



Full wwPDB X-ray Structure Validation Report ⓘ

May 17, 2020 – 08:16 pm BST

PDB ID : 6EHB
Title : OmpU, an outer membrane protein, of *Vibrio cholerae*
Authors : van den berg, B.; Pathania, M.
Deposited on : 2017-09-13
Resolution : 1.55 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 : 2.11
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) : 2.11

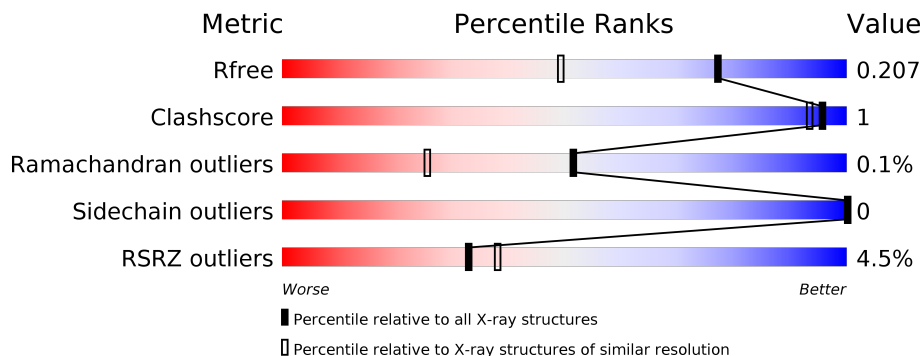
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.55 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	1483 (1.56-1.56)
Clashscore	141614	1529 (1.56-1.56)
Ramachandran outliers	138981	1498 (1.56-1.56)
Sidechain outliers	138945	1495 (1.56-1.56)
RSRZ outliers	127900	1465 (1.56-1.56)

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	320	
1	B	320	
1	C	320	

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	C8E	C	405	-	-	-	X

2 Entry composition [i](#)

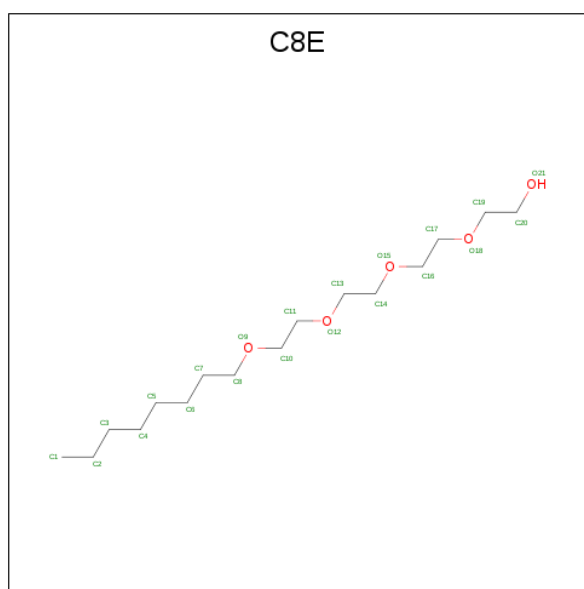
There are 3 unique types of molecules in this entry. The entry contains 8182 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 Outer membrane protein U.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	318	Total 2434	C 1518	N 402	O 509	S 5	0	1	0
1	B	317	Total 2444	C 1529	N 401	O 509	S 5	0	4	0
1	C	320	Total 2463	C 1537	N 406	O 515	S 5	0	2	0

- Molecule 2 is (HYDROXYETHYLOXY)TRI(ETHYLOXY)OCTANE (three-letter code: C8E) (formula: C₁₆H₃₄O₅).



Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	1	Total 6	C 6	0	0
2	A	1	Total 12	C 10	O 2	0
2	A	1	Total 11	C 10	O 1	0

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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	1	Total C 5 5	0	0
2	A	1	Total C O 9 6 3	0	0
2	A	1	Total C O 10 9 1	0	0
2	A	1	Total C O 8 6 2	0	0
2	B	1	Total C 8 8	0	0
2	B	1	Total C 5 5	0	0
2	B	1	Total C O 9 6 3	0	0
2	B	1	Total C O 9 8 1	0	0
2	B	1	Total C O 11 10 1	0	0
2	B	1	Total C O 4 3 1	0	0
2	B	1	Total C O 9 6 3	0	0
2	C	1	Total C 8 8	0	0
2	C	1	Total C O 7 6 1	0	0
2	C	1	Total C 5 5	0	0
2	C	1	Total C O 14 12 2	0	0
2	C	1	Total C O 10 9 1	0	0
2	C	1	Total C 7 7	0	0
2	C	1	Total C O 11 10 1	0	0
2	C	1	Total C O 10 9 1	0	0
2	C	1	Total C O 14 9 5	0	0

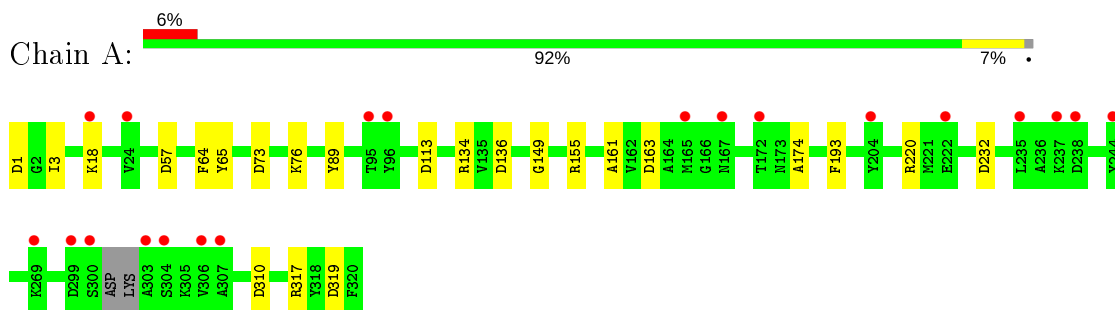
- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	213	Total 213	O 213	0	0
3	B	183	Total 183	O 183	0	0
3	C	243	Total 243	O 243	0	0

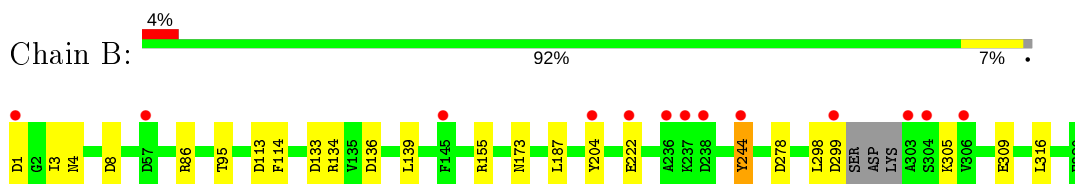
3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA and DNA 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.

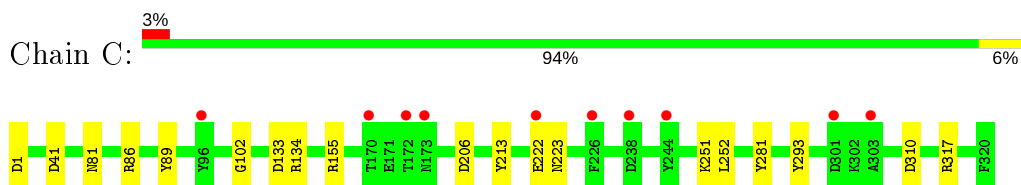
- Molecule 1: Outer membrane protein U



- Molecule 1: Outer membrane protein U



- Molecule 1: Outer membrane protein U



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	62.72Å 153.84Å 66.17Å 90.00° 102.32° 90.00°	Depositor
Resolution (Å)	49.49 – 1.55 49.49 – 1.55	Depositor EDS
% Data completeness (in resolution range)	97.1 (49.49-1.55) 97.1 (49.49-1.55)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.61 (at 1.55Å)	Xtrriage
Refinement program	REFMAC 5.8.0158	Depositor
R, R_{free}	0.170 , 0.199 0.182 , 0.207	Depositor DCC
R_{free} test set	8445 reflections (4.92%)	wwPDB-VP
Wilson B-factor (Å ²)	19.3	Xtrriage
Anisotropy	0.008	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.35 , 49.3	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	8182	wwPDB-VP
Average B, all atoms (Å ²)	24.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.44% of the height of the origin peak. No significant pseudotranslation is detected.*

¹ Intensities estimated from amplitudes.

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

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: 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	1.19	1/2479 (0.0%)	1.18	17/3346 (0.5%)
1	B	1.18	2/2499 (0.1%)	1.16	9/3374 (0.3%)
1	C	1.18	4/2510 (0.2%)	1.15	9/3389 (0.3%)
All	All	1.19	7/7488 (0.1%)	1.16	35/10109 (0.3%)

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

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

All (7) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	213	TYR	CB-CG	-6.84	1.41	1.51
1	B	86	ARG	CZ-NH1	-6.80	1.24	1.33
1	B	244	TYR	CB-CG	-6.14	1.42	1.51
1	A	149	GLY	N-CA	5.71	1.54	1.46
1	C	1	ASP	C-O	5.61	1.34	1.23
1	C	293	TYR	CE1-CZ	-5.57	1.31	1.38
1	C	89	TYR	CG-CD2	5.45	1.46	1.39

All (35) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	134	ARG	NE-CZ-NH1	9.80	125.20	120.30
1	C	86	ARG	NE-CZ-NH1	9.16	124.88	120.30
1	B	113	ASP	CB-CG-OD2	-8.10	111.01	118.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	1	ASP	CB-CG-OD1	7.38	124.94	118.30
1	A	134	ARG	NE-CZ-NH1	7.25	123.92	120.30
1	B	8	ASP	CB-CG-OD1	7.13	124.72	118.30
1	A	113	ASP	CB-CG-OD2	-7.04	111.96	118.30
1	A	220	ARG	NE-CZ-NH1	6.92	123.76	120.30
1	A	57	ASP	CB-CG-OD1	6.86	124.47	118.30
1	A	319	ASP	CB-CG-OD2	-6.81	112.17	118.30
1	A	220	ARG	NE-CZ-NH2	-6.74	116.93	120.30
1	B	278	ASP	CB-CG-OD1	6.73	124.36	118.30
1	C	317	ARG	NE-CZ-NH2	-6.54	117.03	120.30
1	A	136	ASP	CB-CG-OD1	6.52	124.17	118.30
1	B	155	ARG	NE-CZ-NH1	6.39	123.49	120.30
1	C	310	ASP	CB-CG-OD2	-6.37	112.57	118.30
1	B	134	ARG	NE-CZ-NH1	6.34	123.47	120.30
1	C	133	ASP	CB-CG-OD2	-6.19	112.73	118.30
1	B	114	PHE	CB-CG-CD1	6.18	125.13	120.80
1	A	155	ARG	CG-CD-NE	-5.95	99.31	111.80
1	B	155	ARG	CG-CD-NE	-5.89	99.42	111.80
1	A	89	TYR	CB-CG-CD1	5.67	124.40	121.00
1	B	133	ASP	CB-CG-OD2	-5.61	113.25	118.30
1	A	163	ASP	CB-CG-OD1	5.57	123.31	118.30
1	A	64	PHE	CB-CG-CD2	-5.54	116.92	120.80
1	C	252	LEU	CA-CB-CG	5.50	127.94	115.30
1	C	206	ASP	CB-CG-OD1	5.45	123.20	118.30
1	A	134	ARG	NE-CZ-NH2	-5.35	117.62	120.30
1	A	317	ARG	NE-CZ-NH2	-5.33	117.64	120.30
1	C	41	ASP	CB-CG-OD2	5.29	123.06	118.30
1	A	65	TYR	CD1-CE1-CZ	-5.15	115.16	119.80
1	B	136	ASP	CB-CG-OD2	5.15	122.94	118.30
1	C	155	ARG	CG-CD-NE	-5.12	101.05	111.80
1	A	310	ASP	CB-CG-OD2	-5.08	113.73	118.30
1	A	232	ASP	CB-CG-OD2	5.02	122.81	118.30

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	C	102	GLY	Mainchain
1	C	81	ASN	Mainchain

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	2434	0	2267	5	0
1	B	2444	0	2285	8	3
1	C	2463	0	2293	3	0
2	A	61	0	87	1	0
2	B	55	0	76	1	0
2	C	86	0	140	3	2
3	A	213	0	0	1	0
3	B	183	0	0	2	1
3	C	243	0	0	0	1
All	All	8182	0	7148	16	4

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 1.

All (16) 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:C:281:TYR:HB2	2:C:409:C8E:H131	1.80	0.64
1:B:316:LEU:HB2	2:B:401:C8E:H11	1.82	0.59
1:B:139:LEU:HD11	2:C:404:C8E:H61	1.88	0.56
1:A:193:PHE:HB3	2:A:403:C8E:H31	1.91	0.52
1:B:187:LEU:HD12	1:B:204[A]:TYR:CZ	2.45	0.52
1:B:95:THR:OG1	3:B:501:HOH:O	2.19	0.51
1:B:1:ASP:HB3	1:B:4:ASN:O	2.10	0.51
1:B:3:ILE:HD11	3:B:569:HOH:O	2.11	0.50
1:C:222:GLU:O	1:C:223:ASN:HB2	2.11	0.50
1:A:3:ILE:HD11	3:A:627:HOH:O	2.12	0.49
1:B:298:LEU:O	1:B:299:ASP:C	2.54	0.46
1:A:161:ALA:HB1	1:A:174:ALA:CB	2.47	0.45
1:C:251:LYS:HE2	2:C:401:C8E:H13	1.98	0.45
1:B:305:LYS:O	1:B:309:GLU:HG2	2.18	0.43
1:A:161:ALA:HB1	1:A:174:ALA:HB2	2.01	0.42
1:A:73:ASP:HB3	1:A:76:LYS:O	2.20	0.41

All (4) symmetry-related close contacts are listed below. The label for Atom-2 includes the sym-

metry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:244:TYR:OH	2:C:405:C8E:O9[1_656]	1.95	0.25
1:B:173:ASN:ND2	1:B:222:GLU:OE2[1_554]	2.01	0.19
3:B:674:HOH:O	3:C:727:HOH:O[1_655]	2.06	0.14
1:B:244:TYR:OH	2:C:405:C8E:C8[1_656]	2.08	0.12

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	315/320 (98%)	300 (95%)	14 (4%)	1 (0%)	41	19
1	B	317/320 (99%)	305 (96%)	12 (4%)	0	100	100
1	C	320/320 (100%)	306 (96%)	14 (4%)	0	100	100
All	All	952/960 (99%)	911 (96%)	40 (4%)	1 (0%)	51	26

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	18	LYS

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	243/244 (100%)	243 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	B	245/244 (100%)	245 (100%)	0	100	100
1	C	246/244 (101%)	246 (100%)	0	100	100
All	All	734/732 (100%)	734 (100%)	0	100	100

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

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

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 carbohydrates 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	C8E	C	407	-	10,10,20	0.68	0	9,9,19	0.99	1 (11%)
2	C8E	A	402	-	11,11,20	0.42	0	10,10,19	0.38	0
2	C8E	B	405	-	10,10,20	0.60	0	9,9,19	0.36	0
2	C8E	C	401	-	7,7,20	0.45	0	6,6,19	0.86	0
2	C8E	B	403	-	8,8,20	0.69	0	7,7,19	0.70	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	C8E	A	404	-	4,4,20	0.45	0	3,3,19	1.20	0
2	C8E	B	407	-	8,8,20	0.61	0	7,7,19	0.70	0
2	C8E	B	401	-	7,7,20	0.21	0	6,6,19	0.58	0
2	C8E	B	402	-	4,4,20	0.15	0	3,3,19	0.43	0
2	C8E	A	407	-	7,7,20	0.57	0	6,6,19	0.77	0
2	C8E	C	403	-	4,4,20	0.18	0	3,3,19	0.52	0
2	C8E	A	406	-	9,9,20	0.56	0	8,8,19	0.79	0
2	C8E	A	405	-	8,8,20	0.55	0	7,7,19	0.77	0
2	C8E	C	406	-	6,6,20	0.30	0	5,5,19	0.32	0
2	C8E	A	401	-	5,5,20	0.32	0	4,4,19	0.50	0
2	C8E	C	409	-	13,13,20	0.76	0	12,12,19	1.13	1 (8%)
2	C8E	A	403	-	10,10,20	0.56	0	9,9,19	0.70	0
2	C8E	C	408	-	9,9,20	0.62	0	8,8,19	0.91	0
2	C8E	B	404	-	8,8,20	0.47	0	7,7,19	0.55	0
2	C8E	C	402	-	6,6,20	0.57	0	5,5,19	0.56	0
2	C8E	C	405	-	9,9,20	0.50	0	8,8,19	0.70	0
2	C8E	B	406	-	3,3,20	0.50	0	2,2,19	1.37	0
2	C8E	C	404	-	13,13,20	0.60	0	12,12,19	0.71	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	C8E	C	407	-	-	3/8/8/18	-
2	C8E	A	402	-	-	2/9/9/18	-
2	C8E	B	405	-	-	0/8/8/18	-
2	C8E	C	401	-	-	3/5/5/18	-
2	C8E	B	403	-	-	4/6/6/18	-
2	C8E	A	404	-	-	2/2/2/18	-
2	C8E	B	407	-	-	2/6/6/18	-
2	C8E	B	401	-	-	1/5/5/18	-
2	C8E	B	402	-	-	1/2/2/18	-
2	C8E	A	407	-	-	0/5/5/18	-
2	C8E	C	403	-	-	1/2/2/18	-
2	C8E	A	406	-	-	1/7/7/18	-
2	C8E	A	405	-	-	4/6/6/18	-
2	C8E	C	406	-	-	2/4/4/18	-
2	C8E	A	401	-	-	0/3/3/18	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	C8E	C	409	-	-	4/11/11/18	-
2	C8E	A	403	-	-	2/8/8/18	-
2	C8E	C	408	-	-	6/7/7/18	-
2	C8E	B	404	-	-	0/6/6/18	-
2	C8E	C	402	-	-	0/4/4/18	-
2	C8E	C	405	-	-	0/7/7/18	-
2	C8E	B	406	-	-	0/0/1/18	-
2	C8E	C	404	-	-	4/11/11/18	-

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	407	C8E	C10-O9-C8	2.38	121.41	112.90
2	C	409	C8E	C13-O12-C11	2.32	123.34	113.29

There are no chirality outliers.

All (42) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	402	C8E	O9-C10-C11-O12
2	A	405	C8E	O15-C16-C17-O18
2	A	406	C8E	C6-C7-C8-O9
2	B	407	C8E	O15-C16-C17-O18
2	C	404	C8E	C6-C7-C8-O9
2	C	407	C8E	C6-C7-C8-O9
2	C	408	C8E	C6-C7-C8-O9
2	C	408	C8E	C4-C5-C6-C7
2	C	404	C8E	C5-C6-C7-C8
2	C	404	C8E	C4-C5-C6-C7
2	C	401	C8E	C3-C4-C5-C6
2	C	409	C8E	O9-C10-C11-O12
2	B	403	C8E	O12-C13-C14-O15
2	B	401	C8E	C1-C2-C3-C4
2	A	403	C8E	C2-C3-C4-C5
2	C	401	C8E	C5-C6-C7-C8
2	C	408	C8E	C1-C2-C3-C4
2	C	408	C8E	C3-C4-C5-C6
2	C	409	C8E	O12-C13-C14-O15
2	A	404	C8E	C3-C4-C5-C6

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Mol	Chain	Res	Type	Atoms
2	C	406	C8E	C1-C2-C3-C4
2	C	403	C8E	C2-C3-C4-C5
2	C	408	C8E	C2-C3-C4-C5
2	C	407	C8E	C11-C10-O9-C8
2	B	407	C8E	O18-C19-C20-O21
2	B	403	C8E	C14-C13-O12-C11
2	B	403	C8E	C11-C10-O9-C8
2	A	405	C8E	C16-C17-O18-C19
2	A	405	C8E	O18-C19-C20-O21
2	B	403	C8E	O9-C10-C11-O12
2	C	409	C8E	C14-C13-O12-C11
2	C	401	C8E	C1-C2-C3-C4
2	C	406	C8E	C3-C4-C5-C6
2	C	409	C8E	O15-C16-C17-O18
2	C	407	C8E	C2-C3-C4-C5
2	A	404	C8E	C2-C3-C4-C5
2	C	404	C8E	O9-C10-C11-O12
2	C	408	C8E	C5-C6-C7-C8
2	A	405	C8E	C13-C14-O15-C16
2	A	403	C8E	C6-C7-C8-O9
2	A	402	C8E	C10-C11-O12-C13
2	B	402	C8E	C1-C2-C3-C4

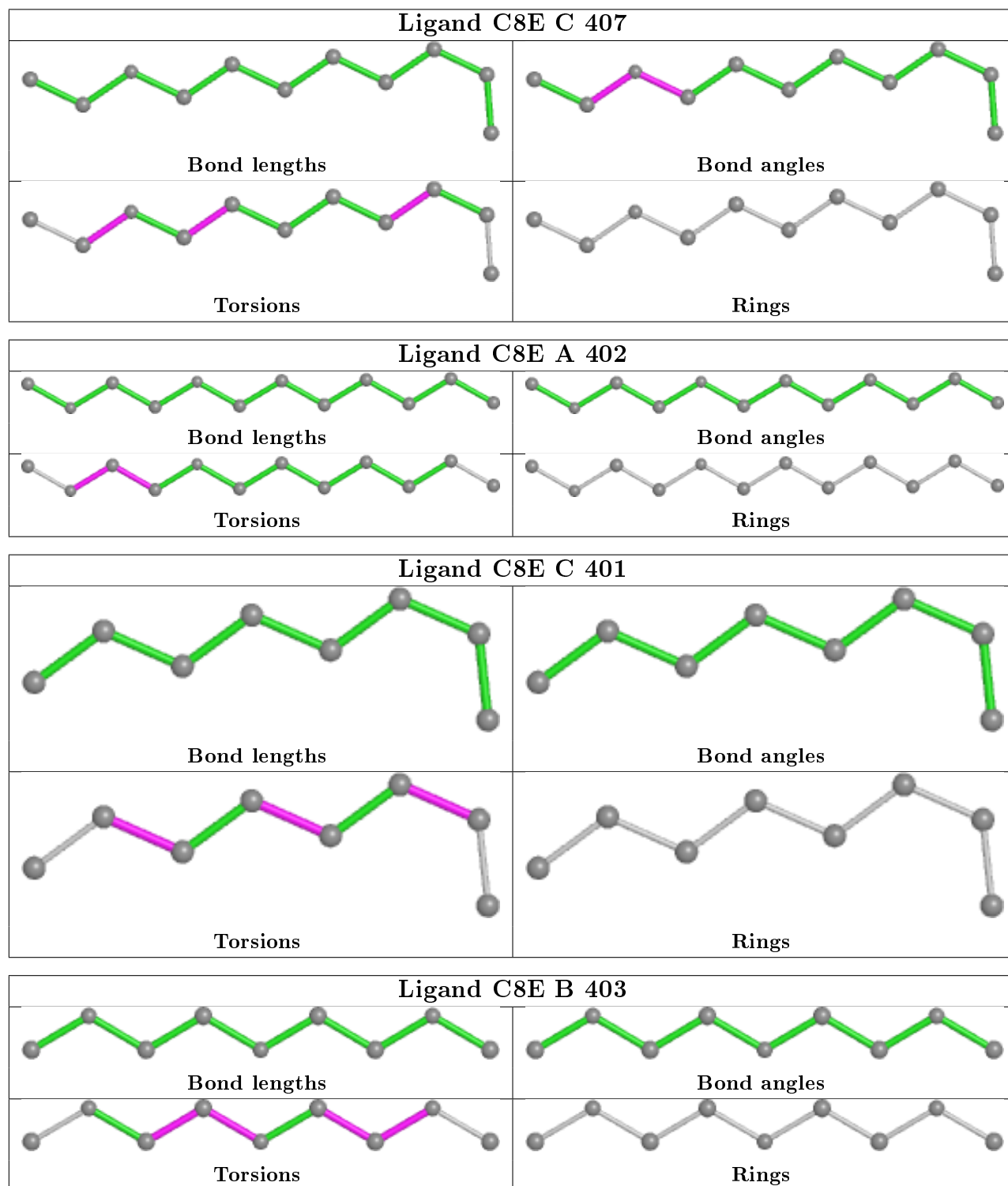
There are no ring outliers.

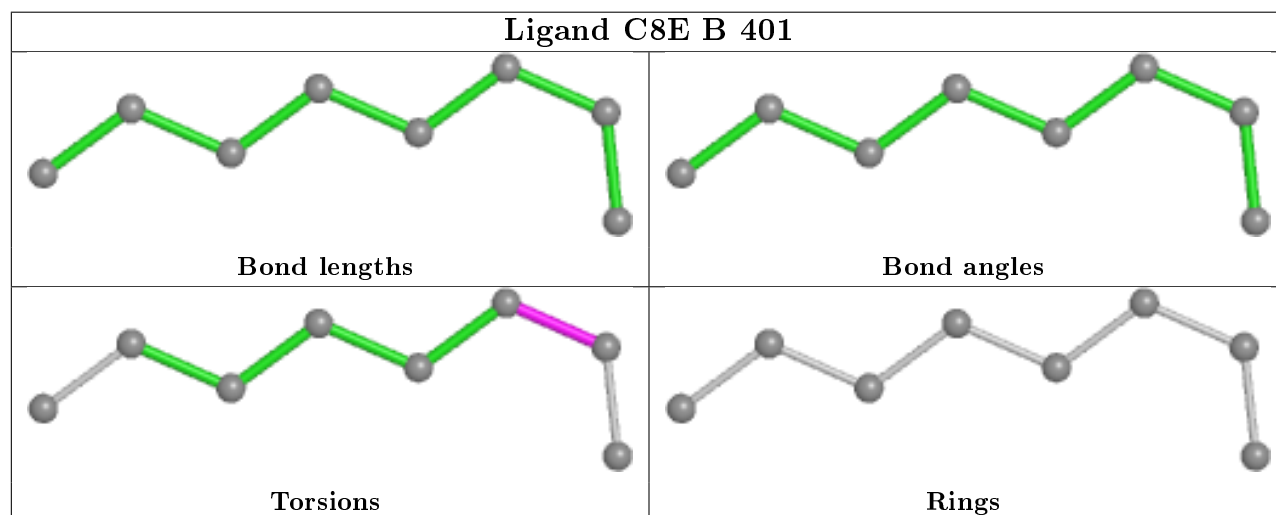
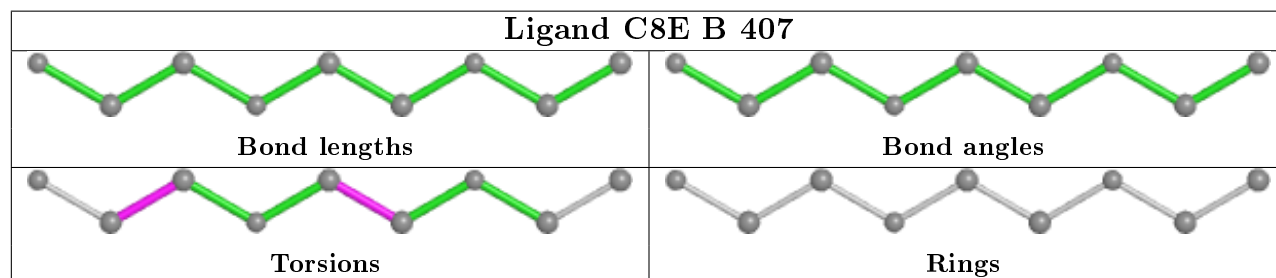
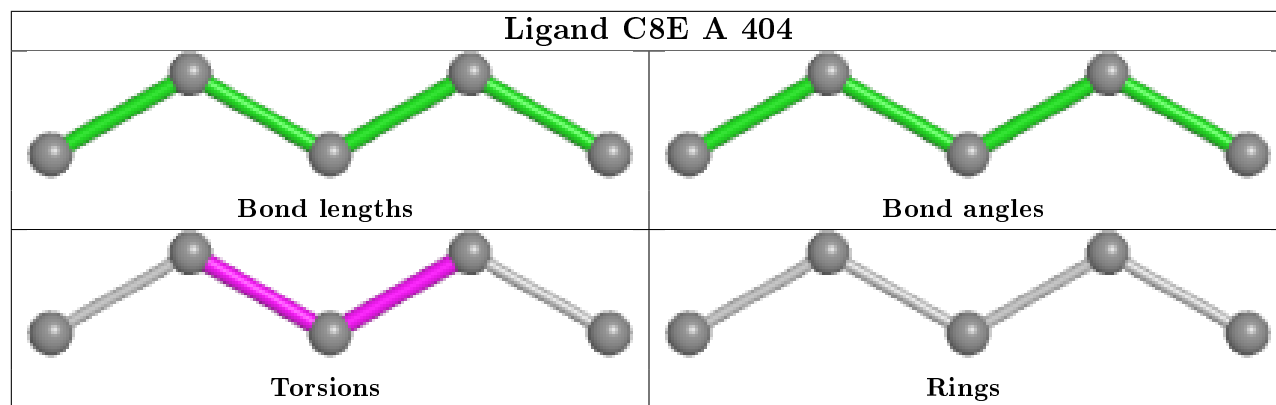
6 monomers are involved in 7 short contacts:

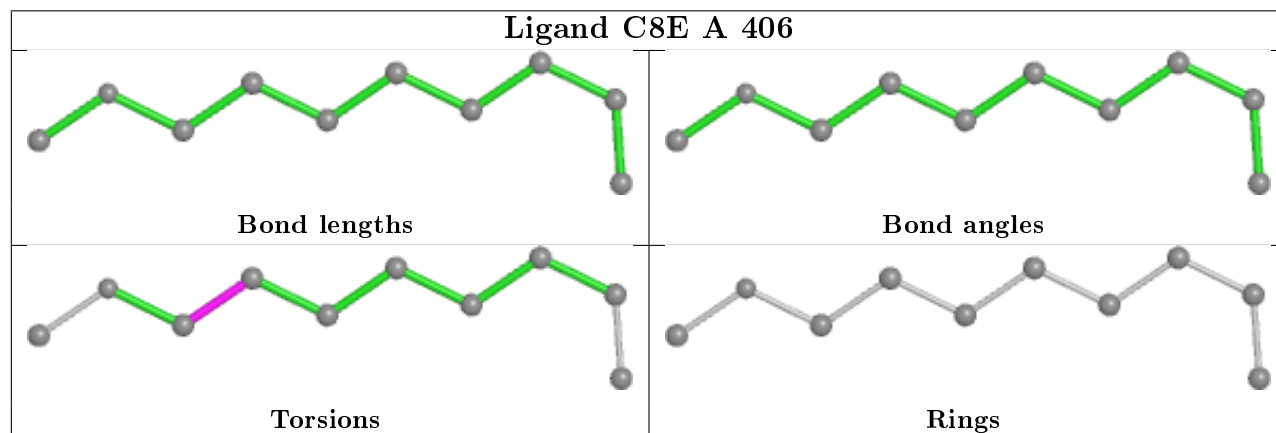
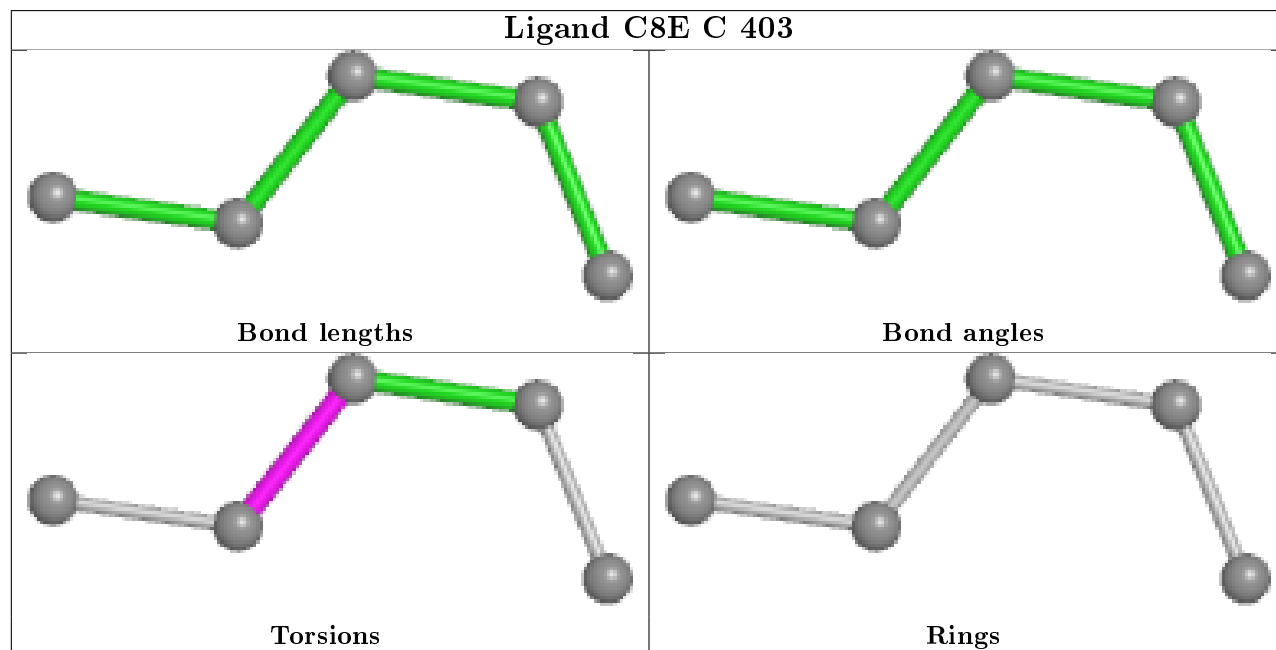
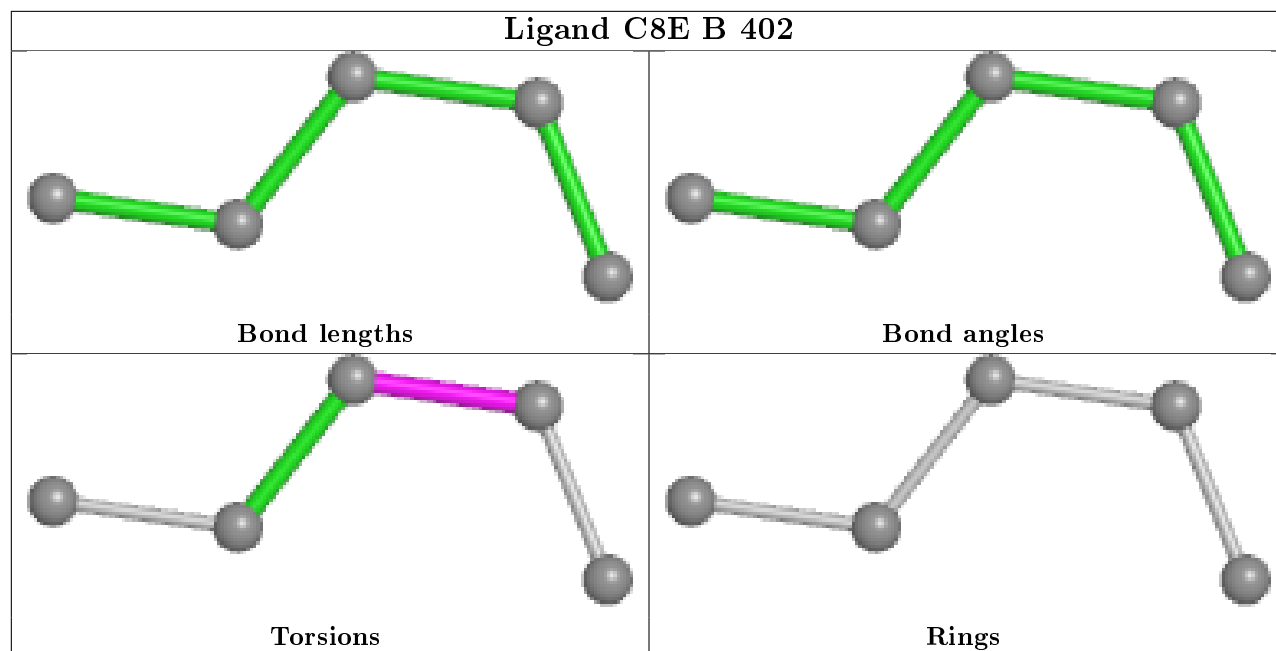
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	C	401	C8E	1	0
2	B	401	C8E	1	0
2	C	409	C8E	1	0
2	A	403	C8E	1	0
2	C	405	C8E	0	2
2	C	404	C8E	1	0

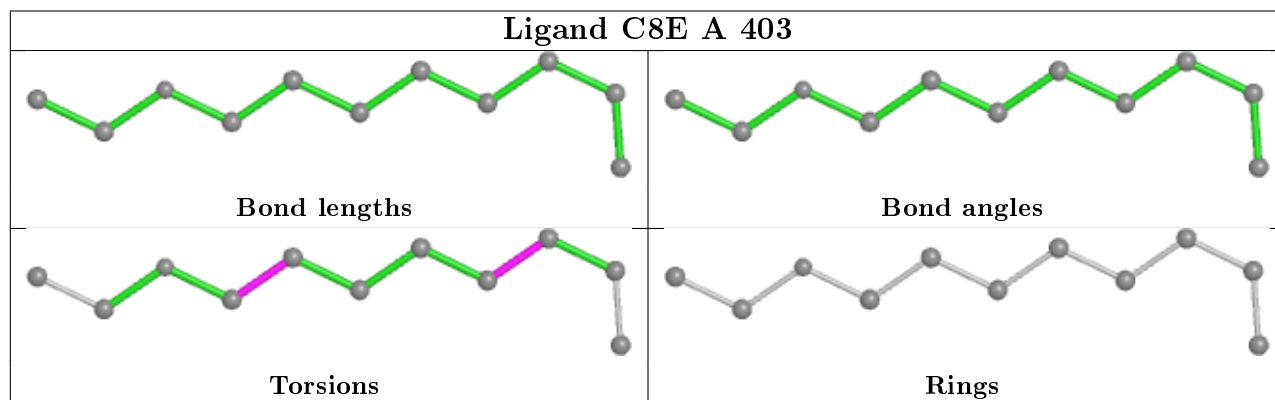
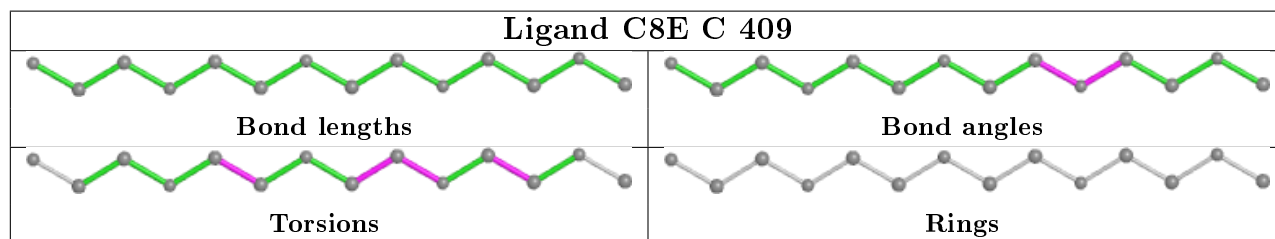
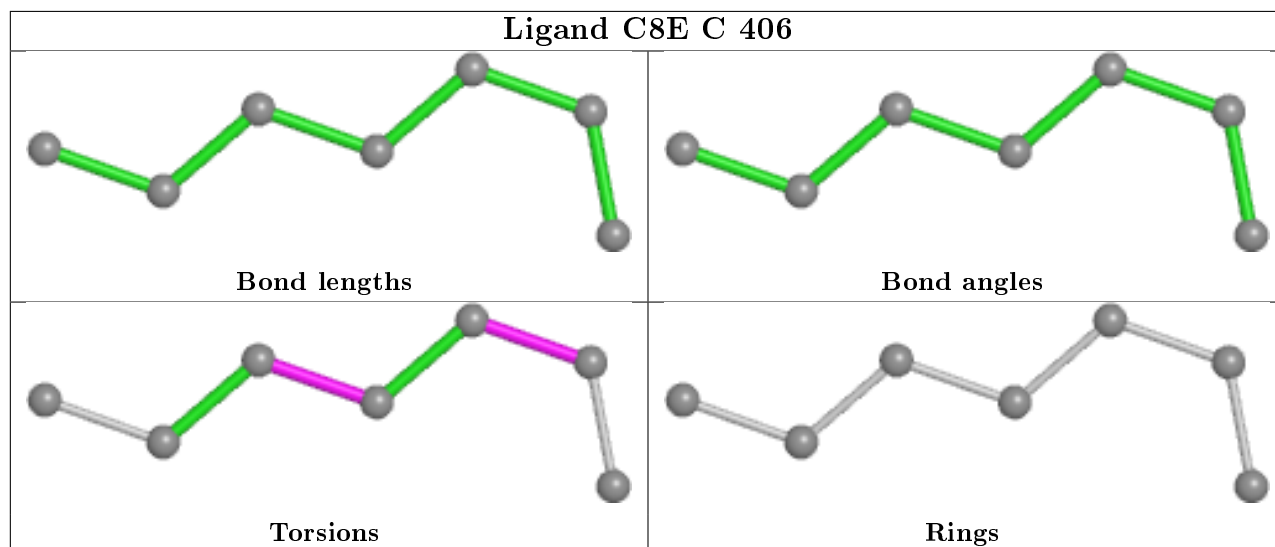
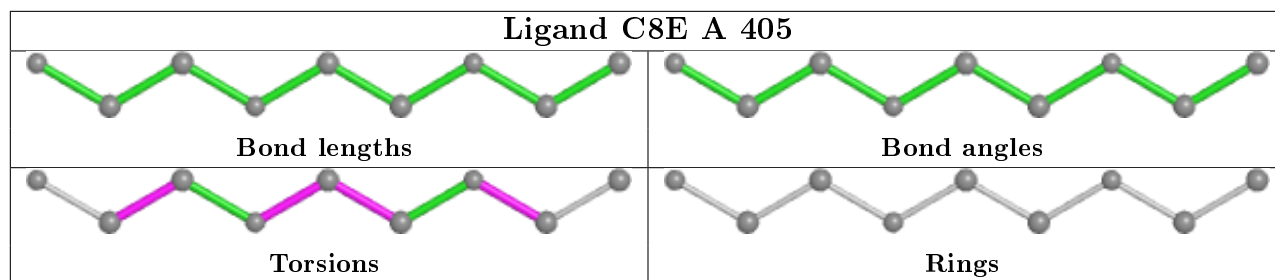
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the

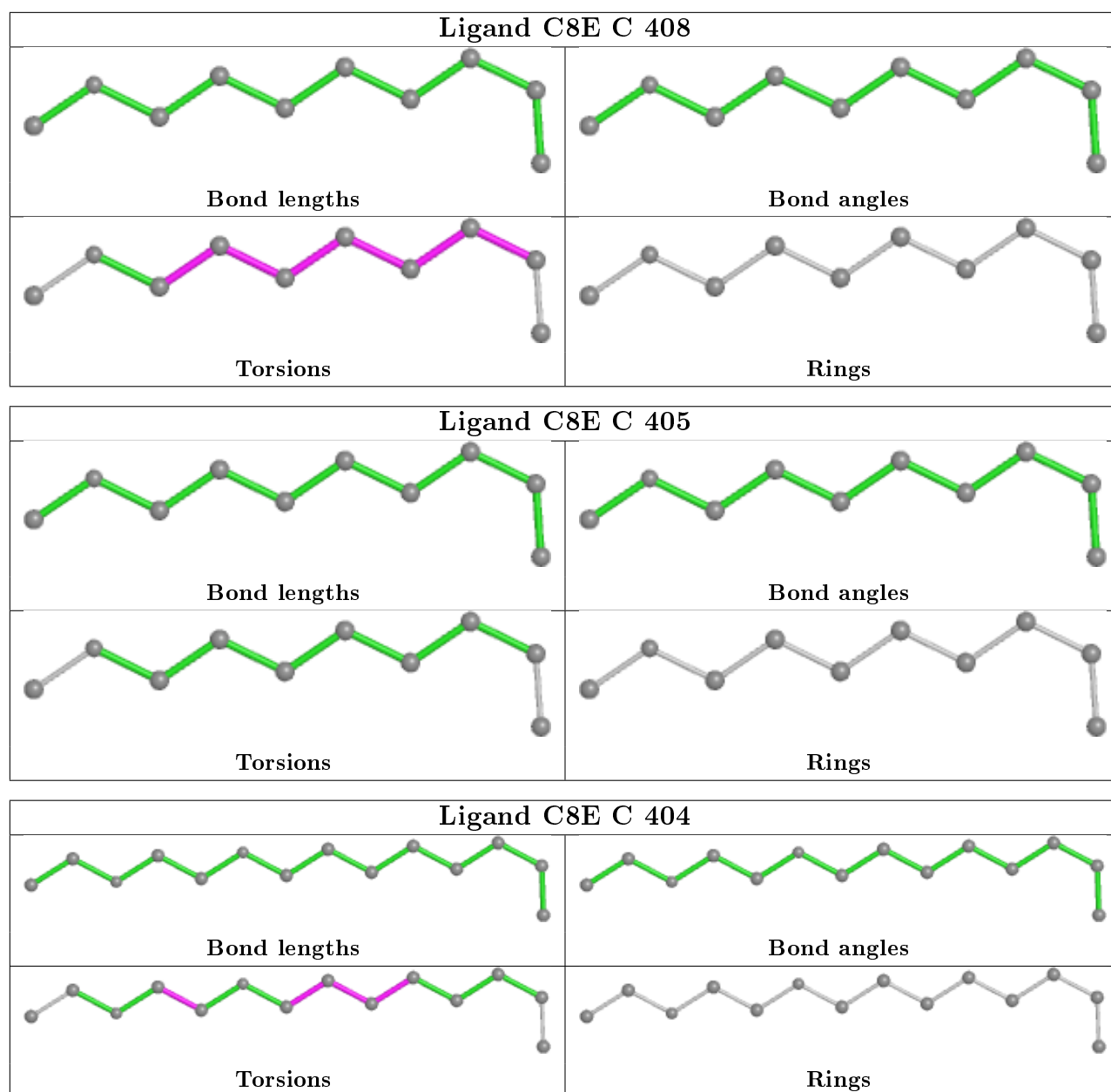
average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.











5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data [i](#)

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

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	318/320 (99%)	0.18	20 (6%) 20 23	13, 20, 40, 65	0
1	B	317/320 (99%)	0.13	13 (4%) 37 43	13, 22, 40, 72	0
1	C	320/320 (100%)	0.06	10 (3%) 49 57	11, 18, 37, 57	0
All	All	955/960 (99%)	0.12	43 (4%) 33 38	11, 20, 40, 72	0

All (43) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	303	ALA	6.2
1	A	303	ALA	6.2
1	B	304	SER	4.6
1	A	238	ASP	4.5
1	A	96	TYR	4.3
1	A	222	GLU	4.2
1	B	299	ASP	4.1
1	C	301	ASP	4.0
1	B	237	LYS	3.9
1	C	96	TYR	3.8
1	B	222	GLU	3.8
1	A	299	ASP	3.5
1	B	1	ASP	3.5
1	A	304	SER	3.4
1	C	172	THR	3.4
1	A	237	LYS	3.4
1	B	238	ASP	3.3
1	A	300	SER	3.3
1	B	57	ASP	3.1
1	B	244	TYR	3.1
1	B	236	ALA	3.1
1	A	306	VAL	3.0
1	A	95	THR	3.0

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Mol	Chain	Res	Type	RSRZ
1	C	170	THR	3.0
1	A	167	ASN	2.9
1	B	145	PHE	2.8
1	A	307	ALA	2.7
1	B	204[A]	TYR	2.7
1	C	222	GLU	2.6
1	A	172	THR	2.6
1	A	165	MET	2.5
1	C	303	ALA	2.5
1	A	244	TYR	2.4
1	C	173	ASN	2.4
1	A	269	LYS	2.4
1	A	204	TYR	2.4
1	C	226	PHE	2.3
1	C	238	ASP	2.2
1	A	24	VAL	2.2
1	A	18	LYS	2.1
1	A	235	LEU	2.1
1	C	244[A]	TYR	2.1
1	B	306[A]	VAL	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 carbohydrates 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	C8E	C	405	10/21	0.22	2.02	179,219,243,247	0
2	C8E	B	405	11/21	0.70	0.36	51,88,123,124	0
2	C8E	C	407	11/21	0.75	0.19	39,46,54,57	0

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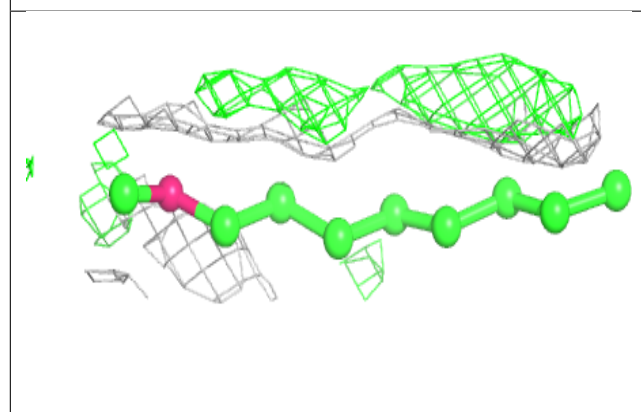
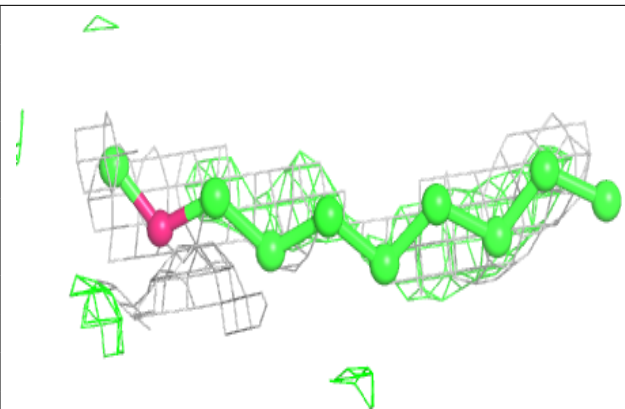
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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
2	C8E	C	406	7/21	0.76	0.14	44,47,48,48	0
2	C8E	B	404	9/21	0.76	0.10	35,44,54,57	0
2	C8E	A	406	10/21	0.76	0.18	46,50,52,52	0
2	C8E	A	405	9/21	0.78	0.12	44,51,63,63	0
2	C8E	A	402	12/21	0.80	0.14	30,39,51,53	0
2	C8E	A	407	8/21	0.81	0.11	36,40,42,47	0
2	C8E	C	401	8/21	0.81	0.23	33,43,46,47	0
2	C8E	C	404	14/21	0.81	0.13	26,47,53,56	0
2	C8E	A	404	5/21	0.82	0.14	33,37,40,41	0
2	C8E	C	408	10/21	0.83	0.12	42,47,49,50	0
2	C8E	B	403	9/21	0.83	0.11	46,51,54,54	0
2	C8E	C	403	5/21	0.84	0.14	41,42,44,46	0
2	C8E	B	407	9/21	0.84	0.12	44,50,54,55	0
2	C8E	B	406	4/21	0.85	0.14	38,45,45,45	0
2	C8E	C	409	14/21	0.86	0.14	38,42,50,52	0
2	C8E	B	402	5/21	0.90	0.25	33,34,38,40	0
2	C8E	A	403	11/21	0.92	0.10	26,30,34,36	0
2	C8E	A	401	6/21	0.92	0.08	22,24,27,35	0
2	C8E	B	401	8/21	0.93	0.14	29,31,40,44	0
2	C8E	C	402	7/21	0.94	0.10	26,27,32,34	0

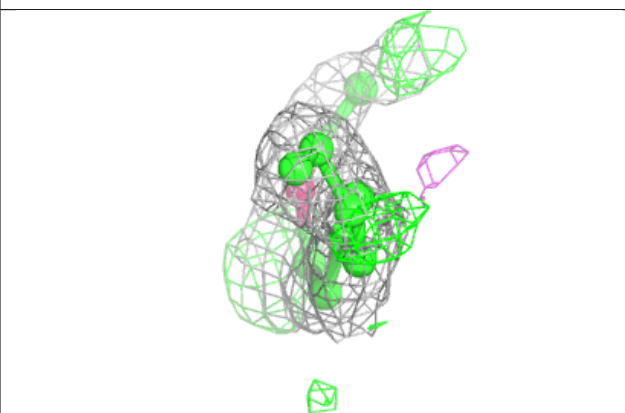
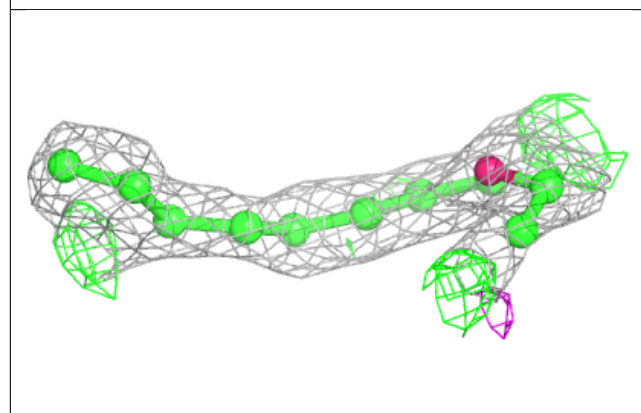
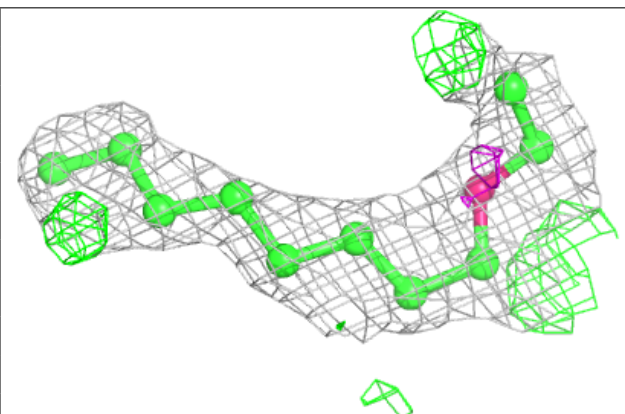
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around C8E C 405:

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

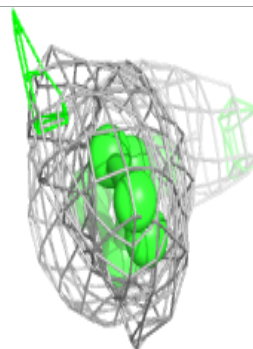
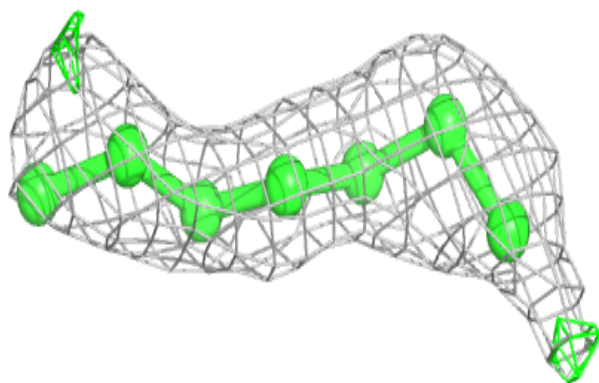
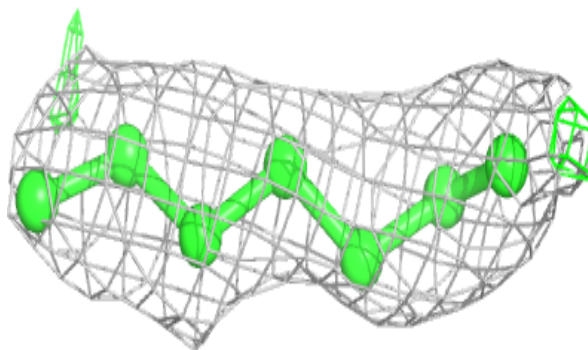
**Electron density around C8E C 407:**

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 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

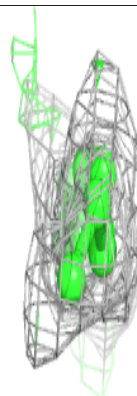
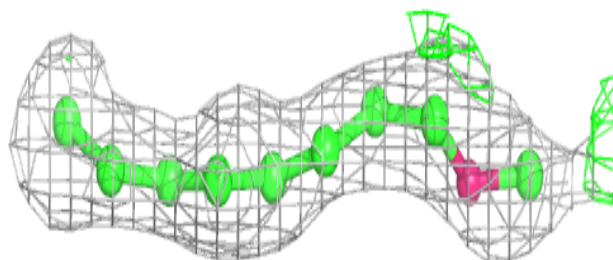
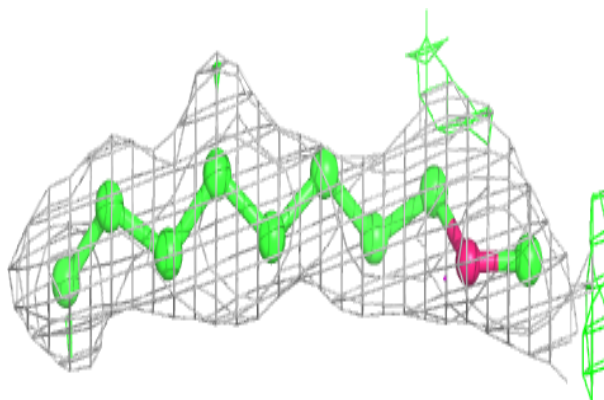


Electron density around C8E C 406:

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

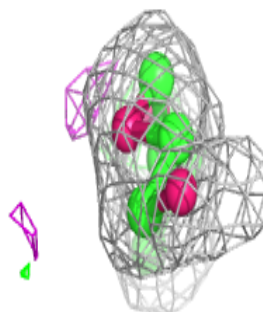
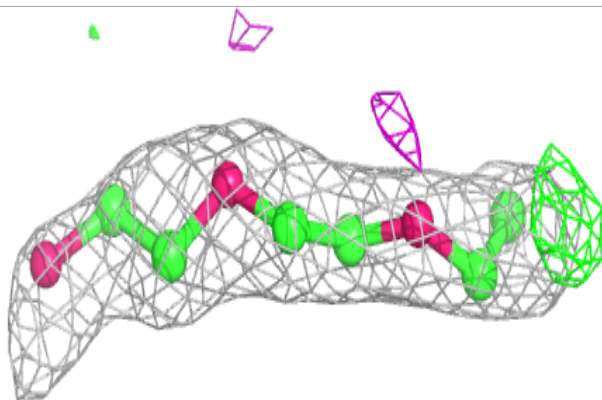
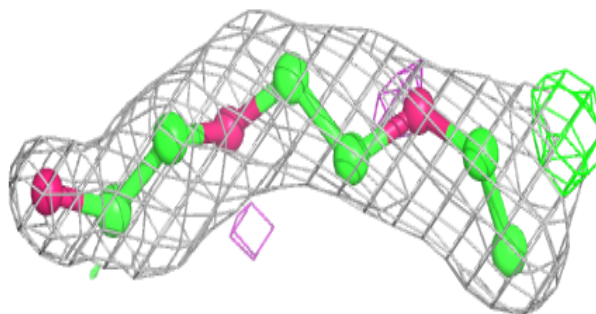
**Electron density around C8E A 406:**

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

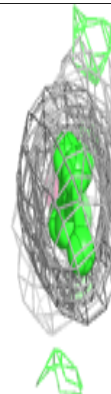
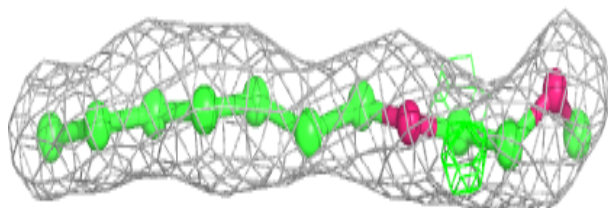
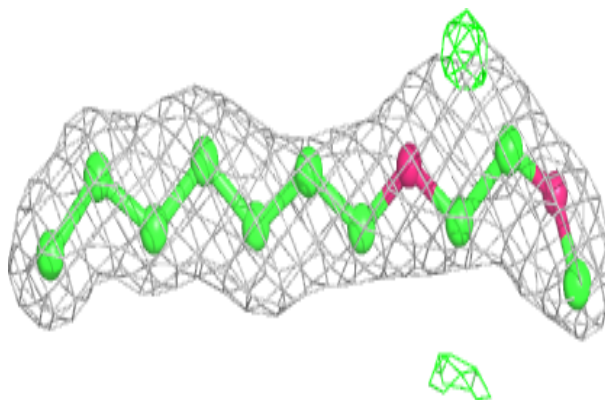


Electron density around C8E A 405:

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 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

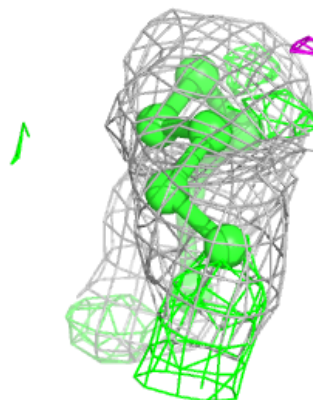
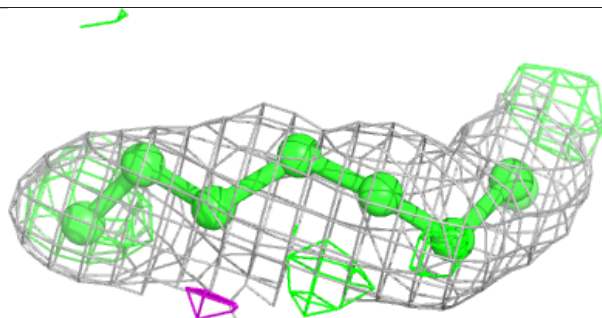
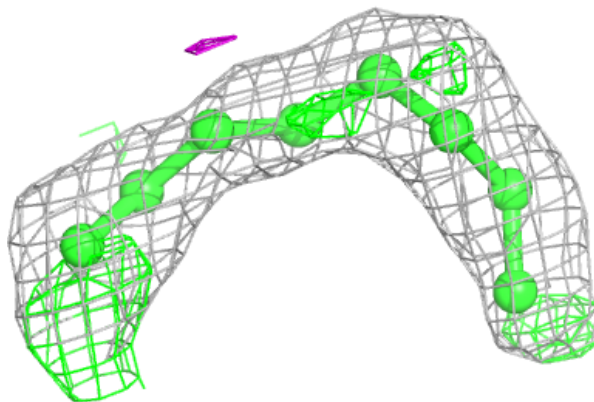
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 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

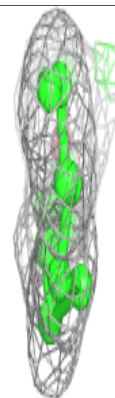
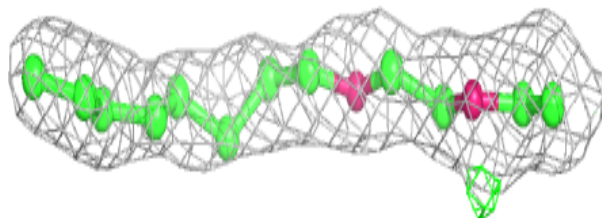
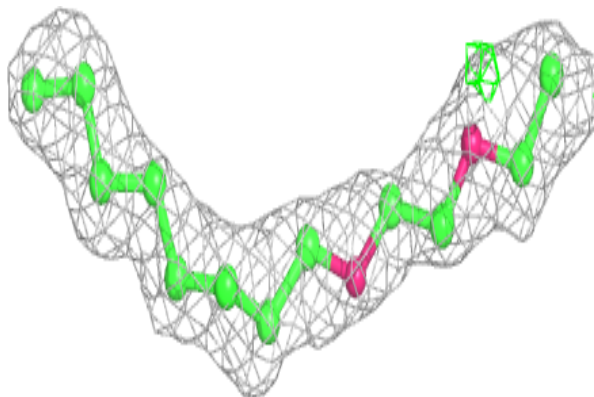


Electron density around C8E C 401:

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 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

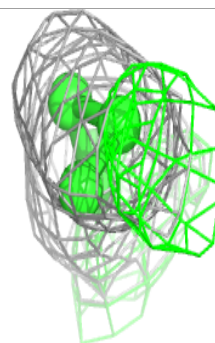
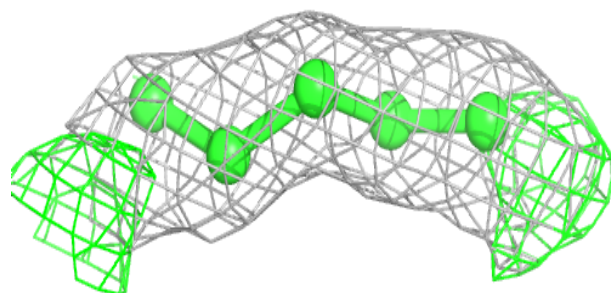
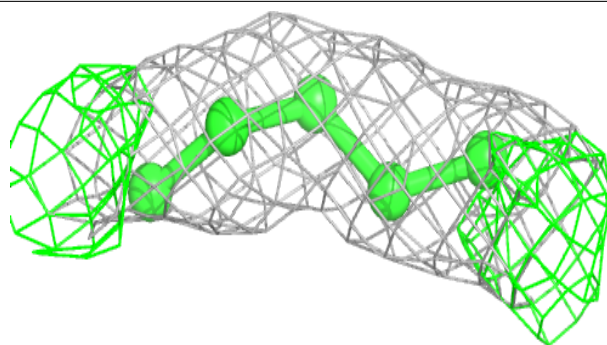
**Electron density around C8E C 404:**

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 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

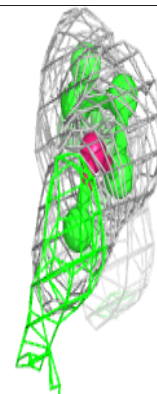
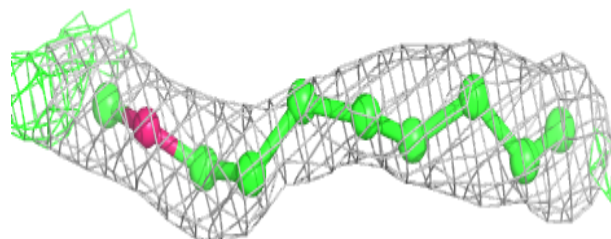
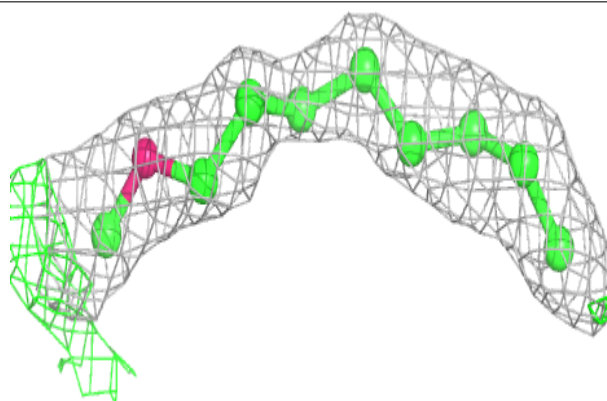


Electron density around C8E A 404:

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and green (positive)

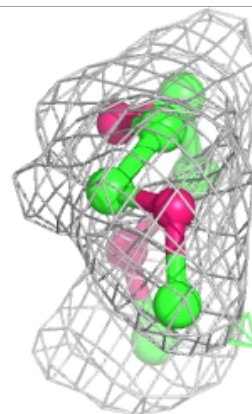
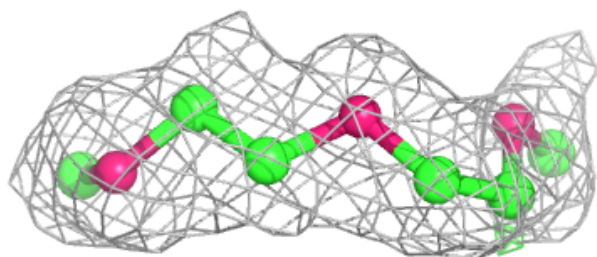
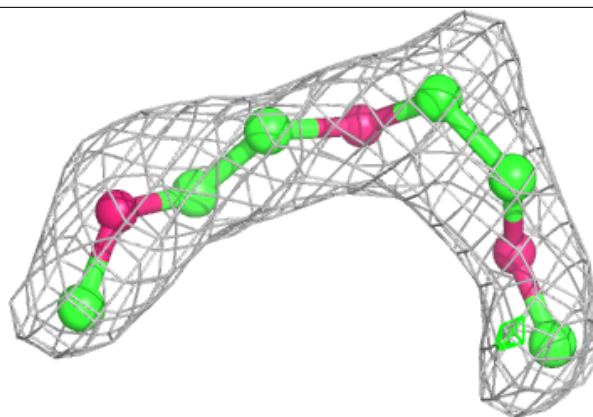
**Electron density around C8E C 408:**

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

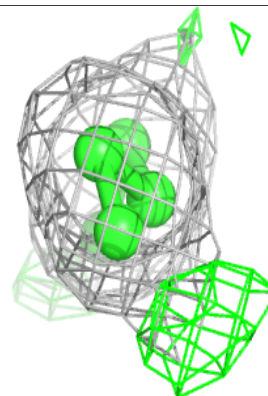
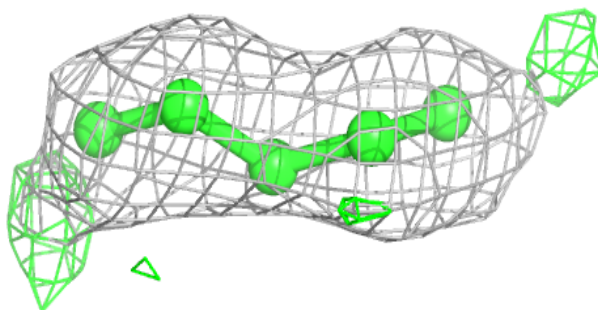
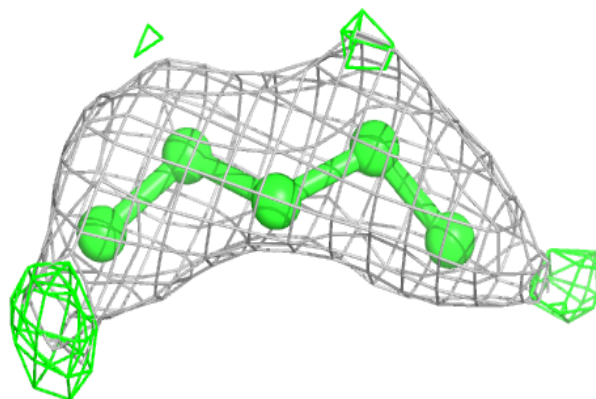


Electron density around C8E B 403:

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

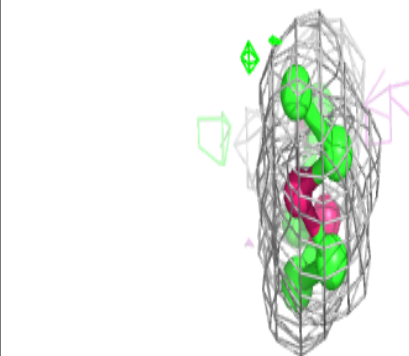
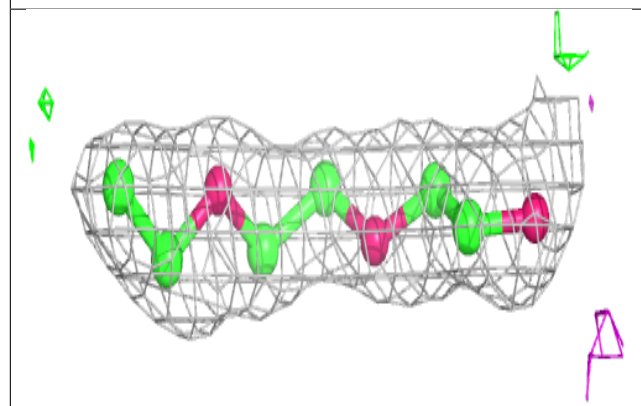
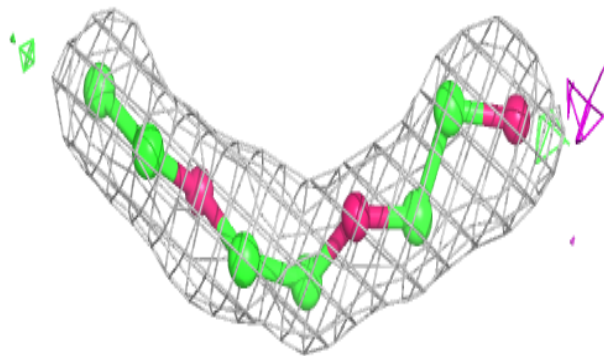
**Electron density around C8E C 403:**

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

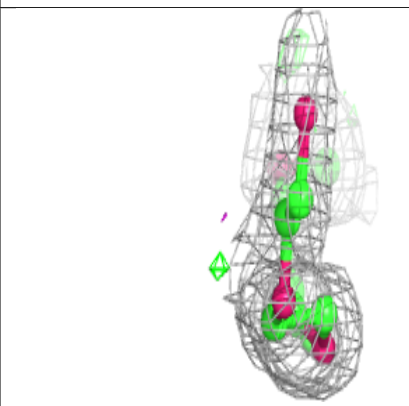
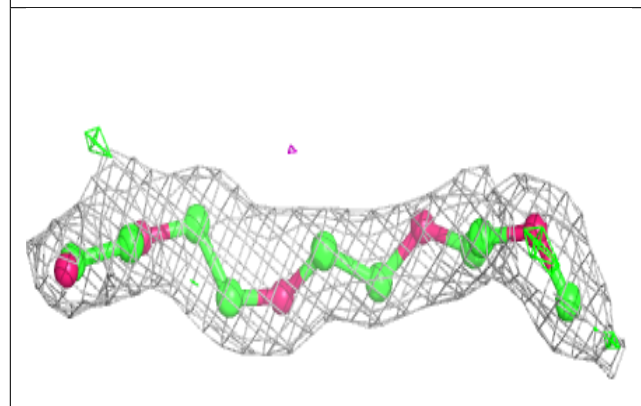
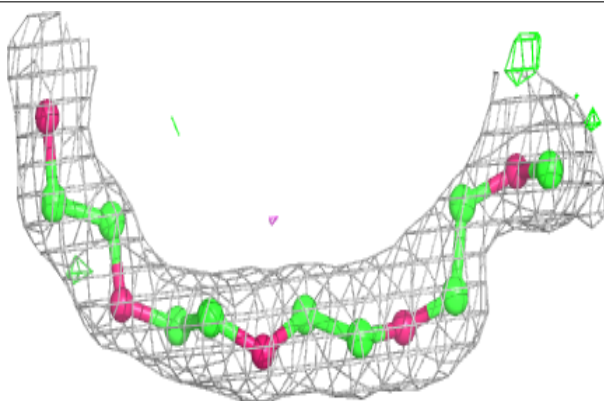


Electron density around C8E B 407:

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

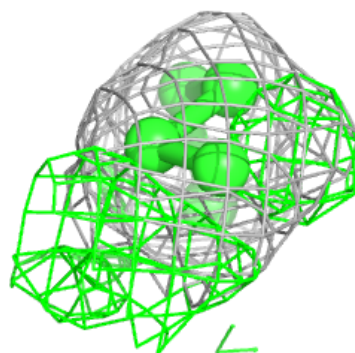
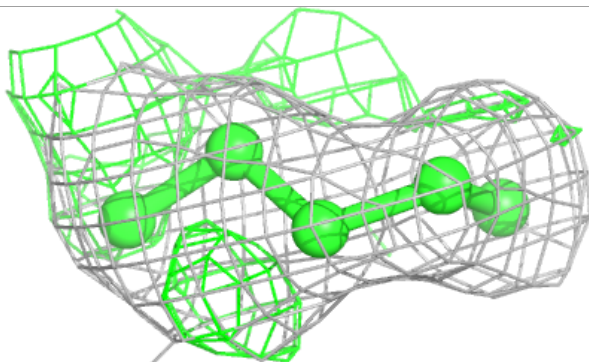
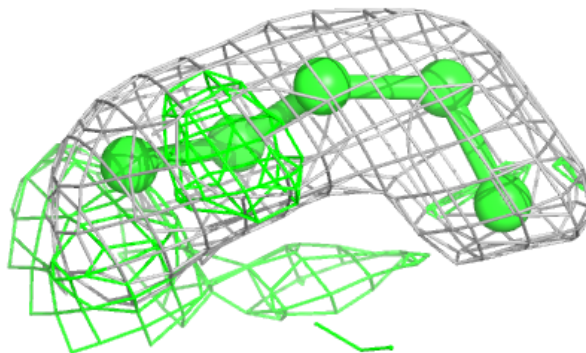
**Electron density around C8E C 409:**

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

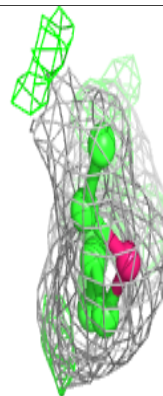
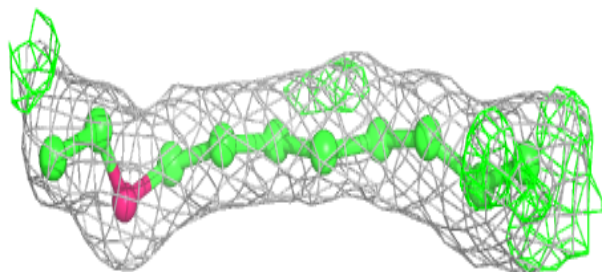
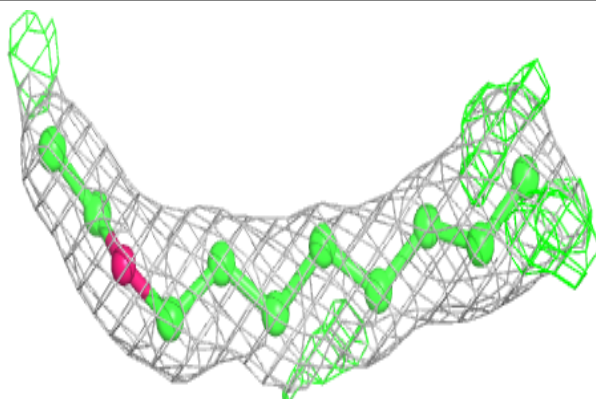


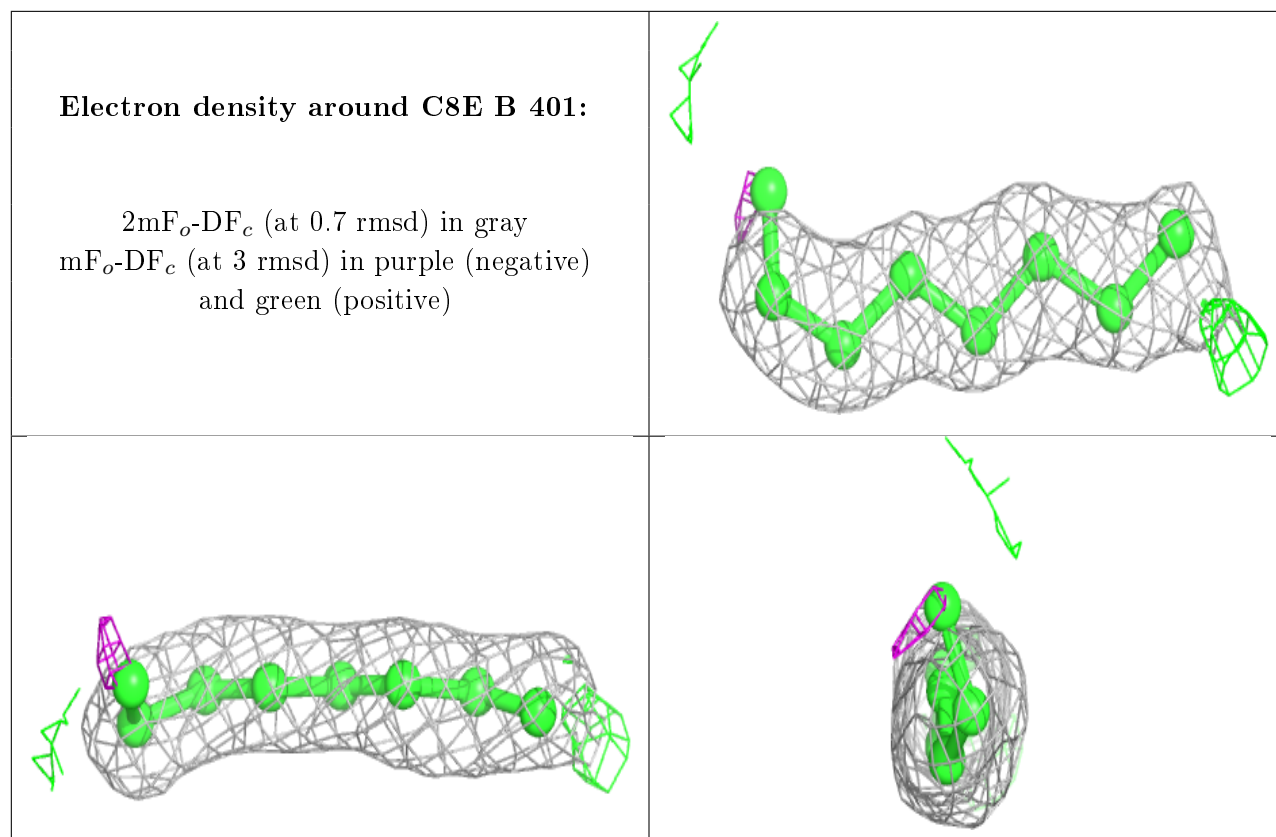
Electron density around C8E B 402:

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

**Electron density around C8E A 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.