



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 3, 2024 – 08:16 AM EST

PDB ID : 6BLP
Title : Pol II elongation complex with an abasic lesion at i+1 position, soaking AM-PCPP
Authors : Wang, W.; Wang, D.
Deposited on : 2017-11-11
Resolution : 3.20 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)
Xtrriage (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

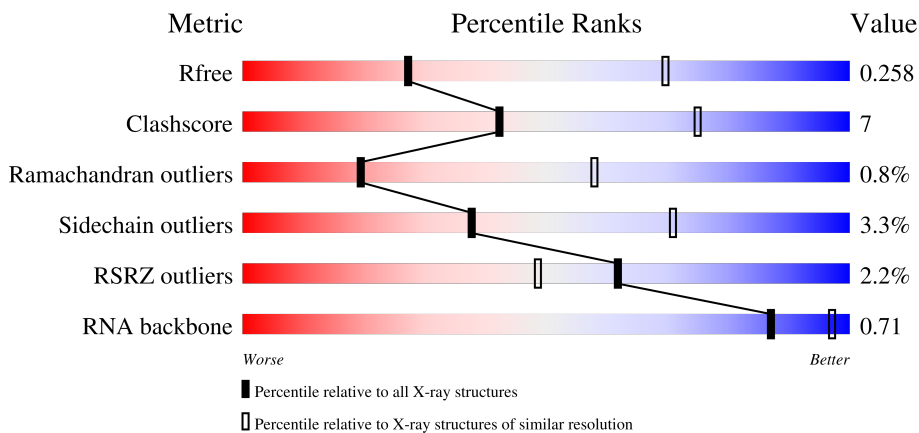
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.20 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.



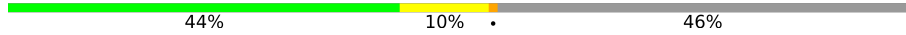






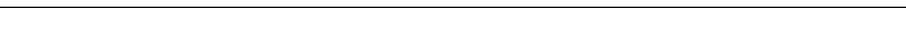
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	1133 (3.20-3.20)
Clashscore	141614	1253 (3.20-3.20)
Ramachandran outliers	138981	1234 (3.20-3.20)
Sidechain outliers	138945	1233 (3.20-3.20)
RSRZ outliers	127900	1095 (3.20-3.20)
RNA backbone	3102	1010 (3.50-2.90)

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 $\leq 5\%$. 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	A	1733	
2	B	1224	
3	C	318	
4	E	215	

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Mol	Chain	Length	Quality of chain
5	F	155	
6	H	146	
7	I	122	
8	J	70	
9	K	120	
10	L	70	
11	T	29	
12	R	8	

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
15	APC	A	1805	-	-	-	X

2 Entry composition

There are 16 unique types of molecules in this entry. The entry contains 28239 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 protein called DNA-directed RNA polymerase II subunit RPB1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	1372	10784	6802	1887	2034	61	0	0	0

- Molecule 2 is a protein called DNA-directed RNA polymerase II subunit RPB2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	1097	8726	5526	1530	1615	55	0	0	0

- Molecule 3 is a protein called DNA-directed RNA polymerase II subunit RPB3.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	C	266	2095	1317	348	417	13	0	0	0

- Molecule 4 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
4	E	213	1744	1107	308	318	11	0	0	0

- Molecule 5 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
5	F	84	679	434	115	127	3	0	0	0

- Molecule 6 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC3.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
6	H	130	1043	660	173	206	4	0	0	0

- Molecule 7 is a protein called DNA-directed RNA polymerase II subunit RPB9.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
7	I	115	935	575	170	180	10	0	0	0

- Molecule 8 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC5.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
8	J	65	532	339	93	94	6	0	0	0

- Molecule 9 is a protein called DNA-directed RNA polymerase II subunit RPB11.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
9	K	114	919	590	156	171	2	0	0	0

- Molecule 10 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC4.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
10	L	44	351	217	70	60	4	0	0	0

- Molecule 11 is a DNA chain called DNA (5'-D(P*AP*(3DR)P*CP*TP*CP*TP*CP*GP*A P*TP*G)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	P			
11	T	11	214	102	35	66	11	0	0	0

- Molecule 12 is a RNA chain called RNA (5'-R(P*AP*UP*CP*GP*AP*GP*AP*G)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	P			
12	R	8	175	78	35	54	8	0	0	0

- Molecule 13 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
13	A	2	Total	Zn	0	0
			2	2		

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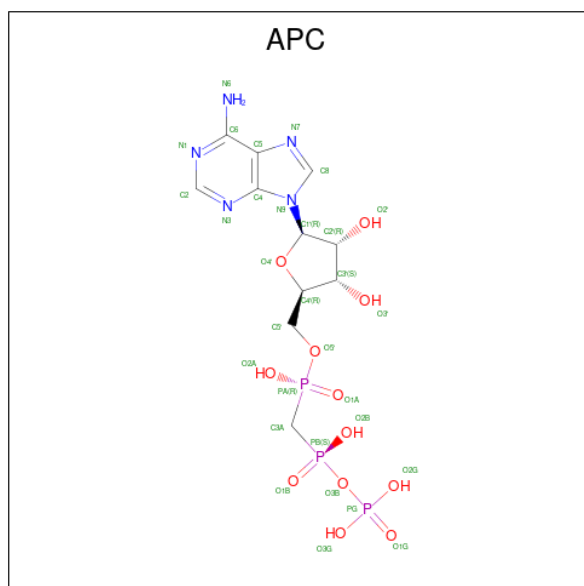
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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
13	B	1	Total	Zn	0	0
			1	1		
13	C	1	Total	Zn	0	0
			1	1		
13	I	2	Total	Zn	0	0
			2	2		
13	J	1	Total	Zn	0	0
			1	1		
13	L	1	Total	Zn	0	0
			1	1		

- Molecule 14 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
14	A	2	Total	Mg	0	0
			2	2		

- Molecule 15 is DIPHOSPHOMETHYLPHOSPHONIC ACID ADENOSYL ESTER (three-letter code: APC) (formula: C₁₁H₁₈N₅O₁₂P₃).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	
15	A	1	Total	C	N	O	P	0	0
			31	11	5	12	3		

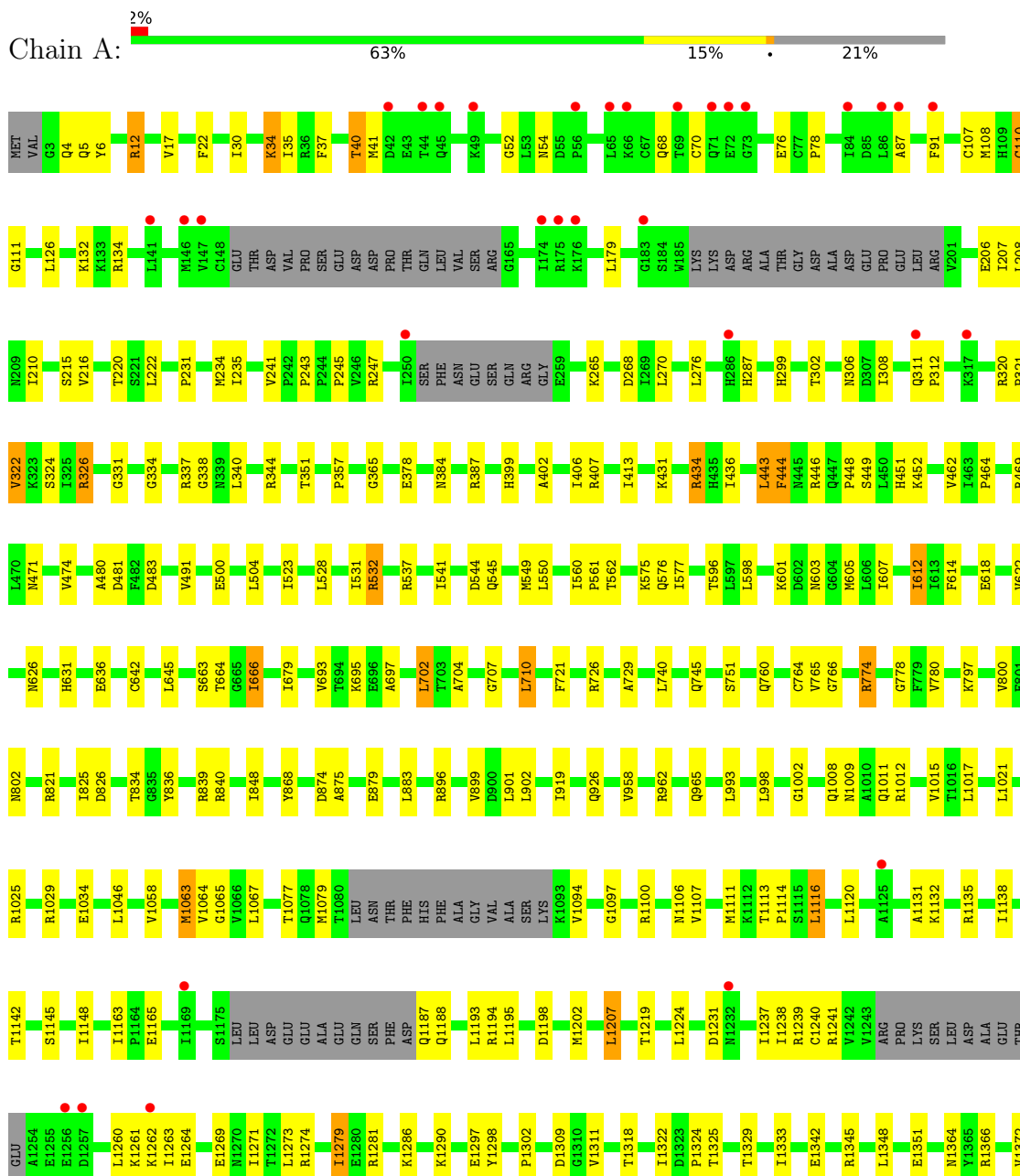
- Molecule 16 is water.

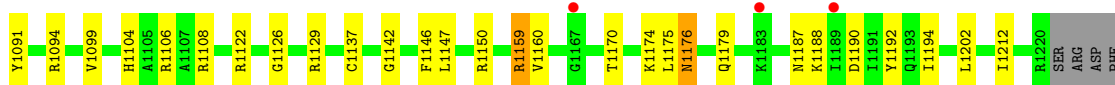
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
16	B	1	Total	O	0	0
			1	1		

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.

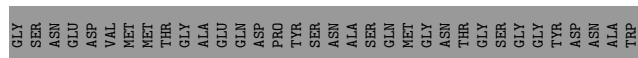
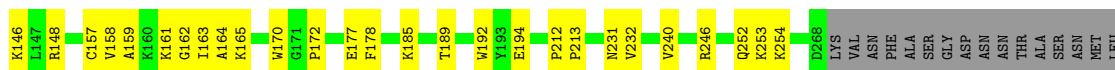
- Molecule 1: DNA-directed RNA polymerase II subunit RPB1





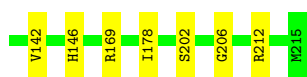
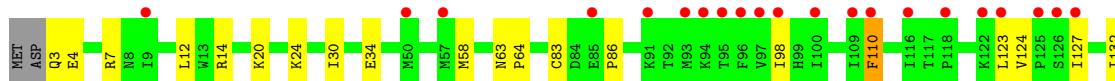
- Molecule 3: DNA-directed RNA polymerase II subunit RPB3

Chain C: 65% 17% 16%



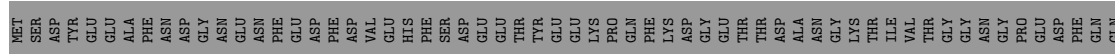
- Molecule 4: DNA-directed RNA polymerases I, II, and III subunit RPABC1

Chain E: 10% 87% 12%



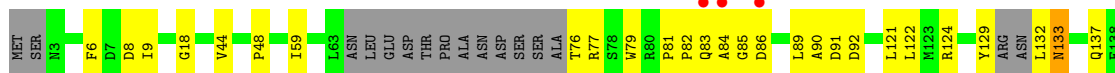
- Molecule 5: DNA-directed RNA polymerases I, II, and III subunit RPABC2

Chain F: 44% 10% 46%




- Molecule 6: DNA-directed RNA polymerases I, II, and III subunit RPABC3

Chain H: 3% 70% 18% 11%



- Molecule 7: DNA-directed RNA polymerase II subunit RPB9

Chain I:  80% 13% 6%




- Molecule 8: DNA-directed RNA polymerases I, II, and III subunit RPABC5

Chain J:  71% 20% 7%



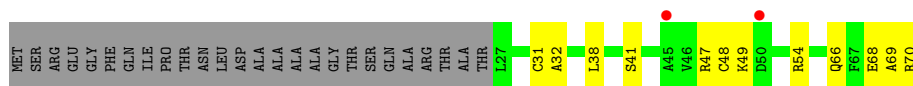
- Molecule 9: DNA-directed RNA polymerase II subunit RPB11

Chain K:  78% 17% 5%



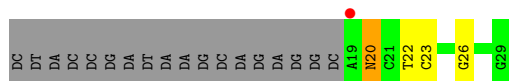
- Molecule 10: DNA-directed RNA polymerases I, II, and III subunit RPABC4

Chain L:  3% 46% 17% 37%



- Molecule 11: DNA (5'-D(P*AP*(3DR)P*CP*TP*CP*TP*CP*GP*AP*TP*G)-3')

Chain T:  3% 24% 10% 62%



- Molecule 12: RNA (5'-R(P*AP*UP*CP*GP*AP*GP*AP*G)-3')

Chain R:  62% 38%



4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	169.06Å 222.18Å 193.20Å 90.00° 101.34° 90.00°	Depositor
Resolution (Å)	82.88 – 3.20 82.88 – 3.20	Depositor EDS
% Data completeness (in resolution range)	87.0 (82.88-3.20) 87.1 (82.88-3.20)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.78 (at 3.19Å)	Xtrriage
Refinement program	PHENIX 1.8.4_1496	Depositor
R, R_{free}	0.214 , 0.257 0.216 , 0.258	Depositor DCC
R_{free} test set	4883 reflections (4.89%)	wwPDB-VP
Wilson B-factor (Å ²)	54.2	Xtrriage
Anisotropy	0.018	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.27 , 46.6	EDS
L-test for twinning ²	$\langle L \rangle = 0.47$, $\langle L^2 \rangle = 0.30$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.88	EDS
Total number of atoms	28239	wwPDB-VP
Average B, all atoms (Å ²)	68.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.68% 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

Bond lengths and bond angles in the following residue types are not validated in this section: APC, ZN, MG, 3DR

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	A	0.21	0/10975	0.37	0/14838
2	B	0.21	0/8896	0.37	0/11996
3	C	0.20	0/2133	0.37	0/2891
4	E	0.21	0/1780	0.36	0/2395
5	F	0.20	0/691	0.38	0/933
6	H	0.21	0/1060	0.38	0/1434
7	I	0.21	0/953	0.36	0/1284
8	J	0.21	0/541	0.36	0/727
9	K	0.21	0/937	0.35	0/1265
10	L	0.20	0/353	0.35	0/468
11	T	0.45	0/225	0.89	0/342
12	R	0.13	0/196	0.64	0/304
All	All	0.21	0/28740	0.38	0/38877

There are no bond length outliers.

There are no bond angle outliers.

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	A	10784	0	10872	164	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	B	8726	0	8759	147	0
3	C	2095	0	2051	39	0
4	E	1744	0	1772	13	0
5	F	679	0	701	9	0
6	H	1043	0	1015	24	0
7	I	935	0	886	11	0
8	J	532	0	542	12	0
9	K	919	0	929	14	0
10	L	351	0	375	6	0
11	T	214	0	122	4	0
12	R	175	0	87	2	0
13	A	2	0	0	0	0
13	B	1	0	0	0	0
13	C	1	0	0	0	0
13	I	2	0	0	0	0
13	J	1	0	0	0	0
13	L	1	0	0	0	0
14	A	2	0	0	0	0
15	A	31	0	14	1	0
16	B	1	0	0	0	0
All	All	28239	0	28125	387	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 7.

All (387) 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)
6:H:89:LEU:HD13	6:H:91:ASP:OD1	1.57	1.05
6:H:89:LEU:HD12	6:H:91:ASP:H	1.29	0.98
2:B:29:ASP:HB3	2:B:658:ILE:HG12	1.62	0.82
2:B:25:ILE:HD11	2:B:653:VAL:HB	1.62	0.80
2:B:653:VAL:HG22	2:B:689:LEU:HB3	1.69	0.74
6:H:89:LEU:HD12	6:H:91:ASP:N	2.03	0.73
8:J:5:VAL:HG22	8:J:6:ARG:HG3	1.69	0.73
1:A:35:ILE:HG13	1:A:241:VAL:HG21	1.72	0.71
1:A:875:ALA:HB2	1:A:1366:ARG:HD2	1.73	0.70
1:A:448:PRO:HG3	15:A:1805:APC:H2	1.75	0.69
3:C:6:PRO:HB2	9:K:101:LEU:HD23	1.73	0.69
2:B:287:ARG:NH1	2:B:324:ILE:O	2.26	0.69
2:B:911:ILE:HD11	2:B:941:LEU:HD23	1.74	0.68

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:1174:LYS:HB2	2:B:1179:GLN:HB2	1.74	0.68
7:I:92:ARG:HB3	7:I:95:THR:HG23	1.75	0.67
2:B:763:GLN:HG2	2:B:765:PRO:HD2	1.74	0.67
3:C:48:SER:HB3	3:C:158:VAL:HB	1.76	0.67
1:A:704:ALA:HB2	1:A:710:LEU:HD12	1.77	0.66
6:H:89:LEU:CD1	6:H:91:ASP:H	2.06	0.66
4:E:178:ILE:HB	4:E:212:ARG:HD3	1.78	0.66
1:A:338:GLY:HA2	2:B:1129:ARG:HH21	1.60	0.65
2:B:635:ARG:NH1	2:B:742:GLU:OE2	2.27	0.65
3:C:69:LEU:HD12	8:J:6:ARG:HD3	1.79	0.65
2:B:205:ILE:HG13	2:B:461:LEU:HB3	1.79	0.64
1:A:1187:GLN:HG3	1:A:1188:GLN:HG3	1.80	0.64
1:A:469:ARG:NH2	2:B:991:GLY:O	2.29	0.64
2:B:778:MET:HE1	2:B:1094:ARG:HH11	1.64	0.63
2:B:998:ASP:OD1	3:C:35:ARG:NH2	2.31	0.63
2:B:1175:LEU:O	2:B:1176:ASN:ND2	2.30	0.63
3:C:177:GLU:HB2	3:C:231:ASN:HB3	1.81	0.63
1:A:110:CYS:SG	1:A:111:GLY:N	2.72	0.63
1:A:1193:LEU:HB2	1:A:1260:LEU:HD21	1.81	0.63
2:B:165:VAL:HG21	2:B:448:ILE:HD12	1.80	0.63
2:B:1129:ARG:NH1	11:T:22:DT:OP1	2.32	0.63
2:B:287:ARG:HG2	2:B:292:ILE:HA	1.81	0.63
1:A:693:VAL:HG21	1:A:721:PHE:HE2	1.64	0.62
3:C:46:ILE:HD13	3:C:159:ALA:HB2	1.81	0.62
1:A:1424:VAL:HG22	1:A:1436:ILE:HD11	1.81	0.62
2:B:642:ASP:HB3	2:B:649:LYS:HG2	1.82	0.62
1:A:899:VAL:HG22	1:A:1029:ARG:HG2	1.82	0.61
1:A:4:GLN:OE1	2:B:1159:ARG:NH1	2.32	0.61
1:A:601:LYS:HB2	1:A:603:ASN:HD22	1.66	0.60
1:A:1364:ASN:OD1	1:A:1366:ARG:NH1	2.34	0.60
1:A:1281:ARG:HG2	1:A:1309:ASP:HB2	1.83	0.60
1:A:840:ARG:NH2	1:A:1106:ASN:OD1	2.35	0.60
2:B:800:GLN:HB3	8:J:52:THR:HG22	1.83	0.60
6:H:129:TYR:O	6:H:132:LEU:N	2.35	0.60
2:B:916:THR:HG23	2:B:935:ARG:HB2	1.84	0.60
2:B:613:VAL:HG22	2:B:628:THR:HG23	1.84	0.59
1:A:134:ARG:NH1	1:A:220:THR:O	2.35	0.59
1:A:1100:ARG:HH21	1:A:1351:GLU:HG2	1.67	0.59
3:C:41:ILE:HB	3:C:172:PRO:HG3	1.84	0.59
1:A:306:ASN:ND2	1:A:321:PRO:O	2.35	0.59
1:A:483:ASP:HA	2:B:988:GLY:HA2	1.85	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:E:4:GLU:OE1	4:E:7:ARG:NH2	2.35	0.58
3:C:46:ILE:HD12	3:C:157:CYS:HB3	1.84	0.58
1:A:40:THR:HG22	1:A:41:MET:HG3	1.83	0.58
2:B:120:ARG:HG2	2:B:955:THR:HG21	1.84	0.58
2:B:63:ILE:O	2:B:67:SER:OG	2.21	0.58
2:B:522:VAL:HG11	2:B:537:LYS:HD2	1.86	0.58
2:B:810:GLU:OE1	2:B:815:ARG:NH2	2.36	0.58
7:I:14:LEU:HD13	7:I:27:PHE:HB3	1.86	0.58
1:A:1348:LEU:HD23	1:A:1372:VAL:HG13	1.86	0.58
2:B:950:ASP:HB2	2:B:969:ARG:HB2	1.86	0.57
3:C:35:ARG:NH1	9:K:41:THR:OG1	2.36	0.57
3:C:145:CYS:SG	3:C:146:LYS:N	2.76	0.57
2:B:837:ASP:OD2	2:B:1020:ARG:NH2	2.38	0.57
6:H:91:ASP:OD1	6:H:92:ASP:N	2.37	0.57
1:A:406:ILE:HB	1:A:431:LYS:HB2	1.86	0.57
2:B:274:PRO:HG2	2:B:359:GLU:HB3	1.86	0.57
2:B:834:ASN:HB3	2:B:840:ILE:HG13	1.87	0.57
5:F:82:THR:HG22	5:F:84:TYR:H	1.69	0.56
1:A:1325:THR:OG1	4:E:146:HIS:O	2.22	0.56
2:B:273:LEU:HB2	2:B:276:ILE:HD12	1.88	0.56
7:I:101:PHE:HE1	7:I:112:SER:HB3	1.70	0.56
3:C:3:GLU:HG3	3:C:4:GLU:HG3	1.86	0.56
7:I:32:CYS:SG	7:I:33:SER:N	2.77	0.56
3:C:252:GLN:HG3	9:K:95:ILE:HG23	1.87	0.56
1:A:726:ARG:HD3	1:A:766:GLY:HA3	1.87	0.56
1:A:365:GLY:HA3	1:A:469:ARG:HB2	1.87	0.56
2:B:1065:GLN:HG2	2:B:1069:PHE:HB2	1.87	0.56
1:A:34:LYS:H	1:A:34:LYS:HD3	1.70	0.56
2:B:1056:SER:HB3	2:B:1066:SER:HB2	1.88	0.56
1:A:993:LEU:HD22	1:A:1046:LEU:HG	1.88	0.56
5:F:97:ARG:NH1	5:F:100:GLN:OE1	2.39	0.56
1:A:491:VAL:O	2:B:1150:ARG:NH2	2.39	0.55
2:B:847:ASP:OD2	9:K:6:ARG:NH2	2.39	0.55
1:A:1386:ARG:O	1:A:1391:ARG:NH1	2.39	0.55
1:A:1064:VAL:HG23	1:A:1067:LEU:HD23	1.89	0.55
1:A:636:GLU:OE2	1:A:962:ARG:NH1	2.41	0.54
8:J:14:VAL:HB	8:J:50:ILE:HD11	1.88	0.54
2:B:356:LEU:HA	2:B:360:PHE:HB3	1.90	0.54
6:H:8:ASP:OD1	6:H:9:ILE:N	2.39	0.54
6:H:89:LEU:HD13	6:H:91:ASP:CG	2.27	0.54
1:A:30:ILE:HG23	2:B:1170:THR:HG23	1.90	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:760:GLN:HG2	1:A:765:VAL:HA	1.90	0.54
3:C:54:ASN:ND2	3:C:60:ASP:OD1	2.35	0.54
2:B:995:ARG:NH1	2:B:997:GLU:OE1	2.41	0.54
1:A:902:LEU:HG	1:A:926:GLN:HG3	1.89	0.54
2:B:269:ILE:HD11	2:B:386:LEU:HD21	1.90	0.54
3:C:6:PRO:HB3	3:C:25:VAL:HG13	1.90	0.54
1:A:1138:ILE:HG22	1:A:1279:ILE:HG21	1.90	0.54
1:A:537:ARG:HD2	6:H:121:LEU:HD23	1.90	0.53
2:B:661:LEU:HD11	2:B:684:LEU:HD11	1.91	0.53
5:F:82:THR:O	5:F:136:ARG:NH1	2.37	0.53
2:B:512:ARG:NH1	2:B:533:CYS:O	2.41	0.53
2:B:313:MET:HE3	2:B:386:LEU:HD22	1.90	0.53
5:F:76:LYS:O	5:F:79:ARG:NH1	2.38	0.53
6:H:85:GLY:HA2	6:H:86:ASP:HB3	1.90	0.53
1:A:1194:ARG:HH21	1:A:1237:ILE:HD13	1.74	0.53
1:A:666:ILE:HG23	2:B:1026:LEU:HB2	1.91	0.53
2:B:487:THR:OG1	2:B:777:ALA:O	2.27	0.53
2:B:1077:THR:HG23	2:B:1079:LYS:H	1.73	0.53
1:A:1239:ARG:HH22	1:A:1241:ARG:HH21	1.55	0.52
2:B:307:ASP:OD1	2:B:392:ARG:NH1	2.37	0.52
6:H:137:GLN:HG3	6:H:139:ASN:H	1.74	0.52
1:A:1342:GLU:OE2	4:E:212:ARG:NH1	2.42	0.52
1:A:1207:LEU:HD23	1:A:1274:ARG:HD2	1.91	0.52
1:A:879:GLU:OE1	1:A:962:ARG:NH2	2.41	0.52
6:H:89:LEU:HD13	6:H:92:ASP:H	1.73	0.52
1:A:1063:MET:SD	1:A:1436:ILE:HG13	2.50	0.52
1:A:17:VAL:HB	1:A:1419:ASP:HB3	1.91	0.52
1:A:1148:ILE:HD13	7:I:49:ILE:HD12	1.91	0.52
2:B:521:LEU:HD22	2:B:633:VAL:HG12	1.90	0.52
1:A:544:ASP:HB2	9:K:47:ARG:HH21	1.75	0.52
1:A:834:THR:HG21	1:A:1077:THR:HA	1.92	0.51
2:B:1067:ARG:NE	3:C:194:GLU:OE1	2.36	0.51
1:A:37:PHE:HB2	1:A:52:GLY:HA3	1.92	0.51
1:A:774:ARG:HG3	1:A:797:LYS:HZ2	1.74	0.51
8:J:44:TYR:HA	8:J:47:ARG:HB3	1.93	0.51
2:B:639:ILE:HD11	2:B:691:GLU:HG3	1.92	0.51
2:B:28:GLU:OE1	2:B:807:ARG:NH1	2.33	0.51
2:B:579:ARG:HA	2:B:589:VAL:HA	1.92	0.51
10:L:68:GLU:O	10:L:70:ARG:N	2.43	0.51
1:A:562:THR:O	1:A:576:GLN:NE2	2.44	0.50
1:A:528:LEU:HD23	1:A:751:SER:HA	1.94	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:697:ALA:HA	1:A:702:LEU:HB2	1.92	0.50
1:A:1286:LYS:HE2	1:A:1302:PRO:HB2	1.93	0.50
2:B:726:ALA:HB1	2:B:1051:THR:HG21	1.92	0.50
4:E:20:LYS:NZ	4:E:34:GLU:O	2.42	0.50
2:B:843:GLN:HB2	2:B:993:THR:HB	1.92	0.50
5:F:81:THR:HB	5:F:136:ARG:HH11	1.77	0.50
1:A:54:ASN:OD1	1:A:247:ARG:NH1	2.41	0.50
2:B:466:TRP:HB2	2:B:479:VAL:HG21	1.93	0.50
1:A:1373:ASP:HA	1:A:1376:THR:HG22	1.93	0.50
2:B:640:VAL:HG22	2:B:651:LEU:HD23	1.94	0.50
2:B:802:PRO:HG2	2:B:805:THR:HG22	1.94	0.49
1:A:550:LEU:HD21	1:A:561:PRO:HD2	1.93	0.49
6:H:44:VAL:HG13	6:H:48:PRO:HA	1.94	0.49
10:L:31:CYS:SG	10:L:32:ALA:N	2.85	0.49
2:B:1013:ASN:OD1	2:B:1015:HIS:ND1	2.31	0.49
1:A:4:GLN:HE22	2:B:1159:ARG:H	1.60	0.49
4:E:83:CYS:HB2	4:E:110:PHE:HE1	1.77	0.49
9:K:21:ILE:HD13	9:K:84:LYS:HE2	1.94	0.49
2:B:294:ASP:HB2	7:I:12:ASN:HA	1.94	0.49
9:K:58:PHE:HB3	9:K:76:GLN:HB3	1.94	0.49
1:A:340:LEU:HD13	1:A:1429:ILE:HG23	1.93	0.49
5:F:107:VAL:HG12	5:F:109:VAL:H	1.77	0.49
1:A:778:GLY:HA3	2:B:516:ASN:HB2	1.95	0.49
3:C:50:GLU:HG2	10:L:66:GLN:HG2	1.94	0.49
8:J:10:CYS:SG	8:J:11:GLY:N	2.86	0.49
2:B:680:THR:O	2:B:683:SER:OG	2.26	0.49
6:H:89:LEU:CD1	6:H:92:ASP:H	2.25	0.49
2:B:287:ARG:NH1	2:B:321:GLY:O	2.45	0.48
4:E:124:VAL:HG13	4:E:132:ILE:HB	1.95	0.48
8:J:36:LEU:HD11	8:J:51:LEU:HB2	1.94	0.48
9:K:22:ASP:HB2	9:K:32:VAL:HG13	1.95	0.48
10:L:48:CYS:SG	10:L:49:LYS:N	2.86	0.48
1:A:802:ASN:OD1	2:B:729:ILE:N	2.43	0.48
3:C:99:LEU:HD12	3:C:118:LEU:HB3	1.94	0.48
1:A:663:SER:OG	1:A:664:THR:N	2.47	0.48
1:A:839:ARG:HD3	11:T:20:3DR:H5''	1.95	0.48
1:A:1009:ASN:OD1	1:A:1012:ARG:NH2	2.33	0.48
1:A:1324:PRO:HB2	4:E:142:VAL:HG11	1.96	0.48
3:C:162:GLY:HA3	3:C:170:TRP:CE2	2.48	0.48
1:A:1120:LEU:HD21	1:A:1131:ALA:HB2	1.96	0.48
2:B:284:ILE:HG21	2:B:333:PHE:HD2	1.78	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:326:ARG:HG2	1:A:1406:VAL:HG11	1.95	0.48
1:A:344:ARG:HA	2:B:1129:ARG:HA	1.96	0.48
1:A:848:ILE:HB	1:A:1065:GLY:HA3	1.96	0.47
1:A:868:TYR:CZ	1:A:1064:VAL:HG21	2.49	0.47
1:A:1345:ARG:HG3	1:A:1376:THR:HG21	1.96	0.47
1:A:378:GLU:OE2	1:A:387:ARG:NH2	2.44	0.47
2:B:60:GLN:NE2	2:B:64:CYS:SG	2.87	0.47
3:C:7:GLN:HB2	3:C:23:SER:HB2	1.95	0.47
6:H:84:ALA:HB3	6:H:86:ASP:HB3	1.96	0.47
1:A:243:PRO:HB2	1:A:245:PRO:HD2	1.96	0.47
2:B:1002:THR:HG23	2:B:1004:GLU:H	1.78	0.47
1:A:545:GLN:HG2	1:A:549:MET:HE3	1.96	0.47
1:A:68:GLN:O	1:A:70:CYS:N	2.43	0.47
1:A:107:CYS:SG	1:A:108:MET:N	2.88	0.47
1:A:407:ARG:HD2	1:A:413:ILE:HD11	1.96	0.47
1:A:108:MET:O	1:A:110:CYS:N	2.46	0.47
1:A:707:GLY:O	1:A:1281:ARG:NH1	2.45	0.47
2:B:1187:ASN:ND2	2:B:1190:ASP:O	2.47	0.47
3:C:165:LYS:O	9:K:6:ARG:NH1	2.47	0.47
9:K:56:VAL:HG22	9:K:77:THR:HG22	1.97	0.47
3:C:75:MET:O	3:C:246:ARG:NH2	2.45	0.47
1:A:679:ILE:HG23	1:A:729:ALA:HB1	1.97	0.47
1:A:1261:LYS:O	1:A:1264:GLU:HG3	2.15	0.47
2:B:610:ASN:HB3	2:B:613:VAL:HG23	1.96	0.47
6:H:76:THR:OG1	6:H:77:ARG:N	2.48	0.47
1:A:544:ASP:OD1	1:A:545:GLN:N	2.44	0.47
1:A:1116:LEU:HD23	1:A:1311:VAL:HA	1.96	0.47
1:A:471:ASN:O	1:A:474:VAL:HG12	2.14	0.46
1:A:614:PHE:HB3	6:H:122:LEU:HD21	1.97	0.46
2:B:1129:ARG:N	11:T:23:DC:OP1	2.36	0.46
1:A:306:ASN:HB2	1:A:324:SER:HB3	1.97	0.46
1:A:446:ARG:HD2	1:A:480:ALA:HB2	1.97	0.46
1:A:1397:LEU:HB2	1:A:1426:GLU:HG2	1.96	0.46
1:A:1436:ILE:O	1:A:1438:THR:N	2.49	0.46
2:B:1065:GLN:HG3	2:B:1067:ARG:H	1.79	0.46
1:A:1163:ILE:HG22	1:A:1165:GLU:H	1.80	0.46
1:A:5:GLN:O	2:B:1159:ARG:NH2	2.48	0.46
2:B:963:PHE:HE2	2:B:965:LYS:HE3	1.81	0.46
7:I:50:THR:HB	7:I:52:ILE:HG22	1.98	0.46
1:A:87:ALA:HB3	1:A:276:LEU:HD23	1.96	0.46
3:C:185:LYS:HG2	3:C:213:PRO:HG3	1.98	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:836:TYR:OH	1:A:1403:GLU:OE2	2.26	0.46
1:A:868:TYR:OH	1:A:1366:ARG:HD3	2.15	0.46
1:A:1111:MET:HG3	1:A:1114:PRO:HG3	1.97	0.46
2:B:37:PHE:O	2:B:39:ARG:N	2.44	0.46
2:B:198:ASP:OD1	2:B:485:ARG:NH2	2.49	0.46
3:C:40:GLU:OE1	3:C:254:LYS:NZ	2.42	0.46
1:A:901:LEU:HB2	1:A:926:GLN:HG2	1.98	0.45
1:A:1224:LEU:HD11	1:A:1240:CYS:HB3	1.98	0.45
2:B:298:LEU:O	2:B:302:CYS:N	2.44	0.45
2:B:736:THR:O	2:B:738:PHE:N	2.48	0.45
3:C:98:VAL:HG22	3:C:158:VAL:HG22	1.98	0.45
1:A:528:LEU:O	1:A:531:ILE:HG22	2.16	0.45
2:B:30:SER:OG	2:B:743:ILE:O	2.25	0.45
2:B:547:VAL:N	2:B:612:GLU:OE2	2.44	0.45
2:B:69:LEU:HB2	2:B:90:ILE:HG12	1.99	0.45
3:C:56:THR:HG21	3:C:63:ILE:HD11	1.97	0.45
3:C:77:ILE:HG12	3:C:129:ILE:HD11	1.97	0.45
2:B:706:GLN:OE1	2:B:730:ARG:NH1	2.49	0.45
8:J:36:LEU:HD13	8:J:47:ARG:HG3	1.99	0.45
2:B:1106:ARG:HH11	2:B:1126:GLY:HA2	1.81	0.45
1:A:962:ARG:HA	1:A:965:GLN:HG2	1.98	0.45
1:A:868:TYR:CE1	1:A:1064:VAL:HG21	2.52	0.45
1:A:1011:GLN:O	1:A:1015:VAL:HG23	2.17	0.45
2:B:114:PRO:HG2	2:B:181:LEU:HD11	1.97	0.45
2:B:1104:HIS:CG	2:B:1122:ARG:HG3	2.52	0.45
6:H:133:ASN:OD1	6:H:133:ASN:N	2.37	0.45
1:A:265:LYS:NZ	1:A:302:THR:HG23	2.31	0.45
2:B:120:ARG:HB2	2:B:122:LEU:HG	1.99	0.45
1:A:302:THR:OG1	1:A:306:ASN:OD1	2.35	0.45
1:A:337:ARG:O	2:B:1129:ARG:NH2	2.49	0.45
1:A:883:LEU:HD23	1:A:1021:LEU:HD13	1.99	0.45
2:B:209:GLU:OE1	2:B:788:ARG:NH2	2.49	0.45
1:A:1142:THR:O	1:A:1145:SER:OG	2.31	0.44
1:A:1219:THR:HG21	1:A:1271:ILE:HD11	1.99	0.44
2:B:620:ARG:HD2	7:I:68:LEU:HD11	1.99	0.44
1:A:1333:ILE:HD13	1:A:1381:LEU:HD12	1.99	0.44
2:B:281:PRO:HB2	2:B:284:ILE:HG12	1.99	0.44
2:B:378:LEU:O	2:B:382:ILE:HG12	2.17	0.44
2:B:620:ARG:NH2	7:I:89:GLN:OE1	2.51	0.44
3:C:163:ILE:HG22	3:C:165:LYS:H	1.83	0.44
1:A:206:GLU:O	1:A:210:ILE:HG12	2.18	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:523:ILE:HD13	1:A:622:VAL:HG22	2.00	0.44
6:H:83:GLN:HA	6:H:84:ALA:HA	1.75	0.44
2:B:118:ARG:HA	2:B:207:GLY:HA2	2.00	0.44
2:B:883:LEU:O	2:B:885:MET:N	2.51	0.44
2:B:1142:GLY:HA3	5:F:88:TYR:HE2	1.82	0.44
3:C:116:LYS:HD3	3:C:140:ASN:HA	2.00	0.44
1:A:541:ILE:HD12	1:A:577:ILE:HG12	2.00	0.44
2:B:1084:GLN:OE1	3:C:192:TRP:N	2.46	0.44
1:A:12:ARG:HH11	2:B:1192:TYR:HE1	1.65	0.44
1:A:1281:ARG:NE	1:A:1309:ASP:OD2	2.51	0.44
2:B:30:SER:O	2:B:34:ILE:HG13	2.18	0.44
2:B:103:ASN:OD1	2:B:169:ARG:NH2	2.44	0.44
2:B:999:MET:HG3	2:B:1000:PRO:HD2	2.00	0.44
1:A:265:LYS:HZ1	1:A:302:THR:HG23	1.82	0.44
1:A:626:ASN:O	1:A:631:HIS:ND1	2.37	0.44
5:F:138:LEU:HD12	5:F:142:SER:HB2	1.99	0.44
2:B:757:PRO:HG2	2:B:984:HIS:NE2	2.32	0.44
2:B:778:MET:HE1	2:B:1094:ARG:NH1	2.30	0.44
2:B:1082:MET:HA	3:C:189:THR:HA	2.00	0.44
9:K:49:GLU:OE2	9:K:97:LYS:NZ	2.33	0.44
1:A:874:ASP:HB2	1:A:1058:VAL:HA	2.00	0.43
1:A:998:LEU:HA	1:A:1011:GLN:HE22	1.82	0.43
1:A:1438:THR:HG23	5:F:92:ARG:HB2	1.99	0.43
2:B:866:TYR:HB2	2:B:870:ILE:HB	1.98	0.43
1:A:331:GLY:HA2	1:A:334:GLY:H	1.83	0.43
2:B:193:LYS:HE2	8:J:65:PRO:HG3	2.00	0.43
1:A:402:ALA:HA	1:A:434:ARG:HA	2.00	0.43
2:B:846:ILE:HG23	2:B:974:PRO:HG2	1.99	0.43
2:B:983:ARG:NH1	2:B:1091:TYR:HB3	2.33	0.43
2:B:1001:PHE:HE2	3:C:178:PHE:HB3	1.83	0.43
6:H:81:PRO:O	6:H:83:GLN:N	2.52	0.43
1:A:357:PRO:HD2	2:B:833:TYR:CZ	2.52	0.43
1:A:1094:VAL:HA	1:A:1113:THR:HG21	2.00	0.43
2:B:939:THR:HA	2:B:940:PRO:HD3	1.85	0.43
2:B:942:ARG:HB2	2:B:945:GLU:HB2	2.00	0.43
4:E:202:SER:HB3	4:E:206:GLY:H	1.83	0.43
2:B:496:ARG:NH2	2:B:540:SER:O	2.45	0.43
3:C:39:ALA:HA	3:C:164:ALA:HB3	2.00	0.43
1:A:596:THR:C	1:A:598:LEU:H	2.22	0.43
2:B:95:ILE:HD11	2:B:128:LEU:HB3	2.01	0.43
2:B:121:ASN:HA	2:B:207:GLY:HA3	2.00	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:765:VAL:HG22	1:A:800:VAL:HB	2.00	0.43
4:E:24:LYS:HB3	4:E:30:ILE:HB	2.01	0.43
2:B:600:LEU:HB3	2:B:615:MET:SD	2.59	0.43
10:L:38:LEU:HD21	10:L:48:CYS:HA	2.01	0.43
1:A:444:PHE:HD1	1:A:444:PHE:HA	1.71	0.42
1:A:1132:LYS:HG3	1:A:1135:ARG:HH12	1.84	0.42
2:B:428:ILE:HD11	2:B:448:ILE:HG23	2.01	0.42
1:A:378:GLU:OE2	1:A:384:ASN:ND2	2.52	0.42
1:A:399:HIS:CE1	1:A:462:VAL:HG21	2.54	0.42
2:B:779:GLY:HA2	2:B:796:LEU:HB2	2.01	0.42
2:B:916:THR:HA	2:B:917:PRO:HD3	1.80	0.42
2:B:952:VAL:HG13	2:B:966:VAL:HG22	2.01	0.42
2:B:280:ILE:HD11	2:B:337:ARG:HG3	2.01	0.42
2:B:984:HIS:CE1	2:B:1025:HIS:HA	2.54	0.42
3:C:77:ILE:O	3:C:161:LYS:NZ	2.41	0.42
1:A:1239:ARG:HH22	1:A:1241:ARG:NH2	2.18	0.42
2:B:63:ILE:HD12	2:B:95:ILE:HB	2.01	0.42
2:B:227:LYS:HG2	2:B:236:HIS:CD2	2.53	0.42
2:B:840:ILE:HB	2:B:1011:ILE:HB	2.01	0.42
1:A:215:SER:OG	1:A:216:VAL:N	2.50	0.42
2:B:199:MET:SD	2:B:199:MET:N	2.85	0.42
4:E:12:LEU:HD21	4:E:58:MET:HE1	2.02	0.42
3:C:69:LEU:O	8:J:6:ARG:HD2	2.20	0.42
1:A:695:LYS:HE3	1:A:695:LYS:HB2	1.86	0.42
1:A:1261:LYS:HE3	1:A:1261:LYS:HB2	1.88	0.42
10:L:47:ARG:HG2	10:L:54:ARG:HG2	2.02	0.42
1:A:1318:THR:O	4:E:14:ARG:NH2	2.53	0.42
2:B:120:ARG:HA	2:B:963:PHE:HZ	1.85	0.42
2:B:1060:ARG:HA	2:B:1060:ARG:HD2	1.90	0.42
1:A:231:PRO:HA	1:A:234:MET:HG3	2.02	0.42
1:A:1198:ASP:O	1:A:1202:MET:HG2	2.20	0.42
1:A:1410:PHE:CD2	2:B:1212:ILE:HD11	2.55	0.42
2:B:941:LEU:HD22	2:B:942:ARG:H	1.85	0.42
8:J:18:TRP:O	8:J:21:TYR:HB3	2.20	0.42
1:A:443:LEU:HD12	2:B:1146:PHE:CZ	2.55	0.42
2:B:326:ASP:OD1	2:B:329:THR:OG1	2.24	0.42
4:E:63:ASN:HA	4:E:64:PRO:HD3	1.88	0.41
1:A:76:GLU:OE2	2:B:1159:ARG:NH1	2.52	0.41
1:A:1193:LEU:HB3	1:A:1240:CYS:HB2	2.02	0.41
1:A:1290:LYS:HE2	1:A:1298:TYR:HB3	2.01	0.41
7:I:85:PHE:HB3	7:I:101:PHE:CD2	2.55	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
8:J:64:ASN:N	8:J:65:PRO:HD2	2.34	0.41
12:R:3:C:H2'	12:R:4:G:C8	2.55	0.41
1:A:532:ARG:HH12	1:A:745:GLN:HA	1.85	0.41
1:A:901:LEU:HD22	1:A:919:ILE:HG23	2.02	0.41
1:A:1410:PHE:HD2	2:B:1212:ILE:HD11	1.85	0.41
2:B:256:VAL:HG11	2:B:382:ILE:HD13	2.02	0.41
2:B:364:ILE:HG13	2:B:365:THR:OG1	2.20	0.41
2:B:408:LEU:HB3	2:B:409:ALA:H	1.65	0.41
3:C:18:VAL:HG23	3:C:232:VAL:HB	2.03	0.41
3:C:212:PRO:HA	3:C:213:PRO:HD3	1.85	0.41
6:H:89:LEU:HD12	6:H:90:ALA:N	2.35	0.41
1:A:268:ASP:HB3	1:A:299:HIS:CE1	2.56	0.41
1:A:449:SER:HB3	2:B:1137:CYS:SG	2.61	0.41
1:A:607:ILE:HG12	1:A:612:ILE:HA	2.02	0.41
1:A:821:ARG:O	1:A:825:ILE:HG12	2.20	0.41
1:A:1260:LEU:HD12	1:A:1263:ILE:HD12	2.03	0.41
2:B:899:ILE:HG21	2:B:949:VAL:HG21	2.02	0.41
3:C:54:ASN:OD1	3:C:56:THR:HG22	2.21	0.41
6:H:6:PHE:HB3	6:H:59:ILE:HB	2.02	0.41
1:A:464:PRO:HB2	9:K:4:PRO:HD3	2.02	0.41
1:A:1079:MET:HE1	1:A:1097:GLY:HA2	2.01	0.41
3:C:99:LEU:HB3	3:C:120:ILE:HD13	2.02	0.41
1:A:311:GLN:N	1:A:312:PRO:HD2	2.36	0.41
1:A:436:ILE:HD11	1:A:491:VAL:HG11	2.03	0.41
1:A:642:CYS:O	1:A:645:LEU:HB3	2.20	0.41
2:B:258:LEU:HB2	2:B:385:LEU:HD21	2.01	0.41
1:A:575:LYS:HB3	1:A:612:ILE:HD13	2.03	0.41
2:B:857:ARG:NH2	11:T:26:DG:OP1	2.54	0.41
1:A:1064:VAL:HA	1:A:1067:LEU:HB3	2.02	0.41
1:A:91:PHE:HZ	1:A:207:ILE:HD12	1.87	0.40
1:A:560:ILE:HB	6:H:79:TRP:H	1.86	0.40
1:A:1207:LEU:HD22	1:A:1273:LEU:HD23	2.03	0.40
2:B:226:PHE:HA	2:B:395:GLN:HG3	2.03	0.40
2:B:394:ASP:H	7:I:91:ARG:HG3	1.86	0.40
2:B:681:TRP:CH2	2:B:690:VAL:HG11	2.55	0.40
2:B:992:ILE:HG13	9:K:67:PHE:HE1	1.86	0.40
1:A:598:LEU:O	6:H:122:LEU:HD12	2.21	0.40
1:A:1002:GLY:O	1:A:1008:GLN:NE2	2.54	0.40
2:B:102:VAL:HG23	2:B:112:LEU:HB2	2.04	0.40
12:R:3:C:H2'	12:R:4:G:H8	1.86	0.40
1:A:320:ARG:HA	1:A:321:PRO:HD3	1.97	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:500:GLU:O	1:A:504:LEU:HB2	2.21	0.40
2:B:855:PHE:HZ	2:B:857:ARG:HH11	1.69	0.40
3:C:84:ARG:HD2	9:K:11:LEU:HD21	2.03	0.40
1:A:1195:LEU:HB2	1:A:1238:ILE:HB	2.03	0.40
2:B:31:TRP:CE3	2:B:34:ILE:HD12	2.57	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	
1	A	1358/1733 (78%)	1239 (91%)	110 (8%)	9 (1%)	22	61
2	B	1077/1224 (88%)	991 (92%)	77 (7%)	9 (1%)	19	58
3	C	264/318 (83%)	245 (93%)	17 (6%)	2 (1%)	19	58
4	E	211/215 (98%)	200 (95%)	10 (5%)	1 (0%)	29	67
5	F	82/155 (53%)	77 (94%)	5 (6%)	0	100	100
6	H	124/146 (85%)	107 (86%)	15 (12%)	2 (2%)	9	43
7	I	113/122 (93%)	100 (88%)	13 (12%)	0	100	100
8	J	63/70 (90%)	57 (90%)	6 (10%)	0	100	100
9	K	112/120 (93%)	108 (96%)	3 (3%)	1 (1%)	17	56
10	L	42/70 (60%)	33 (79%)	7 (17%)	2 (5%)	2	17
All	All	3446/4173 (83%)	3157 (92%)	263 (8%)	26 (1%)	19	58

All (26) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	322	VAL
1	A	1437	GLY

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Mol	Chain	Res	Type
1	A	78	PRO
1	A	110	CYS
1	A	1279	ILE
2	B	468	GLU
2	B	1046	PRO
4	E	86	PRO
10	L	69	ALA
1	A	40	THR
2	B	337	ARG
2	B	884	ARG
3	C	148	ARG
9	K	26	LYS
2	B	737	THR
3	C	90	ASP
10	L	41	SER
1	A	958	VAL
1	A	1063	MET
2	B	367	LEU
2	B	1017	ILE
2	B	1108	ARG
6	H	82	PRO
6	H	18	GLY
1	A	1107	VAL
2	B	260	GLY

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
1	A	1196/1520 (79%)	1147 (96%)	49 (4%)	30 66
2	B	952/1061 (90%)	922 (97%)	30 (3%)	39 71
3	C	234/274 (85%)	227 (97%)	7 (3%)	41 73
4	E	195/197 (99%)	189 (97%)	6 (3%)	40 72
5	F	74/137 (54%)	71 (96%)	3 (4%)	30 66

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
6	H	114/128 (89%)	112 (98%)	2 (2%)	59	82
7	I	109/116 (94%)	107 (98%)	2 (2%)	59	82
8	J	60/65 (92%)	59 (98%)	1 (2%)	60	83
9	K	99/102 (97%)	98 (99%)	1 (1%)	76	90
10	L	39/57 (68%)	39 (100%)	0	100	100
All	All	3072/3657 (84%)	2971 (97%)	101 (3%)	38	71

All (101) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	6	TYR
1	A	12	ARG
1	A	22	PHE
1	A	34	LYS
1	A	126	LEU
1	A	132	LYS
1	A	179	LEU
1	A	208	LEU
1	A	222	LEU
1	A	235	ILE
1	A	270	LEU
1	A	287	HIS
1	A	308	ILE
1	A	322	VAL
1	A	326	ARG
1	A	351	THR
1	A	434	ARG
1	A	443	LEU
1	A	444	PHE
1	A	451	HIS
1	A	452	LYS
1	A	481	ASP
1	A	532	ARG
1	A	605	MET
1	A	612	ILE
1	A	618	GLU
1	A	666	ILE
1	A	702	LEU
1	A	710	LEU
1	A	740	LEU

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Mol	Chain	Res	Type
1	A	764	CYS
1	A	774	ARG
1	A	780	VAL
1	A	826	ASP
1	A	896	ARG
1	A	1017	LEU
1	A	1025	ARG
1	A	1034	GLU
1	A	1116	LEU
1	A	1207	LEU
1	A	1231	ASP
1	A	1262	LYS
1	A	1269	GLU
1	A	1297	GLU
1	A	1322	ILE
1	A	1329	THR
1	A	1374	VAL
1	A	1400	CYS
1	A	1407	GLU
2	B	46	GLN
2	B	90	ILE
2	B	109	THR
2	B	134	LYS
2	B	217	ARG
2	B	319	GLU
2	B	364	ILE
2	B	365	THR
2	B	483	LEU
2	B	549	THR
2	B	570	VAL
2	B	628	THR
2	B	737	THR
2	B	797	TYR
2	B	868	MET
2	B	916	THR
2	B	931	TYR
2	B	983	ARG
2	B	987	LYS
2	B	997	GLU
2	B	1051	THR
2	B	1065	GLN
2	B	1099	VAL

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Mol	Chain	Res	Type
2	B	1147	LEU
2	B	1159	ARG
2	B	1160	VAL
2	B	1176	ASN
2	B	1188	LYS
2	B	1194	ILE
2	B	1202	LEU
3	C	18	VAL
3	C	25	VAL
3	C	77	ILE
3	C	99	LEU
3	C	137	LYS
3	C	240	VAL
3	C	253	LYS
4	E	3	GLN
4	E	98	ILE
4	E	110	PHE
4	E	123	LEU
4	E	127	ILE
4	E	169	ARG
5	F	93	ILE
5	F	97	ARG
5	F	155	LEU
6	H	124	ARG
6	H	133	ASN
7	I	14	LEU
7	I	111	THR
8	J	5	VAL
9	K	1	MET

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (3) such sidechains are listed below:

Mol	Chain	Res	Type
2	B	115	GLN
2	B	762	ASN
2	B	984	HIS

5.3.3 RNA

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
12	R	7/8 (87%)	1 (14%)	0

All (1) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
12	R	8	G

There are no RNA pucker outliers to report.

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

1 non-standard protein/DNA/RNA residue is modelled in this entry.

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
11	3DR	T	20	11	8,11,12	1.43	1 (12%)	9,14,17	1.10	1 (11%)

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
11	3DR	T	20	11	-	1/3/15/16	0/1/1/1

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
11	T	20	3DR	O4'-C4'	-2.46	1.40	1.44

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
11	T	20	3DR	O4'-C4'-C3'	2.33	107.15	103.73

There are no chirality outliers.

All (1) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
11	T	20	3DR	O4'-C4'-C5'-O5'

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
11	T	20	3DR	1	0

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 11 ligands modelled in this entry, 10 are monoatomic - leaving 1 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
15	APC	A	1805	14	27,33,33	1.48	4 (14%)	31,52,52	1.40	5 (16%)

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
15	APC	A	1805	14	-	4/15/38/38	0/3/3/3

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
15	A	1805	APC	PB-O3B	4.05	1.62	1.58
15	A	1805	APC	PA-O2A	-2.75	1.49	1.56
15	A	1805	APC	PB-O2B	-2.65	1.50	1.56
15	A	1805	APC	C2'-C1'	-2.45	1.50	1.53

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
15	A	1805	APC	C3'-C2'-C1'	3.58	106.37	100.98
15	A	1805	APC	C4-C5-N7	-3.28	105.98	109.40
15	A	1805	APC	N3-C2-N1	-2.90	124.14	128.68
15	A	1805	APC	O2A-PA-O1A	2.52	118.47	110.07
15	A	1805	APC	O3B-PG-O1G	-2.00	100.08	111.19

There are no chirality outliers.

All (4) torsion outliers are listed below:

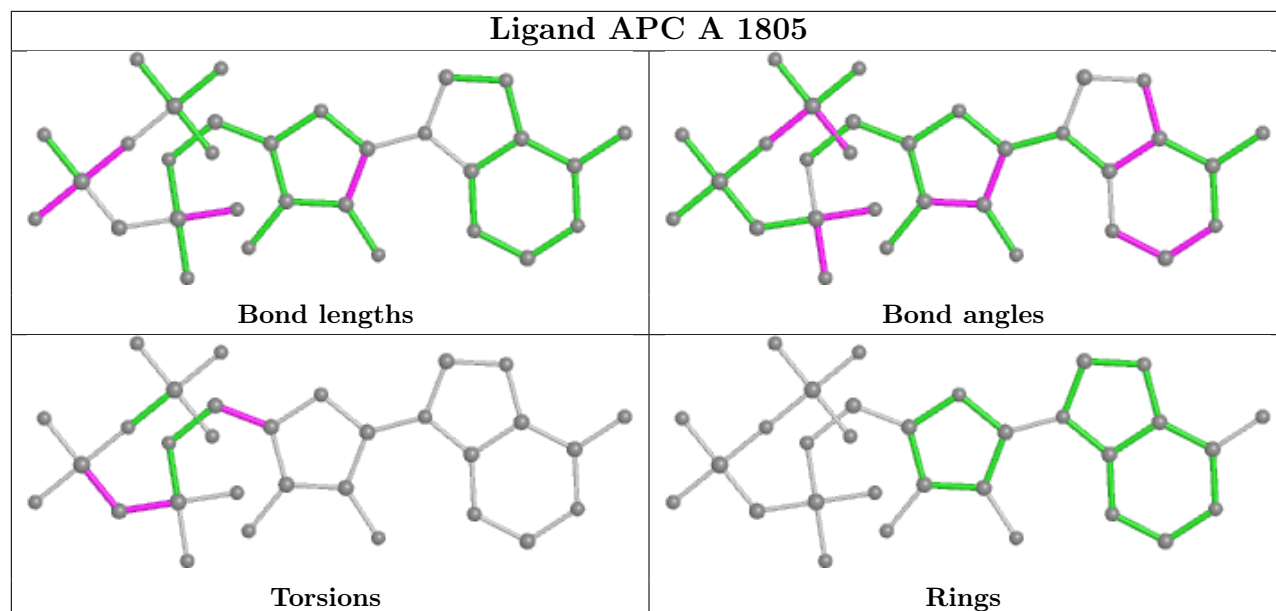
Mol	Chain	Res	Type	Atoms
15	A	1805	APC	PA-C3A-PB-O1B
15	A	1805	APC	O4'-C4'-C5'-O5'
15	A	1805	APC	C3'-C4'-C5'-O5'
15	A	1805	APC	PB-C3A-PA-O1A

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
15	A	1805	APC	1	0

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 than 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.



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	A	1372/1733 (79%)	-0.01	32 (2%) 60 47	12, 61, 151, 315	0
2	B	1097/1224 (89%)	-0.13	16 (1%) 73 61	14, 50, 122, 258	0
3	C	266/318 (83%)	-0.34	0 100 100	15, 50, 100, 176	0
4	E	213/215 (99%)	0.37	21 (9%) 7 4	23, 90, 172, 289	0
5	F	84/155 (54%)	-0.24	0 100 100	31, 61, 113, 145	0
6	H	130/146 (89%)	0.13	4 (3%) 49 32	43, 88, 147, 188	0
7	I	115/122 (94%)	-0.19	0 100 100	29, 66, 105, 149	0
8	J	65/70 (92%)	-0.43	1 (1%) 73 61	22, 39, 92, 168	0
9	K	114/120 (95%)	-0.30	0 100 100	22, 57, 98, 133	0
10	L	44/70 (62%)	0.27	2 (4%) 33 21	30, 93, 180, 216	0
11	T	10/29 (34%)	0.67	1 (10%) 7 4	50, 60, 162, 166	0
12	R	8/8 (100%)	0.70	0 100 100	42, 54, 134, 171	0
All	All	3518/4210 (83%)	-0.07	77 (2%) 62 48	12, 59, 142, 315	0

All (77) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	44	THR	8.7
4	E	93	MET	7.8
2	B	643	ASP	6.0
2	B	868	MET	5.8
4	E	125	PRO	5.3
1	A	45	GLN	4.5
2	B	474	SER	4.5
1	A	49	LYS	4.5
1	A	250	ILE	4.1
4	E	126	SER	4.1
1	A	69	THR	4.1

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Mol	Chain	Res	Type	RSRZ
2	B	867	GLY	4.0
10	L	45	ALA	4.0
1	A	73	GLY	3.8
1	A	174	ILE	3.7
4	E	97	VAL	3.7
1	A	147	VAL	3.6
6	H	139	ASN	3.6
1	A	1256	GLU	3.6
4	E	9	ILE	3.4
1	A	65	LEU	3.4
2	B	869	SER	3.3
1	A	183	GLY	3.3
1	A	286	HIS	3.3
2	B	261	ARG	3.2
4	E	123	LEU	3.2
4	E	110	PHE	3.2
2	B	1183	LYS	3.1
2	B	1167	GLY	3.1
4	E	94	LYS	3.0
1	A	1232	ASN	2.8
2	B	929	THR	2.8
4	E	85	GLU	2.7
1	A	141	LEU	2.7
2	B	263	GLY	2.6
4	E	91	LYS	2.6
11	T	19	DA	2.6
2	B	1189	ILE	2.6
6	H	83	GLN	2.6
1	A	42	ASP	2.5
2	B	262	GLU	2.5
4	E	100	ILE	2.5
1	A	56	PRO	2.5
1	A	91	PHE	2.5
4	E	127	ILE	2.5
1	A	1262	LYS	2.4
2	B	865	LYS	2.4
4	E	109	ILE	2.3
2	B	647	GLY	2.3
1	A	86	LEU	2.3
4	E	116	ILE	2.3
1	A	1257	ASP	2.3
1	A	87	ALA	2.2

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Mol	Chain	Res	Type	RSRZ
1	A	71	GLN	2.2
4	E	57	MET	2.2
1	A	146	MET	2.2
10	L	50	ASP	2.2
2	B	432	MET	2.2
4	E	118	PRO	2.2
4	E	96	PHE	2.2
6	H	84	ALA	2.2
4	E	98	ILE	2.2
1	A	1169	ILE	2.2
1	A	317	LYS	2.1
6	H	86	ASP	2.1
1	A	175	ARG	2.1
4	E	50	MET	2.1
1	A	176	LYS	2.1
4	E	122	LYS	2.1
4	E	95	THR	2.1
8	J	65	PRO	2.1
1	A	72	GLU	2.1
2	B	870	ILE	2.1
1	A	84	ILE	2.1
1	A	311	GLN	2.0
1	A	1125	ALA	2.0
1	A	66	LYS	2.0

6.2 Non-standard residues in protein, DNA, RNA chains [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, 95th 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
11	3DR	T	20	11/12	0.93	0.26	82,98,111,121	0

6.3 Carbohydrates [i](#)

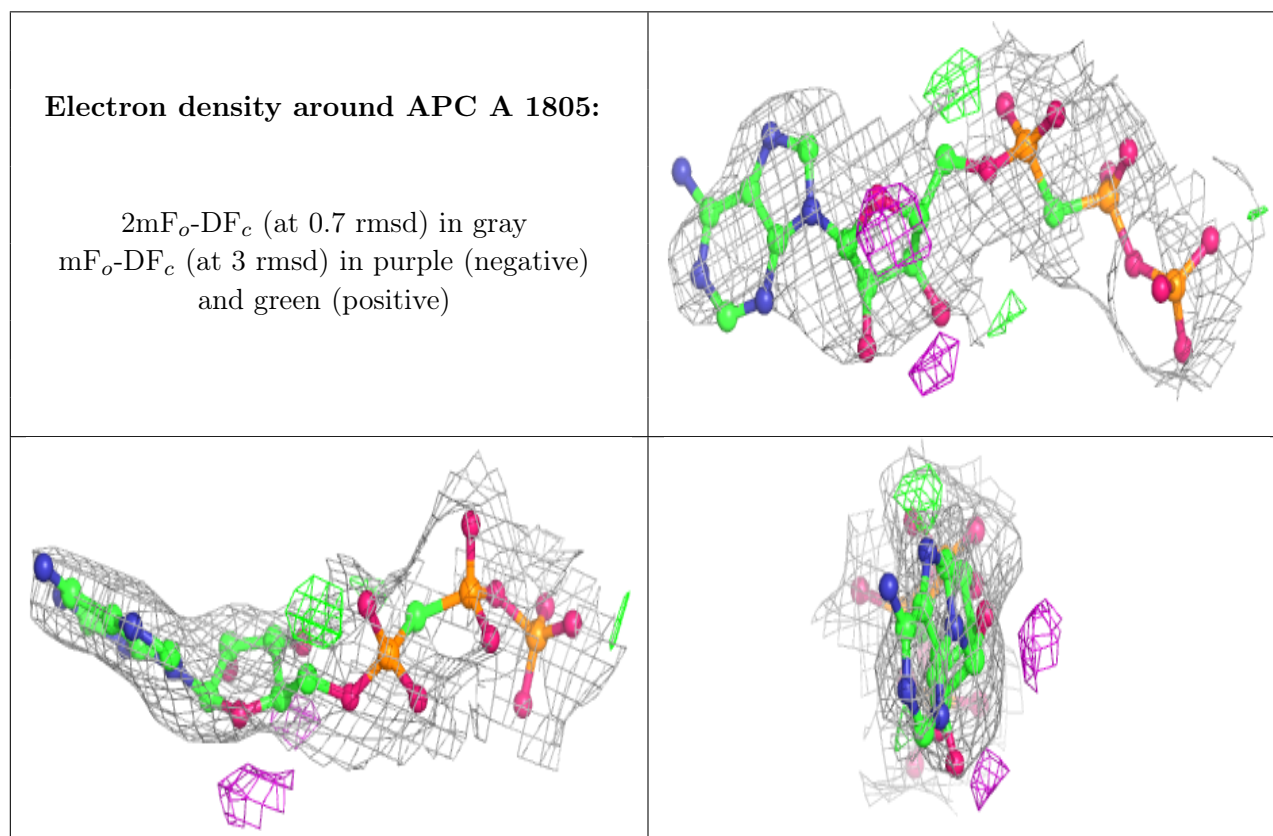
There are no monosaccharides in this entry.

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, 95th 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
13	ZN	A	1801	1/1	0.73	0.06	173,173,173,173	0
15	APC	A	1805	31/31	0.80	0.41	117,127,182,195	0
13	ZN	A	1802	1/1	0.93	0.10	91,91,91,91	0
14	MG	A	1804	1/1	0.94	0.33	68,68,68,68	0
13	ZN	B	1301	1/1	0.97	0.10	82,82,82,82	0
13	ZN	L	101	1/1	0.97	0.08	101,101,101,101	0
13	ZN	J	101	1/1	0.99	0.17	38,38,38,38	0
13	ZN	C	401	1/1	0.99	0.15	47,47,47,47	0
14	MG	A	1803	1/1	0.99	0.29	6,6,6,6	0
13	ZN	I	201	1/1	0.99	0.13	53,53,53,53	0
13	ZN	I	202	1/1	0.99	0.15	45,45,45,45	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.



6.5 Other polymers [i](#)

There are no such residues in this entry.