Supplementary Data for

In silico and *in vitro* evaluation of imatinib as an inhibitor for SARS-CoV-2

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Affiliations
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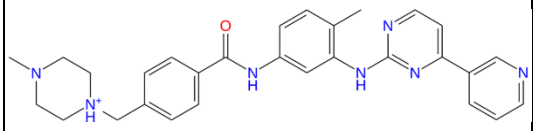
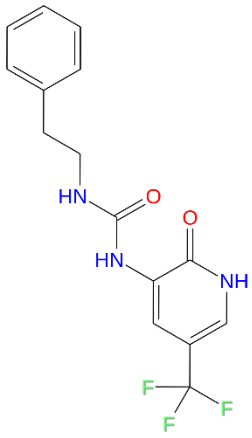
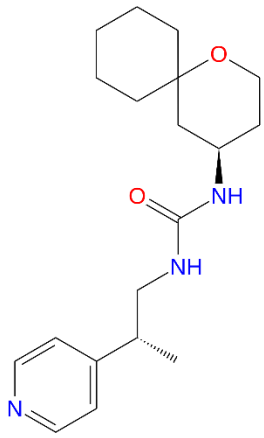
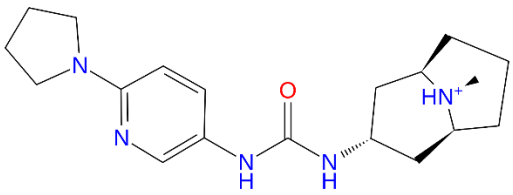
Table S1. Information of compounds screened from *in silico* studies.

Compound ID/ Name/ ZINC ID	**2D structure**	**Applications and mechanism of action**	**References**
ZINCFDA754/ imatinib/ ZINC000019632618		Leukemia treatment by inhibition of Bcr-Abl tyrosine kinase.	[1]
Antiviral2038 / Z787722876 / ZINC50038784		No reported bioactivity. Antiviral properties based on Enamine predictions.	
Antiviral2981/ Z1452532074/ ZINC170674881		Has a molinspiration bioactivity score of 0.35 as GPCR ligand	[1]
Antiviral825/ Z1277226201/ ZINC104169890		Has good molinspiration bioactivity scores as GPCR ligand (0.43), Ion channel modulator (0.38), kinase inhibitor (0.27) and enzyme inhibitor (0.2)	[1]

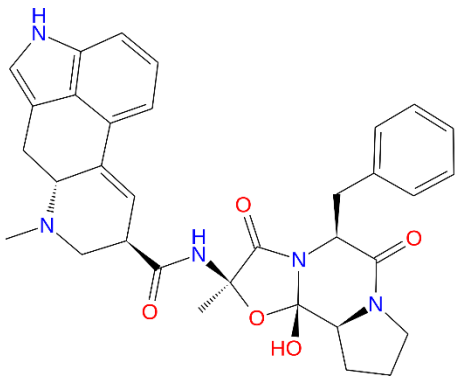
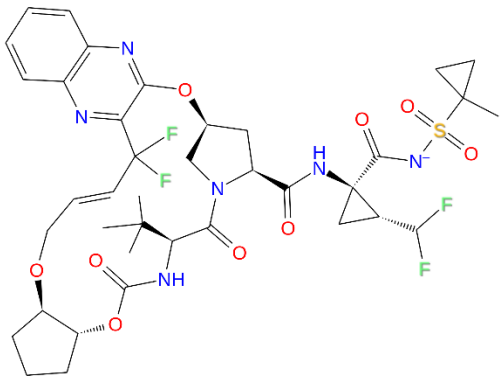
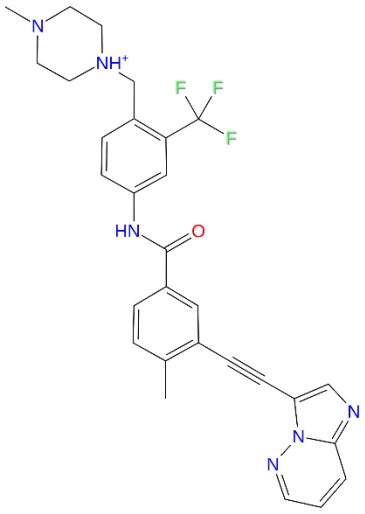
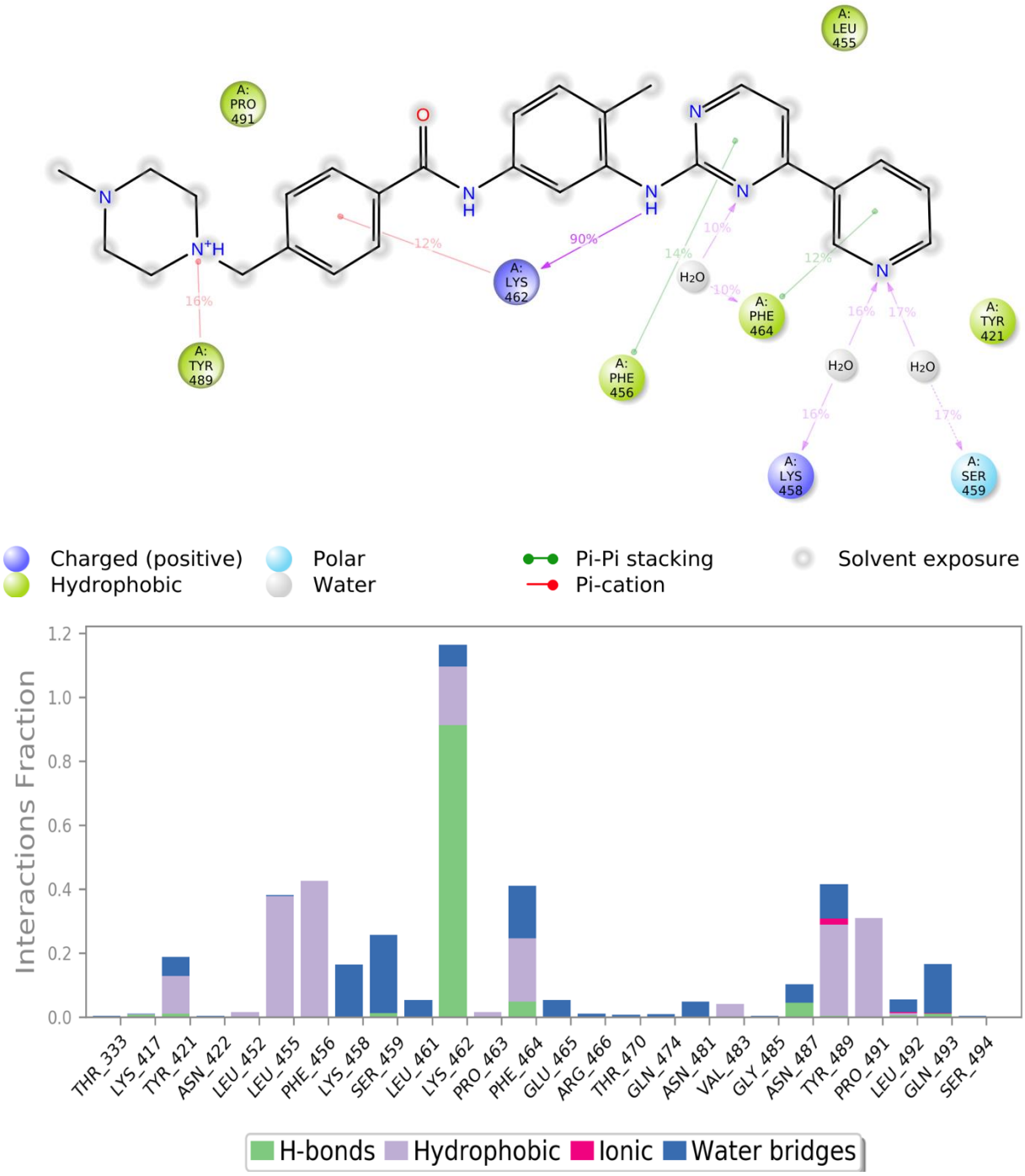
ZINCFDA130/ ergotamine/ ZINC000052955754		Migraine treatment via acting as an agonist to 5-HT1A, 5-HT1B, 5-HT1D, and 5-HT1F receptors	[2]
ZINCFDA2083/ glecaprevir/ ZINC164528615		Hepatitis C treatment by NS3/4 protease inhibition	[3]
ZINCFDA515/ ponatinib/ ZINC000036701290		Leukemia treatment by inhibition of Bcr-Abl tyrosine kinase	[4]

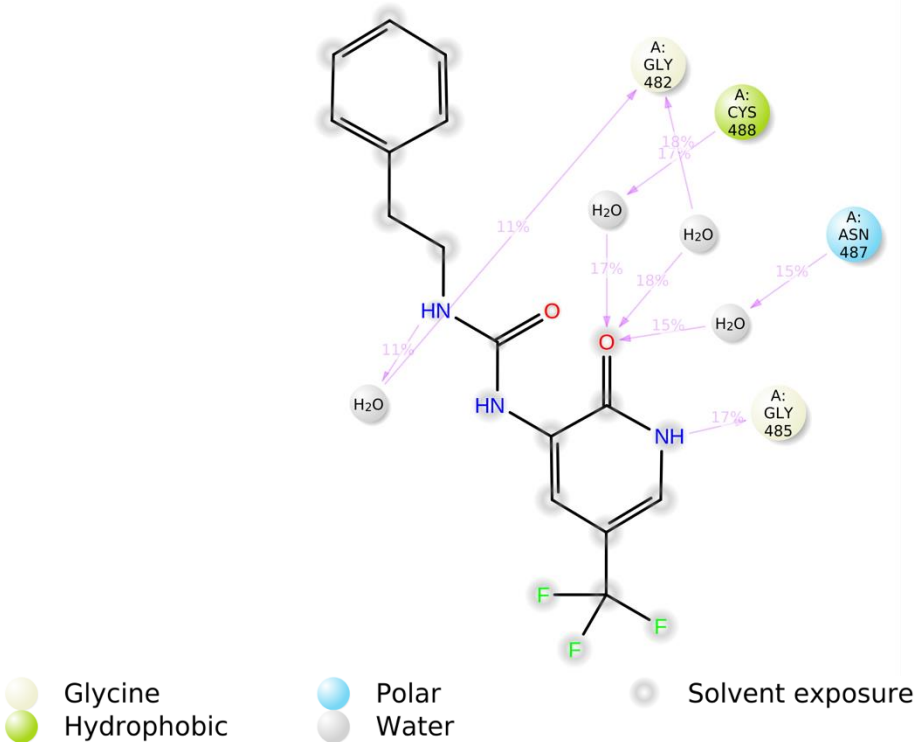
Table S2. Docking validation using Glide.

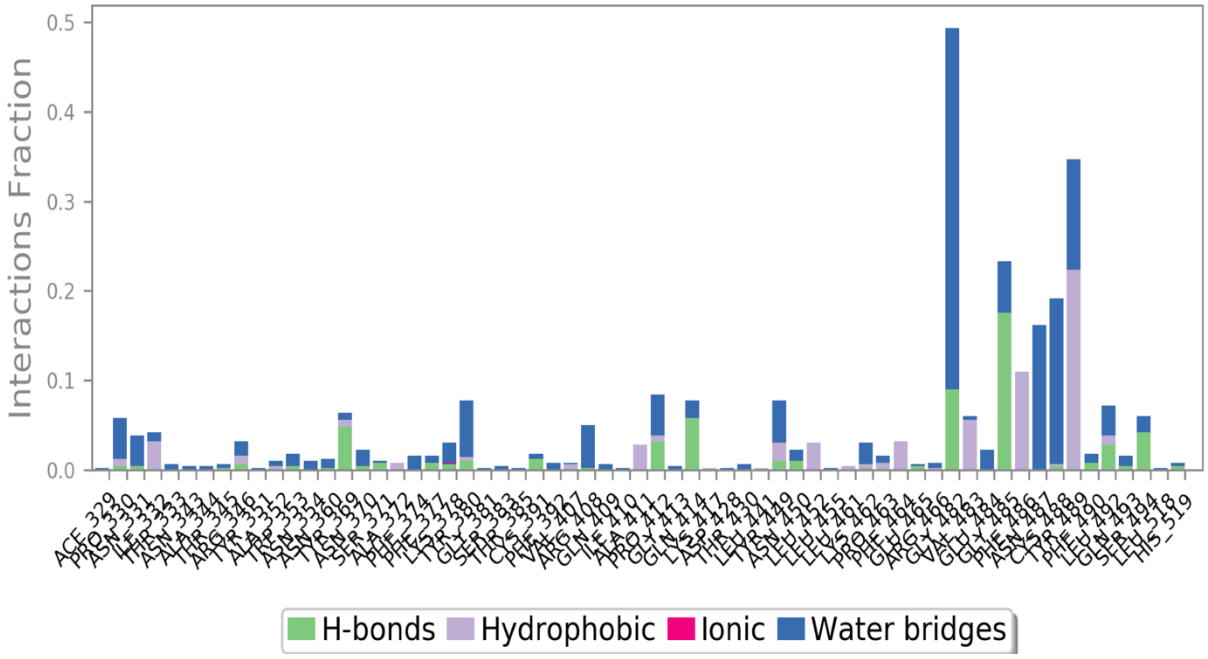
Compounds	Without NAG		With NAG at Asn343	
	Glide docking score (kcal/mol)	Glide energy (kcal/mol)	Glide docking score (kcal/mol)	Glide energy (kcal/mol)
Antiviral825	-3.951	-26.131	-3.356	-28.943
Antiviral2038	-4.161	-30.52	-4.188	-34.03
Antiviral2981	-4.179	-28.595	-3.589	-29.072
ZINCFDA130 (ergotamine)	-5.658	-40.58	-5.078	-50.459
ZINCFDA515 (ponatinib)	-4.261	-42.646	-4.263	-41.717
ZINCFDA754 (imatinib)	-3.983	-38.676	-3.933	-41.212
ZINCFDA2083 (glecaprevir)	-4.672	-40.94	-5.1	-57.671

A. Imatinib

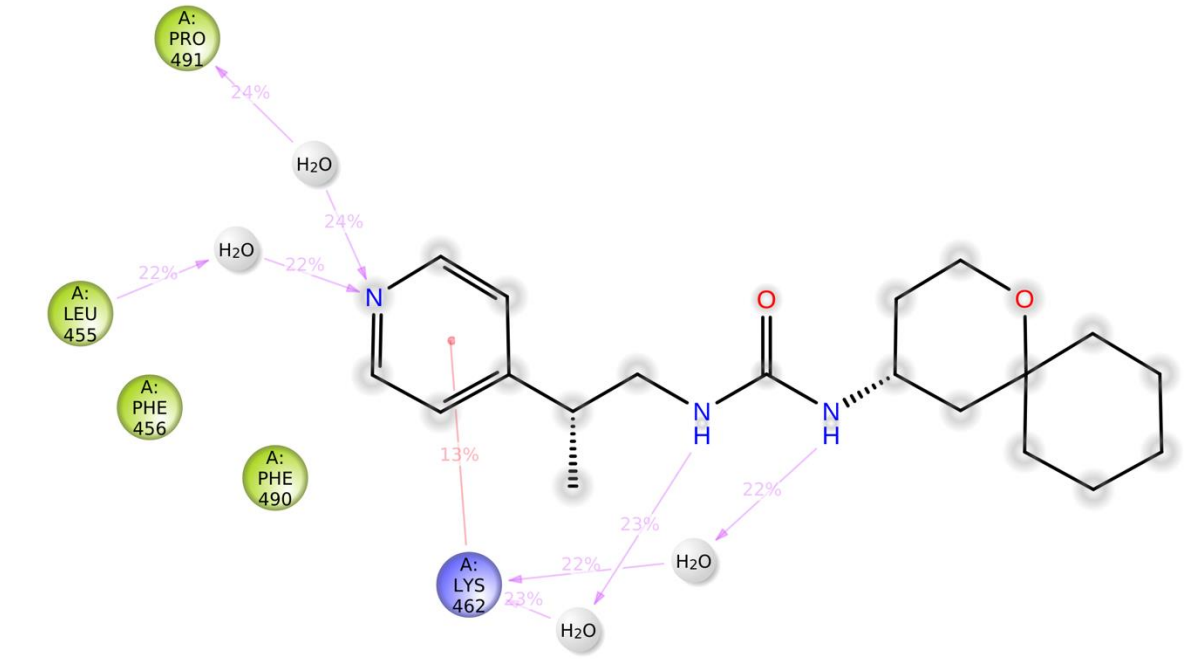

A: LEU 455
A: PRO 491
O
N
N
H
N
H
N
N
N
N+H
12%
90%
A: LYS 462
14%
10%
H2O
10%
12%
A: PHE 464
A: TYR 421
16%
A: TYR 489
A: PHE 456
16%
17%
H2O
H2O
16%
17%
A: LYS 458
A: SER 459
Charged (positive)
Hydrophobic
Polar
Water
Pi-Pi stacking
Pi-cation
Solvent exposure
Interactions Fraction
1.2
1.0
0.8
0.6
0.4
0.2
0.0
THR_333
LYS_417
TYR_421
ASN_422
LEU_452
LEU_455
PHE_456
LYS_458
SER_459
LEU_461
LYS_462
PRO_463
PHE_464
GLU_465
ARG_466
THR_470
GLN_474
ASN_481
VAL_483
GLY_485
ASN_487
TYR_489
PRO_491
LEU_492
GLN_493
SER_494
H-bonds
Hydrophobic
Ionic
Water bridges

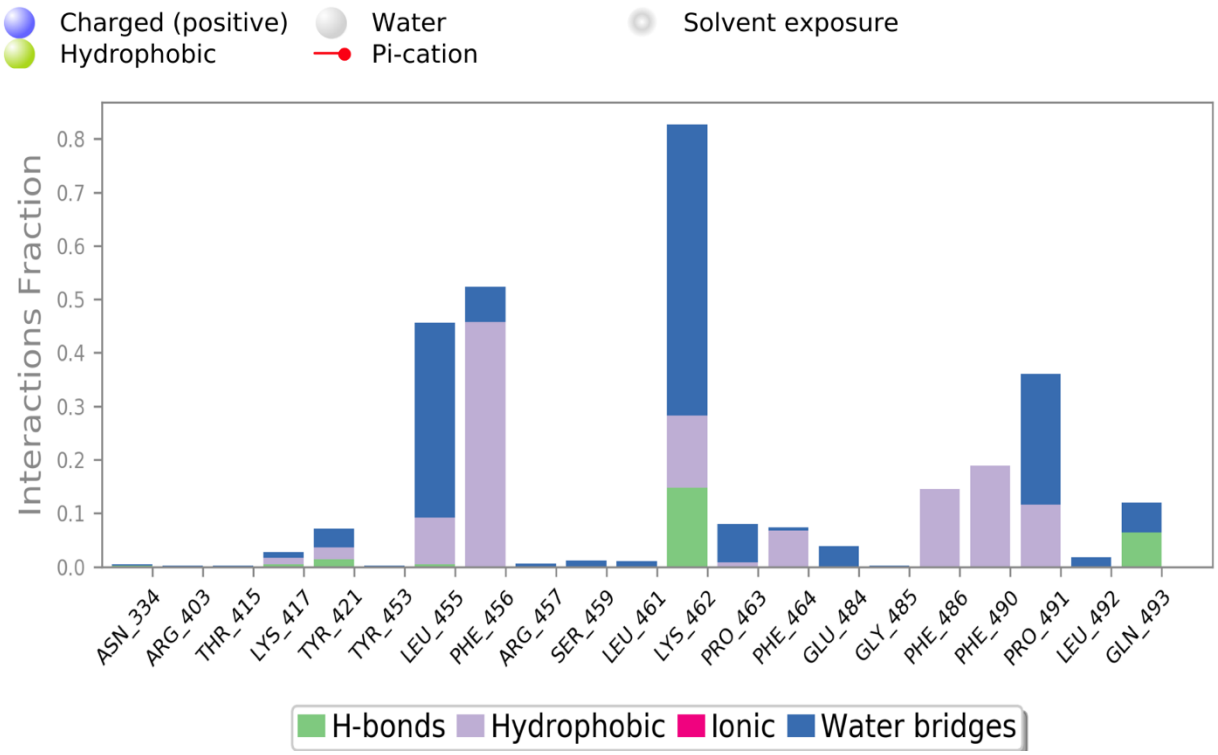
B. Antiviral2038



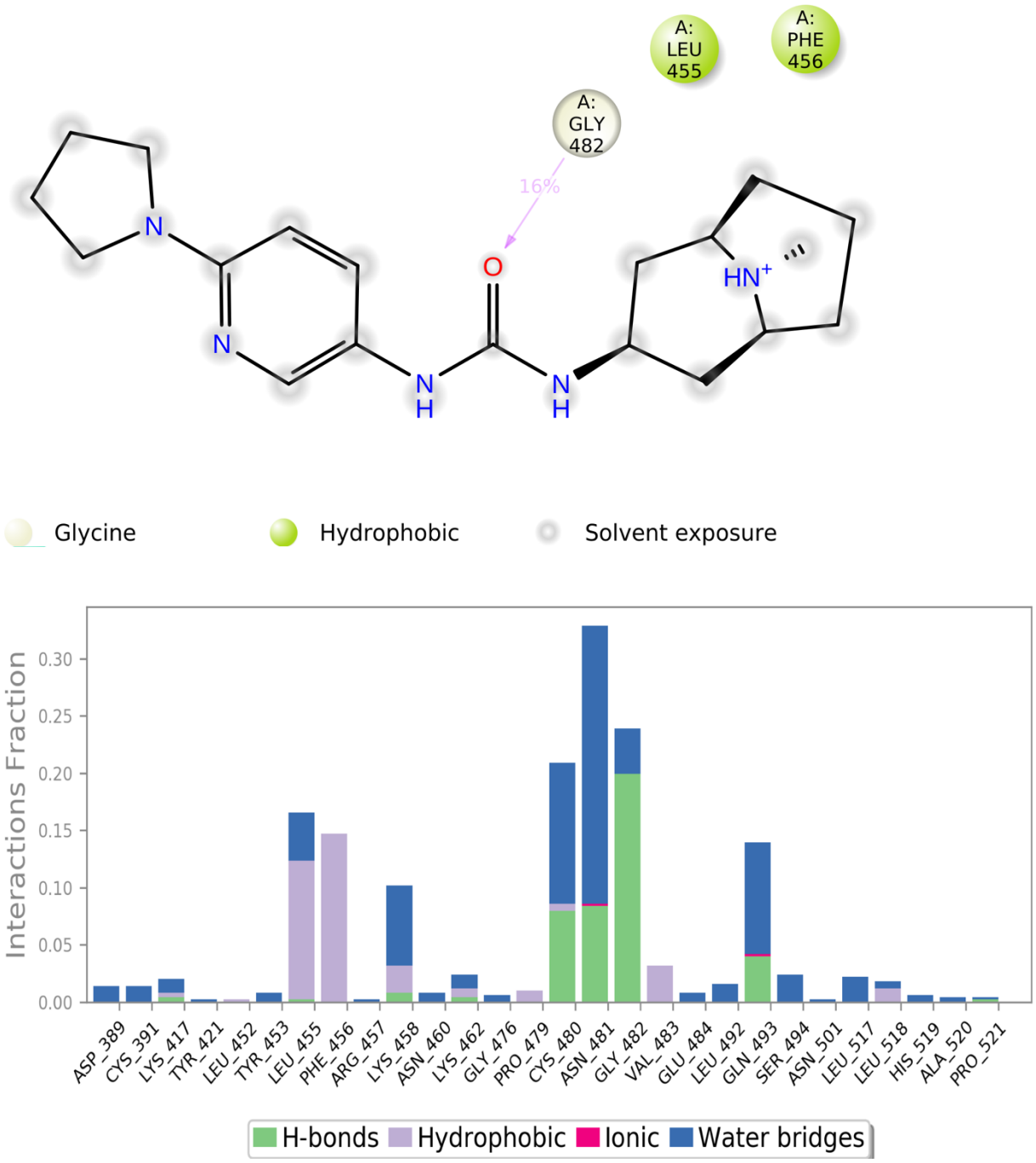


C. Antiviral2981

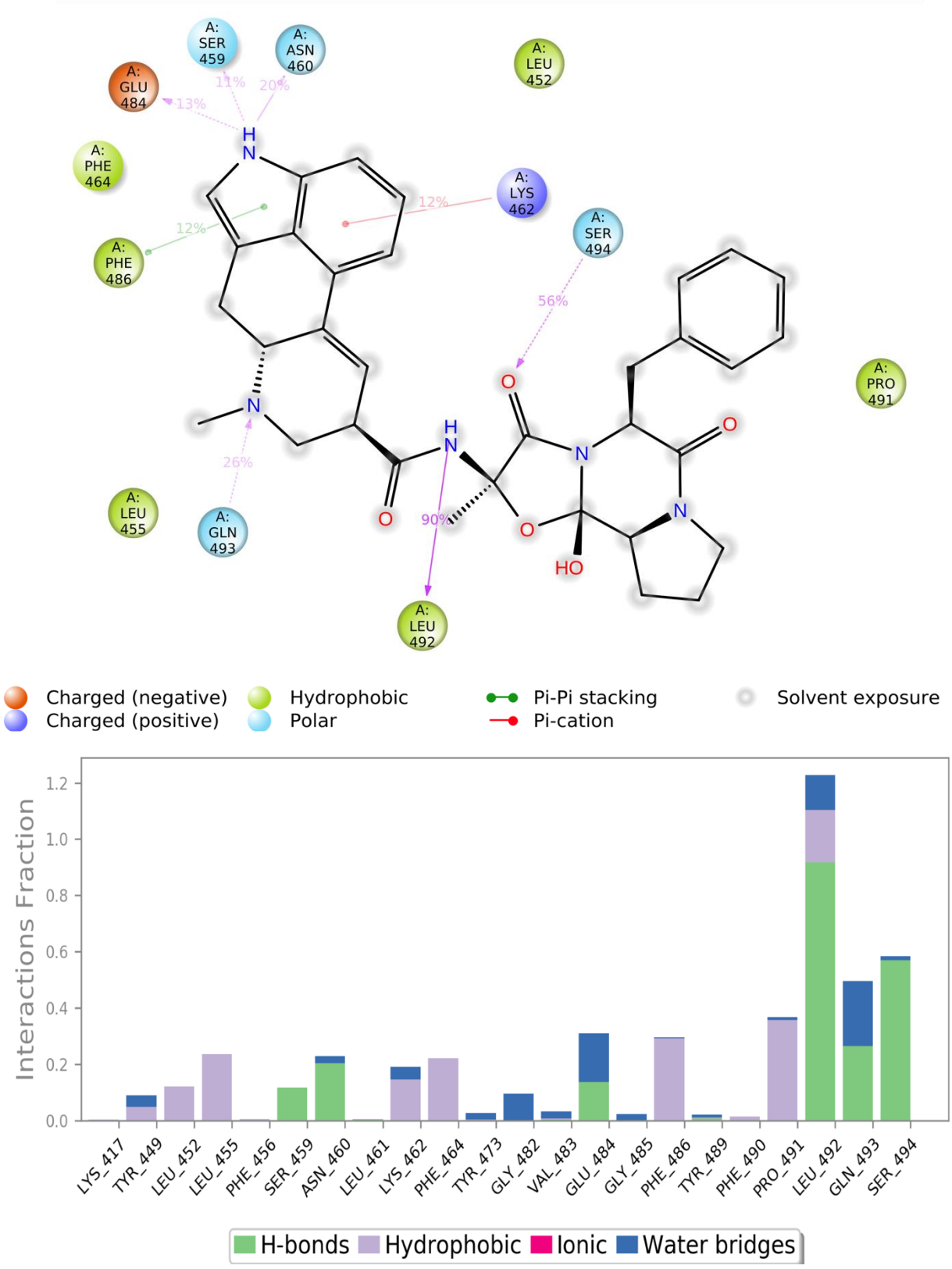




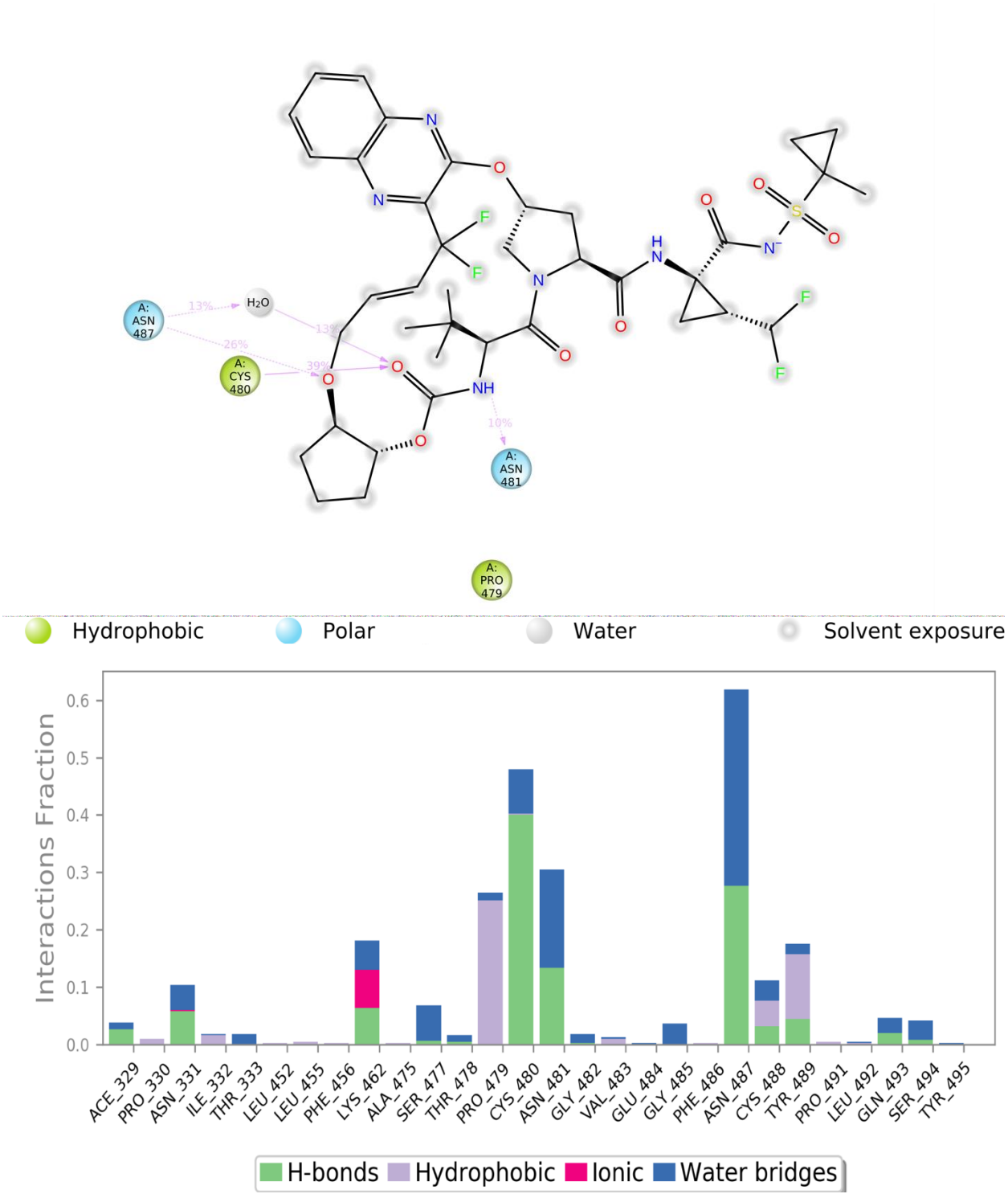
D. Antiviral825



E. Ergotamine



F. Glecaprevir



G. Ponatinib

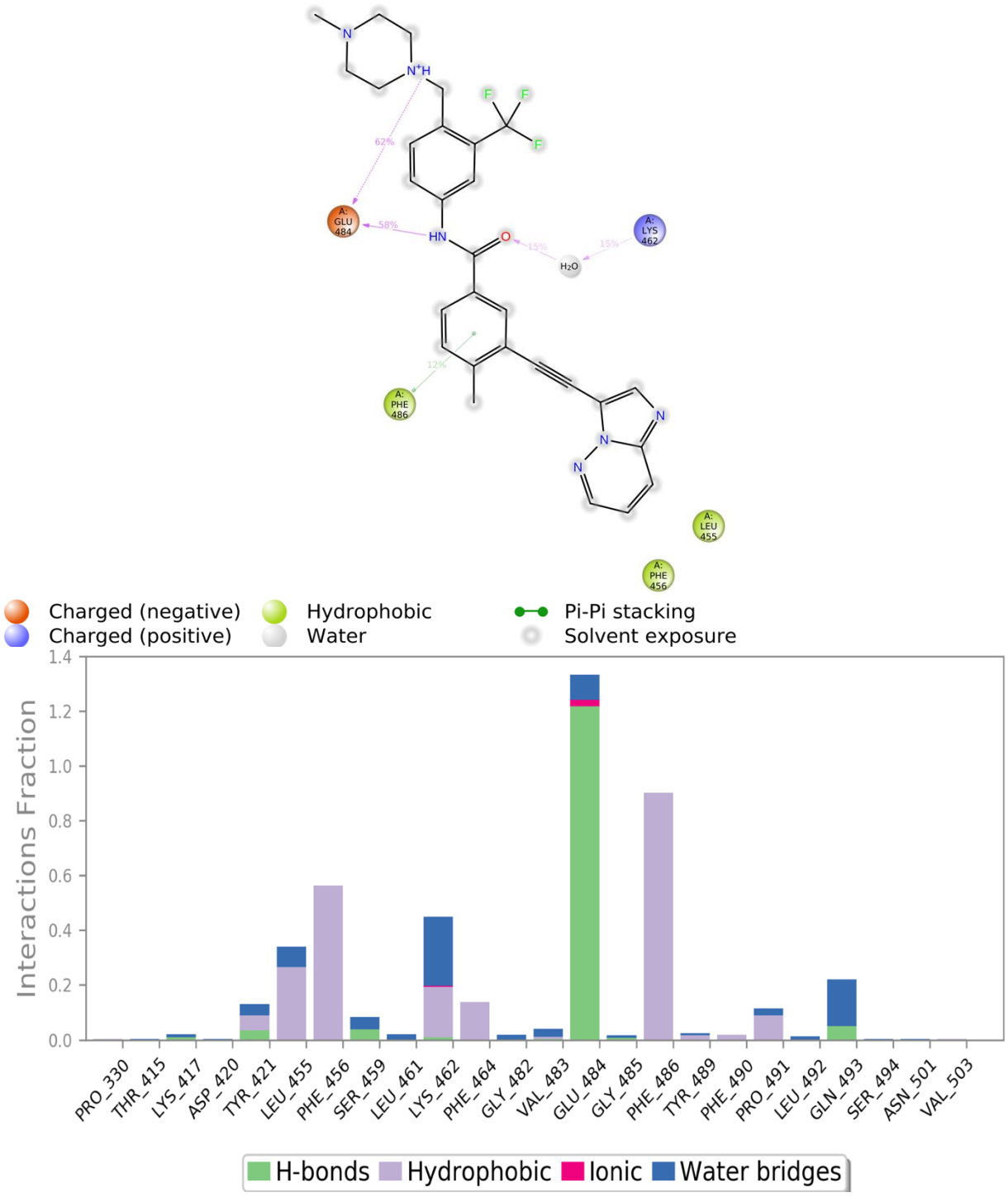


Figure S1. A-G. Interactions diagrams of the seven selected compounds with the spike RBD protein.

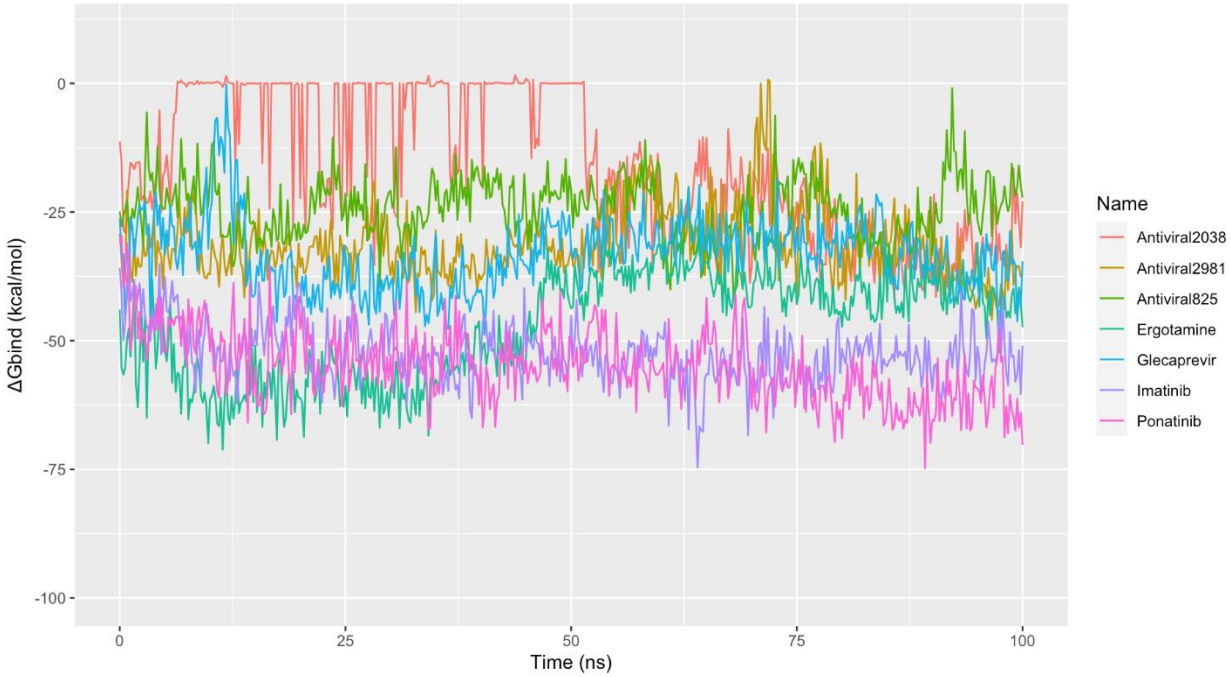


Figure S2. Plot of MM-GBSA binding free energy (kcal/mol) versus time (ns) for all protein-ligand complexes.

References:

1. Sisk, J.M., M.B. Frieman, and C.E. Machamer, *Coronavirus S protein-induced fusion is blocked prior to hemifusion by Abl kinase inhibitors.* The Journal of general virology, 2018. **99**(5): p. 619.
2. Silberstein, S.D., *The pharmacology of ergotamine and dihydroergotamine.* Headache, 1997. **37 Suppl 1**: p. S15-25.
3. Gane, E., et al., *Glecaprevir and pibrentasvir in patients with HCV and severe renal impairment.* New England Journal of Medicine, 2017. **377**(15): p. 1448-1455.
4. Goldman, J.M., *Ponatinib for chronic myeloid leukemia*. 2012, Mass Medical Soc.