



Full wwPDB X-ray Structure Validation Report ⓘ

Apr 19, 2026 – 05:58 AM UTC

PDB ID : 7FTD / pdb_00007ftd
Title : SDCBP PanDDA analysis group deposition – The PDZ domains of SDCBP in complex with Z27782662
Authors : Bradshaw, W.J.; Katis, V.L.; Bountra, C.; von Delft, F.; Brennan, P.E.
Deposited on : 2023-01-24
Resolution : 1.80 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

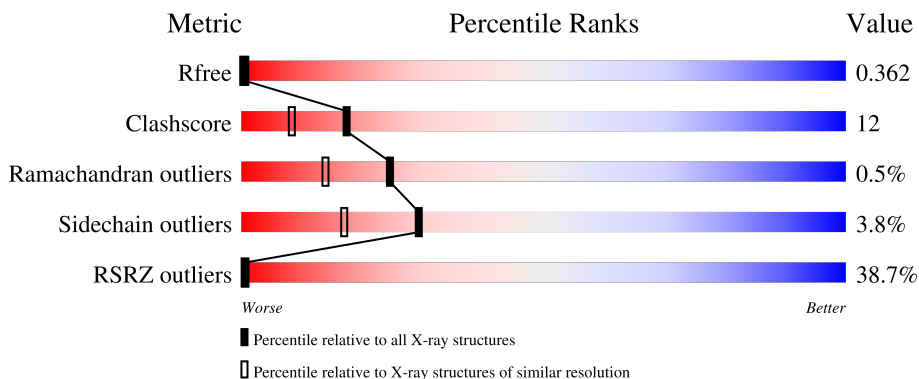
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.80 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	7662 (1.80-1.80)
Clashscore	190562	8479 (1.80-1.80)
Ramachandran outliers	187476	8391 (1.80-1.80)
Sidechain outliers	187428	8390 (1.80-1.80)
RSRZ outliers	180081	7663 (1.80-1.80)

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	195	
1	B	195	
1	C	195	
1	D	195	

2 Entry composition [i](#)

There are 8 unique types of molecules in this entry. The entry contains 6330 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.

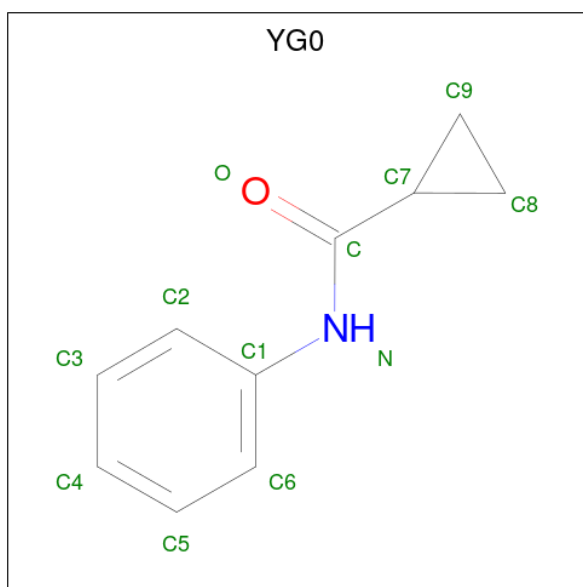
- Molecule 1 is a protein called Syntenin-1.

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	1503	947	266	281	9	0	2	0
1	D	191	1481	935	262	275	9	0	1	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 N-phenylcyclopropanecarboxamide (CCD ID: YG0) (formula: C₁₀H₁₁NO) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	N	O		
2	A	1	12	10	1	1	0	0

- Molecule 3 is 1,2-ETHANEDIOL (CCD ID: EDO) (formula: $C_2H_6O_2$).



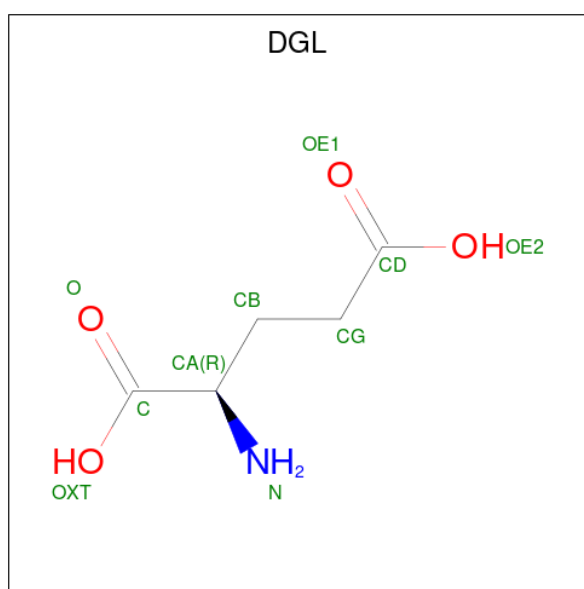
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
			Total	C	O		
3	A	1	4	2	2	0	0
3	B	1	4	2	2	0	0
3	B	1	4	2	2	0	0

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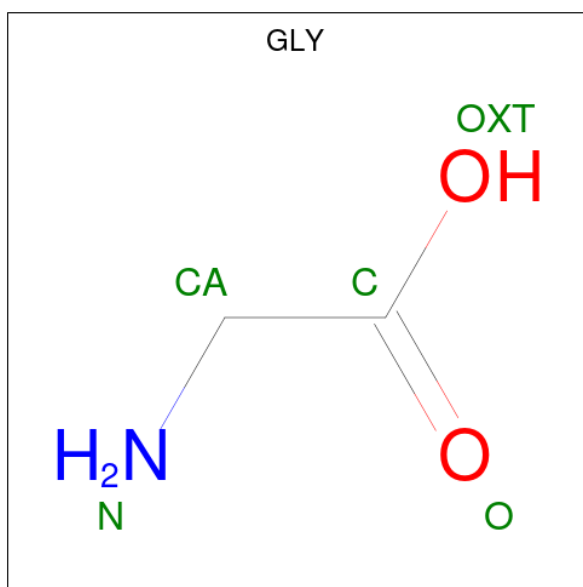
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	C	1	Total	C	O	0	0
			4	2	2		
3	C	1	Total	C	O	0	0
			4	2	2		
3	D	1	Total	C	O	0	0
			4	2	2		
3	D	1	Total	C	O	0	0
			4	2	2		

- Molecule 4 is D-GLUTAMIC ACID (CCD ID: DGL) (formula: C₅H₉NO₄).



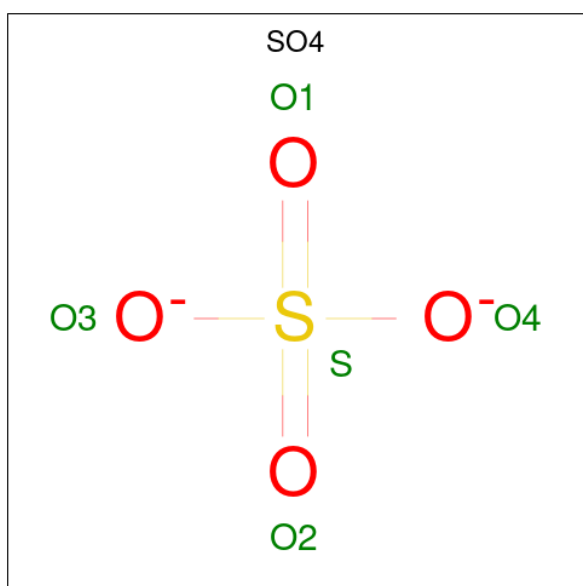
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	B	1	Total	C	N	O	0	0
			10	5	1	4		
4	D	1	Total	C	N	O	0	0
			10	5	1	4		

- Molecule 5 is GLYCINE (CCD ID: GLY) (formula: C₂H₅NO₂).



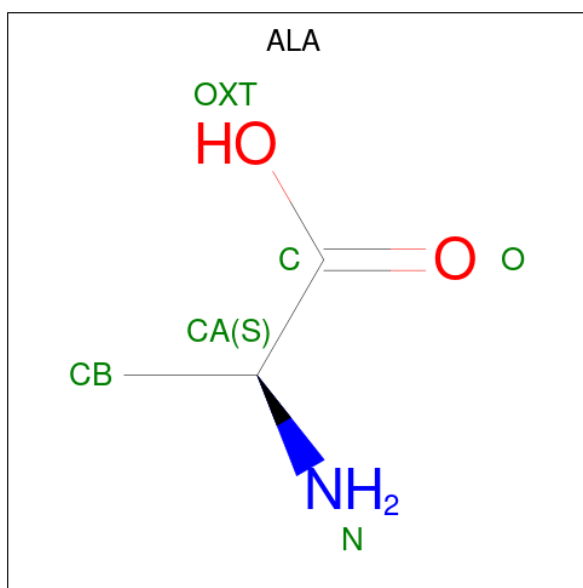
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf	
			Total	C	N			O
5	C	1	5	2	1	2	0	0
5	D	1	5	2	1	2	0	0

- Molecule 6 is SULFATE ION (CCD ID: SO₄) (formula: O₄S).



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

- Molecule 7 is ALANINE (CCD ID: ALA) (formula: C₃H₇NO₂).



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

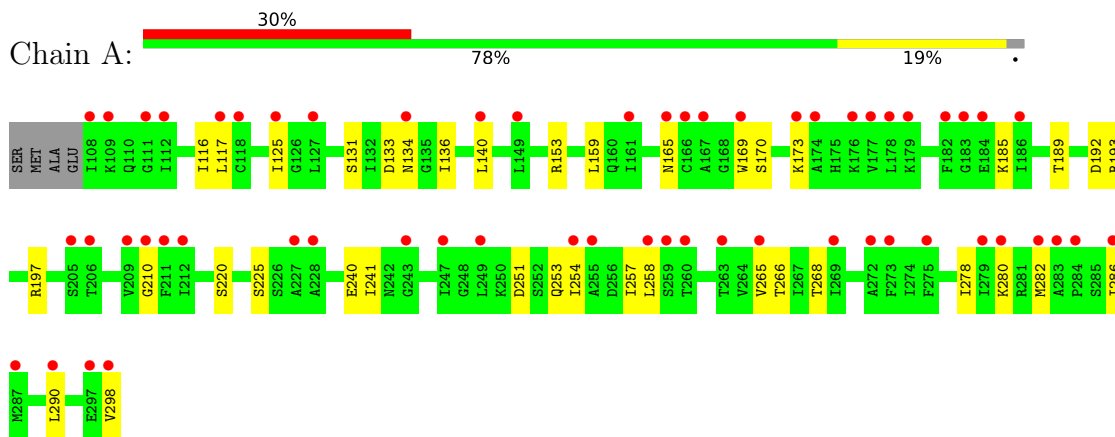
- Molecule 8 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	O		
8	A	39	39	39	0	0
8	B	100	100	100	0	1
8	C	61	61	61	0	0
8	D	84	84	84	0	1

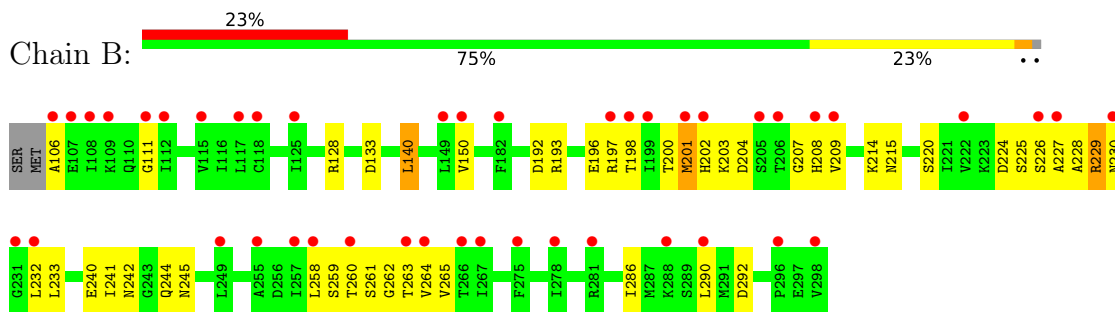
3 Residue-property plots [i](#)

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.

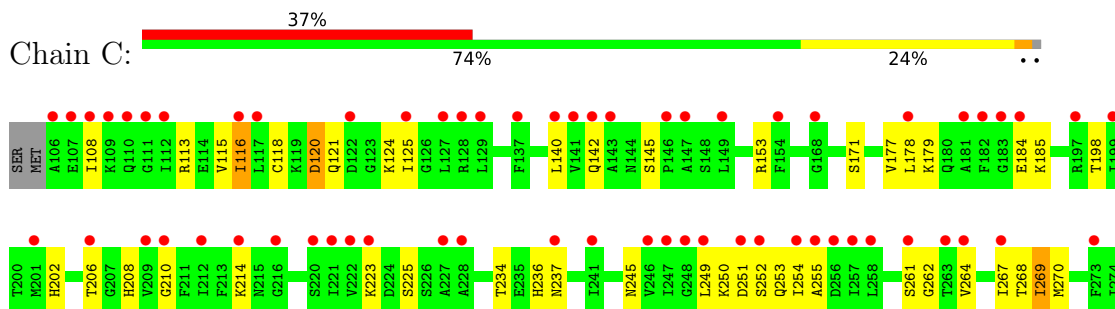
- Molecule 1: Syntenin-1

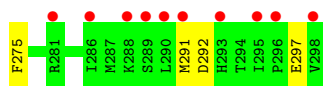


- Molecule 1: Syntenin-1

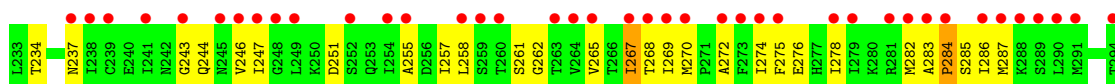
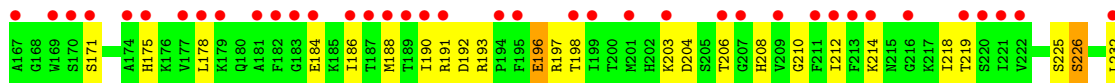
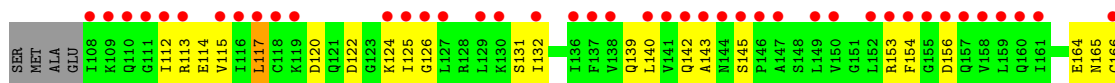


- Molecule 1: Syntenin-1





- Molecule 1: Syntenin-1



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	80.12Å 49.37Å 115.54Å 90.00° 94.61° 90.00°	Depositor
Resolution (Å)	57.58 – 1.80 57.58 – 1.80	Depositor EDS
% Data completeness (in resolution range)	99.8 (57.58-1.80) 99.8 (57.58-1.80)	Depositor EDS
R_{merge}	0.06	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.08 (at 1.80Å)	Xtrriage
Refinement program	REFMAC 5.8.0403	Depositor
R, R_{free}	0.289 , 0.359 0.294 , 0.362	Depositor DCC
R_{free} test set	4121 reflections (4.90%)	wwPDB-VP
Wilson B-factor (Å ²)	42.0	Xtrriage
Anisotropy	0.203	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.33 , 41.1	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	6330	wwPDB-VP
Average B, all atoms (Å ²)	55.0	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 34.50 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 6.7589e-04. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

¹Intensities estimated from amplitudes.

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

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: SO4, DGL, YG0, 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	0.55	0/1502	1.00	0/2019
1	B	0.62	0/1516	1.12	2/2038 (0.1%)
1	C	0.57	0/1524	1.03	0/2049
1	D	0.67	0/1502	1.24	4/2019 (0.2%)
All	All	0.60	0/6044	1.10	6/8125 (0.1%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	1
1	C	0	1
All	All	0	2

There are no bond length outliers.

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	165	ASN	CB-CA-C	-6.12	102.27	109.80
1	B	292	ASP	CA-CB-CG	5.84	118.44	112.60
1	D	196	GLU	CB-CG-CD	5.69	122.28	112.60
1	D	175	HIS	CA-CB-CG	5.26	119.06	113.80
1	D	237	ASN	CB-CA-C	5.25	118.30	109.48
1	B	229	ARG	CB-CA-C	5.24	119.08	110.95

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	153	ARG	Sidechain
1	C	113	ARG	Sidechain

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	19	0
1	B	1495	0	1541	38	0
1	C	1503	0	1546	37	0
1	D	1481	0	1530	60	0
2	A	12	0	0	1	0
3	A	4	0	6	0	0
3	B	8	0	12	1	0
3	C	8	0	12	0	0
3	D	8	0	12	0	0
4	B	10	0	7	0	0
4	D	10	0	7	0	0
5	C	5	0	2	0	0
5	D	5	0	2	0	0
6	D	10	0	0	2	0
7	D	6	0	4	0	0
8	A	39	0	0	2	0
8	B	100	0	0	13	0
8	C	61	0	0	3	0
8	D	84	0	0	12	0
All	All	6330	0	6211	153	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 12.

All (153) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:153:ARG:O	1:D:156:ASP:OD1	1.72	1.06
1:D:197:ARG:NH1	8:D:401:HOH:O	1.91	1.04
1:D:226:SER:OG	6:D:303:SO4:O2	1.87	0.93

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:201:MET:SD	1:B:227:ALA:HA	2.09	0.93
1:D:197:ARG:NH2	8:D:402:HOH:O	2.02	0.92
1:C:142:GLN:O	1:C:145:SER:OG	1.89	0.89
1:B:202:HIS:HA	1:B:263:THR:O	1.75	0.85
1:B:228:ALA:O	8:B:401:HOH:O	1.97	0.82
1:B:208:HIS:O	8:B:402:HOH:O	1.98	0.80
1:D:234:THR:OG1	8:D:403:HOH:O	2.04	0.76
1:B:150:VAL:O	8:B:403:HOH:O	2.05	0.75
1:A:241:ILE:HD11	1:A:254:ILE:HG23	1.71	0.72
1:D:204:ASP:OD2	8:D:404:HOH:O	2.09	0.71
1:A:240:GLU:HB2	1:A:268:THR:HB	1.73	0.71
1:D:255:ALA:O	8:D:405:HOH:O	2.09	0.70
1:C:249:LEU:HB3	1:C:253:GLN:HB2	1.72	0.69
1:D:139:GLN:HG2	1:D:282:MET:CE	2.22	0.69
1:C:198:THR:HG22	1:C:268:THR:OG1	1.95	0.66
1:B:196:GLU:O	8:B:405:HOH:O	2.15	0.65
1:B:200:THR:O	1:B:230:ASN:OD1	2.15	0.64
1:C:116:ILE:HD12	1:C:116:ILE:N	2.13	0.63
1:B:202:HIS:CD2	8:B:418:HOH:O	2.52	0.62
1:D:153:ARG:C	1:D:156:ASP:OD1	2.42	0.62
1:C:118:CYS:SG	1:C:184:GLU:O	2.57	0.61
1:D:270:MET:SD	1:D:275:PHE:HA	2.41	0.60
1:D:131:SER:O	1:D:132:ILE:HD13	2.00	0.60
1:D:251:ASP:N	6:D:304:SO4:O4	2.31	0.60
1:C:116:ILE:HG23	1:C:185:LYS:HB2	1.82	0.60
1:D:120:ASP:OD1	1:D:120:ASP:C	2.43	0.60
1:D:210:GLY:HA3	1:D:225:SER:HB2	1.82	0.59
1:D:212:ILE:O	1:D:219:THR:OG1	2.21	0.59
1:D:196:GLU:HA	1:D:269:ILE:O	2.03	0.58
1:C:214:LYS:HB3	8:C:459:HOH:O	2.04	0.58
1:D:114:GLU:O	8:D:406:HOH:O	2.17	0.57
1:D:193:ARG:NH1	8:D:409:HOH:O	2.38	0.57
1:D:270:MET:SD	1:D:278:ILE:HD12	2.44	0.57
1:B:214:LYS:NZ	8:B:417:HOH:O	2.39	0.56
1:B:197:ARG:HH12	1:B:233:LEU:CD1	2.19	0.55
1:D:122:ASP:HB2	1:D:124:LYS:HG2	1.87	0.55
1:D:286:ILE:O	1:D:287:MET:C	2.49	0.55
1:B:197:ARG:HH12	1:B:233:LEU:HD11	1.72	0.54
1:C:267:ILE:HG22	1:C:269:ILE:HG23	1.89	0.54
1:D:283:ALA:O	1:D:284:PRO:C	2.49	0.54
1:D:197:ARG:O	1:D:268:THR:HA	2.06	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:230:ASN:HD22	1:B:230:ASN:N	2.06	0.54
1:D:139:GLN:HG2	1:D:282:MET:HE1	1.89	0.54
1:D:117:LEU:HD12	1:D:186:ILE:HB	1.91	0.53
1:A:133:ASP:HB3	1:C:234:THR:O	2.09	0.53
1:A:286:ILE:O	1:A:290:LEU:HB2	2.08	0.53
1:B:229:ARG:NH2	8:B:418:HOH:O	2.39	0.53
1:D:244:GLN:O	1:D:246:VAL:HG13	2.09	0.53
1:A:165:ASN:O	1:A:169:TRP:CZ2	2.62	0.53
1:A:192:ASP:O	1:A:193:ARG:C	2.51	0.53
1:A:251:ASP:N	8:A:401:HOH:O	2.17	0.53
1:B:224:ASP:N	8:B:406:HOH:O	2.18	0.52
1:D:139:GLN:CG	1:D:282:MET:HE2	2.39	0.52
1:D:274:ILE:O	1:D:275:PHE:C	2.52	0.52
1:B:226:SER:O	1:B:227:ALA:C	2.53	0.51
1:C:210:GLY:HA3	1:C:225:SER:HB2	1.91	0.51
1:C:140:LEU:HD12	1:C:291:MET:HE2	1.92	0.51
1:A:131:SER:HA	1:A:136:ILE:HD13	1.92	0.51
1:D:258:LEU:HD21	1:D:267:ILE:HD11	1.92	0.51
1:C:250:LYS:C	1:C:252:SER:N	2.66	0.51
1:D:140:LEU:C	1:D:140:LEU:HD23	2.34	0.51
1:B:226:SER:O	1:B:229:ARG:N	2.44	0.51
1:C:153:ARG:HD3	8:C:418:HOH:O	2.10	0.51
1:D:218:ILE:HD13	1:D:232:LEU:HD11	1.92	0.51
1:D:287:MET:SD	8:D:481:HOH:O	2.60	0.51
1:D:283:ALA:HB3	1:D:286:ILE:HD12	1.93	0.50
1:B:203:LYS:NZ	1:B:259:SER:O	2.44	0.50
1:B:203:LYS:NZ	1:B:259:SER:HA	2.26	0.50
1:C:250:LYS:O	1:C:252:SER:N	2.45	0.50
1:C:115:VAL:C	1:C:116:ILE:HD12	2.37	0.49
1:C:250:LYS:O	1:C:251:ASP:C	2.54	0.49
1:D:261:SER:OG	1:D:265:VAL:HG22	2.13	0.49
1:C:245:ASN:OD1	1:C:245:ASN:C	2.56	0.49
1:B:209:VAL:O	1:B:225:SER:HB2	2.12	0.49
1:D:203:LYS:HD2	1:D:262:GLY:O	2.13	0.49
1:A:140:LEU:HD11	1:A:282:MET:SD	2.53	0.49
1:B:262:GLY:O	1:B:263:THR:C	2.56	0.49
1:B:133:ASP:OD1	3:B:301:EDO:O2	2.23	0.48
1:C:214:LYS:HA	1:C:251:ASP:OD2	2.11	0.48
1:B:202:HIS:ND1	1:B:264:VAL:HG22	2.28	0.48
1:D:243:GLY:HA2	8:D:409:HOH:O	2.13	0.48
1:B:111:GLY:HA2	8:B:474:HOH:O	2.13	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:121:GLN:OE1	1:C:121:GLN:N	2.41	0.47
1:B:192:ASP:O	1:B:193:ARG:C	2.57	0.47
1:D:297:GLU:HG2	1:D:298:VAL:OXT	2.15	0.47
1:B:215:ASN:ND2	8:B:421:HOH:O	2.46	0.47
1:C:223:LYS:HA	1:C:223:LYS:HE2	1.95	0.47
1:B:200:THR:HA	1:B:265:VAL:O	2.14	0.47
1:A:241:ILE:CD1	1:A:254:ILE:HG23	2.43	0.47
1:D:112:ILE:HA	1:D:190:ILE:O	2.15	0.47
1:D:154:PHE:CD1	1:D:247:ILE:CD1	2.98	0.47
1:D:117:LEU:CD1	1:D:186:ILE:HB	2.44	0.47
1:D:139:GLN:HG2	1:D:282:MET:HE2	1.93	0.46
1:D:198:THR:HG22	1:D:268:THR:OG1	2.16	0.46
1:D:164:GLU:HB2	8:D:427:HOH:O	2.14	0.46
1:C:206:THR:HG1	1:C:208:HIS:HD1	1.61	0.46
1:B:286:ILE:HG23	1:B:290:LEU:HD12	1.97	0.46
1:C:116:ILE:N	1:C:116:ILE:CD1	2.78	0.45
1:C:249:LEU:HB2	1:C:254:ILE:HG13	1.97	0.45
1:A:210:GLY:HA3	1:A:225:SER:HB2	1.97	0.45
1:B:245:ASN:OD1	1:B:245:ASN:C	2.58	0.45
1:D:126:GLY:HA3	1:D:145:SER:HB2	1.99	0.45
1:B:203:LYS:N	1:B:263:THR:O	2.49	0.45
1:B:240:GLU:HA	1:B:244:GLN:O	2.17	0.45
1:B:204:ASP:O	1:B:207:GLY:N	2.47	0.44
1:D:154:PHE:CD1	1:D:247:ILE:HD13	2.51	0.44
1:C:108:ILE:CD1	1:C:198:THR:HG23	2.48	0.44
1:D:244:GLN:HE22	1:D:257:ILE:HD13	1.82	0.44
1:A:170:SER:OG	1:A:173:LYS:N	2.47	0.44
1:A:286:ILE:O	1:A:290:LEU:N	2.50	0.44
1:A:280:LYS:HG3	8:A:424:HOH:O	2.17	0.44
1:D:214:LYS:HG2	8:D:431:HOH:O	2.16	0.44
1:C:214:LYS:CB	8:C:459:HOH:O	2.62	0.43
1:D:206:THR:OG1	1:D:208:HIS:CD2	2.71	0.43
1:D:212:ILE:HG21	8:D:441:HOH:O	2.17	0.43
1:C:250:LYS:C	1:C:252:SER:H	2.26	0.43
1:C:202:HIS:CD2	1:C:264:VAL:HG22	2.54	0.43
1:D:142:GLN:HG2	1:D:143:ALA:O	2.19	0.43
1:D:283:ALA:O	1:D:285:SER:N	2.51	0.43
1:B:245:ASN:HB2	8:B:413:HOH:O	2.18	0.43
1:B:259:SER:O	1:B:261:SER:N	2.52	0.43
1:D:247:ILE:HG22	1:D:287:MET:HE3	2.00	0.43
1:C:210:GLY:HA3	1:C:225:SER:CB	2.49	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:154:PHE:CE1	1:D:247:ILE:HD13	2.54	0.43
1:D:204:ASP:N	1:D:208:HIS:O	2.43	0.43
1:B:242:ASN:ND2	8:B:425:HOH:O	2.52	0.42
1:D:192:ASP:O	1:D:193:ARG:C	2.61	0.42
1:C:292:ASP:C	1:C:292:ASP:OD1	2.63	0.42
1:D:191:ARG:CG	1:D:191:ARG:HH11	2.32	0.42
1:A:258:LEU:CD2	1:A:265:VAL:HG11	2.49	0.42
1:B:232:LEU:O	8:B:407:HOH:O	2.21	0.42
1:A:159:LEU:N	1:A:189:THR:O	2.43	0.42
1:B:106:ALA:O	1:B:198:THR:HG21	2.20	0.42
1:B:241:ILE:HD13	1:B:258:LEU:HG	2.02	0.42
1:D:272:ALA:O	1:D:276:GLU:HG2	2.20	0.42
1:C:261:SER:OG	1:C:262:GLY:N	2.53	0.41
1:A:253:GLN:O	1:A:257:ILE:HG13	2.21	0.41
1:D:142:GLN:HB3	1:D:145:SER:HB3	2.02	0.41
1:D:178:LEU:HD21	1:D:188:MET:HE3	2.03	0.41
1:C:237:ASN:CG	1:C:275:PHE:CD2	2.98	0.41
1:C:251:ASP:O	1:C:255:ALA:HB2	2.21	0.41
1:C:178:LEU:O	1:C:179:LYS:C	2.63	0.41
1:D:113:ARG:O	1:D:113:ARG:HG3	2.20	0.41
1:A:116:ILE:HG23	1:A:185:LYS:HG3	2.02	0.41
1:A:197:ARG:HD2	2:A:301:YG0:C5	2.51	0.41
1:C:120:ASP:OD1	1:C:120:ASP:C	2.64	0.41
1:C:236:HIS:CD2	1:C:269:ILE:HD12	2.57	0.40
1:B:128:ARG:HB2	1:B:140:LEU:HB3	2.02	0.40
1:C:125:ILE:O	1:C:145:SER:HB2	2.22	0.40
1:C:237:ASN:ND2	1:C:275:PHE:CE2	2.89	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%)	182 (96%)	8 (4%)	0	100	100
1	B	192/195 (98%)	184 (96%)	7 (4%)	1 (0%)	24	14
1	C	193/195 (99%)	177 (92%)	15 (8%)	1 (0%)	24	14
1	D	190/195 (97%)	178 (94%)	10 (5%)	2 (1%)	11	3
All	All	765/780 (98%)	721 (94%)	40 (5%)	4 (0%)	24	14

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	D	184	GLU
1	C	120	ASP
1	B	260	THR
1	D	284	PRO

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%)	159 (96%)	7 (4%)	26	14
1	B	167/168 (99%)	164 (98%)	3 (2%)	51	43
1	C	168/168 (100%)	161 (96%)	7 (4%)	26	14
1	D	166/168 (99%)	158 (95%)	8 (5%)	23	11
All	All	667/672 (99%)	642 (96%)	25 (4%)	29	18

All (25) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	117	LEU
1	A	125	ILE
1	A	134	ASN
1	A	220	SER
1	A	266	THR
1	A	278	ILE
1	A	298	VAL

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Mol	Chain	Res	Type
1	B	140	LEU
1	B	201	MET
1	B	220	SER
1	C	116	ILE
1	C	124	LYS
1	C	171	SER
1	C	177	VAL
1	C	269	ILE
1	C	270	MET
1	C	297	GLU
1	D	115	VAL
1	D	117	LEU
1	D	125	ILE
1	D	166	CYS
1	D	171	SER
1	D	226	SER
1	D	267	ILE
1	D	297	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (15) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	208	HIS
1	A	215	ASN
1	A	230	ASN
1	B	142	GLN
1	B	157	GLN
1	B	215	ASN
1	B	230	ASN
1	C	139	GLN
1	C	236	HIS
1	C	237	ASN
1	C	253	GLN
1	D	208	HIS
1	D	215	ASN
1	D	237	ASN
1	D	244	GLN

5.3.3 RNA

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

15 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
6	SO4	D	304	-	4,4,4	0.38	0	6,6,6	0.14	0
5	GLY	D	307	-	4,4,4	0.78	0	3,4,4	1.26	0
6	SO4	D	303	-	4,4,4	0.30	0	6,6,6	0.14	0
3	EDO	B	302	-	3,3,3	0.17	0	2,2,2	0.51	0
2	YG0	A	301	-	13,13,13	0.44	0	17,17,17	0.57	0
3	EDO	D	302	-	3,3,3	0.12	0	2,2,2	0.28	0
4	DGL	D	306	-	8,9,9	1.02	0	8,11,11	0.95	0
5	GLY	C	303	-	4,4,4	0.94	0	3,4,4	1.03	0
3	EDO	C	301	-	3,3,3	0.35	0	2,2,2	0.12	0
3	EDO	A	302	-	3,3,3	0.13	0	2,2,2	0.24	0
3	EDO	C	302	-	3,3,3	0.06	0	2,2,2	0.20	0
3	EDO	D	301	-	3,3,3	0.28	0	2,2,2	0.33	0
3	EDO	B	301	-	3,3,3	0.36	0	2,2,2	0.30	0
7	ALA	D	305	-	5,5,5	1.11	0	6,6,6	0.73	0
4	DGL	B	303	-	8,9,9	1.18	1 (12%)	8,11,11	1.01	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. '2' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	GLY	D	307	-	-	1/2/2/2	-
3	EDO	B	302	-	-	1/1/1/1	-
2	YG0	A	301	-	-	2/8/10/10	0/2/2/2
3	EDO	D	302	-	-	1/1/1/1	-
4	DGL	D	306	-	-	1/9/9/9	-
5	GLY	C	303	-	-	2/2/2/2	-
3	EDO	C	301	-	-	1/1/1/1	-
3	EDO	A	302	-	-	1/1/1/1	-
3	EDO	C	302	-	-	1/1/1/1	-
3	EDO	D	301	-	-	0/1/1/1	-
3	EDO	B	301	-	-	1/1/1/1	-
7	ALA	D	305	-	-	1/4/4/4	-
4	DGL	B	303	-	-	2/9/9/9	-

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	B	303	DGL	O-C	2.34	1.29	1.22

There are no bond angle outliers.

There are no chirality outliers.

All (15) torsion outliers are listed below:

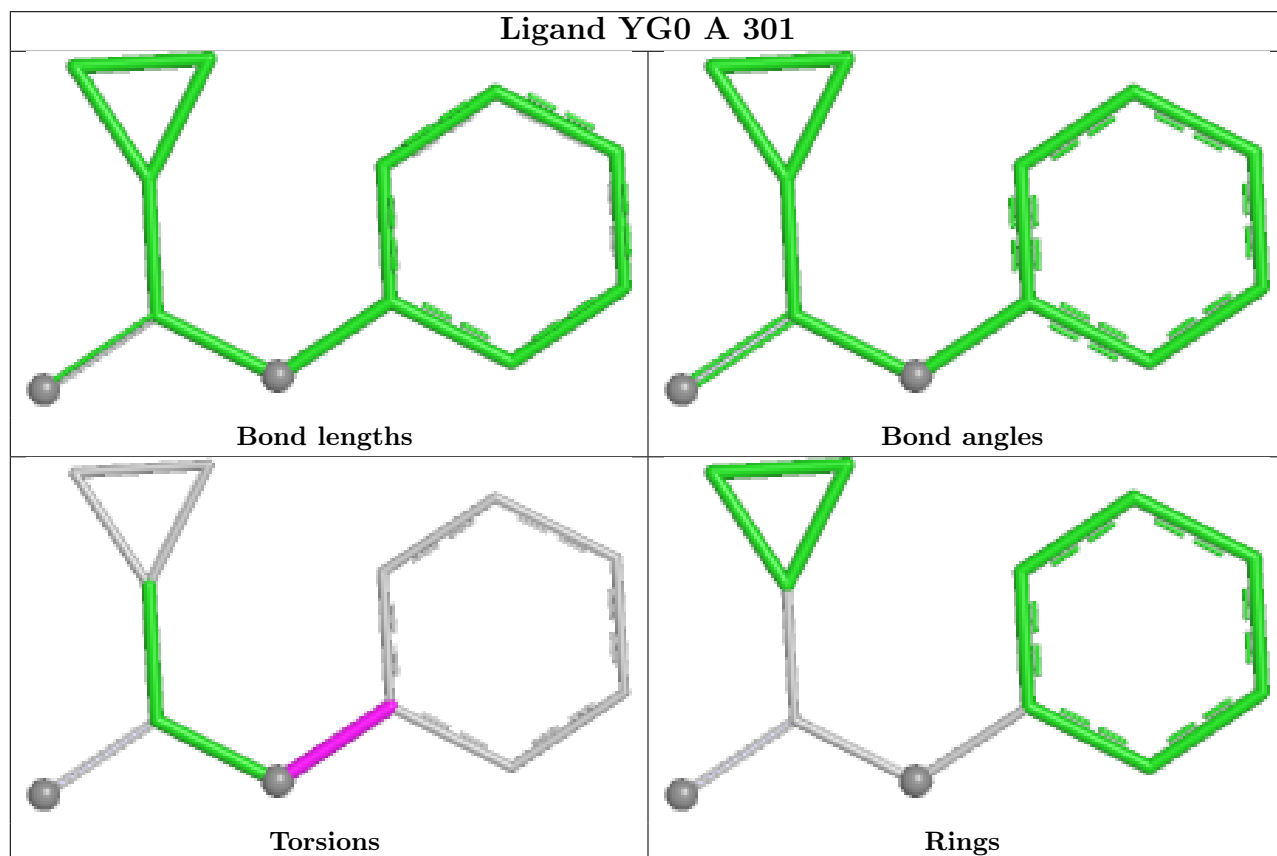
Mol	Chain	Res	Type	Atoms
5	C	303	GLY	O-C-CA-N
5	C	303	GLY	OXT-C-CA-N
3	A	302	EDO	O1-C1-C2-O2
3	B	302	EDO	O1-C1-C2-O2
4	D	306	DGL	O-C-CA-N
5	D	307	GLY	OXT-C-CA-N
4	B	303	DGL	CA-CB-CG-CD
7	D	305	ALA	OXT-C-CA-N
3	C	301	EDO	O1-C1-C2-O2
2	A	301	YG0	C2-C1-N-C
3	D	302	EDO	O1-C1-C2-O2
2	A	301	YG0	C6-C1-N-C
4	B	303	DGL	N-CA-CB-CG
3	B	301	EDO	O1-C1-C2-O2
3	C	302	EDO	O1-C1-C2-O2

There are no ring outliers.

4 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	D	304	SO4	1	0
6	D	303	SO4	1	0
2	A	301	YG0	1	0
3	B	301	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 [i](#)

6.1 Protein, DNA and RNA chains [i](#)

In the following table, the column labelled ‘#RSRZ > 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q < 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	191/195 (97%)	1.58	58 (30%) 1 1	20, 55, 87, 118	1 (0%)
1	B	193/195 (98%)	1.42	44 (22%) 2 1	19, 52, 73, 92	1 (0%)
1	C	193/195 (98%)	1.88	72 (37%) 1 0	23, 57, 83, 116	2 (1%)
1	D	191/195 (97%)	2.76	123 (64%) 0 0	22, 51, 77, 115	1 (0%)
All	All	768/780 (98%)	1.91	297 (38%) 1 0	19, 53, 81, 118	5 (0%)

All (297) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	106	ALA	8.3
1	B	106	ALA	7.3
1	C	108	ILE	7.1
1	D	254	ILE	7.1
1	D	267	ILE	7.1
1	D	182	PHE	7.0
1	D	177	VAL	6.5
1	A	182	PHE	6.5
1	D	149	LEU	6.5
1	A	108	ILE	6.2
1	D	190	ILE	5.9
1	D	273[A]	PHE	5.7
1	C	182	PHE	5.7
1	D	178	LEU	5.5
1	A	112	ILE	5.4
1	A	283	ALA	5.4
1	D	249	LEU	5.3
1	D	265	VAL	5.3
1	D	298	VAL	5.3
1	A	282	MET	5.3
1	D	248	GLY	5.2

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Mol	Chain	Res	Type	RSRZ
1	D	141	VAL	5.2
1	D	161	ILE	5.2
1	D	183	GLY	5.2
1	D	125	ILE	5.1
1	B	264	VAL	5.0
1	D	116	ILE	5.0
1	B	108	ILE	5.0
1	C	110	GLN	4.9
1	D	238	ILE	4.9
1	D	189	THR	4.8
1	D	275	PHE	4.8
1	D	241	ILE	4.8
1	C	273[A]	PHE	4.8
1	D	213	PHE	4.8
1	D	209	VAL	4.8
1	A	286	ILE	4.8
1	B	109	LYS	4.7
1	D	108	ILE	4.7
1	D	138	VAL	4.6
1	D	269	ILE	4.6
1	C	249	LEU	4.5
1	D	284	PRO	4.4
1	C	125	ILE	4.4
1	D	129	LEU	4.3
1	D	167	ALA	4.2
1	D	186	ILE	4.2
1	C	209	VAL	4.2
1	D	117	LEU	4.1
1	B	125	ILE	4.1
1	C	143	ALA	4.1
1	D	155	GLY	4.1
1	D	216	GLY	4.1
1	D	152	LEU	4.1
1	D	169	TRP	4.0
1	D	287	MET	4.0
1	C	257	ILE	4.0
1	D	212	ILE	3.9
1	D	260	THR	3.9
1	D	278	ILE	3.9
1	A	109	LYS	3.8
1	C	183	GLY	3.8
1	B	199	ILE	3.8

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Mol	Chain	Res	Type	RSRZ
1	D	136	ILE	3.8
1	A	284	PRO	3.7
1	C	258	LEU	3.7
1	D	181	ALA	3.7
1	D	283	ALA	3.7
1	D	112	ILE	3.7
1	D	154	PHE	3.7
1	D	174	ALA	3.7
1	D	142	GLN	3.7
1	C	141	VAL	3.7
1	D	137	PHE	3.7
1	B	202	HIS	3.6
1	D	286	ILE	3.6
1	D	115	VAL	3.6
1	C	109	LYS	3.6
1	D	126	GLY	3.6
1	C	263	THR	3.5
1	C	254	ILE	3.5
1	D	246	VAL	3.5
1	D	127	LEU	3.5
1	D	159	LEU	3.5
1	A	290	LEU	3.5
1	C	248	GLY	3.5
1	C	112	ILE	3.4
1	A	258	LEU	3.4
1	B	263	THR	3.4
1	D	145	SER	3.4
1	B	298	VAL	3.3
1	D	237	ASN	3.3
1	D	211	PHE	3.3
1	D	118	CYS	3.3
1	C	111	GLY	3.3
1	D	144	ASN	3.3
1	C	127	LEU	3.3
1	C	296	PRO	3.3
1	D	111	GLY	3.3
1	C	212	ILE	3.2
1	C	286	ILE	3.2
1	A	140	LEU	3.2
1	B	206	THR	3.1
1	B	230	ASN	3.1
1	C	251	ASP	3.1

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Mol	Chain	Res	Type	RSRZ
1	D	255	ALA	3.1
1	B	222	VAL	3.1
1	D	290	LEU	3.1
1	D	198	THR	3.1
1	B	111	GLY	3.1
1	C	222	VAL	3.1
1	D	150	VAL	3.1
1	A	174	ALA	3.1
1	C	181	ALA	3.0
1	C	246	VAL	3.0
1	D	264	VAL	3.0
1	A	260	THR	3.0
1	A	243	GLY	3.0
1	A	273[A]	PHE	3.0
1	D	140	LEU	2.9
1	D	232	LEU	2.9
1	D	288	LYS	2.9
1	D	294	THR	2.9
1	D	146	PRO	2.9
1	B	118	CYS	2.9
1	C	267	ILE	2.9
1	B	149	LEU	2.9
1	A	280	LYS	2.9
1	C	281	ARG	2.9
1	B	201	MET	2.9
1	D	272	ALA	2.9
1	C	293	HIS	2.9
1	B	112	ILE	2.9
1	C	221	ILE	2.9
1	D	258	LEU	2.9
1	B	107	GLU	2.9
1	D	291	MET	2.9
1	D	289	SER	2.9
1	C	107	GLU	2.9
1	A	149	LEU	2.9
1	D	268	THR	2.8
1	C	255	ALA	2.8
1	D	239	CYS	2.8
1	C	216	GLY	2.8
1	A	287	MET	2.8
1	B	258	LEU	2.8
1	C	178	LEU	2.8

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Mol	Chain	Res	Type	RSRZ
1	D	247	ILE	2.8
1	D	295	ILE	2.8
1	A	263	THR	2.8
1	D	296	PRO	2.8
1	C	142	GLN	2.8
1	D	191	ARG	2.8
1	A	169	TRP	2.8
1	A	265	VAL	2.8
1	C	289	SER	2.7
1	D	175	HIS	2.7
1	D	109	LYS	2.7
1	B	278	ILE	2.7
1	C	116	ILE	2.7
1	D	130	LYS	2.7
1	D	158	VAL	2.7
1	C	206	THR	2.7
1	D	206	THR	2.7
1	B	290	LEU	2.7
1	A	209	VAL	2.7
1	A	228	ALA	2.6
1	A	127	LEU	2.6
1	B	117	LEU	2.6
1	A	125	ILE	2.6
1	A	279	ILE	2.6
1	A	183	GLY	2.6
1	B	150	VAL	2.6
1	B	281	ARG	2.6
1	D	214	LYS	2.6
1	A	212	ILE	2.6
1	D	132	ILE	2.6
1	D	279	ILE	2.6
1	A	297	GLU	2.6
1	B	209	VAL	2.6
1	C	264	VAL	2.6
1	B	288	LYS	2.6
1	C	288	LYS	2.6
1	C	128	ARG	2.6
1	C	140	LEU	2.6
1	A	167	ALA	2.6
1	A	134	ASN	2.6
1	D	171	SER	2.6
1	D	263	THR	2.6

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Mol	Chain	Res	Type	RSRZ
1	D	195	PHE	2.5
1	A	178	LEU	2.5
1	C	149	LEU	2.5
1	A	176	LYS	2.5
1	B	267	ILE	2.5
1	C	247	ILE	2.5
1	D	245	ASN	2.5
1	D	252	SER	2.5
1	D	113	ARG	2.5
1	B	232	LEU	2.5
1	C	129	LEU	2.5
1	D	147	ALA	2.5
1	D	222	VAL	2.5
1	B	182	PHE	2.5
1	A	254	ILE	2.5
1	C	252	SER	2.5
1	D	270	MET	2.5
1	D	156	ASP	2.5
1	A	111	GLY	2.4
1	D	153	ARG	2.4
1	C	295	ILE	2.4
1	D	207	GLY	2.4
1	B	208	HIS	2.4
1	D	157	GLN	2.4
1	A	249	LEU	2.4
1	C	117	LEU	2.4
1	A	275	PHE	2.4
1	D	194	PRO	2.4
1	C	261	SER	2.4
1	D	170	SER	2.4
1	D	179	LYS	2.4
1	B	115	VAL	2.4
1	B	231	GLY	2.4
1	D	201	MET	2.4
1	D	166	CYS	2.4
1	B	249	LEU	2.3
1	B	255	ALA	2.3
1	C	228	ALA	2.3
1	A	177	VAL	2.3
1	D	184	GLU	2.3
1	D	187	THR	2.3
1	A	255	ALA	2.3

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Mol	Chain	Res	Type	RSRZ
1	C	199	ILE	2.3
1	B	296	PRO	2.3
1	D	282	MET	2.3
1	C	223	LYS	2.3
1	A	118	CYS	2.3
1	A	117	LEU	2.3
1	B	257	ILE	2.3
1	C	168	GLY	2.3
1	D	199	ILE	2.3
1	D	221	ILE	2.3
1	A	184	GLU	2.3
1	D	160	GLN	2.3
1	A	206	THR	2.3
1	D	124	LYS	2.3
1	D	259	SER	2.2
1	A	161	ILE	2.2
1	D	274	ILE	2.2
1	B	198	THR	2.2
1	B	266	THR	2.2
1	B	205	SER	2.2
1	A	227	ALA	2.2
1	C	147	ALA	2.2
1	C	227	ALA	2.2
1	A	179	LYS	2.2
1	C	201	MET	2.2
1	A	298	VAL	2.2
1	B	260	THR	2.2
1	D	110	GLN	2.2
1	C	210	GLY	2.2
1	A	272	ALA	2.2
1	A	269	ILE	2.2
1	A	165	ASN	2.2
1	A	166	CYS	2.2
1	D	188	MET	2.1
1	B	275	PHE	2.1
1	C	137	PHE	2.1
1	A	186	ILE	2.1
1	A	210	GLY	2.1
1	C	214	LYS	2.1
1	D	281	ARG	2.1
1	A	247	ILE	2.1
1	C	220	SER	2.1

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Mol	Chain	Res	Type	RSRZ
1	C	298	VAL	2.1
1	D	243	GLY	2.1
1	A	173	LYS	2.1
1	D	203	LYS	2.1
1	D	143	ALA	2.1
1	A	211	PHE	2.1
1	C	241	ILE	2.1
1	A	205	SER	2.1
1	A	259	SER	2.1
1	C	197	ARG	2.1
1	D	119	LYS	2.1
1	C	291	MET	2.1
1	C	184	GLU	2.0
1	D	219	THR	2.0
1	C	237	ASN	2.0
1	C	290	LEU	2.0
1	B	197	ARG	2.0
1	B	227	ALA	2.0
1	C	122	ASP	2.0
1	C	256	ASP	2.0
1	B	226	SER	2.0
1	D	220	SER	2.0
1	C	154	PHE	2.0
1	C	146	PRO	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](#)

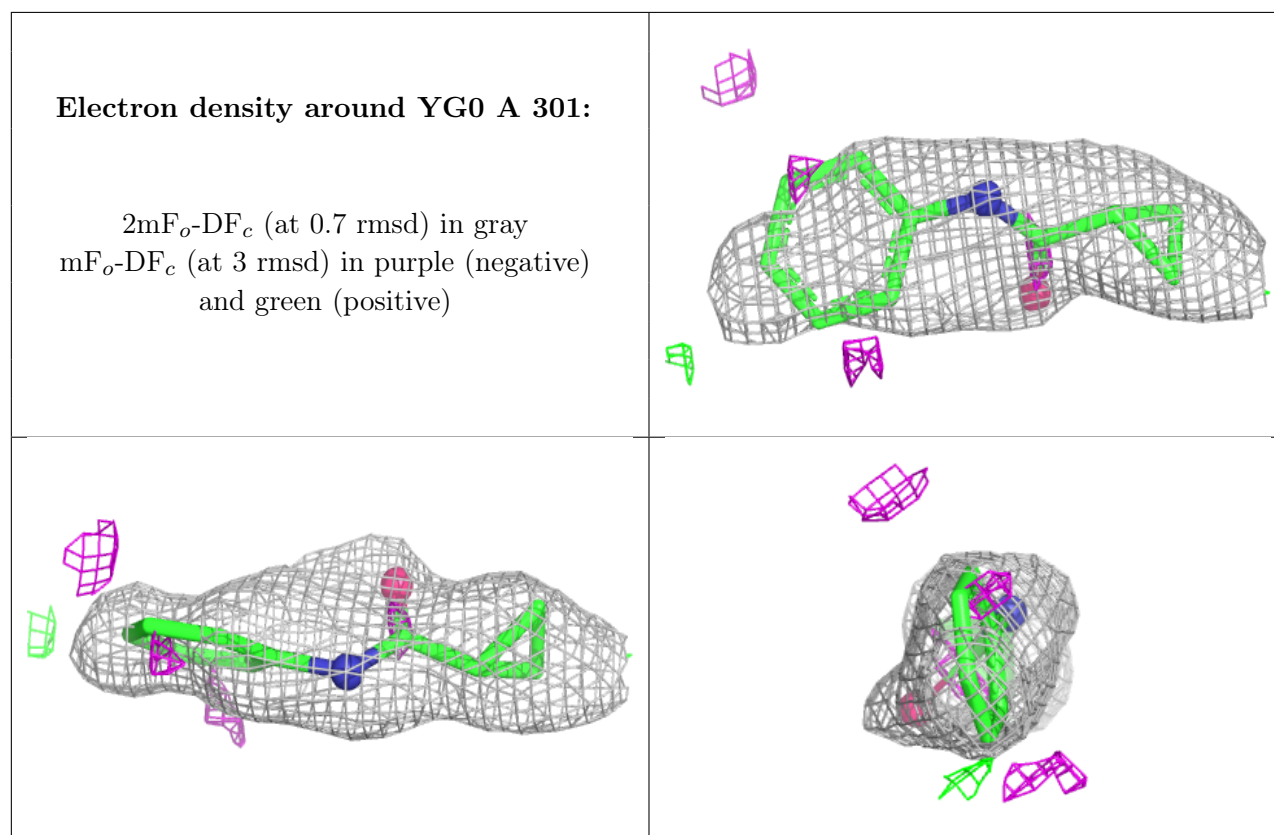
There are no oligosaccharides in this entry.

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(\AA^2)	Q<0.9
4	DGL	D	306	10/10	0.58	0.18	62,89,102,105	0
7	ALA	D	305	6/6	0.60	0.20	73,74,80,83	0
6	SO4	D	304	5/5	0.61	0.14	51,64,71,92	0
3	EDO	C	301	4/4	0.65	0.22	46,52,56,58	0
5	GLY	C	303	5/5	0.71	0.15	59,61,69,71	0
4	DGL	B	303	10/10	0.73	0.16	44,60,68,72	0
6	SO4	D	303	5/5	0.73	0.11	84,85,89,102	0
2	YG0	A	301	12/12	0.82	0.19	43,55,61,64	0
5	GLY	D	307	5/5	0.85	0.14	57,62,66,69	0
3	EDO	C	302	4/4	0.85	0.15	47,47,51,54	0
3	EDO	D	302	4/4	0.86	0.14	51,55,57,61	0
3	EDO	D	301	4/4	0.87	0.13	42,49,50,51	0
3	EDO	B	301	4/4	0.91	0.12	38,44,44,54	0
3	EDO	A	302	4/4	0.93	0.10	47,49,52,54	0
3	EDO	B	302	4/4	0.97	0.07	40,41,42,49	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.