



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 12, 2026 – 03:01 PM UTC

PDB ID : 5IH3 / pdb_00005ih3
Title : Crystal structure of mouse CARM1 in complex with SAH at 1.8 Angstroms resolution
Authors : Cura, V.; Marechal, N.; Mailliot, J.; Troffer-Charlier, N.; Hassenboehler, P.; Wurtz, J.M.; Bonnefond, L.; Cavarelli, J.
Deposited on : 2016-02-29
Resolution : 1.77 Å(reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

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

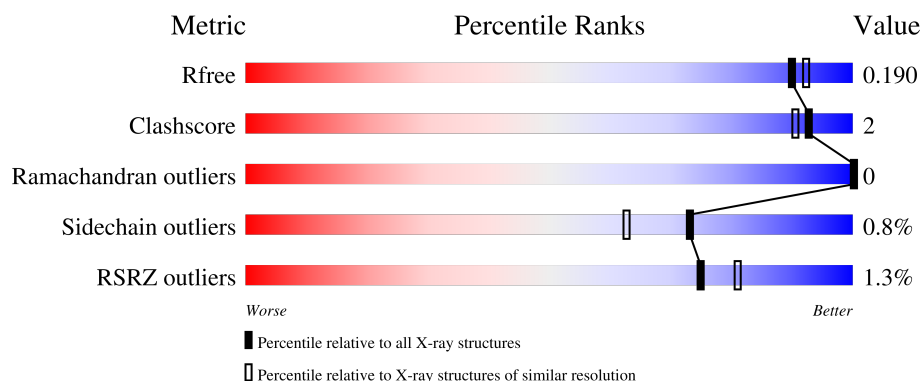
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.77 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	1365 (1.78-1.78)
Clashscore	190562	1395 (1.78-1.78)
Ramachandran outliers	187476	1382 (1.78-1.78)
Sidechain outliers	187428	1382 (1.78-1.78)
RSRZ outliers	180081	1365 (1.78-1.78)

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	% 91% • 5%
1	B	361	2% 91% • 5%
1	C	361	% 93% • 5%
1	D	361	% 89% 6% 6%

2 Entry composition

There are 8 unique types of molecules in this entry. The entry contains 23515 atoms, of which 11151 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.

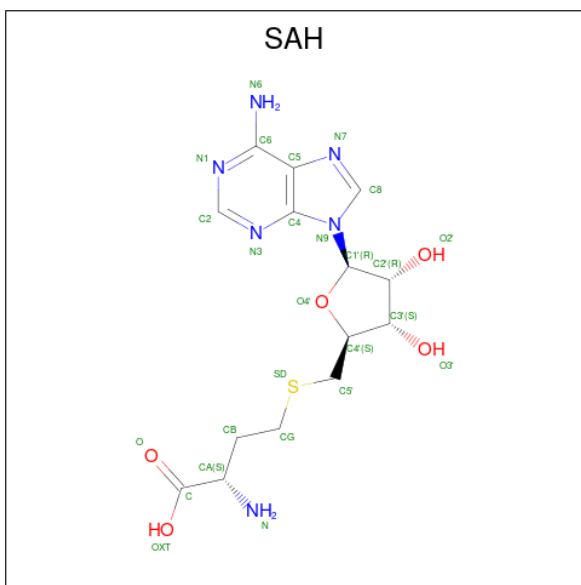
- Molecule 1 is a protein called Histone-arginine methyltransferase CARM1.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	343	Total	C	H	N	O	S	0	4	0
			5499	1790	2725	457	511	16			
1	B	343	Total	C	H	N	O	S	0	3	0
			5488	1786	2718	460	509	15			
1	C	343	Total	C	H	N	O	S	0	3	0
			5479	1784	2714	456	510	15			
1	D	341	Total	C	H	N	O	S	0	4	0
			5461	1776	2706	456	507	16			

There are 12 discrepancies between the modelled and reference sequences:

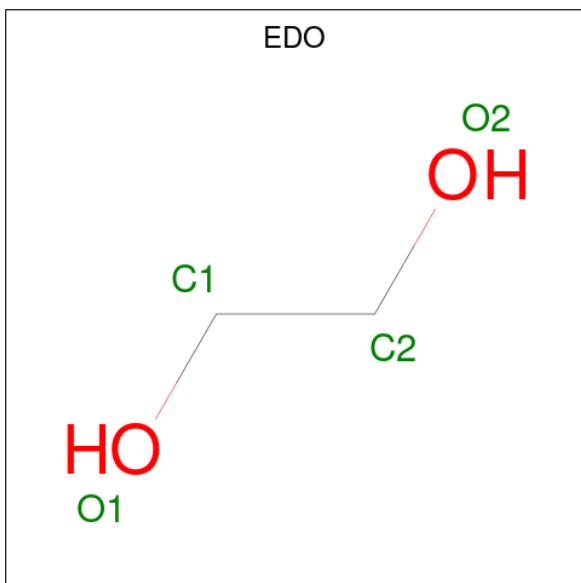
Chain	Residue	Modelled	Actual	Comment	Reference
A	127	GLY	-	expression tag	UNP Q9WVG6
A	128	HIS	-	expression tag	UNP Q9WVG6
A	129	MET	-	expression tag	UNP Q9WVG6
B	127	GLY	-	expression tag	UNP Q9WVG6
B	128	HIS	-	expression tag	UNP Q9WVG6
B	129	MET	-	expression tag	UNP Q9WVG6
C	127	GLY	-	expression tag	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 S-ADENOSYL-L-HOMOCYSTEINE (CCD ID: SAH) (formula: C₁₄H₂₀N₆O₅S).



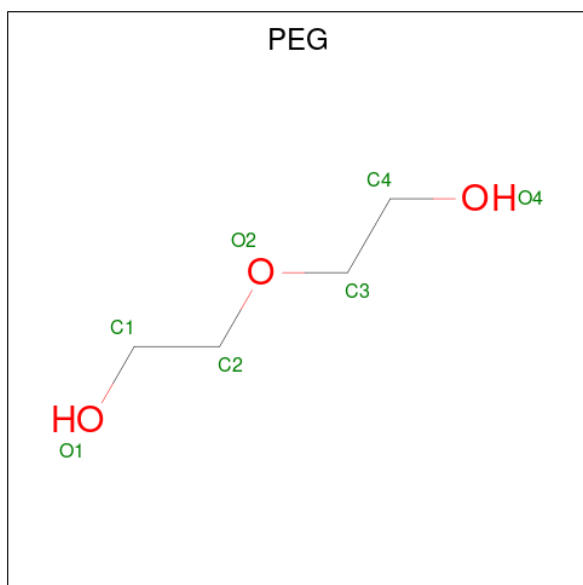
Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
2	A	1	Total 46	C 14	H 20	N 6	O 5	S 1	0	0
2	B	1	Total 46	C 14	H 20	N 6	O 5	S 1	0	0
2	C	1	Total 46	C 14	H 20	N 6	O 5	S 1	0	0
2	D	1	Total 46	C 14	H 20	N 6	O 5	S 1	0	0

- 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	B	1	Total C H O 10 2 6 2	0	0
3	B	1	Total C H O 10 2 6 2	0	0
3	B	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 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 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).



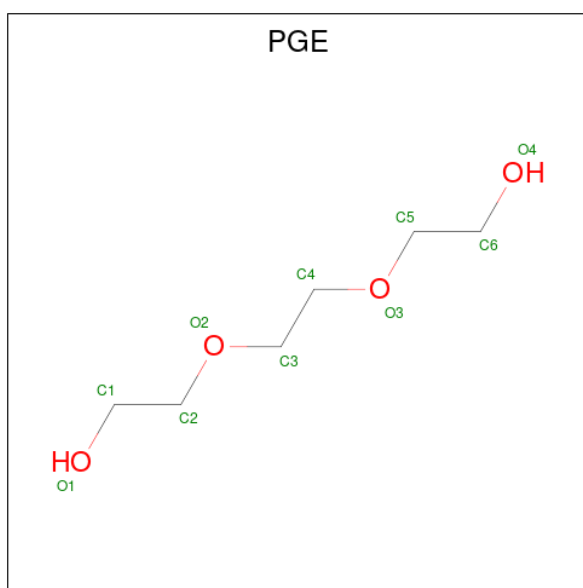
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total C H O 17 4 10 3	0	0

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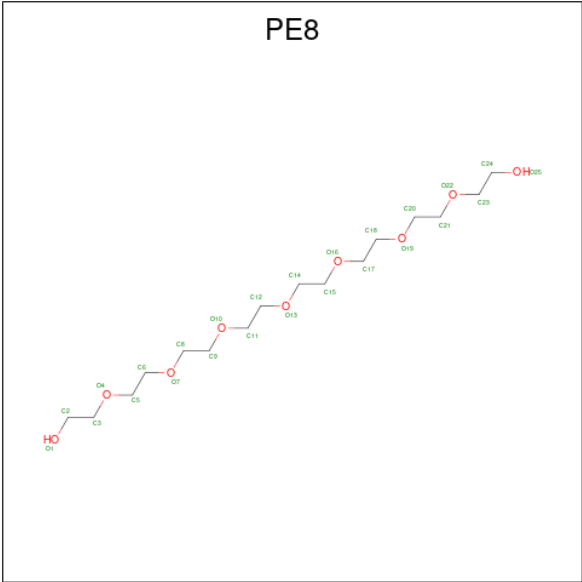
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	A	1	Total	C	H	O	0	0
			17	4	10	3		
4	A	1	Total	C	H	O	0	0
			17	4	10	3		
4	B	1	Total	C	H	O	0	0
			17	4	10	3		
4	C	1	Total	C	H	O	0	0
			17	4	10	3		
4	C	1	Total	C	H	O	0	0
			17	4	10	3		

- Molecule 5 is TRIETHYLENE GLYCOL (CCD ID: PGE) (formula: $C_6H_{14}O_4$).



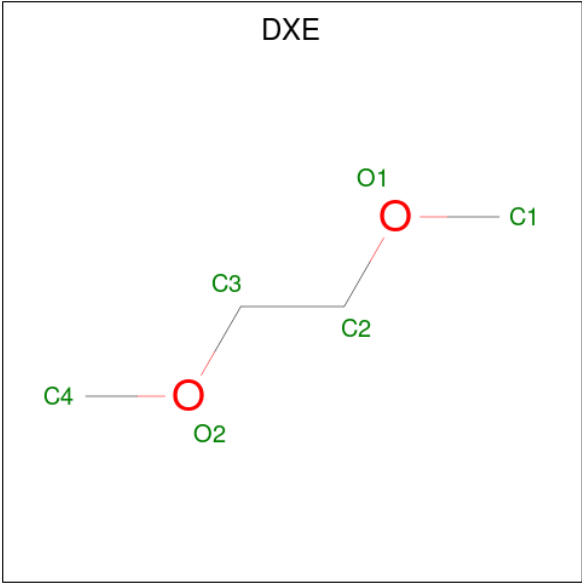
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
5	A	1	Total	C	H	O	0	0
			24	6	14	4		

- Molecule 6 is 3,6,9,12,15,18,21-HEPTAOXATRICOSANE-1,23-DIOL (CCD ID: PE8) (formula: $C_{16}H_{34}O_9$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
6	B	1	Total	C	H	O	0	0
			59	16	34	9		

- Molecule 7 is 1,2-DIMETHOXYETHANE (CCD ID: DXE) (formula: C₄H₁₀O₂).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
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		

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

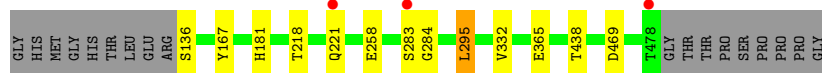
- Molecule 8 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
8	A	283	Total	O	0	0
			283	283		
8	B	269	Total	O	0	0
			269	269		
8	C	267	Total	O	0	0
			267	267		
8	D	232	Total	O	0	0
			232	232		

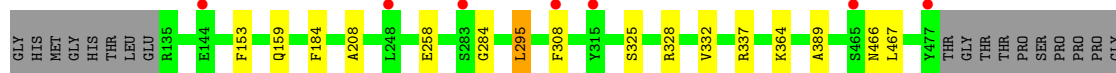
3 Residue-property plots [i](#)

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



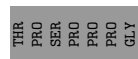
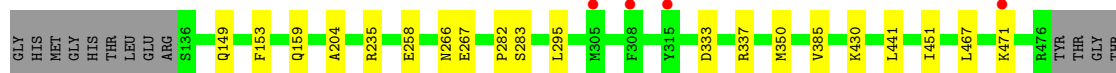
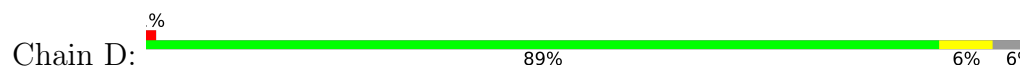
- Molecule 1: Histone-arginine methyltransferase CARM1



- 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	74.63Å 97.92Å 204.96Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	47.62 – 1.77 47.62 – 1.77	Depositor EDS
% Data completeness (in resolution range)	99.8 (47.62-1.77) 99.9 (47.62-1.77)	Depositor EDS
R_{merge}	0.13	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.68 (at 1.77Å)	Xtrriage
Refinement program	PHENIX dev_1951	Depositor
R, R_{free}	0.164 , 0.191 0.163 , 0.190	Depositor DCC
R_{free} test set	7270 reflections (4.95%)	wwPDB-VP
Wilson B-factor (Å ²)	21.1	Xtrriage
Anisotropy	0.357	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.41 , 47.5	EDS
L-test for twinning ²	$\langle L \rangle = 0.46$, $\langle L^2 \rangle = 0.29$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.97	EDS
Total number of atoms	23515	wwPDB-VP
Average B, all atoms (Å ²)	31.0	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 30.92 % 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 1.2071e-03. 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: SAH, PGE, DXE, PEG, PE8, EDO

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	0.58	0/2849	0.73	1/3860 (0.0%)
1	B	0.57	0/2840	0.71	1/3847 (0.0%)
1	C	0.53	0/2840	0.73	0/3848
1	D	0.54	0/2829	0.70	0/3832
All	All	0.56	0/11358	0.72	2/15387 (0.0%)

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	284	GLY	N-CA-C	5.37	119.42	112.54
1	B	284	GLY	N-CA-C	5.33	120.66	112.51

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	2774	2725	2717	12	0
1	B	2770	2718	2709	8	0
1	C	2765	2714	2707	5	0
1	D	2755	2706	2698	11	0
2	A	26	20	19	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	B	26	20	19	0	0
2	C	26	20	19	0	0
2	D	26	20	19	0	0
3	A	8	12	12	0	0
3	B	12	18	18	0	0
3	C	12	18	18	1	0
3	D	12	12	18	0	0
4	A	21	30	30	1	0
4	B	7	10	10	0	0
4	C	14	20	20	0	0
5	A	10	14	14	0	0
6	B	25	34	34	1	0
7	B	12	20	20	0	0
7	C	12	20	20	1	0
8	A	283	0	0	7	3
8	B	269	0	0	3	1
8	C	267	0	0	0	0
8	D	232	0	0	1	0
All	All	12364	11151	11121	34	3

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:A:283:SER:OG	8:A:601:HOH:O	1.99	0.79
1:A:221:GLN:NE2	8:A:603:HOH:O	2.16	0.78
1:A:181:HIS:ND1	8:A:604:HOH:O	2.21	0.74
1:B:332:VAL:HG11	8:D:646:HOH:O	1.95	0.67
1:A:365:GLU:OE2	8:A:602:HOH:O	2.13	0.66
1:B:364:LYS:NZ	8:B:606:HOH:O	2.37	0.58
1:A:136:SER:N	8:A:608:HOH:O	2.36	0.57
1:B:153:PHE:CE2	1:B:159[A]:GLN:HG2	2.42	0.55
1:A:218:THR:O	1:A:221:GLN:OE1	2.27	0.53
1:D:153:PHE:CE2	1:D:159[B]:GLN:HG2	2.44	0.52
6:B:506:PE8:H242	8:B:695:HOH:O	2.10	0.51
1:A:438[B]:THR:HG23	8:A:783:HOH:O	2.10	0.51
1:C:178:LEU:HD13	7:C:507:DXE:H31	1.93	0.49
1:C:149:GLN:NE2	1:D:149:GLN:OE1	2.43	0.49
1:D:337:ARG:HG2	1:D:467:LEU:O	2.15	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:337:ARG:HG2	1:B:467:LEU:O	2.15	0.46
1:D:204:ALA:O	1:D:235:ARG:NH2	2.48	0.45
1:A:295:LEU:HD23	1:A:295:LEU:N	2.31	0.45
1:A:332:VAL:HG12	4:A:504:PEG:H41	2.00	0.44
1:D:441:LEU:CD2	1:D:451:ILE:HG12	2.48	0.43
1:C:399:SER:HA	3:C:503:EDO:H11	2.01	0.42
1:C:248:LEU:HB2	1:C:279:TYR:CE1	2.55	0.42
1:D:350[A]:MET:SD	1:D:385:VAL:HG22	2.59	0.42
1:C:266:ASN:O	1:C:267:GLU:HB2	2.19	0.42
1:D:333:ASP:O	1:D:337:ARG:HG3	2.19	0.42
1:B:466:ASN:HB3	8:B:717:HOH:O	2.19	0.42
1:A:167:TYR:CD2	1:D:430:LYS:HE2	2.55	0.42
1:D:266:ASN:O	1:D:267:GLU:HB2	2.19	0.42
1:B:295:LEU:HA	1:B:389:ALA:O	2.20	0.41
1:A:167:TYR:CD2	1:D:430:LYS:CE	3.03	0.41
1:A:469:ASP:OD1	8:A:605:HOH:O	2.21	0.41
1:B:184:PHE:O	1:B:208:ALA:HA	2.20	0.41
1:D:282:PRO:O	1:D:283:SER:HB2	2.21	0.40
1:B:325:SER:O	1:B:328:ARG:HG2	2.22	0.40

All (3) 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)
8:A:806:HOH:O	8:A:806:HOH:O[2_655]	2.03	0.17
8:A:842:HOH:O	8:A:842:HOH:O[2_765]	2.13	0.07
8:A:725:HOH:O	8:B:723:HOH:O[4_556]	2.14	0.06

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%)	335 (97%)	10 (3%)	0	100	100
1	B	343/361 (95%)	333 (97%)	10 (3%)	0	100	100
1	C	344/361 (95%)	335 (97%)	9 (3%)	0	100	100
1	D	343/361 (95%)	332 (97%)	11 (3%)	0	100	100
All	All	1375/1444 (95%)	1335 (97%)	40 (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	302/313 (96%)	300 (99%)	2 (1%)	76	66
1	B	301/313 (96%)	298 (99%)	3 (1%)	68	55
1	C	301/313 (96%)	300 (100%)	1 (0%)	86	80
1	D	300/313 (96%)	297 (99%)	3 (1%)	68	55
All	All	1204/1252 (96%)	1195 (99%)	9 (1%)	73	66

All (9) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	258	GLU
1	A	295	LEU
1	B	258	GLU
1	B	295	LEU
1	B	308	PHE
1	C	258	GLU
1	D	258	GLU
1	D	295	LEU
1	D	471	LYS

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

Mol	Chain	Res	Type
1	B	160[B]	GLN
1	B	381	HIS
1	C	162	ASN
1	C	181	HIS
1	D	160	GLN
1	D	381	HIS
1	D	447	GLN
1	D	472	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

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

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

27 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	$\# Z > 2$
4	PEG	A	505	-	6,6,6	0.50	0	5,5,5	0.41	0
2	SAH	D	501	-	27,28,28	0.43	0	36,40,40	0.50	0
3	EDO	A	502	-	3,3,3	0.40	0	2,2,2	0.54	0
6	PE8	B	506	-	24,24,24	0.56	0	23,23,23	0.56	0
4	PEG	A	506	-	6,6,6	0.55	0	5,5,5	0.61	0
7	DXE	C	508	-	5,5,5	0.40	0	4,4,4	0.47	0
3	EDO	C	504	-	3,3,3	0.41	0	2,2,2	0.52	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
4	PEG	C	506	-	6,6,6	0.48	0	5,5,5	0.28	0
3	EDO	B	504	-	3,3,3	0.38	0	2,2,2	0.48	0
3	EDO	B	503	-	3,3,3	0.43	0	2,2,2	0.41	0
5	PGE	A	507	-	9,9,9	0.46	0	8,8,8	0.42	0
3	EDO	D	503	-	3,3,3	0.44	0	2,2,2	0.60	0
2	SAH	B	501	-	27,28,28	0.45	0	36,40,40	0.47	0
3	EDO	D	502	-	3,3,3	0.41	0	2,2,2	0.58	0
7	DXE	C	507	-	5,5,5	0.35	0	4,4,4	0.28	0
3	EDO	A	503	-	3,3,3	0.44	0	2,2,2	0.38	0
4	PEG	C	505	-	6,6,6	0.47	0	5,5,5	0.52	0
3	EDO	C	503	-	3,3,3	0.42	0	2,2,2	0.48	0
7	DXE	B	507	-	5,5,5	0.41	0	4,4,4	0.24	0
4	PEG	A	504	-	6,6,6	0.52	0	5,5,5	0.71	0
3	EDO	C	502	-	3,3,3	0.39	0	2,2,2	0.45	0
7	DXE	B	508	-	5,5,5	0.50	0	4,4,4	0.99	0
3	EDO	D	504	-	3,3,3	0.47	0	2,2,2	0.38	0
4	PEG	B	505	-	6,6,6	0.47	0	5,5,5	0.66	0
3	EDO	B	502	-	3,3,3	0.44	0	2,2,2	0.52	0
2	SAH	A	501	-	27,28,28	0.49	0	36,40,40	0.63	1 (2%)
2	SAH	C	501	-	27,28,28	0.38	0	36,40,40	0.60	1 (2%)

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
4	PEG	A	505	-	-	3/4/4/4	-
2	SAH	D	501	-	-	0/15/31/31	0/3/3/3
3	EDO	A	502	-	-	1/1/1/1	-
6	PE8	B	506	-	-	9/22/22/22	-
4	PEG	A	506	-	-	2/4/4/4	-
7	DXE	C	508	-	-	2/3/3/3	-
3	EDO	C	504	-	-	1/1/1/1	-
4	PEG	C	506	-	-	2/4/4/4	-
3	EDO	B	504	-	-	0/1/1/1	-
3	EDO	B	503	-	-	1/1/1/1	-
5	PGE	A	507	-	-	4/7/7/7	-
3	EDO	D	503	-	-	1/1/1/1	-
2	SAH	B	501	-	-	0/15/31/31	0/3/3/3
3	EDO	D	502	-	-	1/1/1/1	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
7	DXE	C	507	-	-	2/3/3/3	-
3	EDO	A	503	-	-	1/1/1/1	-
4	PEG	C	505	-	-	2/4/4/4	-
3	EDO	C	503	-	-	1/1/1/1	-
7	DXE	B	507	-	-	1/3/3/3	-
4	PEG	A	504	-	-	3/4/4/4	-
3	EDO	C	502	-	-	1/1/1/1	-
7	DXE	B	508	-	-	1/3/3/3	-
3	EDO	D	504	-	-	0/1/1/1	-
4	PEG	B	505	-	-	3/4/4/4	-
3	EDO	B	502	-	-	0/1/1/1	-
2	SAH	A	501	-	-	0/15/31/31	0/3/3/3
2	SAH	C	501	-	-	0/15/31/31	0/3/3/3

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	501	SAH	CB-CG-SD	-2.57	107.72	113.45
2	C	501	SAH	CB-CG-SD	-2.36	108.18	113.45

There are no chirality outliers.

All (42) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
6	B	506	PE8	C8-C9-O10-C11
6	B	506	PE8	O7-C8-C9-O10
7	B	507	DXE	O1-C2-C3-O2
7	B	508	DXE	C3-C2-O1-C1
7	C	507	DXE	O1-C2-C3-O2
4	A	504	PEG	O2-C3-C4-O4
4	A	506	PEG	O1-C1-C2-O2
5	A	507	PGE	O2-C3-C4-O3
4	A	504	PEG	O1-C1-C2-O2
4	A	505	PEG	O2-C3-C4-O4
6	B	506	PE8	O22-C23-C24-O25
4	B	505	PEG	O2-C3-C4-O4
4	C	506	PEG	O1-C1-C2-O2
4	C	505	PEG	O1-C1-C2-O2
7	C	508	DXE	O1-C2-C3-O2

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Mol	Chain	Res	Type	Atoms
4	A	506	PEG	O2-C3-C4-O4
4	B	505	PEG	O1-C1-C2-O2
4	C	505	PEG	O2-C3-C4-O4
5	A	507	PGE	O3-C5-C6-O4
6	B	506	PE8	O1-C2-C3-O4
3	A	502	EDO	O1-C1-C2-O2
6	B	506	PE8	O4-C5-C6-O7
3	B	503	EDO	O1-C1-C2-O2
6	B	506	PE8	C12-C11-O10-C9
4	B	505	PEG	C4-C3-O2-C2
6	B	506	PE8	C6-C5-O4-C3
4	A	504	PEG	C4-C3-O2-C2
4	C	506	PEG	C4-C3-O2-C2
3	D	503	EDO	O1-C1-C2-O2
4	A	505	PEG	C4-C3-O2-C2
4	A	505	PEG	O1-C1-C2-O2
5	A	507	PGE	C3-C4-O3-C5
6	B	506	PE8	C20-C21-O22-C23
3	C	502	EDO	O1-C1-C2-O2
3	C	504	EDO	O1-C1-C2-O2
7	C	508	DXE	C3-C2-O1-C1
5	A	507	PGE	C1-C2-O2-C3
6	B	506	PE8	C24-C23-O22-C21
3	A	503	EDO	O1-C1-C2-O2
3	C	503	EDO	O1-C1-C2-O2
3	D	502	EDO	O1-C1-C2-O2
7	C	507	DXE	C3-C2-O1-C1

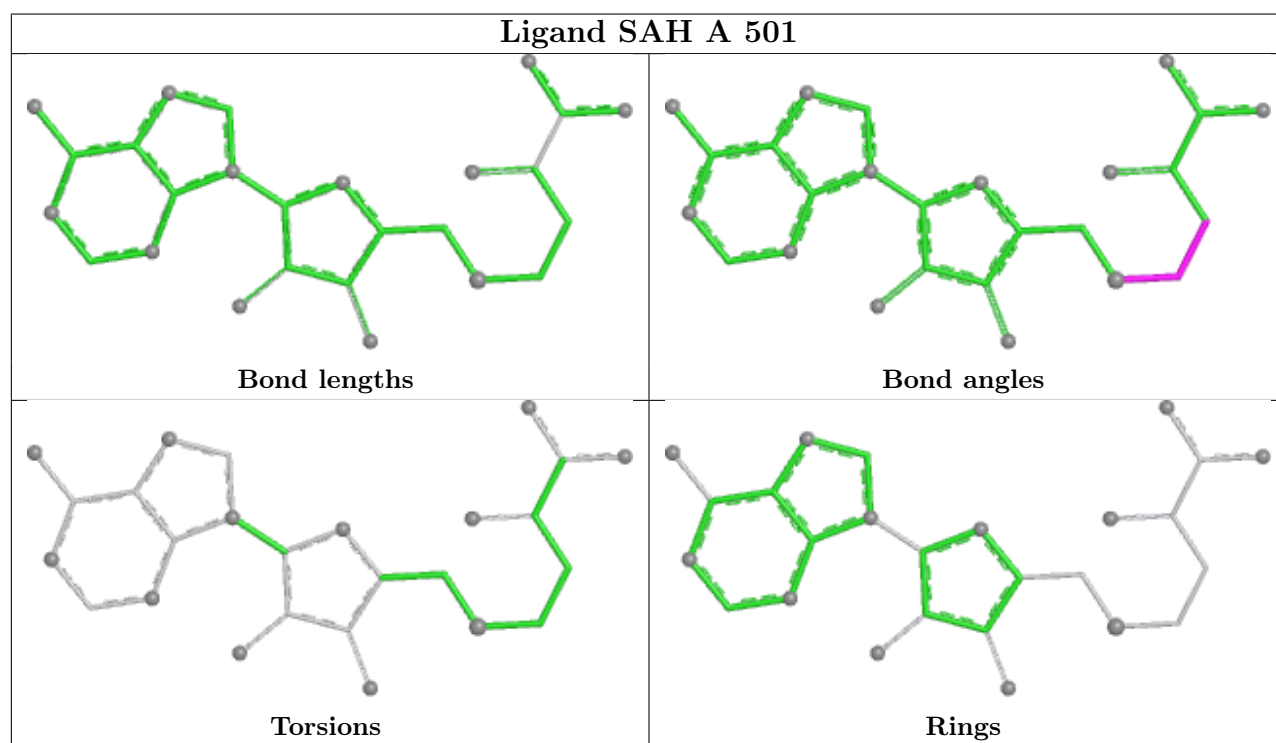
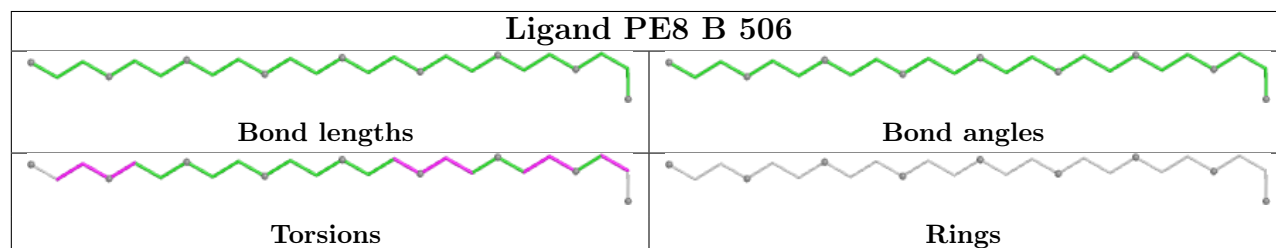
There are no ring outliers.

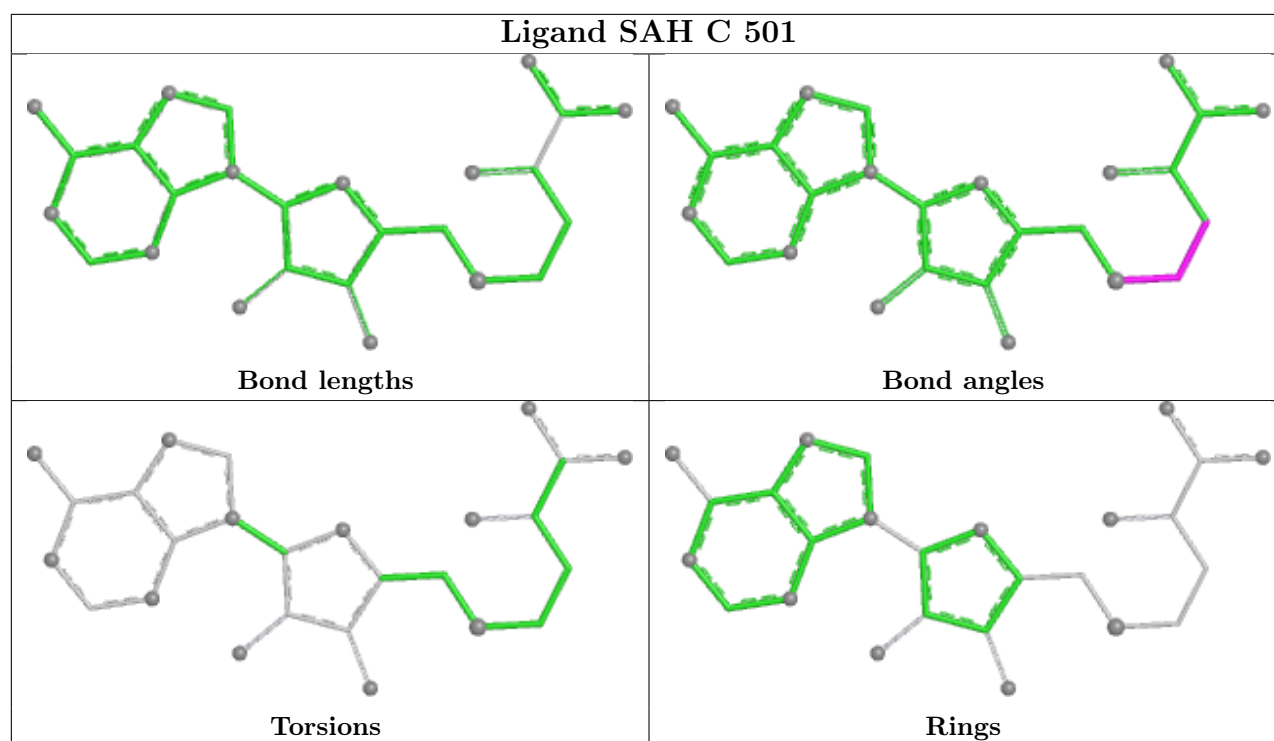
4 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	B	506	PE8	1	0
7	C	507	DXE	1	0
3	C	503	EDO	1	0
4	A	504	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 [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%)	-0.39	3 (0%) 81 86	11, 24, 49, 68	3 (0%)
1	B	343/361 (95%)	-0.19	7 (2%) 65 73	11, 28, 55, 83	2 (0%)
1	C	343/361 (95%)	-0.22	4 (1%) 76 82	10, 28, 55, 75	2 (0%)
1	D	341/361 (94%)	-0.15	4 (1%) 76 82	12, 29, 56, 75	3 (0%)
All	All	1370/1444 (94%)	-0.24	18 (1%) 75 81	10, 28, 54, 83	10 (0%)

All (18) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	308	PHE	4.2
1	B	477	TYR	4.2
1	D	315	TYR	4.0
1	D	305	MET	3.0
1	D	471	LYS	2.9
1	A	478	THR	2.8
1	A	283	SER	2.8
1	B	315	TYR	2.8
1	C	478	THR	2.7
1	B	283	SER	2.6
1	A	221	GLN	2.2
1	B	248	LEU	2.2
1	C	376	LYS	2.1
1	B	465	SER	2.1
1	B	308	PHE	2.1
1	C	431	ALA	2.1
1	B	144	GLU	2.1
1	C	221	GLN	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 oligosaccharides in this entry.

6.4 Ligands [i](#)

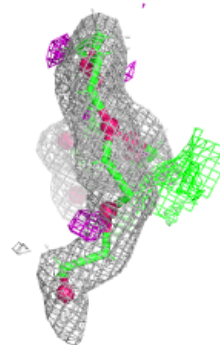
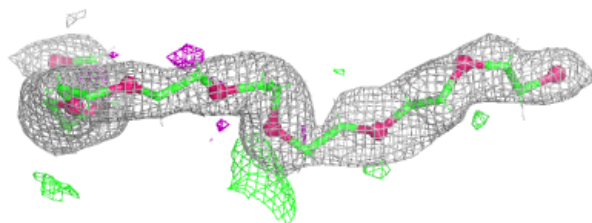
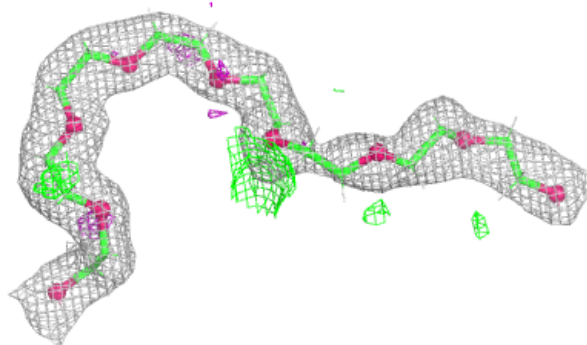
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
7	DXE	B	508	6/6	0.69	0.17	41,49,52,52	0
7	DXE	C	507	6/6	0.76	0.16	41,49,50,50	0
7	DXE	C	508	6/6	0.81	0.15	36,43,45,45	0
4	PEG	A	504	7/7	0.84	0.13	40,48,52,53	0
5	PGE	A	507	10/10	0.87	0.11	37,45,55,57	0
7	DXE	B	507	6/6	0.87	0.11	36,44,45,45	0
4	PEG	A	505	7/7	0.87	0.10	40,48,61,61	0
4	PEG	B	505	7/7	0.87	0.10	38,46,50,52	0
4	PEG	C	505	7/7	0.87	0.12	40,48,53,56	0
3	EDO	C	503	4/4	0.88	0.11	48,58,66,70	0
6	PE8	B	506	25/25	0.88	0.12	30,44,67,69	0
4	PEG	A	506	7/7	0.88	0.11	33,40,48,51	0
3	EDO	C	504	4/4	0.88	0.11	44,53,55,56	0
3	EDO	B	503	4/4	0.88	0.11	42,51,53,56	0
4	PEG	C	506	7/7	0.88	0.11	41,49,58,62	0
3	EDO	B	504	4/4	0.89	0.11	36,43,45,49	0
3	EDO	D	504	4/4	0.89	0.12	34,35,37,37	0
3	EDO	D	502	4/4	0.90	0.09	38,46,48,50	0
3	EDO	B	502	4/4	0.91	0.09	39,47,53,59	0
3	EDO	D	503	4/4	0.91	0.09	40,48,48,50	0
3	EDO	C	502	4/4	0.91	0.11	42,50,53,57	0
3	EDO	A	503	4/4	0.92	0.08	36,43,45,48	0
3	EDO	A	502	4/4	0.92	0.09	38,46,49,52	0
2	SAH	D	501	26/26	0.98	0.04	16,20,25,25	0
2	SAH	A	501	26/26	0.98	0.05	16,21,26,27	0
2	SAH	B	501	26/26	0.98	0.04	13,18,23,23	0
2	SAH	C	501	26/26	0.98	0.05	15,21,28,30	0

The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.

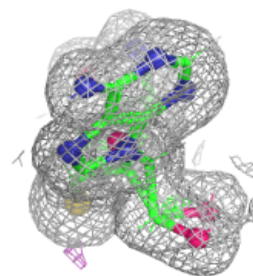
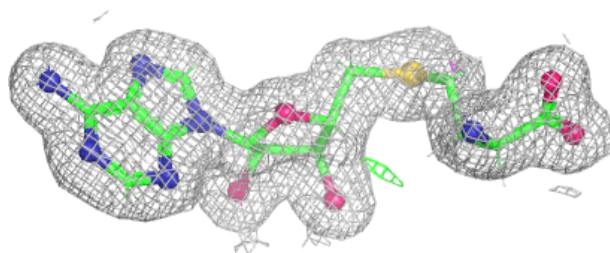
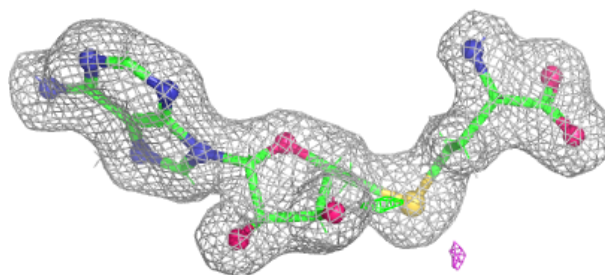
Electron density around PE8 B 506:

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

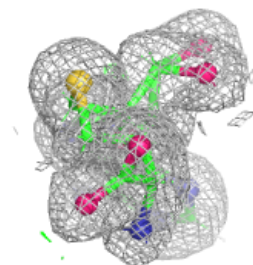
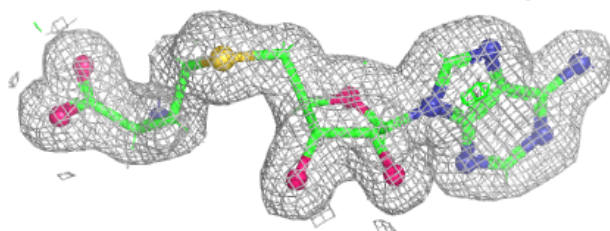
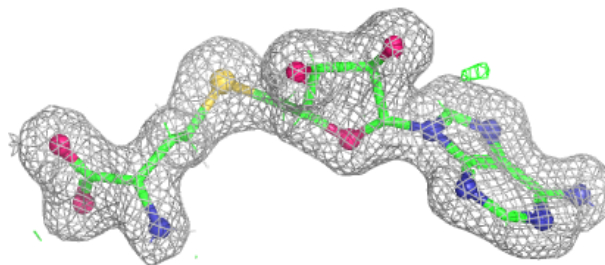


Electron density around SAH A 501:

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

**Electron density around SAH 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.