



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 8, 2026 – 05:07 PM UTC

PDB ID : 5G3W / pdb_00005g3w
Title : Structure of HDAC like protein from Bordetella Alcaligenes in complex with the photoswitchable inhibitor CEW65
Authors : Kraemer, A.; Meyer-Almes, F.J.; Yildiz, O.
Deposited on : 2016-05-02
Resolution : 1.60 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	:	4-5-2 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

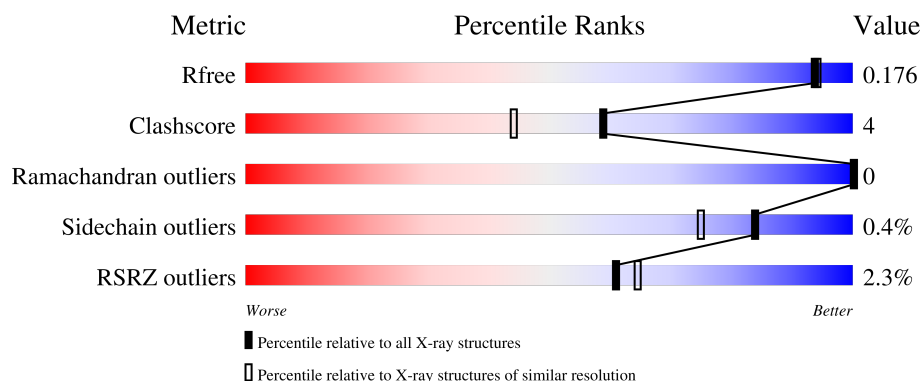
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.60 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	4673 (1.60-1.60)
Clashscore	190562	4931 (1.60-1.60)
Ramachandran outliers	187476	4831 (1.60-1.60)
Sidechain outliers	187428	4830 (1.60-1.60)
RSRZ outliers	180081	4672 (1.60-1.60)

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	374	
1	B	374	
1	C	374	
1	D	374	

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
4	PEG	D	376	-	-	X	-
5	C65	A	376	-	-	X	-

2 Entry composition

There are 7 unique types of molecules in this entry. The entry contains 13170 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 HISTONE DEACETYLASE-LIKE AMIDOHYDROLASE.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	369	Total	C	N	O	S	0	3	0
			2793	1749	505	520	19			
1	B	369	Total	C	N	O	S	0	3	0
			2791	1750	503	518	20			
1	C	369	Total	C	N	O	S	0	2	0
			2788	1751	503	516	18			
1	D	371	Total	C	N	O	S	0	2	0
			2806	1758	509	520	19			

There are 28 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-4	HIS	-	expression tag	UNP Q70I53
A	-3	HIS	-	expression tag	UNP Q70I53
A	-2	HIS	-	expression tag	UNP Q70I53
A	-1	HIS	-	expression tag	UNP Q70I53
A	0	HIS	-	expression tag	UNP Q70I53
A	1	HIS	-	expression tag	UNP Q70I53
A	251	PRO	HIS	engineered mutation	UNP Q70I53
B	-4	HIS	-	expression tag	UNP Q70I53
B	-3	HIS	-	expression tag	UNP Q70I53
B	-2	HIS	-	expression tag	UNP Q70I53
B	-1	HIS	-	expression tag	UNP Q70I53
B	0	HIS	-	expression tag	UNP Q70I53
B	1	HIS	-	expression tag	UNP Q70I53
B	251	PRO	HIS	engineered mutation	UNP Q70I53
C	-4	HIS	-	expression tag	UNP Q70I53
C	-3	HIS	-	expression tag	UNP Q70I53
C	-2	HIS	-	expression tag	UNP Q70I53
C	-1	HIS	-	expression tag	UNP Q70I53
C	0	HIS	-	expression tag	UNP Q70I53
C	1	HIS	-	expression tag	UNP Q70I53
C	251	PRO	HIS	engineered mutation	UNP Q70I53

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Chain	Residue	Modelled	Actual	Comment	Reference
D	-4	HIS	-	expression tag	UNP Q70I53
D	-3	HIS	-	expression tag	UNP Q70I53
D	-2	HIS	-	expression tag	UNP Q70I53
D	-1	HIS	-	expression tag	UNP Q70I53
D	0	HIS	-	expression tag	UNP Q70I53
D	1	HIS	-	expression tag	UNP Q70I53
D	251	PRO	HIS	engineered mutation	UNP Q70I53

- Molecule 2 is ZINC ION (CCD ID: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	1	Total Zn 1 1	0	0
2	B	1	Total Zn 1 1	0	0
2	C	1	Total Zn 1 1	0	0
2	D	1	Total Zn 1 1	0	0

- Molecule 3 is POTASSIUM ION (CCD ID: K) (formula: K).

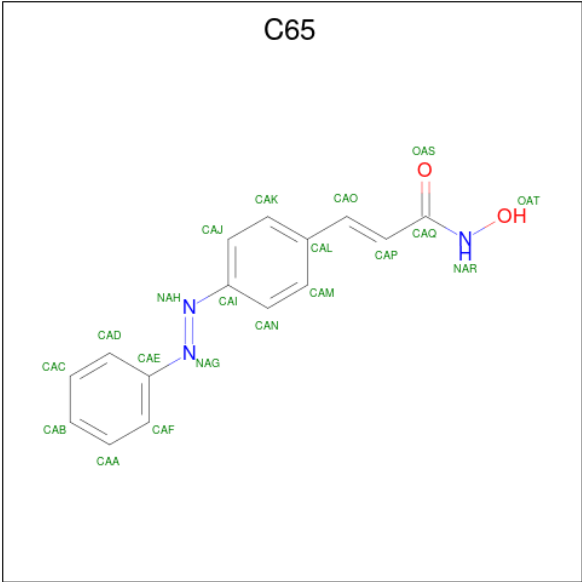
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	2	Total K 2 2	0	0
3	B	2	Total K 2 2	0	0
3	C	2	Total K 2 2	0	0
3	D	2	Total K 2 2	0	0

- Molecule 4 is DI(HYDROXYETHYL)ETHER (CCD ID: PEG) (formula: C₄H₁₀O₃).



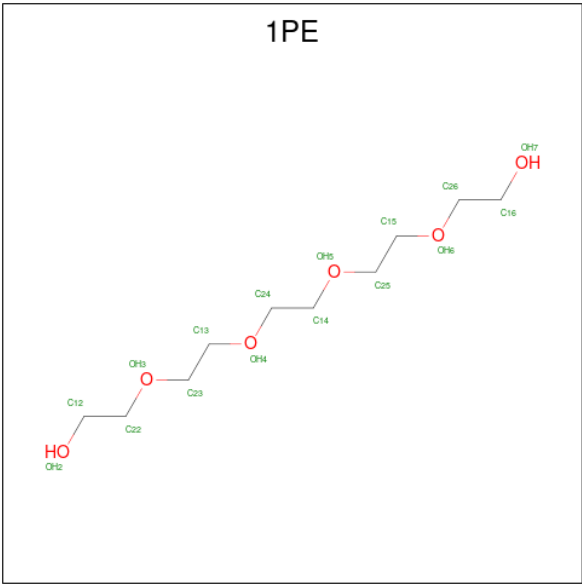
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total	C	O	0	0
			7	4	3		
4	A	1	Total	C	O	0	0
			7	4	3		
4	A	1	Total	C	O	0	0
			7	4	3		
4	B	1	Total	C	O	0	0
			7	4	3		
4	B	1	Total	C	O	0	0
			7	4	3		
4	B	1	Total	C	O	0	0
			7	4	3		
4	C	1	Total	C	O	0	0
			7	4	3		
4	C	1	Total	C	O	0	0
			7	4	3		
4	D	1	Total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

- Molecule 5 is (2E)-N-hydroxy-3-{4-[(E)-phenyldiazenyl]phenyl}prop-2-enamide (CCD ID: C65) (formula: C₁₅H₁₃N₃O₂).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
5	A	1	Total	C	N	O	0	0
			20	15	3	2		
5	B	1	Total	C	N	O	0	0
			20	15	3	2		
5	C	1	Total	C	N	O	0	0
			20	15	3	2		
5	D	1	Total	C	N	O	0	0
			20	15	3	2		

- Molecule 6 is PENTAETHYLENE GLYCOL (CCD ID: 1PE) (formula: C₁₀H₂₂O₆).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	B	1	Total	C	O	0	0
			16	10	6		
6	C	1	Total	C	O	0	0
			16	10	6		

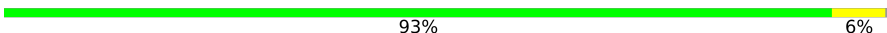
- Molecule 7 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	514	Total	O	0	0
			514	514		
7	B	413	Total	O	0	0
			413	413		
7	C	480	Total	O	0	0
			480	480		
7	D	384	Total	O	0	0
			384	384		

3 Residue-property plots [i](#)

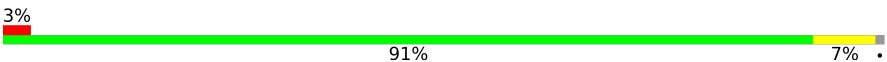
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density.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

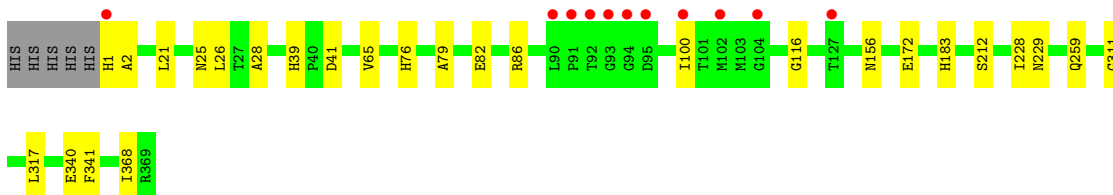
- Molecule 1: HISTONE DEACETYLASE-LIKE AMIDOHYDROLASE

Chain A: 

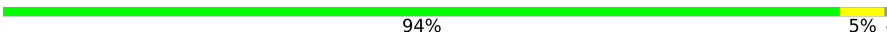


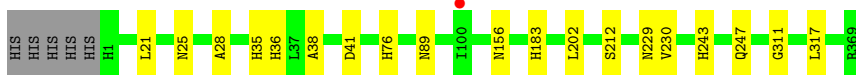
- Molecule 1: HISTONE DEACETYLASE-LIKE AMIDOHYDROLASE

Chain B: 



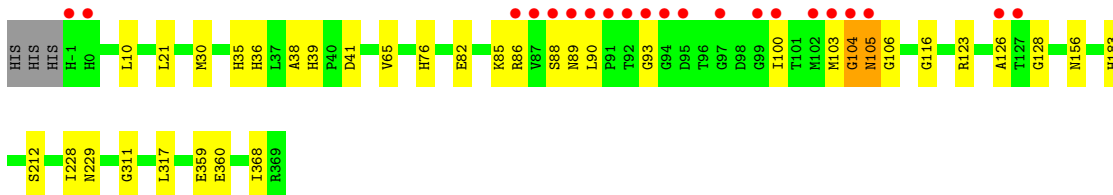
- Molecule 1: HISTONE DEACETYLASE-LIKE AMIDOHYDROLASE

Chain C: 



- Molecule 1: HISTONE DEACETYLASE-LIKE AMIDOHYDROLASE

Chain D: 



4 Data and refinement statistics

Property	Value	Source
Space group	I 2 2 2	Depositor
Cell constants a, b, c, α , β , γ	92.27Å 130.14Å 251.13Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	125.57 – 1.60 125.56 – 1.60	Depositor EDS
% Data completeness (in resolution range)	99.6 (125.57-1.60) 99.6 (125.56-1.60)	Depositor EDS
R_{merge}	0.10	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	3.01 (at 1.60Å)	Xtriage
Refinement program	REFMAC 5.8.0103	Depositor
R, R_{free}	0.125 , 0.167 0.139 , 0.176	Depositor DCC
R_{free} test set	9839 reflections (4.99%)	wwPDB-VP
Wilson B-factor (Å ²)	12.0	Xtriage
Anisotropy	0.553	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.34 , 43.8	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	0.97	EDS
Total number of atoms	13170	wwPDB-VP
Average B, all atoms (Å ²)	16.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.79% 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: PEG, ZN, K, C65, 1PE

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	0.67	0/2862	0.83	2/3901 (0.1%)
1	B	0.69	0/2863	0.82	0/3901
1	C	0.67	0/2858	0.79	0/3896
1	D	0.68	2/2877 (0.1%)	0.84	3/3921 (0.1%)
All	All	0.68	2/11460 (0.0%)	0.82	5/15619 (0.0%)

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	D	104	GLY	N-CA	6.92	1.51	1.44
1	D	89	ASN	C-O	-5.16	1.17	1.24

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	30	MET	CG-SD-CE	-6.86	85.81	100.90
1	D	128	GLY	N-CA-C	5.82	123.09	115.47
1	A	210	PRO	CA-C-N	-5.64	113.18	123.34
1	A	210	PRO	C-N-CA	-5.64	113.18	123.34
1	D	105	ASN	N-CA-C	-5.02	102.63	110.10

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	2793	0	2701	24	0
1	B	2791	0	2707	30	0
1	C	2788	0	2703	12	0
1	D	2806	0	2712	31	0
2	A	1	0	0	0	0
2	B	1	0	0	0	0
2	C	1	0	0	0	0
2	D	1	0	0	0	0
3	A	2	0	0	0	0
3	B	2	0	0	0	0
3	C	2	0	0	0	0
3	D	2	0	0	0	0
4	A	21	0	30	0	0
4	B	21	0	30	2	0
4	C	14	0	20	0	0
4	D	21	0	30	5	0
5	A	20	0	0	16	0
5	B	20	0	0	5	0
5	C	20	0	0	0	0
5	D	20	0	0	3	0
6	B	16	0	22	0	0
6	C	16	0	22	0	0
7	A	514	0	0	2	0
7	B	413	0	0	4	1
7	C	480	0	0	0	1
7	D	384	0	0	5	0
All	All	13170	0	10977	99	2

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 4.

All (99) 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:D:36:HIS:HD2	1:D:38:ALA:H	1.27	0.82
1:A:36:HIS:HD2	1:A:38:ALA:H	1.28	0.81
1:C:36:HIS:HD2	1:C:38:ALA:H	1.29	0.78
5:A:376:C65:NAG	1:B:341:PHE:CE1	2.51	0.78
1:A:100:ILE:HD12	5:A:376:C65:CAN	2.16	0.75
1:A:36:HIS:CD2	1:A:38:ALA:H	2.07	0.72

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:36:HIS:CD2	1:D:38:ALA:H	2.06	0.72
1:B:39:HIS:HD2	1:B:41:ASP:H	1.35	0.71
1:B:228:ILE:HD11	1:B:368:ILE:HD11	1.70	0.71
1:D:86:ARG:HB2	7:D:2129:HOH:O	1.91	0.70
1:C:76:HIS:HE1	1:C:156:ASN:H	1.40	0.70
1:B:76:HIS:HE1	1:B:156:ASN:H	1.40	0.69
1:A:76:HIS:HE1	1:A:156:ASN:H	1.41	0.68
1:A:100:ILE:HG21	5:A:376:C65:CAF	2.24	0.68
1:C:36:HIS:CD2	1:C:38:ALA:H	2.11	0.68
1:D:76:HIS:HE1	1:D:156:ASN:H	1.39	0.68
1:D:39:HIS:HD2	1:D:41:ASP:H	1.42	0.67
1:A:39:HIS:HD2	1:A:41:ASP:H	1.41	0.66
1:B:21:LEU:HD11	5:B:377:C65:CAN	2.25	0.66
1:D:90:LEU:O	1:D:105:ASN:HB2	1.96	0.65
1:B:76:HIS:CE1	1:B:156:ASN:H	2.14	0.65
1:C:76:HIS:CE1	1:C:156:ASN:H	2.14	0.63
5:A:376:C65:NAH	1:B:341:PHE:CE1	2.66	0.63
1:D:88:SER:OG	4:D:376:PEG:H11	1.98	0.62
1:A:76:HIS:CE1	1:A:156:ASN:H	2.19	0.61
1:D:76:HIS:CE1	1:D:156:ASN:H	2.17	0.61
1:B:25:ASN:HD22	1:B:28:ALA:H	1.50	0.60
1:B:26:LEU:HD22	7:D:2168:HOH:O	2.02	0.59
1:C:25:ASN:HD22	1:C:28:ALA:H	1.51	0.59
1:A:142:HIS:NE2	5:A:376:C65:OAT	2.27	0.57
1:C:202:LEU:HD23	1:C:230:VAL:HB	1.87	0.56
1:D:360[A]:GLU:OE2	7:D:2369:HOH:O	2.18	0.55
1:B:39:HIS:CD2	1:B:41:ASP:H	2.21	0.54
1:D:100:ILE:CD1	5:D:373:C65:CAN	2.85	0.54
1:D:123:ARG:O	1:D:126:ALA:O	2.25	0.54
1:D:183:HIS:HE1	1:D:229:ASN:HD21	1.56	0.53
1:B:86:ARG:HH22	4:B:376:PEG:C2	2.21	0.53
1:C:243:HIS:CE1	1:C:247:GLN:HG3	2.42	0.53
5:A:376:C65:NAG	1:B:341:PHE:CZ	2.77	0.53
1:D:88:SER:O	1:D:106:GLY:N	2.41	0.52
1:D:88:SER:O	1:D:105:ASN:HA	2.09	0.52
1:A:39:HIS:CD2	1:A:41:ASP:H	2.26	0.51
1:B:183:HIS:HD2	1:B:212:SER:OG	1.94	0.51
1:B:26:LEU:HD11	1:D:10:LEU:HD22	1.92	0.50
1:A:21:LEU:HG	5:A:376:C65:CAE	2.41	0.49
1:A:36:HIS:HD2	1:A:38:ALA:N	2.04	0.49
5:A:376:C65:NAG	1:B:341:PHE:CD1	2.80	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:100:ILE:CD1	5:B:377:C65:CAJ	2.90	0.49
1:D:39:HIS:CD2	1:D:41:ASP:H	2.26	0.48
1:A:183:HIS:HE1	1:A:229:ASN:HD21	1.62	0.48
1:D:93:GLY:HA3	1:D:104:GLY:HA2	1.96	0.48
1:D:88:SER:OG	4:D:376:PEG:C1	2.62	0.48
1:B:1:HIS:CG	1:B:2:ALA:H	2.32	0.48
1:B:172[A]:GLU:H	1:B:259:GLN:HE22	1.61	0.48
1:D:21:LEU:HD11	5:D:373:C65:CAJ	2.43	0.48
1:B:228:ILE:CD1	1:B:368:ILE:HD11	2.43	0.47
1:D:359:GLU:HG2	7:D:2288:HOH:O	2.14	0.46
1:A:341:PHE:CE1	5:B:377:C65:NAG	2.84	0.46
1:C:35:HIS:HE1	1:C:41:ASP:OD2	1.99	0.46
1:D:183:HIS:HD2	1:D:212:SER:OG	1.98	0.46
1:B:172[B]:GLU:H	1:B:259:GLN:HE22	1.62	0.46
5:A:376:C65:CAQ	7:A:2317:HOH:O	2.63	0.46
1:A:100:ILE:CD1	5:A:376:C65:NAH	2.79	0.46
1:B:183:HIS:HE1	1:B:229:ASN:HD21	1.63	0.46
1:B:39:HIS:HE1	7:B:2090:HOH:O	1.99	0.45
1:A:39:HIS:HE1	7:A:2117:HOH:O	2.00	0.45
1:B:311:GLY:HA3	1:B:317:LEU:HD12	1.99	0.45
1:D:88:SER:CB	4:D:376:PEG:H11	2.46	0.45
7:B:2078:HOH:O	1:D:39:HIS:HE1	2.00	0.44
5:A:376:C65:CAE	1:B:341:PHE:CD1	3.00	0.44
5:A:376:C65:CAJ	1:B:341:PHE:CE1	3.01	0.44
1:D:21:LEU:O	1:D:36:HIS:HE1	2.01	0.44
4:B:375:PEG:H21	7:B:2182:HOH:O	2.16	0.44
1:A:21:LEU:HG	5:A:376:C65:CAD	2.47	0.44
1:D:36:HIS:HD2	1:D:38:ALA:N	2.04	0.44
1:A:21:LEU:O	1:A:36:HIS:HE1	2.01	0.44
1:A:228:ILE:HD11	1:A:368:ILE:HD11	2.00	0.43
1:D:100:ILE:HD13	5:D:373:C65:NAH	2.33	0.43
1:A:311:GLY:HA3	1:A:317:LEU:HD12	2.01	0.43
1:C:21:LEU:O	1:C:36:HIS:HE1	2.02	0.43
1:D:228:ILE:HD11	1:D:368:ILE:HD11	2.00	0.43
1:D:35:HIS:HE1	1:D:41:ASP:OD2	2.01	0.43
1:D:85:LYS:HB3	4:D:376:PEG:H31	1.99	0.43
1:B:65:VAL:O	1:B:116:GLY:HA3	2.19	0.42
1:B:100:ILE:HD13	5:B:377:C65:NAH	2.34	0.42
5:A:376:C65:CAJ	1:B:341:PHE:CZ	3.03	0.42
1:B:79:ALA:HB2	7:B:2155:HOH:O	2.19	0.42
1:D:311:GLY:HA3	1:D:317:LEU:HD12	2.01	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:65:VAL:O	1:A:116:GLY:HA3	2.19	0.42
1:A:100:ILE:HD12	5:A:376:C65:NAH	2.34	0.42
1:A:142:HIS:ND1	1:A:178:ASP:OD2	2.52	0.42
1:A:183:HIS:HD2	1:A:212:SER:OG	2.03	0.42
1:C:183:HIS:HD2	1:C:212:SER:OG	2.02	0.42
1:D:65:VAL:O	1:D:116:GLY:HA3	2.19	0.42
4:D:376:PEG:H12	7:D:2171:HOH:O	2.20	0.42
1:B:100:ILE:HG21	5:B:377:C65:CAD	2.50	0.41
1:C:183:HIS:HE1	1:C:229:ASN:HD21	1.69	0.40
1:C:311:GLY:HA3	1:C:317:LEU:HD12	2.02	0.40
1:A:21:LEU:CD2	5:A:376:C65:CAD	2.99	0.40

All (2) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
7:B:2413:HOH:O	7:B:2413:HOH:O[2_655]	0.53	1.67
7:C:2410:HOH:O	7:C:2410:HOH:O[4_565]	1.00	1.20

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	370/374 (99%)	361 (98%)	9 (2%)	0	100	100
1	B	370/374 (99%)	362 (98%)	8 (2%)	0	100	100
1	C	369/374 (99%)	358 (97%)	11 (3%)	0	100	100
1	D	371/374 (99%)	359 (97%)	12 (3%)	0	100	100
All	All	1480/1496 (99%)	1440 (97%)	40 (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	285/287 (99%)	285 (100%)	0	100	100
1	B	285/287 (99%)	283 (99%)	2 (1%)	76	63
1	C	284/287 (99%)	283 (100%)	1 (0%)	84	75
1	D	286/287 (100%)	283 (99%)	3 (1%)	68	50
All	All	1140/1148 (99%)	1134 (100%)	6 (0%)	84	70

All (6) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	82	GLU
1	B	340	GLU
1	C	89	ASN
1	D	82	GLU
1	D	103[A]	MET
1	D	103[B]	MET

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (36) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	36	HIS
1	A	39	HIS
1	A	76	HIS
1	A	147	ASN
1	A	183	HIS
1	A	203	HIS
1	A	222	ASN
1	A	224	HIS
1	A	229	ASN
1	B	25	ASN
1	B	31	GLN
1	B	39	HIS
1	B	76	HIS

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Mol	Chain	Res	Type
1	B	183	HIS
1	B	227	ASN
1	B	229	ASN
1	B	259	GLN
1	C	25	ASN
1	C	31	GLN
1	C	35	HIS
1	C	36	HIS
1	C	55	GLN
1	C	76	HIS
1	C	183	HIS
1	C	224	HIS
1	C	227	ASN
1	C	229	ASN
1	C	287	GLN
1	D	31	GLN
1	D	35	HIS
1	D	36	HIS
1	D	39	HIS
1	D	76	HIS
1	D	183	HIS
1	D	224	HIS
1	D	229	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](#)

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 29 ligands modelled in this entry, 12 are monoatomic - leaving 17 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$
5	C65	B	377	2	20,21,21	1.20	1 (5%)	26,26,26	2.57	10 (38%)
4	PEG	C	374	-	6,6,6	0.60	0	5,5,5	0.35	0
4	PEG	B	375	-	6,6,6	0.42	0	5,5,5	0.71	0
4	PEG	B	373	-	6,6,6	0.51	0	5,5,5	0.62	0
4	PEG	C	376	-	6,6,6	0.47	0	5,5,5	0.47	0
4	PEG	D	376	-	6,6,6	0.47	0	5,5,5	0.80	0
6	1PE	B	374	-	15,15,15	0.42	0	14,14,14	0.33	0
6	1PE	C	375	-	15,15,15	0.60	0	14,14,14	0.75	0
4	PEG	A	374	-	6,6,6	0.57	0	5,5,5	0.36	0
5	C65	C	373	2	20,21,21	0.80	0	26,26,26	1.91	4 (15%)
5	C65	D	373	2	20,21,21	0.68	0	26,26,26	2.04	9 (34%)
5	C65	A	376	2	20,21,21	1.68	3 (15%)	26,26,26	3.37	15 (57%)
4	PEG	A	373	-	6,6,6	0.57	0	5,5,5	0.57	0
4	PEG	B	376	-	6,6,6	0.67	0	5,5,5	0.85	0
4	PEG	D	375	-	6,6,6	0.56	0	5,5,5	0.38	0
4	PEG	D	374	-	6,6,6	0.53	0	5,5,5	0.32	0
4	PEG	A	375	-	6,6,6	0.51	0	5,5,5	0.45	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	C65	B	377	2	-	4/12/12/12	0/2/2/2
4	PEG	C	374	-	-	2/4/4/4	-
4	PEG	B	375	-	-	3/4/4/4	-
4	PEG	B	373	-	-	2/4/4/4	-
4	PEG	C	376	-	-	2/4/4/4	-
4	PEG	D	376	-	-	4/4/4/4	-
6	1PE	B	374	-	-	9/13/13/13	-
6	1PE	C	375	-	-	6/13/13/13	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	PEG	A	374	-	-	1/4/4/4	-
5	C65	C	373	2	-	2/12/12/12	0/2/2/2
5	C65	D	373	2	-	2/12/12/12	0/2/2/2
5	C65	A	376	2	-	6/12/12/12	0/2/2/2
4	PEG	A	373	-	-	3/4/4/4	-
4	PEG	B	376	-	-	4/4/4/4	-
4	PEG	D	375	-	-	2/4/4/4	-
4	PEG	D	374	-	-	0/4/4/4	-
4	PEG	A	375	-	-	0/4/4/4	-

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	A	376	C65	OAT-NAR	-3.91	1.30	1.40
5	A	376	C65	CAJ-CAI	3.16	1.45	1.39
5	B	377	C65	OAT-NAR	-2.51	1.33	1.40
5	A	376	C65	CAA-CAF	2.46	1.43	1.38

All (38) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	C	373	C65	OAS-CAQ-NAR	-7.08	110.50	122.87
5	B	377	C65	OAS-CAQ-NAR	-6.95	110.72	122.87
5	A	376	C65	CAN-CAI-CAJ	-6.52	108.98	119.23
5	A	376	C65	CAI-NAH-NAG	5.77	141.39	112.97
5	A	376	C65	CAC-CAD-CAE	5.64	127.08	119.75
5	A	376	C65	CAE-NAG-NAH	5.46	139.88	112.97
5	A	376	C65	CAF-CAE-CAD	-5.41	110.73	119.23
5	A	376	C65	CAK-CAJ-CAI	5.14	126.67	120.39
5	D	373	C65	OAS-CAQ-NAR	-5.13	113.90	122.87
5	B	377	C65	CAI-NAH-NAG	4.48	135.04	112.97
5	A	376	C65	OAS-CAQ-NAR	-4.36	115.24	122.87
5	A	376	C65	OAS-CAQ-CAP	4.28	132.82	122.95
5	B	377	C65	CAN-CAI-CAJ	-4.28	112.50	119.23
5	D	373	C65	OAS-CAQ-CAP	4.13	132.47	122.95
5	A	376	C65	CAM-CAN-CAI	4.10	125.41	120.39
5	B	377	C65	CAP-CAQ-NAR	4.06	121.56	114.41
5	B	377	C65	CAE-NAG-NAH	3.74	131.37	112.97
5	B	377	C65	CAA-CAF-CAE	3.37	124.13	119.75
5	C	373	C65	CAP-CAQ-NAR	3.29	120.21	114.41
5	D	373	C65	CAE-NAG-NAH	3.28	129.13	112.97

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	A	376	C65	CAO-CAP-CAQ	-3.22	113.82	121.33
5	D	373	C65	CAN-CAI-CAJ	-3.18	114.23	119.23
5	D	373	C65	CAI-NAH-NAG	2.90	127.24	112.97
5	B	377	C65	CAM-CAN-CAI	2.81	123.83	120.39
5	B	377	C65	CAF-CAE-CAD	-2.78	114.87	119.23
5	C	373	C65	OAS-CAQ-CAP	2.75	129.29	122.95
5	C	373	C65	CAE-NAG-NAH	2.73	126.40	112.97
5	B	377	C65	CAK-CAJ-CAI	2.66	123.65	120.39
5	A	376	C65	CAC-CAB-CAA	-2.49	116.45	119.87
5	D	373	C65	CAO-CAP-CAQ	-2.46	115.60	121.33
5	A	376	C65	CAA-CAF-CAE	2.45	122.93	119.75
5	A	376	C65	OAT-NAR-CAQ	-2.41	113.91	119.67
5	D	373	C65	CAA-CAF-CAE	2.26	122.70	119.75
5	A	376	C65	CAJ-CAI-NAH	2.24	132.57	120.26
5	D	373	C65	CAK-CAJ-CAI	2.21	123.09	120.39
5	B	377	C65	OAS-CAQ-CAP	2.06	127.70	122.95
5	D	373	C65	CAM-CAN-CAI	2.04	122.89	120.39
5	A	376	C65	CAB-CAA-CAF	2.02	122.73	120.24

There are no chirality outliers.

All (52) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	A	376	C65	CAO-CAP-CAQ-NAR
5	A	376	C65	CAP-CAQ-NAR-OAT
5	A	376	C65	OAS-CAQ-NAR-OAT
5	B	377	C65	CAO-CAP-CAQ-NAR
5	C	373	C65	CAO-CAP-CAQ-NAR
5	D	373	C65	CAO-CAP-CAQ-NAR
4	B	376	PEG	C4-C3-O2-C2
5	A	376	C65	CAJ-CAI-NAH-NAG
5	A	376	C65	CAO-CAP-CAQ-OAS
4	B	375	PEG	O1-C1-C2-O2
4	C	374	PEG	O1-C1-C2-O2
6	B	374	1PE	OH2-C12-C22-OH3
6	C	375	1PE	OH4-C13-C23-OH3
5	A	376	C65	CAN-CAI-NAH-NAG
4	A	373	PEG	O2-C3-C4-O4
4	B	373	PEG	O1-C1-C2-O2
4	C	374	PEG	O2-C3-C4-O4
6	B	374	1PE	OH5-C14-C24-OH4
4	C	376	PEG	O2-C3-C4-O4

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Mol	Chain	Res	Type	Atoms
4	D	375	PEG	O2-C3-C4-O4
6	C	375	1PE	C13-C23-OH3-C22
5	B	377	C65	CAN-CAI-NAH-NAG
4	A	373	PEG	O1-C1-C2-O2
4	B	376	PEG	O2-C3-C4-O4
4	C	376	PEG	O1-C1-C2-O2
4	D	376	PEG	O1-C1-C2-O2
6	B	374	1PE	OH4-C13-C23-OH3
4	B	376	PEG	O1-C1-C2-O2
4	D	376	PEG	O2-C3-C4-O4
5	B	377	C65	CAJ-CAI-NAH-NAG
4	B	373	PEG	O2-C3-C4-O4
6	C	375	1PE	OH7-C16-C26-OH6
4	B	375	PEG	C1-C2-O2-C3
6	B	374	1PE	OH7-C16-C26-OH6
4	B	375	PEG	C4-C3-O2-C2
6	B	374	1PE	OH6-C15-C25-OH5
4	A	373	PEG	C4-C3-O2-C2
4	B	376	PEG	C1-C2-O2-C3
4	A	374	PEG	O2-C3-C4-O4
5	B	377	C65	CAO-CAP-CAQ-OAS
5	C	373	C65	CAO-CAP-CAQ-OAS
5	D	373	C65	CAO-CAP-CAQ-OAS
4	D	376	PEG	C4-C3-O2-C2
4	D	375	PEG	C1-C2-O2-C3
6	B	374	1PE	C14-C24-OH4-C13
6	B	374	1PE	C16-C26-OH6-C15
6	C	375	1PE	C16-C26-OH6-C15
6	B	374	1PE	C12-C22-OH3-C23
6	B	374	1PE	C23-C13-OH4-C24
6	C	375	1PE	C15-C25-OH5-C14
4	D	376	PEG	C1-C2-O2-C3
6	C	375	1PE	OH6-C15-C25-OH5

There are no ring outliers.

6 monomers are involved in 31 short contacts:

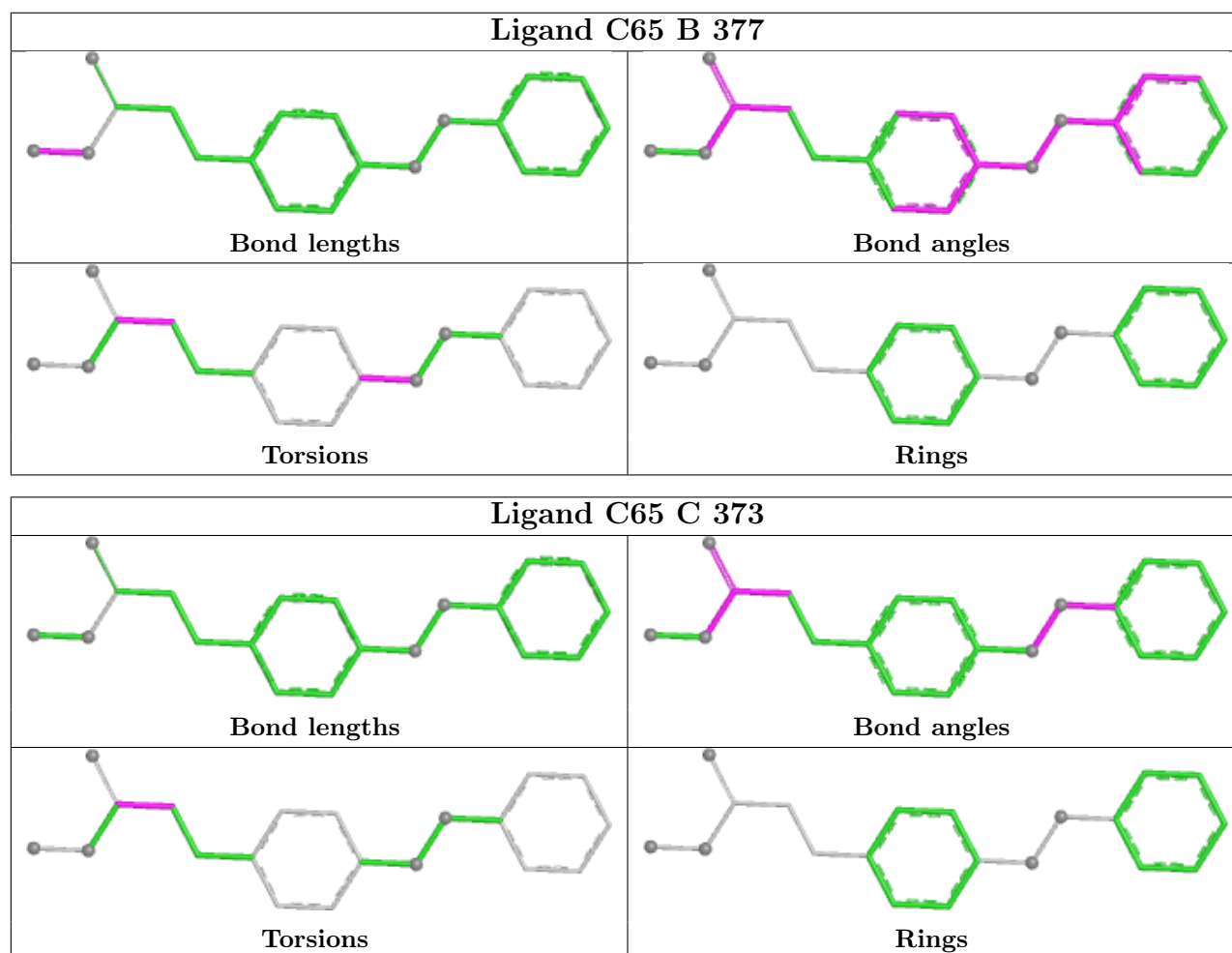
Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	B	377	C65	5	0
4	B	375	PEG	1	0
4	D	376	PEG	5	0
5	D	373	C65	3	0

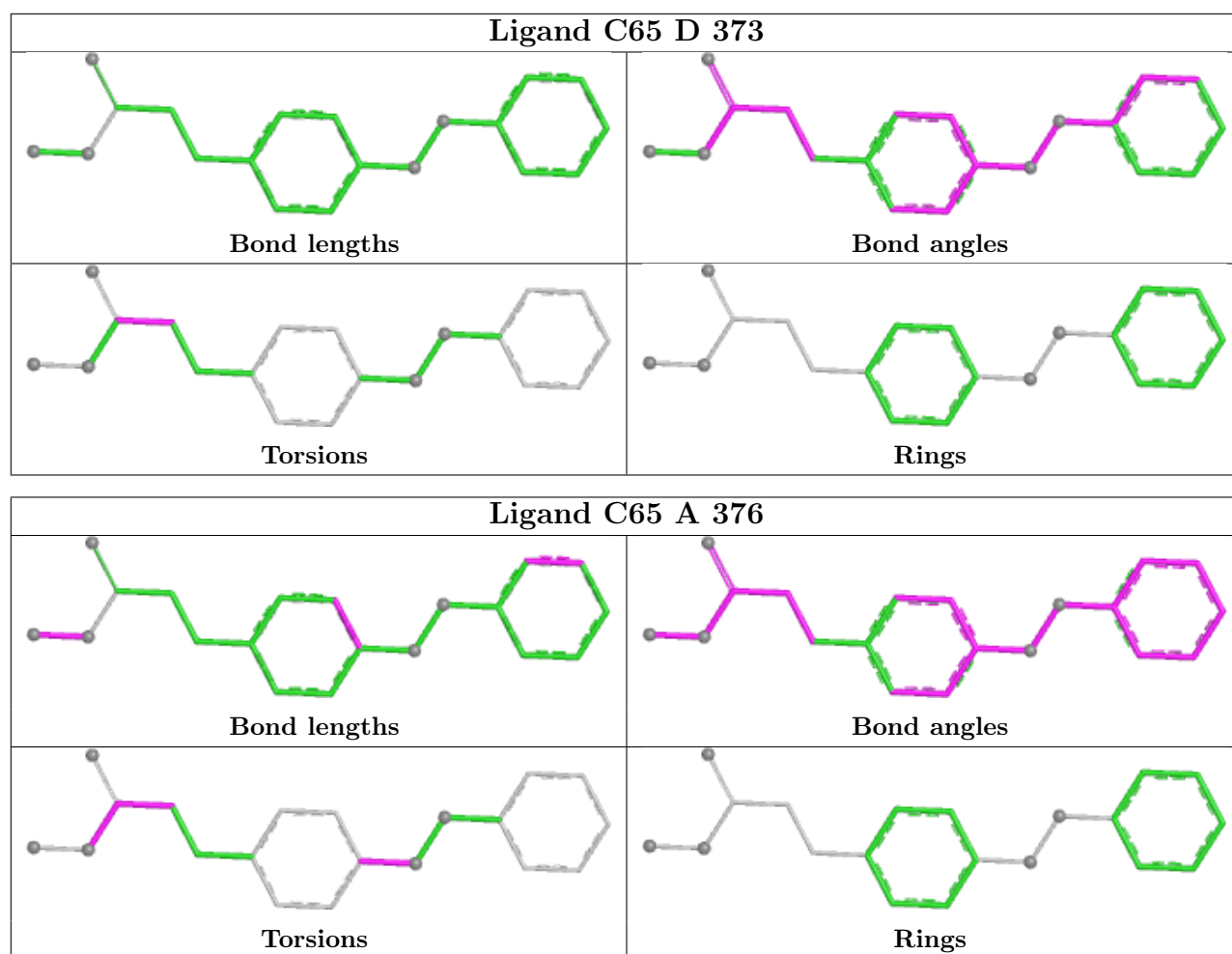
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Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	A	376	C65	16	0
4	B	376	PEG	1	0

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

6.1 Protein, DNA and RNA chains

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	369/374 (98%)	-0.67	1 (0%) 90 91	7, 12, 23, 38	9 (2%)
1	B	369/374 (98%)	-0.52	11 (2%) 52 55	5, 11, 27, 44	5 (1%)
1	C	369/374 (98%)	-0.64	1 (0%) 90 91	7, 12, 22, 44	6 (1%)
1	D	371/374 (99%)	-0.34	21 (5%) 29 30	8, 14, 32, 49	7 (1%)
All	All	1478/1496 (98%)	-0.54	34 (2%) 61 64	5, 12, 27, 49	27 (1%)

All (34) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	92	THR	4.4
1	D	90	LEU	4.3
1	D	87	VAL	4.2
1	D	102	MET	4.0
1	D	93	GLY	3.9
1	D	104	GLY	3.7
1	D	94	GLY	3.6
1	B	100	ILE	3.3
1	D	0	HIS	3.1
1	B	1	HIS	3.0
1	D	-1	HIS	3.0
1	D	86	ARG	2.9
1	C	100[A]	ILE	2.8
1	B	94	GLY	2.7
1	D	89	ASN	2.7
1	D	100	ILE	2.7
1	B	127	THR	2.6
1	B	93	GLY	2.6
1	D	103[A]	MET	2.6
1	A	1	HIS	2.6
1	B	102[A]	MET	2.5

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Mol	Chain	Res	Type	RSRZ
1	D	126	ALA	2.5
1	D	88	SER	2.4
1	B	91	PRO	2.4
1	D	91	PRO	2.4
1	B	95	ASP	2.4
1	D	127	THR	2.3
1	B	104	GLY	2.3
1	D	105	ASN	2.2
1	B	92	THR	2.2
1	D	97	GLY	2.1
1	D	99	GLY	2.1
1	B	90	LEU	2.1
1	D	95	ASP	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 oligosaccharides 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	C65	A	376	20/20	0.60	0.29	11,21,26,27	20
4	PEG	B	375	7/7	0.68	0.19	16,22,24,26	7
5	C65	B	377	20/20	0.69	0.26	11,24,27,29	20
5	C65	D	373	20/20	0.70	0.30	10,29,31,31	20
4	PEG	D	376	7/7	0.72	0.15	26,28,34,36	0
4	PEG	B	376	7/7	0.73	0.14	29,31,34,35	0
4	PEG	C	376	7/7	0.77	0.12	29,31,36,38	0
5	C65	C	373	20/20	0.78	0.19	9,28,30,30	20
4	PEG	A	374	7/7	0.79	0.14	32,35,37,41	0
4	PEG	B	373	7/7	0.80	0.13	35,38,42,45	0

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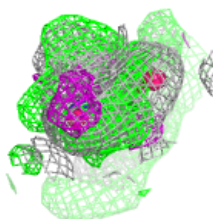
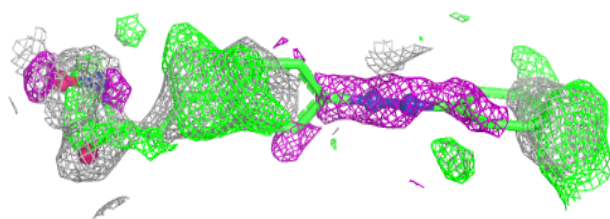
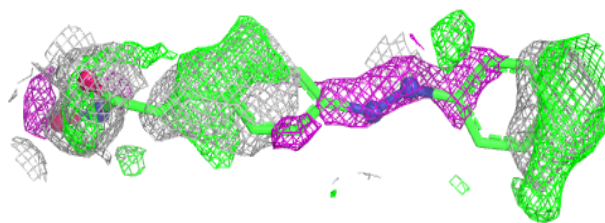
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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
4	PEG	A	373	7/7	0.81	0.15	27,29,33,38	0
4	PEG	C	374	7/7	0.82	0.11	31,33,37,37	0
4	PEG	A	375	7/7	0.83	0.10	28,31,33,40	0
4	PEG	D	374	7/7	0.87	0.12	22,32,41,49	0
6	1PE	C	375	16/16	0.87	0.11	26,34,41,45	0
4	PEG	D	375	7/7	0.89	0.10	31,35,37,37	0
6	1PE	B	374	16/16	0.91	0.10	25,31,37,38	16
2	ZN	D	370	1/1	0.99	0.04	14,14,14,14	1
3	K	B	372	1/1	1.00	0.01	12,12,12,12	0
3	K	C	371	1/1	1.00	0.03	12,12,12,12	1
3	K	C	372	1/1	1.00	0.02	12,12,12,12	0
3	K	D	371	1/1	1.00	0.01	14,14,14,14	0
3	K	D	372	1/1	1.00	0.02	12,12,12,12	1
2	ZN	B	370	1/1	1.00	0.02	8,8,8,8	1
2	ZN	C	370	1/1	1.00	0.02	11,11,11,11	1
2	ZN	A	370	1/1	1.00	0.03	10,10,10,10	1
3	K	A	371	1/1	1.00	0.03	12,12,12,12	1
3	K	A	372	1/1	1.00	0.01	13,13,13,13	0
3	K	B	371	1/1	1.00	0.02	11,11,11,11	1

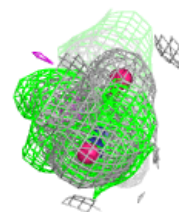
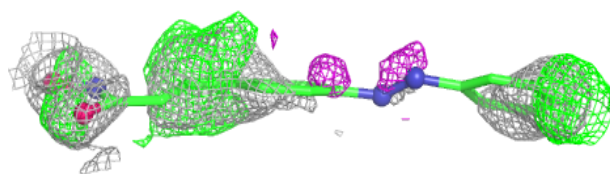
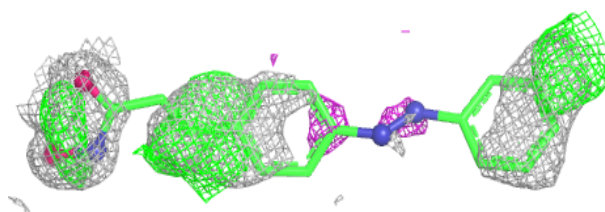
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around C65 A 376:

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

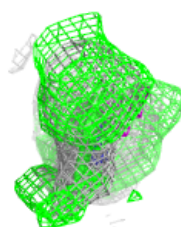
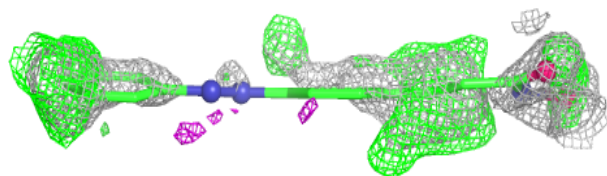
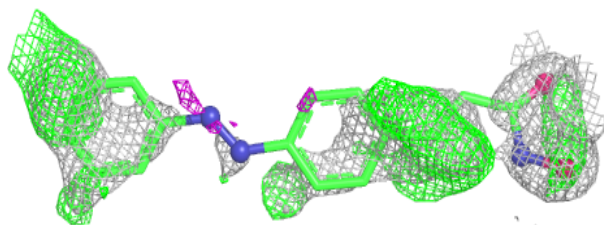
**Electron density around C65 B 377:**

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

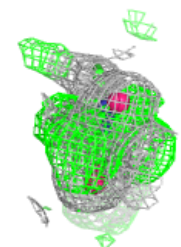
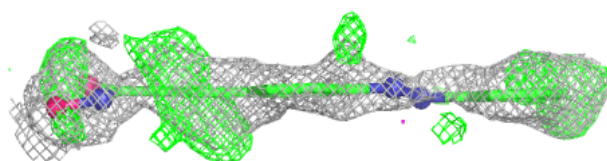
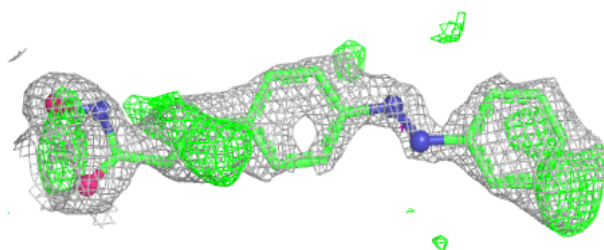


Electron density around C65 D 373:

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

**Electron density around C65 C 373:**

$2mF_o-DF_c$ (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.