Full wwPDB X-ray Structure Validation Report ⓘ

Mar 5, 2024 – 02:17 PM EST

PDB ID	:	8VTO
Title	:	Crystal structure of R. sphaeroides Photosynthetic Reaction Center variant Y (M210)2-methylphenylalanine
Authors	:	Tran, K.; Mathews, I.; Boxer, S.G.
Deposited on	:	2024-01-26
Resolution	:	3.09 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:

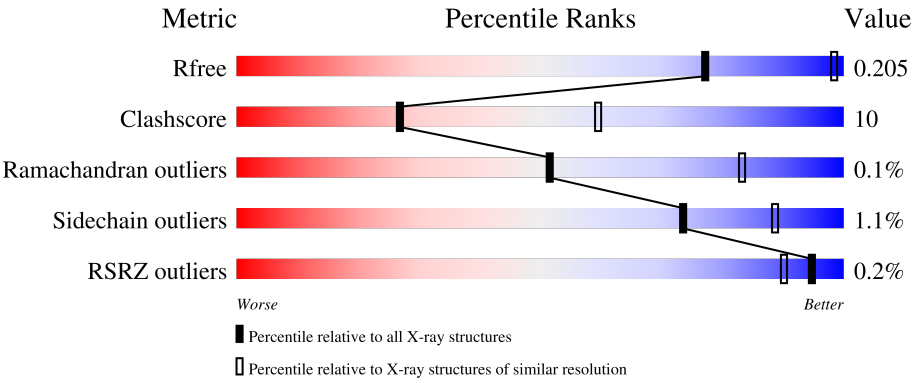
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.36
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

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 3.09 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	1094 (3.10-3.10)
Clashscore	141614	1184 (3.10-3.10)
Ramachandran outliers	138981	1141 (3.10-3.10)
Sidechain outliers	138945	1141 (3.10-3.10)
RSRZ outliers	127900	1067 (3.10-3.10)

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	H	240	78% 22%
2	L	281	82% 18%
3	M	301	77% 22% .

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
11	CDL	M	407	X	-	-	-
6	U10	L	304	-	-	-	X

2 Entry composition

There are 12 unique types of molecules in this entry. The entry contains 7026 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 Reaction center protein H chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	H	240	Total	C	N	O	S	0	0	0
			1829	1169	314	337	9			

- Molecule 2 is a protein called Reaction center protein L chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	L	281	Total	C	N	O	S	0	1	0
			2240	1511	356	365	8			

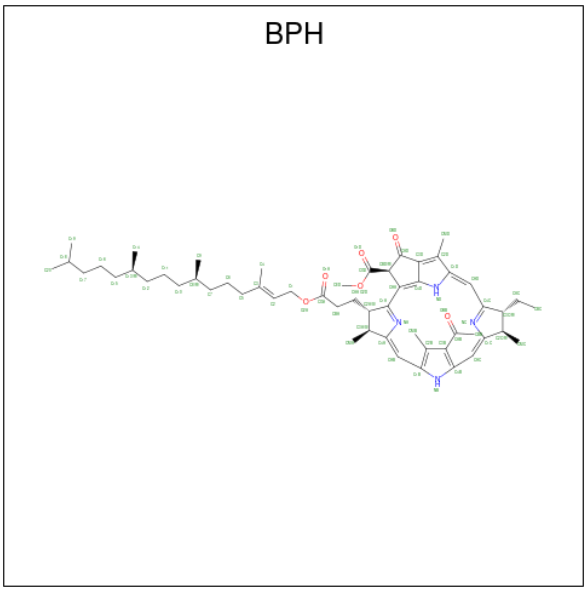
- Molecule 3 is a protein called Reaction center protein M chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	M	301	Total	C	N	O	S	0	0	0
			2396	1599	392	395	10			

There are 2 discrepancies between the modelled and reference sequences:

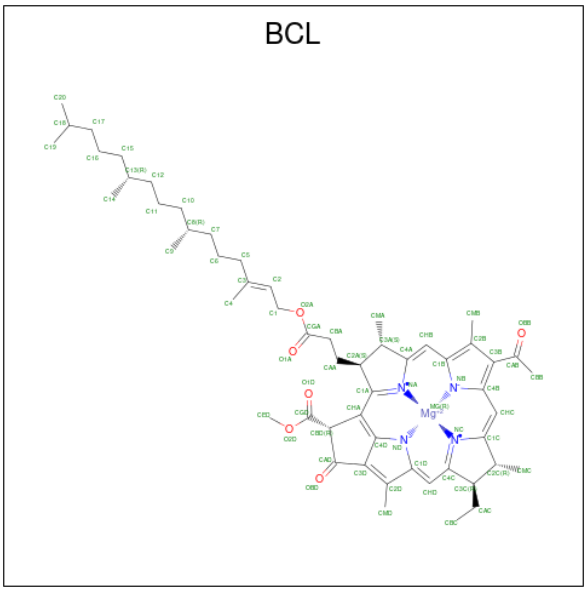
Chain	Residue	Modelled	Actual	Comment	Reference
M	210	A1ADW	TYR	conflict	UNP P0C0Y9
M	252	VAL	TRP	conflict	UNP P0C0Y9

- Molecule 4 is BACTERIOPHEOPHYTIN A (three-letter code: BPH) (formula: $C_{55}H_{76}N_4O_6$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	L	1	Total	C	N	O	0	0
			55	45	4	6		
4	L	1	Total	C	N	O	0	0
			65	55	4	6		

- Molecule 5 is BACTERIOCHLOROPHYLL A (three-letter code: BCL) (formula: $C_{55}H_{74}MgN_4O_6$) (labeled as "Ligand of Interest" by depositor).



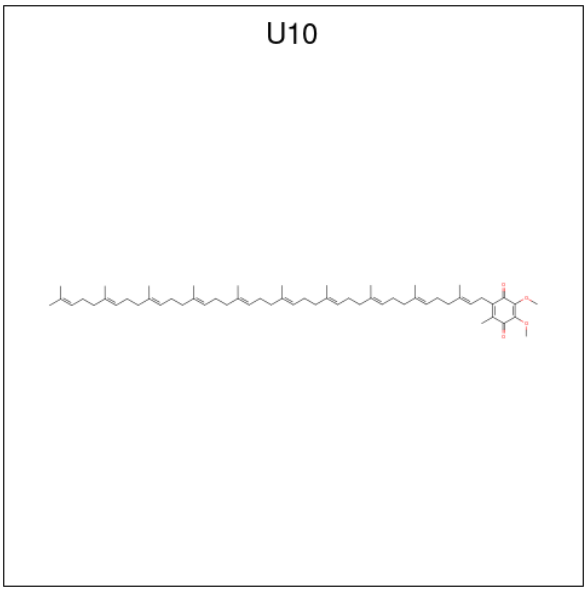
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
5	L	1	Total	C	Mg	N	O	0	0
			66	55	1	4	6		

Continued on next page...

Continued from previous page...

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
5	L	1	Total	C	Mg	N	O	0	0
			66	55	1	4	6		
5	M	1	Total	C	Mg	N	O	0	0
			66	55	1	4	6		
5	M	1	Total	C	Mg	N	O	0	0
			51	40	1	4	6		

- Molecule 6 is UBIQUINONE-10 (three-letter code: U10) (formula: $C_{59}H_{90}O_4$) (labeled as "Ligand of Interest" by depositor).

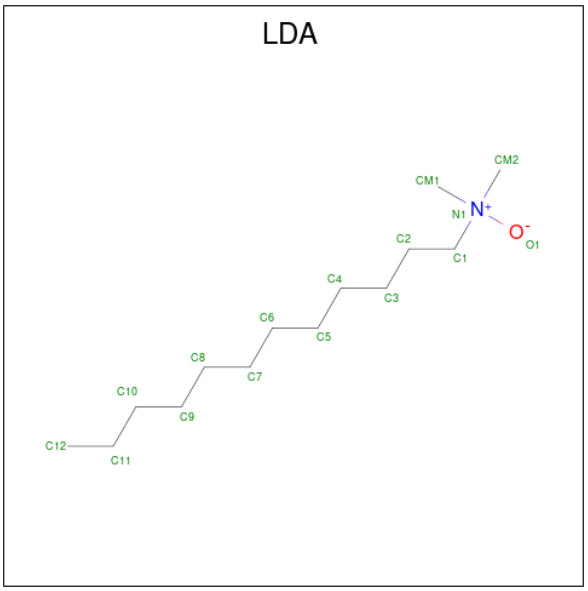


Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	L	1	Total	C	O	0	0
			18	14	4		

- Molecule 7 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	L	1	Total	Cl	0	0
			1	1		

- Molecule 8 is LAURYL DIMETHYLAMINE-N-OXIDE (three-letter code: LDA) (formula: $C_{14}H_{31}NO$).

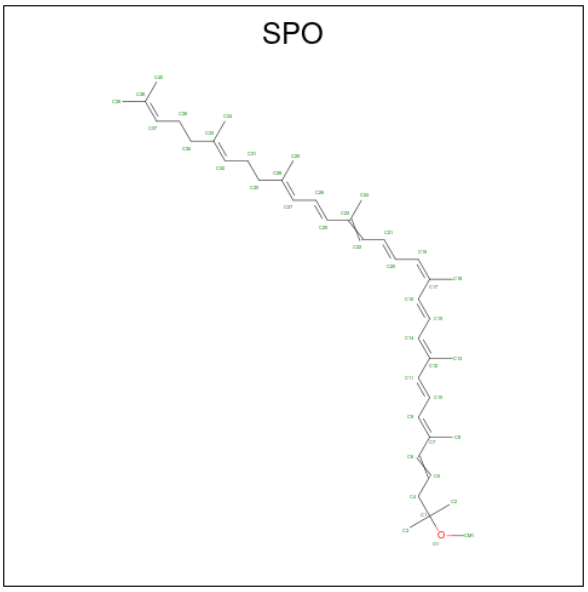


Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
8	M	1	Total C N O 16 14 1 1	0	0
8	M	1	Total C N O 16 14 1 1	0	0
8	M	1	Total C N O 16 14 1 1	0	0

- Molecule 9 is FE (III) ION (three-letter code: FE) (formula: Fe).

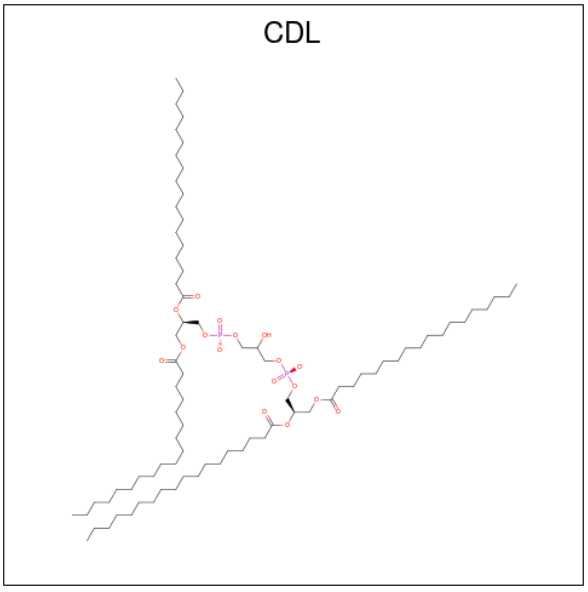
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
9	M	1	Total Fe 1 1	0	0

- Molecule 10 is SPHEROIDENE (three-letter code: SPO) (formula: $C_{41}H_{60}O$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
			Total	C	O		
10	M	1	42	41	1	0	0

- Molecule 11 is CARDIOLIPIN (three-letter code: CDL) (formula: $C_{81}H_{156}O_{17}P_2$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	O	P		
11	M	1	69	50	17	2	0	0

- Molecule 12 is water.

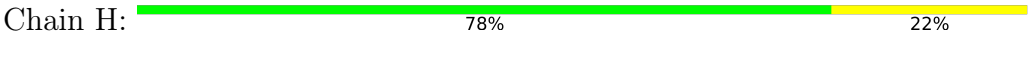
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
12	H	2	Total O 2 2	0	0
12	L	8	Total O 8 8	0	0
12	M	3	Total O 3 3	0	0

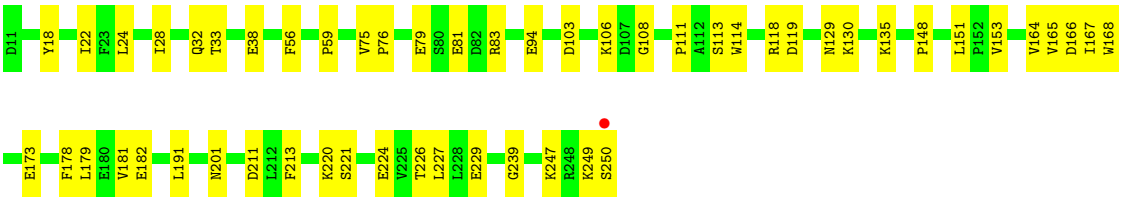
3 Residue-property plots (i)

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: Reaction center protein H chain

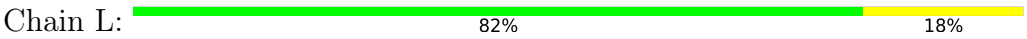
Chain H:

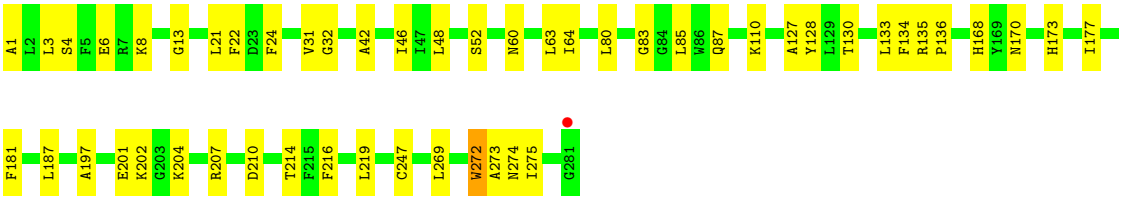




• Molecule 2: Reaction center protein L chain

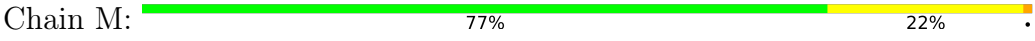
Chain L:

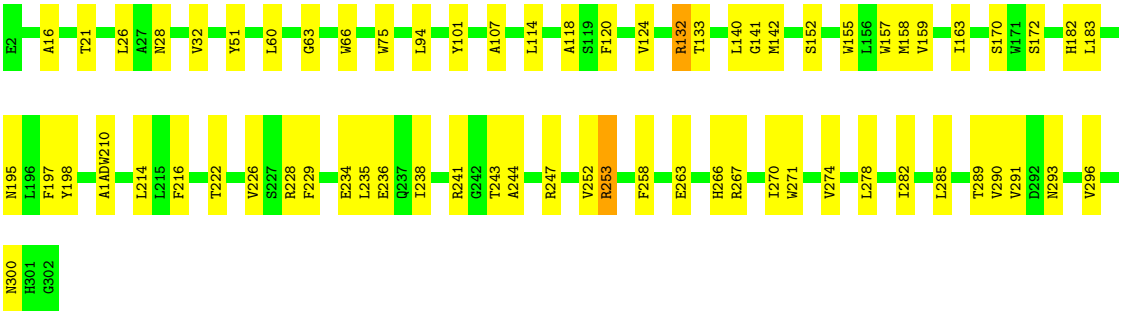




• Molecule 3: Reaction center protein M chain

Chain M:





4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 31 2 1	Depositor
Cell constants a, b, c, α, β, γ	140.94Å 140.94Å 186.71Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	39.75 – 3.09 39.75 – 3.09	Depositor EDS
% Data completeness (in resolution range)	99.9 (39.75-3.09) 91.3 (39.75-3.09)	Depositor EDS
R_{merge}	0.28	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.22 (at 3.06Å)	Xtriage
Refinement program	PHENIX (1.19.2_4158: ???)	Depositor
R, R_{free}	0.177 , 0.205 0.178 , 0.205	Depositor DCC
R_{free} test set	1992 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å^2)	67.8	Xtriage
Anisotropy	0.182	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.29 , 54.7	EDS
L-test for twinning[2]	$< \|L\| > = 0.49$, $< L^2 > = 0.32$	Xtriage
Estimated twinning fraction	0.026 for -h,-k,l	Xtriage
F_o,F_c correlation	0.93	EDS
Total number of atoms	7026	wwPDB-VP
Average B, all atoms (Å^2)	65.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.67% 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: CL, CDL, A1ADW, U10, BPH, FE, BCL, SPO, LDA

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	H	0.55	0/1877	0.74	0/2553
2	L	0.55	0/2328	0.66	0/3186
3	M	0.51	0/2472	0.66	0/3372
All	All	0.53	0/6677	0.68	0/9111

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	H	1829	0	1836	38	0
2	L	2240	0	2190	46	0
3	M	2396	0	2301	51	0
4	L	120	0	129	13	0
5	L	132	0	148	10	0
5	M	117	0	115	10	0
6	L	18	0	15	1	0
7	L	1	0	0	0	0
8	M	48	0	93	2	0
9	M	1	0	0	0	0

Continued on next page...

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
10	M	42	0	60	4	0
11	M	69	0	82	3	0
12	H	2	0	0	1	0
12	L	8	0	0	0	0
12	M	3	0	0	2	0
All	All	7026	0	6969	143	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 10.

All (143) 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:M:75:TRP:HE1	10:M:406:SPO:HM12	1.23	1.04
2:L:187:LEU:HD13	3:M:216:PHE:HB2	1.61	0.83
2:L:272:TRP:HA	2:L:275:ILE:HD12	1.60	0.82
5:L:302:BCL:HBB3	5:L:305:BCL:H52	1.61	0.82
1:H:81:GLU:OE1	2:L:8:LYS:NZ	2.13	0.80
3:M:21:THR:HG23	3:M:26:LEU:HD11	1.66	0.78
1:H:94:GLU:OE1	12:H:301:HOH:O	2.01	0.78
4:L:303:BPH:HBB3	4:L:303:BPH:HHC	1.68	0.75
1:H:135:LYS:HE3	1:H:166:ASP:OD2	1.87	0.73
1:H:249:LYS:HD3	1:H:250:SER:H	1.52	0.71
3:M:300:ASN:ND2	12:M:501:HOH:O	2.21	0.70
1:H:148:PRO:HA	1:H:151:LEU:HD12	1.72	0.70
5:L:302:BCL:HBB2	5:L:302:BCL:HHC	1.76	0.68
3:M:267:ARG:NH1	12:M:502:HOH:O	2.27	0.66
3:M:234:GLU:O	3:M:238:ILE:HG13	1.95	0.65
2:L:133:LEU:HD23	2:L:134:PHE:CE1	2.32	0.65
1:H:148:PRO:HD2	1:H:167:ILE:HD11	1.78	0.65
3:M:197:PHE:HZ	5:M:401:BCL:HBB2	1.61	0.64
2:L:1:ALA:O	3:M:253:ARG:NH2	2.31	0.64
1:H:32:GLN:HG2	1:H:56:PHE:CE1	2.33	0.64
1:H:191:LEU:HD11	1:H:213:PHE:HE2	1.64	0.62
3:M:238:ILE:HD13	3:M:263:GLU:HB2	1.82	0.62
2:L:13:GLY:O	2:L:110:LYS:HE2	2.00	0.62
3:M:157:TRP:CE3	3:M:158:MET:HG2	2.35	0.62
1:H:119:ASP:OD2	1:H:220:LYS:NZ	2.29	0.62
11:M:407:CDL:HB4	11:M:407:CDL:HA62	1.81	0.62
2:L:219:LEU:O	3:M:132:ARG:NH2	2.32	0.61
1:H:181:VAL:HG21	1:H:191:LEU:HD12	1.83	0.60

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:M:197:PHE:CZ	5:M:401:BCL:HBB2	2.37	0.59
2:L:181:PHE:HB3	4:L:301:BPH:HBB2	1.85	0.59
3:M:16:ALA:HB1	3:M:32:VAL:HG11	1.85	0.58
1:H:103:ASP:HB3	1:H:106:LYS:HB2	1.84	0.58
3:M:75:TRP:NE1	10:M:406:SPO:HM12	2.07	0.58
4:L:301:BPH:H5C1	3:M:63:GLY:HA3	1.86	0.57
3:M:243:THR:O	3:M:247:ARG:HG3	2.03	0.57
4:L:303:BPH:ND	3:M:214:LEU:HD13	2.20	0.57
1:H:168:TRP:HB2	1:H:178:PHE:HB2	1.87	0.56
11:M:407:CDL:HB32	11:M:407:CDL:HA21	1.87	0.56
5:M:401:BCL:H41	5:M:408:BCL:HBB3	1.88	0.56
3:M:285:LEU:O	3:M:289:THR:OG1	2.22	0.56
2:L:135:ARG:HB3	2:L:136:PRO:HD3	1.88	0.56
1:H:153:VAL:HG21	1:H:181:VAL:HG22	1.88	0.56
5:M:408:BCL:HHC	5:M:408:BCL:HBB2	1.88	0.55
1:H:165:VAL:HG11	1:H:182:GLU:HB2	1.88	0.55
1:H:221:SER:HB3	1:H:224:GLU:HG2	1.89	0.54
3:M:252:VAL:HG12	3:M:258:PHE:O	2.06	0.54
2:L:42:ALA:O	2:L:46:ILE:HG12	2.08	0.54
4:L:301:BPH:H6C1	5:M:401:BCL:H192	1.90	0.53
2:L:3:LEU:HB2	2:L:6:GLU:HB2	1.90	0.53
3:M:120:PHE:O	3:M:124:VAL:HG23	2.08	0.53
2:L:269:LEU:HB2	2:L:272:TRP:NE1	2.24	0.53
2:L:207:ARG:HG3	3:M:142:MET:HG2	1.91	0.52
5:L:305:BCL:HMB2	5:M:401:BCL:HMB2	1.92	0.52
1:H:33:THR:O	1:H:59:PRO:HG3	2.09	0.52
1:H:18:TYR:O	1:H:22:ILE:HG13	2.08	0.52
3:M:159:VAL:HA	3:M:163:ILE:HB	1.92	0.52
1:H:113:SER:HB3	2:L:8:LYS:HD2	1.92	0.52
3:M:195:ASN:HB3	3:M:198:TYR:CD2	2.45	0.52
3:M:170:SER:HG	3:M:172:SER:HG	1.56	0.51
2:L:46:ILE:HD11	5:L:302:BCL:H191	1.92	0.51
4:L:301:BPH:HHC	4:L:301:BPH:HBB3	1.92	0.51
1:H:38:GLU:OE1	3:M:241:ARG:NH1	2.38	0.51
1:H:118:ARG:NH2	3:M:236:GLU:OE2	2.44	0.50
2:L:197:ALA:HB1	3:M:235:LEU:HD11	1.93	0.50
2:L:201:GLU:HB2	2:L:204:LYS:HG3	1.93	0.50
3:M:293:ASN:HB3	3:M:296:VAL:HB	1.92	0.50
5:L:305:BCL:OBB	5:L:305:BCL:HHC	2.12	0.49
3:M:290:VAL:HG12	3:M:291:VAL:HG23	1.95	0.49
1:H:165:VAL:CG1	1:H:182:GLU:HB2	2.43	0.49

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:H:111:PRO:HB2	1:H:239:GLY:HA2	1.95	0.49
2:L:272:TRP:HA	2:L:275:ILE:CD1	2.37	0.49
3:M:270:ILE:O	3:M:274:VAL:HG13	2.13	0.48
1:H:249:LYS:HA	1:H:249:LYS:HE2	1.95	0.48
2:L:170:ASN:HB3	2:L:173:HIS:HB2	1.95	0.48
3:M:155:TRP:O	3:M:159:VAL:HG23	2.13	0.47
1:H:211:ASP:OD2	1:H:247:LYS:NZ	2.47	0.47
4:L:301:BPH:HBB3	4:L:301:BPH:CHC	2.45	0.47
5:L:302:BCL:HHC	5:L:302:BCL:CBB	2.43	0.47
2:L:83:GLY:O	2:L:87:GLN:HG3	2.15	0.47
1:H:220:LYS:HE3	1:H:229:GLU:OE2	2.15	0.47
2:L:60:ASN:O	2:L:64:ILE:HG13	2.15	0.47
4:L:301:BPH:HBC3	4:L:301:BPH:HHD	1.97	0.47
2:L:22:PHE:HA	2:L:24:PHE:CE2	2.50	0.47
3:M:66:TRP:HD1	3:M:118:ALA:O	1.99	0.46
3:M:114:LEU:HA	3:M:114:LEU:HD12	1.67	0.46
3:M:228:ARG:HG3	3:M:229:PHE:CE2	2.51	0.46
3:M:94:LEU:HD11	3:M:114:LEU:HB3	1.97	0.46
2:L:168:HIS:HB3	3:M:183:LEU:HD13	1.97	0.46
4:L:301:BPH:H4C1	3:M:60:LEU:HD12	1.98	0.45
6:L:304:U10:H1M1	6:L:304:U10:H71	1.71	0.45
2:L:127:ALA:CB	5:L:305:BCL:H43	2.46	0.45
11:M:407:CDL:H312	11:M:407:CDL:H511	1.99	0.45
3:M:152:SER:O	3:M:155:TRP:HB3	2.17	0.45
1:H:108:GLY:O	1:H:113:SER:HA	2.16	0.45
8:M:403:LDA:H21	8:M:403:LDA:HM11	1.57	0.45
5:M:408:BCL:HHC	5:M:408:BCL:CBB	2.47	0.44
3:M:271:TRP:HA	3:M:274:VAL:HG22	2.00	0.44
1:H:227:LEU:HA	1:H:227:LEU:HD23	1.74	0.44
2:L:133:LEU:HD23	2:L:134:PHE:CD1	2.52	0.44
1:H:130:LYS:HZ1	1:H:173:GLU:HG3	1.83	0.44
2:L:127:ALA:HB3	5:L:305:BCL:H43	1.99	0.44
10:M:406:SPO:H243	5:M:408:BCL:CBB	2.48	0.44
2:L:21:LEU:HD23	2:L:22:PHE:CE2	2.53	0.44
3:M:229:PHE:HB2	3:M:244:ALA:HB2	1.99	0.44
5:L:305:BCL:H193	5:L:305:BCL:H162	1.70	0.43
3:M:234:GLU:OE1	3:M:266:HIS:CE1	2.71	0.43
5:M:401:BCL:HBB2	5:M:401:BCL:HHC	1.99	0.43
1:H:153:VAL:HG21	1:H:181:VAL:CG2	2.48	0.43
2:L:31:VAL:HG12	2:L:32:GLY:N	2.34	0.43
1:H:164:VAL:HG11	1:H:179:LEU:HD22	2.00	0.43

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:L:128:TYR:HD1	5:L:302:BCL:HBB1	1.83	0.43
2:L:181:PHE:HB3	4:L:301:BPH:CBB	2.48	0.43
10:M:406:SPO:H243	5:M:408:BCL:HBB2	2.01	0.43
1:H:75:VAL:HA	1:H:76:PRO:C	2.39	0.43
2:L:60:ASN:HB3	2:L:63:LEU:HD12	2.00	0.42
1:H:83:ARG:NH1	1:H:114:TRP:O	2.50	0.42
1:H:28:ILE:HD11	8:M:402:LDA:H102	2.02	0.42
2:L:187:LEU:HD13	3:M:216:PHE:CB	2.39	0.42
2:L:269:LEU:HD23	2:L:269:LEU:HA	1.79	0.42
2:L:201:GLU:HG3	3:M:141:GLY:HA2	2.01	0.42
1:H:79:GLU:OE1	2:L:4:SER:OG	2.27	0.41
2:L:210:ASP:OD1	2:L:210:ASP:N	2.53	0.41
3:M:222:THR:O	3:M:226:VAL:HG22	2.19	0.41
3:M:28:ASN:O	3:M:51:TYR:HA	2.20	0.41
2:L:173:HIS:O	2:L:177:ILE:HG12	2.21	0.41
1:H:129:ASN:ND2	1:H:224:GLU:HB2	2.35	0.41
2:L:181:PHE:CD2	4:L:301:BPH:HBB1	2.54	0.41
2:L:219:LEU:HD21	3:M:133:THR:HG22	2.01	0.41
3:M:236:GLU:O	3:M:236:GLU:HG3	2.21	0.41
1:H:24:LEU:O	1:H:28:ILE:HG12	2.20	0.41
2:L:48:LEU:N	2:L:48:LEU:HD23	2.36	0.41
2:L:197:ALA:CB	3:M:235:LEU:HD11	2.51	0.41
4:L:303:BPH:H121	4:L:303:BPH:H8	1.89	0.41
2:L:80:LEU:HD13	2:L:85:LEU:HD21	2.03	0.40
2:L:127:ALA:O	2:L:130:THR:HB	2.21	0.40
2:L:214:THR:HG21	3:M:140:LEU:HD21	2.04	0.40
2:L:272:TRP:O	2:L:274:ASN:N	2.55	0.40
4:L:303:BPH:HHC	4:L:303:BPH:CBB	2.46	0.40
1:H:226:THR:OG1	1:H:229:GLU:HG3	2.21	0.40
2:L:216:PHE:HD1	2:L:216:PHE:HA	1.74	0.40
3:M:101:TYR:CE2	3:M:107:ALA:HA	2.57	0.40
3:M:278:LEU:O	3:M:282:ILE:HG13	2.22	0.40
1:H:201:ASN:N	1:H:201:ASN:OD1	2.55	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	H	238/240 (99%)	229 (96%)	9 (4%)	0	100 100
2	L	280/281 (100%)	268 (96%)	11 (4%)	1 (0%)	34 69
3	M	296/301 (98%)	284 (96%)	12 (4%)	0	100 100
All	All	814/822 (99%)	781 (96%)	32 (4%)	1 (0%)	51 83

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	L	273	ALA

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	H	195/195 (100%)	195 (100%)	0	100 100
2	L	221/220 (100%)	217 (98%)	4 (2%)	59 82
3	M	235/235 (100%)	232 (99%)	3 (1%)	69 87
All	All	651/650 (100%)	644 (99%)	7 (1%)	73 89

All (7) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	L	52	SER
2	L	202	LYS

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
2	L	247	CYS
2	L	272	TRP
3	M	132	ARG
3	M	182	HIS
3	M	253	ARG

Sometimes 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)

1 non-standard protein/DNA/RNA residue is 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	$\#\|Z\| > 2$
3	A1ADW	M	210	3	11,12,13	0.91	1 (9%)	12,15,17	0.40	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	A1ADW	M	210	3	-	1/5/6/8	0/1/1/1

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	M	210	A1ADW	O1-C3	2.85	1.31	1.19

There are no bond angle outliers.

There are no chirality outliers.

All (1) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	M	210	A1ADW	C2-C5-C6-C7

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

Of 14 ligands modelled in this entry, 2 are monoatomic - leaving 12 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	$\#\|Z\| > 2$
5	BCL	M	401	-	64,74,74	1.50	6 (9%)	78,115,115	1.56	12 (15%)
5	BCL	M	408	-	49,59,74	1.92	11 (22%)	60,97,115	2.02	17 (28%)
8	LDA	M	402	-	12,15,15	2.00	1 (8%)	14,17,17	0.70	0
5	BCL	L	305	-	64,74,74	1.50	6 (9%)	78,115,115	1.54	13 (16%)
11	CDL	M	407	-	68,68,99	1.09	6 (8%)	74,80,111	1.04	3 (4%)
4	BPH	L	301	-	41,60,70	0.98	1 (2%)	40,89,101	1.56	8 (20%)
10	SPO	M	406	-	40,41,41	0.67	1 (2%)	47,50,50	0.62	0
4	BPH	L	303	-	51,70,70	1.10	3 (5%)	52,101,101	1.36	7 (13%)
8	LDA	M	404	-	12,15,15	1.97	1 (8%)	14,17,17	0.54	0
8	LDA	M	403	-	12,15,15	1.90	1 (8%)	14,17,17	0.31	0
5	BCL	L	302	-	64,74,74	1.58	9 (14%)	78,115,115	1.57	15 (19%)
6	U10	L	304	-	18,18,63	2.72	8 (44%)	22,25,79	2.23	8 (36%)

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
5	BCL	M	401	-	-	4/37/137/137	-
5	BCL	M	408	-	-	3/19/119/137	-
8	LDA	M	402	-	-	6/13/13/13	-
5	BCL	L	305	-	-	7/37/137/137	-
11	CDL	M	407	-	1/1/9/9	43/79/79/110	-
4	BPH	L	301	-	-	3/25/93/105	0/5/6/6
10	SPO	M	406	-	-	7/47/47/47	-
4	BPH	L	303	-	-	5/37/105/105	0/5/6/6
8	LDA	M	404	-	-	4/13/13/13	-
8	LDA	M	403	-	-	5/13/13/13	-
5	BCL	L	302	-	-	4/37/137/137	-
6	U10	L	304	-	-	5/9/33/87	0/1/1/1

All (54) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
8	M	402	LDA	O1-N1	-6.79	1.26	1.42
8	M	404	LDA	O1-N1	-6.75	1.26	1.42
6	L	304	U10	C8-C9	6.43	1.50	1.32
8	M	403	LDA	O1-N1	-6.41	1.27	1.42
5	M	408	BCL	C1B-NB	6.27	1.40	1.35
5	L	302	BCL	C1B-NB	5.99	1.40	1.35
5	L	305	BCL	C1B-NB	5.94	1.40	1.35
5	M	401	BCL	C1B-NB	5.75	1.40	1.35
5	L	305	BCL	MG-NA	5.72	2.19	2.06
5	M	401	BCL	MG-NA	5.61	2.19	2.06
4	L	303	BPH	CBD-CGD	-5.57	1.44	1.52
5	L	302	BCL	MG-NA	5.11	2.18	2.06
6	L	304	U10	O4-C4	-4.69	1.25	1.36
5	M	408	BCL	MG-NA	4.43	2.16	2.06
5	L	302	BCL	MG-NC	4.32	2.16	2.06
5	L	305	BCL	MG-NC	4.26	2.16	2.06
5	M	408	BCL	OBD-CAD	4.12	1.29	1.22
6	L	304	U10	C6-C1	4.01	1.42	1.35
5	M	408	BCL	MG-NC	3.99	2.15	2.06
5	M	408	BCL	C4B-NB	3.87	1.38	1.35

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	L	304	U10	O3-C3	-3.83	1.27	1.36
5	M	401	BCL	MG-NC	3.82	2.15	2.06
10	M	406	SPO	C27-C28	-3.60	1.30	1.34
5	M	408	BCL	C1-C2	3.53	1.59	1.49
5	M	408	BCL	O1A-CGA	-3.49	1.12	1.22
4	L	301	BPH	CBD-CGD	-3.33	1.48	1.52
5	M	401	BCL	C4B-NB	3.15	1.38	1.35
5	L	302	BCL	CHD-C1D	3.08	1.44	1.38
5	L	302	BCL	C4B-NB	3.04	1.37	1.35
11	M	407	CDL	PA1-OA4	-2.97	1.41	1.55
11	M	407	CDL	PB2-OB5	2.90	1.71	1.59
5	L	302	BCL	C1D-ND	2.84	1.41	1.37
5	M	408	BCL	CHD-C1D	2.78	1.43	1.38
5	M	408	BCL	O2A-CGA	2.78	1.41	1.33
5	L	305	BCL	C4B-NB	2.75	1.37	1.35
6	L	304	U10	C3-C2	-2.75	1.41	1.48
5	L	302	BCL	O1A-CGA	-2.74	1.14	1.22
11	M	407	CDL	PA1-OA5	2.74	1.70	1.59
6	L	304	U10	C7-C8	2.72	1.54	1.50
11	M	407	CDL	PB2-OB4	-2.72	1.42	1.55
6	L	304	U10	C7-C6	2.68	1.55	1.51
5	L	302	BCL	OBD-CAD	2.67	1.27	1.22
5	M	408	BCL	C1D-ND	2.63	1.41	1.37
11	M	407	CDL	PB2-OB3	-2.59	1.41	1.50
5	L	305	BCL	C5-C3	2.43	1.56	1.51
5	M	401	BCL	C1D-ND	2.33	1.40	1.37
6	L	304	U10	C4-C3	2.14	1.45	1.36
4	L	303	BPH	C1A-C2A	2.09	1.54	1.51
4	L	303	BPH	C1C-C2C	-2.09	1.47	1.51
11	M	407	CDL	CA3-CA4	2.09	1.57	1.50
5	L	305	BCL	C1D-C2D	-2.08	1.41	1.45
5	L	302	BCL	C1-C2	2.07	1.55	1.49
5	M	408	BCL	O2A-C1	2.06	1.52	1.46
5	M	401	BCL	CHD-C1D	2.05	1.42	1.38

All (83) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
6	L	304	U10	C6-C1-C2	6.66	124.45	119.18
5	L	302	BCL	CHD-C1D-ND	-5.59	119.31	124.45
5	M	401	BCL	CHD-C1D-ND	-5.20	119.67	124.45
5	M	408	BCL	CHD-C1D-ND	-5.13	119.74	124.45

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
5	M	401	BCL	C4D-CHA-C1A	5.12	127.48	121.25
5	M	408	BCL	C1-C2-C3	4.93	134.73	126.75
4	L	303	BPH	C11-C10-C8	-4.87	100.19	115.92
5	L	302	BCL	C1D-ND-C4D	-4.55	103.11	106.33
5	M	408	BCL	C4D-CHA-C1A	4.54	126.78	121.25
4	L	301	BPH	C1-C2-C3	-4.52	118.22	126.04
5	L	305	BCL	CHD-C1D-ND	-4.33	120.48	124.45
5	L	302	BCL	C4D-CHA-C1A	4.23	126.40	121.25
5	L	305	BCL	C16-C15-C13	-4.14	102.54	115.92
5	M	408	BCL	C1D-ND-C4D	-3.98	103.51	106.33
5	M	408	BCL	CBA-CAA-C2A	3.80	125.07	113.86
5	M	408	BCL	CMB-C2B-C1B	-3.78	122.65	128.46
6	L	304	U10	C1-C6-C5	-3.77	116.03	119.58
5	L	305	BCL	C4D-CHA-C1A	3.72	125.78	121.25
5	M	401	BCL	C1D-ND-C4D	-3.70	103.71	106.33
5	L	305	BCL	C1D-ND-C4D	-3.67	103.72	106.33
5	M	401	BCL	CMB-C2B-C1B	-3.50	123.08	128.46
5	L	305	BCL	CMB-C2B-C1B	-3.49	123.10	128.46
5	M	408	BCL	O2A-CGA-O1A	-3.43	114.93	123.59
5	M	401	BCL	CHA-C1A-NA	-3.37	118.69	126.40
4	L	301	BPH	CAC-C3C-C2C	-3.35	105.89	114.26
5	L	302	BCL	CMB-C2B-C1B	-3.29	123.41	128.46
4	L	301	BPH	OBD-CAD-CBD	-3.27	121.02	125.82
5	L	305	BCL	C4B-C3B-CAB	-3.25	120.85	127.13
5	M	401	BCL	C1-C2-C3	-3.23	120.45	126.04
6	L	304	U10	C1M-C1-C6	-3.23	119.13	124.40
5	M	408	BCL	O2A-CGA-CBA	3.20	121.94	111.91
5	L	305	BCL	CHA-C1A-NA	-3.17	119.13	126.40
5	L	302	BCL	O2D-CGD-CBD	3.16	116.89	111.27
5	L	305	BCL	C2A-C1A-CHA	3.16	129.38	123.86
5	M	408	BCL	C1-O2A-CGA	3.11	124.61	116.44
5	M	408	BCL	CAA-C2A-C1A	-3.01	102.10	111.97
5	L	302	BCL	C2A-C1A-CHA	2.96	129.04	123.86
5	M	408	BCL	C5-C3-C4	-2.94	108.11	114.60
6	L	304	U10	C7-C6-C5	2.93	122.01	118.48
5	L	302	BCL	CHA-C1A-NA	-2.93	119.69	126.40
5	M	408	BCL	CHA-C1A-NA	-2.87	119.83	126.40
4	L	303	BPH	CMC-C2C-C1C	-2.81	108.22	114.38
4	L	303	BPH	OBD-CAD-CBD	-2.71	121.85	125.82
5	M	401	BCL	C2A-C1A-CHA	2.70	128.58	123.86
5	M	408	BCL	O2D-CGD-O1D	-2.69	118.58	123.84
5	L	305	BCL	CMB-C2B-C3B	2.69	129.71	124.68

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
11	M	407	CDL	OB4-PB2-OB3	2.68	125.48	112.24
5	L	305	BCL	CHC-C1C-NC	-2.65	120.84	124.51
5	L	302	BCL	C2D-C1D-ND	2.64	112.05	110.10
6	L	304	U10	C3M-O3-C3	2.63	125.80	116.47
5	L	305	BCL	C15-C13-C12	-2.63	98.31	112.13
5	M	401	BCL	CMB-C2B-C3B	2.58	129.50	124.68
5	M	408	BCL	O2D-CGD-CBD	2.57	115.83	111.27
5	M	408	BCL	OBB-CAB-CBB	-2.57	114.39	120.17
5	L	305	BCL	C11-C10-C8	-2.56	107.64	115.92
4	L	301	BPH	CMD-C2D-C3D	2.55	129.44	124.68
6	L	304	U10	C8-C7-C6	2.51	118.81	112.05
5	L	302	BCL	CMB-C2B-C3B	2.47	129.29	124.68
4	L	301	BPH	O2D-CGD-CBD	2.44	114.08	111.00
4	L	303	BPH	C16-C15-C13	-2.42	108.10	115.92
6	L	304	U10	O5-C5-C6	-2.38	117.37	121.55
11	M	407	CDL	OA4-PA1-OA3	2.38	123.99	112.24
4	L	303	BPH	CMD-C2D-C3D	2.34	129.06	124.68
5	M	401	BCL	C4A-NA-C1A	2.34	107.76	106.71
5	L	305	BCL	O2D-CGD-CBD	2.30	115.36	111.27
4	L	303	BPH	CMA-C3A-C4A	-2.30	109.35	114.38
5	M	408	BCL	CMB-C2B-C3B	2.27	128.92	124.68
5	M	401	BCL	C11-C10-C8	-2.26	108.60	115.92
4	L	301	BPH	CMB-C2B-C3B	2.26	128.91	124.68
6	L	304	U10	C4-C3-C2	-2.26	116.24	120.68
5	L	302	BCL	CED-O2D-CGD	2.26	121.04	115.94
11	M	407	CDL	CA4-OA6-CA5	2.24	123.31	117.79
5	L	302	BCL	OBB-CAB-CBB	-2.23	115.14	120.17
5	L	302	BCL	O2A-C1-C2	-2.19	102.88	108.64
5	M	408	BCL	C2D-C1D-ND	2.15	111.69	110.10
4	L	301	BPH	OBB-CAB-CBB	-2.15	115.34	120.17
5	M	401	BCL	CHC-C1C-NC	-2.14	121.55	124.51
5	L	302	BCL	C16-C17-C18	-2.13	105.92	115.98
4	L	303	BPH	OBB-CAB-CBB	-2.12	115.39	120.17
5	M	401	BCL	C11-C12-C13	-2.10	109.15	115.92
4	L	301	BPH	O2A-C1-C2	-2.07	103.18	108.64
5	L	302	BCL	O2D-CGD-O1D	-2.02	119.89	123.84
5	L	302	BCL	C4A-NA-C1A	2.01	107.61	106.71

All (1) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
11	M	407	CDL	CA4

All (96) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	L	305	BCL	C4C-C3C-CAC-CBC
5	M	408	BCL	O2A-C1-C2-C3
8	M	402	LDA	C2-C1-N1-O1
8	M	402	LDA	C2-C1-N1-CM1
8	M	402	LDA	C2-C1-N1-CM2
8	M	403	LDA	C2-C1-N1-O1
8	M	403	LDA	C2-C1-N1-CM1
8	M	403	LDA	N1-C1-C2-C3
10	M	406	SPO	C5-C6-C7-C8
10	M	406	SPO	C5-C6-C7-C9
11	M	407	CDL	CA2-C1-CB2-OB2
11	M	407	CDL	CA3-OA5-PA1-OA3
11	M	407	CDL	CA3-OA5-PA1-OA4
11	M	407	CDL	C11-CA5-OA6-CA4
11	M	407	CDL	CB2-OB2-PB2-OB4
11	M	407	CDL	CB2-OB2-PB2-OB5
11	M	407	CDL	OA9-CA7-OA8-CA6
11	M	407	CDL	OB9-CB7-OB8-CB6
11	M	407	CDL	OA7-CA5-OA6-CA4
11	M	407	CDL	C31-CA7-OA8-CA6
11	M	407	CDL	C71-CB7-OB8-CB6
6	L	304	U10	C7-C8-C9-C11
6	L	304	U10	C7-C8-C9-C10
5	M	401	BCL	C14-C13-C15-C16
11	M	407	CDL	CA7-C31-C32-C33
5	L	305	BCL	C13-C15-C16-C17
11	M	407	CDL	CA3-OA5-PA1-OA2
11	M	407	CDL	CB2-C1-CA2-OA2
4	L	303	BPH	C4-C3-C5-C6
11	M	407	CDL	CA6-CA4-OA6-CA5
11	M	407	CDL	OB7-CB5-OB6-CB4
8	M	403	LDA	C6-C7-C8-C9
11	M	407	CDL	O1-C1-CA2-OA2
5	M	401	BCL	C16-C17-C18-C20
4	L	303	BPH	C2-C3-C5-C6
11	M	407	CDL	C31-C32-C33-C34
8	M	404	LDA	C2-C3-C4-C5
11	M	407	CDL	C51-CB5-OB6-CB4
5	L	305	BCL	C15-C16-C17-C18
8	M	402	LDA	C1-C2-C3-C4
8	M	403	LDA	C1-C2-C3-C4
11	M	407	CDL	C71-C72-C73-C74

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms
4	L	301	BPH	C2-C3-C5-C6
5	M	401	BCL	C16-C17-C18-C19
11	M	407	CDL	CB3-OB5-PB2-OB2
4	L	301	BPH	C4-C3-C5-C6
5	L	305	BCL	C2C-C3C-CAC-CBC
11	M	407	CDL	CA3-CA4-CA6-OA8
11	M	407	CDL	CB3-CB4-CB6-OB8
6	L	304	U10	C1-C6-C7-C8
11	M	407	CDL	C13-C14-C15-C16
11	M	407	CDL	C17-C18-C19-C20
10	M	406	SPO	C34-C33-C35-C36
8	M	402	LDA	C3-C4-C5-C6
11	M	407	CDL	C33-C34-C35-C36
10	M	406	SPO	C32-C33-C35-C36
8	M	404	LDA	C6-C7-C8-C9
8	M	404	LDA	N1-C1-C2-C3
8	M	402	LDA	C7-C8-C9-C10
11	M	407	CDL	C51-C52-C53-C54
11	M	407	CDL	OA6-CA4-CA6-OA8
11	M	407	CDL	C40-C41-C42-C43
4	L	301	BPH	CAD-CBD-CGD-O2D
5	L	302	BCL	CAD-CBD-CGD-O2D
11	M	407	CDL	CA5-C11-C12-C13
8	M	404	LDA	C4-C5-C6-C7
11	M	407	CDL	O1-C1-CB2-OB2
11	M	407	CDL	CB2-OB2-PB2-OB3
11	M	407	CDL	C75-C76-C77-C78
11	M	407	CDL	C52-C53-C54-C55
11	M	407	CDL	OB6-CB4-CB6-OB8
11	M	407	CDL	C74-C75-C76-C77
11	M	407	CDL	C36-C37-C38-C39
10	M	406	SPO	C33-C35-C36-C37
10	M	406	SPO	C2-C1-C4-C5
5	M	401	BCL	C12-C13-C15-C16
11	M	407	CDL	CB5-C51-C52-C53
4	L	303	BPH	C16-C17-C18-C20
5	L	305	BCL	C2-C1-O2A-CGA
5	L	302	BCL	C11-C10-C8-C9
4	L	303	BPH	O2A-C1-C2-C3
5	L	302	BCL	C12-C13-C15-C16
11	M	407	CDL	C73-C74-C75-C76
11	M	407	CDL	C14-C15-C16-C17

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms
5	M	408	BCL	C2A-CAA-CBA-CGA
11	M	407	CDL	C32-C33-C34-C35
5	L	302	BCL	C14-C13-C15-C16
6	L	304	U10	C5-C6-C7-C8
4	L	303	BPH	CAD-CBD-CGD-O2D
5	L	305	BCL	CAD-CBD-CGD-O2D
5	M	408	BCL	CAD-CBD-CGD-O2D
5	L	305	BCL	C5-C6-C7-C8
10	M	406	SPO	C28-C30-C31-C32
6	L	304	U10	C6-C7-C8-C9
11	M	407	CDL	CB3-OB5-PB2-OB3
11	M	407	CDL	C35-C36-C37-C38

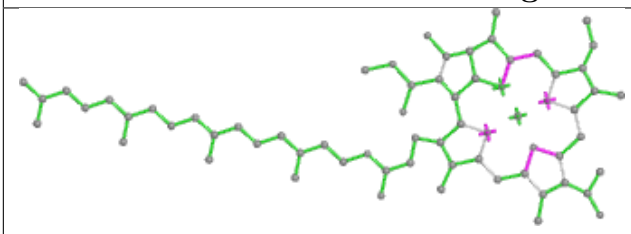
There are no ring outliers.

11 monomers are involved in 39 short contacts:

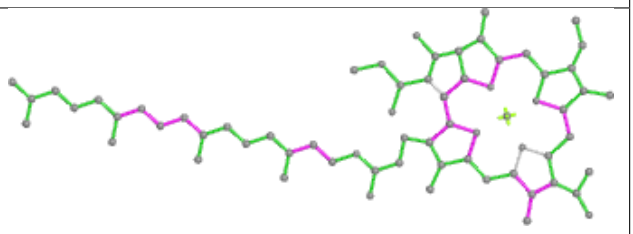
Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	M	401	BCL	6	0
5	M	408	BCL	5	0
8	M	402	LDA	1	0
5	L	305	BCL	6	0
11	M	407	CDL	3	0
4	L	301	BPH	9	0
10	M	406	SPO	4	0
4	L	303	BPH	4	0
8	M	403	LDA	1	0
5	L	302	BCL	5	0
6	L	304	U10	1	0

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 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.

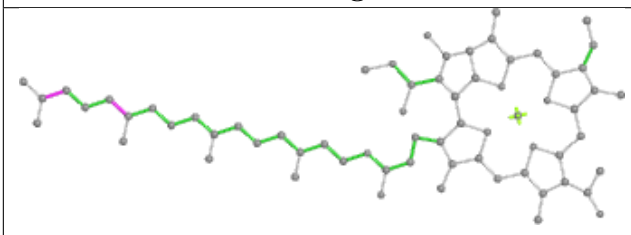
Ligand BCL M 401



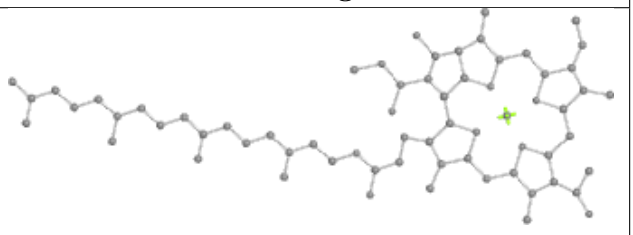
Bond lengths



Bond angles

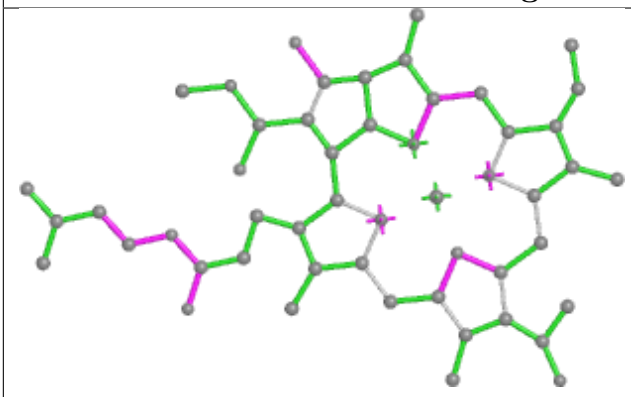


Torsions

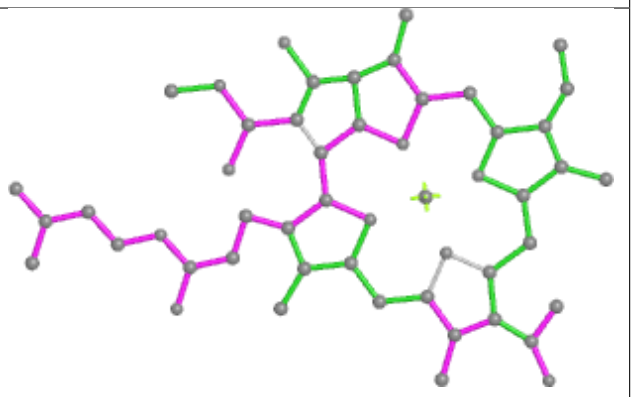


Rings

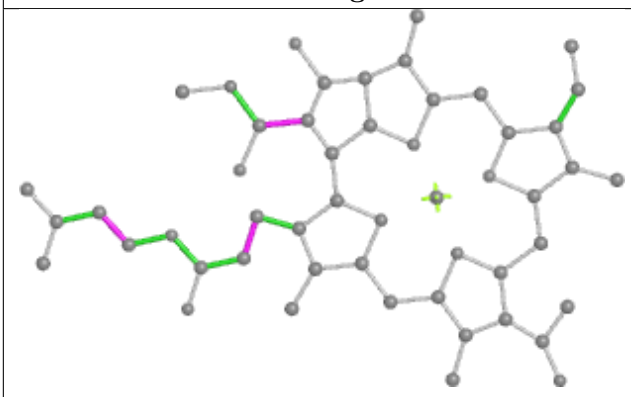
Ligand BCL M 408



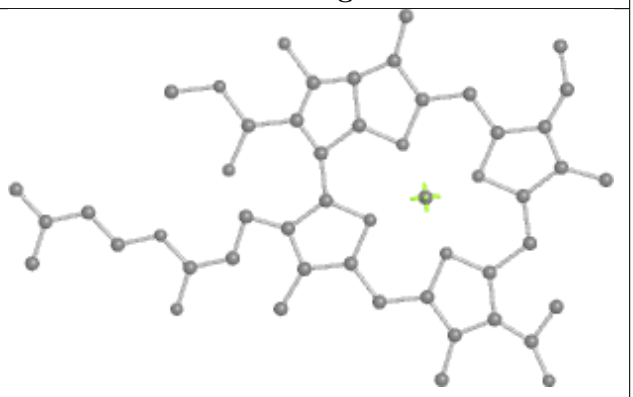
Bond lengths



Bond angles

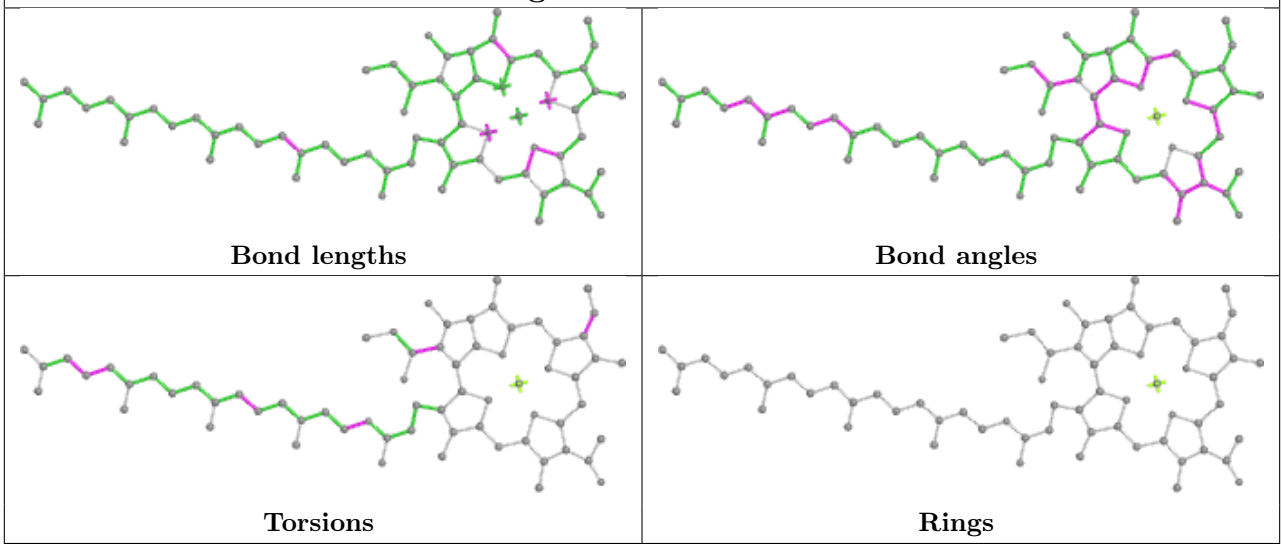


Torsions

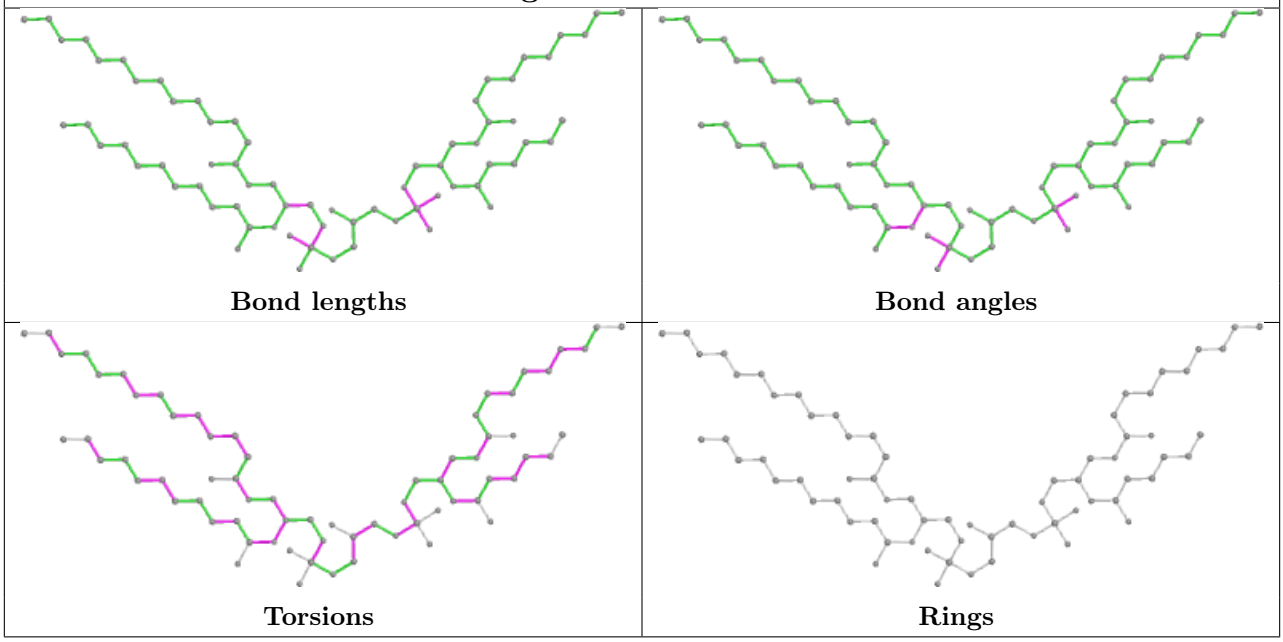


Rings

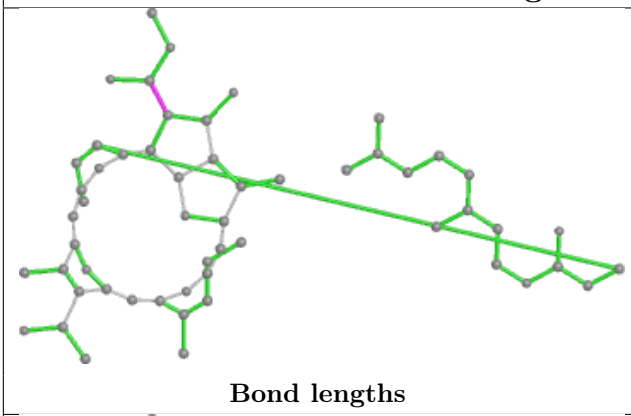
Ligand BCL L 305



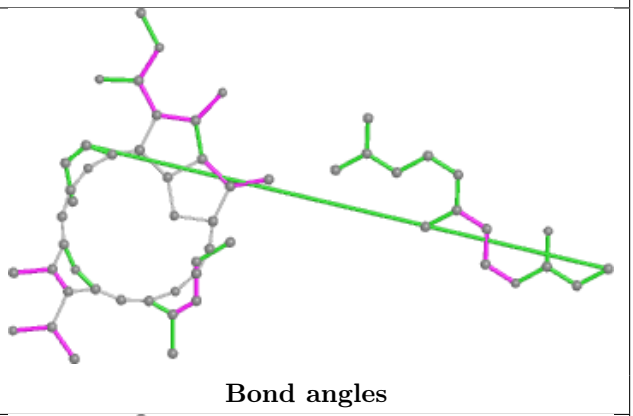
Ligand CDL M 407



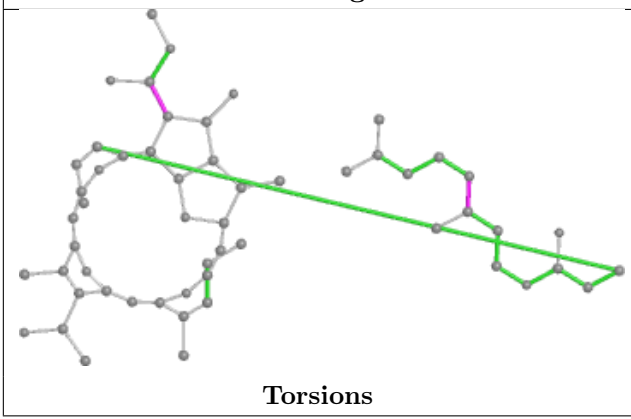
Ligand BPH L 301



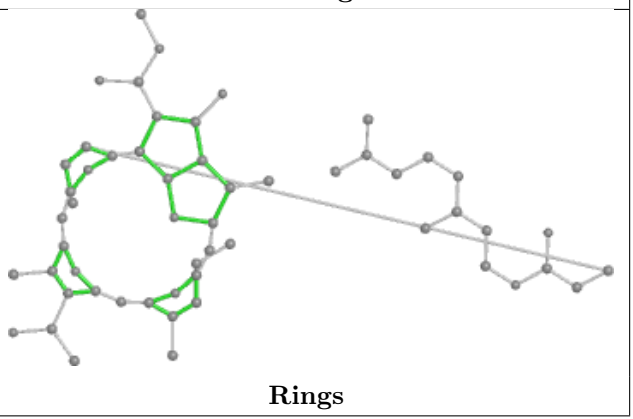
Bond lengths



Bond angles

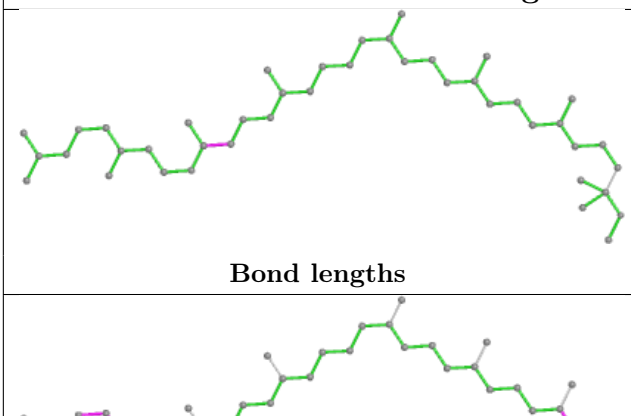


Torsions

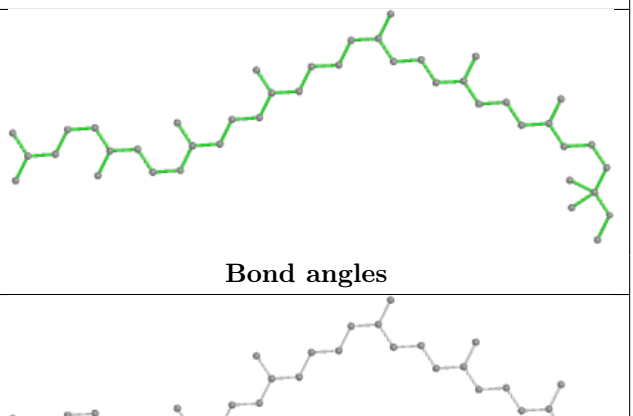


Rings

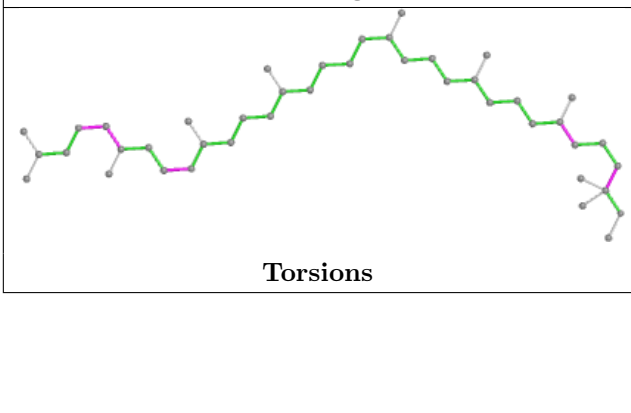
Ligand SPO M 406



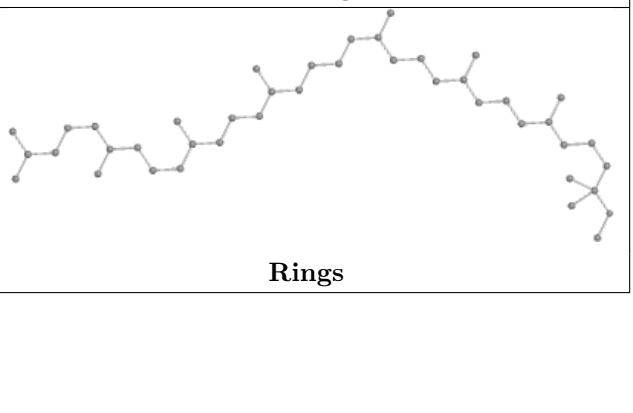
Bond lengths



Bond angles

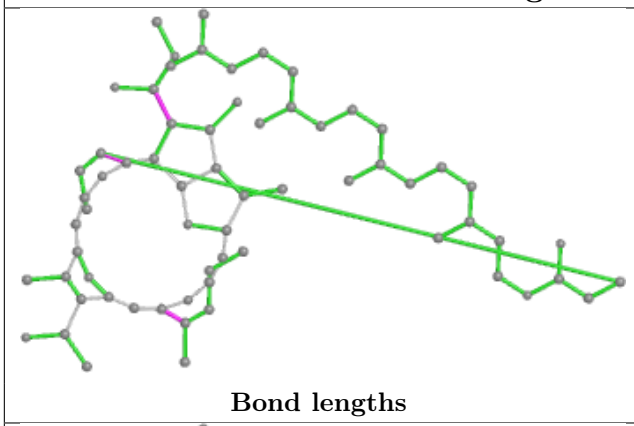


Torsions

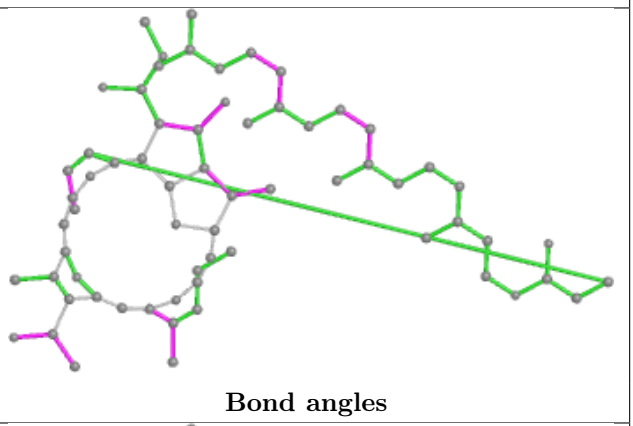


Rings

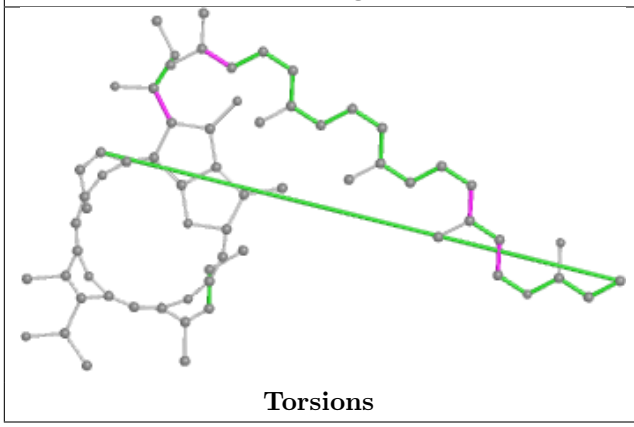
Ligand BPH L 303



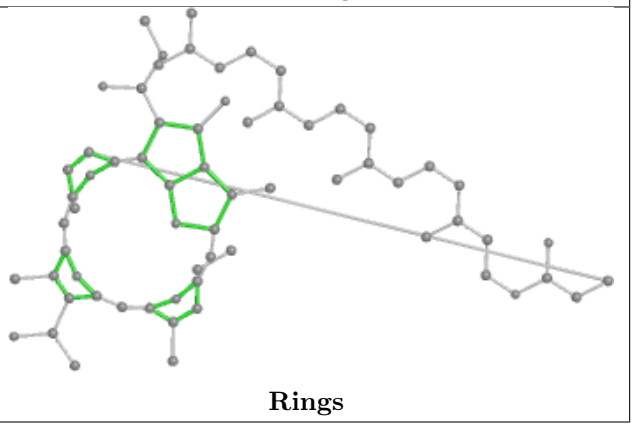
Bond lengths



Bond angles

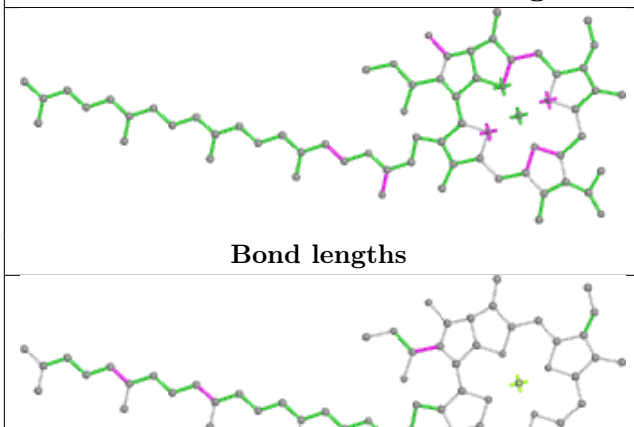


Torsions

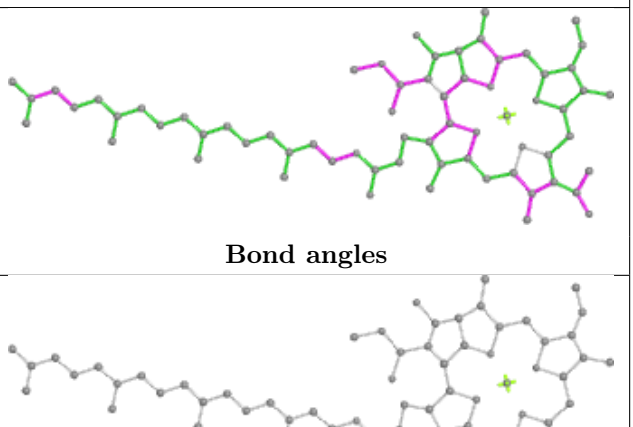


Rings

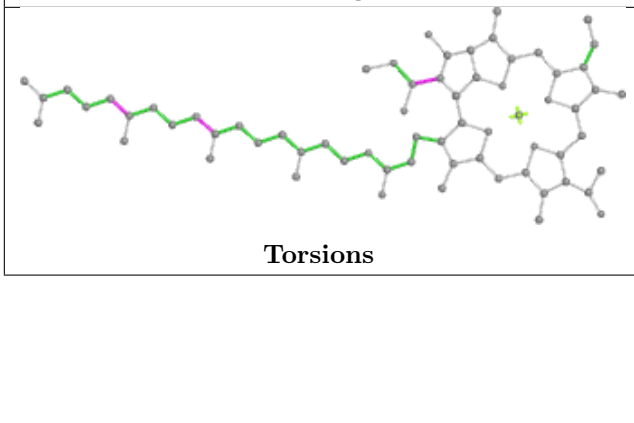
Ligand BCL L 302



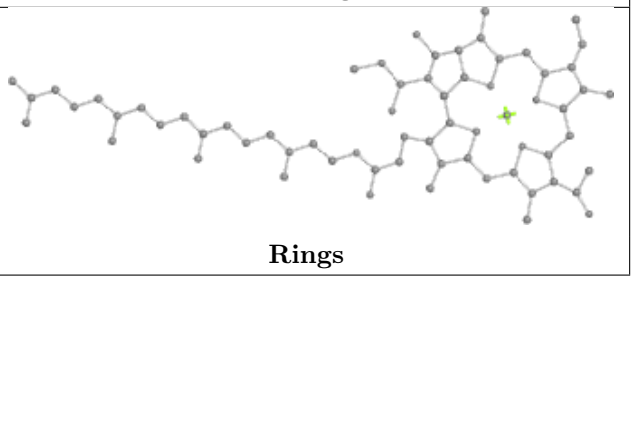
Bond lengths



Bond angles

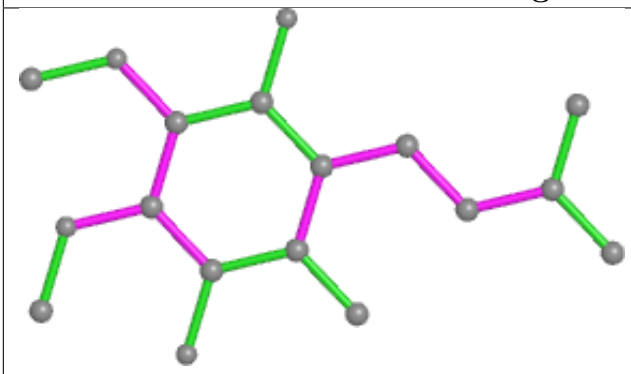


Torsions

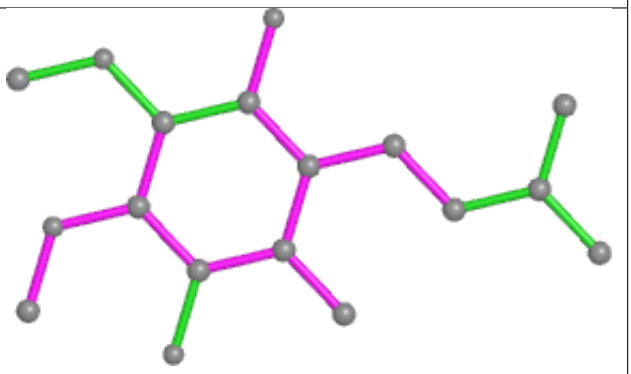


Rings

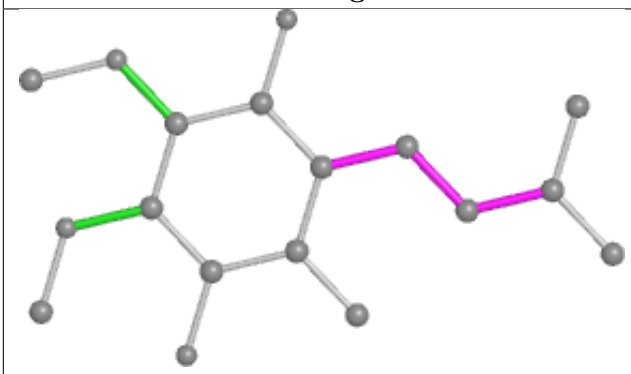
Ligand U10 L 304



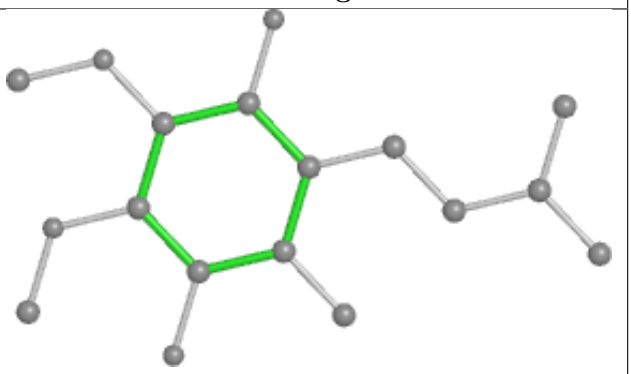
Bond lengths



Bond angles



Torsions



Rings

5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

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	H	240/240 (100%)	-0.60	1 (0%) 92 84	50, 64, 93, 138	0
2	L	281/281 (100%)	-0.63	1 (0%) 92 84	43, 59, 94, 128	0
3	M	300/301 (99%)	-0.74	0 100 100	47, 62, 95, 130	0
All	All	821/822 (99%)	-0.66	2 (0%) 95 90	43, 62, 94, 138	0

All (2) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	H	250	SER	2.4
2	L	281	GLY	2.0

6.2 Non-standard residues in protein, DNA, RNA chains

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
3	A1ADW	M	210	12/13	0.98	0.18	44,48,50,52	0

6.3 Carbohydrates

There are no monosaccharides in this entry.

6.4 Ligands

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,

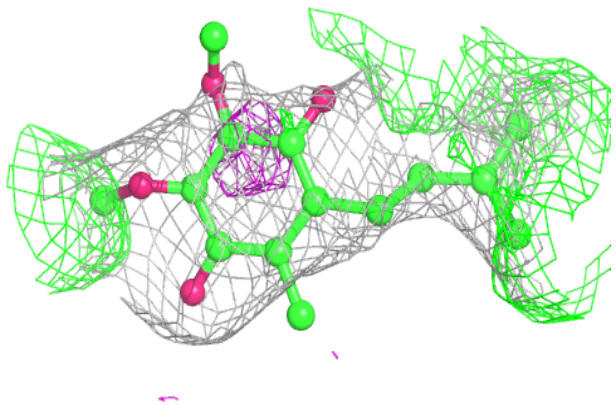
median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

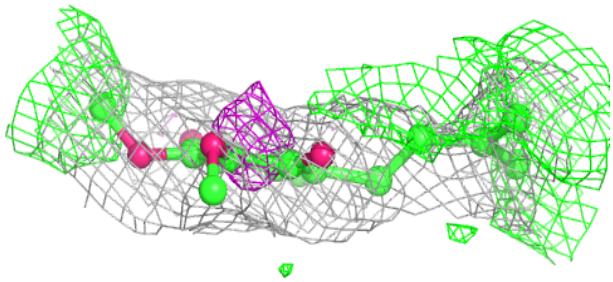
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
6	U10	L	304	18/63	0.50	0.49	88,116,131,133	0
8	LDA	M	404	16/16	0.81	0.29	60,82,136,136	0
7	CL	L	306	1/1	0.82	0.14	97,97,97,97	0
8	LDA	M	403	16/16	0.87	0.47	80,85,98,100	0
8	LDA	M	402	16/16	0.92	0.29	71,79,98,98	0
11	CDL	M	407	69/100	0.93	0.34	65,84,101,114	0
10	SPO	M	406	42/42	0.95	0.27	51,67,82,87	0
5	BCL	M	401	66/66	0.97	0.17	43,52,69,94	0
4	BPH	L	301	55/65	0.97	0.15	42,55,74,84	0
5	BCL	M	408	51/66	0.98	0.14	40,52,65,80	0
5	BCL	L	302	66/66	0.98	0.14	43,51,69,74	0
5	BCL	L	305	66/66	0.98	0.17	43,52,58,64	0
4	BPH	L	303	65/65	0.98	0.15	38,50,59,65	0
9	FE	M	405	1/1	0.99	0.11	42,42,42,42	0

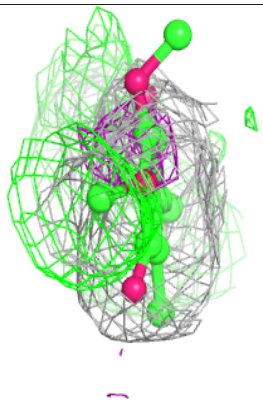
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around U10 L 304:

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

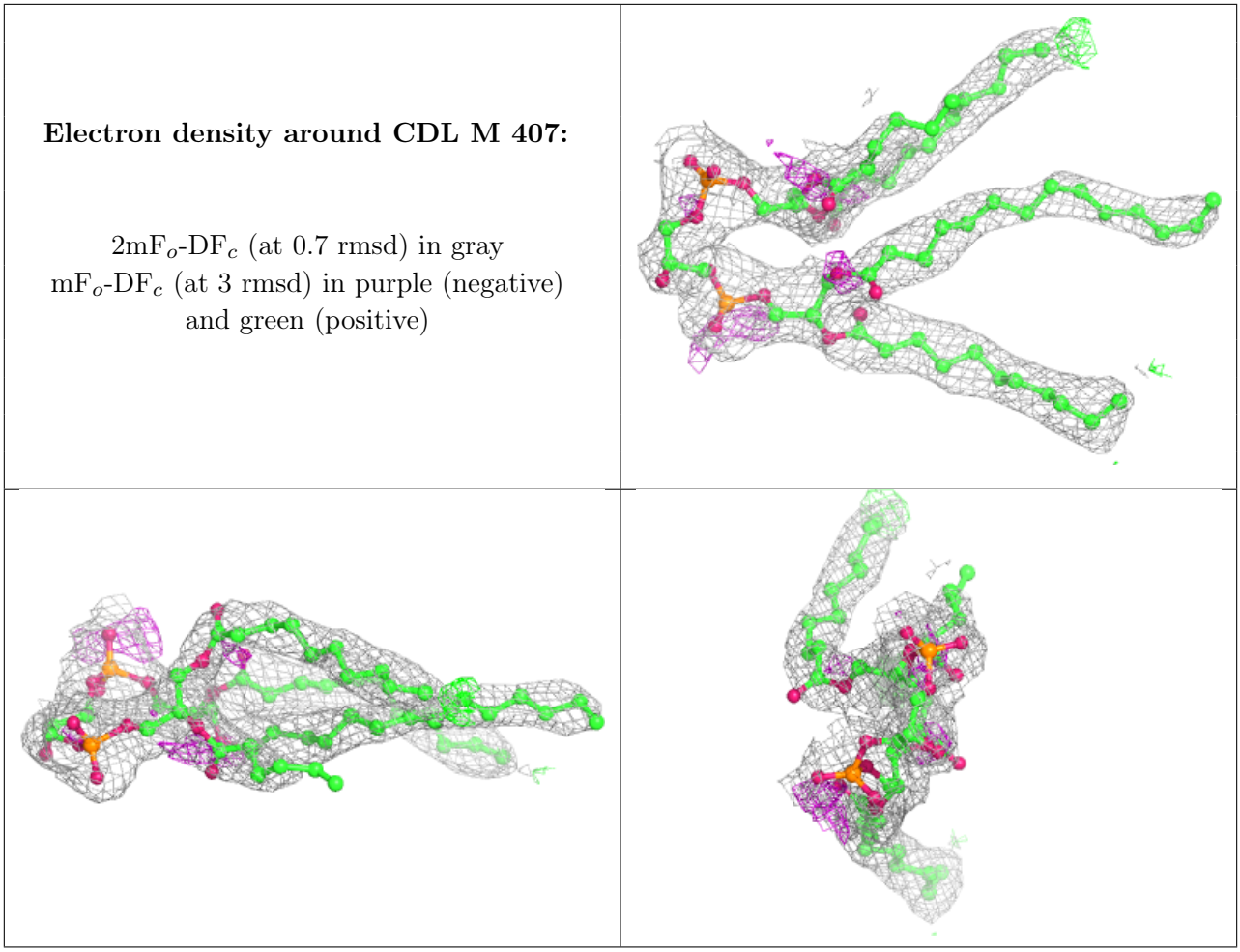






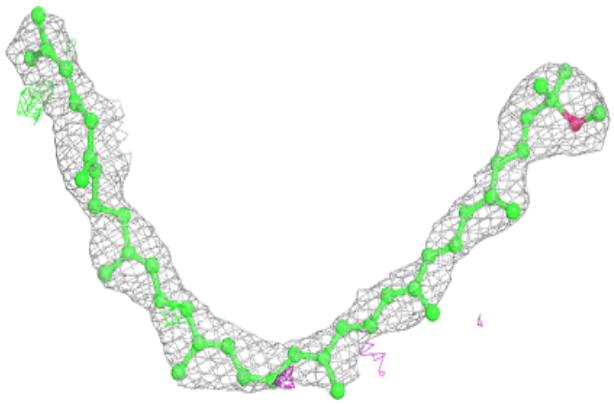
Electron density around CDL M 407:

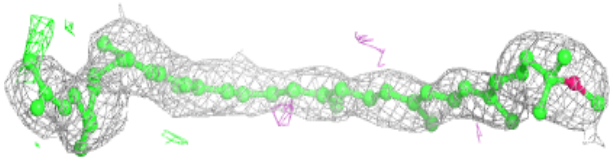
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



Electron density around SPO M 406:

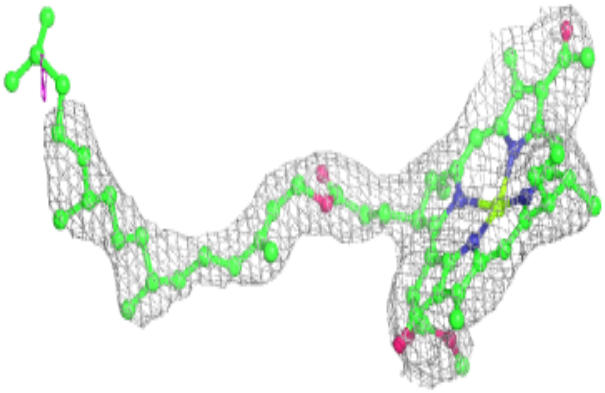
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

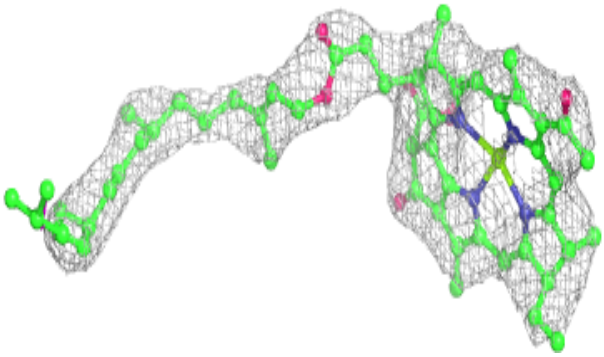


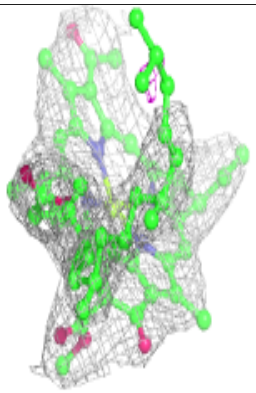


Electron density around BCL M 401:

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

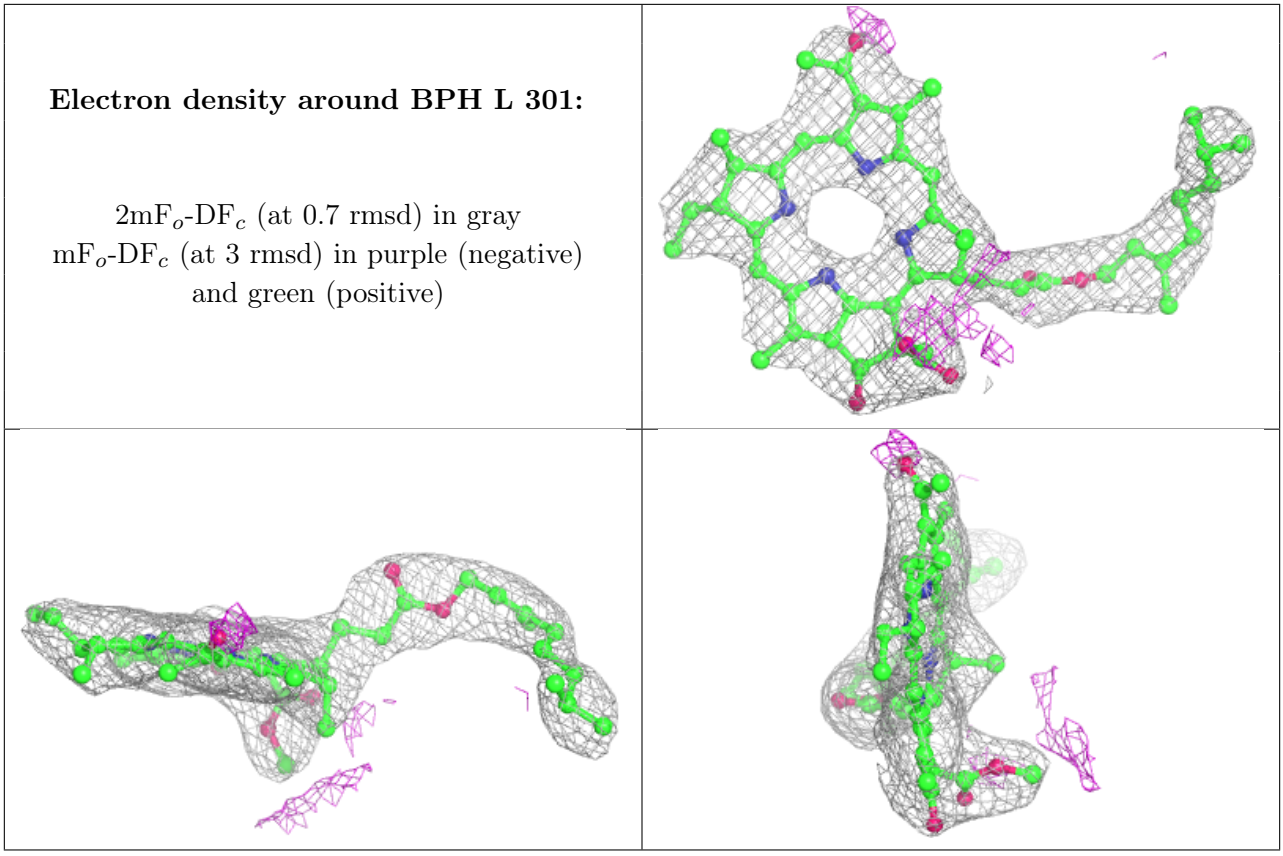






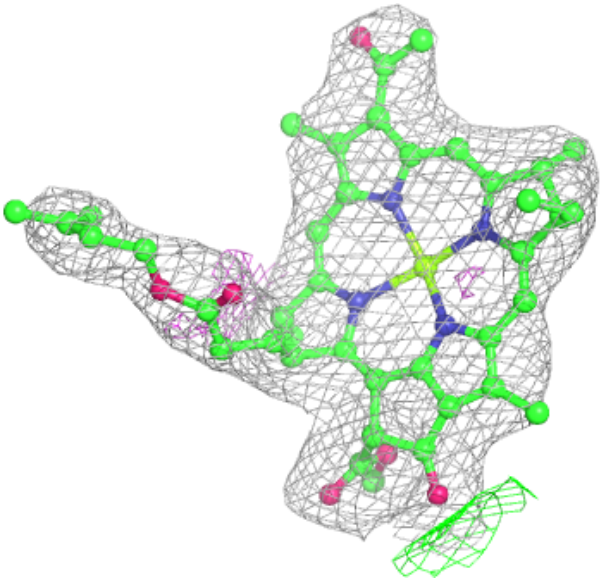
Electron density around BPH L 301:

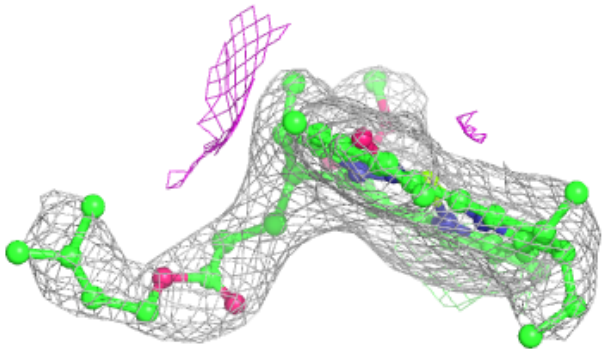
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

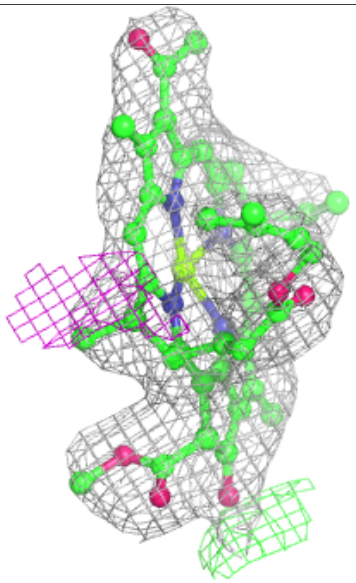


Electron density around BCL M 408:

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

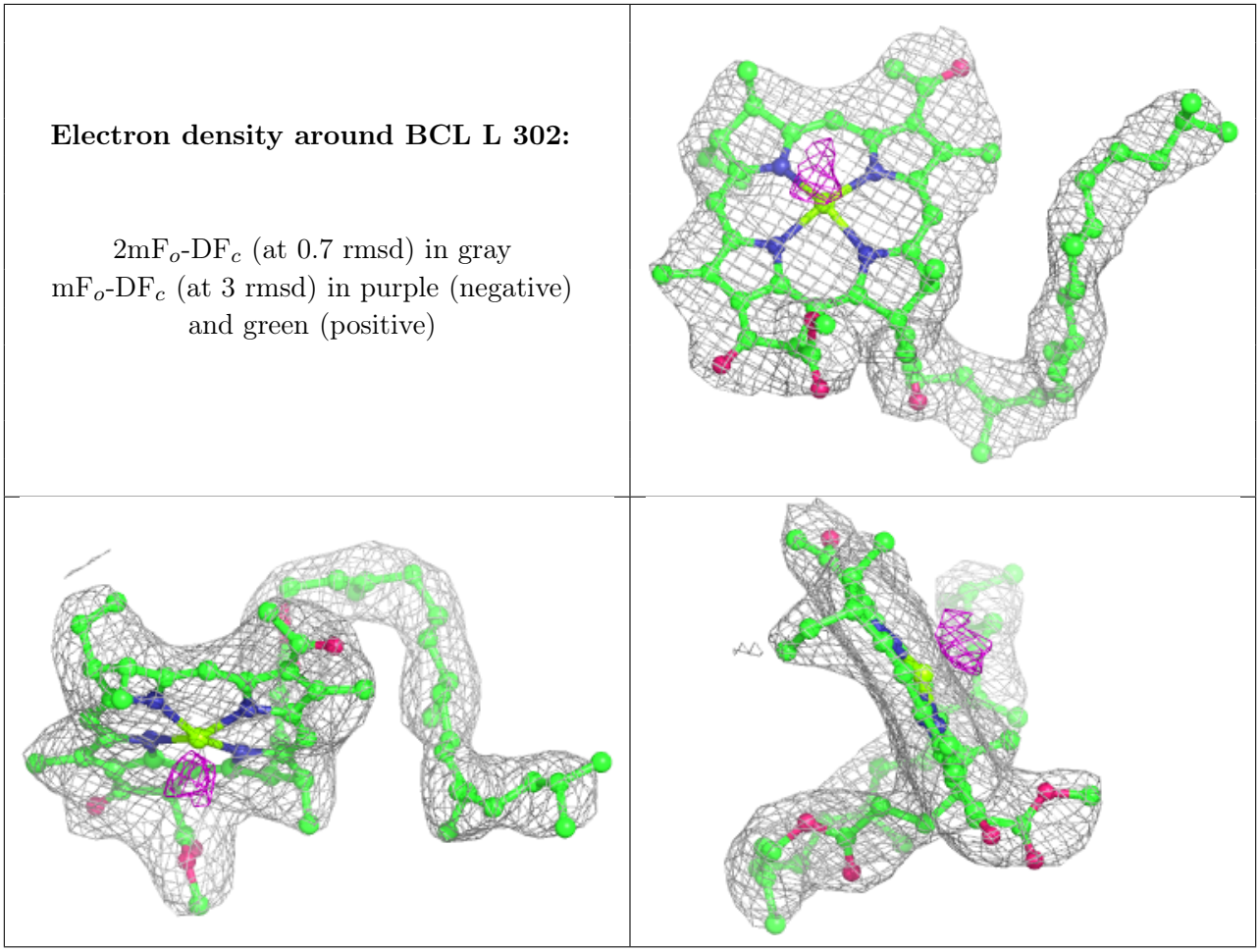






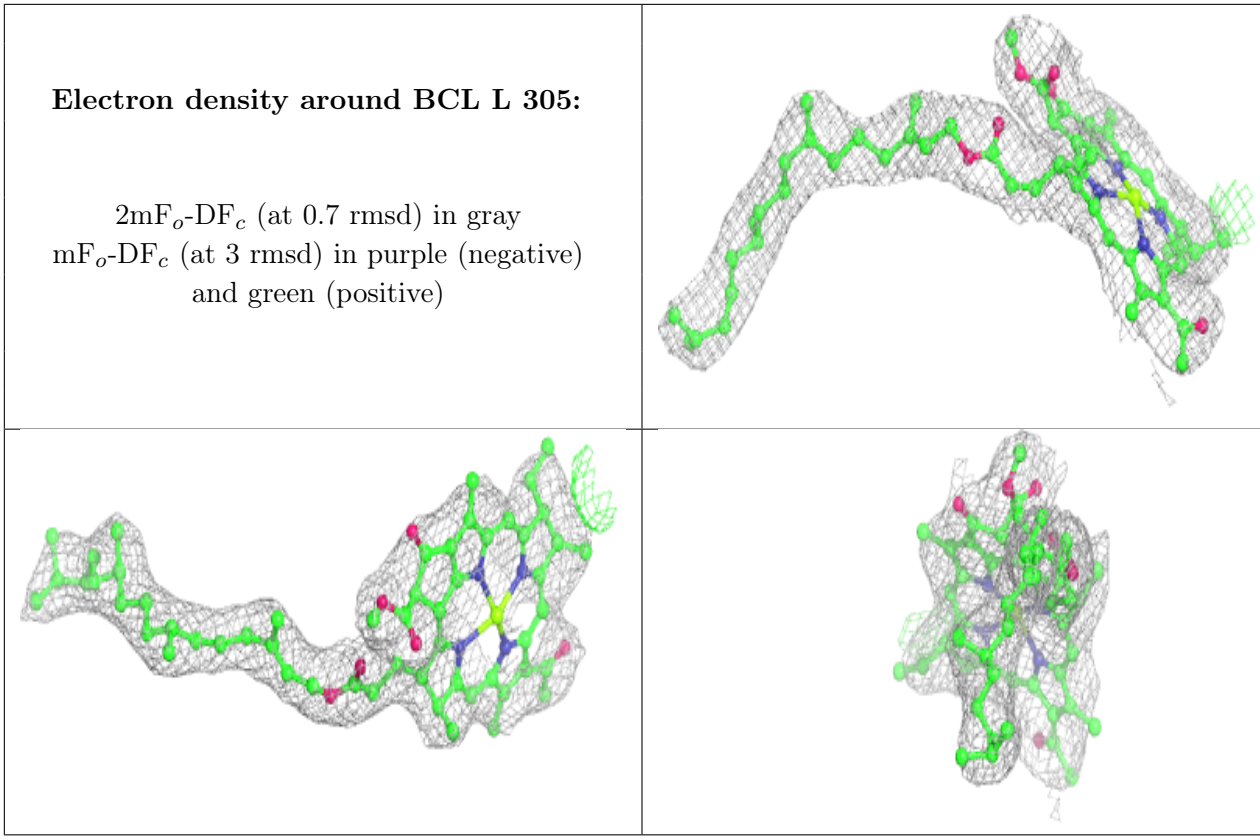
Electron density around BCL L 302:

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



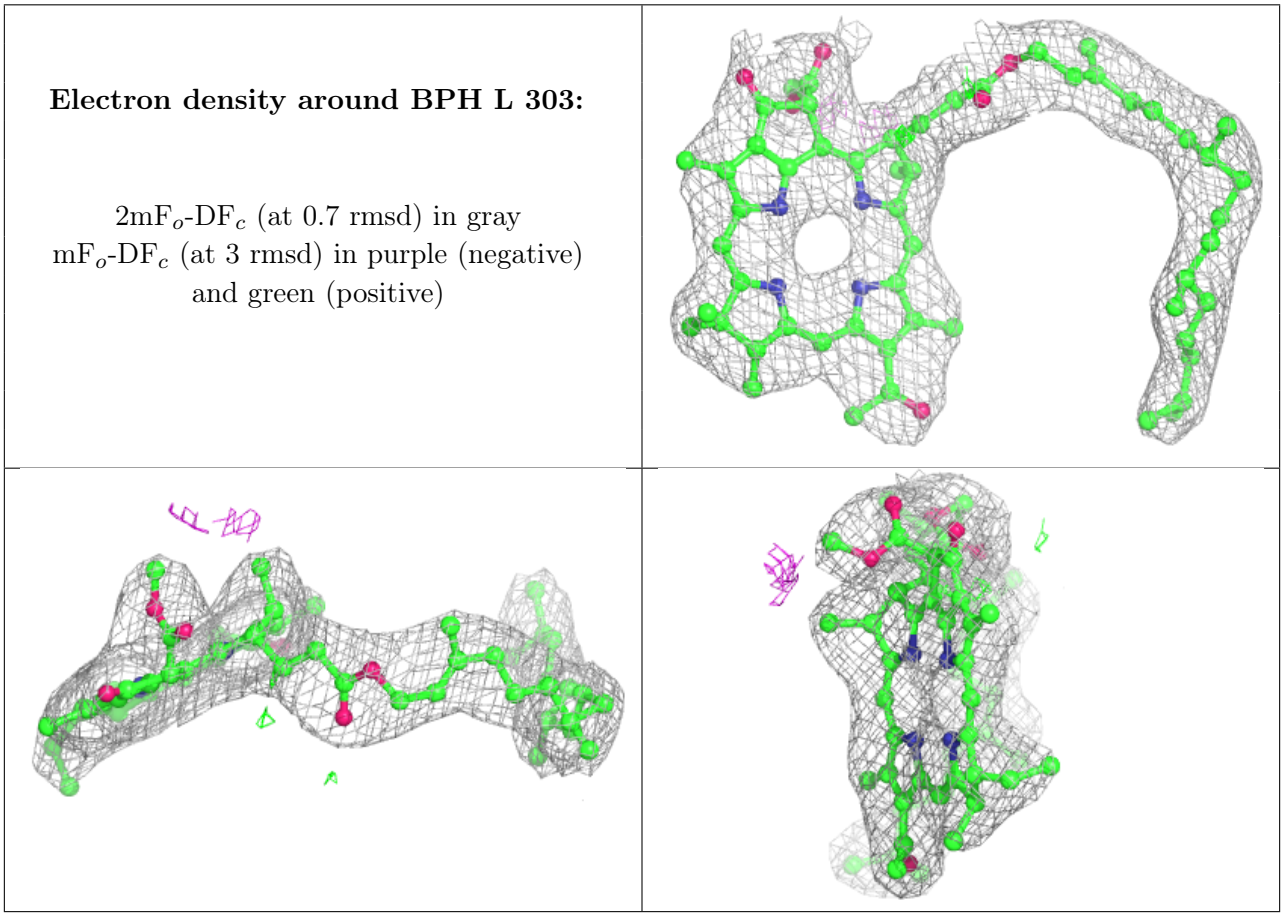
Electron density around BCL L 305:

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



Electron density around BPH L 303:

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



6.5 Other polymers (i)

There are no such residues in this entry.