



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 8, 2026 – 05:51 PM UTC

PDB ID : 1RY5 / pdb_00001ry5
Title : PHOTOSYNTHETIC REACTION CENTER MUTANT FROM
RHODOBACTER SPHAEROIDES WITH ASP L213 REPLACED WITH
ASN
Authors : Xu, Q.; Axelrod, H.L.; Abresch, E.C.; Paddock, M.L.; Okamura, M.Y.; Feher,
G.
Deposited on : 2003-12-19
Resolution : 2.10 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](#) ①) were used in the production of this report:

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

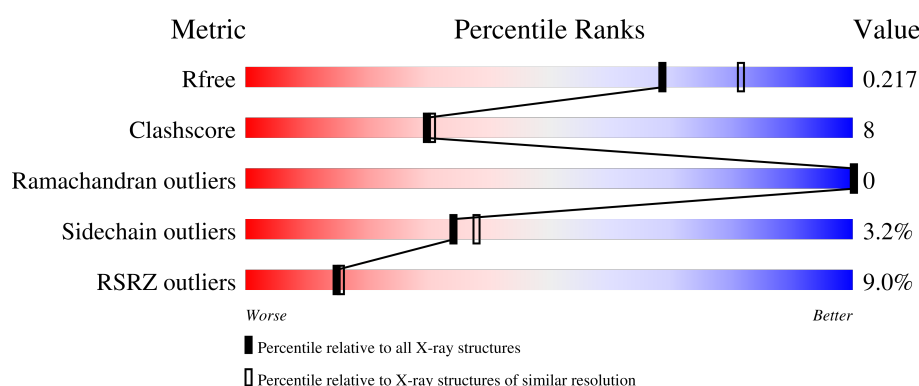
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.10 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	180053	6658 (2.10-2.10)
Clashscore	190562	7164 (2.10-2.10)
Ramachandran outliers	187476	7099 (2.10-2.10)
Sidechain outliers	187428	7100 (2.10-2.10)
RSRZ outliers	180081	6662 (2.10-2.10)

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 $\leq 5\%$. 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	L	281	11% 83% 15% .
2	M	307	9% 79% 19% ..
3	H	260	6% 72% 18% 8%

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
5	BPH	L	856	X	-	-	-
7	GOL	L	866	-	X	-	-

2 Entry composition

There are 14 unique types of molecules in this entry. The entry contains 7504 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 L chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	L	281	Total	C	N	O	S	0	0	0
			2232	1507	356	361	8			

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
L	213	ASN	ASP	engineered mutation	UNP P02954

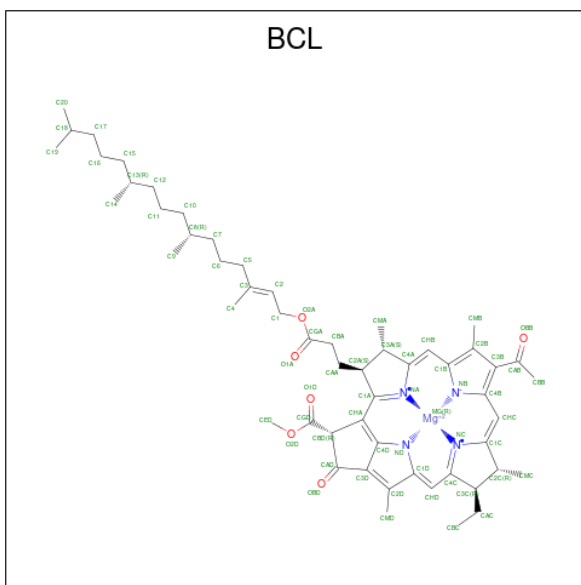
- Molecule 2 is a protein called Reaction center protein M chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	M	301	Total	C	N	O	S	0	0	0
			2404	1605	393	396	10			

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

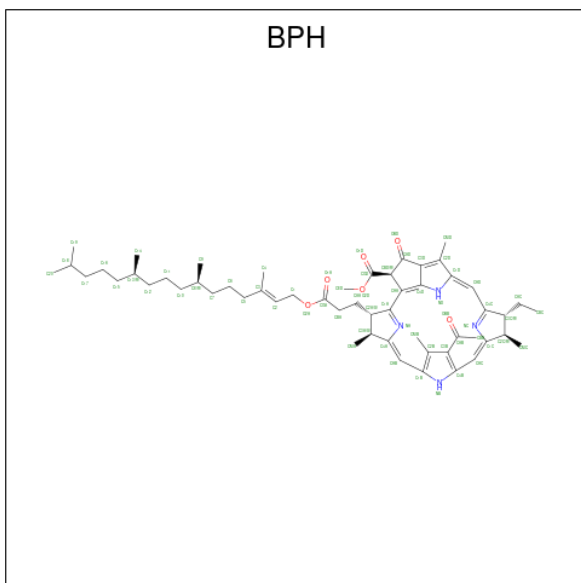
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	H	239	Total	C	N	O	S	0	1	0
			1832	1171	314	338	9			

- Molecule 4 is BACTERIOCHLOROPHYLL A (CCD ID: BCL) (formula: C₅₅H₇₄MgN₄O₆).



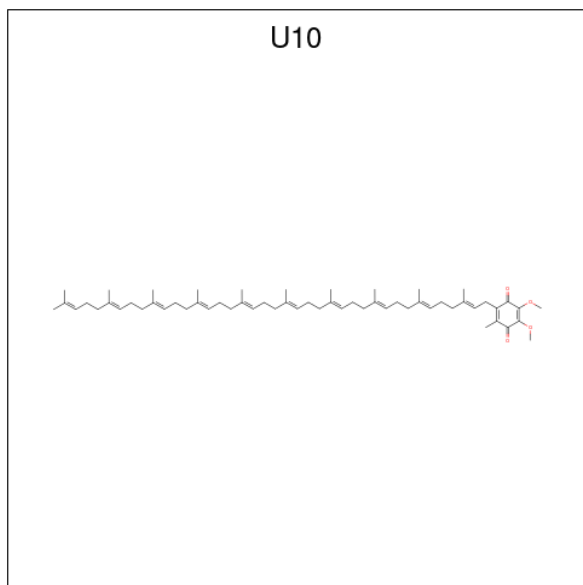
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
4	L	1	Total 51	C 40	Mg 1	N 4	O 6	0	0
4	L	1	Total 66	C 55	Mg 1	N 4	O 6	0	0
4	L	1	Total 66	C 55	Mg 1	N 4	O 6	0	0
4	M	1	Total 66	C 55	Mg 1	N 4	O 6	0	0

- Molecule 5 is BACTERIOPHEOPHYTIN A (CCD ID: BPH) (formula: $C_{55}H_{76}N_4O_6$).



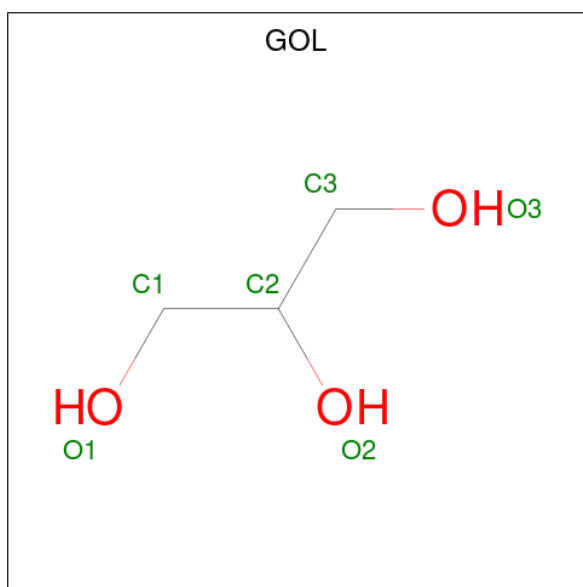
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
5	L	1	Total	C	N	O	0	0
			65	55	4	6		
5	M	1	Total	C	N	O	0	0
			51	41	4	6		

- Molecule 6 is UBIQUINONE-10 (CCD ID: U10) (formula: $C_{59}H_{90}O_4$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	L	1	Total	C	O	0	0
			24	20	4		
6	M	1	Total	C	O	0	0
			48	44	4		

- Molecule 7 is GLYCEROL (CCD ID: GOL) (formula: $C_3H_8O_3$).

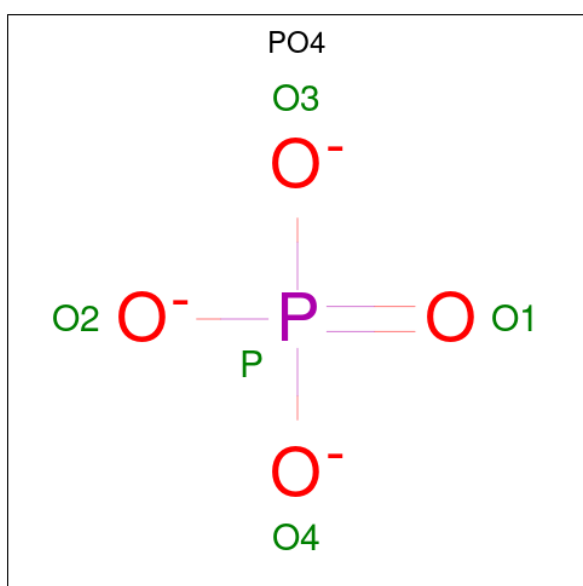


Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
7	L	1	Total	C	O	0	0
			6	3	3		

- Molecule 8 is FE (II) ION (CCD ID: FE2) (formula: Fe).

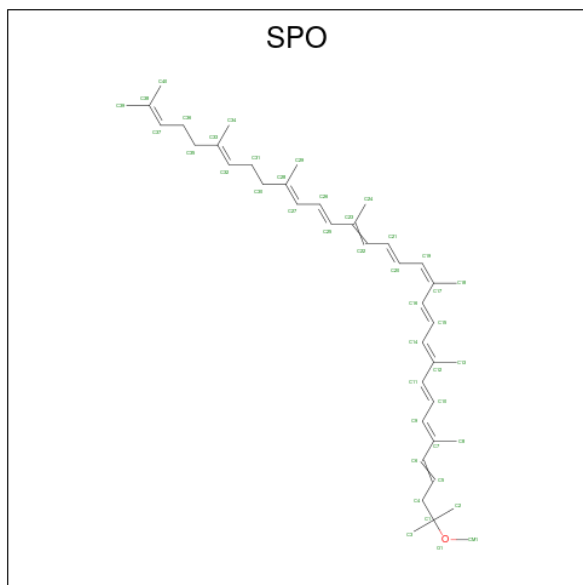
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
8	M	1	Total	Fe	0	0
			1	1		

- Molecule 9 is PHOSPHATE ION (CCD ID: PO4) (formula: O₄P).



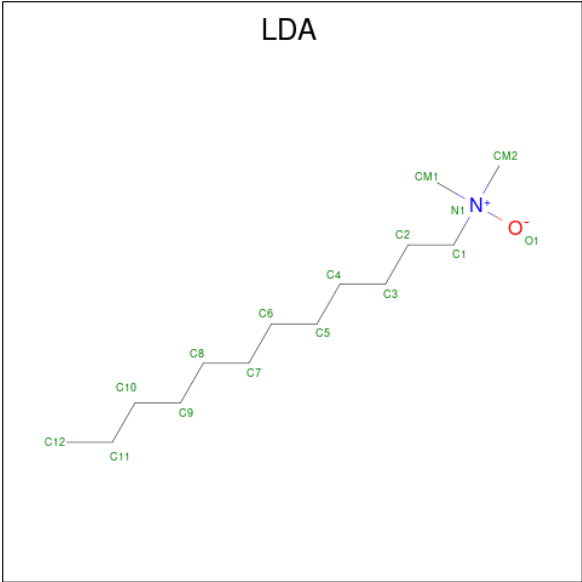
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
9	M	1	Total	O	P	0	0
			5	4	1		
9	M	1	Total	O	P	0	0
			5	4	1		

- Molecule 10 is SPHEROIDENE (CCD ID: SPO) (formula: $C_{41}H_{60}O$).



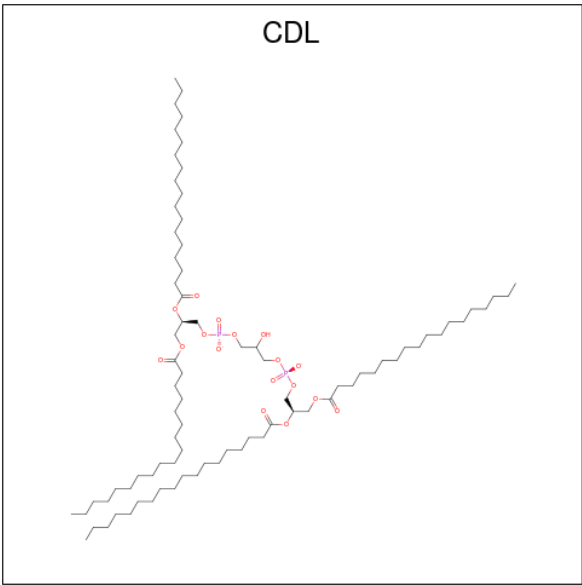
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
10	M	1	Total	C	O	0	0
			42	41	1		

- Molecule 11 is LAURYL DIMETHYLAMINE-N-OXIDE (CCD ID: LDA) (formula: $C_{14}H_{31}NO$).



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

- Molecule 12 is CARDIOLIPIN (CCD ID: CDL) (formula: $C_{81}H_{156}O_{17}P_2$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
12	M	1	Total	C	O	P	0	0
			81	62	17	2		

- Molecule 13 is POTASSIUM ION (CCD ID: K) (formula: K).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
13	H	1	Total K 1 1	0	0

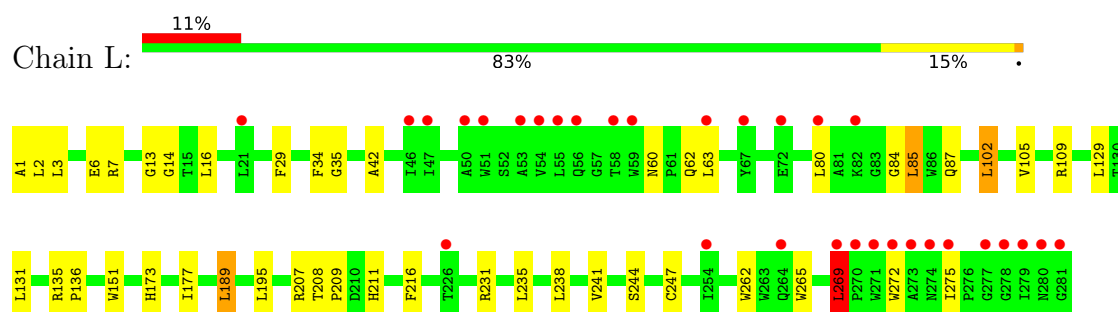
- Molecule 14 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
14	L	107	Total O 107 107	0	0
14	M	130	Total O 130 130	0	1
14	H	173	Total O 173 173	0	1

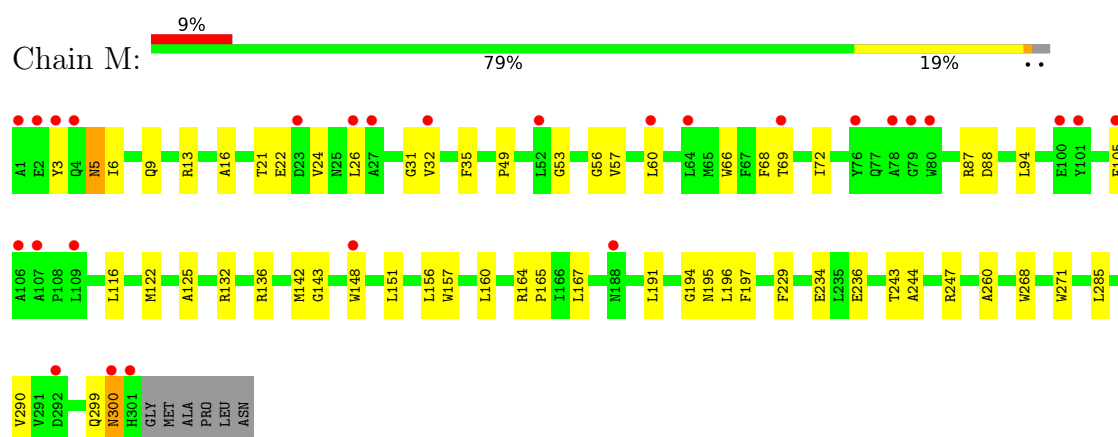
3 Residue-property plots [i](#)

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.

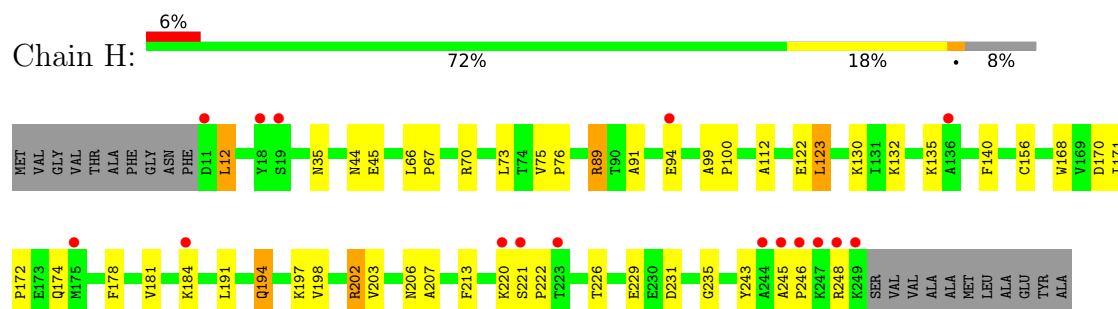
- Molecule 1: Reaction center protein L chain



- Molecule 2: Reaction center protein M chain



- Molecule 3: Reaction center protein H chain



4 Data and refinement statistics

Property	Value	Source
Space group	P 31 2 1	Depositor
Cell constants a, b, c, α , β , γ	139.07Å 139.07Å 184.60Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	39.23 – 2.10 39.23 – 2.10	Depositor EDS
% Data completeness (in resolution range)	98.7 (39.23-2.10) 98.8 (39.23-2.10)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.10	Depositor
$\langle I/\sigma(I) \rangle$ ¹	3.03 (at 2.10Å)	Xtriage
Refinement program	CNS	Depositor
R, R_{free}	0.211 , 0.226 0.203 , 0.217	Depositor DCC
R_{free} test set	6001 reflections (5.04%)	wwPDB-VP
Wilson B-factor (Å ²)	30.4	Xtriage
Anisotropy	0.034	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.33 , 52.3	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	0.017 for -h,-k,l	Xtriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	7504	wwPDB-VP
Average B, all atoms (Å ²)	37.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.66% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

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

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: U10, BCL, PO4, GOL, LDA, CDL, SPO, BPH, K, FE2

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	L	0.41	0/2320	0.91	9/3175 (0.3%)
2	M	0.40	0/2496	0.88	5/3408 (0.1%)
3	H	0.39	0/1880	0.87	3/2557 (0.1%)
All	All	0.40	0/6696	0.89	17/9140 (0.2%)

There are no bond length outliers.

All (17) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	L	6	GLU	N-CA-C	10.71	123.03	111.36
1	L	13	GLY	N-CA-C	6.98	118.58	111.95
2	M	234	GLU	N-CA-C	6.65	118.53	111.28
1	L	3	LEU	N-CA-C	-6.25	102.28	110.53
1	L	7	ARG	N-CA-C	6.23	118.87	111.33
1	L	35	GLY	N-CA-C	-5.92	105.19	112.77
3	H	44	ASN	N-CA-C	-5.83	103.00	110.53
1	L	269	LEU	CA-C-N	5.60	126.84	119.84
1	L	269	LEU	C-N-CA	5.60	126.84	119.84
2	M	31	GLY	N-CA-C	-5.52	104.16	112.89
2	M	160	LEU	N-CA-C	5.49	116.94	111.07
1	L	29	PHE	N-CA-C	5.40	118.06	109.96
2	M	268	TRP	N-CA-C	-5.38	105.41	111.28
3	H	243	TYR	N-CA-C	5.33	119.63	113.18
2	M	6	ILE	N-CA-C	-5.31	105.95	111.58
3	H	207	ALA	N-CA-C	5.21	117.70	111.71
1	L	244	SER	N-CA-C	-5.17	105.56	111.14

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	L	2232	0	2189	29	0
2	M	2404	0	2318	49	0
3	H	1832	0	1836	41	0
4	L	183	0	189	13	0
4	M	66	0	74	4	0
5	L	65	0	74	6	0
5	M	51	0	45	2	0
6	L	24	0	25	1	0
6	M	48	0	62	0	0
7	L	6	0	4	0	0
8	M	1	0	0	0	0
9	M	10	0	0	0	0
10	M	42	0	60	0	0
11	H	16	0	31	0	0
11	M	32	0	62	0	0
12	M	81	0	106	1	0
13	H	1	0	0	0	0
14	H	173	0	0	3	0
14	L	107	0	0	1	0
14	M	130	0	0	2	0
All	All	7504	0	7075	120	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 8.

All (120) 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:L:241:VAL:HG21	5:L:856:BPH:HAC2	1.35	1.03
2:M:157:TRP:HB2	4:M:853:BCL:H62	1.54	0.90
2:M:236:GLU:HG3	3:H:122:GLU:CD	1.98	0.89
2:M:21:THR:HG23	2:M:26:LEU:HD11	1.65	0.78
2:M:13:ARG:HD2	2:M:35:PHE:CD2	2.23	0.74
3:H:194:GLN:H	3:H:194:GLN:NE2	1.88	0.72
3:H:89:ARG:HG3	14:H:875:HOH:O	1.92	0.69

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:H:245:ALA:HA	3:H:248:ARG:NH1	2.08	0.68
2:M:16:ALA:HB1	2:M:32:VAL:HG11	1.74	0.68
2:M:300:ASN:HD22	2:M:300:ASN:N	1.92	0.68
1:L:62:GLN:HE21	1:L:151:TRP:HE1	1.40	0.67
14:L:922:HOH:O	2:M:143:GLY:HA2	1.95	0.66
2:M:105:PHE:HD1	2:M:116:LEU:HD13	1.60	0.66
2:M:9:GLN:NE2	3:H:198:VAL:H	1.94	0.66
1:L:60:ASN:CG	1:L:63:LEU:HD23	2.21	0.65
4:L:852:BCL:H42	4:L:854:BCL:HBC3	1.79	0.65
2:M:9:GLN:HE22	3:H:198:VAL:H	1.43	0.65
3:H:202:ARG:HG2	3:H:203:VAL:N	2.13	0.64
3:H:206:ASN:HD21	3:H:248:ARG:HD3	1.61	0.64
1:L:135:ARG:HB3	1:L:136:PRO:HD3	1.80	0.63
3:H:130:LYS:HE3	3:H:170:ASP:OD2	1.99	0.62
3:H:181:VAL:HG21	3:H:191:LEU:HD12	1.82	0.62
1:L:207:ARG:HG2	2:M:142:MET:HG2	1.83	0.61
2:M:260:ALA:HB1	3:H:35:ASN:OD1	2.01	0.60
1:L:189:LEU:HG	1:L:216:PHE:HZ	1.67	0.60
2:M:136:ARG:NE	2:M:136:ARG:HA	2.19	0.58
2:M:13:ARG:O	3:H:140:PHE:HA	2.04	0.58
1:L:208:THR:H	1:L:211:HIS:CD2	2.22	0.57
1:L:231:ARG:HH21	2:M:5:ASN:ND2	2.01	0.57
1:L:62:GLN:NE2	1:L:151:TRP:HE1	2.01	0.57
3:H:112:ALA:HA	3:H:235:GLY:O	2.05	0.57
3:H:89:ARG:HG2	3:H:91:ALA:O	2.05	0.56
4:L:851:BCL:HBC1	4:M:853:BCL:HBD	1.87	0.56
2:M:26:LEU:H	2:M:26:LEU:HD12	1.70	0.56
3:H:140:PHE:CE2	3:H:174:GLN:HG2	2.40	0.56
2:M:60:LEU:HA	5:M:855:BPH:H4C2	1.88	0.55
3:H:45:GLU:HG3	3:H:94:GLU:OE2	2.06	0.55
2:M:229:PHE:HB2	2:M:244:ALA:HB2	1.88	0.55
2:M:236:GLU:HG3	3:H:122:GLU:CG	2.37	0.54
2:M:148:TRP:HA	2:M:148:TRP:CE3	2.42	0.54
3:H:132:LYS:HG2	14:H:933:HOH:O	2.08	0.54
1:L:265:TRP:O	1:L:269:LEU:HD13	2.07	0.54
3:H:75:VAL:HA	3:H:76:PRO:C	2.33	0.54
2:M:243:THR:O	2:M:247:ARG:HG3	2.08	0.53
3:H:140:PHE:HE2	3:H:174:GLN:HG2	1.74	0.52
1:L:105:VAL:O	1:L:109:ARG:HG3	2.10	0.52
1:L:14:GLY:O	1:L:109:ARG:HD3	2.10	0.51
1:L:80:LEU:HB3	1:L:85:LEU:HD13	1.93	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:L:851:BCL:HBC3	4:M:853:BCL:CAD	2.41	0.51
2:M:167:LEU:HD12	2:M:285:LEU:HD11	1.92	0.51
1:L:211:HIS:HE1	2:M:22:GLU:OE1	1.94	0.51
4:L:854:BCL:H151	5:L:856:BPH:H171	1.93	0.51
3:H:156:CYS:HB2	3:H:248:ARG:HG3	1.93	0.51
2:M:68:PHE:HA	14:M:1025:HOH:O	2.11	0.50
2:M:195:ASN:HD22	2:M:195:ASN:C	2.19	0.50
2:M:164:ARG:HB3	2:M:165:PRO:HD3	1.94	0.50
2:M:300:ASN:N	2:M:300:ASN:ND2	2.56	0.50
4:L:851:BCL:CBC	4:M:853:BCL:HBD	2.42	0.50
2:M:26:LEU:HD12	2:M:26:LEU:N	2.27	0.50
2:M:194:GLY:O	2:M:195:ASN:HB3	2.11	0.49
6:L:859:U10:H3M1	14:M:923:HOH:O	2.13	0.49
1:L:16:LEU:HD23	1:L:109:ARG:NH1	2.27	0.48
3:H:245:ALA:HB3	3:H:246:PRO:HD3	1.94	0.48
2:M:66:TRP:CD1	2:M:122:MET:HB2	2.48	0.48
2:M:236:GLU:HG3	3:H:122:GLU:HG3	1.95	0.48
2:M:125:ALA:HB1	5:M:855:BPH:H2	1.95	0.48
3:H:135:LYS:HD2	14:H:904:HOH:O	2.13	0.48
3:H:226:THR:OG1	3:H:229:GLU:HG3	2.14	0.48
2:M:271:TRP:HH2	12:M:900:CDL:H342	1.78	0.47
3:H:194:GLN:H	3:H:194:GLN:HE21	1.59	0.47
1:L:208:THR:H	1:L:211:HIS:HD2	1.61	0.47
2:M:32:VAL:HG12	2:M:49:PRO:HD3	1.94	0.47
1:L:208:THR:HB	1:L:209:PRO:HD2	1.96	0.47
2:M:3:TYR:CZ	2:M:5:ASN:HA	2.50	0.47
4:L:854:BCL:H193	4:L:854:BCL:H162	1.80	0.47
3:H:168:TRP:HB2	3:H:178:PHE:HB2	1.96	0.47
2:M:56:GLY:HA2	2:M:132:ARG:HD2	1.97	0.47
3:H:171:ILE:HB	3:H:172:PRO:HD3	1.97	0.46
4:L:854:BCL:HBB3	5:L:856:BPH:H141	1.98	0.46
4:L:852:BCL:H122	5:L:856:BPH:H3A	1.97	0.46
2:M:69:THR:O	2:M:72:ILE:HG22	2.16	0.46
1:L:173:HIS:CE1	1:L:177:ILE:HD11	2.51	0.46
4:L:852:BCL:CGA	4:L:854:BCL:HBC1	2.46	0.46
2:M:24:VAL:O	2:M:26:LEU:HD12	2.16	0.46
4:L:852:BCL:HBD	4:L:854:BCL:HAC1	1.98	0.46
1:L:84:GLY:HA2	1:L:87:GLN:HE21	1.81	0.45
3:H:245:ALA:HA	3:H:248:ARG:HH12	1.81	0.45
1:L:131:LEU:HD13	4:L:854:BCL:HMC3	1.99	0.45
2:M:66:TRP:CZ2	2:M:122:MET:HE3	2.51	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:L:34:PHE:CE1	1:L:102:LEU:HD23	2.52	0.45
1:L:238:LEU:HD23	5:L:856:BPH:CBC	2.47	0.45
1:L:1:ALA:C	1:L:2:LEU:HD12	2.41	0.44
3:H:170:ASP:OD1	3:H:172:PRO:HD2	2.17	0.44
3:H:184:LYS:N	3:H:184:LYS:HD2	2.32	0.44
3:H:206:ASN:HD21	3:H:248:ARG:CD	2.29	0.44
2:M:148:TRP:HA	2:M:148:TRP:HE3	1.82	0.44
1:L:235:LEU:C	1:L:235:LEU:HD13	2.42	0.44
2:M:53:GLY:O	2:M:57:VAL:HG23	2.18	0.44
1:L:208:THR:HB	1:L:209:PRO:CD	2.48	0.43
3:H:66:LEU:HA	3:H:67:PRO:HD3	1.86	0.43
1:L:42:ALA:HA	5:L:856:BPH:H9C3	2.01	0.43
2:M:195:ASN:ND2	2:M:197:PHE:H	2.17	0.43
2:M:194:GLY:O	2:M:195:ASN:CB	2.67	0.43
2:M:26:LEU:H	2:M:26:LEU:CD1	2.31	0.42
2:M:290:VAL:HG11	3:H:12:LEU:HB3	2.01	0.42
3:H:99:ALA:HA	3:H:100:PRO:HD3	1.92	0.42
3:H:191:LEU:HD11	3:H:213:PHE:HE2	1.84	0.42
2:M:9:GLN:HE22	3:H:197:LYS:HA	1.83	0.42
2:M:299:GLN:C	2:M:300:ASN:HD22	2.27	0.42
4:L:851:BCL:HBC2	4:L:851:BCL:H2C	1.87	0.42
3:H:70:ARG:HH22	3:H:123:LEU:HD13	1.85	0.42
1:L:272:TRP:HA	1:L:275:ILE:HG13	2.01	0.42
2:M:56:GLY:O	2:M:60:LEU:HD13	2.20	0.41
3:H:220:LYS:HG3	3:H:229:GLU:OE2	2.19	0.41
1:L:60:ASN:CB	1:L:63:LEU:HD23	2.51	0.41
3:H:221:SER:HA	3:H:222:PRO:HD3	1.84	0.41
3:H:220:LYS:HB2	3:H:220:LYS:HE3	1.78	0.41
4:L:854:BCL:H141	4:L:854:BCL:H161	1.87	0.40
1:L:262:TRP:O	1:L:265:TRP:HD1	2.05	0.40
2:M:87:ARG:HG3	2:M:88:ASP:N	2.35	0.40

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	L	279/281 (99%)	270 (97%)	9 (3%)	0	100	100
2	M	299/307 (97%)	292 (98%)	7 (2%)	0	100	100
3	H	238/260 (92%)	234 (98%)	4 (2%)	0	100	100
All	All	816/848 (96%)	796 (98%)	20 (2%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	L	220/220 (100%)	213 (97%)	7 (3%)	34	38
2	M	236/240 (98%)	229 (97%)	7 (3%)	36	41
3	H	195/208 (94%)	188 (96%)	7 (4%)	31	34
All	All	651/668 (98%)	630 (97%)	21 (3%)	34	38

All (21) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	L	85	LEU
1	L	102	LEU
1	L	129	LEU
1	L	189	LEU
1	L	195	LEU
1	L	247	CYS
1	L	269	LEU
2	M	5	ASN
2	M	94	LEU
2	M	151	LEU
2	M	156	LEU
2	M	191	LEU
2	M	196	LEU

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Mol	Chain	Res	Type
2	M	300	ASN
3	H	12	LEU
3	H	73	LEU
3	H	89	ARG
3	H	123	LEU
3	H	194	GLN
3	H	202	ARG
3	H	231	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (13) such sidechains are listed below:

Mol	Chain	Res	Type
1	L	62	GLN
1	L	87	GLN
1	L	183	ASN
1	L	211	HIS
1	L	213	ASN
2	M	5	ASN
2	M	9	GLN
2	M	138	GLN
2	M	195	ASN
2	M	300	ASN
3	H	68	HIS
3	H	194	GLN
3	H	206	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry

Of 18 ligands modelled in this entry, 2 are monoatomic - leaving 16 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
11	LDA	M	862	-	13,15,15	1.94	1 (7%)	14,17,17	1.72	4 (28%)
11	LDA	H	861	-	13,15,15	1.93	1 (7%)	14,17,17	1.75	4 (28%)
6	U10	M	858	-	48,48,63	2.03	16 (33%)	60,61,79	2.76	13 (21%)
5	BPH	L	856	-	59,70,70	2.17	14 (23%)	59,101,101	2.73	20 (33%)
11	LDA	M	863	-	13,15,15	1.97	1 (7%)	14,17,17	1.69	4 (28%)
4	BCL	L	852	-	69,74,74	1.75	11 (15%)	79,115,115	1.79	20 (25%)
4	BCL	M	853	-	69,74,74	1.74	10 (14%)	79,115,115	1.96	20 (25%)
5	BPH	M	855	-	45,56,70	2.36	14 (31%)	41,84,101	3.18	19 (46%)
9	PO4	M	864	-	4,4,4	1.71	0	6,6,6	0.46	0
10	SPO	M	860	-	41,41,41	3.19	22 (53%)	47,50,50	2.39	17 (36%)
4	BCL	L	854	-	69,74,74	1.84	14 (20%)	79,115,115	1.76	17 (21%)
9	PO4	M	865	-	4,4,4	1.74	1 (25%)	6,6,6	0.46	0
7	GOL	L	866	-	5,5,5	4.78	5 (100%)	5,5,5	6.07	3 (60%)
12	CDL	M	900	-	80,80,99	0.82	2 (2%)	86,92,111	0.97	4 (4%)
4	BCL	L	851	-	54,59,74	1.88	15 (27%)	61,97,115	2.10	17 (27%)
6	U10	L	859	-	24,24,63	2.14	8 (33%)	30,32,79	2.08	10 (33%)

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
11	LDA	M	862	-	-	6/13/13/13	-
11	LDA	H	861	-	-	5/13/13/13	-
6	U10	M	858	-	-	5/45/69/87	0/1/1/1
5	BPH	L	856	-	2/2/18/22	10/37/105/105	0/5/6/6

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
11	LDA	M	863	-	-	7/13/13/13	-
4	BCL	L	852	-	-	3/41/137/137	-
4	BCL	M	853	-	-	11/41/137/137	-
5	BPH	M	855	-	-	3/21/89/105	0/5/6/6
10	SPO	M	860	-	-	12/47/47/47	-
4	BCL	L	854	-	-	13/41/137/137	-
7	GOL	L	866	-	-	3/4/4/4	-
12	CDL	M	900	-	-	26/91/91/110	-
4	BCL	L	851	-	-	0/23/119/137	-
6	U10	L	859	-	-	4/17/41/87	0/1/1/1

All (135) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
10	M	860	SPO	C6-C5	8.53	1.55	1.32
10	M	860	SPO	C10-C11	8.11	1.55	1.34
7	L	866	GOL	C3-C2	-8.05	1.21	1.51
10	M	860	SPO	C15-C16	7.66	1.54	1.34
5	M	855	BPH	C2C-C3C	-7.15	1.48	1.54
4	L	852	BCL	C3B-C4B	6.93	1.54	1.41
11	M	863	LDA	O1-N1	-6.74	1.25	1.42
5	L	856	BPH	C2C-C3C	-6.73	1.48	1.54
11	M	862	LDA	O1-N1	-6.67	1.25	1.42
11	H	861	LDA	O1-N1	-6.66	1.25	1.42
4	M	853	BCL	C3B-C4B	6.60	1.54	1.41
5	L	856	BPH	C1D-C2D	6.55	1.46	1.39
4	L	854	BCL	C3B-C4B	6.50	1.54	1.41
4	L	851	BCL	C3B-C4B	6.29	1.53	1.41
5	M	855	BPH	C1D-C2D	6.25	1.46	1.39
5	M	855	BPH	C1B-C2B	5.71	1.45	1.39
5	L	856	BPH	C11-C10	-5.50	1.29	1.52
6	M	858	U10	O4-C4	5.34	1.49	1.36
4	L	854	BCL	MG-NB	-5.31	1.95	2.05
4	M	853	BCL	MG-NB	-5.19	1.95	2.05
4	L	854	BCL	MG-ND	5.12	2.15	2.05
5	L	856	BPH	C1B-C2B	5.11	1.45	1.39
10	M	860	SPO	C21-C20	5.01	1.49	1.36
4	L	852	BCL	MG-ND	5.01	2.15	2.05
4	M	853	BCL	MG-ND	4.86	2.15	2.05
10	M	860	SPO	C26-C25	4.65	1.46	1.34

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	L	852	BCL	MG-NB	-4.64	1.96	2.05
4	L	851	BCL	MG-ND	4.57	2.14	2.05
7	L	866	GOL	O1-C1	4.57	1.61	1.42
6	L	859	U10	O4-C4	4.55	1.47	1.36
10	M	860	SPO	O1-CM1	4.32	1.56	1.43
4	L	851	BCL	MG-NB	-4.26	1.97	2.05
6	L	859	U10	C13-C14	4.22	1.42	1.33
5	M	855	BPH	O2A-CGA	4.11	1.45	1.33
5	M	855	BPH	O2D-CGD	4.02	1.43	1.33
5	L	856	BPH	O2A-CGA	3.98	1.45	1.33
5	L	856	BPH	C3B-C4B	3.91	1.47	1.41
5	L	856	BPH	O2D-CGD	3.83	1.42	1.33
4	M	853	BCL	MG-NA	3.79	2.15	2.06
6	M	858	U10	C13-C14	3.68	1.41	1.33
6	L	859	U10	O3-C3	3.61	1.45	1.36
10	M	860	SPO	C4-C1	3.54	1.59	1.52
4	L	854	BCL	MG-NA	3.51	2.14	2.06
6	M	858	U10	C6-C1	3.39	1.41	1.35
6	M	858	U10	C23-C24	3.36	1.40	1.33
6	M	858	U10	O3-C3	3.33	1.44	1.36
4	L	852	BCL	MG-NA	3.32	2.14	2.06
7	L	866	GOL	O3-C3	3.29	1.56	1.42
5	L	856	BPH	CHA-CBD	3.29	1.55	1.51
4	L	852	BCL	CBB-CAB	3.29	1.56	1.50
10	M	860	SPO	C10-C9	3.26	1.53	1.43
4	M	853	BCL	CBB-CAB	3.23	1.56	1.50
6	L	859	U10	C7-C8	-3.22	1.45	1.50
6	M	858	U10	C7-C8	-3.19	1.45	1.50
6	M	858	U10	O3-C3M	-3.16	1.38	1.45
5	M	855	BPH	C3B-C4B	3.15	1.46	1.41
6	L	859	U10	C6-C1	3.14	1.40	1.35
6	L	859	U10	C8-C9	3.12	1.40	1.33
5	M	855	BPH	CHA-CBD	3.11	1.55	1.51
4	L	854	BCL	C1B-C2B	3.11	1.50	1.43
6	L	859	U10	O3-C3M	-3.06	1.38	1.45
4	L	852	BCL	C1B-C2B	3.04	1.50	1.43
10	M	860	SPO	C25-C23	-3.03	1.39	1.46
10	M	860	SPO	C32-C33	3.03	1.40	1.33
4	L	851	BCL	MG-NA	3.00	2.13	2.06
7	L	866	GOL	C1-C2	-2.99	1.40	1.51
4	M	853	BCL	C1B-C2B	2.96	1.50	1.43
7	L	866	GOL	O2-C2	-2.93	1.34	1.43

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	M	855	BPH	C1A-C2A	2.91	1.55	1.51
5	M	855	BPH	C4D-ND	-2.89	1.34	1.38
10	M	860	SPO	C15-C14	2.87	1.52	1.43
5	L	856	BPH	C2-C3	2.85	1.39	1.33
6	M	858	U10	C8-C9	2.85	1.39	1.33
4	L	851	BCL	C1B-C2B	2.82	1.49	1.43
4	L	851	BCL	C3D-C4D	-2.82	1.37	1.44
10	M	860	SPO	O1-C1	2.81	1.57	1.41
10	M	860	SPO	C8-C7	2.80	1.56	1.50
5	L	856	BPH	C4D-ND	-2.80	1.34	1.38
12	M	900	CDL	OA8-CA7	2.79	1.41	1.33
5	M	855	BPH	C3A-C2A	-2.78	1.52	1.54
5	M	855	BPH	O2D-CED	-2.78	1.39	1.45
4	L	854	BCL	C3D-C4D	-2.77	1.37	1.44
6	M	858	U10	C32-C33	-2.76	1.42	1.50
5	L	856	BPH	C1A-C2A	2.75	1.55	1.51
4	L	851	BCL	C3C-C4C	-2.72	1.48	1.51
10	M	860	SPO	C13-C12	2.72	1.56	1.50
5	M	855	BPH	C2-C3	2.71	1.39	1.33
10	M	860	SPO	C37-C38	2.71	1.40	1.32
4	L	854	BCL	CBB-CAB	2.68	1.55	1.50
4	L	851	BCL	MG-NC	-2.68	1.99	2.06
6	M	858	U10	C18-C19	2.66	1.39	1.33
5	L	856	BPH	O2D-CED	-2.66	1.39	1.45
4	M	853	BCL	C3D-C4D	-2.64	1.38	1.44
10	M	860	SPO	C14-C12	2.64	1.41	1.35
4	L	851	BCL	CBB-CAB	2.63	1.55	1.50
4	L	854	BCL	MG-NC	-2.61	2.00	2.06
4	M	853	BCL	CHD-C1D	2.57	1.43	1.38
4	L	854	BCL	CAA-CBA	2.56	1.60	1.52
10	M	860	SPO	C26-C27	2.56	1.51	1.43
4	L	852	BCL	C3D-C4D	-2.54	1.38	1.44
6	M	858	U10	C38-C39	2.53	1.40	1.32
4	L	851	BCL	CHD-C1D	2.50	1.43	1.38
10	M	860	SPO	C9-C7	2.46	1.41	1.35
4	L	854	BCL	CAA-C2A	2.46	1.58	1.54
6	M	858	U10	C15-C14	2.44	1.56	1.50
4	M	853	BCL	CMD-C2D	2.41	1.55	1.50
5	M	855	BPH	CAA-C2A	2.40	1.58	1.54
4	L	854	BCL	CHD-C1D	2.38	1.43	1.38
6	L	859	U10	C15-C14	2.38	1.56	1.50
6	M	858	U10	C28-C29	2.37	1.38	1.33

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	L	852	BCL	C4-C3	2.36	1.56	1.50
4	L	852	BCL	CHD-C1D	2.36	1.43	1.38
10	M	860	SPO	C11-C12	-2.32	1.41	1.46
10	M	860	SPO	C24-C23	2.30	1.55	1.50
5	L	856	BPH	CAA-C2A	2.30	1.58	1.54
12	M	900	CDL	CB3-CB4	2.27	1.57	1.50
5	M	855	BPH	C3D-C2D	-2.27	1.35	1.39
4	L	852	BCL	CMD-C2D	2.26	1.55	1.50
4	L	854	BCL	C1D-C2D	-2.26	1.40	1.45
4	L	852	BCL	CMB-C2B	2.25	1.55	1.50
4	M	853	BCL	C4-C3	2.21	1.56	1.50
4	L	854	BCL	C4-C3	2.20	1.56	1.50
10	M	860	SPO	C6-C7	-2.19	1.41	1.46
10	M	860	SPO	C19-C17	2.18	1.40	1.35
6	M	858	U10	C31-C29	2.15	1.55	1.51
4	L	851	BCL	CMD-C2D	2.15	1.55	1.50
6	M	858	U10	C27-C28	-2.14	1.44	1.50
4	L	854	BCL	OBB-CAB	-2.09	1.18	1.23
4	L	851	BCL	C4-C3	2.06	1.55	1.50
5	L	856	BPH	O1D-CGD	2.05	1.26	1.21
4	L	851	BCL	C4B-NB	-2.03	1.35	1.37
9	M	865	PO4	P-O3	-2.01	1.48	1.54
6	M	858	U10	C30-C29	2.01	1.55	1.50
4	L	851	BCL	CAA-CBA	2.01	1.58	1.52
4	L	851	BCL	OBB-CAB	-2.00	1.18	1.23

All (172) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	M	858	U10	C32-C33-C34	15.75	163.67	127.62
5	M	855	BPH	O2D-CGD-CBD	13.52	125.80	110.95
5	L	856	BPH	O2D-CGD-CBD	12.97	125.20	110.95
7	L	866	GOL	O3-C3-C2	10.92	159.56	110.38
7	L	866	GOL	O2-C2-C3	7.24	139.13	109.18
6	M	858	U10	C27-C28-C29	6.82	143.24	127.62
4	M	853	BCL	C1-C2-C3	6.64	137.07	126.20
6	M	858	U10	C3M-O3-C3	6.44	139.11	116.47
10	M	860	SPO	C15-C14-C12	-6.32	118.42	127.28
6	L	859	U10	C3M-O3-C3	6.25	138.43	116.47
5	M	855	BPH	C1-C2-C3	6.14	136.26	126.20
5	L	856	BPH	C1-C2-C3	6.01	136.05	126.20
4	L	851	BCL	C4A-NA-C1A	-5.75	104.06	106.68

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
10	M	860	SPO	C20-C21-C22	-5.74	111.77	123.52
4	L	851	BCL	CAC-C3C-C4C	-5.69	99.94	112.58
4	L	854	BCL	C4A-NA-C1A	-5.57	104.14	106.68
4	L	851	BCL	C1D-ND-C4D	5.28	110.01	106.31
10	M	860	SPO	C25-C23-C22	-5.12	110.95	119.01
5	M	855	BPH	O1D-CGD-CBD	-5.01	117.13	124.72
5	L	856	BPH	O1D-CGD-CBD	-4.47	117.94	124.72
5	M	855	BPH	CED-O2D-CGD	4.47	126.05	115.92
5	L	856	BPH	C6-C5-C3	4.44	124.29	113.47
4	M	853	BCL	C4D-CHA-C1A	4.44	126.54	121.24
4	L	854	BCL	C1D-ND-C4D	4.40	109.40	106.31
4	M	853	BCL	C1D-ND-C4D	4.37	109.38	106.31
5	L	856	BPH	CED-O2D-CGD	4.34	125.75	115.92
4	L	851	BCL	C2C-C3C-C4C	4.33	107.82	101.34
5	M	855	BPH	C4D-CHA-CBD	-4.31	106.39	108.45
10	M	860	SPO	C26-C27-C28	-4.28	121.67	127.69
4	M	853	BCL	C4-C3-C5	4.27	122.65	115.23
10	M	860	SPO	C24-C23-C25	4.25	124.58	118.09
5	L	856	BPH	CBC-CAC-C3C	4.25	122.13	113.78
4	L	852	BCL	C4A-NA-C1A	-4.20	104.76	106.68
4	L	852	BCL	C1-C2-C3	-4.16	119.39	126.20
4	L	852	BCL	C1D-ND-C4D	4.09	109.18	106.31
12	M	900	CDL	OB8-CB6-CB4	4.04	120.05	108.40
5	M	855	BPH	CBC-CAC-C3C	4.04	121.73	113.78
5	L	856	BPH	C4D-CHA-CBD	-4.01	106.53	108.45
4	M	853	BCL	C5-C3-C2	-3.91	112.40	121.17
4	L	854	BCL	OBB-CAB-CBB	-3.90	111.03	119.77
4	L	852	BCL	OBB-CAB-CBB	-3.88	111.08	119.77
4	M	853	BCL	CBB-CAB-C3B	3.88	128.58	120.40
4	L	851	BCL	C4D-CHA-C1A	3.88	125.87	121.24
4	M	853	BCL	OBB-CAB-CBB	-3.87	111.11	119.77
4	L	851	BCL	OBB-CAB-CBB	-3.86	111.13	119.77
10	M	860	SPO	C4-C5-C6	-3.78	119.61	124.91
4	L	852	BCL	C4D-CHA-C1A	3.77	125.74	121.24
10	M	860	SPO	C3-C1-C2	3.73	117.25	110.43
4	L	851	BCL	CBB-CAB-C3B	3.72	128.25	120.40
4	M	853	BCL	C11-C12-C13	-3.71	103.62	115.97
4	L	852	BCL	C7-C6-C5	-3.70	103.41	113.26
4	L	852	BCL	CBB-CAB-C3B	3.65	128.09	120.40
5	L	856	BPH	C1C-C2C-C3C	3.63	106.29	102.84
5	L	856	BPH	C11-C10-C8	3.62	128.00	115.97
5	L	856	BPH	O2D-CGD-O1D	-3.62	116.81	123.85

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
11	H	861	LDA	CM1-N1-C1	-3.58	102.72	110.23
6	L	859	U10	O5-C5-C6	-3.54	114.94	121.79
11	M	862	LDA	CM1-N1-C1	-3.53	102.81	110.23
6	L	859	U10	O2-C2-C3	-3.52	113.57	121.03
5	M	855	BPH	O2D-CGD-O1D	-3.49	117.05	123.85
4	L	854	BCL	C11-C12-C13	-3.46	104.46	115.97
7	L	866	GOL	O1-C1-C2	3.46	125.93	110.38
10	M	860	SPO	C15-C16-C17	-3.45	116.89	126.36
4	L	854	BCL	CBB-CAB-C3B	3.44	127.64	120.40
10	M	860	SPO	C18-C17-C19	-3.42	117.28	122.82
4	L	854	BCL	C4D-CHA-C1A	3.41	125.31	121.24
6	M	858	U10	C30-C29-C31	-3.40	109.32	115.23
11	M	863	LDA	CM1-N1-C1	-3.40	103.09	110.23
6	M	858	U10	O5-C5-C6	-3.34	115.33	121.79
4	L	851	BCL	C1-C2-C3	-3.32	121.39	126.76
12	M	900	CDL	CB4-OB6-CB5	3.25	125.57	117.80
4	L	854	BCL	CAA-C2A-C3A	-3.17	104.42	113.00
4	L	854	BCL	C2C-C3C-C4C	3.14	106.05	101.34
5	L	856	BPH	C2B-C1B-NB	3.14	111.70	109.43
5	L	856	BPH	CMB-C2B-C3B	3.13	130.94	124.68
4	L	852	BCL	CAC-C3C-C4C	-3.13	105.64	112.58
4	L	852	BCL	CAA-C2A-C3A	-3.12	104.58	113.00
5	L	856	BPH	CMA-C3A-C4A	-3.11	107.91	114.61
5	M	855	BPH	C1C-C2C-C3C	3.04	105.73	102.84
4	L	851	BCL	CAA-C2A-C3A	-3.03	104.82	113.00
10	M	860	SPO	C8-C7-C6	3.01	122.69	118.09
10	M	860	SPO	C6-C7-C9	-3.00	114.30	119.01
4	L	852	BCL	CHD-C1D-ND	-2.99	120.60	124.80
4	L	854	BCL	C7-C6-C5	-2.98	105.33	113.26
4	M	853	BCL	CHA-C1A-NA	-2.94	119.73	126.39
5	L	856	BPH	C4C-C3C-C2C	2.92	105.62	102.84
6	L	859	U10	C15-C14-C16	-2.89	112.73	116.13
4	L	851	BCL	CHA-C1A-NA	-2.88	119.86	126.39
5	M	855	BPH	CMA-C3A-C4A	-2.87	108.42	114.61
4	L	854	BCL	CHA-C1A-NA	-2.86	119.91	126.39
6	M	858	U10	O2-C2-C3	-2.86	114.98	121.03
11	H	861	LDA	O1-N1-C1	2.85	116.26	109.27
5	M	855	BPH	C4C-C3C-C2C	2.84	105.54	102.84
6	L	859	U10	C1-C6-C5	-2.83	116.87	119.62
11	M	863	LDA	O1-N1-C1	2.82	116.20	109.27
11	M	862	LDA	O1-N1-C1	2.81	116.16	109.27
6	M	858	U10	C20-C19-C21	-2.79	110.38	115.23

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	L	856	BPH	C7-C6-C5	-2.78	105.86	113.26
4	M	853	BCL	CHD-C1D-ND	-2.75	120.94	124.80
4	M	853	BCL	CAA-C2A-C3A	-2.74	105.61	113.00
4	L	851	BCL	CHD-C1D-ND	-2.73	120.96	124.80
4	L	852	BCL	CHA-C1A-NA	-2.69	120.29	126.39
10	M	860	SPO	C1-C4-C5	2.68	119.94	112.98
5	M	855	BPH	C1B-NB-C4B	-2.65	104.96	108.82
10	M	860	SPO	C10-C9-C7	-2.64	123.57	127.28
4	M	853	BCL	C16-C15-C13	-2.62	107.27	115.97
4	L	854	BCL	C1-C2-C3	-2.62	121.91	126.20
4	L	854	BCL	CHD-C1D-ND	-2.61	121.13	124.80
4	L	851	BCL	C4D-C3D-CAD	-2.60	105.29	108.11
5	M	855	BPH	C2B-C1B-NB	2.58	111.30	109.43
5	M	855	BPH	CMB-C2B-C3B	2.57	129.82	124.68
4	M	853	BCL	C11-C10-C8	-2.57	107.43	115.97
6	M	858	U10	C6-C1-C2	2.56	121.19	119.17
4	M	853	BCL	C4A-NA-C1A	-2.56	105.51	106.68
4	L	852	BCL	O2D-CGD-CBD	-2.56	106.76	111.23
5	M	855	BPH	CAA-C2A-C3A	-2.54	106.13	113.00
5	L	856	BPH	C1B-NB-C4B	-2.54	105.11	108.82
5	L	856	BPH	O2A-CGA-O1A	-2.54	117.28	123.63
4	L	851	BCL	C3C-C2C-C1C	-2.53	97.79	101.87
4	M	853	BCL	CED-O2D-CGD	2.53	121.65	115.92
4	L	852	BCL	O1D-CGD-CBD	2.53	129.50	124.52
4	M	853	BCL	C4D-C3D-CAD	-2.52	105.37	108.11
4	L	851	BCL	CHD-C1D-C2D	2.47	130.63	125.49
12	M	900	CDL	CB6-CB4-CB3	-2.46	106.05	111.78
5	L	856	BPH	CAA-C2A-C3A	-2.44	106.40	113.00
4	L	852	BCL	C11-C12-C13	-2.44	107.85	115.97
6	M	858	U10	C1-C6-C5	-2.43	117.26	119.62
11	M	862	LDA	CM2-N1-C1	2.41	115.29	110.23
11	H	861	LDA	CM2-N1-C1	2.37	115.21	110.23
5	M	855	BPH	C4-C3-C5	2.36	118.90	116.13
10	M	860	SPO	C27-C26-C25	-2.34	116.42	123.20
4	L	854	BCL	C12-C11-C10	-2.33	102.84	113.28
11	H	861	LDA	C9-C8-C7	-2.32	102.63	114.37
4	L	854	BCL	CAC-C3C-C4C	-2.31	107.46	112.58
4	L	854	BCL	C4D-C3D-CAD	-2.30	105.61	108.11
11	M	863	LDA	CM2-N1-C1	2.29	115.05	110.23
11	M	862	LDA	C9-C8-C7	-2.27	102.91	114.37
6	L	859	U10	C8-C7-C6	2.26	117.64	112.08
4	L	852	BCL	C12-C11-C10	-2.25	103.19	113.28

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	L	852	BCL	CED-O2D-CGD	2.24	121.00	115.92
5	M	855	BPH	O2A-CGA-O1A	-2.24	118.04	123.63
6	M	858	U10	C31-C29-C28	2.23	126.16	121.17
12	M	900	CDL	C52-C51-CB5	2.22	121.84	113.69
6	L	859	U10	C6-C1-C2	2.21	120.91	119.17
5	M	855	BPH	CMD-C2D-C3D	2.19	129.06	124.68
6	M	858	U10	C16-C14-C13	2.19	126.08	121.17
4	L	851	BCL	C1C-NC-C4C	2.18	107.67	106.68
4	L	854	BCL	C16-C15-C13	-2.18	108.71	115.97
6	L	859	U10	C4-C3-C2	-2.18	116.69	120.69
10	M	860	SPO	C20-C19-C17	-2.18	124.22	127.28
11	M	863	LDA	C9-C8-C7	-2.17	103.39	114.37
4	L	852	BCL	C2C-C3C-C4C	2.17	104.58	101.34
4	M	853	BCL	CHD-C1D-C2D	2.16	129.98	125.49
4	L	852	BCL	CHD-C1D-C2D	2.15	129.97	125.49
6	L	859	U10	C7-C6-C5	-2.12	116.05	118.52
4	L	854	BCL	CHD-C1D-C2D	2.12	129.90	125.49
6	M	858	U10	C4-C3-C2	-2.11	116.83	120.69
4	L	851	BCL	CBC-CAC-C3C	-2.10	108.96	113.41
5	L	856	BPH	CMD-C2D-C3D	2.08	128.84	124.68
4	M	853	BCL	C3D-C2D-C1D	-2.08	103.00	105.83
6	M	858	U10	C21-C19-C18	2.08	125.83	121.17
4	L	852	BCL	C3D-C2D-C1D	-2.07	103.01	105.83
5	L	856	BPH	OBD-CAD-CBD	-2.06	122.80	125.82
10	M	860	SPO	O1-C1-C2	2.06	123.12	108.97
4	L	852	BCL	CMA-C3A-C2A	-2.06	106.03	113.98
5	M	855	BPH	CMA-C3A-C2A	-2.05	106.20	114.13
4	M	853	BCL	C14-C13-C15	-2.05	103.95	111.27
4	M	853	BCL	C7-C6-C5	-2.03	107.84	113.26
10	M	860	SPO	C10-C11-C12	-2.03	120.80	126.36
6	L	859	U10	C1M-C1-C6	-2.03	121.12	124.45
5	M	855	BPH	OBD-CAD-CBD	-2.01	122.87	125.82
4	L	851	BCL	CMA-C3A-C2A	-2.01	106.22	113.98

All (2) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
5	L	856	BPH	C13
5	L	856	BPH	C8

All (108) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	L	854	BCL	C2C-C3C-CAC-CBC
4	L	854	BCL	CHA-CBD-CGD-O1D
4	L	854	BCL	CHA-CBD-CGD-O2D
5	L	856	BPH	C2C-C3C-CAC-CBC
5	M	855	BPH	O2A-C1-C2-C3
5	M	855	BPH	C1-C2-C3-C4
6	L	859	U10	C15-C14-C16-C17
6	M	858	U10	C31-C32-C33-C34
7	L	866	GOL	C1-C2-C3-O3
10	M	860	SPO	C3-C1-O1-CM1
10	M	860	SPO	C4-C5-C6-C7
12	M	900	CDL	CA3-OA5-PA1-OA2
12	M	900	CDL	CA3-OA5-PA1-OA3
12	M	900	CDL	CA3-OA5-PA1-OA4
12	M	900	CDL	CB3-OB5-PB2-OB2
10	M	860	SPO	C36-C37-C38-C40
6	M	858	U10	C24-C26-C27-C28
10	M	860	SPO	C33-C35-C36-C37
10	M	860	SPO	C36-C37-C38-C39
12	M	900	CDL	CB7-C71-C72-C73
5	L	856	BPH	C8-C10-C11-C12
5	L	856	BPH	C10-C11-C12-C13
4	L	854	BCL	C16-C17-C18-C20
12	M	900	CDL	C11-CA5-OA6-CA4
12	M	900	CDL	C78-C79-C80-C81
12	M	900	CDL	C11-C12-C13-C14
11	H	861	LDA	C11-C10-C9-C8
12	M	900	CDL	C20-C21-C22-C23
12	M	900	CDL	C34-C35-C36-C37
12	M	900	CDL	C19-C20-C21-C22
12	M	900	CDL	OA7-CA5-OA6-CA4
10	M	860	SPO	C1-C4-C5-C6
11	M	863	LDA	C1-C2-C3-C4
4	M	853	BCL	C3-C5-C6-C7
11	M	862	LDA	C2-C3-C4-C5
4	L	854	BCL	C1A-C2A-CAA-CBA
12	M	900	CDL	OA5-CA3-CA4-CA6
4	M	853	BCL	C11-C10-C8-C7
11	M	863	LDA	C4-C5-C6-C7
5	L	856	BPH	C4-C3-C5-C6
5	L	856	BPH	C2-C3-C5-C6
4	L	854	BCL	C15-C16-C17-C18
4	M	853	BCL	C11-C10-C8-C9

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Mol	Chain	Res	Type	Atoms
12	M	900	CDL	CA3-CA4-CA6-OA8
11	M	863	LDA	C2-C3-C4-C5
5	L	856	BPH	O2A-C1-C2-C3
12	M	900	CDL	C17-C18-C19-C20
11	H	861	LDA	C9-C10-C11-C12
12	M	900	CDL	C40-C41-C42-C43
12	M	900	CDL	C55-C56-C57-C58
7	L	866	GOL	O1-C1-C2-O2
12	M	900	CDL	C21-C22-C23-C24
11	M	862	LDA	C1-C2-C3-C4
4	L	854	BCL	C11-C12-C13-C15
10	M	860	SPO	C20-C21-C22-C23
4	M	853	BCL	C4-C3-C5-C6
12	M	900	CDL	OA5-CA3-CA4-OA6
4	L	852	BCL	C15-C16-C17-C18
12	M	900	CDL	CA5-C11-C12-C13
4	L	854	BCL	C16-C17-C18-C19
12	M	900	CDL	C39-C40-C41-C42
5	L	856	BPH	C12-C13-C15-C16
12	M	900	CDL	OA6-CA4-CA6-OA8
4	M	853	BCL	C15-C16-C17-C18
11	M	862	LDA	C2-C1-N1-CM1
11	M	862	LDA	C2-C1-N1-CM2
11	M	863	LDA	C2-C1-N1-CM1
11	M	863	LDA	C2-C1-N1-CM2
11	H	861	LDA	C2-C1-N1-CM1
11	H	861	LDA	C2-C1-N1-CM2
12	M	900	CDL	C80-C81-C82-C83
6	L	859	U10	C13-C14-C16-C17
4	M	853	BCL	C11-C12-C13-C15
4	L	854	BCL	C11-C10-C8-C9
11	M	862	LDA	C2-C1-N1-O1
11	M	863	LDA	C2-C1-N1-O1
11	H	861	LDA	C2-C1-N1-O1
5	L	856	BPH	C4C-C3C-CAC-CBC
11	M	863	LDA	C9-C10-C11-C12
12	M	900	CDL	CB3-OB5-PB2-OB4
4	M	853	BCL	C11-C12-C13-C14
5	L	856	BPH	C14-C13-C15-C16
4	M	853	BCL	C2-C3-C5-C6
6	L	859	U10	C9-C11-C12-C13
6	M	858	U10	C5-C4-O4-C4M

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Mol	Chain	Res	Type	Atoms
10	M	860	SPO	C18-C17-C19-C20
7	L	866	GOL	O1-C1-C2-C3
10	M	860	SPO	C16-C17-C19-C20
4	L	852	BCL	C12-C13-C15-C16
4	L	854	BCL	C11-C10-C8-C7
6	M	858	U10	C30-C29-C31-C32
5	M	855	BPH	C1-C2-C3-C5
4	L	854	BCL	C4C-C3C-CAC-CBC
4	L	854	BCL	C13-C15-C16-C17
10	M	860	SPO	C4-C1-O1-CM1
10	M	860	SPO	C17-C19-C20-C21
11	M	862	LDA	C6-C7-C8-C9
4	L	854	BCL	C11-C12-C13-C14
4	M	853	BCL	CAA-CBA-CGA-O2A
6	M	858	U10	C28-C29-C31-C32
12	M	900	CDL	C32-C31-CA7-OA8
10	M	860	SPO	C30-C31-C32-C33
12	M	900	CDL	C32-C31-CA7-OA9
6	L	859	U10	C5-C4-O4-C4M
4	L	852	BCL	C14-C13-C15-C16
4	M	853	BCL	C14-C13-C15-C16
4	M	853	BCL	CAA-CBA-CGA-O1A
5	L	856	BPH	CAD-CBD-CGD-O2D

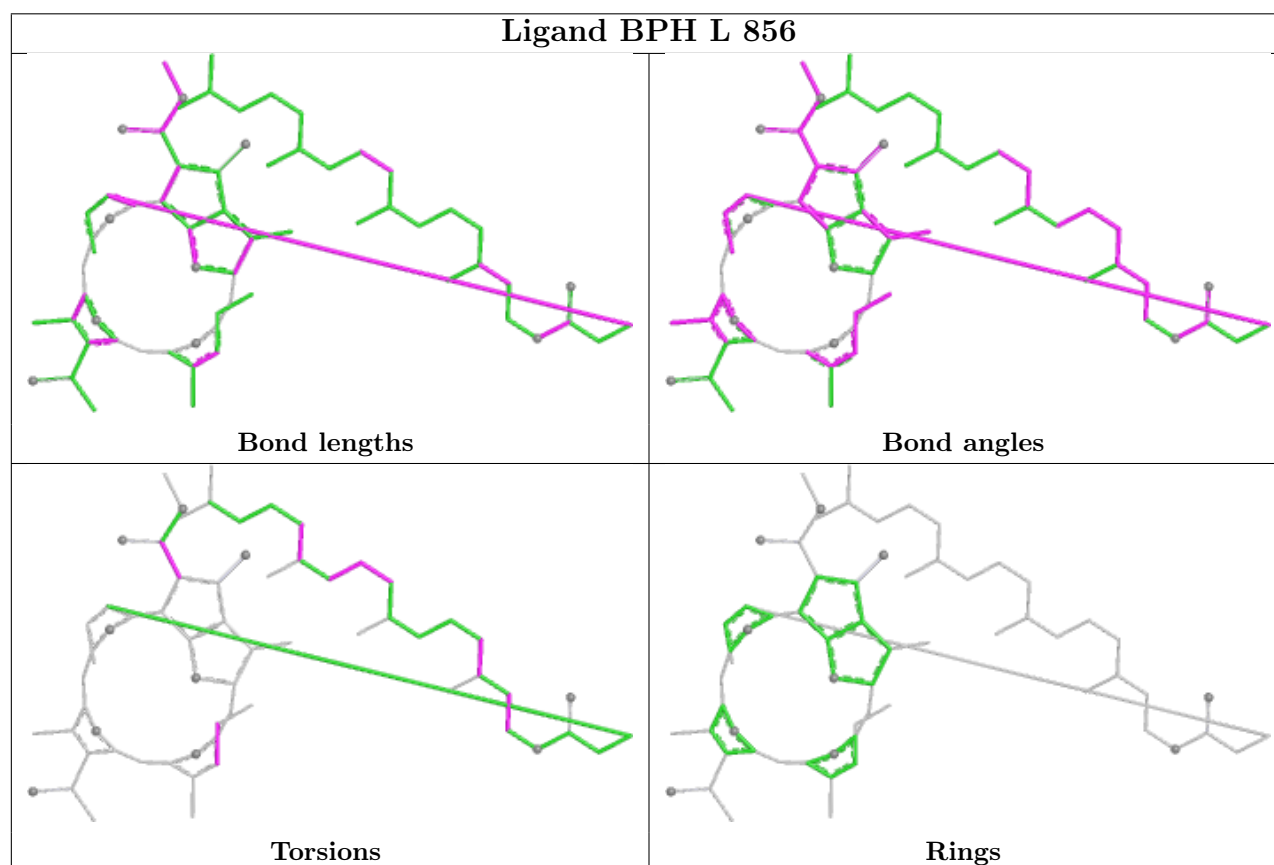
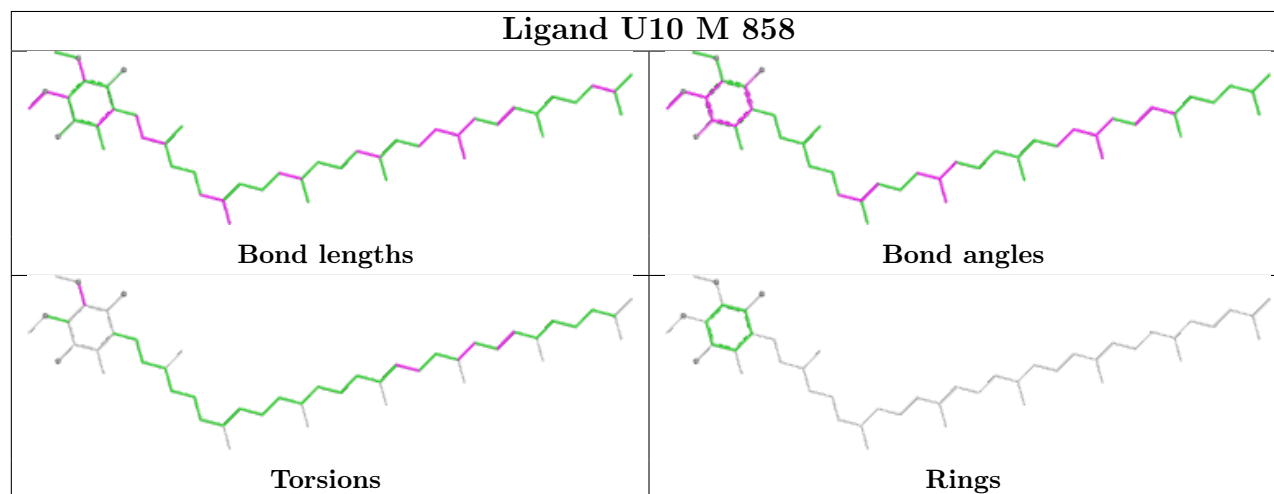
There are no ring outliers.

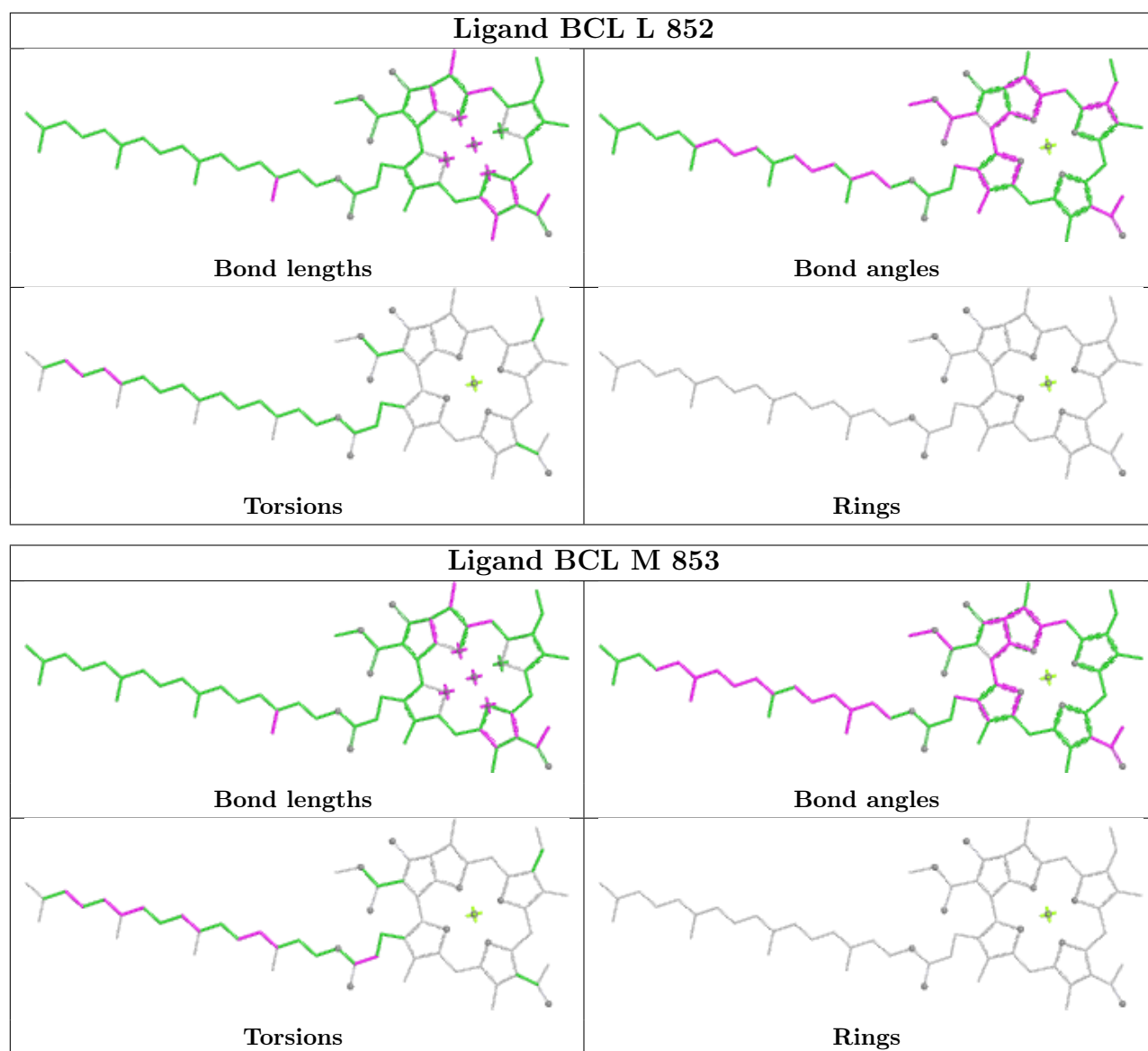
8 monomers are involved in 21 short contacts:

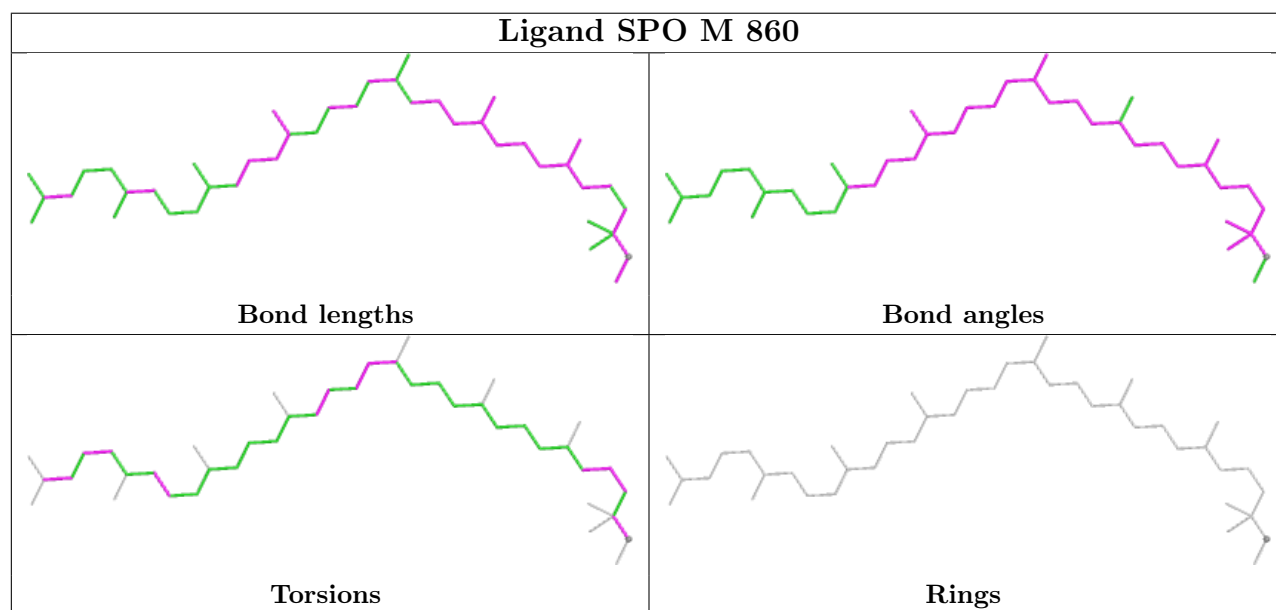
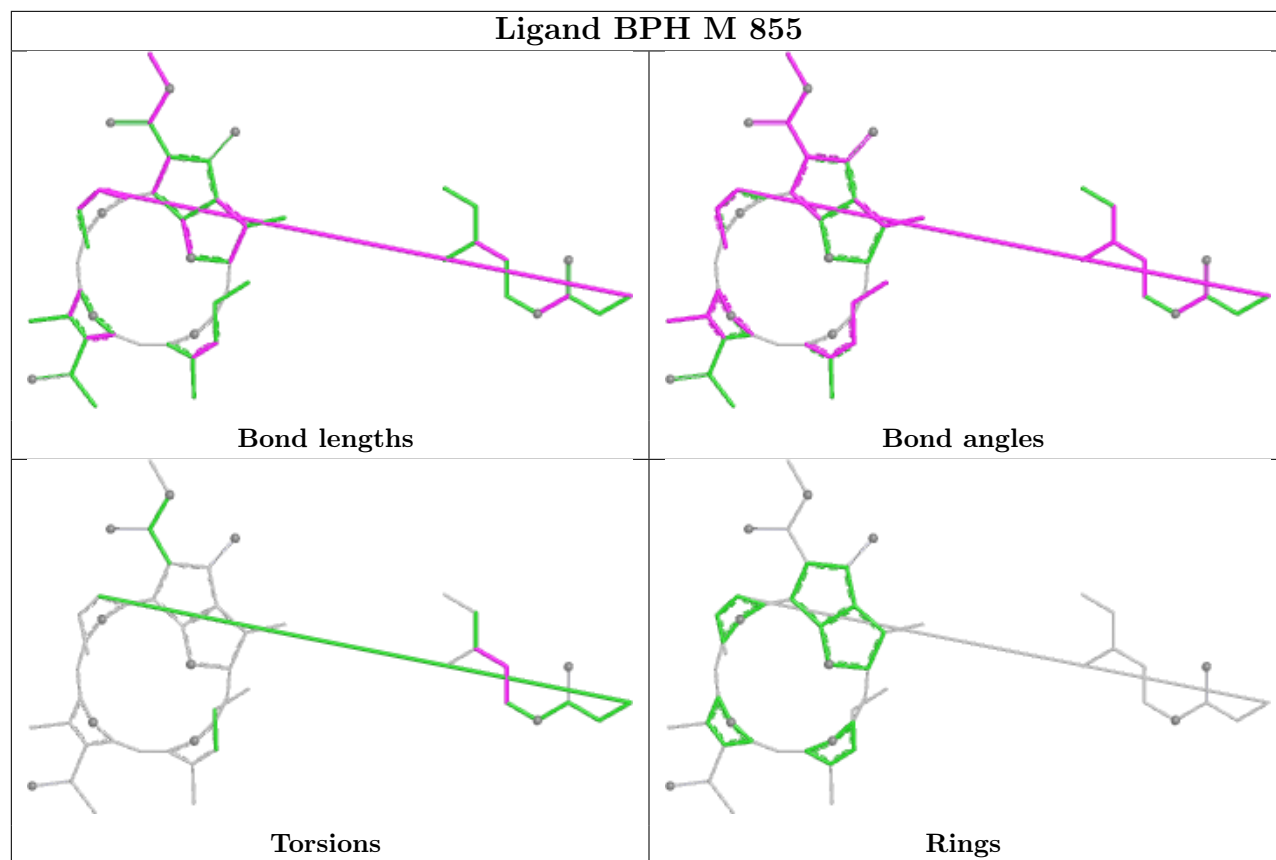
Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	L	856	BPH	6	0
4	L	852	BCL	4	0
4	M	853	BCL	4	0
5	M	855	BPH	2	0
4	L	854	BCL	8	0
12	M	900	CDL	1	0
4	L	851	BCL	4	0
6	L	859	U10	1	0

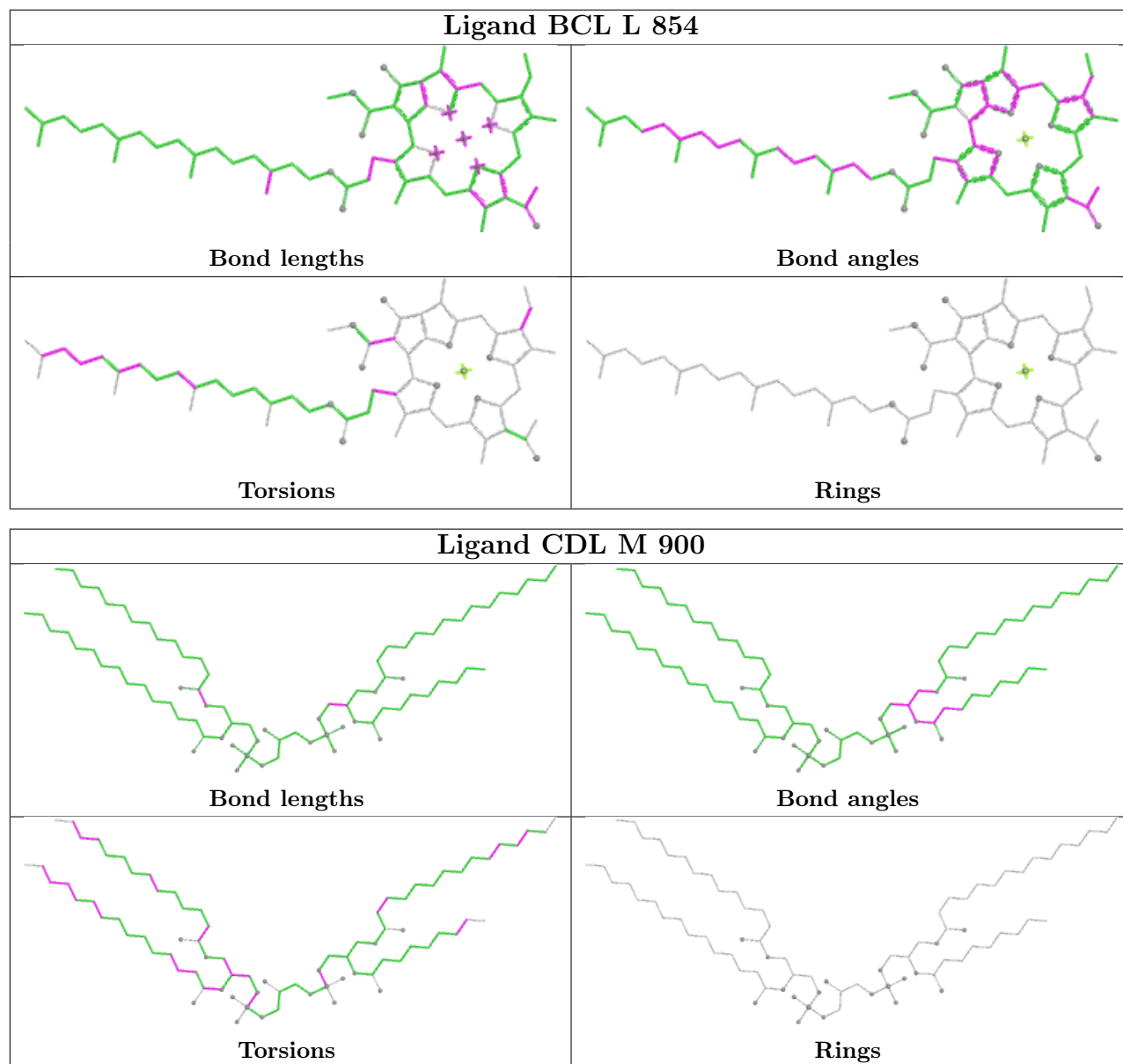
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less 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.

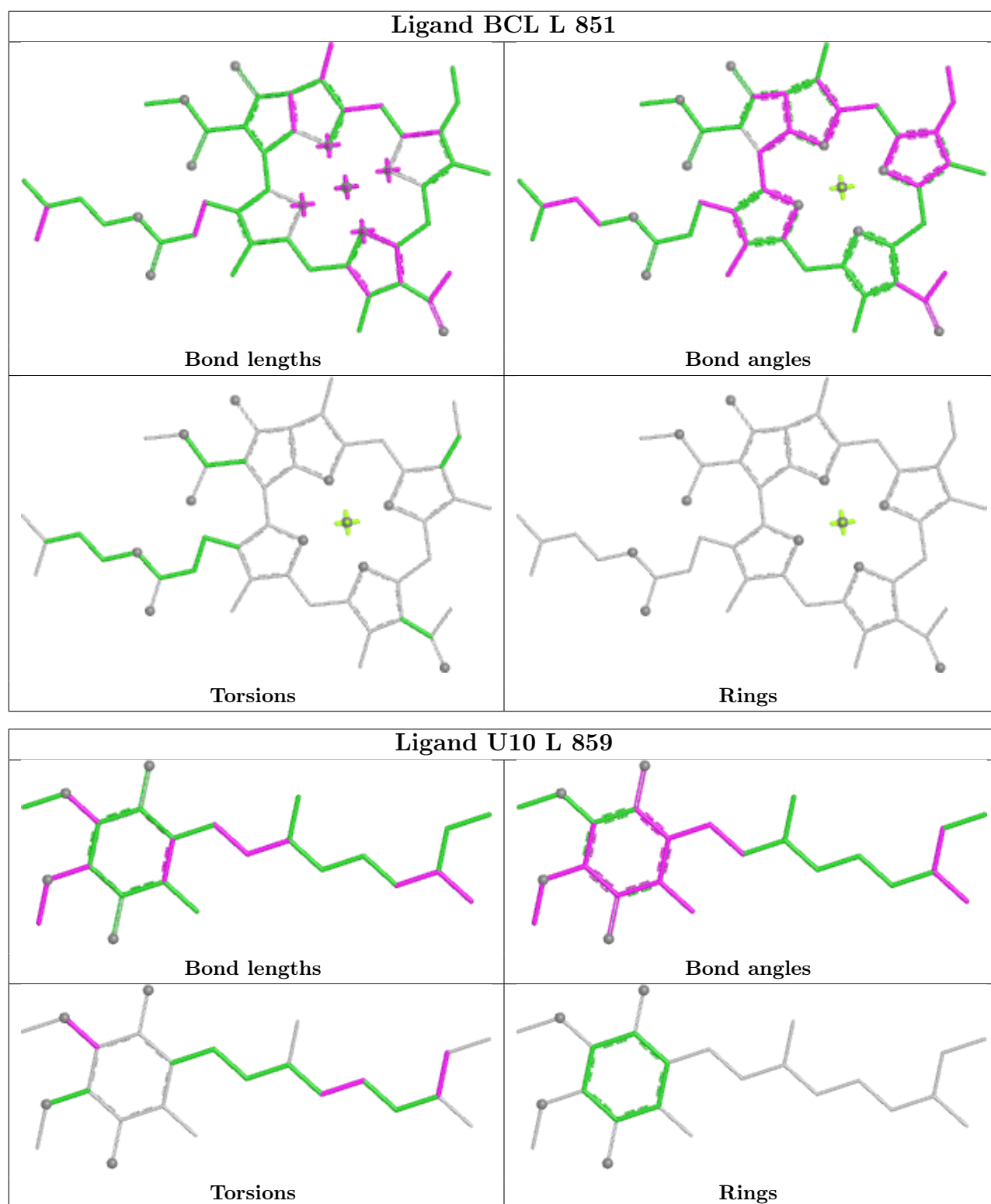
Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD 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 ⓘ

There are no chain breaks in this entry.

6 Fit of model and data ⓘ

6.1 Protein, DNA and RNA chains ⓘ

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2		OWAB(Å ²)	Q<0.9
1	L	281/281 (100%)	0.60	31 (11%)	10 11	22, 31, 55, 82	0
2	M	301/307 (98%)	0.60	27 (8%)	15 16	21, 35, 57, 78	0
3	H	239/260 (91%)	0.56	16 (6%)	24 25	21, 35, 49, 84	1 (0%)
All	All	821/848 (96%)	0.59	74 (9%)	15 16	21, 34, 54, 84	1 (0%)

All (74) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	M	1	ALA	8.3
2	M	3	TYR	8.1
1	L	279	ILE	6.5
2	M	301	HIS	5.9
2	M	2	GLU	5.4
3	H	246	PRO	4.9
1	L	281	GLY	4.5
2	M	148	TRP	4.4
1	L	275	ILE	4.4
3	H	244	ALA	4.3
1	L	280	ASN	4.1
3	H	249	LYS	4.0
1	L	59	TRP	4.0
1	L	277	GLY	4.0
1	L	278	GLY	4.0
1	L	67	TYR	4.0
2	M	300	ASN	3.9
2	M	105	PHE	3.7
2	M	292	ASP	3.6
3	H	247	LYS	3.6
2	M	106	ALA	3.4
3	H	245	ALA	3.4
1	L	270	PRO	3.4

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Mol	Chain	Res	Type	RSRZ
1	L	269	LEU	3.3
1	L	274	ASN	3.2
2	M	27	ALA	3.1
1	L	72	GLU	3.1
3	H	248	ARG	3.0
2	M	4	GLN	3.0
2	M	60	LEU	3.0
2	M	100	GLU	2.9
1	L	273	ALA	2.9
2	M	52	LEU	2.8
3	H	19	SER	2.8
1	L	46	ILE	2.7
1	L	58	THR	2.7
1	L	226	THR	2.7
1	L	82	LYS	2.7
1	L	50	ALA	2.6
1	L	264	GLN	2.6
1	L	80	LEU	2.6
3	H	221	SER	2.6
3	H	175	MET	2.6
3	H	94	GLU	2.5
1	L	271	TRP	2.5
2	M	107	ALA	2.5
2	M	188	ASN	2.5
2	M	32	VAL	2.4
3	H	18	TYR	2.4
1	L	272	TRP	2.4
2	M	101	TYR	2.4
3	H	11	ASP	2.3
1	L	51	TRP	2.3
1	L	56	GLN	2.3
3	H	223	THR	2.3
2	M	26	LEU	2.3
2	M	79	GLY	2.3
2	M	23	ASP	2.3
1	L	55	LEU	2.2
1	L	254	ILE	2.2
2	M	69	THR	2.2
2	M	109	LEU	2.2
2	M	78	ALA	2.2
1	L	47	ILE	2.1
1	L	54	VAL	2.1

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Mol	Chain	Res	Type	RSRZ
3	H	220	LYS	2.1
1	L	21	LEU	2.1
1	L	63	LEU	2.1
2	M	76	TYR	2.1
3	H	184	LYS	2.1
1	L	53	ALA	2.1
3	H	136	ALA	2.1
2	M	80	TRP	2.0
2	M	64	LEU	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 oligosaccharides in this entry.

6.4 Ligands [i](#)

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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
6	U10	L	859	24/63	0.75	0.27	43,53,58,58	0
11	LDA	M	863	16/16	0.78	0.31	67,72,73,73	0
11	LDA	M	862	16/16	0.79	0.32	74,75,82,82	0
12	CDL	M	900	81/100	0.83	0.27	61,75,84,86	0
7	GOL	L	866	6/6	0.85	0.17	47,52,53,54	0
11	LDA	H	861	16/16	0.86	0.27	63,65,68,69	0
10	SPO	M	860	42/42	0.86	0.21	34,46,62,64	0
9	PO4	M	864	5/5	0.87	0.11	67,68,68,69	0
9	PO4	M	865	5/5	0.88	0.12	70,71,71,71	0
4	BCL	L	854	66/66	0.90	0.15	22,29,54,57	0
4	BCL	L	851	51/66	0.91	0.14	24,29,55,57	0
6	U10	M	858	48/63	0.91	0.18	25,41,69,69	0
4	BCL	M	853	66/66	0.92	0.14	19,26,56,62	0
5	BPH	M	855	51/65	0.92	0.12	28,33,56,59	0

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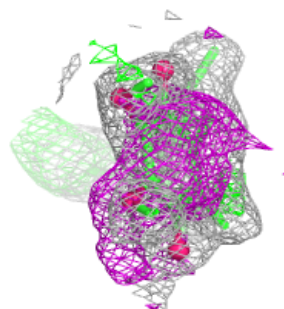
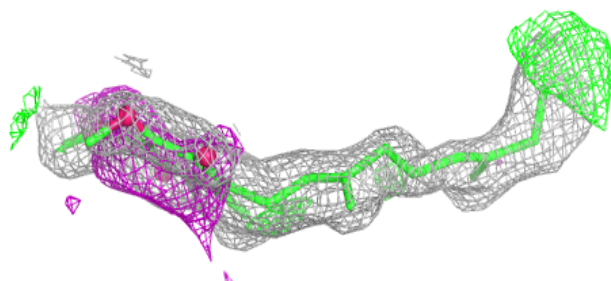
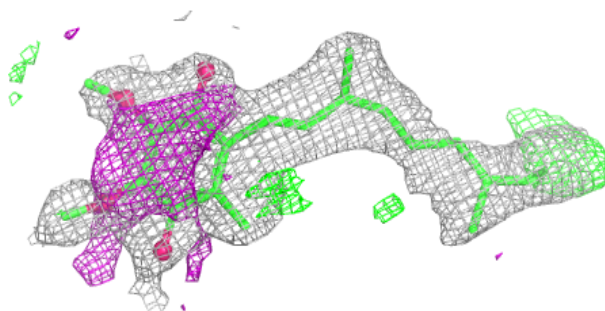
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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
5	BPH	L	856	65/65	0.93	0.12	22,26,50,51	0
4	BCL	L	852	66/66	0.94	0.10	21,26,41,47	0
13	K	H	867	1/1	0.97	0.06	36,36,36,36	0
8	FE2	M	857	1/1	0.99	0.02	21,21,21,21	0

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.

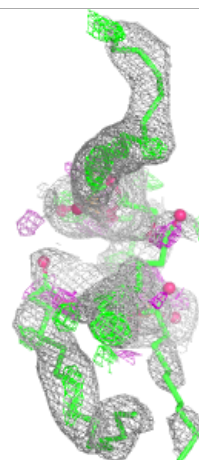
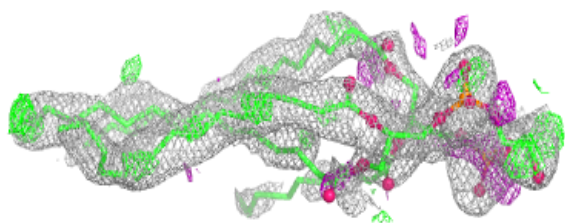
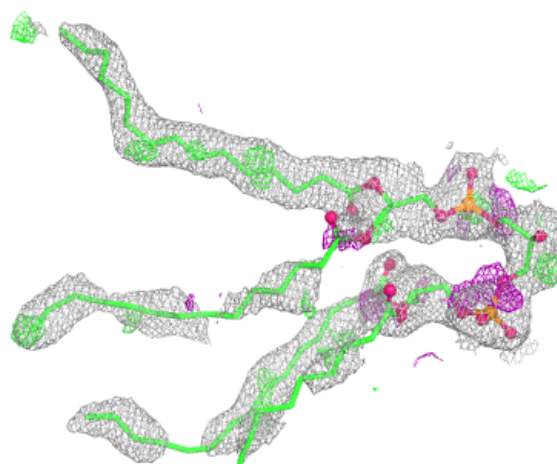
Electron density around U10 L 859:

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



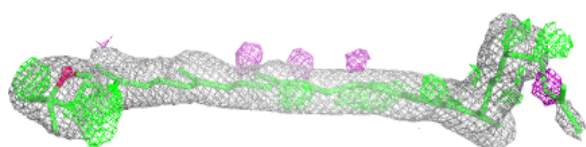
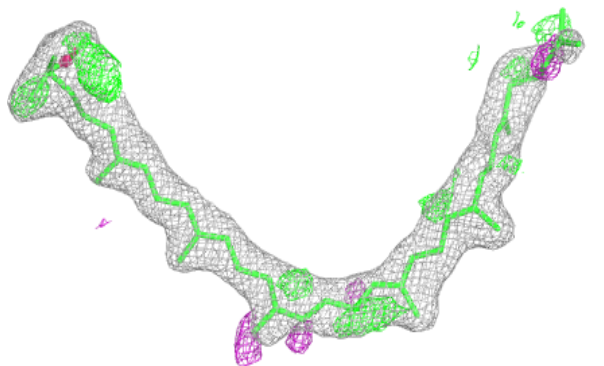
Electron density around CDL M 900:

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

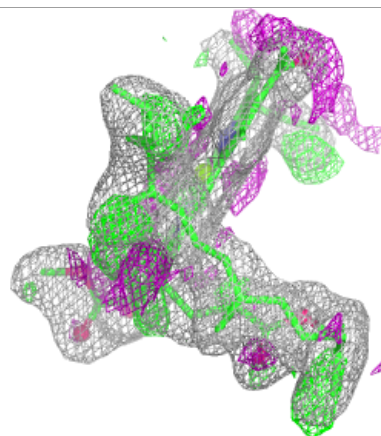
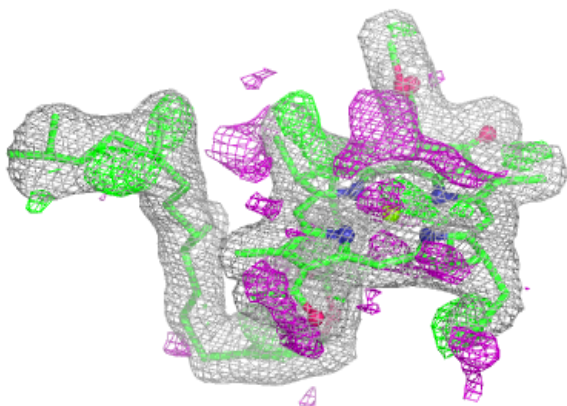
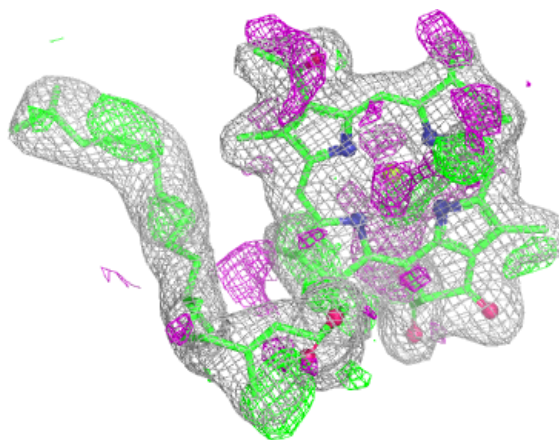


Electron density around SPO M 860:

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

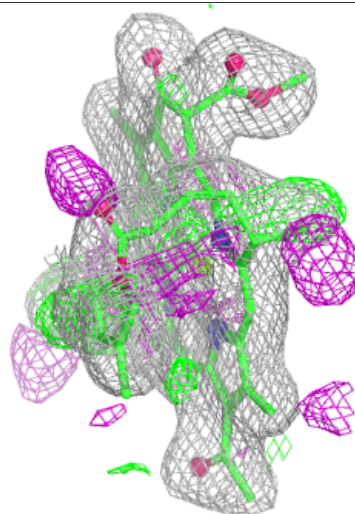
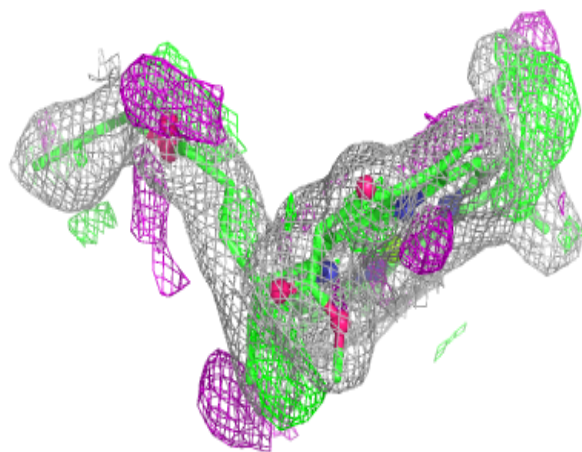
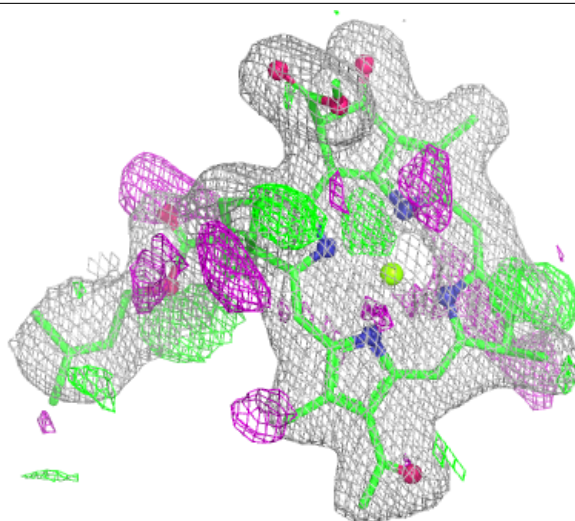
**Electron density around BCL L 854:**

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



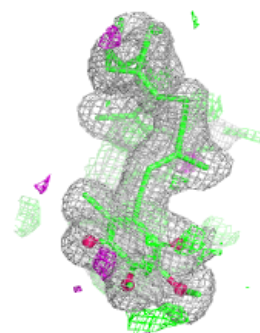
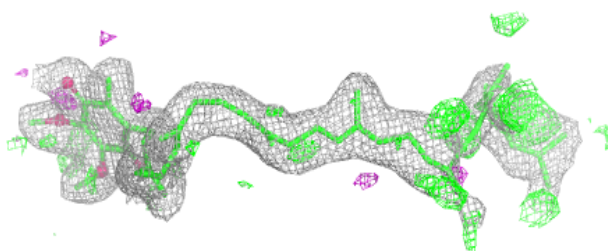
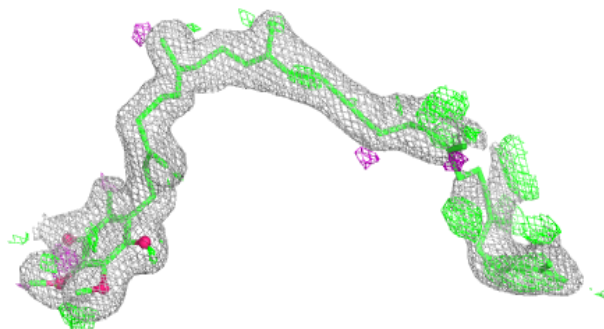
Electron density around BCL L 851:

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

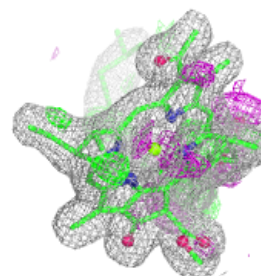
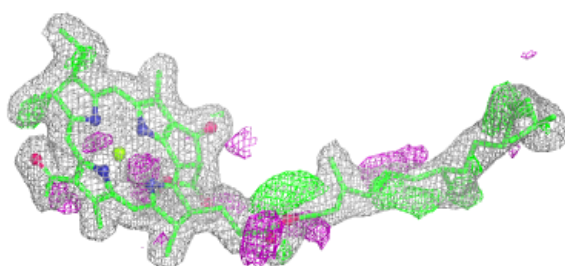
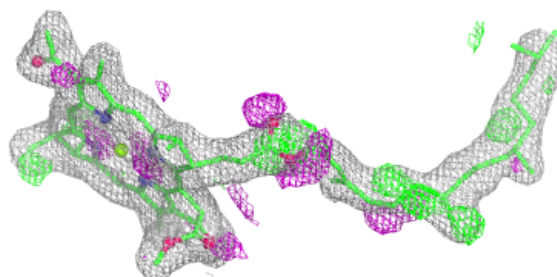


Electron density around U10 M 858:

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

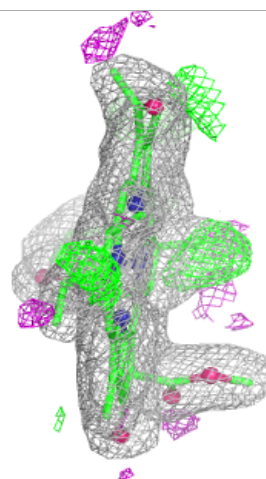
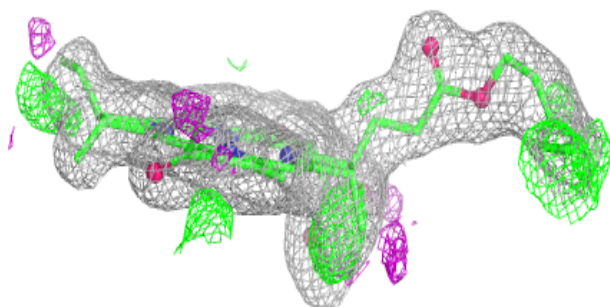
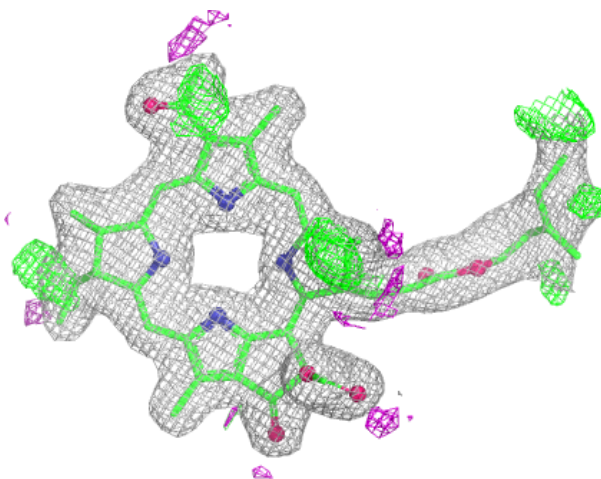
**Electron density around BCL M 853:**

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



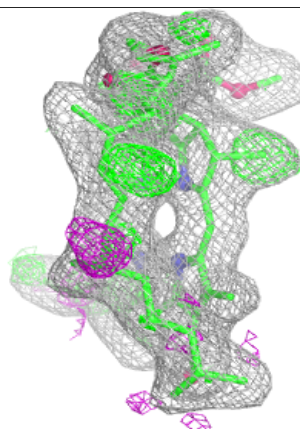
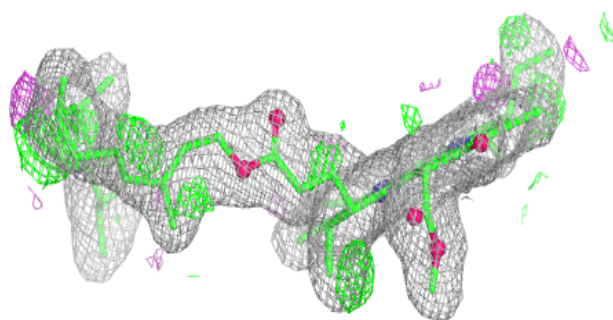
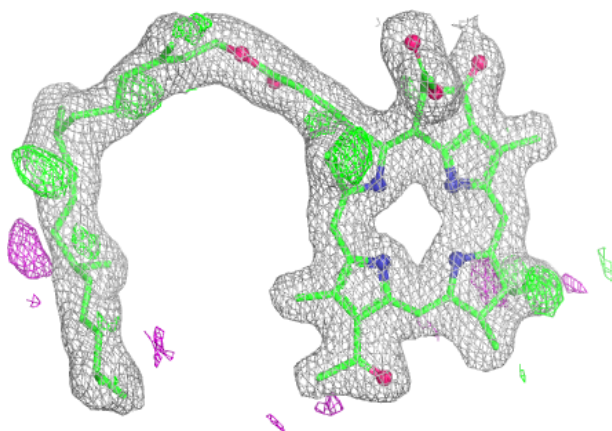
Electron density around BPH M 855:

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

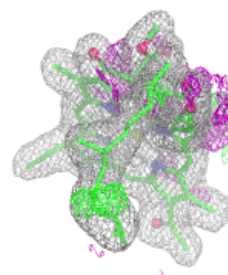
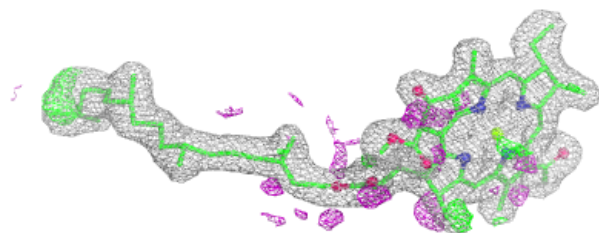
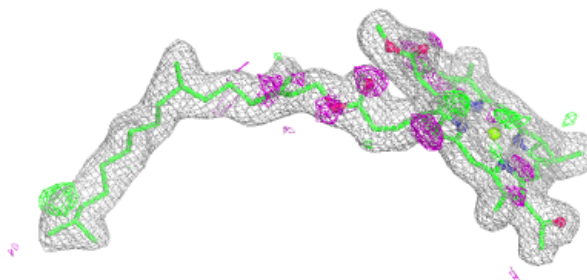


Electron density around BPH L 856:

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

**Electron density around BCL L 852:**

$2mF_o-DF_c$ (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.