Full wwPDB X-ray Structure Validation Report ⓘ

Jul 3, 2025 – 05:26 pm BST

PDB ID	:	9GA1 / pdb_00009ga1
Title	:	Structure of Pentameric Outer Membrane Protein A from Bdellovibrio bacteriovorus
Authors	:	Parr, R.J.; Lovering, A.L.
Deposited on	:	2024-07-26
Resolution	:	2.80 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:

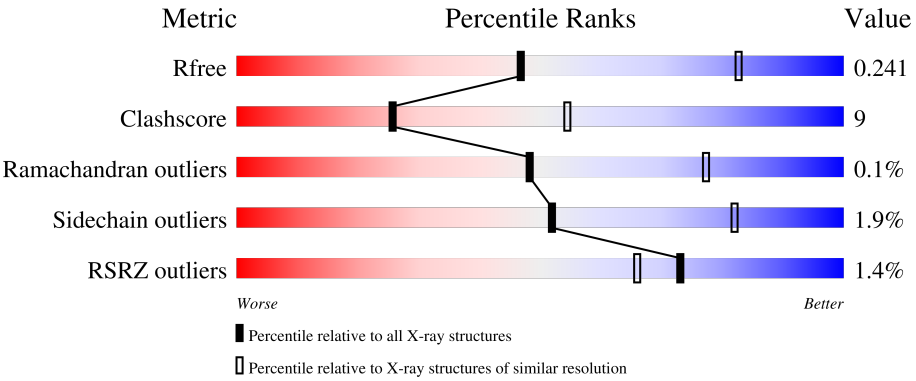
MolProbity	:	4-5-2 with Phenix2.0rc1
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	2.0rc1
EDS	:	3.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.003 (Gargrove)
Density-Fitness	:	1.0.11
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.44

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 2.80 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}	164625	3657 (2.80-2.80)
Clashscore	180529	4123 (2.80-2.80)
Ramachandran outliers	177936	4071 (2.80-2.80)
Sidechain outliers	177891	4073 (2.80-2.80)
RSRZ outliers	164620	3659 (2.80-2.80)

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 <=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	333	2% 84% 16%
1	B	333	83% 17%
1	C	333	80% 19%
1	D	333	2% 84% 16%
1	E	333	2% 83% 16%

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
3	OCT	B	402	-	-	-	X
3	OCT	C	403	-	-	-	X

2 Entry composition

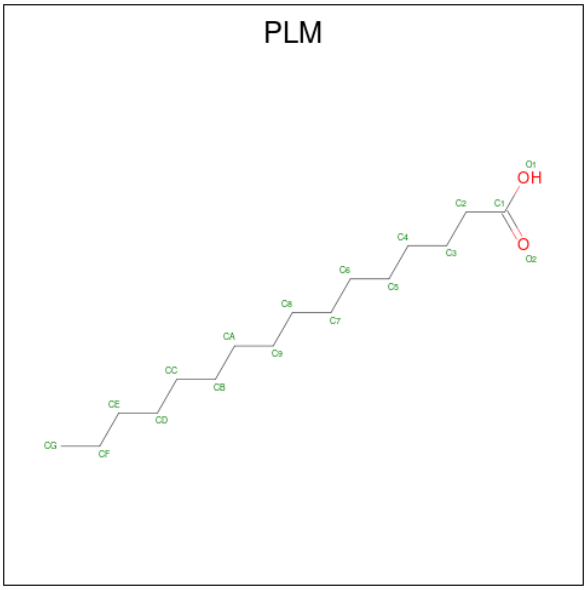
There are 6 unique types of molecules in this entry. The entry contains 13352 atoms, of which 155 are hydrogens and 0 are deuteriums.

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 Major outer membrane protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	333	Total	C	N	O	Se	0	1	0
			2532	1581	425	517	9			
1	B	333	Total	C	N	O	Se	0	2	0
			2540	1585	427	519	9			
1	C	333	Total	C	N	O	Se	0	1	0
			2532	1581	425	517	9			
1	D	333	Total	C	N	O	Se	0	0	0
			2524	1577	423	515	9			
1	E	333	Total	C	N	O	Se	0	0	0
			2524	1577	423	515	9			

- Molecule 2 is PALMITIC ACID (CCD ID: PLM) (formula: $C_{16}H_{32}O_2$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total	C	H	O	0	0
			49	16	31	2		

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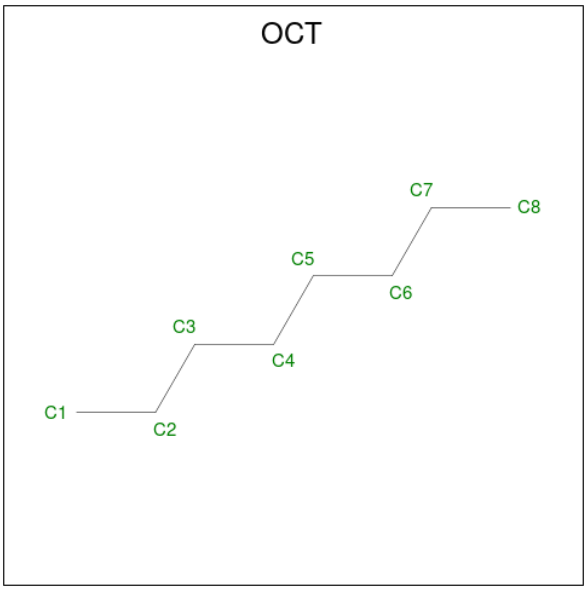
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	B	1	Total C H O 49 16 31 2	0	0
2	C	1	Total C H O 49 16 31 2	0	0
2	D	1	Total C H O 49 16 31 2	0	0
2	E	1	Total C H O 49 16 31 2	0	0

- Molecule 3 is N-OCTANE (CCD ID: OCT) (formula: C_8H_{18}).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total C 8 8	0	0
3	A	1	Total C 8 8	0	0
3	A	1	Total C 8 8	0	0
3	B	1	Total C 8 8	0	0
3	C	1	Total C 8 8	0	0
3	C	1	Total C 8 8	0	0
3	D	1	Total C 8 8	0	0

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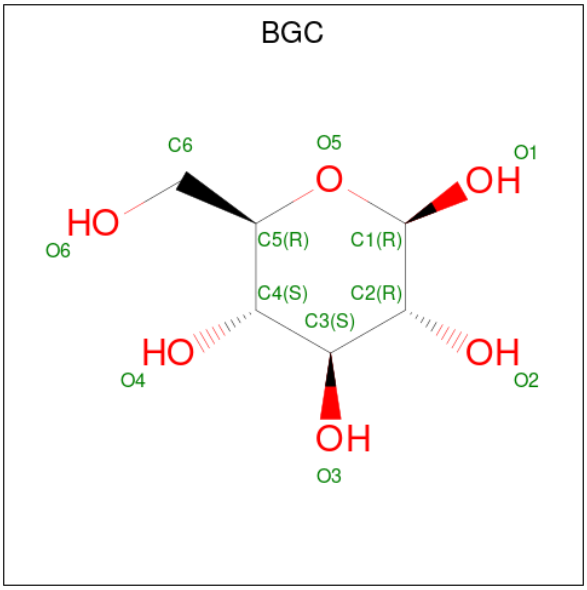
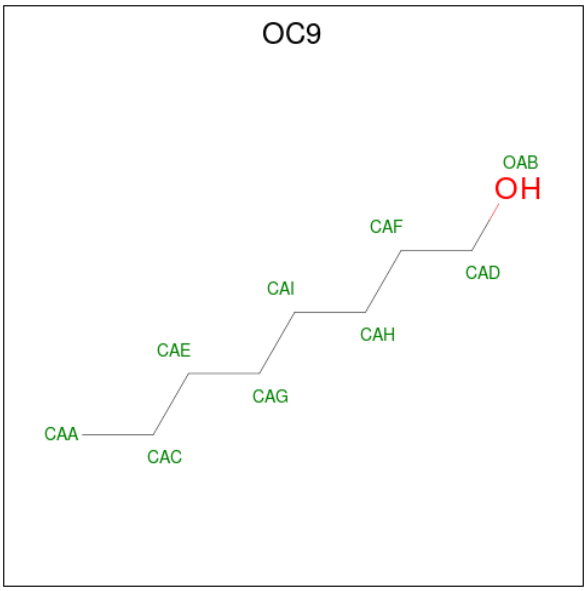
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	D	1	Total C 8 8	0	0
3	D	1	Total C 8 8	0	0
3	E	1	Total C 8 8	0	0

- Molecule 4 is beta-D-glucopyranose (CCD ID: BGC) (formula: $C_6H_{12}O_6$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total C O 11 6 5	0	0
4	B	1	Total C O 11 6 5	0	0
4	D	1	Total C O 11 6 5	0	0
4	E	1	Total C O 11 6 5	0	0

- Molecule 5 is OCTAN-1-OL (CCD ID: OC9) (formula: $C_8H_{18}O$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	1	Total C O 9 8 1	0	0
5	C	1	Total C O 9 8 1	0	0
5	D	1	Total C O 9 8 1	0	0
5	E	1	Total C O 9 8 1	0	0

- Molecule 6 is water.

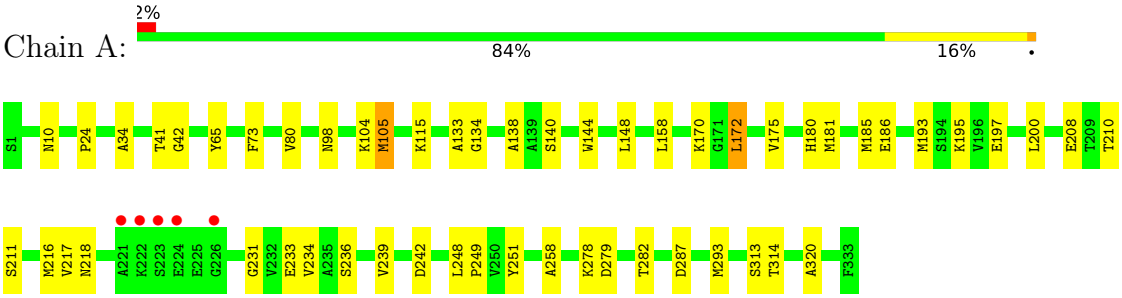
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	65	Total O 65 65	0	0
6	B	69	Total O 69 69	0	0
6	C	50	Total O 50 50	0	0
6	D	49	Total O 49 49	0	0
6	E	62	Total O 62 62	0	0

3 Residue-property plots (i)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density (RSRZ > 2). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

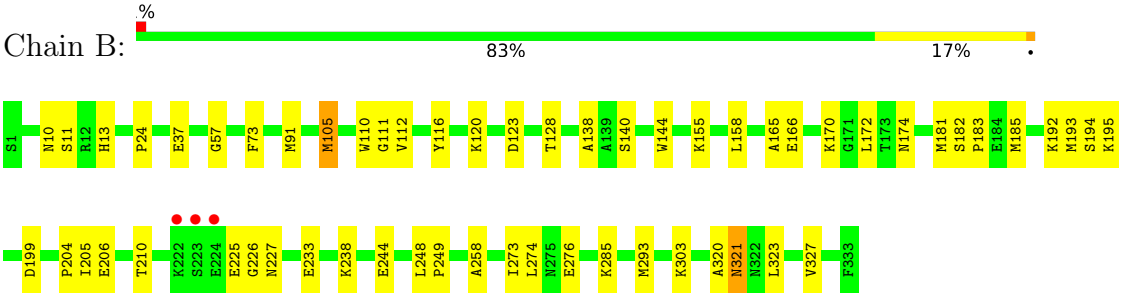
• Molecule 1: Major outer membrane protein

Chain A:



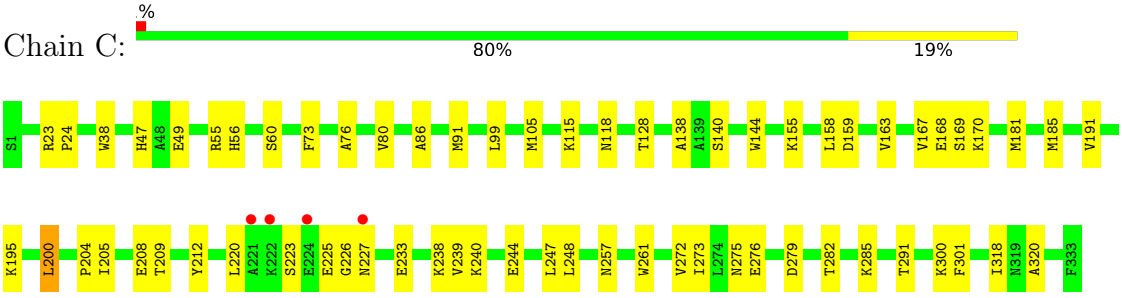
• Molecule 1: Major outer membrane protein

Chain B:



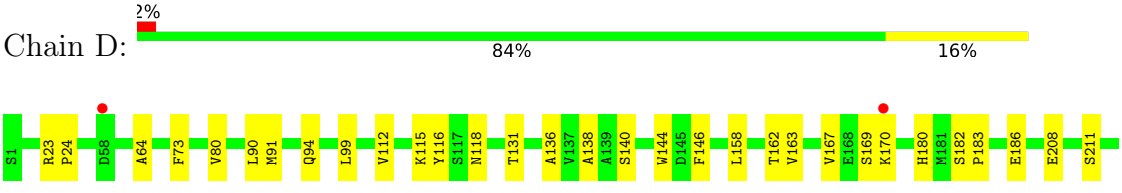
• Molecule 1: Major outer membrane protein

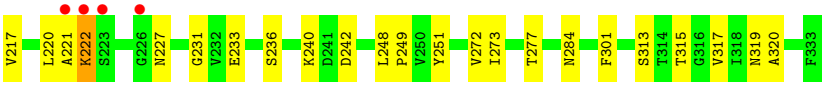
Chain C:



• Molecule 1: Major outer membrane protein

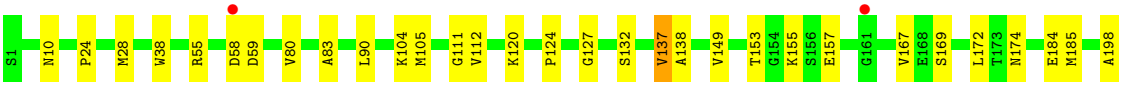
Chain D:





• Molecule 1: Major outer membrane protein

Chain E:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	C 2 2 21	Depositor
Cell constants a, b, c, α, β, γ	175.43Å 191.35Å 184.31Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	63.54 – 2.80 63.54 – 2.80	Depositor EDS
% Data completeness (in resolution range)	99.9 (63.54-2.80) 100.0 (63.54-2.80)	Depositor EDS
R_{merge}	0.16	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	4.27 (at 2.82Å)	Xtriage
Refinement program	PHENIX (1.20.1_4487: ???)	Depositor
R, R_{free}	0.198 , 0.239 0.201 , 0.241	Depositor DCC
R_{free} test set	3743 reflections (4.90%)	wwPDB-VP
Wilson B-factor (Å^2)	50.8	Xtriage
Anisotropy	0.348	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.34 , 56.1	EDS
L-test for twinning[2]	$< \|L\| > = 0.50$, $< L^2 > = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.93	EDS
Total number of atoms	13352	wwPDB-VP
Average B, all atoms (Å^2)	46.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.69% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: OC9, OCT, BGC, PLM

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	0.37	0/2573	0.61	0/3473
1	B	0.47	3/2581 (0.1%)	0.69	4/3484 (0.1%)
1	C	0.39	0/2573	0.62	0/3473
1	D	0.40	0/2565	0.63	0/3462
1	E	0.40	0/2565	0.63	2/3462 (0.1%)
All	All	0.41	3/12857 (0.0%)	0.64	6/17354 (0.0%)

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	116	TYR	C-N	9.70	1.45	1.33
1	B	194	SER	C-N	-5.68	1.25	1.33
1	B	195	LYS	C-N	-5.36	1.25	1.33

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	123	ASP	O-C-N	-10.07	113.61	121.47
1	B	123	ASP	CA-C-N	6.90	127.48	119.47
1	B	123	ASP	C-N-CA	6.90	127.48	119.47
1	E	58	ASP	N-CA-C	-6.60	104.86	113.17
1	E	296	GLY	O-C-N	-5.54	117.42	123.29
1	B	321	ASN	N-CA-C	-5.32	106.80	113.72

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	2532	0	2402	48	0
1	B	2540	0	2407	49	0
1	C	2532	0	2402	57	0
1	D	2524	0	2397	47	0
1	E	2524	0	2397	47	0
2	A	18	31	31	5	0
2	B	18	31	31	1	0
2	C	18	31	31	5	0
2	D	18	31	31	6	0
2	E	18	31	31	2	0
3	A	24	0	54	6	0
3	B	8	0	18	1	0
3	C	16	0	36	5	0
3	D	24	0	54	5	0
3	E	8	0	18	0	0
4	A	11	0	10	3	0
4	B	11	0	10	2	0
4	D	11	0	10	1	0
4	E	11	0	10	0	0
5	A	9	0	17	0	0
5	C	9	0	17	1	0
5	D	9	0	17	3	0
5	E	9	0	17	0	0
6	A	65	0	0	4	0
6	B	69	0	0	5	0
6	C	50	0	0	4	0
6	D	49	0	0	0	0
6	E	62	0	0	5	0
All	All	13197	155	12448	237	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 9.

All (237) 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:320:ALA:HB1	1:E:320:ALA:HB2	1.22	1.20
1:C:195:LYS:HE3	6:C:548:HOH:O	1.39	1.18
1:A:320:ALA:HB3	1:C:320:ALA:HB1	1.23	1.11
1:B:320:ALA:HB1	1:C:320:ALA:HB2	1.34	1.09
1:E:216:MSE:HE2	1:E:218:ASN:HD21	1.13	1.07
1:B:320:ALA:HB3	1:D:320:ALA:HB1	1.44	0.97
1:D:320:ALA:HB3	1:E:320:ALA:HB1	1.41	0.97
1:A:320:ALA:CB	1:C:320:ALA:HB1	1.98	0.92
1:C:238:LYS:HE3	1:C:244:GLU:OE1	1.72	0.88
1:B:320:ALA:HB1	1:C:320:ALA:CB	2.07	0.84
1:A:181:MSE:HE3	1:A:185:MSE:HE1	1.59	0.83
1:B:320:ALA:CB	1:D:320:ALA:HB1	2.10	0.81
1:E:216:MSE:CE	1:E:218:ASN:HD21	1.91	0.80
1:B:37:GLU:HG3	6:B:560:HOH:O	1.82	0.78
1:D:320:ALA:CB	1:E:320:ALA:HB1	2.14	0.77
1:B:105:MSE:SE	1:B:110:TRP:HE1	2.18	0.77
1:C:225:GLU:HG3	1:C:226:GLY:N	2.03	0.74
3:A:402:OCT:C4	3:C:403:OCT:H12	2.19	0.72
1:E:227:ASN:N	6:E:501:HOH:O	2.21	0.72
1:E:55:ARG:NH1	6:E:502:HOH:O	2.22	0.71
1:A:320:ALA:CB	1:E:320:ALA:HB2	2.13	0.71
3:A:402:OCT:H41	3:C:403:OCT:H12	1.73	0.70
1:A:185:MSE:HG2	1:A:218:ASN:OD1	1.91	0.70
1:C:208:GLU:HB3	1:C:240:LYS:HE3	1.74	0.70
1:A:287:ASP:OD1	6:A:501:HOH:O	2.09	0.70
1:D:169:SER:HB2	2:D:403:PLM:HD1	1.72	0.69
1:B:238:LYS:HG3	1:B:244:GLU:HG3	1.74	0.69
4:A:405:BGC:O6	6:A:501:HOH:O	2.12	0.67
3:D:402:OCT:H13	3:D:404:OCT:H13	1.74	0.67
1:E:303:LYS:HE3	1:E:333:PHE:OXT	1.93	0.67
1:B:276:GLU:OE2	1:B:285:LYS:HD3	1.96	0.66
1:B:181:MSE:HB3	1:B:185:MSE:HE2	1.76	0.66
1:D:180:HIS:CE1	1:D:186:GLU:HG3	2.31	0.65
1:E:272:VAL:HG12	1:E:273:ILE:HG12	1.80	0.64
1:A:170:LYS:HE3	1:A:197:GLU:OE1	1.98	0.64
1:B:193:MSE:HG2	1:B:210:THR:HG23	1.80	0.64
1:E:216:MSE:HE2	1:E:218:ASN:ND2	1.98	0.62
1:A:73:PHE:HA	2:A:401:PLM:HE2	1.80	0.62
1:A:195:LYS:HG3	1:A:208:GLU:HG3	1.80	0.62
1:E:80:VAL:HG13	1:E:200:LEU:HD21	1.82	0.62
1:D:162:THR:HG22	1:D:163:VAL:HG13	1.83	0.61
1:C:209:THR:HG23	1:C:239:VAL:HG22	1.82	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:116:TYR:CD2	5:D:405:OC9:HAI1	2.36	0.60
1:A:134:GLY:HA3	2:A:401:PLM:H62	1.84	0.60
1:A:148:LEU:HD23	1:A:175:VAL:HG22	1.83	0.60
1:C:167:VAL:HG13	2:C:401:PLM:HG1	1.85	0.59
1:C:158:LEU:C	1:C:158:LEU:HD23	2.28	0.59
1:A:216:MSE:HE2	1:A:218:ASN:HD21	1.66	0.59
1:B:120:LYS:NZ	1:C:276:GLU:OE2	2.33	0.59
1:D:80:VAL:HG11	1:D:90:LEU:HD22	1.83	0.59
1:E:238:LYS:HG2	1:E:244:GLU:HG3	1.83	0.59
1:C:158:LEU:HD23	1:C:159:ASP:N	2.18	0.59
1:E:167:VAL:HG23	1:E:198:ALA:HB2	1.83	0.58
1:B:233:GLU:O	1:B:249:PRO:HD2	2.03	0.58
1:E:112:VAL:HG22	1:E:137:VAL:HG13	1.85	0.58
1:E:105:MSE:HE3	1:E:105:MSE:HA	1.86	0.57
1:E:169:SER:HB2	2:E:402:PLM:HD1	1.85	0.57
1:A:158:LEU:C	1:A:158:LEU:HD23	2.29	0.57
1:A:278:LYS:HZ2	1:A:278:LYS:HB3	1.70	0.57
6:B:562:HOH:O	1:C:285:LYS:HE3	2.04	0.57
1:B:225:GLU:CG	1:B:226:GLY:N	2.68	0.56
1:A:80:VAL:HG13	1:A:200:LEU:HD22	1.87	0.56
1:C:208:GLU:OE1	1:C:240:LYS:HE2	2.05	0.56
1:D:118:ASN:ND2	1:D:131:THR:OG1	2.39	0.56
1:A:231:GLY:HA3	1:A:251:TYR:CZ	2.40	0.55
1:C:169:SER:HB2	2:C:401:PLM:HC1	1.87	0.55
1:E:167:VAL:HG13	2:E:402:PLM:HG2	1.89	0.54
1:B:238:LYS:CG	1:B:244:GLU:HG3	2.37	0.54
3:D:402:OCT:C1	3:D:404:OCT:H32	2.37	0.54
1:A:233:GLU:O	1:A:249:PRO:HD2	2.07	0.54
1:A:320:ALA:HB1	1:E:320:ALA:CB	2.15	0.54
4:A:405:BGC:H3	1:C:118:ASN:HD22	1.72	0.54
1:C:105:MSE:O	1:C:105:MSE:HG3	2.06	0.54
1:E:155:LYS:HE2	1:E:157:GLU:OE2	2.07	0.54
1:C:99:LEU:HG	5:C:404:OC9:HAA2	1.89	0.54
1:E:279:ASP:OD2	1:E:282:THR:HG23	2.08	0.53
1:A:24:PRO:HD2	1:A:138:ALA:HB3	1.89	0.53
1:D:80:VAL:CG1	1:D:90:LEU:HD22	2.38	0.53
1:D:167:VAL:HG13	2:D:403:PLM:HG1	1.89	0.53
1:E:238:LYS:HE3	1:E:244:GLU:OE2	2.09	0.53
1:A:172:LEU:HD12	2:A:401:PLM:CB	2.40	0.52
3:D:402:OCT:H12	3:D:404:OCT:H32	1.91	0.52
1:A:181:MSE:HE3	1:A:185:MSE:CE	2.33	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:314:THR:HG23	6:E:522:HOH:O	2.08	0.52
1:A:239:VAL:HB	1:A:242:ASP:HB3	1.92	0.51
1:D:208:GLU:HG2	1:D:240:LYS:HE2	1.91	0.51
1:A:134:GLY:HA3	2:A:401:PLM:C6	2.41	0.51
1:C:56:HIS:O	1:C:60:SER:OG	2.29	0.51
1:C:169:SER:HB2	2:C:401:PLM:CC	2.40	0.51
1:B:258:ALA:HB1	1:D:301:PHE:HB3	1.92	0.51
1:D:233:GLU:O	1:D:249:PRO:HD2	2.10	0.51
1:C:115:LYS:NZ	6:C:501:HOH:O	2.22	0.51
1:E:227:ASN:CA	6:E:501:HOH:O	2.59	0.51
1:E:239:VAL:HG12	1:E:242:ASP:HB3	1.93	0.51
1:D:116:TYR:HD2	5:D:405:OC9:HAI1	1.76	0.50
1:D:73:PHE:HA	2:D:403:PLM:HE2	1.94	0.50
1:B:320:ALA:O	1:C:320:ALA:N	2.30	0.50
1:C:155:LYS:HD2	1:C:168:GLU:HB2	1.94	0.50
1:C:167:VAL:HG13	2:C:401:PLM:CG	2.41	0.50
1:B:158:LEU:C	1:B:158:LEU:HD23	2.37	0.49
1:C:91:MSE:HG3	1:C:128:THR:HB	1.93	0.49
1:A:279:ASP:OD2	1:A:282:THR:HG23	2.12	0.49
1:B:248:LEU:HB2	1:B:274:LEU:HB2	1.93	0.49
1:B:273:ILE:HA	4:B:403:BGC:O2	2.12	0.49
1:C:191:VAL:HG22	1:C:212:TYR:HD1	1.77	0.49
1:D:231:GLY:HA3	1:D:251:TYR:CE1	2.48	0.49
4:A:405:BGC:H3	1:C:118:ASN:ND2	2.28	0.49
1:A:193:MSE:HE3	1:A:210:THR:OG1	2.12	0.48
1:C:223:SER:OG	1:C:225:GLU:HG2	2.13	0.48
1:C:76:ALA:HB1	1:C:167:VAL:HG21	1.96	0.48
1:E:24:PRO:HD2	1:E:138:ALA:HB3	1.95	0.48
1:C:279:ASP:OD2	1:C:282:THR:HG23	2.14	0.48
1:E:233:GLU:O	1:E:249:PRO:HD2	2.14	0.48
1:A:278:LYS:HB3	1:A:278:LYS:NZ	2.28	0.48
1:B:303:LYS:HE3	1:C:225:GLU:OE2	2.13	0.48
1:B:225:GLU:CG	1:B:226:GLY:H	2.26	0.48
1:C:47:HIS:O	1:C:49:GLU:HG3	2.14	0.48
1:D:158:LEU:C	1:D:158:LEU:HD23	2.39	0.48
1:D:170:LYS:O	1:D:170:LYS:HG2	2.14	0.48
1:D:313:SER:HA	1:E:38:TRP:CE3	2.49	0.48
1:B:73:PHE:HA	2:B:401:PLM:HD2	1.96	0.47
1:C:227:ASN:ND2	6:C:507:HOH:O	2.42	0.47
1:A:140:SER:HA	1:A:144:TRP:O	2.13	0.47
1:B:227[B]:ASN:N	1:B:227[B]:ASN:OD1	2.48	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:220:LEU:O	1:D:221:ALA:C	2.56	0.47
3:D:402:OCT:H13	3:D:404:OCT:C1	2.42	0.47
1:C:191:VAL:HG22	1:C:212:TYR:CD1	2.49	0.47
1:D:138:ALA:HA	1:D:146:PHE:O	2.15	0.47
1:E:80:VAL:HG11	1:E:90:LEU:HD22	1.97	0.47
1:C:247:LEU:HD23	1:C:275:ASN:HA	1.97	0.47
1:E:24:PRO:HB2	1:E:111:GLY:C	2.40	0.47
1:E:232:VAL:HG13	1:E:250:VAL:HG22	1.97	0.47
1:B:276:GLU:HB2	6:B:551:HOH:O	2.15	0.47
1:E:28:MSE:HG3	1:E:28:MSE:O	2.15	0.47
1:B:24:PRO:HB2	1:B:111:GLY:C	2.41	0.46
1:E:149:VAL:HB	1:E:174:ASN:HB3	1.98	0.46
1:A:314:THR:HG23	6:A:529:HOH:O	2.15	0.46
1:B:140:SER:HA	1:B:144:TRP:O	2.16	0.46
1:B:293:MSE:HE2	1:B:293:MSE:HB2	1.92	0.46
1:B:57:GLY:HA3	6:B:549:HOH:O	2.15	0.46
1:A:41:THR:HG22	1:A:42:GLY:N	2.31	0.46
1:A:217:VAL:HG22	1:A:251:TYR:OH	2.16	0.46
1:C:55:ARG:NE	6:C:506:HOH:O	2.42	0.46
3:D:402:OCT:H13	3:D:404:OCT:C2	2.46	0.46
1:B:174:ASN:HD22	1:B:192:LYS:CG	2.29	0.45
1:D:115:LYS:HB3	2:D:403:PLM:H41	1.97	0.45
1:A:293:MSE:HE2	1:A:293:MSE:HB2	1.92	0.45
3:A:403:OCT:H12	3:A:404:OCT:C3	2.46	0.45
1:B:174:ASN:HD22	1:B:192:LYS:HG3	1.81	0.45
1:B:225:GLU:HG2	1:B:226:GLY:H	1.81	0.45
1:A:80:VAL:HG13	1:A:200:LEU:CD2	2.47	0.45
1:D:167:VAL:HG13	2:D:403:PLM:CG	2.47	0.45
1:B:204:PRO:C	1:B:205:ILE:HG12	2.42	0.45
1:A:193:MSE:HE2	1:A:193:MSE:HB3	1.91	0.45
1:A:233:GLU:O	1:A:248:LEU:HD12	2.17	0.45
1:B:105:MSE:SE	1:B:110:TRP:NE1	2.95	0.45
1:C:73:PHE:HA	2:C:401:PLM:HD2	1.98	0.45
1:E:80:VAL:HG13	1:E:200:LEU:CD2	2.47	0.45
1:A:148:LEU:HD13	1:A:148:LEU:C	2.40	0.45
1:A:195:LYS:HE3	1:A:208:GLU:OE1	2.17	0.45
1:B:182:SER:HB2	1:B:183:PRO:HD2	1.99	0.45
1:E:132:SER:HA	1:E:153:THR:O	2.17	0.45
1:B:105:MSE:HE3	1:B:105:MSE:HB3	1.80	0.45
1:D:140:SER:HA	1:D:144:TRP:O	2.16	0.45
1:D:221:ALA:O	1:D:222:LYS:C	2.59	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:23:ARG:N	1:C:24:PRO:HD3	2.32	0.44
1:D:24:PRO:HD2	1:D:138:ALA:HB3	1.98	0.44
1:C:24:PRO:HD2	1:C:138:ALA:HB3	2.00	0.44
1:B:11:SER:CB	1:B:13:HIS:HD1	2.30	0.44
1:B:91:MSE:HG3	1:B:128:THR:HB	1.99	0.44
1:D:284:ASN:ND2	1:E:124:PRO:HD3	2.32	0.44
1:D:91:MSE:HE2	1:D:94:GLN:CD	2.43	0.44
1:C:257[B]:ASN:OD1	1:C:300:LYS:NZ	2.51	0.44
1:A:186:GLU:OE2	6:A:502:HOH:O	2.20	0.44
1:B:258:ALA:HB1	1:D:301:PHE:CB	2.48	0.44
1:D:273:ILE:O	4:D:406:BGC:H2	2.18	0.44
3:A:403:OCT:H12	3:A:404:OCT:H31	2.00	0.43
1:D:319:ASN:HB2	1:E:320:ALA:O	2.18	0.43
1:A:231:GLY:HA3	1:A:251:TYR:CE2	2.53	0.43
1:B:24:PRO:HD2	1:B:138:ALA:HB3	1.99	0.43
1:C:80:VAL:HG13	1:C:200:LEU:HD22	2.00	0.43
1:D:112:VAL:HA	1:D:136:ALA:O	2.19	0.43
1:A:105:MSE:HB3	1:A:105:MSE:HE3	1.72	0.43
1:A:115:LYS:O	1:A:133:ALA:HA	2.17	0.43
1:C:233:GLU:O	1:C:248:LEU:HD12	2.17	0.43
1:E:80:VAL:O	1:E:83:ALA:HB3	2.18	0.43
1:B:303:LYS:CE	1:C:225:GLU:OE2	2.67	0.43
1:C:181:MSE:CE	1:C:185:MSE:SE	3.17	0.43
1:D:116:TYR:CE2	5:D:405:OC9:HAF2	2.53	0.43
1:A:172:LEU:HD12	2:A:401:PLM:HB2	2.00	0.43
1:E:59:ASP:HB3	1:E:104:LYS:O	2.18	0.43
1:B:182:SER:HB2	1:B:183:PRO:CD	2.49	0.43
1:C:86:ALA:HB1	1:C:163:VAL:HG21	2.00	0.43
1:D:23:ARG:N	1:D:24:PRO:HD3	2.33	0.43
1:E:172:LEU:C	1:E:172:LEU:HD13	2.43	0.43
1:D:169:SER:HB2	2:D:403:PLM:CD	2.44	0.43
1:B:238:LYS:NZ	6:B:514:HOH:O	2.52	0.43
1:C:272:VAL:HG12	1:C:273:ILE:HG12	1.99	0.43
1:D:182:SER:HB2	1:D:183:PRO:HD2	2.01	0.43
1:B:165:ALA:HA	1:B:199:ASP:O	2.19	0.42
1:D:231:GLY:HA3	1:D:251:TYR:CZ	2.55	0.42
3:A:402:OCT:H42	3:A:403:OCT:H31	2.02	0.42
1:E:239:VAL:HG12	1:E:242:ASP:CB	2.49	0.42
1:B:181:MSE:HG2	1:B:185:MSE:HE1	2.01	0.42
1:C:238:LYS:HG3	1:C:244:GLU:HB3	2.02	0.42
1:D:182:SER:HB2	1:D:183:PRO:CD	2.49	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:204:PRO:C	1:C:205:ILE:HG12	2.45	0.42
1:A:258:ALA:HB1	1:C:301:PHE:HB3	2.01	0.42
1:A:313:SER:HA	1:C:38:TRP:CE3	2.55	0.42
1:B:225:GLU:HG3	1:B:226:GLY:N	2.34	0.42
3:B:402:OCT:H31	3:C:402:OCT:C4	2.49	0.42
1:B:273:ILE:O	4:B:403:BGC:H3	2.20	0.42
1:A:180:HIS:ND1	1:A:186:GLU:HB2	2.35	0.41
1:E:185:MSE:HG2	1:E:218:ASN:OD1	2.20	0.41
3:A:402:OCT:H42	3:C:403:OCT:H12	1.97	0.41
1:B:327:VAL:HG21	1:C:318:ILE:HG13	2.02	0.41
1:D:211:SER:HA	1:D:236:SER:O	2.19	0.41
1:C:140:SER:HA	1:C:144:TRP:O	2.20	0.41
1:C:220:LEU:HD13	1:C:220:LEU:HA	1.74	0.41
1:C:261:TRP:HE1	3:C:402:OCT:H11	1.85	0.41
1:E:184:GLU:O	1:E:218:ASN:HA	2.20	0.41
1:A:211:SER:HA	1:A:236:SER:O	2.20	0.41
1:D:248:LEU:HD23	1:D:272:VAL:O	2.20	0.41
1:A:65:TYR:HB3	1:A:98:ASN:HB2	2.03	0.41
1:C:208:GLU:OE1	1:C:240:LYS:CE	2.69	0.41
1:E:227:ASN:HB2	6:E:501:HOH:O	2.21	0.41
1:A:34:ALA:HB1	1:E:252:MSE:CE	2.51	0.41
1:D:64:ALA:HB2	1:D:99:LEU:HD23	2.03	0.41
1:E:24:PRO:HD2	1:E:138:ALA:CB	2.51	0.41
1:D:240:LYS:H	1:D:240:LYS:HD3	1.87	0.40
1:E:112:VAL:CG2	1:E:137:VAL:HG13	2.49	0.40
1:B:172:LEU:C	1:B:172:LEU:HD13	2.47	0.40
1:C:170:LYS:HA	1:C:170:LYS:HD3	1.71	0.40
1:D:186:GLU:HB3	1:D:217:VAL:HG12	2.04	0.40
1:D:180:HIS:CE1	1:D:186:GLU:CG	3.04	0.40
1:B:323:LEU:HA	1:B:323:LEU:HD12	1.83	0.40
1:D:242:ASP:OD1	1:D:242:ASP:C	2.64	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	332/333 (100%)	313 (94%)	19 (6%)	0	100	100
1	B	333/333 (100%)	311 (93%)	22 (7%)	0	100	100
1	C	332/333 (100%)	309 (93%)	23 (7%)	0	100	100
1	D	331/333 (99%)	311 (94%)	20 (6%)	0	100	100
1	E	331/333 (99%)	311 (94%)	19 (6%)	1 (0%)	37	67
All	All	1659/1665 (100%)	1555 (94%)	103 (6%)	1 (0%)	48	77

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	E	127	GLY

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	265/255 (104%)	260 (98%)	5 (2%)	52	82
1	B	266/255 (104%)	258 (97%)	8 (3%)	36	70
1	C	265/255 (104%)	263 (99%)	2 (1%)	79	93
1	D	264/255 (104%)	259 (98%)	5 (2%)	52	82
1	E	264/255 (104%)	259 (98%)	5 (2%)	52	82
All	All	1324/1275 (104%)	1299 (98%)	25 (2%)	52	82

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

Mol	Chain	Res	Type
1	A	10	ASN
1	A	104	LYS
1	A	105	MSE
1	A	172	LEU

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Mol	Chain	Res	Type
1	A	234	VAL
1	B	10	ASN
1	B	105	MSE
1	B	112	VAL
1	B	155	LYS
1	B	166	GLU
1	B	170	LYS
1	B	206	GLU
1	B	321	ASN
1	C	200	LEU
1	C	291	THR
1	D	222	LYS
1	D	227	ASN
1	D	277	THR
1	D	315	THR
1	D	317	VAL
1	E	10	ASN
1	E	120	LYS
1	E	137	VAL
1	E	223	SER
1	E	291	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (11) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	26	GLN
1	B	174	ASN
1	C	118	ASN
1	C	218	ASN
1	D	33	GLN
1	D	118	ASN
1	D	190	ASN
1	E	78	GLN
1	E	190	ASN
1	E	218	ASN
1	E	270	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)

23 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	PLM	A	401	-	17,17,17	1.61	1 (5%)	17,17,17	0.81	1 (5%)
3	OCT	E	401	-	7,7,7	0.32	0	6,6,6	0.22	0
5	OC9	A	406	4	8,8,8	0.66	0	7,7,7	0.85	0
3	OCT	B	402	-	7,7,7	0.35	0	6,6,6	0.49	0
2	PLM	C	401	-	17,17,17	1.58	1 (5%)	17,17,17	0.67	0
4	BGC	D	406	5	11,11,12	1.94	2 (18%)	15,15,17	1.86	3 (20%)
3	OCT	D	404	-	7,7,7	0.34	0	6,6,6	0.34	0
2	PLM	D	403	-	17,17,17	1.13	1 (5%)	17,17,17	0.87	2 (11%)
3	OCT	C	402	-	7,7,7	0.38	0	6,6,6	0.22	0
3	OCT	D	402	-	7,7,7	0.27	0	6,6,6	0.25	0
5	OC9	D	405	4	8,8,8	0.69	0	7,7,7	0.76	0
3	OCT	A	403	-	7,7,7	0.31	0	6,6,6	0.14	0
4	BGC	E	404	5	11,11,12	2.14	2 (18%)	15,15,17	1.05	1 (6%)
3	OCT	D	401	-	7,7,7	0.34	0	6,6,6	0.20	0
3	OCT	A	404	-	7,7,7	0.39	0	6,6,6	0.29	0
5	OC9	C	404	4	8,8,8	0.67	0	7,7,7	0.83	0
4	BGC	A	405	5	11,11,12	2.15	3 (27%)	15,15,17	0.91	1 (6%)
4	BGC	B	403	5	11,11,12	2.00	1 (9%)	15,15,17	1.52	3 (20%)
2	PLM	B	401	-	17,17,17	0.78	1 (5%)	17,17,17	0.91	2 (11%)
5	OC9	E	403	4	8,8,8	0.71	0	7,7,7	0.63	0
3	OCT	A	402	-	7,7,7	0.38	0	6,6,6	0.27	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
3	OCT	C	403	-	7,7,7	0.32	0	6,6,6	0.29	0
2	PLM	E	402	-	17,17,17	1.22	2 (11%)	17,17,17	0.71	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
2	PLM	A	401	-	-	9/15/15/15	-
3	OCT	E	401	-	-	2/5/5/5	-
5	OC9	A	406	4	-	3/6/6/6	-
3	OCT	B	402	-	-	0/5/5/5	-
2	PLM	C	401	-	-	8/15/15/15	-
4	BGC	D	406	5	-	2/2/19/22	0/1/1/1
3	OCT	D	404	-	-	1/5/5/5	-
2	PLM	D	403	-	-	8/15/15/15	-
3	OCT	C	402	-	-	2/5/5/5	-
3	OCT	D	402	-	-	2/5/5/5	-
5	OC9	D	405	4	-	6/6/6/6	-
3	OCT	A	403	-	-	0/5/5/5	-
4	BGC	E	404	5	-	2/2/19/22	0/1/1/1
3	OCT	D	401	-	-	1/5/5/5	-
3	OCT	A	404	-	-	2/5/5/5	-
5	OC9	C	404	4	-	2/6/6/6	-
4	BGC	A	405	5	-	2/2/19/22	0/1/1/1
4	BGC	B	403	5	-	0/2/19/22	0/1/1/1
2	PLM	B	401	-	-	8/15/15/15	-
5	OC9	E	403	4	-	3/6/6/6	-
3	OCT	A	402	-	-	2/5/5/5	-
3	OCT	C	403	-	-	1/5/5/5	-
2	PLM	E	402	-	-	9/15/15/15	-

All (14) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	E	404	BGC	O5-C1	6.11	1.53	1.43
4	A	405	BGC	O5-C1	6.07	1.53	1.43

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	401	PLM	C2-C1	5.91	1.64	1.50
4	B	403	BGC	O5-C1	5.89	1.53	1.43
4	D	406	BGC	O5-C1	5.55	1.52	1.43
2	C	401	PLM	C2-C1	5.42	1.63	1.50
2	E	402	PLM	C2-C1	3.82	1.59	1.50
2	D	403	PLM	C2-C1	3.51	1.58	1.50
2	B	401	PLM	C2-C1	2.64	1.56	1.50
4	A	405	BGC	C2-C3	-2.39	1.49	1.52
4	D	406	BGC	C2-C3	-2.32	1.49	1.52
4	E	404	BGC	O3-C3	2.05	1.47	1.43
2	E	402	PLM	O2-C1	2.02	1.28	1.22
4	A	405	BGC	O3-C3	2.01	1.47	1.43

All (14) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	D	406	BGC	C1-O5-C5	-4.93	105.51	112.19
4	B	403	BGC	C1-C2-C3	3.06	113.43	109.67
4	D	406	BGC	O5-C5-C6	2.94	111.81	107.20
2	B	401	PLM	O2-C1-C2	-2.71	114.36	123.08
2	D	403	PLM	O1-C1-O2	2.50	129.53	123.30
2	A	401	PLM	O2-C1-C2	-2.49	115.08	123.08
2	D	403	PLM	O2-C1-C2	-2.48	115.13	123.08
4	E	404	BGC	O5-C1-C2	2.44	114.54	110.77
4	D	406	BGC	C1-C2-C3	2.43	112.65	109.67
4	B	403	BGC	O3-C3-C4	-2.39	104.83	110.35
2	B	401	PLM	O1-C1-O2	2.20	128.78	123.30
4	A	405	BGC	C1-C2-C3	2.19	112.36	109.67
4	B	403	BGC	O3-C3-C2	2.19	114.19	109.99
2	E	402	PLM	O1-C1-O2	2.16	128.67	123.30

There are no chirality outliers.

All (75) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	E	403	OC9	CAD-CAF-CAH-CAI
4	E	404	BGC	O5-C5-C6-O6
4	A	405	BGC	O5-C5-C6-O6
4	A	405	BGC	C4-C5-C6-O6
4	E	404	BGC	C4-C5-C6-O6
2	C	401	PLM	C1-C2-C3-C4
2	A	401	PLM	C1-C2-C3-C4

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Mol	Chain	Res	Type	Atoms
4	D	406	BGC	C4-C5-C6-O6
2	E	402	PLM	C2-C3-C4-C5
2	B	401	PLM	C3-C4-C5-C6
2	D	403	PLM	CC-CD-CE-CF
2	E	402	PLM	C6-C7-C8-C9
5	E	403	OC9	CAE-CAG-CAI-CAH
2	B	401	PLM	C6-C7-C8-C9
2	C	401	PLM	C6-C7-C8-C9
5	D	405	OC9	CAC-CAE-CAG-CAI
2	C	401	PLM	C8-C9-CA-CB
2	D	403	PLM	C5-C6-C7-C8
2	E	402	PLM	C9-CA-CB-CC
5	E	403	OC9	CAC-CAE-CAG-CAI
5	D	405	OC9	CAD-CAF-CAH-CAI
2	A	401	PLM	C7-C8-C9-CA
2	D	403	PLM	C8-C9-CA-CB
2	D	403	PLM	CA-CB-CC-CD
2	E	402	PLM	C8-C9-CA-CB
2	A	401	PLM	C3-C4-C5-C6
2	B	401	PLM	C1-C2-C3-C4
3	A	402	OCT	C2-C3-C4-C5
5	D	405	OC9	CAE-CAG-CAI-CAH
5	D	405	OC9	CAF-CAH-CAI-CAG
5	C	404	OC9	CAD-CAF-CAH-CAI
5	A	406	OC9	OAB-CAD-CAF-CAH
5	A	406	OC9	CAD-CAF-CAH-CAI
3	C	403	OCT	C1-C2-C3-C4
2	D	403	PLM	C3-C4-C5-C6
5	C	404	OC9	OAB-CAD-CAF-CAH
5	D	405	OC9	OAB-CAD-CAF-CAH
2	A	401	PLM	CD-CE-CF-CG
3	C	402	OCT	C1-C2-C3-C4
2	E	402	PLM	CB-CC-CD-CE
4	D	406	BGC	O5-C5-C6-O6
5	A	406	OC9	CAA-CAC-CAE-CAG
2	A	401	PLM	C6-C7-C8-C9
3	D	402	OCT	C5-C6-C7-C8
2	D	403	PLM	C2-C3-C4-C5
2	B	401	PLM	C5-C6-C7-C8
2	E	402	PLM	C7-C8-C9-CA
2	E	402	PLM	C5-C6-C7-C8
3	D	401	OCT	C2-C3-C4-C5

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Mol	Chain	Res	Type	Atoms
2	C	401	PLM	CD-CE-CF-CG
3	A	402	OCT	C1-C2-C3-C4
3	D	404	OCT	C5-C6-C7-C8
2	B	401	PLM	C2-C3-C4-C5
3	D	402	OCT	C1-C2-C3-C4
3	E	401	OCT	C3-C4-C5-C6
5	D	405	OC9	CAA-CAC-CAE-CAG
2	C	401	PLM	CA-CB-CC-CD
2	C	401	PLM	C5-C6-C7-C8
3	A	404	OCT	C5-C6-C7-C8
2	B	401	PLM	CC-CD-CE-CF
2	B	401	PLM	O2-C1-C2-C3
2	A	401	PLM	C5-C6-C7-C8
2	E	402	PLM	O1-C1-C2-C3
3	E	401	OCT	C4-C5-C6-C7
2	A	401	PLM	C2-C3-C4-C5
2	E	402	PLM	O2-C1-C2-C3
2	B	401	PLM	O1-C1-C2-C3
2	A	401	PLM	O1-C1-C2-C3
2	D	403	PLM	CD-CE-CF-CG
2	A	401	PLM	O2-C1-C2-C3
2	C	401	PLM	O1-C1-C2-C3
3	A	404	OCT	C1-C2-C3-C4
2	C	401	PLM	O2-C1-C2-C3
2	D	403	PLM	C6-C7-C8-C9
3	C	402	OCT	C2-C3-C4-C5

There are no ring outliers.

18 monomers are involved in 42 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	401	PLM	5	0
3	B	402	OCT	1	0
2	C	401	PLM	5	0
4	D	406	BGC	1	0
3	D	404	OCT	5	0
2	D	403	PLM	6	0
3	C	402	OCT	2	0
3	D	402	OCT	5	0
5	D	405	OC9	3	0
3	A	403	OCT	3	0
3	A	404	OCT	2	0

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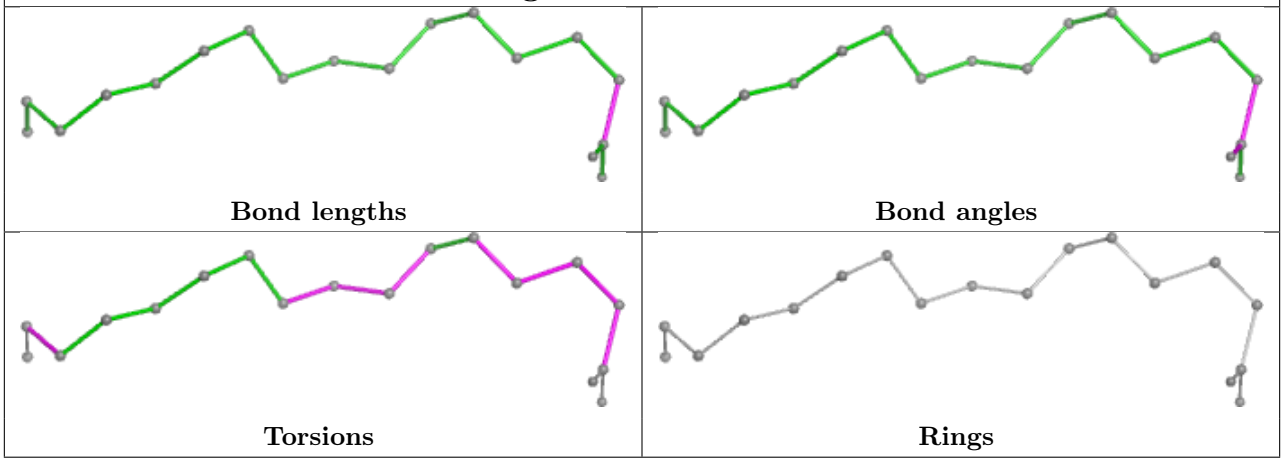
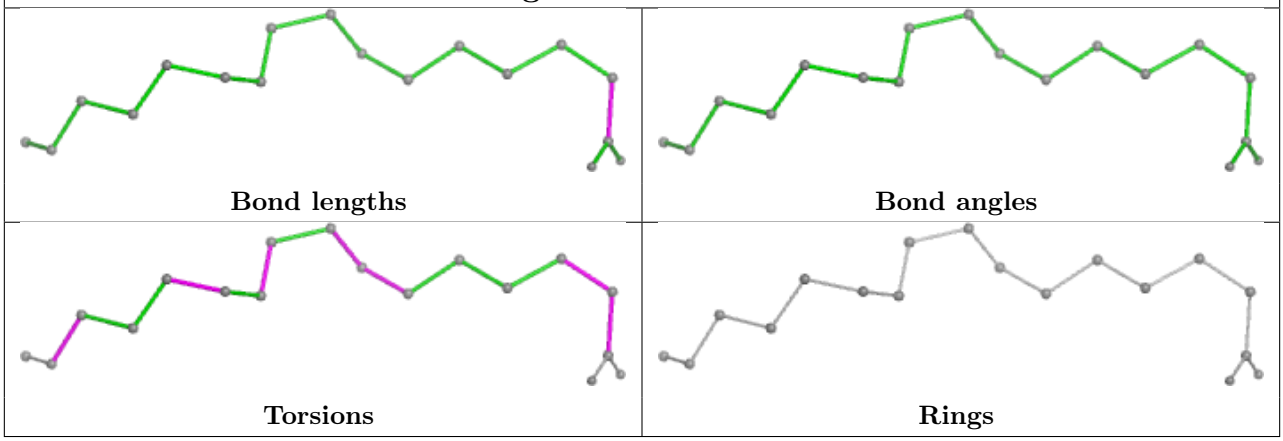
Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	C	404	OC9	1	0
4	A	405	BGC	3	0
4	B	403	BGC	2	0
2	B	401	PLM	1	0
3	A	402	OCT	4	0
3	C	403	OCT	3	0
2	E	402	PLM	2	0

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 then 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.

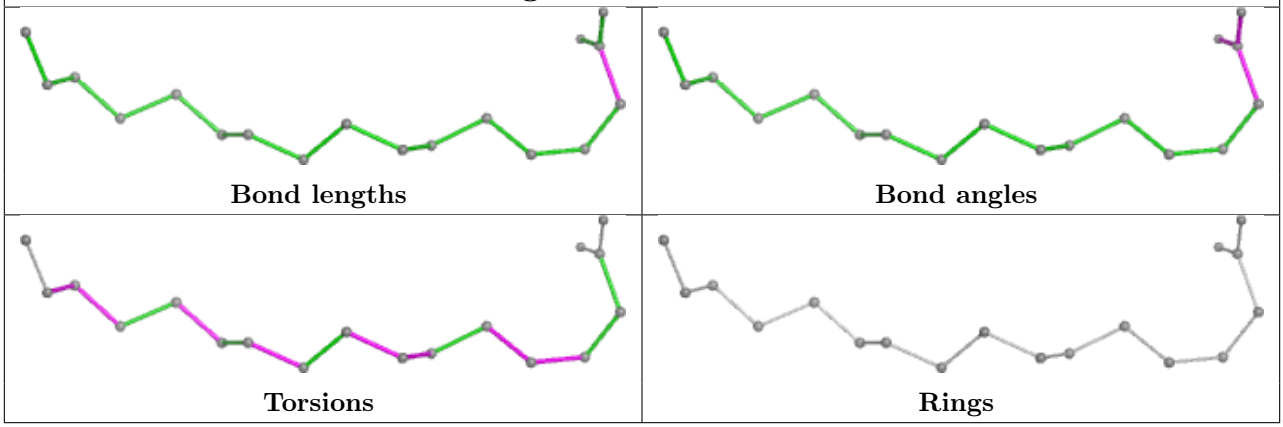
Ligand PLM A 401



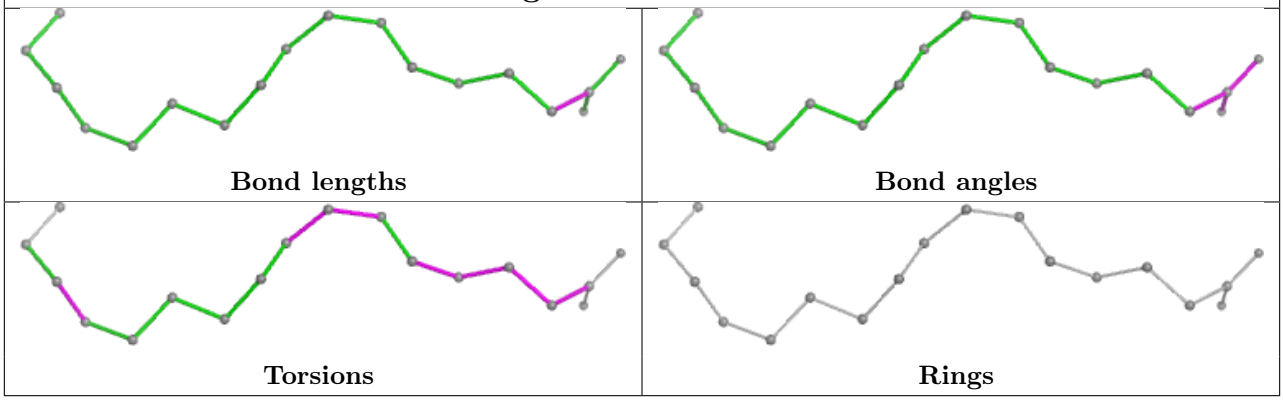
Ligand PLM C 401



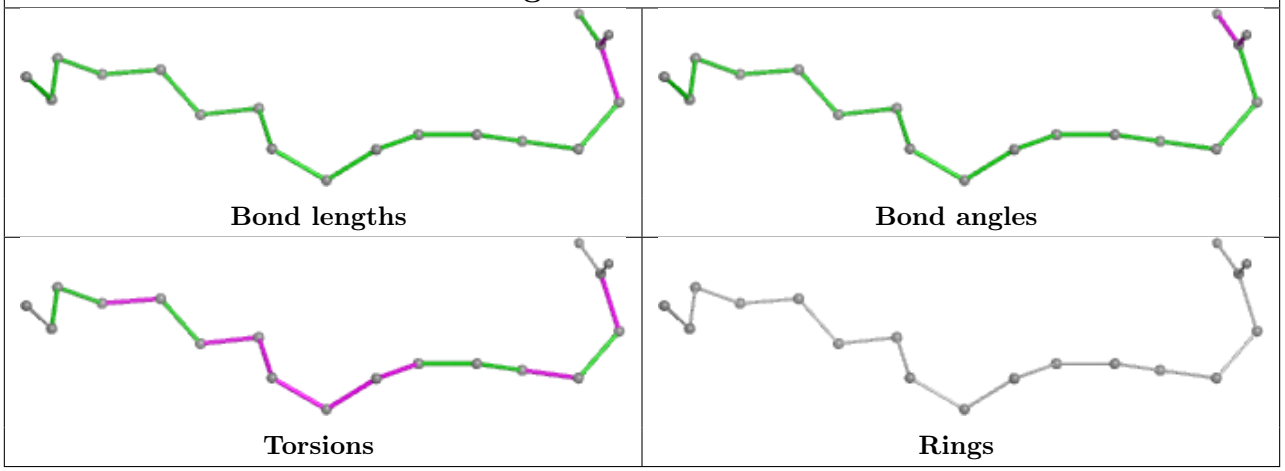
Ligand PLM D 403



Ligand PLM B 401



Ligand PLM E 402



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^{th} 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	324/333 (97%)	-0.46	5 (1%)	71	64	18, 43, 67, 96	1 (0%)
1	B	324/333 (97%)	-0.46	3 (0%)	81	75	18, 42, 65, 98	2 (0%)
1	C	324/333 (97%)	-0.35	4 (1%)	76	69	19, 43, 70, 96	1 (0%)
1	D	324/333 (97%)	-0.39	6 (1%)	66	58	25, 46, 71, 99	0
1	E	324/333 (97%)	-0.29	5 (1%)	71	64	23, 45, 70, 92	0
All	All	1620/1665 (97%)	-0.39	23 (1%)	73	66	18, 44, 70, 99	4 (0%)

All (23) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	222	LYS	4.3
1	A	222	LYS	4.1
1	E	226	GLY	4.0
1	D	58	ASP	3.7
1	D	222	LYS	3.3
1	B	222	LYS	3.2
1	D	170	LYS	3.1
1	C	224	GLU	3.1
1	D	223	SER	3.0
1	A	221	ALA	2.8
1	A	226	GLY	2.8
1	B	223	SER	2.8
1	E	222	LYS	2.7
1	C	227	ASN	2.6
1	E	161	GLY	2.4
1	D	221	ALA	2.3
1	D	226	GLY	2.3
1	E	58	ASP	2.2
1	E	223	SER	2.1
1	A	224	GLU	2.1

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Mol	Chain	Res	Type	RSRZ
1	B	224	GLU	2.1
1	A	223	SER	2.1
1	C	221	ALA	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, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
4	BGC	D	406	11/12	0.61	0.25	67,98,133,148	0
3	OCT	B	402	8/8	0.69	0.42	38,48,62,72	0
3	OCT	C	402	8/8	0.71	0.36	41,43,49,50	0
4	BGC	A	405	11/12	0.72	0.15	64,82,96,103	0
3	OCT	A	402	8/8	0.73	0.37	38,46,60,60	0
4	BGC	E	404	11/12	0.74	0.17	64,73,77,84	0
3	OCT	E	401	8/8	0.75	0.33	50,54,64,66	0
3	OCT	A	403	8/8	0.76	0.38	43,51,63,69	0
3	OCT	D	401	8/8	0.76	0.33	37,42,54,68	0
3	OCT	C	403	8/8	0.78	0.41	38,56,66,71	0
3	OCT	A	404	8/8	0.79	0.26	32,43,51,54	0
4	BGC	B	403	11/12	0.79	0.14	60,74,82,86	0
3	OCT	D	404	8/8	0.80	0.33	34,43,57,72	0
3	OCT	D	402	8/8	0.83	0.27	39,50,69,72	0
5	OC9	E	403	9/9	0.84	0.24	50,62,96,108	0
2	PLM	A	401	18/18	0.86	0.18	42,62,79,85	0
2	PLM	E	402	18/18	0.87	0.15	48,66,79,79	0
5	OC9	D	405	9/9	0.88	0.20	46,53,74,90	0
2	PLM	B	401	18/18	0.88	0.16	45,63,76,79	0
2	PLM	C	401	18/18	0.89	0.15	47,64,78,79	0

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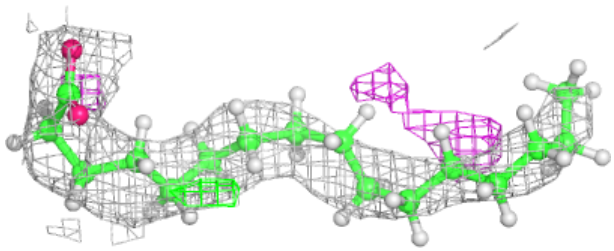
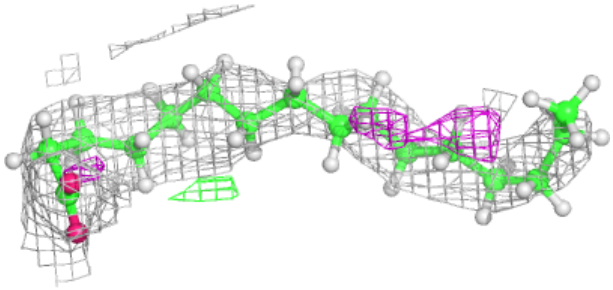
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
5	OC9	A	406	9/9	0.90	0.17	41,53,75,88	0
5	OC9	C	404	9/9	0.91	0.17	41,53,81,87	0
2	PLM	D	403	18/18	0.92	0.12	43,57,69,69	0

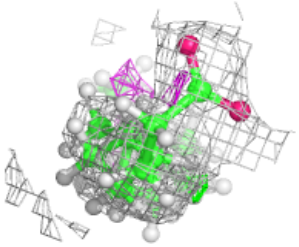
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around PLM A 401:

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

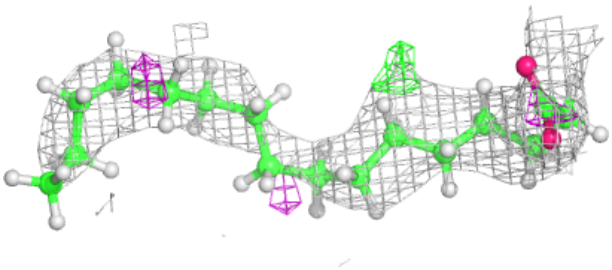


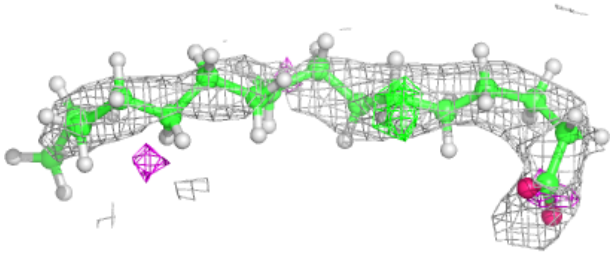


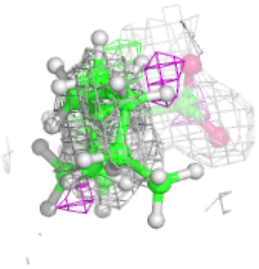


Electron density around PLM E 402:

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

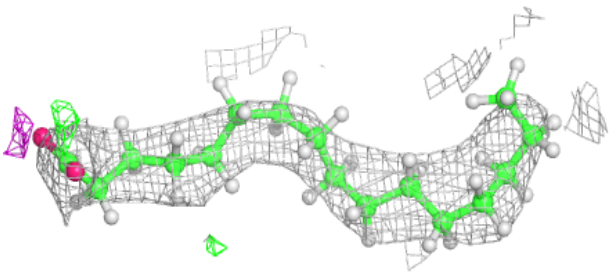


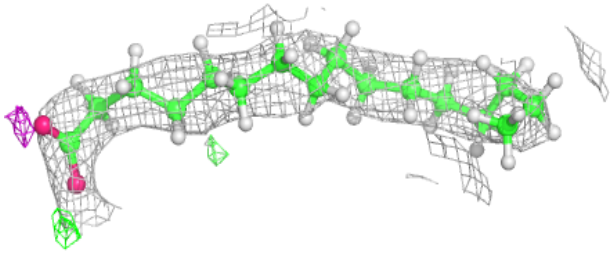


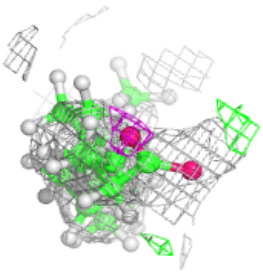


Electron density around PLM B 401:

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

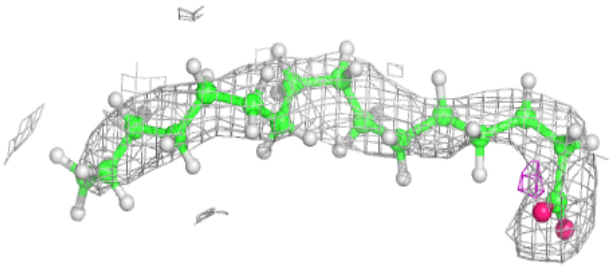


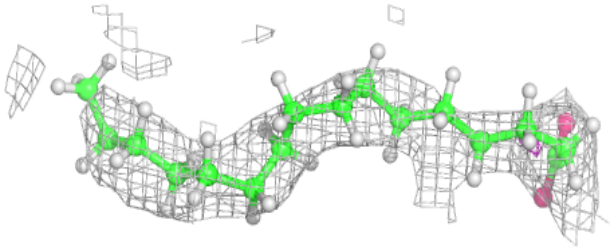




Electron density around PLM C 401:

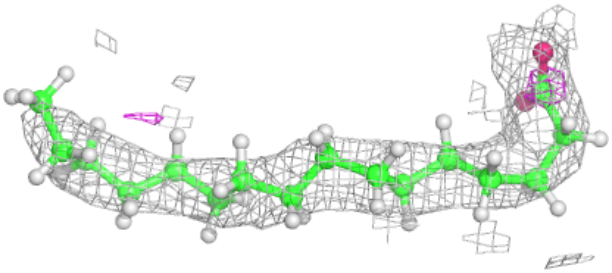
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

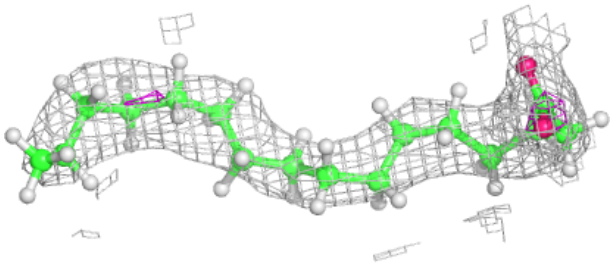


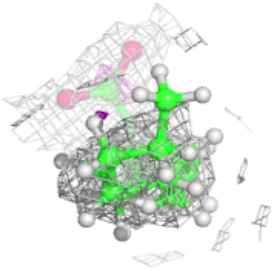


Electron density around PLM D 403:

$2mF_o$-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.