Full wwPDB X-ray Structure Validation Report (i)

Jan 29, 2024 – 12:29 am GMT

PDB ID	:	6G1Y
Title	:	Crystal structure of the photosensory core module (PCM) of a bathy phytochrome from Agrobacterium fabrum in the Pfr state.
Authors	:	Schmidt, A.; Qureshi, B.M.; Scheerer, P.
Deposited on	:	2018-03-22
Resolution	:	2.50 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 (i) 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 (i)) were used in the production of this report:

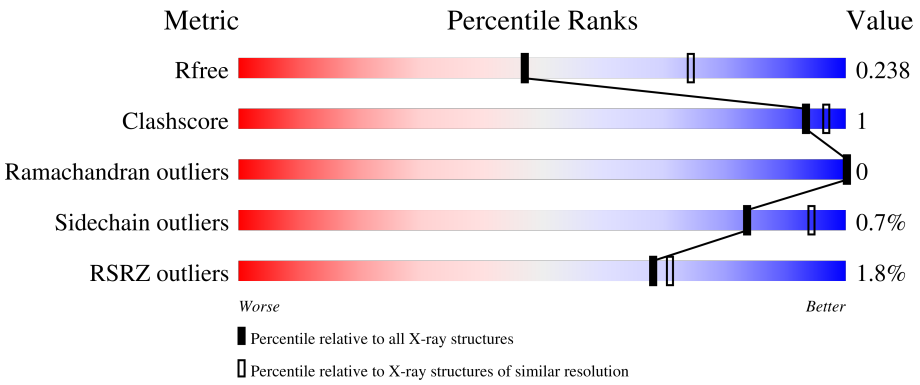
MolProbity	:	4.02b-467
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.36
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
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 2.50 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	4661 (2.50-2.50)
Clashscore	141614	5346 (2.50-2.50)
Ramachandran outliers	138981	5231 (2.50-2.50)
Sidechain outliers	138945	5233 (2.50-2.50)
RSRZ outliers	127900	4559 (2.50-2.50)

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	A	507	2% 93%
2	B	507	2% 93% 5%

2 Entry composition (i)

There are 4 unique types of molecules in this entry. The entry contains 8040 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 Bacteriophytochrome protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	492	3883	2455	696	710	22	0	11	0

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	502	HIS	-	expression tag	UNP A9CI81
A	503	HIS	-	expression tag	UNP A9CI81
A	504	HIS	-	expression tag	UNP A9CI81
A	505	HIS	-	expression tag	UNP A9CI81
A	506	HIS	-	expression tag	UNP A9CI81
A	507	HIS	-	expression tag	UNP A9CI81

- Molecule 2 is a protein called Bacteriophytochrome protein.

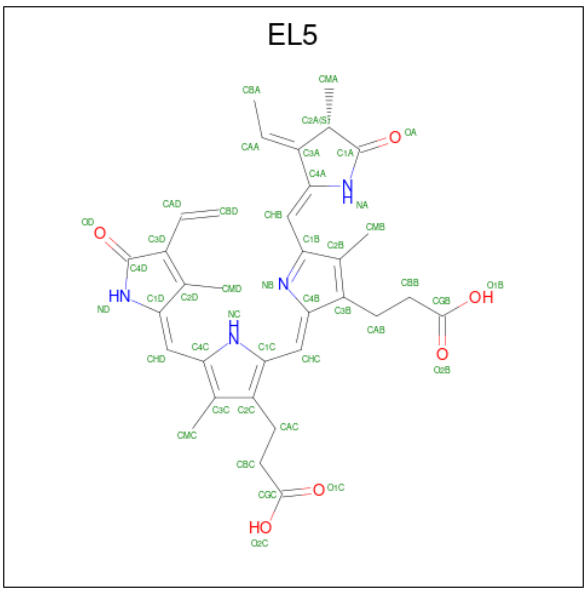
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	493	3867	2443	693	709	22	0	5	0

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	502	HIS	-	expression tag	UNP A9CI81
B	503	HIS	-	expression tag	UNP A9CI81
B	504	HIS	-	expression tag	UNP A9CI81
B	505	HIS	-	expression tag	UNP A9CI81
B	506	HIS	-	expression tag	UNP A9CI81
B	507	HIS	-	expression tag	UNP A9CI81

- Molecule 3 is 3-[(2Z)-2-({3-(2-carboxyethyl)-5-[(E)-(4-ethenyl-3-methyl-5-oxo-1,5-dihydro-2H-pyrrol-2-ylidene)methyl]-4-methyl-1H-pyrrol-2-yl}methylidene)-5-{(Z)-[(3E,4S)-3-ethylidene-4-methyl-5-oxopyrrolidin-2-ylidene]methyl}-4-methyl-2H-pyrrol-3-yl]propanoic acid

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



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

- Molecule 4 is water.

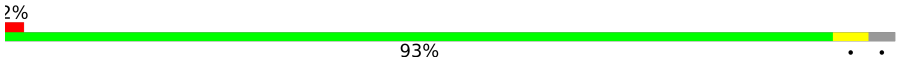
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	108	Total	O	0	2
			110	110		
4	B	94	Total	O	0	0
			94	94		

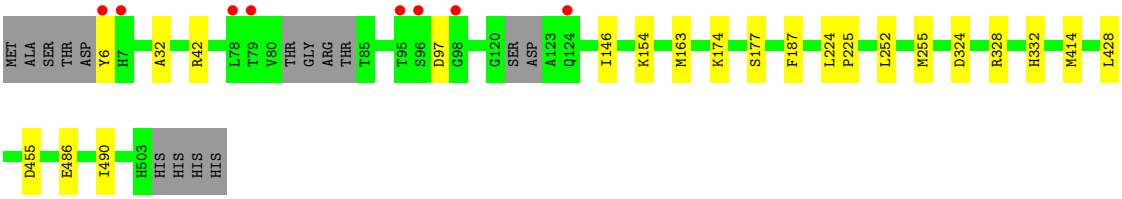
3 Residue-property plots (i)

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: Bacteriophytochrome protein

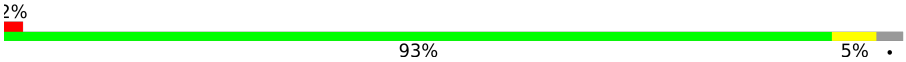
Chain A:

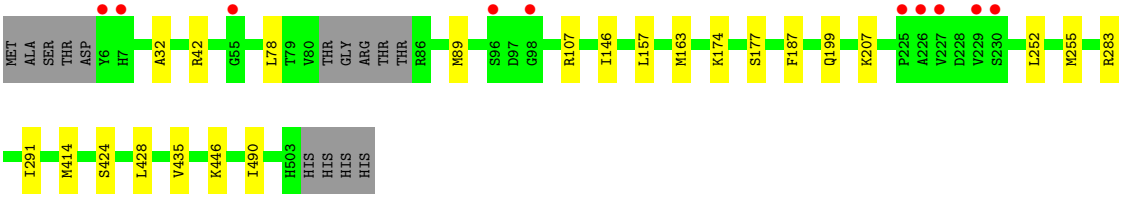




• Molecule 2: Bacteriophytochrome protein

Chain B:





4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	74.52Å 93.36Å 174.42Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	45.09 – 2.50 45.09 – 2.50	Depositor EDS
% Data completeness (in resolution range)	99.8 (45.09-2.50) 99.8 (45.09-2.50)	Depositor EDS
R_{merge}	0.19	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.95 (at 2.51Å)	Xtriage
Refinement program	REFMAC 5.8.0135	Depositor
R, R_{free}	0.201 , 0.241 0.205 , 0.238	Depositor DCC
R_{free} test set	2050 reflections (4.79%)	wwPDB-VP
Wilson B-factor (Å^2)	33.8	Xtriage
Anisotropy	0.477	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.31 , 38.1	EDS
L-test for twinning[2]	$< \|L\| > = 0.49$, $< L^2 > = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.94	EDS
Total number of atoms	8040	wwPDB-VP
Average B, all atoms (Å^2)	38.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.94% 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 (i)

5.1 Standard geometry (i)

Bond lengths and bond angles in the following residue types are not validated in this section: MLZ, 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	0.44	0/3983	0.55	0/5401
2	B	0.44	0/3939	0.55	0/5346
All	All	0.44	0/7922	0.55	0/10747

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 (i)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3883	0	3851	11	0
2	B	3867	0	3811	13	0
3	A	43	0	0	0	0
3	B	43	0	0	0	0
4	A	110	0	0	0	0
4	B	94	0	0	1	0
All	All	8040	0	7662	22	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 1.

All (22) 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:A:146:ILE:HG22	1:A:177:SER:HB2	1.81	0.62
1:A:32:ALA:HB3	1:A:42:ARG:HB2	1.87	0.56
2:B:146:ILE:HG23	2:B:177:SER:HB2	1.88	0.54
2:B:157:LEU:O	2:B:283:ARG:NH2	2.37	0.54
2:B:163:MET:CE	2:B:187:PHE:HB2	2.38	0.53
1:A:486:GLU:O	1:A:490[B]:ILE:HG12	2.09	0.52
1:A:163:MET:CE	1:A:187:PHE:HB2	2.41	0.50
2:B:414:MET:CE	2:B:428:LEU:HD13	2.42	0.50
1:A:252:LEU:HD23	1:A:255:MET:CE	2.43	0.48
2:B:78:LEU:HD21	2:B:107:ARG:HD2	1.97	0.47
1:A:163:MET:HE1	1:A:187:PHE:HB2	1.98	0.45
1:A:490[B]:ILE:HG21	2:B:490:ILE:HG21	1.99	0.44
2:B:163:MET:HE3	2:B:187:PHE:HB2	1.99	0.44
2:B:252:LEU:HD23	2:B:255:MET:CE	2.48	0.43
1:A:414:MET:CE	1:A:428:LEU:HD13	2.49	0.43
2:B:89[B]:MET:HB3	2:B:291:ILE:HD11	2.02	0.42
1:A:490[B]:ILE:HG21	2:B:490:ILE:CG2	2.50	0.42
2:B:163:MET:HE1	2:B:187:PHE:HB2	2.02	0.41
2:B:435:VAL:HG23	4:B:758:HOH:O	2.19	0.41
1:A:324[A]:ASP:OD1	1:A:328:ARG:NH1	2.54	0.41
1:A:224:LEU:HA	1:A:225:PRO:HA	1.93	0.41
2:B:32:ALA:HB3	2:B:42:ARG:HB2	2.03	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	A	495/507 (98%)	488 (99%)	7 (1%)	0	100	100
2	B	491/507 (97%)	484 (99%)	7 (1%)	0	100	100
All	All	986/1014 (97%)	972 (99%)	14 (1%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains (i)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	412/419 (98%)	408 (99%)	4 (1%)	76	90
2	B	406/418 (97%)	403 (99%)	3 (1%)	84	94
All	All	818/837 (98%)	811 (99%)	7 (1%)	84	92

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

Mol	Chain	Res	Type
1	A	6	TYR
1	A	97	ASP
1	A	332	HIS
1	A	455	ASP
2	B	199[A]	GLN
2	B	199[B]	GLN
2	B	424	SER

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)

5 non-standard protein/DNA/RNA residues 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	MLZ	B	446	2	8,9,10	0.59	0	4,9,11	1.57	1 (25%)
2	MLZ	B	174	2	8,9,10	0.42	0	4,9,11	1.32	1 (25%)
2	MLZ	B	207	2	8,9,10	0.52	0	4,9,11	1.56	1 (25%)
1	MLZ	A	154	1	8,9,10	0.53	0	4,9,11	1.58	1 (25%)
1	MLZ	A	174	1	8,9,10	0.55	0	4,9,11	1.49	1 (25%)

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	MLZ	B	446	2	-	3/7/8/10	-
2	MLZ	B	174	2	-	0/7/8/10	-
2	MLZ	B	207	2	-	1/7/8/10	-
1	MLZ	A	154	1	-	3/7/8/10	-
1	MLZ	A	174	1	-	2/7/8/10	-

There are no bond length outliers.

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	154	MLZ	CM-NZ-CE	3.10	120.90	111.95
2	B	446	MLZ	CM-NZ-CE	3.09	120.87	111.95
2	B	207	MLZ	CM-NZ-CE	3.00	120.60	111.95
1	A	174	MLZ	CM-NZ-CE	2.66	119.65	111.95
2	B	174	MLZ	CM-NZ-CE	2.39	118.85	111.95

There are no chirality outliers.

All (9) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	A	174	MLZ	CG-CD-CE-NZ
2	B	446	MLZ	CD-CE-NZ-CM
1	A	154	MLZ	CA-CB-CG-CD
1	A	154	MLZ	CE-CD-CG-CB

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Mol	Chain	Res	Type	Atoms
2	B	446	MLZ	CE-CD-CG-CB
1	A	154	MLZ	CD-CE-NZ-CM
2	B	446	MLZ	CA-CB-CG-CD
2	B	207	MLZ	CD-CE-NZ-CM
1	A	174	MLZ	CD-CE-NZ-CM

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)

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	$\#\|Z\| > 2$
3	EL5	A	601	1	42,46,46	4.54	21 (50%)	47,67,67	2.78	13 (27%)
3	EL5	B	601	2	42,46,46	3.98	24 (57%)	47,67,67	3.15	17 (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
3	EL5	A	601	1	-	6/26/74/74	0/4/4/4
3	EL5	B	601	2	-	11/26/74/74	0/4/4/4

All (45) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	601	EL5	C2A-C3A	-13.36	1.34	1.51
3	A	601	EL5	CHC-C4B	13.04	1.46	1.35
3	A	601	EL5	C1D-C2D	10.20	1.63	1.45
3	B	601	EL5	C2A-C1A	-9.77	1.40	1.51
3	A	601	EL5	C2A-C1A	-9.72	1.40	1.51
3	B	601	EL5	C2A-C3A	-9.54	1.39	1.51
3	B	601	EL5	CMC-C3C	8.30	1.68	1.51
3	B	601	EL5	C1A-NA	8.22	1.48	1.37
3	B	601	EL5	C4D-ND	-8.14	1.20	1.38
3	A	601	EL5	CAA-C3A	7.95	1.55	1.33
3	B	601	EL5	C1D-ND	7.13	1.49	1.37
3	A	601	EL5	C1A-NA	6.30	1.45	1.37
3	A	601	EL5	CHB-C1B	5.93	1.54	1.40
3	B	601	EL5	C1B-C2B	-5.61	1.33	1.45
3	B	601	EL5	CHB-C1B	5.01	1.52	1.40
3	A	601	EL5	C4D-ND	-4.89	1.27	1.38
3	A	601	EL5	C1D-ND	4.74	1.45	1.37
3	A	601	EL5	C1B-C2B	-4.40	1.36	1.45
3	B	601	EL5	OA-C1A	-4.36	1.14	1.23
3	B	601	EL5	CBC-CGC	4.02	1.59	1.50
3	A	601	EL5	O2C-CGC	-3.80	1.18	1.30
3	A	601	EL5	OD-C4D	-3.67	1.16	1.23
3	B	601	EL5	CBB-CAB	-3.60	1.40	1.52
3	B	601	EL5	CBB-CGB	3.54	1.58	1.50
3	B	601	EL5	CAD-C3D	3.41	1.56	1.47
3	A	601	EL5	C3D-C2D	-3.30	1.30	1.37
3	B	601	EL5	OD-C4D	-3.26	1.17	1.23
3	B	601	EL5	CAA-C3A	3.18	1.42	1.33
3	B	601	EL5	C3D-C2D	-3.15	1.30	1.37
3	A	601	EL5	C4B-C3B	3.10	1.50	1.45
3	A	601	EL5	C1C-CHC	-3.01	1.29	1.41
3	A	601	EL5	CBC-CGC	2.79	1.57	1.50
3	B	601	EL5	O2C-CGC	-2.67	1.21	1.30
3	B	601	EL5	C1B-NB	-2.58	1.30	1.36
3	B	601	EL5	CAC-C2C	2.56	1.55	1.52
3	A	601	EL5	CBA-CAA	2.55	1.59	1.49
3	A	601	EL5	CHD-C1D	2.54	1.39	1.34
3	A	601	EL5	CBD-CAD	2.50	1.42	1.30
3	B	601	EL5	O1C-CGC	-2.49	1.13	1.22
3	A	601	EL5	CMB-C2B	2.47	1.56	1.50
3	B	601	EL5	O2B-CGB	2.40	1.30	1.22
3	B	601	EL5	C3D-C4D	-2.34	1.40	1.47
3	B	601	EL5	CAC-CBC	-2.17	1.41	1.52

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	601	EL5	CMD-C2D	-2.16	1.46	1.50
3	B	601	EL5	C4A-C3A	-2.09	1.41	1.45

All (30) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	B	601	EL5	CHD-C1D-C2D	10.23	147.18	126.97
3	A	601	EL5	C3D-C4D-ND	8.99	116.34	106.19
3	A	601	EL5	CHD-C1D-C2D	8.31	143.37	126.97
3	B	601	EL5	C3D-C4D-ND	7.82	115.03	106.19
3	B	601	EL5	C1C-CHC-C4B	7.36	137.60	128.81
3	B	601	EL5	CHD-C1D-ND	-7.13	106.44	130.40
3	B	601	EL5	CHC-C4B-NB	-6.41	119.94	128.83
3	A	601	EL5	CHD-C1D-ND	-5.97	110.35	130.40
3	A	601	EL5	C1C-CHC-C4B	5.40	135.26	128.81
3	A	601	EL5	CHC-C4B-NB	-5.18	121.64	128.83
3	B	601	EL5	C1D-ND-C4D	-4.88	104.45	110.67
3	A	601	EL5	C1D-ND-C4D	-4.30	105.19	110.67
3	B	601	EL5	CHC-C4B-C3B	3.70	133.86	125.32
3	B	601	EL5	CMD-C2D-C1D	3.69	128.78	124.17
3	A	601	EL5	CAA-C3A-C4A	-3.49	122.15	126.36
3	A	601	EL5	C3D-C2D-C1D	-3.47	103.83	108.03
3	A	601	EL5	CMD-C2D-C1D	3.43	128.45	124.17
3	B	601	EL5	CAA-C3A-C4A	-3.35	122.31	126.36
3	B	601	EL5	C2A-C3A-C4A	3.17	111.29	107.81
3	B	601	EL5	OA-C1A-C2A	-3.01	123.38	126.28
3	A	601	EL5	OD-C4D-C3D	-3.00	122.65	129.46
3	A	601	EL5	CHC-C4B-C3B	2.77	131.71	125.32
3	B	601	EL5	C3B-C4B-NB	-2.74	106.06	110.05
3	A	601	EL5	CHB-C1B-NB	-2.72	119.24	124.93
3	B	601	EL5	C3D-C2D-C1D	-2.66	104.82	108.03
3	B	601	EL5	OD-C4D-C3D	-2.63	123.50	129.46
3	B	601	EL5	CHB-C1B-NB	-2.42	119.86	124.93
3	A	601	EL5	C3B-C4B-NB	-2.40	106.55	110.05
3	B	601	EL5	CAB-CBB-CGB	-2.35	108.55	113.60
3	B	601	EL5	CBC-CAC-C2C	2.06	116.14	112.62

There are no chirality outliers.

All (17) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	601	EL5	C2C-C1C-CHC-C4B

Continued on next page...

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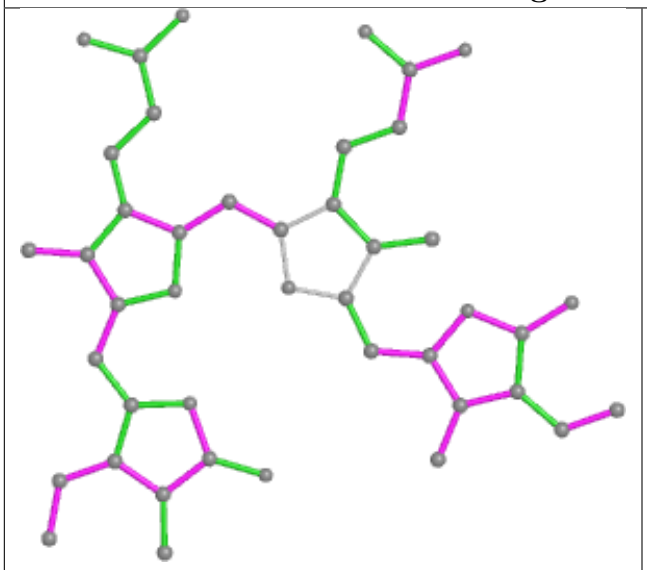
Mol	Chain	Res	Type	Atoms
3	A	601	EL5	NC-C1C-CHC-C4B
3	A	601	EL5	C2D-C1D-CHD-C4C
3	A	601	EL5	ND-C1D-CHD-C4C
3	B	601	EL5	C2C-C1C-CHC-C4B
3	B	601	EL5	NC-C1C-CHC-C4B
3	B	601	EL5	C2D-C1D-CHD-C4C
3	B	601	EL5	ND-C1D-CHD-C4C
3	B	601	EL5	C1C-C2C-CAC-CBC
3	B	601	EL5	C3C-C2C-CAC-CBC
3	B	601	EL5	C3C-C4C-CHD-C1D
3	B	601	EL5	CAB-CBB-CGB-O1B
3	B	601	EL5	CAB-CBB-CGB-O2B
3	A	601	EL5	CAB-CBB-CGB-O1B
3	A	601	EL5	CAB-CBB-CGB-O2B
3	B	601	EL5	CAC-CBC-CGC-O2C
3	B	601	EL5	CAC-CBC-CGC-O1C

There are no ring outliers.

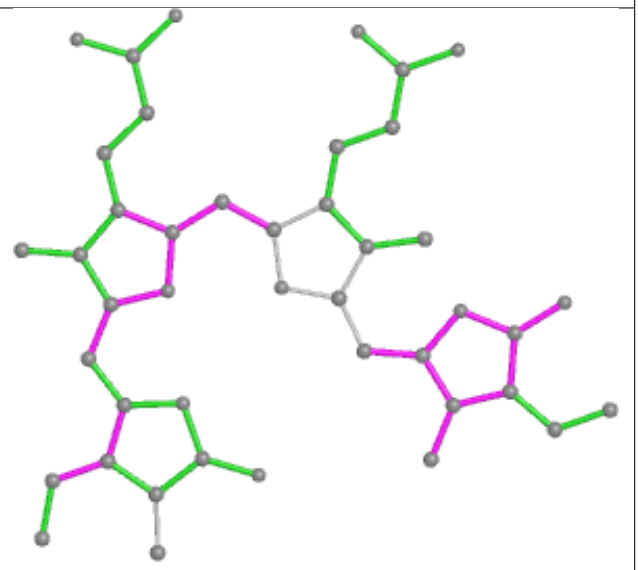
No monomer is involved in short contacts.

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 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.

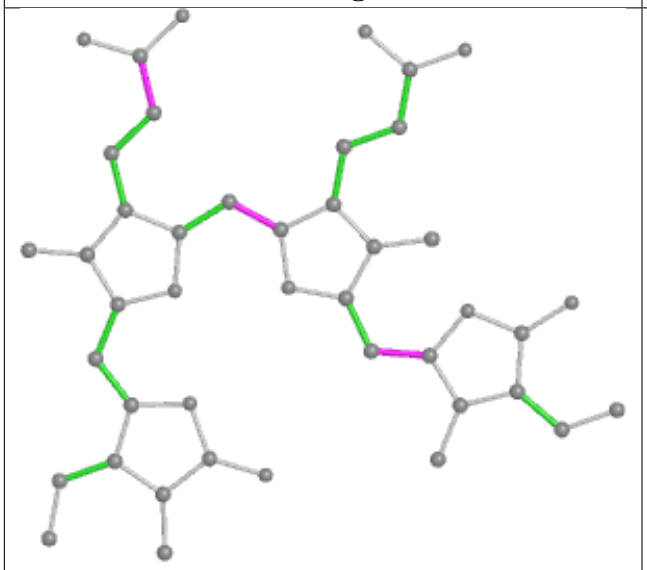
Ligand EL5 A 601



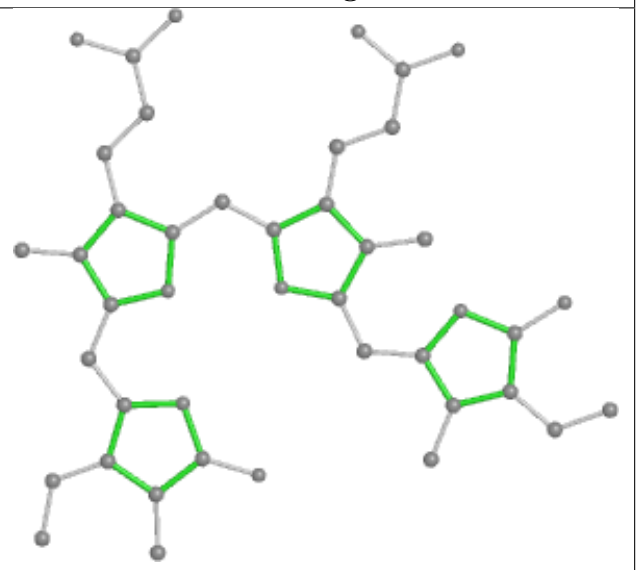
Bond lengths



Bond angles

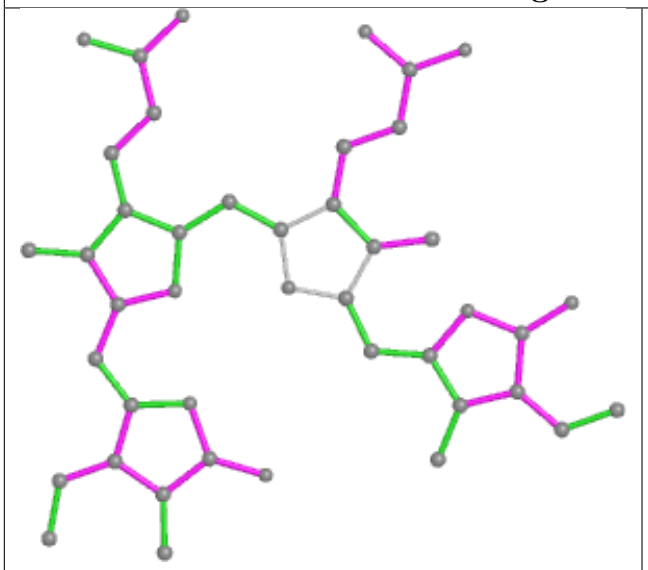


Torsions

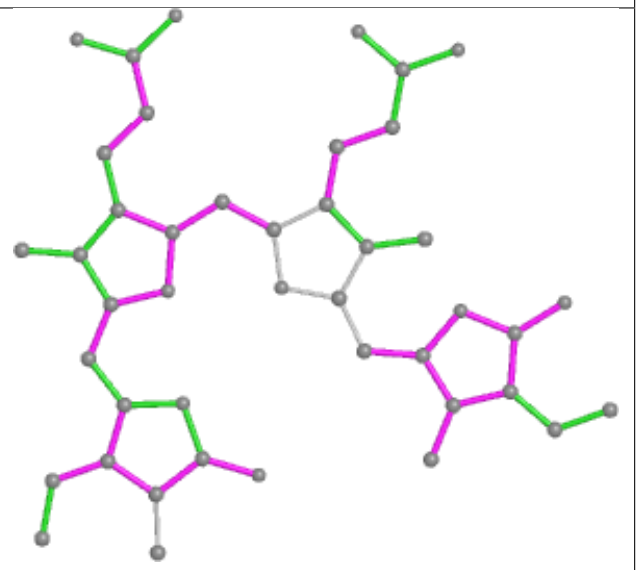


Rings

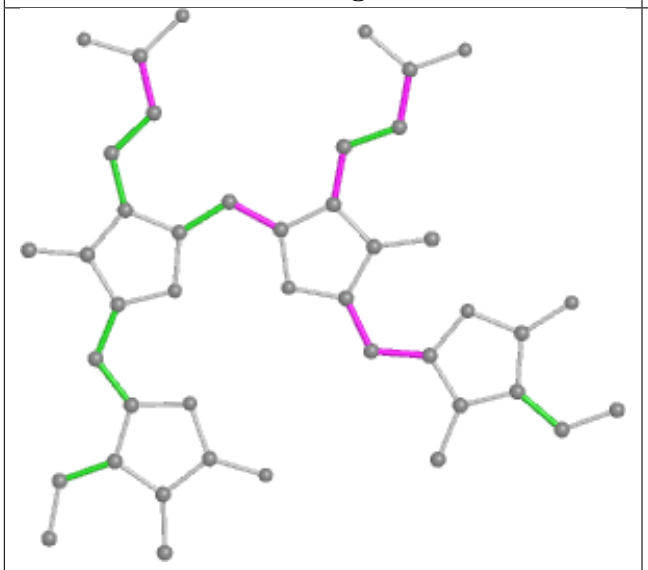
Ligand EL5 B 601



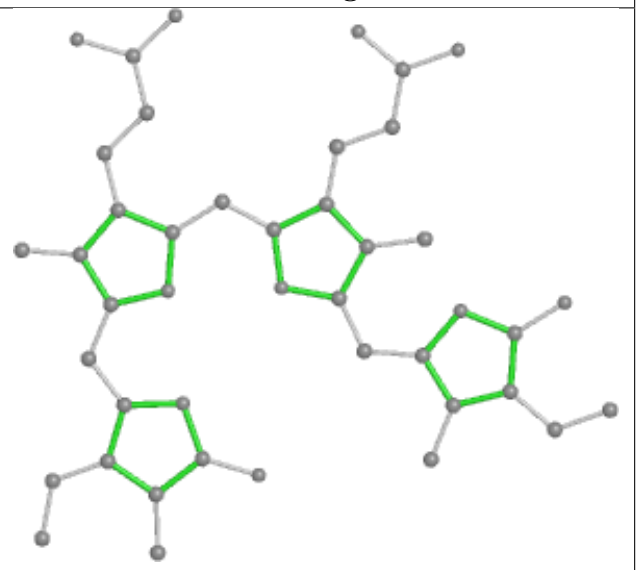
Bond lengths



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 (i)

6.1 Protein, DNA and RNA chains (i)

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2			OWAB(Å^2)	Q<0.9
1	A	490/507 (96%)	-0.17	8 (1%)	72	74	20, 35, 57, 75	0
2	B	490/507 (96%)	-0.08	10 (2%)	65	68	17, 37, 66, 92	1 (0%)
All	All	980/1014 (96%)	-0.13	18 (1%)	68	71	17, 36, 61, 92	1 (0%)

All (18) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	6	TYR	4.5
2	B	6	TYR	4.3
2	B	229	VAL	4.0
1	A	96	SER	3.7
1	A	7	HIS	3.5
2	B	7	HIS	3.3
2	B	227	VAL	3.2
2	B	98	GLY	3.0
1	A	78	LEU	3.0
1	A	98	GLY	3.0
1	A	95	THR	2.9
2	B	230	SER	2.8
2	B	96	SER	2.7
2	B	55	GLY	2.5
1	A	124	GLN	2.3
2	B	225	PRO	2.2
2	B	226	ALA	2.2
1	A	79	THR	2.1

6.2 Non-standard residues in protein, DNA, RNA chains (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
1	MLZ	A	154	10/11	0.94	0.14	24,28,34,35	0
1	MLZ	A	174	10/11	0.95	0.18	16,23,25,26	0
2	MLZ	B	207	10/11	0.95	0.12	27,41,45,45	0
2	MLZ	B	446	10/11	0.95	0.14	25,41,47,53	0
2	MLZ	B	174	10/11	0.96	0.18	20,23,26,26	0

6.3 Carbohydrates (i)

There are no monosaccharides in this entry.

6.4 Ligands (i)

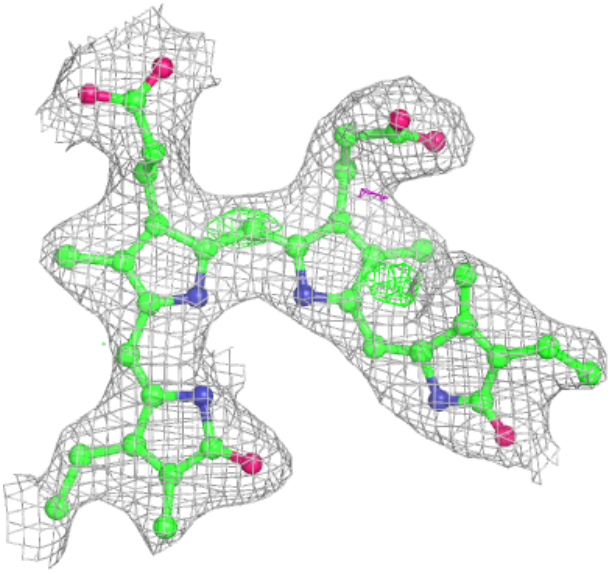
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

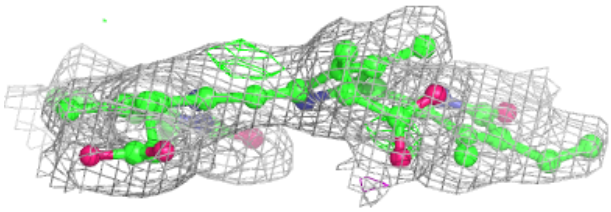
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
3	EL5	A	601	43/43	0.94	0.15	23,28,33,34	0
3	EL5	B	601	43/43	0.95	0.13	23,27,33,34	0

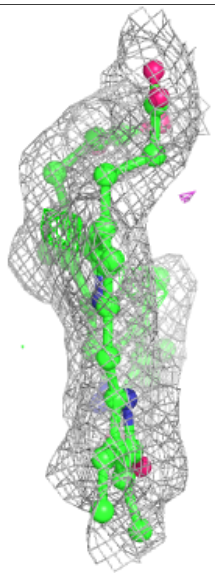
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around EL5 A 601:

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

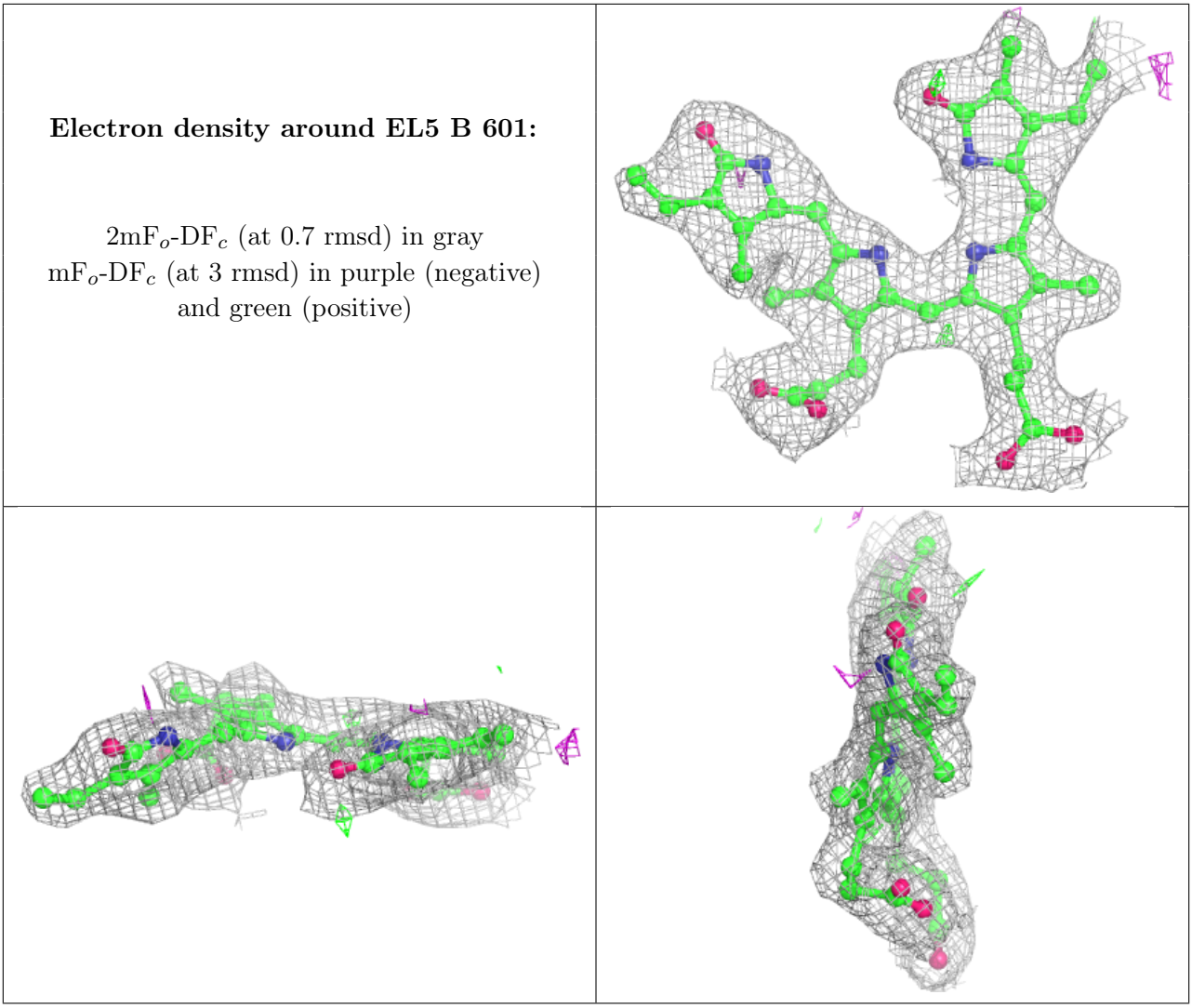






Electron density around EL5 B 601:

$2mF_o$-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.