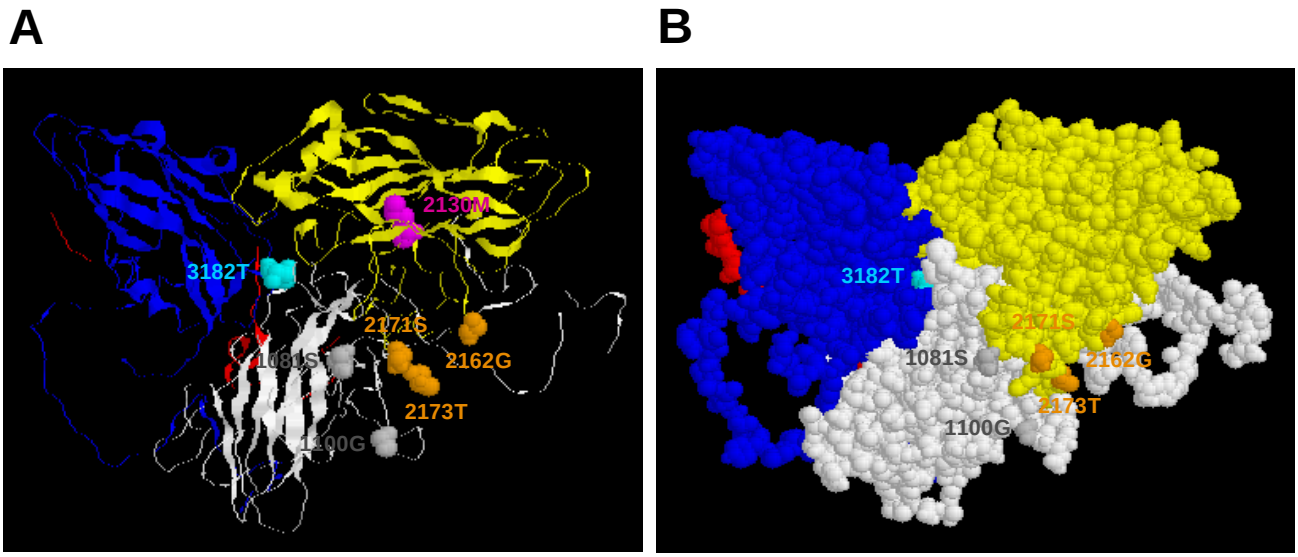
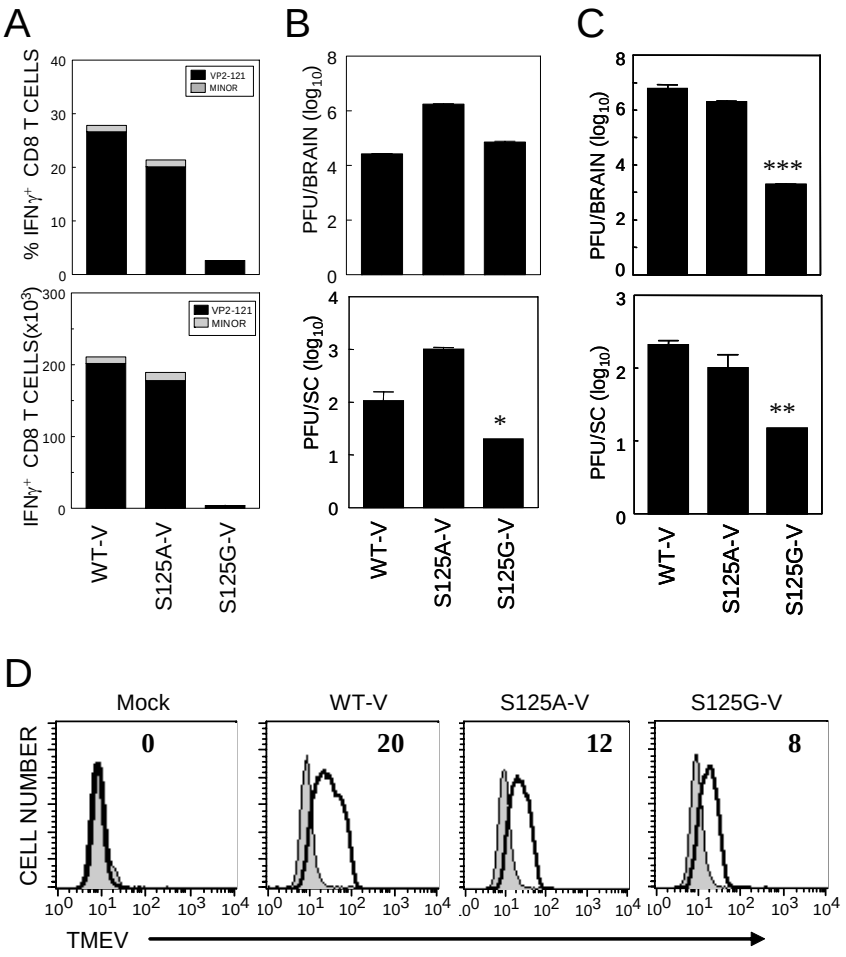


Supplemental Figure1. Structure of the protomer of the TMEV icosahedral coat generated by the RasMol program. A, Ribbon display of the protomer. Each coat protein is indicated in different colors (VP1: white, VP2: yellow, VP3: blue, VP4: red). Important residues, known to be binding sialic acid, on the coat proteins are displayed by space-fill models in different colors: VP2 puff B in orange, VP1 loop residues (1100G and 1081S) in grey and 3182T in cyan. $VP2_{121\text{-}130}$ is shown in purple with the residue 130(M) exhibited by space-filling model. B, Spacefill display of the protomer. The same color scheme was used to depict each chain and residues involved in contacting sialic acid. Notably, the VP2 130 residue is not exposed on the surface. The Protein Data Bank ID of the TMEV coat protein is 1TMF.



Supplemental Figure 2. TMEV-specific CD8$^+$ T cell responses, viral persistence and binding properties of variant viruses substituted at VP2$_{125}$ (**A**). CNS-infiltrating MNC isolated from mice (3 mice/group) infected with WT and variant viruses (S125A and S125G) for 8 days were stimulated with either immunodominant VP2$_{121\text{-}130}$ or minor epitope mix (VP2$_{165\text{-}173}$ and VP3$_{110\text{-}120}$). The percentage and number of IFNγ-producing epitope-specific CD8$^+$ T cells are plotted. (**B**). Viral load at d8 PI in the brain and spinal cord of C57BL/6 mice infected with WT and variant viruses was assessed by plaque assay. (**C**). The levels of replicating viruses in the CNS of Rag1$^{-/-}$ mice (3 mice/group) infected with WT and variant viruses for 7 days were assessed by plaque assay. (**D**). Viral binding to peritoneal exudate cells derived from C57BL/6 was assessed. Filled histograms and open histograms represent staining with an isotype control Ab and monoclonal Ab specific to TMEV, respectively. Numbers in each histogram plot indicate subtracted MFI value (MFI with TMEV-specific antibody – MFI with control Ab). *, p<0.05 and **, p<0.01 between WT-V and S125G-V.