



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 8, 2026 – 09:55 AM UTC

PDB ID : 1ZTH / pdb_00001zth
Title : Crystal Structure of A.fulgidus Rio1 serine protein kinase bound to ADP and Manganese ion
Authors : Wlodawer, A.; LaRonde-LeBlanc, N.
Deposited on : 2005-05-27
Resolution : 1.89 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

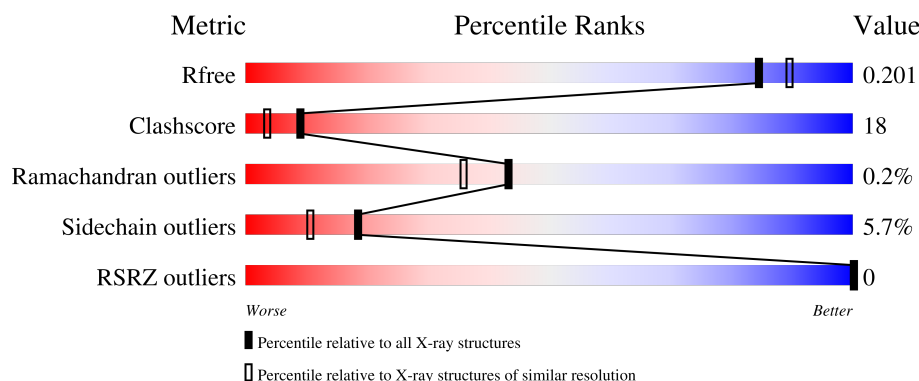
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

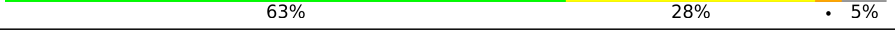
The reported resolution of this entry is 1.89 Å.

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	7789 (1.90-1.90)
Clashscore	190562	8410 (1.90-1.90)
Ramachandran outliers	187476	8333 (1.90-1.90)
Sidechain outliers	187428	8333 (1.90-1.90)
RSRZ outliers	180081	7790 (1.90-1.90)

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	258	 67% 24% • 5%
1	B	258	 74% 16% • 7%
1	C	258	 69% 21% • 7%
1	D	258	 63% 28% • 5%

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 8764 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 Rio1 serine protein kinase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	245	Total	C	N	O	Se	0	0	0
			1974	1270	321	373	10			
1	B	241	Total	C	N	O	Se	0	0	0
			1951	1259	316	368	8			
1	C	241	Total	C	N	O	Se	0	0	0
			1930	1243	313	365	9			
1	D	244	Total	C	N	O	Se	0	0	0
			1975	1276	319	371	9			

There are 44 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	1	MSE	MET	modified residue	GB 11499392
A	51	MSE	MET	modified residue	GB 11499392
A	77	MSE	MET	modified residue	GB 11499392
A	92	MSE	MET	modified residue	GB 11499392
A	104	MSE	MET	modified residue	GB 11499392
A	141	MSE	MET	modified residue	GB 11499392
A	147	MSE	MET	modified residue	GB 11499392
A	203	MSE	MET	modified residue	GB 11499392
A	213	MSE	MET	modified residue	GB 11499392
A	223	MSE	MET	modified residue	GB 11499392
A	251	MSE	MET	modified residue	GB 11499392
B	1	MSE	MET	modified residue	GB 11499392
B	51	MSE	MET	modified residue	GB 11499392
B	77	MSE	MET	modified residue	GB 11499392
B	92	MSE	MET	modified residue	GB 11499392
B	104	MSE	MET	modified residue	GB 11499392
B	141	MSE	MET	modified residue	GB 11499392
B	147	MSE	MET	modified residue	GB 11499392
B	203	MSE	MET	modified residue	GB 11499392
B	213	MSE	MET	modified residue	GB 11499392
B	223	MSE	MET	modified residue	GB 11499392

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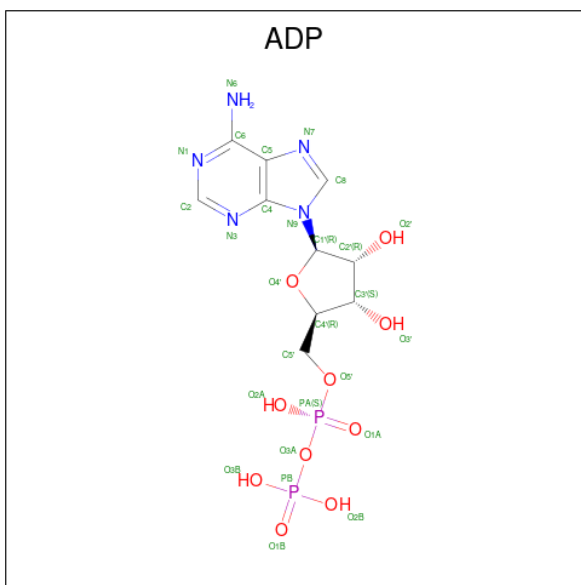
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Chain	Residue	Modelled	Actual	Comment	Reference
B	251	MSE	MET	modified residue	GB 11499392
C	1	MSE	MET	modified residue	GB 11499392
C	51	MSE	MET	modified residue	GB 11499392
C	77	MSE	MET	modified residue	GB 11499392
C	92	MSE	MET	modified residue	GB 11499392
C	104	MSE	MET	modified residue	GB 11499392
C	141	MSE	MET	modified residue	GB 11499392
C	147	MSE	MET	modified residue	GB 11499392
C	203	MSE	MET	modified residue	GB 11499392
C	213	MSE	MET	modified residue	GB 11499392
C	223	MSE	MET	modified residue	GB 11499392
C	251	MSE	MET	modified residue	GB 11499392
D	1	MSE	MET	modified residue	GB 11499392
D	51	MSE	MET	modified residue	GB 11499392
D	77	MSE	MET	modified residue	GB 11499392
D	92	MSE	MET	modified residue	GB 11499392
D	104	MSE	MET	modified residue	GB 11499392
D	141	MSE	MET	modified residue	GB 11499392
D	147	MSE	MET	modified residue	GB 11499392
D	203	MSE	MET	modified residue	GB 11499392
D	213	MSE	MET	modified residue	GB 11499392
D	223	MSE	MET	modified residue	GB 11499392
D	251	MSE	MET	modified residue	GB 11499392

- Molecule 2 is MANGANESE (II) ION (CCD ID: MN) (formula: Mn).

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

- 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
3	D	1	Total 27	C 10	N 5	O 10	P 2	0	0

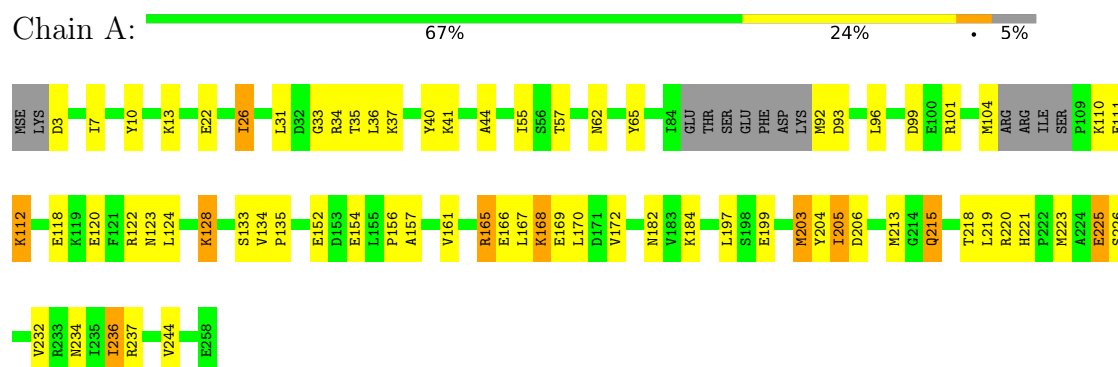
- Molecule 4 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	204	Total O 204 204	0	0
4	B	240	Total O 240 240	0	0
4	C	199	Total O 199 199	0	0
4	D	179	Total O 179 179	0	0

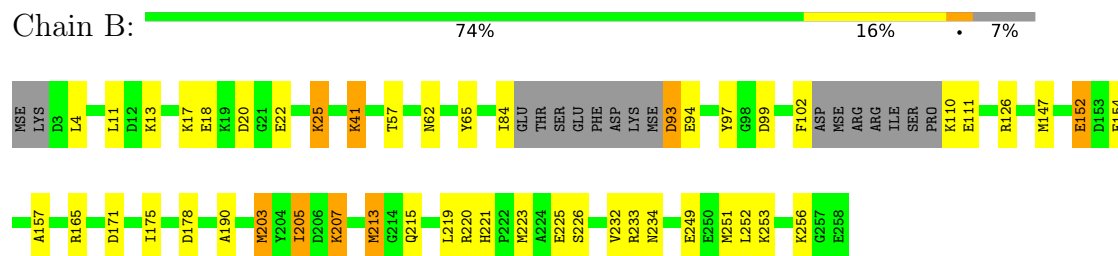
3 Residue-property plots [i](#)

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.

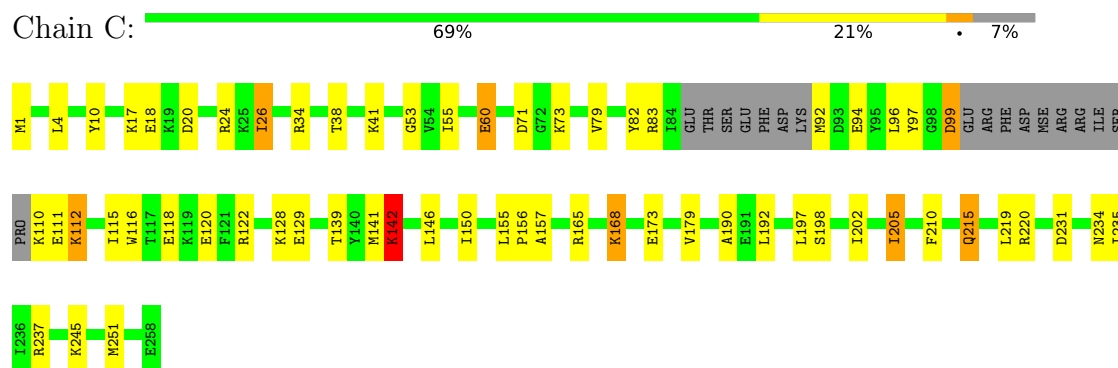
- Molecule 1: Rio1 serine protein kinase



- Molecule 1: Rio1 serine protein kinase

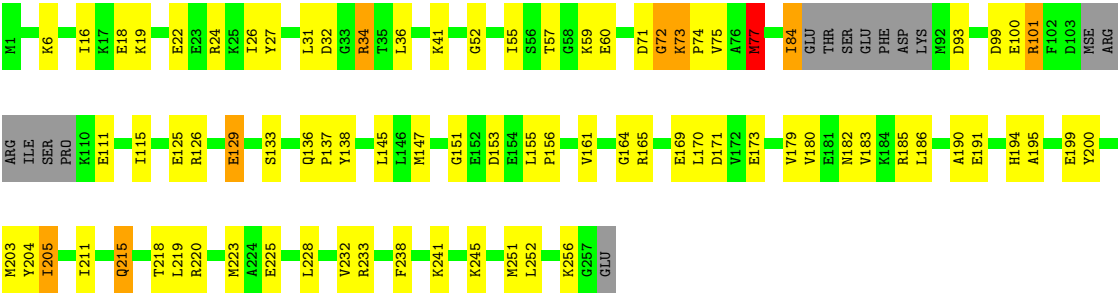


- Molecule 1: Rio1 serine protein kinase



- Molecule 1: Rio1 serine protein kinase

Chain D: 63% 28% 5%



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	53.41Å 80.08Å 121.06Å 90.00° 90.17° 90.00°	Depositor
Resolution (Å)	30.00 – 1.89 30.00 – 1.89	Depositor EDS
% Data completeness (in resolution range)	96.1 (30.00-1.89) 95.2 (30.00-1.89)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.15	Depositor
$\langle I/\sigma(I) \rangle$ ¹	3.29 (at 1.89Å)	Xtriage
Refinement program	REFMAC 5.2.0005	Depositor
R, R_{free}	0.189 , 0.262 (Not available) , 0.201	Depositor DCC
R_{free} test set	3935 reflections (4.82%)	wwPDB-VP
Wilson B-factor (Å ²)	25.8	Xtriage
Anisotropy	0.096	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.35 , 42.7	EDS
L-test for twinning ²	$\langle L \rangle = 0.44$, $\langle L^2 \rangle = 0.26$	Xtriage
Estimated twinning fraction	0.266 for h,-k,-l	Xtriage
F_o, F_c correlation	0.97	EDS
Total number of atoms	8764	wwPDB-VP
Average B, all atoms (Å ²)	30.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 8.60% 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: ADP, MN

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	0.98	3/1998 (0.2%)	1.03	4/2668 (0.1%)
1	B	0.93	2/1977 (0.1%)	1.00	1/2644 (0.0%)
1	C	0.85	0/1954	1.02	7/2614 (0.3%)
1	D	0.85	1/2001 (0.0%)	1.00	1/2673 (0.0%)
All	All	0.90	6/7930 (0.1%)	1.02	13/10599 (0.1%)

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

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

All (6) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	226	SER	C-O	10.89	1.37	1.24
1	B	203	MSE	SE-CE	-9.35	1.67	1.95
1	B	213	MSE	SE-CE	6.47	2.14	1.95
1	A	203	MSE	SE-CE	-6.41	1.76	1.95
1	D	77	MSE	SE-CE	-6.15	1.77	1.95
1	A	134	VAL	CA-CB	5.89	1.61	1.54

All (13) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	71	ASP	N-CA-C	-5.96	104.61	112.24
1	B	178	ASP	N-CA-C	-5.92	104.83	111.28
1	A	135	PRO	CB-CA-C	-5.44	104.88	111.46

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	93	ASP	N-CA-C	5.44	117.97	111.71
1	C	142	LYS	CB-CA-C	-5.40	109.88	117.23
1	C	179	VAL	CB-CA-C	-5.38	104.88	112.14
1	A	120	GLU	N-CA-C	-5.35	105.35	111.07
1	C	53	GLY	N-CA-C	5.30	118.03	111.93
1	C	115	ILE	CB-CA-C	-5.24	104.99	112.22
1	C	190	ALA	N-CA-C	-5.16	106.83	113.23
1	C	26	ILE	CB-CA-C	-5.11	105.42	111.81
1	A	244	VAL	CB-CA-C	-5.09	104.80	110.96
1	A	93	ASP	N-CA-C	5.08	117.21	111.02

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	D	204	TYR	Mainchain
1	D	72	GLY	Peptide

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	1974	0	1957	72	0
1	B	1951	0	1938	53	0
1	C	1930	0	1917	69	0
1	D	1975	0	1976	96	0
2	A	1	0	0	0	0
2	B	1	0	0	0	0
2	C	1	0	0	0	0
2	D	1	0	0	0	0
3	A	27	0	12	0	0
3	B	27	0	12	2	0
3	C	27	0	12	0	0
3	D	27	0	12	0	0
4	A	204	0	0	26	0
4	B	240	0	0	25	0
4	C	199	0	0	28	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	D	179	0	0	31	0
All	All	8764	0	7836	291	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 18.

All (291) 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:B:213:MSE:SE	1:B:213:MSE:CE	2.14	1.44
1:D:223:MSE:HG3	4:D:939:HOH:O	1.45	1.14
1:C:237:ARG:HD3	4:C:999:HOH:O	1.50	1.12
1:C:1:MSE:HA	4:C:1021:HOH:O	1.49	1.12
1:D:225:GLU:HG3	4:D:1040:HOH:O	1.51	1.10
3:B:903:ADP:H2'	4:B:1008:HOH:O	1.52	1.09
1:D:84:ILE:HG21	4:D:990:HOH:O	1.52	1.09
1:D:161:VAL:CG1	1:D:199:GLU:HG3	1.84	1.07
1:D:18:GLU:HB3	4:D:981:HOH:O	1.54	1.04
1:A:37:LYS:HD2	4:A:1000:HOH:O	1.61	1.00
1:A:218:THR:HG22	1:A:220:ARG:H	1.27	1.00
1:B:221:HIS:HD2	1:B:223:MSE:H	1.10	0.97
1:B:18:GLU:HB2	4:B:1118:HOH:O	1.65	0.94
1:D:73:LYS:HB2	1:D:74:PRO:HD2	1.49	0.94
1:D:218:THR:HG22	1:D:220:ARG:H	1.33	0.93
1:C:197:LEU:HD11	1:C:202:ILE:HD11	1.49	0.91
1:A:166:GLU:HG3	4:A:965:HOH:O	1.70	0.91
1:B:252:LEU:HG	1:B:256:LYS:HE2	1.53	0.90
1:D:145:LEU:HD11	4:D:1046:HOH:O	1.71	0.90
1:D:99:ASP:OD2	1:D:101:ARG:HD3	1.72	0.89
1:B:110:LYS:HB2	4:B:1133:HOH:O	1.71	0.89
1:A:161:VAL:HG13	1:A:199:GLU:CG	2.03	0.88
1:B:110:LYS:HG2	1:B:111:GLU:N	1.86	0.87
1:D:22:GLU:O	1:D:26:ILE:HD13	1.74	0.87
1:A:161:VAL:HG13	1:A:199:GLU:HG3	1.57	0.87
1:C:110:LYS:HG2	4:C:938:HOH:O	1.76	0.85
1:D:161:VAL:HG12	1:D:199:GLU:HG3	1.57	0.85
1:C:197:LEU:CD1	1:C:202:ILE:HD11	2.06	0.85
1:D:161:VAL:CG1	1:D:199:GLU:CG	2.54	0.85
1:A:111:GLU:HG2	4:A:1060:HOH:O	1.78	0.84
1:A:218:THR:HB	4:A:913:HOH:O	1.78	0.83
1:D:22:GLU:O	1:D:26:ILE:CD1	2.27	0.83

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:251:MSE:HE3	1:D:251:MSE:HA	1.61	0.82
1:D:238:PHE:HE1	4:D:928:HOH:O	1.63	0.82
1:D:99:ASP:OD2	1:D:101:ARG:CD	2.27	0.81
1:A:157:ALA:O	1:A:203:MSE:HE2	1.80	0.81
1:B:4:LEU:HD22	1:B:4:LEU:H	1.45	0.81
1:A:44:ALA:HB2	4:A:1039:HOH:O	1.80	0.81
1:B:110:LYS:HG2	1:B:111:GLU:H	1.46	0.81
1:B:221:HIS:CD2	1:B:223:MSE:H	1.97	0.80
1:D:164:GLY:HA2	4:D:1045:HOH:O	1.82	0.80
1:B:99:ASP:HB3	4:B:1114:HOH:O	1.82	0.80
1:D:34:ARG:HG3	4:D:990:HOH:O	1.82	0.80
1:A:161:VAL:CG1	1:A:199:GLU:HG3	2.12	0.80
1:B:17:LYS:HE2	4:B:1018:HOH:O	1.81	0.80
1:D:73:LYS:HB2	1:D:74:PRO:CD	2.11	0.79
1:A:169:GLU:HB2	4:A:965:HOH:O	1.82	0.79
1:D:223:MSE:HE2	4:D:939:HOH:O	1.82	0.79
1:C:92:MSE:HE2	1:C:96:LEU:HD11	1.64	0.79
1:A:123:ASN:HB2	4:A:1023:HOH:O	1.81	0.78
1:D:161:VAL:HG13	1:D:199:GLU:CG	2.13	0.78
1:C:202:ILE:HD12	1:C:210:PHE:CD2	2.17	0.78
1:D:180:VAL:HG11	1:D:251:MSE:CE	2.13	0.78
1:D:75:VAL:CG2	1:D:77:MSE:HE3	2.14	0.77
1:A:213:MSE:CB	4:A:1023:HOH:O	2.33	0.76
1:C:18:GLU:HA	1:C:24:ARG:HD2	1.67	0.76
1:C:234:ASN:ND2	1:C:237:ARG:HH22	1.83	0.76
1:B:84:ILE:HD12	4:B:1045:HOH:O	1.85	0.76
1:A:213:MSE:HB2	4:A:1023:HOH:O	1.84	0.76
1:B:25:LYS:HD2	4:B:942:HOH:O	1.85	0.75
1:A:99:ASP:HB2	4:A:1042:HOH:O	1.86	0.74
1:D:59:LYS:HE2	1:D:60:GLU:OE2	1.88	0.74
1:D:75:VAL:HG23	1:D:77:MSE:HE3	1.70	0.73
1:A:221:HIS:HD2	1:A:223:MSE:H	1.34	0.72
1:C:251:MSE:SE	4:C:1086:HOH:O	2.56	0.72
1:C:150:ILE:HG22	1:C:205:ILE:HD11	1.71	0.72
1:B:93:ASP:HB3	1:B:97:TYR:CD2	2.25	0.71
1:C:17:LYS:CB	4:C:1053:HOH:O	2.37	0.71
1:A:101:ARG:HH22	1:A:123:ASN:HD21	1.37	0.71
1:B:249:GLU:OE2	1:B:253:LYS:NZ	2.24	0.70
1:D:203:MSE:HE2	1:D:211:ILE:HD13	1.73	0.70
1:A:205:ILE:O	1:A:206:ASP:HB3	1.90	0.69
1:C:92:MSE:CE	1:C:96:LEU:HD11	2.22	0.69

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:180:VAL:HG11	1:D:251:MSE:HE1	1.73	0.69
1:D:126:ARG:O	1:D:129:GLU:HG3	1.93	0.68
1:D:59:LYS:HE3	4:D:1064:HOH:O	1.94	0.68
1:D:32:ASP:OD2	1:D:84:ILE:HD12	1.94	0.68
1:D:165:ARG:NH1	4:D:1083:HOH:O	2.26	0.68
1:A:133:SER:H	1:A:182:ASN:ND2	1.93	0.67
1:D:161:VAL:HG13	1:D:199:GLU:CB	2.25	0.67
1:B:110:LYS:CG	1:B:111:GLU:H	2.07	0.67
1:A:157:ALA:O	1:A:203:MSE:CE	2.44	0.66
1:D:16:ILE:HG22	1:D:24:ARG:HG3	1.77	0.66
1:A:218:THR:HG22	1:A:220:ARG:N	2.07	0.66
1:C:150:ILE:CG2	1:C:205:ILE:HD11	2.24	0.66
1:A:7:ILE:HG23	1:A:36:LEU:CD1	2.25	0.66
1:B:207:LYS:NZ	4:B:1057:HOH:O	2.28	0.66
3:B:903:ADP:C2'	4:B:1008:HOH:O	2.21	0.66
1:B:220:ARG:NH2	4:B:1016:HOH:O	2.29	0.65
1:B:20:ASP:CB	4:B:971:HOH:O	2.45	0.65
1:A:215:GLN:NE2	4:A:1032:HOH:O	2.30	0.65
1:C:234:ASN:ND2	1:C:237:ARG:NH2	2.44	0.65
1:A:7:ILE:HD11	1:A:33:GLY:N	2.12	0.65
1:A:22:GLU:O	1:A:26:ILE:HD13	1.96	0.65
1:C:118:GLU:O	1:C:122:ARG:HG3	1.97	0.64
1:A:57:THR:HA	1:A:62:ASN:HD22	1.61	0.64
1:D:111:GLU:O	1:D:115:ILE:HD13	1.97	0.64
1:D:133:SER:H	1:D:182:ASN:ND2	1.95	0.64
1:B:110:LYS:CG	1:B:111:GLU:N	2.58	0.63
1:D:161:VAL:HG13	1:D:199:GLU:HB2	1.81	0.63
1:D:180:VAL:HG11	1:D:251:MSE:HE2	1.81	0.63
1:D:125:GLU:O	1:D:129:GLU:HG2	1.98	0.63
1:B:232:VAL:HG13	1:B:251:MSE:SE	2.49	0.62
1:C:17:LYS:O	1:C:20:ASP:N	2.33	0.62
1:B:221:HIS:HD2	1:B:223:MSE:N	1.90	0.62
1:A:112:LYS:HE2	4:A:936:HOH:O	1.99	0.62
1:B:4:LEU:HD22	1:B:4:LEU:N	2.15	0.62
1:D:200:TYR:HB2	4:D:1033:HOH:O	2.00	0.62
1:A:221:HIS:CD2	1:A:223:MSE:H	2.17	0.61
1:D:223:MSE:CG	4:D:939:HOH:O	2.22	0.61
1:A:237:ARG:HD2	1:B:22:GLU:OE2	1.99	0.61
1:A:31:LEU:HD22	1:A:35:THR:HG21	1.82	0.61
1:D:77:MSE:HE2	1:D:138:TYR:CD2	2.36	0.60
1:C:129:GLU:HB3	4:C:970:HOH:O	2.01	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:41:LYS:NZ	4:D:1026:HOH:O	2.34	0.60
1:A:161:VAL:CG1	1:A:199:GLU:CG	2.76	0.59
1:C:110:LYS:HZ2	1:C:111:GLU:HG3	1.67	0.59
1:C:168:LYS:HE2	1:C:168:LYS:HA	1.83	0.59
1:D:223:MSE:CE	4:D:939:HOH:O	2.45	0.59
1:B:84:ILE:CD1	4:B:1045:HOH:O	2.46	0.59
1:B:147:MSE:HE1	4:B:910:HOH:O	2.02	0.59
1:D:179:VAL:O	1:D:183:VAL:HG23	2.03	0.58
1:D:251:MSE:HA	1:D:251:MSE:CE	2.34	0.58
1:A:57:THR:HG21	4:A:935:HOH:O	2.03	0.58
1:B:102:PHE:HD2	4:B:1114:HOH:O	1.87	0.58
1:D:205:ILE:C	1:D:205:ILE:HD13	2.28	0.58
1:D:22:GLU:O	1:D:26:ILE:HD12	2.04	0.57
1:B:233:ARG:NH1	4:B:991:HOH:O	2.37	0.57
1:C:110:LYS:NZ	1:C:111:GLU:HG3	2.19	0.57
1:A:157:ALA:HB1	1:A:205:ILE:HG23	1.85	0.57
1:A:124:LEU:O	1:A:128:LYS:HB2	2.05	0.57
1:D:223:MSE:SE	4:D:939:HOH:O	2.73	0.56
1:B:93:ASP:HB3	1:B:97:TYR:CE2	2.40	0.56
1:D:137:PRO:HB3	4:D:1046:HOH:O	2.05	0.56
1:C:1:MSE:CA	4:C:1021:HOH:O	2.27	0.56
1:D:151:GLY:HA2	4:D:1056:HOH:O	2.05	0.56
1:B:111:GLU:HB3	4:B:1077:HOH:O	2.06	0.55
1:D:191:GLU:C	1:D:219:LEU:HD13	2.31	0.55
1:B:65:TYR:CZ	1:B:154:GLU:HG2	2.42	0.55
1:C:128:LYS:HE2	4:C:926:HOH:O	2.07	0.55
1:C:92:MSE:HE3	1:C:116:TRP:CE3	2.42	0.55
1:A:7:ILE:CD1	1:A:33:GLY:N	2.70	0.55
1:B:249:GLU:HG2	1:B:253:LYS:HD2	1.89	0.55
1:C:82:TYR:OH	1:C:120:GLU:OE2	2.20	0.55
1:D:194:HIS:O	1:D:195:ALA:HB3	2.07	0.55
1:C:60:GLU:HG3	4:C:1028:HOH:O	2.04	0.54
1:D:180:VAL:CG1	1:D:251:MSE:HE2	2.37	0.54
1:D:99:ASP:OD2	1:D:101:ARG:HD2	2.04	0.54
1:D:100:GLU:OE1	1:D:218:THR:HG21	2.07	0.54
1:D:147:MSE:HE1	4:D:915:HOH:O	2.08	0.54
1:B:220:ARG:HA	4:B:1104:HOH:O	2.07	0.54
1:B:234:ASN:ND2	4:B:938:HOH:O	2.41	0.54
1:D:75:VAL:CG2	1:D:77:MSE:CE	2.86	0.54
1:C:215:GLN:H	1:C:215:GLN:NE2	2.05	0.53
1:B:57:THR:HA	1:B:62:ASN:HD22	1.73	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:60:GLU:HG2	4:C:908:HOH:O	2.07	0.53
1:A:225:GLU:CG	4:A:1047:HOH:O	2.56	0.53
1:B:223:MSE:HE3	1:B:226:SER:OG	2.08	0.53
1:A:225:GLU:HG2	4:A:1047:HOH:O	2.09	0.53
1:A:165:ARG:NH1	4:A:1001:HOH:O	2.40	0.53
1:B:157:ALA:HB3	1:B:203:MSE:HE2	1.91	0.53
1:B:223:MSE:CE	4:B:1007:HOH:O	2.56	0.53
1:A:152:GLU:HB3	4:A:1079:HOH:O	2.09	0.52
1:A:218:THR:HG22	1:A:219:LEU:N	2.25	0.51
1:C:92:MSE:HE3	1:C:116:TRP:HE3	1.75	0.51
1:C:110:LYS:C	4:C:1030:HOH:O	2.52	0.51
1:D:245:LYS:NZ	4:D:1080:HOH:O	2.44	0.51
1:D:26:ILE:HD12	1:D:26:ILE:N	2.25	0.51
1:D:57:THR:O	1:D:57:THR:HG23	2.10	0.51
1:D:220:ARG:NH2	4:D:997:HOH:O	2.43	0.51
1:B:157:ALA:O	1:B:203:MSE:HE3	2.10	0.51
1:D:71:ASP:O	1:D:72:GLY:C	2.52	0.51
1:A:41:LYS:HD2	4:A:1092:HOH:O	2.10	0.51
1:A:34:ARG:HG2	4:A:1014:HOH:O	2.11	0.50
1:A:165:ARG:HD3	1:A:165:ARG:N	2.24	0.50
1:A:213:MSE:HB3	4:A:1023:HOH:O	2.06	0.50
1:B:4:LEU:H	1:B:4:LEU:CD2	2.21	0.50
1:D:186:LEU:O	1:D:190:ALA:HB3	2.11	0.50
1:C:92:MSE:CE	1:C:112:LYS:HG2	2.42	0.50
1:C:198:SER:O	1:C:202:ILE:HG12	2.11	0.50
1:B:18:GLU:CB	4:B:1118:HOH:O	2.42	0.50
1:C:251:MSE:HE2	4:C:932:HOH:O	2.11	0.50
1:D:84:ILE:HG12	1:D:84:ILE:O	2.10	0.50
1:A:218:THR:CG2	1:A:219:LEU:N	2.75	0.50
1:B:13:LYS:HE2	4:C:1019:HOH:O	2.11	0.50
1:D:170:LEU:O	1:D:171:ASP:HB3	2.11	0.50
1:A:167:LEU:HD23	1:A:170:LEU:HD12	1.94	0.49
1:A:57:THR:CG2	4:A:935:HOH:O	2.60	0.49
1:A:104:MSE:C	4:A:1010:HOH:O	2.55	0.49
1:C:234:ASN:HD22	1:C:237:ARG:NH2	2.08	0.49
1:A:44:ALA:N	4:A:1039:HOH:O	2.46	0.49
1:C:55:ILE:HD13	4:C:1052:HOH:O	2.12	0.49
1:A:92:MSE:CE	1:A:96:LEU:HD11	2.42	0.48
1:C:20:ASP:HA	4:C:968:HOH:O	2.12	0.48
1:C:202:ILE:HD12	1:C:210:PHE:CE2	2.48	0.48
1:C:231:ASP:O	1:C:235:ILE:HG12	2.13	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:251:MSE:SE	4:D:994:HOH:O	2.81	0.48
1:B:94:GLU:H	1:B:94:GLU:CD	2.21	0.48
1:C:92:MSE:HE2	1:C:112:LYS:HG2	1.95	0.48
1:C:129:GLU:CB	4:C:970:HOH:O	2.59	0.48
1:B:225:GLU:OE1	1:B:256:LYS:NZ	2.35	0.48
1:D:73:LYS:CB	1:D:74:PRO:CD	2.82	0.48
1:C:157:ALA:HB2	1:C:205:ILE:HG12	1.96	0.48
1:A:161:VAL:HG13	1:A:199:GLU:HG2	1.89	0.48
1:B:41:LYS:HD2	4:B:962:HOH:O	2.13	0.48
1:C:99:ASP:HB2	4:C:983:HOH:O	2.14	0.48
1:A:7:ILE:HG23	1:A:36:LEU:HD11	1.96	0.48
1:B:126:ARG:HD3	1:B:190:ALA:O	2.14	0.47
1:D:203:MSE:HE2	1:D:211:ILE:HG21	1.94	0.47
1:D:252:LEU:O	1:D:256:LYS:HG3	2.13	0.47
1:D:218:THR:CG2	1:D:219:LEU:N	2.78	0.47
1:A:112:LYS:HD3	1:A:112:LYS:N	2.29	0.47
1:A:234:ASN:ND2	4:A:1013:HOH:O	2.44	0.47
1:A:65:TYR:CZ	1:A:154:GLU:HG2	2.50	0.46
1:D:232:VAL:HG21	1:D:252:LEU:HD12	1.97	0.46
1:A:133:SER:H	1:A:182:ASN:HD21	1.62	0.46
1:D:200:TYR:CB	4:D:1033:HOH:O	2.60	0.46
1:D:205:ILE:HG23	1:D:205:ILE:O	2.15	0.46
1:A:118:GLU:OE1	1:A:122:ARG:HD2	2.16	0.45
1:C:60:GLU:CG	4:C:1028:HOH:O	2.62	0.45
1:A:225:GLU:HG3	4:A:1047:HOH:O	2.17	0.45
1:D:115:ILE:N	1:D:115:ILE:HD12	2.32	0.45
1:A:7:ILE:HD13	1:A:33:GLY:HA2	1.98	0.45
1:D:218:THR:HG22	1:D:219:LEU:N	2.30	0.45
1:C:34:ARG:NH1	4:C:1012:HOH:O	2.49	0.45
1:C:219:LEU:HD11	4:C:936:HOH:O	2.17	0.44
1:D:22:GLU:C	1:D:26:ILE:HD13	2.42	0.44
1:A:22:GLU:H	1:A:22:GLU:CD	2.23	0.44
1:C:83:ARG:NH2	4:C:1065:HOH:O	2.50	0.44
1:D:125:GLU:OE1	4:D:1061:HOH:O	2.21	0.44
1:A:55:ILE:HG23	1:A:156:PRO:HG3	1.99	0.44
1:C:41:LYS:HD3	1:C:141:MSE:SE	2.68	0.44
1:C:168:LYS:HA	1:C:168:LYS:CE	2.47	0.44
1:D:233:ARG:NH2	4:D:972:HOH:O	2.50	0.44
1:D:241:LYS:NZ	4:D:1025:HOH:O	2.50	0.44
1:A:184:LYS:HE3	4:A:1015:HOH:O	2.16	0.44
1:A:232:VAL:O	1:A:236:ILE:HG13	2.18	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:17:LYS:CE	4:B:1018:HOH:O	2.54	0.44
1:C:1:MSE:N	4:C:1021:HOH:O	2.49	0.44
1:C:112:LYS:N	4:C:1030:HOH:O	2.46	0.44
1:D:115:ILE:N	1:D:115:ILE:CD1	2.80	0.44
1:D:205:ILE:C	1:D:205:ILE:CD1	2.91	0.44
1:C:110:LYS:N	4:C:1030:HOH:O	2.51	0.44
1:C:173:GLU:OE2	4:C:962:HOH:O	2.21	0.44
1:C:60:GLU:HG2	1:C:60:GLU:H	1.66	0.43
1:C:55:ILE:HG23	1:C:156:PRO:HG3	2.00	0.43
1:C:79:VAL:HG22	1:C:146:LEU:HD22	2.00	0.43
1:C:139:THR:HG22	1:C:146:LEU:HD12	2.00	0.43
1:D:18:GLU:HA	1:D:24:ARG:CD	2.49	0.43
1:D:84:ILE:CG2	4:D:990:HOH:O	2.33	0.43
1:A:101:ARG:HH12	1:A:123:ASN:ND2	2.17	0.43
1:C:112:LYS:HB3	1:C:112:LYS:HE2	1.75	0.43
1:A:3:ASP:O	1:A:7:ILE:HG12	2.19	0.43
1:C:202:ILE:CD1	1:C:210:PHE:CD2	2.96	0.42
1:A:168:LYS:HE3	1:A:168:LYS:HA	2.01	0.42
1:A:225:GLU:OE2	1:A:225:GLU:HA	2.20	0.42
1:D:27:TYR:OH	1:D:52:GLY:O	2.31	0.42
1:B:110:LYS:CB	4:B:1133:HOH:O	2.49	0.42
1:B:221:HIS:CE1	4:B:1105:HOH:O	2.73	0.42
1:A:197:LEU:HD12	1:A:197:LEU:HA	1.87	0.42
1:B:152:GLU:OE1	1:B:205:ILE:HD11	2.20	0.42
1:C:92:MSE:HG2	1:C:116:TRP:CZ3	2.55	0.42
1:D:32:ASP:O	1:D:36:LEU:HD13	2.20	0.42
1:D:136:GLN:NE2	1:D:137:PRO:HD2	2.34	0.42
1:B:203:MSE:SE	4:B:1008:HOH:O	2.87	0.42
1:C:94:GLU:N	4:C:1041:HOH:O	2.22	0.42
1:C:197:LEU:HD12	1:C:202:ILE:HD11	1.93	0.42
1:D:215:GLN:H	1:D:215:GLN:NE2	2.18	0.42
1:D:153:ASP:HB3	4:D:995:HOH:O	2.20	0.41
1:C:142:LYS:HA	1:C:142:LYS:HD2	1.70	0.41
1:A:10:TYR:OH	1:A:37:LYS:HG3	2.20	0.41
1:A:110:LYS:HB3	1:A:110:LYS:HE3	1.73	0.41
1:C:215:GLN:NE2	4:C:1055:HOH:O	2.53	0.41
1:D:126:ARG:HD2	4:D:930:HOH:O	2.20	0.41
1:D:18:GLU:HA	1:D:24:ARG:HD3	2.02	0.41
1:D:31:LEU:HB2	1:D:36:LEU:HD11	2.03	0.41
1:A:13:LYS:HD3	1:A:40:TYR:CE2	2.56	0.41
1:C:92:MSE:HG2	1:C:116:TRP:CE3	2.56	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:204:TYR:O	1:A:205:ILE:HG23	2.21	0.41
1:D:55:ILE:HG23	1:D:156:PRO:HG3	2.03	0.41
1:D:84:ILE:O	1:D:84:ILE:CG1	2.69	0.41
1:C:4:LEU:HB2	1:C:10:TYR:CZ	2.55	0.41
1:C:110:LYS:N	4:C:942:HOH:O	2.54	0.41
1:C:245:LYS:HD2	4:D:956:HOH:O	2.21	0.41
1:B:157:ALA:O	1:B:203:MSE:CE	2.69	0.40
1:D:32:ASP:OD2	1:D:84:ILE:CD1	2.65	0.40
1:C:38:THR:HG23	1:C:141:MSE:HG2	2.03	0.40
1:D:26:ILE:HD12	1:D:26:ILE:H	1.85	0.40
1:D:137:PRO:CB	4:D:1046:HOH:O	2.65	0.40
1:B:171:ASP:O	1:B:175:ILE:HG13	2.22	0.40
1:C:157:ALA:CB	1:C:205:ILE:HG12	2.52	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	239/258 (93%)	229 (96%)	10 (4%)	0	100	100
1	B	235/258 (91%)	229 (97%)	5 (2%)	1 (0%)	30	22
1	C	235/258 (91%)	226 (96%)	8 (3%)	1 (0%)	30	22
1	D	238/258 (92%)	228 (96%)	10 (4%)	0	100	100
All	All	947/1032 (92%)	912 (96%)	33 (4%)	2 (0%)	43	36

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	97	TYR
1	B	205	ILE

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	206/216 (95%)	196 (95%)	10 (5%)	22	14
1	B	204/216 (94%)	195 (96%)	9 (4%)	25	17
1	C	201/216 (93%)	188 (94%)	13 (6%)	15	8
1	D	207/216 (96%)	192 (93%)	15 (7%)	13	6
All	All	818/864 (95%)	771 (94%)	47 (6%)	18	11

All (47) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	26	ILE
1	A	112	LYS
1	A	128	LYS
1	A	165	ARG
1	A	168	LYS
1	A	172	VAL
1	A	205	ILE
1	A	215	GLN
1	A	225	GLU
1	A	236	ILE
1	B	11	LEU
1	B	25	LYS
1	B	41	LYS
1	B	93	ASP
1	B	152	GLU
1	B	165	ARG
1	B	207	LYS
1	B	215	GLN
1	B	219	LEU
1	C	26	ILE
1	C	60	GLU
1	C	73	LYS
1	C	99	ASP
1	C	112	LYS

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Mol	Chain	Res	Type
1	C	142	LYS
1	C	155	LEU
1	C	165	ARG
1	C	168	LYS
1	C	192	LEU
1	C	205	ILE
1	C	215	GLN
1	C	220	ARG
1	D	6	LYS
1	D	19	LYS
1	D	34	ARG
1	D	73	LYS
1	D	77	MSE
1	D	84	ILE
1	D	101	ARG
1	D	129	GLU
1	D	155	LEU
1	D	169	GLU
1	D	173	GLU
1	D	185	ARG
1	D	205	ILE
1	D	215	GLN
1	D	228	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (20) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	62	ASN
1	A	123	ASN
1	A	182	ASN
1	A	188	GLN
1	A	215	GLN
1	A	221	HIS
1	B	136	GLN
1	B	177	ASN
1	B	188	GLN
1	B	215	GLN
1	B	221	HIS
1	C	136	GLN
1	C	177	ASN
1	C	188	GLN
1	C	215	GLN

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Mol	Chain	Res	Type
1	C	234	ASN
1	D	136	GLN
1	D	182	ASN
1	D	188	GLN
1	D	215	GLN

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 8 ligands modelled in this entry, 4 are monoatomic - leaving 4 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	D	907	2	28,29,29	1.40	3 (10%)	43,45,45	2.18	11 (25%)
3	ADP	C	905	2	28,29,29	1.28	3 (10%)	43,45,45	1.79	12 (27%)
3	ADP	A	901	2	28,29,29	1.48	3 (10%)	43,45,45	2.19	15 (34%)
3	ADP	B	903	2	28,29,29	1.62	4 (14%)	43,45,45	1.98	10 (23%)

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	D	907	2	-	2/16/32/32	0/3/3/3
3	ADP	C	905	2	-	2/16/32/32	0/3/3/3
3	ADP	A	901	2	-	1/16/32/32	0/3/3/3
3	ADP	B	903	2	-	1/16/32/32	0/3/3/3

All (13) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	B	903	ADP	C5-C4	5.28	1.48	1.39
3	A	901	ADP	C5-C4	5.21	1.48	1.39
3	D	907	ADP	C5-C4	4.69	1.47	1.39
3	C	905	ADP	C5-C4	3.76	1.45	1.39
3	A	901	ADP	C5-N7	-3.22	1.33	1.39
3	B	903	ADP	C5-C6	3.12	1.49	1.41
3	D	907	ADP	C5-C6	3.04	1.49	1.41
3	B	903	ADP	C8-N7	2.94	1.37	1.31
3	B	903	ADP	PA-O3A	2.90	1.62	1.59
3	C	905	ADP	C4-N9	-2.76	1.31	1.37
3	C	905	ADP	C5-C6	2.44	1.47	1.41
3	D	907	ADP	C8-N7	2.11	1.35	1.31
3	A	901	ADP	C5-C6	2.01	1.46	1.41

All (48) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	D	907	ADP	C5-C4-N3	-7.07	116.98	126.72
3	D	907	ADP	N3-C4-N9	5.79	137.01	127.17
3	B	903	ADP	C5-C4-N3	-5.59	119.02	126.72
3	A	901	ADP	C5-C4-N3	-5.47	119.19	126.72
3	A	901	ADP	N3-C4-N9	4.99	135.65	127.17
3	B	903	ADP	N3-C4-N9	4.98	135.64	127.17
3	C	905	ADP	C4-N9-C8	4.94	110.92	105.74
3	B	903	ADP	C4-N9-C8	4.58	110.55	105.74
3	D	907	ADP	C2-N3-C4	4.29	122.31	111.83
3	A	901	ADP	C4-C5-N7	-4.25	105.72	110.58
3	A	901	ADP	C5-N7-C8	4.01	109.76	103.45
3	A	901	ADP	N3-C2-N1	-3.99	122.55	128.58
3	D	907	ADP	C4-C5-N7	-3.81	106.23	110.58
3	B	903	ADP	C2-N3-C4	3.75	121.00	111.83
3	C	905	ADP	N3-C4-N9	3.72	133.49	127.17
3	A	901	ADP	C2-N3-C4	3.70	120.87	111.83

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	C	905	ADP	C5-C4-N3	-3.63	121.71	126.72
3	C	905	ADP	C2'-C1'-N9	-3.58	104.40	113.30
3	D	907	ADP	N3-C2-N1	-3.53	123.23	128.58
3	A	901	ADP	C4-N9-C8	3.53	109.44	105.74
3	C	905	ADP	N3-C2-N1	-3.45	123.36	128.58
3	D	907	ADP	C4-N9-C8	3.28	109.18	105.74
3	D	907	ADP	C2'-C1'-N9	-3.26	105.20	113.30
3	B	903	ADP	N9-C8-N7	-3.19	109.40	113.94
3	B	903	ADP	C4-C5-N7	-3.16	106.97	110.58
3	D	907	ADP	C5-N7-C8	3.11	108.34	103.45
3	B	903	ADP	C2'-C1'-N9	-2.88	106.14	113.30
3	A	901	ADP	N9-C8-N7	-2.85	109.90	113.94
3	C	905	ADP	C4-C5-N7	-2.80	107.38	110.58
3	B	903	ADP	N3-C2-N1	-2.80	124.35	128.58
3	D	907	ADP	O2A-PA-O3A	2.78	114.78	107.27
3	C	905	ADP	N9-C8-N7	-2.76	110.02	113.94
3	B	903	ADP	C5-N7-C8	2.72	107.73	103.45
3	C	905	ADP	C2-N3-C4	2.62	118.23	111.83
3	D	907	ADP	N9-C8-N7	-2.61	110.23	113.94
3	A	901	ADP	C2-N1-C6	2.57	122.96	118.73
3	C	905	ADP	C2-N1-C6	2.54	122.89	118.73
3	C	905	ADP	C4-N9-C1'	-2.53	120.72	126.63
3	A	901	ADP	O3B-PB-O3A	-2.44	96.44	104.64
3	A	901	ADP	O2'-C2'-C3'	-2.42	104.06	111.82
3	A	901	ADP	C6-C5-N7	2.39	136.70	132.09
3	B	903	ADP	C6-C5-N7	2.31	136.55	132.09
3	A	901	ADP	O3A-PA-O1A	-2.27	103.86	110.70
3	C	905	ADP	C5-N7-C8	2.19	106.89	103.45
3	C	905	ADP	C6-C5-N7	2.09	136.12	132.09
3	A	901	ADP	C2'-C3'-C4'	-2.08	98.59	102.61
3	A	901	ADP	O2A-PA-O1A	2.08	122.10	112.44
3	D	907	ADP	C6-C5-N7	2.07	136.08	132.09

There are no chirality outliers.

All (6) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	C	905	ADP	PB-O3A-PA-O1A
3	C	905	ADP	PB-O3A-PA-O2A
3	D	907	ADP	PB-O3A-PA-O1A
3	B	903	ADP	PB-O3A-PA-O2A
3	D	907	ADP	PB-O3A-PA-O2A

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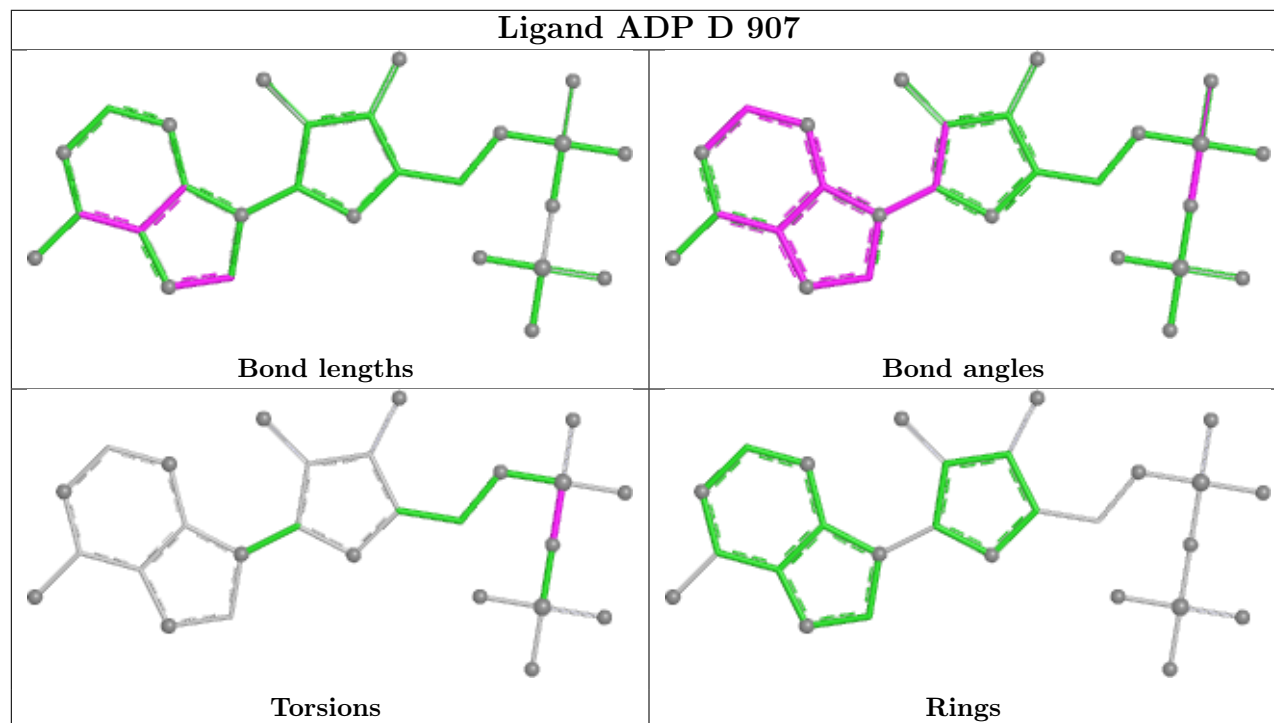
Mol	Chain	Res	Type	Atoms
3	A	901	ADP	PB-O3A-PA-O2A

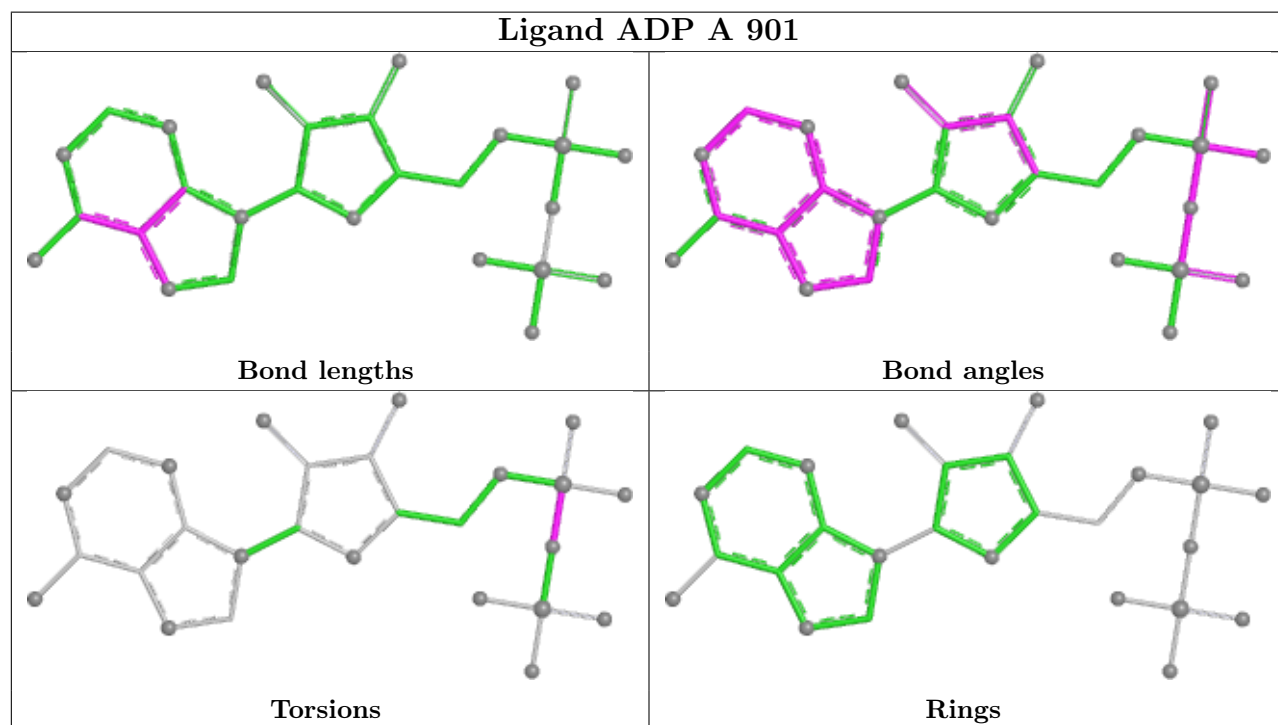
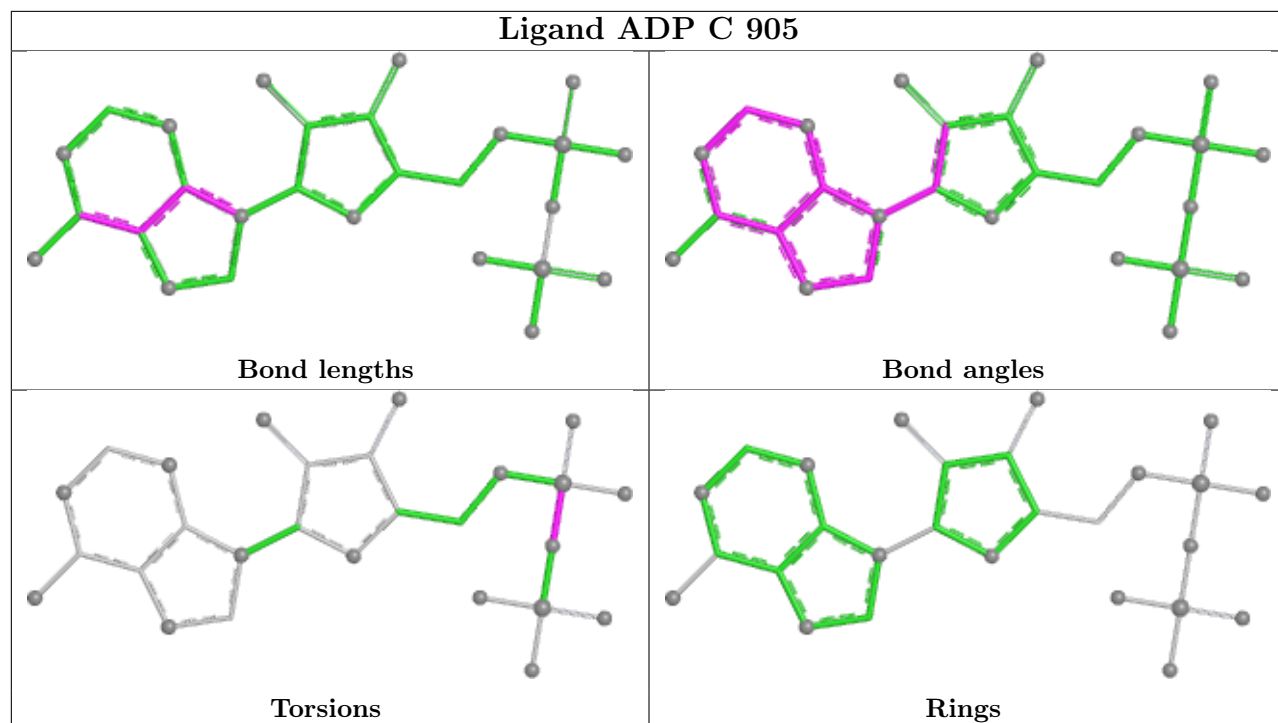
There are no ring outliers.

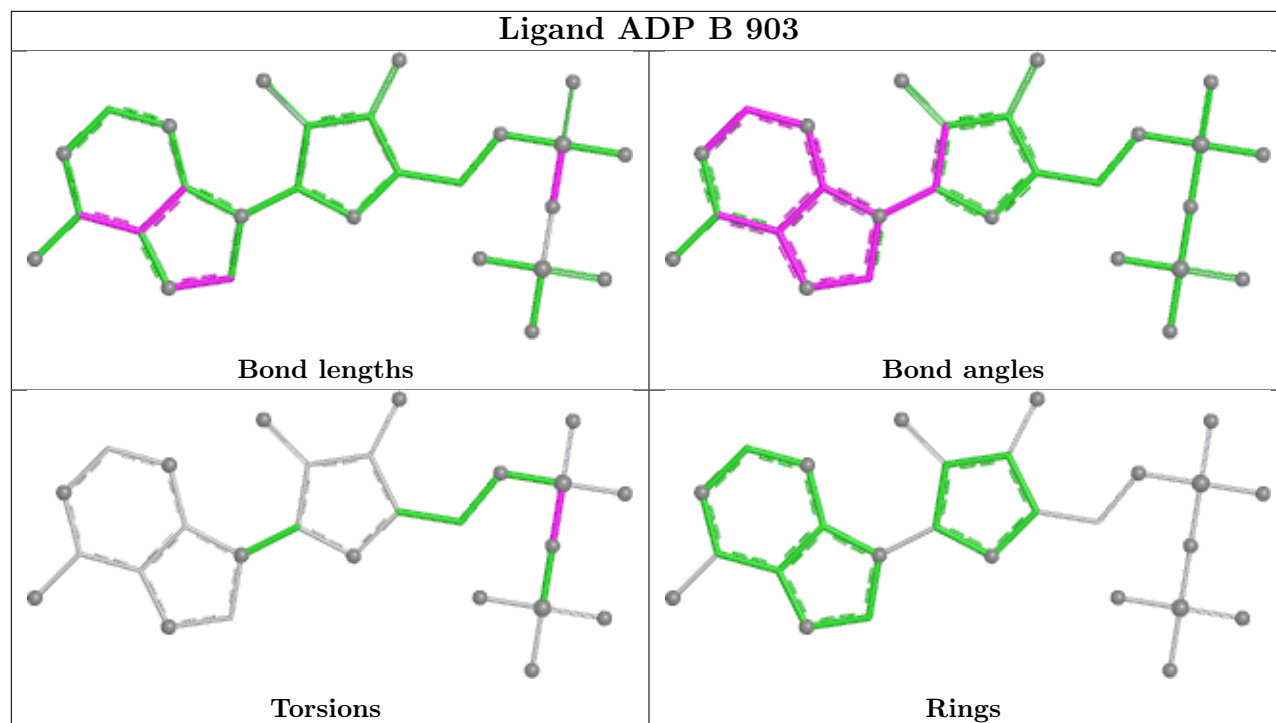
1 monomer is involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	B	903	ADP	2	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	235/258 (91%)	-1.37	0 100 100	17, 25, 46, 54	0
1	B	233/258 (90%)	-1.37	0 100 100	16, 25, 44, 55	0
1	C	231/258 (89%)	-1.35	0 100 100	17, 27, 48, 56	0
1	D	234/258 (90%)	-1.33	0 100 100	19, 30, 47, 56	0
All	All	933/1032 (90%)	-1.36	0 100 100	16, 27, 47, 56	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.

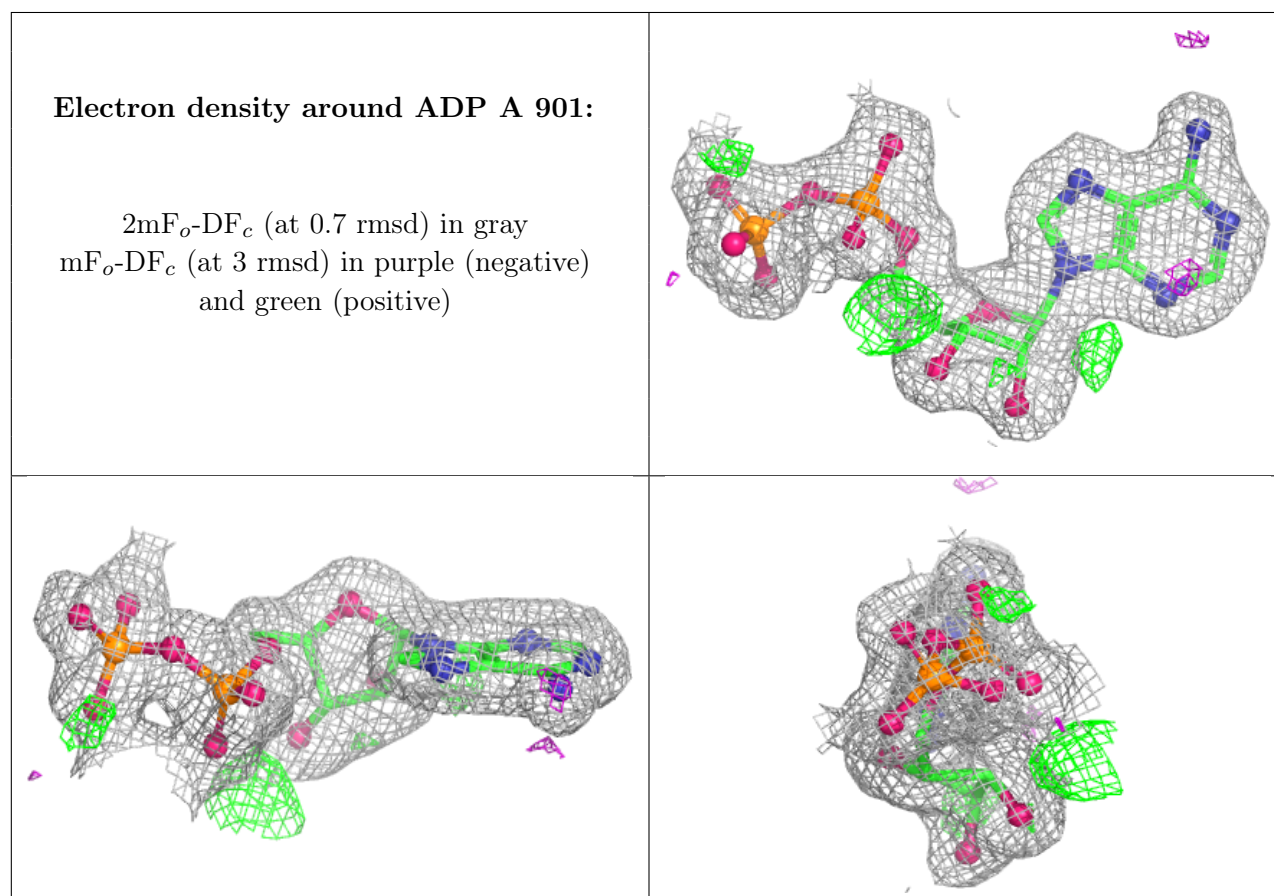
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
2	MN	A	902	1/1	1.00	0.02	21,21,21,21	0
2	MN	B	904	1/1	1.00	0.01	22,22,22,22	0
2	MN	C	906	1/1	1.00	0.01	21,21,21,21	0
2	MN	D	908	1/1	1.00	0.01	22,22,22,22	0

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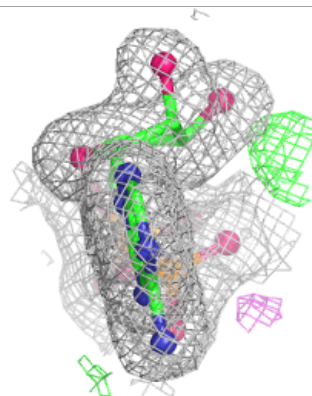
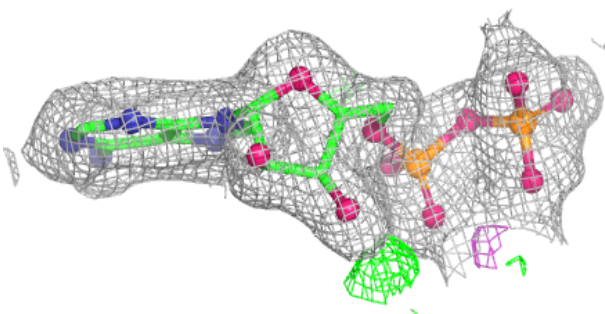
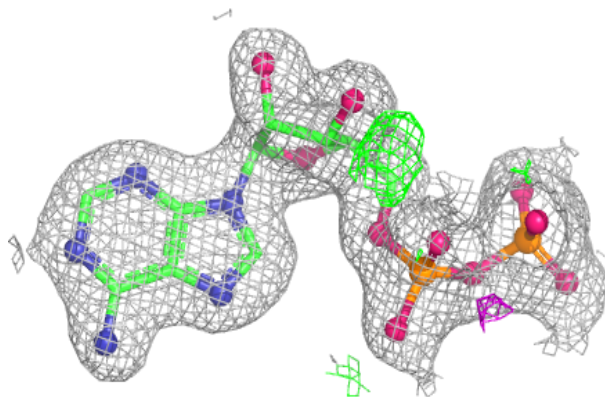
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
3	ADP	A	901	27/27	1.00	0.02	14,19,26,33	0
3	ADP	B	903	27/27	1.00	0.02	15,19,25,30	0
3	ADP	C	905	27/27	1.00	0.02	14,19,25,28	0
3	ADP	D	907	27/27	1.00	0.02	18,22,25,30	0

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.

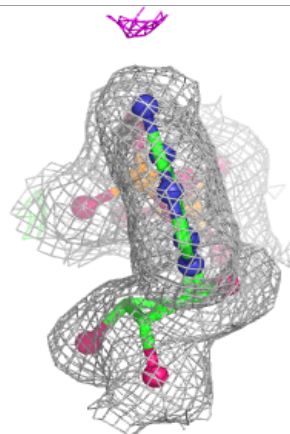
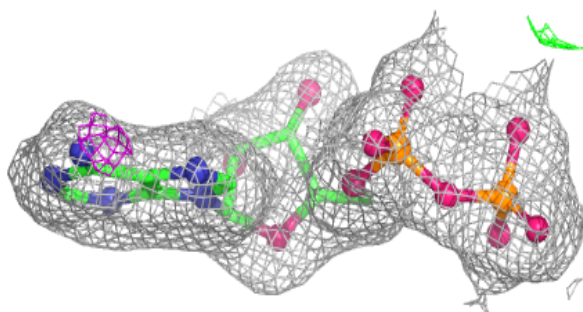
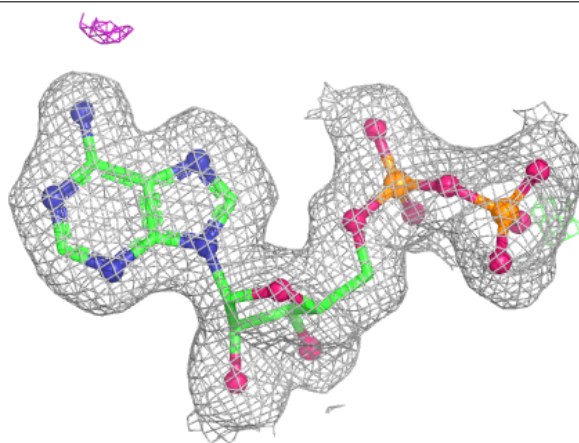


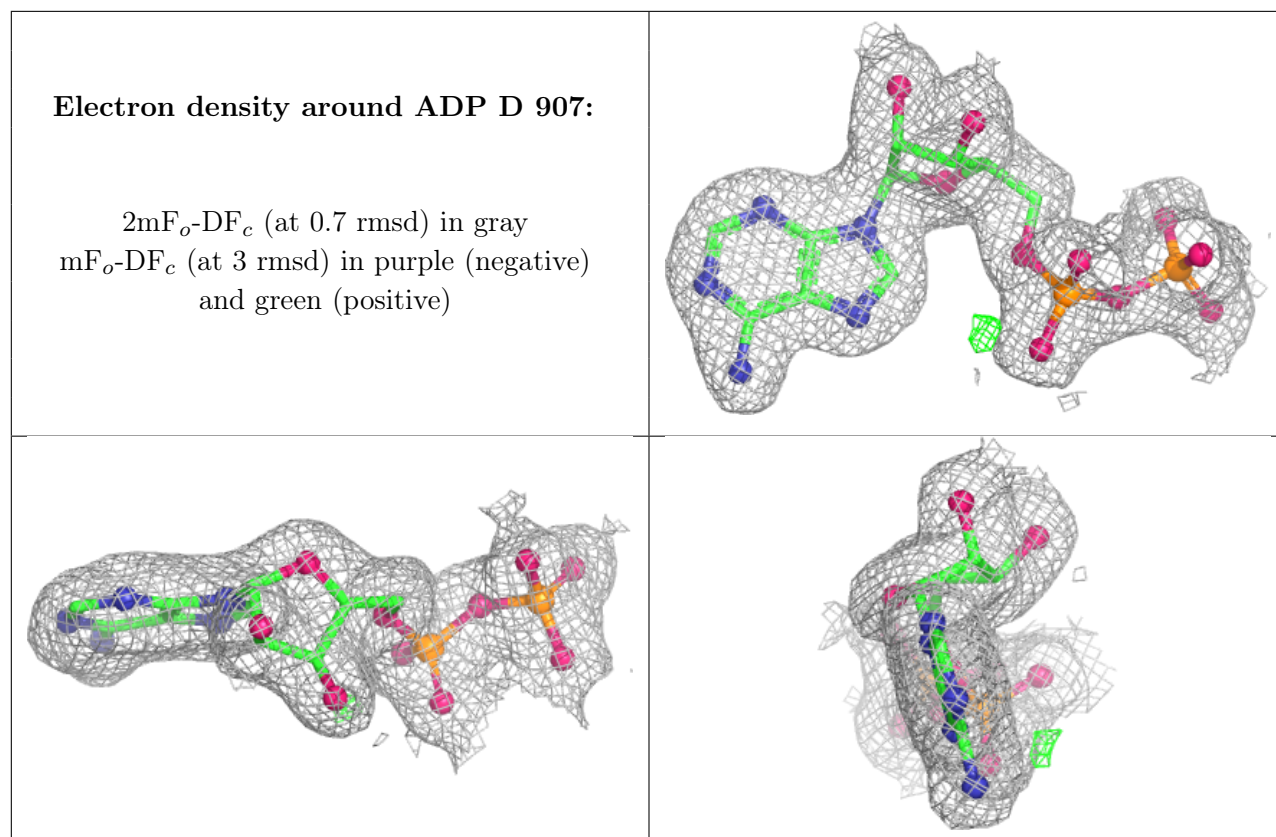
Electron density around ADP B 903:

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

**Electron density around ADP C 905:**

$2mF_o-DF_c$ (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.