



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 6, 2026 – 10:06 AM UTC

PDB ID : 5IS9 / pdb_00005is9
Title : Crystal structure of mouse CARM1 in complex with inhibitor SA0375
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 : 2.40 Å(reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

MolProbity : 4-5-2 with Phenix2.0
Mogul : 2022.3.0, CSD as543be (2022)
Xtriage (Phenix) : 2.0
EDS : 3.0
Buster-report : wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4 : 9.0.010 (Gargrove)
Density-Fitness : 1.0.12
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.49

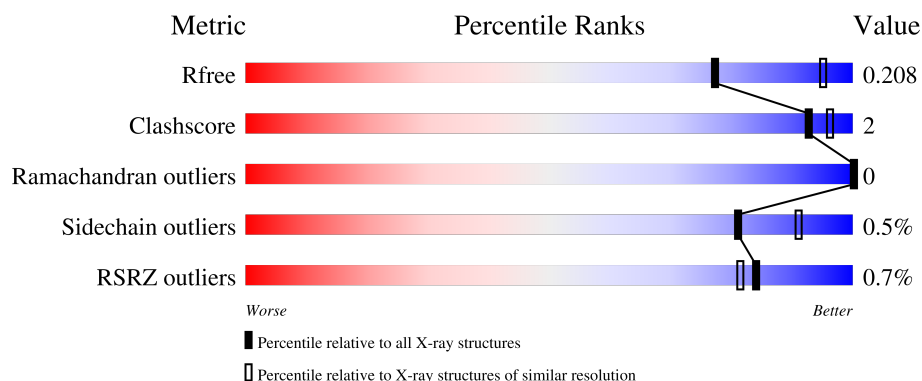
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.40 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	180053	4912 (2.40-2.40)
Clashscore	190562	5391 (2.40-2.40)
Ramachandran outliers	187476	5320 (2.40-2.40)
Sidechain outliers	187428	5321 (2.40-2.40)
RSRZ outliers	180081	4916 (2.40-2.40)

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	% 92% 5%
1	B	361	% 92% 5%
1	C	361	% 93% 5%
1	D	361	% 91% 5%

2 Entry composition

There are 8 unique types of molecules in this entry. The entry contains 23145 atoms, of which 11194 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.

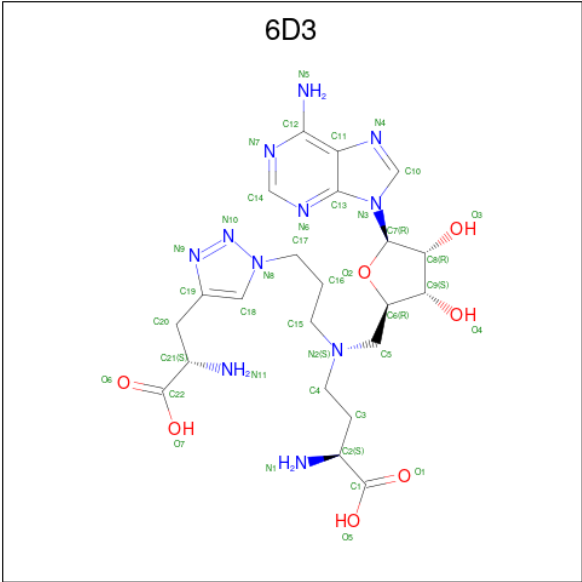
- Molecule 1 is a protein called Histone-arginine methyltransferase CARM1.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	343	Total	C	H	N	O	S	0	5	0
			5530	1801	2737	461	514	17			
1	B	343	Total	C	H	N	O	S	0	4	0
			5525	1805	2733	460	512	15			
1	C	343	Total	C	H	N	O	S	0	2	0
			5484	1787	2715	458	509	15			
1	D	343	Total	C	H	N	O	S	0	6	0
			5539	1805	2739	465	516	14			

There are 12 discrepancies between the modelled and reference sequences:

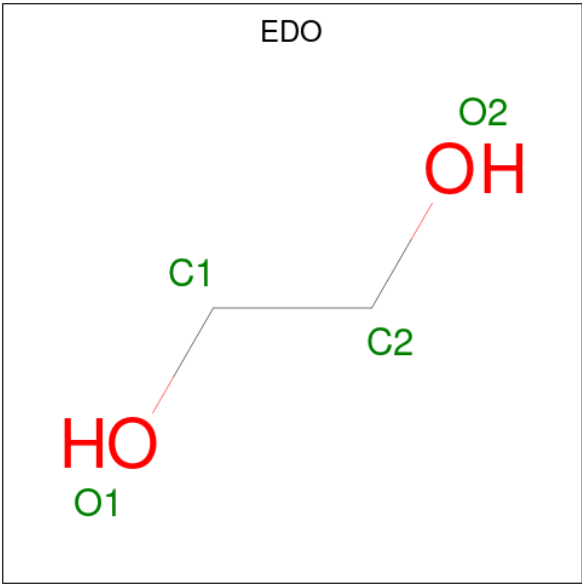
Chain	Residue	Modelled	Actual	Comment	Reference
A	127	GLY	-	expression tag	UNP Q9WVG6
A	128	HIS	-	expression tag	UNP Q9WVG6
A	129	MET	-	expression tag	UNP Q9WVG6
B	127	GLY	-	expression tag	UNP Q9WVG6
B	128	HIS	-	expression tag	UNP Q9WVG6
B	129	MET	-	expression tag	UNP Q9WVG6
C	127	GLY	-	expression tag	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 (2S)-2-amino-4-[(3-{4-[(2S)-2-amino-2-carboxyethyl]-1H-1,2,3-triazol-1-yl}propyl){[(2R,3S,4R,5R)-5-(6-amino-9H-purin-9-yl)-3,4-dihydroxytetrahydrofuran-2-yl]methyl}amino]butanoic acid (non-preferred name) (CCD ID: 6D3) (formula: C₂₂H₃₃N₁₁O₇).



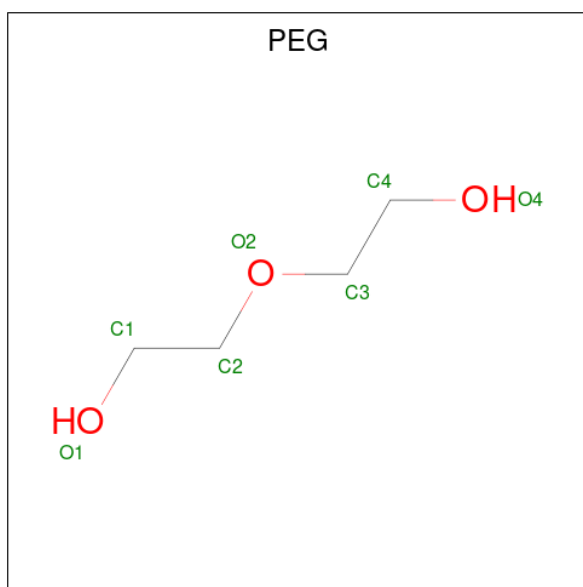
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	H	N	O	0	0
			71	22	31	11	7		
2	B	1	Total	C	H	N	O	0	0
			71	22	31	11	7		
2	C	1	Total	C	H	N	O	0	0
			71	22	31	11	7		
2	D	1	Total	C	H	N	O	0	0
			71	22	31	11	7		

- Molecule 3 is 1,2-ETHANEDIOL (CCD ID: EDO) (formula: C₂H₆O₂).



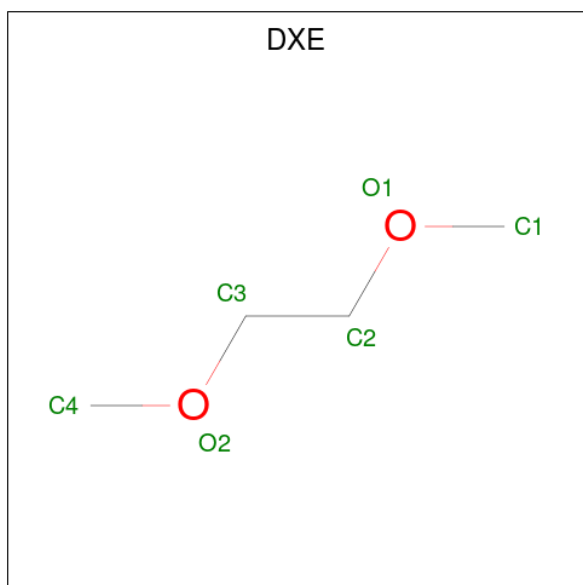
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total C H O 10 2 6 2	0	0
3	A	1	Total C H O 10 2 6 2	0	0
3	A	1	Total C H O 10 2 6 2	0	0
3	A	1	Total C O 4 2 2	0	0
3	A	1	Total C O 4 2 2	0	0
3	B	1	Total C H O 10 2 6 2	0	0
3	B	1	Total C O 4 2 2	0	0
3	B	1	Total C O 4 2 2	0	0
3	C	1	Total C H O 10 2 6 2	0	0
3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

- Molecule 4 is DI(HYDROXYETHYL)ETHER (CCD ID: PEG) (formula: C₄H₁₀O₃).



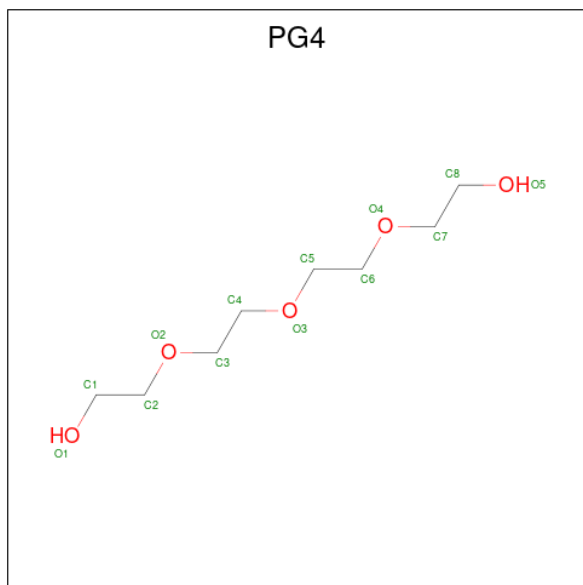
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	A	1	Total	C	H	O	0	0
			17	4	10	3		
4	A	1	Total	C	H	O	0	0
			17	4	10	3		
4	B	1	Total	C	H	O	0	0
			17	4	10	3		
4	D	1	Total	C	H	O	0	0
			17	4	10	3		

- Molecule 5 is 1,2-DIMETHOXYETHANE (CCD ID: DXE) (formula: $C_4H_{10}O_2$).



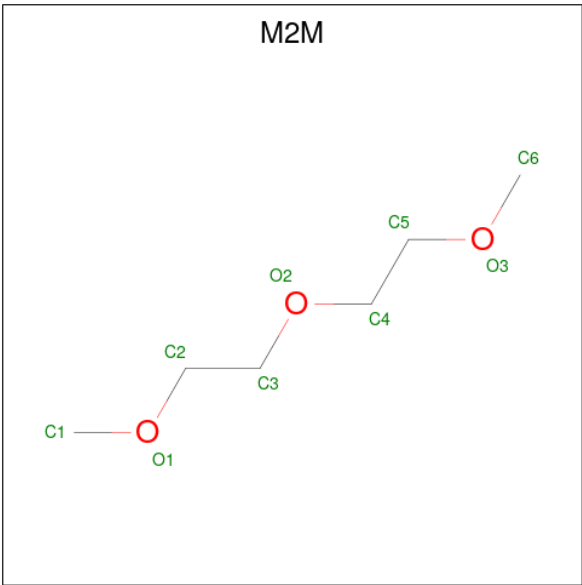
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
5	A	1	Total	C	H	O	0	0
			16	4	10	2		
5	A	1	Total	C	H	O	0	0
			16	4	10	2		

- Molecule 6 is TETRAETHYLENE GLYCOL (CCD ID: PG4) (formula: $C_8H_{18}O_5$).



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

- Molecule 7 is 1-METHOXY-2-(2-METHOXYETHOXY)ETHANE (CCD ID: M2M) (formula: $C_6H_{14}O_3$).



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

- Molecule 8 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
8	A	171	Total	O	0	0
			171	171		
8	B	141	Total	O	0	0
			141	141		
8	C	108	Total	O	0	0
			108	108		
8	D	91	Total	O	0	0
			91	91		

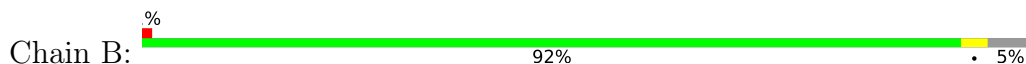
3 Residue-property plots [i](#)

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



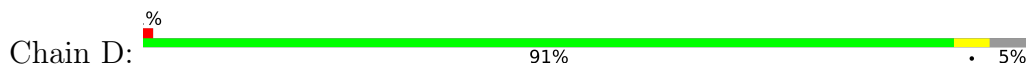
- Molecule 1: Histone-arginine methyltransferase CARM1



- Molecule 1: Histone-arginine methyltransferase CARM1



- Molecule 1: Histone-arginine methyltransferase CARM1



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 2	Depositor
Cell constants a, b, c, α , β , γ	74.89Å 98.37Å 206.94Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	19.60 – 2.40 19.60 – 2.40	Depositor EDS
% Data completeness (in resolution range)	95.8 (19.60-2.40) 99.4 (19.60-2.40)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.09	Depositor
$\langle I/\sigma(I) \rangle$ ¹	4.53 (at 2.33Å)	Xtrriage
Refinement program	PHENIX (dev_2016: ???)	Depositor
R, R_{free}	0.168 , 0.206 0.168 , 0.208	Depositor DCC
R_{free} test set	3194 reflections (3.09%)	wwPDB-VP
Wilson B-factor (Å ²)	32.4	Xtrriage
Anisotropy	0.101	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.41 , 51.9	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	0.96	EDS
Total number of atoms	23145	wwPDB-VP
Average B, all atoms (Å ²)	41.0	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 38.42 % 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 3.6944e-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: M2M, EDO, PG4, PEG, 6D3, DXE

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	0.35	0/2864	0.63	0/3879
1	B	0.34	0/2865	0.62	0/3882
1	C	0.33	0/2840	0.63	0/3848
1	D	0.33	0/2878	0.63	0/3900
All	All	0.34	0/11447	0.63	0/15509

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	2793	2737	2732	9	0
1	B	2792	2733	2729	9	0
1	C	2769	2715	2713	4	0
1	D	2800	2739	2728	12	0
2	A	40	31	0	1	0
2	B	40	31	0	1	0
2	C	40	31	0	1	0
2	D	40	31	0	1	0
3	A	20	18	30	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	B	12	6	18	1	0
3	C	20	18	30	0	0
3	D	12	12	18	1	0
4	A	14	20	20	2	0
4	B	7	10	10	0	0
4	D	7	10	10	1	0
5	A	12	20	20	0	0
6	A	13	18	18	0	0
7	B	9	14	14	2	0
8	A	171	0	0	1	0
8	B	141	0	0	4	0
8	C	108	0	0	2	0
8	D	91	0	0	2	0
All	All	11951	11194	11090	34	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 (34) 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:NH2	1:D:258:GLU:OE2	2.13	0.81
1:A:169:ARG:NH2	1:A:258:GLU:OE2	2.15	0.80
1:B:362:GLU:OE2	8:B:601:HOH:O	2.03	0.75
1:D:333[B]:ASP:OD1	1:D:337:ARG:NH2	2.28	0.67
1:D:469:ASP:OD1	8:D:601:HOH:O	2.15	0.65
1:C:469:ASP:OD1	8:C:601:HOH:O	2.16	0.58
7:B:506:M2M:H13	8:B:697:HOH:O	2.05	0.57
1:D:277:LYS:NZ	1:D:363:ALA:O	2.39	0.55
1:B:465:SER:O	8:B:602:HOH:O	2.18	0.54
1:A:188:ILE:HD12	1:A:210:LYS:HB3	1.90	0.52
1:C:267:GLU:OE2	2:C:501:6D3:N11	2.43	0.52
1:D:150:TYR:HA	3:D:504:EDO:H11	1.92	0.52
1:C:224:GLU:OE1	8:C:602:HOH:O	2.18	0.52
1:B:266:ASN:O	1:B:267:GLU:HB2	2.11	0.50
1:A:266:ASN:O	1:A:267:GLU:HB2	2.11	0.50
1:C:266:ASN:O	1:C:267:GLU:HB2	2.12	0.50
1:B:267:GLU:OE2	2:B:501:6D3:N11	2.45	0.49
1:D:266:ASN:O	1:D:267:GLU:HB2	2.12	0.48
1:B:413:LEU:HD23	3:B:503:EDO:H11	1.95	0.47
1:A:167:TYR:CE2	1:D:430:LYS:HD3	2.51	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:188:ILE:CD1	1:A:210:LYS:HB3	2.46	0.46
1:A:281:LYS:NZ	8:A:617:HOH:O	2.48	0.46
1:B:333:ASP:OD1	1:B:337:ARG:NH2	2.49	0.46
4:A:507:PEG:H42	1:D:461:GLY:HA3	2.00	0.44
1:D:315:TYR:HD2	1:D:328:ARG:CD	2.31	0.43
1:B:467:LEU:HG	7:B:506:M2M:C2	2.49	0.43
1:A:178:LEU:HD13	4:A:507:PEG:H32	2.01	0.42
1:D:463:LYS:NZ	8:D:610:HOH:O	2.48	0.42
1:D:267:GLU:OE2	2:D:501:6D3:N11	2.52	0.42
1:B:242:LYS:NZ	8:B:613:HOH:O	2.52	0.41
1:A:169:ARG:HD2	1:A:258:GLU:OE2	2.21	0.41
1:A:267:GLU:OE2	2:A:501:6D3:N11	2.54	0.41
1:B:317:PRO:HG3	4:D:505:PEG:H41	2.02	0.41
1:D:295:LEU:CD1	1:D:295:LEU:N	2.85	0.40

There are no symmetry-related clashes.

5.3 Torsion angles

5.3.1 Protein backbone

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	346/361 (96%)	336 (97%)	10 (3%)	0	100	100
1	B	345/361 (96%)	337 (98%)	8 (2%)	0	100	100
1	C	343/361 (95%)	333 (97%)	10 (3%)	0	100	100
1	D	346/361 (96%)	336 (97%)	10 (3%)	0	100	100
All	All	1380/1444 (96%)	1342 (97%)	38 (3%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	304/313 (97%)	302 (99%)	2 (1%)	76	88
1	B	303/313 (97%)	302 (100%)	1 (0%)	86	93
1	C	301/313 (96%)	299 (99%)	2 (1%)	76	88
1	D	305/313 (97%)	304 (100%)	1 (0%)	86	93
All	All	1213/1252 (97%)	1207 (100%)	6 (0%)	81	91

All (6) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	248	LEU
1	A	295	LEU
1	B	364	LYS
1	C	258	GLU
1	C	347	ARG
1	D	295	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (8) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	472	ASN
1	B	316	GLN
1	B	447	GLN
1	C	149	GLN
1	C	378	HIS
1	C	472	ASN
1	D	159	GLN
1	D	165	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

28 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	503	-	3,3,3	0.43	0	2,2,2	0.52	0
5	DXE	A	509	-	5,5,5	0.43	0	4,4,4	0.30	0
3	EDO	C	502	-	3,3,3	0.44	0	2,2,2	0.47	0
3	EDO	A	504	-	3,3,3	0.42	0	2,2,2	0.56	0
2	6D3	B	501	-	41,43,43	1.45	5 (12%)	52,61,61	2.07	13 (25%)
6	PG4	A	511	-	12,12,12	0.53	0	11,11,11	0.29	0
3	EDO	C	505	-	3,3,3	0.44	0	2,2,2	0.54	0
5	DXE	A	510	-	5,5,5	0.45	0	4,4,4	0.28	0
3	EDO	D	503	-	3,3,3	0.44	0	2,2,2	0.47	0
3	EDO	D	502	-	3,3,3	0.44	0	2,2,2	0.46	0
3	EDO	A	502	-	3,3,3	0.44	0	2,2,2	0.46	0
3	EDO	B	504	-	3,3,3	0.43	0	2,2,2	0.39	0
2	6D3	A	501	-	41,43,43	1.44	5 (12%)	52,61,61	2.14	14 (26%)
3	EDO	D	504	-	3,3,3	0.44	0	2,2,2	0.47	0
4	PEG	A	508	-	6,6,6	0.50	0	5,5,5	0.55	0
3	EDO	A	505	-	3,3,3	0.43	0	2,2,2	0.53	0
3	EDO	A	506	-	3,3,3	0.44	0	2,2,2	0.43	0
3	EDO	C	506	-	3,3,3	0.44	0	2,2,2	0.57	0
4	PEG	B	505	-	6,6,6	0.50	0	5,5,5	0.62	0
3	EDO	B	503	-	3,3,3	0.41	0	2,2,2	0.66	0
2	6D3	C	501	-	41,43,43	1.50	5 (12%)	52,61,61	2.11	13 (25%)
3	EDO	C	503	-	3,3,3	0.43	0	2,2,2	0.56	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
3	EDO	C	504	-	3,3,3	0.43	0	2,2,2	0.48	0
4	PEG	A	507	-	6,6,6	0.49	0	5,5,5	0.48	0
7	M2M	B	506	-	8,8,8	0.58	0	7,7,7	0.32	0
2	6D3	D	501	-	41,43,43	1.45	5 (12%)	52,61,61	2.04	13 (25%)
4	PEG	D	505	-	6,6,6	0.49	0	5,5,5	0.43	0
3	EDO	B	502	-	3,3,3	0.42	0	2,2,2	0.50	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
3	EDO	A	503	-	-	1/1/1/1	-
5	DXE	A	509	-	-	2/3/3/3	-
3	EDO	C	502	-	-	1/1/1/1	-
3	EDO	A	504	-	-	1/1/1/1	-
2	6D3	B	501	-	-	7/31/47/47	0/4/4/4
6	PG4	A	511	-	-	2/10/10/10	-
3	EDO	C	505	-	-	1/1/1/1	-
5	DXE	A	510	-	-	2/3/3/3	-
3	EDO	D	503	-	-	1/1/1/1	-
3	EDO	D	502	-	-	1/1/1/1	-
3	EDO	A	502	-	-	1/1/1/1	-
3	EDO	B	504	-	-	0/1/1/1	-
2	6D3	A	501	-	-	8/31/47/47	0/4/4/4
3	EDO	D	504	-	-	0/1/1/1	-
4	PEG	A	508	-	-	3/4/4/4	-
3	EDO	A	505	-	-	1/1/1/1	-
3	EDO	A	506	-	-	0/1/1/1	-
3	EDO	C	506	-	-	1/1/1/1	-
4	PEG	B	505	-	-	2/4/4/4	-
3	EDO	B	503	-	-	1/1/1/1	-
2	6D3	C	501	-	-	9/31/47/47	0/4/4/4
3	EDO	C	503	-	-	1/1/1/1	-
3	EDO	C	504	-	-	1/1/1/1	-
4	PEG	A	507	-	-	1/4/4/4	-
7	M2M	B	506	-	-	3/6/6/6	-
2	6D3	D	501	-	-	8/31/47/47	0/4/4/4
4	PEG	D	505	-	-	3/4/4/4	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	EDO	B	502	-	-	1/1/1/1	-

All (20) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	501	6D3	C18-C19	5.60	1.45	1.36
2	D	501	6D3	C18-C19	5.53	1.45	1.36
2	B	501	6D3	C18-C19	5.52	1.45	1.36
2	A	501	6D3	C18-C19	5.43	1.45	1.36
2	C	501	6D3	C5-N2	-2.43	1.42	1.47
2	C	501	6D3	C4-N2	-2.23	1.42	1.47
2	C	501	6D3	C12-N5	2.21	1.39	1.34
2	B	501	6D3	C12-N5	2.19	1.39	1.34
2	C	501	6D3	C10-N3	-2.19	1.33	1.37
2	A	501	6D3	C5-N2	-2.18	1.42	1.47
2	D	501	6D3	C10-N3	-2.17	1.33	1.37
2	A	501	6D3	C4-N2	-2.17	1.42	1.47
2	D	501	6D3	C12-N5	2.16	1.39	1.34
2	A	501	6D3	C12-N5	2.16	1.39	1.34
2	B	501	6D3	C4-N2	-2.16	1.42	1.47
2	B	501	6D3	C5-N2	-2.14	1.43	1.47
2	D	501	6D3	O6-C22	2.07	1.28	1.22
2	D	501	6D3	C4-N2	-2.05	1.42	1.47
2	B	501	6D3	O6-C22	2.04	1.28	1.22
2	A	501	6D3	C10-N3	-2.02	1.34	1.37

All (53) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	501	6D3	N8-N10-N9	6.18	112.58	107.02
2	C	501	6D3	N8-N10-N9	5.96	112.39	107.02
2	D	501	6D3	C11-C13-N6	-5.85	118.66	126.72
2	C	501	6D3	C11-C13-N6	-5.80	118.74	126.72
2	B	501	6D3	C11-C13-N6	-5.78	118.75	126.72
2	A	501	6D3	C11-C13-N6	-5.78	118.75	126.72
2	D	501	6D3	N8-N10-N9	5.69	112.14	107.02
2	B	501	6D3	N8-N10-N9	5.65	112.11	107.02
2	B	501	6D3	N6-C13-N3	4.75	135.25	127.17
2	D	501	6D3	N6-C13-N3	4.67	135.10	127.17
2	A	501	6D3	N6-C13-N3	4.64	135.06	127.17
2	C	501	6D3	N6-C13-N3	4.60	134.99	127.17
2	B	501	6D3	N7-C14-N6	-4.57	121.67	128.58

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	D	501	6D3	N7-C14-N6	-4.50	121.77	128.58
2	A	501	6D3	N7-C14-N6	-4.48	121.80	128.58
2	C	501	6D3	N7-C14-N6	-4.36	121.98	128.58
2	A	501	6D3	C20-C19-N9	4.06	127.86	121.75
2	A	501	6D3	C18-N8-N10	-4.02	106.84	110.75
2	D	501	6D3	C14-N6-C13	3.95	121.48	111.83
2	B	501	6D3	C14-N6-C13	3.90	121.36	111.83
2	A	501	6D3	C14-N6-C13	3.85	121.22	111.83
2	C	501	6D3	C14-N6-C13	3.80	121.12	111.83
2	C	501	6D3	C18-N8-N10	-3.58	107.26	110.75
2	A	501	6D3	C17-N8-N10	3.52	127.84	120.78
2	B	501	6D3	C18-N8-N10	-3.41	107.43	110.75
2	C	501	6D3	C20-C19-N9	3.38	126.83	121.75
2	D	501	6D3	C18-N8-N10	-3.38	107.46	110.75
2	C	501	6D3	C13-C11-N4	-3.11	107.02	110.58
2	D	501	6D3	C13-C11-N4	-2.97	107.18	110.58
2	C	501	6D3	C17-N8-N10	2.96	126.72	120.78
2	D	501	6D3	C11-N4-C10	2.95	108.08	103.45
2	B	501	6D3	N3-C10-N4	-2.93	109.78	113.94
2	C	501	6D3	C11-N4-C10	2.91	108.02	103.45
2	B	501	6D3	C13-N3-C10	2.90	108.78	105.74
2	B	501	6D3	C20-C19-N9	2.89	126.10	121.75
2	D	501	6D3	N3-C10-N4	-2.88	109.84	113.94
2	B	501	6D3	C11-N4-C10	2.87	107.97	103.45
2	D	501	6D3	C20-C19-N9	2.84	126.02	121.75
2	C	501	6D3	C13-N3-C10	2.84	108.72	105.74
2	C	501	6D3	N3-C10-N4	-2.81	109.95	113.94
2	D	501	6D3	C13-N3-C10	2.78	108.66	105.74
2	A	501	6D3	C13-C11-N4	-2.73	107.47	110.58
2	B	501	6D3	C13-C11-N4	-2.73	107.47	110.58
2	D	501	6D3	C17-N8-N10	2.68	126.17	120.78
2	B	501	6D3	C17-N8-N10	2.67	126.15	120.78
2	A	501	6D3	C11-N4-C10	2.65	107.62	103.45
2	A	501	6D3	N3-C10-N4	-2.57	110.29	113.94
2	A	501	6D3	C13-N3-C10	2.56	108.43	105.74
2	B	501	6D3	C18-C19-N9	-2.47	105.11	108.12
2	A	501	6D3	C18-C19-N9	-2.43	105.17	108.12
2	C	501	6D3	C18-C19-N9	-2.29	105.33	108.12
2	D	501	6D3	C18-C19-N9	-2.28	105.34	108.12
2	A	501	6D3	C8-C9-C6	2.13	106.73	102.61

There are no chirality outliers.

All (63) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	501	6D3	N1-C2-C3-C4
2	C	501	6D3	C1-C2-C3-C4
2	C	501	6D3	N1-C2-C3-C4
2	D	501	6D3	C20-C21-C22-O7
6	A	511	PG4	O2-C3-C4-O3
7	B	506	M2M	O2-C4-C5-O3
2	A	501	6D3	C15-C16-C17-N8
4	B	505	PEG	O1-C1-C2-O2
6	A	511	PG4	O1-C1-C2-O2
5	A	510	DXE	O1-C2-C3-O2
2	B	501	6D3	N9-C19-C20-C21
2	B	501	6D3	C18-C19-C20-C21
2	B	501	6D3	C15-C16-C17-N8
2	C	501	6D3	C15-C16-C17-N8
2	D	501	6D3	C15-C16-C17-N8
4	A	507	PEG	O2-C3-C4-O4
4	D	505	PEG	O1-C1-C2-O2
5	A	509	DXE	O1-C2-C3-O2
2	D	501	6D3	N11-C21-C22-O7
4	A	508	PEG	O2-C3-C4-O4
2	A	501	6D3	C19-C20-C21-N11
2	D	501	6D3	C20-C21-C22-O6
2	C	501	6D3	O5-C1-C2-N1
4	A	508	PEG	C1-C2-O2-C3
4	A	508	PEG	O1-C1-C2-O2
3	C	503	EDO	O1-C1-C2-O2
3	C	504	EDO	O1-C1-C2-O2
4	B	505	PEG	O2-C3-C4-O4
2	C	501	6D3	O1-C1-C2-N1
2	D	501	6D3	N11-C21-C22-O6
3	A	504	EDO	O1-C1-C2-O2
3	C	502	EDO	O1-C1-C2-O2
7	B	506	M2M	O1-C2-C3-O2
2	C	501	6D3	C16-C17-N8-C18
4	D	505	PEG	C4-C3-O2-C2
7	B	506	M2M	C5-C4-O2-C3
2	A	501	6D3	C1-C2-C3-C4
2	B	501	6D3	C20-C21-C22-O6
2	A	501	6D3	C16-C17-N8-C18
2	C	501	6D3	N2-C15-C16-C17
5	A	510	DXE	C3-C2-O1-C1
2	B	501	6D3	C20-C21-C22-O7

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Mol	Chain	Res	Type	Atoms
3	C	506	EDO	O1-C1-C2-O2
2	D	501	6D3	N9-C19-C20-C21
2	D	501	6D3	C18-C19-C20-C21
2	C	501	6D3	C16-C17-N8-N10
3	A	505	EDO	O1-C1-C2-O2
2	D	501	6D3	C6-C5-N2-C4
2	A	501	6D3	C19-C20-C21-C22
2	A	501	6D3	C16-C17-N8-N10
3	A	502	EDO	O1-C1-C2-O2
3	B	502	EDO	O1-C1-C2-O2
3	A	503	EDO	O1-C1-C2-O2
3	C	505	EDO	O1-C1-C2-O2
3	D	503	EDO	O1-C1-C2-O2
2	B	501	6D3	C6-C5-N2-C4
3	B	503	EDO	O1-C1-C2-O2
3	D	502	EDO	O1-C1-C2-O2
5	A	509	DXE	C3-C2-O1-C1
4	D	505	PEG	C1-C2-O2-C3
2	A	501	6D3	C6-C5-N2-C15
2	C	501	6D3	N11-C21-C22-O7
2	B	501	6D3	C2-C3-C4-N2

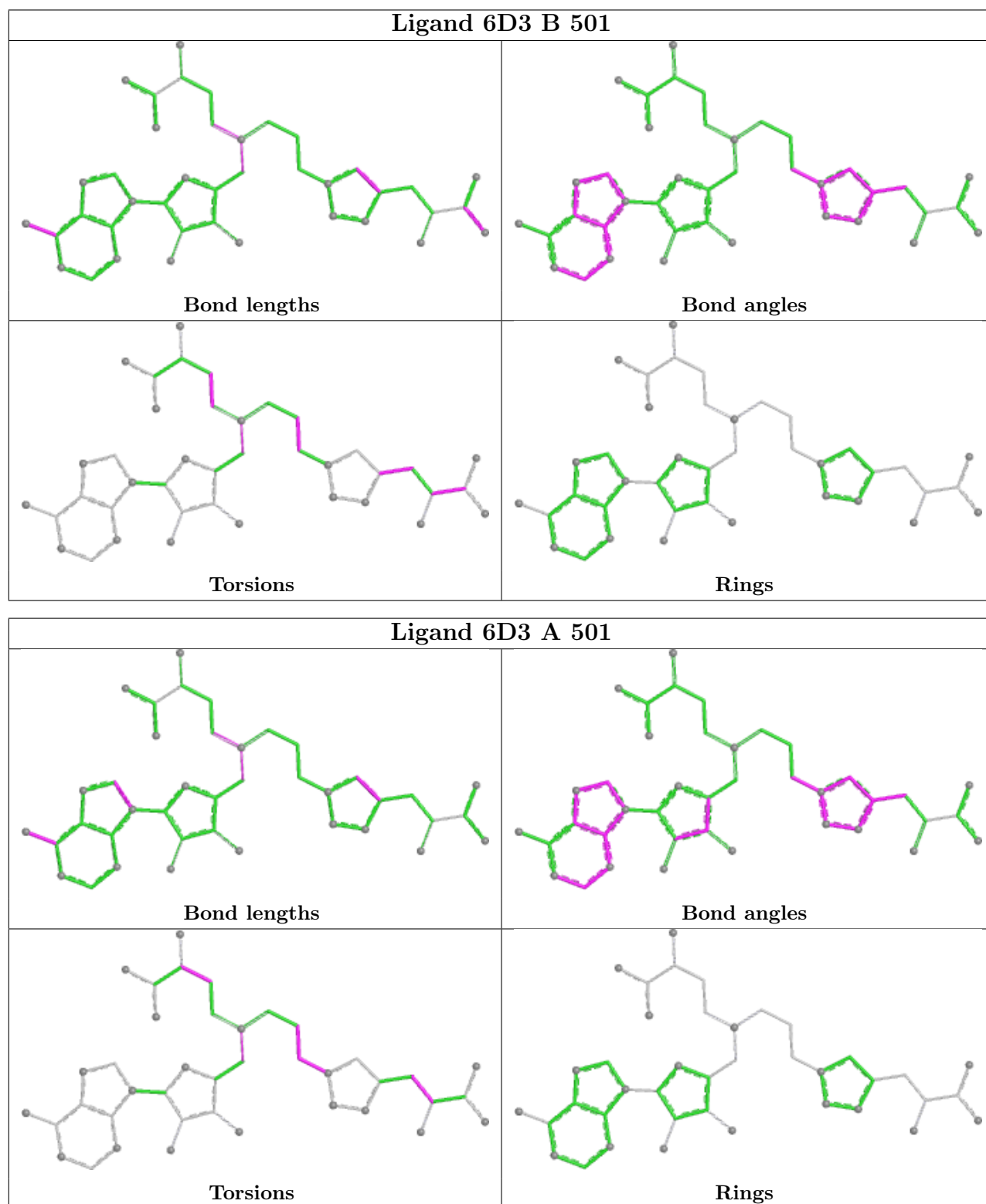
There are no ring outliers.

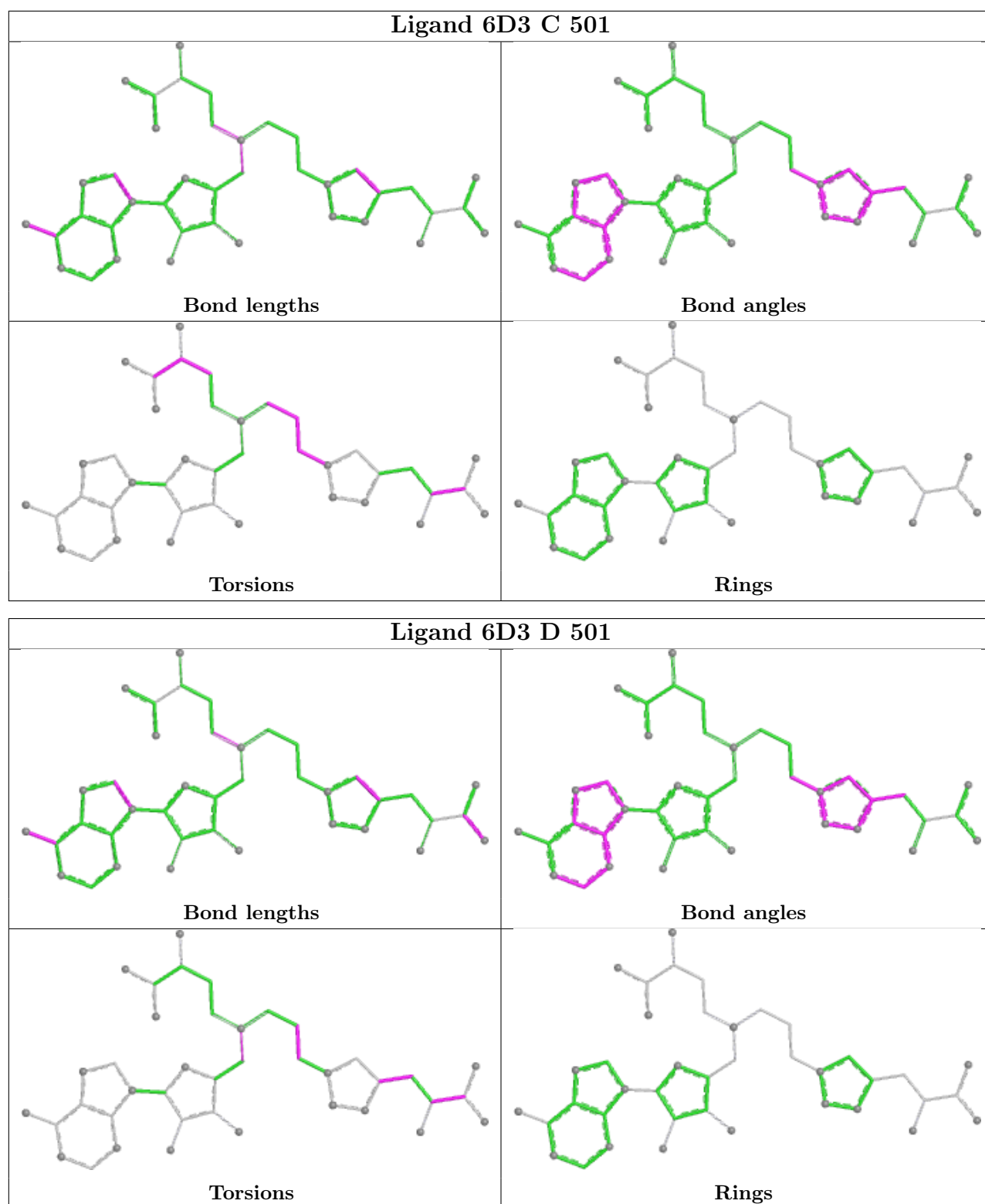
9 monomers are involved in 11 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	501	6D3	1	0
2	A	501	6D3	1	0
3	D	504	EDO	1	0
3	B	503	EDO	1	0
2	C	501	6D3	1	0
4	A	507	PEG	2	0
7	B	506	M2M	2	0
2	D	501	6D3	1	0
4	D	505	PEG	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 ⓘ

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	343/361 (95%)	-0.67	2 (0%) 85 83	13, 32, 51, 72	5 (1%)
1	B	343/361 (95%)	-0.57	2 (0%) 85 83	15, 36, 57, 73	4 (1%)
1	C	343/361 (95%)	-0.39	2 (0%) 85 83	23, 43, 68, 87	2 (0%)
1	D	343/361 (95%)	-0.43	3 (0%) 81 78	24, 42, 63, 76	5 (1%)
All	All	1372/1444 (95%)	-0.52	9 (0%) 84 81	13, 39, 64, 87	16 (1%)

All (9) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	175[A]	ARG	3.6
1	D	477[A]	TYR	3.6
1	D	472[A]	ASN	2.9
1	A	283	SER	2.8
1	B	283	SER	2.7
1	B	478	THR	2.5
1	C	478	THR	2.4
1	A	478	THR	2.4
1	C	415[A]	HIS	2.2

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

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

6.3 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

6.4 Ligands ⓘ

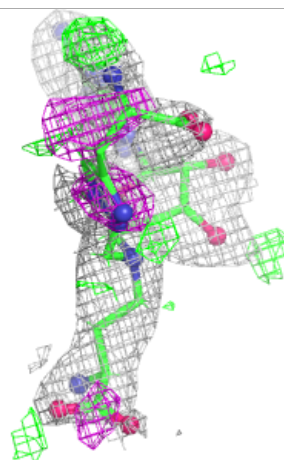
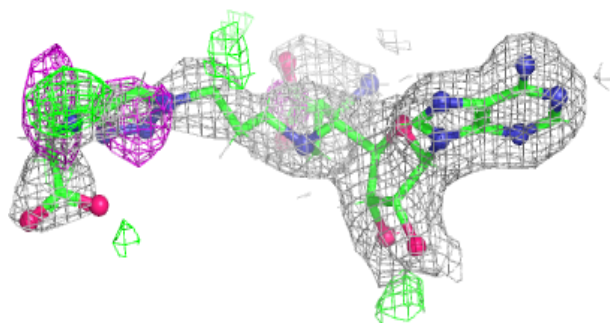
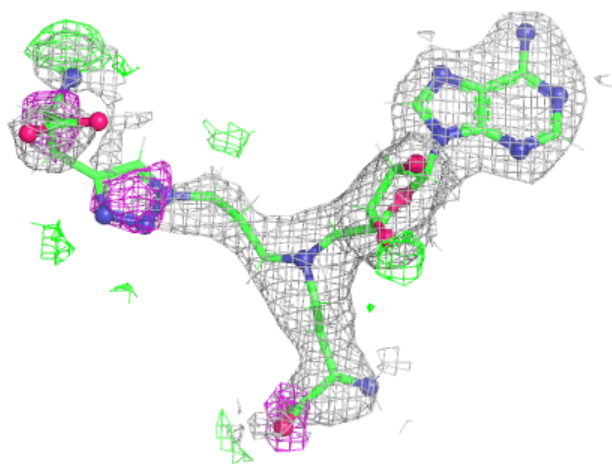
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists 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	A	509	6/6	0.57	0.18	43,51,58,58	0
7	M2M	B	506	9/9	0.61	0.16	53,64,69,69	0
5	DXE	A	510	6/6	0.64	0.14	52,63,68,68	0
3	EDO	B	504	4/4	0.70	0.17	48,49,49,50	0
4	PEG	D	505	7/7	0.72	0.13	49,59,70,70	0
3	EDO	D	503	4/4	0.78	0.11	50,60,60,61	0
3	EDO	C	505	4/4	0.79	0.15	57,57,58,59	0
4	PEG	A	508	7/7	0.82	0.19	44,53,54,54	0
4	PEG	B	505	7/7	0.82	0.12	43,52,58,62	0
3	EDO	A	504	4/4	0.82	0.10	44,53,58,61	0
3	EDO	C	506	4/4	0.83	0.13	45,46,47,48	0
3	EDO	C	502	4/4	0.83	0.10	48,57,58,59	0
6	PG4	A	511	13/13	0.83	0.10	44,53,57,58	0
4	PEG	A	507	7/7	0.83	0.10	45,54,60,60	0
3	EDO	A	506	4/4	0.84	0.13	34,35,35,40	0
2	6D3	C	501	40/40	0.85	0.13	28,52,86,94	0
3	EDO	C	504	4/4	0.86	0.10	51,61,62,63	0
3	EDO	A	502	4/4	0.86	0.10	38,46,50,53	0
3	EDO	B	503	4/4	0.87	0.14	47,47,48,51	0
3	EDO	D	504	4/4	0.87	0.10	49,50,51,52	0
3	EDO	C	503	4/4	0.88	0.10	50,60,61,62	0
2	6D3	D	501	40/40	0.88	0.11	26,42,86,90	0
3	EDO	D	502	4/4	0.89	0.09	44,53,54,54	0
2	6D3	A	501	40/40	0.90	0.11	15,42,74,86	0
3	EDO	A	505	4/4	0.91	0.10	43,43,45,47	0
3	EDO	A	503	4/4	0.92	0.07	39,47,51,57	0
2	6D3	B	501	40/40	0.92	0.10	18,38,67,73	0
3	EDO	B	502	4/4	0.92	0.07	44,53,56,58	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.

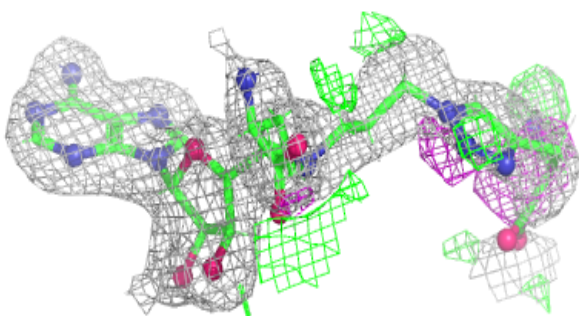
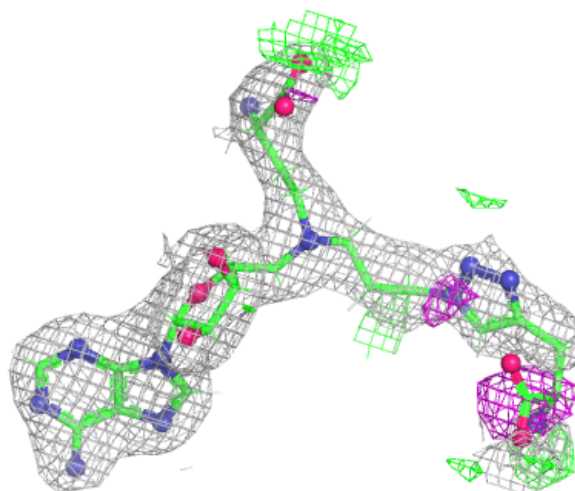
Electron density around 6D3 C 501:

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



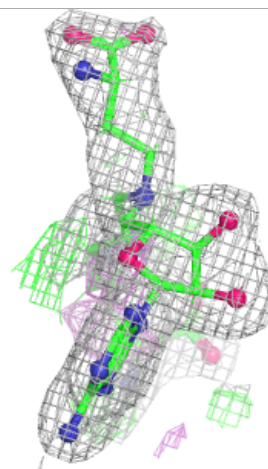
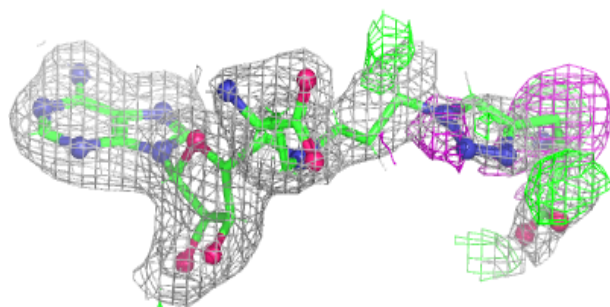
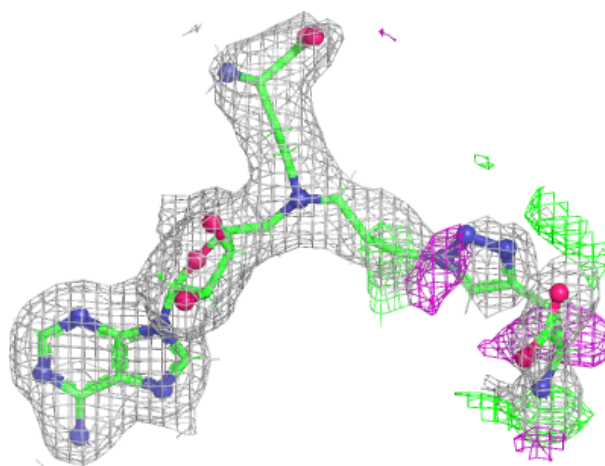
Electron density around 6D3 D 501:

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



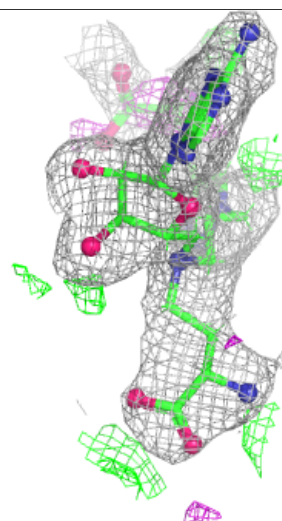
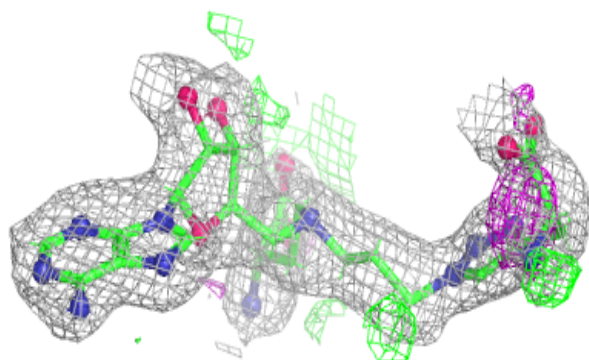
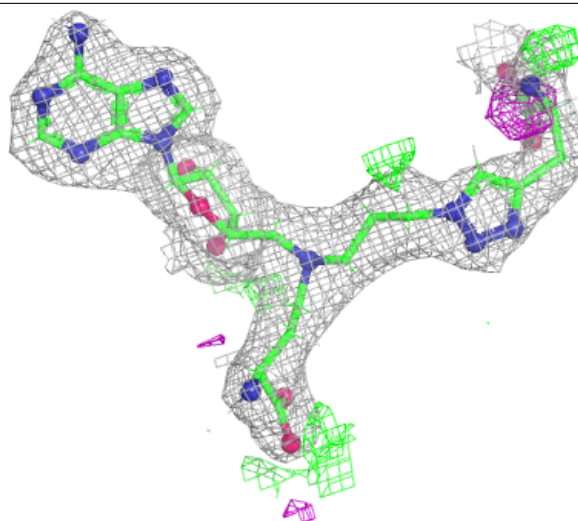
Electron density around 6D3 A 501:

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



Electron density around 6D3 B 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.