



Full wwPDB X-ray Structure Validation Report ⓘ

Aug 20, 2020 – 02:00 PM BST

PDB ID : 5ISF
Title : Crystal structure of mouse CARM1 in complex with inhibitor SA0705
Authors : Cura, V.; Marechal, N.; Mailliot, J.; Troffer-Charlier, N.; Hassenboehler, P.;
Wurtz, J.M.; Bonnefond, L.; Cavarelli, J.
Deposited on : 2016-03-15
Resolution : 2.22 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 following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity : 4.02b-467
Mogul : 1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix) : 1.13
EDS : 2.13.1
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac : 5.8.0158
CCP4 : 7.0.044 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.13.1

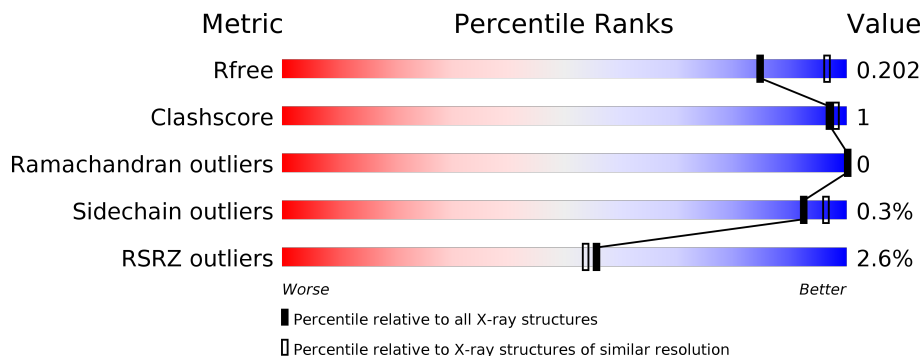
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.22 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	5912 (2.24-2.20)
Clashscore	141614	6646 (2.24-2.20)
Ramachandran outliers	138981	6543 (2.24-2.20)
Sidechain outliers	138945	6544 (2.24-2.20)
RSRZ outliers	127900	5797 (2.24-2.20)

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 on 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	361	 % 94% • 5%
1	B	361	 2% 92% • 5%
1	C	361	 3% 93% • 5%
1	D	361	 3% 93% • 5%

2 Entry composition [i](#)

There are 9 unique types of molecules in this entry. The entry contains 22818 atoms, of which 11128 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.

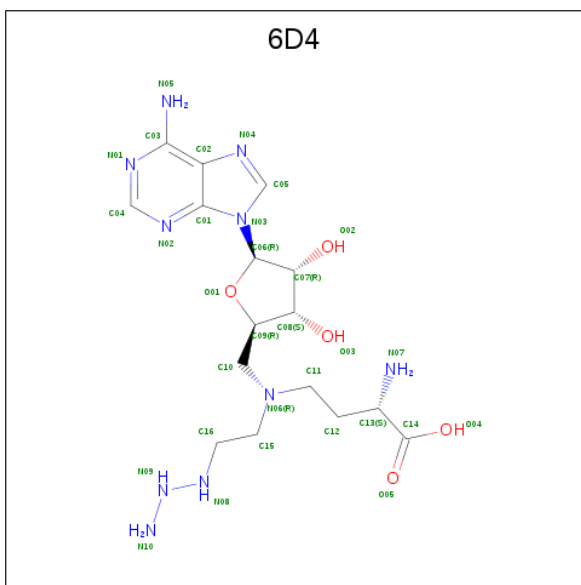
- Molecule 1 is a protein called Histone-arginine methyltransferase CARM1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace	
			Total	C	H	N	O				S
1	A	343	5520	1796	2734	461	513	16	0	4	0
1	B	343	5467	1781	2708	455	508	15	0	1	0
1	C	343	5467	1781	2708	455	508	15	0	1	0
1	D	343	5479	1784	2712	458	511	14	0	3	0

There are 12 discrepancies between the modelled and reference sequences:

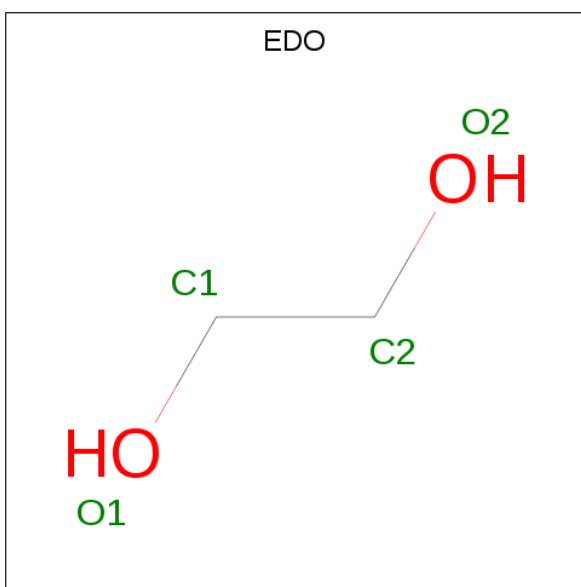
Chain	Residue	Modelled	Actual	Comment	Reference
A	127	GLY	-	expression tag	UNP Q9WVG6
A	128	HIS	-	expression tag	UNP Q9WVG6
A	129	MET	-	expression tag	UNP Q9WVG6
B	127	GLY	-	expression tag	UNP Q9WVG6
B	128	HIS	-	expression tag	UNP Q9WVG6
B	129	MET	-	expression tag	UNP Q9WVG6
C	127	GLY	-	expression tag	UNP Q9WVG6
C	128	HIS	-	expression tag	UNP Q9WVG6
C	129	MET	-	expression tag	UNP Q9WVG6
D	127	GLY	-	expression tag	UNP Q9WVG6
D	128	HIS	-	expression tag	UNP Q9WVG6
D	129	MET	-	expression tag	UNP Q9WVG6

- Molecule 2 is 5'-{[(3S)-3-amino-3-carboxypropyl][2-(triazan-1-yl)ethyl]amino}-5'-deoxyadenosine (three-letter code: 6D4) (formula: C₁₆H₂₈N₁₀O₅).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	
			Total	C	H	N			O
2	A	1	55	16	24	10	5	0	0
2	B	1	55	16	24	10	5	0	0
2	D	1	55	16	24	10	5	0	0

- Molecule 3 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: C₂H₆O₂).



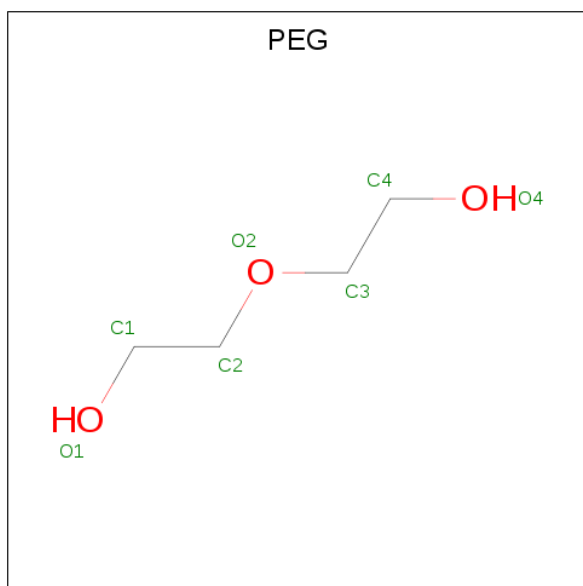
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	H	O		
3	A	1	10	2	6	2	0	0

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Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	H	O		
3	B	1	Total 10	C 2	H 6	O 2	0	0
3	B	1	Total 10	C 2	H 6	O 2	0	0
3	C	1	Total 10	C 2	H 6	O 2	0	0
3	C	1	Total 10	C 2	H 6	O 2	0	0
3	D	1	Total 10	C 2	H 6	O 2	0	0
3	D	1	Total 10	C 2	H 6	O 2	0	0

- Molecule 4 is DI(HYDROXYETHYL)ETHER (three-letter code: PEG) (formula: C₄H₁₀O₃).



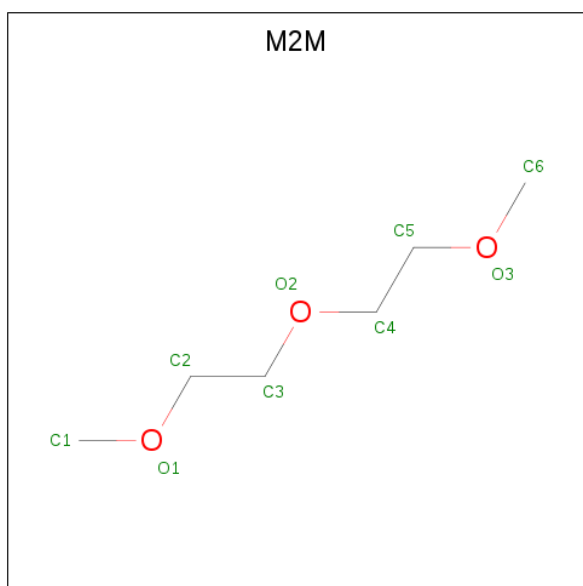
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	H	O		
4	A	1	Total 17	C 4	H 10	O 3	0	0

- Molecule 5 is TETRAETHYLENE GLYCOL (three-letter code: PG4) (formula: C₈H₁₈O₅).



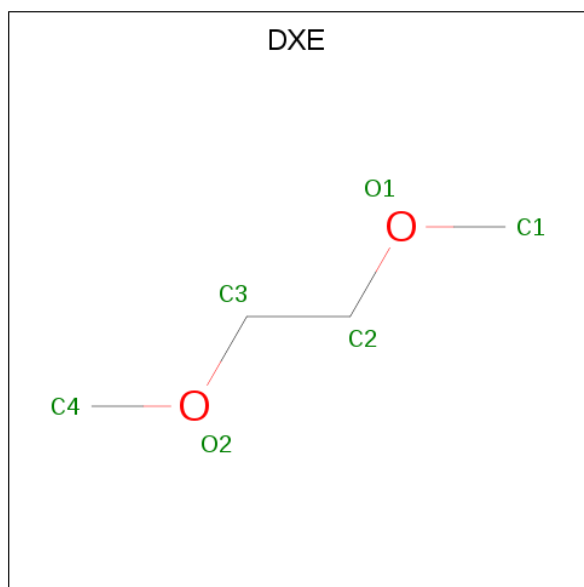
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	H	O		
5	A	1	Total	C	H	O	0	0
			31	8	18	5		
5	A	1	Total	C	H	O	0	0
			31	8	18	5		
5	B	1	Total	C	H	O	0	0
			31	8	18	5		

- Molecule 6 is 1-METHOXY-2-(2-METHOXYETHOXY)ETHANE (three-letter code: M2M) (formula: $C_6H_{14}O_3$).



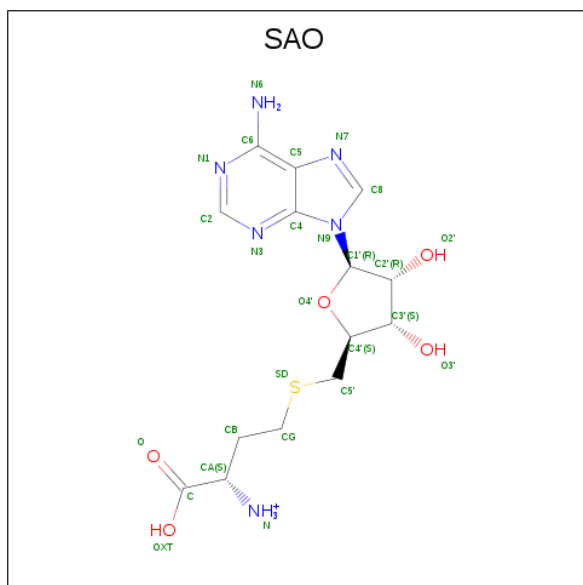
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
6	A	1	Total	C	H	O	0	0
			23	6	14	3		
6	C	1	Total	C	H	O	0	0
			23	6	14	3		

- Molecule 7 is 1,2-DIMETHOXYETHANE (three-letter code: DXE) (formula: C₄H₁₀O₂).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
7	A	1	Total	C	H	O	0	0
			16	4	10	2		
7	B	1	Total	C	H	O	0	0
			16	4	10	2		
7	B	1	Total	C	H	O	0	0
			16	4	10	2		
7	C	1	Total	C	H	O	0	0
			16	4	10	2		

- Molecule 8 is 5'-S-[(3S)-3-azaniumyl-3-carboxypropyl]-5'-thioadenosine (three-letter code: SAO) (formula: C₁₄H₂₁N₆O₅S).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	
			Total	C	H	N	O			S
8	C	1	46	14	20	6	5	1	0	0

- Molecule 9 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
9	A	128	Total	O	0	0
			128	128		
9	B	100	Total	O	0	0
			100	100		
9	C	91	Total	O	0	0
			91	91		
9	D	65	Total	O	0	0
			65	65		

3 Residue-property plots [i](#)

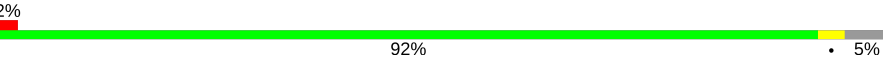
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. 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: Histone-arginine methyltransferase CARM1

Chain A: 

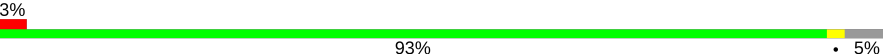


- Molecule 1: Histone-arginine methyltransferase CARM1

Chain B: 

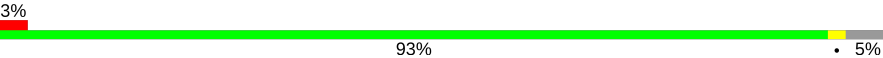


- Molecule 1: Histone-arginine methyltransferase CARM1

Chain C: 



- Molecule 1: Histone-arginine methyltransferase CARM1

Chain D: 



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 2	Depositor
Cell constants a, b, c, α , β , γ	74.74Å 98.14Å 206.67Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	20.00 – 2.22 20.19 – 2.22	Depositor EDS
% Data completeness (in resolution range)	97.1 (20.00-2.22) 97.2 (20.19-2.22)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.09	Depositor
$\langle I/\sigma(I) \rangle$ ¹	4.12 (at 2.21Å)	Xtrriage
Refinement program	PHENIX dev_1980	Depositor
R, R_{free}	0.166 , 0.201 0.167 , 0.202	Depositor DCC
R_{free} test set	3647 reflections (4.95%)	wwPDB-VP
Wilson B-factor (Å ²)	42.9	Xtrriage
Anisotropy	0.357	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.40 , 43.0	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	0.97	EDS
Total number of atoms	22818	wwPDB-VP
Average B, all atoms (Å ²)	54.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 36.38 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 5.0437e-04. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

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: SAO, 6D4, EDO, M2M, PG4, DXE, PEG

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	A	0.24	0/2856	0.39	0/3868
1	B	0.23	0/2829	0.38	0/3833
1	C	0.23	0/2829	0.37	0/3833
1	D	0.23	0/2845	0.38	0/3857
All	All	0.23	0/11359	0.38	0/15391

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [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	2786	2734	2730	2	0
1	B	2759	2708	2707	5	0
1	C	2759	2708	2707	6	0
1	D	2767	2712	2699	6	0
2	A	31	24	0	0	0
2	B	31	24	0	0	0
2	D	31	24	0	1	0
3	A	4	6	6	0	0
3	B	8	12	12	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	C	8	12	12	0	0
3	D	8	12	12	0	0
4	A	7	10	10	0	0
5	A	26	36	36	0	0
5	B	13	18	18	0	0
6	A	9	14	14	0	0
6	C	9	14	14	0	0
7	A	6	10	10	0	0
7	B	12	20	20	0	0
7	C	6	10	10	0	0
8	C	26	20	0	0	0
9	A	128	0	0	1	0
9	B	100	0	0	1	0
9	C	91	0	0	4	0
9	D	65	0	0	2	0
All	All	11690	11128	11017	19	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 1.

All (19) 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:D:169:ARG:NH1	1:D:258:GLU:OE2	2.09	0.84
1:B:362:GLU:OE2	9:B:601:HOH:O	2.02	0.76
1:C:159:GLN:OE1	9:C:601:HOH:O	2.08	0.71
1:D:175:ARG:NH2	9:D:602:HOH:O	2.22	0.71
1:B:169:ARG:NH1	1:B:258:GLU:OE2	2.27	0.68
1:A:469:ASP:OD1	9:A:601:HOH:O	2.12	0.67
1:D:469:ASP:OD1	9:D:601:HOH:O	2.17	0.58
1:C:302:GLN:NE2	9:C:604:HOH:O	2.37	0.58
1:D:169:ARG:NH1	2:D:501:6D4:O05	2.36	0.56
1:D:333:ASP:O	1:D:337:ARG:HG3	2.13	0.48
1:C:469:ASP:OD1	9:C:602:HOH:O	2.20	0.48
1:B:266:ASN:O	1:B:267:GLU:HB2	2.14	0.47
1:A:266:ASN:O	1:A:267:GLU:HB2	2.14	0.47
1:D:266:ASN:O	1:D:267:GLU:HB2	2.15	0.47
1:C:136:SER:N	9:C:608:HOH:O	2.49	0.44
1:C:266:ASN:O	1:C:267:GLU:HB2	2.17	0.44
1:B:441:LEU:HD23	1:B:451:ILE:HG12	2.00	0.42
1:C:263:MET:O	1:C:264:LEU:HB3	2.20	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:263:MET:O	1:B:264:LEU:HB3	2.20	0.41

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	345/361 (96%)	334 (97%)	11 (3%)	0	100	100
1	B	342/361 (95%)	333 (97%)	9 (3%)	0	100	100
1	C	342/361 (95%)	331 (97%)	11 (3%)	0	100	100
1	D	344/361 (95%)	335 (97%)	9 (3%)	0	100	100
All	All	1373/1444 (95%)	1333 (97%)	40 (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	303/313 (97%)	302 (100%)	1 (0%)	92	96
1	B	300/313 (96%)	299 (100%)	1 (0%)	92	96
1	C	300/313 (96%)	299 (100%)	1 (0%)	92	96
1	D	302/313 (96%)	301 (100%)	1 (0%)	92	96

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
All	All	1205/1252 (96%)	1201 (100%)	4 (0%)	92 96

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

Mol	Chain	Res	Type
1	A	258	GLU
1	B	295	LEU
1	C	258	GLU
1	D	295	LEU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

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 monosaccharides in this entry.

5.6 Ligand geometry [i](#)

21 ligands 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	$\# Z > 2$
5	PG4	A	505	-	12,12,12	0.53	0	11,11,11	0.35	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	6D4	B	501	-	25,33,33	4.61	11 (44%)	24,46,46	2.38	4 (16%)
6	M2M	C	505	-	8,8,8	0.59	0	7,7,7	0.25	0
3	EDO	D	503	-	3,3,3	0.47	0	2,2,2	0.48	0
5	PG4	B	506	-	12,12,12	0.52	0	11,11,11	0.50	0
8	SAO	C	501	-	21,28,28	0.63	0	20,40,40	1.14	2 (10%)
6	M2M	A	506	-	8,8,8	0.59	0	7,7,7	0.27	0
4	PEG	A	503	-	6,6,6	0.47	0	5,5,5	0.80	0
3	EDO	B	503	-	3,3,3	0.47	0	2,2,2	0.48	0
7	DXE	C	504	-	5,5,5	0.42	0	4,4,4	0.21	0
3	EDO	B	502	-	3,3,3	0.48	0	2,2,2	0.45	0
2	6D4	D	501	-	25,33,33	4.62	12 (48%)	24,46,46	2.40	5 (20%)
3	EDO	D	502	-	3,3,3	0.47	0	2,2,2	0.46	0
3	EDO	A	502	-	3,3,3	0.47	0	2,2,2	0.47	0
5	PG4	A	504	-	12,12,12	0.51	0	11,11,11	0.51	0
7	DXE	A	507	-	5,5,5	0.39	0	4,4,4	0.20	0
3	EDO	C	503	-	3,3,3	0.48	0	2,2,2	0.47	0
3	EDO	C	502	-	3,3,3	0.47	0	2,2,2	0.49	0
7	DXE	B	504	-	5,5,5	0.43	0	4,4,4	0.23	0
2	6D4	A	501	-	25,33,33	4.64	11 (44%)	24,46,46	2.15	5 (20%)
7	DXE	B	505	-	5,5,5	0.43	0	4,4,4	0.18	0

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
5	PG4	A	505	-	-	0/10/10/10	-
2	6D4	B	501	-	-	4/12/38/38	0/3/3/3
6	M2M	C	505	-	-	3/6/6/6	-
3	EDO	D	503	-	-	0/1/1/1	-
5	PG4	B	506	-	-	5/10/10/10	-
8	SAO	C	501	-	-	1/7/31/31	0/3/3/3
6	M2M	A	506	-	-	4/6/6/6	-
4	PEG	A	503	-	-	3/4/4/4	-
3	EDO	B	503	-	-	0/1/1/1	-
7	DXE	C	504	-	-	1/3/3/3	-
3	EDO	B	502	-	-	1/1/1/1	-
2	6D4	D	501	-	-	8/12/38/38	0/3/3/3
3	EDO	D	502	-	-	0/1/1/1	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	EDO	A	502	-	-	0/1/1/1	-
5	PG4	A	504	-	-	4/10/10/10	-
7	DXE	A	507	-	-	1/3/3/3	-
3	EDO	C	503	-	-	1/1/1/1	-
3	EDO	C	502	-	-	0/1/1/1	-
7	DXE	B	504	-	-	1/3/3/3	-
2	6D4	A	501	-	-	8/12/38/38	0/3/3/3
7	DXE	B	505	-	-	2/3/3/3	-

All (34) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	501	6D4	C16-N08	-18.73	1.26	1.45
2	D	501	6D4	C16-N08	-18.65	1.26	1.45
2	B	501	6D4	C16-N08	-18.61	1.26	1.45
2	A	501	6D4	O01-C06	8.21	1.52	1.41
2	D	501	6D4	O01-C06	8.18	1.52	1.41
2	B	501	6D4	O01-C06	7.93	1.52	1.41
2	A	501	6D4	N10-N09	-4.52	1.22	1.41
2	D	501	6D4	N10-N09	-4.50	1.22	1.41
2	B	501	6D4	N10-N09	-4.44	1.23	1.41
2	D	501	6D4	C03-N05	3.74	1.47	1.34
2	D	501	6D4	C07-C06	-3.73	1.48	1.53
2	A	501	6D4	C07-C06	-3.70	1.48	1.53
2	B	501	6D4	C03-N05	3.70	1.47	1.34
2	B	501	6D4	C07-C06	-3.69	1.48	1.53
2	A	501	6D4	C03-N05	3.69	1.47	1.34
2	B	501	6D4	C02-N04	3.63	1.52	1.39
2	D	501	6D4	C02-N04	3.58	1.52	1.39
2	B	501	6D4	O01-C09	3.58	1.53	1.45
2	A	501	6D4	C02-N04	3.58	1.52	1.39
2	D	501	6D4	O01-C09	3.45	1.52	1.45
2	A	501	6D4	O01-C09	3.38	1.52	1.45
2	B	501	6D4	C04-N02	2.98	1.36	1.32
2	A	501	6D4	C04-N02	2.93	1.36	1.32
2	D	501	6D4	C04-N02	2.93	1.36	1.32
2	A	501	6D4	C12-C11	2.72	1.58	1.52
2	D	501	6D4	C12-C11	2.66	1.58	1.52
2	B	501	6D4	C08-C07	-2.53	1.46	1.53
2	B	501	6D4	C08-C09	-2.45	1.46	1.53
2	B	501	6D4	C12-C11	2.39	1.57	1.52
2	D	501	6D4	C08-C09	-2.33	1.47	1.53

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	501	6D4	C08-C09	-2.29	1.47	1.53
2	A	501	6D4	C08-C07	-2.28	1.47	1.53
2	D	501	6D4	C08-C07	-2.19	1.47	1.53
2	D	501	6D4	C01-N02	-2.00	1.32	1.35

All (16) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	501	6D4	C16-N08-N09	9.28	120.77	111.27
2	D	501	6D4	C16-N08-N09	8.80	120.28	111.27
2	A	501	6D4	C16-N08-N09	7.72	119.17	111.27
2	D	501	6D4	C06-N03-C01	-4.59	118.58	126.64
2	A	501	6D4	C06-N03-C01	-4.29	119.11	126.64
2	B	501	6D4	C06-N03-C01	-3.99	119.63	126.64
2	D	501	6D4	C08-C07-C06	3.79	106.69	100.98
8	C	501	SAO	CB-CG-SD	-3.51	105.45	113.31
2	B	501	6D4	C08-C07-C06	3.31	105.96	100.98
2	A	501	6D4	C08-C07-C06	3.20	105.79	100.98
2	A	501	6D4	C07-C08-C09	2.80	108.08	102.64
2	D	501	6D4	C07-C08-C09	2.77	108.02	102.64
8	C	501	SAO	C5-C6-N6	2.38	123.96	120.35
2	D	501	6D4	C15-C16-N08	2.33	116.53	112.19
2	B	501	6D4	C07-C08-C09	2.29	107.09	102.64
2	A	501	6D4	C15-C16-N08	2.00	115.92	112.19

There are no chirality outliers.

All (47) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	D	501	6D4	C11-C12-C13-C14
2	D	501	6D4	C11-C12-C13-N07
2	D	501	6D4	C08-C09-C10-N06
2	D	501	6D4	O01-C09-C10-N06
2	B	501	6D4	N06-C11-C12-C13
2	B	501	6D4	C08-C09-C10-N06
2	B	501	6D4	O01-C09-C10-N06
2	A	501	6D4	N06-C15-C16-N08
2	A	501	6D4	C11-C12-C13-C14
2	A	501	6D4	C11-C12-C13-N07
2	A	501	6D4	C16-C15-N06-C10
2	D	501	6D4	C16-C15-N06-C10
2	B	501	6D4	C16-C15-N06-C10

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Mol	Chain	Res	Type	Atoms
5	B	506	PG4	O2-C3-C4-O3
7	B	504	DXE	O1-C2-C3-O2
5	B	506	PG4	O3-C5-C6-O4
4	A	503	PEG	C4-C3-O2-C2
6	C	505	M2M	O2-C4-C5-O3
6	A	506	M2M	O2-C4-C5-O3
5	A	504	PG4	O1-C1-C2-O2
2	D	501	6D4	C12-C11-N06-C15
2	A	501	6D4	C12-C11-N06-C15
7	B	505	DXE	O1-C2-C3-O2
2	A	501	6D4	C12-C11-N06-C10
4	A	503	PEG	O1-C1-C2-O2
2	D	501	6D4	N06-C15-C16-N08
2	D	501	6D4	C12-C11-N06-C10
7	B	505	DXE	C3-C2-O1-C1
2	A	501	6D4	O01-C09-C10-N06
3	C	503	EDO	O1-C1-C2-O2
2	A	501	6D4	C08-C09-C10-N06
5	A	504	PG4	C4-C3-O2-C2
4	A	503	PEG	C1-C2-O2-C3
5	B	506	PG4	C4-C3-O2-C2
6	A	506	M2M	C5-C4-O2-C3
5	B	506	PG4	C6-C5-O3-C4
5	B	506	PG4	C1-C2-O2-C3
6	C	505	M2M	C4-C5-O3-C6
6	A	506	M2M	C4-C5-O3-C6
3	B	502	EDO	O1-C1-C2-O2
5	A	504	PG4	O3-C5-C6-O4
7	A	507	DXE	C3-C2-O1-C1
7	C	504	DXE	O1-C2-C3-O2
6	A	506	M2M	O1-C2-C3-O2
5	A	504	PG4	O2-C3-C4-O3
8	C	501	SAO	CB-CG-SD-C5'
6	C	505	M2M	O1-C2-C3-O2

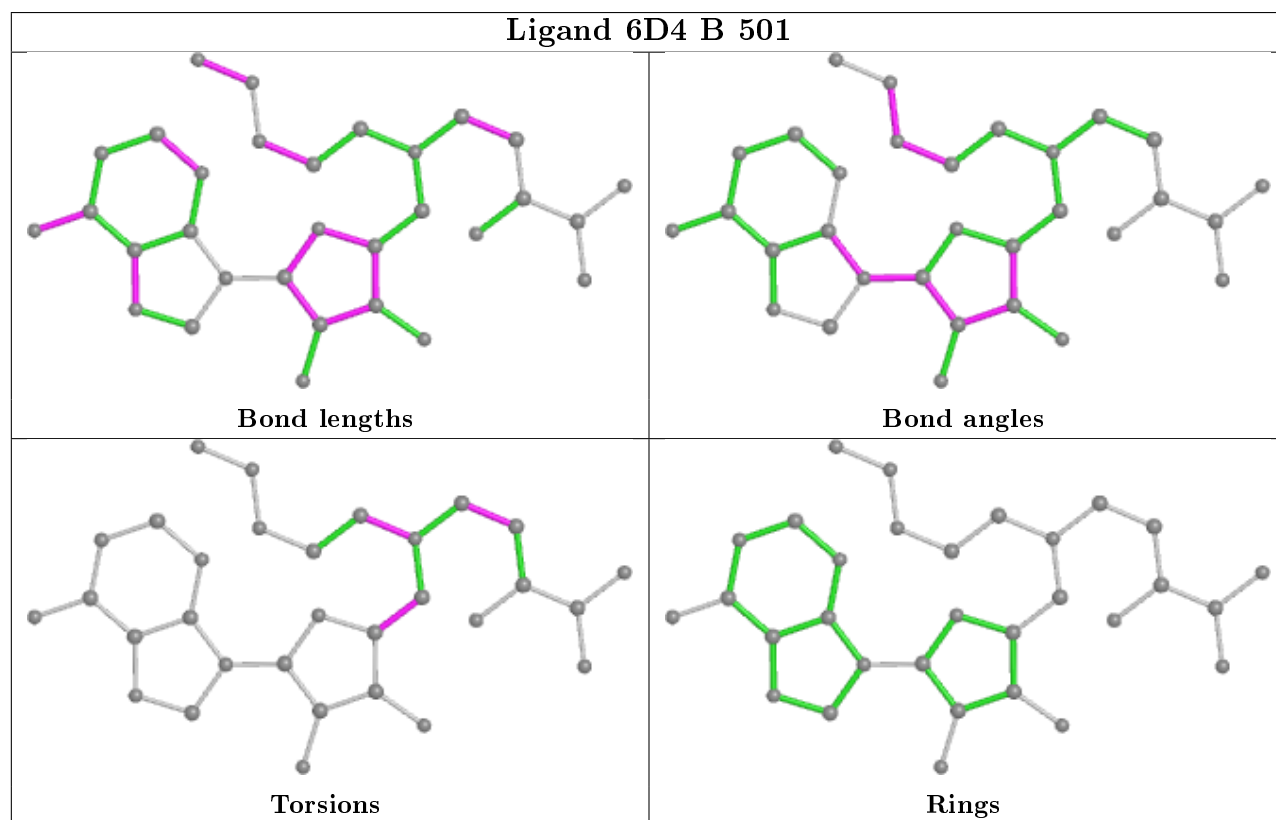
There are no ring outliers.

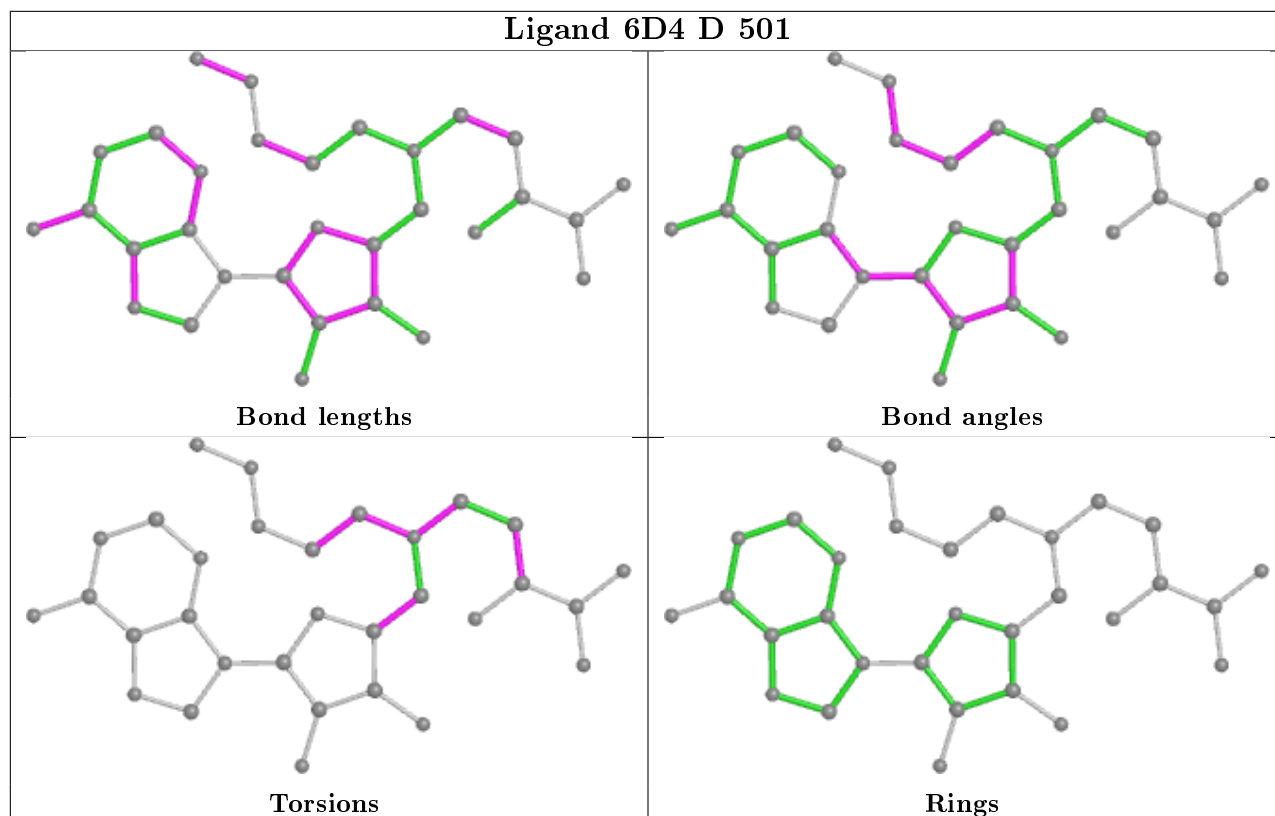
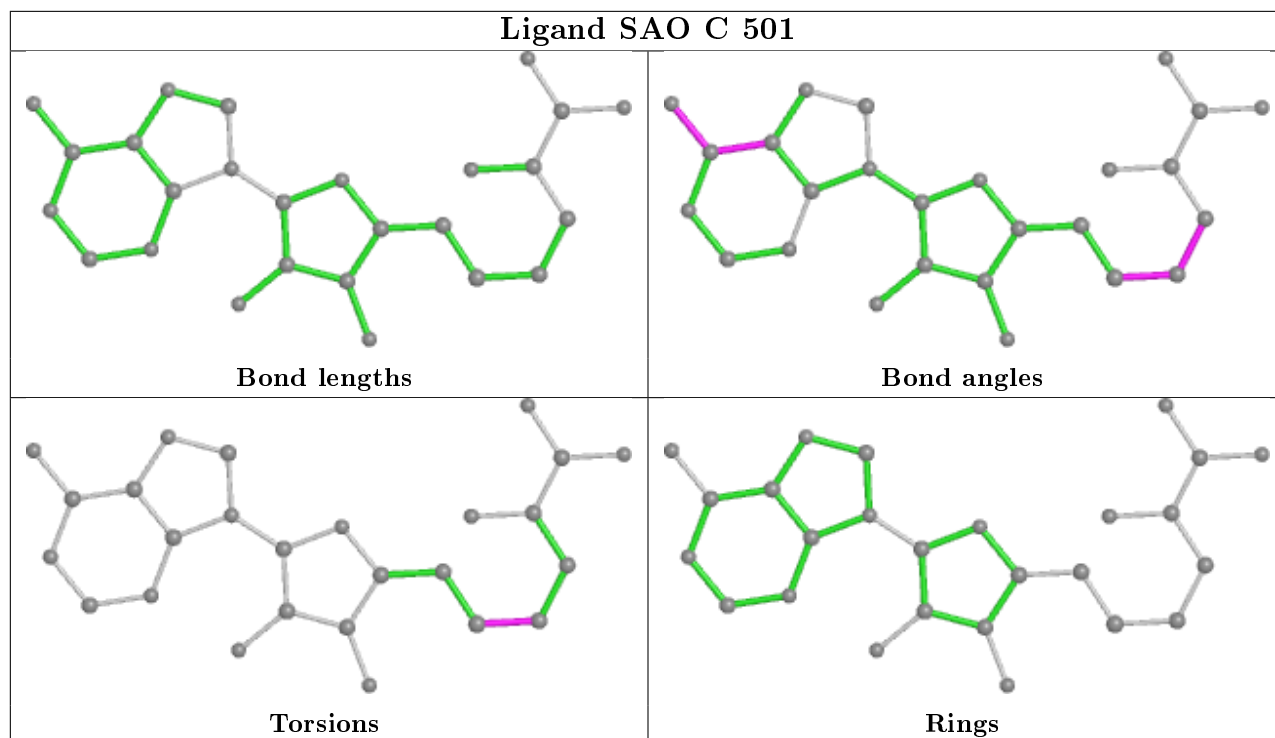
1 monomer is involved in 1 short contact:

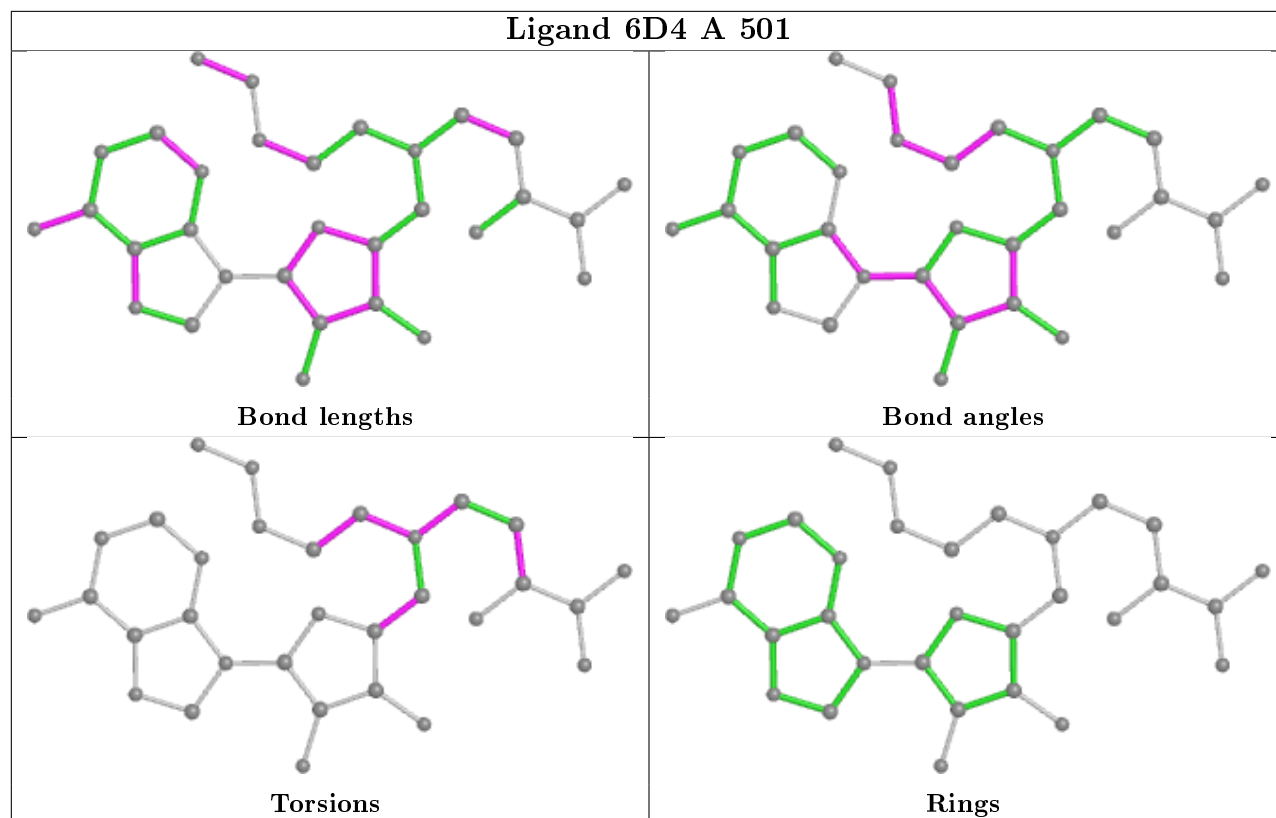
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	D	501	6D4	1	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths,

bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.







5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

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	343/361 (95%)	-0.30	5 (1%) 73 72	28, 40, 60, 90	0
1	B	343/361 (95%)	-0.20	9 (2%) 56 54	29, 44, 65, 100	0
1	C	343/361 (95%)	-0.12	11 (3%) 47 45	35, 50, 72, 105	0
1	D	343/361 (95%)	-0.07	11 (3%) 47 45	37, 50, 72, 114	0
All	All	1372/1444 (95%)	-0.17	36 (2%) 56 54	28, 47, 70, 114	0

All (36) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	477	TYR	6.5
1	D	478	THR	5.7
1	A	478	THR	5.2
1	B	478	THR	5.0
1	C	478	THR	3.9
1	B	477	TYR	3.9
1	D	475	PHE	3.3
1	C	477	TYR	3.1
1	C	282	PRO	3.0
1	A	477	TYR	3.0
1	D	388	LEU	3.0
1	C	256	ILE	2.9
1	D	347	ARG	2.9
1	D	389	ALA	2.8
1	C	140	GLU	2.8
1	C	191	ASP	2.7
1	D	167	TYR	2.6
1	D	390	PHE	2.6
1	B	282	PRO	2.4
1	D	140	GLU	2.4
1	C	231	ASN	2.4

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Mol	Chain	Res	Type	RSRZ
1	C	197	GLY	2.4
1	A	347	ARG	2.3
1	A	197	GLY	2.3
1	B	347	ARG	2.3
1	B	312	ASN	2.3
1	B	389	ALA	2.2
1	A	388	LEU	2.2
1	B	296	ALA	2.2
1	B	387	GLY	2.2
1	B	475	PHE	2.2
1	D	296	ALA	2.2
1	C	136	SER	2.2
1	D	136	SER	2.1
1	C	347	ARG	2.1
1	C	221	GLN	2.1

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

There are no non-standard protein/DNA/RNA residues in this entry.

6.3 Carbohydrates [i](#)

There are no monosaccharides in this entry.

6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 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.

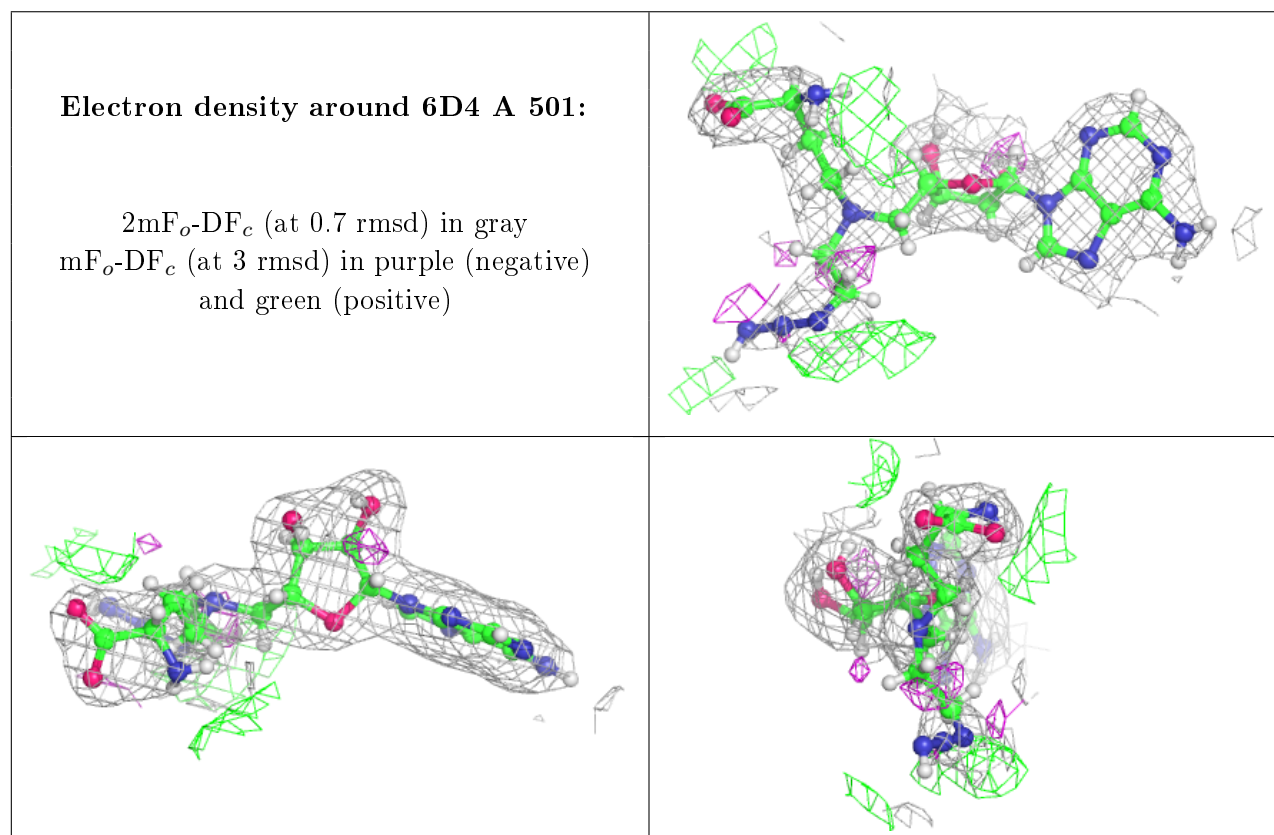
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
5	PG4	B	506	13/13	0.77	0.21	62,74,82,84	0
5	PG4	A	505	13/13	0.78	0.40	65,78,80,80	0
3	EDO	D	503	4/4	0.80	0.17	63,76,77,79	0
6	M2M	A	506	9/9	0.81	0.26	60,72,79,82	0
7	DXE	B	505	6/6	0.82	0.19	61,73,80,80	0
4	PEG	A	503	7/7	0.85	0.21	60,72,79,79	0
6	M2M	C	505	9/9	0.85	0.20	63,76,85,87	0
3	EDO	B	502	4/4	0.86	0.13	48,58,61,67	0

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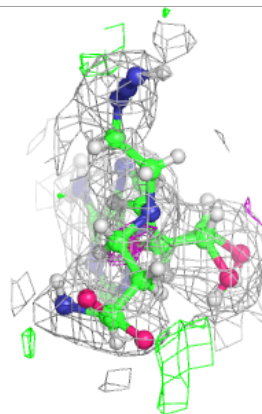
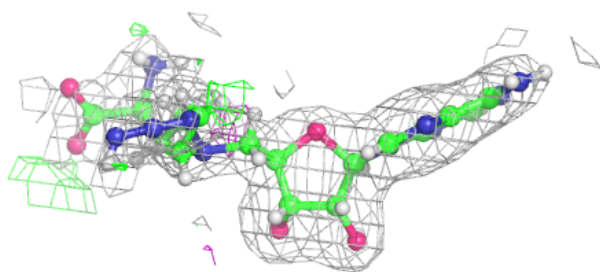
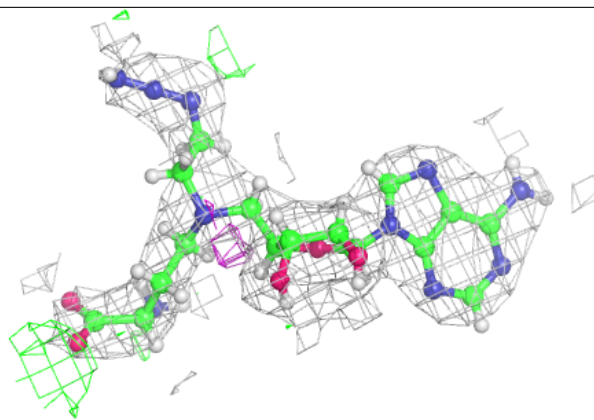
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
7	DXE	A	507	6/6	0.88	0.28	39,47,53,53	0
3	EDO	B	503	4/4	0.88	0.32	58,70,74,77	0
3	EDO	C	502	4/4	0.88	0.14	60,72,74,77	0
3	EDO	C	503	4/4	0.88	0.14	60,72,74,74	0
7	DXE	B	504	6/6	0.88	0.18	63,75,84,84	0
3	EDO	A	502	4/4	0.88	0.17	60,72,74,77	0
3	EDO	D	502	4/4	0.89	0.14	58,70,71,73	0
7	DXE	C	504	6/6	0.90	0.30	62,74,78,78	0
5	PG4	A	504	13/13	0.91	0.16	56,69,85,85	0
2	6D4	A	501	31/31	0.92	0.14	31,45,77,92	0
2	6D4	D	501	31/31	0.92	0.14	39,56,87,99	0
8	SAO	C	501	26/26	0.96	0.10	42,52,67,68	0
2	6D4	B	501	31/31	0.96	0.12	29,52,78,93	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.

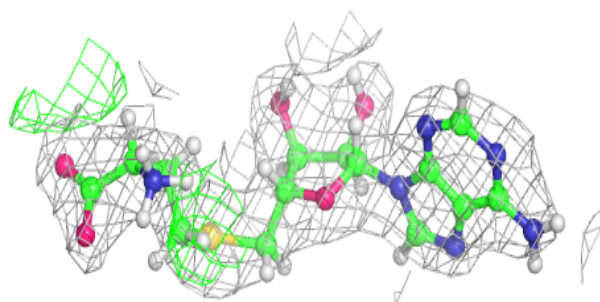
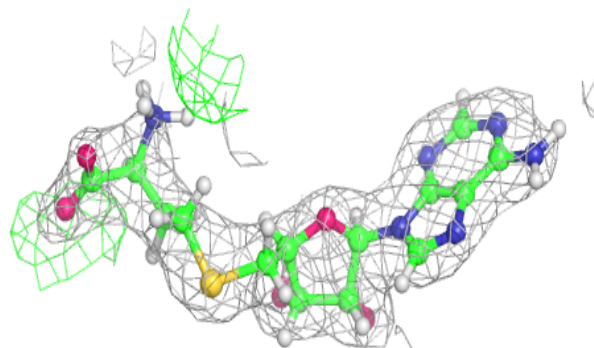


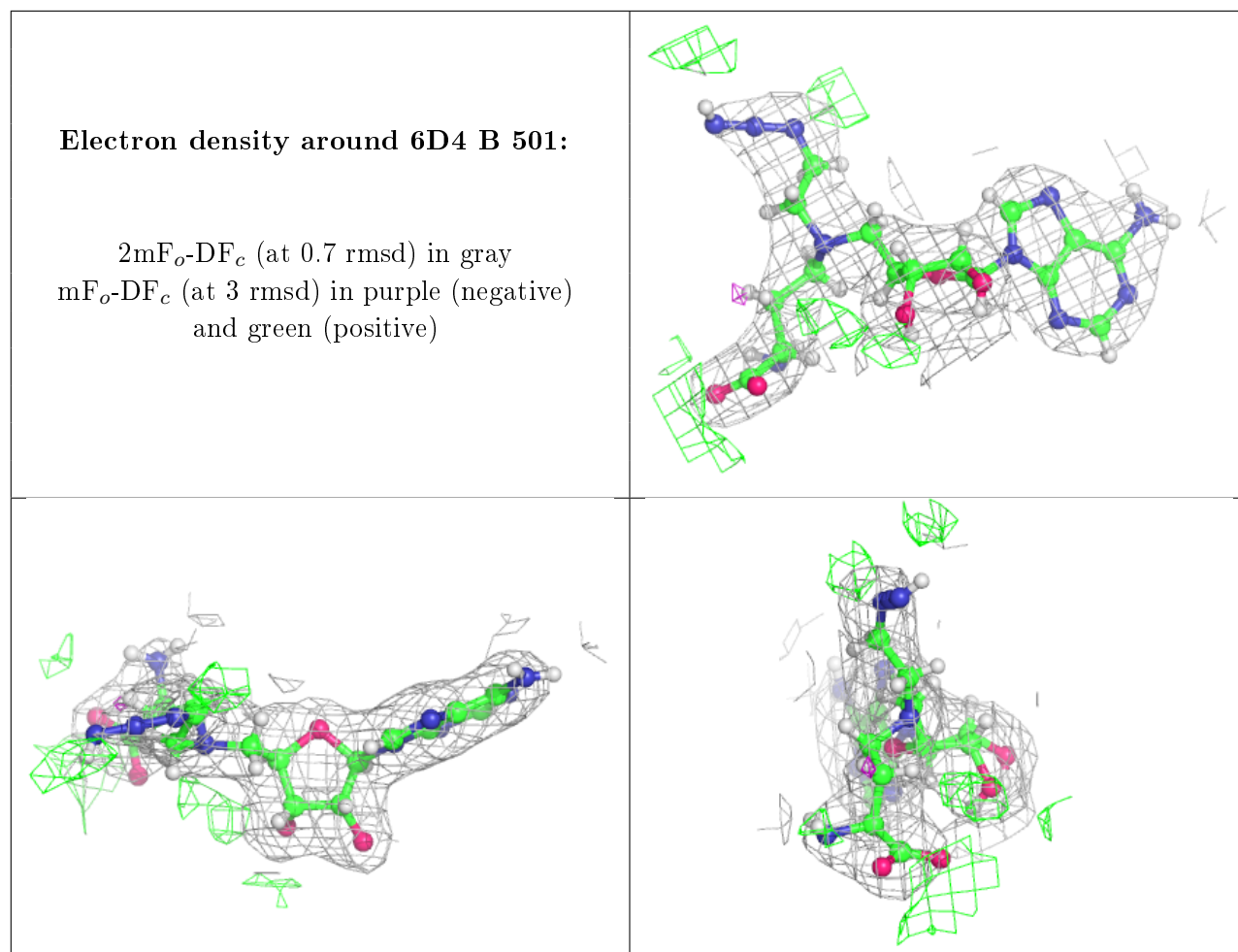
Electron density around 6D4 D 501:

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

**Electron density around SAO C 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 [i](#)

There are no such residues in this entry.