



# Full wwPDB X-ray Structure Validation Report ⓘ

Nov 7, 2023 – 12:07 AM EST

PDB ID : 5JJK  
Title : Rho transcription termination factor bound to rA7 and 6 ADP-BeF3 molecules  
Authors : Thomsen, N.D.; Lawson, M.R.; Witkowsky, L.B.; Qu, S.; Berger, J.M.  
Deposited on : 2016-04-24  
Resolution : 3.15 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](mailto: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>.

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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

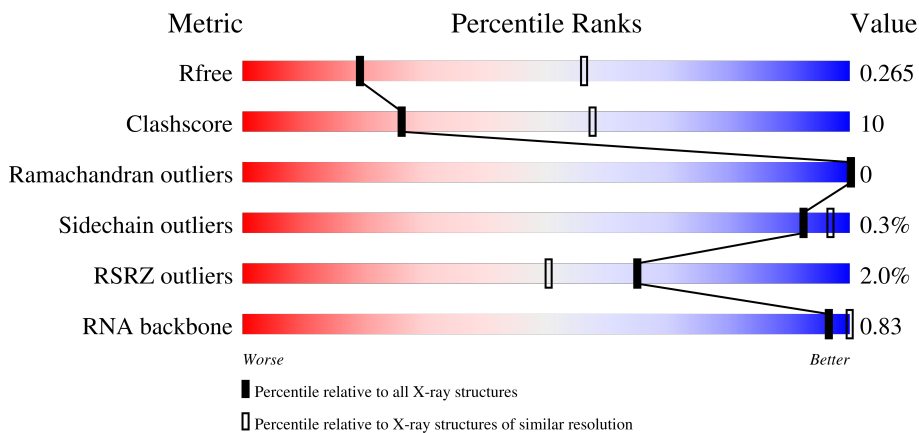
# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 3.15 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.



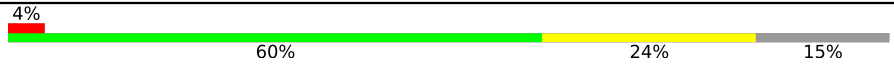

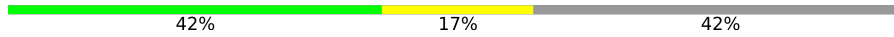
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	130704	1665 (3.20-3.12)
Clashscore	141614	1804 (3.20-3.12)
Ramachandran outliers	138981	1770 (3.20-3.12)
Sidechain outliers	138945	1769 (3.20-3.12)
RSRZ outliers	127900	1616 (3.20-3.12)
RNA backbone	3102	1073 (3.50-2.82)

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  $\geq 3$ , 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	420	
1	B	420	
1	C	420	
1	D	420	

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Mol	Chain	Length	Quality of chain
1	E	420	
1	F	420	
2	G	12	

## 2 Entry composition [i](#)

There are 6 unique types of molecules in this entry. The entry contains 19062 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 Transcription termination factor Rho.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
			Total	C	N	O	S	Se			
1	A	405	3181	2006	560	599	1	15	0	0	0
1	B	409	3219	2028	569	606	1	15	0	0	0
1	C	411	3231	2035	571	608	1	16	0	0	0
1	D	405	3181	2005	560	600	1	15	0	0	0
1	E	356	2792	1763	491	524	1	13	0	0	0
1	F	392	3092	1951	547	578	1	15	0	0	0

There are 24 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-2	MSE	-	initiating methionine	UNP P0AG32
A	-1	GLY	-	expression tag	UNP P0AG32
A	0	HIS	-	expression tag	UNP P0AG32
A	1	MSE	-	expression tag	UNP P0AG32
B	-2	MSE	-	initiating methionine	UNP P0AG32
B	-1	GLY	-	expression tag	UNP P0AG32
B	0	HIS	-	expression tag	UNP P0AG32
B	1	MSE	-	expression tag	UNP P0AG32
C	-2	MSE	-	initiating methionine	UNP P0AG32
C	-1	GLY	-	expression tag	UNP P0AG32
C	0	HIS	-	expression tag	UNP P0AG32
C	1	MSE	-	expression tag	UNP P0AG32
D	-2	MSE	-	initiating methionine	UNP P0AG32
D	-1	GLY	-	expression tag	UNP P0AG32
D	0	HIS	-	expression tag	UNP P0AG32
D	1	MSE	-	expression tag	UNP P0AG32
E	-2	MSE	-	initiating methionine	UNP P0AG32

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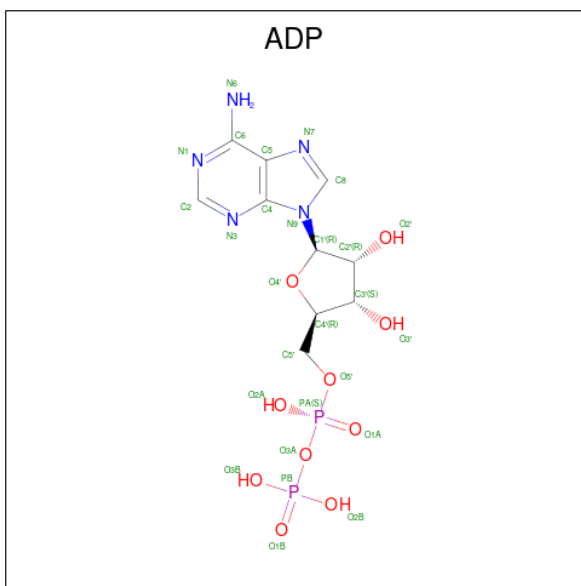
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Chain	Residue	Modelled	Actual	Comment	Reference
E	-1	GLY	-	expression tag	UNP P0AG32
E	0	HIS	-	expression tag	UNP P0AG32
E	1	MSE	-	expression tag	UNP P0AG32
F	-2	MSE	-	initiating methionine	UNP P0AG32
F	-1	GLY	-	expression tag	UNP P0AG32
F	0	HIS	-	expression tag	UNP P0AG32
F	1	MSE	-	expression tag	UNP P0AG32

- Molecule 2 is a RNA chain called rA12: RNA (5'-R(P\*AP\*AP\*AP\*AP\*AP\*A)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	P			
2	G	7	155	70	35	43	7	0	0	0

- Molecule 3 is ADENOSINE-5'-DIPHOSPHATE (three-letter code: ADP) (formula: C<sub>10</sub>H<sub>15</sub>N<sub>5</sub>O<sub>10</sub>P<sub>2</sub>).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	N	O	P		
3	A	1	27	10	5	10	2	0	0
3	B	1	27	10	5	10	2	0	0
3	C	1	27	10	5	10	2	0	0
3	D	1	27	10	5	10	2	0	0

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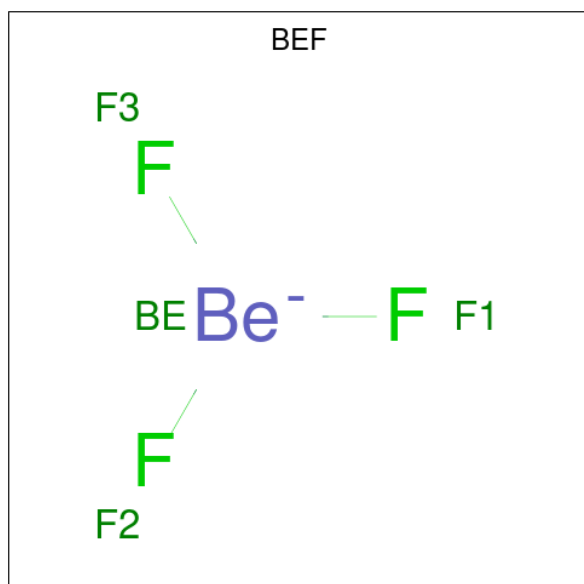
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Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	
3	E	1	Total	C	N	O	P	0	0
			27	10	5	10	2		
3	F	1	Total	C	N	O	P	0	0
			27	10	5	10	2		

- Molecule 4 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	1	Total	Mg	0	0
			1	1		
4	B	1	Total	Mg	0	0
			1	1		
4	C	1	Total	Mg	0	0
			1	1		
4	D	1	Total	Mg	0	0
			1	1		
4	E	1	Total	Mg	0	0
			1	1		
4	F	1	Total	Mg	0	0
			1	1		

- Molecule 5 is BERYLLIUM TRIFLUORIDE ION (three-letter code: BEF) (formula: BeF<sub>3</sub>).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	A	1	Total	Be	F	0	0
			4	1	3		

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	B	1	Total 4	Be 1	F 3	0	0
5	C	1	Total 4	Be 1	F 3	0	0
5	D	1	Total 4	Be 1	F 3	0	0
5	E	1	Total 4	Be 1	F 3	0	0
5	F	1	Total 4	Be 1	F 3	0	0

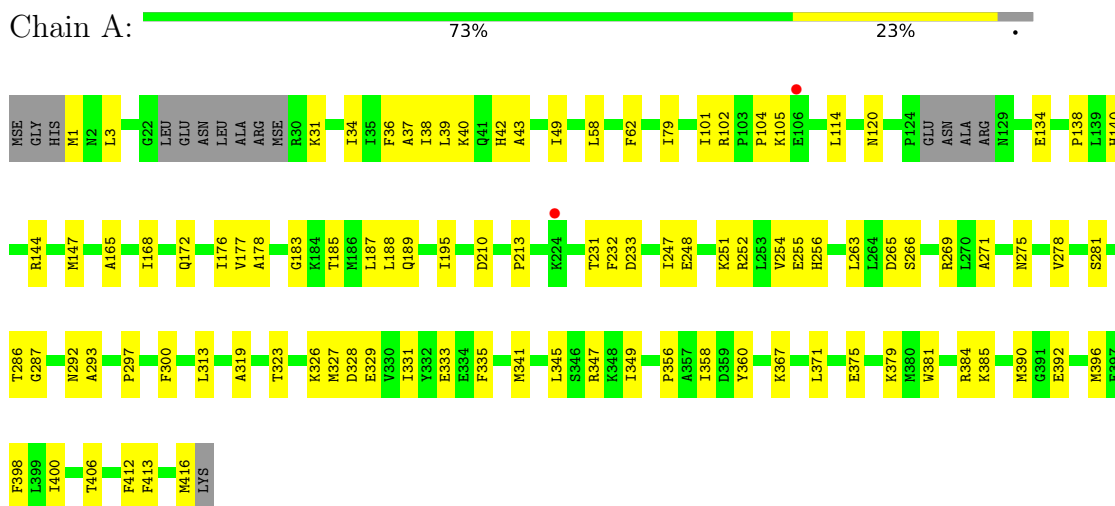
- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	3	Total 3	O 3	0	0
6	B	3	Total 3	O 3	0	0
6	C	3	Total 3	O 3	0	0
6	D	3	Total 3	O 3	0	0
6	E	3	Total 3	O 3	0	0
6	F	3	Total 3	O 3	0	0
6	G	1	Total 1	O 1	0	0

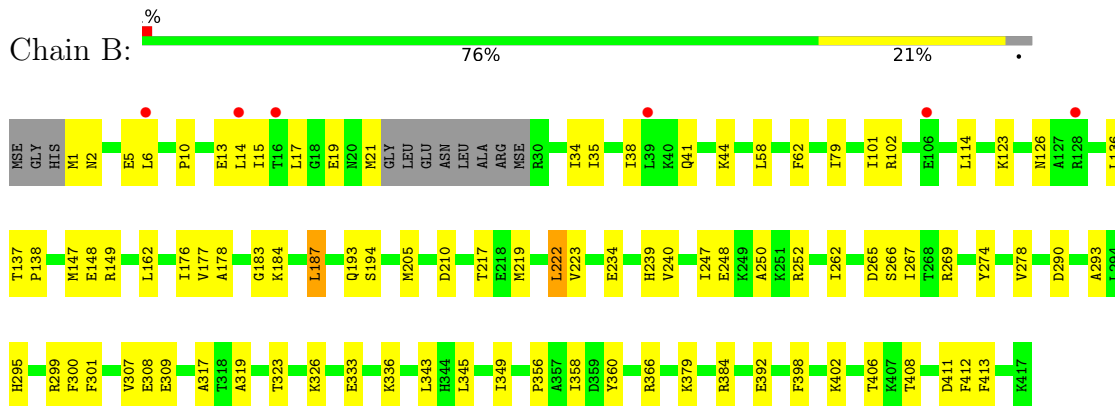
### 3 Residue-property plots [i](#)

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.

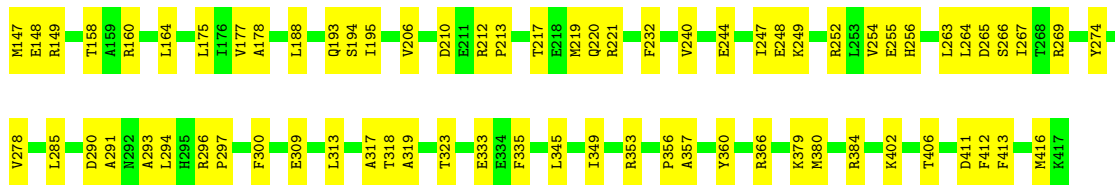
- Molecule 1: Transcription termination factor Rho



- Molecule 1: Transcription termination factor Rho

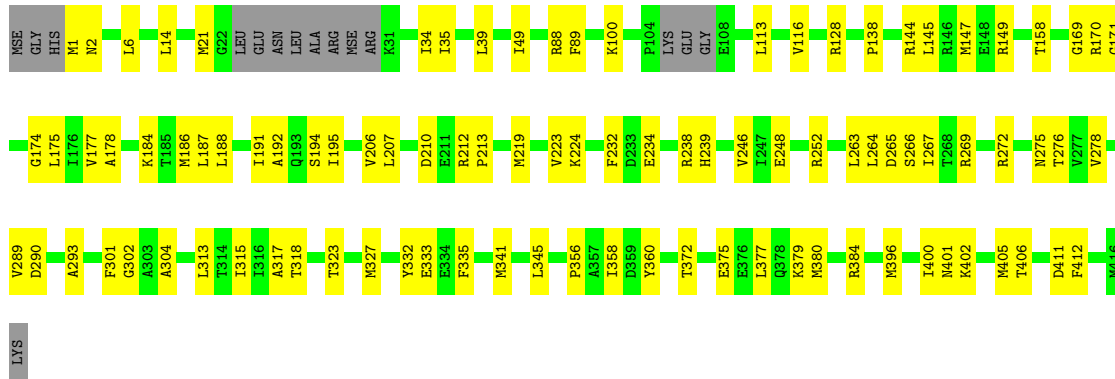






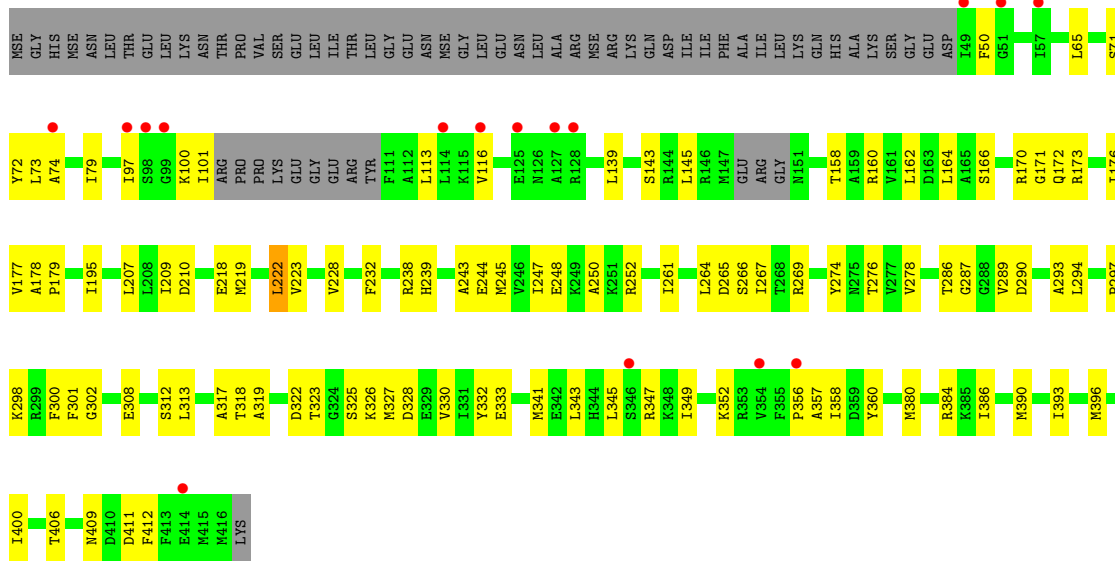
- Molecule 1: Transcription termination factor Rho

Chain D: 74% 23%



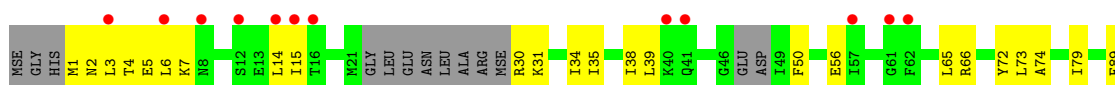
- Molecule 1: Transcription termination factor Rho

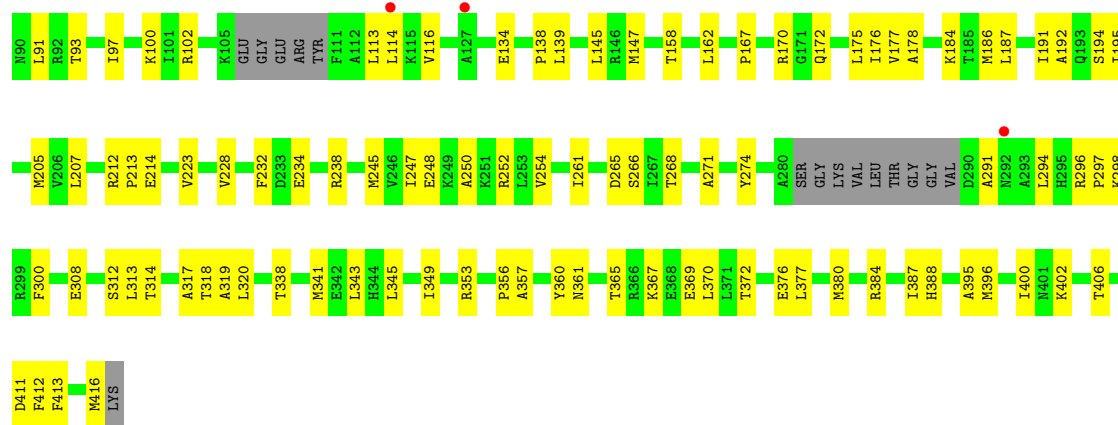
Chain E: 4% 60% 24% 15%



- Molecule 1: Transcription termination factor Rho

Chain F: 4% 65% 28% 7%





- Molecule 2: rA12: RNA (5'-R(P\*AP\*AP\*AP\*AP\*AP\*AP\*A)-3')

Chain G:

42%                      17%                      42%



## 4 Data and refinement statistics i

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	68.76Å 199.21Å 112.20Å 90.00° 104.83° 90.00°	Depositor
Resolution (Å)	49.80 – 3.15 49.80 – 3.15	Depositor EDS
% Data completeness (in resolution range)	99.0 (49.80-3.15) 98.9 (49.80-3.15)	Depositor EDS
$R_{merge}$	0.12	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.85 (at 3.12Å)	Xtrriage
Refinement program	PHENIX 1.10.1_2155	Depositor
R, $R_{free}$	0.233 , 0.265 0.234 , 0.265	Depositor DCC
$R_{free}$ test set	2517 reflections (5.05%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	65.0	Xtrriage
Anisotropy	0.521	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.27 , 36.1	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.46$ , $\langle L^2 \rangle = 0.29$	Xtrriage
Estimated twinning fraction	0.044 for h,-k,-h-l	Xtrriage
$F_o, F_c$ correlation	0.90	EDS
Total number of atoms	19062	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	80.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.46% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical 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 [i](#)

### 5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: MG, BEF, ADP

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	0.24	0/3214	0.40	0/4304
1	B	0.24	0/3253	0.41	1/4357 (0.0%)
1	C	0.24	0/3265	0.41	0/4372
1	D	0.24	0/3214	0.41	0/4306
1	E	0.25	0/2820	0.41	0/3778
1	F	0.24	0/3122	0.40	0/4178
2	G	0.17	0/175	0.63	0/269
All	All	0.24	0/19063	0.41	1/25564 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed( $^{\circ}$ )	Ideal( $^{\circ}$ )
1	B	222	LEU	CA-CB-CG	5.48	127.90	115.30

There are no chirality outliers.

There are no planarity outliers.

### 5.2 Too-close contacts [i](#)

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	3181	0	3252	67	0
1	B	3219	0	3293	59	0
1	C	3231	0	3305	67	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	D	3181	0	3247	64	0
1	E	2792	0	2850	74	0
1	F	3092	0	3167	81	0
2	G	155	0	78	2	0
3	A	27	0	12	1	0
3	B	27	0	12	1	0
3	C	27	0	12	0	0
3	D	27	0	12	1	0
3	E	27	0	12	0	0
3	F	27	0	12	1	0
4	A	1	0	0	0	0
4	B	1	0	0	0	0
4	C	1	0	0	0	0
4	D	1	0	0	0	0
4	E	1	0	0	0	0
4	F	1	0	0	0	0
5	A	4	0	0	0	0
5	B	4	0	0	0	0
5	C	4	0	0	0	0
5	D	4	0	0	0	0
5	E	4	0	0	0	0
5	F	4	0	0	0	0
6	A	3	0	0	0	0
6	B	3	0	0	0	0
6	C	3	0	0	0	0
6	D	3	0	0	0	0
6	E	3	0	0	0	0
6	F	3	0	0	0	0
6	G	1	0	0	1	0
All	All	19062	0	19264	398	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 10.

All (398) 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)
1:A:323:THR:HA	1:B:333:GLU:HG2	1.62	0.82
1:E:177:VAL:HG12	1:E:319:ALA:HB3	1.63	0.80
1:A:1:MSE:HE3	1:A:39:LEU:HD23	1.64	0.77
1:A:1:MSE:HE1	1:A:38:ILE:HG22	1.67	0.77

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:172:GLN:HE21	1:E:341:MSE:HB2	1.49	0.76
1:A:210:ASP:HB3	1:A:269:ARG:HB3	1.68	0.76
1:C:147:MSE:HE3	1:C:194:SER:HB2	1.66	0.75
1:B:323:THR:HA	1:C:333:GLU:HG2	1.69	0.73
1:E:210:ASP:HB3	1:E:269:ARG:HD3	1.71	0.73
1:F:6:LEU:HD23	1:F:35:ILE:HG13	1.71	0.72
1:E:162:LEU:HD13	1:E:343:LEU:HD22	1.72	0.72
1:D:406:THR:HG21	1:D:411:ASP:HB2	1.72	0.71
1:E:323:THR:HG23	1:E:325:SER:H	1.58	0.69
1:C:323:THR:HA	1:D:333:GLU:HG2	1.74	0.68
1:F:73:LEU:HD11	1:F:238:ARG:HG3	1.75	0.68
1:B:6:LEU:HD23	1:B:35:ILE:HG23	1.77	0.66
1:A:43:ALA:HB2	1:A:49:ILE:HD11	1.78	0.66
1:E:360:TYR:HE2	1:E:384:ARG:HG2	1.60	0.66
1:B:210:ASP:HB3	1:B:269:ARG:HB3	1.76	0.66
1:C:188:LEU:HD11	1:C:263:LEU:HB3	1.78	0.66
1:F:369:GLU:HG2	1:F:370:LEU:HD12	1.78	0.66
1:F:113:LEU:HD21	1:F:116:VAL:HG12	1.77	0.65
1:F:234:GLU:HB3	1:F:238:ARG:HD3	1.78	0.65
1:C:290:ASP:HB3	1:C:293:ALA:HB2	1.79	0.65
1:A:278:VAL:HG21	1:A:293:ALA:HB2	1.79	0.65
1:F:147:MSE:HE3	1:F:194:SER:HB2	1.79	0.64
1:A:79:ILE:HD13	1:A:101:ILE:HG21	1.79	0.64
1:F:4:THR:HA	1:F:7:LYS:HE2	1.79	0.64
1:C:1:MSE:HE3	1:C:39:LEU:HD23	1.79	0.64
1:C:147:MSE:HE1	1:C:195:ILE:HG13	1.80	0.63
1:E:79:ILE:HD13	1:E:101:ILE:HG21	1.80	0.63
1:E:158:THR:HA	1:E:356:PRO:HG3	1.80	0.63
1:F:176:ILE:HB	1:F:318:THR:HG22	1.81	0.63
1:A:375:GLU:HG2	1:A:379:LYS:HE3	1.81	0.62
1:F:192:ALA:HB1	1:F:223:VAL:HG21	1.81	0.62
1:C:79:ILE:HD13	1:C:101:ILE:HG21	1.82	0.62
1:D:192:ALA:HB1	1:D:223:VAL:HG23	1.81	0.62
1:F:177:VAL:HG22	1:F:319:ALA:HB3	1.81	0.62
2:G:4:A:N6	6:G:101:HOH:O	2.30	0.61
1:F:72:TYR:HB3	1:F:245:MSE:HG2	1.82	0.61
1:F:367:LYS:HB3	1:F:370:LEU:HD13	1.82	0.61
1:C:120:ASN:HD22	1:C:256:HIS:CE1	2.17	0.61
1:C:1:MSE:HE1	1:C:38:ILE:HG22	1.83	0.60
1:B:162:LEU:HD13	1:B:343:LEU:HD22	1.82	0.60
1:B:217:THR:HG21	1:C:138:PRO:O	2.01	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:186:MSE:HG3	3:F:1000:ADP:C8	2.37	0.60
1:A:286:THR:HG22	1:A:326:LYS:HG2	1.84	0.59
1:B:147:MSE:HE3	1:B:194:SER:HB2	1.83	0.59
1:E:173:ARG:HG2	1:E:301:PHE:CZ	2.37	0.59
1:C:267:ILE:HB	1:C:317:ALA:HB1	1.85	0.59
1:E:276:THR:HG23	1:F:291:ALA:HB3	1.83	0.59
1:E:50:PHE:HA	1:E:100:LYS:HA	1.85	0.59
1:A:213:PRO:HB2	1:B:138:PRO:HG2	1.84	0.58
1:B:102:ARG:HB2	1:B:114:LEU:HD11	1.85	0.58
1:F:213:PRO:HD3	1:F:232:PHE:CE2	2.38	0.58
1:F:271:ALA:HB1	1:F:294:LEU:HD22	1.84	0.58
1:A:347:ARG:HH21	1:B:336:LYS:HD3	1.67	0.58
1:B:379:LYS:HD2	1:B:413:PHE:HB3	1.84	0.58
1:D:372:THR:HG21	1:D:380:MSE:HE1	1.84	0.58
1:C:360:TYR:HE2	1:C:384:ARG:HG2	1.68	0.58
1:D:1:MSE:HB3	1:D:49:ILE:HD12	1.85	0.58
1:D:145:LEU:HD11	1:D:170:ARG:HG2	1.85	0.58
1:C:206:VAL:HG11	1:C:219:MSE:HG2	1.84	0.57
1:F:377:LEU:HA	1:F:380:MSE:HE2	1.86	0.57
1:A:172:GLN:HE21	1:A:341:MSE:HB2	1.68	0.57
1:A:356:PRO:HD2	1:A:400:ILE:HD11	1.86	0.57
1:C:210:ASP:HB3	1:C:269:ARG:HB3	1.85	0.57
1:C:175:LEU:HD11	1:C:335:PHE:HB3	1.85	0.57
1:A:177:VAL:HG22	1:A:319:ALA:HB3	1.86	0.57
1:F:102:ARG:HG2	1:F:114:LEU:HD11	1.86	0.57
1:E:176:ILE:HB	1:E:318:THR:HG22	1.86	0.57
1:E:178:ALA:HB2	1:E:345:LEU:HB2	1.86	0.57
1:F:341:MSE:HG2	1:F:365:THR:HG22	1.86	0.56
1:A:406:THR:HG21	1:A:412:PHE:N	2.21	0.56
1:D:206:VAL:HG11	1:D:219:MSE:HG2	1.88	0.56
1:F:172:GLN:HE21	1:F:341:MSE:HB2	1.70	0.56
1:C:43:ALA:HB2	1:C:49:ILE:HD11	1.88	0.56
1:C:217:THR:HG21	1:D:138:PRO:O	2.04	0.56
1:D:402:LYS:HB3	1:D:412:PHE:HE1	1.70	0.56
1:D:396:MSE:HA	1:D:396:MSE:HE2	1.88	0.56
1:A:213:PRO:HD3	1:A:232:PHE:CE2	2.41	0.56
1:A:36:PHE:HE1	1:A:104:PRO:HD2	1.71	0.55
1:D:323:THR:HA	1:E:333:GLU:HG2	1.88	0.55
1:D:356:PRO:HB2	1:D:358:ILE:HG13	1.88	0.55
1:E:145:LEU:HD21	1:E:170:ARG:HG2	1.88	0.55
1:A:120:ASN:HD22	1:A:256:HIS:CE1	2.24	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1:MSE:HG2	1:A:42:HIS:CD2	2.41	0.55
1:A:147:MSE:HE3	1:A:168:ILE:HD12	1.87	0.54
1:E:158:THR:HG22	1:E:356:PRO:HB3	1.89	0.54
1:D:178:ALA:HB2	1:D:345:LEU:HB2	1.89	0.54
1:A:247:ILE:HB	1:A:300:PHE:CE1	2.42	0.54
1:A:379:LYS:NZ	1:A:413:PHE:HB3	2.23	0.54
1:C:158:THR:HA	1:C:356:PRO:HG3	1.88	0.54
1:E:232:PHE:CE1	1:F:338:THR:HG23	2.42	0.54
1:D:89:PHE:HA	1:D:128:ARG:HD3	1.88	0.54
1:F:387:ILE:HG23	1:F:395:ALA:HB1	1.90	0.54
1:A:39:LEU:HD22	1:A:49:ILE:HG23	1.89	0.54
1:B:21:MSE:SE	1:B:38:ILE:HG23	2.57	0.54
1:F:6:LEU:HG	1:F:14:LEU:HD11	1.89	0.54
1:A:349:ILE:HD11	1:A:392:GLU:HB2	1.90	0.54
1:C:266:SER:HB3	1:C:269:ARG:HG2	1.90	0.54
1:A:102:ARG:HG2	1:A:114:LEU:HD11	1.90	0.53
1:A:231:THR:HG22	1:A:233:ASP:H	1.73	0.53
1:A:254:VAL:HG21	1:A:313:LEU:HB2	1.91	0.53
1:B:219:MSE:O	1:B:223:VAL:HG12	2.09	0.53
1:D:207:LEU:HD13	1:D:246:VAL:HG21	1.91	0.53
1:F:413:PHE:HA	1:F:416:MSE:HE2	1.90	0.53
1:F:205:MSE:HE1	1:F:250:ALA:HB2	1.89	0.53
1:C:102:ARG:HB3	1:C:114:LEU:HD21	1.91	0.53
1:D:210:ASP:HB3	1:D:269:ARG:HB3	1.91	0.53
1:C:213:PRO:HD3	1:C:232:PHE:CE2	2.44	0.53
1:B:102:ARG:CB	1:B:114:LEU:HD11	2.39	0.53
1:B:247:ILE:HB	1:B:300:PHE:CE1	2.43	0.53
1:C:402:LYS:HB3	1:C:412:PHE:HE1	1.75	0.52
1:F:167:PRO:O	1:F:365:THR:HG21	2.09	0.52
1:E:274:TYR:CD2	1:E:297:PRO:HG3	2.44	0.52
1:A:281:SER:HB3	1:A:292:ASN:ND2	2.24	0.52
1:A:329:GLU:O	1:A:333:GLU:HG2	2.09	0.52
1:F:158:THR:HA	1:F:356:PRO:HG3	1.91	0.52
1:D:219:MSE:O	1:D:223:VAL:HG12	2.09	0.52
1:A:188:LEU:HD11	1:A:263:LEU:HB3	1.92	0.52
1:D:14:LEU:HD12	1:D:34:ILE:HD12	1.92	0.52
1:E:244:GLU:HA	1:E:247:ILE:HG22	1.92	0.52
1:E:267:ILE:HB	1:E:317:ALA:HB1	1.92	0.51
1:B:178:ALA:HB2	1:B:345:LEU:HB2	1.93	0.51
1:B:149:ARG:HH21	1:B:193:GLN:HB2	1.74	0.51
1:E:179:PRO:HG2	1:E:347:ARG:HB2	1.91	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:102:ARG:CG	1:F:114:LEU:HD11	2.40	0.51
1:B:79:ILE:HD13	1:B:101:ILE:HG21	1.92	0.51
1:F:139:LEU:CD2	1:F:308:GLU:HB2	2.41	0.51
1:F:178:ALA:HB2	1:F:345:LEU:HB2	1.92	0.51
1:E:289:VAL:HG22	1:E:327:MSE:HG3	1.93	0.51
1:C:217:THR:O	1:C:221:ARG:HD3	2.11	0.51
1:C:267:ILE:HG22	1:C:318:THR:O	2.10	0.51
1:E:113:LEU:HD11	1:E:116:VAL:HG13	1.92	0.51
1:B:15:ILE:O	1:B:19:GLU:HG2	2.10	0.51
1:A:275:ASN:ND2	1:A:327:MSE:HE1	2.25	0.50
1:D:360:TYR:HE2	1:D:384:ARG:HD2	1.76	0.50
1:C:379:LYS:HD3	1:C:413:PHE:HB3	1.93	0.50
1:E:178:ALA:CB	1:E:345:LEU:HB2	2.41	0.50
1:F:247:ILE:HB	1:F:300:PHE:CE1	2.46	0.50
1:E:73:LEU:HD22	1:E:74:ALA:H	1.75	0.50
1:F:3:LEU:HD12	1:F:35:ILE:HD11	1.92	0.50
1:B:234:GLU:HB2	1:B:239:HIS:HE1	1.75	0.50
1:B:406:THR:CG2	1:B:411:ASP:HB2	2.41	0.50
1:E:290:ASP:HB3	1:E:293:ALA:HB2	1.93	0.50
1:B:266:SER:HB3	1:B:269:ARG:HG2	1.93	0.50
1:B:1:MSE:HE2	1:B:6:LEU:HD22	1.93	0.50
1:A:3:LEU:HD23	1:A:39:LEU:HD11	1.94	0.49
1:C:212:ARG:HA	1:C:232:PHE:HE2	1.77	0.49
1:E:278:VAL:HG11	1:E:293:ALA:HB2	1.94	0.49
1:A:356:PRO:HB2	1:A:358:ILE:HG13	1.93	0.49
1:B:58:LEU:HD12	1:B:62:PHE:CE1	2.47	0.49
1:C:149:ARG:HH21	1:C:193:GLN:HB3	1.77	0.49
1:C:178:ALA:HB2	1:C:345:LEU:HB2	1.93	0.49
1:E:172:GLN:NE2	1:E:341:MSE:HB2	2.25	0.49
1:E:177:VAL:HG11	1:E:332:TYR:CD1	2.48	0.49
1:F:360:TYR:CE2	1:F:384:ARG:HG2	2.47	0.49
1:A:327:MSE:HG3	1:A:328:ASP:N	2.27	0.49
1:E:323:THR:HG21	1:E:328:ASP:OD2	2.12	0.49
1:E:356:PRO:HB2	1:E:358:ILE:HG13	1.92	0.49
1:F:207:LEU:HA	1:F:228:VAL:O	2.13	0.49
1:F:248:GLU:O	1:F:252:ARG:HG2	2.13	0.49
1:F:2:ASN:HB3	1:F:5:GLU:HB3	1.94	0.49
1:F:50:PHE:CE1	1:F:100:LYS:HG2	2.48	0.49
1:E:195:ILE:HD13	1:E:261:ILE:HG21	1.94	0.49
1:E:349:ILE:HB	1:E:357:ALA:HB1	1.95	0.49
1:C:248:GLU:O	1:C:252:ARG:HG2	2.13	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:406:THR:HG21	1:E:412:PHE:N	2.28	0.49
1:F:139:LEU:HD23	1:F:308:GLU:HB2	1.94	0.49
3:A:1000:ADP:O1A	1:B:366:ARG:NH2	2.46	0.48
1:C:127:ALA:O	1:C:130:LYS:HD2	2.14	0.48
1:D:272:ARG:O	1:D:276:THR:HG23	2.13	0.48
1:E:218:GLU:O	1:E:222:LEU:HD12	2.13	0.48
1:B:406:THR:HG22	1:B:408:THR:H	1.79	0.48
1:C:83:PRO:O	1:C:87:ARG:HG3	2.13	0.48
1:F:89:PHE:HB2	1:F:91:LEU:HG	1.96	0.48
1:F:178:ALA:CB	1:F:345:LEU:HB2	2.43	0.48
1:F:294:LEU:C	1:F:297:PRO:HD2	2.34	0.48
1:A:102:ARG:NH1	1:A:105:LYS:HG3	2.28	0.48
1:E:171:GLY:HA2	1:E:313:LEU:O	2.14	0.48
1:B:278:VAL:HG11	1:B:293:ALA:HB2	1.95	0.48
1:B:148:GLU:OE1	1:B:408:THR:HA	2.14	0.48
1:D:88:ARG:O	1:D:128:ARG:HD3	2.14	0.48
1:C:232:PHE:CE1	1:D:302:GLY:HA3	2.49	0.48
1:D:147:MSE:HE3	1:D:194:SER:HB2	1.96	0.47
1:F:294:LEU:O	1:F:298:LYS:HG3	2.14	0.47
1:A:178:ALA:HB2	1:A:345:LEU:HB2	1.96	0.47
1:F:1:MSE:HE3	1:F:39:LEU:HD23	1.96	0.47
1:D:401:ASN:O	1:D:405:MSE:HG3	2.14	0.47
1:F:147:MSE:HG3	1:F:162:LEU:HD22	1.97	0.47
1:C:360:TYR:CE2	1:C:384:ARG:HG2	2.49	0.47
1:E:164:LEU:HD23	1:E:380:MSE:HE2	1.96	0.47
1:D:275:ASN:HA	1:D:293:ALA:HB1	1.97	0.47
1:D:278:VAL:HG11	1:D:293:ALA:HA	1.97	0.47
1:F:1:MSE:HE1	1:F:38:ILE:HG22	1.96	0.47
1:A:37:ALA:HA	1:A:40:LYS:HE2	1.95	0.47
1:E:209:ILE:HG23	1:E:239:HIS:HB3	1.96	0.47
1:A:176:ILE:HD13	1:A:187:LEU:HD12	1.96	0.47
1:C:177:VAL:HG22	1:C:319:ALA:HB3	1.97	0.47
1:D:234:GLU:HB2	1:D:239:HIS:CE1	2.50	0.47
1:F:265:ASP:HA	1:F:266:SER:HA	1.60	0.47
1:C:265:ASP:HA	1:C:266:SER:HA	1.54	0.46
1:F:2:ASN:O	1:F:6:LEU:HB2	2.15	0.46
1:E:177:VAL:HG11	1:E:332:TYR:CE1	2.50	0.46
1:A:271:ALA:HB1	1:A:331:ILE:HD13	1.97	0.46
1:D:186:MSE:HE1	3:D:1000:ADP:H3'	1.97	0.46
1:D:267:ILE:HD11	1:D:301:PHE:HB2	1.97	0.46
1:D:175:LEU:HD11	1:D:335:PHE:HB3	1.97	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:234:GLU:HB2	1:D:239:HIS:HE1	1.80	0.46
1:D:377:LEU:HA	1:D:380:MSE:HE2	1.98	0.46
1:F:100:LYS:O	1:F:113:LEU:HD12	2.15	0.46
1:F:175:LEU:HA	1:F:317:ALA:O	2.16	0.46
1:A:165:ALA:HA	1:A:384:ARG:HH12	1.81	0.46
1:A:297:PRO:HB2	1:A:335:PHE:CZ	2.50	0.46
1:B:10:PRO:HG2	1:B:13:GLU:HG2	1.96	0.46
1:B:177:VAL:HG22	1:B:319:ALA:HB3	1.97	0.46
1:C:247:ILE:HB	1:C:300:PHE:CE1	2.51	0.46
1:D:212:ARG:HA	1:D:232:PHE:CE2	2.51	0.46
1:D:234:GLU:HB3	1:D:238:ARG:HD3	1.96	0.46
1:D:178:ALA:HB3	1:D:184:LYS:CG	2.46	0.46
1:D:264:LEU:HB3	1:D:317:ALA:HB2	1.97	0.46
1:E:65:LEU:HD21	1:E:97:ILE:HD12	1.96	0.46
1:B:356:PRO:HB2	1:B:358:ILE:HG13	1.97	0.46
1:C:274:TYR:CD2	1:C:297:PRO:HG3	2.51	0.46
1:B:17:LEU:HD21	1:B:21:MSE:HE3	1.97	0.46
1:D:290:ASP:HB3	1:D:293:ALA:HB2	1.98	0.46
1:E:209:ILE:HG12	1:E:264:LEU:HD11	1.98	0.46
1:D:187:LEU:O	1:D:191:ILE:HG12	2.15	0.46
1:D:267:ILE:HB	1:D:317:ALA:HB1	1.98	0.46
1:F:31:LYS:O	1:F:35:ILE:HG22	2.16	0.46
1:B:267:ILE:HB	1:B:317:ALA:HB1	1.98	0.45
1:E:286:THR:O	1:E:330:VAL:HG21	2.16	0.45
1:E:406:THR:HG23	1:E:411:ASP:HB2	1.98	0.45
1:F:254:VAL:HG21	1:F:313:LEU:HB2	1.97	0.45
1:E:219:MSE:O	1:E:223:VAL:HG12	2.16	0.45
1:E:287:GLY:HA2	1:E:326:LYS:HB3	1.99	0.45
1:F:145:LEU:HD11	1:F:170:ARG:HG3	1.99	0.45
1:B:360:TYR:CE2	1:B:384:ARG:HD2	2.52	0.45
1:A:360:TYR:HB2	1:A:396:MSE:HE3	1.99	0.45
1:C:36:PHE:CE1	1:C:40:LYS:HD2	2.52	0.45
1:C:102:ARG:NH1	1:C:105:LYS:HG3	2.31	0.45
1:E:71:SER:HB2	1:E:238:ARG:NH2	2.31	0.45
1:F:65:LEU:HD21	1:F:97:ILE:HD12	1.98	0.45
1:A:168:ILE:HD11	1:A:341:MSE:HE3	1.99	0.45
1:A:233:ASP:HB3	1:B:299:ARG:HH11	1.82	0.45
1:C:130:LYS:HE2	1:C:255:GLU:HB3	1.99	0.45
1:C:278:VAL:HG11	1:C:293:ALA:HB2	1.99	0.45
1:E:179:PRO:HG3	1:E:322:ASP:HB2	1.99	0.45
1:F:56:GLU:HA	1:F:93:THR:HG23	1.98	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:72:TYR:HB3	1:E:245:MSE:HE2	1.99	0.45
1:E:352:LYS:HD3	1:E:393:ILE:HG21	1.98	0.45
1:B:295:HIS:CE1	1:B:299:ARG:HD2	2.52	0.45
1:D:356:PRO:HD2	1:D:400:ILE:HD11	1.97	0.45
1:A:147:MSE:HE1	1:A:195:ILE:HD11	1.98	0.44
1:A:248:GLU:O	1:A:252:ARG:HG2	2.17	0.44
1:E:170:ARG:HB3	1:E:312:SER:OG	2.18	0.44
1:D:265:ASP:HA	1:D:266:SER:HA	1.53	0.44
1:A:144:ARG:HD3	1:A:371:LEU:HB3	1.99	0.44
1:D:406:THR:CG2	1:D:411:ASP:HB2	2.44	0.44
1:E:266:SER:HB2	1:E:318:THR:O	2.17	0.44
1:B:248:GLU:O	1:B:252:ARG:HG2	2.18	0.44
1:C:175:LEU:HA	1:C:317:ALA:O	2.17	0.44
1:E:386:ILE:HG22	1:E:390:MSE:HE3	1.99	0.44
1:F:268:THR:HG21	1:F:320:LEU:H	1.81	0.44
1:A:31:LYS:HA	1:A:34:ILE:HG22	1.99	0.44
1:A:381:TRP:O	1:A:385:LYS:HG3	2.16	0.44
1:B:123:LYS:HB2	1:B:126:ASN:HD22	1.81	0.44
1:C:296:ARG:HB2	1:C:297:PRO:HD3	1.98	0.44
1:D:100:LYS:O	1:D:113:LEU:HD22	2.18	0.44
1:F:138:PRO:C	1:F:139:LEU:HD22	2.38	0.44
1:E:173:ARG:HD2	1:E:302:GLY:HA2	2.00	0.44
1:F:212:ARG:HB3	1:F:214:GLU:OE1	2.18	0.44
1:A:271:ALA:HB1	1:A:331:ILE:HG21	2.00	0.44
1:C:178:ALA:CB	1:C:345:LEU:HB2	2.48	0.44
1:C:349:ILE:HB	1:C:357:ALA:HB1	2.00	0.43
1:D:191:ILE:O	1:D:195:ILE:HG12	2.17	0.43
1:A:265:ASP:HA	1:A:266:SER:HA	1.57	0.43
1:B:326:LYS:NZ	2:G:6:A:H61	2.16	0.43
1:D:1:MSE:HE3	1:D:21:MSE:HE1	1.98	0.43
1:E:207:LEU:O	1:E:264:LEU:HA	2.18	0.43
1:A:178:ALA:CB	1:A:345:LEU:HB2	2.48	0.43
1:F:361:ASN:OD1	1:F:388:HIS:HA	2.18	0.43
1:A:412:PHE:CE2	1:A:416:MSE:HE2	2.53	0.43
1:D:178:ALA:CB	1:D:345:LEU:HB2	2.48	0.43
1:C:267:ILE:HG13	1:C:335:PHE:CE1	2.54	0.43
1:D:232:PHE:CE1	1:E:302:GLY:HA3	2.54	0.43
1:D:213:PRO:HD3	1:D:232:PHE:CZ	2.53	0.43
1:D:375:GLU:O	1:D:379:LYS:HG2	2.18	0.43
1:C:294:LEU:C	1:C:297:PRO:HD2	2.39	0.43
1:F:170:ARG:HB3	1:F:312:SER:OG	2.19	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:261:ILE:HG12	1:F:314:THR:HB	2.01	0.43
1:A:134:GLU:CD	1:A:134:GLU:H	2.22	0.43
1:C:285:LEU:HD13	1:C:291:ALA:HA	1.99	0.43
1:D:304:ALA:HB2	1:D:315:ILE:HG13	2.01	0.43
1:D:380:MSE:O	1:D:384:ARG:HB2	2.19	0.43
1:E:139:LEU:HD12	1:E:308:GLU:HB3	2.00	0.43
1:F:30:ARG:O	1:F:34:ILE:HG13	2.19	0.43
1:A:172:GLN:NE2	1:A:341:MSE:HB2	2.31	0.43
1:B:178:ALA:CB	1:B:345:LEU:HB2	2.49	0.43
1:A:384:ARG:HG2	1:F:353:ARG:HG2	2.00	0.43
1:C:212:ARG:HA	1:C:232:PHE:CE2	2.53	0.43
1:C:240:VAL:O	1:C:244:GLU:HG2	2.19	0.43
1:E:250:ALA:HB1	1:E:313:LEU:HD13	2.01	0.43
1:A:138:PRO:HG3	1:F:213:PRO:HB2	2.01	0.42
1:A:396:MSE:HE2	1:A:396:MSE:HA	2.01	0.42
1:B:2:ASN:HB3	1:B:5:GLU:HG2	2.00	0.42
1:B:398:PHE:O	1:B:402:LYS:HG2	2.19	0.42
1:C:2:ASN:O	1:C:6:LEU:HD13	2.19	0.42
1:E:143:SER:HB3	1:E:170:ARG:HG3	2.01	0.42
1:E:265:ASP:HA	1:E:266:SER:HA	1.55	0.42
1:B:136:LEU:HB3	1:B:307:VAL:HG13	2.01	0.42
1:C:131:ILE:HD12	1:C:309:GLU:HG2	2.00	0.42
1:C:148:GLU:HG3	1:C:160:ARG:HG2	2.01	0.42
1:D:171:GLY:HA2	1:D:313:LEU:O	2.19	0.42
1:E:360:TYR:CE2	1:E:384:ARG:HG2	2.48	0.42
1:F:356:PRO:HD2	1:F:400:ILE:HD11	2.02	0.42
1:A:58:LEU:HD12	1:A:62:PHE:CE1	2.54	0.42
3:B:1000:ADP:O2A	1:C:366:ARG:NH2	2.52	0.42
1:C:29:MSE:HG3	1:C:34:ILE:HD12	2.01	0.42
1:E:207:LEU:HA	1:E:228:VAL:O	2.18	0.42
1:E:294:LEU:O	1:E:298:LYS:HB2	2.19	0.42
1:F:402:LYS:HB3	1:F:412:PHE:HE1	1.84	0.42
1:E:356:PRO:O	1:E:396:MSE:HE2	2.19	0.42
1:F:50:PHE:CD1	1:F:100:LYS:HG2	2.53	0.42
1:F:176:ILE:HD12	1:F:343:LEU:HD23	2.01	0.42
1:B:183:GLY:O	1:B:187:LEU:HB2	2.19	0.42
1:B:234:GLU:HB2	1:B:239:HIS:CE1	2.53	0.42
1:B:290:ASP:HB3	1:B:293:ALA:HB2	2.01	0.42
1:D:35:ILE:O	1:D:39:LEU:HG	2.20	0.42
1:F:296:ARG:HB2	1:F:297:PRO:HD3	2.00	0.42
1:E:345:LEU:HA	1:E:357:ALA:O	2.20	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:54:VAL:HG21	1:C:249:LYS:HD2	2.02	0.42
1:D:224:LYS:HD3	1:D:224:LYS:HA	1.90	0.42
1:E:396:MSE:O	1:E:400:ILE:HG12	2.20	0.42
1:B:265:ASP:HA	1:B:266:SER:HA	1.55	0.42
1:C:21:MSE:SE	1:C:38:ILE:HG23	2.70	0.42
1:E:406:THR:CG2	1:E:411:ASP:HB2	2.50	0.42
1:B:41:GLN:HG3	1:B:44:LYS:HD2	2.01	0.42
1:E:289:VAL:CG2	1:E:327:MSE:HG3	2.50	0.42
1:F:15:ILE:HG12	1:F:34:ILE:HD13	2.02	0.42
1:F:178:ALA:HB3	1:F:184:LYS:CG	2.50	0.41
1:C:379:LYS:HB3	1:C:416:MSE:HE1	2.00	0.41
1:D:267:ILE:HG22	1:D:318:THR:O	2.20	0.41
1:E:247:ILE:HB	1:E:300:PHE:CE1	2.56	0.41
1:F:406:THR:CG2	1:F:411:ASP:HB2	2.51	0.41
1:A:49:ILE:HB	1:A:101:ILE:O	2.20	0.41
1:A:390:MSE:HE1	1:A:398:PHE:HB2	2.01	0.41
1:B:178:ALA:HB3	1:B:184:LYS:CG	2.50	0.41
1:D:6:LEU:HD22	1:D:39:LEU:HD21	2.02	0.41
1:D:144:ARG:HA	1:D:169:GLY:HA2	2.02	0.41
1:D:174:GLY:HA3	1:D:341:MSE:SE	2.70	0.41
1:D:188:LEU:HD11	1:D:263:LEU:HB3	2.03	0.41
1:E:248:GLU:O	1:E:252:ARG:HG2	2.20	0.41
1:C:406:THR:HG21	1:C:412:PHE:HB2	2.02	0.41
1:F:376:GLU:O	1:F:380:MSE:HG3	2.20	0.41
1:F:396:MSE:O	1:F:400:ILE:HG12	2.20	0.41
1:B:205:MSE:HE1	1:B:250:ALA:HB2	2.03	0.41
1:F:3:LEU:HD23	1:F:79:ILE:HD11	2.01	0.41
1:B:349:ILE:HD11	1:B:392:GLU:HB3	2.02	0.41
1:D:289:VAL:CG2	1:D:327:MSE:HG3	2.51	0.41
1:B:137:THR:HG23	1:B:308:GLU:HB3	2.01	0.41
1:B:402:LYS:HB3	1:B:412:PHE:HE1	1.86	0.41
1:C:36:PHE:CZ	1:C:40:LYS:HD2	2.56	0.41
1:D:158:THR:HA	1:D:356:PRO:HG3	2.03	0.41
1:A:287:GLY:HA2	1:A:326:LYS:HB3	2.02	0.41
1:C:164:LEU:O	1:C:380:MSE:HE3	2.20	0.41
1:C:406:THR:OG1	1:C:411:ASP:HB2	2.21	0.41
1:F:274:TYR:CD2	1:F:297:PRO:HG3	2.56	0.41
1:F:349:ILE:HB	1:F:357:ALA:HB1	2.02	0.41
1:F:372:THR:HG21	1:F:380:MSE:HE1	2.03	0.41
1:A:140:HIS:CG	1:A:367:LYS:HG3	2.56	0.41
1:A:271:ALA:CB	1:A:331:ILE:HG21	2.51	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:176:ILE:HD12	1:B:343:LEU:HD23	2.03	0.41
1:C:217:THR:HA	1:C:220:GLN:HG2	2.02	0.41
1:C:254:VAL:HG21	1:C:313:LEU:HB2	2.03	0.41
1:E:166:SER:OG	1:E:341:MSE:HE2	2.21	0.41
1:F:191:ILE:O	1:F:195:ILE:HG12	2.22	0.40
1:B:205:MSE:HE3	1:B:262:ILE:HG12	2.03	0.40
1:C:1:MSE:HG2	1:C:42:HIS:CD2	2.57	0.40
1:E:267:ILE:HG22	1:E:318:THR:O	2.20	0.40
1:E:380:MSE:O	1:E:384:ARG:HG3	2.21	0.40
1:F:66:ARG:NH1	1:F:74:ALA:HA	2.36	0.40
1:A:185:THR:O	1:A:189:GLN:HG3	2.20	0.40
1:A:251:LYS:O	1:A:255:GLU:HG3	2.22	0.40
1:B:137:THR:HG22	1:B:309:GLU:OE2	2.21	0.40
1:E:160:ARG:HB3	1:E:409:ASN:OD1	2.20	0.40
1:E:207:LEU:HD21	1:E:243:ALA:HA	2.02	0.40
1:A:183:GLY:O	1:A:187:LEU:HB2	2.21	0.40
1:B:240:VAL:HG13	1:B:274:TYR:CE1	2.56	0.40
1:C:264:LEU:O	1:C:317:ALA:HA	2.22	0.40
1:F:34:ILE:O	1:F:38:ILE:HG13	2.22	0.40
1:B:14:LEU:HB3	1:B:34:ILE:HG21	2.04	0.40
1:B:267:ILE:HD11	1:B:301:PHE:HB2	2.04	0.40
1:D:2:ASN:O	1:D:6:LEU:HD13	2.21	0.40
1:D:177:VAL:HG21	1:D:332:TYR:HE1	1.85	0.40
1:D:248:GLU:O	1:D:252:ARG:HG2	2.21	0.40
1:F:134:GLU:H	1:F:134:GLU:CD	2.25	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	399/420 (95%)	391 (98%)	8 (2%)	0	100 100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	B	405/420 (96%)	393 (97%)	12 (3%)	0	100	100
1	C	407/420 (97%)	397 (98%)	10 (2%)	0	100	100
1	D	399/420 (95%)	385 (96%)	14 (4%)	0	100	100
1	E	350/420 (83%)	342 (98%)	8 (2%)	0	100	100
1	F	382/420 (91%)	375 (98%)	7 (2%)	0	100	100
All	All	2342/2520 (93%)	2283 (98%)	59 (2%)	0	100	100

There are no Ramachandran outliers to report.

### 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	347/342 (102%)	347 (100%)	0	100	100
1	B	351/342 (103%)	349 (99%)	2 (1%)	86	94
1	C	352/342 (103%)	351 (100%)	1 (0%)	92	97
1	D	347/342 (102%)	345 (99%)	2 (1%)	86	94
1	E	304/342 (89%)	303 (100%)	1 (0%)	92	97
1	F	338/342 (99%)	337 (100%)	1 (0%)	92	97
All	All	2039/2052 (99%)	2032 (100%)	7 (0%)	92	97

All (7) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	187	LEU
1	B	222	LEU
1	C	353	ARG
1	D	116	VAL
1	D	149	ARG
1	E	222	LEU
1	F	187	LEU



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

Mol	Chain	Res	Type
1	A	59	GLN
1	A	129	ASN
1	A	172	GLN
1	A	256	HIS
1	B	59	GLN
1	B	126	ASN
1	B	140	HIS
1	B	189	GLN
1	B	401	ASN
1	C	2	ASN
1	C	20	ASN
1	C	41	GLN
1	C	117	ASN
1	C	241	GLN
1	C	256	HIS
1	D	32	GLN
1	D	142	ASN
1	E	59	GLN
1	E	172	GLN
1	E	378	GLN
1	E	401	ASN
1	F	172	GLN
1	F	189	GLN
1	F	275	ASN
1	F	292	ASN

### 5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
2	G	6/12 (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 18 ligands modelled in this entry, 6 are monoatomic - leaving 12 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
5	BEF	C	1002	3	0,3,3	-	-	-		
3	ADP	E	1000	4,5	24,29,29	0.96	1 (4%)	29,45,45	1.51	4 (13%)
5	BEF	D	1002	3	0,3,3	-	-	-		
3	ADP	C	1000	4,5	24,29,29	0.96	1 (4%)	29,45,45	1.51	4 (13%)
5	BEF	A	1002	3	0,3,3	-	-	-		
5	BEF	F	1002	3	0,3,3	-	-	-		
3	ADP	B	1000	4,5	24,29,29	0.97	1 (4%)	29,45,45	1.51	4 (13%)
5	BEF	E	1002	3	0,3,3	-	-	-		
3	ADP	F	1000	4,5	24,29,29	0.96	1 (4%)	29,45,45	1.50	4 (13%)
3	ADP	D	1000	4,5	24,29,29	0.96	1 (4%)	29,45,45	1.51	4 (13%)
5	BEF	B	1002	3	0,3,3	-	-	-		
3	ADP	A	1000	4,5	24,29,29	0.96	1 (4%)	29,45,45	1.51	4 (13%)

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
3	ADP	E	1000	4,5	-	2/12/32/32	0/3/3/3
3	ADP	C	1000	4,5	-	3/12/32/32	0/3/3/3
3	ADP	B	1000	4,5	-	3/12/32/32	0/3/3/3
3	ADP	F	1000	4,5	-	2/12/32/32	0/3/3/3
3	ADP	D	1000	4,5	-	3/12/32/32	0/3/3/3

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	ADP	A	1000	4,5	-	2/12/32/32	0/3/3/3

All (6) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	1000	ADP	C5-C4	2.51	1.47	1.40
3	D	1000	ADP	C5-C4	2.51	1.47	1.40
3	C	1000	ADP	C5-C4	2.50	1.47	1.40
3	F	1000	ADP	C5-C4	2.50	1.47	1.40
3	E	1000	ADP	C5-C4	2.48	1.47	1.40
3	B	1000	ADP	C5-C4	2.48	1.47	1.40

All (24) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	D	1000	ADP	C3'-C2'-C1'	3.58	106.37	100.98
3	C	1000	ADP	PA-O3A-PB	-3.57	120.56	132.83
3	D	1000	ADP	PA-O3A-PB	-3.57	120.57	132.83
3	E	1000	ADP	C3'-C2'-C1'	3.57	106.35	100.98
3	B	1000	ADP	C3'-C2'-C1'	3.56	106.34	100.98
3	F	1000	ADP	PA-O3A-PB	-3.56	120.60	132.83
3	A	1000	ADP	PA-O3A-PB	-3.56	120.60	132.83
3	B	1000	ADP	PA-O3A-PB	-3.56	120.60	132.83
3	F	1000	ADP	C3'-C2'-C1'	3.56	106.34	100.98
3	E	1000	ADP	PA-O3A-PB	-3.55	120.63	132.83
3	C	1000	ADP	C3'-C2'-C1'	3.55	106.32	100.98
3	A	1000	ADP	C3'-C2'-C1'	3.55	106.32	100.98
3	C	1000	ADP	N3-C2-N1	-3.25	123.59	128.68
3	B	1000	ADP	N3-C2-N1	-3.24	123.62	128.68
3	D	1000	ADP	N3-C2-N1	-3.22	123.64	128.68
3	A	1000	ADP	N3-C2-N1	-3.21	123.66	128.68
3	E	1000	ADP	N3-C2-N1	-3.21	123.66	128.68
3	F	1000	ADP	N3-C2-N1	-3.19	123.69	128.68
3	F	1000	ADP	C4-C5-N7	-2.61	106.68	109.40
3	D	1000	ADP	C4-C5-N7	-2.60	106.69	109.40
3	B	1000	ADP	C4-C5-N7	-2.60	106.69	109.40
3	A	1000	ADP	C4-C5-N7	-2.60	106.69	109.40
3	C	1000	ADP	C4-C5-N7	-2.59	106.70	109.40
3	E	1000	ADP	C4-C5-N7	-2.58	106.71	109.40

There are no chirality outliers.

All (15) torsion outliers are listed below:

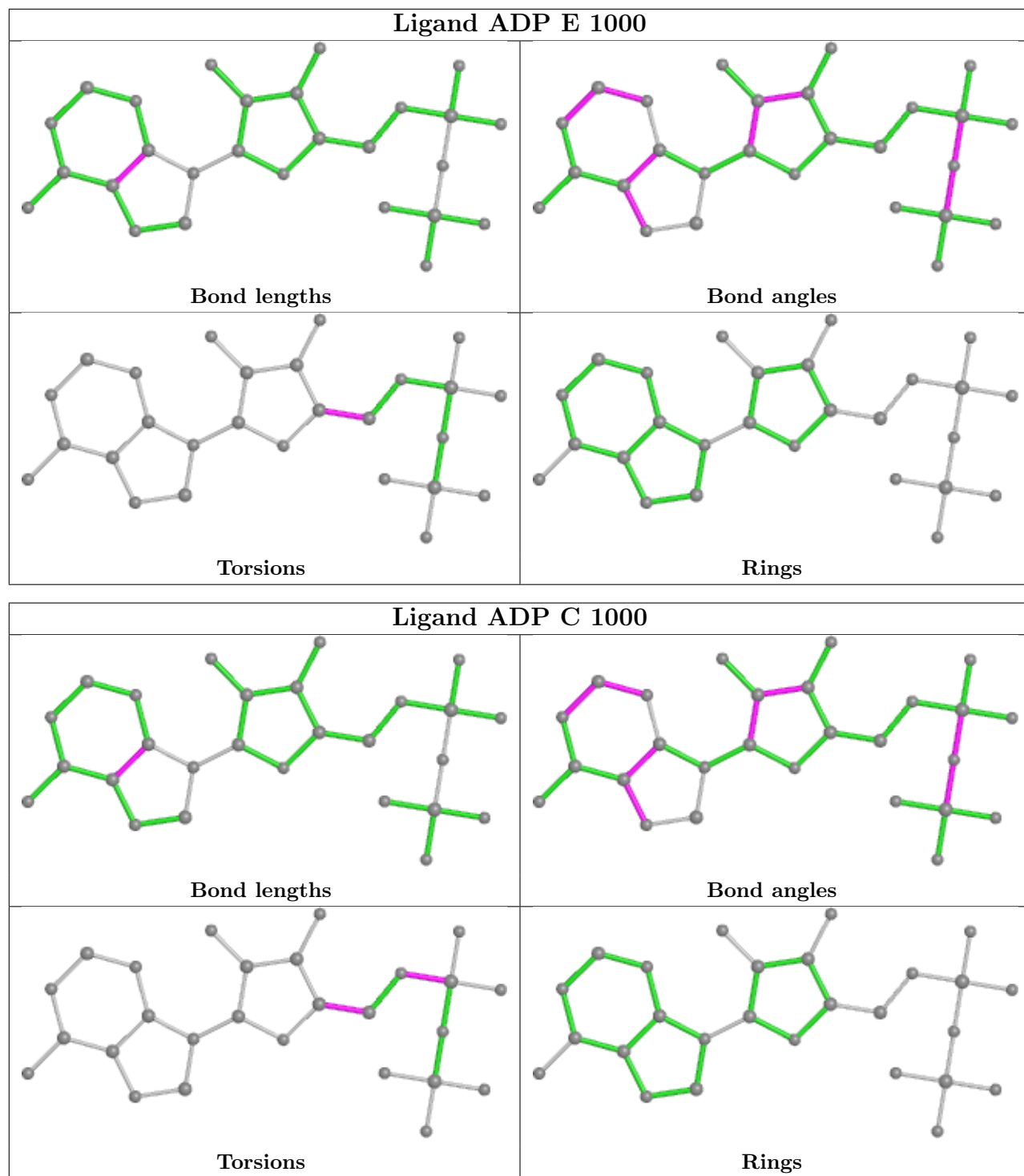
Mol	Chain	Res	Type	Atoms
3	B	1000	ADP	C5'-O5'-PA-O1A
3	C	1000	ADP	C5'-O5'-PA-O1A
3	D	1000	ADP	C5'-O5'-PA-O1A
3	A	1000	ADP	C3'-C4'-C5'-O5'
3	B	1000	ADP	C3'-C4'-C5'-O5'
3	C	1000	ADP	C3'-C4'-C5'-O5'
3	D	1000	ADP	C3'-C4'-C5'-O5'
3	E	1000	ADP	C3'-C4'-C5'-O5'
3	F	1000	ADP	C3'-C4'-C5'-O5'
3	C	1000	ADP	O4'-C4'-C5'-O5'
3	A	1000	ADP	O4'-C4'-C5'-O5'
3	B	1000	ADP	O4'-C4'-C5'-O5'
3	D	1000	ADP	O4'-C4'-C5'-O5'
3	E	1000	ADP	O4'-C4'-C5'-O5'
3	F	1000	ADP	O4'-C4'-C5'-O5'

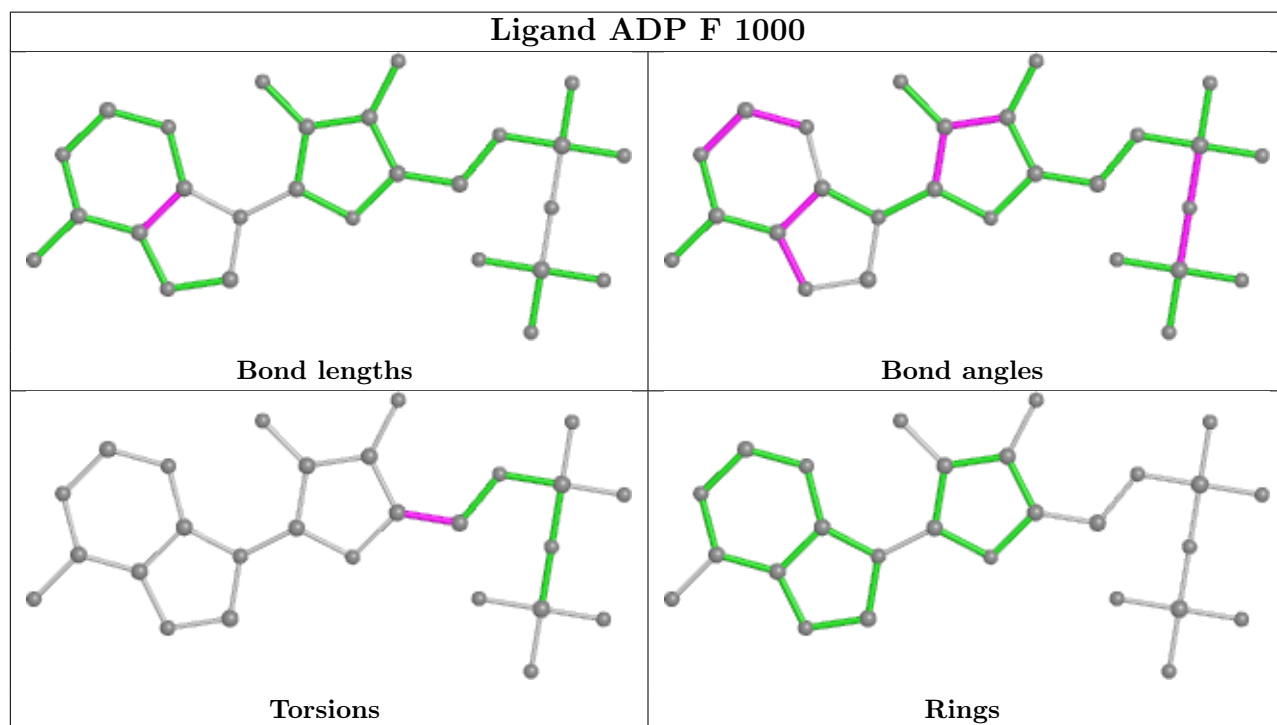
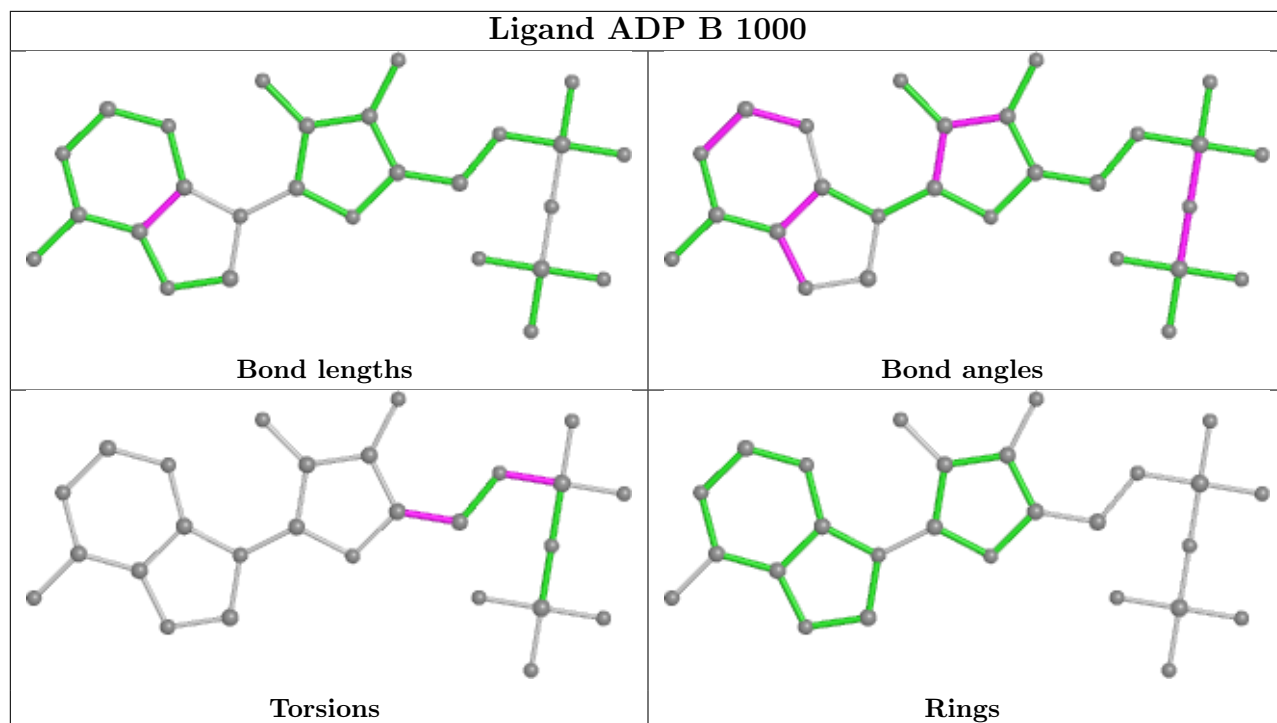
There are no ring outliers.

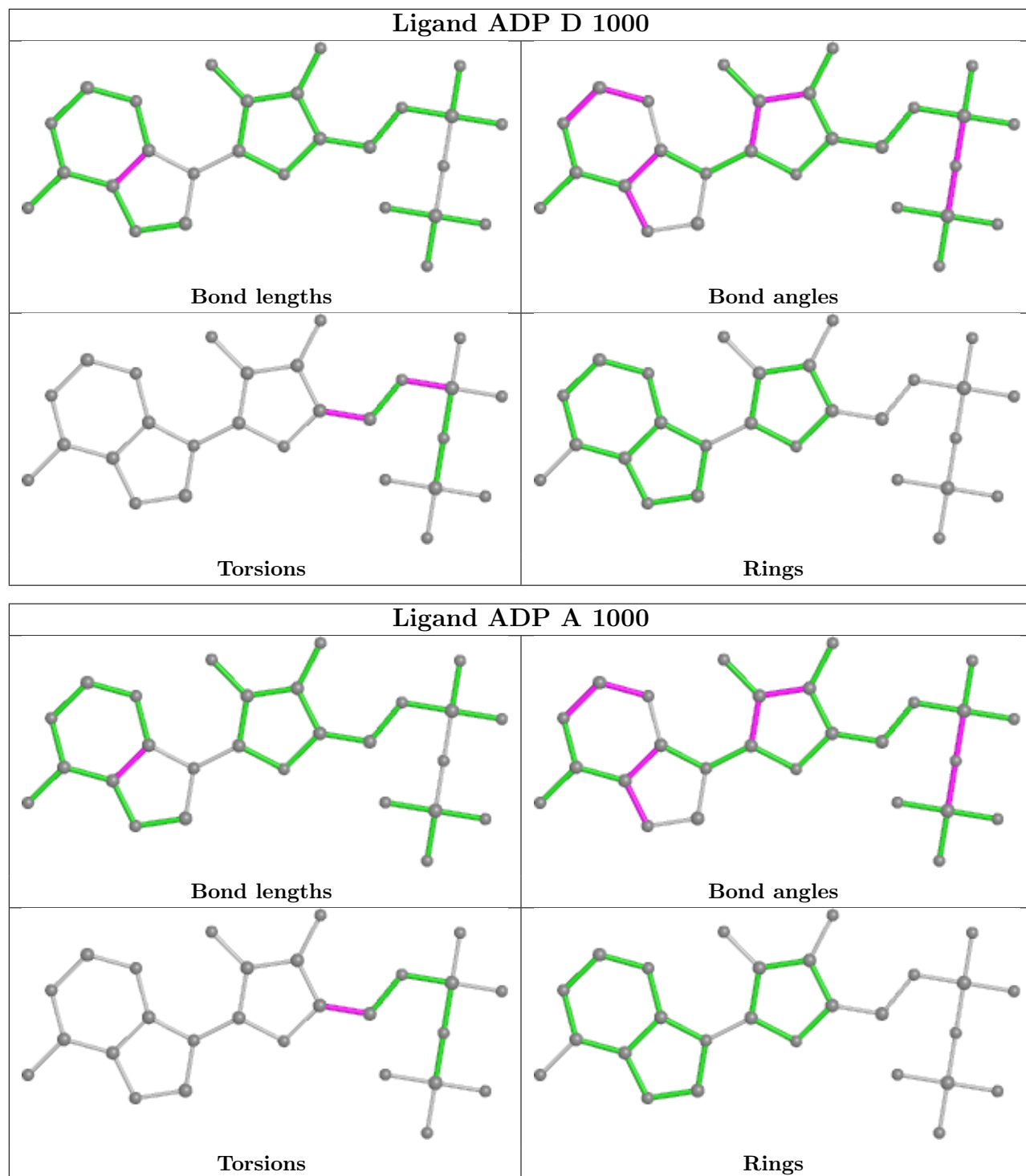
4 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	B	1000	ADP	1	0
3	F	1000	ADP	1	0
3	D	1000	ADP	1	0
3	A	1000	ADP	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

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, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	390/420 (92%)	-0.16	2 (0%) 91 86	36, 68, 124, 149	0
1	B	394/420 (93%)	-0.24	6 (1%) 73 61	24, 49, 127, 164	0
1	C	395/420 (94%)	-0.27	6 (1%) 73 61	22, 51, 113, 146	0
1	D	390/420 (92%)	-0.19	0 100 100	30, 73, 119, 163	0
1	E	343/420 (81%)	0.37	16 (4%) 31 17	67, 111, 154, 192	0
1	F	377/420 (89%)	0.20	15 (3%) 38 23	65, 98, 147, 177	0
2	G	7/12 (58%)	-0.08	0 100 100	47, 52, 88, 122	0
All	All	2296/2532 (90%)	-0.06	45 (1%) 65 50	22, 76, 138, 192	0

All (45) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	E	98	SER	5.4
1	E	116	VAL	4.9
1	B	128	ARG	4.4
1	E	51	GLY	4.3
1	E	127	ALA	4.0
1	E	97	ILE	3.6
1	B	14	LEU	3.5
1	F	16	THR	3.4
1	F	6	LEU	3.4
1	E	99	GLY	3.3
1	B	106	GLU	3.2
1	F	41	GLN	3.2
1	C	15	ILE	3.1
1	E	49	ILE	3.1
1	E	74	ALA	3.0
1	C	107	GLY	3.0
1	B	6	LEU	2.9

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Mol	Chain	Res	Type	RSRZ
1	F	62	PHE	2.9
1	E	114	LEU	2.9
1	B	39	LEU	2.9
1	E	354	VAL	2.8
1	C	106	GLU	2.8
1	C	44	LYS	2.8
1	F	40	LYS	2.8
1	E	414	GLU	2.7
1	C	49	ILE	2.7
1	F	3	LEU	2.7
1	F	14	LEU	2.7
1	F	12	SER	2.7
1	E	125	GLU	2.6
1	A	224	LYS	2.5
1	C	41	GLN	2.4
1	F	61	GLY	2.3
1	F	57	ILE	2.3
1	E	356	PRO	2.2
1	F	15	ILE	2.2
1	B	16	THR	2.2
1	E	128	ARG	2.2
1	F	292	ASN	2.2
1	F	8	ASN	2.1
1	A	106	GLU	2.1
1	F	114	LEU	2.1
1	E	346	SER	2.1
1	F	127	ALA	2.0
1	E	57	ILE	2.0

## 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,

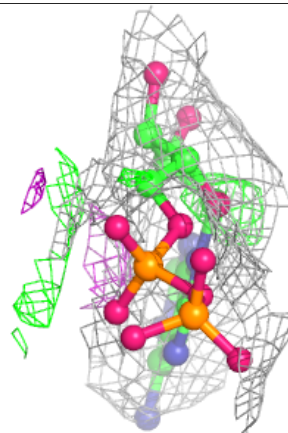
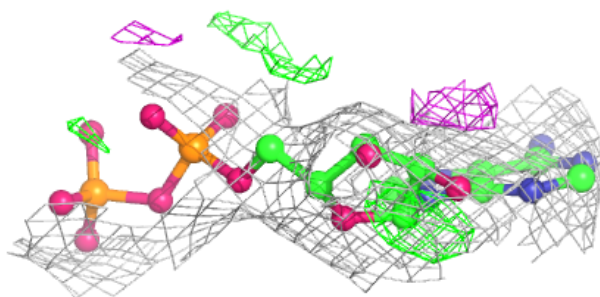
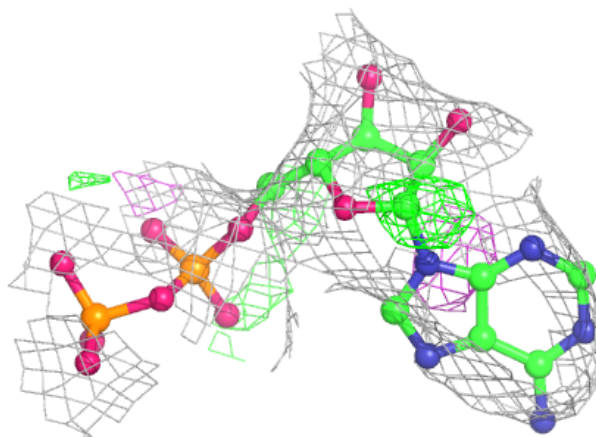
median, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
4	MG	E	1001	1/1	0.69	0.12	119,119,119,119	0
5	BEF	E	1002	4/4	0.84	0.19	115,117,117,118	0
3	ADP	E	1000	27/27	0.85	0.19	112,126,134,137	0
4	MG	D	1001	1/1	0.86	0.21	97,97,97,97	0
3	ADP	B	1000	27/27	0.92	0.22	35,41,45,46	0
3	ADP	F	1000	27/27	0.93	0.17	79,82,86,87	0
3	ADP	C	1000	27/27	0.93	0.22	45,56,63,64	0
3	ADP	D	1000	27/27	0.95	0.17	60,77,86,88	0
4	MG	A	1001	1/1	0.96	0.07	36,36,36,36	0
5	BEF	B	1002	4/4	0.96	0.19	32,33,33,33	0
5	BEF	C	1002	4/4	0.96	0.26	43,44,45,46	0
5	BEF	D	1002	4/4	0.96	0.25	78,81,81,83	0
3	ADP	A	1000	27/27	0.96	0.17	39,43,49,49	0
4	MG	F	1001	1/1	0.97	0.10	64,64,64,64	0
5	BEF	A	1002	4/4	0.97	0.13	45,45,45,46	0
4	MG	B	1001	1/1	0.97	0.07	26,26,26,26	0
5	BEF	F	1002	4/4	0.97	0.17	64,64,64,65	0
4	MG	C	1001	1/1	0.98	0.17	37,37,37,37	0

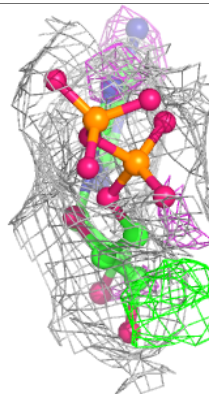
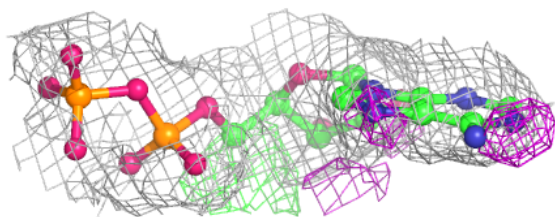
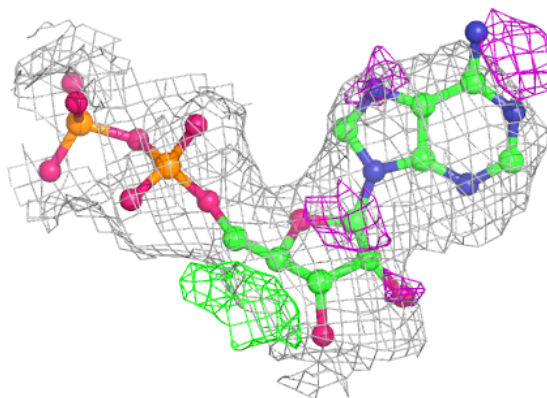
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

**Electron density around ADP E 1000:**

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

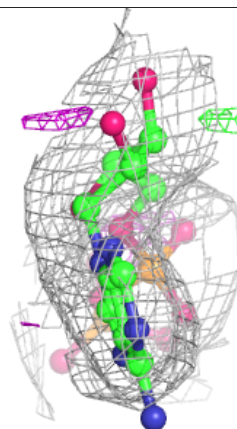
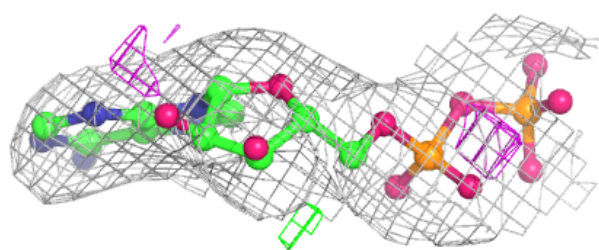
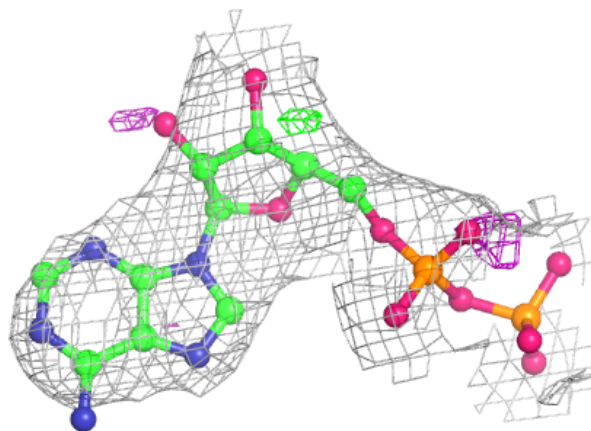
**Electron density around ADP B 1000:**

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



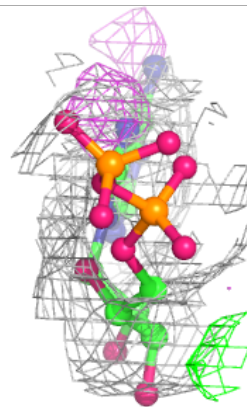
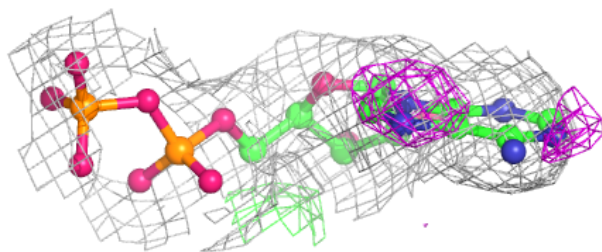
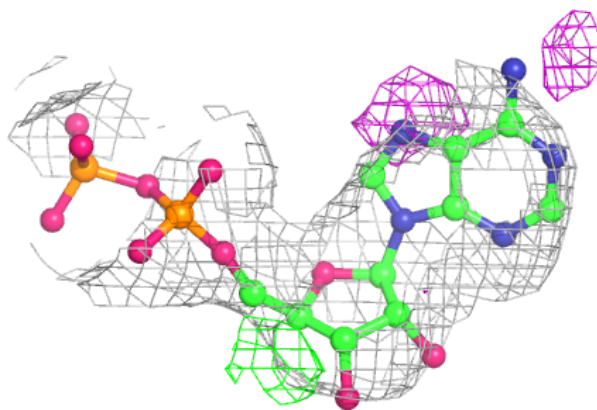
**Electron density around ADP F 1000:**

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



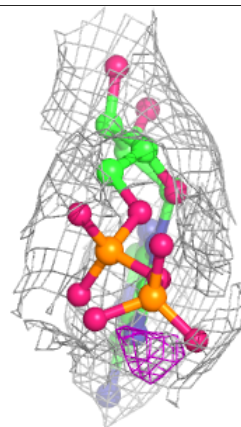
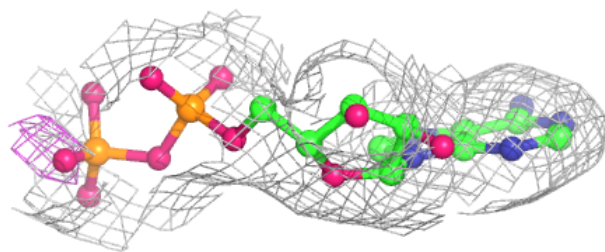
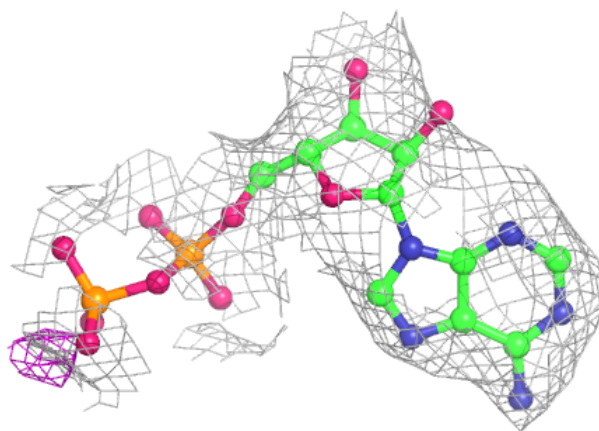
**Electron density around ADP C 1000:**

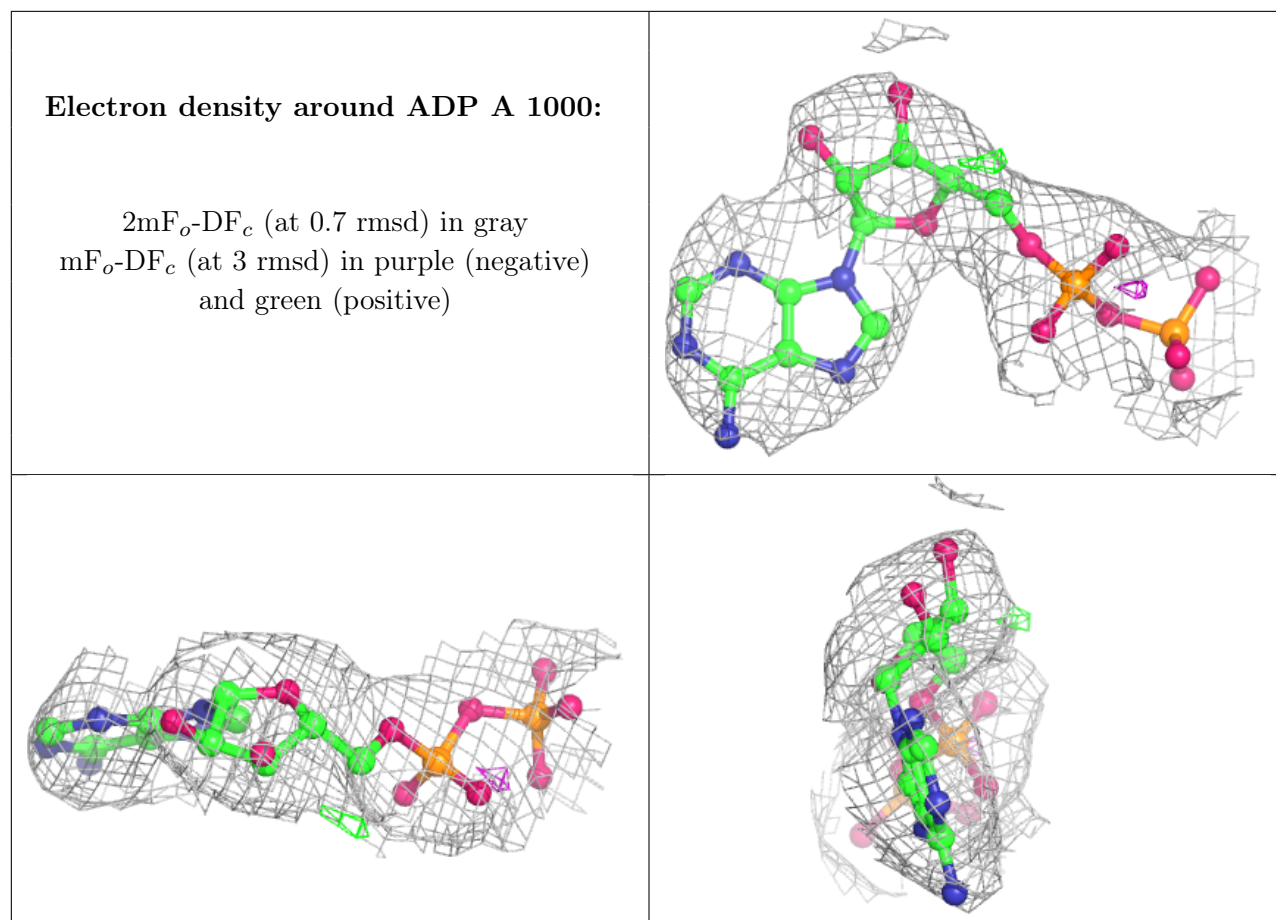
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)



**Electron density around ADP D 1000:**

$2mF_o-DF_c$  (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.