



Full wwPDB X-ray Structure Validation Report ⓘ

May 13, 2020 – 05:19 pm BST

PDB ID : 6PTX
Title : Dark, 100K, PCM Myxobacterial Phytochrome, P2, Wild Type,
Authors : Pandey, S.; Schmidt, M.; Stojkovic, E.A.
Deposited on : 2019-07-16
Resolution : 1.65 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity : 4.02b-467
Mogul : 1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix) : 1.13
EDS : 2.11
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac : 5.8.0158
CCP4 : 7.0.044 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.11

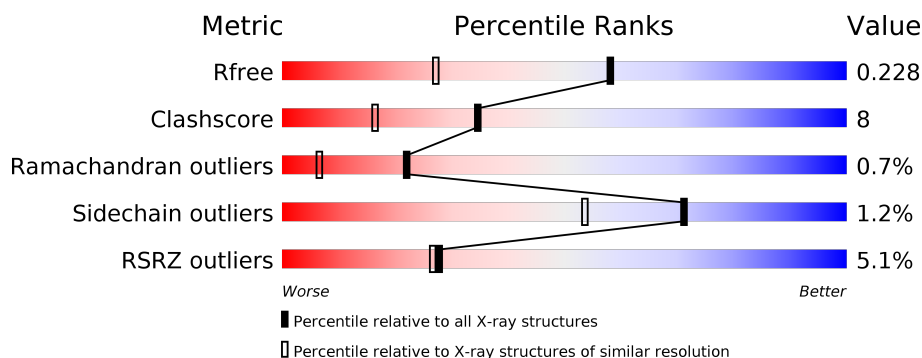
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.65 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	1827 (1.66-1.66)
Clashscore	141614	1931 (1.66-1.66)
Ramachandran outliers	138981	1891 (1.66-1.66)
Sidechain outliers	138945	1891 (1.66-1.66)
RSRZ outliers	127900	1791 (1.66-1.66)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments on the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	481	
1	B	481	

2 Entry composition [i](#)

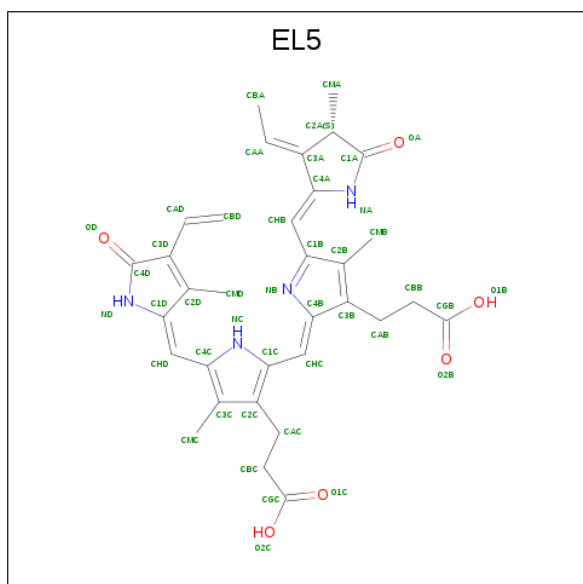
There are 3 unique types of molecules in this entry. The entry contains 8606 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 Photoreceptor-histidine kinase BphP.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	481	Total	C	N	O	S	0	0	0
			3654	2314	665	665	10			
1	B	481	Total	C	N	O	S	0	0	0
			3654	2314	665	665	10			

- Molecule 2 is Biliverdin (three-letter code: EL5) (formula: $C_{33}H_{36}N_4O_6$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total	C	N	O	0	0
			43	33	4	6		
2	B	1	Total	C	N	O	0	0
			43	33	4	6		

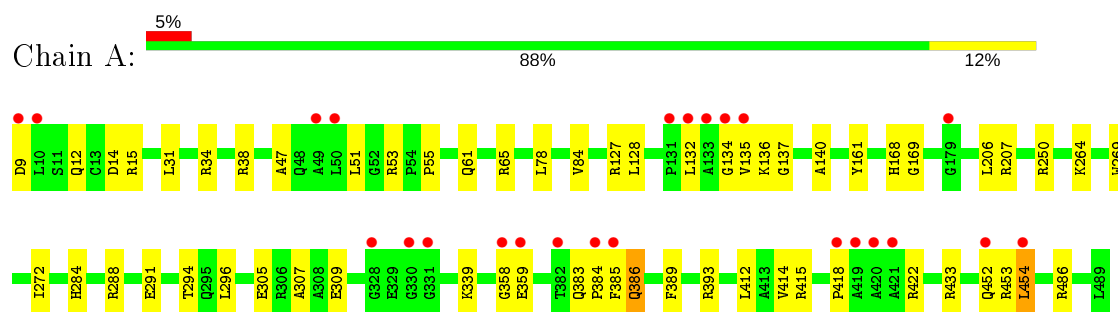
- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	618	Total 618	O 618	0	0
3	B	594	Total 594	O 594	0	0

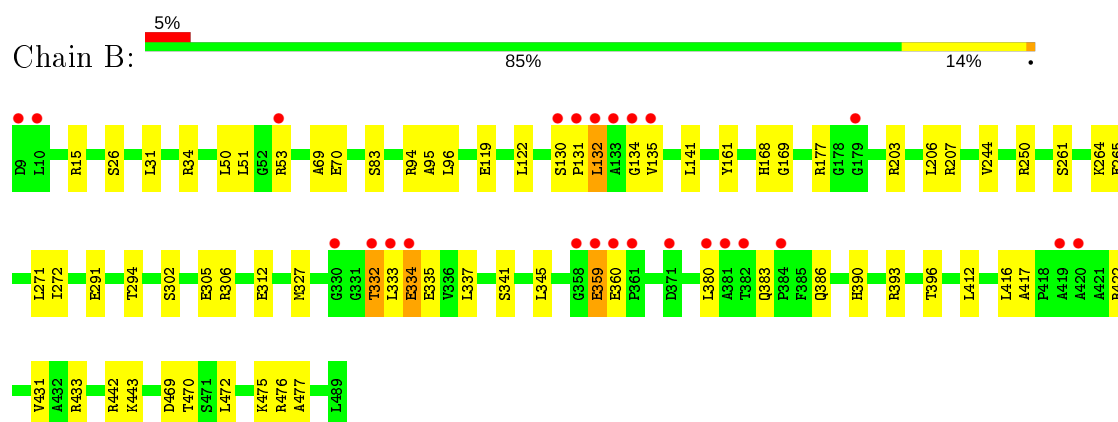
3 Residue-property plots [i](#)

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

- Molecule 1: Photoreceptor-histidine kinase BphP



- Molecule 1: Photoreceptor-histidine kinase BphP



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	82.05Å 81.33Å 83.11Å 90.00° 107.13° 90.00°	Depositor
Resolution (Å)	41.99 – 1.65 42.00 – 1.65	Depositor EDS
% Data completeness (in resolution range)	84.1 (41.99-1.65) 84.1 (42.00-1.65)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.06	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.89 (at 1.65Å)	Xtriage
Refinement program	PHENIX	Depositor
R, R_{free}	0.198 , 0.228 0.198 , 0.228	Depositor DCC
R_{free} test set	5193 reflections (4.92%)	wwPDB-VP
Wilson B-factor (Å ²)	14.1	Xtriage
Anisotropy	0.104	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.38 , 53.2	EDS
L-test for twinning ²	$\langle L \rangle = 0.47$, $\langle L^2 \rangle = 0.29$	Xtriage
Estimated twinning fraction	0.023 for l,-k,h	Xtriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	8606	wwPDB-VP
Average B, all atoms (Å ²)	19.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 12.58% 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: EL5

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\# Z > 5$	RMSZ	$\# Z > 5$
1	A	0.36	0/3735	0.58	0/5094
1	B	0.41	0/3735	0.59	0/5094
All	All	0.39	0/7470	0.59	0/10188

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3654	0	3694	47	0
1	B	3654	0	3694	77	0
2	A	43	0	0	0	0
2	B	43	0	0	0	0
3	A	618	0	0	27	9
3	B	594	0	0	30	10
All	All	8606	0	7388	122	13

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 (122) 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:B:332:THR:HG23	1:B:335:GLU:HB2	1.37	1.03
1:B:70:GLU:O	3:B:601:HOH:O	1.84	0.96
1:B:433:ARG:HH22	1:B:470:THR:HB	1.31	0.95
1:A:53:ARG:NH1	3:A:603:HOH:O	2.01	0.90
1:A:61:GLN:OE1	1:A:65:ARG:NH1	2.05	0.89
1:A:453:ARG:HG3	3:A:637:HOH:O	1.78	0.84
1:A:136:LYS:O	3:A:601:HOH:O	1.96	0.82
1:B:203:ARG:NH1	3:B:603:HOH:O	2.01	0.81
1:B:134:GLY:HA3	1:B:141:LEU:HG	1.63	0.81
1:A:433:ARG:NH1	3:A:609:HOH:O	2.14	0.81
1:A:383:GLN:O	3:A:602:HOH:O	1.99	0.80
1:B:272:ILE:HD12	1:B:294:THR:HG22	1.63	0.80
1:B:332:THR:HG22	1:B:335:GLU:OE2	1.83	0.79
1:B:177:ARG:NH1	3:B:609:HOH:O	2.18	0.77
1:A:386:GLN:N	3:A:612:HOH:O	2.18	0.76
1:A:309:GLU:OE2	3:A:604:HOH:O	2.04	0.75
1:B:475:LYS:HG3	1:B:477:ALA:H	1.52	0.74
1:A:272:ILE:HD12	1:A:294:THR:HG22	1.69	0.74
1:B:332:THR:HG23	1:B:335:GLU:CB	2.16	0.74
1:A:307:ALA:HB2	1:B:306:ARG:HH11	1.52	0.73
1:B:386:GLN:OE1	3:B:605:HOH:O	2.07	0.72
1:B:119:GLU:OE2	3:B:606:HOH:O	2.08	0.72
1:B:50:LEU:N	3:B:612:HOH:O	2.21	0.71
1:B:333:LEU:HD11	1:B:337:LEU:HD11	1.71	0.71
1:B:333:LEU:HD13	1:B:337:LEU:HD12	1.72	0.71
1:A:135:VAL:O	3:A:605:HOH:O	2.09	0.71
1:A:132:LEU:HB3	1:A:135:VAL:HG11	1.72	0.70
1:A:127:ARG:NH2	3:A:618:HOH:O	2.25	0.69
1:A:14:ASP:OD1	3:A:607:HOH:O	2.11	0.68
1:B:416:LEU:O	3:B:607:HOH:O	2.10	0.68
1:B:69:ALA:O	3:B:602:HOH:O	2.11	0.67
1:B:332:THR:OG1	1:B:334:GLU:OE1	2.14	0.65
1:A:135:VAL:O	3:A:608:HOH:O	2.14	0.65
1:B:332:THR:CG2	1:B:335:GLU:HB2	2.21	0.65
1:B:334:GLU:CD	1:B:334:GLU:H	1.99	0.65
1:B:333:LEU:CD1	1:B:337:LEU:CD1	2.74	0.65
1:A:305:GLU:HG3	3:A:943:HOH:O	1.97	0.64
1:B:393:ARG:HG3	3:B:844:HOH:O	1.96	0.64
1:A:15:ARG:NH2	3:A:606:HOH:O	2.11	0.64
1:B:333:LEU:CD1	1:B:337:LEU:HD12	2.29	0.62
1:A:38:ARG:NH1	3:A:624:HOH:O	2.33	0.61

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:333:LEU:HD13	1:B:337:LEU:CD1	2.31	0.60
1:A:47:ALA:HB3	1:A:55:PRO:HB3	1.84	0.60
1:B:130:SER:O	1:B:132:LEU:N	2.35	0.59
1:A:393:ARG:NH2	3:A:628:HOH:O	2.35	0.59
1:B:433:ARG:NH1	3:B:625:HOH:O	2.36	0.58
1:B:475:LYS:HE2	1:B:476:ARG:HB3	1.86	0.58
1:B:264:LYS:NZ	1:B:305:GLU:OE1	2.35	0.57
1:A:250:ARG:NH2	3:A:611:HOH:O	2.18	0.57
1:A:307:ALA:CB	1:B:306:ARG:HH11	2.17	0.57
1:A:339:LYS:NZ	3:A:634:HOH:O	2.37	0.56
1:A:250:ARG:HG2	3:A:844:HOH:O	2.05	0.55
1:B:34:ARG:NE	3:B:617:HOH:O	2.39	0.54
1:B:433:ARG:NE	3:B:630:HOH:O	2.40	0.54
1:A:137:GLY:N	3:A:615:HOH:O	2.35	0.53
1:A:9:ASP:OD2	3:A:613:HOH:O	2.18	0.53
1:A:415:ARG:NH2	3:A:602:HOH:O	2.05	0.53
1:A:452:GLN:NE2	3:A:637:HOH:O	2.41	0.53
1:B:359:GLU:O	3:B:610:HOH:O	2.19	0.52
1:B:333:LEU:HD11	1:B:337:LEU:CD1	2.32	0.52
1:B:94:ARG:NH2	3:B:619:HOH:O	2.29	0.52
1:B:302:SER:O	1:B:306:ARG:HD2	2.10	0.51
1:A:31:LEU:HD21	1:A:51:LEU:HD11	1.92	0.51
1:B:203:ARG:HD2	3:B:1029:HOH:O	2.09	0.51
1:B:306:ARG:CZ	3:B:644:HOH:O	2.57	0.51
1:B:26:SER:OG	3:B:608:HOH:O	2.17	0.50
1:B:327:MET:SD	3:B:1059:HOH:O	2.58	0.50
1:B:332:THR:CG2	1:B:335:GLU:CD	2.80	0.50
1:B:161:TYR:CZ	1:B:169:GLY:HA3	2.46	0.50
1:B:417:ALA:HB3	3:B:685:HOH:O	2.11	0.50
1:A:34:ARG:HD3	3:A:890:HOH:O	2.12	0.50
1:B:206:LEU:HD21	1:B:291:GLU:HB2	1.93	0.50
1:B:475:LYS:HG3	1:B:477:ALA:N	2.22	0.49
1:B:31:LEU:HD21	1:B:51:LEU:HD11	1.95	0.48
1:A:132:LEU:HB3	1:A:135:VAL:CG1	2.41	0.47
1:A:385:PHE:CG	1:A:389:PHE:HB2	2.49	0.47
1:B:132:LEU:O	1:B:135:VAL:HB	2.15	0.47
1:B:422:ARG:HB2	3:B:685:HOH:O	2.14	0.46
1:A:38:ARG:HD3	3:A:624:HOH:O	2.15	0.46
1:A:454:LEU:HA	1:A:454:LEU:HD23	1.80	0.46
1:A:12:GLN:HA	1:A:15:ARG:HG3	1.96	0.46
1:B:431:VAL:HG21	1:B:472:LEU:HG	1.97	0.46

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:15:ARG:NH1	3:B:615:HOH:O	2.23	0.46
1:B:332:THR:HG22	1:B:335:GLU:CD	2.35	0.46
1:B:390:HIS:HB3	1:B:412:LEU:HD13	1.97	0.46
1:B:469:ASP:OD1	3:B:611:HOH:O	2.21	0.46
1:B:475:LYS:HG2	3:B:622:HOH:O	2.15	0.46
1:A:358:GLY:HA2	1:A:422:ARG:NE	2.31	0.46
1:B:393:ARG:HD3	1:B:470:THR:OG1	2.15	0.46
1:B:250:ARG:HG2	3:B:692:HOH:O	2.15	0.45
1:B:312:GLU:HG3	3:B:622:HOH:O	2.15	0.45
1:B:380:LEU:HA	1:B:383:GLN:HG2	1.98	0.45
1:A:264:LYS:HE3	1:A:269:TRP:CD1	2.51	0.45
1:B:264:LYS:O	1:B:265:GLU:HG3	2.16	0.45
1:B:306:ARG:NE	3:B:644:HOH:O	2.50	0.45
1:A:161:TYR:CZ	1:A:169:GLY:HA3	2.53	0.44
1:B:83:SER:HA	1:B:95:ALA:O	2.18	0.44
1:B:334:GLU:N	1:B:334:GLU:CD	2.69	0.44
1:A:140:ALA:HB3	3:A:723:HOH:O	2.18	0.44
1:A:284:HIS:NE2	1:A:288:ARG:HD2	2.33	0.44
1:A:78:LEU:HD13	1:A:84:VAL:HG22	2.00	0.44
1:B:475:LYS:HE2	1:B:477:ALA:H	1.83	0.43
1:A:134:GLY:O	3:A:615:HOH:O	2.21	0.43
1:A:128:LEU:HB3	1:A:296:LEU:CD2	2.48	0.43
1:B:393:ARG:HH21	1:B:396:THR:CG2	2.32	0.43
1:B:306:ARG:CD	3:B:644:HOH:O	2.67	0.42
1:B:261:SER:HA	1:B:271:LEU:HD23	2.00	0.42
1:B:333:LEU:CD1	1:B:337:LEU:HD11	2.38	0.42
1:B:332:THR:HG23	1:B:335:GLU:H	1.84	0.42
1:B:34:ARG:NH2	3:B:617:HOH:O	2.52	0.42
1:B:442:ARG:C	1:B:443:LYS:HD2	2.40	0.42
1:A:264:LYS:HB3	3:A:692:HOH:O	2.20	0.42
1:A:206:LEU:HD21	1:A:291:GLU:HB2	2.01	0.41
1:B:332:THR:CG2	1:B:335:GLU:OE2	2.59	0.41
1:B:83:SER:HB2	1:B:96:LEU:HD23	2.02	0.41
1:A:414:VAL:HB	1:A:486:ARG:HD2	2.02	0.41
1:A:65:ARG:HB3	1:A:65:ARG:CZ	2.49	0.41
1:B:53:ARG:NH1	3:B:642:HOH:O	2.49	0.41
1:B:244:VAL:HG23	3:B:792:HOH:O	2.21	0.41
1:B:359:GLU:HB2	1:B:360:GLU:H	1.71	0.40
1:B:341:SER:O	1:B:345:LEU:HG	2.22	0.40
1:B:393:ARG:HE	1:B:393:ARG:HB3	1.79	0.40

All (13) symmetry-related close contacts are listed below. The label for Atom-2 includes the

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

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:861:HOH:O	3:B:1010:HOH:O[1_455]	1.92	0.28
3:A:1000:HOH:O	3:B:807:HOH:O[1_455]	1.97	0.23
3:A:999:HOH:O	3:A:1015:HOH:O[2_445]	2.01	0.19
3:A:1021:HOH:O	3:B:1149:HOH:O[2_454]	2.02	0.18
3:B:974:HOH:O	3:B:1127:HOH:O[2_444]	2.03	0.17
3:B:1135:HOH:O	3:B:1136:HOH:O[2_454]	2.05	0.15
3:B:1135:HOH:O	3:B:1137:HOH:O[2_454]	2.08	0.12
3:A:768:HOH:O	3:A:1015:HOH:O[2_445]	2.08	0.12
3:B:715:HOH:O	3:B:1084:HOH:O[2_454]	2.08	0.12
3:A:1124:HOH:O	3:B:1075:HOH:O[2_555]	2.15	0.05
3:A:797:HOH:O	3:B:755:HOH:O[1_455]	2.15	0.05
3:A:682:HOH:O	3:A:688:HOH:O[2_455]	2.16	0.04
3:A:1010:HOH:O	3:B:1044:HOH:O[2_455]	2.19	0.01

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	479/481 (100%)	466 (97%)	9 (2%)	4 (1%)	19	5
1	B	479/481 (100%)	460 (96%)	16 (3%)	3 (1%)	25	8
All	All	958/962 (100%)	926 (97%)	25 (3%)	7 (1%)	22	6

All (7) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	386	GLN
1	B	131	PRO
1	B	359	GLU
1	A	418	PRO
1	A	454	LEU
1	B	132	LEU

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	A	384	PRO

5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	374/374 (100%)	370 (99%)	4 (1%)	73	57
1	B	374/374 (100%)	369 (99%)	5 (1%)	69	50
All	All	748/748 (100%)	739 (99%)	9 (1%)	71	53

All (9) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	168	HIS
1	A	207	ARG
1	A	359	GLU
1	A	412	LEU
1	B	122	LEU
1	B	168	HIS
1	B	207	ARG
1	B	332	THR
1	B	334	GLU

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

Mol	Chain	Res	Type
1	A	386	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no carbohydrates in this entry.

5.6 Ligand geometry [i](#)

2 ligands are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z > 2$	Counts	RMSZ	$\# Z > 2$
2	EL5	A	501	1	36,46,46	3.96	17 (47%)	41,67,67	1.71	11 (26%)
2	EL5	B	501	1	36,46,46	3.97	16 (44%)	41,67,67	1.64	9 (21%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	EL5	A	501	1	-	5/22/74/74	0/4/4/4
2	EL5	B	501	1	-	5/22/74/74	0/4/4/4

All (33) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	501	EL5	C1A-NA	12.32	1.53	1.37
2	B	501	EL5	C1A-NA	12.22	1.53	1.37
2	B	501	EL5	C4A-NA	9.07	1.53	1.37
2	B	501	EL5	C1D-ND	8.93	1.52	1.37
2	A	501	EL5	C1D-ND	8.87	1.52	1.37
2	A	501	EL5	C4A-NA	8.61	1.52	1.37

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	501	EL5	C4D-ND	6.83	1.52	1.38
2	B	501	EL5	C4D-ND	6.70	1.52	1.38
2	A	501	EL5	C4B-NB	6.69	1.52	1.38
2	B	501	EL5	C4B-NB	6.46	1.52	1.38
2	B	501	EL5	C1B-NB	5.73	1.49	1.36
2	A	501	EL5	C1B-NB	5.66	1.49	1.36
2	A	501	EL5	CHB-C1B	5.21	1.52	1.40
2	B	501	EL5	CHB-C1B	5.05	1.52	1.40
2	B	501	EL5	C3B-C2B	4.72	1.46	1.36
2	A	501	EL5	C3B-C2B	4.54	1.46	1.36
2	B	501	EL5	C4B-C3B	4.05	1.52	1.45
2	A	501	EL5	C4B-C3B	3.57	1.51	1.45
2	B	501	EL5	C4C-CHD	2.95	1.52	1.41
2	A	501	EL5	C4C-CHD	2.91	1.52	1.41
2	A	501	EL5	C3D-C2D	2.80	1.43	1.37
2	A	501	EL5	CHB-C4A	-2.77	1.31	1.38
2	A	501	EL5	C1C-CHC	2.71	1.51	1.41
2	B	501	EL5	CHB-C4A	-2.66	1.31	1.38
2	B	501	EL5	CHC-C4B	-2.60	1.32	1.35
2	B	501	EL5	OA-C1A	-2.60	1.18	1.23
2	A	501	EL5	CHC-C4B	-2.53	1.33	1.35
2	A	501	EL5	OD-C4D	-2.52	1.18	1.23
2	B	501	EL5	C3D-C2D	2.43	1.42	1.37
2	B	501	EL5	C1C-CHC	2.41	1.50	1.41
2	A	501	EL5	OA-C1A	-2.28	1.18	1.23
2	B	501	EL5	C4A-C3A	2.22	1.49	1.45
2	A	501	EL5	CAD-C3D	2.11	1.53	1.47

All (20) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	501	EL5	CAA-C3A-C4A	-4.70	120.68	126.36
2	B	501	EL5	CAA-C3A-C4A	-4.31	121.15	126.36
2	B	501	EL5	CAB-CBB-CGB	-4.20	105.63	112.67
2	A	501	EL5	C4B-C3B-C2B	3.32	110.46	106.78
2	A	501	EL5	CHC-C4B-NB	3.13	133.17	128.83
2	A	501	EL5	CAB-CBB-CGB	-3.05	107.55	112.67
2	A	501	EL5	C3B-C4B-NB	-3.03	105.65	110.05
2	B	501	EL5	C4B-C3B-C2B	3.00	110.10	106.78
2	A	501	EL5	CHB-C1B-NB	2.96	131.13	124.93
2	B	501	EL5	C3B-C4B-NB	-2.90	105.83	110.05
2	A	501	EL5	C1D-ND-C4D	-2.58	107.38	110.67

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	501	EL5	C2A-C3A-C4A	2.55	110.61	107.81
2	B	501	EL5	C1D-ND-C4D	-2.44	107.56	110.67
2	B	501	EL5	CHB-C1B-NB	2.40	129.96	124.93
2	A	501	EL5	CHB-C1B-C2B	-2.40	118.74	124.90
2	B	501	EL5	C4D-C3D-C2D	2.35	110.94	107.92
2	B	501	EL5	C2A-C3A-C4A	2.33	110.36	107.81
2	A	501	EL5	C4D-C3D-C2D	2.27	110.83	107.92
2	A	501	EL5	C1C-CHC-C4B	-2.25	126.12	128.81
2	B	501	EL5	CHC-C4B-NB	2.16	131.82	128.83

There are no chirality outliers.

All (10) torsion outliers are listed below:

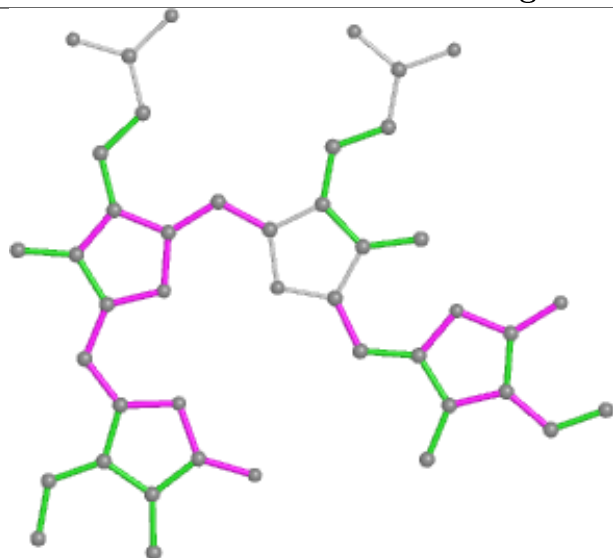
Mol	Chain	Res	Type	Atoms
2	A	501	EL5	ND-C1D-CHD-C4C
2	A	501	EL5	C3C-C4C-CHD-C1D
2	A	501	EL5	NC-C4C-CHD-C1D
2	B	501	EL5	ND-C1D-CHD-C4C
2	B	501	EL5	C3C-C4C-CHD-C1D
2	B	501	EL5	NC-C4C-CHD-C1D
2	A	501	EL5	NB-C4B-CHC-C1C
2	B	501	EL5	NB-C4B-CHC-C1C
2	A	501	EL5	C2D-C1D-CHD-C4C
2	B	501	EL5	C2D-C1D-CHD-C4C

There are no ring outliers.

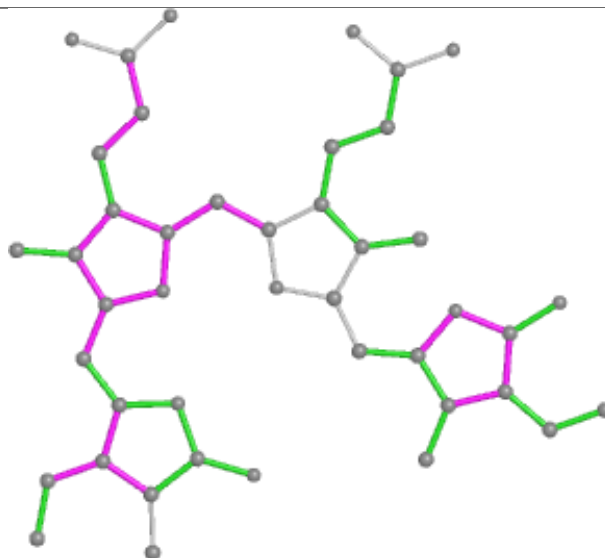
No monomer is involved in short contacts.

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.

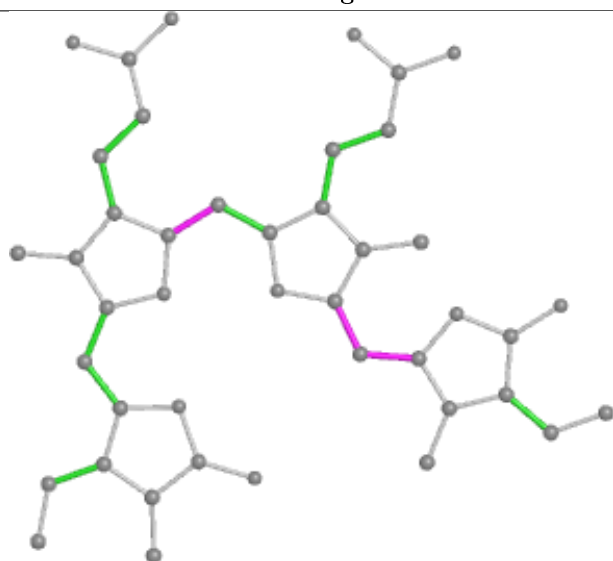
Ligand EL5 A 501



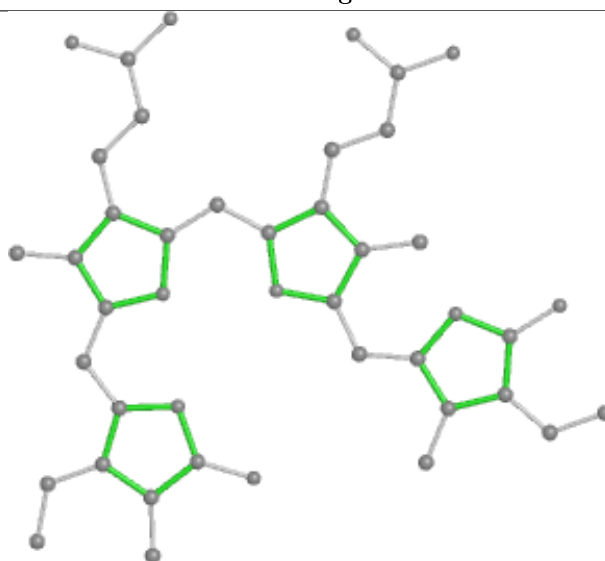
Bond lengths



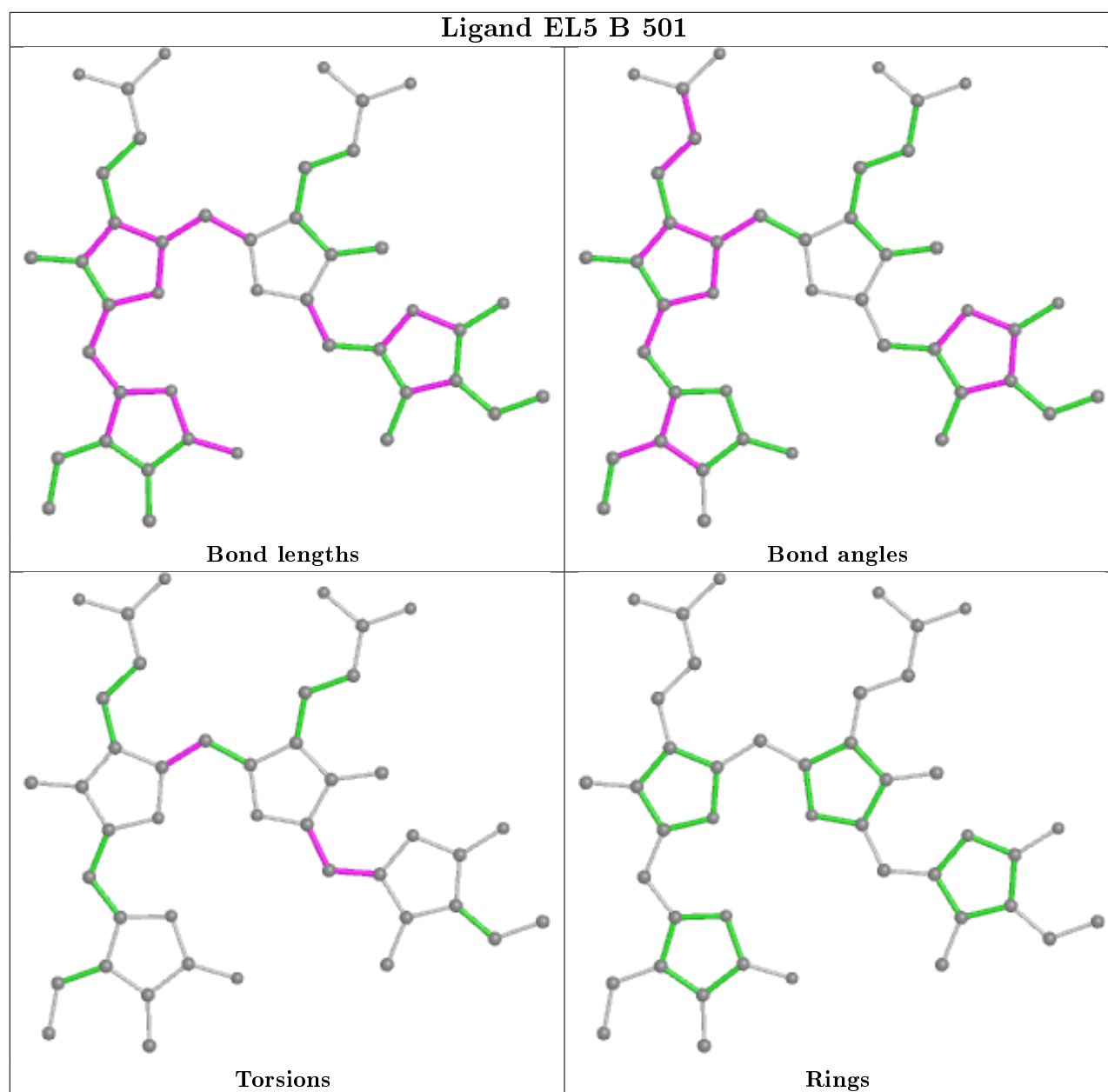
Bond angles



Torsions



Rings



5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	481/481 (100%)	0.06	24 (4%) 28 27	7, 14, 33, 45	0
1	B	481/481 (100%)	0.13	25 (5%) 27 26	6, 15, 36, 57	0
All	All	962/962 (100%)	0.09	49 (5%) 28 27	6, 14, 35, 57	0

All (49) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	419	ALA	8.1
1	A	10	LEU	8.0
1	A	419	ALA	7.9
1	A	328	GLY	7.3
1	B	133	ALA	6.4
1	B	10	LEU	6.2
1	B	9	ASP	5.8
1	A	133	ALA	5.7
1	A	131	PRO	5.5
1	B	420	ALA	5.4
1	B	358	GLY	5.3
1	B	131	PRO	5.2
1	B	179	GLY	5.1
1	A	9	ASP	5.1
1	B	135	VAL	4.6
1	A	179	GLY	4.1
1	A	418	PRO	3.7
1	B	359	GLU	3.6
1	B	384	PRO	3.6
1	B	130	SER	3.5
1	A	134	GLY	3.4
1	A	49	ALA	3.4
1	A	132	LEU	3.4
1	A	385	PHE	3.4

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	B	330	GLY	3.3
1	A	50	LEU	3.1
1	B	132	LEU	2.9
1	A	420	ALA	2.7
1	B	334	GLU	2.7
1	A	330	GLY	2.7
1	B	134	GLY	2.7
1	B	360	GLU	2.6
1	B	332	THR	2.6
1	B	361	PRO	2.5
1	B	382	THR	2.4
1	A	421	ALA	2.4
1	B	53	ARG	2.3
1	B	371	ASP	2.3
1	A	135	VAL	2.2
1	A	331	GLY	2.2
1	A	452	GLN	2.2
1	A	359	GLU	2.2
1	B	380	LEU	2.2
1	B	381	ALA	2.2
1	A	454	LEU	2.1
1	A	358	GLY	2.1
1	A	384	PRO	2.1
1	B	333	LEU	2.0
1	A	382	THR	2.0

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

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

6.3 Carbohydrates ⓘ

There are no carbohydrates in this entry.

6.4 Ligands ⓘ

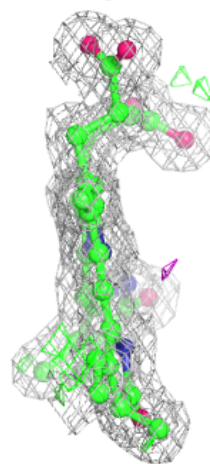
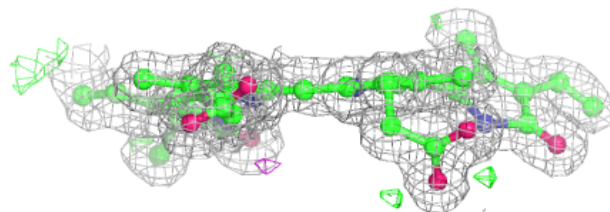
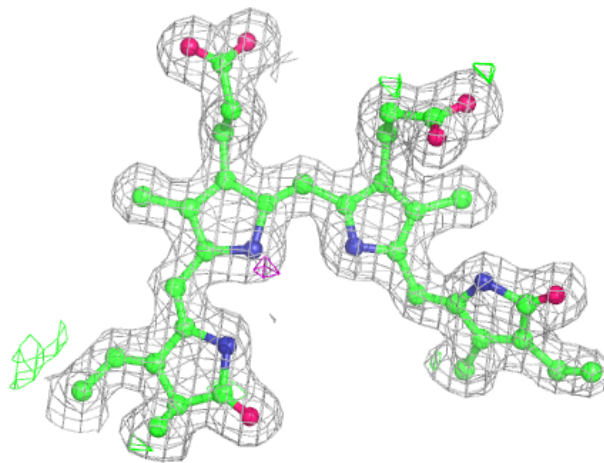
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
2	EL5	A	501	43/43	0.96	0.08	7,9,14,20	0
2	EL5	B	501	43/43	0.97	0.07	5,7,13,22	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.

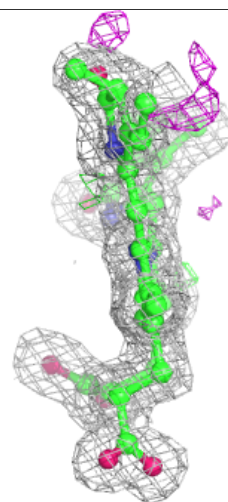
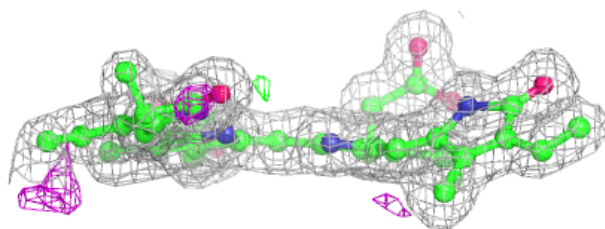
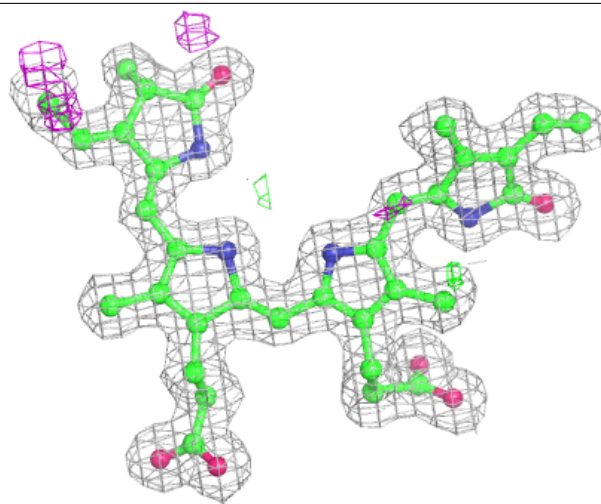
Electron density around EL5 A 501:

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



Electron density around EL5 B 501:

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



6.5 Other polymers [i](#)

There are no such residues in this entry.