



wwPDB X-ray Structure Validation Summary Report ⓘ

Mar 20, 2026 – 09:41 AM UTC

PDB ID : 3NHQ / pdb_00003nhq
Title : The dark Pfr structure of the photosensory core module of *P. aeruginosa* Bacteriophytochrome
Authors : Yang, X.; Ren, Z.; Kuk, J.; Moffat, K.
Deposited on : 2010-06-14
Resolution : 2.55 Å(reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

MolProbity	:	4-5-2 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

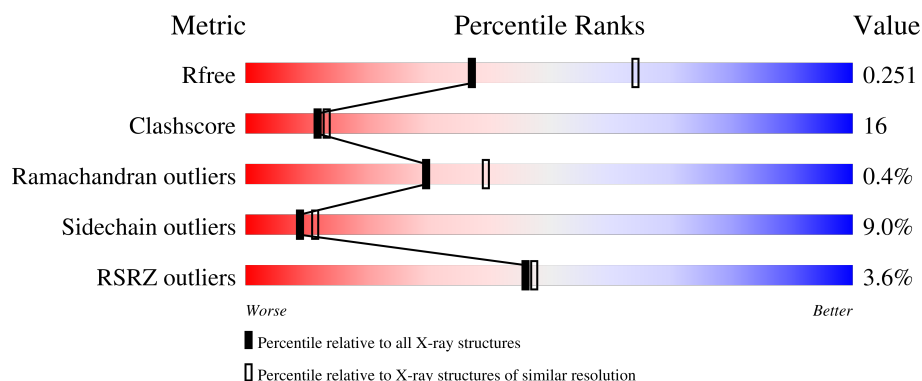
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.55 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	180053	1091 (2.54-2.54)
Clashscore	190562	1120 (2.54-2.54)
Ramachandran outliers	187476	1106 (2.54-2.54)
Sidechain outliers	187428	1106 (2.54-2.54)
RSRZ outliers	180081	1091 (2.54-2.54)

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	A	505	3% 62% 29% • 5%
1	B	505	5% 62% 26% 5% 7%
1	C	505	• 66% 26% • 5%
1	D	505	3% 63% 28% • 5%
1	E	505	4% 62% 28% 5% 5%

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Mol	Chain	Length	Quality of chain
1	F	505	5% 62% 26% 5% 7%
1	G	505	2% 64% 26% 5% 5%
1	H	505	4% 63% 29% • 5%

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 30788 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.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	479	Total	C	N	O	S	0	0	0
			3790	2386	682	703	19			
1	B	470	Total	C	N	O	S	0	0	0
			3709	2332	665	693	19			
1	C	482	Total	C	N	O	S	0	0	0
			3812	2398	688	707	19			
1	D	480	Total	C	N	O	S	0	0	0
			3801	2391	686	705	19			
1	E	479	Total	C	N	O	S	0	0	0
			3790	2386	683	702	19			
1	F	471	Total	C	N	O	S	0	0	0
			3717	2338	666	694	19			
1	G	482	Total	C	N	O	S	0	1	0
			3816	2401	688	708	19			
1	H	481	Total	C	N	O	S	0	0	0
			3808	2396	687	706	19			

There are 64 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	498	LEU	-	expression tag	UNP Q9HWR3
A	499	GLU	-	expression tag	UNP Q9HWR3
A	500	HIS	-	expression tag	UNP Q9HWR3
A	501	HIS	-	expression tag	UNP Q9HWR3
A	502	HIS	-	expression tag	UNP Q9HWR3
A	503	HIS	-	expression tag	UNP Q9HWR3
A	504	HIS	-	expression tag	UNP Q9HWR3
A	505	HIS	-	expression tag	UNP Q9HWR3
B	498	LEU	-	expression tag	UNP Q9HWR3
B	499	GLU	-	expression tag	UNP Q9HWR3
B	500	HIS	-	expression tag	UNP Q9HWR3
B	501	HIS	-	expression tag	UNP Q9HWR3
B	502	HIS	-	expression tag	UNP Q9HWR3

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Chain	Residue	Modelled	Actual	Comment	Reference
B	503	HIS	-	expression tag	UNP Q9HWR3
B	504	HIS	-	expression tag	UNP Q9HWR3
B	505	HIS	-	expression tag	UNP Q9HWR3
C	498	LEU	-	expression tag	UNP Q9HWR3
C	499	GLU	-	expression tag	UNP Q9HWR3
C	500	HIS	-	expression tag	UNP Q9HWR3
C	501	HIS	-	expression tag	UNP Q9HWR3
C	502	HIS	-	expression tag	UNP Q9HWR3
C	503	HIS	-	expression tag	UNP Q9HWR3
C	504	HIS	-	expression tag	UNP Q9HWR3
C	505	HIS	-	expression tag	UNP Q9HWR3
D	498	LEU	-	expression tag	UNP Q9HWR3
D	499	GLU	-	expression tag	UNP Q9HWR3
D	500	HIS	-	expression tag	UNP Q9HWR3
D	501	HIS	-	expression tag	UNP Q9HWR3
D	502	HIS	-	expression tag	UNP Q9HWR3
D	503	HIS	-	expression tag	UNP Q9HWR3
D	504	HIS	-	expression tag	UNP Q9HWR3
D	505	HIS	-	expression tag	UNP Q9HWR3
E	498	LEU	-	expression tag	UNP Q9HWR3
E	499	GLU	-	expression tag	UNP Q9HWR3
E	500	HIS	-	expression tag	UNP Q9HWR3
E	501	HIS	-	expression tag	UNP Q9HWR3
E	502	HIS	-	expression tag	UNP Q9HWR3
E	503	HIS	-	expression tag	UNP Q9HWR3
E	504	HIS	-	expression tag	UNP Q9HWR3
E	505	HIS	-	expression tag	UNP Q9HWR3
F	498	LEU	-	expression tag	UNP Q9HWR3
F	499	GLU	-	expression tag	UNP Q9HWR3
F	500	HIS	-	expression tag	UNP Q9HWR3
F	501	HIS	-	expression tag	UNP Q9HWR3
F	502	HIS	-	expression tag	UNP Q9HWR3
F	503	HIS	-	expression tag	UNP Q9HWR3
F	504	HIS	-	expression tag	UNP Q9HWR3
F	505	HIS	-	expression tag	UNP Q9HWR3
G	498	LEU	-	expression tag	UNP Q9HWR3
G	499	GLU	-	expression tag	UNP Q9HWR3
G	500	HIS	-	expression tag	UNP Q9HWR3
G	501	HIS	-	expression tag	UNP Q9HWR3
G	502	HIS	-	expression tag	UNP Q9HWR3
G	503	HIS	-	expression tag	UNP Q9HWR3
G	504	HIS	-	expression tag	UNP Q9HWR3

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Chain	Residue	Modelled	Actual	Comment	Reference
G	505	HIS	-	expression tag	UNP Q9HWR3
H	498	LEU	-	expression tag	UNP Q9HWR3
H	499	GLU	-	expression tag	UNP Q9HWR3
H	500	HIS	-	expression tag	UNP Q9HWR3
H	501	HIS	-	expression tag	UNP Q9HWR3
H	502	HIS	-	expression tag	UNP Q9HWR3
H	503	HIS	-	expression tag	UNP Q9HWR3
H	504	HIS	-	expression tag	UNP Q9HWR3
H	505	HIS	-	expression tag	UNP Q9HWR3

- # BLA

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



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

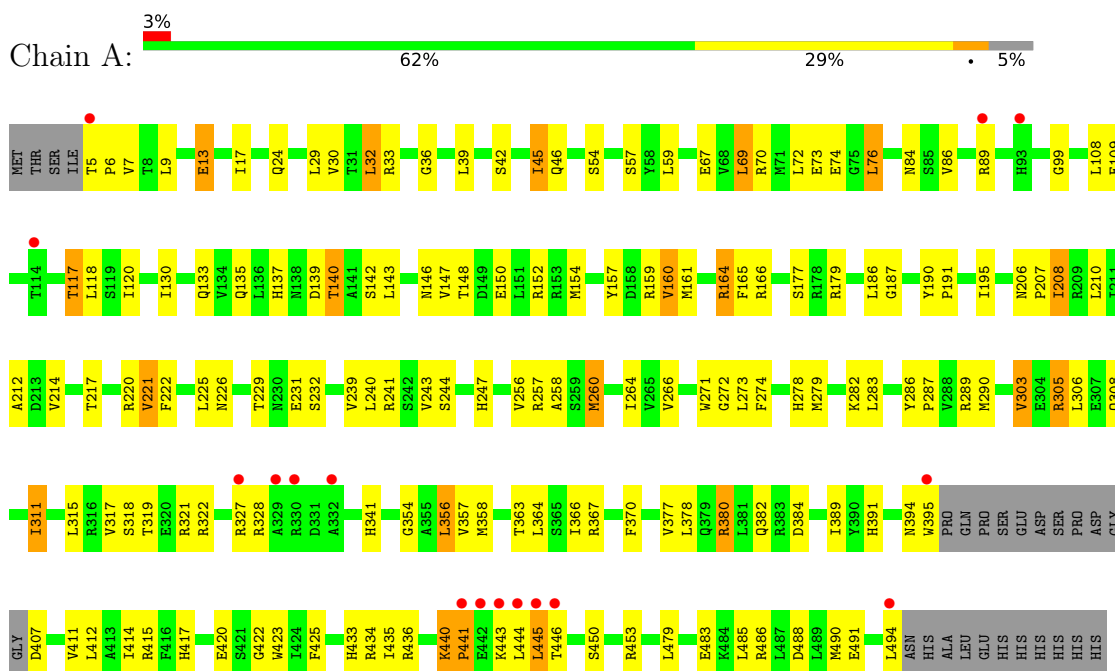
- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	61	Total	O	0	0
			61	61		
3	B	16	Total	O	0	0
			16	16		
3	C	44	Total	O	0	0
			44	44		
3	D	14	Total	O	0	0
			14	14		
3	E	15	Total	O	0	0
			15	15		
3	F	7	Total	O	0	0
			7	7		
3	G	37	Total	O	0	0
			37	37		
3	H	7	Total	O	0	0
			7	7		

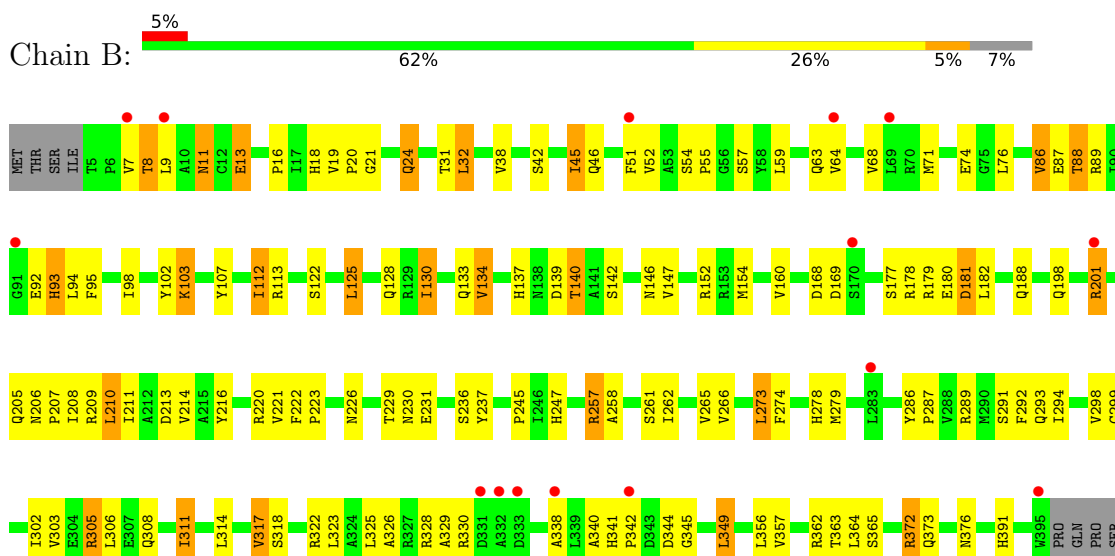
3 Residue-property plots [i](#)

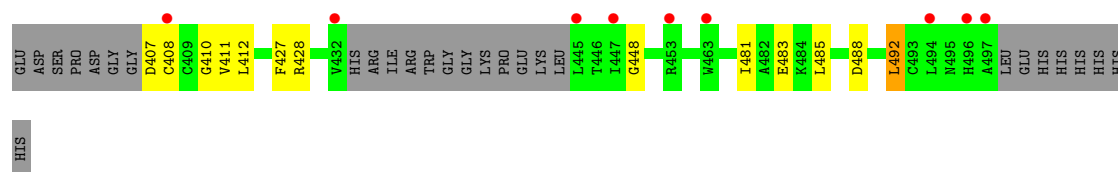
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. 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

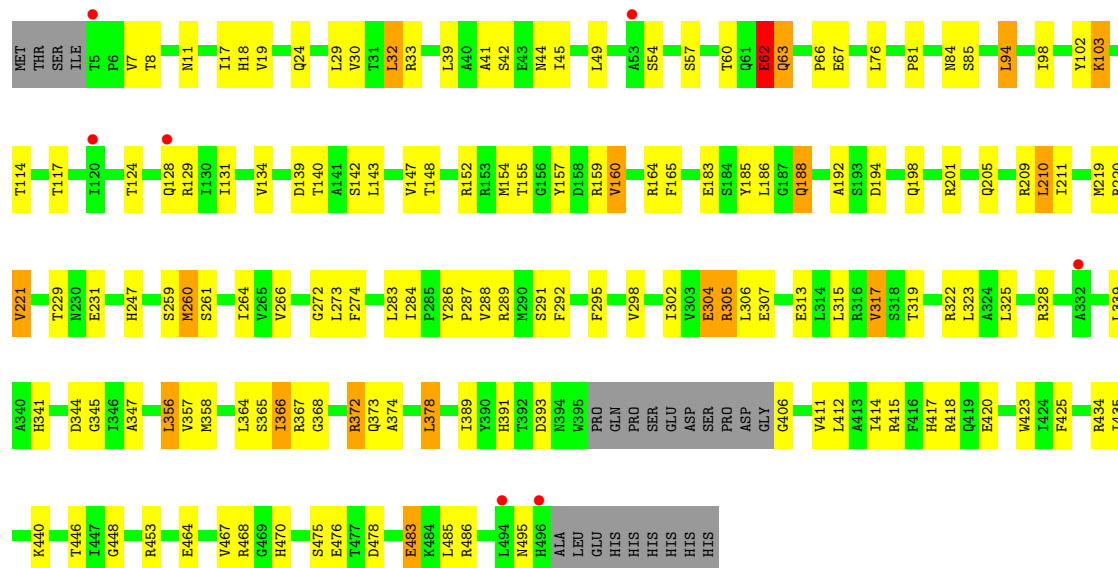


• Molecule 1: Bacteriophytochrome

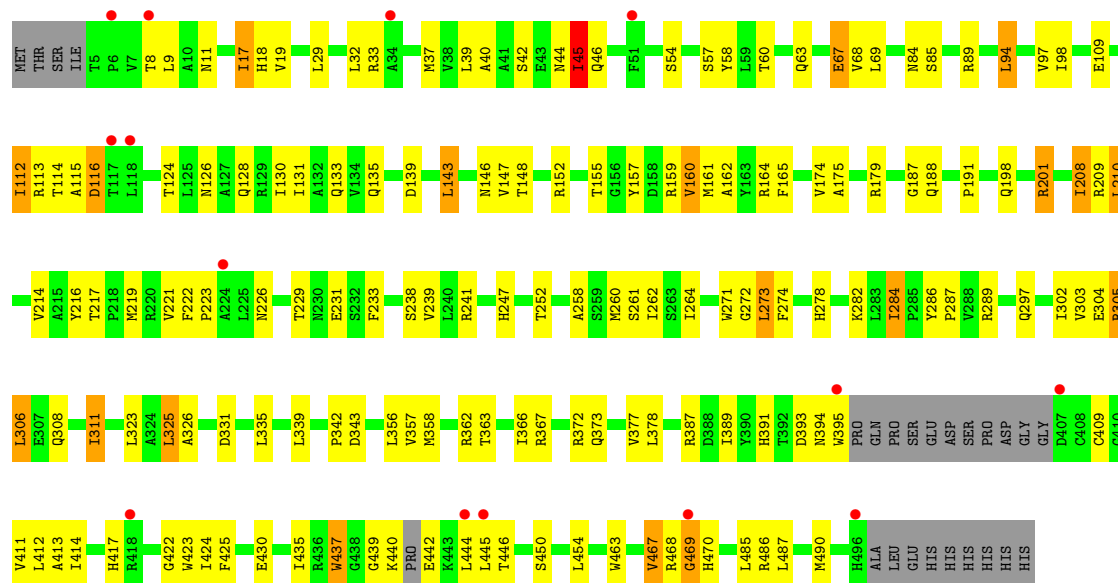




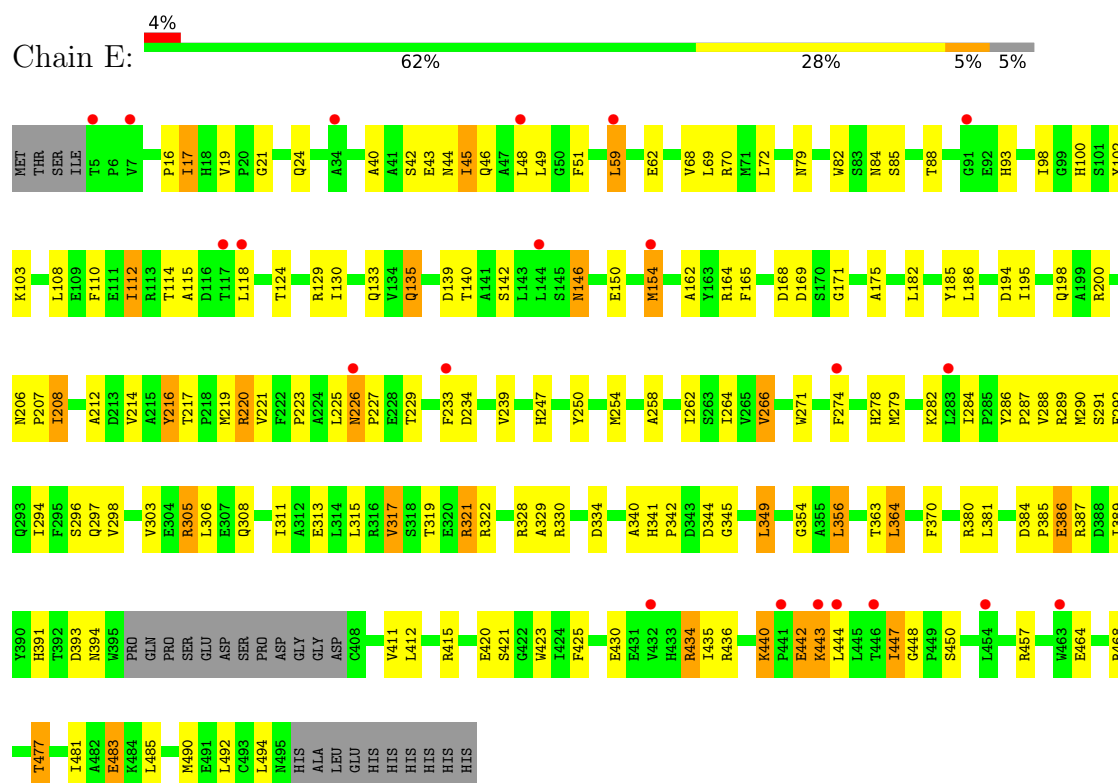
• Molecule 1: Bacteriophytochrome

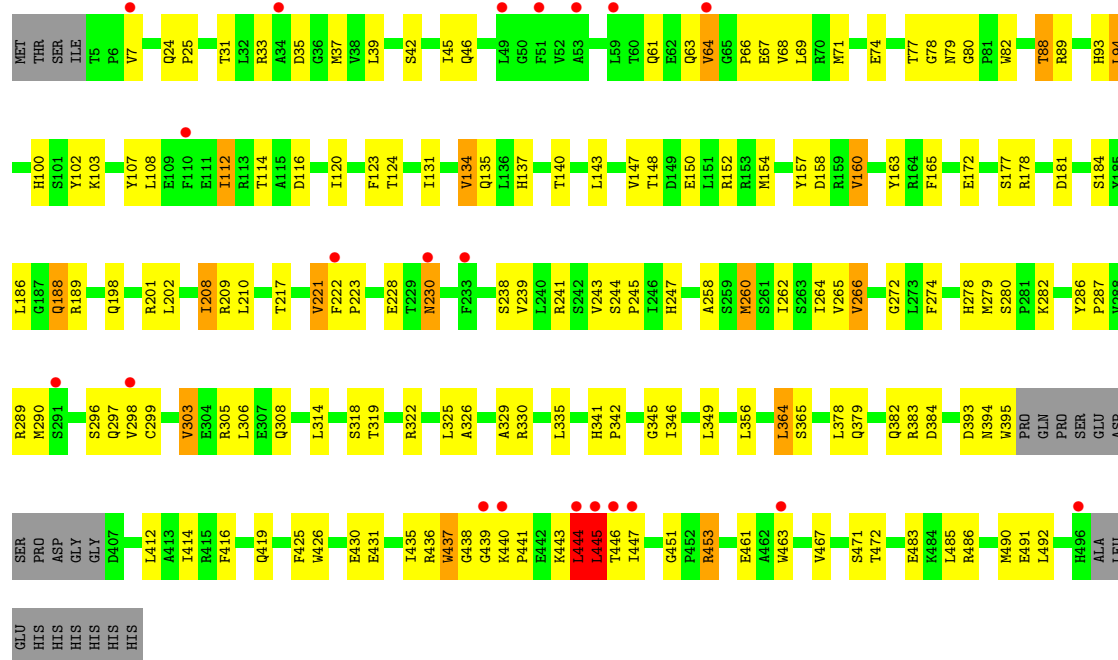


• Molecule 1: Bacteriophytochrome



• Molecule 1: Bacteriophytochrome





4 Data and refinement statistics

Property	Value	Source
Space group	C 2 2 21	Depositor
Cell constants a, b, c, α , β , γ	154.38Å 162.98Å 436.10Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	48.48 – 2.55 48.48 – 2.55	Depositor EDS
% Data completeness (in resolution range)	82.9 (48.48-2.55) 82.9 (48.48-2.55)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.07 (at 2.51Å)	Xtriage
Refinement program	PHENIX (phenix.refine: 1.6.1_357)	Depositor
R, R_{free}	0.215 , 0.258 0.210 , 0.251	Depositor DCC
R_{free} test set	7437 reflections (4.07%)	wwPDB-VP
Wilson B-factor (Å ²)	56.2	Xtriage
Anisotropy	0.538	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.31 , 63.2	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	30788	wwPDB-VP
Average B, all atoms (Å ²)	83.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.19% 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: BLA

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	0.35	0/3874	0.77	4/5258 (0.1%)
1	B	0.31	0/3789	0.77	6/5144 (0.1%)
1	C	0.33	0/3897	0.77	5/5289 (0.1%)
1	D	0.31	0/3884	0.77	3/5269 (0.1%)
1	E	0.30	0/3874	0.75	4/5258 (0.1%)
1	F	0.31	0/3797	0.79	6/5155 (0.1%)
1	G	0.33	0/3904	0.77	3/5299 (0.1%)
1	H	0.30	0/3893	0.77	5/5284 (0.1%)
All	All	0.32	0/30912	0.77	36/41956 (0.1%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	2
1	B	0	1
1	C	0	1
All	All	0	4

There are no bond length outliers.

The worst 5 of 36 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	63	GLN	N-CA-C	-9.30	102.07	113.97
1	F	116	ASP	N-CA-C	8.08	119.72	111.07
1	H	451	GLY	CA-C-N	6.40	126.96	120.04
1	H	451	GLY	C-N-CA	6.40	126.96	120.04
1	D	469	GLY	N-CA-C	-6.32	106.03	114.25

There are no chirality outliers.

All (4) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	407	ASP	Peptide
1	A	441	PRO	Peptide
1	B	92	GLU	Peptide
1	C	62	GLU	Peptide

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	3790	0	3734	110	0
1	B	3709	0	3641	125	0
1	C	3812	0	3750	110	0
1	D	3801	0	3739	128	0
1	E	3790	0	3736	131	0
1	F	3717	0	3652	131	0
1	G	3816	0	3757	122	0
1	H	3808	0	3747	122	0
2	A	43	0	30	2	0
2	B	43	0	31	6	0
2	C	43	0	31	9	0
2	D	43	0	31	4	0
2	E	43	0	30	6	0
2	F	43	0	31	8	0
2	G	43	0	30	5	0
2	H	43	0	31	5	0
3	A	61	0	0	4	0
3	B	16	0	0	1	0
3	C	44	0	0	4	0
3	D	14	0	0	6	0
3	E	15	0	0	4	0
3	F	7	0	0	1	0
3	G	37	0	0	0	0
3	H	7	0	0	0	0
All	All	30788	0	30001	955	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 16.

The worst 5 of 955 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:F:70:ARG:HG3	1:F:70:ARG:HH11	1.00	1.10
1:H:444:LEU:HD23	1:H:444:LEU:H	1.26	0.96
1:F:70:ARG:HG3	1:F:70:ARG:NH1	1.76	0.93
1:A:290:MET:HE3	1:B:128:GLN:HE22	1.34	0.93
1:G:84:ASN:HD22	1:G:85:SER:H	1.02	0.92

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	475/505 (94%)	442 (93%)	30 (6%)	3 (1%)	21	29
1	B	464/505 (92%)	436 (94%)	28 (6%)	0	100	100
1	C	478/505 (95%)	455 (95%)	20 (4%)	3 (1%)	21	29
1	D	474/505 (94%)	451 (95%)	23 (5%)	0	100	100
1	E	475/505 (94%)	452 (95%)	22 (5%)	1 (0%)	43	56
1	F	465/505 (92%)	436 (94%)	27 (6%)	2 (0%)	30	39
1	G	479/505 (95%)	460 (96%)	18 (4%)	1 (0%)	43	56
1	H	477/505 (94%)	444 (93%)	28 (6%)	5 (1%)	12	17
All	All	3787/4040 (94%)	3576 (94%)	196 (5%)	15 (0%)	30	39

5 of 15 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	445	LEU
1	H	444	LEU

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Mol	Chain	Res	Type
1	H	445	LEU
1	E	443	LYS
1	A	441	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	408/431 (95%)	371 (91%)	37 (9%)	9	11
1	B	400/431 (93%)	363 (91%)	37 (9%)	8	10
1	C	410/431 (95%)	376 (92%)	34 (8%)	10	14
1	D	409/431 (95%)	381 (93%)	28 (7%)	14	20
1	E	408/431 (95%)	366 (90%)	42 (10%)	7	8
1	F	401/431 (93%)	364 (91%)	37 (9%)	8	10
1	G	411/431 (95%)	375 (91%)	36 (9%)	9	12
1	H	410/431 (95%)	367 (90%)	43 (10%)	6	8
All	All	3257/3448 (94%)	2963 (91%)	294 (9%)	9	11

5 of 294 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	G	164	ARG
1	H	444	LEU
1	G	303	VAL
1	H	134	VAL
1	C	325	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 97 such sidechains are listed below:

Mol	Chain	Res	Type
1	F	24	GLN
1	G	84	ASN

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Mol	Chain	Res	Type
1	F	84	ASN
1	F	198	GLN
1	G	205	GLN

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 ⓘ

8 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	BLA	B	900	1	46,46,46	2.58	16 (34%)	66,67,67	1.64	13 (19%)
2	BLA	A	900	1	46,46,46	2.50	18 (39%)	66,67,67	1.54	13 (19%)
2	BLA	D	900	1	46,46,46	2.58	16 (34%)	66,67,67	1.68	11 (16%)
2	BLA	H	900	1	46,46,46	2.53	16 (34%)	66,67,67	1.55	12 (18%)
2	BLA	F	900	1	46,46,46	2.53	14 (30%)	66,67,67	1.58	12 (18%)
2	BLA	E	900	1	46,46,46	2.59	17 (36%)	66,67,67	1.61	12 (18%)
2	BLA	G	900	1	46,46,46	2.56	16 (34%)	66,67,67	1.53	13 (19%)
2	BLA	C	900	1	46,46,46	2.52	18 (39%)	66,67,67	1.54	12 (18%)

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	BLA	B	900	1	-	11/26/74/74	0/4/4/4
2	BLA	A	900	1	-	12/26/74/74	0/4/4/4
2	BLA	D	900	1	-	6/26/74/74	0/4/4/4
2	BLA	H	900	1	-	10/26/74/74	0/4/4/4
2	BLA	F	900	1	-	10/26/74/74	0/4/4/4
2	BLA	E	900	1	-	14/26/74/74	0/4/4/4
2	BLA	G	900	1	-	12/26/74/74	0/4/4/4
2	BLA	C	900	1	-	8/26/74/74	0/4/4/4

The worst 5 of 131 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	900	BLA	CHD-C4C	6.52	1.53	1.37
2	E	900	BLA	CHD-C4C	6.48	1.53	1.37
2	F	900	BLA	CHD-C4C	6.38	1.53	1.37
2	D	900	BLA	CHD-C4C	6.31	1.53	1.37
2	G	900	BLA	CHD-C4C	6.31	1.53	1.37

The worst 5 of 98 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	D	900	BLA	C1A-CHA-C4D	-5.92	115.29	128.22
2	B	900	BLA	C4C-CHD-C1D	-5.78	113.88	128.06
2	E	900	BLA	C4C-CHD-C1D	-5.61	114.28	128.06
2	A	900	BLA	C1A-CHA-C4D	-5.16	116.95	128.22
2	D	900	BLA	C4C-CHD-C1D	-5.07	115.61	128.06

There are no chirality outliers.

5 of 83 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	900	BLA	NB-C1B-CHB-C4A
2	A	900	BLA	C2B-C1B-CHB-C4A
2	B	900	BLA	NB-C1B-CHB-C4A
2	B	900	BLA	C2B-C1B-CHB-C4A
2	C	900	BLA	NB-C1B-CHB-C4A

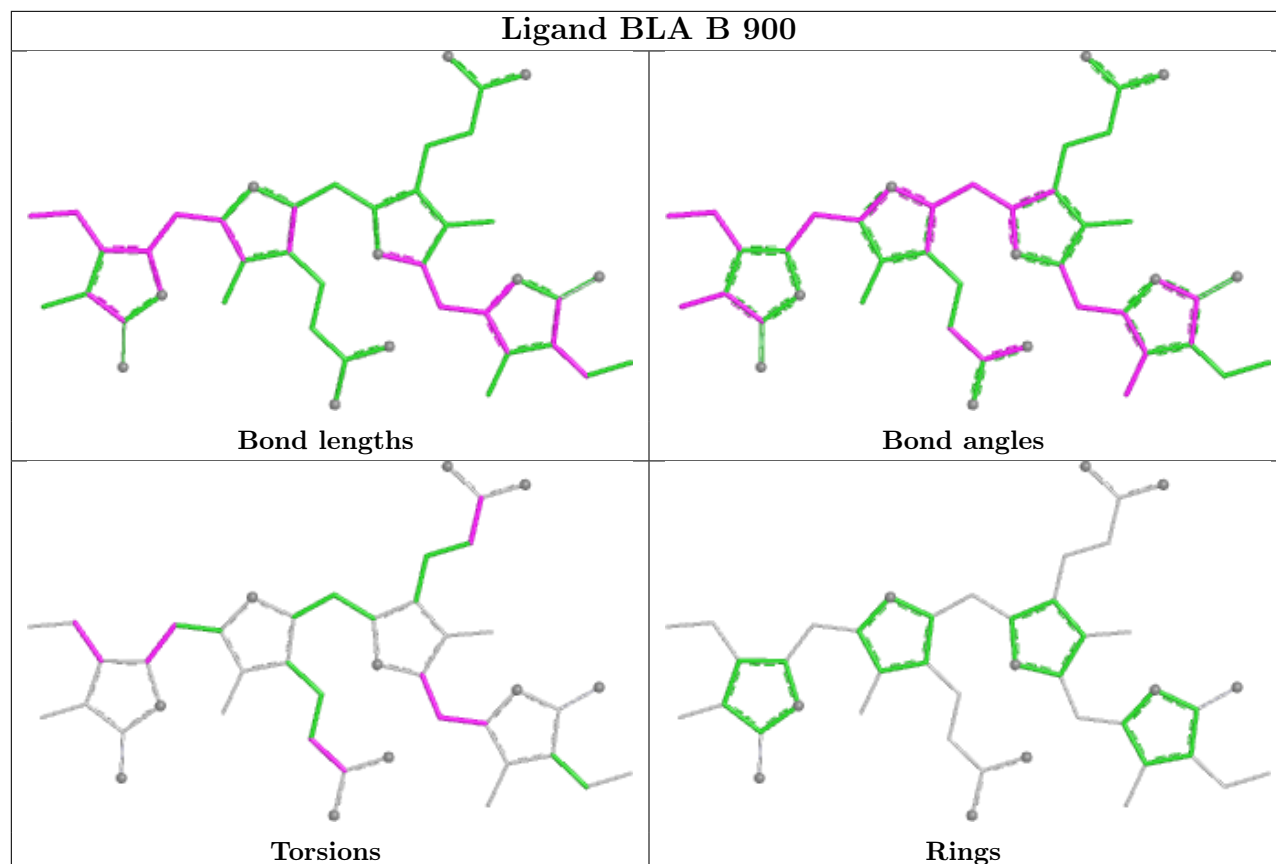
There are no ring outliers.

8 monomers are involved in 45 short contacts:

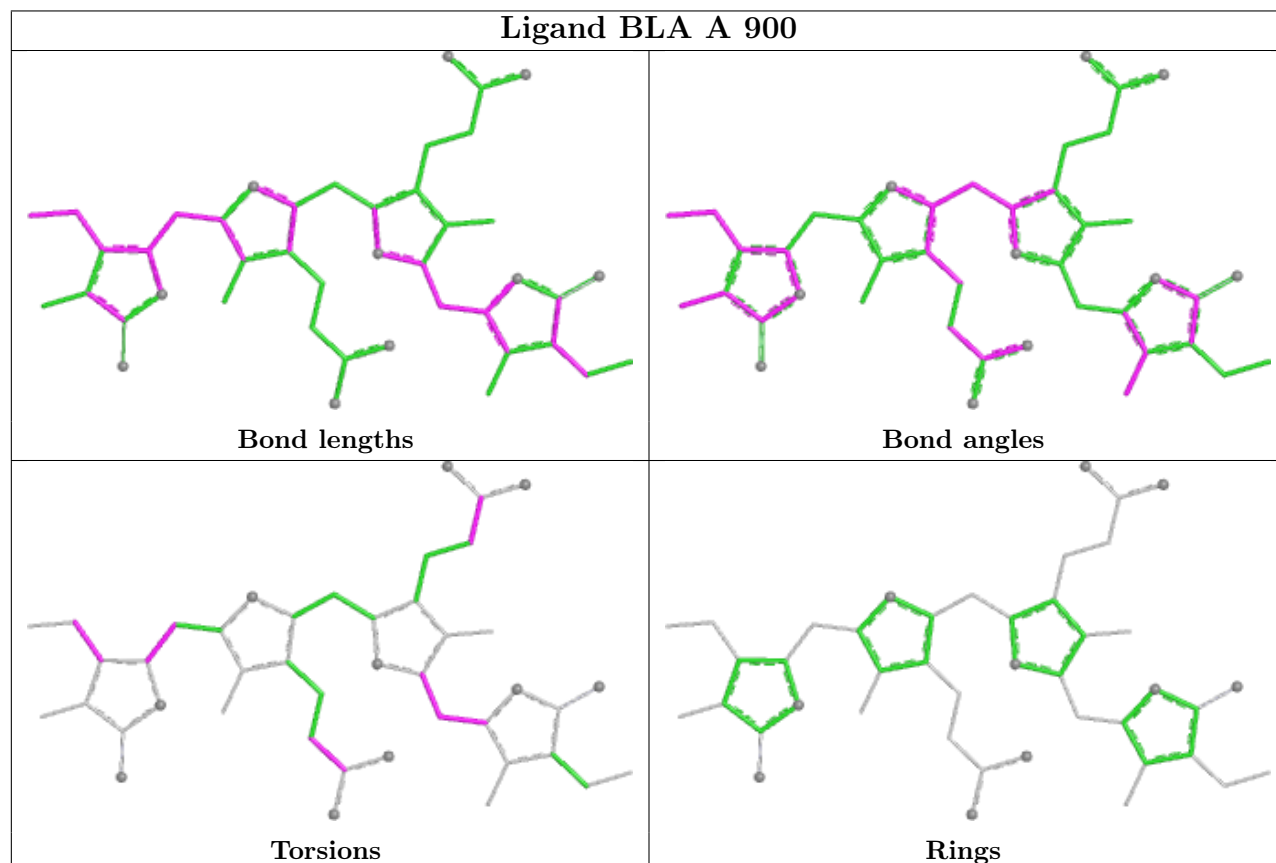
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	900	BLA	6	0
2	A	900	BLA	2	0
2	D	900	BLA	4	0
2	H	900	BLA	5	0
2	F	900	BLA	8	0
2	E	900	BLA	6	0
2	G	900	BLA	5	0
2	C	900	BLA	9	0

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.

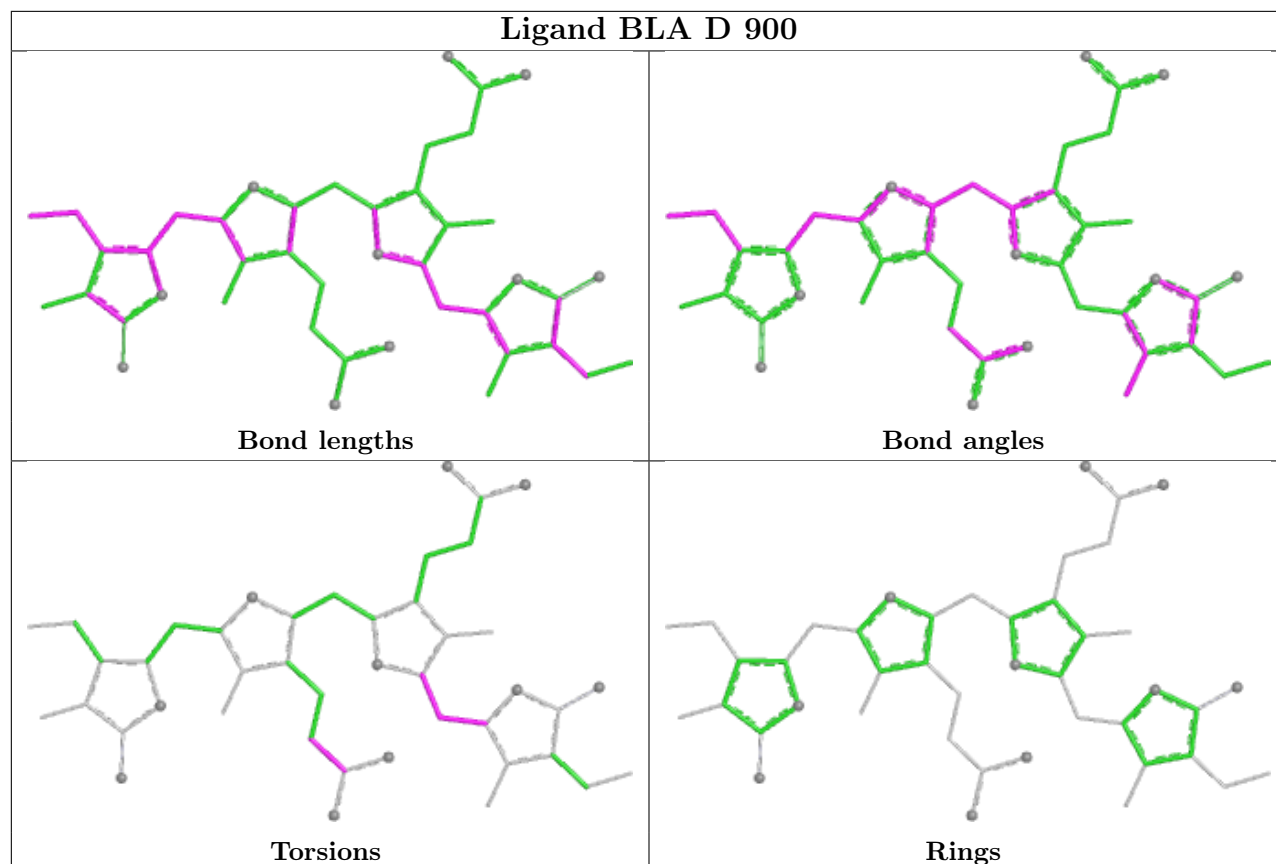
Ligand BLA B 900



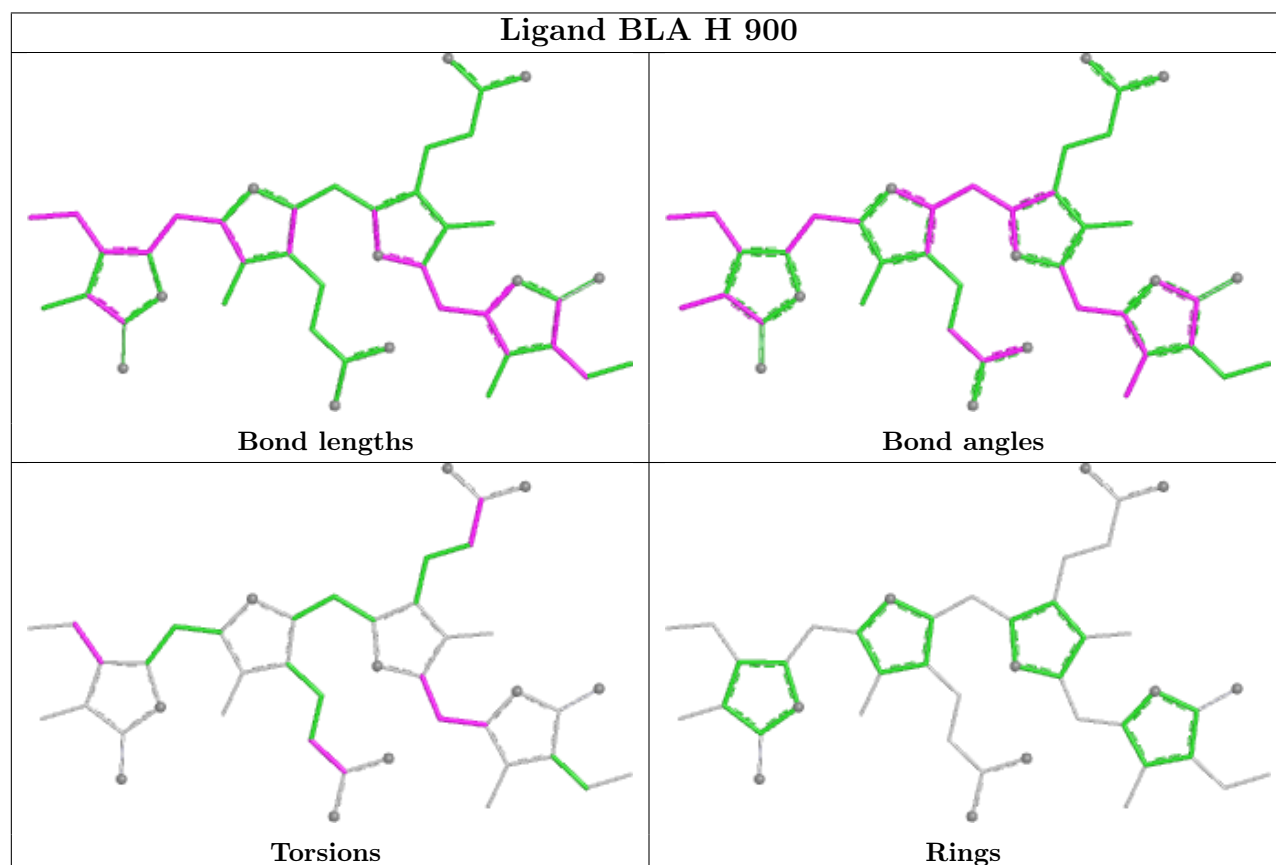
Ligand BLA A 900



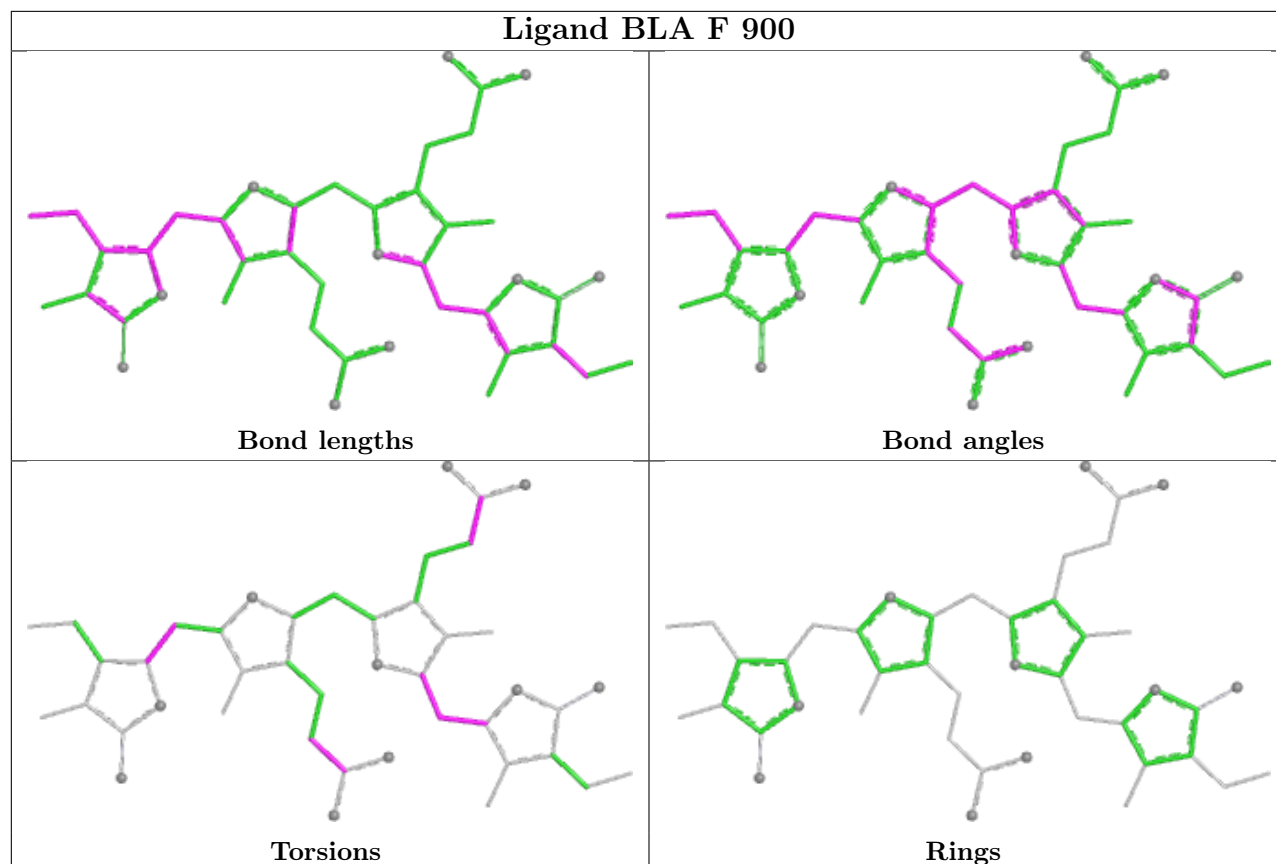
Ligand BLA D 900



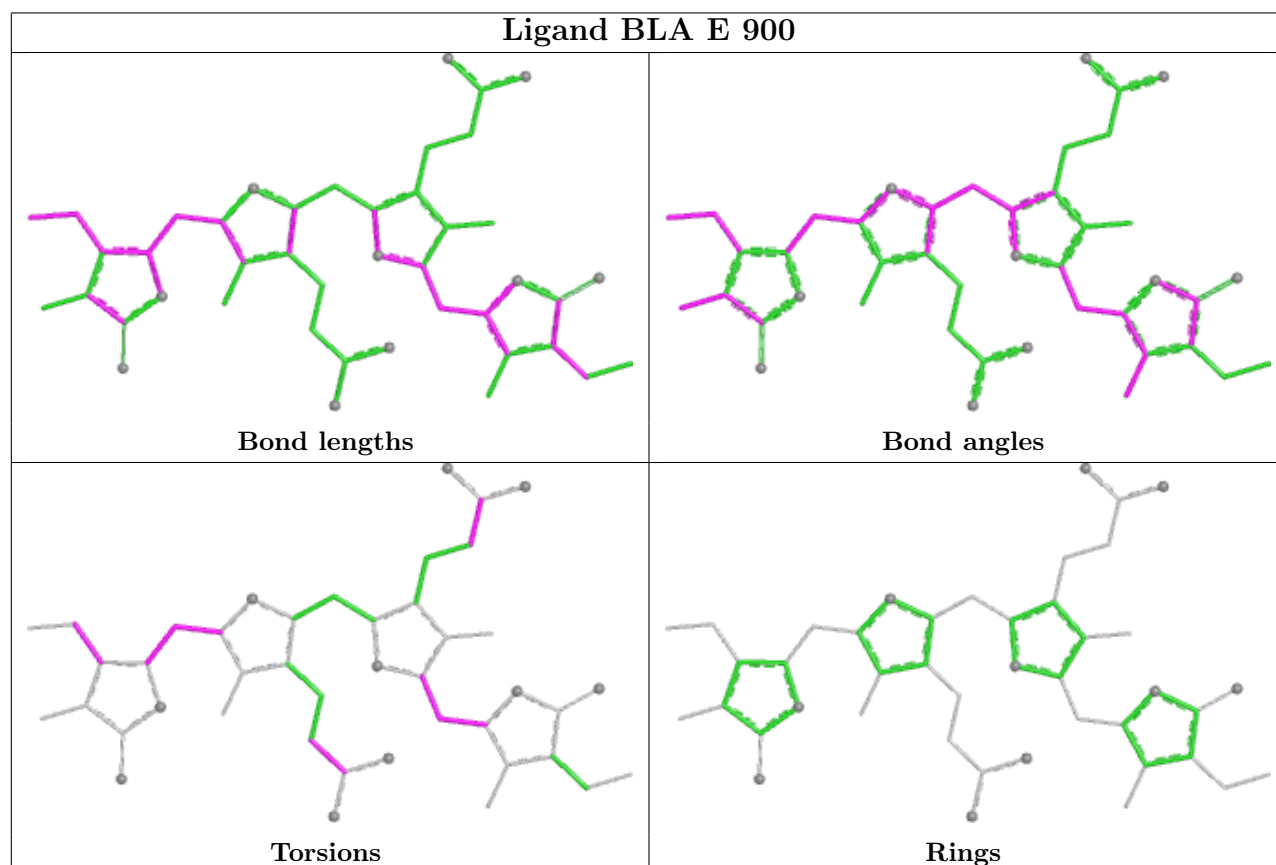
Ligand BLA H 900



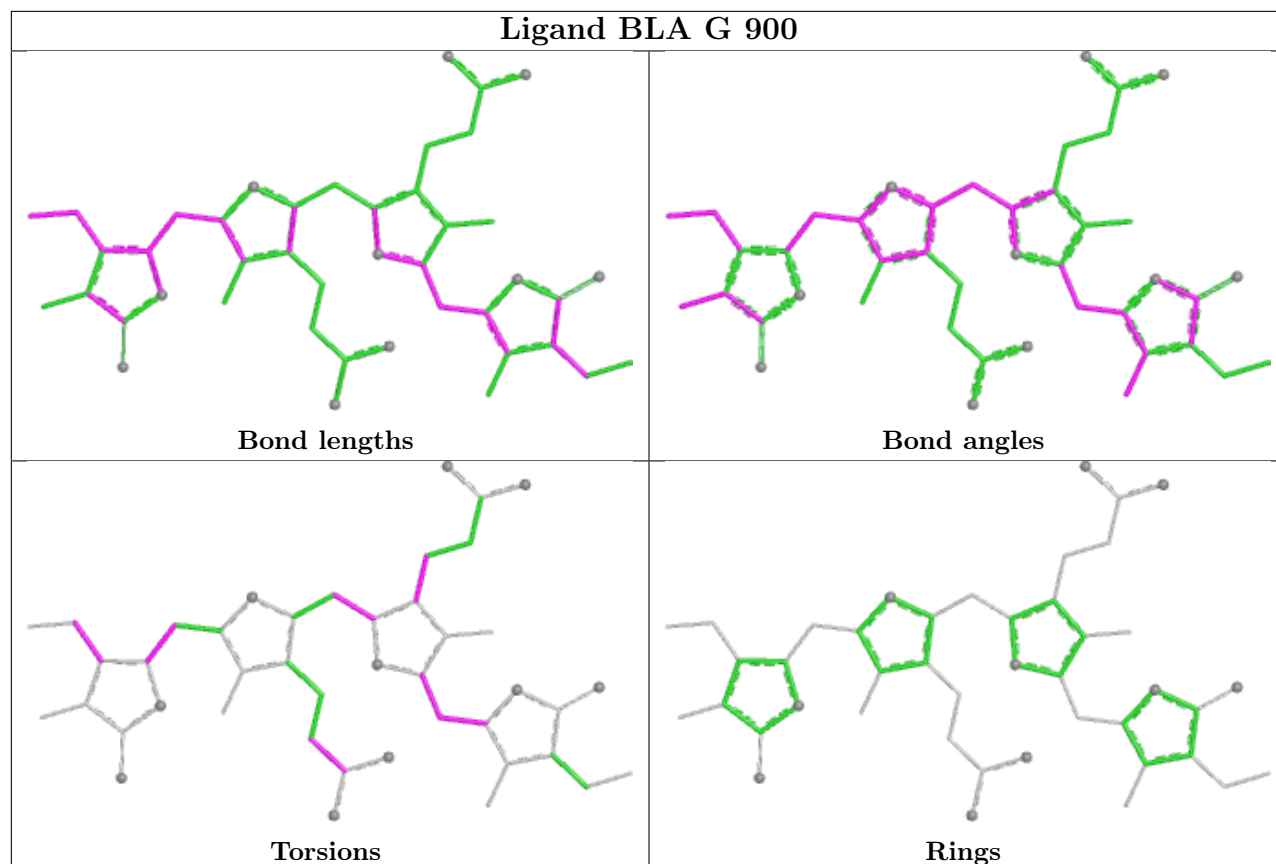
Ligand BLA F 900



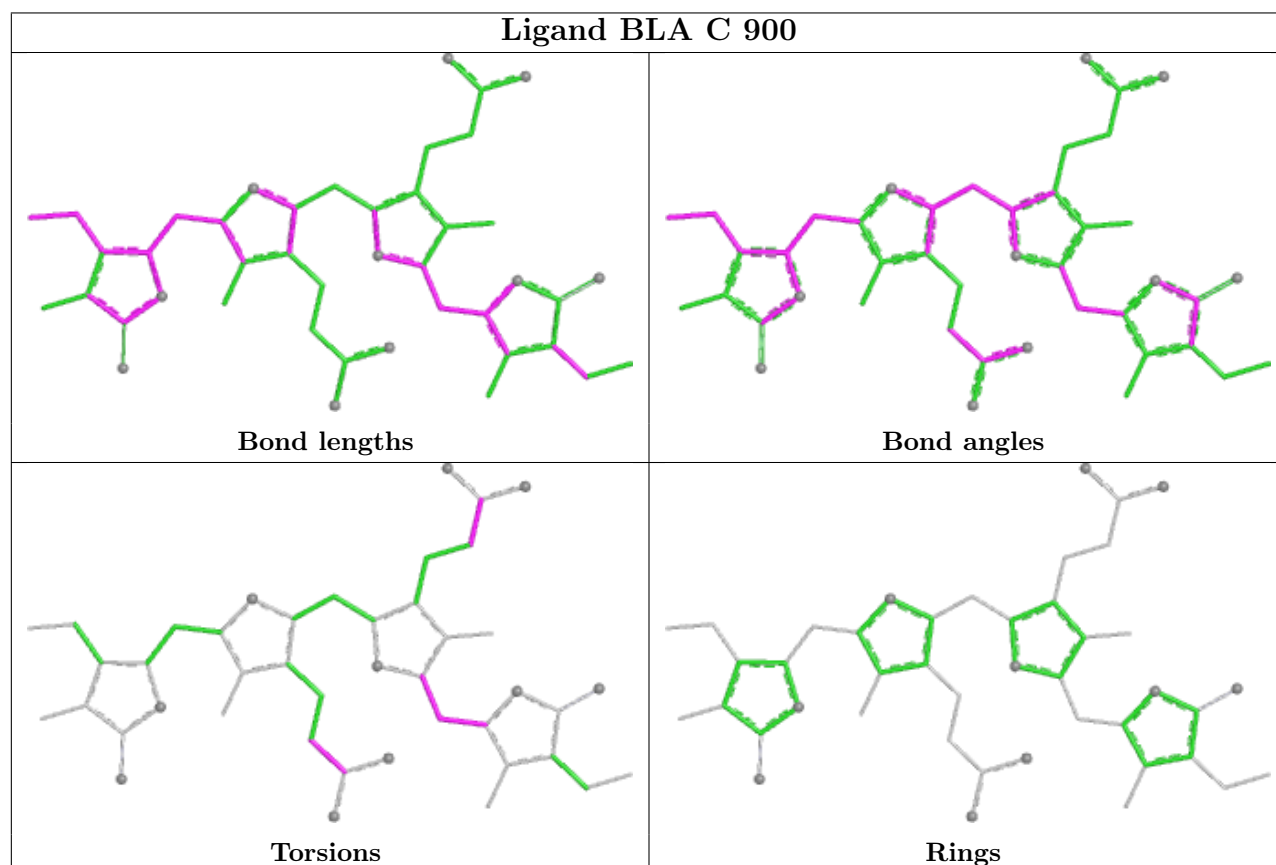
Ligand BLA E 900



Ligand BLA G 900



Ligand BLA C 900



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	479/505 (94%)	-0.01	16 (3%)	49	50	37, 58, 109, 160	0
1	B	470/505 (93%)	0.45	24 (5%)	33	33	43, 88, 136, 183	0
1	C	482/505 (95%)	-0.05	7 (1%)	72	73	39, 61, 102, 147	0
1	D	480/505 (95%)	0.47	14 (2%)	53	55	52, 92, 144, 191	0
1	E	479/505 (94%)	0.50	21 (4%)	39	39	49, 92, 134, 191	0
1	F	471/505 (93%)	0.40	23 (4%)	35	34	41, 81, 144, 171	0
1	G	482/505 (95%)	-0.02	10 (2%)	63	64	31, 63, 105, 165	2 (0%)
1	H	481/505 (95%)	0.54	21 (4%)	39	39	55, 95, 158, 207	0
All	All	3824/4040 (94%)	0.28	136 (3%)	46	47	31, 79, 138, 207	2 (0%)

The worst 5 of 136 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	F	432	VAL	5.9
1	E	59	LEU	4.8
1	B	432	VAL	4.5
1	H	59	LEU	4.5
1	F	59	LEU	4.4

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

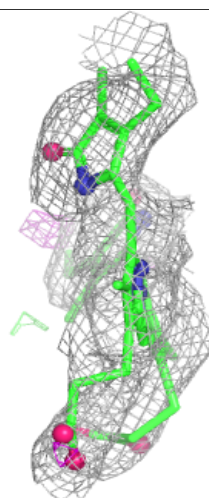
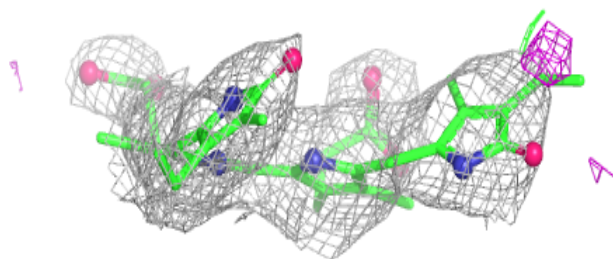
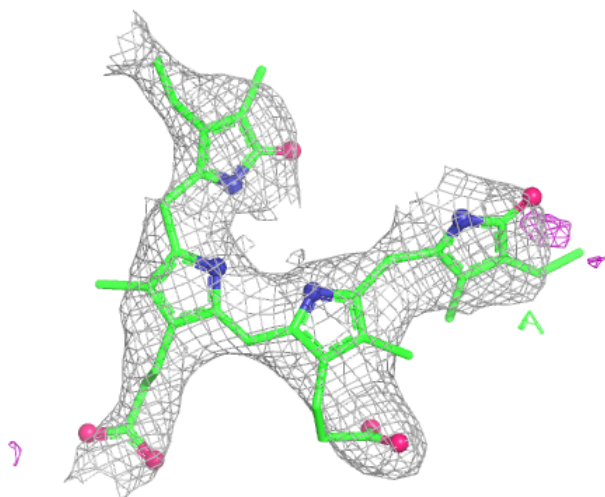
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
2	BLA	E	900	43/43	0.93	0.13	72,92,104,113	0
2	BLA	H	900	43/43	0.94	0.12	64,83,93,105	0
2	BLA	A	900	43/43	0.95	0.08	34,49,64,77	0
2	BLA	F	900	43/43	0.95	0.09	39,60,70,84	0
2	BLA	B	900	43/43	0.95	0.10	60,76,95,107	0
2	BLA	D	900	43/43	0.96	0.09	62,81,95,101	0
2	BLA	C	900	43/43	0.96	0.09	34,54,68,85	0
2	BLA	G	900	43/43	0.97	0.08	37,58,68,89	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.

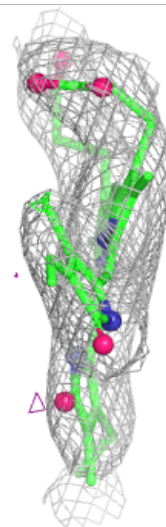
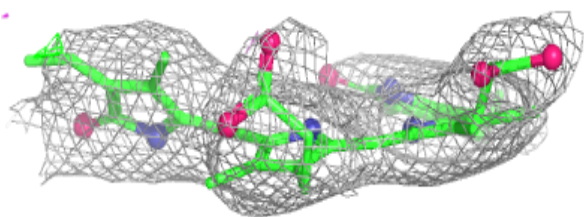
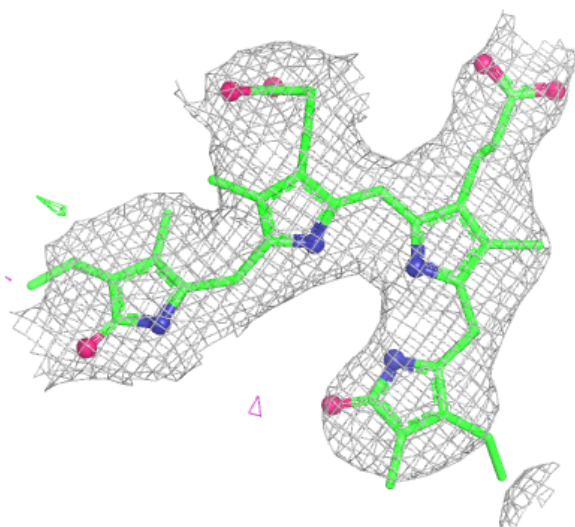
Electron density around BLA E 900:

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



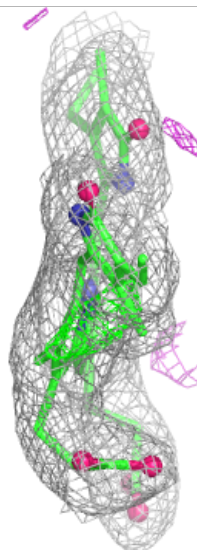
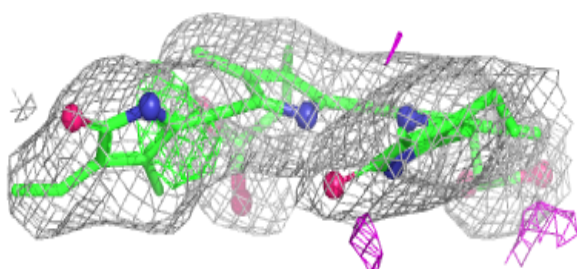
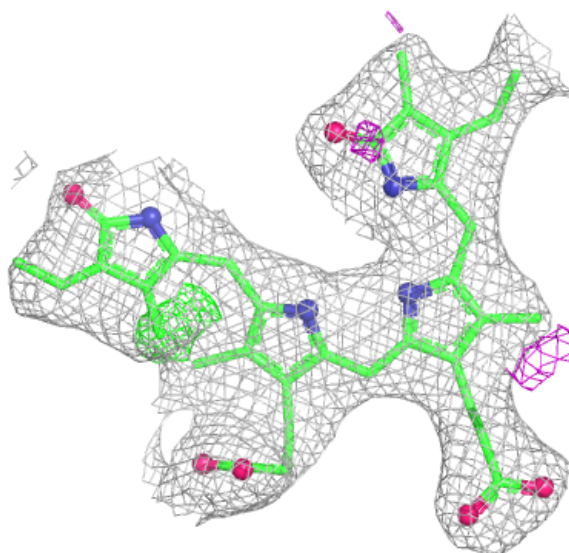
Electron density around BLA H 900:

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



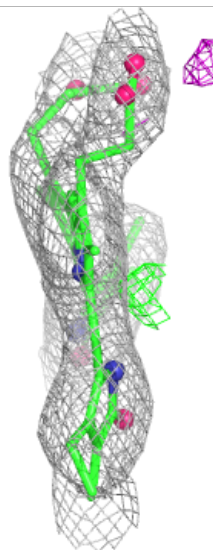
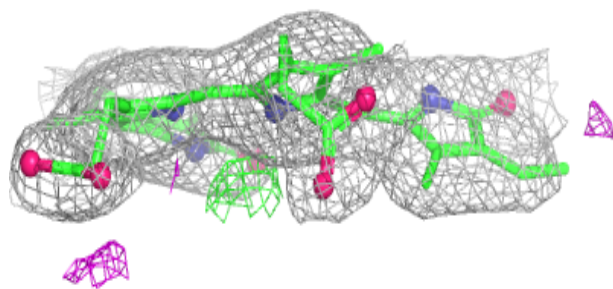
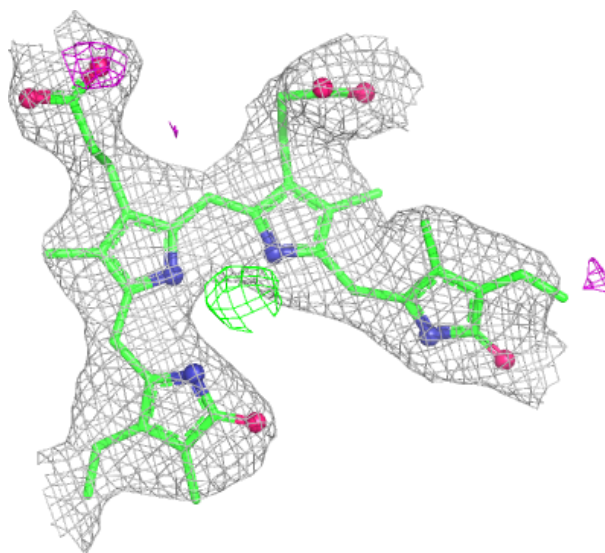
Electron density around BLA A 900:

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



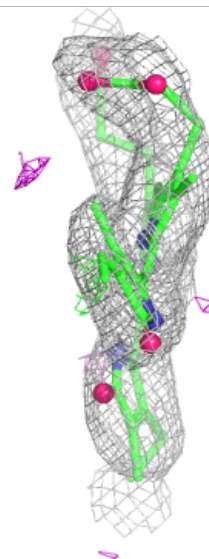
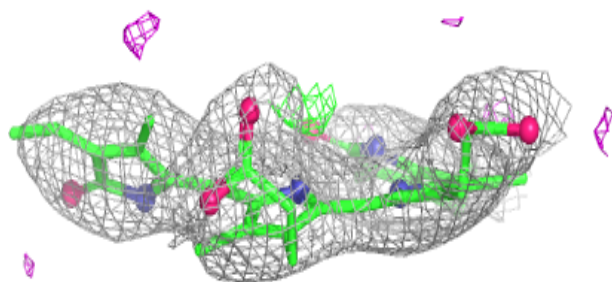
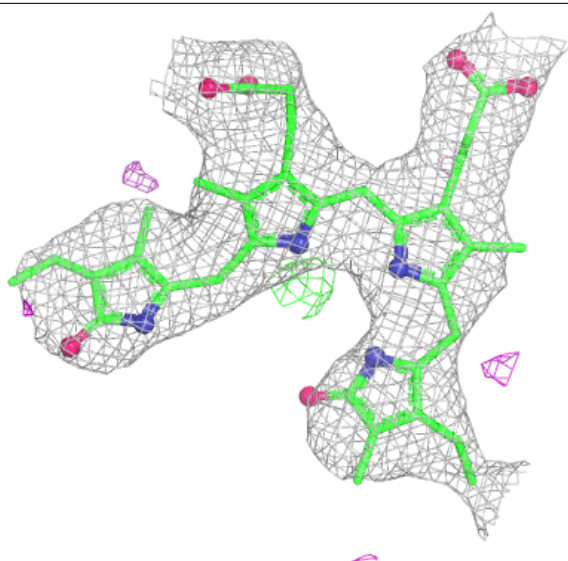
Electron density around BLA F 900:

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



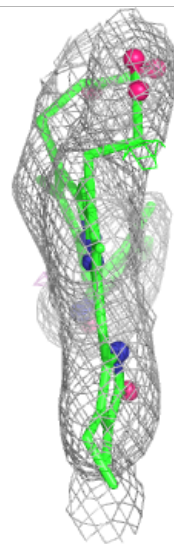
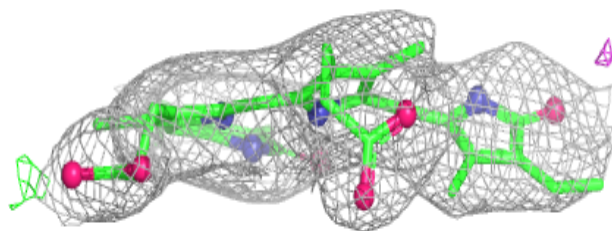
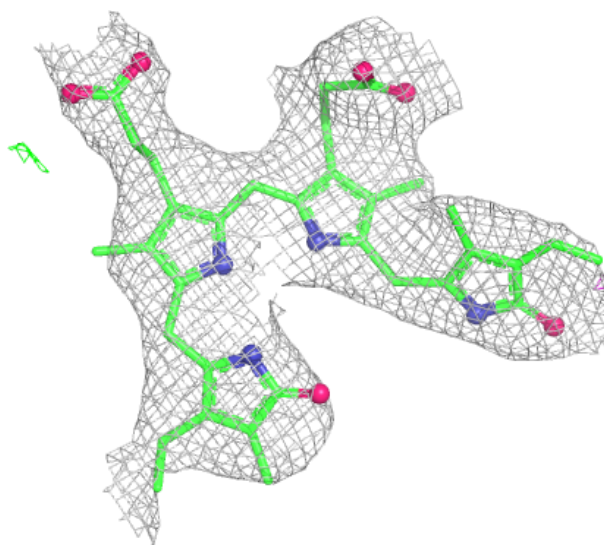
Electron density around BLA B 900:

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



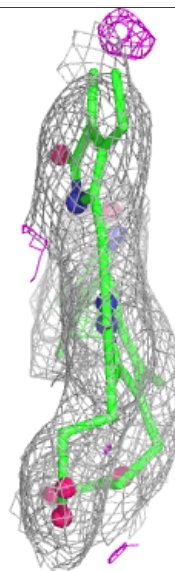
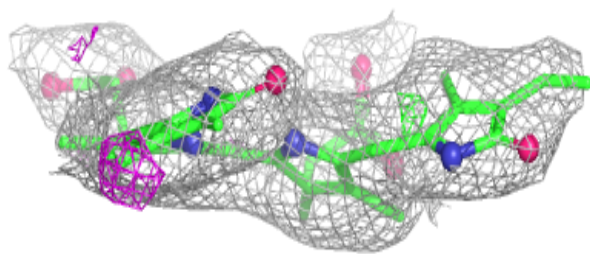
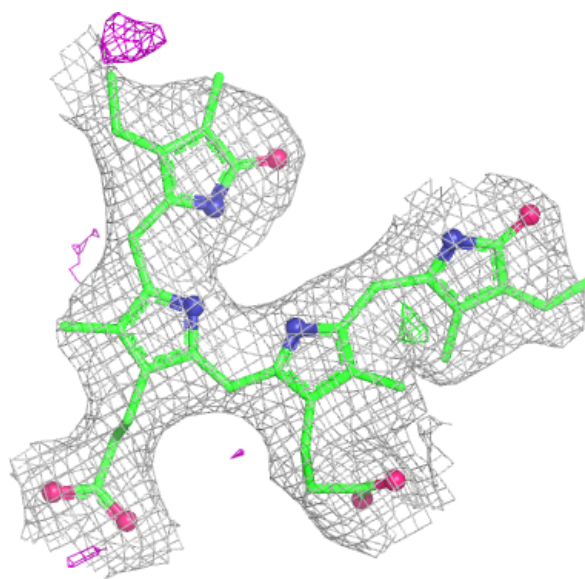
Electron density around BLA D 900:

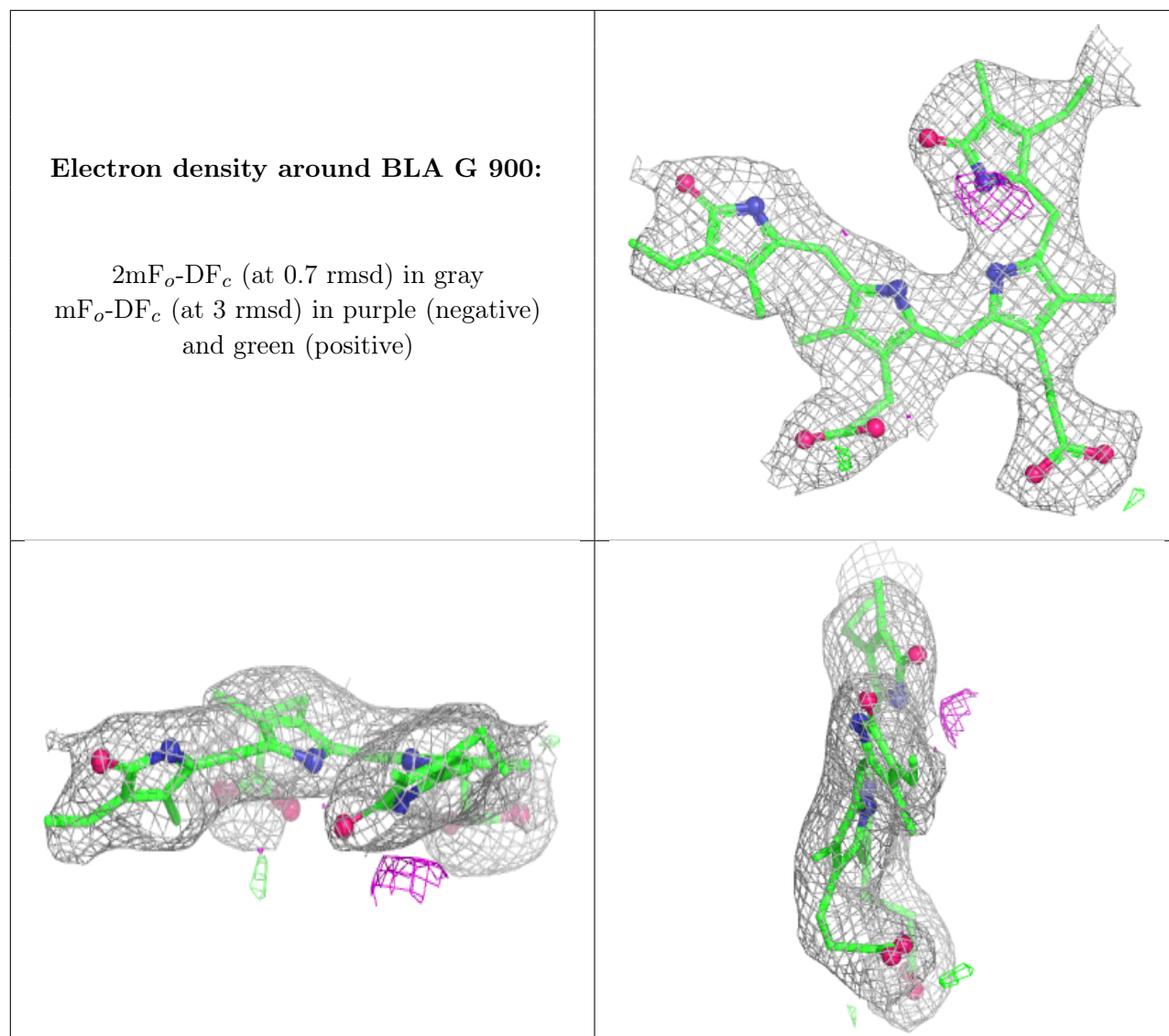
$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



Electron density around BLA C 900:

$2mF_o-DF_c$ (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.