Full wwPDB X-ray Structure Validation Report ⓘ

Nov 11, 2023 – 07:14 pm GMT

PDB ID	:	8B6S
Title	:	X-ray structure of the haloalkane dehalogenase HaloTag7 fusion to the green fluorescent protein GFP (ChemoG1) labeled with a chloroalkane tetramethyl-rhodamine fluorophore substrate
Authors	:	Tarnawski, M.; Hellweg, L.; Hiblot, J.
Deposited on	:	2022-09-27
Resolution	:	1.80 Å(reported)

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

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/XrayValidationReportHelp
with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

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

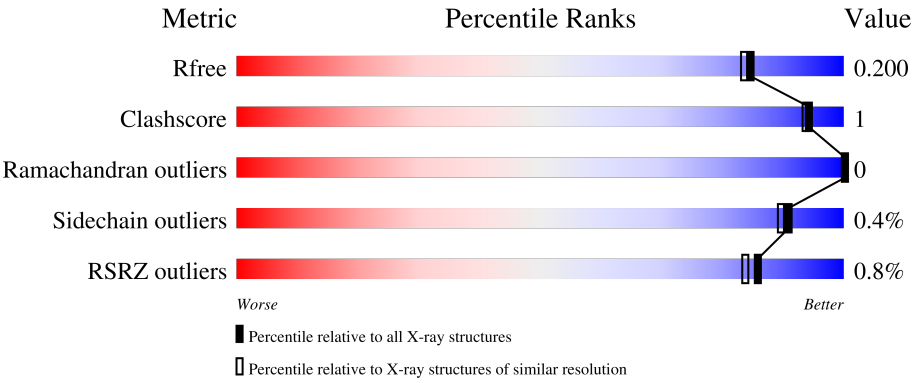
MolProbity	:	4.02b-467
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.36
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
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

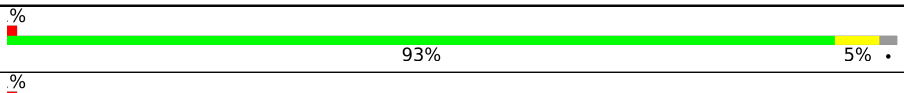
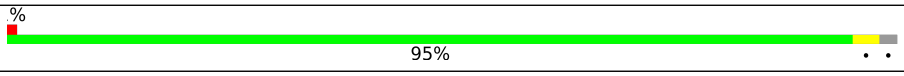
The reported resolution of this entry is 1.80 Å.

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	5950 (1.80-1.80)
Clashscore	141614	6793 (1.80-1.80)
Ramachandran outliers	138981	6697 (1.80-1.80)
Sidechain outliers	138945	6696 (1.80-1.80)
RSRZ outliers	127900	5850 (1.80-1.80)

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	529	
1	B	529	

2 Entry composition (i)

There are 5 unique types of molecules in this entry. The entry contains 8877 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 Green fluorescent protein,Haloalkane dehalogenase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	518	Total	C	N	O	S	0	1	0
			4159	2681	699	764	15			
1	B	517	Total	C	N	O	S	0	2	0
			4156	2680	698	763	15			

There are 58 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	1	GLY	-	expression tag	UNP P42212
A	63	LEU	TYR	conflict	UNP P42212
A	64	CRO	GLY	conflict	UNP P42212
A	230	LEU	HIS	conflict	UNP P42212
A	281	VAL	LEU	conflict	UNP P0A3G3
A	292	THR	SER	conflict	UNP P0A3G3
A	312	GLY	ASP	conflict	UNP P0A3G3
A	321	PHE	TYR	conflict	UNP P0A3G3
A	322	MET	LEU	conflict	UNP P0A3G3
A	362	PHE	CYS	conflict	UNP P0A3G3
A	389	THR	ALA	conflict	UNP P0A3G3
A	394	LYS	GLU	conflict	UNP P0A3G3
A	401	VAL	ALA	conflict	UNP P0A3G3
A	406	THR	ALA	conflict	UNP P0A3G3
A	409	MET	LYS	conflict	UNP P0A3G3
A	410	GLY	CYS	conflict	UNP P0A3G3
A	429	ASN	LYS	conflict	UNP P0A3G3
A	458	GLU	ALA	conflict	UNP P0A3G3
A	461	ASP	ASN	conflict	UNP P0A3G3
A	491	LYS	GLU	conflict	UNP P0A3G3
A	498	ALA	THR	conflict	UNP P0A3G3
A	506	ASN	HIS	conflict	UNP P0A3G3
A	507	LEU	TYR	conflict	UNP P0A3G3
A	525	SER	PRO	conflict	UNP P0A3G3
A	526	THR	ALA	conflict	UNP P0A3G3

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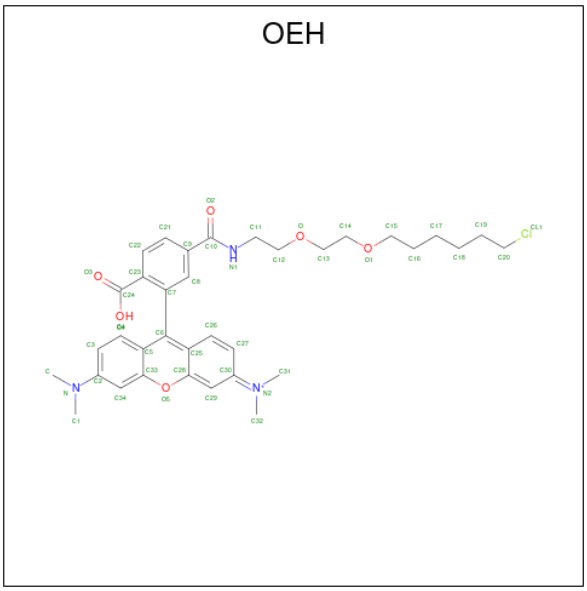
Chain	Residue	Modelled	Actual	Comment	Reference
A	528	GLU	-	expression tag	UNP P0A3G3
A	529	ILE	-	expression tag	UNP P0A3G3
A	530	SER	-	expression tag	UNP P0A3G3
A	531	GLY	-	expression tag	UNP P0A3G3
B	1	GLY	-	expression tag	UNP P42212
B	63	LEU	TYR	conflict	UNP P42212
B	64	CRO	GLY	conflict	UNP P42212
B	230	LEU	HIS	conflict	UNP P42212
B	281	VAL	LEU	conflict	UNP P0A3G3
B	292	THR	SER	conflict	UNP P0A3G3
B	312	GLY	ASP	conflict	UNP P0A3G3
B	321	PHE	TYR	conflict	UNP P0A3G3
B	322	MET	LEU	conflict	UNP P0A3G3
B	362	PHE	CYS	conflict	UNP P0A3G3
B	389	THR	ALA	conflict	UNP P0A3G3
B	394	LYS	GLU	conflict	UNP P0A3G3
B	401	VAL	ALA	conflict	UNP P0A3G3
B	406	THR	ALA	conflict	UNP P0A3G3
B	409	MET	LYS	conflict	UNP P0A3G3
B	410	GLY	CYS	conflict	UNP P0A3G3
B	429	ASN	LYS	conflict	UNP P0A3G3
B	458	GLU	ALA	conflict	UNP P0A3G3
B	461	ASP	ASN	conflict	UNP P0A3G3
B	491	LYS	GLU	conflict	UNP P0A3G3
B	498	ALA	THR	conflict	UNP P0A3G3
B	506	ASN	HIS	conflict	UNP P0A3G3
B	507	LEU	TYR	conflict	UNP P0A3G3
B	525	SER	PRO	conflict	UNP P0A3G3
B	526	THR	ALA	conflict	UNP P0A3G3
B	528	GLU	-	expression tag	UNP P0A3G3
B	529	ILE	-	expression tag	UNP P0A3G3
B	530	SER	-	expression tag	UNP P0A3G3
B	531	GLY	-	expression tag	UNP P0A3G3

- Molecule 2 is [9-[2-carboxy-5-[2-[2-(6-chloranylhexoxy)ethoxy]ethylcarbamoyl]phenyl]-6-(dimethylamino)xanthen-3-ylidene]-dimethyl-azanium (three-letter code: OEH) (formula: $C_{35}H_{43}ClN_3O_6$) (labeled as "Ligand of Interest" by depositor).

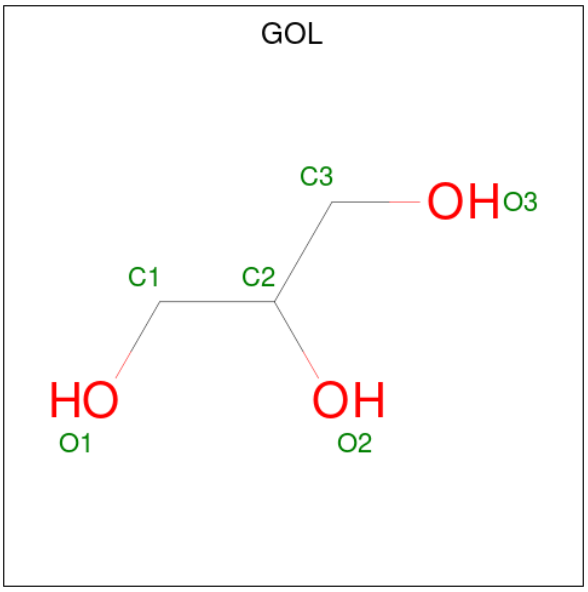


Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	1	Total C N O 44 35 3 6	0	0
2	B	1	Total C N O 44 35 3 6	0	0

- Molecule 3 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total Cl 1 1	0	0
3	B	1	Total Cl 1 1	0	0

- Molecule 4 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$).



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

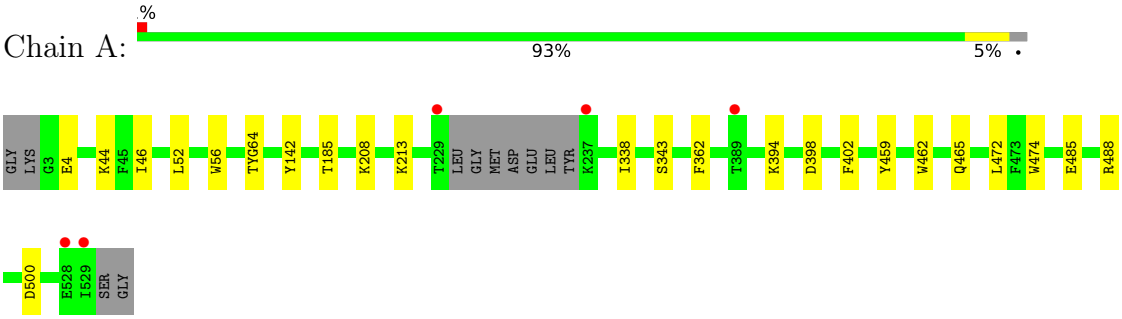
- Molecule 5 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	223	Total O 223 223	0	0
5	B	237	Total O 237 237	0	0

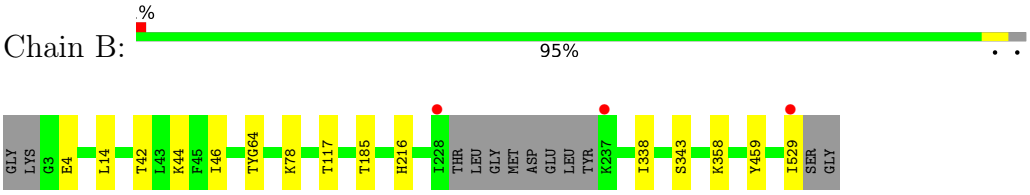
3 Residue-property plots (i)

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: Green fluorescent protein,Haloalkane dehalogenase



• Molecule 1: Green fluorescent protein,Haloalkane dehalogenase



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α, β, γ	46.19Å 63.71Å 89.42Å 93.56° 91.02° 90.85°	Depositor
Resolution (Å)	46.18 – 1.80 46.18 – 1.80	Depositor EDS
% Data completeness (in resolution range)	95.3 (46.18-1.80) 95.3 (46.18-1.80)	Depositor EDS
R_{merge}	0.04	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.63 (at 1.79Å)	Xtriage
Refinement program	PHENIX 1.19.2_4158	Depositor
R, R_{free}	0.173 , 0.201 0.172 , 0.200	Depositor DCC
R_{free} test set	4493 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å^2)	24.9	Xtriage
Anisotropy	0.335	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.39 , 43.0	EDS
L-test for twinning[2]	$< \|L\| > = 0.51$, $< L^2 > = 0.34$	Xtriage
Estimated twinning fraction	0.098 for h,-k,-l	Xtriage
F_o,F_c correlation	0.97	EDS
Total number of atoms	8877	wwPDB-VP
Average B, all atoms (Å^2)	26.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.63% 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

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: GOL, CL, OEH, CRO

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	0/4259	0.57	0/5796
1	B	0.36	0/4259	0.58	0/5796
All	All	0.36	0/8518	0.58	0/11592

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	4159	0	4054	13	0
1	B	4156	0	4054	9	0
2	A	44	0	0	0	0
2	B	44	0	0	0	0
3	A	1	0	0	0	0
3	B	1	0	0	0	0
4	A	6	0	8	0	0
4	B	6	0	8	0	0
5	A	223	0	0	2	0
5	B	237	0	0	3	0
All	All	8877	0	8124	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:B:14:LEU:HD23	1:B:117:THR:HG21	1.52	0.90
1:B:44:LYS:HE2	1:B:46:ILE:HD11	1.88	0.56
1:B:46:ILE:HD13	1:B:216:HIS:HB3	1.89	0.54
1:A:474:TRP:CZ2	1:A:500:ASP:HB2	2.43	0.54
1:A:4:GLU:HG2	5:A:706:HOH:O	2.09	0.52
1:A:44:LYS:HE2	1:A:46:ILE:HD11	1.92	0.50
1:A:485:GLU:OE1	1:A:488:ARG:NH2	2.35	0.49
1:B:185[B]:THR:HG22	5:B:713:HOH:O	2.12	0.48
1:B:4:GLU:H	1:B:4:GLU:CD	2.16	0.48
1:A:338:ILE:HB	1:A:343:SER:HA	1.97	0.46
1:B:338:ILE:HB	1:B:343:SER:HA	1.98	0.44
1:A:462:TRP:O	1:A:465:GLN:HG3	2.17	0.44
1:A:362:PHE:CE2	1:A:472:LEU:HD13	2.52	0.44
1:A:394:LYS:O	1:A:398:ASP:HB2	2.19	0.43
1:B:358:LYS:HA	1:B:358:LYS:HD2	1.83	0.42
1:B:78:LYS:HD2	5:B:755:HOH:O	2.19	0.42
1:A:185[A]:THR:HG22	5:A:876:HOH:O	2.20	0.41
1:B:42[A]:THR:HG22	5:B:886:HOH:O	2.20	0.41
1:A:52:LEU:HD22	1:A:56:TRP:CD2	2.55	0.41
1:A:142:TYR:CZ	1:A:208:LYS:HE2	2.56	0.41
1:A:213:LYS:HA	1:A:213:LYS:HD2	1.93	0.41
1:A:338:ILE:HD12	1:A:343:SER:HA	2.02	0.41

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	512/529 (97%)	500 (98%)	12 (2%)	0	100	100
1	B	512/529 (97%)	499 (98%)	13 (2%)	0	100	100
All	All	1024/1058 (97%)	999 (98%)	25 (2%)	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	450/457 (98%)	448 (100%)	2 (0%)	91	89
1	B	450/457 (98%)	448 (100%)	2 (0%)	91	89
All	All	900/914 (98%)	896 (100%)	4 (0%)	91	89

All (4) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	402	PHE
1	A	459	TYR
1	B	459	TYR
1	B	529	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	495	ASN
1	B	495	ASN

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

2 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	$\#\|Z\| > 2$
1	CRO	A	64	1	23,23,24	2.81	8 (34%)	30,32,34	6.31	15 (50%)
1	CRO	B	64	1	23,23,24	2.63	8 (34%)	30,32,34	6.13	13 (43%)

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
1	CRO	A	64	1	-	1/12/31/32	0/2/2/2
1	CRO	B	64	1	-	1/12/31/32	0/2/2/2

All (16) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	64	CRO	CA2-C2	7.92	1.56	1.48
1	B	64	CRO	CA2-C2	7.13	1.55	1.48
1	A	64	CRO	C1-N2	6.98	1.42	1.32
1	B	64	CRO	C1-N2	6.45	1.41	1.32
1	B	64	CRO	CA2-N2	4.90	1.49	1.38
1	A	64	CRO	CA2-N2	4.72	1.48	1.38
1	A	64	CRO	CB2-CA2	-3.14	1.32	1.35
1	A	64	CRO	C2-N3	2.87	1.46	1.39
1	B	64	CRO	CA1-C1	2.74	1.55	1.51
1	B	64	CRO	CG2-CB2	2.70	1.52	1.46
1	B	64	CRO	C2-N3	2.66	1.46	1.39
1	A	64	CRO	CG2-CB2	2.62	1.51	1.46
1	B	64	CRO	C1-N3	2.57	1.41	1.37
1	A	64	CRO	CA1-C1	2.48	1.54	1.51
1	B	64	CRO	CB2-CA2	-2.11	1.33	1.35
1	A	64	CRO	C1-N3	2.10	1.40	1.37

All (28) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	64	CRO	CB2-CA2-C2	19.80	145.91	122.28
1	B	64	CRO	CB2-CA2-C2	19.69	145.78	122.28
1	A	64	CRO	CB2-CA2-N2	-16.30	106.22	128.83
1	B	64	CRO	CB2-CA2-N2	-16.14	106.44	128.83
1	A	64	CRO	O2-C2-CA2	-15.17	122.44	130.96
1	B	64	CRO	O2-C2-CA2	-13.74	123.25	130.96
1	A	64	CRO	CG2-CB2-CA2	9.78	141.92	129.94
1	B	64	CRO	CG2-CB2-CA2	9.58	141.68	129.94
1	B	64	CRO	CA1-C1-N3	-8.10	115.03	124.75
1	A	64	CRO	CA1-C1-N3	-7.56	115.68	124.75
1	A	64	CRO	N3-C1-N2	6.60	116.03	111.45
1	B	64	CRO	N3-C1-N2	5.29	115.12	111.45
1	B	64	CRO	CA1-C1-N2	4.25	129.83	123.89
1	A	64	CRO	O2-C2-N3	4.07	132.43	124.35
1	B	64	CRO	O2-C2-N3	3.71	131.72	124.35
1	A	64	CRO	CA2-C2-N3	3.69	105.12	103.37
1	B	64	CRO	CA2-C2-N3	3.50	105.03	103.37
1	A	64	CRO	CE1-CD1-CG2	-3.48	116.71	121.25
1	B	64	CRO	CD2-CG2-CB2	-3.32	109.91	121.22
1	B	64	CRO	CD2-CG2-CD1	3.27	122.48	117.64
1	B	64	CRO	O3-C3-CA3	-3.20	116.73	126.39
1	A	64	CRO	CD2-CG2-CD1	3.20	122.38	117.64
1	A	64	CRO	CD2-CG2-CB2	-3.16	110.47	121.22
1	A	64	CRO	CA1-C1-N2	3.15	128.29	123.89
1	B	64	CRO	CE1-CD1-CG2	-3.04	117.28	121.25
1	A	64	CRO	CA2-N2-C1	-2.48	103.94	105.77
1	A	64	CRO	O3-C3-CA3	-2.37	119.22	126.39
1	A	64	CRO	CG1-CB1-CA1	-2.19	107.01	112.16

There are no chirality outliers.

All (2) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	A	64	CRO	C3-CA3-N3-C2
1	B	64	CRO	C3-CA3-N3-C2

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)

Of 6 ligands modelled in this entry, 2 are monoatomic - leaving 4 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
2	OEH	A	601	1	47,47,48	1.00	4 (8%)	64,64,65	0.77	1 (1%)
2	OEH	B	601	1	47,47,48	0.99	4 (8%)	64,64,65	0.72	1 (1%)
4	GOL	B	603	-	5,5,5	1.11	0	5,5,5	0.92	0
4	GOL	A	603	-	5,5,5	0.92	0	5,5,5	1.12	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
2	OEH	A	601	1	-	0/31/37/38	0/4/4/4
2	OEH	B	601	1	-	0/31/37/38	0/4/4/4
4	GOL	B	603	-	-	0/4/4/4	-
4	GOL	A	603	-	-	4/4/4/4	-

All (8) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	601	OEH	C5-C6	-2.92	1.39	1.47
2	B	601	OEH	C5-C6	-2.80	1.39	1.47
2	A	601	OEH	C30-N2	2.74	1.38	1.34
2	B	601	OEH	C25-C6	2.72	1.48	1.39
2	B	601	OEH	C5-C33	2.67	1.45	1.40
2	A	601	OEH	C5-C33	2.58	1.45	1.40
2	A	601	OEH	C25-C6	2.49	1.47	1.39

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	601	OEH	C30-N2	2.15	1.37	1.34

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	A	601	OEH	C7-C6-C25	-2.89	117.36	120.45
2	B	601	OEH	C7-C6-C25	-2.11	118.20	120.45

There are no chirality outliers.

All (4) torsion outliers are listed below:

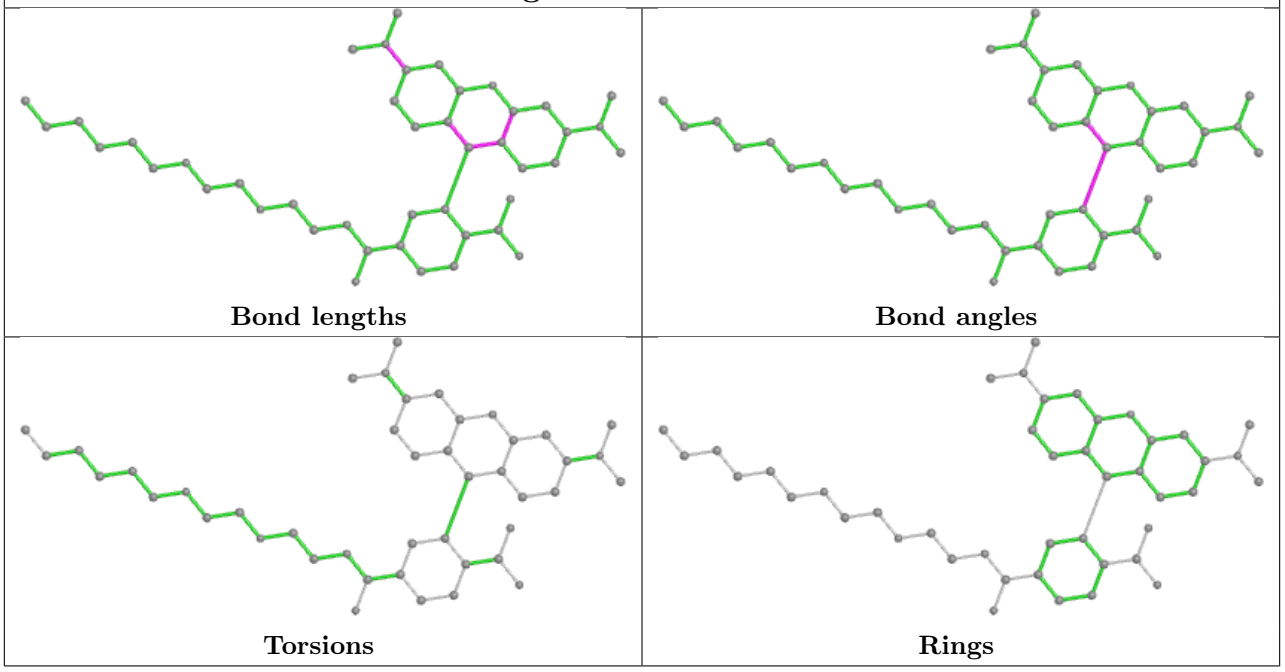
Mol	Chain	Res	Type	Atoms
4	A	603	GOL	O1-C1-C2-C3
4	A	603	GOL	C1-C2-C3-O3
4	A	603	GOL	O2-C2-C3-O3
4	A	603	GOL	O1-C1-C2-O2

There are no ring outliers.

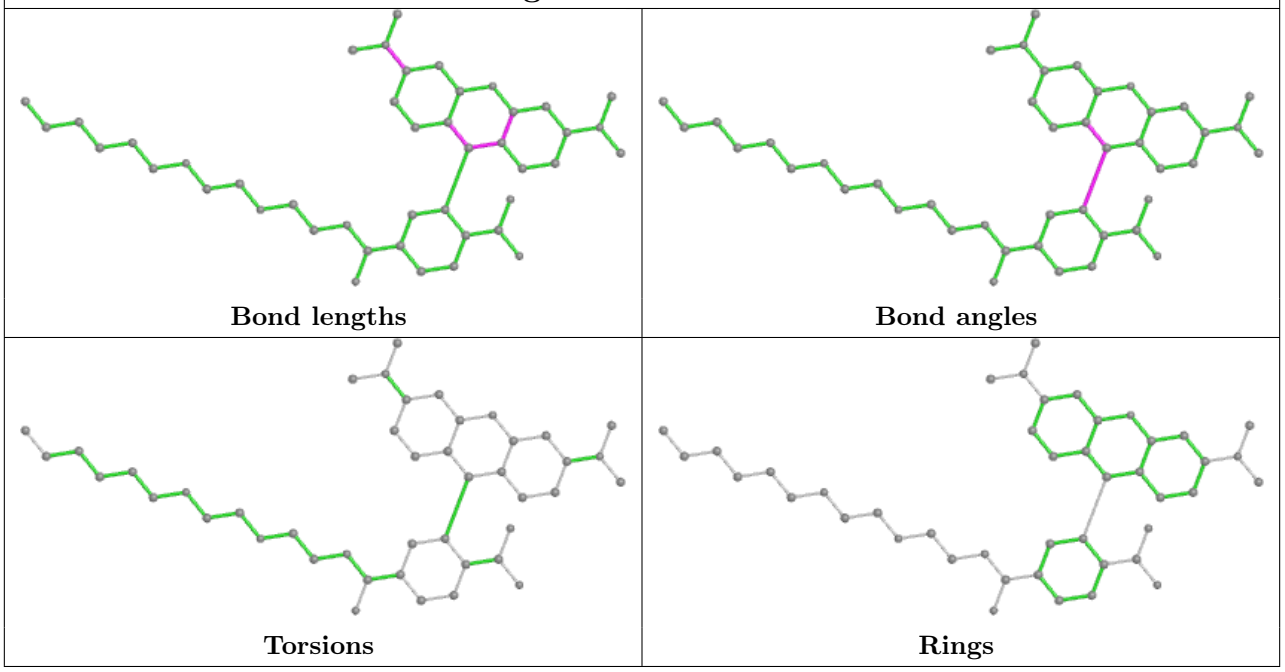
No monomer is involved in short contacts.

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 OEH A 601



Ligand OEH B 601



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, 95^{th} 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	517/529 (97%)	-0.36	5 (0%)	82	80	18, 25, 38, 67	0
1	B	516/529 (97%)	-0.37	3 (0%)	89	87	17, 24, 36, 65	0
All	All	1033/1058 (97%)	-0.37	8 (0%)	86	84	17, 25, 37, 67	0

All (8) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	529	ILE	5.5
1	A	529	ILE	4.1
1	A	229	THR	4.0
1	A	528	GLU	2.9
1	A	237	LYS	2.6
1	B	228	ILE	2.5
1	A	389	THR	2.4
1	B	237	LYS	2.0

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

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, 95^{th} 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	CRO	A	64	22/23	0.95	0.10	19,21,22,23	0
1	CRO	B	64	22/23	0.95	0.10	17,18,20,22	0

6.3 Carbohydrates

There are no monosaccharides in this entry.

6.4 Ligands (i)

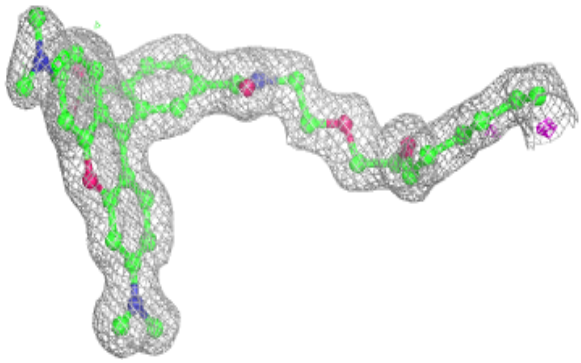
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9'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

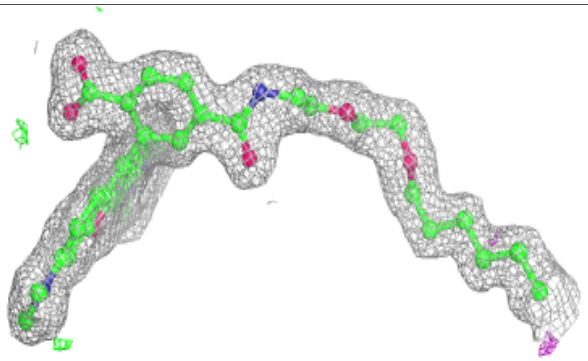
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
4	GOL	A	603	6/6	0.93	0.10	24,30,33,36	0
4	GOL	B	603	6/6	0.93	0.09	25,26,28,29	0
2	OEH	A	601	44/45	0.95	0.09	17,22,27,31	0
2	OEH	B	601	44/45	0.96	0.08	17,21,25,27	0
3	CL	A	602	1/1	0.99	0.09	21,21,21,21	0
3	CL	B	602	1/1	0.99	0.10	20,20,20,20	0

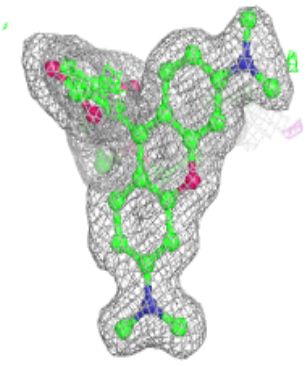
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around OEH 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)

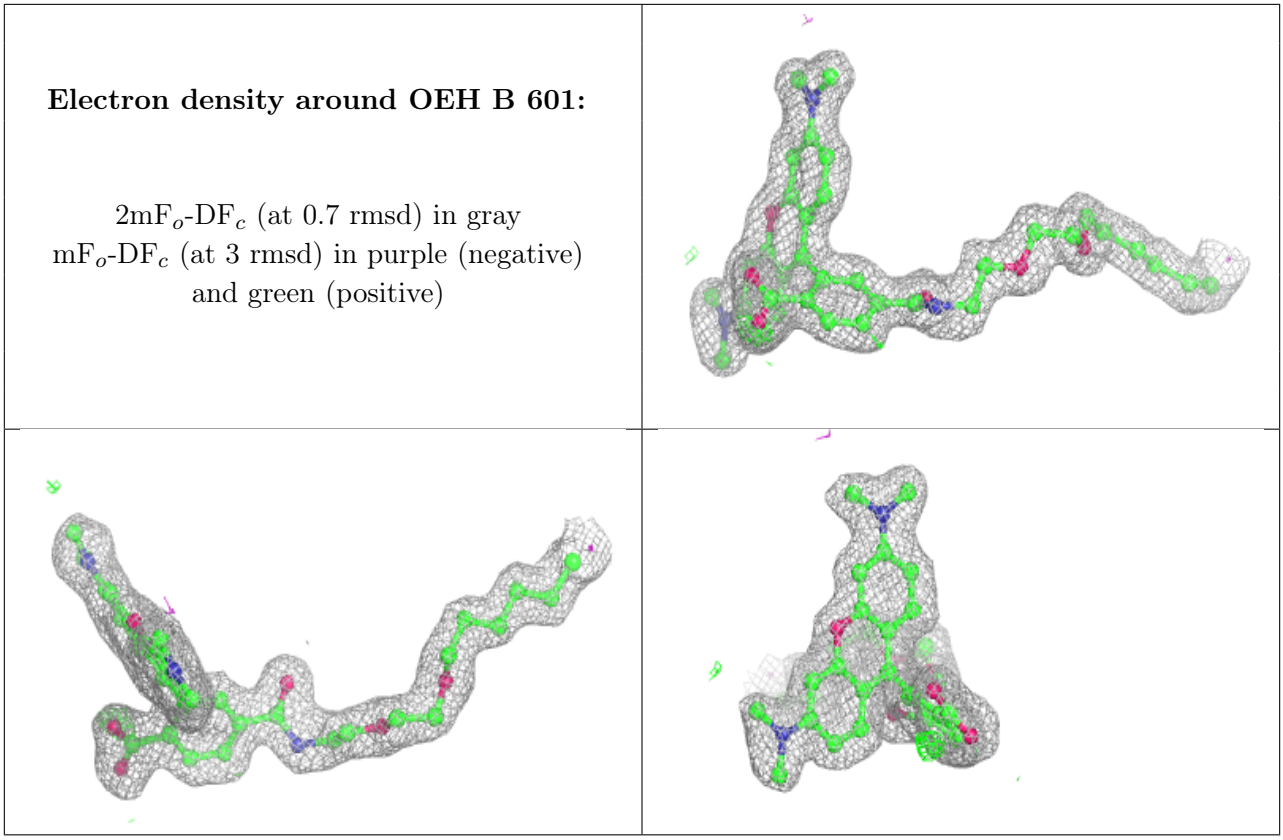






Electron density around OEH B 601:

$2mF_o$-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.