



Full wwPDB X-ray Structure Validation Report ⓘ

Aug 20, 2020 – 10:54 PM BST

PDB ID : 4FSO
Title : Crystal Structure of Pseudomonas aeruginosa OccK10 (OpdN)
Authors : Eren, E.; van den Berg, B.
Deposited on : 2012-06-27
Resolution : 2.75 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 following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity : 4.02b-467
Mogul : 1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix) : 1.13
EDS : 2.13.1
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac : 5.8.0158
CCP4 : 7.0.044 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.13.1

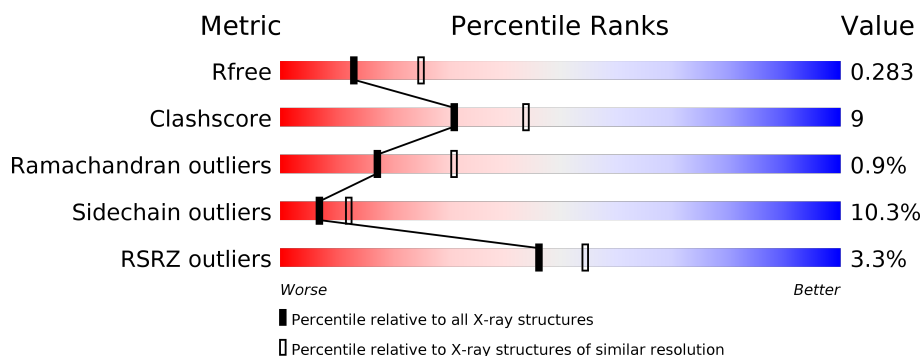
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.75 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	1235 (2.78-2.74)
Clashscore	141614	1277 (2.78-2.74)
Ramachandran outliers	138981	1257 (2.78-2.74)
Sidechain outliers	138945	1257 (2.78-2.74)
RSRZ outliers	127900	1207 (2.78-2.74)

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 on 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	406	 67% 18% • 13%
1	B	406	 5% 66% 16% • 16%

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 5274 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 Probable porin.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	354	Total	C	N	O	S	0	0	0
			2736	1726	482	519	9			
1	B	340	Total	C	N	O	S	0	0	0
			2356	1477	415	457	7			

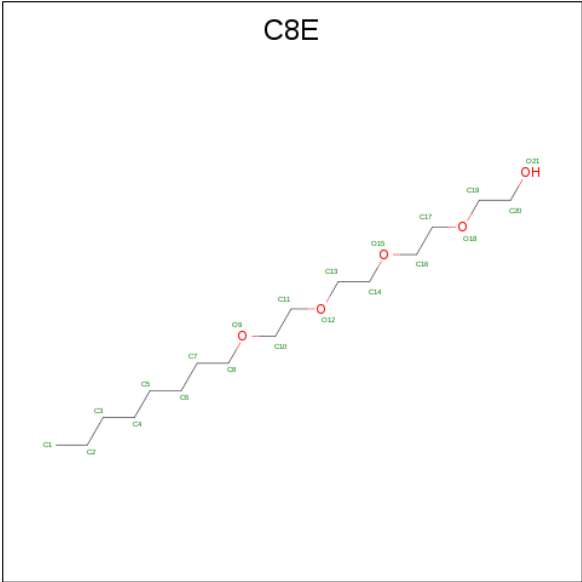
There are 12 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-5	HIS	-	EXPRESSION TAG	UNP Q9HWK2
A	-4	HIS	-	EXPRESSION TAG	UNP Q9HWK2
A	-3	HIS	-	EXPRESSION TAG	UNP Q9HWK2
A	-2	HIS	-	EXPRESSION TAG	UNP Q9HWK2
A	-1	HIS	-	EXPRESSION TAG	UNP Q9HWK2
A	0	HIS	-	EXPRESSION TAG	UNP Q9HWK2
B	-5	HIS	-	EXPRESSION TAG	UNP Q9HWK2
B	-4	HIS	-	EXPRESSION TAG	UNP Q9HWK2
B	-3	HIS	-	EXPRESSION TAG	UNP Q9HWK2
B	-2	HIS	-	EXPRESSION TAG	UNP Q9HWK2
B	-1	HIS	-	EXPRESSION TAG	UNP Q9HWK2
B	0	HIS	-	EXPRESSION TAG	UNP Q9HWK2

- Molecule 2 is CALCIUM ION (three-letter code: CA) (formula: Ca).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	2	Total	Ca	0	0
			2	2		

- Molecule 3 is (HYDROXYETHYLOXY)TRI(ETHYLOXY)OCTANE (three-letter code: C8E) (formula: C₁₆H₃₄O₅).



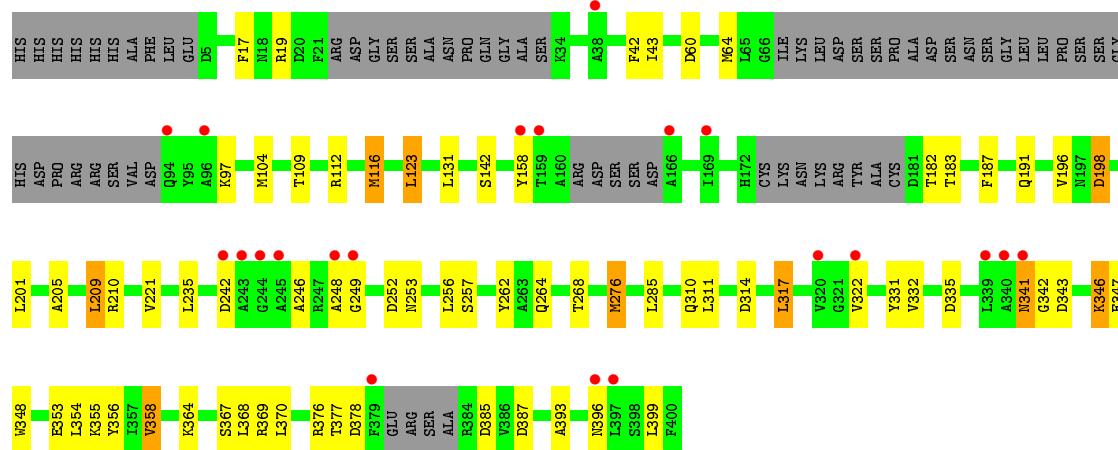
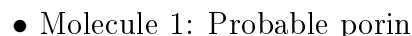
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	C	O	0	0
			21	16	5		
3	A	1	Total	C	O	0	0
			10	8	2		
3	A	1	Total	C	O	0	0
			14	12	2		
3	A	1	Total	C	O	0	0
			14	9	5		
3	A	1	Total	C	O	0	0
			9	8	1		
3	A	1	Total	C	O	0	0
			15	12	3		
3	A	1	Total	C		0	0
			6	6			
3	B	1	Total	C	O	0	0
			19	15	4		
3	B	1	Total	C	O	0	0
			12	10	2		

- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	45	Total	O	0	0
			45	45		
4	B	15	Total	O	0	0
			15	15		

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.

- Chain A:  67% 18% • 13%



4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	116.87Å 87.08Å 98.18Å 90.00° 98.21° 90.00°	Depositor
Resolution (Å)	14.80 – 2.75 35.26 – 2.75	Depositor EDS
% Data completeness (in resolution range)	99.6 (14.80-2.75) 99.6 (35.26-2.75)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.08	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.34 (at 2.76Å)	Xtriage
Refinement program	PHENIX (phenix.refine: 1.7.3_928)	Depositor
R, R_{free}	0.216 , 0.287 0.210 , 0.283	Depositor DCC
R_{free} test set	1301 reflections (5.10%)	wwPDB-VP
Wilson B-factor (Å ²)	51.2	Xtriage
Anisotropy	0.296	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.29 , 66.9	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.92	EDS
Total number of atoms	5274	wwPDB-VP
Average B, all atoms (Å ²)	60.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 8.18% 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

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: CA, C8E

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	0.50	0/2788	0.69	0/3765
1	B	0.40	0/2398	0.58	0/3241
All	All	0.46	0/5186	0.64	0/7006

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

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	2736	0	2577	43	0
1	B	2356	0	1979	40	0
2	A	2	0	0	0	0
3	A	89	0	133	12	0
3	B	31	0	49	1	0
4	A	45	0	0	1	0
4	B	15	0	0	3	0
All	All	5274	0	4738	91	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 (91) 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)
3:A:504:C8E:H81	3:A:505:C8E:H32	1.61	0.80
1:B:346:LYS:N	1:B:378:ASP:OD1	2.18	0.74
1:B:268:THR:HB	1:B:314:ASP:HB2	1.68	0.74
1:A:61:THR:HG22	1:A:100:VAL:HG22	1.73	0.71
1:A:350:ARG:HG3	3:A:503:C8E:H131	1.73	0.69
1:A:182:THR:HG21	1:A:248:ALA:HB2	1.73	0.69
1:B:358:VAL:HG22	1:B:364:LYS:HA	1.74	0.68
1:B:42:PHE:O	4:B:604:HOH:O	2.12	0.66
1:B:262:TYR:OH	1:B:264:GLN:OE1	2.13	0.65
1:A:17:PHE:HZ	1:A:19:ARG:HE	1.43	0.65
1:B:248:ALA:H	1:B:249:GLY:HA2	1.62	0.64
1:A:225:GLN:HG2	1:A:230:LYS:HE2	1.81	0.62
1:A:55:LEU:HD11	1:A:104:MET:HE3	1.82	0.61
1:A:358:VAL:HG22	1:A:364:LYS:HA	1.82	0.61
1:B:112:ARG:HH21	1:B:116:MET:HG3	1.66	0.60
1:A:198:ASP:OD1	1:A:198:ASP:N	2.34	0.60
1:B:209:LEU:HD12	1:B:210:ARG:H	1.66	0.59
1:B:355:LYS:HA	1:B:369:ARG:HA	1.85	0.59
1:B:253:ASN:HD21	1:B:276:MET:HG3	1.68	0.59
1:B:356:TYR:O	1:B:368:LEU:N	2.31	0.57
1:B:64:MET:HA	4:B:604:HOH:O	2.04	0.57
1:B:109:THR:HG23	1:B:142:SER:HB2	1.87	0.57
1:B:341:ASN:OD1	1:B:342:GLY:N	2.38	0.57
1:B:60:ASP:OD2	1:B:112:ARG:NH1	2.37	0.57
3:A:503:C8E:H192	1:B:331:TYR:CE2	2.41	0.56
1:A:67:ILE:HD13	1:A:94:GLN:HG3	1.88	0.56
1:A:366:LEU:HD12	1:A:394:SER:O	2.06	0.56
1:B:198:ASP:N	1:B:198:ASP:OD1	2.39	0.56
1:B:235:LEU:HD11	1:B:256:LEU:HD11	1.89	0.55
1:A:284:TYR:CE2	1:A:290:PRO:HD3	2.41	0.55
1:A:148:LEU:HD11	1:A:192:LEU:HD21	1.89	0.55
1:A:113:TYR:HD1	1:A:114:GLY:N	2.06	0.54
1:B:310:GLN:HB2	1:B:332:VAL:HG22	1.88	0.54
1:B:248:ALA:N	1:B:249:GLY:HA2	2.20	0.54
1:A:44:LEU:HB3	1:A:63:ALA:HB3	1.90	0.53
1:B:367:SER:O	1:B:393:ALA:HA	2.09	0.53
1:A:248:ALA:N	1:A:249:GLY:HA2	2.24	0.53
1:B:335:ASP:HB3	1:B:346:LYS:HG3	1.93	0.51
1:A:310:GLN:HB2	1:A:332:VAL:HG22	1.92	0.51
1:B:43:ILE:HA	4:B:604:HOH:O	2.10	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:317:LEU:HD13	1:B:322:VAL:HB	1.93	0.50
1:A:103:LYS:HB3	1:A:112:ARG:HG2	1.92	0.50
1:B:123:LEU:HG	1:B:285:LEU:HD12	1.94	0.50
1:B:354:LEU:O	1:B:370:LEU:N	2.43	0.49
1:B:347:GLU:HA	1:B:377:THR:HA	1.95	0.49
1:A:268:THR:HB	1:A:314:ASP:HB2	1.94	0.49
1:A:279:ALA:O	1:A:338:ARG:NH2	2.46	0.48
1:A:248:ALA:H	1:A:249:GLY:HA2	1.77	0.47
3:A:504:C8E:H82	3:A:505:C8E:H52	1.95	0.47
1:A:271:ALA:HB1	3:A:504:C8E:H72	1.97	0.47
1:B:341:ASN:OD1	1:B:343:ASP:N	2.39	0.46
1:A:284:TYR:CZ	1:A:290:PRO:HD3	2.50	0.46
1:A:370:LEU:HD13	1:A:391:LEU:CD2	2.46	0.46
1:A:274:GLN:O	4:A:645:HOH:O	2.21	0.46
1:B:246:ALA:C	1:B:248:ALA:H	2.18	0.46
1:A:17:PHE:HZ	1:A:19:ARG:NE	2.11	0.45
1:A:380:GLU:HB3	1:A:384:ARG:HD3	1.99	0.45
1:A:341:ASN:HB3	1:A:343:ASP:H	1.81	0.45
3:A:504:C8E:C8	3:A:505:C8E:H52	2.46	0.45
1:B:17:PHE:CZ	1:B:19:ARG:HG3	2.52	0.44
1:A:370:LEU:HD13	1:A:391:LEU:HD23	1.98	0.44
1:A:214:ARG:HD2	1:A:241:GLU:OE2	2.18	0.44
1:A:127:ASP:N	1:A:127:ASP:OD1	2.49	0.44
3:A:503:C8E:H171	3:A:503:C8E:H141	1.60	0.44
1:A:15:VAL:HG13	1:A:39:ALA:HB3	1.99	0.44
1:B:191:GLN:HG3	1:B:205:ALA:HB2	2.00	0.43
1:B:201:LEU:N	1:B:221:VAL:O	2.47	0.43
1:A:279:ALA:HA	1:A:338:ARG:HH22	1.83	0.43
3:A:503:C8E:H142	3:A:503:C8E:H41	1.99	0.43
1:B:64:MET:N	1:B:97:LYS:O	2.42	0.43
1:A:335:ASP:HB3	1:A:346:LYS:HG2	2.00	0.43
1:B:187:PHE:CD1	1:B:285:LEU:HD11	2.53	0.43
3:A:503:C8E:H142	3:A:503:C8E:C4	2.49	0.42
1:A:241:GLU:HA	1:A:251:ILE:O	2.18	0.42
1:B:331:TYR:HE1	1:B:348:TRP:CE3	2.37	0.42
1:A:236:ARG:O	1:A:256:LEU:HD12	2.19	0.42
1:B:356:TYR:N	1:B:368:LEU:O	2.43	0.42
1:A:350:ARG:CG	3:A:503:C8E:H131	2.46	0.42
1:A:305:GLU:OE1	1:A:338:ARG:NH1	2.53	0.42
3:B:502:C8E:H22	3:B:502:C8E:H52	1.83	0.42
1:A:46:LEU:HB2	1:A:61:THR:OG1	2.19	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:253:ASN:ND2	1:B:276:MET:HG3	2.34	0.42
3:A:508:C8E:H112	3:A:508:C8E:H141	1.90	0.41
1:A:204:TYR:HD1	1:A:218:LEU:HD12	1.85	0.41
1:A:326:SER:OG	1:A:355:LYS:HB3	2.19	0.41
1:B:376:ARG:HA	1:B:385:ASP:OD1	2.20	0.41
1:A:124:LYS:HA	1:A:124:LYS:HD2	1.88	0.41
1:A:325:LEU:HD13	1:A:356:TYR:CD1	2.55	0.41
1:B:348:TRP:NE1	1:B:376:ARG:HB2	2.35	0.40
1:B:353:GLU:HA	1:B:370:LEU:O	2.21	0.40
1:A:335:ASP:OD2	3:A:505:C8E:H131	2.21	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	346/406 (85%)	330 (95%)	12 (4%)	4 (1%)	13	23
1	B	326/406 (80%)	299 (92%)	25 (8%)	2 (1%)	25	42
All	All	672/812 (83%)	629 (94%)	37 (6%)	6 (1%)	17	31

All (6) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	175	ASN
1	A	176	LYS
1	A	226	VAL
1	B	131	LEU
1	B	341	ASN
1	A	177	ARG

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	263/328 (80%)	237 (90%)	26 (10%)	8	13
1	B	185/328 (56%)	165 (89%)	20 (11%)	6	10
All	All	448/656 (68%)	402 (90%)	46 (10%)	7	12

All (46) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	14	THR
1	A	43	ILE
1	A	46	LEU
1	A	110	GLN
1	A	113	TYR
1	A	122	LEU
1	A	127	ASP
1	A	129	ARG
1	A	133	THR
1	A	158	TYR
1	A	175	ASN
1	A	183	THR
1	A	197	ASN
1	A	198	ASP
1	A	221	VAL
1	A	230	LYS
1	A	240	SER
1	A	260	LEU
1	A	311	LEU
1	A	358	VAL
1	A	380	GLU
1	A	384	ARG
1	A	386	VAL
1	A	387	ASP
1	A	394	SER
1	A	399	LEU
1	B	104	MET

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Mol	Chain	Res	Type
1	B	116	MET
1	B	123	LEU
1	B	158	TYR
1	B	182	THR
1	B	183	THR
1	B	196	VAL
1	B	198	ASP
1	B	209	LEU
1	B	242	ASP
1	B	252	ASP
1	B	257	SER
1	B	276	MET
1	B	311	LEU
1	B	317	LEU
1	B	346	LYS
1	B	358	VAL
1	B	387	ASP
1	B	396	ASN
1	B	399	LEU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	253	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

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

5.5 Carbohydrates ⓘ

There are no monosaccharides in this entry.

5.6 Ligand geometry

Of 11 ligands modelled in this entry, 2 are monoatomic - leaving 9 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
3	C8E	A	506	-	13,13,20	0.49	0	12,12,19	0.40	0
3	C8E	A	509	-	5,5,20	0.37	0	4,4,19	0.38	0
3	C8E	A	508	-	14,14,20	0.47	0	13,13,19	0.55	0
3	C8E	A	505	-	13,13,20	0.40	0	12,12,19	0.36	0
3	C8E	B	501	-	17,17,20	0.46	0	15,15,19	0.40	0
3	C8E	B	502	-	11,11,20	0.42	0	10,10,19	0.46	0
3	C8E	A	507	-	8,8,20	0.33	0	7,7,19	0.52	0
3	C8E	A	503	-	20,20,20	0.47	0	19,19,19	0.52	0
3	C8E	A	504	-	9,9,20	0.37	0	8,8,19	0.55	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	C8E	A	506	-	-	7/11/11/18	-
3	C8E	A	509	-	-	1/3/3/18	-
3	C8E	A	508	-	-	6/12/12/18	-
3	C8E	A	505	-	-	8/11/11/18	-
3	C8E	B	501	-	-	10/13/13/18	-
3	C8E	B	502	-	-	6/9/9/18	-
3	C8E	A	507	-	-	2/6/6/18	-
3	C8E	A	503	-	-	9/18/18/18	-
3	C8E	A	504	-	-	5/7/7/18	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (54) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	508	C8E	C14-C13-O12-C11
3	B	501	C8E	O18-C19-C20-O21
3	A	504	C8E	O9-C10-C11-O12
3	A	503	C8E	C2-C3-C4-C5
3	B	502	C8E	C2-C3-C4-C5
3	A	503	C8E	O12-C13-C14-O15
3	A	503	C8E	C17-C16-O15-C14
3	A	504	C8E	C6-C7-C8-O9
3	B	501	C8E	C6-C7-C8-O9
3	A	508	C8E	O12-C13-C14-O15
3	A	508	C8E	C3-C4-C5-C6
3	A	509	C8E	C3-C4-C5-C6
3	B	502	C8E	C6-C7-C8-O9
3	A	505	C8E	C3-C4-C5-C6
3	A	505	C8E	C5-C6-C7-C8
3	A	505	C8E	C2-C3-C4-C5
3	B	501	C8E	C2-C3-C4-C5
3	A	503	C8E	O18-C19-C20-O21
3	A	504	C8E	C3-C4-C5-C6
3	A	508	C8E	C4-C5-C6-C7
3	A	506	C8E	O18-C19-C20-O21
3	A	507	C8E	C2-C3-C4-C5
3	B	501	C8E	C4-C5-C6-C7
3	A	503	C8E	C4-C5-C6-C7
3	A	506	C8E	O15-C16-C17-O18
3	A	506	C8E	O12-C13-C14-O15
3	A	505	C8E	C7-C8-O9-C10
3	B	502	C8E	C1-C2-C3-C4
3	B	501	C8E	C5-C6-C7-C8
3	A	506	C8E	C17-C16-O15-C14
3	B	502	C8E	C5-C6-C7-C8
3	A	507	C8E	C3-C4-C5-C6
3	A	503	C8E	C16-C17-O18-C19
3	A	505	C8E	C4-C5-C6-C7
3	A	503	C8E	C11-C10-O9-C8
3	B	502	C8E	O9-C10-C11-O12
3	A	508	C8E	C7-C8-O9-C10
3	B	501	C8E	C3-C4-C5-C6
3	A	504	C8E	C4-C5-C6-C7
3	A	506	C8E	C11-C10-O9-C8
3	A	505	C8E	O9-C10-C11-O12
3	B	502	C8E	C7-C8-O9-C10

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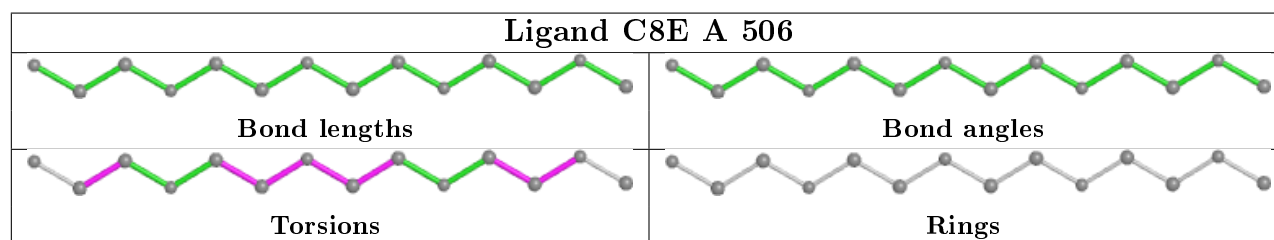
Mol	Chain	Res	Type	Atoms
3	B	501	C8E	C10-C11-O12-C13
3	B	501	C8E	C7-C8-O9-C10
3	A	505	C8E	C10-C11-O12-C13
3	A	508	C8E	O9-C10-C11-O12
3	A	503	C8E	C10-C11-O12-C13
3	A	506	C8E	C13-C14-O15-C16
3	A	503	C8E	C13-C14-O15-C16
3	A	504	C8E	C7-C8-O9-C10
3	B	501	C8E	C16-C17-O18-C19
3	B	501	C8E	C11-C10-O9-C8
3	A	505	C8E	C11-C10-O9-C8
3	A	506	C8E	O9-C10-C11-O12

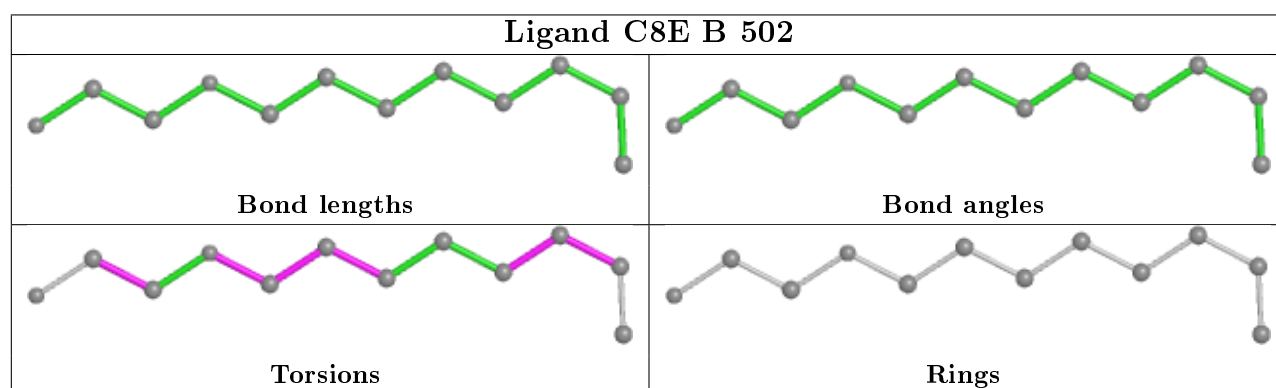
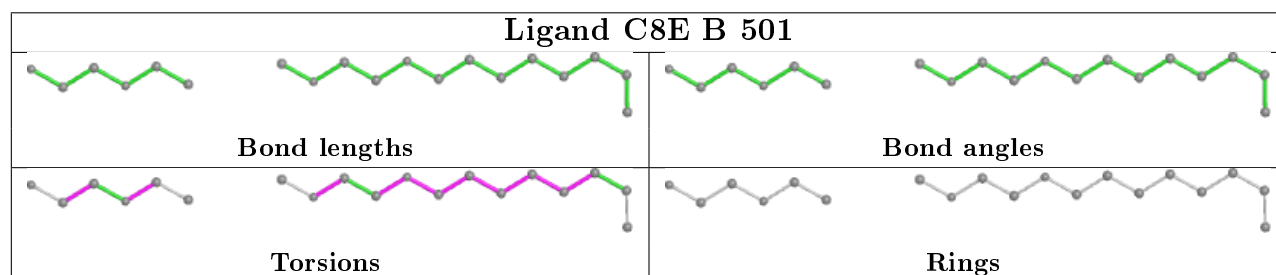
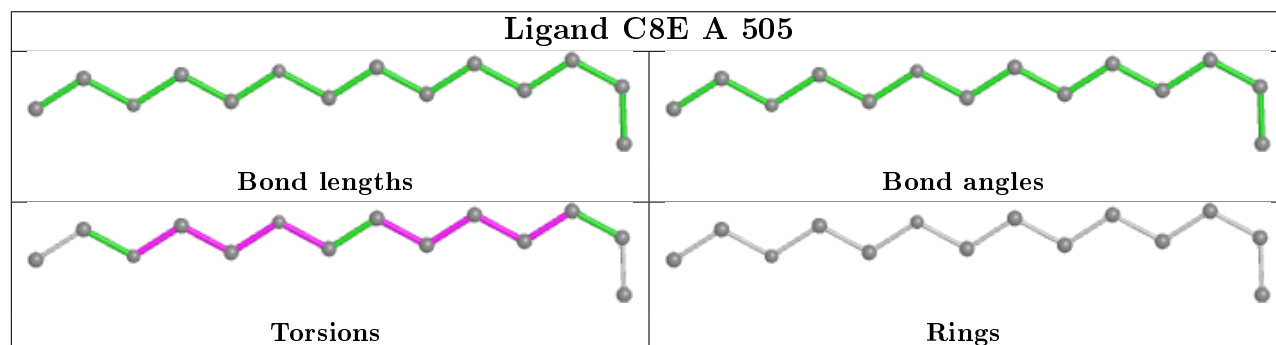
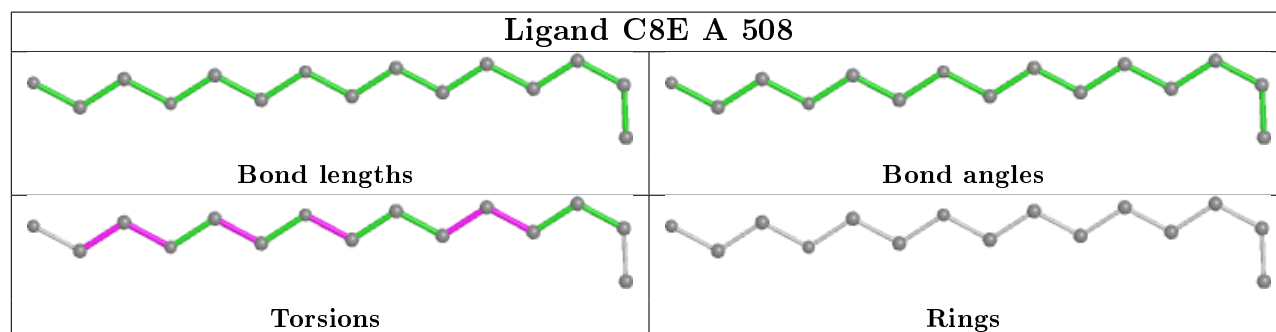
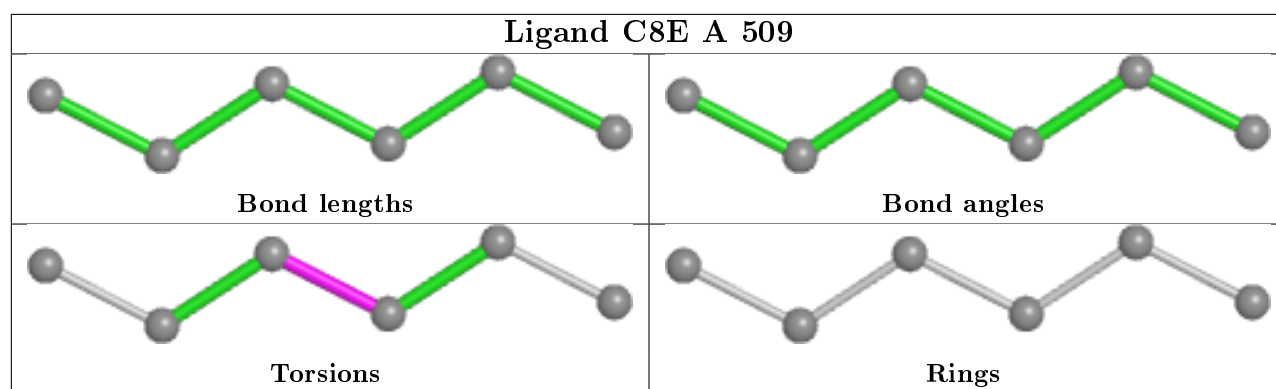
There are no ring outliers.

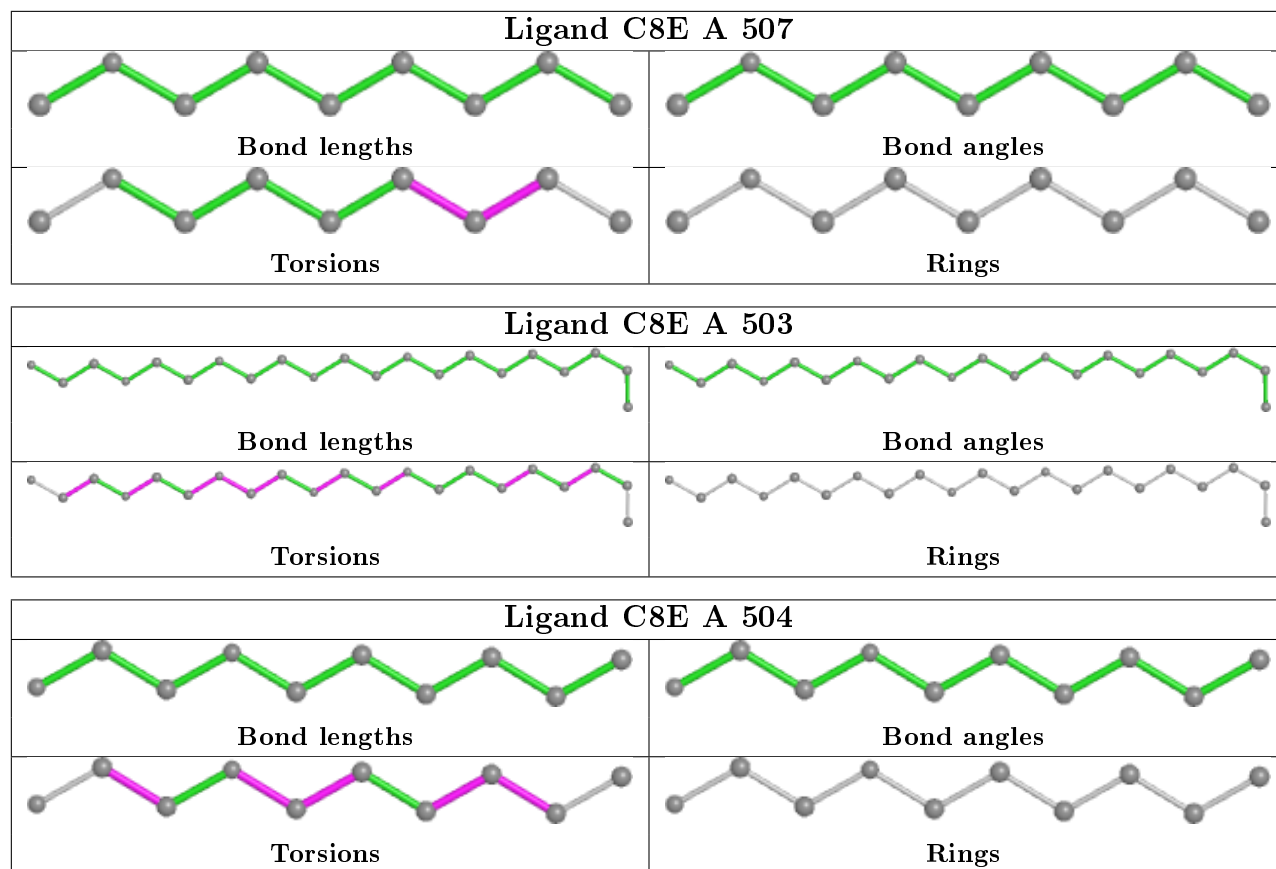
5 monomers are involved in 13 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	508	C8E	1	0
3	A	505	C8E	4	0
3	B	502	C8E	1	0
3	A	503	C8E	6	0
3	A	504	C8E	4	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	354/406 (87%)	-0.18	2 (0%) 89 92	15, 43, 80, 99	0
1	B	340/406 (83%)	0.21	21 (6%) 20 25	34, 77, 116, 128	0
All	All	694/812 (85%)	0.01	23 (3%) 46 54	15, 59, 109, 128	0

All (23) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	339	LEU	4.9
1	B	244	GLY	4.7
1	B	243	ALA	4.7
1	B	96	ALA	4.4
1	B	340	ALA	3.8
1	B	245	ALA	3.7
1	B	248	ALA	3.4
1	B	397	LEU	3.3
1	B	320	VAL	3.2
1	B	159	THR	3.1
1	B	322	VAL	3.0
1	B	396	ASN	2.9
1	B	249	GLY	2.9
1	B	169	ILE	2.8
1	B	158	TYR	2.6
1	B	341	ASN	2.6
1	B	379	PHE	2.5
1	B	38	ALA	2.4
1	B	242	ASP	2.3
1	A	341	ASN	2.1
1	A	363	PHE	2.1
1	B	166	ALA	2.1
1	B	94	GLN	2.0

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

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

6.3 Carbohydrates [i](#)

There are no monosaccharides in this entry.

6.4 Ligands [i](#)

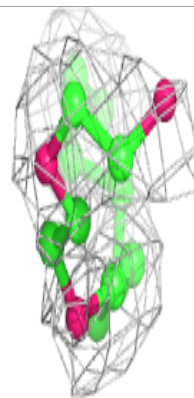
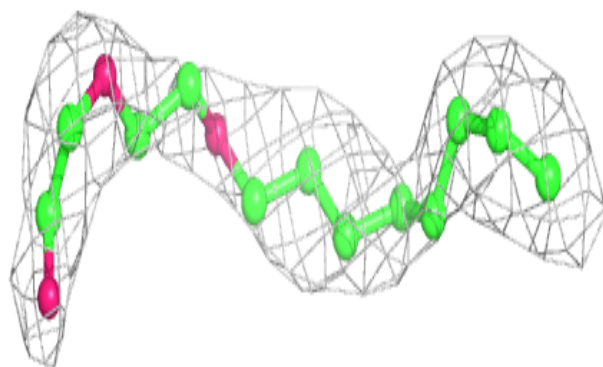
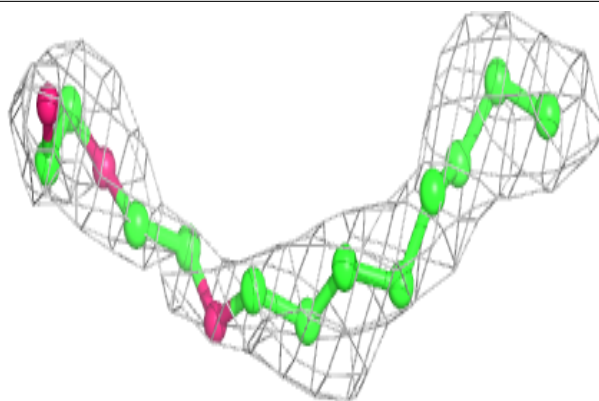
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
3	C8E	A	508	15/21	0.81	0.30	31,57,77,77	0
3	C8E	B	501	19/21	0.81	0.36	47,66,73,73	0
3	C8E	A	503	21/21	0.85	0.29	48,62,74,80	0
3	C8E	A	504	10/21	0.86	0.29	44,62,72,73	0
3	C8E	A	506	14/21	0.87	0.23	46,53,73,83	0
3	C8E	A	509	6/21	0.90	0.14	40,42,56,57	0
3	C8E	B	502	12/21	0.90	0.27	36,50,69,69	0
3	C8E	A	505	14/21	0.95	0.26	32,48,56,56	0
3	C8E	A	507	9/21	0.95	0.23	45,52,57,60	0
2	CA	A	502	1/1	0.97	0.34	75,75,75,75	0
2	CA	A	501	1/1	0.99	0.10	52,52,52,52	0

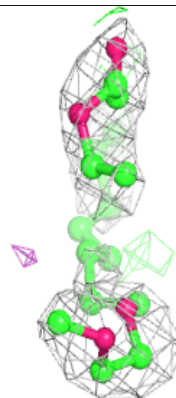
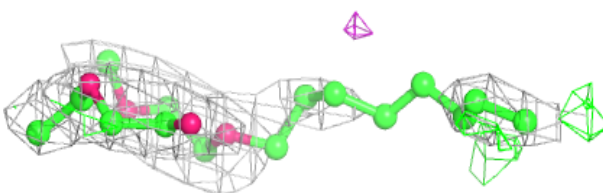
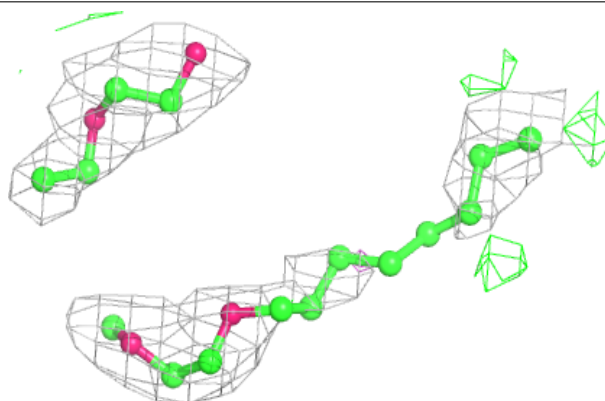
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around C8E A 508:

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

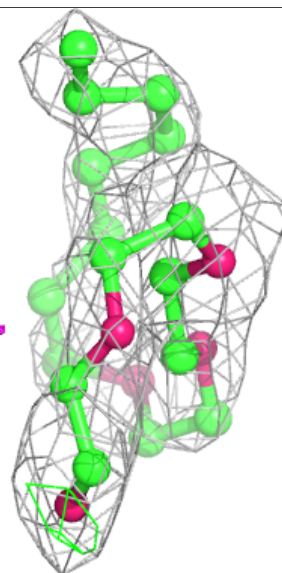
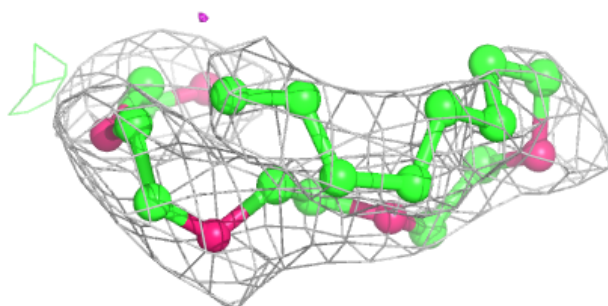
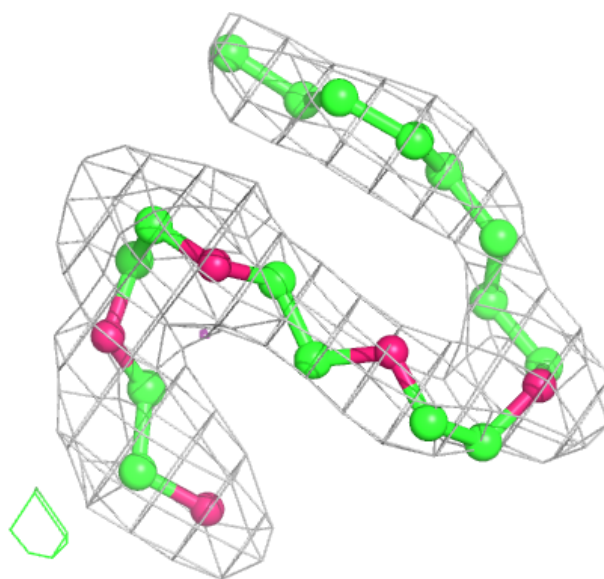
**Electron density around C8E B 501:**

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



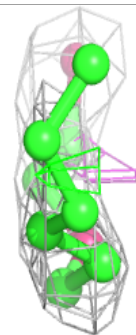
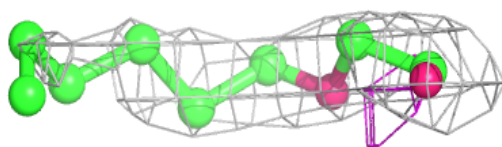
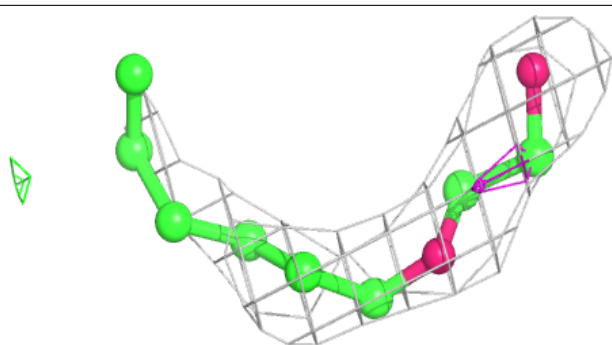
Electron density around C8E A 503:

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



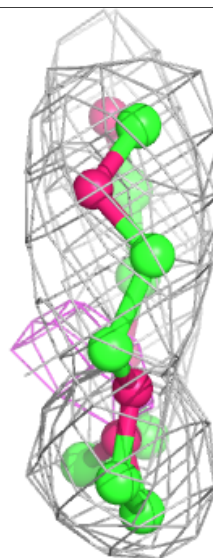
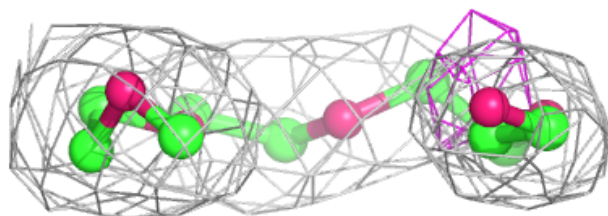
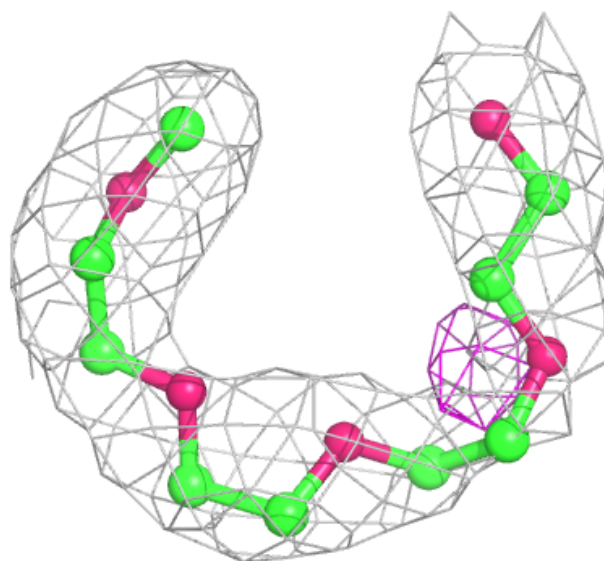
Electron density around C8E A 504:

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



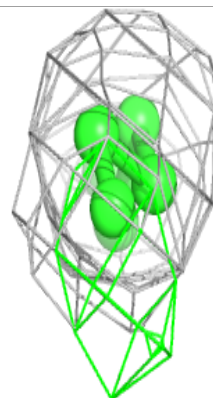
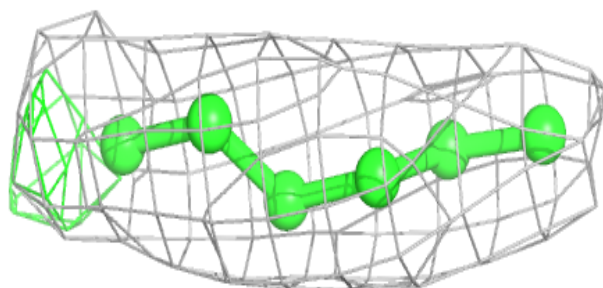
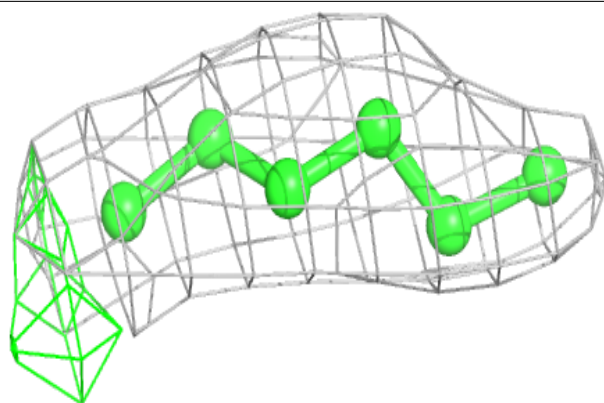
Electron density around C8E A 506:

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

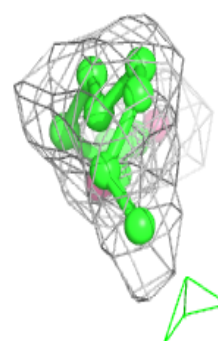
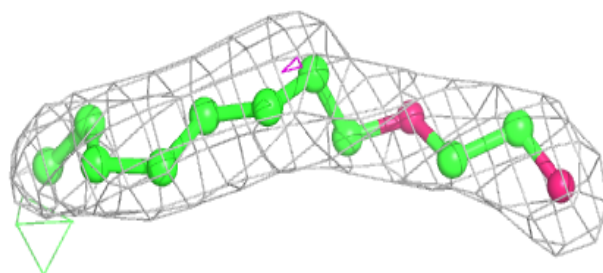
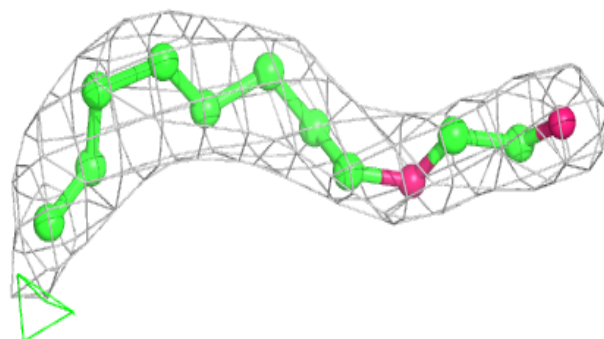


Electron density around C8E A 509:

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

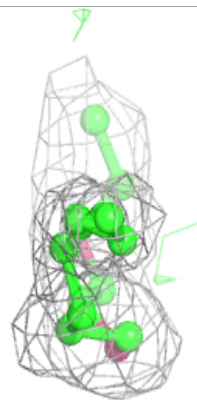
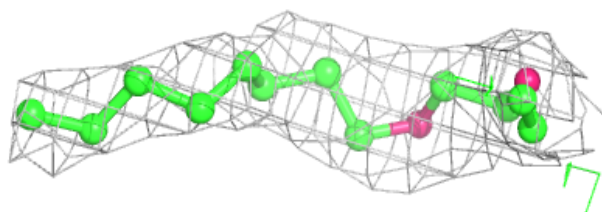
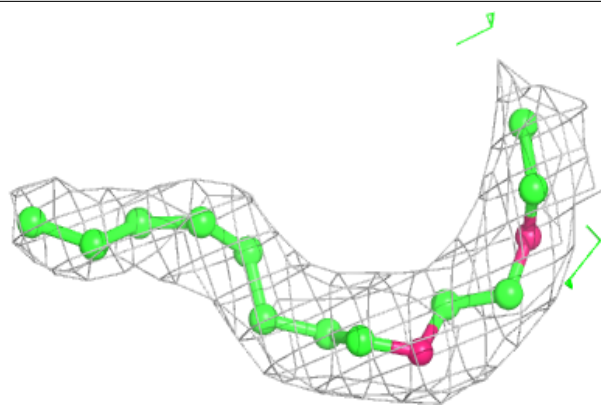
**Electron density around C8E B 502:**

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

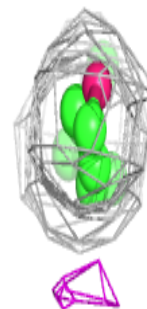
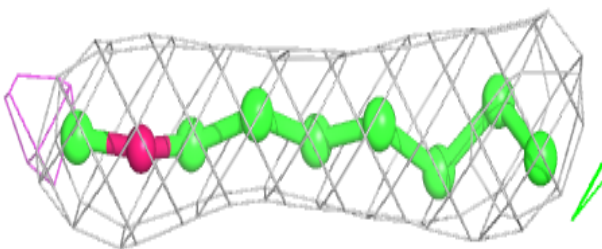
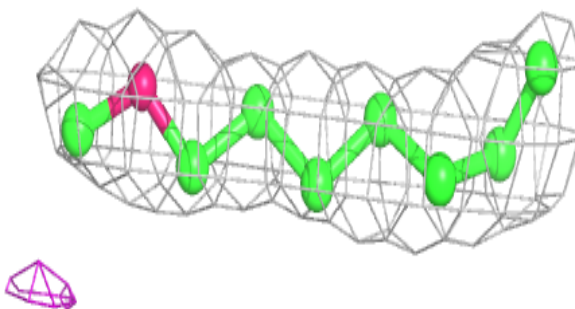


Electron density around C8E A 505:

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

**Electron density around C8E A 507:**

$2mF_o-DF_c$ (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.