

SUPPLEMENTARY DATA

STable 1. Amino acid sequences and *in silico* predicted epitopes of the peptides derived from Erum0660, Erum2330, Erum2540, Erum2550, Erum2580, Erum2590 and Erum5000 that tested positive. *In silico* predicted epitopes are indicated in red.

Peptide name	1 st aa	aa sequence	Last aa
p0660-12	89	GGILSKIQKDYPCDES	104
p0660-25	193	EPKCCETLVDVLENNVP	208
p0660-26	201	VDVLENNVPILSQLSLR	216
p0660-29	225	EHVSKKDIKVRQQVEK	240
p0660-30	233	KVRQQVEKLLINCPM	248
p0660-31	241	LLINCPMETLLYFHG	256
p0660-36	281	DNPSLLEVLVSTNTY	296
p0660-42	329	DIRAILSVDGLFDSKA	344
p2330-1	1	VGDLGFLLLCYIAVIF	16
p2330-2	9	LCYIAVIFLLAVVMI	24
p2330-3	17	FLLAVVMIFYSIFHIL	32
p2330-4	25	FYSIFHILWKRDNPSL	40
p2330-5	33	WKRDNPSLLQTKLSQI	48
p2330-6	41	LQTKLSQIVSSADTTM	56
p2330-7	49	VSSADTTMKNGKCSYK	64
p2330-8	57	KNGKCSYKGRISFYVN ^a	72
p2330-9	65	GRISFYVNGMDVVTL	80
p2330-10	73	GMDVVTLTDRFYR	88
p2330-11	81	TDRFYRGGKQSDKLV	96
p2330-12	89	GKQSDKLVKHLKYVQ	104
p2330-13	97	MKHLKYVQNTMSYNGY	112
p2330-14	105	NTMSYNGYSKSDQTI	120
p2330-15	113	SKSDQTI ^a RAIMGALE	128
p2330-16	121	AIMGALESILIQNVK	136
p2330-17	129	SILIQNVKEKPNMCLI	144
p2330-18	137	EKPNMCLIHHTISYLY	152
p2330-19	145	HHTISYLYAQQYDNLL	160
p2330-20	153	AQQYDNLLNIIDNVV	168
p2330-21	161	LNIIDNVVSQKEYMNE	176
p2330-22	169	SQKEYMNETTLYSLPR	184
p2330-23	177	TTLYSLPRYSSKTLT	192
p2330-24	185	YSSKTLTSVIKMF	200
p2540-6	41	KNRTINIGVEFRIQDG	56
p2540-8	57	WHIYYKSPGDLGLPTV	72
p2540-12	89	QPIQHTDTSNNIFHS	104
p2540-15	113	FPISFALKHDNLN ^a TKE	128
p2540-16	121	HDNLNTKELSLRIK	136
p2540-18	137	YAVCKDVCIPQEKVII	152
p2540-19	145	IPQEKVII ^a NRFLQDY	160
p2540-20	153	LNRFLQDYVNQENL ^a GL	168
p2540-21	161	VNQENLGL ^a INFWKKK	176
p2550-19	145	VTIARAIAQKPAIILL	160
p2580-8	57	HDYMLKPSDKRKIRSS	72
p2580-10	73	NVIFYVDDHLETFIN	88
p2580-12	89	IKDKTLIKLSDVVALL	104
p2580-33	257	LDPIGNIQKESYFDI	272
p2580-34	265	QKESYFDIMQNIANNF	280
p2580-35	273	MQNIANNFFSCLSTT	288
p2590-23	177	KDSFYKLINQLILRYN	192
p5000-6	41	QILSYAWCTDNV ^a NQSQ	56
p5000-7	49	TDNVNQSQKHGVGVSG	64
p5000-8	57	KHGVGV ^a SGILNVKSVS	72
p5000-9	65	ILNVKSVSENPNLGIS	80
p5000-10	73	ENPNLGISYGASLQIG	88

^aIn peptides with more than one distinctive predicted epitope, the additional epitopes are indicated in bold red and overlapping amino acids are underlined.

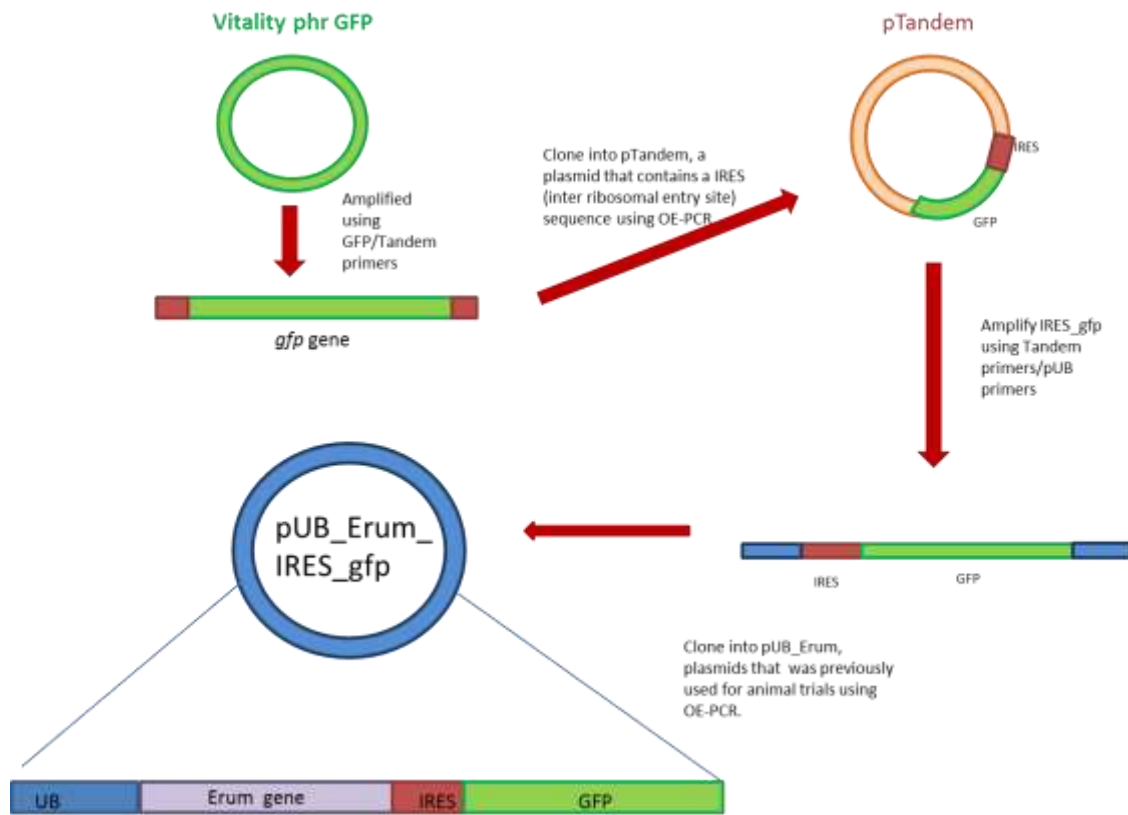


Figure 1. A schematic representation of the Overlap extension PCR cloning to produce the pCMViUBs_gene_IRES_GFP plasmid.

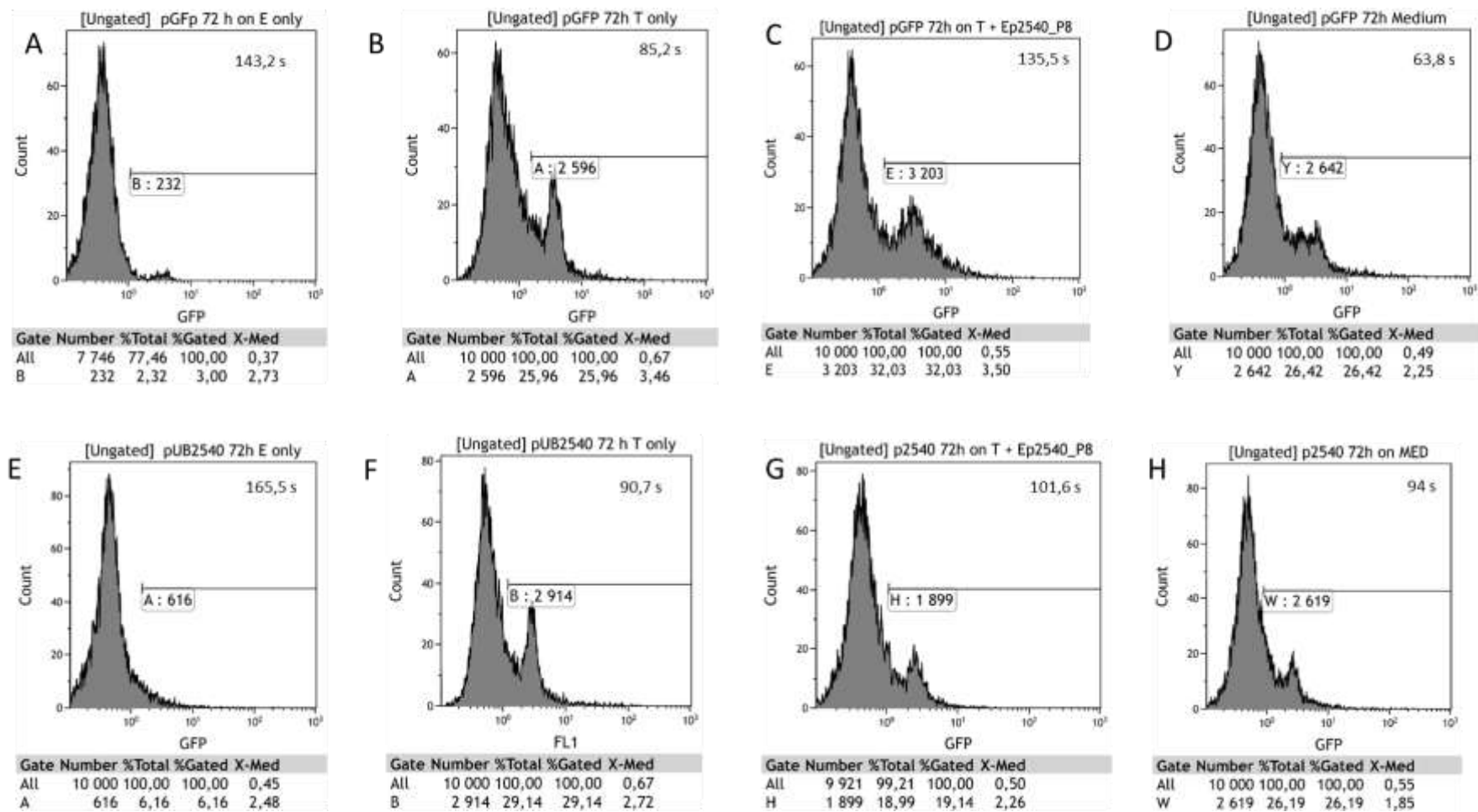


Figure 2. Representative FATTCT assay data for Erum2540 peptide 8. The total number of GFP positive events in the pGFP control samples (A-D) and the pUB2540 samples (E-H) are shown and all the controls for the analysis included. The time in s for each sample is also indicated in the right top corner. The E stands for effector cells and T for target cells. Each sample was tested in triplicate and the average used for the % lysis analysis where events per second is calculated (Table 1). This was also repeated at three time points with similar results obtained each time.

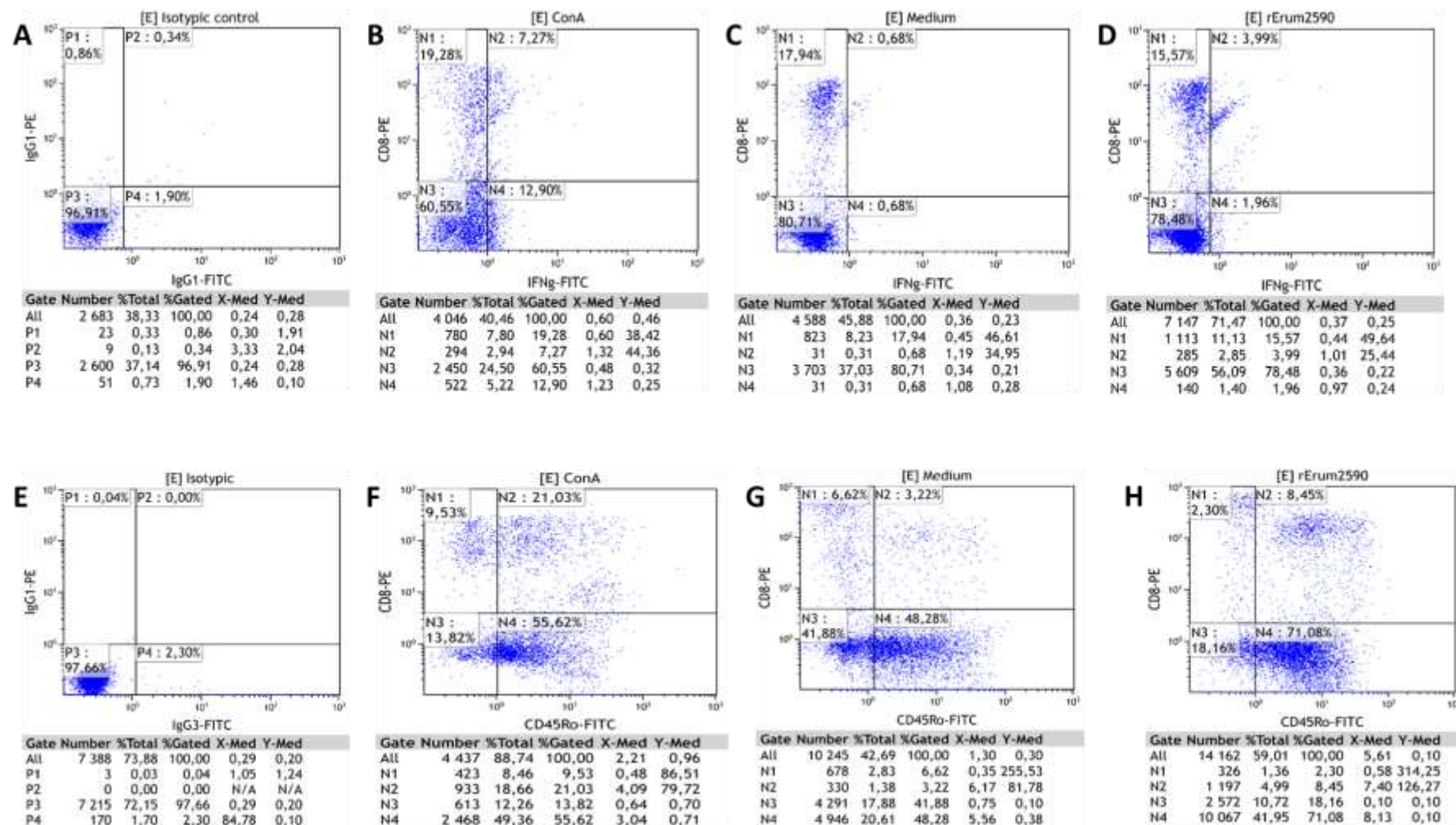
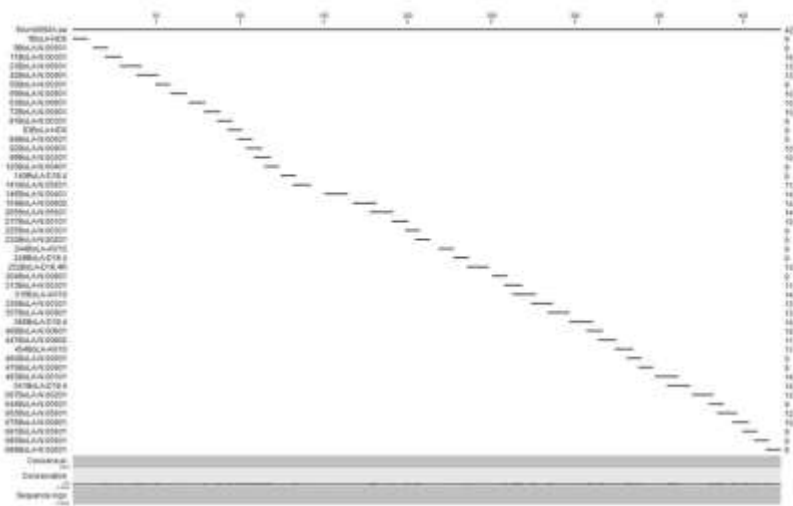
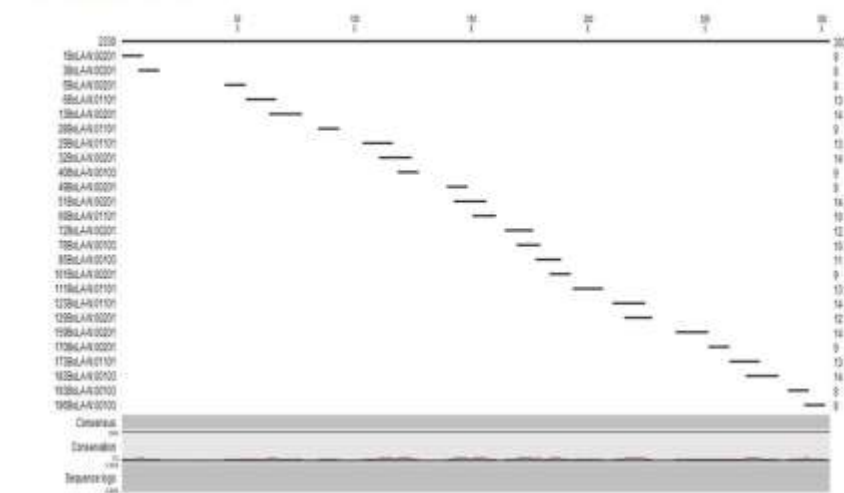


Figure 3. Representative dot plots showing phenotype analysis and intracellular cytokine staining (ICS) data for sheep 6823 immune PBMC. PBMC were stained with markers for CD8 and intracellular IFN- γ (A-D) or with CD8 and CD45Ro (F-H), after incubation with ConA (B, F), unstimulated PBMC medium (C,G) or recombinant Erum2590 protein (D, H) for 72 h. Isotypic controls for each panel are indicated (A, E).

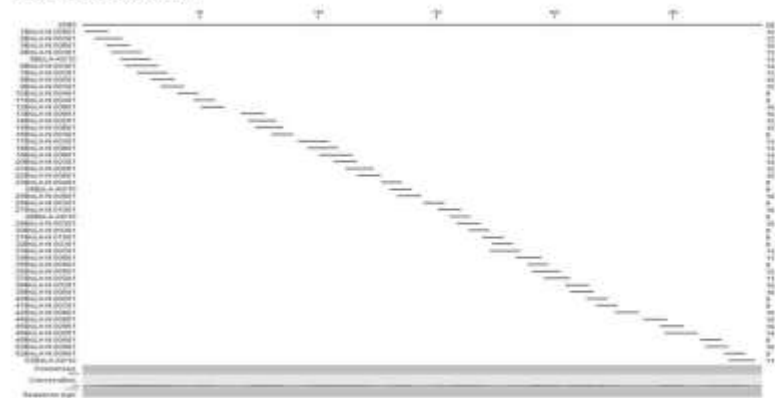
A: Erum0660



B: Erum2330



C: Erum2580



D: Erum5000

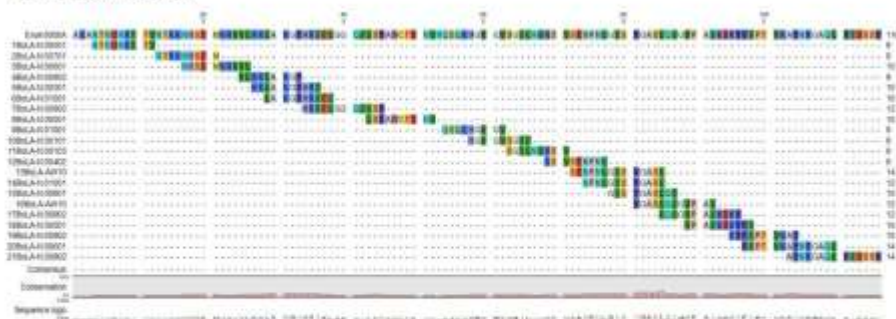


Figure 4. Epitope prediction analysis showing representative epitopes across proteins from A) Erum0660, B) Erum2330; C) Erum2580 and D) Erum5000. Epitopes were predicted using Bovine MHC class I alleles from the IEDB Analysis Recourse database (<http://tools.immuneepitope.org/mhci>).

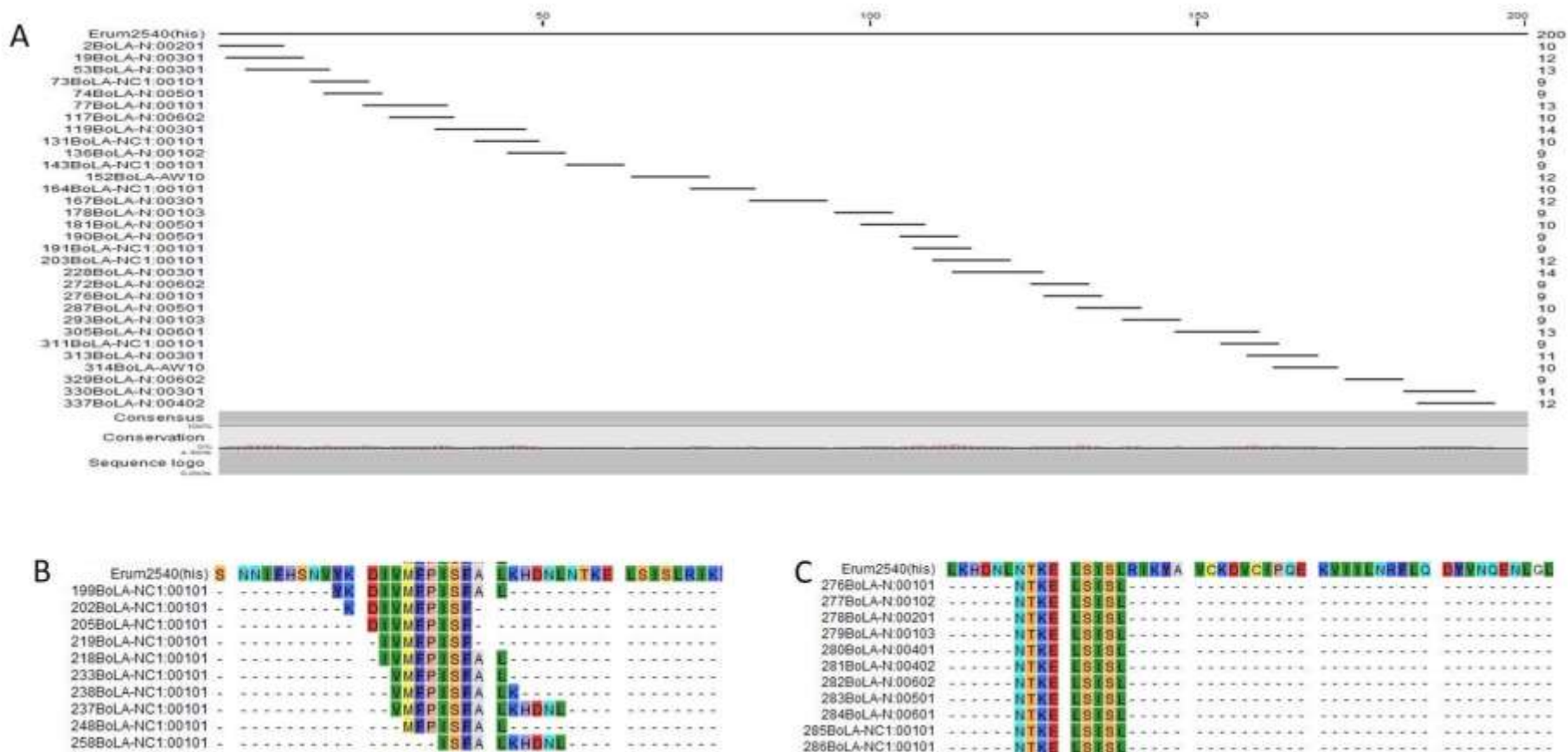


Figure 5. Epitope prediction analysis showing representative epitopes across Erum2540 (A). Specific alignments showing the diverse epitopes predicted by one allele (BoLA-NC1:00101) in peptide Erum2540-P15 are shown in (B) and more than one Bovine MHC I allele predicting the same epitope in peptide Erum2540-P16 (C). Epitopes were predicted using Bovine MHC class I alleles from the IEDB Analysis Recourse database (<http://tools.immuneepitope.org/mhci>).