



Full wwPDB X-ray Structure Validation Report ⓘ

Jan 20, 2026 – 10:11 PM EST

PDB ID : 9YG0 / pdb_00009yg0
Title : Targeting PTPN22 at non-orthosteric binding sites - a fragment approach
Authors : Di Lello, P.; Wells, M.M.
Deposited on : 2025-09-27
Resolution : 1.76 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 : 1.1.7 (2018)
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
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) : 2.47

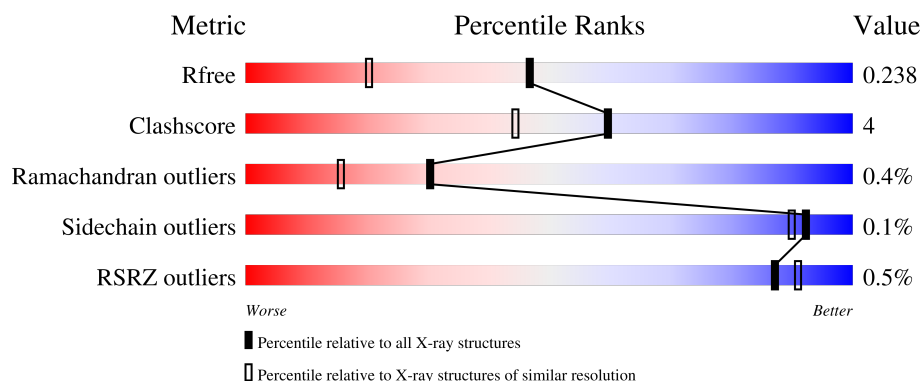
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.76 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}	164625	2888 (1.76-1.76)
Clashscore	180529	3097 (1.76-1.76)
Ramachandran outliers	177936	3072 (1.76-1.76)
Sidechain outliers	177891	3072 (1.76-1.76)
RSRZ outliers	164620	2887 (1.76-1.76)

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	322	
1	B	322	
1	C	322	
1	D	322	

2 Entry composition

There are 7 unique types of molecules in this entry. The entry contains 20363 atoms, of which 9662 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 Tyrosine-protein phosphatase non-receptor type 22.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	300	Total	C	H	N	O	S	0	0	0
			4833	1573	2384	404	456	16			
1	B	300	Total	C	H	N	O	S	0	0	0
			4824	1571	2381	401	454	17			
1	C	304	Total	C	H	N	O	S	0	0	0
			4873	1584	2399	408	465	17			
1	D	304	Total	C	H	N	O	S	0	1	0
			4856	1581	2382	408	469	16			

There are 76 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-15	MET	-	initiating methionine	UNP Q9Y2R2
A	-14	HIS	-	expression tag	UNP Q9Y2R2
A	-13	HIS	-	expression tag	UNP Q9Y2R2
A	-12	HIS	-	expression tag	UNP Q9Y2R2
A	-11	HIS	-	expression tag	UNP Q9Y2R2
A	-10	HIS	-	expression tag	UNP Q9Y2R2
A	-9	HIS	-	expression tag	UNP Q9Y2R2
A	-8	GLY	-	expression tag	UNP Q9Y2R2
A	-7	GLU	-	expression tag	UNP Q9Y2R2
A	-6	ASN	-	expression tag	UNP Q9Y2R2
A	-5	LEU	-	expression tag	UNP Q9Y2R2
A	-4	TYR	-	expression tag	UNP Q9Y2R2
A	-3	PHE	-	expression tag	UNP Q9Y2R2
A	-2	GLN	-	expression tag	UNP Q9Y2R2
A	-1	GLY	-	expression tag	UNP Q9Y2R2
A	0	SER	-	expression tag	UNP Q9Y2R2
A	304	GLY	-	expression tag	UNP Q9Y2R2
A	305	ASN	-	expression tag	UNP Q9Y2R2
A	306	SER	-	expression tag	UNP Q9Y2R2
B	-15	MET	-	initiating methionine	UNP Q9Y2R2
B	-14	HIS	-	expression tag	UNP Q9Y2R2

Continued on next page...

Continued from previous page...

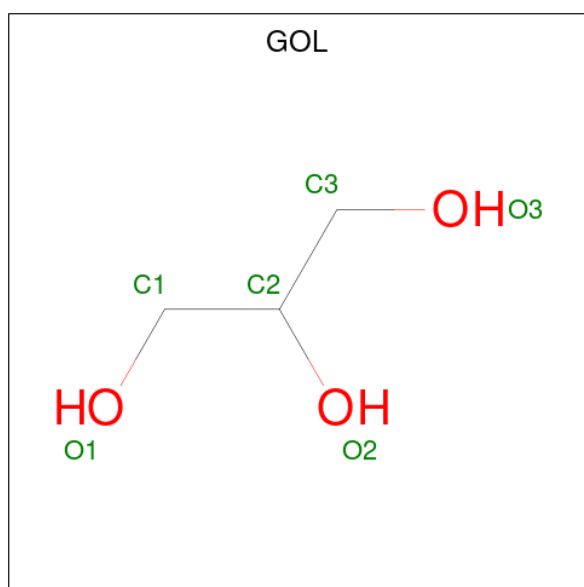
Chain	Residue	Modelled	Actual	Comment	Reference
B	-13	HIS	-	expression tag	UNP Q9Y2R2
B	-12	HIS	-	expression tag	UNP Q9Y2R2
B	-11	HIS	-	expression tag	UNP Q9Y2R2
B	-10	HIS	-	expression tag	UNP Q9Y2R2
B	-9	HIS	-	expression tag	UNP Q9Y2R2
B	-8	GLY	-	expression tag	UNP Q9Y2R2
B	-7	GLU	-	expression tag	UNP Q9Y2R2
B	-6	ASN	-	expression tag	UNP Q9Y2R2
B	-5	LEU	-	expression tag	UNP Q9Y2R2
B	-4	TYR	-	expression tag	UNP Q9Y2R2
B	-3	PHE	-	expression tag	UNP Q9Y2R2
B	-2	GLN	-	expression tag	UNP Q9Y2R2
B	-1	GLY	-	expression tag	UNP Q9Y2R2
B	0	SER	-	expression tag	UNP Q9Y2R2
B	304	GLY	-	expression tag	UNP Q9Y2R2
B	305	ASN	-	expression tag	UNP Q9Y2R2
B	306	SER	-	expression tag	UNP Q9Y2R2
C	-15	MET	-	initiating methionine	UNP Q9Y2R2
C	-14	HIS	-	expression tag	UNP Q9Y2R2
C	-13	HIS	-	expression tag	UNP Q9Y2R2
C	-12	HIS	-	expression tag	UNP Q9Y2R2
C	-11	HIS	-	expression tag	UNP Q9Y2R2
C	-10	HIS	-	expression tag	UNP Q9Y2R2
C	-9	HIS	-	expression tag	UNP Q9Y2R2
C	-8	GLY	-	expression tag	UNP Q9Y2R2
C	-7	GLU	-	expression tag	UNP Q9Y2R2
C	-6	ASN	-	expression tag	UNP Q9Y2R2
C	-5	LEU	-	expression tag	UNP Q9Y2R2
C	-4	TYR	-	expression tag	UNP Q9Y2R2
C	-3	PHE	-	expression tag	UNP Q9Y2R2
C	-2	GLN	-	expression tag	UNP Q9Y2R2
C	-1	GLY	-	expression tag	UNP Q9Y2R2
C	0	SER	-	expression tag	UNP Q9Y2R2
C	304	GLY	-	expression tag	UNP Q9Y2R2
C	305	ASN	-	expression tag	UNP Q9Y2R2
C	306	SER	-	expression tag	UNP Q9Y2R2
D	-15	MET	-	initiating methionine	UNP Q9Y2R2
D	-14	HIS	-	expression tag	UNP Q9Y2R2
D	-13	HIS	-	expression tag	UNP Q9Y2R2
D	-12	HIS	-	expression tag	UNP Q9Y2R2
D	-11	HIS	-	expression tag	UNP Q9Y2R2
D	-10	HIS	-	expression tag	UNP Q9Y2R2

Continued on next page...

Continued from previous page...

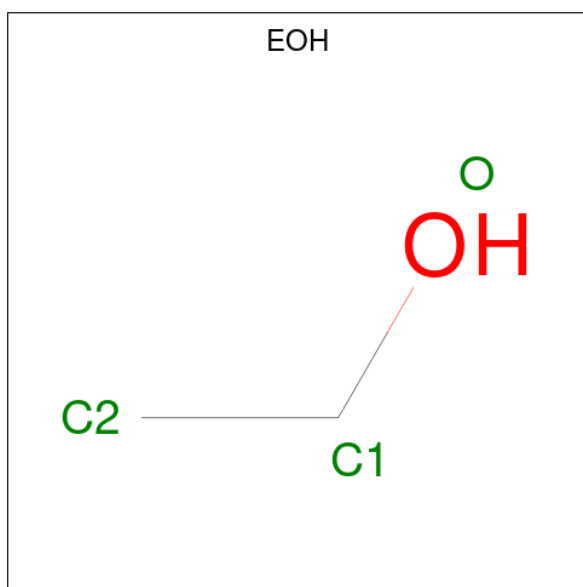
Chain	Residue	Modelled	Actual	Comment	Reference
D	-9	HIS	-	expression tag	UNP Q9Y2R2
D	-8	GLY	-	expression tag	UNP Q9Y2R2
D	-7	GLU	-	expression tag	UNP Q9Y2R2
D	-6	ASN	-	expression tag	UNP Q9Y2R2
D	-5	LEU	-	expression tag	UNP Q9Y2R2
D	-4	TYR	-	expression tag	UNP Q9Y2R2
D	-3	PHE	-	expression tag	UNP Q9Y2R2
D	-2	GLN	-	expression tag	UNP Q9Y2R2
D	-1	GLY	-	expression tag	UNP Q9Y2R2
D	0	SER	-	expression tag	UNP Q9Y2R2
D	304	GLY	-	expression tag	UNP Q9Y2R2
D	305	ASN	-	expression tag	UNP Q9Y2R2
D	306	SER	-	expression tag	UNP Q9Y2R2

- Molecule 2 is GLYCEROL (CCD ID: GOL) (formula: $C_3H_8O_3$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total	C	H	O	0	0
			14	3	8	3		

- Molecule 3 is ETHANOL (CCD ID: EOH) (formula: C_2H_6O).

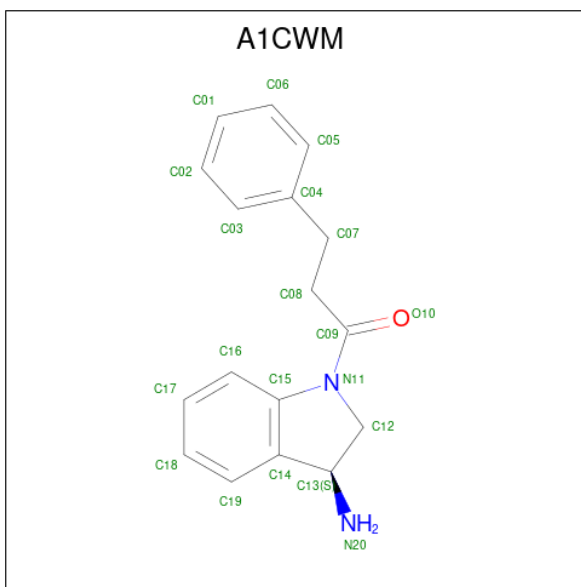


Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	1	Total	C	H	O	0	0
			9	2	6	1		
3	B	1	Total	C	H	O	0	0
			9	2	6	1		
3	B	1	Total	C	H	O	0	0
			9	2	6	1		
3	C	1	Total	C	H	O	0	0
			9	2	6	1		
3	D	1	Total	C	H	O	0	0
			9	2	6	1		
3	D	1	Total	C	H	O	0	0
			9	2	6	1		

- Molecule 4 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

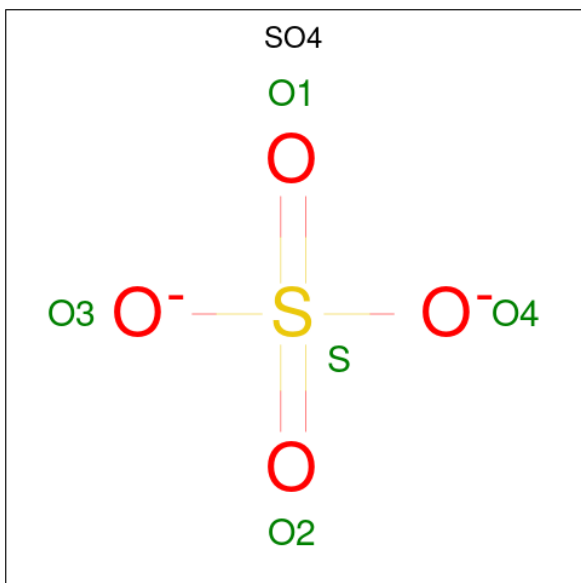
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	1	Total	Mg	0	0
			1	1		
4	B	3	Total	Mg	0	0
			3	3		
4	C	1	Total	Mg	0	0
			1	1		

- Molecule 5 is 1-[(3S)-3-amino-2,3-dihydro-1H-indol-1-yl]-3-phenylpropan-1-one (CCD ID: A1CWM) (formula: C₁₇H₁₈N₂O) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
5	A	1	Total	C	H	N	O	0	0
			38	17	18	2	1		
5	B	1	Total	C	H	N	O	0	0
			38	17	18	2	1		
5	C	1	Total	C	H	N	O	0	0
			38	17	18	2	1		
5	D	1	Total	C	H	N	O	0	0
			38	17	18	2	1		

- Molecule 6 is SULFATE ION (CCD ID: SO4) (formula: O₄S).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	C	1	Total	O	S	0	0
			5	4	1		
6	D	1	Total	O	S	0	0
			5	4	1		

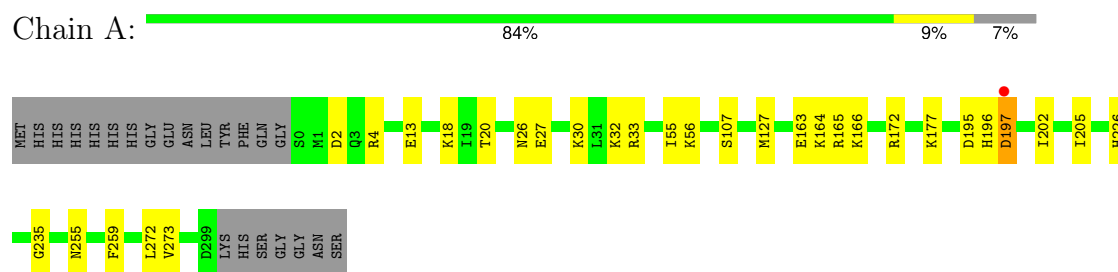
- Molecule 7 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	176	Total	O	0	0
			176	176		
7	B	171	Total	O	0	0
			171	171		
7	C	203	Total	O	0	0
			203	203		
7	D	192	Total	O	0	0
			192	192		

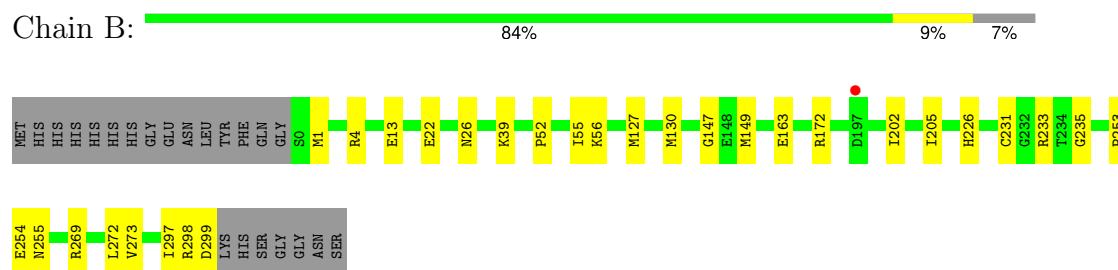
3 Residue-property plots [i](#)

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.

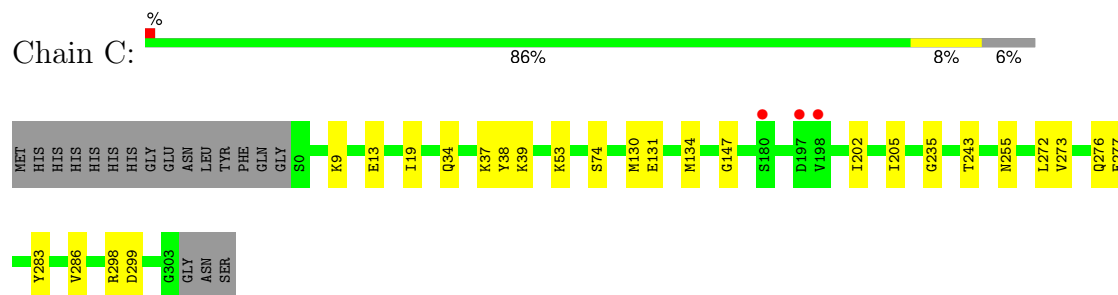
- Molecule 1: Tyrosine-protein phosphatase non-receptor type 22



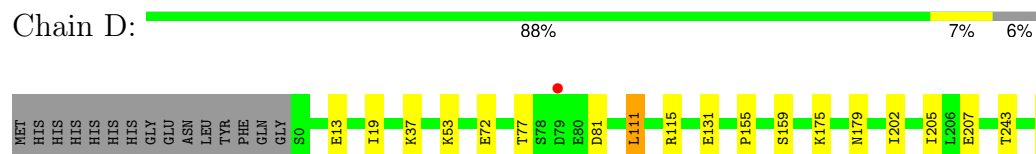
- Molecule 1: Tyrosine-protein phosphatase non-receptor type 22

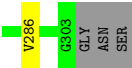


- Molecule 1: Tyrosine-protein phosphatase non-receptor type 22



- Molecule 1: Tyrosine-protein phosphatase non-receptor type 22





4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	120.02Å 48.40Å 120.14Å 90.00° 102.67° 90.00°	Depositor
Resolution (Å)	58.61 – 1.76 58.61 – 1.76	Depositor EDS
% Data completeness (in resolution range)	75.3 (58.61-1.76) 75.3 (58.61-1.76)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	76.83 (at 1.76Å)	Xtriage
Refinement program	PHENIX (1.20.1_4487-000)	Depositor
R, R_{free}	0.209 , 0.240 0.208 , 0.238	Depositor DCC
R_{free} test set	4987 reflections (3.70%)	wwPDB-VP
Wilson B-factor (Å ²)	27.4	Xtriage
Anisotropy	0.036	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.40 , 28.5	EDS
L-test for twinning ²	$\langle L \rangle = 0.45$, $\langle L^2 \rangle = 0.27$	Xtriage
Estimated twinning fraction	0.090 for l,-k,h	Xtriage
F_o, F_c correlation	0.98	EDS
Total number of atoms	20363	wwPDB-VP
Average B, all atoms (Å ²)	34.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 78.64 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 6.6308e-07. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

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: EOH, MG, GOL, SO4, A1CWM

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	0.14	0/2505	0.27	0/3388
1	B	0.14	0/2499	0.28	0/3380
1	C	0.14	0/2531	0.25	0/3424
1	D	0.14	0/2531	0.26	0/3426
All	All	0.14	0/10066	0.27	0/13618

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	2449	2384	2419	24	3
1	B	2443	2381	2413	23	0
1	C	2474	2399	2420	23	3
1	D	2474	2382	2401	19	0
2	A	6	8	8	0	0
3	A	3	6	6	0	0
3	B	6	12	12	0	0
3	C	3	6	6	0	0
3	D	6	12	12	0	0

Continued on next page...

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	A	1	0	0	0	0
4	B	3	0	0	0	0
4	C	1	0	0	0	0
5	A	20	18	0	0	0
5	B	20	18	0	0	0
5	C	20	18	0	1	0
5	D	20	18	0	1	0
6	C	5	0	0	0	0
6	D	5	0	0	0	0
7	A	176	0	0	8	1
7	B	171	0	0	5	0
7	C	203	0	0	6	1
7	D	192	0	0	8	0
All	All	10701	9662	9697	83	4

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 (83) 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:39:LYS:NZ	7:B:501:HOH:O	1.86	1.08
1:C:134:MET:HE3	1:C:134:MET:HA	1.45	0.96
1:A:33:ARG:NH2	7:A:501:HOH:O	2.09	0.85
1:D:175:LYS:O	7:D:501:HOH:O	1.95	0.83
1:A:30:LYS:NZ	7:A:501:HOH:O	2.09	0.82
1:B:22:GLU:OE1	7:B:502:HOH:O	1.99	0.80
1:A:164:LYS:HE2	1:A:166:LYS:HE2	1.63	0.80
1:A:26:ASN:ND2	7:A:503:HOH:O	2.14	0.79
1:B:149:MET:SD	1:C:134:MET:HE1	2.23	0.79
1:A:165:ARG:NH1	7:A:504:HOH:O	2.17	0.77
1:D:37:LYS:NZ	7:D:505:HOH:O	2.17	0.76
1:B:26:ASN:OD1	7:B:503:HOH:O	2.05	0.75
1:C:53:LYS:NZ	7:C:505:HOH:O	2.20	0.73
1:B:4:ARG:HG3	1:B:297:ILE:HG21	1.73	0.70
1:A:255:ASN:ND2	7:A:508:HOH:O	2.26	0.69
1:A:4:ARG:HH11	1:A:4:ARG:HG2	1.57	0.68
1:B:13:GLU:OE1	7:B:504:HOH:O	2.12	0.67
1:D:264:GLU:OE1	7:D:502:HOH:O	2.13	0.66
1:C:74:SER:O	7:C:502:HOH:O	2.13	0.65
1:D:13:GLU:OE2	7:D:503:HOH:O	2.14	0.64

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:159:SER:OG	7:D:501:HOH:O	2.15	0.64
1:C:131:GLU:OE1	7:C:503:HOH:O	2.15	0.63
1:C:134:MET:HA	1:C:134:MET:CE	2.27	0.63
1:A:177:LYS:NZ	1:A:177:LYS:HB3	2.14	0.61
1:D:159:SER:N	7:D:501:HOH:O	2.32	0.61
1:D:72:GLU:OE1	7:D:504:HOH:O	2.16	0.61
1:C:9:LYS:O	1:C:13:GLU:HG3	2.03	0.59
1:C:37:LYS:NZ	7:C:501:HOH:O	2.12	0.57
1:A:195:ASP:O	7:A:505:HOH:O	2.18	0.55
1:A:127:MET:HG3	1:A:226:HIS:CE1	2.42	0.55
1:A:18:LYS:HE3	1:A:20:THR:HG22	1.89	0.55
1:A:4:ARG:HG2	1:A:4:ARG:NH1	2.21	0.54
1:B:149:MET:SD	1:C:134:MET:CE	2.95	0.54
1:C:276:GLN:OE1	7:C:504:HOH:O	2.18	0.54
1:B:1:MET:HG3	1:B:254:GLU:OE2	2.08	0.54
1:D:202:ILE:O	1:D:205:ILE:HG22	2.09	0.53
1:A:13:GLU:OE1	7:A:506:HOH:O	2.18	0.52
1:C:9:LYS:HE3	1:C:13:GLU:OE1	2.11	0.51
1:A:164:LYS:CE	1:A:166:LYS:HE2	2.37	0.51
1:B:127:MET:HG3	1:B:226:HIS:CE1	2.46	0.50
1:B:235:GLY:CA	1:B:272:LEU:HD22	2.41	0.50
1:B:231:CYS:HA	1:B:272:LEU:HD23	1.94	0.49
1:A:177:LYS:HB3	1:A:177:LYS:HZ1	1.78	0.49
1:C:202:ILE:O	1:C:205:ILE:HG22	2.13	0.48
1:A:2:ASP:OD2	1:A:4:ARG:NH2	2.46	0.48
1:A:163:GLU:HG2	1:A:172:ARG:HG2	1.95	0.48
1:A:202:ILE:O	1:A:205:ILE:HG22	2.14	0.48
1:B:202:ILE:O	1:B:205:ILE:HG22	2.14	0.47
1:B:298:ARG:O	1:B:299:ASP:C	2.56	0.47
1:B:233:ARG:NH1	7:B:511:HOH:O	2.41	0.47
1:A:166:LYS:O	7:A:507:HOH:O	2.20	0.47
1:B:253:PRO:HB2	1:B:255:ASN:OD1	2.14	0.47
1:B:163:GLU:HG2	1:B:172:ARG:HG2	1.97	0.47
1:C:39:LYS:HD2	1:C:39:LYS:HA	1.77	0.45
1:B:52:PRO:HD2	1:D:207:GLU:HG3	1.99	0.45
1:C:19:ILE:HD13	5:C:404:A1CWM:C19	2.47	0.44
1:C:235:GLY:CA	1:C:272:LEU:HG	2.48	0.44
1:A:196:HIS:O	1:A:197:ASP:CB	2.65	0.43
1:A:235:GLY:CA	1:A:272:LEU:HD22	2.48	0.43
1:D:131:GLU:OE1	7:D:506:HOH:O	2.21	0.43
1:B:52:PRO:CD	1:D:207:GLU:HG3	2.49	0.43

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:130:MET:HE1	1:C:147:GLY:C	2.43	0.43
1:B:147:GLY:C	1:C:130:MET:HE1	2.44	0.43
1:D:77:THR:OG1	1:D:81:ASP:OD2	2.30	0.43
1:C:34:GLN:HG3	1:C:38:TYR:CZ	2.54	0.42
1:D:111:LEU:CD1	1:D:115:ARG:HD2	2.48	0.42
1:D:255:ASN:OD1	1:D:255:ASN:C	2.62	0.42
1:A:55:ILE:HG23	1:A:56:LYS:HD3	2.02	0.42
1:B:55:ILE:HG23	1:B:56:LYS:HD3	2.00	0.42
1:C:19:ILE:HD12	1:C:283:TYR:CZ	2.55	0.42
1:B:272:LEU:HD23	1:B:272:LEU:HA	1.84	0.42
1:C:243:THR:HG21	1:C:286:VAL:HG13	2.02	0.42
1:C:255:ASN:OD1	1:C:255:ASN:C	2.62	0.42
1:A:27:GLU:HG2	1:A:259:PHE:CD2	2.55	0.42
1:A:32:LYS:HE3	1:A:32:LYS:HB3	1.78	0.42
1:B:269:ARG:HB3	1:B:272:LEU:HG	2.01	0.41
1:C:53:LYS:HE3	1:C:53:LYS:HB3	1.84	0.41
1:D:179:ASN:HD22	1:D:179:ASN:HA	1.70	0.41
1:D:243:THR:HG21	1:D:286:VAL:HG13	2.03	0.41
1:D:53:LYS:HB3	1:D:53:LYS:HE3	1.84	0.41
1:C:277:GLU:OE1	7:C:506:HOH:O	2.22	0.40
1:D:111:LEU:HD21	1:D:155:PRO:HD2	2.03	0.40
1:D:19:ILE:HD13	5:D:404:A1CWM:C19	2.52	0.40

All (4) 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)
1:A:107:SER:OG	1:C:298:ARG:O[2_455]	2.14	0.06
7:A:579:HOH:O	7:C:669:HOH:O[2_455]	2.14	0.06
1:A:107:SER:HG	1:C:298:ARG:O[2_455]	1.58	0.02
1:A:107:SER:OG	1:C:299:ASP:OD1[2_455]	2.19	0.01

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	298/322 (92%)	285 (96%)	11 (4%)	2 (1%)	19	7
1	B	298/322 (92%)	288 (97%)	9 (3%)	1 (0%)	37	22
1	C	302/322 (94%)	292 (97%)	9 (3%)	1 (0%)	37	22
1	D	303/322 (94%)	294 (97%)	8 (3%)	1 (0%)	37	22
All	All	1201/1288 (93%)	1159 (96%)	37 (3%)	5 (0%)	30	16

All (5) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	273	VAL
1	A	197	ASP
1	B	273	VAL
1	C	273	VAL
1	D	273	VAL

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	268/295 (91%)	268 (100%)	0	100	100
1	B	267/295 (90%)	267 (100%)	0	100	100
1	C	270/295 (92%)	270 (100%)	0	100	100
1	D	269/295 (91%)	268 (100%)	1 (0%)	89	86
All	All	1074/1180 (91%)	1073 (100%)	1 (0%)	92	90

All (1) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	D	111	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (8) such

sidechains are listed below:

Mol	Chain	Res	Type
1	A	26	ASN
1	A	150	GLN
1	C	15	GLN
1	C	179	ASN
1	C	276	GLN
1	D	150	GLN
1	D	179	ASN
1	D	216	GLN

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 18 ligands modelled in this entry, 5 are monoatomic - leaving 13 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	$\# Z > 2$
3	EOH	B	401	-	2,2,2	0.45	0	1,1,1	0.18	0
3	EOH	B	402	-	2,2,2	0.45	0	1,1,1	0.20	0
3	EOH	A	402	-	2,2,2	0.46	0	1,1,1	0.17	0
3	EOH	D	401	-	2,2,2	0.44	0	1,1,1	0.15	0
5	A1CWM	B	406	-	22,22,22	2.25	3 (13%)	25,30,30	0.96	1 (4%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
5	A1CWM	D	404	-	22,22,22	2.24	3 (13%)	25,30,30	0.93	1 (4%)
6	SO4	C	402	-	4,4,4	0.26	0	6,6,6	0.09	0
6	SO4	D	403	-	4,4,4	0.27	0	6,6,6	0.09	0
5	A1CWM	C	404	-	22,22,22	2.23	3 (13%)	25,30,30	0.95	1 (4%)
3	EOH	D	402	-	2,2,2	0.45	0	1,1,1	0.16	0
2	GOL	A	401	-	5,5,5	0.88	0	5,5,5	1.13	0
3	EOH	C	401	-	2,2,2	0.45	0	1,1,1	0.13	0
5	A1CWM	A	404	-	22,22,22	2.23	3 (13%)	25,30,30	0.94	1 (4%)

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	A1CWM	D	404	-	-	0/9/21/21	0/3/3/3
5	A1CWM	B	406	-	-	0/9/21/21	0/3/3/3
5	A1CWM	C	404	-	-	0/9/21/21	0/3/3/3
2	GOL	A	401	-	-	0/4/4/4	-
5	A1CWM	A	404	-	-	0/9/21/21	0/3/3/3

All (12) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	C	404	A1CWM	C09-N11	6.47	1.45	1.36
5	A	404	A1CWM	C09-N11	6.46	1.45	1.36
5	B	406	A1CWM	C09-N11	6.41	1.45	1.36
5	D	404	A1CWM	C09-N11	6.36	1.45	1.36
5	D	404	A1CWM	C15-N11	5.71	1.50	1.39
5	C	404	A1CWM	C15-N11	5.63	1.50	1.39
5	A	404	A1CWM	C15-N11	5.62	1.50	1.39
5	B	406	A1CWM	C15-N11	5.61	1.50	1.39
5	B	406	A1CWM	C12-C13	-5.44	1.50	1.55
5	A	404	A1CWM	C12-C13	-5.24	1.51	1.55
5	D	404	A1CWM	C12-C13	-5.22	1.51	1.55
5	C	404	A1CWM	C12-C13	-5.01	1.51	1.55

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	B	406	A1CWM	C13-C12-N11	2.89	105.65	102.67

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	A	404	A1CWM	C13-C12-N11	2.71	105.46	102.67
5	C	404	A1CWM	C13-C12-N11	2.30	105.04	102.67
5	D	404	A1CWM	C13-C12-N11	2.08	104.81	102.67

There are no chirality outliers.

There are no torsion outliers.

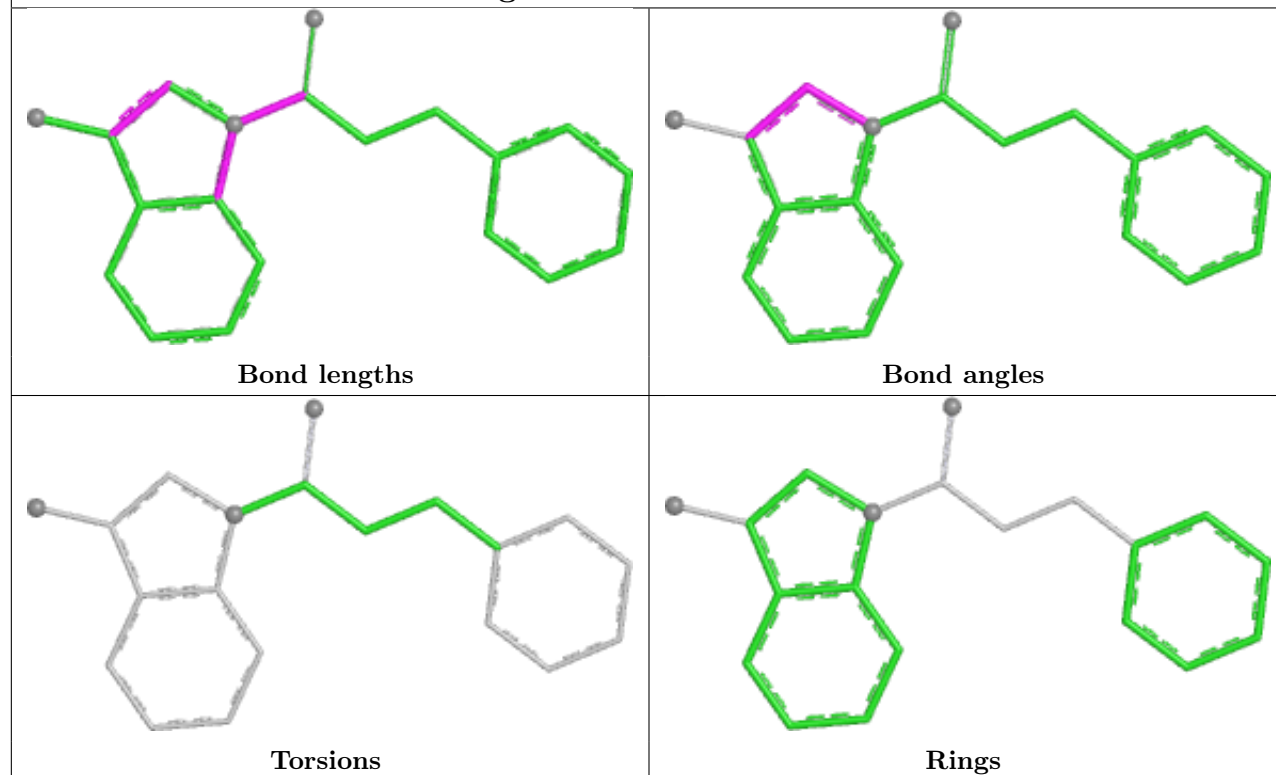
There are no ring outliers.

2 monomers are involved in 2 short contacts:

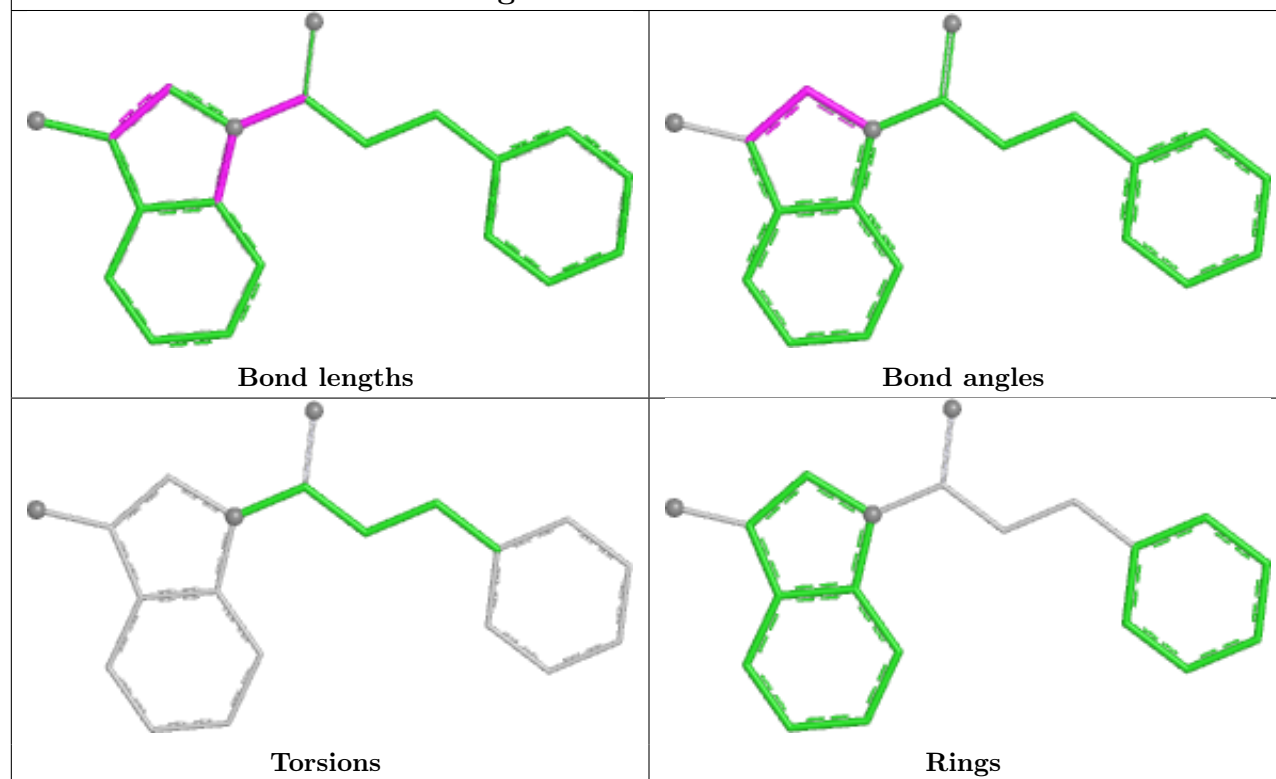
Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	D	404	A1CWM	1	0
5	C	404	A1CWM	1	0

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.

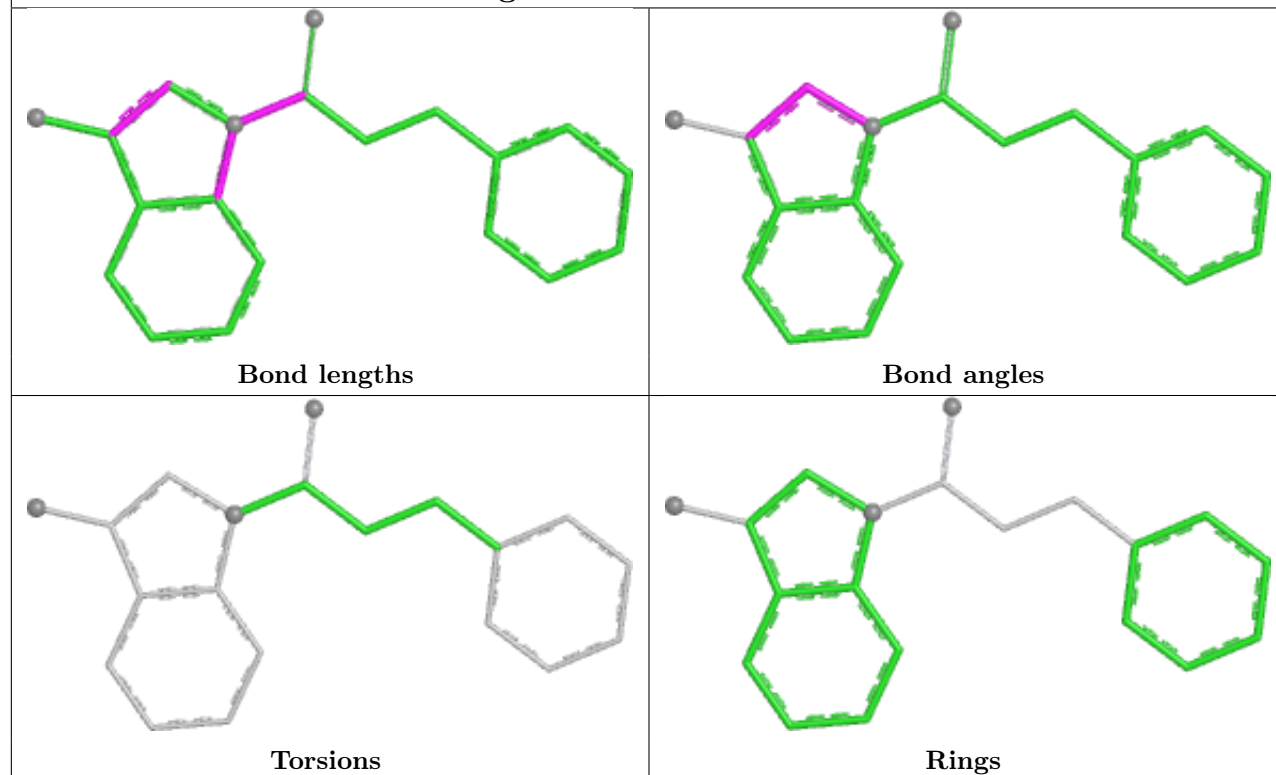
Ligand A1CWM B 406



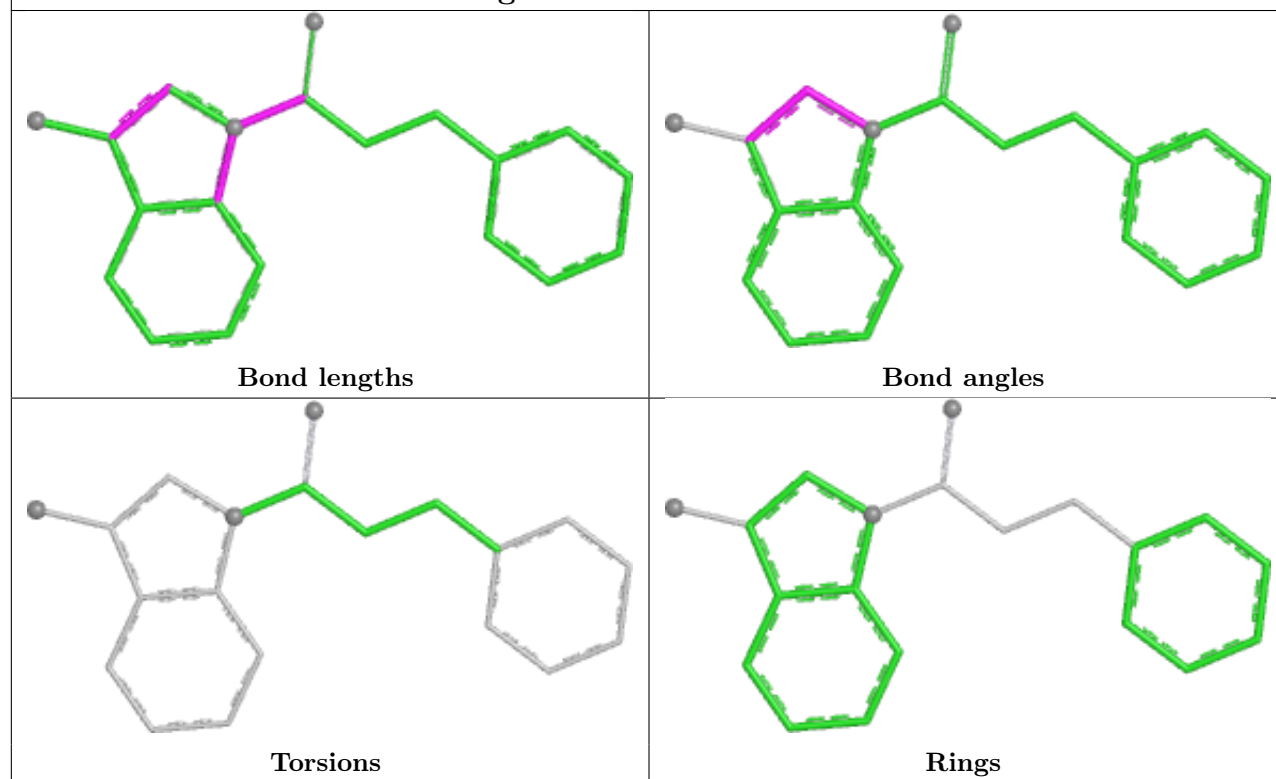
Ligand A1CWM D 404



Ligand A1CWM C 404



Ligand A1CWM A 404



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	300/322 (93%)	-1.36	1 (0%) 90 93	18, 31, 53, 82	0
1	B	300/322 (93%)	-1.34	1 (0%) 90 93	21, 33, 53, 97	0
1	C	304/322 (94%)	-1.31	3 (0%) 79 84	19, 31, 58, 88	0
1	D	304/322 (94%)	-1.30	1 (0%) 90 93	14, 32, 55, 91	1 (0%)
All	All	1208/1288 (93%)	-1.33	6 (0%) 87 91	14, 32, 55, 97	1 (0%)

All (6) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	197	ASP	3.2
1	A	197	ASP	2.9
1	B	197	ASP	2.8
1	C	180	SER	2.2
1	C	198	VAL	2.1
1	D	79	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,

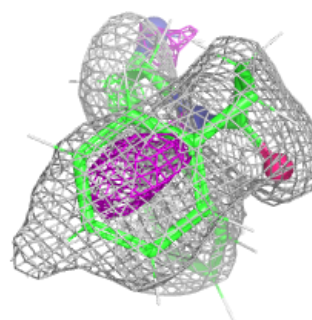
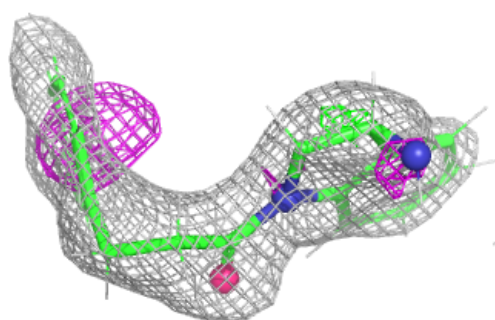
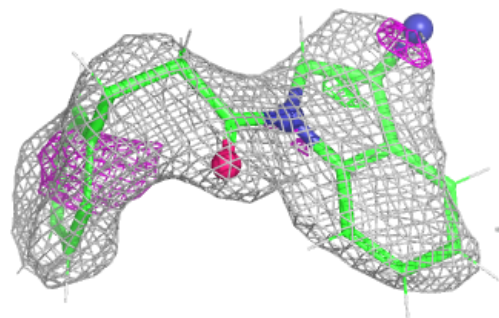
median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
3	EOH	D	402	3/3	0.95	0.07	35,41,45,53	0
5	A1CWM	B	406	20/20	0.96	0.08	37,49,65,68	0
3	EOH	B	402	3/3	0.97	0.07	30,36,38,45	0
3	EOH	D	401	3/3	0.98	0.04	22,26,34,34	0
3	EOH	A	402	3/3	0.98	0.05	34,41,46,46	0
5	A1CWM	A	404	20/20	0.98	0.07	37,51,67,80	0
3	EOH	C	401	3/3	0.98	0.04	23,27,30,30	0
6	SO4	C	402	5/5	0.98	0.03	41,44,47,60	0
6	SO4	D	403	5/5	0.98	0.03	38,43,45,59	0
3	EOH	B	401	3/3	0.99	0.05	29,34,45,45	0
5	A1CWM	C	404	20/20	0.99	0.05	33,45,63,71	0
5	A1CWM	D	404	20/20	0.99	0.05	35,48,61,69	0
4	MG	B	403	1/1	0.99	0.09	42,42,42,42	0
2	GOL	A	401	6/6	0.99	0.03	28,35,41,49	0
4	MG	B	405	1/1	1.00	0.01	22,22,22,22	0
4	MG	C	403	1/1	1.00	0.02	21,21,21,21	0
4	MG	A	403	1/1	1.00	0.03	27,27,27,27	0
4	MG	B	404	1/1	1.00	0.04	26,26,26,26	0

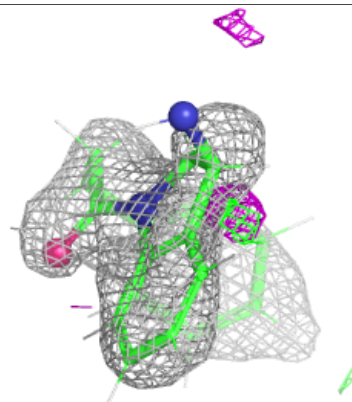
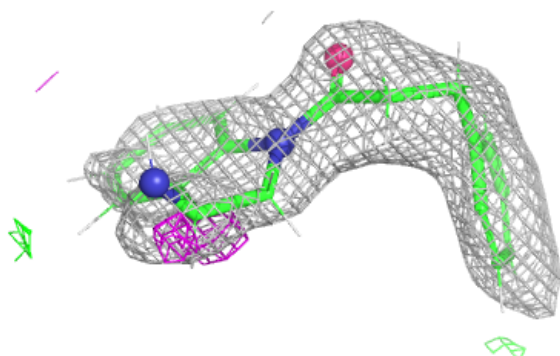
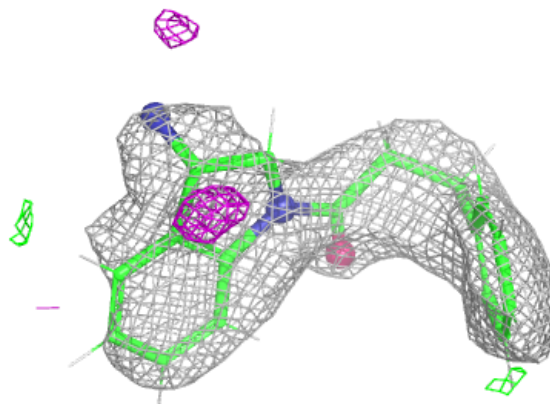
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around A1CWM B 406:

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

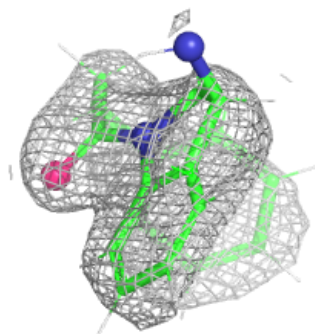
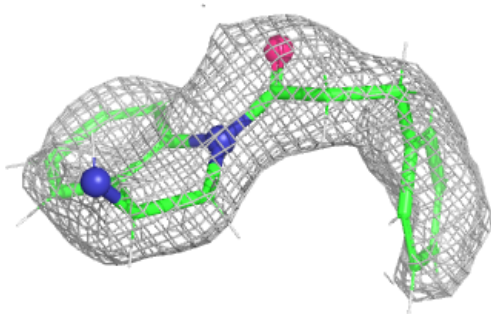
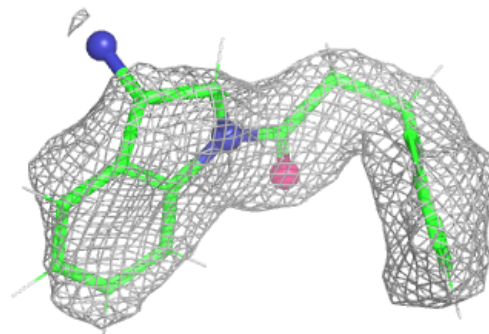
**Electron density around A1CWM A 404:**

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

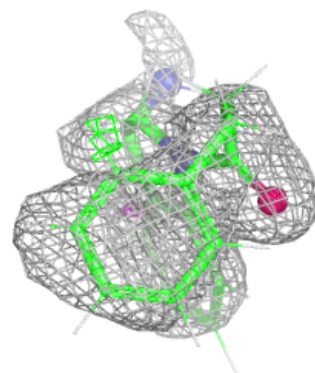
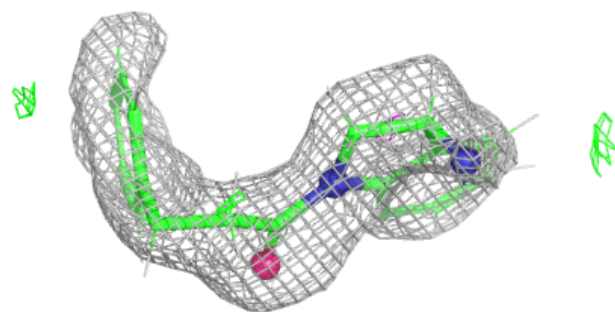
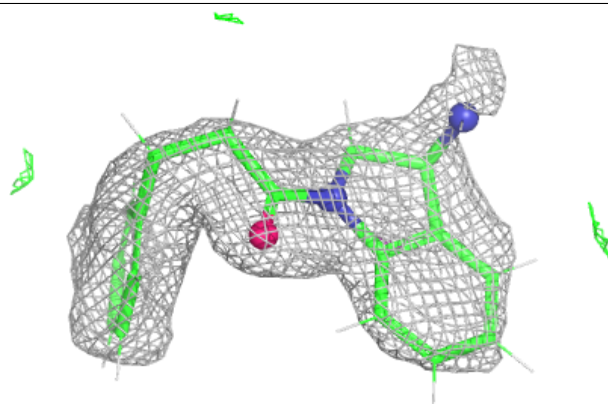


Electron density around A1CWM C 404:

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

**Electron density around A1CWM D 404:**

$2mF_o-DF_c$ (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.