**References**

[1] Ma Y, Frutos-Beltrán E, Kang D, et al. Medicinal chemistry strategies for discovering antivirals effective against drug-resistant viruses[J]. Chem Soc Rev, 2021, 50: 4514-4540.

[2] Fu ZP, Kang DW, Liu XY, et al. Advances of research on target-based anti-AIDS drugs [J]. Prog

Pharm Sci (药学进展), 2020, 44: 681-697.

[3] Huo ZP, Zuo XF, Kang DW, et al. Research progress on new targets of anti-AIDS drugs and their small molecule inhibitors [J]. Acta Pharm Sin (药学学报), 2018, 53: 356-374.

[4] Song LT, Cheng YS, Gao SH, et al. Research progress of human coronavirus broad-spectrum inhibitors[J]. Chin J Med Chem (中国药物化学杂志), 2021, 31: 721-738.

[5] Huang TG, Sun L, Zhan P, et al. Recent advances in the research of broad-spectrum antiviral agents[J]. Acta Pharm Sin (药学学报), 2020, 55: 679-693.

[6] Li J, Jiang XY, Xu SJ, et al. Medicinal chemistry strategies in seeking coronavirus inhibitors[J]. Acta Pharm Sin (药学学报), 2020, 55: 537-553.

[7] Jiang S, He Y, Liu S. SARS vaccine development[J]. Emerg Infect Dis, 2005, 11: 1016- 1020.

[8] Xu SJ, Zhang XJ, Ding D, et al. Bioinorganic chemistry strategies in antiviral drug discovery [J]. Acta Pharm Sin ( 药 学 学 报 ), 2021.

<http://kns.cnki.net/kcms/detail/11.2163.R.20211019.1349.004.html>.

[9] Xu SJ, Ding D, Zhang XJ, et al. Novel targets and strategies in antiviral drug discovery[J]. Acta Pharm Sin (药学学报), 2021. <http://kns.cnki.net/kcms/detail/11.2163.R.20211018.0917.004.html>.

[10] Bravo MF, Lema MA, Marianski M, et al. Flexible synthetic carbohydrate receptors as

inhibitors of viral attachment[J]. Biochemistry, 2021, 60: 999- 1018.

[11] Balzarini J. Carbohydrate-binding agents: a potential future cornerstone for the chemotherapy

of enveloped viruses? [J]. Antivir Chem Chemother, 2007, 18: 1- 11.

[12] Gupta RK, Apte GR, Lokhande KB, et al. Carbohydrate-binding agents: potential of

repurposing for COVID- 19 therapy[J]. Curr Protein Pept Sci, 2020, 21: 1085- 1096.

[13] François KO, Balzarini J. Potential of carbohydrate-binding agents as therapeutics against

enveloped viruses[J]. Med Res Rev, 2012, 32: 349-387.

[14] Palanichamy K, Joshi A, Mehmetoglu-Gurbuz T, et al. Anti-zika activity of a library of synthetic carbohydrate receptors[J]. J Med Chem, 2019, 62: 4110-4119.

[15] Vanderlinden E, Van Winkel N, Naesens L, et al. *In* *vitro* characterization of the carbohydrate- binding agents HHA, GNA, and UDA as inhibitors of influenza A and B virus replication[J]. Antimicrob Agents Chemother, 2021, 65: e01732-20.

[16] Francesconi O, Nativi C, Gabrielli G, et al. Antiviral activity of synthetic aminopyrrolic carbohydrate binding agents: targeting the glycans of viral gp120 to inhibit HIV entry[J]. Chemistry,

2015, 21: 10089- 10093.

[17] Trippier PC, McGuigan C, Balzarini J. Phenylboronic-acid-based carbohydrate binders as antiviral therapeutics: monophenylboronic acids[J]. Antivir Chem Chemother, 2010, 20: 249- 257.

[18] Vigant F, Santos NC, Lee B. Broad-spectrum antivirals against viral fusion[J]. Nat Rev Microbiol, 2015, 13: 426-437.

[19] Jackman JA. Antiviral peptide engineering for targeting membrane-enveloped viruses: recent progress and future directions[J]. Biochim Biophys Acta Biomembr, 2021, 1864: 183821.

[20] Yoon BK, Jeon WY, Sut TN, et al. Stopping membrane-enveloped viruses with nanotechnology

strategies: toward antiviral drug development and pandemic preparedness[J]. ACS Nano, 2021, 15:

125- 148.

[21] Regen SL. Membrane-disrupting molecules as therapeutic agents: a cautionary note[J]. JACS

Au, 2020, 1: 3-7.

[22] Mbarek A, Moussa G, Chain JL. Pharmaceutical applications of molecular tweezers, clefts and

clips[J]. Molecules, 2019, 24: 1803.

[23] Weil T, Groß R, Röcker A, et al. Supramolecular mechanism of viral envelope disruption by

molecular tweezers[J]. J Am Chem Soc, 2020, 142: 17024- 17038.

[24] Lump E, Castellano LM, Meier C, et al. A molecular tweezer antagonizes seminal amyloids

and HIV infection[J]. Elife, 2015, 18: e05397.

[25] Röcker AE, Müller JA, Dietzel E, et al. The molecular tweezer CLR01 inhibits Ebola and Zika

virus infection[J]. Antiviral Res, 2018, 152: 26-35.

[26] Yu X, Zhang L, Tong L, Zhang N, et al. Broad-spectrum virucidal activity of bacterial secreted

lipases against flaviviruses, SARS-CoV-2 and other enveloped viruses[J]. bioRxiv

2020.05.22.109900; doi: <https://doi.org/10.1101/2020.05.22.109900>

[27] Xu HT, Colby-Germinario SP, Hassounah S, et al. Identification of a pyridoxine-derived small- molecule inhibitor targeting dengue virus RNA-dependent RNA polymerase[J]. Antimicrob Agents Chemother, 2015, 60: 600-608.

[28] Maio N, Lafont BAP, Sil D, et al. Fe-S cofactors in the SARS-CoV-2 RNA-dependent RNA polymerase are potential antiviral targets[J]. Science, 2021, 373: 236-241.

[29] García CC, Damonte EB. Zn finger containing proteins as targets for the control of viral infections[J]. Infect Disord Drug Targets, 2007, 7: 204-212.