



Full wwPDB X-ray Structure Validation Report ⓘ

Nov 22, 2023 – 06:05 PM JST

PDB ID : 7WUY
Title : The crystal structure of FinI in complex with SAM and fischerin
Authors : Zhou, J.; Lu, J.
Deposited on : 2022-02-09
Resolution : 1.84 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 : 2.36
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) : 2.36

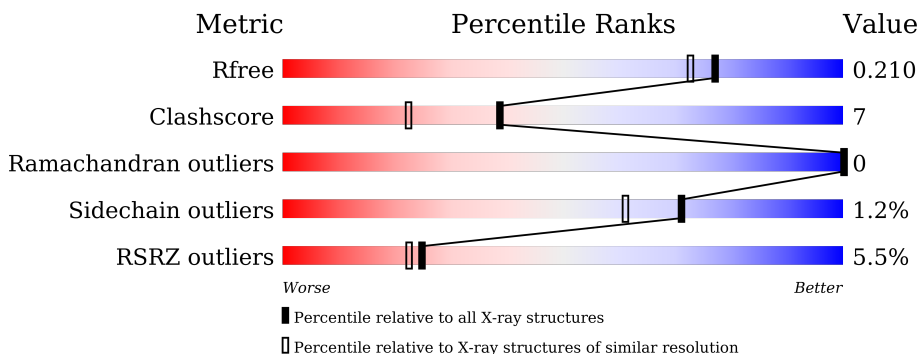
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.84 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	4003 (1.86-1.82)
Clashscore	141614	4233 (1.86-1.82)
Ramachandran outliers	138981	4185 (1.86-1.82)
Sidechain outliers	138945	4186 (1.86-1.82)
RSRZ outliers	127900	3957 (1.86-1.82)

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	409	 2% 87% 9% .
1	B	409	 8% 85% 11% . .

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
2	SO4	A	501	-	-	X	-
4	EDO	B	506	-	-	X	-
5	GOL	B	517	-	-	X	-

2 Entry composition [i](#)

There are 9 unique types of molecules in this entry. The entry contains 6928 atoms, of which 2 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 Methyltransf_2 domain-containing protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace	
			Total	C	H	N	O				S
1	A	393	3072	1958	2	525	568	19	0	2	0
1	B	393	3072	1959	528	566	19	0	1	0	

There are 20 discrepancies between the modelled and reference sequences:

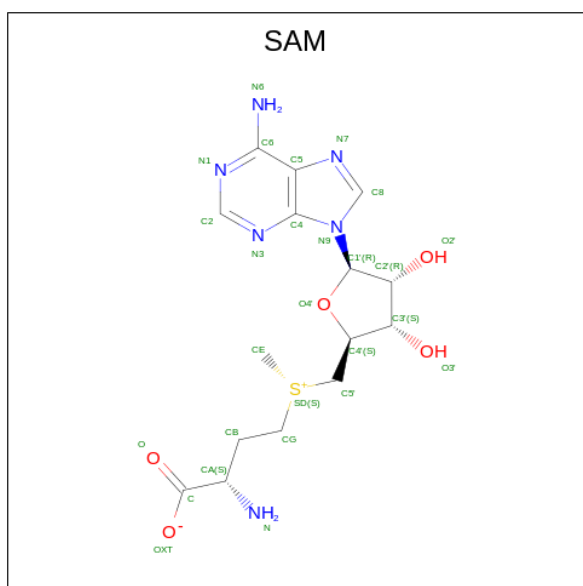
Chain	Residue	Modelled	Actual	Comment	Reference
A	19	ILE	VAL	conflict	UNP A0A1R3S1W7
A	159	PRO	SER	conflict	UNP A0A1R3S1W7
A	227	PRO	ARG	conflict	UNP A0A1R3S1W7
A	403	GLU	-	expression tag	UNP A0A1R3S1W7
A	404	HIS	-	expression tag	UNP A0A1R3S1W7
A	405	HIS	-	expression tag	UNP A0A1R3S1W7
A	406	HIS	-	expression tag	UNP A0A1R3S1W7
A	407	HIS	-	expression tag	UNP A0A1R3S1W7
A	408	HIS	-	expression tag	UNP A0A1R3S1W7
A	409	HIS	-	expression tag	UNP A0A1R3S1W7
B	19	ILE	VAL	conflict	UNP A0A1R3S1W7
B	159	PRO	SER	conflict	UNP A0A1R3S1W7
B	227	PRO	ARG	conflict	UNP A0A1R3S1W7
B	403	GLU	-	expression tag	UNP A0A1R3S1W7
B	404	HIS	-	expression tag	UNP A0A1R3S1W7
B	405	HIS	-	expression tag	UNP A0A1R3S1W7
B	406	HIS	-	expression tag	UNP A0A1R3S1W7
B	407	HIS	-	expression tag	UNP A0A1R3S1W7
B	408	HIS	-	expression tag	UNP A0A1R3S1W7
B	409	HIS	-	expression tag	UNP A0A1R3S1W7

- Molecule 2 is SULFATE ION (three-letter code: SO4) (formula: O₄S).



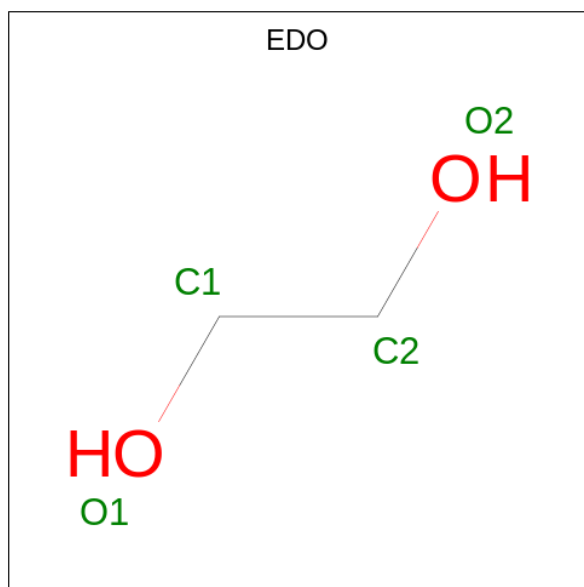
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	1	Total O S 5 4 1	0	0
2	B	1	Total O S 5 4 1	0	0
2	B	1	Total O S 5 4 1	0	0

- Molecule 3 is S-ADENOSYLMETHIONINE (three-letter code: SAM) (formula: $C_{15}H_{22}N_6O_5S$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total	C	N	O	S	0	0
			27	15	6	5	1		
3	B	1	Total	C	N	O	S	0	0
			27	15	6	5	1		

- Molecule 4 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: C₂H₆O₂).



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

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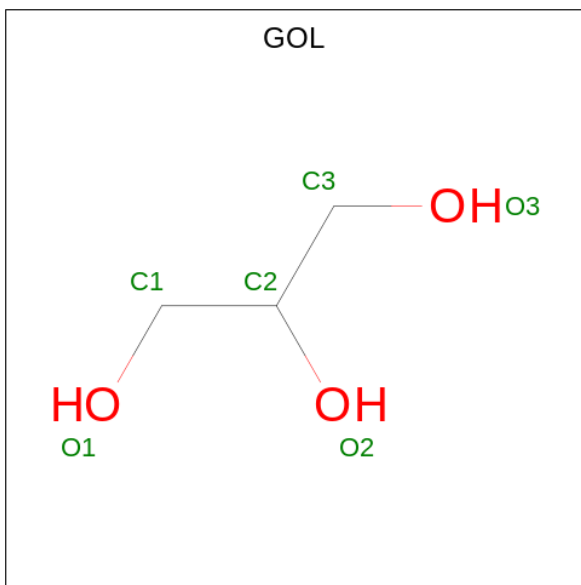
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total	C	O	0	0
			4	2	2		
4	A	1	Total	C	O	0	0
			4	2	2		
4	A	1	Total	C	O	0	0
			4	2	2		
4	A	1	Total	C	O	0	0
			4	2	2		
4	A	1	Total	C	O	0	0
			4	2	2		
4	A	1	Total	C	O	0	0
			4	2	2		
4	A	1	Total	C	O	0	0
			4	2	2		
4	A	1	Total	C	O	0	0
			4	2	2		
4	A	1	Total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

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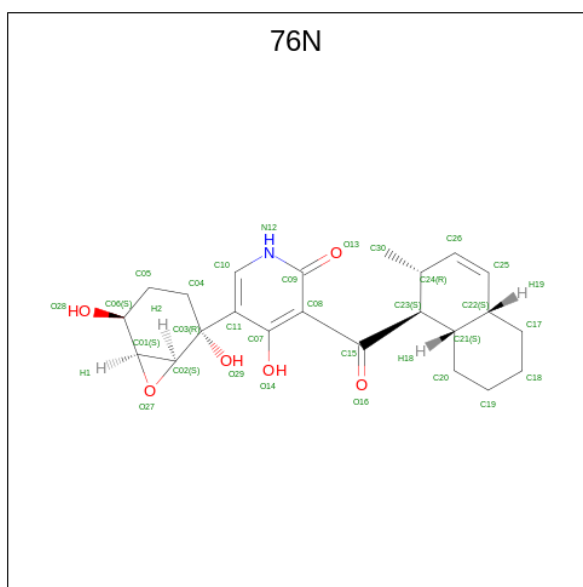
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	B	1	Total C O 4 2 2	0	0
4	B	1	Total C O 4 2 2	0	0

- Molecule 5 is GLYCEROL (three-letter code: GOL) (formula: C₃H₈O₃).



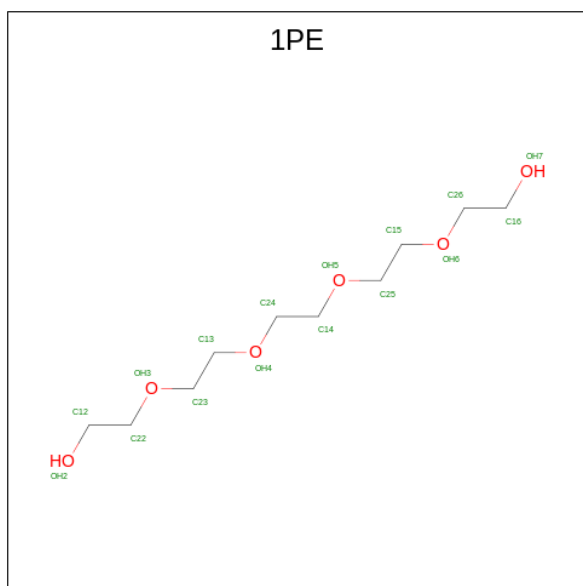
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	1	Total C O 6 3 3	0	0
5	A	1	Total C O 6 3 3	0	0
5	A	1	Total C O 6 3 3	0	0
5	A	1	Total C O 6 3 3	0	0
5	B	1	Total C O 6 3 3	0	0
5	B	1	Total C O 6 3 3	0	0
5	B	1	Total C O 6 3 3	0	0

- Molecule 6 is 3-[[[(1 {S},2 {R},4 {a} {S},8 {a} {S})-2-methyl-1,2,4 {a},5,6,7,8,8 {a}-octahydronaphthalen-1-yl]carbonyl]-5-[(1 {S},2 {R},5 {S},6 {S})-2,5-bis(oxidanyl)-7-oxabicyclo[4.1.0]heptan-2-yl]-4-oxidanyl-1 {H}-pyridin-2-one (three-letter code: 76N) (formula: C₂₃H₂₉NO₆) (labeled as "Ligand of Interest" by depositor).



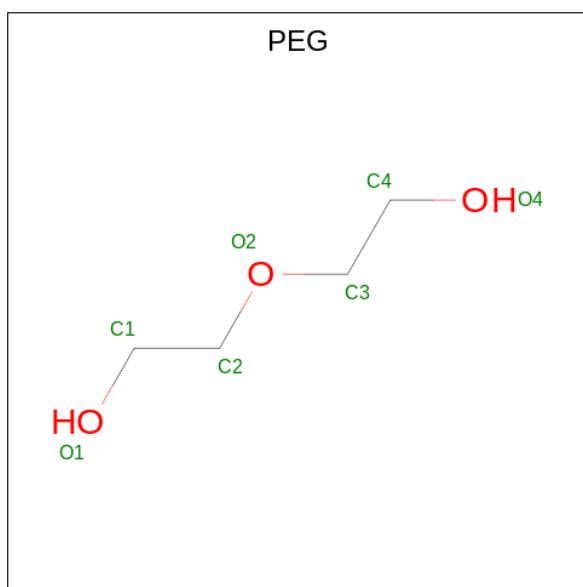
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf	
			Total	C	N			O
6	A	1	30	23	1	6	0	0

- Molecule 7 is PENTAETHYLENE GLYCOL (three-letter code: 1PE) (formula: $C_{10}H_{22}O_6$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
			Total	C	O		
7	A	1	16	10	6	0	0

- Molecule 8 is DI(HYDROXYETHYL)ETHER (three-letter code: PEG) (formula: $C_4H_{10}O_3$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
8	B	1	Total C O 7 4 3	0	0
8	B	1	Total C O 7 4 3	0	0

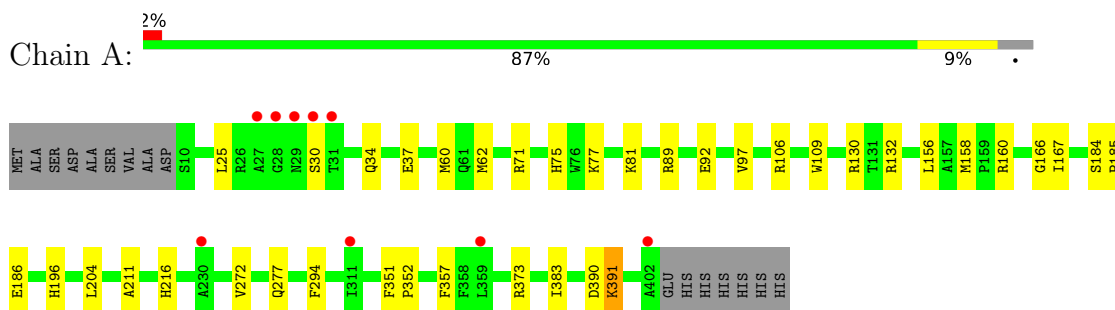
- Molecule 9 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
9	A	265	Total O 265 265	0	0
9	B	216	Total O 216 216	0	0

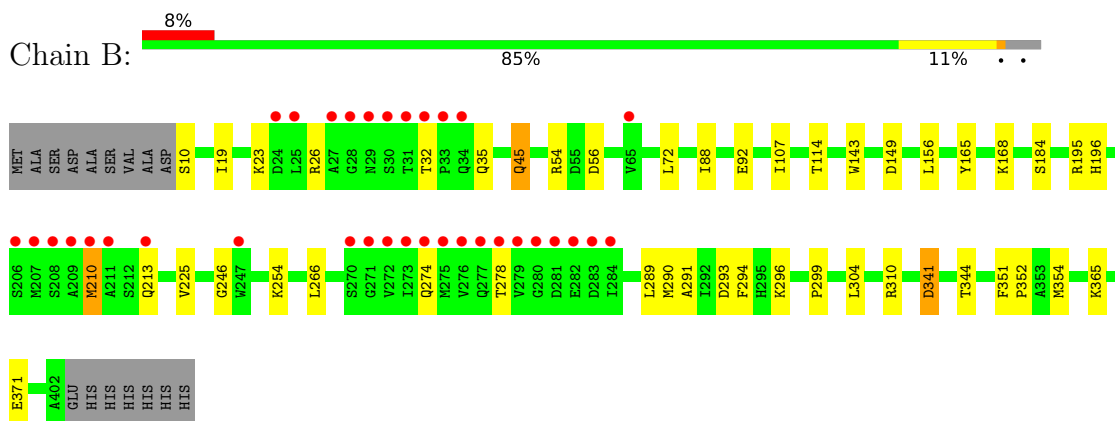
3 Residue-property plots [i](#)

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: Methyltransf_2 domain-containing protein



- Molecule 1: Methyltransf_2 domain-containing protein



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 2 21	Depositor
Cell constants a, b, c, α , β , γ	72.95Å 108.30Å 122.77Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	40.61 – 1.84 40.61 – 1.84	Depositor EDS
% Data completeness (in resolution range)	98.4 (40.61-1.84) 98.4 (40.61-1.84)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.11 (at 1.84Å)	Xtrriage
Refinement program	PHENIX 1.17.1_3660	Depositor
R, R_{free}	0.170 , 0.211 0.170 , 0.210	Depositor DCC
R_{free} test set	4142 reflections (4.95%)	wwPDB-VP
Wilson B-factor (Å ²)	27.6	Xtrriage
Anisotropy	0.451	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.38 , 51.8	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.97	EDS
Total number of atoms	6928	wwPDB-VP
Average B, all atoms (Å ²)	33.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.49% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: 1PE, 76N, EDO, PEG, GOL, SAM, SO4

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	0.74	0/3140	0.75	0/4264
1	B	0.67	0/3139	0.70	1/4262 (0.0%)
All	All	0.71	0/6279	0.73	1/8526 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	149	ASP	CB-CG-OD1	5.43	123.18	118.30

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	3070	2	3087	48	0
1	B	3072	0	3090	50	0
2	A	5	0	0	3	0
2	B	10	0	0	0	0
3	A	27	0	22	0	0
3	B	27	0	22	0	0
4	A	88	0	132	21	0
4	B	44	0	66	15	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
5	A	24	0	31	4	0
5	B	18	0	24	6	0
6	A	30	0	0	0	0
7	A	16	0	22	0	0
8	B	14	0	20	3	0
9	A	265	0	0	7	0
9	B	216	0	0	5	0
All	All	6926	2	6516	97	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 7.

All (97) 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:195:ARG:HH11	5:B:517:GOL:H11	0.97	1.10
1:A:60:MET:HB2	5:A:527:GOL:H2	1.29	1.07
1:B:344:THR:HG21	9:B:748:HOH:O	1.64	0.97
1:B:195:ARG:NH1	5:B:517:GOL:H11	1.81	0.94
1:B:195:ARG:HH11	5:B:517:GOL:C1	1.82	0.92
1:A:216:HIS:H	4:A:518:EDO:H11	1.30	0.92
1:A:106:ARG:HG2	4:B:506:EDO:H22	1.53	0.89
1:B:365:LYS:HE3	4:B:506:EDO:H11	1.52	0.88
1:A:196:HIS:HB3	2:A:501:SO4:O2	1.75	0.86
1:A:160:ARG:HH21	4:A:509:EDO:H11	1.41	0.83
1:A:132:ARG:HH12	4:A:517:EDO:H21	1.46	0.80
1:B:274:GLN:O	1:B:278:THR:HG23	1.83	0.79
1:A:158:MET:HE2	1:B:72:LEU:HD22	1.66	0.78
1:B:290:MET:HE1	1:B:299:PRO:HG2	1.65	0.77
1:A:62:MET:HE2	1:B:354:MET:SD	2.25	0.76
4:B:508:EDO:H21	9:B:782:HOH:O	1.86	0.75
1:B:114:THR:HB	4:B:514:EDO:H21	1.71	0.72
1:A:390:ASP:OD1	1:A:391:LYS:HG3	1.90	0.71
4:A:505:EDO:H12	4:A:514:EDO:O2	1.91	0.70
1:B:365:LYS:CE	4:B:506:EDO:H11	2.23	0.69
1:A:109:TRP:HZ3	4:B:506:EDO:H21	1.59	0.67
1:B:293:ASP:HB3	1:B:296:LYS:HE2	1.78	0.65
1:A:373:ARG:HH22	4:A:520:EDO:H11	1.64	0.63
1:B:19:ILE:O	1:B:23:LYS:HG3	1.99	0.62
1:B:54:ARG:HB3	8:B:518:PEG:H22	1.81	0.62
1:B:225:VAL:HG13	1:B:304:LEU:HD23	1.80	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:A:506:EDO:H21	4:A:507:EDO:H22	1.81	0.61
4:A:522:EDO:H11	9:A:783:HOH:O	2.00	0.61
1:A:196:HIS:HB3	2:A:501:SO4:S	2.39	0.61
1:B:32:THR:H	1:B:35:GLN:HE21	1.49	0.60
1:B:143:TRP:CH2	1:B:210:MET:HB2	2.37	0.59
1:B:291:ALA:H	4:B:507:EDO:H11	1.67	0.59
1:A:25:LEU:HD23	1:A:30:SER:HB3	1.84	0.59
1:A:75:HIS:ND1	4:A:503:EDO:H12	2.18	0.59
1:B:371:GLU:OE1	4:B:506:EDO:H12	2.02	0.59
1:B:10:SER:N	1:B:45:GLN:HE22	2.00	0.58
1:B:184:SER:OG	5:B:517:GOL:H32	2.04	0.57
1:B:344:THR:HG22	9:B:692:HOH:O	2.05	0.56
1:A:62:MET:HE1	1:B:354:MET:HB2	1.89	0.55
1:A:186:GLU:HB2	9:A:652:HOH:O	2.06	0.55
1:A:81:LYS:HE3	1:A:97:VAL:HG12	1.88	0.55
1:A:106:ARG:HG2	4:B:506:EDO:C2	2.32	0.54
9:A:792:HOH:O	8:B:518:PEG:H42	2.08	0.54
4:A:514:EDO:H22	5:A:528:GOL:O2	2.08	0.54
4:B:508:EDO:C2	9:B:782:HOH:O	2.48	0.53
1:A:204:LEU:HD21	1:A:272:VAL:HG13	1.91	0.52
1:A:106:ARG:CG	4:B:506:EDO:H22	2.34	0.51
1:B:23:LYS:HG2	1:B:26:ARG:NH2	2.25	0.51
1:B:293:ASP:CB	1:B:296:LYS:HE2	2.40	0.51
1:B:290:MET:CE	1:B:299:PRO:HG2	2.37	0.51
1:A:60:MET:CB	5:A:527:GOL:H2	2.21	0.51
1:A:277:GLN:NE2	4:A:508:EDO:H22	2.26	0.50
1:A:158:MET:HE1	9:A:639:HOH:O	2.12	0.50
1:B:351:PHE:HB3	1:B:352:PRO:HD3	1.93	0.50
1:A:196:HIS:HB3	2:A:501:SO4:O1	2.11	0.49
1:A:167:ILE:HG13	4:A:511:EDO:H22	1.94	0.49
1:A:357:PHE:HE2	1:B:107:ILE:HD12	1.78	0.49
1:A:357:PHE:CE2	1:B:107:ILE:HD12	2.47	0.49
4:A:506:EDO:H21	4:A:507:EDO:C2	2.41	0.48
1:B:290:MET:HE3	1:B:290:MET:HB3	1.70	0.48
1:A:166:GLY:HA2	4:A:511:EDO:H11	1.96	0.48
1:B:195:ARG:NH1	5:B:517:GOL:C1	2.59	0.48
9:A:703:HOH:O	8:B:518:PEG:H31	2.14	0.47
1:A:373:ARG:HG2	1:A:383:ILE:HD12	1.95	0.47
1:B:291:ALA:N	4:B:507:EDO:H11	2.30	0.46
1:B:114:THR:CB	4:B:514:EDO:H21	2.43	0.46
1:A:37:GLU:OE1	4:A:514:EDO:H22	2.15	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:310[A]:ARG:HA	1:B:341:ASP:OD1	2.15	0.46
1:A:60:MET:HB2	5:A:527:GOL:C2	2.22	0.46
1:A:156:LEU:HD22	1:B:156:LEU:HD11	1.98	0.45
1:A:216:HIS:H	4:A:518:EDO:C1	2.17	0.45
1:B:310[B]:ARG:HA	1:B:341:ASP:OD1	2.16	0.45
1:B:365:LYS:CE	4:B:506:EDO:C1	2.93	0.45
1:A:277:GLN:HE22	4:A:508:EDO:H22	1.81	0.45
1:A:81:LYS:NZ	4:A:512:EDO:H12	2.32	0.44
1:A:211:ALA:HB1	4:A:518:EDO:H12	1.99	0.43
1:A:89:ARG:HB2	1:A:92:GLU:HG3	1.98	0.43
1:A:77:LYS:NZ	9:A:607:HOH:O	2.42	0.43
1:B:293:ASP:OD2	1:B:296:LYS:HE2	2.19	0.43
1:A:160:ARG:HE	4:A:509:EDO:C1	2.31	0.43
1:A:184:SER:N	1:A:185:PRO:HD3	2.33	0.43
1:B:246:GLY:HA2	9:B:607:HOH:O	2.19	0.43
4:A:513:EDO:H21	9:A:786:HOH:O	2.19	0.42
1:A:62:MET:CE	1:B:354:MET:SD	3.00	0.42
1:A:156:LEU:CD2	1:B:156:LEU:HD11	2.50	0.42
1:B:143:TRP:CZ3	1:B:210:MET:HB2	2.55	0.41
1:B:165:TYR:O	1:B:168:LYS:HE3	2.20	0.41
1:B:266:LEU:HD23	1:B:289:LEU:HD22	2.01	0.41
1:B:290:MET:HA	4:B:507:EDO:H22	2.02	0.41
1:A:71:ARG:HH22	4:A:503:EDO:H11	1.86	0.41
1:A:156:LEU:HD22	1:B:156:LEU:CD1	2.51	0.41
1:A:156:LEU:CD2	1:B:156:LEU:CD1	2.99	0.41
1:A:130:ARG:NE	1:B:56:ASP:OD2	2.54	0.40
1:A:351:PHE:HB3	1:A:352:PRO:HD3	2.02	0.40
1:A:34:GLN:HE22	1:A:391:LYS:HZ2	1.70	0.40
1:B:88:ILE:HD11	1:B:92:GLU:HG3	2.03	0.40
1:B:196:HIS:NE2	5:B:517:GOL:O2	2.54	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	393/409 (96%)	386 (98%)	7 (2%)	0	100	100
1	B	392/409 (96%)	387 (99%)	5 (1%)	0	100	100
All	All	785/818 (96%)	773 (98%)	12 (2%)	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	327/338 (97%)	325 (99%)	2 (1%)	86	82
1	B	326/338 (96%)	320 (98%)	6 (2%)	59	44
All	All	653/676 (97%)	645 (99%)	8 (1%)	71	61

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

Mol	Chain	Res	Type
1	A	294	PHE
1	A	391	LYS
1	B	45	GLN
1	B	210	MET
1	B	213	GLN
1	B	254	LYS
1	B	294	PHE
1	B	341	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	29	ASN
1	B	35	GLN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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](#)

49 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	GOL	B	515	-	5,5,5	0.96	0	5,5,5	1.00	0
4	EDO	A	505	-	3,3,3	0.45	0	2,2,2	0.49	0
4	EDO	A	508	-	3,3,3	0.80	0	2,2,2	0.19	0
4	EDO	A	510	-	3,3,3	0.68	0	2,2,2	0.24	0
5	GOL	A	528	-	5,5,5	0.52	0	5,5,5	1.34	0
4	EDO	A	518	-	3,3,3	0.42	0	2,2,2	0.56	0
5	GOL	A	527	-	5,5,5	2.22	3 (60%)	5,5,5	0.91	0
3	SAM	A	502	-	24,29,29	1.67	2 (8%)	23,42,42	1.89	3 (13%)
2	SO4	B	502	-	4,4,4	0.16	0	6,6,6	0.38	0
4	EDO	B	506	-	3,3,3	0.41	0	2,2,2	0.66	0
5	GOL	A	526	-	5,5,5	2.11	2 (40%)	5,5,5	0.63	0
7	1PE	A	530	-	15,15,15	0.64	0	14,14,14	0.30	0
4	EDO	A	509	-	3,3,3	0.32	0	2,2,2	1.43	0
4	EDO	B	512	-	3,3,3	0.71	0	2,2,2	0.83	0
5	GOL	B	517	-	5,5,5	0.73	0	5,5,5	1.24	0
4	EDO	B	513	-	3,3,3	0.45	0	2,2,2	0.55	0
4	EDO	A	506	-	3,3,3	0.52	0	2,2,2	0.56	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
8	PEG	B	518	-	6,6,6	0.64	0	5,5,5	0.81	0
4	EDO	A	503	-	3,3,3	0.37	0	2,2,2	1.18	0
4	EDO	B	514	-	3,3,3	0.63	0	2,2,2	0.31	0
4	EDO	A	512	-	3,3,3	0.70	0	2,2,2	0.41	0
6	76N	A	529	-	32,34,34	1.90	10 (31%)	36,53,53	1.92	9 (25%)
4	EDO	A	519	-	3,3,3	0.51	0	2,2,2	0.59	0
4	EDO	A	517	-	3,3,3	0.72	0	2,2,2	0.04	0
4	EDO	A	513	-	3,3,3	0.50	0	2,2,2	0.58	0
4	EDO	B	511	-	3,3,3	0.57	0	2,2,2	0.15	0
2	SO4	B	501	-	4,4,4	0.23	0	6,6,6	0.41	0
4	EDO	A	515	-	3,3,3	0.75	0	2,2,2	0.16	0
4	EDO	B	510	-	3,3,3	0.53	0	2,2,2	1.23	0
4	EDO	A	520	-	3,3,3	0.44	0	2,2,2	0.78	0
4	EDO	B	508	-	3,3,3	0.64	0	2,2,2	0.70	0
4	EDO	B	509	-	3,3,3	0.63	0	2,2,2	0.49	0
5	GOL	A	525	-	5,5,5	1.09	0	5,5,5	1.34	1 (20%)
4	EDO	A	522	-	3,3,3	0.35	0	2,2,2	0.60	0
4	EDO	A	514	-	3,3,3	0.40	0	2,2,2	0.93	0
4	EDO	B	504	-	3,3,3	0.69	0	2,2,2	0.40	0
4	EDO	B	507	-	3,3,3	0.45	0	2,2,2	0.37	0
3	SAM	B	503	-	24,29,29	1.22	3 (12%)	23,42,42	1.63	4 (17%)
5	GOL	B	516	-	5,5,5	0.73	0	5,5,5	0.83	0
8	PEG	B	519	-	6,6,6	0.71	0	5,5,5	0.42	0
4	EDO	A	511	-	3,3,3	0.68	0	2,2,2	0.37	0
4	EDO	B	505	-	3,3,3	0.37	0	2,2,2	0.73	0
4	EDO	A	524	-	3,3,3	0.60	0	2,2,2	0.56	0
4	EDO	A	523	-	3,3,3	0.56	0	2,2,2	0.29	0
4	EDO	A	504	-	3,3,3	0.72	0	2,2,2	0.21	0
4	EDO	A	516	-	3,3,3	0.82	0	2,2,2	0.50	0
4	EDO	A	521	-	3,3,3	0.69	0	2,2,2	1.04	0
2	SO4	A	501	-	4,4,4	0.20	0	6,6,6	0.43	0
4	EDO	A	507	-	3,3,3	0.36	0	2,2,2	0.51	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	GOL	B	515	-	-	0/4/4/4	-
4	EDO	A	505	-	-	0/1/1/1	-
4	EDO	A	508	-	-	1/1/1/1	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	EDO	A	510	-	-	1/1/1/1	-
5	GOL	A	528	-	-	2/4/4/4	-
4	EDO	A	518	-	-	1/1/1/1	-
5	GOL	A	527	-	-	0/4/4/4	-
3	SAM	A	502	-	-	2/12/33/33	0/3/3/3
4	EDO	B	506	-	-	1/1/1/1	-
5	GOL	A	526	-	-	2/4/4/4	-
7	1PE	A	530	-	-	1/13/13/13	-
4	EDO	A	509	-	-	1/1/1/1	-
4	EDO	B	512	-	-	1/1/1/1	-
5	GOL	B	517	-	-	3/4/4/4	-
4	EDO	B	513	-	-	1/1/1/1	-
4	EDO	A	506	-	-	1/1/1/1	-
8	PEG	B	518	-	-	3/4/4/4	-
4	EDO	A	503	-	-	1/1/1/1	-
4	EDO	B	514	-	-	0/1/1/1	-
4	EDO	A	512	-	-	1/1/1/1	-
6	76N	A	529	-	-	5/8/59/59	0/5/5/5
4	EDO	A	519	-	-	0/1/1/1	-
4	EDO	A	517	-	-	1/1/1/1	-
4	EDO	A	513	-	-	1/1/1/1	-
4	EDO	B	511	-	-	0/1/1/1	-
4	EDO	A	515	-	-	1/1/1/1	-
4	EDO	B	510	-	-	0/1/1/1	-
4	EDO	A	520	-	-	0/1/1/1	-
4	EDO	B	508	-	-	0/1/1/1	-
4	EDO	B	509	-	-	1/1/1/1	-
5	GOL	A	525	-	-	0/4/4/4	-
4	EDO	A	522	-	-	1/1/1/1	-
4	EDO	A	514	-	-	1/1/1/1	-
4	EDO	B	504	-	-	1/1/1/1	-
4	EDO	B	507	-	-	0/1/1/1	-
3	SAM	B	503	-	-	0/12/33/33	0/3/3/3
5	GOL	B	516	-	-	0/4/4/4	-
8	PEG	B	519	-	-	2/4/4/4	-
4	EDO	A	511	-	-	1/1/1/1	-
4	EDO	B	505	-	-	0/1/1/1	-
4	EDO	A	524	-	-	1/1/1/1	-
4	EDO	A	523	-	-	0/1/1/1	-
4	EDO	A	504	-	-	0/1/1/1	-
4	EDO	A	516	-	-	1/1/1/1	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	EDO	A	521	-	-	1/1/1/1	-
4	EDO	A	507	-	-	0/1/1/1	-

All (20) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	502	SAM	C2-N3	6.40	1.42	1.32
6	A	529	76N	O27-C01	4.28	1.52	1.44
3	B	503	SAM	C2-N3	4.04	1.38	1.32
5	A	526	GOL	O2-C2	-4.02	1.31	1.43
6	A	529	76N	C22-C21	3.72	1.59	1.54
6	A	529	76N	C04-C03	3.63	1.57	1.53
6	A	529	76N	O16-C15	3.43	1.28	1.22
5	A	527	GOL	C1-C2	3.13	1.64	1.51
6	A	529	76N	C23-C24	2.95	1.59	1.55
6	A	529	76N	C23-C15	2.93	1.56	1.51
6	A	529	76N	O28-C06	2.44	1.48	1.43
5	A	527	GOL	O3-C3	2.43	1.52	1.42
3	B	503	SAM	C2-N1	2.42	1.38	1.33
6	A	529	76N	C22-C25	-2.33	1.46	1.50
3	A	502	SAM	C2-N1	2.26	1.38	1.33
5	A	527	GOL	C3-C2	2.15	1.60	1.51
3	B	503	SAM	OXT-C	-2.15	1.23	1.30
6	A	529	76N	C05-C06	2.13	1.55	1.52
5	A	526	GOL	C3-C2	2.11	1.60	1.51
6	A	529	76N	C01-C02	2.02	1.49	1.46

All (17) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	502	SAM	N3-C2-N1	-6.97	117.79	128.68
6	A	529	76N	C17-C22-C25	-5.63	103.55	112.58
3	B	503	SAM	N3-C2-N1	-4.71	121.32	128.68
6	A	529	76N	C19-C20-C21	-3.77	103.86	111.64
6	A	529	76N	C24-C26-C25	-3.74	116.26	124.33
3	B	503	SAM	OXT-C-O	-3.54	116.05	124.09
6	A	529	76N	O16-C15-C23	-2.87	113.70	121.59
3	B	503	SAM	OXT-C-CA	2.85	123.10	113.38
6	A	529	76N	O16-C15-C08	2.84	123.14	119.72
6	A	529	76N	O28-C06-C05	-2.69	103.50	109.96
6	A	529	76N	C30-C24-C26	-2.64	106.68	110.85
3	A	502	SAM	O4'-C1'-C2'	-2.45	103.35	106.93

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	A	529	76N	C30-C24-C23	2.28	117.19	113.50
3	B	503	SAM	C4-C5-N7	-2.27	107.03	109.40
5	A	525	GOL	C3-C2-C1	-2.23	103.05	111.70
6	A	529	76N	O27-C02-C01	2.22	61.25	59.76
3	A	502	SAM	C2-N1-C6	2.22	122.55	118.75

There are no chirality outliers.

All (41) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	A	528	GOL	C1-C2-C3-O3
5	B	517	GOL	C1-C2-C3-O3
6	A	529	76N	C07-C08-C15-C23
6	A	529	76N	C07-C08-C15-O16
6	A	529	76N	C09-C08-C15-C23
6	A	529	76N	C09-C08-C15-O16
4	B	504	EDO	O1-C1-C2-O2
8	B	518	PEG	O1-C1-C2-O2
8	B	519	PEG	O2-C3-C4-O4
5	A	526	GOL	O1-C1-C2-C3
4	A	506	EDO	O1-C1-C2-O2
4	A	511	EDO	O1-C1-C2-O2
4	A	515	EDO	O1-C1-C2-O2
4	A	522	EDO	O1-C1-C2-O2
4	B	509	EDO	O1-C1-C2-O2
8	B	518	PEG	O2-C3-C4-O4
5	A	528	GOL	O2-C2-C3-O3
4	A	518	EDO	O1-C1-C2-O2
4	A	524	EDO	O1-C1-C2-O2
4	B	512	EDO	O1-C1-C2-O2
4	A	508	EDO	O1-C1-C2-O2
4	A	513	EDO	O1-C1-C2-O2
4	B	506	EDO	O1-C1-C2-O2
3	A	502	SAM	CB-CG-SD-C5'
6	A	529	76N	C08-C15-C23-C21
4	A	517	EDO	O1-C1-C2-O2
4	A	521	EDO	O1-C1-C2-O2
8	B	519	PEG	C4-C3-O2-C2
5	A	526	GOL	O1-C1-C2-O2
5	B	517	GOL	O2-C2-C3-O3
7	A	530	1PE	C15-C25-OH5-C14
5	B	517	GOL	O1-C1-C2-O2

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Mol	Chain	Res	Type	Atoms
4	A	514	EDO	O1-C1-C2-O2
4	A	516	EDO	O1-C1-C2-O2
4	A	509	EDO	O1-C1-C2-O2
4	A	510	EDO	O1-C1-C2-O2
3	A	502	SAM	OXT-C-CA-N
8	B	518	PEG	C4-C3-O2-C2
4	A	503	EDO	O1-C1-C2-O2
4	A	512	EDO	O1-C1-C2-O2
4	B	513	EDO	O1-C1-C2-O2

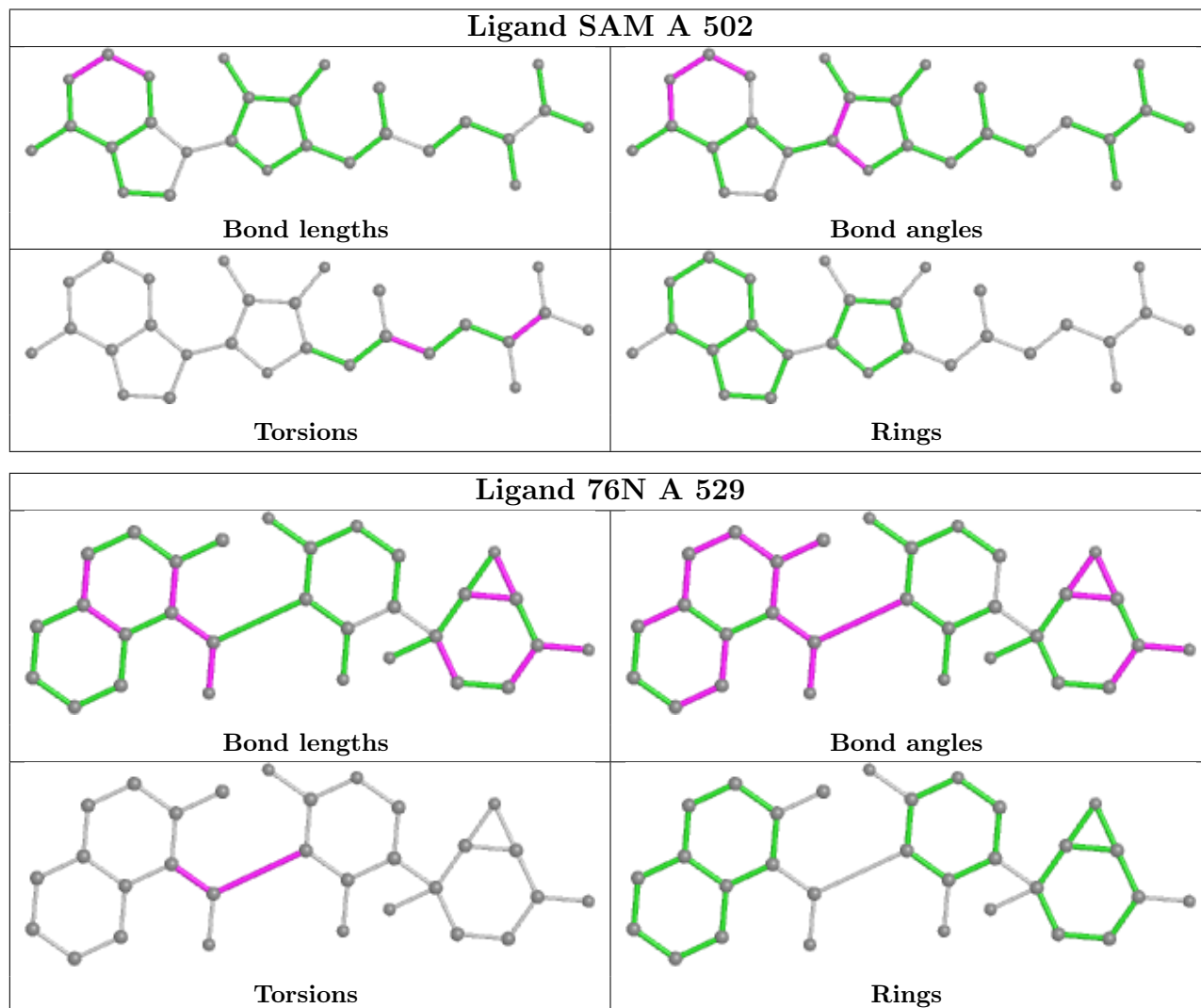
There are no ring outliers.

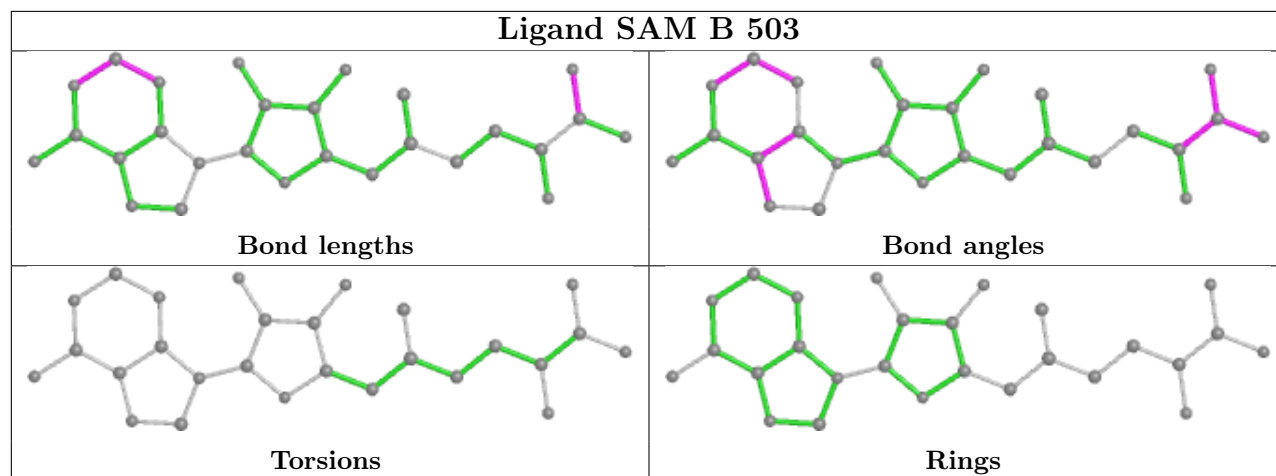
23 monomers are involved in 51 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	A	505	EDO	1	0
4	A	508	EDO	2	0
5	A	528	GOL	1	0
4	A	518	EDO	3	0
5	A	527	GOL	3	0
4	B	506	EDO	8	0
4	A	509	EDO	2	0
5	B	517	GOL	6	0
4	A	506	EDO	2	0
8	B	518	PEG	3	0
4	A	503	EDO	2	0
4	B	514	EDO	2	0
4	A	512	EDO	1	0
4	A	517	EDO	1	0
4	A	513	EDO	1	0
4	A	520	EDO	1	0
4	B	508	EDO	2	0
4	A	522	EDO	1	0
4	A	514	EDO	3	0
4	B	507	EDO	3	0
4	A	511	EDO	2	0
2	A	501	SO4	3	0
4	A	507	EDO	2	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is

within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.





5.7 Other polymers [\(i\)](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [\(i\)](#)

There are no chain breaks in this entry.

6 Fit of model and data

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	393/409 (96%)	-0.10	9 (2%) 60 58	19, 28, 48, 73	0
1	B	393/409 (96%)	0.15	34 (8%) 10 9	21, 33, 63, 88	0
All	All	786/818 (96%)	0.03	43 (5%) 25 22	19, 30, 56, 88	0

All (43) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	30	SER	7.1
1	B	279	VAL	6.9
1	A	29	ASN	5.7
1	B	278	THR	5.6
1	B	28	GLY	5.6
1	A	30	SER	5.4
1	B	247	TRP	5.3
1	B	207	MET	4.9
1	B	210	MET	4.9
1	B	211	ALA	4.4
1	B	282	GLU	4.2
1	B	206	SER	4.0
1	B	31	THR	3.9
1	B	29	ASN	3.9
1	B	274	GLN	3.6
1	B	272	VAL	3.6
1	B	34	GLN	3.6
1	B	270	SER	3.6
1	A	31	THR	3.4
1	B	280	GLY	3.3
1	B	275	MET	3.3
1	A	28	GLY	3.2
1	B	281	ASP	3.2
1	B	33	PRO	3.0

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Mol	Chain	Res	Type	RSRZ
1	B	25	LEU	3.0
1	A	230	ALA	2.9
1	B	284	ILE	2.8
1	A	27	ALA	2.7
1	B	27	ALA	2.7
1	B	208	SER	2.6
1	B	273	ILE	2.6
1	A	359	LEU	2.5
1	B	271	GLY	2.5
1	B	32	THR	2.5
1	B	277	GLN	2.4
1	A	311	ILE	2.4
1	B	213	GLN	2.4
1	B	209	ALA	2.4
1	B	65	VAL	2.3
1	A	402	ALA	2.2
1	B	283	ASP	2.1
1	B	276	VAL	2.1
1	B	24	ASP	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
4	EDO	A	513	4/4	0.64	0.20	39,40,41,55	0
8	PEG	B	519	7/7	0.65	0.31	44,51,57,62	0
5	GOL	A	527	6/6	0.71	0.19	34,40,42,47	0
4	EDO	A	516	4/4	0.78	0.16	32,38,40,45	0

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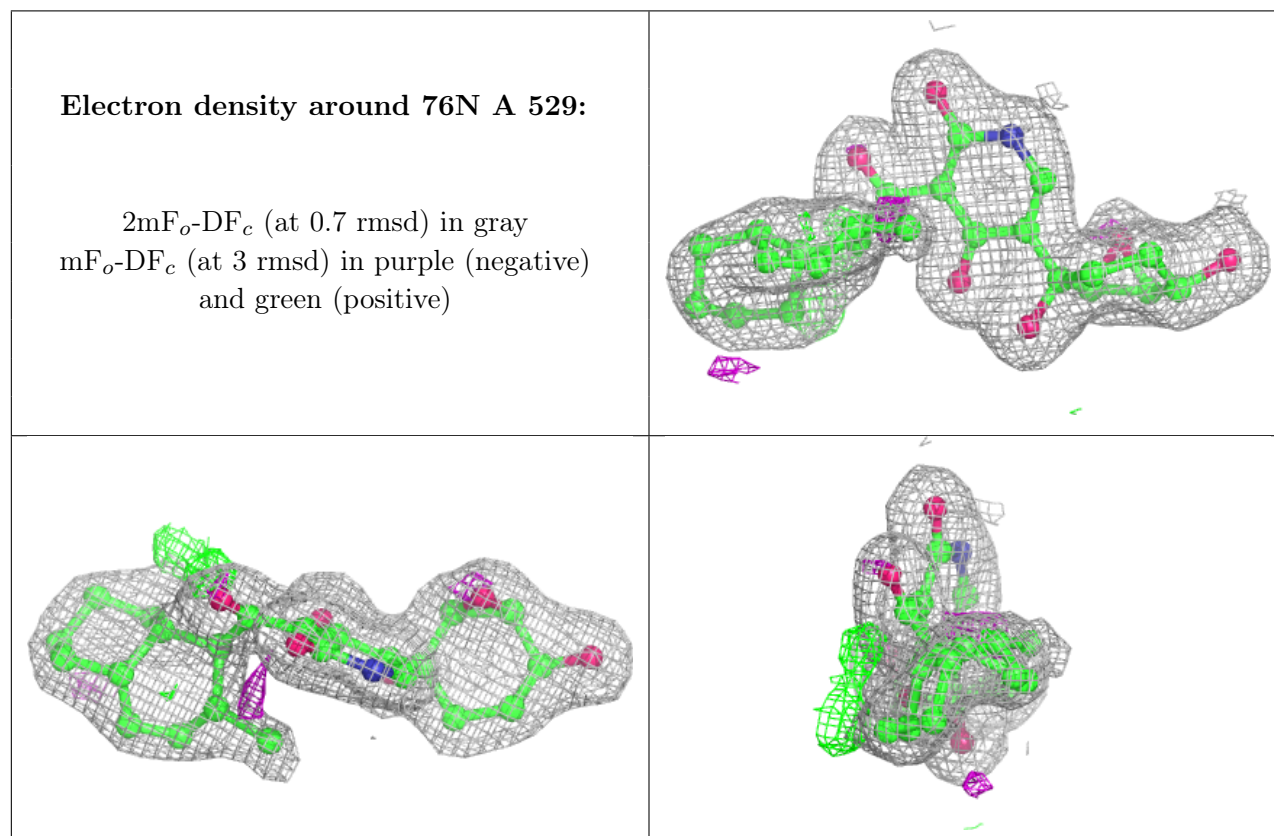
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
4	EDO	A	512	4/4	0.79	0.32	37,45,50,58	0
4	EDO	A	517	4/4	0.79	0.18	45,49,49,50	0
7	1PE	A	530	16/16	0.82	0.19	30,47,59,60	0
4	EDO	B	512	4/4	0.83	0.14	38,47,49,51	0
4	EDO	A	521	4/4	0.83	0.19	41,43,47,51	0
4	EDO	B	513	4/4	0.84	0.21	48,51,53,58	0
5	GOL	B	517	6/6	0.84	0.33	39,45,46,49	0
4	EDO	B	514	4/4	0.85	0.17	42,43,43,45	0
4	EDO	B	507	4/4	0.86	0.33	51,52,56,57	0
4	EDO	A	524	4/4	0.86	0.35	32,45,46,58	0
5	GOL	A	526	6/6	0.87	0.13	31,40,43,46	0
4	EDO	A	510	4/4	0.89	0.18	33,39,45,47	0
4	EDO	A	511	4/4	0.89	0.24	35,38,42,43	0
4	EDO	A	506	4/4	0.89	0.12	40,51,51,53	0
4	EDO	A	523	4/4	0.89	0.25	42,47,52,55	0
4	EDO	A	508	4/4	0.89	0.20	35,38,42,43	0
5	GOL	A	528	6/6	0.89	0.13	30,32,42,45	0
4	EDO	A	515	4/4	0.89	0.16	30,48,49,51	0
4	EDO	B	509	4/4	0.89	0.12	41,42,48,52	0
4	EDO	B	511	4/4	0.89	0.15	49,52,55,58	0
4	EDO	A	519	4/4	0.90	0.13	49,51,56,58	0
4	EDO	B	510	4/4	0.90	0.14	41,43,44,46	0
4	EDO	A	520	4/4	0.91	0.11	43,51,53,53	0
4	EDO	A	507	4/4	0.92	0.23	41,50,51,52	0
5	GOL	B	516	6/6	0.92	0.19	35,47,50,59	0
4	EDO	A	505	4/4	0.92	0.13	28,41,48,51	0
4	EDO	A	509	4/4	0.92	0.21	38,43,44,47	0
4	EDO	A	504	4/4	0.92	0.12	25,30,42,44	0
4	EDO	A	522	4/4	0.93	0.24	41,44,48,51	0
8	PEG	B	518	7/7	0.93	0.09	26,39,44,44	0
4	EDO	B	505	4/4	0.93	0.13	35,39,47,47	0
4	EDO	A	518	4/4	0.94	0.10	28,39,50,50	0
4	EDO	B	508	4/4	0.94	0.13	25,32,33,40	0
4	EDO	B	504	4/4	0.94	0.11	26,28,36,37	0
4	EDO	A	503	4/4	0.94	0.08	32,33,34,57	0
4	EDO	B	506	4/4	0.95	0.17	26,30,30,42	0
6	76N	A	529	30/30	0.95	0.18	20,24,35,41	0
3	SAM	B	503	27/27	0.95	0.10	29,41,45,51	0
4	EDO	A	514	4/4	0.95	0.11	36,40,43,50	0
5	GOL	A	525	6/6	0.95	0.10	24,28,35,38	0
5	GOL	B	515	6/6	0.96	0.09	33,36,42,48	0
2	SO4	A	501	5/5	0.97	0.15	31,34,44,54	1

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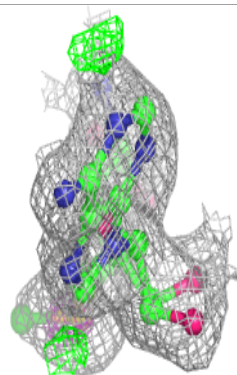
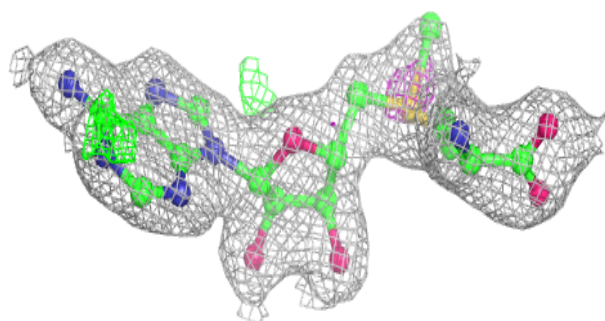
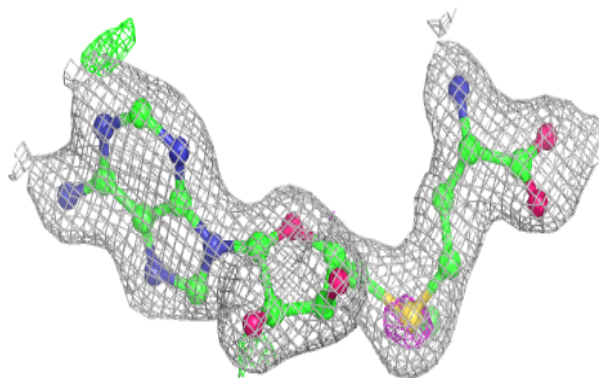
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
2	SO4	B	502	5/5	0.97	0.07	31,33,44,50	5
3	SAM	A	502	27/27	0.97	0.14	17,20,22,22	0
2	SO4	B	501	5/5	0.99	0.07	30,34,35,39	0

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.

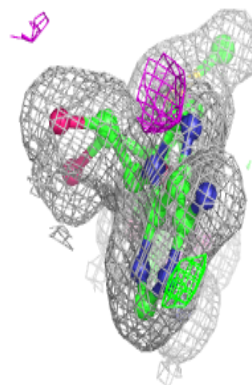
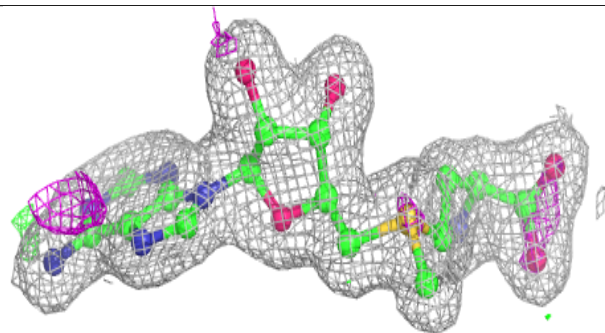
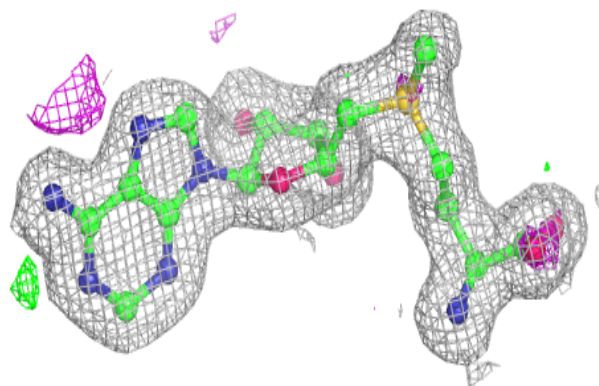


Electron density around SAM B 503:

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

**Electron density around SAM A 502:**

$2mF_o-DF_c$ (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.