



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 8, 2026 – 02:05 PM UTC

PDB ID : 6PT1 / pdb_00006pt1
Title : Crystal Structure of Class D Beta-lactamase OXA-48 with Meropenem
Authors : Akhtar, A.; Chen, Y.
Deposited on : 2019-07-14
Resolution : 2.00 Å(reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

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

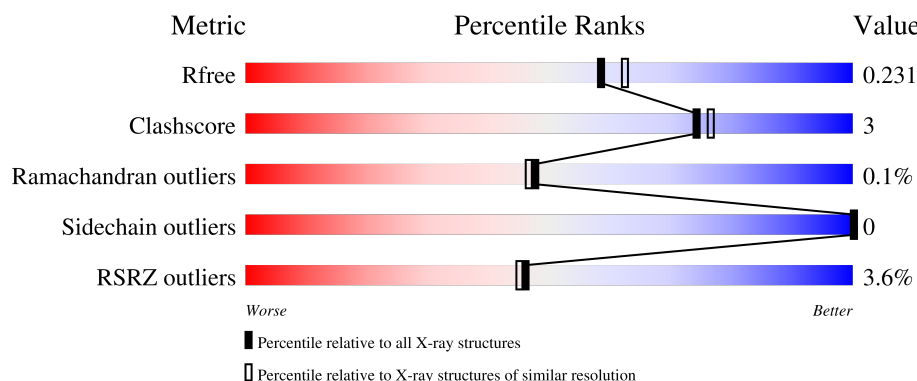
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

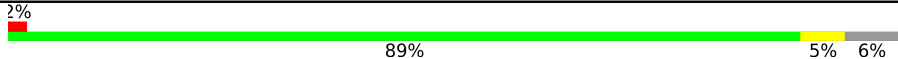
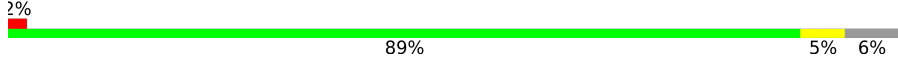
The reported resolution of this entry is 2.00 Å.

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	10052 (2.00-2.00)
Clashscore	190562	11152 (2.00-2.00)
Ramachandran outliers	187476	11031 (2.00-2.00)
Sidechain outliers	187428	11029 (2.00-2.00)
RSRZ outliers	180081	10067 (2.00-2.00)

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	263	
1	B	263	
1	C	263	
1	D	263	

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	CL	B	301	-	-	X	-
2	CL	D	301	-	-	X	-

2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 8729 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 Class D Carbapenemase OXA-48.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	247	Total	C	N	O	S	0	1	0
			2033	1297	359	370	7			
1	B	244	Total	C	N	O	S	0	2	0
			2007	1279	353	368	7			
1	C	247	Total	C	N	O	S	0	0	0
			2019	1289	355	368	7			
1	D	244	Total	C	N	O	S	0	1	0
			2004	1277	353	367	7			

There are 88 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	3	MET	-	initiating methionine	UNP A0A482LRD5
A	4	LYS	-	expression tag	UNP A0A482LRD5
A	5	HIS	-	expression tag	UNP A0A482LRD5
A	6	HIS	-	expression tag	UNP A0A482LRD5
A	7	HIS	-	expression tag	UNP A0A482LRD5
A	8	HIS	-	expression tag	UNP A0A482LRD5
A	9	HIS	-	expression tag	UNP A0A482LRD5
A	10	HIS	-	expression tag	UNP A0A482LRD5
A	11	MET	-	expression tag	UNP A0A482LRD5
A	12	HIS	-	expression tag	UNP A0A482LRD5
A	13	HIS	-	expression tag	UNP A0A482LRD5
A	14	HIS	-	expression tag	UNP A0A482LRD5
A	15	HIS	-	expression tag	UNP A0A482LRD5
A	16	HIS	-	expression tag	UNP A0A482LRD5
A	17	HIS	-	expression tag	UNP A0A482LRD5
A	18	GLU	-	expression tag	UNP A0A482LRD5
A	19	ASN	-	expression tag	UNP A0A482LRD5
A	20	LEU	-	expression tag	UNP A0A482LRD5
A	21	TYR	-	expression tag	UNP A0A482LRD5
A	22	PHE	-	expression tag	UNP A0A482LRD5
A	23	GLN	-	expression tag	UNP A0A482LRD5

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Chain	Residue	Modelled	Actual	Comment	Reference
A	24	GLY	-	expression tag	UNP A0A482LRD5
B	3	MET	-	initiating methionine	UNP A0A482LRD5
B	4	LYS	-	expression tag	UNP A0A482LRD5
B	5	HIS	-	expression tag	UNP A0A482LRD5
B	6	HIS	-	expression tag	UNP A0A482LRD5
B	7	HIS	-	expression tag	UNP A0A482LRD5
B	8	HIS	-	expression tag	UNP A0A482LRD5
B	9	HIS	-	expression tag	UNP A0A482LRD5
B	10	HIS	-	expression tag	UNP A0A482LRD5
B	11	MET	-	expression tag	UNP A0A482LRD5
B	12	HIS	-	expression tag	UNP A0A482LRD5
B	13	HIS	-	expression tag	UNP A0A482LRD5
B	14	HIS	-	expression tag	UNP A0A482LRD5
B	15	HIS	-	expression tag	UNP A0A482LRD5
B	16	HIS	-	expression tag	UNP A0A482LRD5
B	17	HIS	-	expression tag	UNP A0A482LRD5
B	18	GLU	-	expression tag	UNP A0A482LRD5
B	19	ASN	-	expression tag	UNP A0A482LRD5
B	20	LEU	-	expression tag	UNP A0A482LRD5
B	21	TYR	-	expression tag	UNP A0A482LRD5
B	22	PHE	-	expression tag	UNP A0A482LRD5
B	23	GLN	-	expression tag	UNP A0A482LRD5
B	24	GLY	-	expression tag	UNP A0A482LRD5
C	3	MET	-	initiating methionine	UNP A0A482LRD5
C	4	LYS	-	expression tag	UNP A0A482LRD5
C	5	HIS	-	expression tag	UNP A0A482LRD5
C	6	HIS	-	expression tag	UNP A0A482LRD5
C	7	HIS	-	expression tag	UNP A0A482LRD5
C	8	HIS	-	expression tag	UNP A0A482LRD5
C	9	HIS	-	expression tag	UNP A0A482LRD5
C	10	HIS	-	expression tag	UNP A0A482LRD5
C	11	MET	-	expression tag	UNP A0A482LRD5
C	12	HIS	-	expression tag	UNP A0A482LRD5
C	13	HIS	-	expression tag	UNP A0A482LRD5
C	14	HIS	-	expression tag	UNP A0A482LRD5
C	15	HIS	-	expression tag	UNP A0A482LRD5
C	16	HIS	-	expression tag	UNP A0A482LRD5
C	17	HIS	-	expression tag	UNP A0A482LRD5
C	18	GLU	-	expression tag	UNP A0A482LRD5
C	19	ASN	-	expression tag	UNP A0A482LRD5
C	20	LEU	-	expression tag	UNP A0A482LRD5
C	21	TYR	-	expression tag	UNP A0A482LRD5

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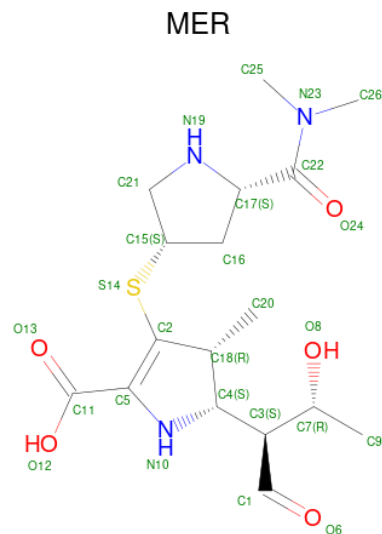
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Chain	Residue	Modelled	Actual	Comment	Reference
C	22	PHE	-	expression tag	UNP A0A482LRD5
C	23	GLN	-	expression tag	UNP A0A482LRD5
C	24	GLY	-	expression tag	UNP A0A482LRD5
D	3	MET	-	initiating methionine	UNP A0A482LRD5
D	4	LYS	-	expression tag	UNP A0A482LRD5
D	5	HIS	-	expression tag	UNP A0A482LRD5
D	6	HIS	-	expression tag	UNP A0A482LRD5
D	7	HIS	-	expression tag	UNP A0A482LRD5
D	8	HIS	-	expression tag	UNP A0A482LRD5
D	9	HIS	-	expression tag	UNP A0A482LRD5
D	10	HIS	-	expression tag	UNP A0A482LRD5
D	11	MET	-	expression tag	UNP A0A482LRD5
D	12	HIS	-	expression tag	UNP A0A482LRD5
D	13	HIS	-	expression tag	UNP A0A482LRD5
D	14	HIS	-	expression tag	UNP A0A482LRD5
D	15	HIS	-	expression tag	UNP A0A482LRD5
D	16	HIS	-	expression tag	UNP A0A482LRD5
D	17	HIS	-	expression tag	UNP A0A482LRD5
D	18	GLU	-	expression tag	UNP A0A482LRD5
D	19	ASN	-	expression tag	UNP A0A482LRD5
D	20	LEU	-	expression tag	UNP A0A482LRD5
D	21	TYR	-	expression tag	UNP A0A482LRD5
D	22	PHE	-	expression tag	UNP A0A482LRD5
D	23	GLN	-	expression tag	UNP A0A482LRD5
D	24	GLY	-	expression tag	UNP A0A482LRD5

- Molecule 2 is CHLORIDE ION (CCD ID: CL) (formula: Cl).

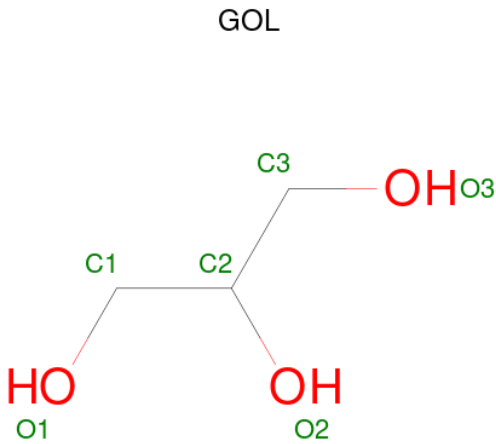
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	2	Total Cl 2 2	0	0
2	B	1	Total Cl 1 1	0	0
2	C	2	Total Cl 2 2	0	0
2	D	1	Total Cl 1 1	0	0

- Molecule 3 is (4R,5S)-3-{[(3S,5S)-5-(dimethylcarbamoyl)pyrrolidin-3-yl]sulfanyl}-5-[(2S,3R)-3-hydroxy-1-oxobutan-2-yl]-4-methyl-4,5-dihydro-1H-pyrrole-2-carboxylic acid (CCD ID: MER) (formula: C₁₇H₂₇N₃O₅S) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total 26	C 17	N 3	O 5	S 1	0	0
3	B	1	Total 26	C 17	N 3	O 5	S 1	0	0
3	C	1	Total 26	C 17	N 3	O 5	S 1	0	0
3	D	1	Total 26	C 17	N 3	O 5	S 1	0	0

- Molecule 4 is GLYCEROL (CCD ID: GOL) (formula: $\text{C}_3\text{H}_8\text{O}_3$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	C	1	Total	C	O	0	0
			6	3	3		
4	D	1	Total	C	O	0	0
			6	3	3		

- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	136	Total	O	0	0
			136	136		
5	B	137	Total	O	0	0
			137	137		
5	C	148	Total	O	0	0
			148	148		
5	D	123	Total	O	0	0
			123	123		

- Molecule 1: Class D Carbapenemase OXA-48



-

- [illegible]

- | | | | | | | | | | | | | | | | | | |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| MET | LYS | HIS | HIS | HIS | HIS | HIS | HIS | HIS | MET | HIS | HIS | HIS | HIS | HIS | HIS | GLU | ASN | LEU | TYR | F22 | F23 | F24 | F25 | F26 | W31 | Q53 | M57 | K73 | M15 | S118 | V119 | V120 | D148 | I149 | S150 | G151 | M152 | V153 | D154 | S155 | F156 | V157 | L158 | K208 | K218 | K259 | T627 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|

4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	59.80Å 106.51Å 95.83Å 90.00° 104.66° 90.00°	Depositor
Resolution (Å)	30.99 – 2.00 30.99 – 2.00	Depositor EDS
% Data completeness (in resolution range)	99.1 (30.99-2.00) 99.3 (30.99-2.00)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.23 (at 2.00Å)	Xtriage
Refinement program	PHENIX 1.16_3549	Depositor
R, R_{free}	0.187 , 0.231 0.187 , 0.231	Depositor DCC
R_{free} test set	2000 reflections (2.54%)	wwPDB-VP
Wilson B-factor (Å ²)	26.1	Xtriage
Anisotropy	0.091	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.37 , 44.8	EDS
L-test for twinning ²	$\langle L \rangle = 0.51$, $\langle L^2 \rangle = 0.35$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	8729	wwPDB-VP
Average B, all atoms (Å ²)	35.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 9.42% 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: GOL, MER, CL

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	0.34	0/2085	0.49	0/2820
1	B	0.34	0/2057	0.51	1/2781 (0.0%)
1	C	0.36	0/2070	0.51	0/2800
1	D	0.33	0/2054	0.51	0/2777
All	All	0.34	0/8266	0.50	1/11178 (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	221	TRP	CA-CB-CG	5.00	123.11	113.60

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	2033	0	1979	15	0
1	B	2007	0	1952	12	0
1	C	2019	0	1967	8	0
1	D	2004	0	1952	14	0
2	A	2	0	0	0	0
2	B	1	0	0	2	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	C	2	0	0	0	0
2	D	1	0	0	3	0
3	A	26	0	25	2	0
3	B	26	0	25	0	0
3	C	26	0	25	0	0
3	D	26	0	25	0	0
4	C	6	0	8	1	0
4	D	6	0	8	0	0
5	A	136	0	0	0	0
5	B	137	0	0	1	0
5	C	148	0	0	0	0
5	D	123	0	0	1	0
All	All	8729	0	7966	50	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 3.

All (50) 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:73:LYS:NZ	2:B:301:CL:CL	2.40	0.91
1:D:73:LYS:NZ	2:D:301:CL:CL	2.39	0.90
1:D:157:TRP:NE1	2:D:301:CL:CL	2.47	0.84
1:B:157:TRP:NE1	2:B:301:CL:CL	2.55	0.76
1:D:152:ASN:HD22	1:D:154:ASP:HB3	1.53	0.73
1:B:139:LEU:HD12	1:B:149:ILE:HD11	1.72	0.72
1:A:115:MET:CE	1:A:194:ALA:C	2.65	0.70
1:A:115:MET:CE	1:A:194:ALA:O	2.39	0.70
1:A:115:MET:HE2	1:A:194:ALA:O	1.95	0.67
1:D:152:ASN:ND2	1:D:154:ASP:HB3	2.12	0.64
1:C:121:PRO:HB2	4:C:304:GOL:H31	1.86	0.57
1:A:115:MET:HE3	1:A:195:MET:HA	1.89	0.54
1:A:115:MET:CE	1:A:195:MET:HA	2.38	0.54
1:A:115:MET:HE2	1:A:194:ALA:C	2.32	0.54
1:C:31:TRP:HB2	1:C:57:ASN:HB3	1.91	0.53
1:A:237:MET:HE1	1:A:239:MET:HE3	1.90	0.52
1:B:159:ASP:HB3	1:B:214:ARG:HD3	1.91	0.51
1:B:31:TRP:HB2	1:B:57:ASN:HB3	1.93	0.51
1:A:115:MET:HE1	1:A:195:MET:N	2.28	0.49
1:B:156:PHE:HA	1:B:160:GLY:HA3	1.95	0.48
1:A:177:TYR:CZ	1:A:232:VAL:HG21	2.48	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:148:ASP:OD1	1:D:150:SER:HB3	2.12	0.48
1:A:115:MET:HE1	1:A:194:ALA:C	2.37	0.47
1:B:29:LYS:NZ	5:B:403:HOH:O	2.47	0.47
1:B:255:LYS:O	1:B:259:LYS:HG3	2.14	0.47
1:D:31:TRP:HB2	1:D:57:ASN:HB3	1.97	0.47
1:A:237:MET:HE1	1:A:239:MET:CE	2.45	0.46
1:B:177:TYR:CZ	1:B:232:VAL:HG21	2.50	0.46
1:D:22:PHE:O	1:D:53:GLN:NE2	2.39	0.45
1:D:120:VAL:HG22	2:D:301:CL:CL	2.54	0.45
1:D:152:ASN:O	1:D:156:PHE:HD1	2.00	0.45
1:B:149:ILE:HG23	1:B:156:PHE:CG	2.51	0.45
1:A:209:THR:OG1	3:A:303:MER:O12	2.27	0.45
1:A:220:GLY:O	1:A:238:ASN:HA	2.17	0.44
1:A:25:TRP:CE3	1:A:54:GLY:HA3	2.52	0.44
1:B:73:LYS:HE2	1:B:118:SER:C	2.42	0.44
1:C:138:MET:HA	1:C:138:MET:HE2	2.00	0.44
1:B:115:MET:HE3	1:B:115:MET:HB3	1.87	0.44
1:D:259:LYS:HE3	1:D:265:PRO:O	2.18	0.43
1:A:31:TRP:HB2	1:A:57:ASN:HB3	2.00	0.43
1:C:25:TRP:CE3	1:C:54:GLY:HA3	2.54	0.43
1:C:220:GLY:O	1:C:238:ASN:HA	2.19	0.42
1:D:155:SER:O	1:D:155:SER:OG	2.37	0.42
1:D:118:SER:HG	1:D:208:LYS:HZ1	1.64	0.42
3:A:303:MER:H20	3:A:303:MER:O8	2.20	0.41
1:C:170:ILE:O	1:C:174:ARG:HG3	2.21	0.41
1:D:115:MET:HE3	1:D:115:MET:HB3	1.83	0.41
1:D:218:LYS:NZ	5:D:411:HOH:O	2.52	0.41
1:C:115:MET:HG2	1:C:123:TYR:OH	2.21	0.41
1:C:157:TRP:HA	1:C:162:ILE:CG2	2.52	0.40

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	246/263 (94%)	241 (98%)	5 (2%)	0	100	100
1	B	244/263 (93%)	237 (97%)	6 (2%)	1 (0%)	30	27
1	C	245/263 (93%)	240 (98%)	5 (2%)	0	100	100
1	D	243/263 (92%)	237 (98%)	6 (2%)	0	100	100
All	All	978/1052 (93%)	955 (98%)	22 (2%)	1 (0%)	48	46

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	149	ILE

5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	216/231 (94%)	216 (100%)	0	100	100
1	B	213/231 (92%)	213 (100%)	0	100	100
1	C	214/231 (93%)	214 (100%)	0	100	100
1	D	213/231 (92%)	213 (100%)	0	100	100
All	All	856/924 (93%)	856 (100%)	0	100	100

There are no protein residues with a non-rotameric sidechain to report.

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (10) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	32	ASN
1	A	90	HIS
1	A	182	HIS
1	B	38	HIS
1	B	41	GLN
1	C	19	ASN
1	C	52	GLN

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Mol	Chain	Res	Type
1	D	23	GLN
1	D	26	GLN
1	D	152	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 oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 12 ligands modelled in this entry, 6 are monoatomic - leaving 6 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z > 2$	Counts	RMSZ	$\# Z > 2$
4	GOL	C	304	-	5,5,5	0.89	0	5,5,5	1.07	0
3	MER	B	302	1	22,27,27	1.07	1 (4%)	20,39,39	0.70	0
3	MER	A	303	1	22,27,27	0.98	1 (4%)	20,39,39	0.96	1 (5%)
4	GOL	D	303	-	5,5,5	1.05	0	5,5,5	0.86	0
3	MER	D	302	1	22,27,27	1.09	1 (4%)	20,39,39	0.90	1 (5%)
3	MER	C	303	1	22,27,27	0.98	1 (4%)	20,39,39	0.87	1 (5%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns.

'-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	GOL	C	304	-	-	0/4/4/4	-
3	MER	B	302	1	-	10/23/51/51	0/2/2/2
3	MER	A	303	1	-	6/23/51/51	0/2/2/2
4	GOL	D	303	-	-	2/4/4/4	-
3	MER	D	302	1	-	10/23/51/51	0/2/2/2
3	MER	C	303	1	-	3/23/51/51	0/2/2/2

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	B	302	MER	C5-C11	3.41	1.53	1.48
3	D	302	MER	C5-C11	3.29	1.53	1.48
3	A	303	MER	C5-C11	3.16	1.53	1.48
3	C	303	MER	C5-C11	2.86	1.52	1.48

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	D	302	MER	C18-C4-N10	-2.35	103.26	105.07
3	C	303	MER	C18-C4-N10	-2.26	103.32	105.07
3	A	303	MER	C18-C4-N10	-2.16	103.40	105.07

There are no chirality outliers.

All (31) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	303	MER	C5-C2-S14-C15
3	A	303	MER	C7-C3-C4-C18
3	A	303	MER	O12-C11-C5-C2
3	A	303	MER	O12-C11-C5-N10
3	A	303	MER	O13-C11-C5-N10
3	B	302	MER	C7-C3-C4-C18
3	B	302	MER	O12-C11-C5-C2
3	B	302	MER	O13-C11-C5-C2
3	B	302	MER	O12-C11-C5-N10
3	B	302	MER	O13-C11-C5-N10
3	B	302	MER	C17-C22-N23-C25
3	B	302	MER	C17-C22-N23-C26
3	B	302	MER	O24-C22-N23-C25

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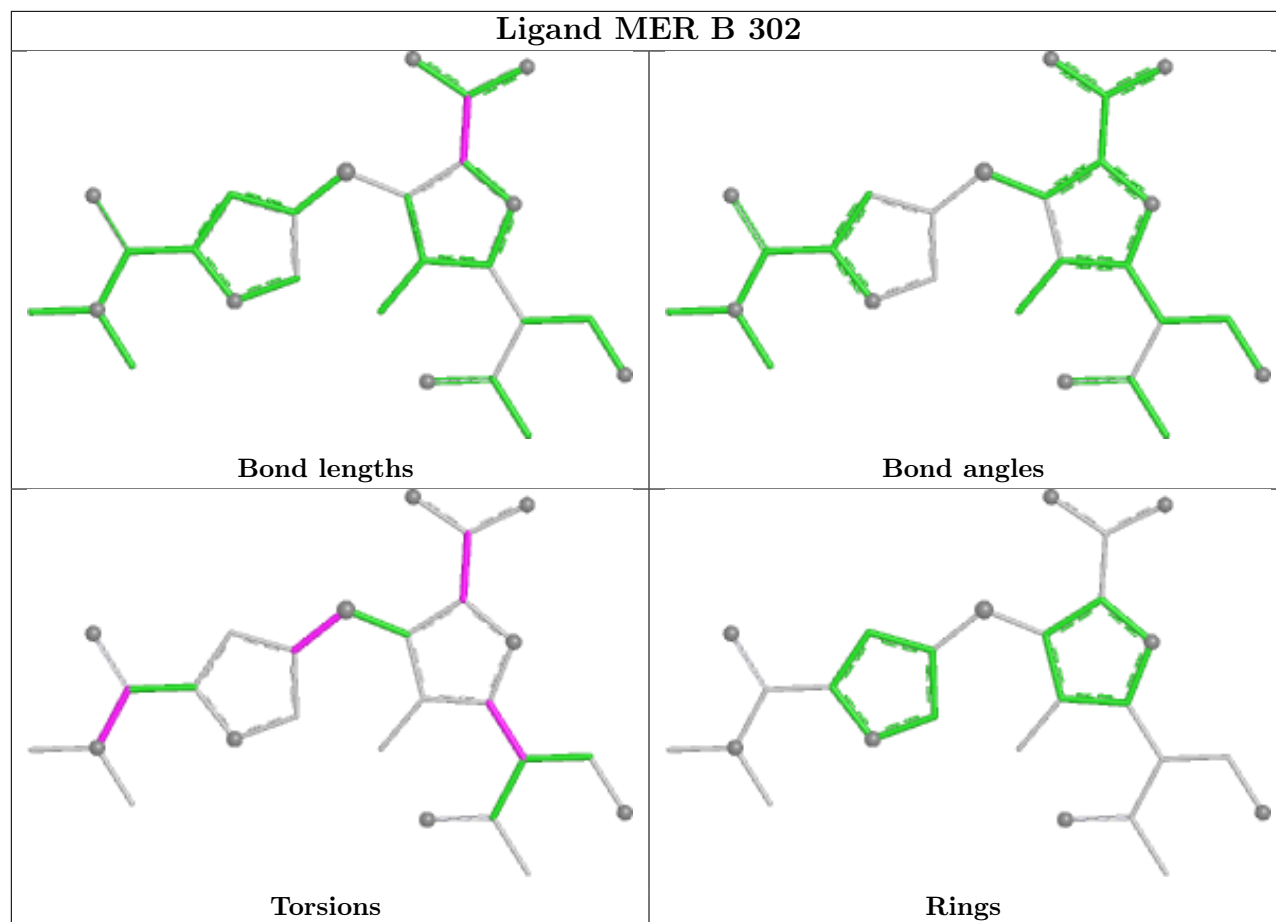
Mol	Chain	Res	Type	Atoms
3	B	302	MER	O24-C22-N23-C26
3	C	303	MER	C5-C2-S14-C15
3	C	303	MER	C7-C3-C4-C18
3	D	302	MER	C5-C2-S14-C15
3	D	302	MER	C7-C3-C4-C18
3	D	302	MER	O12-C11-C5-C2
3	D	302	MER	O13-C11-C5-C2
3	D	302	MER	O12-C11-C5-N10
3	D	302	MER	O13-C11-C5-N10
3	D	302	MER	C17-C22-N23-C25
3	D	302	MER	C17-C22-N23-C26
3	D	302	MER	O24-C22-N23-C25
3	D	302	MER	O24-C22-N23-C26
3	A	303	MER	O13-C11-C5-C2
3	B	302	MER	C21-C15-S14-C2
3	C	303	MER	C18-C2-S14-C15
4	D	303	GOL	O1-C1-C2-C3
4	D	303	GOL	O1-C1-C2-O2

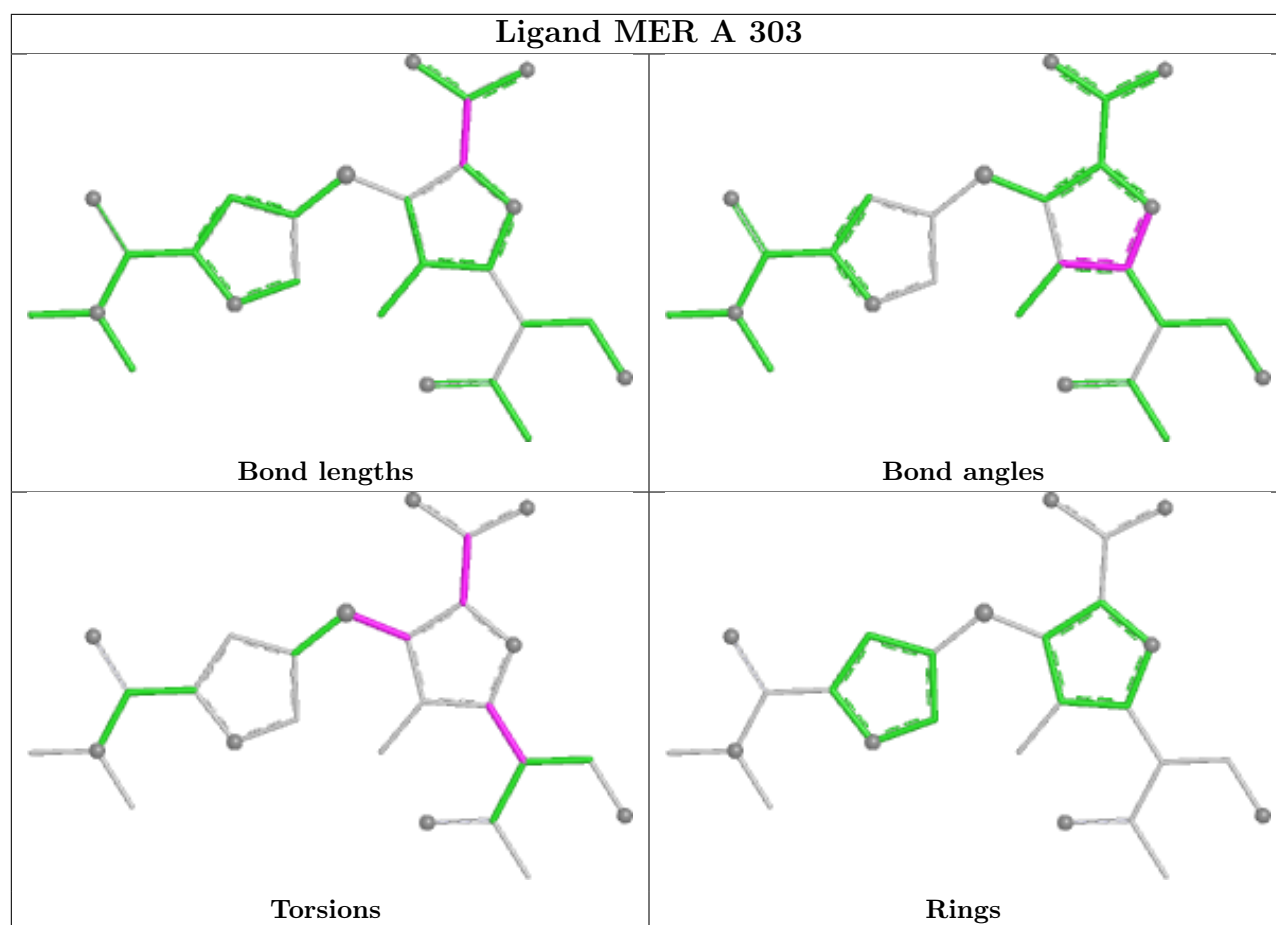
There are no ring outliers.

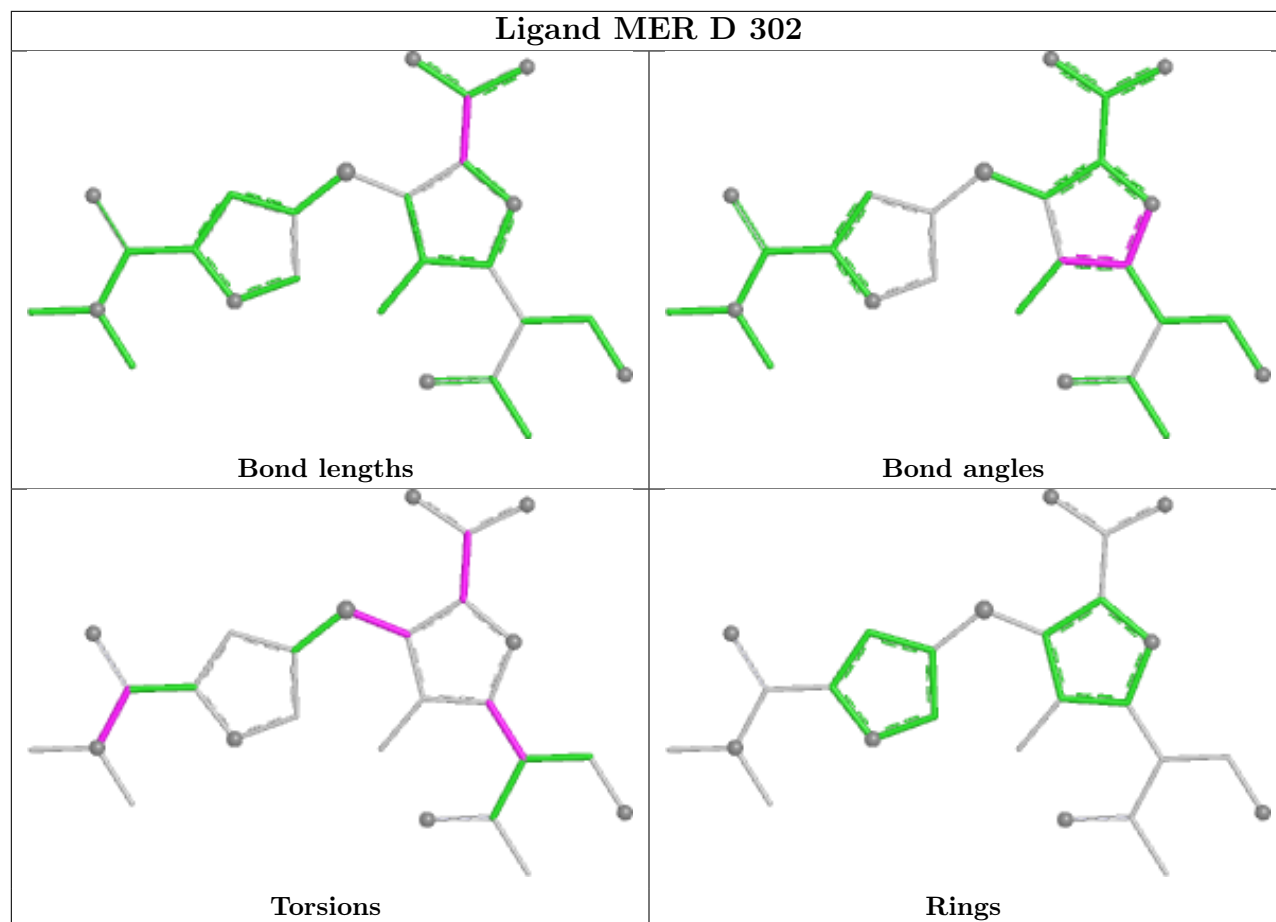
2 monomers are involved in 3 short contacts:

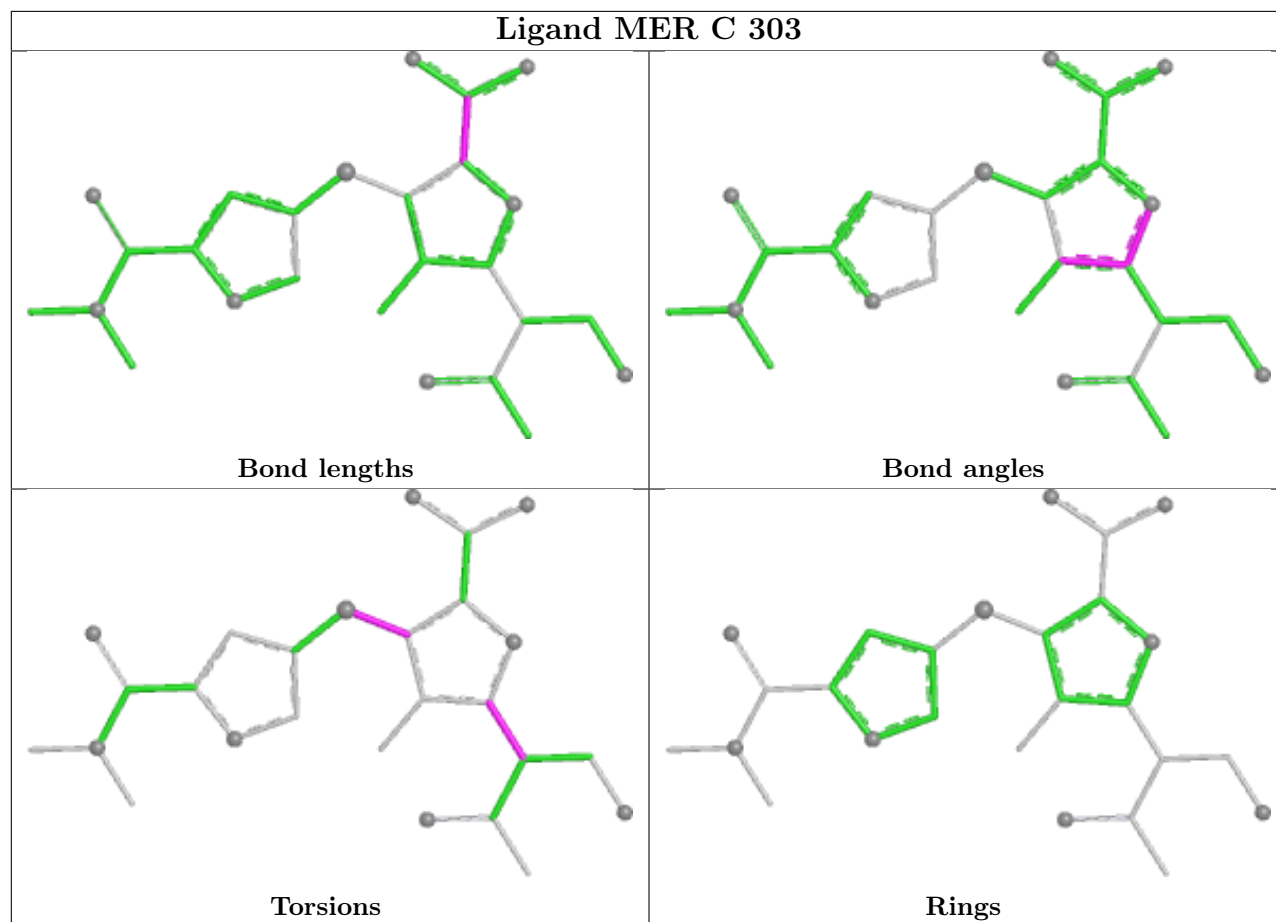
Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	C	304	GOL	1	0
3	A	303	MER	2	0

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	247/263 (93%)	-0.07	6 (2%) 59 59	17, 33, 56, 85	1 (0%)
1	B	244/263 (92%)	-0.07	11 (4%) 38 37	19, 32, 69, 93	2 (0%)
1	C	247/263 (93%)	-0.27	5 (2%) 65 64	19, 30, 53, 79	0
1	D	244/263 (92%)	0.02	13 (5%) 32 31	19, 32, 73, 94	1 (0%)
All	All	982/1052 (93%)	-0.10	35 (3%) 46 45	17, 32, 62, 94	4 (0%)

All (35) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	22	PHE	4.5
1	A	19	ASN	3.9
1	D	156	PHE	3.8
1	B	150	SER	3.6
1	D	151	GLY	3.5
1	A	20	LEU	3.4
1	D	149	ILE	3.4
1	B	151	GLY	3.4
1	B	153	VAL	3.3
1	B	152	ASN	3.3
1	B	157	TRP	3.3
1	D	157	TRP	3.2
1	D	158	LEU	3.1
1	B	158	LEU	3.1
1	D	153	VAL	3.1
1	C	20	LEU	3.0
1	A	21	TYR	2.6
1	B	149	ILE	2.6
1	C	97	GLY	2.5
1	C	19	ASN	2.5
1	A	23	GLN	2.4

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Mol	Chain	Res	Type	RSRZ
1	B	156	PHE	2.4
1	D	154	ASP	2.4
1	B	155	SER	2.4
1	D	152	ASN	2.3
1	C	21	TYR	2.3
1	B	148	ASP	2.3
1	B	154	ASP	2.3
1	D	24	GLY	2.3
1	C	95	TRP	2.3
1	A	22	PHE	2.2
1	A	97	GLY	2.1
1	D	26	GLN	2.1
1	D	150	SER	2.1
1	D	155	SER	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 oligosaccharides in this entry.

6.4 Ligands [i](#)

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

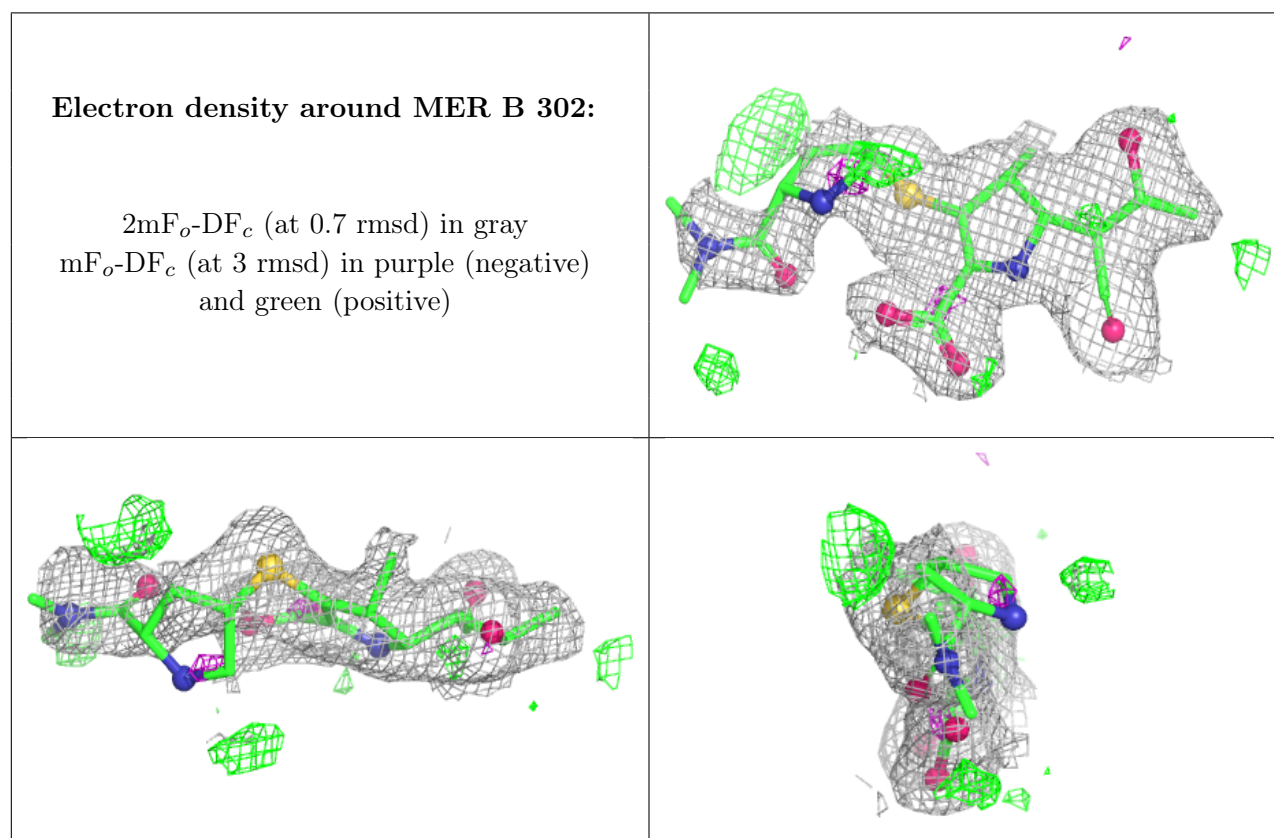
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
2	CL	D	301	1/1	0.83	0.16	70,70,70,70	0
4	GOL	C	304	6/6	0.85	0.15	39,42,44,51	0
3	MER	B	302	26/26	0.86	0.15	23,44,71,76	26
3	MER	D	302	26/26	0.88	0.14	28,45,73,77	0
3	MER	A	303	26/26	0.88	0.13	27,42,58,59	26
4	GOL	D	303	6/6	0.88	0.12	32,44,47,48	0
3	MER	C	303	26/26	0.90	0.10	27,38,50,51	26
2	CL	B	301	1/1	0.91	0.09	42,42,42,42	1
2	CL	A	302	1/1	0.96	0.06	35,35,35,35	1

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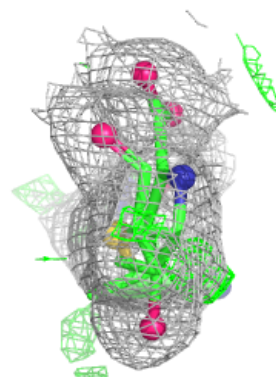
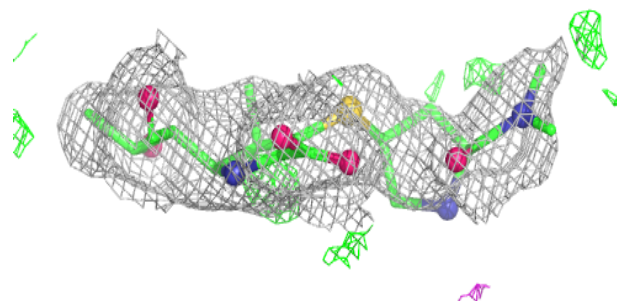
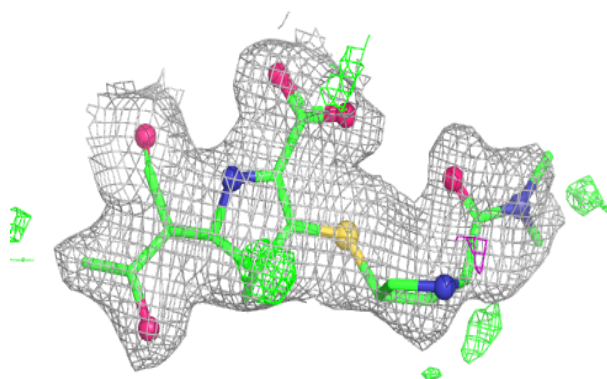
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
2	CL	C	302	1/1	0.97	0.06	38,38,38,38	0
2	CL	A	301	1/1	0.99	0.05	23,23,23,23	0
2	CL	C	301	1/1	0.99	0.04	23,23,23,23	0

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.

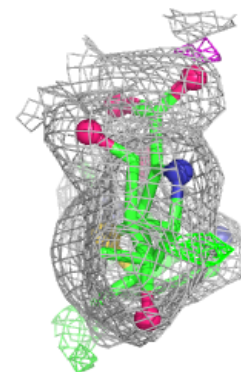
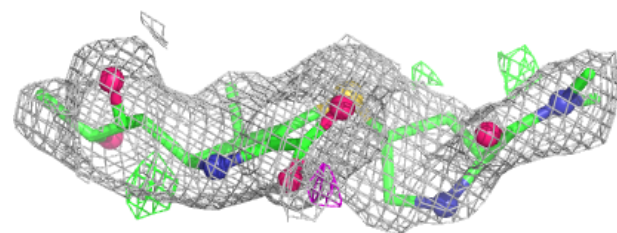
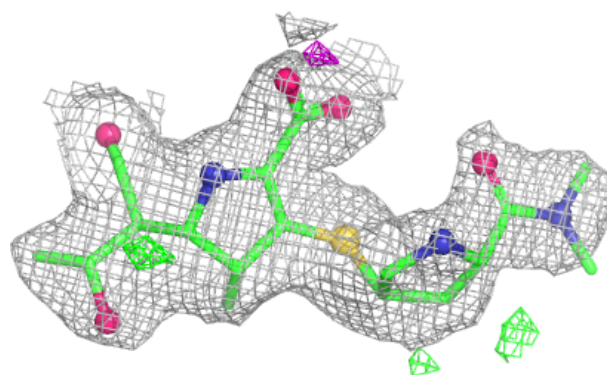


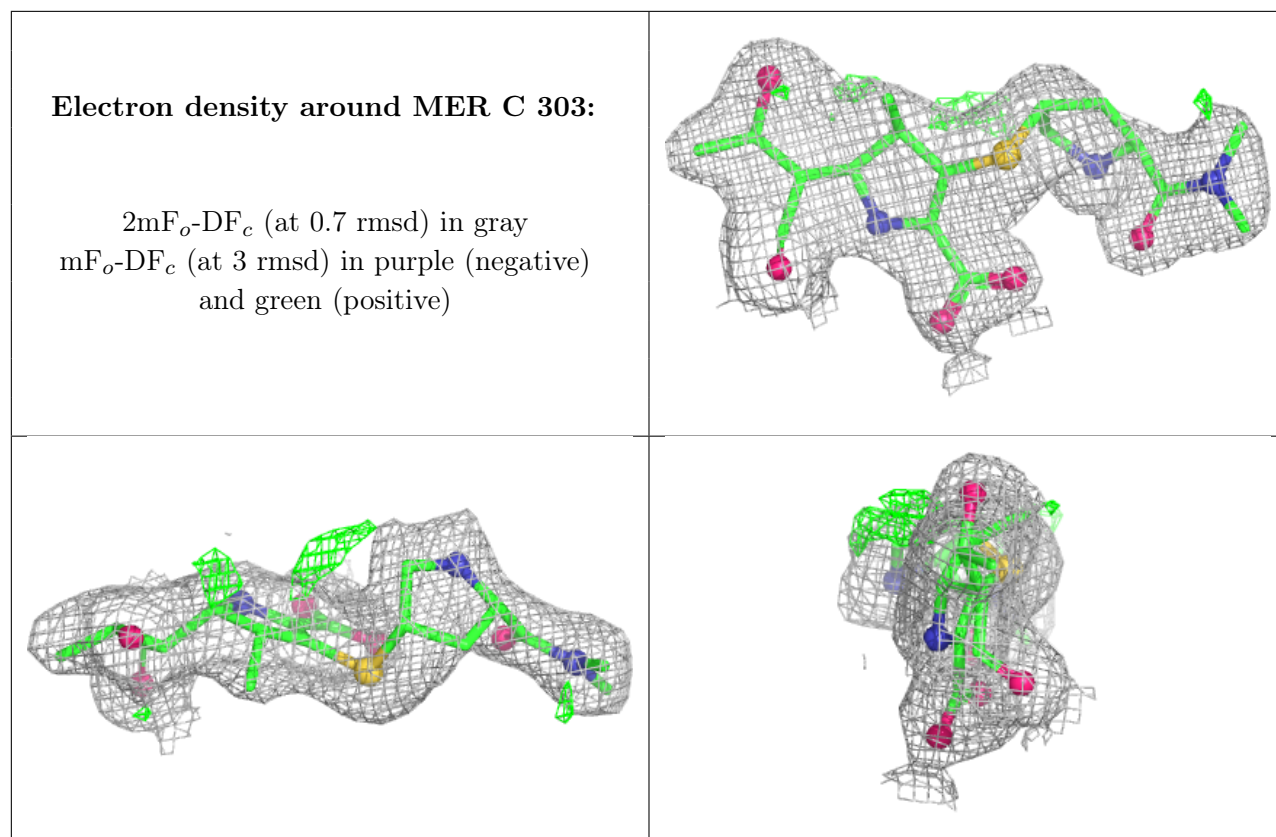
Electron density around MER D 302:

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

**Electron density around MER A 303:**

$2mF_o-DF_c$ (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.