



Full wwPDB X-ray Structure Validation Report ⓘ

Apr 7, 2026 – 01:14 pm BST

PDB ID : 9TPI / pdb_00009tpi
Title : Survivin 1-122 in complex with a molecular tweezer-Histone-H3-peptide conjugate
Authors : Vetter, I.R.; Bier, D.
Deposited on : 2025-12-18
Resolution : 1.80 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

MolProbity : 4-5-2 with Phenix2.0
Mogul : 1.8.4, CSD as541be (2020)
Xtriage (Phenix) : 2.0
EDS : 3.0
buster-report : 1.1.7 (2018)
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
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) : 2.48.1

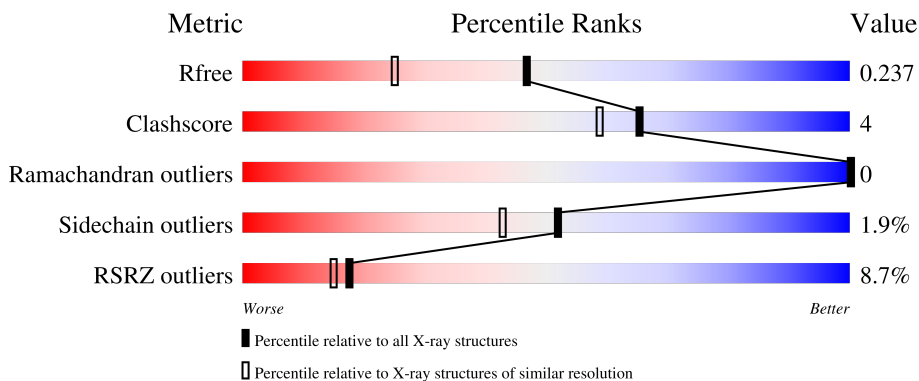
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.80 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	164625	7108 (1.80-1.80)
Clashscore	180529	8162 (1.80-1.80)
Ramachandran outliers	177936	8077 (1.80-1.80)
Sidechain outliers	177891	8076 (1.80-1.80)
RSRZ outliers	164620	7108 (1.80-1.80)

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	121	 9% 88% 8% .
1	B	121	 8% 88% 8% ..
2	C	6	 50% 33% 17%
2	D	6	 50% 50%

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

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

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
5	A1JXR	C	101	-	X	-	-
5	A1JXR	D	101	-	X	-	-

2 Entry composition [i](#)

There are 6 unique types of molecules in this entry. The entry contains 2251 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 Baculoviral IAP repeat-containing protein 5.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	117	957	612	162	176	7	0	0	0
1	B	118	967	618	163	178	8	0	1	0

- Molecule 2 is a protein called Histone-H3-peptide conjugated to molecular tweezer.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	P			
2	C	6	44	24	10	9	1	0	0	1
2	D	6	44	24	10	9	1	0	0	1

- Molecule 3 is ZINC ION (CCD ID: ZN) (formula: Zn).

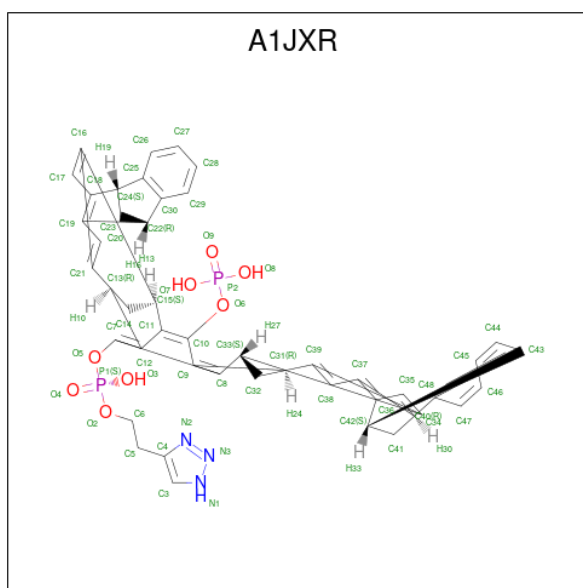
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	1	Total	Zn	0	0
			1	1		
3	B	1	Total	Zn	0	0
			1	1		

- Molecule 4 is CALCIUM ION (CCD ID: CA) (formula: Ca).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	1	Total	Ca	0	0
			1	1		
4	C	1	Total	Ca	0	0
			1	1		
4	D	1	Total	Ca	0	0
			1	1		

- Molecule 5 is Molecular tweezer (BIRC5) (CCD ID: A1JXR) (formula: C₄₆H₃₇N₃O₈P₂) (la-

beled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	
			Total	C	N	O			P
5	C	1	59	46	3	8	2	0	0
5	D	1	59	46	3	8	2	0	0

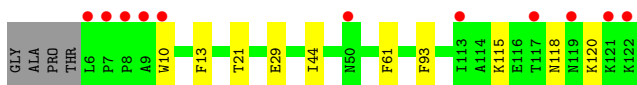
- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	O		
6	A	48	48	48	0	0
6	B	40	40	40	0	0
6	C	17	17	17	0	0
6	D	11	11	11	0	0

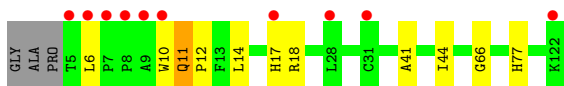
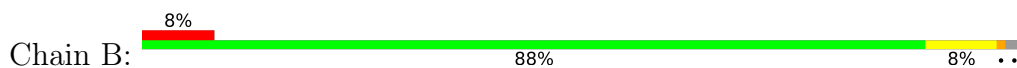
3 Residue-property plots [i](#)

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: Baculoviral IAP repeat-containing protein 5



- Molecule 1: Baculoviral IAP repeat-containing protein 5



- Molecule 2: Histone-H3-peptide conjugated to molecular tweezer



- Molecule 2: Histone-H3-peptide conjugated to molecular tweezer



4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	95.45Å 63.99Å 63.08Å 90.00° 127.61° 90.00°	Depositor
Resolution (Å)	49.97 – 1.80 49.97 – 1.80	Depositor EDS
% Data completeness (in resolution range)	90.9 (49.97-1.80) 90.9 (49.97-1.80)	Depositor EDS
R_{merge}	0.10	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.95 (at 1.79Å)	Xtrriage
Refinement program	REFMAC 5.8.0258	Depositor
R, R_{free}	0.197 , 0.235 0.204 , 0.237	Depositor DCC
R_{free} test set	1272 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å ²)	31.4	Xtrriage
Anisotropy	0.244	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.32 , 26.0	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	2251	wwPDB-VP
Average B, all atoms (Å ²)	41.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 10.22% 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: NH2, ZN, TPO, EE0, A1JXR, CA

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	1.00	0/985	1.31	0/1326
1	B	1.02	0/998	1.32	0/1344
2	C	3.54	2/23 (8.7%)	2.30	1/26 (3.8%)
2	D	3.44	3/23 (13.0%)	2.23	0/26
All	All	1.13	5/2029 (0.2%)	1.34	1/2722 (0.0%)

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	2	ARG	NE-CZ	12.64	1.47	1.33
2	D	2	ARG	NE-CZ	10.71	1.44	1.33
2	D	1	ALA	C-N	8.57	1.45	1.33
2	C	1	ALA	C-N	8.41	1.45	1.33
2	D	2	ARG	CZ-NH2	-5.18	1.26	1.33

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	2	ARG	NE-CZ-NH1	-6.29	115.21	121.50

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	957	0	921	4	0
1	B	967	0	933	7	0
2	C	44	0	39	1	0
2	D	44	0	39	0	0
3	A	1	0	0	0	0
3	B	1	0	0	0	0
4	A	1	0	0	0	0
4	C	1	0	0	0	0
4	D	1	0	0	0	0
5	C	59	0	0	2	0
5	D	59	0	0	2	0
6	A	48	0	0	1	0
6	B	40	0	0	1	1
6	C	17	0	0	0	1
6	D	11	0	0	0	0
All	All	2251	0	1932	15	1

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 4.

All (15) 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)
5:D:101:A1JXR:C9	5:D:101:A1JXR:C8	1.77	1.49
5:D:101:A1JXR:C12	5:D:101:A1JXR:C11	1.79	1.44
5:C:101:A1JXR:C8	5:C:101:A1JXR:C9	1.75	1.43
5:C:101:A1JXR:C12	5:C:101:A1JXR:C11	1.78	1.41
1:B:17:HIS:HE1	6:B:334:HOH:O	1.75	0.69
1:A:61:PHE:O	1:A:115:LYS:HE3	2.01	0.60
1:A:13:PHE:HB3	1:A:93:PHE:CD1	2.44	0.51
1:A:21:THR:HG21	1:A:44:ILE:HG23	1.96	0.47
1:B:6:LEU:HG	1:B:14:LEU:HD21	1.96	0.46
1:B:18:ARG:HG2	1:B:44:ILE:HD11	1.97	0.45
1:B:41:ALA:O	1:B:77:HIS:ND1	2.51	0.43
1:B:11:GLN:N	1:B:12:PRO:CD	2.83	0.41
1:B:66:GLY:HA2	2:C:2:ARG:CZ	2.49	0.41
1:A:10:TRP:CD1	6:A:306:HOH:O	2.73	0.41
1:B:6:LEU:HD12	1:B:10:TRP:HE3	1.84	0.41

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:B:329:HOH:O	6:C:202:HOH:O[4_656]	2.06	0.14

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	115/121 (95%)	111 (96%)	4 (4%)	0	100	100
1	B	117/121 (97%)	114 (97%)	3 (3%)	0	100	100
2	C	2/6 (33%)	2 (100%)	0	0	100	100
2	D	2/6 (33%)	2 (100%)	0	0	100	100
All	All	236/254 (93%)	229 (97%)	7 (3%)	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	104/106 (98%)	101 (97%)	3 (3%)	37	26
1	B	106/106 (100%)	105 (99%)	1 (1%)	75	72
2	C	2/2 (100%)	2 (100%)	0	100	100
2	D	2/2 (100%)	2 (100%)	0	100	100
All	All	214/216 (99%)	210 (98%)	4 (2%)	52	43

All (4) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	29	GLU
1	A	118	ASN
1	A	120	LYS
1	B	11	GLN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	92	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](#)

2 non-standard protein/DNA/RNA residues are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	TPO	C	3	2	8,10,11	1.73	1 (12%)	10,14,16	1.09	1 (10%)
2	TPO	D	3	2	8,10,11	1.61	1 (12%)	10,14,16	1.02	1 (10%)

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
2	TPO	C	3	2	-	1/9/11/13	-
2	TPO	D	3	2	-	1/9/11/13	-

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	3	TPO	P-OG1	3.97	1.66	1.59
2	D	3	TPO	P-OG1	2.98	1.64	1.59

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	D	3	TPO	CG2-CB-CA	-2.13	108.95	113.16
2	C	3	TPO	O-C-CA	-2.00	119.53	124.78

There are no chirality outliers.

All (2) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	D	3	TPO	CB-OG1-P-O3P
2	C	3	TPO	CB-OG1-P-O3P

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 7 ligands modelled in this entry, 5 are monoatomic - leaving 2 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	A1JXR	D	101	2	71,72,72	9.66	53 (74%)	112,118,118	4.06	68 (60%)
5	A1JXR	C	101	2	71,72,72	9.52	52 (73%)	112,118,118	3.87	67 (59%)

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. '2' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	A1JXR	D	101	2	-	4/16/97/97	0/1/14/14
5	A1JXR	C	101	2	-	3/16/97/97	0/1/14/14

All (105) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	D	101	A1JXR	C12-C11	22.32	1.79	1.40
5	C	101	A1JXR	C12-C11	21.72	1.78	1.40
5	D	101	A1JXR	C9-C8	21.00	1.77	1.40
5	C	101	A1JXR	C30-C25	-20.52	1.04	1.40
5	D	101	A1JXR	C48-C43	-20.38	1.04	1.40
5	C	101	A1JXR	C48-C43	-20.27	1.04	1.40
5	D	101	A1JXR	C30-C25	-20.17	1.04	1.40
5	C	101	A1JXR	C9-C8	19.93	1.75	1.40
5	C	101	A1JXR	C35-C34	19.71	1.72	1.39
5	D	101	A1JXR	C35-C34	18.70	1.70	1.39
5	D	101	A1JXR	C23-C22	-18.67	1.35	1.55
5	D	101	A1JXR	C41-C42	-18.53	1.35	1.55
5	D	101	A1JXR	C38-C39	18.32	1.70	1.39
5	C	101	A1JXR	C23-C22	-18.06	1.35	1.55
5	C	101	A1JXR	C17-C16	17.91	1.69	1.39
5	C	101	A1JXR	C38-C39	17.40	1.68	1.39
5	D	101	A1JXR	C20-C21	17.39	1.68	1.39
5	D	101	A1JXR	C17-C16	17.24	1.68	1.39
5	C	101	A1JXR	C20-C21	17.18	1.68	1.39
5	C	101	A1JXR	C41-C42	-17.15	1.36	1.55
5	D	101	A1JXR	C41-C40	-16.86	1.36	1.55
5	D	101	A1JXR	C23-C24	-15.76	1.38	1.55
5	C	101	A1JXR	C23-C24	-15.66	1.38	1.55
5	D	101	A1JXR	C44-C43	15.49	1.60	1.39
5	C	101	A1JXR	C41-C40	-15.46	1.38	1.55
5	D	101	A1JXR	C47-C48	14.44	1.58	1.39
5	C	101	A1JXR	C26-C25	14.16	1.58	1.39
5	C	101	A1JXR	C44-C43	14.01	1.58	1.39
5	C	101	A1JXR	C29-C30	13.41	1.57	1.39
5	D	101	A1JXR	C26-C25	12.99	1.56	1.39
5	D	101	A1JXR	C21-C13	-12.65	1.32	1.52
5	D	101	A1JXR	C19-C18	12.49	1.61	1.40
5	C	101	A1JXR	C19-C18	12.35	1.61	1.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	C	101	A1JXR	C47-C48	12.07	1.55	1.39
5	D	101	A1JXR	C29-C30	12.02	1.55	1.39
5	C	101	A1JXR	C16-C15	-11.99	1.33	1.52
5	C	101	A1JXR	C37-C36	11.50	1.60	1.40
5	C	101	A1JXR	C21-C13	-11.47	1.34	1.52
5	D	101	A1JXR	C37-C36	11.23	1.59	1.40
5	D	101	A1JXR	C16-C15	-11.04	1.35	1.52
5	D	101	A1JXR	C34-C33	-10.13	1.36	1.52
5	D	101	A1JXR	C39-C31	-10.10	1.36	1.52
5	C	101	A1JXR	C39-C31	-9.93	1.36	1.52
5	C	101	A1JXR	C34-C33	-9.80	1.37	1.52
5	C	101	A1JXR	C21-C16	-8.72	1.24	1.40
5	C	101	A1JXR	C32-C33	-8.44	1.46	1.55
5	D	101	A1JXR	C39-C34	-8.37	1.25	1.40
5	D	101	A1JXR	C21-C16	-8.03	1.26	1.40
5	C	101	A1JXR	C39-C34	-7.97	1.26	1.40
5	C	101	A1JXR	C10-C11	7.58	1.52	1.39
5	D	101	A1JXR	C32-C33	-7.50	1.47	1.55
5	D	101	A1JXR	C32-C31	-7.43	1.47	1.55
5	C	101	A1JXR	C32-C31	-7.14	1.47	1.55
5	D	101	A1JXR	C14-C15	-6.93	1.47	1.55
5	D	101	A1JXR	C10-C11	6.68	1.51	1.39
5	C	101	A1JXR	C7-C8	6.62	1.51	1.39
5	D	101	A1JXR	C7-C8	6.59	1.51	1.39
5	C	101	A1JXR	C14-C15	-6.55	1.48	1.55
5	D	101	A1JXR	C37-C40	6.50	1.62	1.52
5	D	101	A1JXR	C14-C13	-6.13	1.48	1.55
5	C	101	A1JXR	C43-C42	-6.08	1.42	1.52
5	D	101	A1JXR	C25-C24	-5.98	1.43	1.52
5	C	101	A1JXR	C14-C13	-5.97	1.48	1.55
5	C	101	A1JXR	C25-C24	-5.88	1.43	1.52
5	D	101	A1JXR	C43-C42	-5.70	1.43	1.52
5	C	101	A1JXR	C37-C40	5.64	1.61	1.52
5	D	101	A1JXR	C19-C22	5.48	1.61	1.52
5	D	101	A1JXR	C48-C40	-5.45	1.43	1.52
5	C	101	A1JXR	C48-C40	-5.40	1.44	1.52
5	C	101	A1JXR	C18-C24	5.34	1.60	1.52
5	D	101	A1JXR	C30-C22	-5.26	1.44	1.52
5	C	101	A1JXR	C19-C22	5.14	1.60	1.52
5	C	101	A1JXR	C36-C42	5.02	1.60	1.52
5	D	101	A1JXR	C36-C42	4.79	1.59	1.52
5	C	101	A1JXR	C10-C9	4.63	1.47	1.39

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	C	101	A1JXR	N2-N3	4.40	1.41	1.34
5	D	101	A1JXR	C7-C12	4.37	1.47	1.39
5	D	101	A1JXR	C10-C9	4.36	1.47	1.39
5	D	101	A1JXR	C18-C24	4.22	1.59	1.52
5	C	101	A1JXR	C7-C12	4.06	1.46	1.39
5	C	101	A1JXR	C4-N2	3.99	1.39	1.34
5	D	101	A1JXR	C17-C18	-3.78	1.33	1.39
5	D	101	A1JXR	N2-N3	3.78	1.40	1.34
5	D	101	A1JXR	C4-N2	3.77	1.39	1.34
5	C	101	A1JXR	C17-C18	-3.75	1.33	1.39
5	D	101	A1JXR	O6-C10	-3.75	1.34	1.40
5	C	101	A1JXR	O6-C10	-3.67	1.34	1.40
5	C	101	A1JXR	C30-C22	-3.65	1.46	1.52
5	C	101	A1JXR	P2-O6	3.53	1.64	1.59
5	C	101	A1JXR	C20-C19	-3.44	1.34	1.39
5	D	101	A1JXR	C20-C19	-3.29	1.34	1.39
5	D	101	A1JXR	O5-C7	-2.96	1.35	1.40
5	C	101	A1JXR	C5-C4	2.65	1.56	1.51
5	D	101	A1JXR	C35-C36	-2.58	1.35	1.39
5	D	101	A1JXR	C8-C33	2.54	1.55	1.52
5	C	101	A1JXR	C46-C45	-2.46	1.31	1.38
5	D	101	A1JXR	P2-O6	2.31	1.62	1.59
5	D	101	A1JXR	C38-C37	-2.26	1.35	1.39
5	D	101	A1JXR	C3-N1	2.19	1.40	1.33
5	D	101	A1JXR	P1-O2	2.19	1.68	1.59
5	C	101	A1JXR	C3-N1	2.15	1.40	1.33
5	D	101	A1JXR	C28-C27	-2.09	1.32	1.38
5	C	101	A1JXR	C8-C33	2.08	1.55	1.52
5	C	101	A1JXR	C38-C37	-2.03	1.36	1.39
5	C	101	A1JXR	C35-C36	-2.01	1.36	1.39

All (135) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	D	101	A1JXR	C24-C23-C22	11.93	100.58	94.43
5	C	101	A1JXR	C42-C41-C40	10.72	99.96	94.43
5	D	101	A1JXR	C9-C8-C33	-10.00	97.41	106.69
5	D	101	A1JXR	C11-C12-C13	-9.92	97.48	106.69
5	D	101	A1JXR	C19-C18-C24	-9.26	97.00	106.58
5	C	101	A1JXR	C12-C11-C15	-9.20	98.14	106.69
5	C	101	A1JXR	C19-C18-C24	-8.86	97.42	106.58
5	C	101	A1JXR	C9-C8-C33	-8.84	98.48	106.69

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	D	101	A1JXR	C36-C37-C40	-8.84	97.44	106.58
5	D	101	A1JXR	C42-C41-C40	8.69	98.91	94.43
5	C	101	A1JXR	C36-C37-C40	-8.54	97.75	106.58
5	C	101	A1JXR	C11-C12-C13	-8.53	98.77	106.69
5	C	101	A1JXR	C33-C32-C31	8.36	98.74	94.43
5	C	101	A1JXR	C24-C23-C22	8.14	98.63	94.43
5	C	101	A1JXR	C8-C9-C31	-8.04	99.23	106.69
5	D	101	A1JXR	C15-C14-C13	7.97	98.54	94.43
5	D	101	A1JXR	C33-C32-C31	7.83	98.47	94.43
5	D	101	A1JXR	C12-C11-C15	-7.81	99.44	106.69
5	D	101	A1JXR	C8-C9-C31	-7.60	99.64	106.69
5	C	101	A1JXR	C18-C19-C22	-7.29	99.04	106.58
5	D	101	A1JXR	C21-C20-C19	-7.16	111.11	123.20
5	D	101	A1JXR	C18-C17-C16	-7.11	111.19	123.20
5	D	101	A1JXR	C37-C36-C42	-7.02	99.32	106.58
5	C	101	A1JXR	C18-C17-C16	-6.72	111.85	123.20
5	C	101	A1JXR	C15-C14-C13	6.71	97.89	94.43
5	C	101	A1JXR	C21-C20-C19	-6.38	112.43	123.20
5	C	101	A1JXR	O6-C10-C11	6.20	125.61	118.34
5	D	101	A1JXR	C18-C19-C22	-6.08	100.30	106.58
5	C	101	A1JXR	C37-C36-C42	-6.05	100.32	106.58
5	C	101	A1JXR	C36-C35-C34	-5.92	113.21	123.20
5	D	101	A1JXR	N2-N3-N1	-5.70	104.14	111.24
5	C	101	A1JXR	C41-C40-C48	-5.68	94.31	99.28
5	D	101	A1JXR	C36-C35-C34	-5.62	113.71	123.20
5	D	101	A1JXR	C38-C37-C40	5.48	139.79	130.88
5	D	101	A1JXR	C21-C16-C15	5.42	112.18	106.58
5	C	101	A1JXR	N2-N3-N1	-5.19	104.78	111.24
5	D	101	A1JXR	C30-C25-C24	5.07	111.83	106.58
5	C	101	A1JXR	C21-C16-C15	5.07	111.82	106.58
5	C	101	A1JXR	C43-C48-C40	5.04	111.80	106.58
5	D	101	A1JXR	C48-C43-C42	5.00	111.75	106.58
5	C	101	A1JXR	C16-C21-C13	4.92	111.67	106.58
5	C	101	A1JXR	C34-C39-C31	4.91	111.66	106.58
5	C	101	A1JXR	C39-C38-C37	-4.91	114.92	123.20
5	C	101	A1JXR	O5-C7-C12	4.89	124.08	118.34
5	C	101	A1JXR	C48-C43-C42	4.83	111.58	106.58
5	D	101	A1JXR	C39-C38-C37	-4.82	115.06	123.20
5	D	101	A1JXR	C48-C40-C37	4.71	110.51	105.39
5	D	101	A1JXR	C20-C21-C13	-4.57	123.46	130.88
5	C	101	A1JXR	C38-C37-C40	4.57	138.30	130.88
5	D	101	A1JXR	O5-C7-C12	4.52	123.64	118.34

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	C	101	A1JXR	C17-C18-C24	4.49	138.18	130.88
5	C	101	A1JXR	C41-C42-C43	-4.45	95.38	99.28
5	D	101	A1JXR	C25-C30-C22	4.43	111.17	106.58
5	D	101	A1JXR	C39-C34-C33	4.43	111.16	106.58
5	D	101	A1JXR	C16-C21-C13	4.38	111.11	106.58
5	D	101	A1JXR	O6-C10-C11	4.28	123.36	118.34
5	C	101	A1JXR	C30-C25-C24	4.28	111.01	106.58
5	D	101	A1JXR	C9-C31-C39	4.20	107.95	104.53
5	D	101	A1JXR	C41-C40-C48	-4.19	95.61	99.28
5	C	101	A1JXR	C25-C30-C22	4.07	110.79	106.58
5	C	101	A1JXR	C17-C16-C15	-4.06	124.28	130.88
5	D	101	A1JXR	C34-C39-C31	4.02	110.74	106.58
5	D	101	A1JXR	O5-C7-C8	4.00	123.03	118.34
5	D	101	A1JXR	C45-C44-C43	-3.97	115.97	121.01
5	D	101	A1JXR	C17-C18-C19	3.87	126.08	121.36
5	D	101	A1JXR	C35-C36-C42	3.79	137.05	130.88
5	D	101	A1JXR	C41-C42-C43	-3.75	96.00	99.28
5	D	101	A1JXR	C8-C33-C34	3.73	107.57	104.53
5	C	101	A1JXR	C35-C36-C42	3.73	136.94	130.88
5	D	101	A1JXR	C43-C42-C36	3.72	109.44	105.39
5	D	101	A1JXR	C17-C18-C24	3.71	136.91	130.88
5	C	101	A1JXR	C20-C19-C22	3.70	136.90	130.88
5	C	101	A1JXR	C45-C44-C43	-3.70	116.31	121.01
5	C	101	A1JXR	C20-C21-C13	-3.66	124.93	130.88
5	D	101	A1JXR	O6-C10-C9	3.63	122.60	118.34
5	C	101	A1JXR	C10-C11-C15	3.56	139.25	131.67
5	D	101	A1JXR	C17-C16-C15	-3.54	125.13	130.88
5	C	101	A1JXR	C12-C7-C8	-3.49	113.11	119.45
5	D	101	A1JXR	C7-C12-C13	3.49	139.11	131.67
5	D	101	A1JXR	C12-C13-C21	-3.45	101.73	104.53
5	D	101	A1JXR	C12-C7-C8	-3.44	113.21	119.45
5	D	101	A1JXR	C35-C34-C33	-3.39	125.37	130.88
5	C	101	A1JXR	O5-C7-C8	3.37	122.29	118.34
5	D	101	A1JXR	P1-O5-C7	-3.31	116.00	124.18
5	D	101	A1JXR	C20-C21-C16	3.31	125.41	121.36
5	D	101	A1JXR	C7-C8-C33	3.30	138.70	131.67
5	D	101	A1JXR	C20-C19-C22	3.26	136.18	130.88
5	D	101	A1JXR	C23-C24-C25	-3.23	96.46	99.28
5	D	101	A1JXR	C14-C13-C12	3.23	101.70	99.24
5	D	101	A1JXR	C43-C48-C40	3.22	109.91	106.58
5	C	101	A1JXR	C14-C15-C11	3.17	101.66	99.24
5	C	101	A1JXR	C48-C40-C37	3.15	108.81	105.39

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	C	101	A1JXR	P2-O6-C10	-3.12	112.80	123.96
5	C	101	A1JXR	C10-C9-C31	3.11	138.29	131.67
5	C	101	A1JXR	C39-C34-C33	3.09	109.78	106.58
5	C	101	A1JXR	C11-C10-C9	-3.08	113.85	119.45
5	D	101	A1JXR	O6-P2-O9	-3.08	97.69	109.31
5	D	101	A1JXR	C26-C25-C24	-3.05	124.87	129.37
5	C	101	A1JXR	P1-O5-C7	-3.03	116.70	124.18
5	D	101	A1JXR	C11-C10-C9	-3.03	113.95	119.45
5	C	101	A1JXR	C7-C12-C13	3.00	138.06	131.67
5	D	101	A1JXR	C10-C11-C15	2.97	138.00	131.67
5	C	101	A1JXR	C35-C34-C33	-2.88	126.20	130.88
5	D	101	A1JXR	O8-P2-O9	2.88	121.94	110.68
5	D	101	A1JXR	P2-O6-C10	-2.87	113.71	123.96
5	C	101	A1JXR	C14-C13-C12	2.86	101.42	99.24
5	D	101	A1JXR	C27-C26-C25	-2.84	117.40	121.01
5	D	101	A1JXR	C28-C29-C30	-2.67	117.62	121.01
5	D	101	A1JXR	C23-C22-C30	-2.64	96.97	99.28
5	D	101	A1JXR	C11-C15-C16	-2.63	102.40	104.53
5	D	101	A1JXR	C10-C9-C31	2.59	137.18	131.67
5	C	101	A1JXR	C43-C42-C36	2.56	108.18	105.39
5	C	101	A1JXR	C17-C18-C19	2.47	124.37	121.36
5	D	101	A1JXR	C44-C43-C42	-2.46	125.74	129.37
5	D	101	A1JXR	C3-N1-N3	2.46	113.26	107.97
5	C	101	A1JXR	C26-C25-C24	-2.45	125.77	129.37
5	C	101	A1JXR	C9-C31-C39	2.44	106.52	104.53
5	D	101	A1JXR	C26-C25-C30	2.40	123.28	120.65
5	C	101	A1JXR	C7-C8-C9	2.39	124.88	120.95
5	C	101	A1JXR	C26-C25-C30	2.35	123.22	120.65
5	C	101	A1JXR	C46-C47-C48	-2.33	118.05	121.01
5	C	101	A1JXR	C7-C8-C33	2.33	136.63	131.67
5	D	101	A1JXR	O3-P1-O2	2.33	118.56	107.75
5	C	101	A1JXR	C38-C39-C31	-2.31	127.13	130.88
5	C	101	A1JXR	C3-N1-N3	2.21	112.72	107.97
5	C	101	A1JXR	C20-C19-C18	2.20	124.04	121.36
5	C	101	A1JXR	C35-C34-C39	2.16	124.00	121.36
5	C	101	A1JXR	C44-C43-C42	-2.14	126.22	129.37
5	C	101	A1JXR	C38-C37-C36	2.11	123.94	121.36
5	C	101	A1JXR	C32-C31-C39	-2.09	97.45	99.28
5	C	101	A1JXR	C28-C29-C30	-2.07	118.38	121.01
5	C	101	A1JXR	C47-C48-C40	-2.07	126.32	129.37
5	C	101	A1JXR	C17-C16-C21	2.07	123.88	121.36
5	D	101	A1JXR	C46-C47-C48	-2.01	118.45	121.01

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	C	101	A1JXR	O6-P2-O9	-2.01	101.74	109.31

There are no chirality outliers.

All (7) torsion outliers are listed below:

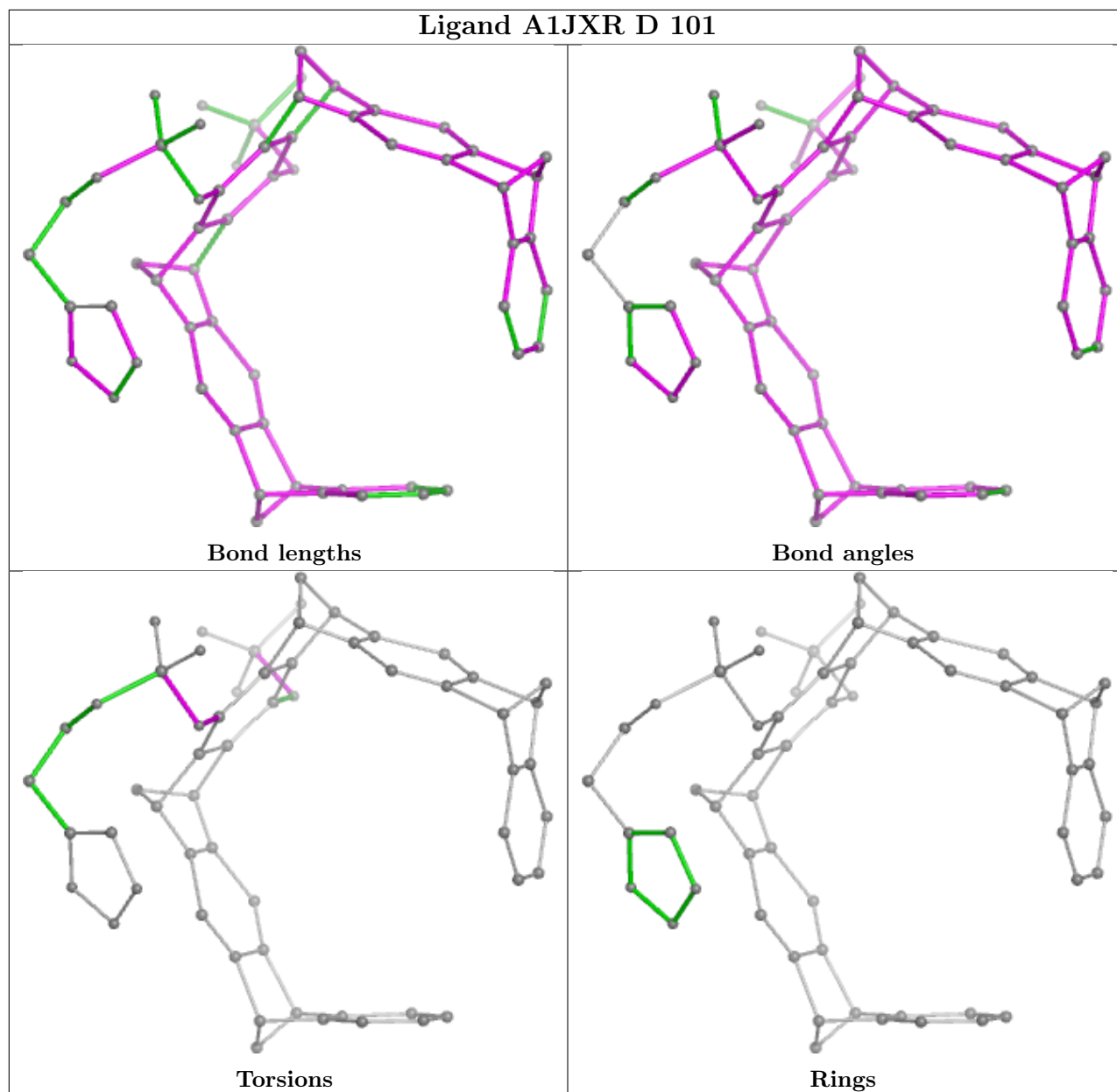
Mol	Chain	Res	Type	Atoms
5	C	101	A1JXR	C7-O5-P1-O3
5	D	101	A1JXR	C10-O6-P2-O9
5	D	101	A1JXR	C8-C7-O5-P1
5	D	101	A1JXR	C12-C7-O5-P1
5	C	101	A1JXR	C8-C7-O5-P1
5	C	101	A1JXR	C7-O5-P1-O4
5	D	101	A1JXR	C7-O5-P1-O4

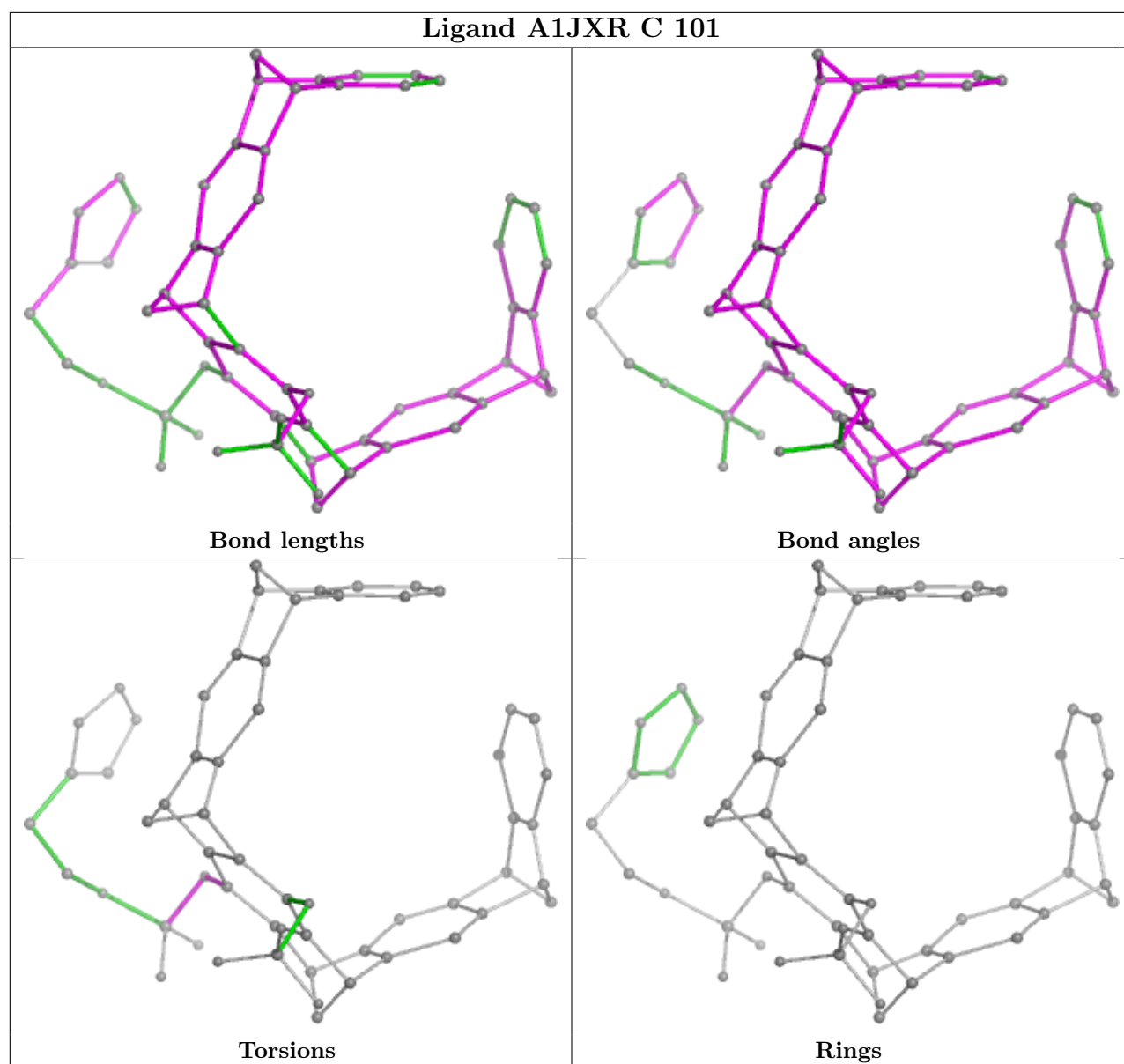
There are no ring outliers.

2 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	D	101	A1JXR	2	0
5	C	101	A1JXR	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	117/121 (96%)	0.47	11 (9%) 15 13	24, 38, 83, 114	0
1	B	118/121 (97%)	0.31	10 (8%) 18 16	25, 36, 82, 102	1 (0%)
2	C	3/6 (50%)	-0.49	0 100 100	29, 29, 31, 40	0
2	D	3/6 (50%)	-0.45	0 100 100	26, 26, 30, 37	0
All	All	241/254 (94%)	0.37	21 (8%) 17 15	24, 37, 82, 114	1 (0%)

All (21) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	5	THR	4.7
1	B	6	LEU	4.2
1	A	6	LEU	3.7
1	A	8	PRO	3.6
1	B	10	TRP	3.5
1	A	9	ALA	3.5
1	B	7	PRO	3.1
1	A	121	LYS	3.0
1	B	8	PRO	2.9
1	B	122	LYS	2.8
1	A	117	THR	2.7
1	A	7	PRO	2.7
1	B	28	LEU	2.5
1	A	10	TRP	2.4
1	A	122	LYS	2.4
1	B	17	HIS	2.2
1	A	50	ASN	2.2
1	B	9	ALA	2.2
1	B	31	CYS	2.1
1	A	119	ASN	2.1
1	A	113	ILE	2.1

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

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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
2	TPO	C	3	11/12	0.98	0.05	24,29,33,35	0
2	TPO	D	3	11/12	0.98	0.06	24,28,30,30	0

6.3 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

6.4 Ligands [i](#)

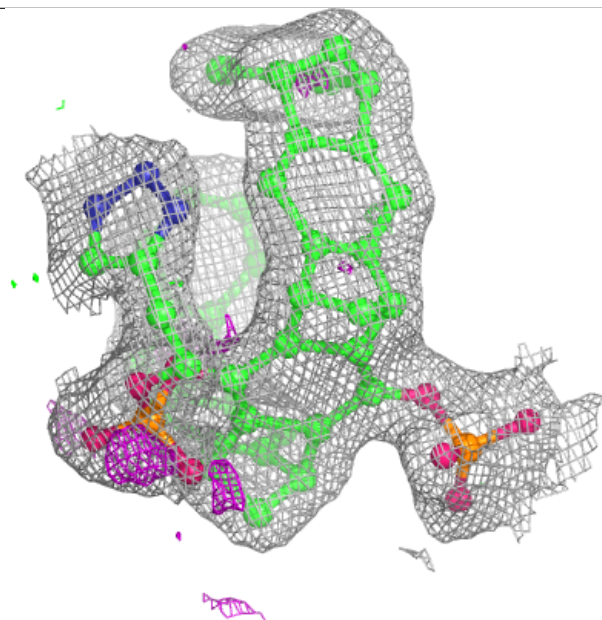
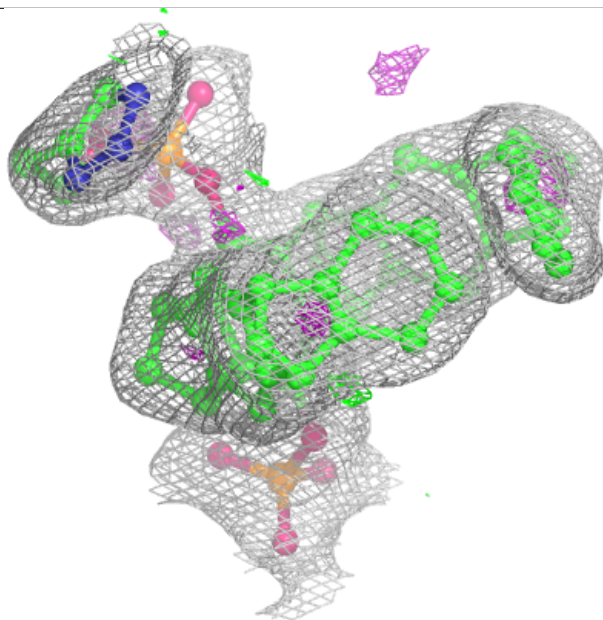
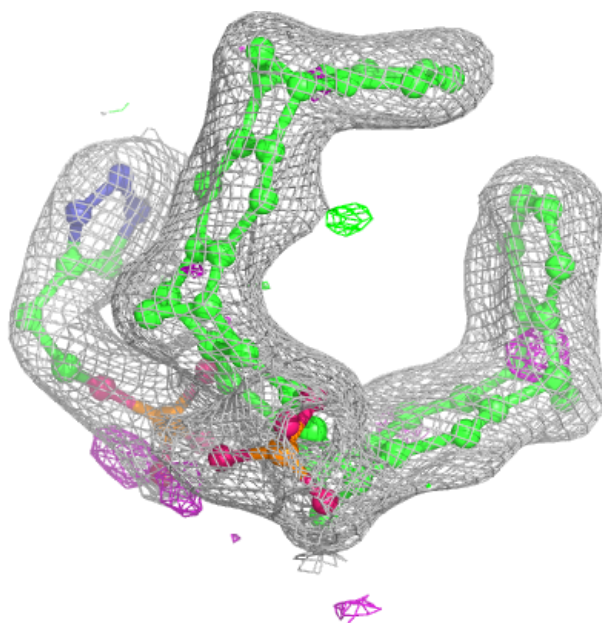
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

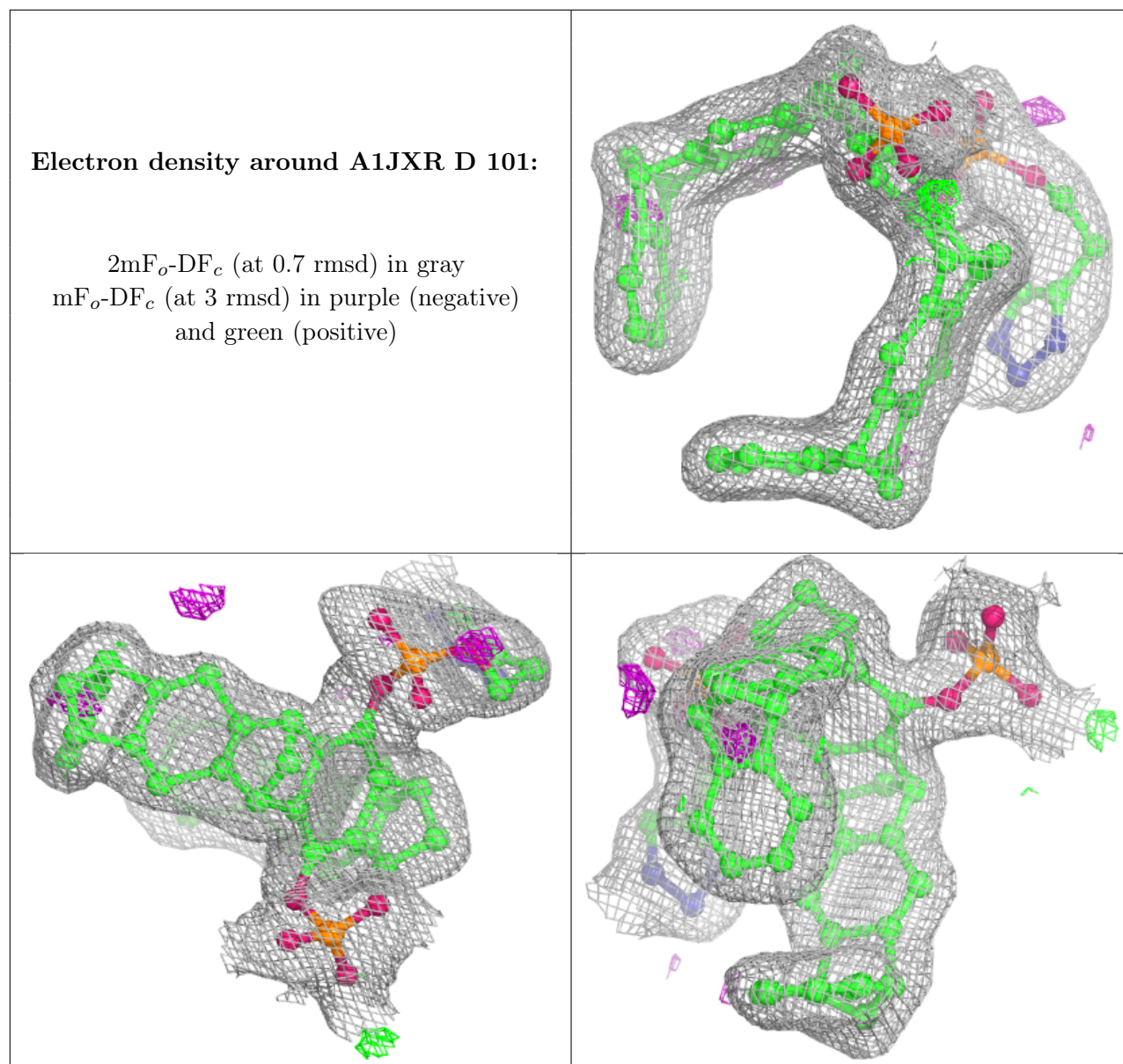
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
4	CA	C	102	1/1	0.93	0.09	73,73,73,73	0
5	A1JXR	C	101	59/59	0.95	0.08	26,34,52,57	0
5	A1JXR	D	101	59/59	0.95	0.07	28,32,45,46	0
4	CA	D	102	1/1	0.96	0.09	61,61,61,61	0
3	ZN	B	200	1/1	1.00	0.02	29,29,29,29	0
4	CA	A	202	1/1	1.00	0.04	29,29,29,29	0
3	ZN	A	201	1/1	1.00	0.02	31,31,31,31	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 A1JXR C 101:

$2mF_o-DF_c$ (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.