



Full wwPDB X-ray Structure Validation Report ⓘ

May 13, 2020 – 04:31 am BST

PDB ID : 4UBS
Title : The crystal structure of cytochrome P450 105D7 from *Streptomyces avermitilis* in complex with Diclofenac
Authors : Xu, L.H.; Ikeda, H.; Arakawa, T.; Wakagi, T.; Shoun, H.; Fushinobu, S.
Deposited on : 2014-08-13
Resolution : 2.20 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

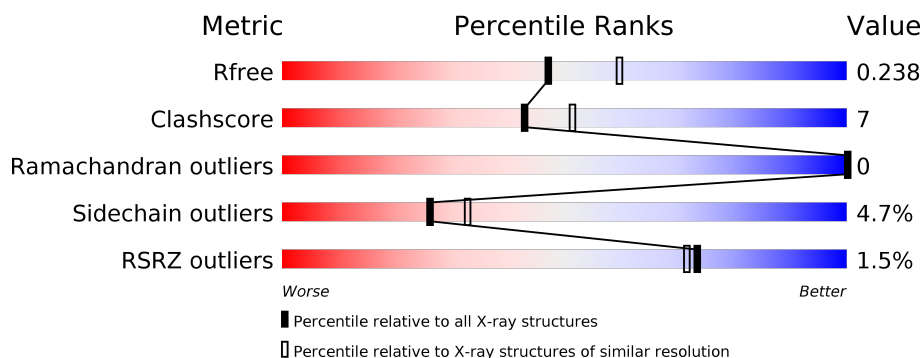
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.20 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	4898 (2.20-2.20)
Clashscore	141614	5594 (2.20-2.20)
Ramachandran outliers	138981	5503 (2.20-2.20)
Sidechain outliers	138945	5504 (2.20-2.20)
RSRZ outliers	127900	4800 (2.20-2.20)

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	393	

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	PEG	A	515	-	-	X	-

2 Entry composition [i](#)

There are 7 unique types of molecules in this entry. The entry contains 3582 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 Pentalenic acid synthase.

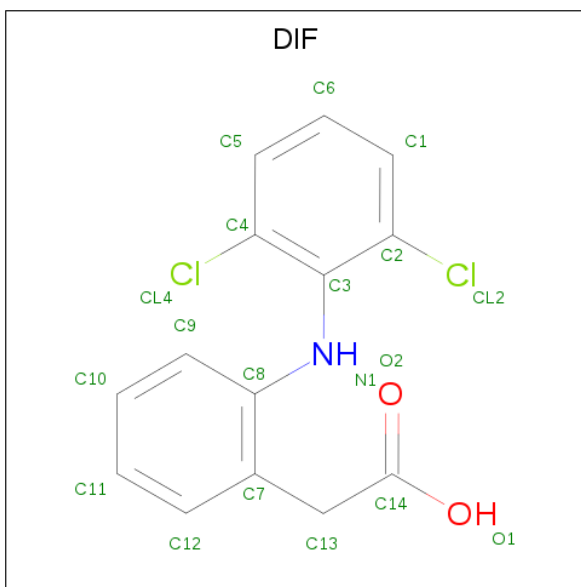
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	393	Total	C	N	O	S	0	0	0
			3044	1918	550	566	10			

- Molecule 2 is PROTOPORPHYRIN IX CONTAINING FE (three-letter code: HEM) (formula: $C_{34}H_{32}FeN_4O_4$).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		

- Molecule 3 is 2-[2,6-DICHLOROPHENYL)AMINO]BENZENEACETIC ACID (three-letter code: DIF) (formula: $C_{14}H_{11}Cl_2NO_2$).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total	C	Cl	N	O	0	0
			19	14	2	1	2		
3	A	1	Total	C	Cl	N	O	0	0
			19	14	2	1	2		

- Molecule 4 is TRIETHYLENE GLYCOL (three-letter code: PGE) (formula: $C_6H_{14}O_4$).



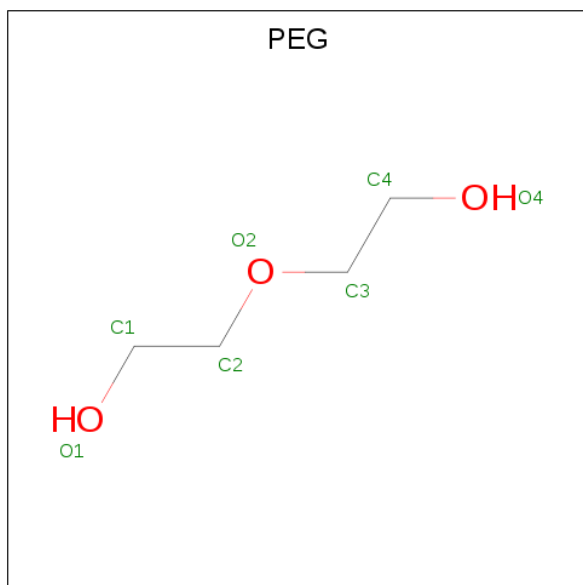
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total	C	O	0	0
			10	6	4		
4	A	1	Total	C	O	0	0
			10	6	4		

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total	C	O	0	0
			10	6	4		
4	A	1	Total	C	O	0	0
			10	6	4		
4	A	1	Total	C	O	0	0
			10	6	4		

- Molecule 5 is DI(HYDROXYETHYL)ETHER (three-letter code: PEG) (formula: $C_4H_{10}O_3$).



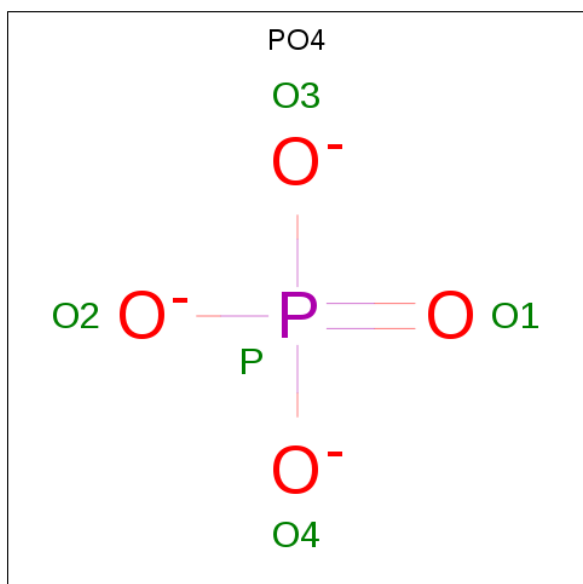
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	A	1	Total	C	O	0	0
			7	4	3		
5	A	1	Total	C	O	0	0
			7	4	3		
5	A	1	Total	C	O	0	0
			7	4	3		
5	A	1	Total	C	O	0	0
			7	4	3		
5	A	1	Total	C	O	0	0
			7	4	3		
5	A	1	Total	C	O	0	0
			7	4	3		
5	A	1	Total	C	O	0	0
			7	4	3		

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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	1	Total C O 7 4 3	0	0
5	A	1	Total C O 7 4 3	0	0
5	A	1	Total C O 7 4 3	0	0
5	A	1	Total C O 7 4 3	0	0
5	A	1	Total C O 7 4 3	0	0
5	A	1	Total C O 7 4 3	0	0

- Molecule 6 is PHOSPHATE ION (three-letter code: PO4) (formula: O₄P).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	1	Total O P 5 4 1	0	0

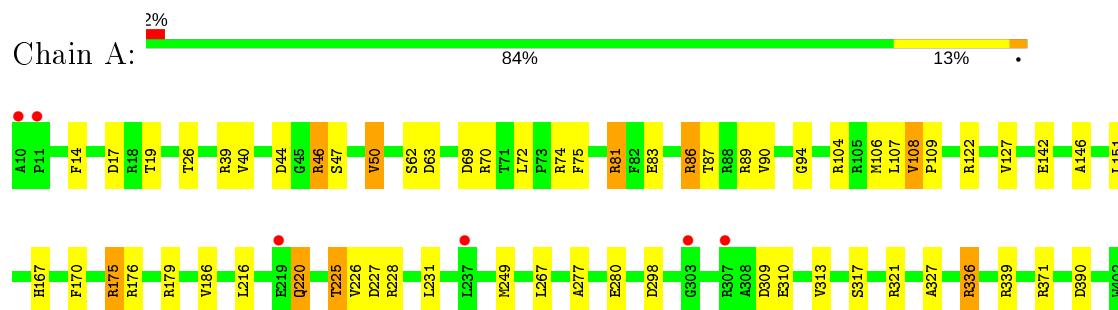
- Molecule 7 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	A	304	Total O 304 304	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: Pentalenic acid synthase



4 Data and refinement statistics

Property	Value	Source
Space group	P 31 2 1	Depositor
Cell constants a, b, c, α , β , γ	139.90 Å 139.90 Å 65.27 Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	44.40 – 2.20 44.40 – 2.20	Depositor EDS
% Data completeness (in resolution range)	99.1 (44.40-2.20) 99.1 (44.40-2.20)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	4.21 (at 2.20 Å)	Xtriage
Refinement program	REFMAC 5.7.0032	Depositor
R, R_{free}	0.177 , 0.228 0.186 , 0.238	Depositor DCC
R_{free} test set	1860 reflections (4.99%)	wwPDB-VP
Wilson B-factor (Å ²)	36.8	Xtriage
Anisotropy	0.095	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.36 , 51.9	EDS
L-test for twinning ²	$\langle L \rangle = 0.51$, $\langle L^2 \rangle = 0.34$	Xtriage
Estimated twinning fraction	0.023 for -h,-k,l	Xtriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	3582	wwPDB-VP
Average B, all atoms (Å ²)	42.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.01% 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 [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: PEG, HEM, DIF, PGE, PO4

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	0.91	0/3107	1.13	25/4229 (0.6%)

There are no bond length outliers.

All (25) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	336	ARG	NE-CZ-NH2	-13.36	113.62	120.30
1	A	336	ARG	NE-CZ-NH1	12.10	126.35	120.30
1	A	81	ARG	NE-CZ-NH1	11.30	125.95	120.30
1	A	228	ARG	NE-CZ-NH1	10.69	125.64	120.30
1	A	46	ARG	NE-CZ-NH1	9.63	125.11	120.30
1	A	228	ARG	NE-CZ-NH2	-8.86	115.87	120.30
1	A	81	ARG	NE-CZ-NH2	-8.22	116.19	120.30
1	A	227	ASP	CB-CG-OD2	7.74	125.27	118.30
1	A	63	ASP	CB-CG-OD2	-7.10	111.91	118.30
1	A	50	VAL	CB-CA-C	-7.00	98.10	111.40
1	A	175	ARG	NE-CZ-NH1	6.85	123.72	120.30
1	A	298	ASP	CB-CG-OD1	6.80	124.42	118.30
1	A	104	ARG	NE-CZ-NH1	6.54	123.57	120.30
1	A	390	ASP	CB-CG-OD1	6.43	124.09	118.30
1	A	104	ARG	NE-CZ-NH2	-6.29	117.16	120.30
1	A	175	ARG	NE-CZ-NH2	-6.14	117.23	120.30
1	A	86	ARG	NE-CZ-NH2	-6.02	117.29	120.30
1	A	176	ARG	NE-CZ-NH2	-5.97	117.32	120.30
1	A	17	ASP	CB-CG-OD1	5.65	123.38	118.30
1	A	17	ASP	CB-CG-OD2	-5.61	113.25	118.30
1	A	176	ARG	NE-CZ-NH1	5.50	123.05	120.30
1	A	46	ARG	NE-CZ-NH2	-5.50	117.55	120.30
1	A	44	ASP	CB-CG-OD1	-5.48	113.37	118.30
1	A	44	ASP	CB-CG-OD2	5.34	123.11	118.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	298	ASP	CB-CG-OD2	-5.18	113.64	118.30

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	3044	0	3049	32	0
2	A	43	0	30	6	0
3	A	38	0	20	2	0
4	A	50	0	70	8	0
5	A	98	0	140	8	0
6	A	5	0	0	0	0
7	A	304	0	0	9	0
All	All	3582	0	3309	45	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 7.

All (45) 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:ALA:HA	4:A:508:PGE:H42	1.61	0.82
1:A:225:THR:HG22	1:A:226:VAL:HG13	1.63	0.80
1:A:280:GLU:OE2	1:A:336:ARG:NH2	2.17	0.78
5:A:515:PEG:H42	7:A:630:HOH:O	1.85	0.75
4:A:507:PGE:H3	7:A:903:HOH:O	1.93	0.69
1:A:371:ARG:HE	4:A:507:PGE:H52	1.59	0.68
1:A:72:LEU:O	1:A:86:ARG:NH2	2.28	0.66
1:A:87:THR:HG22	5:A:516:PEG:H22	1.79	0.64
1:A:249:MET:HG3	2:A:501:HEM:CBB	2.30	0.62
5:A:515:PEG:C4	7:A:630:HOH:O	2.45	0.62
1:A:14:PHE:CE1	1:A:313:VAL:HG11	2.37	0.59
1:A:127:VAL:HG23	1:A:151:LEU:HD13	1.82	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:81:ARG:HD2	4:A:504:PGE:O1	2.03	0.59
1:A:89:ARG:HD3	7:A:615:HOH:O	2.02	0.58
1:A:81:ARG:HG3	1:A:186:VAL:HG21	1.86	0.57
1:A:90:VAL:HG22	1:A:94:GLY:HA3	1.87	0.56
1:A:70:ARG:HA	1:A:75:PHE:CG	2.40	0.56
1:A:81:ARG:CG	1:A:186:VAL:HG21	2.37	0.55
2:A:501:HEM:HMB2	2:A:501:HEM:HBB2	1.89	0.55
5:A:512:PEG:C4	7:A:637:HOH:O	2.55	0.54
1:A:179:ARG:HD3	7:A:877:HOH:O	2.09	0.53
1:A:81:ARG:CD	4:A:504:PGE:O1	2.57	0.52
5:A:521:PEG:H12	7:A:761:HOH:O	2.10	0.51
1:A:371:ARG:NE	4:A:507:PGE:H52	2.24	0.50
5:A:515:PEG:H12	7:A:731:HOH:O	2.12	0.50
2:A:501:HEM:HHD	2:A:501:HEM:HBC2	1.94	0.49
2:A:501:HEM:CMB	2:A:501:HEM:HBB2	2.44	0.47
1:A:167:HIS:HA	1:A:170:PHE:CE2	2.50	0.46
1:A:216:LEU:O	1:A:220:GLN:HB2	2.15	0.46
1:A:249:MET:HG3	2:A:501:HEM:HBB1	1.97	0.46
1:A:280:GLU:CD	1:A:336:ARG:NH2	2.70	0.45
1:A:327:ALA:O	1:A:336:ARG:HD3	2.17	0.45
1:A:317:SER:O	1:A:321:ARG:HG2	2.17	0.44
1:A:83:GLU:O	1:A:86:ARG:HG2	2.17	0.44
1:A:69:ASP:OD1	1:A:69:ASP:C	2.55	0.43
1:A:175:ARG:HB3	4:A:506:PGE:H3	2.01	0.43
1:A:108:VAL:HG12	1:A:109:PRO:HD3	2.01	0.43
1:A:74:ARG:HG3	1:A:309:ASP:HB3	2.00	0.43
1:A:39:ARG:NH2	1:A:310:GLU:OE2	2.52	0.43
1:A:267:LEU:HD21	1:A:277:ALA:HB2	2.01	0.42
2:A:501:HEM:O2A	3:A:503:DIF:O2	2.37	0.42
5:A:515:PEG:C1	7:A:731:HOH:O	2.67	0.41
1:A:106:MET:SD	1:A:220:GLN:HG3	2.62	0.40
3:A:502:DIF:CL2	4:A:504:PGE:H4	2.57	0.40
5:A:513:PEG:H41	5:A:513:PEG:H21	1.91	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	A	391/393 (100%)	379 (97%)	12 (3%)	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	A	318/318 (100%)	303 (95%)	15 (5%)	26	33

All (15) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	19	THR
1	A	26	THR
1	A	40	VAL
1	A	46	ARG
1	A	47	SER
1	A	50	VAL
1	A	62	SER
1	A	107	LEU
1	A	108	VAL
1	A	122	ARG
1	A	142	GLU
1	A	220	GLN
1	A	225	THR

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Mol	Chain	Res	Type
1	A	231	LEU
1	A	339	ARG

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

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 carbohydrates in this entry.

5.6 Ligand geometry ⓘ

23 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	$\# Z > 2$
5	PEG	A	515	-	6,6,6	0.57	0	5,5,5	0.49	0
5	PEG	A	518	-	6,6,6	0.60	0	5,5,5	0.43	0
4	PGE	A	508	-	9,9,9	0.54	0	8,8,8	0.70	0
5	PEG	A	516	-	6,6,6	0.55	0	5,5,5	0.67	0
5	PEG	A	517	-	6,6,6	0.52	0	5,5,5	0.38	0
5	PEG	A	514	-	6,6,6	0.66	0	5,5,5	0.47	0
4	PGE	A	506	-	9,9,9	0.47	0	8,8,8	0.65	0
5	PEG	A	511	-	6,6,6	0.28	0	5,5,5	1.00	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
3	DIF	A	502	-	17,20,20	2.68	3 (17%)	23,27,27	1.70	6 (26%)
5	PEG	A	513	-	6,6,6	0.50	0	5,5,5	0.71	0
5	PEG	A	512	-	6,6,6	0.49	0	5,5,5	0.45	0
5	PEG	A	509	-	6,6,6	0.51	0	5,5,5	0.47	0
5	PEG	A	522	-	6,6,6	0.50	0	5,5,5	0.47	0
5	PEG	A	521	-	6,6,6	0.47	0	5,5,5	0.64	0
4	PGE	A	505	-	9,9,9	0.96	0	8,8,8	1.45	1 (12%)
6	PO4	A	523	-	4,4,4	0.80	0	6,6,6	1.42	1 (16%)
3	DIF	A	503	-	17,20,20	3.30	5 (29%)	23,27,27	2.14	7 (30%)
4	PGE	A	507	-	9,9,9	0.55	0	8,8,8	0.46	0
2	HEM	A	501	1	27,50,50	1.46	6 (22%)	17,82,82	1.85	3 (17%)
5	PEG	A	510	-	6,6,6	0.58	0	5,5,5	1.11	0
5	PEG	A	520	-	6,6,6	0.81	0	5,5,5	0.85	0
5	PEG	A	519	-	6,6,6	0.53	0	5,5,5	0.70	0
4	PGE	A	504	-	9,9,9	0.58	0	8,8,8	0.59	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	PEG	A	515	-	-	2/4/4/4	-
5	PEG	A	518	-	-	1/4/4/4	-
4	PGE	A	508	-	-	4/7/7/7	-
5	PEG	A	516	-	-	3/4/4/4	-
5	PEG	A	517	-	-	2/4/4/4	-
5	PEG	A	514	-	-	2/4/4/4	-
4	PGE	A	506	-	-	5/7/7/7	-
5	PEG	A	511	-	-	2/4/4/4	-
3	DIF	A	502	-	-	0/6/8/8	0/2/2/2
5	PEG	A	513	-	-	1/4/4/4	-
5	PEG	A	512	-	-	2/4/4/4	-
5	PEG	A	509	-	-	3/4/4/4	-
5	PEG	A	522	-	-	2/4/4/4	-
5	PEG	A	521	-	-	2/4/4/4	-
4	PGE	A	505	-	-	5/7/7/7	-
3	DIF	A	503	-	-	0/6/8/8	0/2/2/2
4	PGE	A	507	-	-	6/7/7/7	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	HEM	A	501	1	-	0/6/54/54	-
5	PEG	A	510	-	-	2/4/4/4	-
5	PEG	A	520	-	-	2/4/4/4	-
5	PEG	A	519	-	-	3/4/4/4	-
4	PGE	A	504	-	-	2/7/7/7	-

All (14) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	503	DIF	C8-C7	10.16	1.52	1.40
3	A	502	DIF	C8-C7	8.26	1.50	1.40
3	A	503	DIF	C3-C4	6.48	1.49	1.40
3	A	502	DIF	C3-C2	5.77	1.48	1.40
3	A	503	DIF	C3-C2	4.06	1.46	1.40
3	A	502	DIF	C3-C4	3.56	1.45	1.40
2	A	501	HEM	C3C-CAC	-3.54	1.40	1.47
2	A	501	HEM	C3C-C2C	-3.16	1.36	1.40
3	A	503	DIF	C4-CL4	2.92	1.80	1.73
2	A	501	HEM	C3B-C2B	-2.79	1.36	1.40
2	A	501	HEM	C4D-C3D	2.51	1.48	1.42
2	A	501	HEM	CAA-C2A	2.12	1.55	1.52
3	A	503	DIF	C6-C5	2.10	1.43	1.38
2	A	501	HEM	C4B-NB	-2.01	1.32	1.36

All (18) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	503	DIF	C3-C2-CL2	-7.56	110.62	119.27
2	A	501	HEM	C4C-C3C-C2C	5.28	110.58	106.90
3	A	502	DIF	C7-C8-N1	-3.86	115.55	118.60
2	A	501	HEM	C3C-C4C-NC	-3.43	104.47	110.94
4	A	505	PGE	C5-O3-C4	3.42	128.11	113.29
3	A	502	DIF	C3-C4-CL4	-3.33	115.46	119.27
3	A	502	DIF	C2-C3-N1	2.83	125.71	122.04
3	A	503	DIF	C1-C2-CL2	2.74	123.90	118.41
2	A	501	HEM	C1D-C2D-C3D	-2.48	105.27	107.00
3	A	503	DIF	C7-C8-N1	-2.41	116.69	118.60
6	A	523	PO4	O2-P-O1	-2.36	102.26	110.89
3	A	503	DIF	C1-C2-C3	2.22	125.48	121.96
3	A	503	DIF	C9-C8-N1	2.19	125.90	121.39
3	A	502	DIF	C4-C3-N1	-2.16	119.23	122.04

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	503	DIF	C3-N1-C8	2.15	127.50	123.01
3	A	502	DIF	C9-C8-N1	2.11	125.73	121.39
3	A	503	DIF	C9-C8-C7	-2.10	117.29	119.76
3	A	502	DIF	C4-C3-C2	-2.08	112.91	116.14

There are no chirality outliers.

All (51) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	505	PGE	O1-C1-C2-O2
4	A	505	PGE	O2-C3-C4-O3
5	A	515	PEG	O2-C3-C4-O4
5	A	518	PEG	O1-C1-C2-O2
5	A	517	PEG	C4-C3-O2-C2
4	A	506	PGE	O2-C3-C4-O3
4	A	508	PGE	O3-C5-C6-O4
5	A	511	PEG	O1-C1-C2-O2
5	A	512	PEG	O2-C3-C4-O4
5	A	509	PEG	O2-C3-C4-O4
5	A	519	PEG	O2-C3-C4-O4
5	A	514	PEG	O2-C3-C4-O4
4	A	506	PGE	O1-C1-C2-O2
5	A	519	PEG	O1-C1-C2-O2
4	A	508	PGE	O1-C1-C2-O2
5	A	513	PEG	C4-C3-O2-C2
5	A	520	PEG	O1-C1-C2-O2
5	A	512	PEG	O1-C1-C2-O2
5	A	509	PEG	O1-C1-C2-O2
4	A	507	PGE	O1-C1-C2-O2
4	A	507	PGE	O3-C5-C6-O4
5	A	515	PEG	O1-C1-C2-O2
4	A	505	PGE	C3-C4-O3-C5
5	A	516	PEG	O1-C1-C2-O2
5	A	511	PEG	O2-C3-C4-O4
5	A	520	PEG	O2-C3-C4-O4
4	A	506	PGE	C4-C3-O2-C2
5	A	509	PEG	C4-C3-O2-C2
5	A	521	PEG	C4-C3-O2-C2
4	A	507	PGE	C4-C3-O2-C2
4	A	507	PGE	C3-C4-O3-C5
5	A	519	PEG	C1-C2-O2-C3
5	A	516	PEG	C1-C2-O2-C3

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Mol	Chain	Res	Type	Atoms
4	A	504	PGE	C4-C3-O2-C2
4	A	507	PGE	O2-C3-C4-O3
4	A	505	PGE	O3-C5-C6-O4
5	A	516	PEG	C4-C3-O2-C2
5	A	510	PEG	O2-C3-C4-O4
4	A	508	PGE	C4-C3-O2-C2
5	A	517	PEG	O2-C3-C4-O4
4	A	506	PGE	O3-C5-C6-O4
4	A	506	PGE	C6-C5-O3-C4
4	A	508	PGE	O2-C3-C4-O3
5	A	522	PEG	C4-C3-O2-C2
4	A	505	PGE	C1-C2-O2-C3
4	A	504	PGE	C3-C4-O3-C5
5	A	514	PEG	O1-C1-C2-O2
5	A	510	PEG	C1-C2-O2-C3
5	A	521	PEG	C1-C2-O2-C3
5	A	522	PEG	C1-C2-O2-C3
4	A	507	PGE	C1-C2-O2-C3

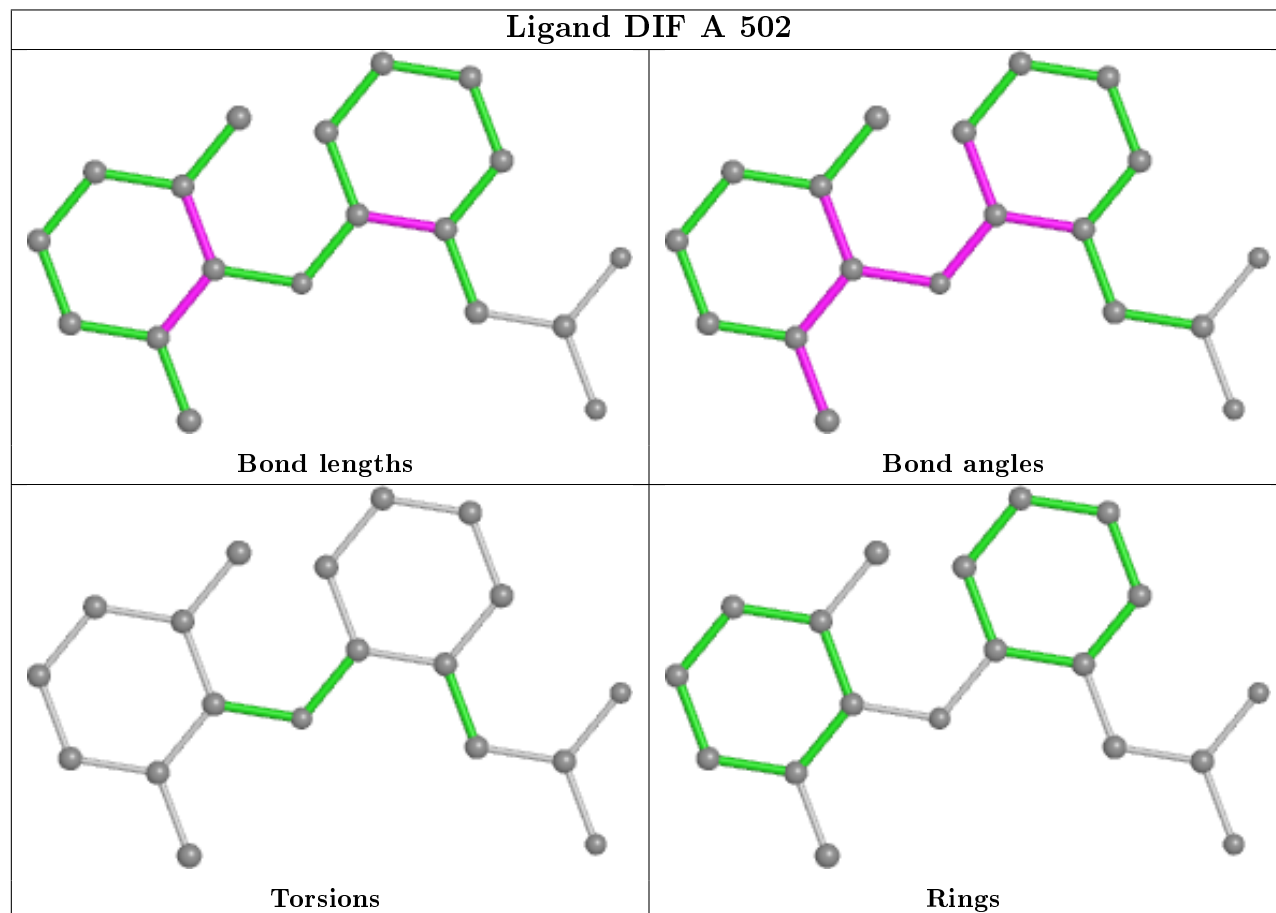
There are no ring outliers.

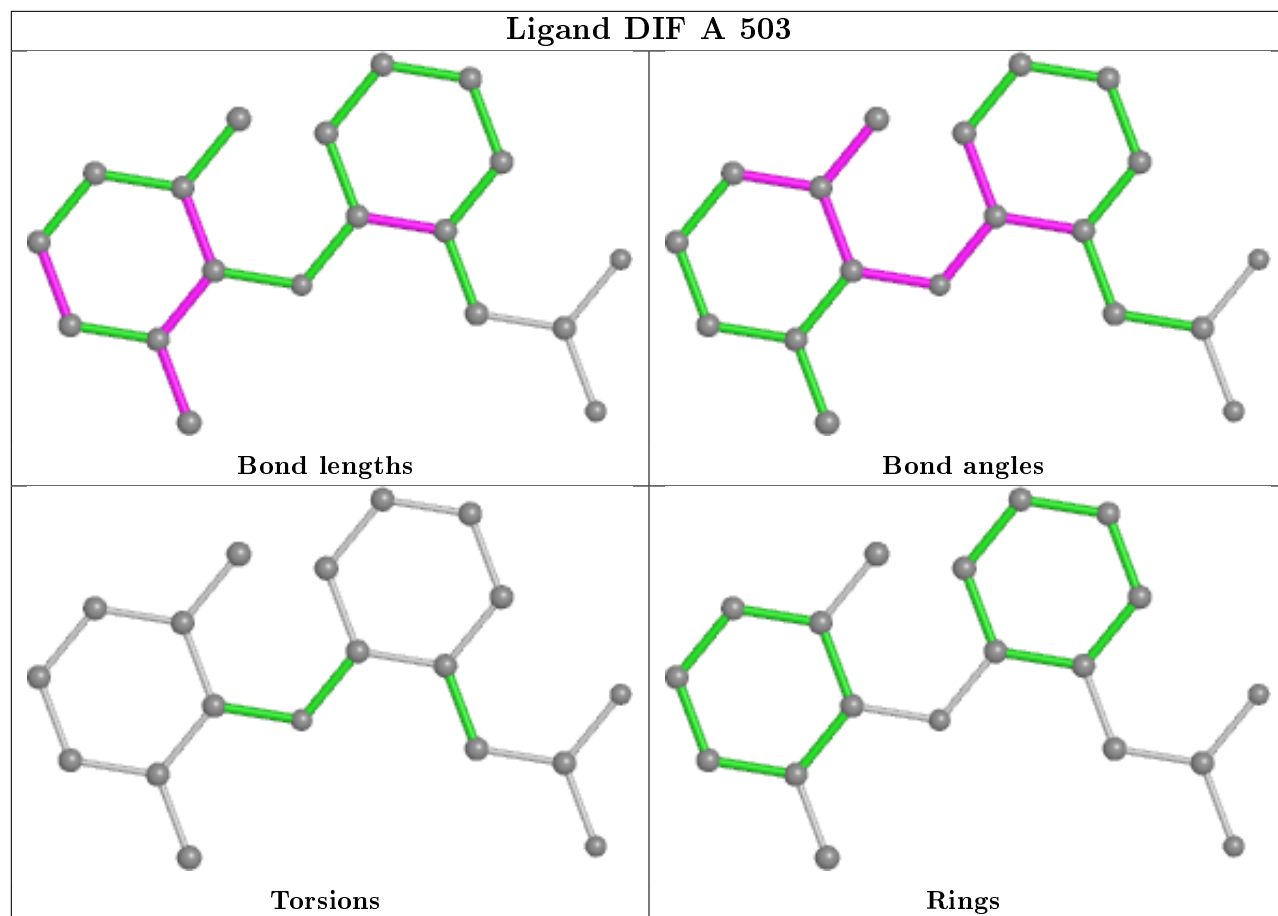
12 monomers are involved in 22 short contacts:

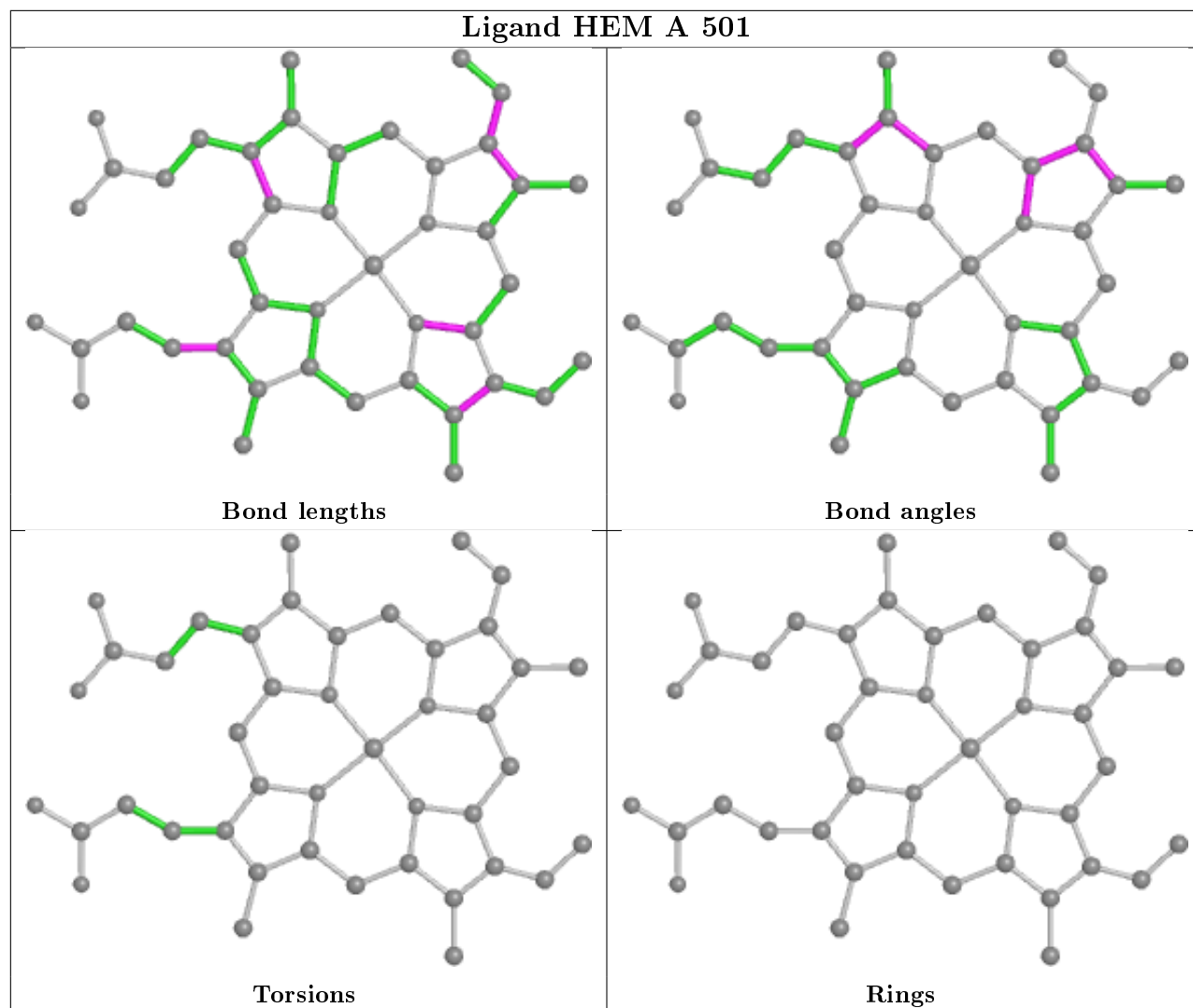
Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	A	515	PEG	4	0
4	A	508	PGE	1	0
5	A	516	PEG	1	0
4	A	506	PGE	1	0
3	A	502	DIF	1	0
5	A	513	PEG	1	0
5	A	512	PEG	1	0
5	A	521	PEG	1	0
3	A	503	DIF	1	0
4	A	507	PGE	3	0
2	A	501	HEM	6	0
4	A	504	PGE	3	0

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 [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	393/393 (100%)	-0.37	6 (1%) 73 72	26, 38, 60, 82	0

All (6) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	10	ALA	3.8
1	A	303	GLY	3.2
1	A	11	PRO	3.2
1	A	219	GLU	2.2
1	A	307	ARG	2.2
1	A	237	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 carbohydrates 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
5	PEG	A	522	7/7	0.72	0.37	92,98,101,103	0

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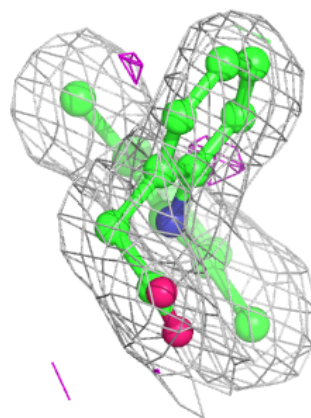
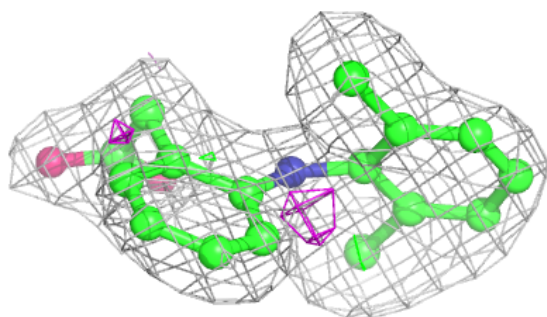
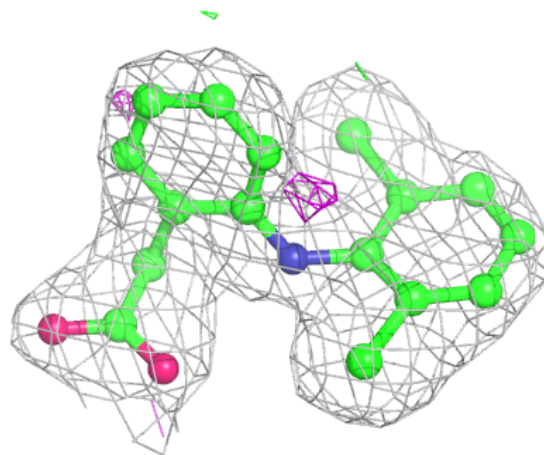
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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
5	PEG	A	519	7/7	0.74	0.21	69,75,80,83	0
5	PEG	A	520	7/7	0.75	0.23	49,68,74,82	0
5	PEG	A	517	7/7	0.76	0.39	80,86,88,91	0
5	PEG	A	515	7/7	0.76	0.22	65,69,72,76	0
5	PEG	A	518	7/7	0.78	0.27	71,74,81,81	0
5	PEG	A	513	7/7	0.82	0.19	65,73,76,78	0
5	PEG	A	514	7/7	0.83	0.27	63,77,80,81	0
5	PEG	A	521	7/7	0.83	0.20	60,64,78,78	0
4	PGE	A	506	10/10	0.84	0.17	59,71,74,80	0
4	PGE	A	505	10/10	0.84	0.33	46,53,60,62	0
5	PEG	A	516	7/7	0.85	0.25	63,70,73,75	0
5	PEG	A	509	7/7	0.86	0.14	48,53,76,76	0
5	PEG	A	512	7/7	0.86	0.13	60,63,69,77	0
5	PEG	A	510	7/7	0.87	0.17	61,63,66,68	0
5	PEG	A	511	7/7	0.91	0.14	61,66,71,73	0
4	PGE	A	508	10/10	0.91	0.16	38,58,65,71	0
4	PGE	A	504	10/10	0.93	0.29	39,50,71,86	0
3	DIF	A	503	19/19	0.95	0.15	36,41,47,48	0
4	PGE	A	507	10/10	0.95	0.12	49,61,76,77	0
3	DIF	A	502	19/19	0.96	0.17	35,40,50,56	0
6	PO4	A	523	5/5	0.97	0.11	59,60,70,81	0
2	HEM	A	501	43/43	0.98	0.16	24,28,31,39	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.

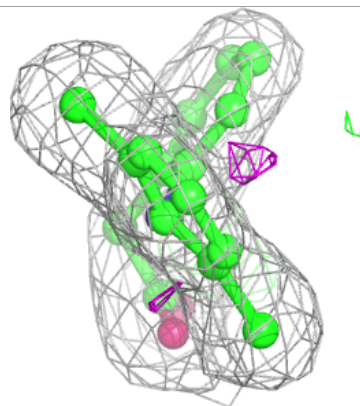
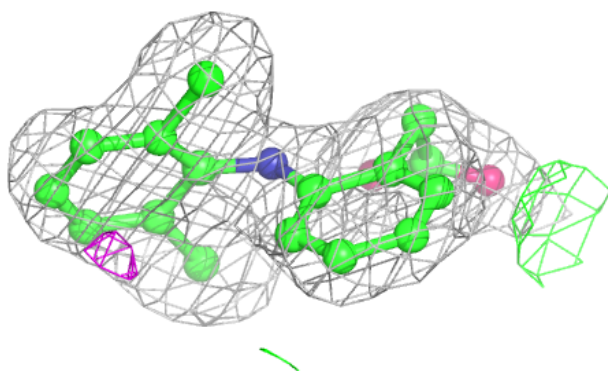
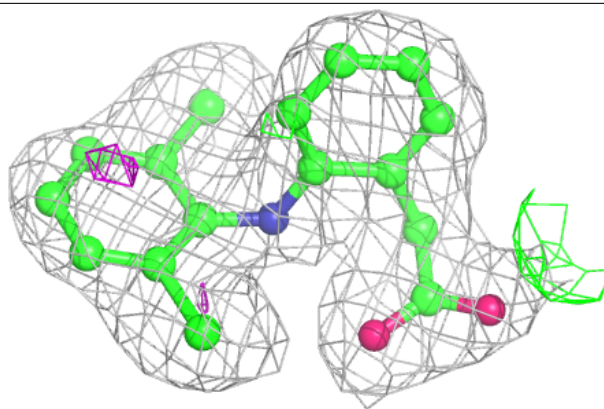
Electron density around DIF A 503:

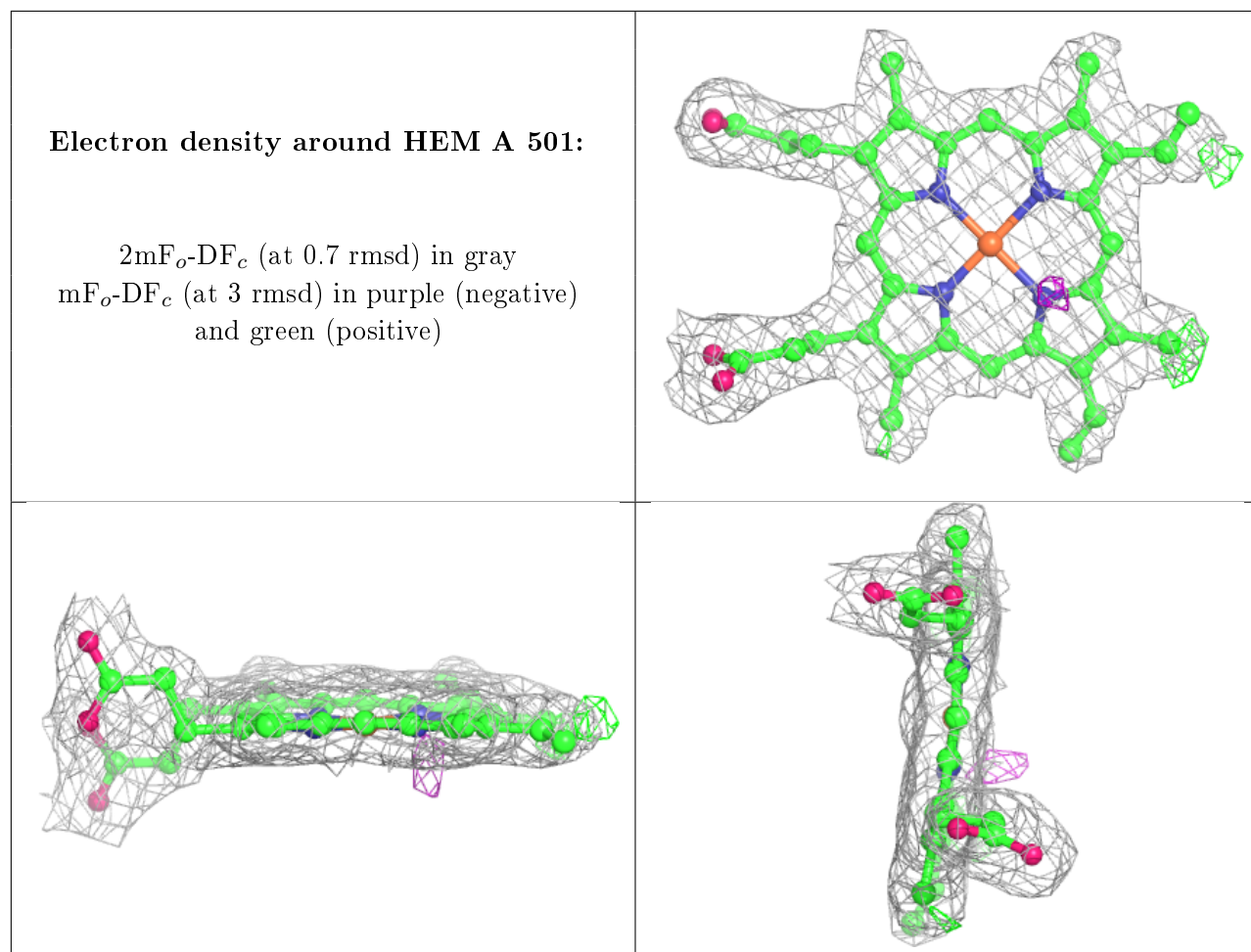
$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



Electron density around DIF A 502:

$2mF_o-DF_c$ (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.