTL	160	1.000
ANNS+QM	2	RIAPFVLPL	82	0.950
ANNS+QM	3	NIFAGGILV	190	0.950
ANNS+QM	4	VLSTAIAGL	30	0.820

ALLELE: HLA-A*0206				
Threshold for .5 % with score: .5				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
ANNS+QM	1	LPLAVTIFV	88	1.000
ANNS+QM	2	VLSTAIAGL	30	0.990
ANNS+QM	3	RIAPFVLPL	82	0.990
ANNS+QM	4	NIFAGGILV	190	0.910

ALLELE: HLA-A*0205				
Threshold for 4 % with score: 5.950				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
QM	1	IVIALAFYL	39	12.000
QM	2	GMRIAPFVL	80	11.790
QM	3	RIAPFVLPL	82	10.120
QM	4	VLSTAIAGL	30	9.800

ALLELE: HLA-A*1101				
Threshold for 4 % with score: 4				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
ANNS+QM	1	RIAPFVLPL	82	0.650
ANNS+QM	2	APINLVEEV	169	0.440
ANNS+QM	3	SLRLFGNIF	184	0.420
ANNS+QM	4	GHTTELLKS	116	0.350

ALLELE: HLA-A11				
Threshold for 4 % with score: 4				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
ANNS+QM	1	LLKSAAADI	121	0.950
ANNS+QM	2	IVIALAFYL	39	0.820
ANNS+QM	3	TVLSTAIAG	29	0.780
ANNS+QM	4	RLFGNIFAG	186	0.720

ALLELE: HLA-A24				
Threshold for 4 % with score: 7.670				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
QM	1	GMRIAPFVL	80	15.430
QM	2	VFILISNWL	96	10.320
QM	3	VGAIQAFIF	223	9.830
QM	4	MTVNTDTVL	23	9.070

ALLELE: HLA-A*2402				
Threshold for 4 % with score: 4				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
ANNS+QM	1	SLRLFGNIF	184	0.900
ANNS+QM	2	VLSTAIAGL	30	0.720
ANNS+QM	3	VTLLAPINL	165	0.640
ANNS+QM	4	GMRIAPFVL	80	0.630

ALLELE: HLA-A3				
Threshold for 4 % with score: 4				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
ANNS+QM	1	RLFGNIFAG	186	0.880
ANNS+QM	2	WAPNAIWKA	210	0.870
ANNS+QM	3	NIFAGGILV	190	0.680
ANNS+QM	4	TVLSTAIAG	29	0.560

ALLELE: HLA-A*3101				
Threshold for 4 % with score: -1.609				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
QM	1	RIAPFVLPL	82	-1.427
QM	2	IVIALAFYL	39	-2.120
QM	3	NIFAGGILV	190	-2.120

ALLELE: HLA-A31				
Threshold for 4 % with score: 4				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
ANNS+QM	1	NIFAGGILV	190	0.900
ANNS+QM	2	IVGHPIKLL	153	0.820
ANNS+QM	3	TAIAGLIVI	33	0.780
ANNS+QM	4	LPLAVTIFV	88	0.680

ALLELE: HLA-A*0301				
Threshold for 4 % with score: 4				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
ANNS+QM	1	AFYLRKAVT	44	0.890
ANNS+QM	2	IKLLKGHVT	158	0.890
ANNS+QM	3	TVLSTAIAG	29	0.580
ANNS+QM	4	LLKSAAADI	121	0.490

ALLELE: HLA-A*3302				
Threshold for 4 % with score: -0.105				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
QM	1	DLFVGAIQA	220	-0.105
QM	2	IVIALAFYL	39	-0.693
QM	3	GMRIAPFVL	80	-0.693

ALLELE: HLA-A68.1				
Threshold for 4 % with score: 1.609				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
QM	1	IVIALAFYL	39	2.079
QM	2	IVGHPIKLL	153	2.079
QM	3	MTVNTDTVL	23	1.099
QM	4	VTLLAPINL	165	0.693

ALLELE: HLA-A20 Cattle				
Threshold for 4 % with score: 3.401				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
QM	1	IKLLKGHVT	158	4.605
QM	2	GMRIAPFVL	80	3.219
QM	3	VLSTAIAGL	30	2.708
QM	4	LLKGHVTL	160	2.708

ALLELE: HLA-A2.1				
Threshold for 4 % with score: 4				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
ANNS+QM	1	IVIALAFYL	39	1.000
ANNS+QM	2	TAIAGLIVI	33	0.990
ANNS+QM	3	VLSTAIAGL	30	0.980
ANNS+QM	4	LLKGHVTL	160	0.980

ALLELE: HLA-B14				
Threshold for 4 % with score: 4				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
ANNS+QM	1	AAADINYVL	125	0.980
ANNS+QM	2	VTLLAPINL	165	0.950
ANNS+QM	3	IAGLIVIAL	35	0.940
ANNS+QM	4	VFILISNWL	96	0.930

ALLELE: HLA-B*2702				
Threshold for 4 % with score: 0.000				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
QM	1	SLRLFGNIF	184	1.099
QM	2	GMRIAPFVL	80	0.405
QM	3	VLSTAIAGL	30	-0.105

ALLELE: HLA-B27				
Threshold for 4 % with score: 4				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
ANNS+QM	1	IKLLKGHVT	158	0.210
ANNS+QM	2	RIAPFVLPL	82	0.170
ANNS+QM	3	IAGLIVIAL	35	0.090
ANNS+QM	4	GMRIAPFVL	80	0.080

ALLELE: HLA-B*2705				
Threshold for 4 % with score: 4				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
ANNS+QM	1	VFILISNWL	96	0.850
ANNS+QM	2	VTLLAPINL	165	0.750
ANNS+QM	3	TAIAGLIVI	33	0.640
ANNS+QM	4	KPISLSLRL	179	0.550

ALLELE: HLA-B*3501				
Threshold for 4 % with score: 4				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
ANNS+QM	1	KPISLSLRL	179	1.000
ANNS+QM	2	LPLAVTIFV	88	0.980
ANNS+QM	3	HPIKLLKGH	156	0.960
ANNS+QM	4	VFILISNWL	96	0.790

ALLELE: HLA-B*3701				
Threshold for 4 % with score: 0.405				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
QM	1	TDTVLSTAI	27	3.689
QM	2	TDVPGGVQL	54	3.689
QM	3	ADINYVLAL	127	3.689
QM	4	EEVAKPISL	175	2.303

ALLELE: HLA-B*3801				
Threshold for 4 % with score: 0.445				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
QM	1	KHGHTTELL	114	3.401
QM	2	GHTTELLKS	116	1.281
QM	3	VFILISNWL	96	0.956
QM	4	AAADINYVL	125	0.956

ALLELE: HLA-B*3901				
Threshold for 4 % with score: 1.792				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
QM	1	KHGHTELL	114	4.500
QM	2	IVIALAFYL	39	1.792
QM	3	VFILISNWL	96	1.792
QM	4	AAADINYVL	125	1.792

ALLELE: HLA-B*3902				
Threshold for 4 % with score: 0.693				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
QM	1	IAGLIVIAL	35	0.875
QM	2	IVIALAFYL	39	0.875
QM	3	RIAPFVLPL	82	0.875
QM	4	VFILISNWL	96	0.875

ALLELE: HLA-B*40				
Threshold for 4 % with score: 0.000				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
QM	1	EEVAKPISL	175	4.382
QM	2	TDVPGGVQL	54	2.996
QM	3	ADINYVLAL	127	2.996
QM	4	GNIFAGGIL	189	1.386

ALLELE: HLA-B*4403				
Threshold for 4 % with score: 0.405				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
QM	1	ADINYVLAL	127	2.708
QM	2	EEVAKPISL	175	2.485
QM	3	VGAIQAFIF	223	1.910
QM	4	APINLVEEV	169	1.099

ALLELE: HLA-B*5101				
Threshold for 4 % with score: 4				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
ANNS+QM	1	LPLAVTIFV	88	1.000
ANNS+QM	2	APINLVEEV	169	1.000
ANNS+QM	3	HPIKLLKGH	156	0.990
ANNS+QM	4	KPISLSLRL	179	0.980

ALLELE: HLA-B*5102				
Threshold for 4 % with score: 9.050				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
QM	1	LPLAVTIFV	88	14.730
QM	2	APINLVEEV	169	12.200
QM	3	TAIAGLIVI	33	7.210
QM	4	FAGGILVAL	192	6.910

ALLELE: HLA-B*5103				
Threshold for 4 % with score: 9.280				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
QM	1	LPLAVTIFV	88	14.730
QM	2	APINLVEEV	169	12.200
QM	3	VGAIQAFIF	223	11.620
QM	4	TAIAGLIVI	33	7.210

ALLELE: HLA-B*5201				
Threshold for 4 % with score: 1.974				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
QM	1	LPLAVTIFV	88	4.777
QM	2	VGAIQAFIF	223	3.807
QM	3	TAIAGLIVI	33	3.679
QM	4	APINLVEEV	169	3.091

ALLELE: HLA-B*5301				
Threshold for 4 % with score: 4				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
ANNS+QM	1	KPISLSLRL	179	1.000
ANNS+QM	2	LPLAVTIFV	88	0.950
ANNS+QM	3	HPIKLLKGH	156	0.880
ANNS+QM	4	APINLVEEV	169	0.840

ALLELE: HLA-B*5401				
Threshold for 4 % with score: 4				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
ANNS+QM	1	LPLAVTIFV	88	1.000
ANNS+QM	2	KPISLSLRL	179	1.000
ANNS+QM	3	APINLVEEV	169	0.970
ANNS+QM	4	HPIKLLKGH	156	0.940

ALLELE: HLA-B*51				
Threshold for 4 % with score: 4				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
ANNS+QM	1	KPISLSLRL	179	1.000
ANNS+QM	2	LPLAVTIFV	88	0.990
ANNS+QM	3	VFILISNWL	96	0.970
ANNS+QM	4	HPIKLLKGH	156	0.970

ALLELE: HLA-B*5801				
Threshold for 4 % with score: -0.223				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
QM	1	HTTELLKSA	117	1.974
QM	2	NTDTVLSTA	26	1.472
QM	3	TTELLKSAA	118	1.099
QM	4	IAGLIVIAL	35	0.993

ALLELE: HLA-B60				
Threshold for 4 % with score: 1.386				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
QM	1	EEVAKPISL	175	6.461
QM	2	TDVPGGVQL	54	4.477
QM	3	ADINYVLAL	127	4.382
QM	4	KPISLSLRL	179	2.963

ALLELE: HLA-B61				
Threshold for 4 % with score: 0.000				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
QM	1	EEVAKPISL	175	2.773
QM	2	TDTVLSTAI	27	0.693
QM	3	TDVPGGVQL	54	0.693
QM	4	LPLAVTIFV	88	0.693

ALLELE: HLA-B62				
Threshold for 4 % with score: 0.693				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
QM	1	SLRLFGNIF	184	5.481
QM	2	LLKGHVTL	160	2.156
QM	3	LLKSAAADI	121	1.792
QM	4	DLFVGAIQA	220	1.569

ALLELE: HLA-B7				
Threshold for 4 % with score: 4				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
ANNS+QM	1	IVIALAFYL	39	1.000
ANNS+QM	2	KPISLSLRL	179	1.000
ANNS+QM	3	TAIAGLIVI	33	0.990
ANNS+QM	4	LPLAVTIFV	88	0.980

ALLELE: HLA-B*0702				
Threshold for 4 % with score: 4				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
ANNS+QM	1	LPLAVTIFV	88	1.000
ANNS+QM	2	KPISLSLRL	179	1.000
ANNS+QM	3	HPIKLLKGH	156	0.950
ANNS+QM	4	APINLVEEV	169	0.860

ALLELE: HLA-B8				
Threshold for 4 % with score: 4				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
ANNS+QM	1	GMRIAPFVL	80	0.680
ANNS+QM	2	NAIWKAFDL	213	0.670
ANNS+QM	3	TAIAGLIVI	33	0.660
ANNS+QM	4	IKLLKGHVT	158	0.650

ALLELE: HLA-Cw*0301				
Threshold for 4 % with score: 2.015				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
QM	1	TDVPGGVQL	54	4.605
QM	2	NAIWKAFDL	213	3.689
QM	3	IVIALAFYL	39	2.996
QM	4	VFILISNWL	96	2.996

ALLELE: HLA-Cw*0401				
Threshold for 4 % with score: 4.370				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
QM	1	NAIWKAFDL	213	3.430
QM	2	VFILISNWL	96	3.370
QM	3	KPISLSLRL	179	3.310
QM	4	VLSTAIAGL	30	3.030

ALLELE: HLA-Cw*0602				
Threshold for 4 % with score: 1.482				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
QM	1	IAGLIVIAL	35	2.676
QM	2	FAGGILVAL	192	2.676
QM	3	RIAPFVLPL	82	2.485
QM	4	KPISLSLRL	179	1.982

ALLELE: HLA-Cw*0702				
Threshold for 4 % with score: 1.212				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
QM	1	RIAPFVLPL	82	1.905
QM	2	IAGLIVIAL	35	1.846
QM	3	FAGGILVAL	192	1.846
QM	4	AAADINYVL	125	1.307

ALLELE: H2-Db				
Threshold for 4 % with score: 4				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
ANNS+QM	1	RLFGNIFAG	186	1.000
ANNS+QM	2	NAIWKAFDL	213	1.000
ANNS+QM	3	MTVNTDTVL	23	0.960
ANNS+QM	4	TDVPGGVQL	54	0.930

ALLELE: H2-Dd				
Threshold for 4 % with score: 11.800				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
QM	1	VGAIQAFIF	223	13.890
QM	2	WAPNAIWKA	210	12.840
QM	3	GMRIAPFVL	80	10.910
QM	4	SLRLFGNIF	184	10.660

ALLELE: H2-Kb				
Threshold for 4 % with score: 4				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
ANNS+QM	1	AAADINYVL	125	0.960
ANNS+QM	2	VTLLAPINL	165	0.840
ANNS+QM	3	NAIWKAFDL	213	0.840
ANNS+QM	4	VFILISNWL	96	0.760

ALLELE: H2-Kd				
Threshold for 4 % with score: 4				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
ANNS+QM	1	APINLVEEV	169	1.000
ANNS+QM	2	ADINYVLAL	127	0.950
ANNS+QM	3	GMRIAPFVL	80	0.930
ANNS+QM	4	LLKGHVTL	160	0.920

ALLELE: H2-Kk				
Threshold for 4 % with score: 1.609				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
QM	1	TDTVLTSTAI	27	5.298
QM	2	EEVAKPISL	175	3.689
QM	3	TAIAGLIVI	33	2.303
QM	4	TDVPGGVQL	54	2.079

ALLELE: H2-Ld				
Threshold for 4 % with score: 4				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
ANNS+QM	1	AAADINYVL	125	0.840
ANNS+QM	2	NAIWKAFDL	213	0.810
ANNS+QM	3	EEVAKPISL	175	0.630
ANNS+QM	4	KPISLSLRL	179	0.630

ALLELE: HLA-G				
Threshold for 4 % with score: 9.260				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
QM	1	LLKGHVTL	160	18.180
QM	2	VLSTAIAGL	30	16.180
QM	3	RIAPFVLPL	82	15.310
QM	4	IVIALAFYL	39	14.780

ALLELE: H-2Qa				
Threshold for 4 % with score: 6.000				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
QM	1	TDTVLTSTAI	27	7.000
QM	2	IAGLIVIAL	35	6.970
QM	3	EEVAKPISL	175	6.970
QM	4	NAIWKAFDL	213	6.740

ALLELE: HLA-B*2706				
Threshold for 4 % with score: 5.000				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
QM	1	IVGHPIKLL	153	9.330
QM	2	IKLLKGHVT	158	4.800
QM	3	SLRFLGNIF	184	4.330
QM	4	HTTELLKSA	117	4.160

ALLELE: HLA-B35				
Threshold for 4 % with score: 8.350				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
QM	1	KPISLSLRL	179	11.160
QM	2	HPIKLLKGH	156	10.140
QM	3	NAIWKAFDL	213	9.320
QM	4	IVIALAFYL	39	9.090

ALLELE: Mamu-A*01				
Threshold for 4 % with score: 3.650				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
QM	1	IAGLIVIAL	35	4.410
QM	2	IVGHPIKLL	153	3.780
QM	3	VFILISNWL	96	3.570
QM	4	VNTDTVLST	25	3.480

ALLELE: HLA-A*0204				
Threshold for 4 % with score: 12.070				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
QM	1	VLSTAIAGL	30	19.100
QM	2	LLKGHVTL	160	15.760
QM	3	IVGHPIKLL	153	14.780
QM	4	FAGGILVAL	192	14.110

ALLELE: HLA-B*2703				
Threshold for 4 % with score: 5.130				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
QM	1	KHGHTELL	114	3.030
QM	2	SLRFLGNIF	184	2.060
QM	3	APINLVEEV	169	0.030

ALLELE: HLA-B*2704				
Threshold for 4 % with score: 8.790				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
QM	1	VTL LAPINL	165	10.680
QM	2	KPISLSRL	179	10.670
QM	3	IVGHPIKLL	153	10.130
QM	4	IAGLIVIAL	35	8.800

ALLELE: HLA-B*2902				
Threshold for 4 % with score: 7.750				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
QM	1	EEVAKPISL	175	12.080
QM	2	KHGHTELL	114	9.300
QM	3	TDVPGGVQL	54	8.160
QM	4	MTVNTDTVL	23	7.650

ALLELE: HLA-A*3301				
Threshold for 4 % with score: 3.840				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
QM	1	RLFGNIFAG	186	4.310
QM	2	RIAPFVLPL	82	3.180
QM	3	IVGHPIKLL	153	2.600
QM	4	IVIALAFYL	39	2.020

ALLELE: HLA-B44				
Threshold for 4 % with score: 4.900				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
QM	1	EEVAKPISL	175	7.720
QM	2	ADINYVLAL	127	4.200
QM	3	IAGLIVIAL	35	3.470
QM	4	FAGGILVAL	192	3.050

ALLELE: HLA-A*6801				
Threshold for 4 % with score: 4				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
ANNS+QM	1	RLFGNIFAG	186	0.940
ANNS+QM	2	LLKSAAADI	121	0.880
ANNS+QM	3	TVLSTAIAG	29	0.810
ANNS+QM	4	LLKGHVTLL	160	0.450

ALLELE: HLA-A*6802				
Threshold for 4 % with score: 4				
Prediction method	Rank	Sequence	Residue No.	Peptide Score
ANNS+QM	1	VLSTAIAGL	30	1.000
ANNS+QM	2	RLFGNIFAG	186	1.000
ANNS+QM	3	VTLLAPINL	165	0.990
ANNS+QM	4	APINLVEEV	169	0.990