



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 6, 2026 – 05:30 PM UTC

PDB ID : 2Z4R / pdb_00002z4r
Title : Crystal structure of domain III from the Thermotoga maritima replication initiation protein DnaA
Authors : Fujikawa, N.; Ozaki, S.; Kagawa, W.; Park, S.-Y.; Katayama, T.; Kurumizaka, H.; Yokoyama, S.; RIKEN Structural Genomics/Proteomics Initiative (RSGI)
Deposited on : 2007-06-25
Resolution : 3.05 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	:	4-5-2 with Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

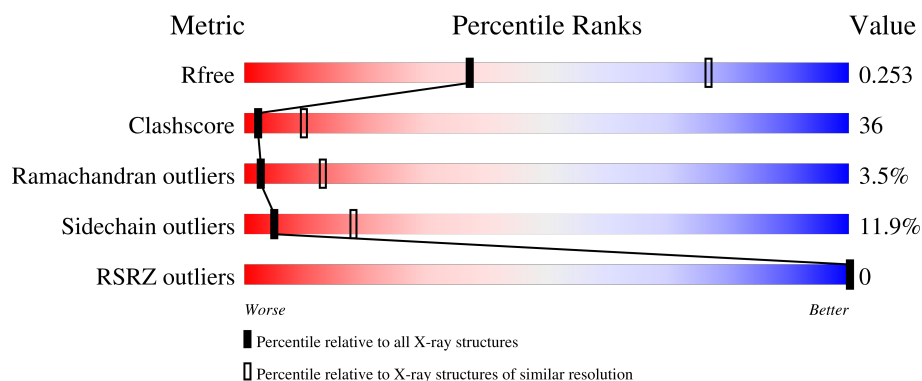
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.05 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}	180053	2469 (3.10-3.02)
Clashscore	190562	2569 (3.10-3.02)
Ramachandran outliers	187476	2424 (3.10-3.02)
Sidechain outliers	187428	2423 (3.10-3.02)
RSRZ outliers	180081	2469 (3.10-3.02)

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	440	
1	B	440	
1	C	440	

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 5905 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 Chromosomal replication initiator protein dnaA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	240	Total	C	N	O	S	0	0	0
			1939	1243	328	363	5			
1	B	240	Total	C	N	O	S	0	0	0
			1939	1243	328	363	5			
1	C	240	Total	C	N	O	S	0	0	0
			1939	1243	328	363	5			

- Molecule 2 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	1	Total	Mg	0	0
			1	1		
2	B	1	Total	Mg	0	0
			1	1		
2	C	1	Total	Mg	0	0
			1	1		

- Molecule 3 is ADENOSINE-5'-DIPHOSPHATE (CCD ID: ADP) (formula: C₁₀H₁₅N₅O₁₀P₂).



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

- Molecule 4 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total O 1 1	0	0
4	B	1	Total O 1 1	0	0
4	C	2	Total O 2 2	0	0

4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	133.34Å 221.79Å 55.60Å 90.00° 106.13° 90.00°	Depositor
Resolution (Å)	48.12 – 3.05 48.12 – 3.05	Depositor EDS
% Data completeness (in resolution range)	94.1 (48.12-3.05) 94.1 (48.12-3.05)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.62 (at 3.07Å)	Xtriage
Refinement program	CNS 1.1	Depositor
R, R_{free}	0.231 , 0.264 0.224 , 0.253	Depositor DCC
R_{free} test set	2761 reflections (9.95%)	wwPDB-VP
Wilson B-factor (Å ²)	74.6	Xtriage
Anisotropy	0.253	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.34 , 63.4	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtriage
Estimated twinning fraction	0.468 for 1/2*h+1/2*k+l,3/2*h-1/2*k+l,-l 0.470 for 1/2*h-1/2*k+l,-3/2*h-1/2*k-l,-l	Xtriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	5905	wwPDB-VP
Average B, all atoms (Å ²)	69.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.68% 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 [i](#)

5.1 Standard geometry [i](#)

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

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	0.47	0/1976	0.97	4/2665 (0.2%)
1	B	0.46	0/1976	0.97	5/2665 (0.2%)
1	C	0.47	0/1976	0.97	3/2665 (0.1%)
All	All	0.47	0/5928	0.97	12/7995 (0.2%)

There are no bond length outliers.

All (12) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	196	ASP	N-CA-C	-6.30	106.14	113.88
1	B	196	ASP	N-CA-C	-6.21	106.24	113.88
1	A	196	ASP	N-CA-C	-6.20	106.25	113.88
1	A	286	GLU	N-CA-C	-6.14	106.76	114.56
1	B	286	GLU	N-CA-C	-5.98	106.97	114.56
1	C	286	GLU	N-CA-C	-5.98	106.97	114.56
1	A	287	VAL	N-CA-C	-5.31	106.51	111.45
1	C	287	VAL	N-CA-C	-5.19	106.62	111.45
1	B	287	VAL	N-CA-C	-5.13	106.67	111.45
1	A	191	TYR	N-CA-C	5.13	118.57	112.72
1	B	191	TYR	N-CA-C	5.09	118.53	112.72
1	B	150	ILE	N-CA-C	-5.08	105.44	110.62

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	1939	0	1960	144	0
1	B	1939	0	1960	144	0
1	C	1939	0	1961	143	0
2	A	1	0	0	0	0
2	B	1	0	0	0	0
2	C	1	0	0	0	0
3	A	27	0	12	3	0
3	B	27	0	12	2	0
3	C	27	0	12	4	0
4	A	1	0	0	0	0
4	B	1	0	0	0	0
4	C	2	0	0	0	0
All	All	5905	0	5917	428	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 36.

All (428) 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:C:318:LYS:HG3	1:C:319:GLU:H	1.07	1.10
1:B:318:LYS:HG3	1:B:319:GLU:H	1.08	1.10
1:A:318:LYS:HG3	1:A:319:GLU:H	1.07	1.10
1:B:183:LYS:HG3	1:B:186:GLU:HG3	1.36	1.08
1:C:183:LYS:HG3	1:C:186:GLU:HG3	1.35	1.07
1:A:183:LYS:HG3	1:A:186:GLU:HG3	1.35	1.05
1:B:110:GLY:H	1:B:113:ASN:HD21	1.11	0.97
1:A:275:MET:HE1	1:A:302:LEU:HD13	1.45	0.97
1:C:275:MET:HE1	1:C:302:LEU:HD13	1.47	0.96
1:A:110:GLY:H	1:A:113:ASN:HD21	1.09	0.96
1:B:275:MET:HE1	1:B:302:LEU:HD13	1.45	0.95
1:C:110:GLY:H	1:C:113:ASN:HD21	1.10	0.94
1:B:167:THR:HG22	1:B:169:GLU:H	1.33	0.93
1:B:196:ASP:HA	1:B:228:LYS:HD2	1.49	0.93
1:A:196:ASP:HA	1:A:228:LYS:HD2	1.49	0.93
1:C:196:ASP:HA	1:C:228:LYS:HD2	1.48	0.92
1:A:167:THR:HG22	1:A:169:GLU:H	1.33	0.91
1:C:167:THR:HG22	1:C:169:GLU:H	1.34	0.91
1:C:318:LYS:HG3	1:C:319:GLU:N	1.85	0.91

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:316:THR:HG22	1:B:318:LYS:HG2	1.54	0.89
1:A:318:LYS:HG3	1:A:319:GLU:N	1.85	0.89
1:B:318:LYS:HG3	1:B:319:GLU:N	1.85	0.89
1:A:316:THR:HG22	1:A:318:LYS:HG2	1.55	0.89
1:B:197:ILE:HG12	1:B:229:GLN:HB3	1.56	0.88
1:C:316:THR:HG22	1:C:318:LYS:HG2	1.55	0.87
1:A:273:ARG:HG3	1:A:288:LEU:HD11	1.55	0.87
1:C:298:ASN:HD22	1:C:300:ARG:H	1.23	0.87
1:C:197:ILE:HG12	1:C:229:GLN:HB3	1.58	0.86
1:C:273:ARG:HG3	1:C:288:LEU:HD11	1.56	0.86
1:A:197:ILE:HG12	1:A:229:GLN:HB3	1.56	0.86
1:B:273:ARG:HG3	1:B:288:LEU:HD11	1.57	0.86
1:A:268:ARG:NH1	1:A:296:ASP:HB3	1.91	0.86
1:B:298:ASN:HD22	1:B:300:ARG:H	1.21	0.85
1:A:298:ASN:HD22	1:A:300:ARG:H	1.23	0.85
1:C:110:GLY:N	1:C:113:ASN:HD21	1.73	0.85
1:C:268:ARG:NH1	1:C:296:ASP:HB3	1.92	0.84
1:A:110:GLY:N	1:A:113:ASN:HD21	1.74	0.84
1:B:110:GLY:N	1:B:113:ASN:HD21	1.74	0.84
1:B:268:ARG:NH1	1:B:296:ASP:HB3	1.92	0.84
1:B:168:SER:HB3	1:B:206:LEU:HD13	1.59	0.84
1:A:318:LYS:CG	1:A:319:GLU:H	1.91	0.83
1:C:168:SER:HB3	1:C:206:LEU:HD13	1.61	0.83
1:B:298:ASN:HD21	1:B:300:ARG:HB3	1.44	0.81
1:B:318:LYS:CG	1:B:319:GLU:H	1.91	0.81
1:C:204:GLN:HG2	1:C:235:ASP:OD1	1.81	0.81
1:A:168:SER:HB3	1:A:206:LEU:HD13	1.63	0.81
1:A:298:ASN:HD21	1:A:300:ARG:HB3	1.45	0.80
1:A:106:ASN:HB3	1:A:278:ILE:HD11	1.63	0.80
1:C:318:LYS:CG	1:C:319:GLU:H	1.91	0.80
1:C:298:ASN:HD21	1:C:300:ARG:HB3	1.44	0.80
1:C:110:GLY:H	1:C:113:ASN:ND2	1.79	0.79
1:C:106:ASN:HB3	1:C:278:ILE:HD11	1.64	0.79
1:A:110:GLY:H	1:A:113:ASN:ND2	1.80	0.79
1:B:163:VAL:HA	1:B:197:ILE:HG22	1.65	0.78
1:B:106:ASN:HB3	1:B:278:ILE:HD11	1.65	0.78
1:B:110:GLY:H	1:B:113:ASN:ND2	1.80	0.78
1:C:163:VAL:HA	1:C:197:ILE:HG22	1.65	0.77
1:C:306:ILE:O	1:C:310:LEU:HG	1.85	0.77
1:A:163:VAL:HA	1:A:197:ILE:HG22	1.65	0.76
1:A:275:MET:CE	1:A:302:LEU:HD13	2.15	0.76

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:204:GLN:HG2	1:B:235:ASP:OD1	1.86	0.76
1:C:157:ASN:N	1:C:157:ASN:HD22	1.82	0.76
1:A:306:ILE:O	1:A:310:LEU:HG	1.86	0.75
1:A:204:GLN:HG2	1:A:235:ASP:OD1	1.85	0.75
1:B:306:ILE:O	1:B:310:LEU:HG	1.86	0.75
1:B:275:MET:CE	1:B:302:LEU:HD13	2.17	0.74
1:B:123:VAL:HG21	1:B:133:LEU:HD22	1.69	0.74
1:B:166:ILE:HD11	1:B:170:LYS:HD3	1.68	0.74
1:C:275:MET:CE	1:C:302:LEU:HD13	2.17	0.73
1:C:183:LYS:HD2	1:C:185:ASN:HB2	1.70	0.73
1:A:166:ILE:HD11	1:A:170:LYS:HD3	1.70	0.73
1:B:157:ASN:N	1:B:157:ASN:HD22	1.84	0.73
1:B:169:GLU:HG3	1:B:205:PHE:CZ	2.23	0.73
1:A:183:LYS:HD2	1:A:185:ASN:HB2	1.71	0.73
1:B:183:LYS:HD2	1:B:185:ASN:HB2	1.70	0.72
1:A:123:VAL:HG21	1:A:133:LEU:HD22	1.72	0.72
1:C:166:ILE:HD11	1:C:170:LYS:HD3	1.71	0.72
1:C:298:ASN:ND2	1:C:300:ARG:HB3	2.04	0.72
1:B:298:ASN:ND2	1:B:300:ARG:HB3	2.04	0.72
1:C:123:VAL:HG21	1:C:133:LEU:HD22	1.72	0.72
1:A:157:ASN:N	1:A:157:ASN:HD22	1.85	0.71
1:A:298:ASN:ND2	1:A:300:ARG:HB3	2.05	0.71
1:C:183:LYS:CE	1:C:183:LYS:HA	2.19	0.71
1:C:183:LYS:HA	1:C:183:LYS:HE2	1.73	0.71
1:A:183:LYS:CE	1:A:183:LYS:HA	2.19	0.70
1:A:332:PHE:C	1:A:333:ILE:HD12	2.16	0.70
1:C:332:PHE:C	1:C:333:ILE:HD12	2.16	0.70
1:B:332:PHE:C	1:B:333:ILE:HD12	2.16	0.70
1:A:275:MET:HE3	1:A:303:ARG:HA	1.73	0.70
1:B:183:LYS:HA	1:B:183:LYS:CE	2.20	0.70
1:A:183:LYS:HA	1:A:183:LYS:HE2	1.74	0.69
1:B:321:ASP:HB3	1:B:324:GLU:HG3	1.74	0.69
1:A:169:GLU:HG3	1:A:205:PHE:CZ	2.27	0.69
1:C:301:ARG:HH22	1:C:332:PHE:HA	1.56	0.69
1:A:321:ASP:HB3	1:A:324:GLU:HG3	1.75	0.69
1:A:301:ARG:HH22	1:A:332:PHE:HA	1.58	0.69
1:B:275:MET:HE3	1:B:303:ARG:HA	1.74	0.69
1:B:183:LYS:HA	1:B:183:LYS:HE2	1.74	0.69
1:C:169:GLU:HG3	1:C:205:PHE:CZ	2.27	0.69
1:C:275:MET:HE3	1:C:303:ARG:HA	1.74	0.68
1:C:321:ASP:HB3	1:C:324:GLU:HG3	1.75	0.68

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:301:ARG:HH22	1:B:332:PHE:HA	1.58	0.67
1:A:167:THR:HG22	1:A:169:GLU:N	2.10	0.66
1:A:298:ASN:ND2	1:A:300:ARG:H	1.93	0.66
1:B:167:THR:HG22	1:B:169:GLU:N	2.09	0.66
1:C:298:ASN:ND2	1:C:300:ARG:H	1.93	0.66
1:C:202:ASP:HA	1:C:204:GLN:HE22	1.61	0.66
1:C:167:THR:HG22	1:C:169:GLU:N	2.10	0.66
1:C:313:LYS:HG3	1:C:320:VAL:HG23	1.80	0.64
1:A:248:LEU:O	1:A:251:ARG:HB2	1.98	0.64
1:C:113:ASN:H	1:C:113:ASN:HD22	1.46	0.64
1:A:202:ASP:HA	1:A:204:GLN:HE22	1.62	0.63
1:B:202:ASP:HA	1:B:204:GLN:HE22	1.64	0.63
1:B:248:LEU:O	1:B:251:ARG:HB2	1.97	0.63
1:B:168:SER:HB3	1:B:206:LEU:CD1	2.27	0.63
1:B:313:LYS:HG3	1:B:320:VAL:HG23	1.81	0.63
1:C:121:LEU:HD11	1:C:125:LYS:HE3	1.81	0.62
1:B:113:ASN:HD22	1:B:113:ASN:H	1.46	0.62
1:A:121:LEU:HD11	1:A:125:LYS:HE3	1.80	0.62
1:A:162:ARG:N	1:A:196:ASP:OD2	2.32	0.62
1:A:313:LYS:HG3	1:A:320:VAL:HG23	1.80	0.62
1:C:162:ARG:N	1:C:196:ASP:OD2	2.32	0.62
1:C:163:VAL:HG22	1:C:197:ILE:HG21	1.82	0.62
1:A:147:LEU:HD11	1:A:199:LEU:HB3	1.81	0.62
1:B:298:ASN:ND2	1:B:300:ARG:H	1.93	0.62
1:C:248:LEU:O	1:C:251:ARG:HB2	1.99	0.62
1:B:183:LYS:CD	1:B:185:ASN:HB2	2.30	0.62
1:B:162:ARG:N	1:B:196:ASP:OD2	2.32	0.61
1:C:147:LEU:HD11	1:C:199:LEU:HB3	1.82	0.61
1:C:172:LEU:CD2	1:C:212:VAL:HG21	2.31	0.61
1:A:168:SER:HB3	1:A:206:LEU:CD1	2.29	0.61
1:A:202:ASP:HA	1:A:204:GLN:NE2	2.16	0.61
1:C:183:LYS:CD	1:C:185:ASN:HB2	2.31	0.61
1:B:169:GLU:HG3	1:B:205:PHE:CE2	2.36	0.61
1:C:156:GLN:C	1:C:157:ASN:HD22	2.08	0.61
1:B:202:ASP:HA	1:B:204:GLN:NE2	2.16	0.60
1:C:202:ASP:HA	1:C:204:GLN:NE2	2.15	0.60
1:B:121:LEU:HD11	1:B:125:LYS:HE3	1.81	0.60
1:B:172:LEU:CD2	1:B:212:VAL:HG21	2.31	0.60
1:A:239:GLN:HE21	1:A:253:GLN:NE2	1.99	0.60
1:B:316:THR:CG2	1:B:318:LYS:HG2	2.30	0.60
1:C:239:GLN:HE21	1:C:253:GLN:NE2	1.99	0.60

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:104:PHE:CD1	1:A:121:LEU:HD23	2.37	0.60
1:B:156:GLN:C	1:B:157:ASN:HD22	2.09	0.59
1:A:183:LYS:CD	1:A:185:ASN:HB2	2.32	0.59
1:B:239:GLN:HE21	1:B:253:GLN:NE2	2.00	0.59
1:A:172:LEU:CD2	1:A:212:VAL:HG21	2.31	0.59
1:C:140:GLY:O	1:C:141:LEU:HD23	2.03	0.59
1:C:168:SER:HB3	1:C:206:LEU:CD1	2.31	0.58
1:A:131:ASN:HD21	1:A:229:GLN:HA	1.67	0.58
1:A:156:GLN:C	1:A:157:ASN:HD22	2.11	0.58
1:A:316:THR:CG2	1:A:318:LYS:HG2	2.30	0.58
1:B:147:LEU:HD11	1:B:199:LEU:HB3	1.84	0.58
1:C:204:GLN:HG2	1:C:235:ASP:CG	2.29	0.58
1:C:316:THR:CG2	1:C:318:LYS:HG2	2.30	0.58
1:A:113:ASN:H	1:A:113:ASN:HD22	1.49	0.58
1:B:131:ASN:HD21	1:B:229:GLN:HA	1.68	0.58
1:B:251:ARG:HE	1:B:254:MET:CE	2.17	0.57
1:B:309:LEU:HD13	1:B:329:LEU:HD21	1.86	0.57
1:C:131:ASN:HD21	1:C:229:GLN:HA	1.70	0.57
1:A:169:GLU:HG3	1:A:205:PHE:CE2	2.39	0.57
1:C:145:HIS:ND1	3:C:503:ADP:H2'	2.19	0.57
1:B:104:PHE:CD1	1:B:121:LEU:HD23	2.39	0.57
1:C:104:PHE:CD1	1:C:121:LEU:HD23	2.39	0.57
1:B:163:VAL:HG22	1:B:197:ILE:HG21	1.86	0.57
1:A:275:MET:HE3	1:A:303:ARG:CA	2.34	0.56
1:B:275:MET:HE3	1:B:303:ARG:CA	2.34	0.56
1:A:140:GLY:N	3:A:501:ADP:O2B	2.39	0.56
1:A:251:ARG:HE	1:A:254:MET:CE	2.19	0.56
1:A:163:VAL:HG22	1:A:197:ILE:HG21	1.86	0.56
1:A:131:ASN:ND2	1:A:229:GLN:HA	2.21	0.56
1:C:142:GLY:O	1:C:146:LEU:HB2	2.06	0.56
1:B:140:GLY:O	1:B:141:LEU:HD23	2.05	0.55
1:C:251:ARG:HE	1:C:254:MET:CE	2.19	0.55
1:A:309:LEU:HD13	1:A:329:LEU:HD21	1.88	0.55
1:B:204:GLN:HG2	1:B:235:ASP:CG	2.31	0.55
1:A:142:GLY:O	1:A:146:LEU:HB2	2.06	0.55
1:B:131:ASN:ND2	1:B:229:GLN:HA	2.22	0.55
1:C:169:GLU:HG3	1:C:205:PHE:CE2	2.42	0.55
1:C:309:LEU:HD13	1:C:329:LEU:HD21	1.88	0.54
1:A:301:ARG:NH2	1:A:335:PRO:HG3	2.22	0.54
1:C:163:VAL:HG22	1:C:197:ILE:CG2	2.37	0.54
1:A:183:LYS:HZ2	1:A:185:ASN:H	1.55	0.54

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:131:ASN:ND2	1:C:229:GLN:HA	2.23	0.54
1:C:275:MET:HE3	1:C:303:ARG:CA	2.37	0.54
1:A:140:GLY:O	1:A:141:LEU:HD23	2.08	0.54
1:C:301:ARG:NH2	1:C:335:PRO:HG3	2.23	0.54
1:B:113:ASN:HD22	1:B:113:ASN:N	2.03	0.53
1:B:301:ARG:NH2	1:B:335:PRO:HG3	2.23	0.53
1:A:204:GLN:HG2	1:A:235:ASP:CG	2.33	0.53
1:B:298:ASN:ND2	1:B:300:ARG:CB	2.72	0.53
1:A:313:LYS:HD2	1:A:319:GLU:OE2	2.09	0.53
1:C:183:LYS:HZ2	1:C:185:ASN:H	1.55	0.53
1:C:113:ASN:HD22	1:C:113:ASN:N	2.03	0.53
1:A:136:TYR:CE2	1:A:259:LYS:HB2	2.44	0.52
1:B:183:LYS:HZ2	1:B:185:ASN:H	1.57	0.52
1:C:172:LEU:HD23	1:C:212:VAL:HG21	1.90	0.52
1:A:157:ASN:N	1:A:157:ASN:ND2	2.56	0.52
1:C:308:LYS:NZ	1:C:328:LEU:O	2.43	0.52
1:A:172:LEU:HD23	1:A:212:VAL:HG21	1.92	0.52
1:B:142:GLY:O	1:B:146:LEU:HB2	2.10	0.52
1:A:137:GLY:O	1:A:235:ASP:HA	2.10	0.52
1:B:163:VAL:HG22	1:B:197:ILE:CG2	2.41	0.51
1:C:136:TYR:CE2	1:C:259:LYS:HB2	2.45	0.51
1:C:313:LYS:HD2	1:C:319:GLU:OE2	2.09	0.51
1:C:137:GLY:O	1:C:235:ASP:HA	2.10	0.51
1:A:308:LYS:NZ	1:A:328:LEU:O	2.44	0.51
1:B:236:ARG:HG3	1:B:240:LYS:HB3	1.93	0.51
1:C:136:TYR:HA	1:C:234:SER:O	2.11	0.51
1:C:275:MET:HE1	1:C:302:LEU:CD1	2.32	0.51
1:B:147:LEU:HD22	1:B:233:CYS:SG	2.51	0.50
1:B:301:ARG:HH11	1:B:301:ARG:HB3	1.76	0.50
1:B:136:TYR:CE2	1:B:259:LYS:HB2	2.46	0.50
1:A:136:TYR:HA	1:A:234:SER:O	2.12	0.50
1:B:275:MET:HE1	1:B:302:LEU:CD1	2.31	0.50
1:B:313:LYS:HD2	1:B:319:GLU:OE2	2.12	0.50
1:C:301:ARG:HH11	1:C:301:ARG:HB3	1.76	0.50
1:A:333:ILE:HD12	1:A:333:ILE:N	2.27	0.50
1:B:136:TYR:HA	1:B:234:SER:O	2.11	0.50
1:B:172:LEU:HD23	1:B:212:VAL:HG21	1.92	0.50
1:C:285:GLU:CD	1:C:285:GLU:H	2.20	0.50
1:A:285:GLU:H	1:A:285:GLU:CD	2.20	0.50
1:B:158:GLU:O	1:B:159:PRO:C	2.54	0.50
1:C:236:ARG:HG3	1:C:240:LYS:HB3	1.94	0.50

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:298:ASN:ND2	1:C:300:ARG:CB	2.72	0.50
1:A:284:PRO:C	1:A:286:GLU:H	2.20	0.50
1:B:316:THR:O	1:B:318:LYS:N	2.45	0.50
1:A:163:VAL:HG22	1:A:197:ILE:CG2	2.41	0.49
1:B:196:ASP:CA	1:B:228:LYS:HD2	2.34	0.49
1:B:122:GLU:HG2	1:C:115:PHE:CG	2.48	0.49
1:C:107:PHE:CE1	1:C:146:LEU:HD13	2.46	0.49
1:C:185:ASN:O	1:C:186:GLU:C	2.56	0.49
1:A:113:ASN:HD22	1:A:113:ASN:N	2.05	0.49
1:B:137:GLY:O	1:B:235:ASP:HA	2.12	0.49
1:C:158:GLU:O	1:C:159:PRO:C	2.55	0.49
1:A:298:ASN:ND2	1:A:300:ARG:CB	2.74	0.49
1:C:168:SER:OG	1:C:203:VAL:HA	2.13	0.49
1:A:158:GLU:O	1:A:159:PRO:C	2.55	0.49
1:A:169:GLU:O	1:A:172:LEU:HB3	2.13	0.49
1:A:321:ASP:HB3	1:A:324:GLU:CG	2.42	0.49
1:B:131:ASN:ND2	1:B:228:LYS:O	2.41	0.49
1:B:285:GLU:CD	1:B:285:GLU:H	2.20	0.49
1:B:308:LYS:NZ	1:B:328:LEU:O	2.44	0.49
1:B:284:PRO:C	1:B:286:GLU:H	2.20	0.49
1:B:124:ALA:HB1	1:B:153:TYR:HD2	1.78	0.49
1:C:316:THR:O	1:C:318:LYS:N	2.46	0.49
1:B:321:ASP:HB3	1:B:324:GLU:CG	2.42	0.48
1:C:333:ILE:HD12	1:C:333:ILE:N	2.27	0.48
1:A:301:ARG:HB3	1:A:301:ARG:HH11	1.77	0.48
1:B:301:ARG:HB3	1:B:301:ARG:NH1	2.28	0.48
1:C:301:ARG:HB3	1:C:301:ARG:NH1	2.28	0.48
1:A:275:MET:HE1	1:A:302:LEU:CD1	2.30	0.48
1:B:185:ASN:O	1:B:186:GLU:C	2.57	0.48
1:C:169:GLU:O	1:C:172:LEU:HB3	2.13	0.48
1:C:279:GLU:HA	1:C:279:GLU:OE1	2.12	0.48
1:A:196:ASP:CA	1:A:228:LYS:HD2	2.33	0.48
1:A:253:GLN:C	1:A:255:GLY:H	2.21	0.48
1:B:172:LEU:HD22	1:B:212:VAL:HG21	1.94	0.48
1:B:279:GLU:OE1	1:B:279:GLU:HA	2.13	0.48
1:C:172:LEU:HD22	1:C:212:VAL:HG21	1.94	0.48
1:A:124:ALA:HB1	1:A:153:TYR:HD2	1.78	0.48
1:B:333:ILE:HD12	1:B:333:ILE:N	2.27	0.48
1:A:316:THR:O	1:A:318:LYS:N	2.46	0.48
1:C:106:ASN:HA	1:C:274:LYS:HE2	1.94	0.48
1:A:131:ASN:ND2	1:A:228:LYS:O	2.43	0.48

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:172:LEU:HD22	1:A:212:VAL:HG21	1.95	0.48
1:A:236:ARG:HG3	1:A:240:LYS:HB3	1.95	0.48
1:B:145:HIS:ND1	3:B:502:ADP:H2'	2.29	0.48
1:B:169:GLU:O	1:B:172:LEU:HB3	2.13	0.48
1:B:235:ASP:OD1	1:B:235:ASP:C	2.57	0.48
1:B:253:GLN:C	1:B:255:GLY:H	2.22	0.48
1:C:253:GLN:C	1:C:255:GLY:H	2.20	0.48
1:A:106:ASN:HA	1:A:274:LYS:HE2	1.96	0.48
1:B:168:SER:OG	1:B:203:VAL:HA	2.13	0.48
1:A:301:ARG:HB3	1:A:301:ARG:NH1	2.29	0.48
1:C:284:PRO:C	1:C:286:GLU:H	2.22	0.48
1:B:106:ASN:HA	1:B:274:LYS:HE2	1.95	0.47
1:B:175:LEU:O	1:B:176:VAL:C	2.57	0.47
1:A:168:SER:OG	1:A:203:VAL:HA	2.15	0.47
1:A:315:THR:O	1:A:317:GLY:N	2.48	0.47
1:C:315:THR:O	1:C:317:GLY:N	2.48	0.47
1:B:315:THR:O	1:B:317:GLY:N	2.48	0.47
1:C:124:ALA:HB1	1:C:153:TYR:HD2	1.80	0.47
1:C:321:ASP:HB3	1:C:324:GLU:CG	2.42	0.47
1:A:279:GLU:HA	1:A:279:GLU:OE1	2.14	0.47
1:C:175:LEU:O	1:C:176:VAL:C	2.58	0.47
1:C:196:ASP:CA	1:C:228:LYS:HD2	2.33	0.46
1:B:96:THR:HG22	1:B:96:THR:O	2.16	0.46
1:B:143:LYS:N	3:B:502:ADP:O1B	2.48	0.46
1:B:167:THR:O	1:B:168:SER:C	2.59	0.46
1:A:275:MET:HE2	1:A:306:ILE:HD12	1.97	0.46
1:A:288:LEU:C	1:A:288:LEU:HD23	2.41	0.46
1:B:115:PHE:CG	1:C:122:GLU:HG2	2.51	0.46
1:A:147:LEU:HD22	1:A:233:CYS:SG	2.55	0.46
1:A:235:ASP:OD1	1:A:235:ASP:C	2.58	0.46
1:B:239:GLN:NE2	1:B:253:GLN:NE2	2.63	0.46
1:A:145:HIS:ND1	3:A:501:ADP:H2'	2.31	0.46
1:A:185:ASN:O	1:A:186:GLU:C	2.56	0.46
1:B:145:HIS:C	1:B:145:HIS:CD2	2.94	0.46
1:A:107:PHE:CE1	1:A:146:LEU:HD13	2.50	0.46
1:A:196:ASP:HA	1:A:228:LYS:CD	2.35	0.46
1:A:272:ALA:HB1	1:A:306:ILE:HD11	1.98	0.46
1:B:329:LEU:O	1:B:333:ILE:HD13	2.15	0.46
1:B:133:LEU:HB3	1:B:231:VAL:HG22	1.98	0.46
1:B:288:LEU:C	1:B:288:LEU:HD23	2.41	0.46
1:C:133:LEU:HB3	1:C:231:VAL:HG22	1.97	0.46

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:140:GLY:N	3:C:503:ADP:O2B	2.49	0.45
1:C:329:LEU:O	1:C:333:ILE:HD13	2.17	0.45
1:B:157:ASN:N	1:B:157:ASN:ND2	2.55	0.45
1:B:175:LEU:HD23	1:B:175:LEU:HA	1.77	0.45
1:C:239:GLN:NE2	1:C:253:GLN:NE2	2.63	0.45
1:C:298:ASN:HD22	1:C:300:ARG:N	2.03	0.45
1:A:175:LEU:O	1:A:176:VAL:C	2.57	0.45
1:C:96:THR:O	1:C:96:THR:HG22	2.16	0.45
1:B:107:PHE:CE1	1:B:146:LEU:HD13	2.52	0.45
1:C:301:ARG:HH11	1:C:301:ARG:CB	2.29	0.45
1:A:145:HIS:C	1:A:145:HIS:CD2	2.93	0.45
1:B:301:ARG:HH11	1:B:301:ARG:CB	2.29	0.45
1:C:196:ASP:HA	1:C:228:LYS:CD	2.35	0.45
1:C:235:ASP:OD1	1:C:235:ASP:C	2.58	0.45
1:C:271:ILE:HG23	3:C:503:ADP:C2	2.51	0.45
1:A:251:ARG:O	1:A:254:MET:HG2	2.17	0.45
1:A:301:ARG:HH11	1:A:301:ARG:CB	2.30	0.45
1:C:251:ARG:HE	1:C:254:MET:HE3	1.81	0.45
1:A:143:LYS:N	3:A:501:ADP:O1B	2.50	0.45
1:C:206:LEU:HD23	1:C:216:LEU:HD12	1.99	0.45
1:C:301:ARG:HH21	1:C:335:PRO:HG3	1.82	0.45
1:A:131:ASN:HA	1:A:132:PRO:HA	1.76	0.45
1:C:131:ASN:ND2	1:C:228:LYS:O	2.41	0.45
1:A:96:THR:O	1:A:96:THR:HG22	2.16	0.45
1:A:206:LEU:HD23	1:A:216:LEU:HD12	1.99	0.44
1:A:329:LEU:O	1:A:333:ILE:HD13	2.17	0.44
1:B:236:ARG:NH2	1:B:240:LYS:HG2	2.32	0.44
1:C:288:LEU:C	1:C:288:LEU:HD23	2.42	0.44
1:B:327:LEU:HD12	1:B:330:LYS:HE3	2.00	0.44
1:C:238:PRO:O	1:C:241:LEU:HB2	2.17	0.44
1:C:327:LEU:HD12	1:C:330:LYS:HE3	2.00	0.44
1:A:239:GLN:NE2	1:A:253:GLN:NE2	2.63	0.44
1:B:301:ARG:HH21	1:B:335:PRO:HG3	1.82	0.44
1:C:145:HIS:C	1:C:145:HIS:CD2	2.94	0.44
1:A:133:LEU:HB3	1:A:231:VAL:HG22	1.98	0.44
1:A:238:PRO:O	1:A:241:LEU:HB2	2.17	0.44
1:C:151:GLY:O	1:C:155:VAL:HG23	2.18	0.44
1:C:206:LEU:CD2	1:C:216:LEU:HD12	2.47	0.44
1:B:189:GLU:O	1:B:194:LYS:HG3	2.18	0.44
1:B:251:ARG:O	1:B:254:MET:HG2	2.17	0.44
1:C:147:LEU:HD22	1:C:233:CYS:SG	2.57	0.44

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:236:ARG:NH2	1:C:240:LYS:HG2	2.32	0.44
1:A:175:LEU:HA	1:A:175:LEU:HD23	1.77	0.44
1:C:272:ALA:HB1	1:C:306:ILE:HD11	2.00	0.44
1:A:206:LEU:CD2	1:A:216:LEU:HD12	2.47	0.44
1:B:104:PHE:CZ	1:B:121:LEU:HA	2.53	0.44
1:A:167:THR:O	1:A:168:SER:C	2.60	0.43
1:A:236:ARG:NH2	1:A:240:LYS:HG2	2.33	0.43
1:B:298:ASN:ND2	1:B:300:ARG:N	2.63	0.43
1:B:206:LEU:CD2	1:B:216:LEU:HD12	2.48	0.43
1:B:220:PHE:CE2	1:B:251:ARG:HD3	2.53	0.43
1:C:136:TYR:OH	1:C:259:LYS:HD2	2.19	0.43
1:C:157:ASN:N	1:C:157:ASN:ND2	2.54	0.43
1:C:167:THR:O	1:C:168:SER:C	2.61	0.43
1:A:220:PHE:CE2	1:A:251:ARG:HD3	2.53	0.43
1:A:301:ARG:HH21	1:A:335:PRO:HG3	1.81	0.43
1:A:327:LEU:HD12	1:A:330:LYS:HE3	2.00	0.43
1:B:123:VAL:CG2	1:B:133:LEU:HD22	2.44	0.43
1:B:272:ALA:HB1	1:B:306:ILE:HD11	1.99	0.43
1:A:136:TYR:OH	1:A:259:LYS:HD2	2.19	0.43
1:A:251:ARG:HE	1:A:254:MET:HE3	1.80	0.43
1:B:134:PHE:CE1	1:B:238:PRO:HD3	2.54	0.43
1:B:158:GLU:HB3	1:B:161:LEU:HD12	2.00	0.43
1:B:319:GLU:CD	1:B:320:VAL:H	2.26	0.43
1:C:220:PHE:CE2	1:C:251:ARG:HD3	2.54	0.43
1:A:298:ASN:ND2	1:A:300:ARG:N	2.64	0.43
1:B:206:LEU:HD23	1:B:216:LEU:HD12	2.00	0.43
1:B:265:GLU:CD	1:B:293:GLU:HG2	2.44	0.43
1:C:99:ASN:HA	1:C:100:PRO:HD3	1.88	0.43
1:A:158:GLU:HB3	1:A:161:LEU:HD12	2.01	0.43
1:A:189:GLU:O	1:A:194:LYS:HG3	2.19	0.43
1:C:144:THR:HG23	1:C:201:ASP:OD2	2.19	0.43
1:A:104:PHE:CZ	1:A:121:LEU:HA	2.54	0.42
1:A:300:ARG:HG3	1:A:300:ARG:HH11	1.84	0.42
1:A:319:GLU:CD	1:A:320:VAL:H	2.26	0.42
1:A:275:MET:HE1	1:A:302:LEU:HB3	2.01	0.42
1:B:238:PRO:O	1:B:241:LEU:HB2	2.19	0.42
1:B:275:MET:HE2	1:B:306:ILE:HD12	2.00	0.42
1:C:104:PHE:CZ	1:C:121:LEU:HA	2.54	0.42
1:A:134:PHE:CE1	1:A:238:PRO:HD3	2.54	0.42
1:B:251:ARG:HE	1:B:254:MET:HE3	1.82	0.42
1:A:265:GLU:CD	1:A:293:GLU:HG2	2.45	0.42

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:151:GLY:O	1:A:155:VAL:HG23	2.20	0.42
1:B:136:TYR:OH	1:B:259:LYS:HD2	2.20	0.42
1:C:265:GLU:CD	1:C:293:GLU:HG2	2.45	0.42
1:B:300:ARG:HG3	1:B:300:ARG:HH11	1.85	0.42
1:C:313:LYS:CG	1:C:320:VAL:HG23	2.49	0.42
1:B:140:GLY:HA3	1:B:298:ASN:HB2	2.00	0.42
1:C:175:LEU:HA	1:C:175:LEU:HD23	1.76	0.42
1:C:275:MET:HE2	1:C:306:ILE:HD12	2.01	0.42
1:A:214:THR:O	1:A:217:PHE:HB3	2.20	0.42
1:B:151:GLY:O	1:B:155:VAL:HG23	2.20	0.42
1:C:113:ASN:ND2	1:C:113:ASN:N	2.67	0.42
1:B:161:LEU:HD23	1:B:161:LEU:HA	1.90	0.42
1:C:319:GLU:CD	1:C:320:VAL:H	2.27	0.42
1:B:321:ASP:O	1:B:322:LEU:C	2.63	0.41
1:C:131:ASN:HA	1:C:132:PRO:HA	1.76	0.41
1:A:301:ARG:NH2	1:A:332:PHE:HA	2.29	0.41
1:B:177:ASP:O	1:B:178:SER:C	2.64	0.41
1:B:214:THR:O	1:B:217:PHE:HB3	2.20	0.41
1:B:184:LEU:O	1:B:184:LEU:HD13	2.20	0.41
1:B:298:ASN:HD22	1:B:300:ARG:N	2.01	0.41
1:A:140:GLY:HA3	1:A:298:ASN:HB2	2.03	0.41
1:C:140:GLY:HA3	1:C:298:ASN:HB2	2.03	0.41
1:C:275:MET:HE1	1:C:302:LEU:HB3	2.00	0.41
1:A:217:PHE:O	1:A:220:PHE:HB3	2.20	0.41
1:C:140:GLY:HA2	3:C:503:ADP:O3A	2.21	0.41
1:A:289:ASN:O	1:A:290:PHE:C	2.63	0.41
1:B:131:ASN:HA	1:B:132:PRO:HA	1.77	0.41
1:B:183:LYS:HD3	1:B:185:ASN:H	1.86	0.41
1:B:122:GLU:CD	1:C:115:PHE:HB2	2.46	0.41
1:C:251:ARG:O	1:C:254:MET:HG2	2.21	0.41
1:A:237:GLU:O	1:A:238:PRO:C	2.64	0.40
1:A:108:VAL:HB	1:A:271:ILE:HG12	2.04	0.40
1:A:113:ASN:ND2	1:A:113:ASN:C	2.78	0.40
1:C:214:THR:O	1:C:217:PHE:HB3	2.21	0.40
1:A:113:ASN:HD22	1:A:114:SER:N	2.19	0.40
1:C:158:GLU:HB3	1:C:161:LEU:HD12	2.03	0.40
1:C:300:ARG:HG3	1:C:300:ARG:HH11	1.87	0.40
1:A:290:PHE:CZ	1:A:326:ILE:HG12	2.56	0.40
1:B:99:ASN:HA	1:B:100:PRO:HD3	1.89	0.40
1:C:318:LYS:CG	1:C:319:GLU:N	2.60	0.40

There are no symmetry-related clashes.

5.3 Torsion angles

5.3.1 Protein backbone

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	238/440 (54%)	203 (85%)	26 (11%)	9 (4%)	2	12
1	B	238/440 (54%)	201 (84%)	29 (12%)	8 (3%)	3	13
1	C	238/440 (54%)	204 (86%)	26 (11%)	8 (3%)	3	13
All	All	714/1320 (54%)	608 (85%)	81 (11%)	25 (4%)	3	13

All (25) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	318	LYS
1	B	318	LYS
1	C	318	LYS
1	A	254	MET
1	A	285	GLU
1	A	317	GLY
1	B	254	MET
1	B	285	GLU
1	B	317	GLY
1	C	254	MET
1	C	285	GLU
1	C	317	GLY
1	A	202	ASP
1	A	297	ASP
1	B	202	ASP
1	B	297	ASP
1	C	202	ASP
1	C	297	ASP
1	A	159	PRO
1	B	159	PRO
1	C	159	PRO
1	C	240	LYS
1	A	102	TYR
1	A	240	LYS

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	B	240	LYS

5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	215/395 (54%)	189 (88%)	26 (12%)	5	17
1	B	215/395 (54%)	190 (88%)	25 (12%)	5	19
1	C	215/395 (54%)	189 (88%)	26 (12%)	5	17
All	All	645/1185 (54%)	568 (88%)	77 (12%)	5	18

All (77) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	113	ASN
1	A	132	PRO
1	A	139	VAL
1	A	157	ASN
1	A	160	ASP
1	A	172	LEU
1	A	175	LEU
1	A	176	VAL
1	A	177	ASP
1	A	178	SER
1	A	183	LYS
1	A	184	LEU
1	A	197	ILE
1	A	198	LEU
1	A	203	VAL
1	A	204	GLN
1	A	210	THR
1	A	216	LEU
1	A	236	ARG
1	A	244	PHE
1	A	248	LEU

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	A	275	MET
1	A	285	GLU
1	A	286	GLU
1	A	302	LEU
1	A	319	GLU
1	B	113	ASN
1	B	132	PRO
1	B	139	VAL
1	B	157	ASN
1	B	160	ASP
1	B	172	LEU
1	B	175	LEU
1	B	176	VAL
1	B	177	ASP
1	B	178	SER
1	B	183	LYS
1	B	184	LEU
1	B	197	ILE
1	B	198	LEU
1	B	203	VAL
1	B	210	THR
1	B	216	LEU
1	B	236	ARG
1	B	244	PHE
1	B	248	LEU
1	B	275	MET
1	B	285	GLU
1	B	286	GLU
1	B	302	LEU
1	B	319	GLU
1	C	113	ASN
1	C	132	PRO
1	C	139	VAL
1	C	157	ASN
1	C	160	ASP
1	C	172	LEU
1	C	175	LEU
1	C	176	VAL
1	C	177	ASP
1	C	178	SER
1	C	183	LYS
1	C	184	LEU

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	C	197	ILE
1	C	198	LEU
1	C	203	VAL
1	C	204	GLN
1	C	210	THR
1	C	216	LEU
1	C	236	ARG
1	C	244	PHE
1	C	248	LEU
1	C	275	MET
1	C	285	GLU
1	C	286	GLU
1	C	302	LEU
1	C	319	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (22) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	113	ASN
1	A	118	HIS
1	A	157	ASN
1	A	204	GLN
1	A	239	GLN
1	A	253	GLN
1	A	298	ASN
1	B	113	ASN
1	B	118	HIS
1	B	157	ASN
1	B	185	ASN
1	B	204	GLN
1	B	239	GLN
1	B	253	GLN
1	B	298	ASN
1	C	113	ASN
1	C	118	HIS
1	C	157	ASN
1	C	204	GLN
1	C	239	GLN
1	C	253	GLN
1	C	298	ASN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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 oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 6 ligands modelled in this entry, 3 are monoatomic - leaving 3 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# $ Z > 2$	Counts	RMSZ	# $ Z > 2$
3	ADP	B	502	2	28,29,29	1.21	5 (17%)	43,45,45	1.87	10 (23%)
3	ADP	A	501	-	28,29,29	1.26	3 (10%)	43,45,45	1.93	10 (23%)
3	ADP	C	503	2	28,29,29	1.17	2 (7%)	43,45,45	1.95	11 (25%)

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	B	502	2	-	0/16/32/32	0/3/3/3
3	ADP	A	501	-	-	0/16/32/32	0/3/3/3
3	ADP	C	503	2	-	0/16/32/32	0/3/3/3

All (10) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	501	ADP	PA-O3A	3.60	1.63	1.59
3	C	503	ADP	PA-O3A	2.99	1.62	1.59
3	B	502	ADP	C5-N7	-2.51	1.34	1.39
3	B	502	ADP	PA-O3A	2.49	1.62	1.59
3	C	503	ADP	C5-N7	-2.41	1.34	1.39
3	A	501	ADP	C5-N7	-2.39	1.34	1.39
3	A	501	ADP	PB-O3B	2.34	1.63	1.54
3	B	502	ADP	PB-O3B	2.14	1.62	1.54
3	B	502	ADP	C6-N6	2.08	1.39	1.34
3	B	502	ADP	C5-C4	2.02	1.42	1.39

All (31) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	C	503	ADP	C5-C4-N3	-5.35	119.35	126.72
3	A	501	ADP	C5-C4-N3	-5.26	119.47	126.72
3	B	502	ADP	C5-C4-N3	-5.04	119.78	126.72
3	C	503	ADP	N3-C2-N1	-4.64	121.55	128.58
3	B	502	ADP	N3-C2-N1	-4.61	121.60	128.58
3	A	501	ADP	N3-C2-N1	-4.61	121.61	128.58
3	C	503	ADP	N3-C4-N9	4.47	134.77	127.17
3	B	502	ADP	N3-C4-N9	4.37	134.60	127.17
3	A	501	ADP	N3-C4-N9	4.34	134.55	127.17
3	A	501	ADP	C2-N3-C4	3.91	121.38	111.83
3	C	503	ADP	C2-N3-C4	3.85	121.23	111.83
3	B	502	ADP	C2-N3-C4	3.70	120.88	111.83
3	A	501	ADP	C5-N7-C8	3.60	109.11	103.45
3	C	503	ADP	C5-N7-C8	3.59	109.09	103.45
3	B	502	ADP	C5-N7-C8	3.33	108.68	103.45
3	A	501	ADP	O4'-C4'-C3'	3.03	111.18	105.15
3	C	503	ADP	O4'-C4'-C3'	2.92	110.96	105.15
3	C	503	ADP	PA-O5'-C5'	-2.92	104.62	121.35
3	B	502	ADP	O4'-C4'-C3'	2.91	110.94	105.15
3	A	501	ADP	C4-C5-N7	-2.91	107.26	110.58
3	C	503	ADP	C4-C5-N7	-2.83	107.34	110.58
3	C	503	ADP	C5'-C4'-C3'	-2.75	105.32	115.21
3	A	501	ADP	PA-O5'-C5'	-2.65	106.17	121.35
3	B	502	ADP	PA-O5'-C5'	-2.62	106.31	121.35
3	B	502	ADP	C4-C5-N7	-2.57	107.64	110.58
3	B	502	ADP	C5'-C4'-C3'	-2.56	105.99	115.21
3	A	501	ADP	C5'-C4'-C3'	-2.50	106.21	115.21
3	A	501	ADP	N9-C8-N7	-2.32	110.65	113.94
3	C	503	ADP	N9-C8-N7	-2.21	110.81	113.94

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	502	ADP	N9-C8-N7	-2.12	110.93	113.94
3	C	503	ADP	C3'-C2'-C1'	2.10	105.44	101.46

There are no chirality outliers.

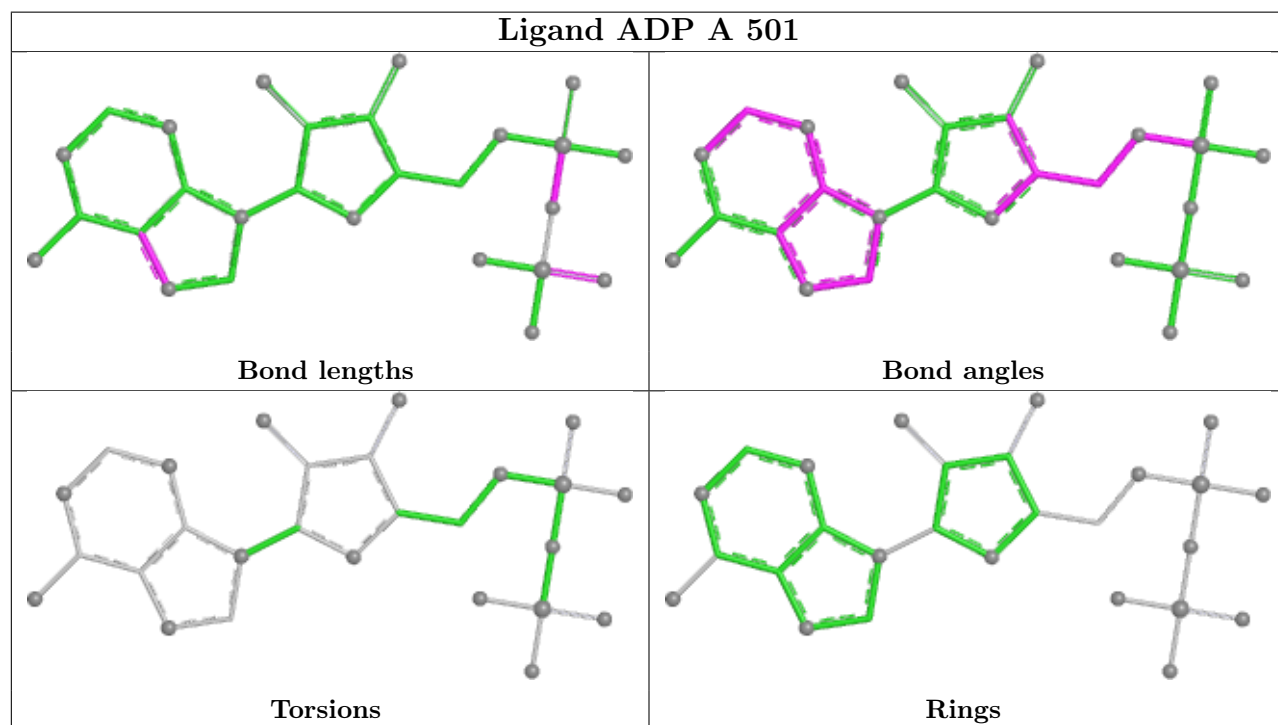
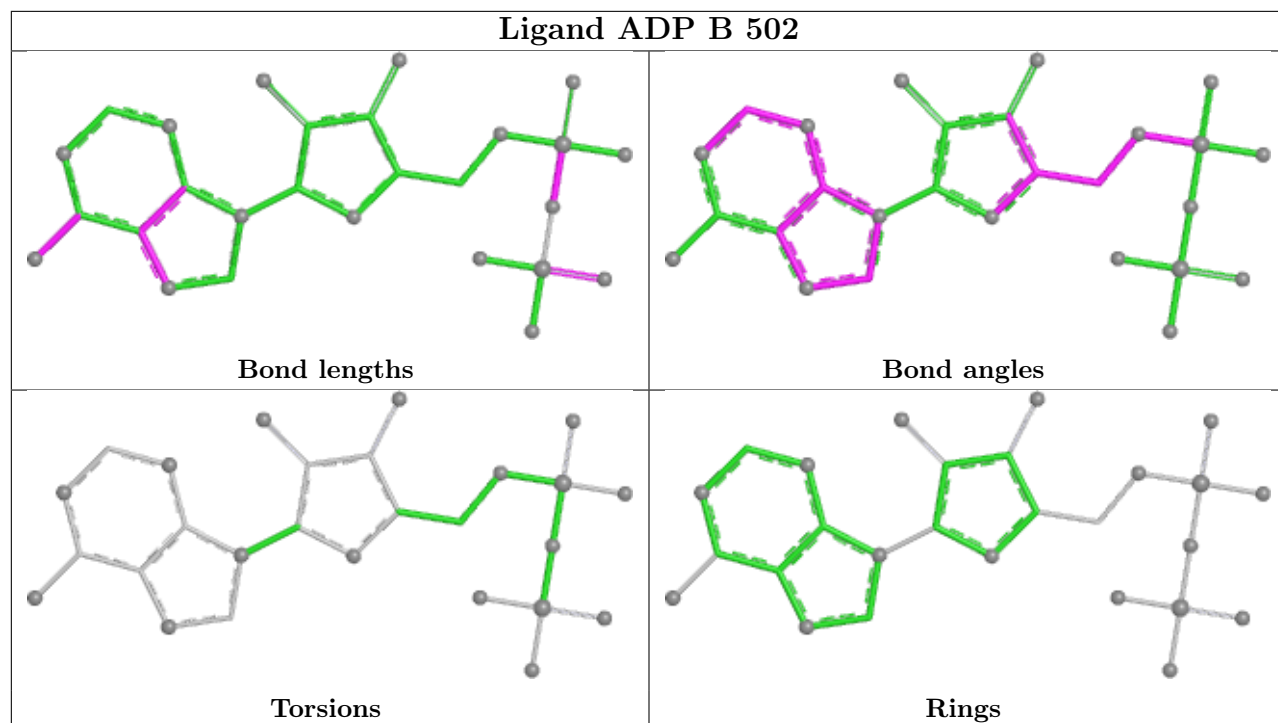
There are no torsion outliers.

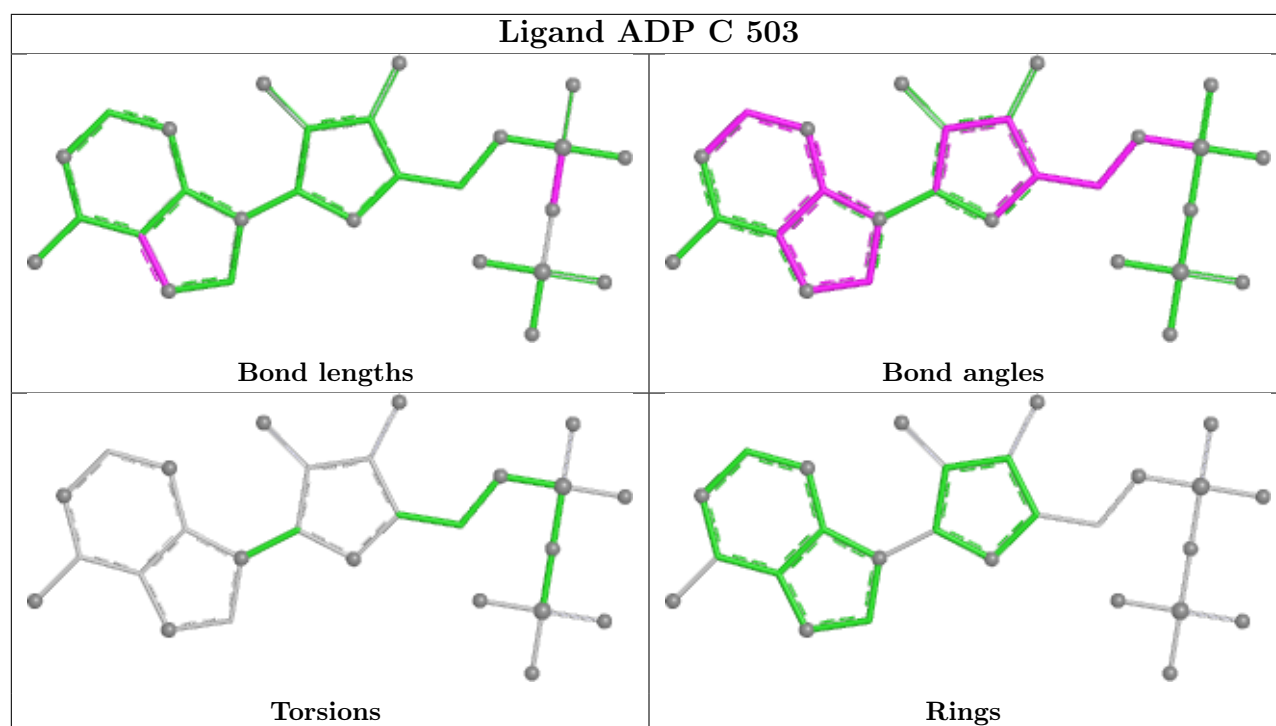
There are no ring outliers.

3 monomers are involved in 9 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	B	502	ADP	2	0
3	A	501	ADP	3	0
3	C	503	ADP	4	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	240/440 (54%)	-1.05	0 100 100	27, 64, 106, 138	0
1	B	240/440 (54%)	-0.99	0 100 100	30, 67, 109, 154	0
1	C	240/440 (54%)	-1.01	0 100 100	25, 66, 104, 149	0
All	All	720/1320 (54%)	-1.01	0 100 100	25, 66, 106, 154	0

There are no RSRZ outliers to report.

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](#)

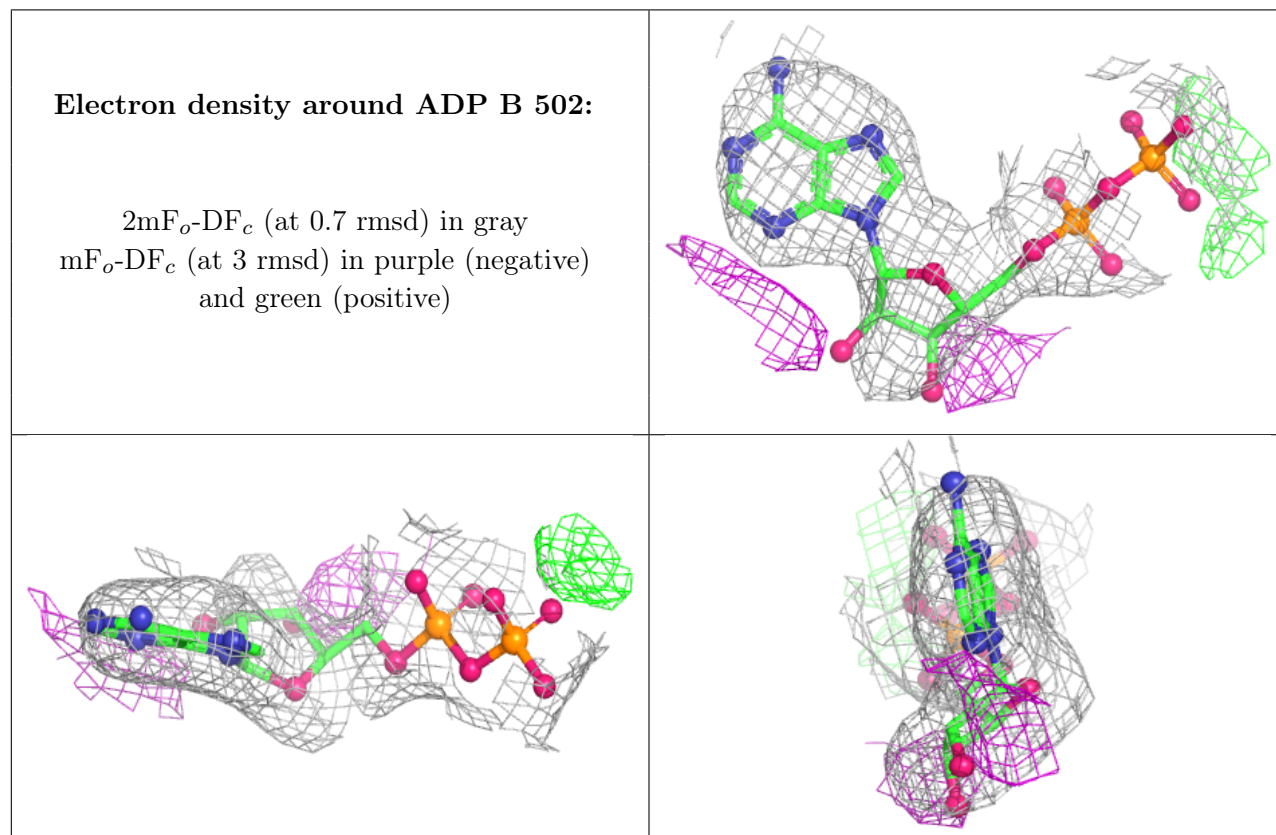
There are no oligosaccharides in this entry.

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.

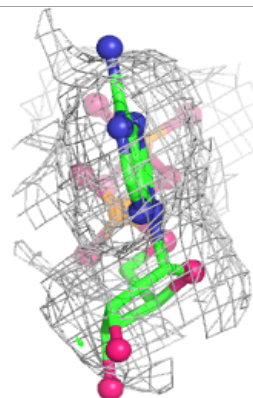
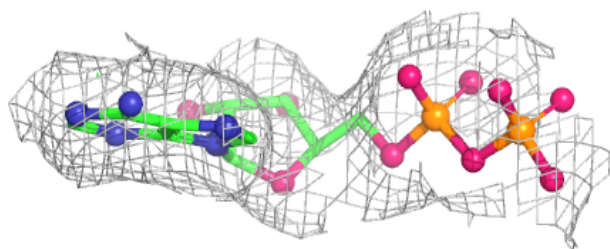
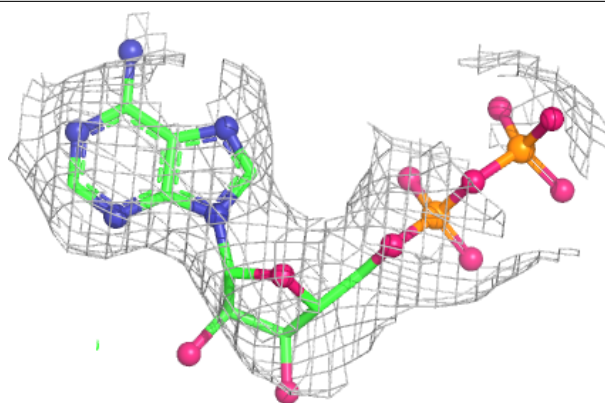
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
2	MG	C	502	1/1	0.98	0.09	48,48,48,48	0
2	MG	B	501	1/1	0.99	0.11	45,45,45,45	0
2	MG	A	500	1/1	0.99	0.09	45,45,45,45	0
3	ADP	B	502	27/27	0.99	0.05	43,51,57,64	0
3	ADP	C	503	27/27	0.99	0.03	47,63,68,75	0
3	ADP	A	501	27/27	1.00	0.04	40,61,67,73	0

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.

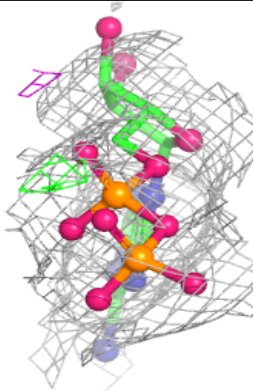
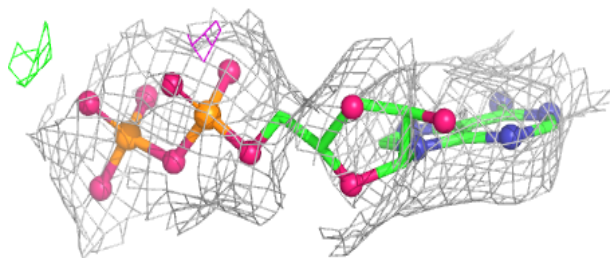
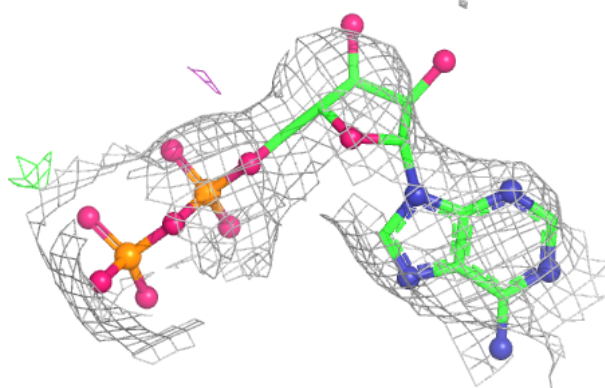


Electron density around ADP C 503:

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

**Electron density around ADP A 501:**

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



6.5 Other polymers ⓘ

There are no such residues in this entry.