



Full wwPDB X-ray Structure Validation Report ⓘ

May 23, 2020 – 03:22 am BST

PDB ID : 2R7V
Title : Crystal Structure of Rotavirus SA11 VP1/RNA (GGCUUU) Complex
Authors : Lu, X.; Harrison, S.C.; Tao, Y.J.; Patton, J.T.; Nibert, M.L.
Deposited on : 2007-09-10
Resolution : 2.80 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity : 4.02b-467
Xtriage (Phenix) : 1.13
EDS : 2.11
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac : 5.8.0158
CCP4 : 7.0.044 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.11

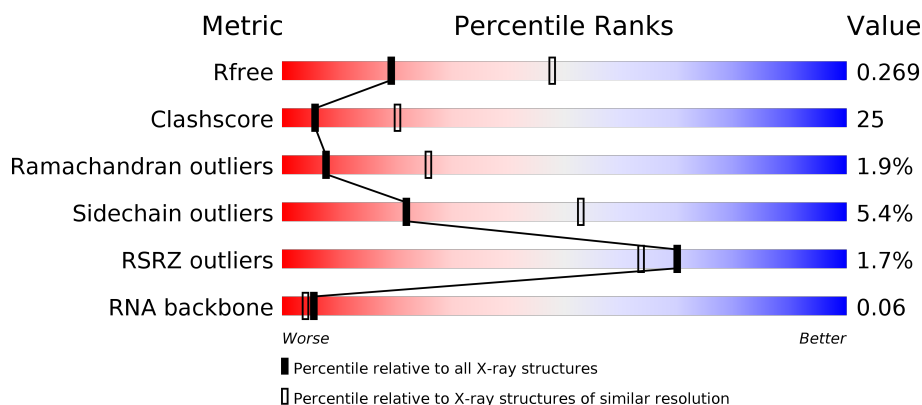
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.80 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	3140 (2.80-2.80)
Clashscore	141614	3569 (2.80-2.80)
Ramachandran outliers	138981	3498 (2.80-2.80)
Sidechain outliers	138945	3500 (2.80-2.80)
RSRZ outliers	127900	3078 (2.80-2.80)
RNA backbone	3102	1227 (3.10-2.50)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments on the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	X	6	<div> <div>50%</div> <div> <div>17%</div> <div>17%</div> <div>50%</div> <div>17%</div> </div> </div>
2	A	1095	<div> <div>%</div> <div> <div>53%</div> <div>41%</div> <div>..</div> </div> </div>

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 8799 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a RNA chain called RNA (5'-R(*G*GP*CP*UP*UP*U)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	X	5	Total	C	N	O	P	0	0	0
			100	46	14	36	4			

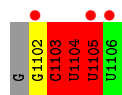
- Molecule 2 is a protein called RNA-dependent RNA polymerase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	A	1073	Total	C	N	O	S	0	0	0
			8699	5579	1448	1634	38			

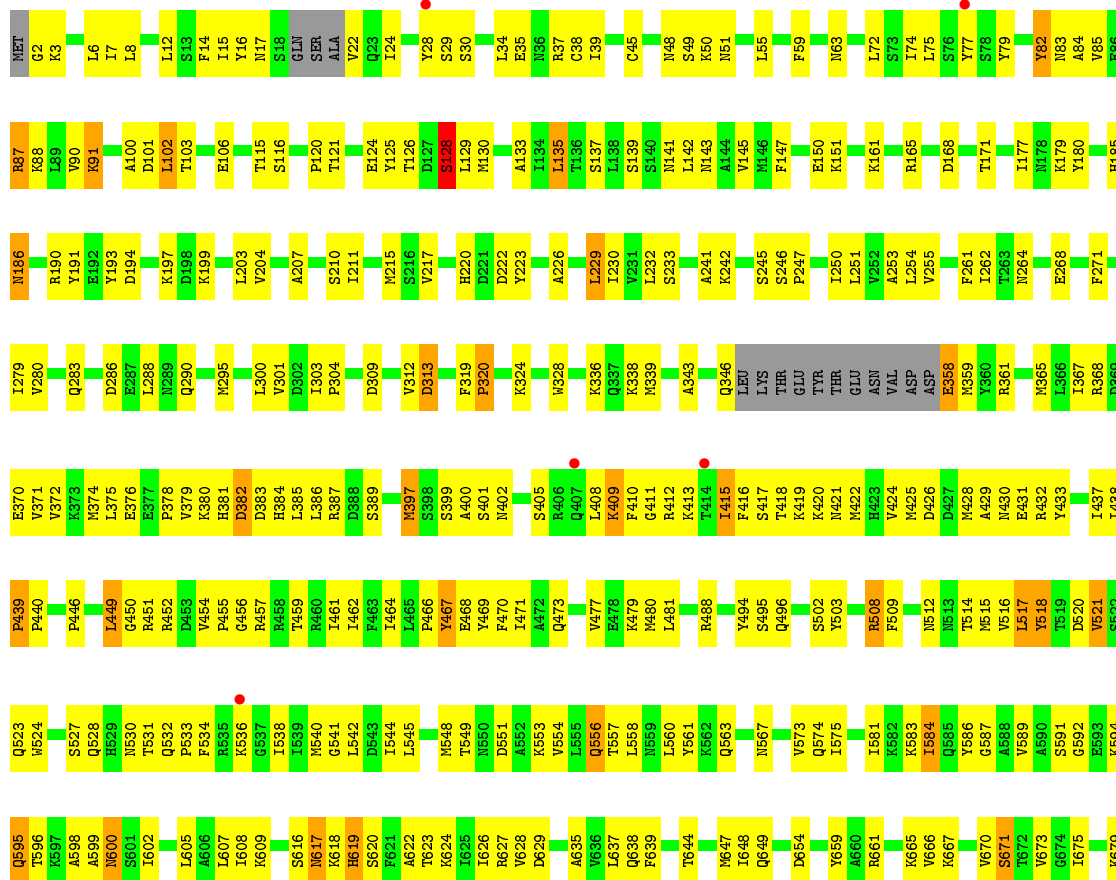
3 Residue-property plots

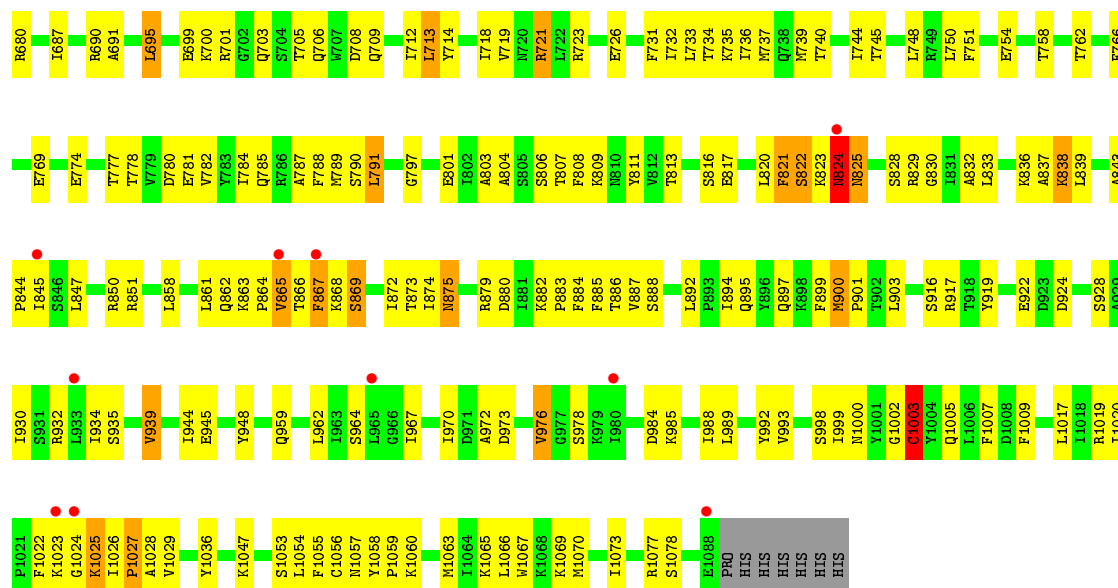
These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density ($RSRZ > 2$). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

- Molecule 1: RNA (5'-R(*G*GP*CP*UP*UP*U)-3')



- Molecule 2: RNA-dependent RNA polymerase





4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	76.45Å 112.31Å 143.72Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	50.00 – 2.80 47.46 – 2.80	Depositor EDS
% Data completeness (in resolution range)	85.9 (50.00-2.80) 85.9 (47.46-2.80)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.65 (at 2.81Å)	Xtriage
Refinement program	CNS	Depositor
R, R_{free}	0.228 , 0.279 0.221 , 0.269	Depositor DCC
R_{free} test set	2490 reflections (7.99%)	wwPDB-VP
Wilson B-factor (Å ²)	58.7	Xtriage
Anisotropy	0.287	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.30 , 46.9	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.93	EDS
Total number of atoms	8799	wwPDB-VP
Average B, all atoms (Å ²)	56.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.71% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality

5.1 Standard geometry

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\# Z > 5$	RMSZ	$\# Z > 5$
1	X	0.57	0/110	1.91	12/169 (7.1%)
2	A	0.47	1/8870 (0.0%)	0.68	2/11989 (0.0%)
All	All	0.48	1/8980 (0.0%)	0.71	14/12158 (0.1%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	X	2	0

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	1003	CYS	CB-SG	-5.11	1.73	1.81

All (14) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	824	ASN	N-CA-C	8.69	134.47	111.00
1	X	1105	U	C2'-C3'-O3'	7.69	126.42	109.50
1	X	1103	C	C2'-C3'-O3'	7.38	125.72	109.50
1	X	1104	U	C2'-C3'-O3'	6.95	124.82	113.70
1	X	1102	G	C4'-C3'-O3'	6.48	125.96	113.00
1	X	1104	U	C4'-C3'-C2'	6.20	108.80	102.60
1	X	1102	G	C4'-C3'-C2'	6.20	108.80	102.60
1	X	1102	G	C2'-C3'-O3'	6.04	123.36	113.70
2	A	825	ASN	N-CA-C	6.00	127.21	111.00
1	X	1105	U	C4'-C3'-O3'	5.65	124.29	113.00
1	X	1103	C	C4'-C3'-C2'	5.53	108.13	102.60
1	X	1105	U	C4'-C3'-C2'	5.34	107.94	102.60
1	X	1104	U	C4'-C3'-O3'	5.26	123.52	113.00

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	X	1104	U	N1-C1'-C2'	-5.20	106.28	112.00

All (2) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
1	X	1102	G	C3'
1	X	1105	U	C3'

There are no planarity outliers.

5.2 Too-close contacts ⓘ

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	X	100	0	54	7	0
2	A	8699	0	8793	442	0
All	All	8799	0	8847	444	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 25.

All (444) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:520:ASP:HB3	2:A:667:LYS:HG2	1.26	1.08
2:A:865:VAL:HG22	2:A:866:THR:H	1.18	1.08
2:A:866:THR:HG22	2:A:867:PHE:H	1.24	1.02
2:A:385:LEU:HD23	2:A:479:LYS:HE2	1.41	1.01
2:A:556:GLN:HE21	2:A:556:GLN:HA	1.30	0.95
2:A:283:GLN:OE1	2:A:649:GLN:HG3	1.67	0.94
2:A:446:PRO:HG2	2:A:583:LYS:HD3	1.46	0.94
2:A:101:ASP:OD1	2:A:103:THR:HG22	1.67	0.94
2:A:186:ASN:ND2	2:A:190:ARG:H	1.67	0.92
2:A:254:LEU:HD23	2:A:280:VAL:HG21	1.53	0.90
2:A:2:GLY:HA2	2:A:754:GLU:OE2	1.72	0.89
2:A:24:ILE:HB	2:A:75:LEU:HB2	1.54	0.89

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:503:TYR:HB2	2:A:687:ILE:HD13	1.53	0.88
2:A:667:LYS:O	2:A:667:LYS:HG3	1.76	0.86
2:A:820:LEU:HB2	2:A:964:SER:O	1.77	0.85
2:A:358:GLU:OE2	2:A:359:MET:HG2	1.77	0.83
2:A:381:HIS:O	2:A:382:ASP:HB2	1.77	0.83
2:A:972:ALA:O	2:A:976:VAL:HG23	1.80	0.82
2:A:824:ASN:CG	2:A:828:SER:HB2	2.02	0.79
2:A:778:THR:O	2:A:782:VAL:HG23	1.84	0.78
2:A:866:THR:HG22	2:A:867:PHE:N	1.99	0.78
2:A:865:VAL:HG22	2:A:866:THR:N	1.98	0.78
2:A:116:SER:HB3	2:A:197:LYS:HG3	1.66	0.78
2:A:286:ASP:O	2:A:290:GLN:HG3	1.86	0.76
2:A:186:ASN:HD21	2:A:190:ARG:H	1.33	0.75
2:A:1023:LYS:O	2:A:1060:LYS:HG2	1.88	0.74
2:A:886:THR:OG1	2:A:1055:PHE:HB3	1.88	0.73
1:X:1105:U:H5'	2:A:400:ALA:CB	2.18	0.73
2:A:520:ASP:CB	2:A:667:LYS:HG2	2.15	0.72
2:A:608:ILE:HD13	2:A:626:ILE:HG23	1.69	0.72
2:A:473:GLN:HG2	2:A:561:TYR:CE1	2.25	0.72
2:A:514:THR:HG22	2:A:638:GLN:HA	1.70	0.72
2:A:6:LEU:H	2:A:6:LEU:HD22	1.53	0.72
2:A:618:LYS:HD2	2:A:654:ASP:OD2	1.90	0.71
2:A:135:LEU:HD22	2:A:709:GLN:NE2	2.04	0.71
2:A:777:THR:HG21	2:A:882:LYS:HE3	1.70	0.71
2:A:885:PHE:CE1	2:A:1056:CYS:HB2	2.25	0.70
2:A:247:PRO:O	2:A:251:LEU:HG	1.92	0.70
2:A:553:LYS:O	2:A:557:THR:HG22	1.90	0.70
2:A:866:THR:CG2	2:A:867:PHE:H	2.05	0.69
2:A:536:LYS:O	2:A:540:MET:HG3	1.94	0.69
2:A:591:SER:HB2	2:A:596:THR:HG21	1.75	0.69
2:A:85:VAL:HG21	2:A:139:SER:OG	1.93	0.68
2:A:882:LYS:HB3	2:A:883:PRO:HD3	1.74	0.68
2:A:145:VAL:HG21	2:A:211:ILE:HG23	1.75	0.68
2:A:820:LEU:HD23	2:A:820:LEU:H	1.59	0.68
2:A:417:SER:OG	2:A:419:LYS:HG2	1.93	0.67
2:A:226:ALA:O	2:A:230:ILE:HG13	1.95	0.66
2:A:3:LYS:HA	2:A:6:LEU:HD23	1.75	0.66
2:A:405:SER:HA	2:A:418:THR:HG22	1.77	0.66
2:A:1019:ARG:HD2	2:A:1053:SER:OG	1.96	0.66
1:X:1105:U:H5'	2:A:400:ALA:HB1	1.78	0.66
2:A:804:ALA:HA	2:A:809:LYS:HE3	1.78	0.66

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:470:PHE:HE1	2:A:594:LYS:HD3	1.59	0.66
2:A:825:ASN:HA	2:A:828:SER:HB3	1.77	0.66
2:A:180:TYR:HB3	2:A:199:LYS:HG3	1.78	0.65
2:A:50:LYS:O	2:A:50:LYS:HG2	1.97	0.65
2:A:215:MET:HE3	2:A:731:PHE:HB2	1.79	0.64
2:A:177:ILE:HD13	2:A:203:LEU:HD11	1.78	0.64
2:A:370:GLU:O	2:A:374:MET:HG3	1.97	0.64
2:A:879:ARG:HG3	2:A:879:ARG:HH11	1.63	0.64
2:A:232:LEU:CD2	2:A:300:LEU:HG	2.28	0.63
2:A:735:LYS:O	2:A:739:MET:HG3	1.97	0.63
2:A:264:ASN:HD21	2:A:268:GLU:HG3	1.63	0.63
2:A:346:GLN:HG2	2:A:586:TYR:CE1	2.34	0.63
2:A:387:ARG:HH11	2:A:387:ARG:HB3	1.63	0.63
2:A:872:ILE:HG22	2:A:1073:ILE:HA	1.80	0.62
2:A:556:GLN:HE21	2:A:556:GLN:CA	2.04	0.62
2:A:930:ILE:O	2:A:934:ILE:HG13	1.98	0.62
2:A:851:ARG:HG2	2:A:851:ARG:HH11	1.64	0.62
2:A:976:VAL:O	2:A:976:VAL:HG12	1.99	0.62
2:A:385:LEU:HD23	2:A:479:LYS:CE	2.23	0.62
2:A:1059:PRO:O	2:A:1063:MET:HG3	1.99	0.62
2:A:420:LYS:O	2:A:424:VAL:HG23	1.99	0.61
2:A:884:PHE:CD1	2:A:1059:PRO:HD3	2.35	0.61
2:A:843:ALA:HB3	2:A:844:PRO:HD3	1.81	0.61
2:A:55:LEU:O	2:A:59:PHE:HD2	1.84	0.61
2:A:762:THR:HA	2:A:1077:ARG:O	1.99	0.61
2:A:399:SER:HB3	2:A:838:LYS:HB3	1.82	0.61
2:A:430:ASN:O	2:A:432:ARG:N	2.33	0.61
2:A:120:PRO:HD2	2:A:124:GLU:OE2	2.01	0.61
2:A:928:SER:O	2:A:932:ARG:HG3	2.01	0.61
2:A:217:VAL:HG13	2:A:222:ASP:HB2	1.82	0.60
2:A:520:ASP:HB2	2:A:667:LYS:HE2	1.83	0.60
2:A:386:LEU:O	2:A:557:THR:HG21	2.01	0.60
2:A:791:LEU:HD23	2:A:791:LEU:N	2.17	0.60
1:X:1104:U:H5"	1:X:1104:U:H6	1.66	0.60
2:A:313:ASP:N	2:A:313:ASP:OD2	2.33	0.60
2:A:400:ALA:O	2:A:419:LYS:HA	2.01	0.60
2:A:865:VAL:CG2	2:A:866:THR:H	2.02	0.59
2:A:375:LEU:C	2:A:378:PRO:HD2	2.23	0.59
2:A:769:GLU:HG2	2:A:1047:LYS:NZ	2.18	0.59
2:A:387:ARG:HB3	2:A:387:ARG:NH1	2.17	0.59
2:A:789:MET:HE1	2:A:873:THR:HG21	1.84	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:87:ARG:O	2:A:90:VAL:HG22	2.02	0.59
2:A:428:MET:HE1	2:A:811:TYR:HD1	1.68	0.59
2:A:461:ILE:HD11	2:A:586:TYR:CZ	2.38	0.59
2:A:892:LEU:HD22	2:A:1017:LEU:HD11	1.83	0.59
2:A:803:ALA:HA	2:A:808:PHE:CD2	2.37	0.59
2:A:250:ILE:HG21	2:A:288:LEU:HB2	1.84	0.59
2:A:343:ALA:O	2:A:346:GLN:HG3	2.03	0.59
2:A:744:ILE:HD11	2:A:750:LEU:HB2	1.84	0.59
2:A:309:ASP:O	2:A:312:VAL:HG22	2.02	0.58
2:A:255:VAL:O	2:A:673:VAL:HG21	2.02	0.58
2:A:803:ALA:HA	2:A:808:PHE:CE2	2.38	0.58
2:A:821:PHE:CD2	2:A:821:PHE:N	2.68	0.58
2:A:312:VAL:HG23	2:A:313:ASP:N	2.19	0.58
2:A:253:ALA:CB	2:A:671:SER:HB2	2.34	0.58
2:A:882:LYS:HE2	2:A:1036:TYR:OH	2.02	0.58
2:A:721:ARG:HH11	2:A:721:ARG:CG	2.17	0.58
2:A:721:ARG:HD2	2:A:726:GLU:HG3	1.86	0.58
2:A:1024:GLY:O	2:A:1025:LYS:CB	2.52	0.58
2:A:598:ALA:O	2:A:602:ILE:HG13	2.03	0.57
2:A:253:ALA:HB1	2:A:671:SER:HB2	1.86	0.57
2:A:381:HIS:O	2:A:382:ASP:CB	2.51	0.57
2:A:470:PHE:CE1	2:A:594:LYS:HD3	2.39	0.57
2:A:6:LEU:HD22	2:A:6:LEU:N	2.19	0.57
2:A:847:LEU:HD23	2:A:850:ARG:NH1	2.19	0.57
2:A:100:ALA:O	2:A:102:LEU:HD22	2.04	0.57
2:A:319:PHE:N	2:A:320:PRO:CD	2.68	0.57
2:A:397:MET:HA	2:A:470:PHE:HE2	1.68	0.57
2:A:784:ILE:HG13	2:A:788:PHE:CE2	2.40	0.57
2:A:989:LEU:O	2:A:993:VAL:HG23	2.04	0.57
2:A:161:LYS:O	2:A:165:ARG:HG3	2.05	0.57
2:A:581:ILE:O	2:A:581:ILE:HG22	2.04	0.57
2:A:312:VAL:HG23	2:A:313:ASP:OD2	2.05	0.56
2:A:451:ARG:HH21	2:A:459:THR:HG21	1.70	0.56
2:A:193:TYR:CZ	2:A:197:LYS:HD2	2.40	0.56
2:A:769:GLU:HG2	2:A:1047:LYS:HZ2	1.70	0.56
2:A:762:THR:HA	2:A:1078:SER:HB3	1.87	0.56
2:A:477:VAL:HA	2:A:480:MET:CE	2.34	0.56
2:A:438:ILE:HD12	2:A:563:GLN:HB3	1.87	0.56
2:A:8:LEU:HD23	2:A:74:ILE:HD12	1.87	0.56
2:A:242:LYS:O	2:A:246:SER:HB2	2.06	0.56
1:X:1105:U:O2	2:A:592:GLY:HA2	2.06	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:887:VAL:HG12	2:A:888:SER:N	2.20	0.56
2:A:858:LEU:O	2:A:862:GLN:HG2	2.05	0.56
2:A:917:ARG:HD2	2:A:919:TYR:CE1	2.40	0.56
2:A:866:THR:O	2:A:867:PHE:HB2	2.06	0.55
2:A:8:LEU:HA	2:A:737:MET:SD	2.46	0.55
2:A:863:LYS:O	2:A:863:LYS:HG3	2.05	0.55
2:A:648:ILE:HG23	2:A:670:VAL:HG12	1.88	0.55
2:A:687:ILE:HG23	2:A:900:MET:HG3	1.87	0.55
2:A:3:LYS:O	2:A:7:ILE:HG12	2.06	0.55
2:A:12:LEU:HD22	2:A:16:TYR:HE2	1.71	0.55
2:A:719:VAL:HG12	2:A:723:ARG:HD2	1.87	0.55
2:A:544:ILE:O	2:A:548:MET:HG3	2.06	0.55
2:A:573:VAL:HG12	2:A:575:ILE:HG13	1.87	0.55
2:A:35:GLU:O	2:A:39:ILE:HG13	2.07	0.55
2:A:744:ILE:N	2:A:744:ILE:HD12	2.22	0.54
2:A:629:ASP:OD1	2:A:680:ARG:NH2	2.39	0.54
2:A:622:ALA:HB3	2:A:638:GLN:HB3	1.88	0.54
2:A:232:LEU:HD23	2:A:300:LEU:HG	1.88	0.54
2:A:813:THR:O	2:A:817:GLU:HG3	2.07	0.54
2:A:516:VAL:HG21	2:A:675:ILE:CG2	2.38	0.54
2:A:383:ASP:O	2:A:387:ARG:HG3	2.08	0.54
2:A:245:SER:HB2	2:A:690:ARG:HH22	1.73	0.54
2:A:372:VAL:HA	2:A:545:LEU:HD21	1.90	0.54
2:A:804:ALA:O	2:A:809:LYS:HE3	2.07	0.54
2:A:207:ALA:O	2:A:211:ILE:HG13	2.08	0.53
2:A:190:ARG:HG2	2:A:701:ARG:NH2	2.22	0.53
2:A:430:ASN:C	2:A:432:ARG:H	2.12	0.53
2:A:556:GLN:NE2	2:A:556:GLN:HA	2.10	0.53
2:A:368:ARG:HG3	2:A:541:GLY:N	2.24	0.53
2:A:261:PHE:CD2	2:A:899:PHE:HB3	2.43	0.53
2:A:437:ILE:O	2:A:439:PRO:HD3	2.09	0.53
2:A:851:ARG:HG2	2:A:851:ARG:NH1	2.24	0.53
2:A:145:VAL:CG2	2:A:211:ILE:HG23	2.37	0.53
2:A:428:MET:HG2	2:A:433:TYR:CG	2.44	0.53
2:A:744:ILE:HB	2:A:748:LEU:HD22	1.91	0.53
2:A:821:PHE:N	2:A:821:PHE:HD2	2.06	0.53
2:A:1026:ILE:HD11	2:A:1067:TRP:CD1	2.44	0.53
2:A:1023:LYS:HD2	2:A:1058:TYR:O	2.10	0.52
2:A:531:THR:HB	2:A:589:VAL:HG23	1.91	0.52
2:A:449:LEU:HD22	2:A:573:VAL:CG1	2.39	0.52
2:A:781:GLU:O	2:A:785:GLN:HG3	2.09	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:1003:CYS:SG	2:A:1007:PHE:CZ	3.02	0.52
2:A:180:TYR:HB3	2:A:199:LYS:CG	2.40	0.52
2:A:561:TYR:OH	2:A:595:GLN:HB3	2.09	0.52
1:X:1103:C:H2'	1:X:1104:U:C6	2.45	0.52
2:A:387:ARG:CB	2:A:387:ARG:HH11	2.23	0.52
2:A:897:GLN:N	2:A:897:GLN:OE1	2.37	0.52
2:A:894:ILE:O	2:A:894:ILE:HG13	2.09	0.51
2:A:962:LEU:O	2:A:967:ILE:HD13	2.10	0.51
2:A:384:HIS:CE1	2:A:935:SER:O	2.63	0.51
2:A:619:HIS:ND1	2:A:619:HIS:N	2.58	0.51
2:A:708:ASP:O	2:A:712:ILE:HG13	2.10	0.51
2:A:450:GLY:O	2:A:462:ILE:N	2.42	0.51
1:X:1105:U:C5'	2:A:400:ALA:HB1	2.40	0.51
2:A:84:ALA:HA	2:A:87:ARG:HG3	1.93	0.51
2:A:477:VAL:HA	2:A:480:MET:HE3	1.91	0.51
2:A:521:VAL:HG12	2:A:666:VAL:HG11	1.93	0.51
2:A:84:ALA:O	2:A:88:LYS:HG3	2.10	0.51
2:A:324:LYS:O	2:A:328:TRP:HD1	1.94	0.51
2:A:439:PRO:HD3	2:A:468:GLU:HG2	1.91	0.51
2:A:22:VAL:HG22	2:A:77:TYR:HB2	1.92	0.51
2:A:518:TYR:N	2:A:518:TYR:CD2	2.78	0.51
2:A:758:THR:HG22	2:A:766:PHE:O	2.11	0.51
2:A:466:PRO:HD2	2:A:469:TYR:HD2	1.76	0.51
2:A:558:LEU:HD23	2:A:558:LEU:O	2.12	0.51
2:A:367:ILE:O	2:A:371:VAL:HG23	2.11	0.50
2:A:409:LYS:HB2	2:A:409:LYS:NZ	2.25	0.50
2:A:466:PRO:HD2	2:A:469:TYR:CD2	2.46	0.50
2:A:785:GLN:OE1	2:A:875:ASN:ND2	2.44	0.50
2:A:262:ILE:HD12	2:A:508:ARG:HD2	1.93	0.50
2:A:549:THR:HG21	2:A:554:VAL:HG11	1.94	0.50
2:A:703:GLN:H	2:A:703:GLN:CD	2.14	0.50
2:A:488:ARG:HG2	2:A:494:TYR:CE1	2.46	0.50
2:A:863:LYS:O	2:A:863:LYS:CG	2.60	0.50
2:A:528:GLN:O	2:A:531:THR:HG22	2.12	0.50
2:A:264:ASN:ND2	2:A:268:GLU:HG3	2.26	0.50
2:A:531:THR:HG21	2:A:587:GLY:O	2.11	0.50
2:A:405:SER:CA	2:A:418:THR:HG22	2.40	0.50
2:A:899:PHE:O	2:A:901:PRO:HD3	2.12	0.50
2:A:14:PHE:CE2	2:A:147:PHE:HB2	2.46	0.49
2:A:115:THR:HB	2:A:197:LYS:HA	1.94	0.49
2:A:12:LEU:HD21	2:A:751:PHE:CE2	2.46	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:454:VAL:CG1	2:A:457:ARG:HB3	2.43	0.49
2:A:397:MET:HE1	2:A:471:ILE:HD11	1.93	0.49
2:A:608:ILE:HD11	2:A:635:ALA:HB2	1.94	0.49
2:A:193:TYR:CE2	2:A:197:LYS:HD2	2.47	0.49
2:A:449:LEU:CD2	2:A:573:VAL:HG11	2.41	0.49
2:A:924:ASP:C	2:A:944:ILE:HD13	2.32	0.49
2:A:451:ARG:NH2	2:A:459:THR:HG21	2.27	0.49
2:A:605:LEU:O	2:A:605:LEU:HD12	2.13	0.49
2:A:703:GLN:N	2:A:703:GLN:CD	2.65	0.49
2:A:736:ILE:O	2:A:740:THR:HG23	2.12	0.49
2:A:832:ALA:O	2:A:836:LYS:HG3	2.12	0.49
2:A:191:TYR:CE2	2:A:204:VAL:HG11	2.47	0.49
2:A:816:SER:O	2:A:820:LEU:HD23	2.13	0.49
2:A:959:GLN:NE2	2:A:973:ASP:OD1	2.46	0.49
2:A:24:ILE:HB	2:A:75:LEU:CB	2.36	0.49
2:A:402:ASN:OD1	2:A:467:TYR:N	2.44	0.49
2:A:419:LYS:HB2	2:A:422:MET:HG3	1.93	0.49
2:A:945:GLU:HG2	2:A:992:TYR:HE1	1.77	0.49
2:A:1023:LYS:NZ	2:A:1057:ASN:HA	2.28	0.49
2:A:397:MET:CE	2:A:471:ILE:HD11	2.43	0.49
2:A:168:ASP:OD2	2:A:223:TYR:OH	2.19	0.48
2:A:509:PHE:CD2	2:A:624:LYS:HB3	2.48	0.48
2:A:102:LEU:H	2:A:102:LEU:HD22	1.77	0.48
2:A:397:MET:HA	2:A:470:PHE:CE2	2.47	0.48
2:A:137:SER:HB2	2:A:185:HIS:CD2	2.48	0.48
2:A:303:ILE:HB	2:A:304:PRO:HD3	1.95	0.48
2:A:532:GLN:HG3	2:A:536:LYS:HE3	1.95	0.48
2:A:967:ILE:HD12	2:A:967:ILE:N	2.28	0.48
2:A:30:SER:N	2:A:780:ASP:OD1	2.44	0.48
2:A:837:ALA:C	2:A:839:LEU:H	2.17	0.48
2:A:820:LEU:CB	2:A:964:SER:O	2.57	0.48
2:A:551:ASP:HB3	2:A:554:VAL:HB	1.95	0.48
2:A:261:PHE:HD2	2:A:899:PHE:HB3	1.76	0.48
2:A:616:SER:O	2:A:617:ASN:C	2.51	0.48
2:A:867:PHE:CE2	2:A:869:SER:HA	2.48	0.48
2:A:514:THR:HB	2:A:637:LEU:O	2.14	0.48
2:A:822:SER:OG	2:A:964:SER:HA	2.14	0.48
2:A:301:VAL:C	2:A:304:PRO:HD2	2.33	0.47
2:A:385:LEU:CD2	2:A:479:LYS:HE2	2.28	0.47
2:A:495:SER:OG	2:A:496:GLN:N	2.47	0.47
2:A:823:LYS:HE3	2:A:825:ASN:ND2	2.29	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:556:GLN:NE2	2:A:556:GLN:CA	2.74	0.47
2:A:667:LYS:O	2:A:667:LYS:CG	2.56	0.47
2:A:959:GLN:HE21	2:A:973:ASP:HA	1.79	0.47
2:A:733:LEU:O	2:A:737:MET:HE2	2.14	0.47
2:A:887:VAL:HG22	2:A:1054:LEU:HD11	1.95	0.47
2:A:15:ILE:HG22	2:A:16:TYR:CD1	2.48	0.47
2:A:126:THR:OG1	2:A:128:SER:HB3	2.14	0.47
2:A:523:GLN:HB2	2:A:665:LYS:O	2.14	0.47
2:A:28:TYR:HD2	2:A:72:LEU:HB2	1.80	0.47
2:A:50:LYS:O	2:A:50:LYS:CG	2.61	0.47
2:A:734:THR:HA	2:A:737:MET:CE	2.44	0.47
2:A:12:LEU:HD21	2:A:751:PHE:CZ	2.49	0.47
2:A:165:ARG:HE	2:A:220:HIS:HA	1.80	0.47
2:A:999:ILE:HD11	2:A:1009:PHE:CZ	2.50	0.47
2:A:1028:ALA:HB1	2:A:1070:MET:HE2	1.97	0.47
2:A:804:ALA:CA	2:A:809:LYS:HE3	2.45	0.47
2:A:375:LEU:O	2:A:379:VAL:HG23	2.15	0.46
2:A:616:SER:O	2:A:618:LYS:N	2.48	0.46
2:A:734:THR:HA	2:A:737:MET:HE3	1.96	0.46
2:A:375:LEU:O	2:A:378:PRO:HD2	2.14	0.46
2:A:473:GLN:HG2	2:A:561:TYR:CD1	2.50	0.46
2:A:887:VAL:CG1	2:A:888:SER:N	2.77	0.46
2:A:1029:VAL:HG13	2:A:1066:LEU:HD23	1.97	0.46
2:A:449:LEU:HD13	2:A:573:VAL:HG13	1.98	0.46
2:A:629:ASP:OD2	2:A:679:LYS:HE2	2.16	0.46
2:A:129:LEU:HD22	2:A:336:LYS:O	2.16	0.46
2:A:410:PHE:O	2:A:412:ARG:N	2.49	0.46
2:A:713:LEU:HD11	2:A:732:ILE:HD12	1.98	0.46
2:A:368:ARG:HD2	2:A:544:ILE:HD11	1.99	0.45
2:A:618:LYS:CD	2:A:654:ASP:OD2	2.63	0.45
2:A:8:LEU:CD2	2:A:74:ILE:HD12	2.46	0.45
2:A:644:THR:OG1	2:A:647:MET:HG3	2.16	0.45
2:A:102:LEU:N	2:A:102:LEU:HD22	2.31	0.45
2:A:180:TYR:O	2:A:199:LYS:HE3	2.17	0.45
2:A:784:ILE:HA	2:A:784:ILE:HD12	1.81	0.45
2:A:1058:TYR:HA	2:A:1059:PRO:HD3	1.83	0.45
2:A:516:VAL:N	2:A:671:SER:O	2.43	0.45
2:A:361:ARG:O	2:A:365:MET:HG2	2.17	0.45
2:A:847:LEU:O	2:A:851:ARG:HG3	2.17	0.45
2:A:261:PHE:CE1	2:A:271:PHE:HB2	2.51	0.45
2:A:822:SER:OG	2:A:823:LYS:N	2.50	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:989:LEU:HD21	2:A:1070:MET:HE3	1.98	0.45
2:A:35:GLU:O	2:A:38:CYS:HB2	2.17	0.45
2:A:49:SER:C	2:A:51:ASN:H	2.21	0.45
2:A:820:LEU:C	2:A:821:PHE:HD2	2.20	0.45
2:A:241:ALA:HB3	2:A:456:GLY:HA2	1.98	0.44
2:A:774:GLU:HA	2:A:774:GLU:OE1	2.17	0.44
2:A:141:ASN:O	2:A:145:VAL:HG23	2.17	0.44
2:A:358:GLU:HG3	2:A:359:MET:HG3	1.99	0.44
2:A:984:ASP:O	2:A:988:ILE:HG12	2.17	0.44
2:A:165:ARG:NE	2:A:220:HIS:HA	2.32	0.44
1:X:1104:U:H5'	2:A:401:SER:HB2	1.99	0.44
2:A:502:SER:HB3	2:A:680:ARG:NH1	2.33	0.44
2:A:806:SER:O	2:A:808:PHE:N	2.50	0.44
2:A:368:ARG:O	2:A:372:VAL:HG23	2.17	0.44
2:A:439:PRO:HA	2:A:440:PRO:HD3	1.84	0.44
2:A:665:LYS:HD3	2:A:665:LYS:HA	1.82	0.44
2:A:744:ILE:HD11	2:A:750:LEU:CB	2.48	0.44
2:A:24:ILE:HD12	2:A:45:CYS:HB3	1.99	0.44
2:A:82:TYR:O	2:A:82:TYR:HD1	2.01	0.44
2:A:1002:GLY:O	2:A:1005:GLN:HG2	2.17	0.44
2:A:358:GLU:HG3	2:A:359:MET:N	2.33	0.44
2:A:477:VAL:HA	2:A:480:MET:HE2	1.98	0.44
2:A:217:VAL:HG13	2:A:222:ASP:CB	2.48	0.43
2:A:430:ASN:C	2:A:432:ARG:N	2.69	0.43
2:A:514:THR:HG22	2:A:638:GLN:HG3	1.99	0.43
2:A:161:LYS:HG2	2:A:165:ARG:CZ	2.49	0.43
2:A:521:VAL:HG11	2:A:607:LEU:HD23	2.00	0.43
2:A:375:LEU:HB2	2:A:545:LEU:HD13	1.99	0.43
2:A:449:LEU:HD22	2:A:573:VAL:HG11	1.98	0.43
2:A:721:ARG:NH1	2:A:721:ARG:CG	2.77	0.43
2:A:880:ASP:OD2	2:A:1069:LYS:HE2	2.19	0.43
2:A:389:SER:HG	2:A:557:THR:CB	2.31	0.43
2:A:415:ILE:HG23	2:A:416:PHE:N	2.32	0.43
2:A:714:TYR:O	2:A:718:ILE:HG12	2.18	0.43
2:A:959:GLN:NE2	2:A:973:ASP:HA	2.34	0.43
2:A:985:LYS:HB3	2:A:985:LYS:HE2	1.87	0.43
2:A:1065:LYS:O	2:A:1069:LYS:HG3	2.18	0.43
2:A:532:GLN:CB	2:A:533:PRO:HD3	2.47	0.43
2:A:616:SER:C	2:A:618:LYS:N	2.71	0.43
2:A:744:ILE:HG22	2:A:745:THR:HG23	2.01	0.43
2:A:879:ARG:CG	2:A:879:ARG:HH11	2.31	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:246:SER:N	2:A:247:PRO:CD	2.82	0.43
2:A:193:TYR:OH	2:A:197:LYS:HD2	2.18	0.43
2:A:515:MET:HG2	2:A:639:PHE:HE2	1.84	0.43
2:A:279:ILE:HB	2:A:648:ILE:HD11	2.00	0.43
2:A:797:GLY:O	2:A:801:GLU:HG3	2.18	0.43
2:A:185:HIS:H	2:A:185:HIS:CD2	2.36	0.43
2:A:168:ASP:O	2:A:171:THR:HB	2.19	0.43
2:A:695:LEU:HG	2:A:713:LEU:HD13	2.00	0.43
2:A:438:ILE:HD11	2:A:560:LEU:HD22	2.00	0.43
2:A:573:VAL:CG1	2:A:574:GLN:N	2.82	0.43
2:A:605:LEU:HD11	2:A:609:LYS:HE3	2.01	0.43
2:A:75:LEU:HD22	2:A:748:LEU:HD21	1.99	0.43
2:A:804:ALA:C	2:A:809:LYS:HE3	2.39	0.43
2:A:385:LEU:HD13	2:A:939:VAL:CG2	2.49	0.43
2:A:421:ASN:O	2:A:425:MET:HG3	2.18	0.42
2:A:454:VAL:HG22	2:A:455:PRO:N	2.34	0.42
2:A:532:GLN:HA	2:A:532:GLN:OE1	2.19	0.42
2:A:376:GLU:CG	2:A:380:LYS:HE2	2.49	0.42
2:A:839:LEU:HB3	2:A:845:ILE:HD12	2.01	0.42
2:A:1000:ASN:O	2:A:1005:GLN:HB3	2.18	0.42
2:A:295:MET:O	2:A:300:LEU:HB2	2.18	0.42
2:A:452:ARG:HD2	2:A:699:GLU:OE2	2.19	0.42
2:A:627:ARG:HH11	2:A:627:ARG:HG2	1.83	0.42
2:A:790:SER:HB3	2:A:791:LEU:HD23	2.00	0.42
2:A:125:TYR:CG	2:A:126:THR:N	2.86	0.42
2:A:301:VAL:O	2:A:304:PRO:HD2	2.19	0.42
2:A:1026:ILE:HD11	2:A:1067:TRP:CG	2.54	0.42
2:A:2:GLY:O	2:A:6:LEU:CD2	2.68	0.42
2:A:135:LEU:HB3	2:A:706:GLN:HG2	2.01	0.42
2:A:467:TYR:C	2:A:467:TYR:CD1	2.93	0.42
2:A:596:THR:O	2:A:600:ASN:HB2	2.20	0.42
2:A:713:LEU:HD12	2:A:713:LEU:O	2.20	0.42
2:A:607:LEU:HD21	2:A:659:TYR:HE1	1.85	0.42
2:A:691:ALA:HB2	2:A:723:ARG:HB3	2.01	0.42
2:A:83:ASN:HB3	2:A:84:ALA:H	1.57	0.42
2:A:133:ALA:HB1	2:A:701:ARG:HG3	2.02	0.42
2:A:161:LYS:HB3	2:A:165:ARG:HH12	1.83	0.42
2:A:387:ARG:NH1	2:A:553:LYS:HG3	2.35	0.42
2:A:452:ARG:HB2	2:A:462:ILE:HD11	2.01	0.42
2:A:781:GLU:O	2:A:784:ILE:HG22	2.20	0.42
2:A:833:LEU:O	2:A:836:LYS:N	2.53	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:84:ALA:HB1	2:A:88:LYS:NZ	2.35	0.42
2:A:29:SER:H	2:A:35:GLU:HG2	1.84	0.41
2:A:477:VAL:O	2:A:481:LEU:HG	2.19	0.41
2:A:534:PHE:HZ	2:A:599:ALA:HB1	1.85	0.41
2:A:1024:GLY:O	2:A:1025:LYS:HB3	2.20	0.41
2:A:165:ARG:HB3	2:A:223:TYR:HB2	2.03	0.41
2:A:623:THR:CG2	2:A:626:ILE:HG13	2.49	0.41
2:A:719:VAL:CG1	2:A:723:ARG:HD2	2.50	0.41
2:A:72:LEU:CD2	2:A:864:PRO:HD3	2.50	0.41
2:A:177:ILE:HD13	2:A:177:ILE:HA	1.88	0.41
2:A:376:GLU:HG3	2:A:380:LYS:HE2	2.02	0.41
2:A:516:VAL:HG21	2:A:675:ILE:HG21	2.02	0.41
2:A:661:ARG:HA	2:A:661:ARG:HD2	1.90	0.41
2:A:744:ILE:HD13	2:A:748:LEU:HD22	2.02	0.41
2:A:22:VAL:CG2	2:A:77:TYR:HB2	2.51	0.41
2:A:142:LEU:HD23	2:A:211:ILE:HD11	2.02	0.41
2:A:464:ILE:O	2:A:464:ILE:HG22	2.20	0.41
2:A:6:LEU:CD2	2:A:6:LEU:H	2.28	0.41
2:A:919:TYR:C	2:A:919:TYR:CD1	2.94	0.41
2:A:948:TYR:OH	2:A:1070:MET:O	2.34	0.41
2:A:413:LYS:HA	2:A:413:LYS:HD3	1.91	0.41
2:A:575:ILE:HD12	2:A:584:ILE:HG12	2.01	0.41
2:A:28:TYR:HA	2:A:35:GLU:OE2	2.20	0.41
2:A:524:TRP:O	2:A:527:SER:HB3	2.21	0.41
2:A:574:GLN:HB3	2:A:581:ILE:CG2	2.51	0.41
2:A:439:PRO:O	2:A:567:ASN:ND2	2.53	0.41
2:A:530:ASN:O	2:A:533:PRO:HD2	2.20	0.41
2:A:541:GLY:O	2:A:545:LEU:HG	2.21	0.41
2:A:824:ASN:CB	2:A:828:SER:HB2	2.50	0.41
2:A:72:LEU:HD23	2:A:861:LEU:O	2.21	0.41
2:A:338:LYS:O	2:A:339:MET:C	2.59	0.41
2:A:34:LEU:HD12	2:A:34:LEU:HA	1.88	0.41
2:A:408:LEU:HD22	2:A:426:ASP:CG	2.41	0.41
2:A:429:ALA:C	2:A:430:ASN:OD1	2.59	0.41
2:A:924:ASP:O	2:A:944:ILE:HD13	2.21	0.41
2:A:962:LEU:O	2:A:967:ILE:HB	2.20	0.41
2:A:147:PHE:O	2:A:151:LYS:HG2	2.21	0.40
2:A:787:ALA:O	2:A:790:SER:HB3	2.20	0.40
2:A:900:MET:HE1	2:A:903:LEU:HD21	2.04	0.40
2:A:229:LEU:HA	2:A:229:LEU:HD12	1.91	0.40
2:A:532:GLN:O	2:A:536:LYS:HG3	2.21	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:538:ILE:O	2:A:542:LEU:HG	2.21	0.40
2:A:874:ILE:HD12	2:A:874:ILE:HA	1.91	0.40
2:A:899:PHE:C	2:A:901:PRO:HD3	2.41	0.40
2:A:88:LYS:O	2:A:91:LYS:HG3	2.21	0.40
2:A:1020:ILE:HG22	2:A:1020:ILE:O	2.21	0.40
2:A:229:LEU:O	2:A:233:SER:HB3	2.21	0.40
2:A:558:LEU:C	2:A:558:LEU:HD23	2.42	0.40
2:A:648:ILE:HG23	2:A:670:VAL:CG1	2.50	0.40
2:A:829:ARG:HG3	2:A:830:GLY:N	2.35	0.40
2:A:12:LEU:HD22	2:A:16:TYR:CE2	2.55	0.40
2:A:295:MET:O	2:A:300:LEU:HD12	2.22	0.40
2:A:428:MET:HG2	2:A:433:TYR:CB	2.51	0.40
2:A:517:LEU:C	2:A:517:LEU:HD23	2.42	0.40
2:A:705:THR:O	2:A:709:GLN:HG3	2.20	0.40
2:A:944:ILE:HA	2:A:944:ILE:HD12	1.91	0.40
2:A:14:PHE:CD1	2:A:150:GLU:OE1	2.74	0.40
2:A:179:LYS:HG2	2:A:179:LYS:O	2.21	0.40
2:A:210:SER:OG	2:A:230:ILE:HG23	2.22	0.40
2:A:34:LEU:O	2:A:37:ARG:HB2	2.21	0.40
2:A:386:LEU:HA	2:A:386:LEU:HD23	1.82	0.40
2:A:446:PRO:HB2	2:A:574:GLN:HG2	2.02	0.40
2:A:473:GLN:HE21	2:A:594:LYS:HB3	1.87	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
2	A	1067/1095 (97%)	966 (90%)	81 (8%)	20 (2%)	8	26

All (20) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	A	382	ASP
2	A	431	GLU
2	A	822	SER
2	A	978	SER
2	A	1025	LYS
2	A	82	TYR
2	A	106	GLU
2	A	807	THR
2	A	102	LEU
2	A	128	SER
2	A	397	MET
2	A	411	GLY
2	A	838	LYS
2	A	867	PHE
2	A	1027	PRO
2	A	439	PRO
2	A	617	ASN
2	A	869	SER
2	A	865	VAL
2	A	976	VAL

5.3.2 Protein sidechains ⓘ

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	A	975/996 (98%)	922 (95%)	53 (5%)	22	53

All (53) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	A	17	ASN
2	A	48	ASN
2	A	63	ASN
2	A	79	TYR
2	A	87	ARG
2	A	91	LYS
2	A	121	THR

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Mol	Chain	Res	Type
2	A	128	SER
2	A	130	MET
2	A	135	LEU
2	A	143	ASN
2	A	186	ASN
2	A	194	ASP
2	A	229	LEU
2	A	313	ASP
2	A	320	PRO
2	A	358	GLU
2	A	409	LYS
2	A	415	ILE
2	A	449	LEU
2	A	467	TYR
2	A	508	ARG
2	A	512	ASN
2	A	517	LEU
2	A	518	TYR
2	A	521	VAL
2	A	556	GLN
2	A	584	ILE
2	A	595	GLN
2	A	600	ASN
2	A	619	HIS
2	A	620	SER
2	A	628	VAL
2	A	671	SER
2	A	695	LEU
2	A	700	LYS
2	A	713	LEU
2	A	721	ARG
2	A	791	LEU
2	A	821	PHE
2	A	824	ASN
2	A	868	LYS
2	A	875	ASN
2	A	895	GLN
2	A	900	MET
2	A	916	SER
2	A	922	GLU
2	A	939	VAL
2	A	970	ILE

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Mol	Chain	Res	Type
2	A	998	SER
2	A	1003	CYS
2	A	1022	PHE
2	A	1027	PRO

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (28) such sidechains are listed below:

Mol	Chain	Res	Type
2	A	36	ASN
2	A	48	ASN
2	A	63	ASN
2	A	185	HIS
2	A	186	ASN
2	A	289	ASN
2	A	294	ASN
2	A	308	GLN
2	A	473	GLN
2	A	496	GLN
2	A	512	ASN
2	A	528	GLN
2	A	556	GLN
2	A	563	GLN
2	A	565	GLN
2	A	574	GLN
2	A	617	ASN
2	A	646	GLN
2	A	653	ASN
2	A	824	ASN
2	A	825	ASN
2	A	853	GLN
2	A	875	ASN
2	A	895	GLN
2	A	912	GLN
2	A	959	GLN
2	A	1034	HIS
2	A	1057	ASN

5.3.3 RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	X	4/6 (66%)	2 (50%)	1 (25%)

All (2) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	X	1104	U
1	X	1105	U

All (1) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
1	X	1103	C

5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

There are no non-standard protein/DNA/RNA residues in this entry.

5.5 Carbohydrates [i](#)

There are no carbohydrates in this entry.

5.6 Ligand geometry [i](#)

There are no ligands in this entry.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data [i](#)

6.1 Protein, DNA and RNA chains [i](#)

In the following table, the column labelled ‘#RSRZ> 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q< 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	X	5/6 (83%)	2.47	3 (60%) 0 0	113, 117, 155, 169	0
2	A	1073/1095 (97%)	-0.09	15 (1%) 75 70	17, 54, 89, 129	0
All	All	1078/1101 (97%)	-0.08	18 (1%) 70 63	17, 54, 90, 169	0

All (18) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	A	824	ASN	4.4
1	X	1102	G	3.9
2	A	867	PHE	3.7
2	A	865	VAL	3.7
2	A	1088	GLU	3.6
1	X	1106	U	3.4
2	A	1024	GLY	2.9
1	X	1105	U	2.8
2	A	1023	LYS	2.7
2	A	407	GLN	2.7
2	A	414	THR	2.6
2	A	965	LEU	2.5
2	A	28	TYR	2.5
2	A	77	TYR	2.4
2	A	536	LYS	2.3
2	A	933	LEU	2.2
2	A	980	ILE	2.2
2	A	845	ILE	2.1

6.2 Non-standard residues in protein, DNA, RNA chains [i](#)

There are no non-standard protein/DNA/RNA residues in this entry.

6.3 Carbohydrates [i](#)

There are no carbohydrates in this entry.

6.4 Ligands [i](#)

There are no ligands in this entry.

6.5 Other polymers [i](#)

There are no such residues in this entry.