**Appendix Figure 1**. Maximum-likelihood phylogenetic trees. Our isolates are marked with blue circle and the Russian human strain, A/Astrakhan/3212/2020(H5N8), is denoted by a red circle. The branches in blue, red, purple, green, and yellow represent sub-clade 2.3.4.4b1, sub-clade 2.3.4.4b1, Eurasian highly pathogenic avian influenza H5, African highly pathogenic avian influenza H5, and low pathogenic avian influenza viruses, respectively. A UFBoot support values of > 95 is shown.