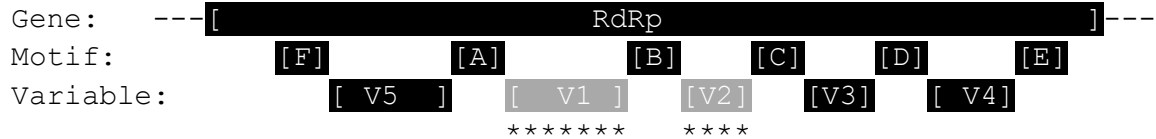




The Laboratory for RNA-Based Lifeforms

Problem #01: Viral RNA-dependent RNA Polymerase structure-function

The hallmark gene of RNA viruses is *rdrp* encoding for RNA-Dependent RNA Polymerase (RdRp). RdRp has six common sequence motifs, **A** through **F**, and variable regions spanning them, **V1** through **V5**.



Motifs A, B, and C form the catalytic core of the enzyme, with essential aspartic acid residues which coordinate a cation for phosphodiester bond formation. The RdRp catalytic core is deeply conserved across polymerase homologs, including in retroviral Reverse Transcriptase (RT).

What are conserved structure-function(s) of the **V1** and **V2** regions of RdRp? How does this activity contrast to the **V1** and **V2** regions of RT?

Are there sequence/structure properties in **V1** through **V5** which resolve RdRp from RT?