



Full wwPDB X-ray Structure Validation Report ⓘ

Jun 17, 2024 – 12:17 AM EDT

PDB ID : 5ISC
Title : Crystal structure of mouse CARM1 in complex with inhibitor SA0491
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 : 2.60 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 : 4.02b-467
Mogul : 1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix) : 1.13
EDS : 2.37.1
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) : 2.37.1

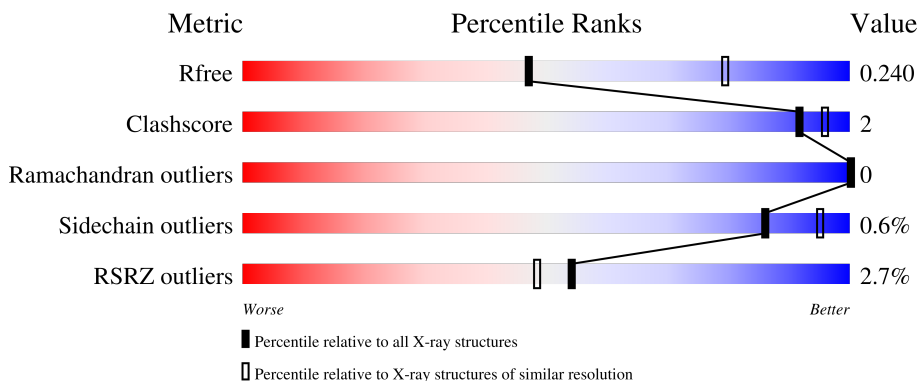
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

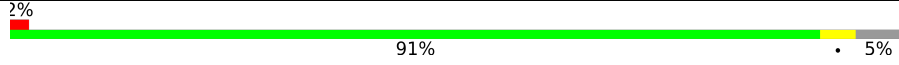
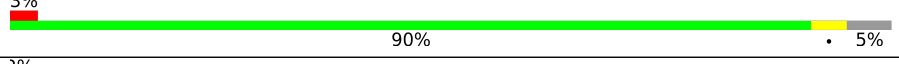
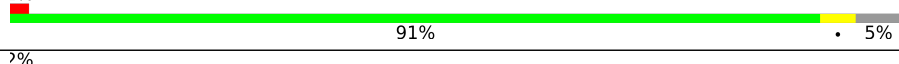

The reported resolution of this entry is 2.60 Å.

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	3163 (2.60-2.60)
Clashscore	141614	3518 (2.60-2.60)
Ramachandran outliers	138981	3455 (2.60-2.60)
Sidechain outliers	138945	3455 (2.60-2.60)
RSRZ outliers	127900	3104 (2.60-2.60)

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	361	 2% 91% 5%
1	B	361	 3% 90% 5%
1	C	361	 2% 91% 5%
1	D	361	 2% 91% 5%

2 Entry composition [i](#)

There are 7 unique types of molecules in this entry. The entry contains 22194 atoms, of which 10915 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.

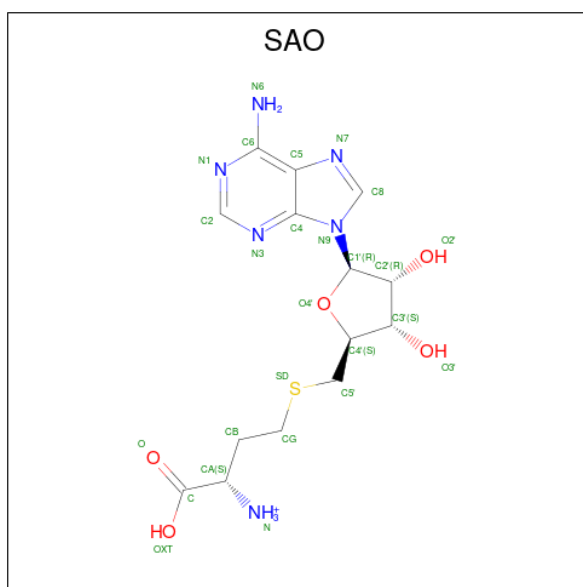
- Molecule 1 is a protein called Histone-arginine methyltransferase CARM1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace	
			Total	C	H	N	O				S
1	A	342	5440	1773	2695	453	505	14	0	0	0
1	B	342	5436	1772	2692	453	505	14	0	0	0
1	C	343	5450	1776	2699	454	507	14	0	0	0
1	D	343	5463	1781	2703	455	510	14	0	1	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'-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
2	A	1	Total	C	H	N	O	S	0	0
			46	14	20	6	5	1		
2	C	1	Total	C	H	N	O	S	0	0
			46	14	20	6	5	1		

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



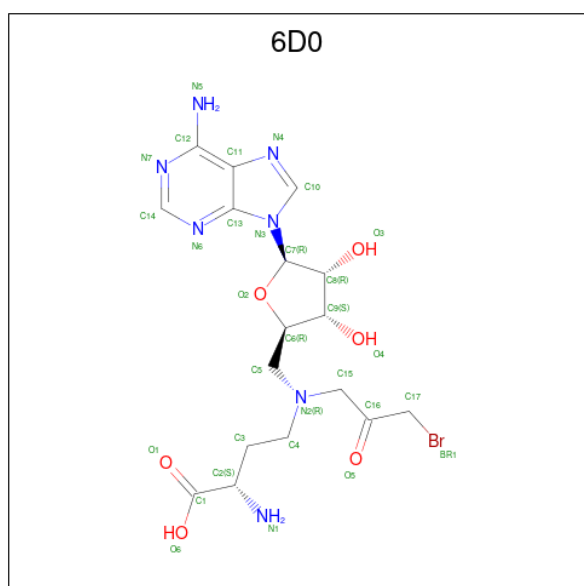
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
			Total	C	O		
3	A	1	Total	C	O	0	0
			4	2	2		
3	A	1	Total	C	O	0	0
			4	2	2		

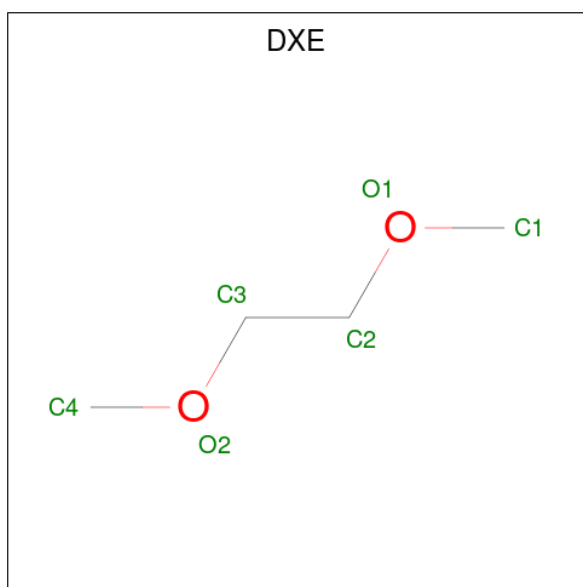
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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf	
3	A	1	Total	C	O	0	0	
			4	2	2			
3	B	1	Total	C	H	O	0	0
			10	2	6	2		
3	C	1	Total	C	O	0	0	
			4	2	2			
3	D	1	Total	C	O	0	0	
			4	2	2			

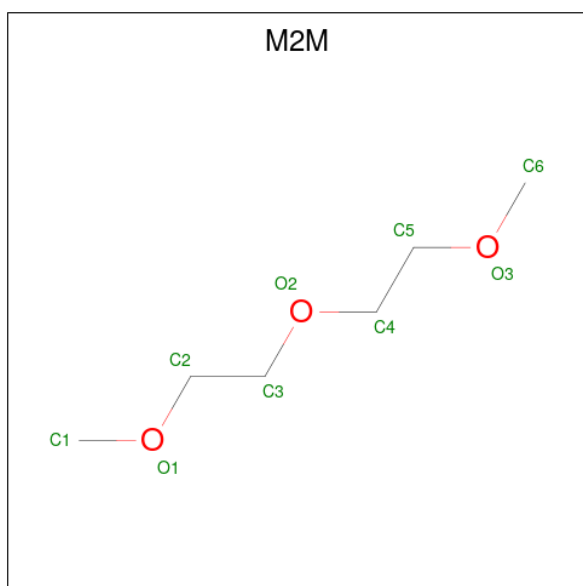
- Molecule 4 is 5'-{[(3S)-3-amino-3-carboxypropyl](3-bromo-2-oxopropyl)amino}-5'-deoxyadenosine (three-letter code: 6D0) (formula: C₁₇H₂₄BrN₇O₆).





Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	H	O		
5	C	1	16	4	10	2	0	0
5	D	1	16	4	10	2	0	0

- Molecule 6 is 1-METHOXY-2-(2-METHOXYETHOXY)ETHANE (three-letter code: M2M) (formula: C₆H₁₄O₃).



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

- Molecule 7 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	A	34	Total O 34 34	0	0
7	B	21	Total O 21 21	0	0
7	C	39	Total O 39 39	0	0
7	D	26	Total O 26 26	0	0

3 Residue-property plots [i](#)

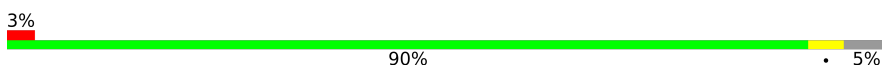
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density.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

Chain A: 



- Molecule 1: Histone-arginine methyltransferase CARM1

Chain B: 

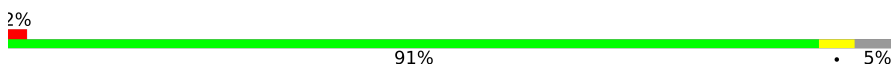


- Molecule 1: Histone-arginine methyltransferase CARM1

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	79.12Å 101.04Å 211.35Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	20.00 – 2.60 19.87 – 2.58	Depositor EDS
% Data completeness (in resolution range)	87.6 (20.00-2.60) 87.7 (19.87-2.58)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.10	Depositor
$\langle I/\sigma(I) \rangle$ ¹	3.75 (at 2.59Å)	Xtrriage
Refinement program	PHENIX dev_1951	Depositor
R, R_{free}	0.206 , 0.239 0.206 , 0.240	Depositor DCC
R_{free} test set	2377 reflections (5.02%)	wwPDB-VP
Wilson B-factor (Å ²)	50.9	Xtrriage
Anisotropy	0.318	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.38 , 61.2	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	22194	wwPDB-VP
Average B, all atoms (Å ²)	61.0	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 46.50 % 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 1.1353e-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: DXE, EDO, 6D0, M2M, SAO

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	0.43	0/2815	0.55	0/3815
1	B	0.40	0/2814	0.54	0/3813
1	C	0.44	0/2821	0.58	0/3823
1	D	0.40	0/2830	0.56	0/3835
All	All	0.42	0/11280	0.56	0/15286

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	2745	2695	2694	8	0
1	B	2744	2692	2692	12	0
1	C	2751	2699	2699	10	0
1	D	2760	2703	2704	11	0
2	A	26	20	0	0	0
2	C	26	20	0	1	0
3	A	12	0	18	0	0
3	B	4	6	6	0	0
3	C	4	0	6	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	D	4	0	6	0	0
4	B	31	23	0	0	0
4	D	31	23	0	1	0
5	C	6	10	10	0	0
5	D	6	10	10	0	0
6	C	9	14	14	0	0
7	A	34	0	0	0	0
7	B	21	0	0	0	0
7	C	39	0	0	0	0
7	D	26	0	0	1	0
All	All	11279	10915	10859	35	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 2.

All (35) 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:218:THR:O	1:B:221:GLN:OE1	2.07	0.72
1:B:137:VAL:HG23	1:B:244:GLU:HG2	1.76	0.68
1:A:198:ILE:HG23	1:A:199:LEU:HD22	1.75	0.66
1:D:175:ARG:NH1	7:D:601:HOH:O	2.28	0.64
1:B:430:LYS:HD2	1:C:167:TYR:CE2	2.34	0.63
1:D:466:ASN:OD1	1:D:467:LEU:N	2.32	0.62
1:C:136:SER:HB3	1:C:245:GLU:OE2	2.00	0.61
1:C:218:THR:O	1:C:221:GLN:OE1	2.20	0.60
1:B:169:ARG:NE	1:B:258:GLU:OE2	2.38	0.54
1:D:370:ARG:HG3	1:D:442:ILE:HD11	1.89	0.54
1:B:430:LYS:CD	1:C:167:TYR:CE2	2.91	0.53
1:D:268:ARG:NH2	1:D:444:ASN:O	2.41	0.52
1:A:167:TYR:CD2	1:D:430:LYS:HD2	2.46	0.51
1:A:266:ASN:O	1:A:267:GLU:HB2	2.11	0.50
1:B:430:LYS:HD2	1:C:167:TYR:CD2	2.47	0.49
1:C:169:ARG:HH22	2:C:501:SAO:C	2.26	0.49
1:A:218:THR:O	1:A:221:GLN:OE1	2.31	0.48
1:C:138:PHE:HB2	1:C:244:GLU:HG3	1.95	0.48
1:D:169:ARG:NH1	4:D:501:6D0:O6	2.46	0.48
1:A:277:LYS:HD2	1:A:286:MET:SD	2.55	0.47
1:B:337:ARG:HG2	1:B:467:LEU:O	2.15	0.47
1:D:370:ARG:HG3	1:D:442:ILE:CD1	2.45	0.46
1:C:218:THR:HB	1:C:221:GLN:OE1	2.16	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:376:LYS:HE3	1:C:434:THR:HG21	1.98	0.45
1:A:167:TYR:CE2	1:D:430:LYS:HD2	2.52	0.45
1:B:143:GLU:HG3	1:B:445:LYS:HD2	2.00	0.44
1:B:137:VAL:CG2	1:B:244:GLU:HG2	2.44	0.43
1:A:151:PHE:CE2	1:A:242:LYS:NZ	2.86	0.43
1:D:266:ASN:O	1:D:267:GLU:HB2	2.18	0.43
1:B:460:THR:HG23	1:D:320:HIS:ND1	2.34	0.42
1:B:266:ASN:O	1:B:267:GLU:HB2	2.20	0.41
1:C:263:MET:O	1:C:264:LEU:HB3	2.20	0.41
1:B:141:ARG:HG3	1:B:142:THR:HG23	2.02	0.41
1:D:141:ARG:HG3	1:D:142:THR:HG23	2.01	0.41
1:A:341:VAL:O	1:A:342:ASP:HB3	2.22	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	340/361 (94%)	330 (97%)	10 (3%)	0	100	100
1	B	340/361 (94%)	329 (97%)	11 (3%)	0	100	100
1	C	341/361 (94%)	331 (97%)	10 (3%)	0	100	100
1	D	342/361 (95%)	333 (97%)	9 (3%)	0	100	100
All	All	1363/1444 (94%)	1323 (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	298/313 (95%)	297 (100%)	1 (0%)	92	98
1	B	298/313 (95%)	296 (99%)	2 (1%)	84	94
1	C	299/313 (96%)	297 (99%)	2 (1%)	84	94
1	D	300/313 (96%)	297 (99%)	3 (1%)	76	90
All	All	1195/1252 (95%)	1187 (99%)	8 (1%)	86	94

All (8) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	258	GLU
1	B	224	GLU
1	B	258	GLU
1	C	258	GLU
1	C	467	LEU
1	D	224[A]	GLU
1	D	224[B]	GLU
1	D	258	GLU

Sometimes 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

13 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
3	EDO	A	502	-	3,3,3	0.46	0	2,2,2	0.52	0
5	DXE	D	503	-	5,5,5	0.43	0	4,4,4	0.33	0
4	6D0	B	501	-	28,33,33	1.66	6 (21%)	27,47,47	1.31	3 (11%)
4	6D0	D	501	-	28,33,33	1.62	6 (21%)	27,47,47	1.41	4 (14%)
3	EDO	B	502	-	3,3,3	0.50	0	2,2,2	0.47	0
3	EDO	A	503	-	3,3,3	0.48	0	2,2,2	0.49	0
3	EDO	D	502	-	3,3,3	0.48	0	2,2,2	0.42	0
3	EDO	A	504	-	3,3,3	0.48	0	2,2,2	0.45	0
5	DXE	C	503	-	5,5,5	0.40	0	4,4,4	0.26	0
6	M2M	C	504	-	8,8,8	0.62	0	7,7,7	0.37	0
3	EDO	C	502	-	3,3,3	0.48	0	2,2,2	0.49	0
2	SAO	C	501	-	24,28,28	0.68	0	25,40,40	1.16	3 (12%)
2	SAO	A	501	-	24,28,28	0.66	0	25,40,40	1.19	3 (12%)

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	EDO	A	502	-	-	1/1/1/1	-
5	DXE	D	503	-	-	0/3/3/3	-
4	6D0	B	501	-	-	6/18/39/39	0/3/3/3
4	6D0	D	501	-	-	6/18/39/39	0/3/3/3
3	EDO	B	502	-	-	0/1/1/1	-
3	EDO	A	503	-	-	0/1/1/1	-
3	EDO	D	502	-	-	1/1/1/1	-
3	EDO	A	504	-	-	0/1/1/1	-
5	DXE	C	503	-	-	3/3/3/3	-
6	M2M	C	504	-	-	3/6/6/6	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	EDO	C	502	-	-	0/1/1/1	-
2	SAO	C	501	-	-	1/11/31/31	0/3/3/3
2	SAO	A	501	-	-	0/11/31/31	0/3/3/3

All (12) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	D	501	6D0	C5-N2	4.70	1.55	1.47
4	B	501	6D0	C5-N2	4.38	1.55	1.47
4	B	501	6D0	O2-C7	3.18	1.45	1.41
4	D	501	6D0	O2-C7	2.69	1.44	1.41
4	B	501	6D0	C9-C8	-2.54	1.46	1.53
4	D	501	6D0	C5-C6	-2.46	1.44	1.51
4	B	501	6D0	C5-C6	-2.36	1.44	1.51
4	D	501	6D0	C9-C8	-2.35	1.46	1.53
4	D	501	6D0	C4-N2	2.15	1.52	1.47
4	D	501	6D0	O5-C16	2.13	1.25	1.21
4	B	501	6D0	O5-C16	2.08	1.25	1.21
4	B	501	6D0	C13-N6	2.03	1.38	1.35

All (13) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	D	501	6D0	N6-C14-N7	-4.20	122.12	128.68
4	B	501	6D0	N6-C14-N7	-4.06	122.34	128.68
2	A	501	SAO	CB-CG-SD	-3.71	104.98	113.31
2	C	501	SAO	CB-CG-SD	-3.56	105.33	113.31
4	D	501	6D0	C15-N2-C5	-2.61	106.85	112.06
4	B	501	6D0	C13-C11-N4	-2.54	106.75	109.40
2	C	501	SAO	C5-C6-N6	2.46	124.08	120.35
2	A	501	SAO	C5-C6-N6	2.44	124.06	120.35
2	A	501	SAO	C4-C5-N7	2.41	111.91	109.40
4	D	501	6D0	C13-C11-N4	-2.35	106.94	109.40
4	D	501	6D0	C9-C8-C7	2.28	104.41	100.98
2	C	501	SAO	C4-C5-N7	2.21	111.70	109.40
4	B	501	6D0	O2-C6-C5	2.09	112.35	108.90

There are no chirality outliers.

All (21) torsion outliers are listed below:

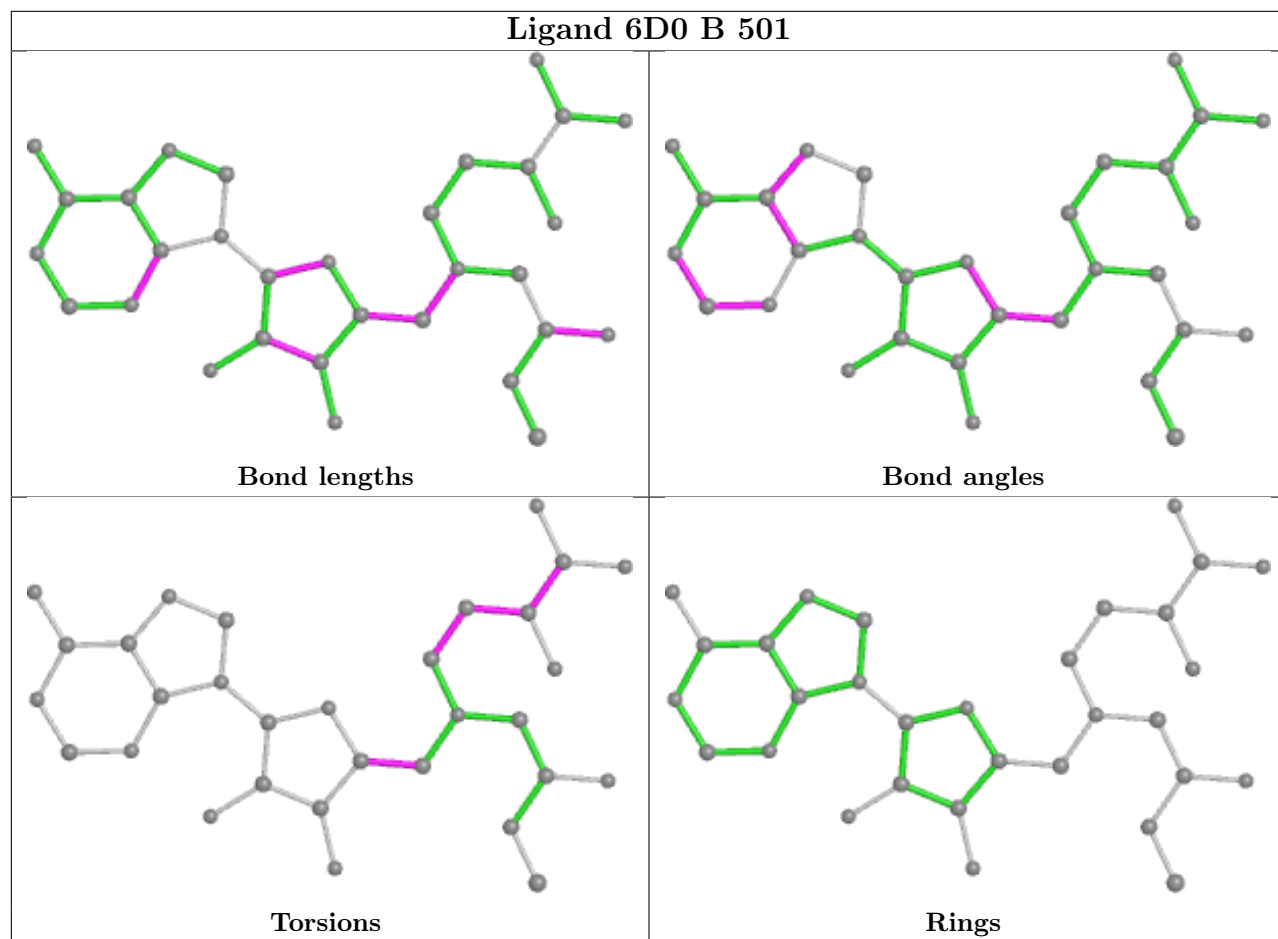
Mol	Chain	Res	Type	Atoms
4	B	501	6D0	C2-C3-C4-N2
4	B	501	6D0	N2-C5-C6-O2
4	B	501	6D0	N2-C5-C6-C9
4	D	501	6D0	C6-C5-N2-C4
5	C	503	DXE	O1-C2-C3-O2
6	C	504	M2M	O2-C4-C5-O3
4	D	501	6D0	N2-C5-C6-O2
4	B	501	6D0	O6-C1-C2-C3
3	D	502	EDO	O1-C1-C2-O2
4	D	501	6D0	N2-C5-C6-C9
4	B	501	6D0	N1-C2-C3-C4
4	D	501	6D0	O5-C16-C17-BR1
4	B	501	6D0	O1-C1-C2-C3
4	D	501	6D0	C2-C3-C4-N2
5	C	503	DXE	C2-C3-O2-C4
3	A	502	EDO	O1-C1-C2-O2
5	C	503	DXE	C3-C2-O1-C1
4	D	501	6D0	C3-C4-N2-C15
2	C	501	SAO	C-CA-CB-CG
6	C	504	M2M	O1-C2-C3-O2
6	C	504	M2M	C2-C3-O2-C4

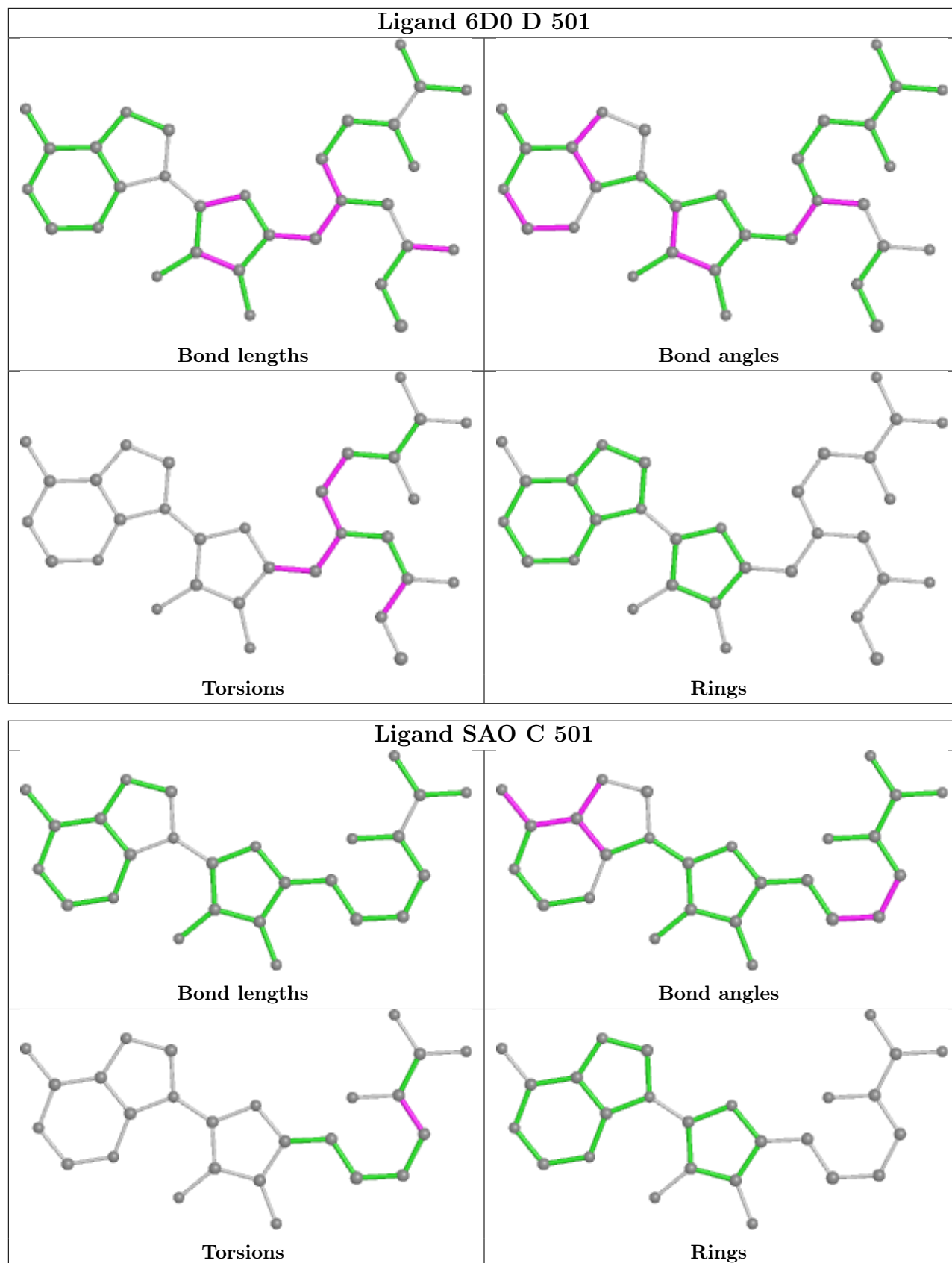
There are no ring outliers.

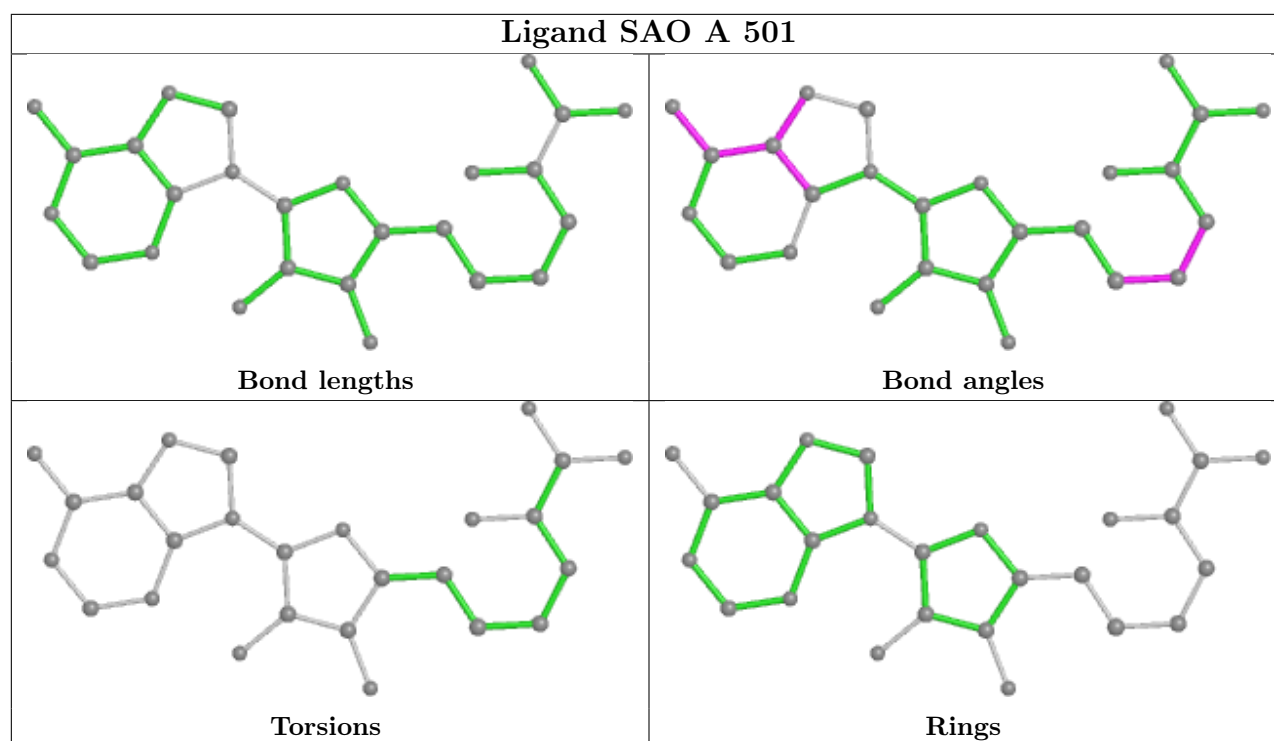
2 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	D	501	6D0	1	0
2	C	501	SAO	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	342/361 (94%)	-0.13	9 (2%) 56 50	27, 57, 86, 128	0
1	B	342/361 (94%)	-0.21	12 (3%) 44 36	36, 55, 86, 131	0
1	C	343/361 (95%)	-0.28	9 (2%) 56 50	26, 47, 76, 104	0
1	D	343/361 (95%)	-0.29	7 (2%) 65 60	30, 53, 84, 130	0
All	All	1370/1444 (94%)	-0.23	37 (2%) 54 48	26, 53, 85, 131	0

All (37) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	136	SER	5.3
1	D	478	THR	5.2
1	A	140	GLU	4.9
1	B	136	SER	4.9
1	B	139	SER	4.7
1	C	140	GLU	4.4
1	D	136	SER	4.4
1	D	140	GLU	4.2
1	B	137	VAL	4.2
1	A	139	SER	4.2
1	C	478	THR	4.1
1	B	144	GLU	3.8
1	A	478	THR	3.7
1	A	477	TYR	3.7
1	B	140	GLU	3.7
1	D	139	SER	3.2
1	C	137	VAL	3.2
1	C	142	THR	3.1
1	B	477	TYR	3.1
1	D	144	GLU	3.0
1	C	149	GLN	3.0

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Mol	Chain	Res	Type	RSRZ
1	D	477	TYR	3.0
1	A	149	GLN	2.9
1	A	282	PRO	2.9
1	C	139	SER	2.7
1	C	477	TYR	2.6
1	B	138	PHE	2.5
1	A	144	GLU	2.4
1	B	328	ARG	2.3
1	A	148	VAL	2.3
1	B	142	THR	2.2
1	D	467	LEU	2.2
1	B	471	LYS	2.1
1	C	347	ARG	2.1
1	B	315	TYR	2.0
1	A	463	LYS	2.0
1	B	141	ARG	2.0

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

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

6.3 Carbohydrates [i](#)

There are no monosaccharides in this entry.

6.4 Ligands [i](#)

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

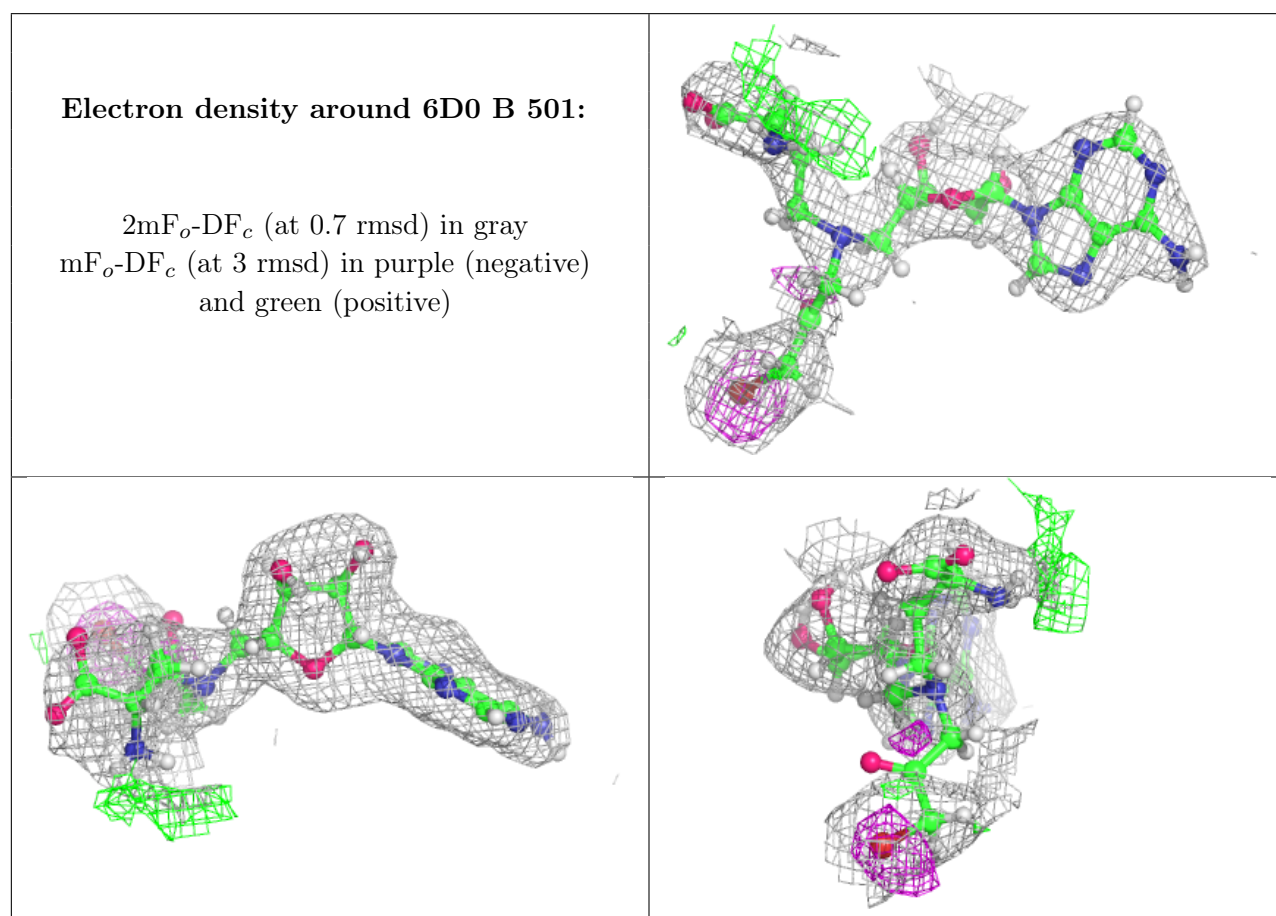
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
5	DXE	D	503	6/6	0.77	0.24	61,73,74,74	0
3	EDO	D	502	4/4	0.80	0.22	67,68,69,69	0
5	DXE	C	503	6/6	0.81	0.24	64,77,78,78	0
3	EDO	C	502	4/4	0.81	0.18	67,67,68,69	0
3	EDO	B	502	4/4	0.85	0.20	56,68,68,68	0
4	6D0	B	501	31/31	0.85	0.20	60,83,106,118	0
3	EDO	A	502	4/4	0.86	0.13	71,72,72,72	0

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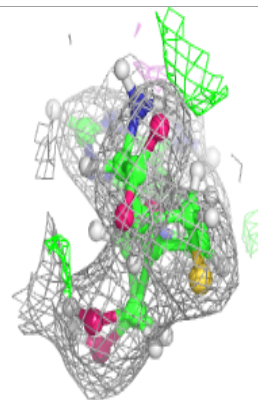
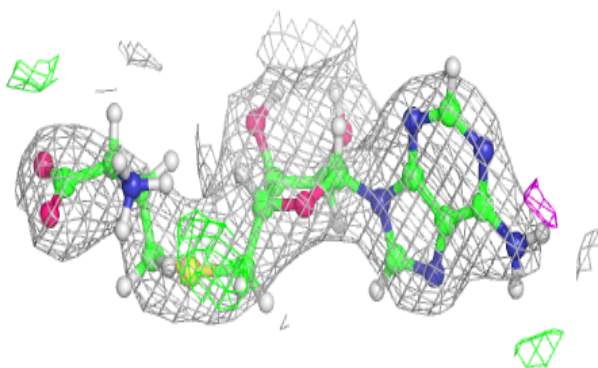
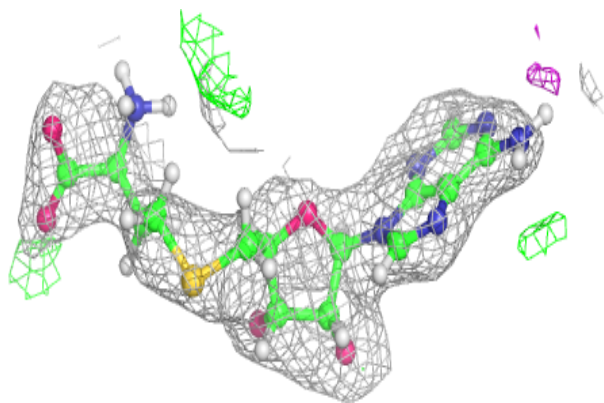
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
2	SAO	C	501	26/26	0.88	0.18	58,75,101,107	0
6	M2M	C	504	9/9	0.88	0.21	77,93,94,94	0
2	SAO	A	501	26/26	0.89	0.16	61,72,86,86	0
3	EDO	A	504	4/4	0.89	0.13	59,59,59,59	0
4	6D0	D	501	31/31	0.89	0.15	64,81,104,115	0
3	EDO	A	503	4/4	0.92	0.12	59,60,60,61	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.

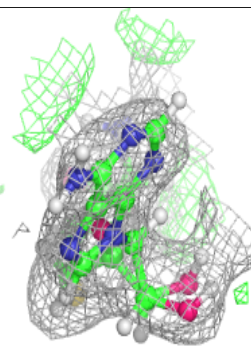
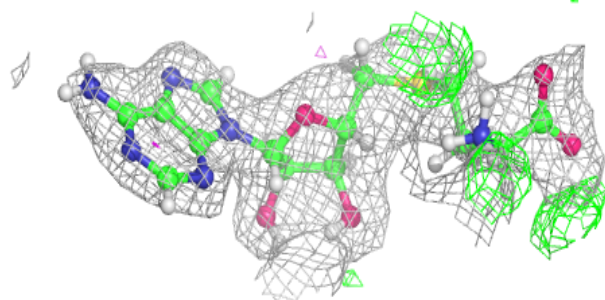
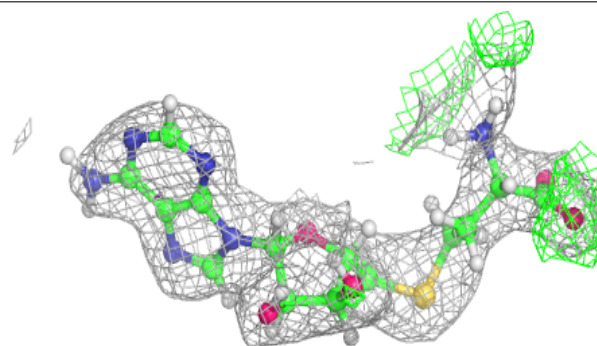


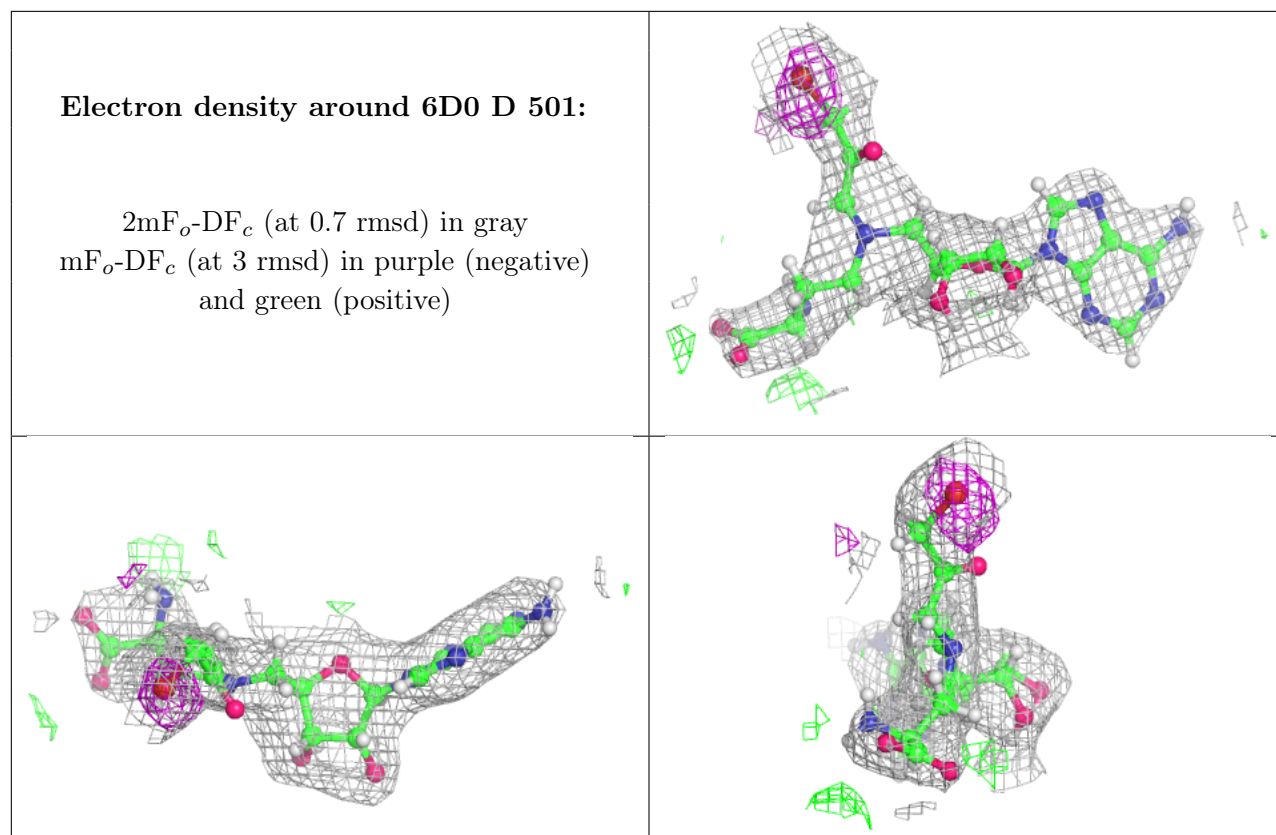
Electron density around SAO C 501:

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

**Electron density around SAO A 501:**

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





6.5 Other polymers [i](#)

There are no such residues in this entry.