Full wwPDB X-ray Structure Validation Report ⓘ

Feb 3, 2024 – 09:44 PM EST

PDB ID	:	1N38
Title	:	reovirus polymerase lambda3 elongation complex with one phosphodiester bond formed
Authors	:	Tao, Y.; Farsetta, D.L.; Nibert, M.L.; Harrison, S.C.
Deposited on	:	2002-10-25
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 types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

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

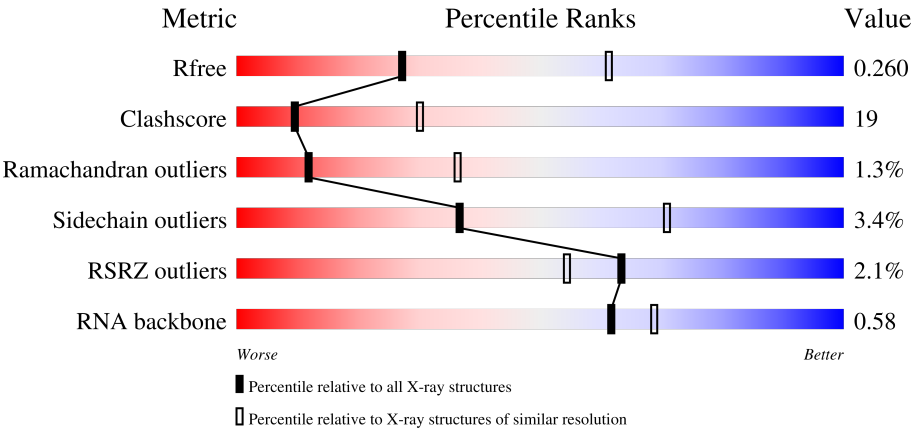
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.36
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

1 Overall quality at a glance (i)

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 of 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 <=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	B	2	100% 50% 50%
2	C	6	17% 33% 50% 17%
3	A	1267	2% 64% 33%

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard

residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
5	U3H	A	1291	X	-	-	-
6	CH1	A	1294	-	-	-	X

2 Entry composition (i)

There are 7 unique types of molecules in this entry. The entry contains 10485 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 5'-R(P*GP*C)-3'.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	B	2	Total	C	N	O	P	0	0	0
			43	19	8	14	2			

- Molecule 2 is a RNA chain called 5'-R(*AP*UP*UP*AP*GP*C)-3'.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	C	5	Total	C	N	O	P	0	0	0
			105	47	17	36	5			

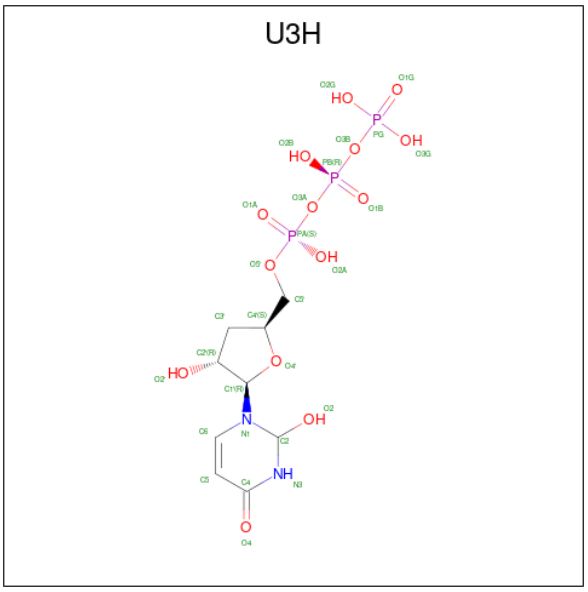
- Molecule 3 is a protein called Minor core protein lambda 3.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	A	1264	Total	C	N	O	S	0	0	0
			9986	6369	1712	1841	64			

- Molecule 4 is MANGANESE (II) ION (three-letter code: MN) (formula: Mn).

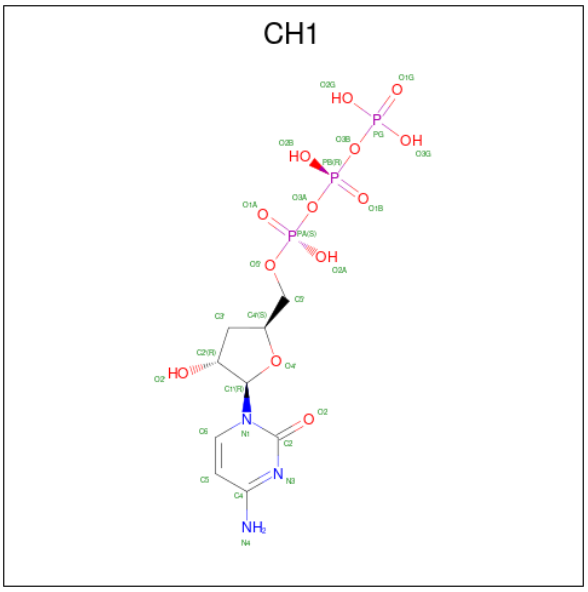
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	2	Total	Mn	0	0
			2	2		

- Molecule 5 is 3'-DEOXY-URIDINE 5'-TRIPHOSPHATE (three-letter code: U3H) (formula: $C_9H_{17}N_2O_{14}P_3$).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
5	A	1	Total	C	N	O	P	0	0
			28	9	2	14	3		

- Molecule 6 is 3'-DEOXY-CYTIDINE-5'-TRIPHOSPHATE (three-letter code: CH1) (formula: $C_9H_{16}N_3O_{13}P_3$).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
6	A	1	Total	C	N	O	P	0	0
			28	9	3	13	3		
6	A	1	Total	C	N	O	P	0	0
			28	9	3	13	3		

- Molecule 7 is water.

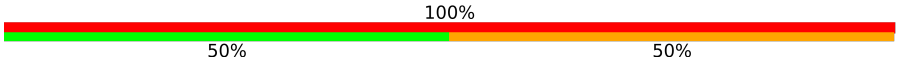
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	B	2	Total O 2 2	0	0
7	C	2	Total O 2 2	0	0
7	A	261	Total O 261 261	0	0

3 Residue-property plots (i)

These plots are drawn for all protein, RNA, DNA and oligosaccharide 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.

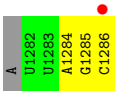
• Molecule 1: 5'-R(P*GP*C)-3'

Chain B:



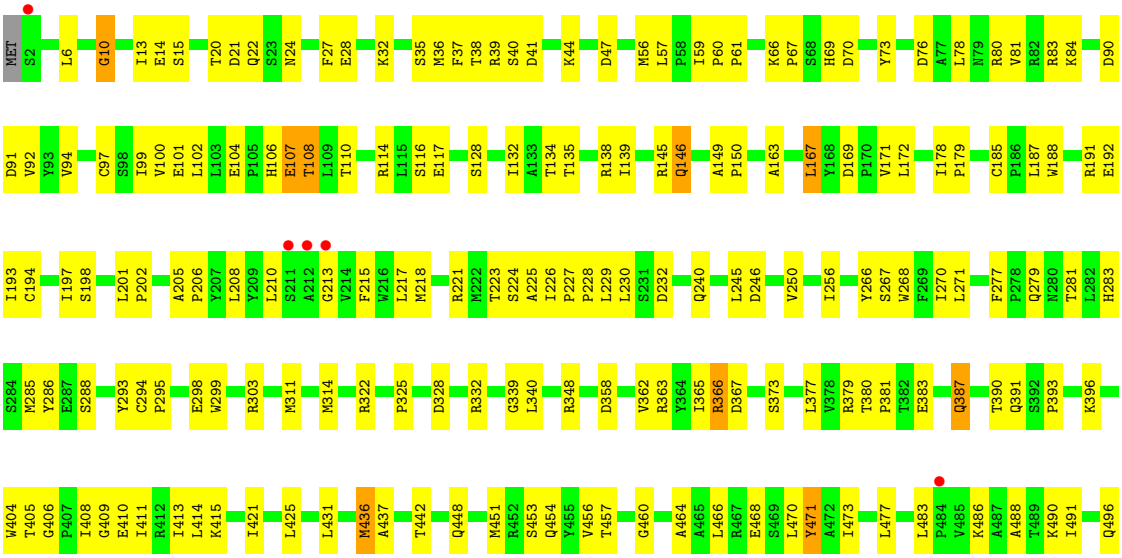
• Molecule 2: 5'-R(*AP*UP*UP*AP*GP*C)-3'

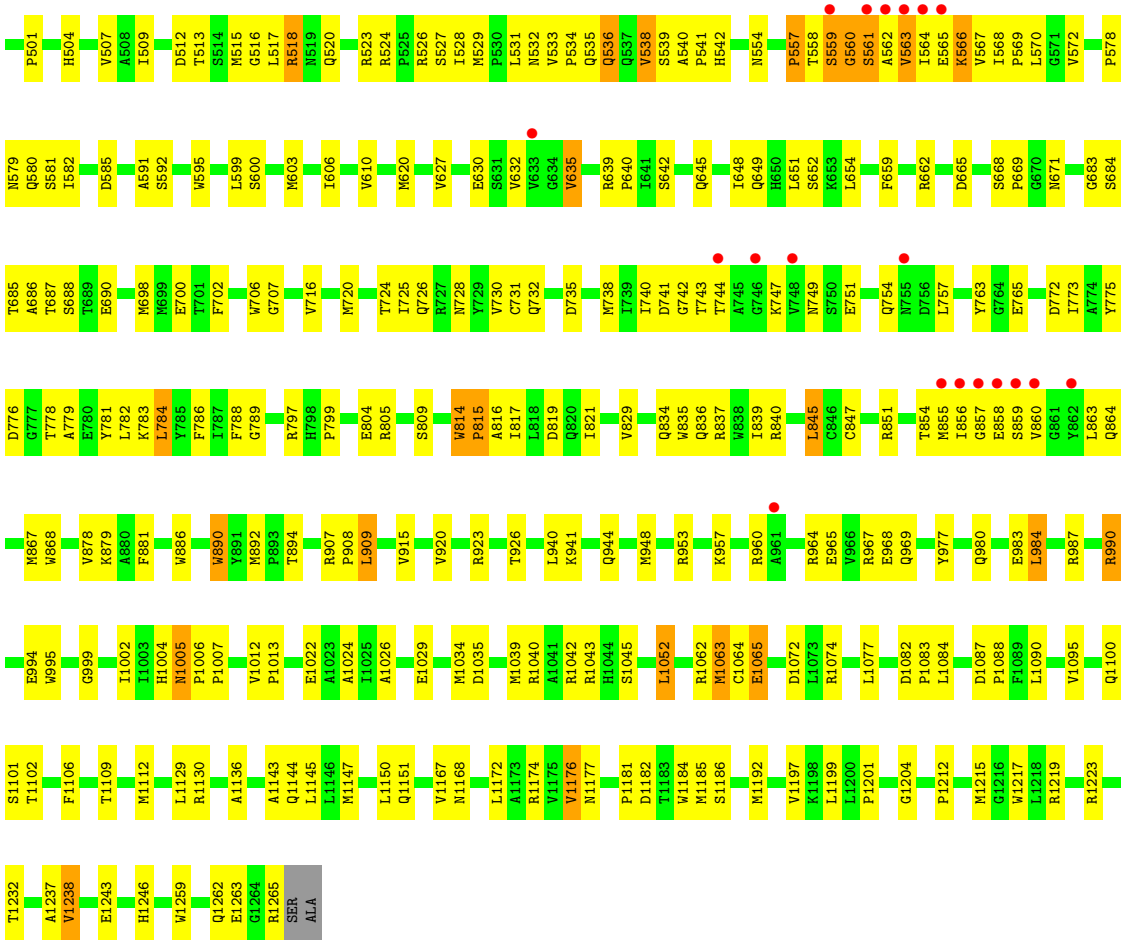
Chain C:



• Molecule 3: Minor core protein lambda 3

Chain A:




P501 H504 V507 A508 I509 D512 T513 S514 M515 G516 L517 R518 N519 Q520 R523 R524 P525 R526 S527 I528 M529 P530 L531 N532 V533 P534 Q535 Q536 Q537 V538 S539 A540 P541 H542 N554 P557 T558 S559 G560 S561 A562 V563 I564 E565 K566 V567 I568 P569 L570 G571 V572 P578
N579 Q580 S581 I582 D585 A591 S592 W595 L599 S600 M603 I606 V610 M620 V627 E630 S631 V632 V633 G634 V635 R639 P640 I641 S642 Q645 I648 Q649 H650 L651 S652 K653 L654 F659 R662 D665 S668 P669 G670 N671 G683 S684
T685 A686 T687 S688 T689 E690 M698 W699 E700 T701 F702 W706 G707 V716 M720 T724 I725 Q726 R727 N728 Y729 V730 C731 Q732 D735 M738 I739 I740 D741 G742 T743 T744 A745 G746 K747 V748 N749 S750 E751 Q754 N755 D756 L757 Y763 G764 E765 D772 I773 A774 Y775
D776 G777 T778 A779 E780 Y781 L782 K783 L784 Y785 F786 Y787 F788 G789 R797 H798 P799 E804 R805 S809 W814 P815 A816 I817 L818 D819 Q820 I821 V829 Q834 W835 Q836 R837 W838 I839 R840 L845 C846 C847 R851 T854 M855 I856 G857 E858 S859 V860 G861 Y862 L863 Q864
M867 W868 V878 K879 A880 F881 W886 W890 Y891 M892 P893 T894 R907 P908 L909 V915 V920 R923 T926 L940 K941 Q944 M948 R953 K957 R960 A961 R964 E965 V966 R967 E968 Q969 Y977 Q980 E983 L984 R987 R990
E994 W995 G999 I1002 I1003 H1004 N1005 P1006 P1007 V1012 P1013 E1022 A1023 A1024 I1025 A1026 E1029 M1034 D1035 M1039 R1040 A1041 R1042 R1043 H1044 S1045 L1052 R1062 M1063 C1064 E1065 D1072 L1073 R1074 L1077 D1082 P1083 L1084 D1087 P1088 F1089 L1090 V1095 Q1100
S1101 T1102 F1106 T1109 M1112 L1129 R1130 A1136 A1143 Q1144 L1145 L1146 M1147 L1150 Q1151 V1167 N1168 L1172 A1173 R1174 V1175 V1176 N1177 P1181 D1182 T1183 W1184 M1185 S1186 M1192 V1197 K1198 L1199 L1200 P1201 G1204 P1212 M1215 G1216 W1217 L1218 R1219 R1223
T1232 A1237 V1238 E1243 H1246 W1259 Q1262 E1263 G1264 R1265 SER ALA

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	70.72Å 85.21Å 248.47Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	46.67 – 2.80 46.67 – 2.49	Depositor EDS
% Data completeness (in resolution range)	85.6 (46.67-2.80) 85.7 (46.67-2.49)	Depositor EDS
R_{merge}	0.14	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	0.00 (at 2.48Å)	Xtriage
Refinement program	CNS	Depositor
R, R_{free}	0.201 , 0.263 0.199 , 0.260	Depositor DCC
R_{free} test set	2767 reflections (5.28%)	wwPDB-VP
Wilson B-factor (Å^2)	29.9	Xtriage
Anisotropy	0.482	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.35 , 35.7	EDS
L-test for twinning[2]	$< \|L\| > = 0.50$, $< L^2 > = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.92	EDS
Total number of atoms	10485	wwPDB-VP
Average B, all atoms (Å^2)	25.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.93% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ 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

Bond lengths and bond angles in the following residue types are not validated in this section: CH1, MN, U3H

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	B	1.37	1/47 (2.1%)	1.06	0/69
2	C	0.89	0/116	0.75	0/178
3	A	0.40	0/10239	0.63	3/13905 (0.0%)
All	All	0.41	1/10402 (0.0%)	0.63	3/14152 (0.0%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	1275	G	OP3-P	-6.33	1.53	1.61

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	A	560	GLY	N-CA-C	-5.88	98.39	113.10
3	A	408	ILE	N-CA-C	-5.69	95.64	111.00
3	A	566	LYS	N-CA-C	-5.69	95.64	111.00

There are no chirality outliers.

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	B	43	0	21	6	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	C	105	0	54	4	0
3	A	9986	0	9903	392	0
4	A	2	0	0	0	0
5	A	28	0	11	0	0
6	A	56	0	24	0	0
7	A	261	0	0	10	0
7	B	2	0	0	0	0
7	C	2	0	0	0	0
All	All	10485	0	10013	394	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 19.

All (394) 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)
3:A:410:GLU:H	3:A:649:GLN:NE2	1.49	1.09
3:A:561:SER:HB3	3:A:566:LYS:HE3	1.34	1.07
3:A:223:THR:HG22	3:A:225:ALA:H	1.21	1.03
3:A:1005:ASN:HD21	3:A:1263:GLU:HB3	1.27	0.99
3:A:410:GLU:H	3:A:649:GLN:HE22	1.07	0.96
3:A:724:THR:HG22	3:A:726:GLN:H	1.31	0.95
3:A:563:VAL:O	3:A:564:ILE:HG22	1.69	0.92
3:A:557:PRO:HD2	3:A:731:CYS:O	1.74	0.86
3:A:81:VAL:H	3:A:671:ASN:HD21	1.22	0.85
3:A:561:SER:CB	3:A:566:LYS:HE3	2.06	0.85
3:A:78:LEU:HD12	3:A:80:ARG:NH2	1.91	0.85
3:A:363:ARG:HH22	3:A:834:GLN:HE22	1.24	0.85
3:A:743:THR:HG22	3:A:744:THR:H	1.41	0.83
3:A:104:GLU:HG3	3:A:116:SER:HA	1.60	0.83
3:A:749:ASN:HD21	3:A:751:GLU:HB3	1.45	0.81
3:A:1109:THR:HG22	3:A:1168:ASN:HD21	1.46	0.81
3:A:406:GLY:HA3	3:A:630:GLU:O	1.81	0.81
3:A:856:ILE:HB	3:A:859:SER:HB2	1.63	0.80
3:A:907:ARG:HB3	3:A:908:PRO:HD3	1.65	0.78
3:A:22:GLN:NE2	3:A:878:VAL:H	1.81	0.77
3:A:94:VAL:HG22	3:A:139:ILE:HG23	1.67	0.77
1:B:1275:G:N2	3:A:560:GLY:HA3	2.00	0.76
3:A:1004:HIS:C	3:A:1006:PRO:HD3	2.06	0.76
3:A:410:GLU:N	3:A:649:GLN:HE22	1.84	0.74
3:A:957:LYS:O	3:A:960:ARG:HG3	1.88	0.73

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:410:GLU:N	3:A:649:GLN:NE2	2.33	0.72
3:A:1005:ASN:HB2	3:A:1130:ARG:HH22	1.54	0.72
3:A:566:LYS:HE2	3:A:782:LEU:O	1.88	0.72
3:A:1005:ASN:ND2	3:A:1263:GLU:HB3	2.03	0.72
3:A:814:TRP:HB3	3:A:815:PRO:HD3	1.72	0.71
3:A:146:GLN:HE22	3:A:805:ARG:H	1.37	0.71
3:A:532:ASN:OD1	3:A:535:GLN:HG3	1.91	0.71
3:A:578:PRO:HB2	3:A:742:GLY:HA3	1.72	0.71
3:A:564:ILE:HG12	3:A:1185:MET:O	1.90	0.71
3:A:564:ILE:HG21	3:A:1185:MET:HB3	1.71	0.71
3:A:1072:ASP:OD1	3:A:1074:ARG:HD3	1.91	0.71
3:A:22:GLN:HE21	3:A:878:VAL:H	1.39	0.70
3:A:167:LEU:HD23	3:A:837:ARG:HD2	1.72	0.70
3:A:393:PRO:HG3	3:A:592:SER:HA	1.73	0.69
3:A:815:PRO:HG2	3:A:1034:MET:CE	2.21	0.69
3:A:92:VAL:CG1	3:A:383:GLU:HB3	2.22	0.69
3:A:926:THR:HG21	3:A:1246:HIS:CG	2.28	0.69
3:A:540:ALA:HB3	3:A:541:PRO:HD3	1.74	0.69
3:A:572:VAL:HG13	3:A:789:GLY:O	1.93	0.68
3:A:570:LEU:HD21	3:A:730:VAL:HG21	1.74	0.68
3:A:193:ILE:HD13	3:A:229:LEU:HD21	1.75	0.68
3:A:56:MET:HG2	3:A:188:TRP:CE2	2.28	0.68
3:A:582:ILE:HG21	3:A:757:LEU:CD2	2.24	0.67
3:A:81:VAL:HG13	3:A:132:ILE:HD13	1.76	0.67
3:A:724:THR:HG22	3:A:726:GLN:N	2.07	0.67
3:A:582:ILE:HG21	3:A:757:LEU:HD21	1.77	0.67
3:A:776:ASP:OD1	3:A:778:THR:HB	1.94	0.67
3:A:915:VAL:HG13	3:A:920:VAL:HG22	1.77	0.66
3:A:743:THR:HG22	3:A:744:THR:N	2.10	0.66
3:A:279:GLN:HE21	3:A:283:HIS:HD2	1.43	0.66
3:A:114:ARG:HB2	3:A:215:PHE:CE1	2.31	0.66
3:A:227:PRO:HB2	3:A:228:PRO:HD3	1.76	0.66
3:A:171:VAL:HG11	3:A:1090:LEU:HD11	1.77	0.65
3:A:299:TRP:CD2	3:A:303:ARG:HG2	2.32	0.65
3:A:83:ARG:HG3	3:A:83:ARG:HH11	1.60	0.65
3:A:566:LYS:HD3	3:A:784:LEU:CD2	2.26	0.65
3:A:1064:CYS:HB3	3:A:1065:GLU:OE2	1.96	0.65
3:A:66:LYS:HB3	3:A:97:CYS:HA	1.78	0.64
3:A:90:ASP:O	3:A:92:VAL:N	2.29	0.64
3:A:448:GLN:NE2	3:A:620:MET:H	1.94	0.64
3:A:779:ALA:HB3	3:A:786:PHE:HB2	1.79	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:92:VAL:HG11	3:A:383:GLU:HB3	1.79	0.63
3:A:1201:PRO:HB2	3:A:1204:GLY:O	1.98	0.63
3:A:425:LEU:HB2	3:A:698:MET:HE1	1.81	0.63
3:A:855:MET:O	3:A:856:ILE:HD13	1.98	0.63
3:A:39:ARG:HH11	3:A:39:ARG:HG2	1.64	0.62
3:A:13:ILE:HD13	3:A:163:ALA:HB3	1.81	0.62
3:A:457:THR:O	3:A:491:ILE:HG13	1.99	0.61
3:A:829:VAL:HG13	3:A:890:TRP:CE2	2.35	0.61
3:A:281:THR:O	3:A:285:MET:HG2	2.00	0.61
3:A:819:ASP:OD1	3:A:953:ARG:NH1	2.35	0.60
3:A:1087:ASP:HB3	3:A:1088:PRO:HD3	1.83	0.60
3:A:1007:PRO:HD2	3:A:1144:GLN:NE2	2.15	0.60
3:A:104:GLU:CG	3:A:116:SER:HA	2.31	0.60
3:A:114:ARG:HB2	3:A:215:PHE:HE1	1.67	0.60
3:A:268:TRP:HB2	7:A:1352:HOH:O	2.01	0.60
3:A:536:GLN:NE2	3:A:685:THR:HG23	2.16	0.60
3:A:957:LYS:HD2	3:A:957:LYS:N	2.17	0.60
3:A:1176:VAL:O	3:A:1176:VAL:HG13	2.01	0.60
3:A:477:LEU:HB3	3:A:496:GLN:HB3	1.84	0.59
3:A:246:ASP:O	3:A:250:VAL:HG23	2.02	0.59
3:A:566:LYS:HD3	3:A:784:LEU:HD23	1.84	0.59
2:C:1286:C:OP1	3:A:454:GLN:HG3	2.03	0.59
3:A:451:MET:HA	3:A:451:MET:CE	2.32	0.59
3:A:855:MET:CE	3:A:858:GLU:H	2.16	0.59
3:A:984:LEU:O	3:A:987:ARG:HB2	2.03	0.59
3:A:995:TRP:CZ2	3:A:1006:PRO:HG3	2.38	0.59
3:A:194:CYS:SG	3:A:206:PRO:HG2	2.43	0.58
3:A:379:ARG:HH12	3:A:387:GLN:NE2	2.00	0.58
3:A:538:VAL:HG13	3:A:651:LEU:HB2	1.85	0.58
3:A:363:ARG:HH22	3:A:834:GLN:NE2	1.98	0.58
3:A:1219:ARG:O	3:A:1223:ARG:HG3	2.03	0.58
3:A:815:PRO:HG2	3:A:1034:MET:HE1	1.83	0.58
3:A:38:THR:O	3:A:41:ASP:HB2	2.03	0.58
3:A:393:PRO:CG	3:A:592:SER:HA	2.34	0.58
3:A:520:GLN:NE2	3:A:523:ARG:HD3	2.18	0.58
3:A:892:MET:HB2	3:A:1232:THR:HG23	1.86	0.58
3:A:542:HIS:NE2	3:A:690:GLU:HG3	2.19	0.58
3:A:293:TYR:CZ	3:A:1074:ARG:NH2	2.71	0.58
3:A:1112:MET:HE1	3:A:1150:LEU:HD11	1.85	0.58
3:A:1062:ARG:HG3	3:A:1243:GLU:HB2	1.86	0.57
3:A:579:ASN:OD1	3:A:741:ASP:HA	2.04	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:957:LYS:HE3	3:A:1026:ALA:HB2	1.87	0.57
2:C:1284:A:C5	3:A:528:ILE:HG12	2.39	0.57
3:A:595:TRP:HA	3:A:599:LEU:HB2	1.86	0.57
3:A:83:ARG:HG3	3:A:83:ARG:NH1	2.18	0.57
3:A:964:ARG:O	3:A:968:GLU:HG3	2.05	0.57
3:A:542:HIS:NE2	3:A:690:GLU:CG	2.68	0.57
3:A:990:ARG:HH11	3:A:994:GLU:CG	2.18	0.57
1:B:1275:G:O2'	3:A:561:SER:CB	2.53	0.56
3:A:294:CYS:SG	3:A:314:MET:HB3	2.44	0.56
3:A:595:TRP:CE2	3:A:600:SER:HB3	2.39	0.56
3:A:1112:MET:HE3	3:A:1150:LEU:HD21	1.87	0.56
3:A:107:GLU:O	3:A:108:THR:CB	2.53	0.56
3:A:456:VAL:HG21	3:A:977:TYR:CE2	2.41	0.56
3:A:1005:ASN:N	3:A:1006:PRO:HD3	2.19	0.56
3:A:926:THR:HG23	3:A:1246:HIS:CD2	2.41	0.56
3:A:814:TRP:O	3:A:817:ILE:HG22	2.05	0.55
3:A:1212:PRO:HB2	3:A:1215:MET:HB2	1.87	0.55
3:A:517:LEU:HD23	3:A:527:SER:HA	1.88	0.55
3:A:81:VAL:N	3:A:671:ASN:HD21	1.99	0.55
3:A:957:LYS:HE2	3:A:1024:ALA:O	2.07	0.55
3:A:167:LEU:HD21	3:A:840:ARG:CZ	2.36	0.55
3:A:40:SER:O	3:A:44:LYS:HG3	2.06	0.55
3:A:138:ARG:NH1	3:A:669:PRO:HG3	2.22	0.55
3:A:1145:LEU:HB3	3:A:1150:LEU:HD22	1.89	0.55
3:A:396:LYS:HD2	3:A:765:GLU:HB3	1.89	0.55
3:A:585:ASP:HB3	3:A:772:ASP:HB3	1.87	0.54
3:A:599:LEU:O	3:A:603:MET:HG2	2.07	0.54
3:A:784:LEU:HD12	3:A:786:PHE:CZ	2.42	0.54
3:A:1082:ASP:HB2	3:A:1083:PRO:CD	2.38	0.54
3:A:835:TRP:O	3:A:839:ILE:HG13	2.06	0.54
3:A:411:ILE:C	3:A:411:ILE:HD12	2.28	0.54
3:A:295:PRO:HD2	3:A:789:GLY:HA3	1.90	0.54
3:A:14:GLU:C	3:A:20:THR:HG22	2.28	0.53
3:A:501:PRO:HD2	3:A:504:HIS:HD2	1.72	0.53
3:A:1062:ARG:HD2	3:A:1243:GLU:OE2	2.08	0.53
3:A:76:ASP:OD2	3:A:80:ARG:NH1	2.40	0.53
3:A:565:GLU:OE1	3:A:565:GLU:HA	2.07	0.53
3:A:285:MET:HG3	3:A:365:ILE:HD11	1.90	0.53
3:A:114:ARG:HG3	3:A:114:ARG:HH11	1.74	0.53
3:A:1172:LEU:HD21	3:A:1217:TRP:HA	1.89	0.53
3:A:188:TRP:CZ2	3:A:192:GLU:HG3	2.43	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:855:MET:HE1	3:A:858:GLU:H	1.74	0.53
3:A:965:GLU:O	3:A:969:GLN:HG3	2.08	0.53
3:A:464:ALA:O	3:A:468:GLU:HG2	2.09	0.52
3:A:210:LEU:HB2	3:A:213:GLY:O	2.10	0.52
1:B:1275:G:H5'	7:A:1539:HOH:O	2.08	0.52
3:A:32:LYS:O	3:A:36:MET:HG3	2.10	0.52
3:A:536:GLN:HA	3:A:536:GLN:HE21	1.74	0.52
3:A:564:ILE:HG13	3:A:1102:THR:HG23	1.92	0.52
3:A:757:LEU:HD22	3:A:773:ILE:HG21	1.92	0.52
3:A:135:THR:OG1	3:A:668:SER:HA	2.10	0.52
3:A:881:PHE:O	3:A:909:LEU:HD12	2.10	0.52
3:A:529:MET:O	3:A:683:GLY:HA3	2.10	0.52
3:A:784:LEU:HB3	3:A:786:PHE:CE2	2.46	0.51
3:A:73:TYR:HB2	3:A:132:ILE:HG23	1.92	0.51
3:A:829:VAL:HG13	3:A:890:TRP:NE1	2.26	0.51
3:A:15:SER:N	3:A:20:THR:HG22	2.26	0.51
3:A:409:GLY:HA3	3:A:627:VAL:HG21	1.92	0.51
3:A:926:THR:CG2	3:A:1246:HIS:CG	2.93	0.51
3:A:1182:ASP:O	3:A:1185:MET:HG2	2.11	0.51
3:A:24:ASN:O	3:A:28:GLU:HG3	2.10	0.51
3:A:561:SER:O	3:A:562:ALA:HB3	2.11	0.51
3:A:47:ASP:HA	3:A:191:ARG:HH11	1.76	0.51
3:A:1029:GLU:OE1	3:A:1029:GLU:N	2.41	0.51
3:A:1065:GLU:H	3:A:1065:GLU:CD	2.12	0.50
3:A:581:SER:HA	3:A:738:MET:O	2.12	0.50
3:A:854:THR:HG21	3:A:863:LEU:HG	1.92	0.50
3:A:814:TRP:O	3:A:815:PRO:C	2.48	0.50
3:A:990:ARG:HH11	3:A:994:GLU:HG3	1.77	0.50
3:A:457:THR:C	3:A:491:ILE:HG13	2.32	0.50
3:A:948:MET:HE1	3:A:1042:ARG:HG3	1.94	0.50
3:A:94:VAL:HG22	3:A:139:ILE:CG2	2.38	0.50
3:A:486:LYS:HE2	3:A:488:ALA:HB3	1.93	0.50
3:A:294:CYS:HB2	3:A:788:PHE:O	2.12	0.49
3:A:146:GLN:NE2	3:A:805:ARG:H	2.09	0.49
3:A:201:LEU:HD13	3:A:217:LEU:HD11	1.94	0.49
3:A:1150:LEU:HD12	3:A:1150:LEU:N	2.27	0.49
3:A:21:ASP:OD1	3:A:879:LYS:HG2	2.12	0.49
3:A:83:ARG:HG2	3:A:92:VAL:HA	1.93	0.49
3:A:509:ILE:HD13	3:A:538:VAL:HG21	1.94	0.49
3:A:542:HIS:HE2	3:A:690:GLU:CG	2.25	0.49
3:A:749:ASN:ND2	3:A:751:GLU:HB3	2.21	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:743:THR:CG2	3:A:744:THR:H	2.19	0.49
1:B:1275:G:H21	3:A:560:GLY:HA3	1.75	0.49
3:A:436:MET:C	3:A:436:MET:HE2	2.33	0.49
3:A:829:VAL:HG22	3:A:890:TRP:CD2	2.48	0.49
3:A:856:ILE:HB	3:A:859:SER:CB	2.39	0.49
3:A:990:ARG:NH1	3:A:994:GLU:CG	2.75	0.49
3:A:198:SER:HA	3:A:217:LEU:HD21	1.95	0.49
3:A:39:ARG:HH11	3:A:39:ARG:CG	2.26	0.48
3:A:80:ARG:HA	3:A:671:ASN:ND2	2.28	0.48
3:A:145:ARG:O	3:A:805:ARG:HD2	2.13	0.48
3:A:299:TRP:CE2	3:A:303:ARG:HG2	2.49	0.48
3:A:1095:VAL:HG23	3:A:1237:ALA:HB2	1.94	0.48
3:A:999:GLY:HA2	3:A:1002:ILE:HD12	1.96	0.48
3:A:409:GLY:HA3	3:A:649:GLN:NE2	2.29	0.48
3:A:740:ILE:HD12	3:A:740:ILE:N	2.29	0.48
3:A:107:GLU:O	3:A:108:THR:HB	2.13	0.48
3:A:1052:LEU:HD22	3:A:1259:TRP:CE2	2.48	0.48
3:A:654:LEU:HD21	3:A:659:PHE:CE1	2.49	0.48
3:A:436:MET:HE2	3:A:436:MET:O	2.14	0.48
3:A:582:ILE:HG21	3:A:757:LEU:HD22	1.95	0.48
3:A:815:PRO:HB2	3:A:953:ARG:O	2.13	0.48
3:A:1082:ASP:OD1	3:A:1084:LEU:HB2	2.14	0.48
3:A:805:ARG:HH11	3:A:805:ARG:HG2	1.79	0.48
3:A:524:ARG:HG2	3:A:524:ARG:HH11	1.78	0.48
3:A:1143:ALA:O	3:A:1147:MET:HG3	2.14	0.48
3:A:473:ILE:HG21	3:A:507:VAL:HG11	1.95	0.47
3:A:1002:ILE:HD13	3:A:1136:ALA:HB2	1.95	0.47
3:A:149:ALA:HB1	3:A:150:PRO:CD	2.44	0.47
3:A:821:ILE:HG23	3:A:845:LEU:HD13	1.94	0.47
3:A:332:ARG:HG2	3:A:332:ARG:HH11	1.79	0.47
3:A:523:ARG:HG2	3:A:524:ARG:N	2.29	0.47
3:A:232:ASP:OD2	3:A:266:TYR:OH	2.25	0.47
3:A:279:GLN:NE2	3:A:283:HIS:HD2	2.12	0.47
3:A:76:ASP:OD2	3:A:80:ARG:HG3	2.15	0.47
3:A:863:LEU:HD11	3:A:1035:ASP:HB3	1.96	0.47
3:A:983:GLU:O	3:A:987:ARG:HG3	2.14	0.47
3:A:256:ILE:HD12	3:A:277:PHE:CE2	2.50	0.47
3:A:358:ASP:O	3:A:362:VAL:HG22	2.14	0.47
3:A:558:THR:O	3:A:559:SER:HB3	2.14	0.47
3:A:104:GLU:HG3	3:A:116:SER:CA	2.40	0.47
3:A:197:ILE:O	3:A:221:ARG:NH1	2.47	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:460:GLY:O	3:A:490:LYS:NZ	2.42	0.47
3:A:531:LEU:HD12	3:A:684:SER:HA	1.97	0.47
3:A:940:LEU:O	3:A:941:LYS:HB2	2.15	0.47
3:A:957:LYS:HD3	3:A:1022:GLU:HA	1.95	0.47
3:A:366:ARG:NH1	3:A:367:ASP:OD1	2.44	0.47
3:A:410:GLU:H	3:A:649:GLN:HE21	1.53	0.47
3:A:533:VAL:HB	3:A:534:PRO:HD3	1.97	0.47
3:A:568:ILE:N	3:A:569:PRO:CD	2.78	0.47
3:A:377:LEU:N	3:A:377:LEU:HD12	2.30	0.47
3:A:603:MET:HE3	3:A:648:ILE:HG23	1.96	0.47
3:A:1192:MET:O	3:A:1197:VAL:HG23	2.15	0.47
3:A:240:GLN:HA	3:A:245:LEU:HB2	1.97	0.47
3:A:1199:LEU:HD12	3:A:1219:ARG:HD3	1.97	0.46
3:A:512:ASP:OD2	3:A:662:ARG:NH2	2.41	0.46
3:A:554:ASN:HB2	7:A:1385:HOH:O	2.16	0.46
3:A:437:ALA:HB2	3:A:610:VAL:HG22	1.98	0.46
3:A:557:PRO:HG3	3:A:781:TYR:OH	2.15	0.46
3:A:567:VAL:HG12	3:A:567:VAL:O	2.15	0.46
3:A:67:PRO:O	3:A:97:CYS:HB3	2.16	0.46
3:A:523:ARG:HG2	3:A:523:ARG:HH11	1.81	0.46
3:A:536:GLN:HE22	3:A:685:THR:H	1.63	0.46
3:A:114:ARG:HG3	3:A:114:ARG:NH1	2.30	0.46
3:A:390:THR:HG22	3:A:391:GLN:N	2.30	0.46
3:A:603:MET:HE3	3:A:652:SER:OG	2.15	0.46
3:A:436:MET:CE	3:A:437:ALA:HA	2.46	0.46
3:A:541:PRO:HB2	3:A:648:ILE:HD11	1.98	0.46
3:A:1012:VAL:HB	3:A:1013:PRO:HD3	1.97	0.46
3:A:100:VAL:HG13	3:A:101:GLU:N	2.31	0.46
3:A:513:THR:HG21	3:A:529:MET:HG2	1.98	0.46
3:A:92:VAL:HG13	3:A:383:GLU:CG	2.45	0.46
3:A:139:ILE:HD13	3:A:380:THR:HG22	1.98	0.46
3:A:566:LYS:HD3	3:A:784:LEU:HD21	1.98	0.46
3:A:606:ILE:O	3:A:610:VAL:HB	2.16	0.46
3:A:863:LEU:HD21	3:A:1039:MET:HB2	1.98	0.46
3:A:1112:MET:CE	3:A:1150:LEU:HD11	2.45	0.46
3:A:700:GLU:HB2	3:A:725:ILE:HD13	1.96	0.45
2:C:1284:A:N3	3:A:683:GLY:HA2	2.31	0.45
3:A:516:GLY:HA3	3:A:528:ILE:HG22	1.97	0.45
3:A:128:SER:O	3:A:132:ILE:HG12	2.15	0.45
3:A:57:LEU:HD22	3:A:185:CYS:SG	2.56	0.45
3:A:380:THR:HG23	7:A:1435:HOH:O	2.16	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:15:SER:HA	3:A:20:THR:O	2.17	0.45
3:A:81:VAL:H	3:A:671:ASN:ND2	2.01	0.45
3:A:557:PRO:HG2	3:A:732:GLN:HB2	1.99	0.45
3:A:926:THR:CG2	3:A:1246:HIS:CD2	2.99	0.45
3:A:101:GLU:HG2	3:A:102:LEU:HG	1.99	0.45
3:A:814:TRP:O	3:A:816:ALA:N	2.50	0.45
3:A:815:PRO:HG2	3:A:1034:MET:HE3	1.96	0.45
3:A:743:THR:CG2	3:A:744:THR:N	2.79	0.45
3:A:169:ASP:HB3	3:A:172:LEU:HB2	1.99	0.44
3:A:886:TRP:HA	7:A:1442:HOH:O	2.17	0.44
3:A:69:HIS:CG	3:A:70:ASP:N	2.85	0.44
3:A:1007:PRO:HD2	3:A:1144:GLN:CD	2.37	0.44
3:A:944:GLN:CD	3:A:944:GLN:H	2.19	0.44
3:A:990:ARG:NH1	3:A:994:GLU:CD	2.70	0.44
3:A:1177:ASN:ND2	3:A:1259:TRP:HH2	2.14	0.44
3:A:560:GLY:O	3:A:561:SER:OG	2.29	0.44
3:A:580:GLN:OE1	3:A:747:LYS:HB2	2.17	0.44
3:A:104:GLU:CD	3:A:117:GLU:H	2.21	0.44
3:A:948:MET:HE2	3:A:1042:ARG:HA	2.00	0.44
3:A:339:GLY:O	3:A:340:LEU:HD23	2.17	0.44
3:A:396:LYS:HB2	3:A:765:GLU:O	2.17	0.44
3:A:483:LEU:HD21	3:A:967:ARG:HA	1.99	0.44
3:A:724:THR:H	3:A:728:ASN:HD22	1.65	0.44
3:A:1109:THR:HG22	3:A:1168:ASN:ND2	2.23	0.44
3:A:59:ILE:HA	3:A:60:PRO:HD3	1.89	0.44
3:A:381:PRO:HD2	3:A:665:ASP:OD1	2.17	0.44
3:A:523:ARG:NH1	3:A:524:ARG:O	2.50	0.44
3:A:855:MET:HE3	3:A:857:GLY:H	1.81	0.44
3:A:60:PRO:HA	3:A:61:PRO:HD3	1.89	0.43
3:A:194:CYS:SG	3:A:206:PRO:CG	3.06	0.43
3:A:539:SER:HA	3:A:651:LEU:HD22	2.00	0.43
3:A:421:ILE:HD12	3:A:421:ILE:HA	1.86	0.43
3:A:821:ILE:HD12	3:A:845:LEU:HD13	2.01	0.43
3:A:829:VAL:HG22	3:A:890:TRP:CE3	2.53	0.43
3:A:1082:ASP:HB2	3:A:1083:PRO:HD2	1.99	0.43
3:A:298:GLU:HB2	3:A:311:MET:CE	2.48	0.43
3:A:501:PRO:HD2	3:A:504:HIS:CD2	2.53	0.43
3:A:836:GLN:NE2	3:A:886:TRP:CD1	2.87	0.43
3:A:1063:MET:HG2	3:A:1238:VAL:HG11	2.00	0.43
3:A:863:LEU:HD11	3:A:1035:ASP:CB	2.48	0.43
3:A:193:ILE:O	3:A:197:ILE:HG13	2.19	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:855:MET:SD	3:A:860:VAL:HG22	2.59	0.43
3:A:27:PHE:CE1	3:A:847:CYS:HB2	2.53	0.43
1:B:1275:G:O2'	3:A:561:SER:HB2	2.18	0.42
1:B:1275:G:H21	3:A:560:GLY:CA	2.32	0.42
3:A:13:ILE:HD13	3:A:163:ALA:CB	2.47	0.42
3:A:1129:LEU:HD21	3:A:1167:VAL:HG21	2.01	0.42
3:A:223:THR:HG22	3:A:224:SER:N	2.34	0.42
3:A:688:SER:HA	7:A:1567:HOH:O	2.18	0.42
3:A:851:ARG:HH11	3:A:864:GLN:HE21	1.67	0.42
3:A:1100:GLN:CG	3:A:1101:SER:N	2.81	0.42
2:C:1285:G:O2'	2:C:1286:C:H5'	2.18	0.42
3:A:78:LEU:HD23	3:A:78:LEU:HA	1.77	0.42
3:A:146:GLN:NE2	3:A:804:GLU:HA	2.35	0.42
3:A:286:TYR:C	3:A:288:SER:N	2.67	0.42
3:A:404:TRP:O	3:A:415:LYS:HE3	2.19	0.42
3:A:716:VAL:HG12	3:A:720:MET:CE	2.49	0.42
3:A:907:ARG:CB	3:A:908:PRO:HD3	2.41	0.42
3:A:1174:ARG:HB2	7:A:1335:HOH:O	2.17	0.42
3:A:245:LEU:CD2	3:A:367:ASP:HA	2.50	0.42
3:A:518:ARG:HG2	3:A:804:GLU:OE2	2.20	0.42
3:A:995:TRP:HZ2	3:A:1006:PRO:HG3	1.84	0.42
3:A:271:LEU:HD13	3:A:377:LEU:CD2	2.49	0.42
3:A:366:ARG:NH2	7:A:1323:HOH:O	2.51	0.42
3:A:523:ARG:HG3	7:A:1437:HOH:O	2.20	0.42
3:A:564:ILE:HD13	3:A:1186:SER:HA	2.01	0.42
3:A:1040:ARG:HG3	3:A:1043:ARG:NH2	2.35	0.42
3:A:1102:THR:O	3:A:1106:PHE:HD2	2.03	0.42
3:A:332:ARG:HG2	3:A:332:ARG:NH1	2.34	0.42
3:A:632:VAL:HB	3:A:635:VAL:HB	2.01	0.42
3:A:814:TRP:CE3	3:A:815:PRO:HG3	2.55	0.42
3:A:814:TRP:CB	3:A:815:PRO:HD3	2.45	0.42
3:A:814:TRP:CG	3:A:815:PRO:N	2.84	0.42
3:A:201:LEU:HA	3:A:202:PRO:HD3	1.79	0.42
3:A:381:PRO:HB3	3:A:515:MET:SD	2.60	0.42
3:A:381:PRO:HG3	3:A:517:LEU:CD1	2.50	0.42
3:A:836:GLN:HG2	3:A:886:TRP:CE3	2.54	0.42
3:A:436:MET:CE	3:A:442:THR:HG21	2.50	0.41
3:A:754:GLN:HE21	3:A:775:TYR:HD2	1.68	0.41
3:A:1181:PRO:HD2	3:A:1184:TRP:CE3	2.55	0.41
3:A:39:ARG:HE	3:A:208:LEU:HD22	1.85	0.41
3:A:328:ASP:HA	3:A:348:ARG:CZ	2.50	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:520:GLN:NE2	3:A:526:ARG:NH1	2.67	0.41
3:A:1262:GLN:HG2	3:A:1265:ARG:NH1	2.35	0.41
3:A:6:LEU:O	3:A:10:GLY:N	2.51	0.41
3:A:797:ARG:C	3:A:799:PRO:HD3	2.41	0.41
3:A:393:PRO:HG3	3:A:591:ALA:O	2.20	0.41
3:A:857:GLY:C	3:A:859:SER:H	2.21	0.41
3:A:867:MET:HG3	3:A:868:TRP:N	2.35	0.41
3:A:139:ILE:HD12	3:A:139:ILE:HA	1.91	0.41
3:A:167:LEU:CD2	3:A:837:ARG:HD2	2.47	0.41
3:A:702:PHE:HB2	3:A:763:TYR:CE2	2.55	0.41
3:A:706:TRP:O	3:A:707:GLY:C	2.59	0.41
3:A:1052:LEU:HD13	3:A:1259:TRP:CG	2.56	0.41
3:A:106:HIS:CE1	3:A:108:THR:HB	2.55	0.41
3:A:226:ILE:O	3:A:230:LEU:HG	2.21	0.41
3:A:1007:PRO:HD2	3:A:1144:GLN:HE22	1.82	0.41
3:A:223:THR:CG2	3:A:224:SER:N	2.84	0.41
3:A:270:ILE:HD12	3:A:373:SER:HB2	2.02	0.41
3:A:471:TYR:CD1	3:A:471:TYR:C	2.94	0.41
3:A:603:MET:CE	3:A:648:ILE:HG23	2.51	0.41
3:A:642:SER:OG	3:A:645:GLN:HG3	2.21	0.41
3:A:778:THR:CG2	3:A:779:ALA:N	2.83	0.41
3:A:322:ARG:NH1	3:A:325:PRO:O	2.42	0.41
3:A:470:LEU:CD2	3:A:477:LEU:HD21	2.51	0.41
3:A:39:ARG:CG	3:A:39:ARG:NH1	2.84	0.40
3:A:205:ALA:HA	3:A:206:PRO:HD3	1.80	0.40
3:A:797:ARG:HB3	7:A:1539:HOH:O	2.21	0.40
3:A:855:MET:HE3	3:A:858:GLU:H	1.84	0.40
3:A:92:VAL:HG13	3:A:383:GLU:HG3	2.03	0.40
3:A:149:ALA:HB1	3:A:150:PRO:HD2	2.04	0.40
3:A:178:ILE:HA	3:A:179:PRO:HD3	1.95	0.40
3:A:279:GLN:HE21	3:A:283:HIS:CD2	2.30	0.40
3:A:405:THR:HG23	3:A:413:ILE:O	2.21	0.40
3:A:536:GLN:NE2	3:A:536:GLN:HA	2.36	0.40
3:A:603:MET:HE1	3:A:651:LEU:HD23	2.03	0.40
3:A:639:ARG:HA	3:A:640:PRO:HD3	1.85	0.40
3:A:686:ALA:O	3:A:690:GLU:HB2	2.22	0.40
3:A:1005:ASN:N	3:A:1006:PRO:CD	2.84	0.40
3:A:134:THR:CG2	3:A:669:PRO:HG2	2.52	0.40
3:A:564:ILE:HA	3:A:568:ILE:HG13	2.03	0.40
3:A:783:LYS:HD2	3:A:797:ARG:NE	2.37	0.40
3:A:854:THR:HG21	3:A:863:LEU:CD1	2.52	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
3	A	1262/1267 (100%)	1162 (92%)	84 (7%)	16 (1%)	12 36

All (16) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
3	A	91	ASP
3	A	108	THR
3	A	561	SER
3	A	563	VAL
3	A	814	TRP
3	A	687	THR
3	A	110	THR
3	A	559	SER
3	A	10	GLY
3	A	146	GLN
3	A	557	PRO
3	A	815	PRO
3	A	218	MET
3	A	635	VAL
3	A	1005	ASN
3	A	99	ILE

5.3.2 Protein sidechains (i)

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
3	A	1081/1083 (100%)	1044 (97%)	37 (3%)	37 71

All (37) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
3	A	35	SER
3	A	37	PHE
3	A	84	LYS
3	A	107	GLU
3	A	167	LEU
3	A	187	LEU
3	A	267	SER
3	A	366	ARG
3	A	387	GLN
3	A	414	LEU
3	A	431	LEU
3	A	436	MET
3	A	453	SER
3	A	466	LEU
3	A	471	TYR
3	A	518	ARG
3	A	536	GLN
3	A	538	VAL
3	A	735	ASP
3	A	784	LEU
3	A	809	SER
3	A	845	LEU
3	A	890	TRP
3	A	894	THR
3	A	909	LEU
3	A	923	ARG
3	A	980	GLN
3	A	984	LEU
3	A	990	ARG
3	A	1045	SER
3	A	1052	LEU
3	A	1063	MET
3	A	1065	GLU
3	A	1077	LEU
3	A	1151	GLN
3	A	1176	VAL
3	A	1238	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (25) such sidechains are listed below:

Mol	Chain	Res	Type
3	A	22	GLN
3	A	121	ASN
3	A	146	GLN
3	A	283	HIS
3	A	296	ASN
3	A	387	GLN
3	A	448	GLN
3	A	474	ASN
3	A	504	HIS
3	A	520	GLN
3	A	536	GLN
3	A	649	GLN
3	A	664	ASN
3	A	671	ASN
3	A	675	HIS
3	A	728	ASN
3	A	749	ASN
3	A	754	GLN
3	A	834	GLN
3	A	864	GLN
3	A	980	GLN
3	A	1004	HIS
3	A	1005	ASN
3	A	1165	GLN
3	A	1246	HIS

5.3.3 RNA (i)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	B	0/2	-	-
2	C	4/6 (66%)	0	0
All	All	4/8 (50%)	0	0

There are no RNA backbone outliers to report.

There are no RNA pucker outliers to report.

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 monosaccharides in this entry.

5.6 Ligand geometry (i)

Of 5 ligands modelled in this entry, 2 are monoatomic - leaving 3 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. 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 $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
6	CH1	A	1294	-	24,29,29	1.22	4 (16%)	33,45,45	2.85	15 (45%)
5	U3H	A	1291	4	23,29,29	2.37	6 (26%)	27,45,45	3.14	14 (51%)
6	CH1	A	1295	-	24,29,29	1.11	1 (4%)	33,45,45	2.68	13 (39%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
6	CH1	A	1294	-	-	6/22/34/34	0/2/2/2
5	U3H	A	1291	4	1/1/9/12	7/22/47/47	0/2/2/2
6	CH1	A	1295	-	-	9/22/34/34	0/2/2/2

All (11) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	A	1291	U3H	C2-N1	6.28	1.63	1.46
5	A	1291	U3H	O2-C2	-5.16	1.23	1.40
5	A	1291	U3H	C2-N3	-4.48	1.39	1.46
5	A	1291	U3H	C4-N3	4.01	1.40	1.34
6	A	1294	CH1	C6-C5	2.68	1.41	1.35
6	A	1295	CH1	C6-C5	2.44	1.40	1.35
6	A	1294	CH1	C1'-N1	2.32	1.54	1.47
6	A	1294	CH1	PG-O1G	2.18	1.57	1.50

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	A	1294	CH1	PB-O1B	2.12	1.58	1.50
5	A	1291	U3H	PB-O1B	2.08	1.58	1.50
5	A	1291	U3H	PG-O1G	2.04	1.57	1.50

All (42) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
5	A	1291	U3H	O4'-C4'-C5'	7.82	122.37	109.52
6	A	1295	CH1	O3G-PG-O1G	-7.64	80.79	110.68
6	A	1294	CH1	O3G-PG-O1G	-7.36	81.88	110.68
6	A	1294	CH1	O3G-PG-O3B	-6.56	82.63	104.64
6	A	1295	CH1	O3G-PG-O3B	-6.39	83.19	104.64
5	A	1291	U3H	C5-C6-N1	6.08	131.60	124.65
5	A	1291	U3H	O3G-PG-O1G	-6.02	87.09	110.68
5	A	1291	U3H	O3G-PG-O3B	-5.60	85.85	104.64
6	A	1294	CH1	O3G-PG-O2G	-5.21	87.74	107.64
6	A	1294	CH1	O2-C2-N3	-5.20	113.88	122.33
6	A	1295	CH1	O3G-PG-O2G	-5.09	88.20	107.64
6	A	1295	CH1	O2-C2-N3	-4.97	114.25	122.33
6	A	1294	CH1	C3'-C4'-C5'	-4.29	104.65	113.11
5	A	1291	U3H	O3G-PG-O2G	-4.23	91.46	107.64
6	A	1294	CH1	O4'-C1'-C2'	-4.04	102.70	106.51
5	A	1291	U3H	O4'-C4'-C3'	3.99	110.21	105.07
5	A	1291	U3H	O4'-C1'-N1	3.87	115.25	108.83
6	A	1295	CH1	C3'-C4'-C5'	-3.21	106.77	113.11
6	A	1294	CH1	O4'-C4'-C5'	3.20	114.78	109.52
6	A	1294	CH1	PB-O3B-PG	-3.10	122.19	132.83
6	A	1294	CH1	C6-N1-C2	-3.08	115.16	120.49
5	A	1291	U3H	O2G-PG-O3B	3.00	114.70	104.64
6	A	1295	CH1	PB-O3A-PA	-2.97	122.65	132.83
5	A	1291	U3H	PB-O3A-PA	-2.93	122.77	132.83
6	A	1294	CH1	PB-O3A-PA	-2.90	122.86	132.83
6	A	1295	CH1	C6-N1-C2	-2.84	115.57	120.49
6	A	1295	CH1	O4'-C4'-C5'	2.83	114.18	109.52
6	A	1295	CH1	PB-O3B-PG	-2.76	123.34	132.83
5	A	1291	U3H	O4-C4-N3	-2.75	119.17	122.21
6	A	1294	CH1	O2G-PG-O3B	2.72	113.75	104.64
5	A	1291	U3H	PB-O3B-PG	-2.62	123.82	132.83
6	A	1295	CH1	O3B-PG-O1G	2.52	125.18	111.19
5	A	1291	U3H	O2G-PG-O1G	2.52	120.55	110.68
5	A	1291	U3H	O3B-PG-O1G	2.38	124.41	111.19
6	A	1294	CH1	N1-C2-N3	2.38	123.14	118.81

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
6	A	1295	CH1	O2G-PG-O3B	2.37	112.58	104.64
6	A	1295	CH1	N1-C2-N3	2.31	123.02	118.81
6	A	1294	CH1	O4'-C1'-N1	2.30	113.62	108.36
6	A	1294	CH1	O3B-PG-O1G	2.29	123.91	111.19
6	A	1294	CH1	O2G-PG-O1G	2.14	119.06	110.68
6	A	1295	CH1	O2G-PG-O1G	2.09	118.86	110.68
5	A	1291	U3H	C3'-C4'-C5'	-2.01	109.15	113.11

All (1) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
5	A	1291	U3H	C2

All (22) torsion outliers are listed below:

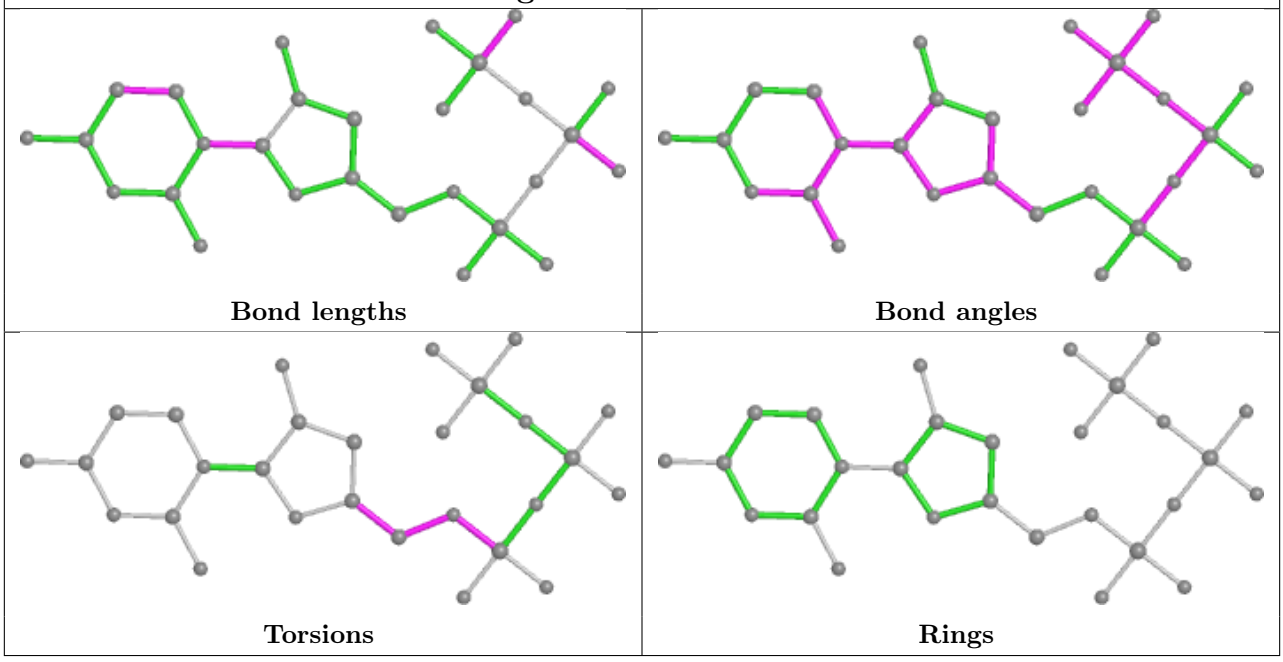
Mol	Chain	Res	Type	Atoms
5	A	1291	U3H	C3'-C4'-C5'-O5'
5	A	1291	U3H	O4'-C4'-C5'-O5'
5	A	1291	U3H	C5'-O5'-PA-O3A
6	A	1294	CH1	C3'-C4'-C5'-O5'
6	A	1294	CH1	O4'-C4'-C5'-O5'
6	A	1294	CH1	C5'-O5'-PA-O1A
6	A	1294	CH1	C5'-O5'-PA-O2A
6	A	1295	CH1	C3'-C4'-C5'-O5'
6	A	1295	CH1	O4'-C4'-C5'-O5'
6	A	1295	CH1	C5'-O5'-PA-O3A
6	A	1294	CH1	C4'-C5'-O5'-PA
6	A	1295	CH1	PG-O3B-PB-O3A
5	A	1291	U3H	PB-O3A-PA-O1A
6	A	1295	CH1	PB-O3A-PA-O1A
5	A	1291	U3H	C5'-O5'-PA-O1A
5	A	1291	U3H	C5'-O5'-PA-O2A
6	A	1295	CH1	C5'-O5'-PA-O1A
6	A	1294	CH1	C5'-O5'-PA-O3A
6	A	1295	CH1	PG-O3B-PB-O1B
6	A	1295	CH1	PG-O3B-PB-O2B
6	A	1295	CH1	C5'-O5'-PA-O2A
5	A	1291	U3H	PB-O3B-PG-O1G

There are no ring outliers.

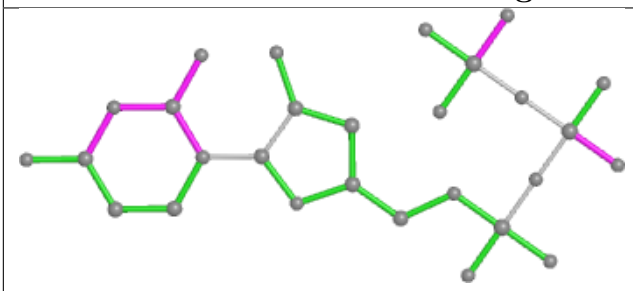
No monomer is involved in short contacts.

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

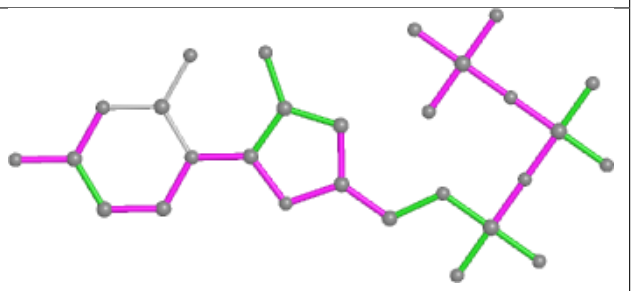
Ligand CH1 A 1294



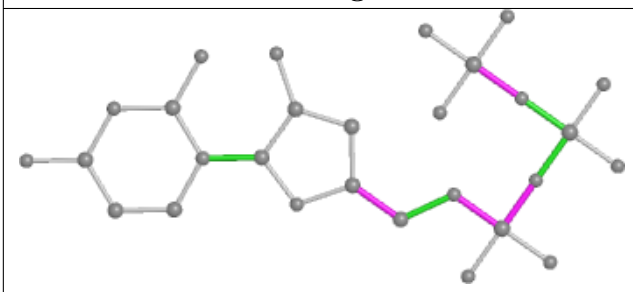
Ligand U3H A 1291



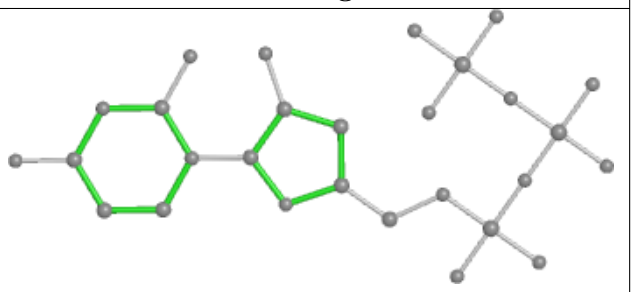
Bond lengths



Bond angles

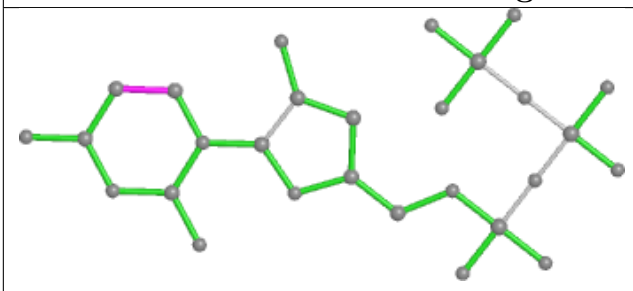


Torsions

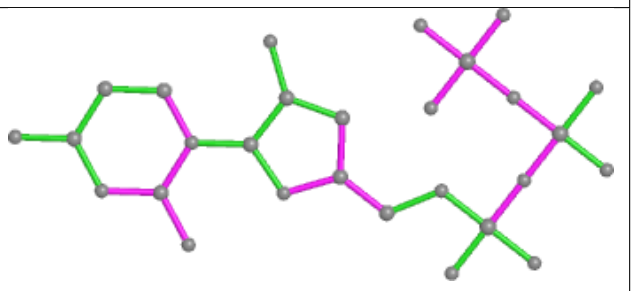


Rings

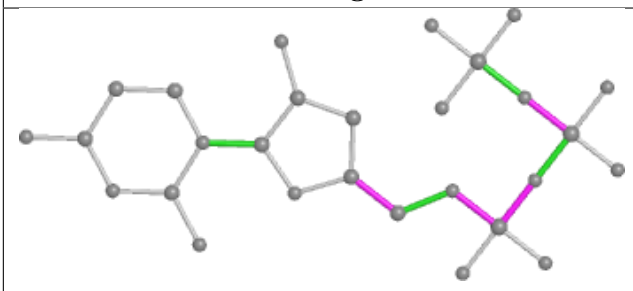
Ligand CH1 A 1295



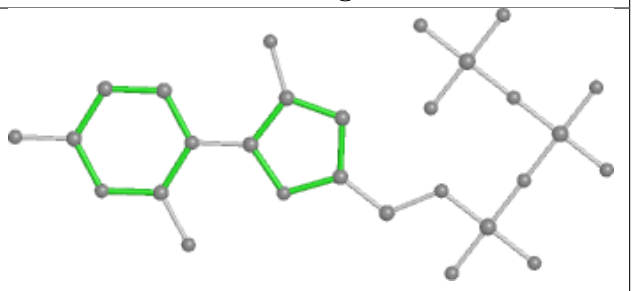
Bond lengths



Bond angles



Torsions



Rings

5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

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, 95^{th} 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	B	2/2 (100%)	4.61	2 (100%) 0 0	96, 96, 96, 122	0
2	C	5/6 (83%)	1.22	1 (20%) 1 0	23, 41, 71, 74	0
3	A	1264/1267 (99%)	-0.33	24 (1%) 66 59	7, 21, 44, 85	0
All	All	1271/1275 (99%)	-0.32	27 (2%) 63 54	7, 21, 45, 122	0

All (27) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
3	A	2	SER	8.2
1	B	1275	G	6.0
3	A	858	GLU	5.2
2	C	1286	C	4.5
3	A	562	ALA	4.5
3	A	561	SER	4.2
3	A	856	ILE	4.1
3	A	744	THR	3.5
3	A	857	GLY	3.4
3	A	859	SER	3.4
3	A	563	VAL	3.4
3	A	633	VAL	3.2
1	B	1276	C	3.2
3	A	855	MET	3.2
3	A	746	GLY	2.9
3	A	565	GLU	2.9
3	A	564	ILE	2.7
3	A	559	SER	2.6
3	A	860	VAL	2.5
3	A	212	ALA	2.5
3	A	748	VAL	2.5
3	A	211	SER	2.3
3	A	961	ALA	2.3

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Mol	Chain	Res	Type	RSRZ
3	A	862	TYR	2.2
3	A	755	ASN	2.1
3	A	213	GLY	2.1
3	A	484	PRO	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 monosaccharides in this entry.

6.4 Ligands (i)

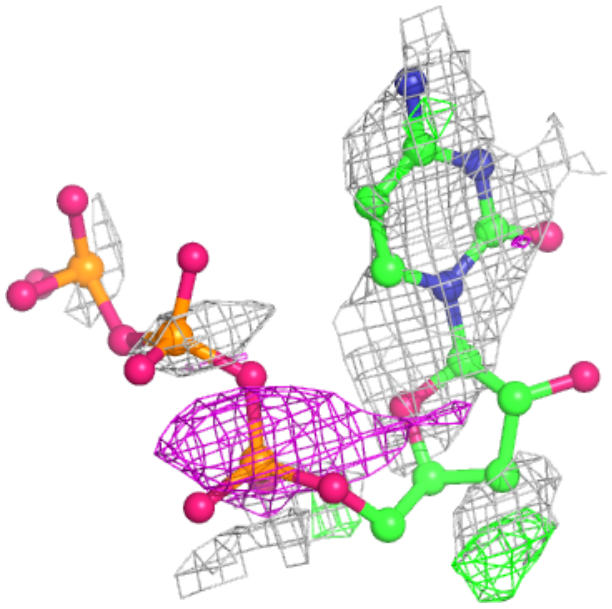
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

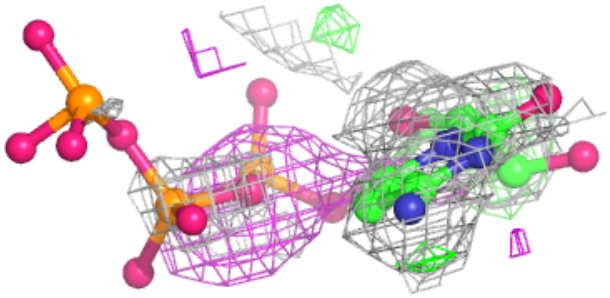
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
6	CH1	A	1294	28/28	0.47	0.58	98,112,132,132	0
5	U3H	A	1291	28/28	0.81	0.26	82,88,95,95	0
6	CH1	A	1295	28/28	0.86	0.22	48,61,74,75	0
4	MN	A	1301	1/1	0.94	0.07	63,63,63,63	0
4	MN	A	1302	1/1	0.96	0.12	39,39,39,39	0

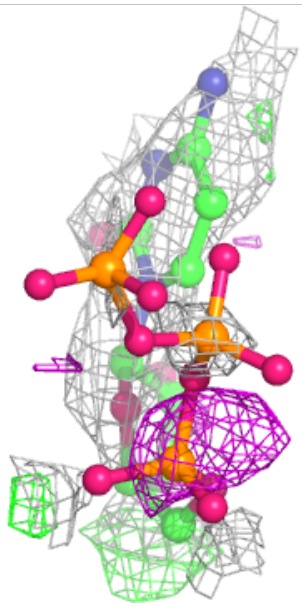
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.

Electron density around CH1 A 1294:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

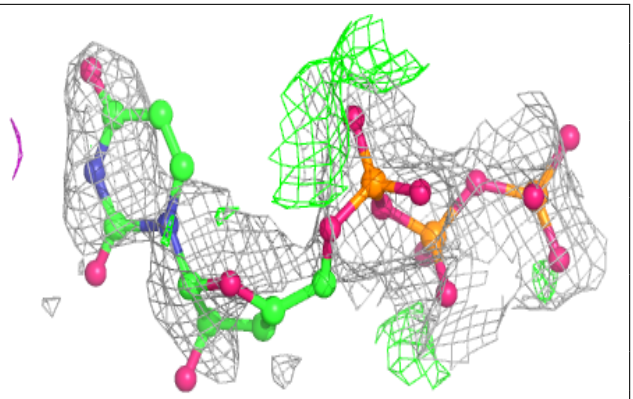


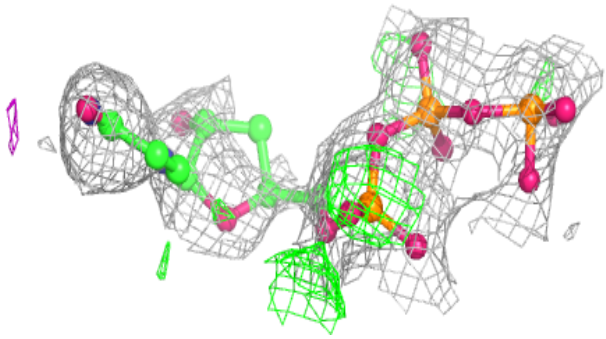


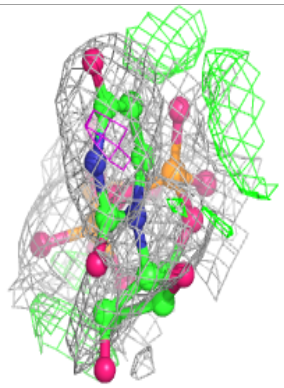


Electron density around U3H A 1291:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

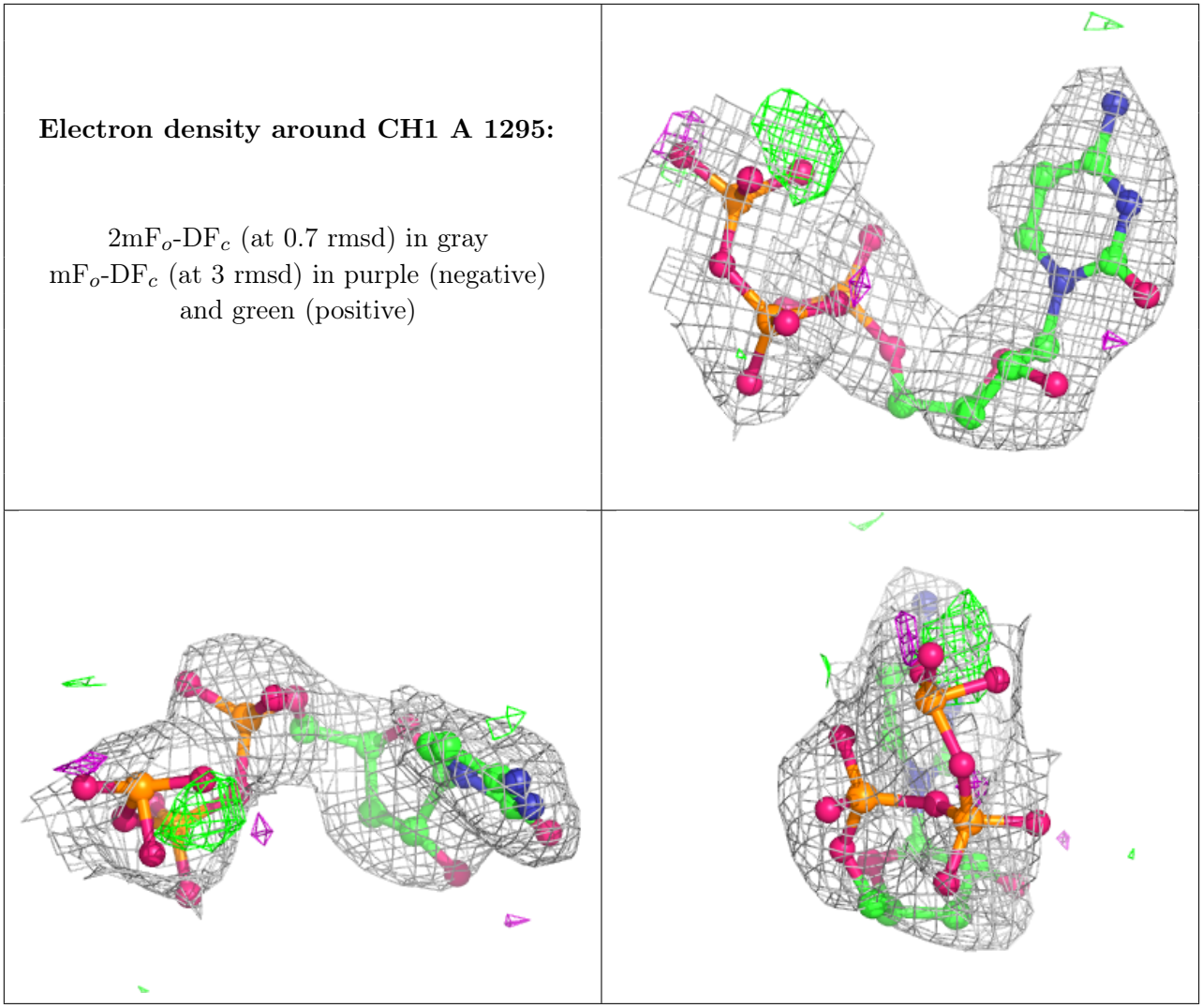






Electron density around CH1 A 1295:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



6.5 Other polymers (i)

There are no such residues in this entry.