



# Full wwPDB X-ray Structure Validation Report ⓘ

Feb 7, 2023 – 04:10 PM EST

PDB ID : 7FT9  
Title : SDCBP PanDDA analysis group deposition – The PDZ domains of SDCBP in complex with Z45636695  
Authors : Bradshaw, W.J.; Katis, V.L.; Bountra, C.; von Delft, F.; Brennan, P.E.  
Deposited on : 2023-01-24  
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](mailto: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>.

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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 : 2.32.1  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Refmac : 5.8.0158  
CCP4 : 7.0.044 (Gargrove)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.32.1

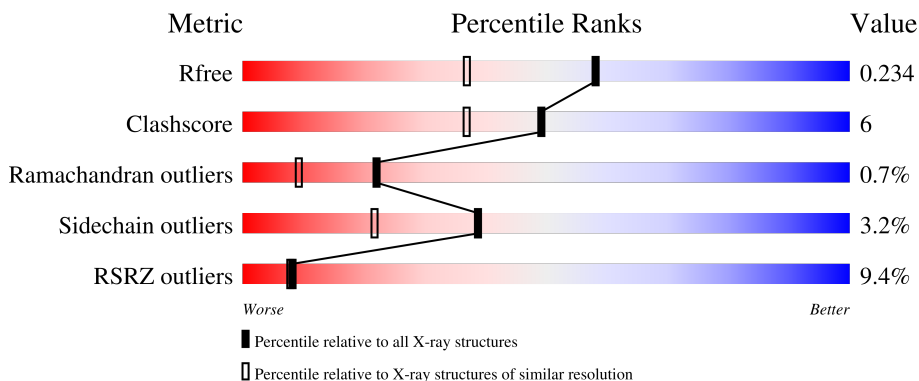
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 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))
$R_{free}$	130704	9185 (1.80-1.76)
Clashscore	141614	10184 (1.80-1.76)
Ramachandran outliers	138981	10051 (1.80-1.76)
Sidechain outliers	138945	10050 (1.80-1.76)
RSRZ outliers	127900	9032 (1.80-1.76)

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  $\geq 3$ , 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	195	
1	B	195	
1	C	195	
1	D	195	

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
6	SO4	D	303	-	-	-	X

## 2 Entry composition [i](#)

There are 8 unique types of molecules in this entry. The entry contains 6378 atoms, of which 0 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 Syntenin-1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	191	1481	935	262	275	9	0	1	0
1	B	193	1495	943	264	279	9	0	1	0
1	C	193	1514	953	270	282	9	0	3	0
1	D	191	1489	939	263	278	9	0	2	0

There are 8 discrepancies between the modelled and reference sequences:

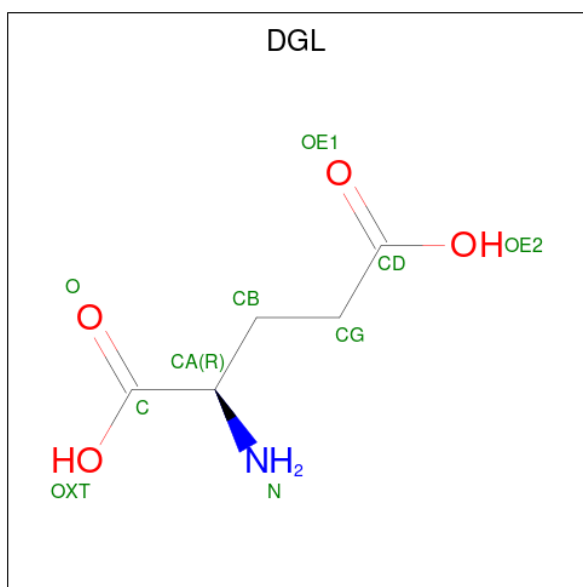
Chain	Residue	Modelled	Actual	Comment	Reference
A	104	SER	-	expression tag	UNP O00560
A	105	MET	-	expression tag	UNP O00560
B	104	SER	-	expression tag	UNP O00560
B	105	MET	-	expression tag	UNP O00560
C	104	SER	-	expression tag	UNP O00560
C	105	MET	-	expression tag	UNP O00560
D	104	SER	-	expression tag	UNP O00560
D	105	MET	-	expression tag	UNP O00560

- Molecule 2 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: C<sub>2</sub>H<sub>6</sub>O<sub>2</sub>).



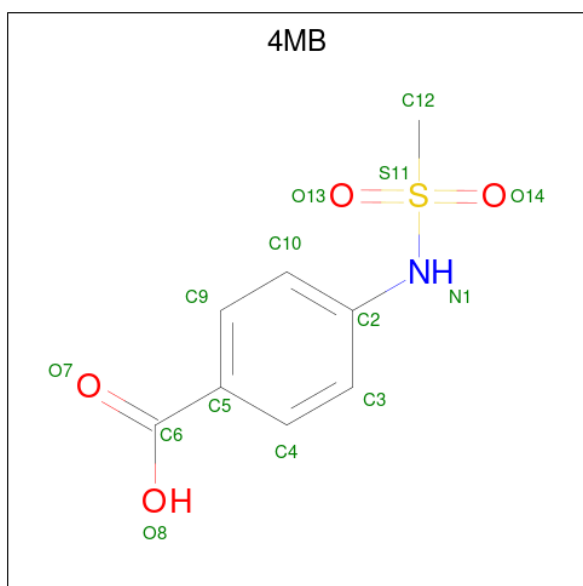
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	1	Total C O 4 2 2	0	0
2	B	1	Total C O 4 2 2	0	0
2	B	1	Total C O 4 2 2	0	0
2	C	1	Total C O 4 2 2	0	0
2	C	1	Total C O 4 2 2	0	0
2	D	1	Total C O 4 2 2	0	0
2	D	1	Total C O 4 2 2	0	0

- Molecule 3 is D-GLUTAMIC ACID (three-letter code: DGL) (formula: C<sub>5</sub>H<sub>9</sub>NO<sub>4</sub>).



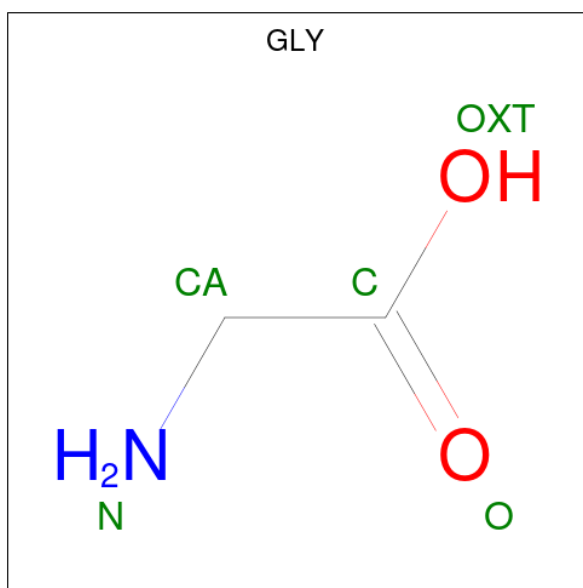
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	N	O		
3	B	1	10	5	1	4	0	0
3	D	1	10	5	1	4	0	0

- Molecule 4 is 4-[(METHYLSULFONYL)AMINO]BENZOIC ACID (three-letter code: 4MB) (formula: C<sub>8</sub>H<sub>9</sub>NO<sub>4</sub>S) (labeled as "Ligand of Interest" by depositor).



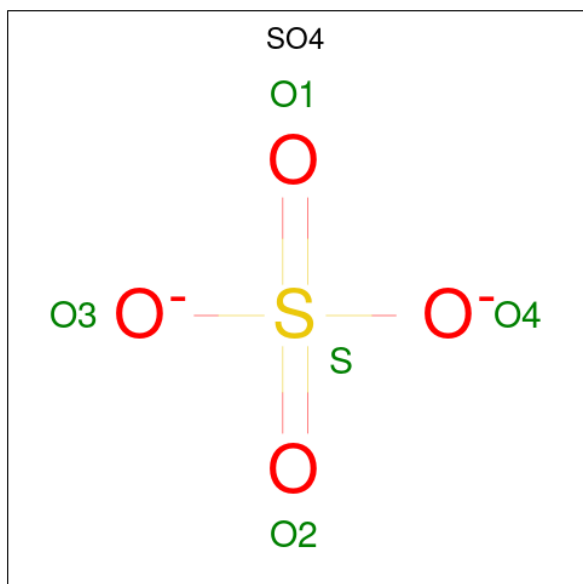
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	N	O	S		
4	C	1	14	8	1	4	1	0	0

- Molecule 5 is GLYCINE (three-letter code: GLY) (formula: C<sub>2</sub>H<sub>5</sub>NO<sub>2</sub>).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf	
			Total	C	N			O
5	C	1	5	2	1	2	0	0
5	D	1	5	2	1	2	0	0

- Molecule 6 is SULFATE ION (three-letter code: SO<sub>4</sub>) (formula: O<sub>4</sub>S).



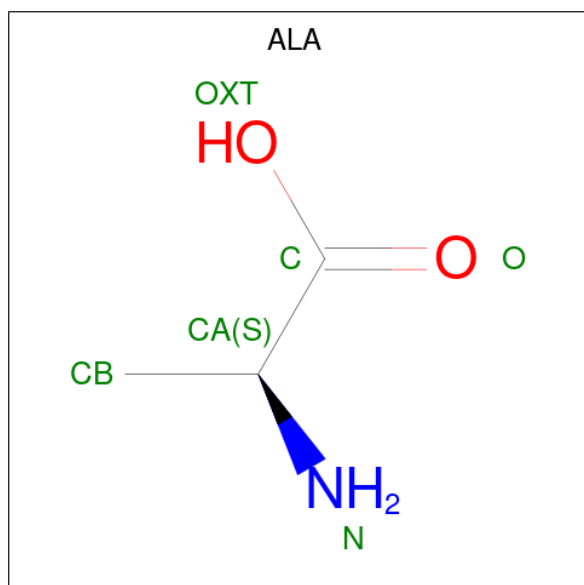
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf	
			Total	O			S
6	D	1	5	4	1	0	0

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	D	1	Total	O	S	0	0
			5	4	1		
6	D	1	Total	O	S	0	0
			5	4	1		

- Molecule 7 is ALANINE (three-letter code: ALA) (formula: C<sub>3</sub>H<sub>7</sub>NO<sub>2</sub>).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
7	D	1	Total	C	N	O	0	0
			6	3	1	2		

- Molecule 8 is water.

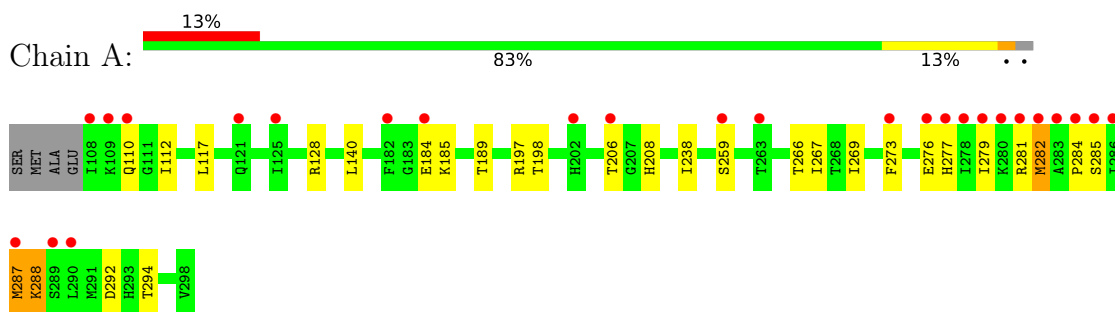
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
8	A	48	Total	O	0	0
			48	48		
8	B	86	Total	O	0	0
			86	86		
8	C	71	Total	O	0	0
			71	71		
8	D	101	Total	O	0	0
			101	101		



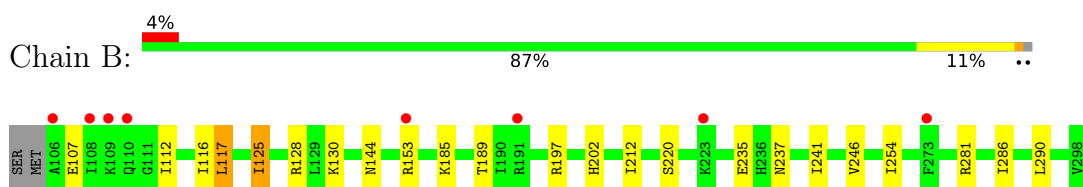
### 3 Residue-property plots [i](#)

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.

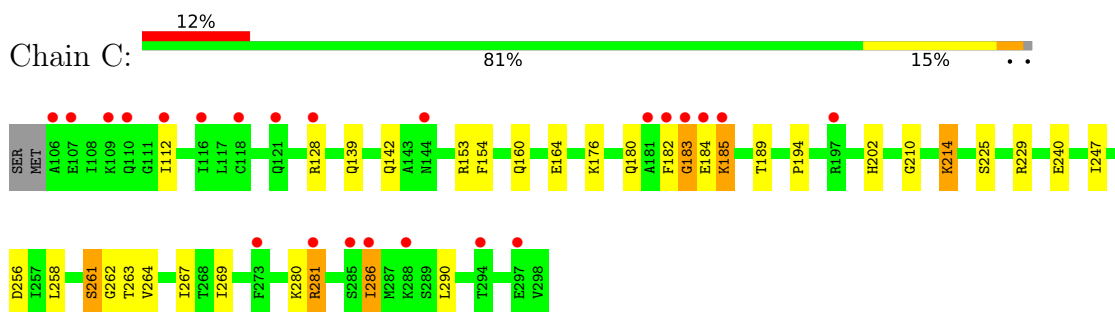
- Molecule 1: Syntenin-1



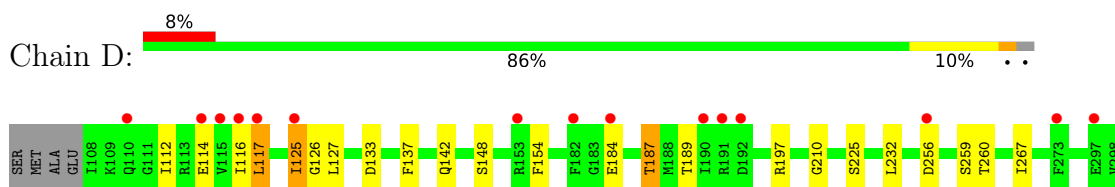
- Molecule 1: Syntenin-1



- Molecule 1: Syntenin-1



- Molecule 1: Syntenin-1



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	80.84Å 49.15Å 115.02Å 90.00° 95.03° 90.00°	Depositor
Resolution (Å)	80.53 – 1.77 80.53 – 1.77	Depositor EDS
% Data completeness (in resolution range)	98.2 (80.53-1.77) 98.2 (80.53-1.77)	Depositor EDS
$R_{merge}$	0.09	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.44 (at 1.77Å)	Xtrriage
Refinement program	REFMAC 5.8.0267	Depositor
R, $R_{free}$	0.205 , 0.247 0.204 , 0.234	Depositor DCC
$R_{free}$ test set	4245 reflections (4.90%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	37.2	Xtrriage
Anisotropy	0.013	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.36 , 47.5	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.96	EDS
Total number of atoms	6378	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	43.0	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 27.80 % 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 2.0622e-03. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical 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: EDO, 4MB, SO4, DGL

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	0.85	0/1502	1.03	0/2019
1	B	0.95	1/1516 (0.1%)	1.07	3/2038 (0.1%)
1	C	0.94	1/1535 (0.1%)	1.06	4/2063 (0.2%)
1	D	1.01	3/1510 (0.2%)	1.14	5/2030 (0.2%)
All	All	0.94	5/6063 (0.1%)	1.08	12/8150 (0.1%)

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	237	ASN	C-O	5.38	1.33	1.23
1	C	240	GLU	CD-OE2	5.34	1.31	1.25
1	D	142	GLN	C-O	5.20	1.33	1.23
1	D	126	GLY	C-O	5.13	1.31	1.23
1	D	148	SER	CA-CB	-5.06	1.45	1.52

All (12) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	197	ARG	NE-CZ-NH1	-8.33	116.13	120.30
1	B	197	ARG	NE-CZ-NH2	-7.64	116.48	120.30
1	C	229	ARG	NE-CZ-NH1	-6.76	116.92	120.30
1	D	137	PHE	CB-CG-CD2	6.11	125.08	120.80
1	B	128	ARG	NE-CZ-NH2	-5.82	117.39	120.30
1	C	261	SER	N-CA-CB	5.76	119.14	110.50
1	C	256	ASP	CB-CA-C	5.65	121.70	110.40
1	B	197	ARG	NE-CZ-NH1	5.64	123.12	120.30
1	D	154	PHE	CB-CG-CD1	5.48	124.64	120.80
1	D	154	PHE	CB-CG-CD2	-5.46	116.98	120.80
1	D	137	PHE	CB-CG-CD1	-5.17	117.18	120.80
1	C	229	ARG	CG-CD-NE	-5.12	101.06	111.80

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	1481	0	1530	27	0
1	B	1495	0	1541	13	0
1	C	1514	0	1558	20	0
1	D	1489	0	1533	14	0
2	A	4	0	6	0	0
2	B	8	0	12	0	0
2	C	8	0	12	0	0
2	D	8	0	12	1	0
3	B	10	0	7	0	0
3	D	10	0	7	0	0
4	C	14	0	8	0	0
5	C	5	0	2	0	0
5	D	5	0	2	0	0
6	D	15	0	0	0	0
7	D	6	0	4	0	0
8	A	48	0	0	0	0
8	B	86	0	0	2	0
8	C	71	0	0	2	0
8	D	101	0	0	3	0
All	All	6378	0	6234	73	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 6.

All (73) 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:140:LEU:HD21	1:A:282:MET:SD	1.96	1.04
1:A:273[B]:PHE:O	1:A:277:HIS:HD2	1.56	0.89
1:D:125:ILE:HD11	1:D:127:LEU:HD12	1.61	0.82
1:D:187:THR:CG2	8:D:491:HOH:O	2.31	0.77

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:187:THR:HG22	8:D:491:HOH:O	1.85	0.76
1:A:198:THR:HG23	1:A:266:THR:CG2	2.15	0.76
1:A:198:THR:HG23	1:A:266:THR:HG23	1.69	0.75
1:A:284:PRO:O	1:A:288:LYS:HD3	1.86	0.74
1:A:128:ARG:HG3	1:A:140:LEU:HD12	1.71	0.72
1:B:125:ILE:HD12	1:B:125:ILE:H	1.58	0.68
1:B:286:ILE:HG23	1:B:290:LEU:HD12	1.76	0.67
1:A:206:THR:HG22	1:A:208:HIS:CE1	2.31	0.65
1:B:125:ILE:HD12	1:B:125:ILE:N	2.12	0.65
1:C:184:GLU:O	1:C:185:LYS:HB3	1.98	0.64
1:A:198:THR:CG2	1:A:266:THR:HG23	2.28	0.64
1:B:241:ILE:HD11	1:B:254:ILE:HG23	1.81	0.63
1:A:284:PRO:HA	1:A:287:MET:HB2	1.85	0.58
1:C:112:ILE:CG2	1:C:189:THR:HG22	2.34	0.57
1:A:112:ILE:CG2	1:A:189:THR:CG2	2.83	0.56
1:B:125:ILE:HD11	8:B:475:HOH:O	2.05	0.56
1:D:114:GLU:OE1	1:D:116:ILE:HD11	2.06	0.56
1:A:273[B]:PHE:O	1:A:277:HIS:CD2	2.47	0.55
1:A:198:THR:CG2	1:A:266:THR:CG2	2.83	0.55
1:C:153:ARG:HD3	8:C:404:HOH:O	2.05	0.54
1:D:133:ASP:OD1	2:D:302:EDO:O1	2.25	0.54
1:B:241:ILE:HD12	1:B:246:VAL:HG11	1.90	0.53
1:A:206:THR:HG22	1:A:206:THR:O	2.10	0.52
1:D:125:ILE:HD11	1:D:127:LEU:CD1	2.38	0.52
1:C:261:SER:OG	1:C:262:GLY:N	2.43	0.51
1:C:202:HIS:CD2	1:C:264:VAL:HG22	2.46	0.51
1:C:214:LYS:HE2	8:C:425:HOH:O	2.11	0.51
1:A:273[A]:PHE:O	1:A:277:HIS:HD2	1.94	0.51
1:A:285:SER:HA	1:A:288:LYS:HD3	1.93	0.50
1:A:285:SER:HA	1:A:288:LYS:CD	2.41	0.50
1:A:140:LEU:CD2	1:A:282:MET:SD	2.86	0.50
1:A:279:ILE:HB	1:A:282:MET:CE	2.42	0.50
1:D:117:LEU:HD12	1:D:117:LEU:C	2.32	0.49
1:B:130:LYS:HE2	1:B:281:ARG:HD3	1.96	0.48
1:A:276:GLU:HA	1:A:276:GLU:OE1	2.13	0.48
1:B:202:HIS:O	8:B:401:HOH:O	2.20	0.47
1:C:128:ARG:NH1	1:C:281:ARG:O	2.47	0.47
1:C:280:LYS:O	1:C:281:ARG:CB	2.62	0.47
1:D:187:THR:HG23	8:D:491:HOH:O	2.07	0.47
1:A:206:THR:O	1:A:206:THR:CG2	2.63	0.47
1:C:182:PHE:O	1:C:183:GLY:O	2.33	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:117:LEU:HD12	1:D:117:LEU:O	2.16	0.46
1:C:112:ILE:CG2	1:C:189:THR:CG2	2.93	0.46
1:C:286:ILE:HG23	1:C:290:LEU:HD12	1.96	0.46
1:A:112:ILE:CG2	1:A:189:THR:HG22	2.46	0.45
1:B:116:ILE:HG23	1:B:185:LYS:HG3	1.98	0.45
1:C:176:LYS:O	1:C:180:GLN:HG3	2.16	0.45
1:D:232:LEU:HD11	1:D:267:ILE:HD11	1.98	0.45
1:A:197:ARG:HD3	1:C:194:PRO:O	2.16	0.45
1:C:154:PHE:CD1	1:C:247:ILE:CD1	2.99	0.45
1:B:112:ILE:CG2	1:B:189:THR:CG2	2.95	0.45
1:A:238:ILE:HG23	1:A:267:ILE:HG23	1.98	0.45
1:D:112:ILE:CG2	1:D:189:THR:CG2	2.94	0.44
1:C:210:GLY:HA3	1:C:225:SER:HB2	1.99	0.44
1:C:267:ILE:HG22	1:C:269:ILE:HG23	1.99	0.44
1:B:112:ILE:CG2	1:B:189:THR:HG22	2.47	0.44
1:B:117:LEU:HD22	1:B:125:ILE:CG2	2.48	0.43
1:C:128:ARG:NH1	1:C:139:GLN:OE1	2.50	0.43
1:A:267:ILE:HG22	1:A:269:ILE:HG23	2.00	0.43
1:C:142:GLN:HA	1:C:290:LEU:O	2.19	0.43
1:D:210:GLY:HA3	1:D:225:SER:CB	2.49	0.42
1:A:273[A]:PHE:CZ	1:A:277:HIS:NE2	2.84	0.42
1:A:292:ASP:OD1	1:A:294:THR:OG1	2.30	0.42
1:D:210:GLY:HA3	1:D:225:SER:HB2	2.02	0.41
1:D:256[B]:ASP:O	1:D:260:THR:HG23	2.20	0.41
1:A:112:ILE:HG23	1:A:189:THR:HG22	2.03	0.41
1:C:160:GLN:HA	1:C:164:GLU:O	2.21	0.41
1:C:258:LEU:HD23	1:C:258:LEU:HA	1.94	0.40
1:B:212:ILE:HB	1:B:220:SER:HB3	2.03	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	190/195 (97%)	179 (94%)	8 (4%)	3 (2%)	9	2
1	B	192/195 (98%)	189 (98%)	3 (2%)	0	100	100
1	C	194/195 (100%)	184 (95%)	8 (4%)	2 (1%)	15	4
1	D	191/195 (98%)	185 (97%)	6 (3%)	0	100	100
All	All	767/780 (98%)	737 (96%)	25 (3%)	5 (1%)	22	9

All (5) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	184	GLU
1	A	282	MET
1	C	183	GLY
1	C	185	LYS
1	A	281	ARG

### 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	166/168 (99%)	160 (96%)	6 (4%)	35	18
1	B	167/168 (99%)	161 (96%)	6 (4%)	35	18
1	C	169/168 (101%)	165 (98%)	4 (2%)	49	33
1	D	167/168 (99%)	162 (97%)	5 (3%)	41	24
All	All	669/672 (100%)	648 (97%)	21 (3%)	39	22

All (21) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	110	GLN
1	A	117	LEU
1	A	185	LYS
1	A	259	SER
1	A	287	MET
1	A	288	LYS

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Mol	Chain	Res	Type
1	B	107	GLU
1	B	117	LEU
1	B	125	ILE
1	B	144	ASN
1	B	153	ARG
1	B	235	GLU
1	C	214	LYS
1	C	263	THR
1	C	281	ARG
1	C	286	ILE
1	D	117	LEU
1	D	125	ILE
1	D	184	GLU
1	D	187	THR
1	D	259	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (5) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	180	GLN
1	C	202	HIS
1	C	277	HIS
1	D	110	GLN
1	D	215	ASN

### 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

16 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
2	EDO	B	301	-	3,3,3	0.27	0	2,2,2	0.44	0
2	EDO	A	301	-	3,3,3	0.09	0	2,2,2	0.12	0
2	EDO	B	302	-	3,3,3	0.30	0	2,2,2	0.32	0
2	EDO	D	301	-	3,3,3	0.41	0	2,2,2	0.20	0
6	SO4	D	304	-	4,4,4	0.36	0	6,6,6	0.06	0
7	ALA	D	306	-	5,5,5	0.89	0	6,6,6	1.01	0
4	4MB	C	301	-	14,14,14	0.48	0	20,20,20	0.84	1 (5%)
2	EDO	C	302	-	3,3,3	0.47	0	2,2,2	0.64	0
6	SO4	D	303	-	4,4,4	0.39	0	6,6,6	0.05	0
6	SO4	D	305	-	4,4,4	0.36	0	6,6,6	0.06	0
5	GLY	D	308	-	4,4,4	1.20	1 (25%)	3,4,4	1.35	0
3	DGL	D	307	-	8,9,9	1.00	0	10,11,11	1.14	1 (10%)
3	DGL	B	303	-	8,9,9	1.01	0	10,11,11	1.51	2 (20%)
5	GLY	C	304	-	4,4,4	0.77	0	3,4,4	1.88	1 (33%)
2	EDO	D	302	-	3,3,3	0.06	0	2,2,2	0.31	0
2	EDO	C	303	-	3,3,3	0.52	0	2,2,2	0.65	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
2	EDO	B	301	-	-	1/1/1/1	-
2	EDO	A	301	-	-	0/1/1/1	-
2	EDO	B	302	-	-	0/1/1/1	-
2	EDO	D	301	-	-	0/1/1/1	-
7	ALA	D	306	-	-	0/4/4/4	-
4	4MB	C	301	-	-	2/9/9/9	0/1/1/1
2	EDO	C	302	-	-	0/1/1/1	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	GLY	D	308	-	-	2/2/2/2	-
3	DGL	D	307	-	-	1/9/9/9	-
3	DGL	B	303	-	-	0/9/9/9	-
5	GLY	C	304	-	-	0/2/2/2	-
2	EDO	D	302	-	-	1/1/1/1	-
2	EDO	C	303	-	-	1/1/1/1	-

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	D	308	GLY	OXT-C	-2.31	1.23	1.30

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	303	DGL	OXT-C-O	-3.08	117.09	124.09
5	C	304	GLY	OXT-C-CA	2.45	123.20	113.45
3	B	303	DGL	OXT-C-CA	2.31	121.27	113.38
4	C	301	4MB	C3-C2-N1	2.10	124.63	120.09
3	D	307	DGL	OXT-C-CA	2.02	120.27	113.38

There are no chirality outliers.

All (8) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	D	308	GLY	O-C-CA-N
5	D	308	GLY	OXT-C-CA-N
2	C	303	EDO	O1-C1-C2-O2
2	D	302	EDO	O1-C1-C2-O2
4	C	301	4MB	C10-C2-N1-S11
4	C	301	4MB	C3-C2-N1-S11
3	D	307	DGL	O-C-CA-N
2	B	301	EDO	O1-C1-C2-O2

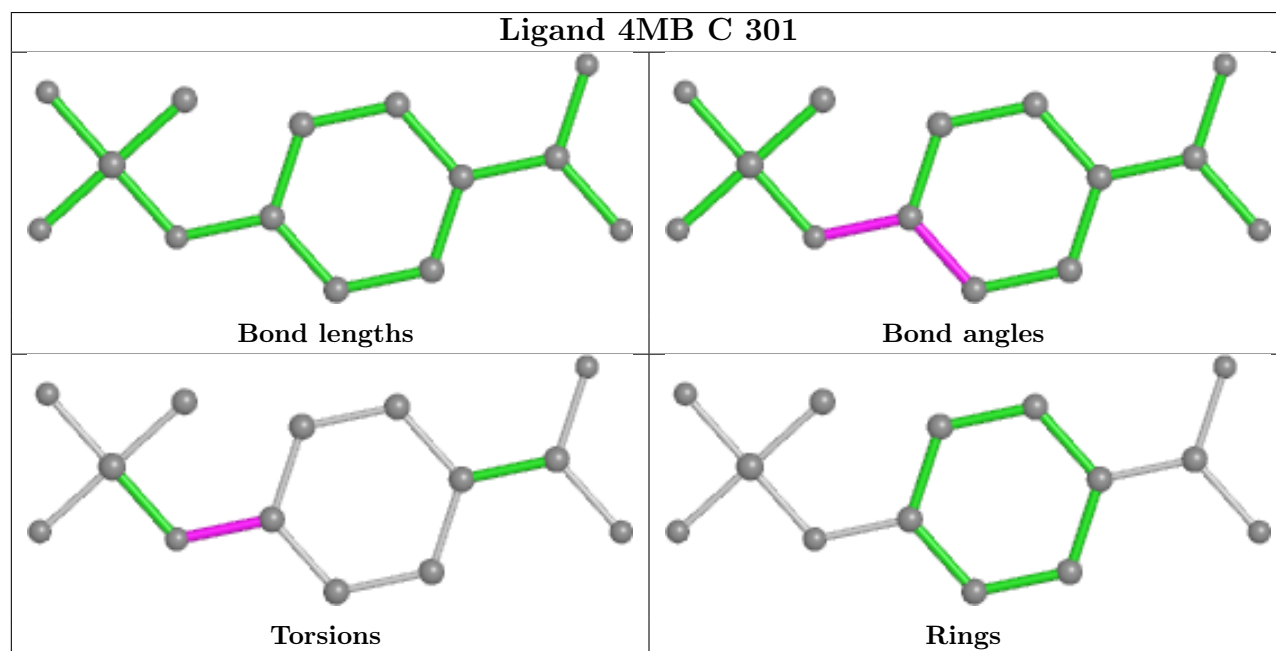
There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	D	302	EDO	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, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	191/195 (97%)	0.81	26 (13%) <b>3</b> <b>3</b>	31, 46, 83, 128	6 (3%)
1	B	193/195 (98%)	0.38	8 (4%) 37 35	27, 40, 59, 69	6 (3%)
1	C	193/195 (98%)	0.47	23 (11%) <b>4</b> <b>4</b>	27, 40, 62, 78	14 (7%)
1	D	191/195 (97%)	0.42	15 (7%) <b>12</b> <b>12</b>	25, 36, 54, 67	13 (6%)
All	All	768/780 (98%)	0.52	72 (9%) <b>8</b> <b>8</b>	25, 40, 62, 128	39 (5%)

All (72) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	286	ILE	11.5
1	A	282	MET	9.7
1	A	278	ILE	8.3
1	A	290	LEU	7.9
1	A	283	ALA	6.9
1	A	110	GLN	6.8
1	B	273[A]	PHE	6.3
1	A	273[A]	PHE	6.2
1	A	287	MET	5.7
1	A	277	HIS	5.6
1	C	273[A]	PHE	5.6
1	A	182	PHE	5.5
1	D	273[A]	PHE	5.5
1	D	116	ILE	5.4
1	D	190	ILE	5.3
1	D	115	VAL	5.3
1	D	117	LEU	4.9
1	C	110	GLN	4.8
1	C	182	PHE	4.8
1	A	276	GLU	4.6
1	C	184	GLU	4.5

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
1	A	184	GLU	4.2
1	C	297	GLU	4.0
1	C	181	ALA	3.9
1	A	285	SER	3.8
1	C	197[A]	ARG	3.8
1	D	182	PHE	3.7
1	A	281	ARG	3.6
1	A	206	THR	3.5
1	A	280	LYS	3.5
1	C	294	THR	3.4
1	D	191	ARG	3.4
1	B	109	LYS	3.4
1	B	153	ARG	3.4
1	C	106	ALA	3.3
1	A	279	ILE	3.2
1	A	121	GLN	3.2
1	D	297	GLU	3.1
1	A	284	PRO	3.1
1	D	184	GLU	3.1
1	C	185	LYS	3.1
1	C	121	GLN	3.0
1	C	285	SER	3.0
1	C	288	LYS	2.9
1	A	108	ILE	2.9
1	C	109	LYS	2.9
1	B	191	ARG	2.9
1	D	153	ARG	2.9
1	D	192	ASP	2.9
1	A	263	THR	2.8
1	D	110	GLN	2.7
1	D	256[A]	ASP	2.7
1	C	144[A]	ASN	2.6
1	C	286	ILE	2.6
1	B	223	LYS	2.5
1	A	202	HIS	2.4
1	C	128	ARG	2.4
1	C	281	ARG	2.4
1	B	110	GLN	2.3
1	C	183	GLY	2.3
1	A	125	ILE	2.3
1	C	116	ILE	2.3
1	B	106	ALA	2.3

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Mol	Chain	Res	Type	RSRZ
1	C	107	GLU	2.3
1	C	118	CYS	2.3
1	A	109	LYS	2.2
1	B	108	ILE	2.1
1	D	125	ILE	2.1
1	A	259	SER	2.0
1	D	114	GLU	2.0
1	C	112	ILE	2.0
1	A	289	SER	2.0

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

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

## 6.3 Carbohydrates [\(i\)](#)

There are no monosaccharides in this entry.

## 6.4 Ligands [\(i\)](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95<sup>th</sup> 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.

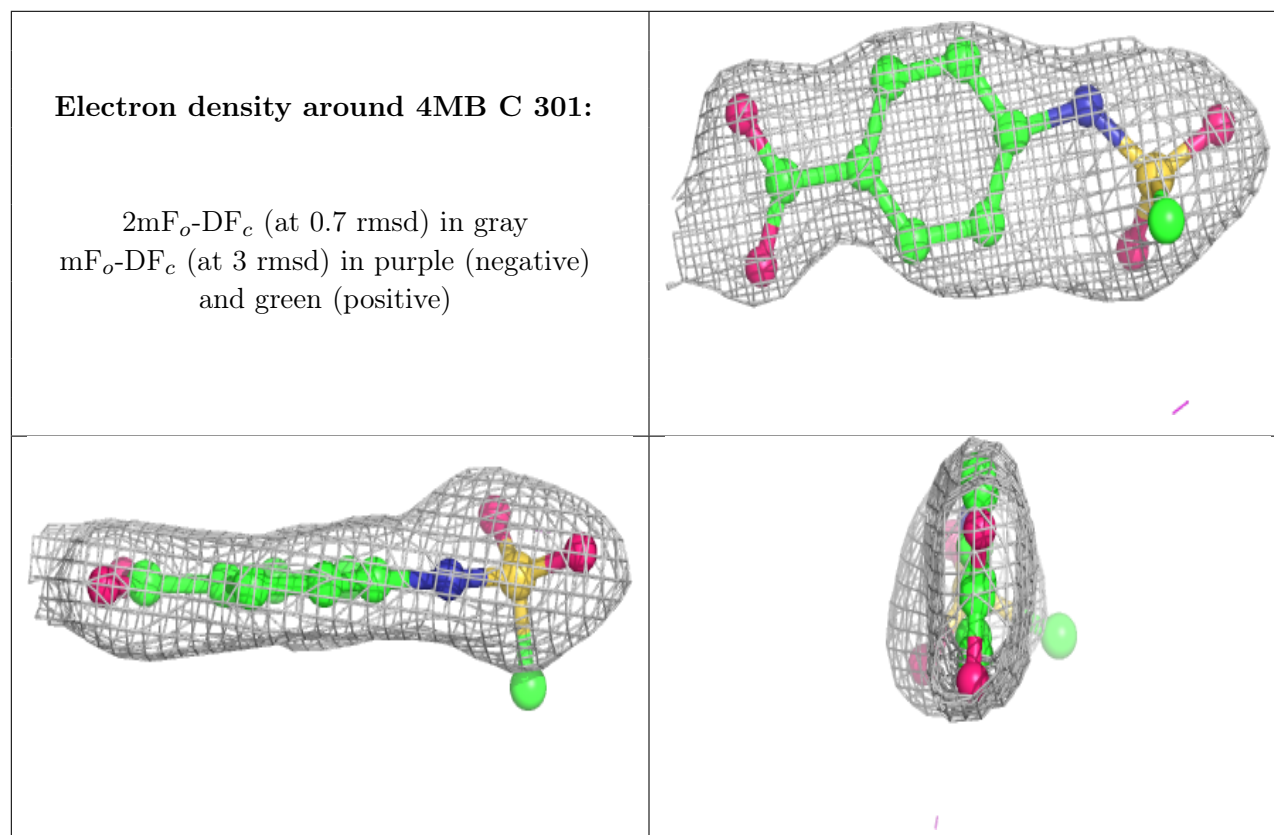
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
6	SO4	D	303	5/5	0.43	1.21	323,326,330,330	5
3	DGL	D	307	10/10	0.68	0.35	38,69,77,78	0
2	EDO	C	303	4/4	0.72	0.21	50,61,62,63	0
2	EDO	A	301	4/4	0.81	0.21	55,55,58,62	0
3	DGL	B	303	10/10	0.82	0.22	45,65,75,83	0
7	ALA	D	306	6/6	0.88	0.17	44,48,53,54	0
2	EDO	D	302	4/4	0.89	0.14	45,48,53,59	0
6	SO4	D	304	5/5	0.89	0.53	67,68,71,75	5
5	GLY	C	304	5/5	0.89	0.21	46,55,64,65	0
2	EDO	C	302	4/4	0.94	0.12	33,33,34,40	0
2	EDO	B	301	4/4	0.94	0.13	45,46,49,56	0
5	GLY	D	308	5/5	0.94	0.16	62,70,75,75	0
4	4MB	C	301	14/14	0.95	0.14	42,45,52,53	14
6	SO4	D	305	5/5	0.95	0.15	62,62,64,65	5

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
2	EDO	D	301	4/4	0.95	0.14	25,26,31,36	0
2	EDO	B	302	4/4	0.97	0.09	29,29,35,37	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.



## 6.5 Other polymers [i](#)

There are no such residues in this entry.