UNLOCKING THE HOST CELL: RECEPTOR-MEDIATED VIRUS–CELL INTERACTION



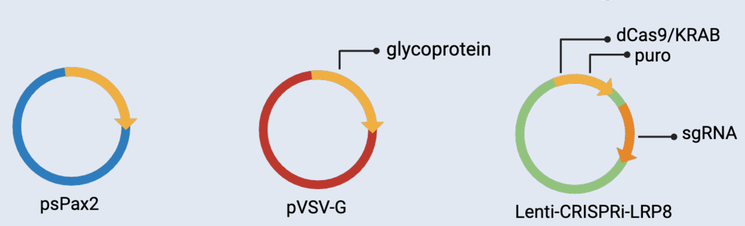
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ABSTRACT

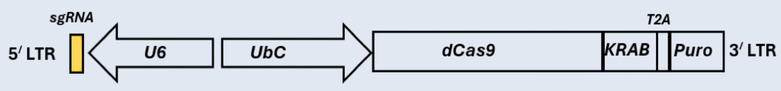
Currently, West Nile virus (WNV) and Usutu virus (USUV) are widespread in European countries. These arthropod-borne viruses (arboviruses), belonging to the genus Flavivirus within the family Flaviviridae, circulate in nature through a transmission cycle involving wild birds and mosquito vectors. WNV infection causes severe neuroinvasive disease in humans and mammals, whereas USUV is highly pathogenic to birds and only rarely affects humans. Despite their clinical significance, the molecular mechanisms underlying the interaction of these viruses with host cells remain poorly understood. Earlier the LRP8 protein was found as a receptor for the Tick-borne encephalitis virus (TBEV). In our laboratory, we have decided to test whether LRP8 serves as a target molecule mediating WNV and USUV entry into cells.

DEVELOPMENT OF LRP8 KNOCK-DOWN CELL LINES USING LENTI/CRISPRI APPROACH

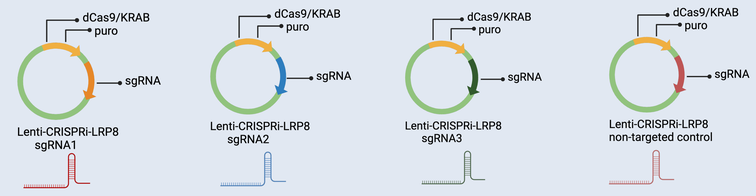
1. Plasmids for lentivirus/CRISPRi system



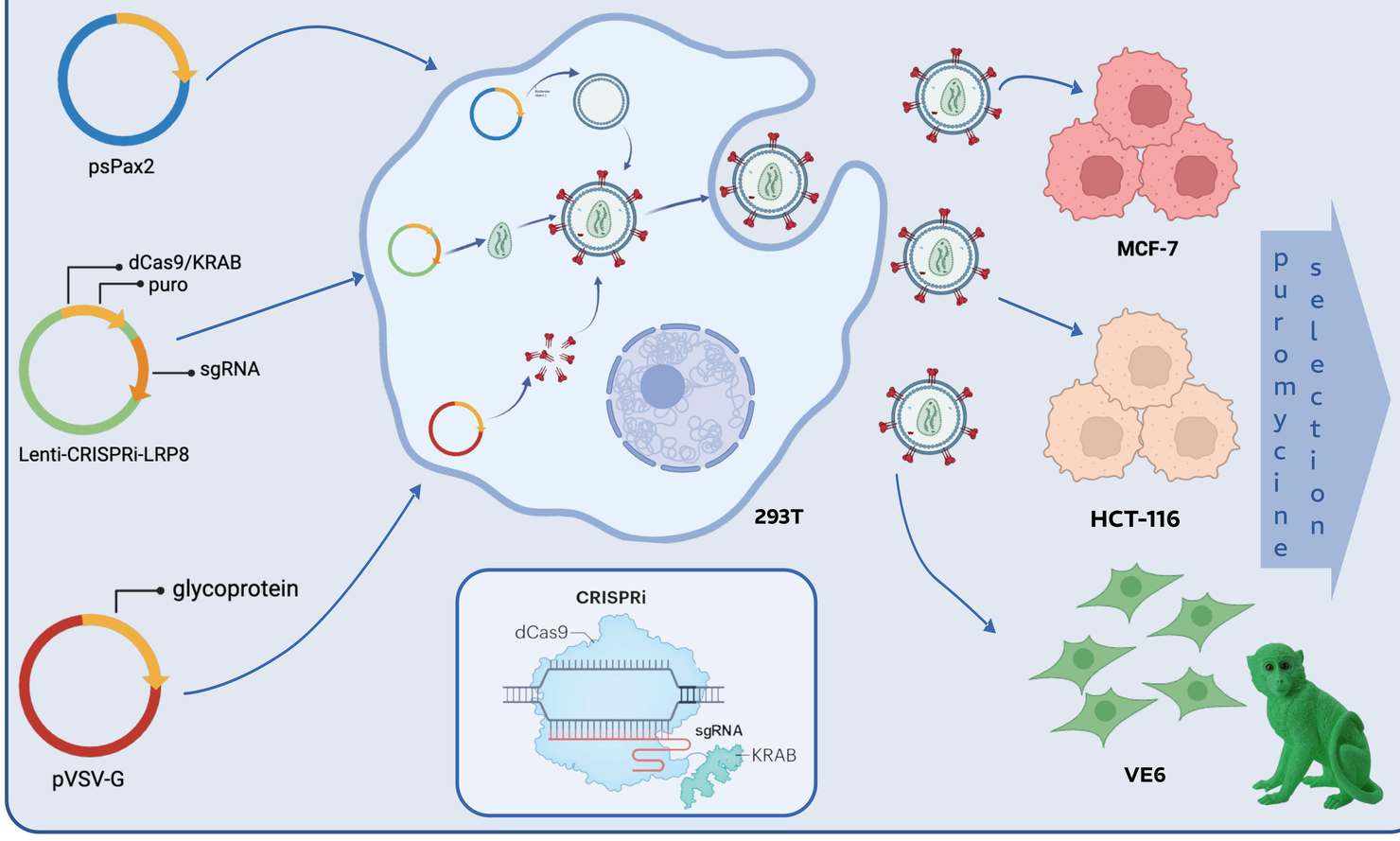
2. The structure of lenti-CRISPRi-LRP8



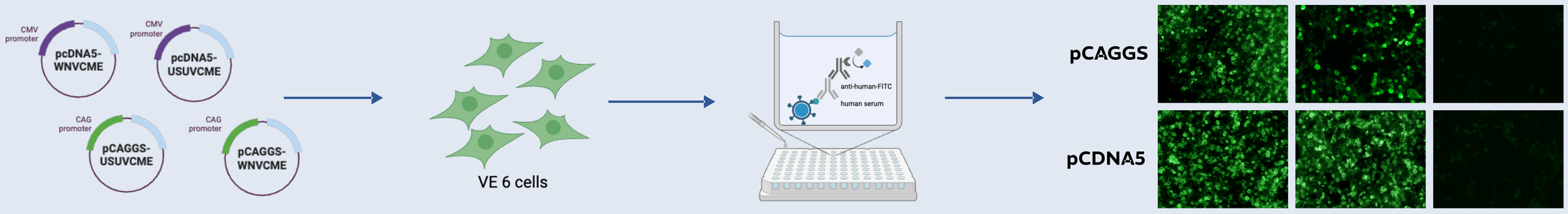
3. sgRNA variants (4 constructs)



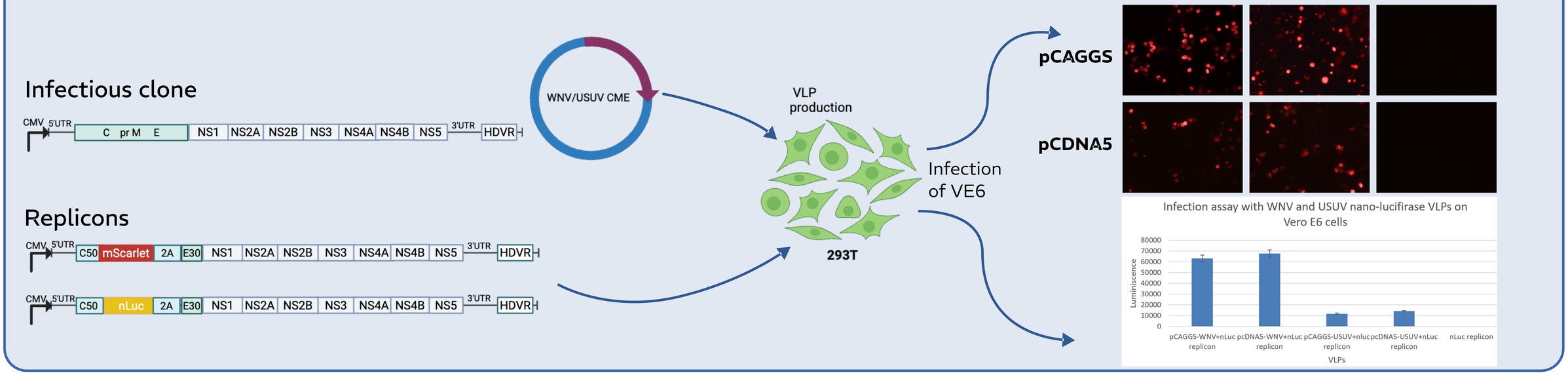
4. CRISPRi lentivirus production and delivery scheme



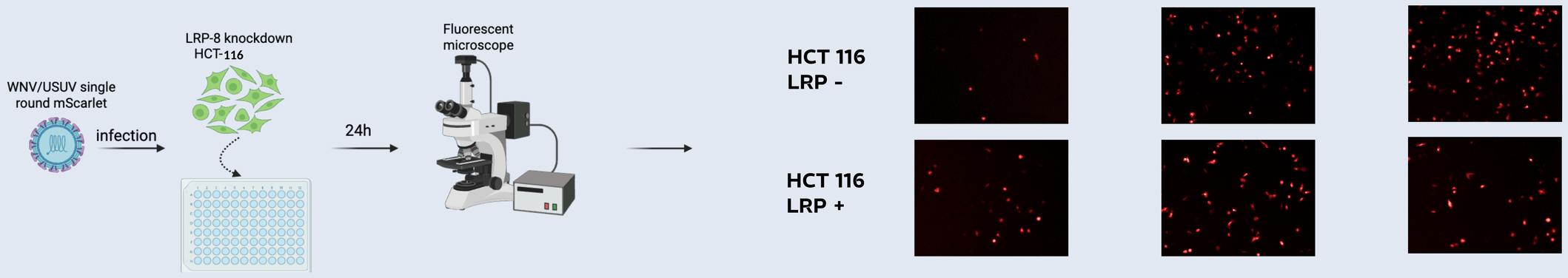
Expression of WNV and USUV structural CME proteins in VE6 cells



Production of single-round WNV and USUV virus-like particles with mScarlet-3 and nLuc



Testing LRP8 as a receptor for WNV and USUV



CONCLUSION

Based on the data obtained in our laboratory, LRP8 does not serve as a potential target receptor mediating WNV and USUV entry into cells, although additional experiments are necessary for conclusive verification.

