



# Full wwPDB X-ray Structure Validation Report ⓘ

Apr 28, 2024 – 12:16 am BST

PDB ID : 6G80  
Title : Structure of Mycobacterium hassiacum MeT1 from orthorhombic crystals.  
Authors : Pereira, P.J.B.; Ripoll-Rozada, J.  
Deposited on : 2018-04-06  
Resolution : 2.05 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](mailto: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>.

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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 : 2.36.2  
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) : 2.36.2

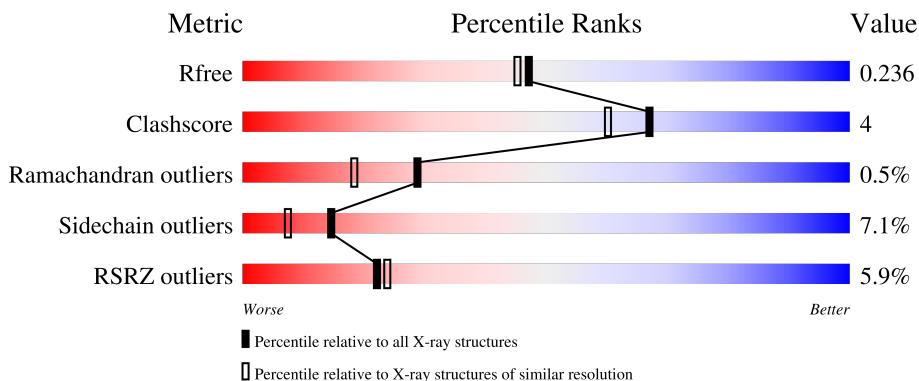
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.05 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	1692 (2.04-2.04)
Clashscore	141614	1773 (2.04-2.04)
Ramachandran outliers	138981	1752 (2.04-2.04)
Sidechain outliers	138945	1752 (2.04-2.04)
RSRZ outliers	127900	1672 (2.04-2.04)

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  $\geq 3$ , 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	231	
1	B	231	
1	C	231	
1	M	231	

## 2 Entry composition i

There are 4 unique types of molecules in this entry. The entry contains 6991 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 Methyltransferase domain protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	213	1655	1048	296	307	4	8	2	0
1	B	226	1755	1108	318	326	3	0	0	0
1	M	218	1679	1061	299	316	3	0	0	0
1	C	214	1674	1056	300	315	3	7	2	0

There are 52 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	219	LYS	-	expression tag	UNP K5B7F3
A	220	LEU	-	expression tag	UNP K5B7F3
A	221	ALA	-	expression tag	UNP K5B7F3
A	222	ALA	-	expression tag	UNP K5B7F3
A	223	ALA	-	expression tag	UNP K5B7F3
A	224	LEU	-	expression tag	UNP K5B7F3
A	225	GLU	-	expression tag	UNP K5B7F3
A	226	HIS	-	expression tag	UNP K5B7F3
A	227	HIS	-	expression tag	UNP K5B7F3
A	228	HIS	-	expression tag	UNP K5B7F3
A	229	HIS	-	expression tag	UNP K5B7F3
A	230	HIS	-	expression tag	UNP K5B7F3
A	231	HIS	-	expression tag	UNP K5B7F3
B	219	LYS	-	expression tag	UNP K5B7F3
B	220	LEU	-	expression tag	UNP K5B7F3
B	221	ALA	-	expression tag	UNP K5B7F3
B	222	ALA	-	expression tag	UNP K5B7F3
B	223	ALA	-	expression tag	UNP K5B7F3
B	224	LEU	-	expression tag	UNP K5B7F3
B	225	GLU	-	expression tag	UNP K5B7F3
B	226	HIS	-	expression tag	UNP K5B7F3

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Chain	Residue	Modelled	Actual	Comment	Reference
B	227	HIS	-	expression tag	UNP K5B7F3
B	228	HIS	-	expression tag	UNP K5B7F3
B	229	HIS	-	expression tag	UNP K5B7F3
B	230	HIS	-	expression tag	UNP K5B7F3
B	231	HIS	-	expression tag	UNP K5B7F3
M	219	LYS	-	expression tag	UNP K5B7F3
M	220	LEU	-	expression tag	UNP K5B7F3
M	221	ALA	-	expression tag	UNP K5B7F3
M	222	ALA	-	expression tag	UNP K5B7F3
M	223	ALA	-	expression tag	UNP K5B7F3
M	224	LEU	-	expression tag	UNP K5B7F3
M	225	GLU	-	expression tag	UNP K5B7F3
M	226	HIS	-	expression tag	UNP K5B7F3
M	227	HIS	-	expression tag	UNP K5B7F3
M	228	HIS	-	expression tag	UNP K5B7F3
M	229	HIS	-	expression tag	UNP K5B7F3
M	230	HIS	-	expression tag	UNP K5B7F3
M	231	HIS	-	expression tag	UNP K5B7F3
C	219	LYS	-	expression tag	UNP K5B7F3
C	220	LEU	-	expression tag	UNP K5B7F3
C	221	ALA	-	expression tag	UNP K5B7F3
C	222	ALA	-	expression tag	UNP K5B7F3
C	223	ALA	-	expression tag	UNP K5B7F3
C	224	LEU	-	expression tag	UNP K5B7F3
C	225	GLU	-	expression tag	UNP K5B7F3
C	226	HIS	-	expression tag	UNP K5B7F3
C	227	HIS	-	expression tag	UNP K5B7F3
C	228	HIS	-	expression tag	UNP K5B7F3
C	229	HIS	-	expression tag	UNP K5B7F3
C	230	HIS	-	expression tag	UNP K5B7F3
C	231	HIS	-	expression tag	UNP K5B7F3

- Molecule 2 is S-ADENOSYL-L-HOMOCYSTEINE (three-letter code: SAH) (formula:  $C_{14}H_{20}N_6O_5S$ ).



- Molecule 4 is water.

<b>Mol</b>	<b>Chain</b>	<b>Residues</b>	<b>Atoms</b>		<b>ZeroOcc</b>	<b>AltConf</b>
4	A	33	Total 33	O 33	0	0
4	B	49	Total 49	O 49	0	0
4	M	43	Total 43	O 43	0	0
4	C	19	Total 19	O 19	0	0



## 4 Data and refinement statistics i

Property	Value	Source
Space group	C 2 2 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	117.15Å 119.72Å 145.00Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	46.16 – 2.05 46.16 – 2.05	Depositor EDS
% Data completeness (in resolution range)	98.4 (46.16-2.05) 98.7 (46.16-2.05)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.50 (at 2.05Å)	Xtrriage
Refinement program	PHENIX (1.13_2998: ???)	Depositor
R, $R_{free}$	0.192 , 0.236 0.192 , 0.236	Depositor DCC
$R_{free}$ test set	3162 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	49.8	Xtrriage
Anisotropy	0.139	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.36 , 55.4	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.50$ , $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	0.018 for -k,-h,-l	Xtrriage
$F_o, F_c$ correlation	0.96	EDS
Total number of atoms	6991	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	60.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.34% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical 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: SAH, GOL

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	0.36	0/1697	0.54	0/2308
1	B	0.39	0/1803	0.56	0/2455
1	C	0.35	0/1718	0.53	0/2339
1	M	0.40	0/1723	0.58	1/2347 (0.0%)
All	All	0.38	0/6941	0.55	1/9449 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	M	220	LEU	CA-CB-CG	7.56	132.68	115.30

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	1655	0	1588	16	0
1	B	1755	0	1669	12	0
1	C	1674	0	1592	14	0
1	M	1679	0	1600	12	0
2	A	26	0	19	1	0
2	C	26	0	19	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	M	26	0	19	4	0
3	B	6	0	8	0	0
4	A	33	0	0	0	0
4	B	49	0	0	0	0
4	C	19	0	0	0	0
4	M	43	0	0	0	0
All	All	6991	0	6514	52	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 4.

All (52) 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:80:GLN:HB3	1:B:81:PRO:HD2	1.76	0.68
1:A:154:ASP:OD1	1:A:188:ARG:NH2	2.27	0.68
1:C:172:PHE:O	1:C:180:GLN:NE2	2.26	0.67
1:M:150:GLN:OE1	1:M:188:ARG:NH1	2.29	0.65
1:C:146:GLU:OE2	1:C:184:HIS:ND1	2.31	0.64
1:C:219:LYS:HE2	1:C:219:LYS:H	1.65	0.61
1:M:125:ALA:HB2	1:M:151:ARG:HD2	1.85	0.59
1:C:125:ALA:HB2	1:C:151:ARG:HD2	1.85	0.58
1:B:24:ASP:HB2	1:B:201:TYR:CE2	2.38	0.58
1:M:81:PRO:HA	1:M:86:HIS:CD2	2.39	0.56
1:A:209:ARG:HH11	1:A:212:GLY:HA3	1.72	0.55
1:A:221:ALA:O	1:A:223:ALA:N	2.40	0.55
1:C:14:ALA:HB2	1:C:54:VAL:HG22	1.90	0.54
1:C:6:ASP:HB2	1:C:61:ARG:HH22	1.73	0.54
1:B:24:ASP:OD1	1:B:24:ASP:N	2.37	0.52
1:M:141:ASP:OD2	2:M:301:SAH:N	2.44	0.51
1:A:149:ALA:HB1	1:A:185:ILE:HD13	1.91	0.51
1:A:90:LEU:HD13	1:A:100:THR:HG22	1.94	0.49
1:A:61:ARG:HG2	1:A:116:HIS:CD2	2.48	0.49
1:C:16:ARG:NH2	1:C:110:GLU:OE2	2.46	0.49
1:A:14:ALA:HB2	1:A:54:VAL:HG22	1.95	0.48
1:M:104:LEU:O	1:M:104:LEU:HG	2.11	0.47
1:M:186:TYR:OH	1:M:197:GLU:OE1	2.26	0.47
1:B:168:ILE:HG22	1:B:169:HIS:H	1.80	0.47
1:B:220:LEU:HD13	1:B:225:GLU:HA	1.97	0.46
1:C:131:TRP:O	1:C:132[B]:ARG:HD3	2.15	0.46
1:B:14:ALA:HB2	1:B:54:VAL:HG22	1.98	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:81:PRO:HD3	1:C:145:THR:HG22	1.97	0.46
1:A:57:GLY:HA3	1:A:113:LEU:HD13	1.97	0.46
1:M:141:ASP:O	2:M:301:SAH:H5'2	2.15	0.46
1:A:85:TYR:CZ	1:C:82:GLY:HA2	2.51	0.45
1:A:141:ASP:O	2:A:301:SAH:HG1	2.16	0.45
1:A:50:GLY:O	1:A:54:VAL:HG13	2.17	0.44
1:B:24:ASP:HB2	1:B:201:TYR:CZ	2.53	0.44
1:B:218:LEU:HA	1:B:219:LYS:HE2	1.98	0.44
1:M:71:ASP:OD1	2:M:301:SAH:H1'	2.17	0.43
1:B:168:ILE:HG22	1:B:169:HIS:N	2.33	0.43
1:C:154:ASP:CG	1:C:188:ARG:HH22	2.21	0.43
1:M:84:GLU:H	1:M:84:GLU:HG2	1.49	0.43
1:M:86:HIS:CG	1:M:87:ASP:N	2.87	0.42
1:B:80:GLN:HB3	1:B:81:PRO:CD	2.45	0.42
1:M:197:GLU:OE2	1:M:200:ALA:HB2	2.20	0.42
1:A:14:ALA:HB2	1:A:54:VAL:CG2	2.50	0.42
1:C:219:LYS:H	1:C:219:LYS:CE	2.32	0.42
1:A:146:GLU:OE2	1:A:184:HIS:ND1	2.41	0.42
1:A:181:ALA:HB3	1:A:182:PRO:HD3	2.00	0.42
1:A:85:TYR:CE1	1:C:82:GLY:HA2	2.56	0.41
1:A:131:TRP:O	1:A:132[B]:ARG:HD3	2.21	0.41
1:B:146:GLU:OE2	1:B:184:HIS:ND1	2.32	0.41
1:C:218:LEU:HA	1:C:219:LYS:HE2	2.02	0.41
1:B:219:LYS:HE2	1:B:219:LYS:H	1.86	0.40
1:M:151:ARG:NH2	2:M:301:SAH:HN61	2.18	0.40

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	211/231 (91%)	207 (98%)	3 (1%)	1 (0%)	29 18

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	B	224/231 (97%)	217 (97%)	6 (3%)	1 (0%)	34	24
1	C	214/231 (93%)	206 (96%)	7 (3%)	1 (0%)	29	18
1	M	216/231 (94%)	206 (95%)	9 (4%)	1 (0%)	29	18
All	All	865/924 (94%)	836 (97%)	25 (3%)	4 (0%)	29	18

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	222	ALA
1	C	77	GLU
1	M	221	ALA
1	B	80	GLN

### 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	166/182 (91%)	154 (93%)	12 (7%)	14	7
1	B	177/182 (97%)	165 (93%)	12 (7%)	16	8
1	C	170/182 (93%)	155 (91%)	15 (9%)	10	4
1	M	169/182 (93%)	158 (94%)	11 (6%)	17	9
All	All	682/728 (94%)	632 (93%)	50 (7%)	14	6

All (50) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	27	ARG
1	A	54	VAL
1	A	61	ARG
1	A	103	ARG
1	A	110	GLU
1	A	151	ARG
1	A	158	ARG

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Mol	Chain	Res	Type
1	A	198	VAL
1	A	204[A]	MET
1	A	204[B]	MET
1	A	213	ILE
1	A	220	LEU
1	B	5	ARG
1	B	15	ASP
1	B	24	ASP
1	B	54	VAL
1	B	61	ARG
1	B	67	VAL
1	B	76	SER
1	B	158	ARG
1	B	198	VAL
1	B	219	LYS
1	B	220	LEU
1	B	228	HIS
1	M	15	ASP
1	M	20	PHE
1	M	54	VAL
1	M	77	GLU
1	M	78	GLU
1	M	83	TRP
1	M	84	GLU
1	M	97	LEU
1	M	147	GLU
1	M	219	LYS
1	M	220	LEU
1	C	6	ASP
1	C	15	ASP
1	C	18	THR
1	C	24	ASP
1	C	27	ARG
1	C	54	VAL
1	C	61	ARG
1	C	69[A]	THR
1	C	69[B]	THR
1	C	77	GLU
1	C	79	HIS
1	C	154	ASP
1	C	158	ARG
1	C	198	VAL

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Mol	Chain	Res	Type
1	C	219	LYS

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

### 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 monosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

4 ligands are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
2	SAH	M	301	-	24,28,28	1.17	3 (12%)	25,40,40	1.62	4 (16%)
2	SAH	A	301	-	24,28,28	1.21	3 (12%)	25,40,40	1.69	4 (16%)
3	GOL	B	301	-	5,5,5	0.92	0	5,5,5	1.00	0
2	SAH	C	301	-	24,28,28	1.15	3 (12%)	25,40,40	1.62	4 (16%)

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	SAH	M	301	-	-	1/11/31/31	0/3/3/3
2	SAH	A	301	-	-	0/11/31/31	0/3/3/3
3	GOL	B	301	-	-	0/4/4/4	-
2	SAH	C	301	-	-	3/11/31/31	0/3/3/3

All (9) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	301	SAH	C2-N3	4.08	1.38	1.32
2	C	301	SAH	C2-N3	4.01	1.38	1.32
2	M	301	SAH	C2-N3	3.93	1.38	1.32
2	A	301	SAH	OXT-C	-2.46	1.22	1.30
2	A	301	SAH	C2-N1	2.44	1.38	1.33
2	M	301	SAH	C2-N1	2.26	1.38	1.33
2	C	301	SAH	C2-N1	2.26	1.38	1.33
2	M	301	SAH	OXT-C	-2.15	1.23	1.30
2	C	301	SAH	OXT-C	-2.11	1.23	1.30

All (12) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	301	SAH	N3-C2-N1	-5.72	119.73	128.68
2	C	301	SAH	N3-C2-N1	-5.52	120.05	128.68
2	M	301	SAH	N3-C2-N1	-5.51	120.06	128.68
2	A	301	SAH	C5'-SD-CG	-3.11	92.95	102.27
2	A	301	SAH	OXT-C-O	-3.08	117.10	124.09
2	M	301	SAH	C5'-SD-CG	-2.71	94.12	102.27
2	C	301	SAH	OXT-C-O	-2.67	118.02	124.09
2	M	301	SAH	OXT-C-O	-2.66	118.06	124.09
2	C	301	SAH	C5'-SD-CG	-2.46	94.88	102.27
2	C	301	SAH	OXT-C-CA	2.46	121.75	113.38
2	M	301	SAH	OXT-C-CA	2.10	120.54	113.38
2	A	301	SAH	C4-C5-N7	-2.02	107.29	109.40

There are no chirality outliers.

All (4) torsion outliers are listed below:

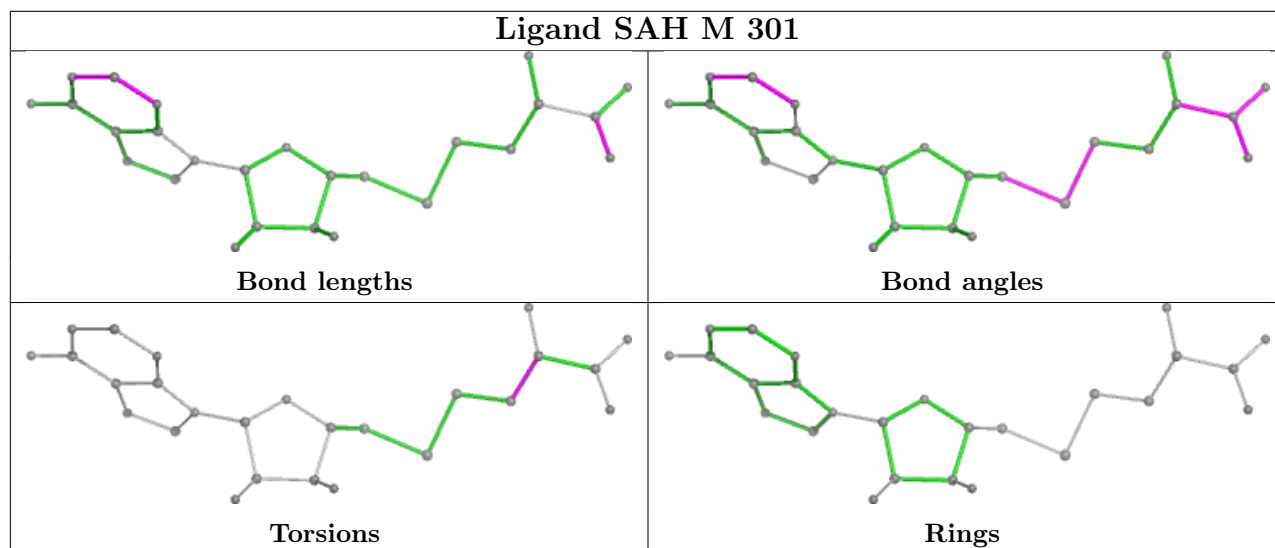
Mol	Chain	Res	Type	Atoms
2	C	301	SAH	N-CA-CB-CG
2	C	301	SAH	O-C-CA-CB
2	C	301	SAH	OXT-C-CA-CB
2	M	301	SAH	N-CA-CB-CG

There are no ring outliers.

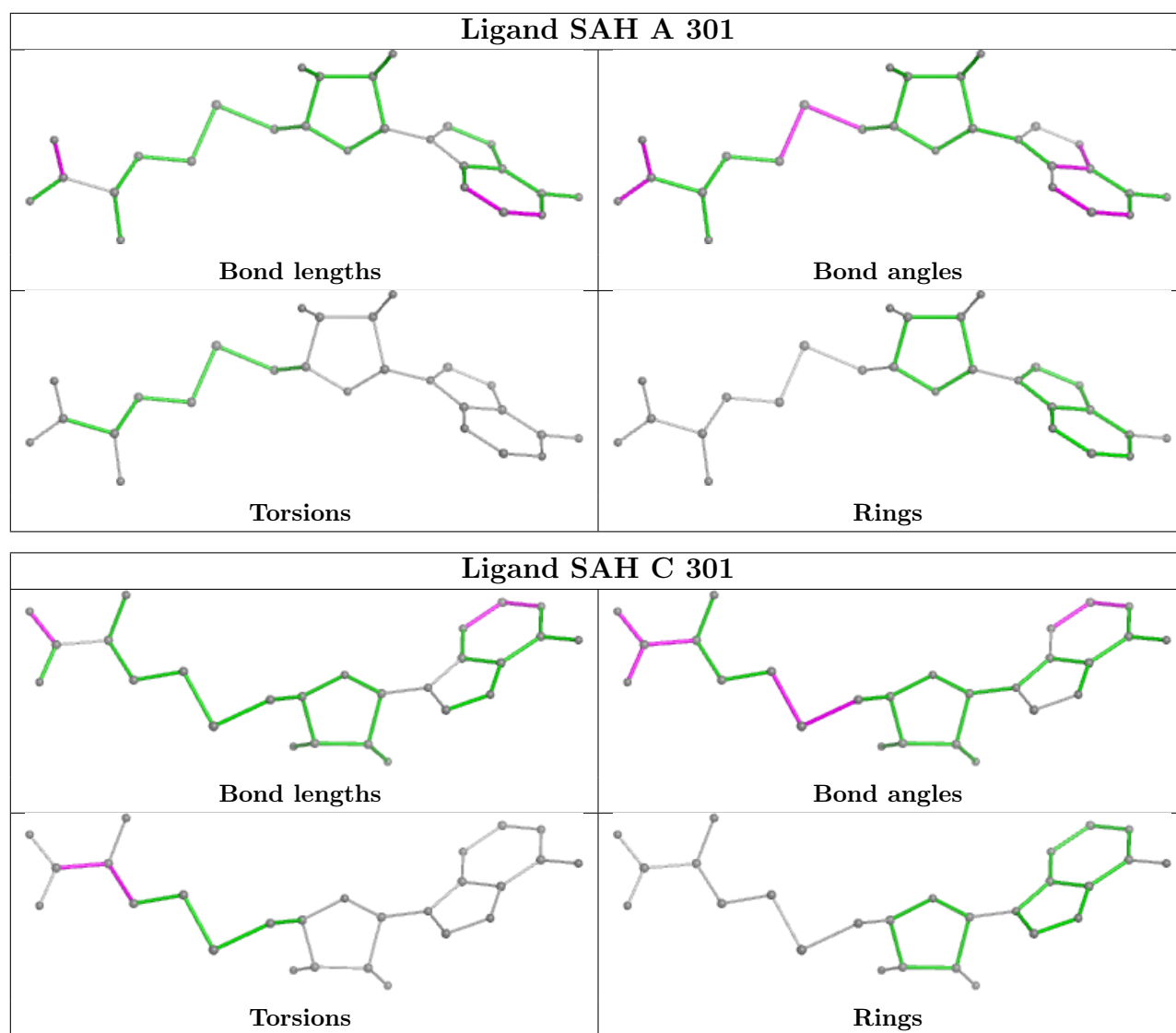
2 monomers are involved in 5 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	M	301	SAH	4	0
2	A	301	SAH	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, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	213/231 (92%)	0.14	7 (3%) 46 50	40, 56, 87, 125	0
1	B	226/231 (97%)	0.34	17 (7%) 14 15	39, 53, 107, 156	0
1	C	214/231 (92%)	0.25	13 (6%) 21 22	41, 58, 96, 151	0
1	M	218/231 (94%)	0.39	14 (6%) 19 21	39, 51, 106, 142	0
All	All	871/924 (94%)	0.28	51 (5%) 22 24	39, 54, 101, 156	0

All (51) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	M	220	LEU	10.1
1	M	84	GLU	7.6
1	B	82	GLY	7.0
1	C	79	HIS	5.7
1	M	85	TYR	5.6
1	B	227	HIS	5.2
1	B	226	HIS	5.2
1	B	79	HIS	4.9
1	M	81	PRO	4.8
1	M	221	ALA	4.5
1	M	83	TRP	4.4
1	B	85	TYR	4.0
1	B	201	TYR	4.0
1	B	5	ARG	3.9
1	M	80	GLN	3.9
1	C	83	TRP	3.9
1	C	11	PHE	3.7
1	M	49	CYS	3.7
1	A	81	PRO	3.7
1	A	220	LEU	3.7
1	B	9	ALA	3.7

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Mol	Chain	Res	Type	RSRZ
1	B	228	HIS	3.6
1	B	6	ASP	3.5
1	C	76	SER	3.4
1	A	222	ALA	3.4
1	B	4	ILE	3.4
1	C	81	PRO	3.3
1	A	211	SER	3.1
1	B	84	GLU	3.1
1	C	78	GLU	3.0
1	M	222	ALA	3.0
1	M	223	ALA	3.0
1	B	78	GLU	2.9
1	C	86	HIS	2.9
1	B	80	GLN	2.8
1	C	77	GLU	2.8
1	C	6	ASP	2.7
1	M	213	ILE	2.7
1	A	6	ASP	2.7
1	B	8	ASP	2.6
1	M	79	HIS	2.6
1	B	81	PRO	2.5
1	C	88	PRO	2.5
1	C	12	ALA	2.4
1	A	88	PRO	2.4
1	C	7	THR	2.3
1	M	6	ASP	2.2
1	B	83	TRP	2.2
1	M	176	LYS	2.2
1	A	219	LYS	2.0
1	C	85	TYR	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 [\(i\)](#)

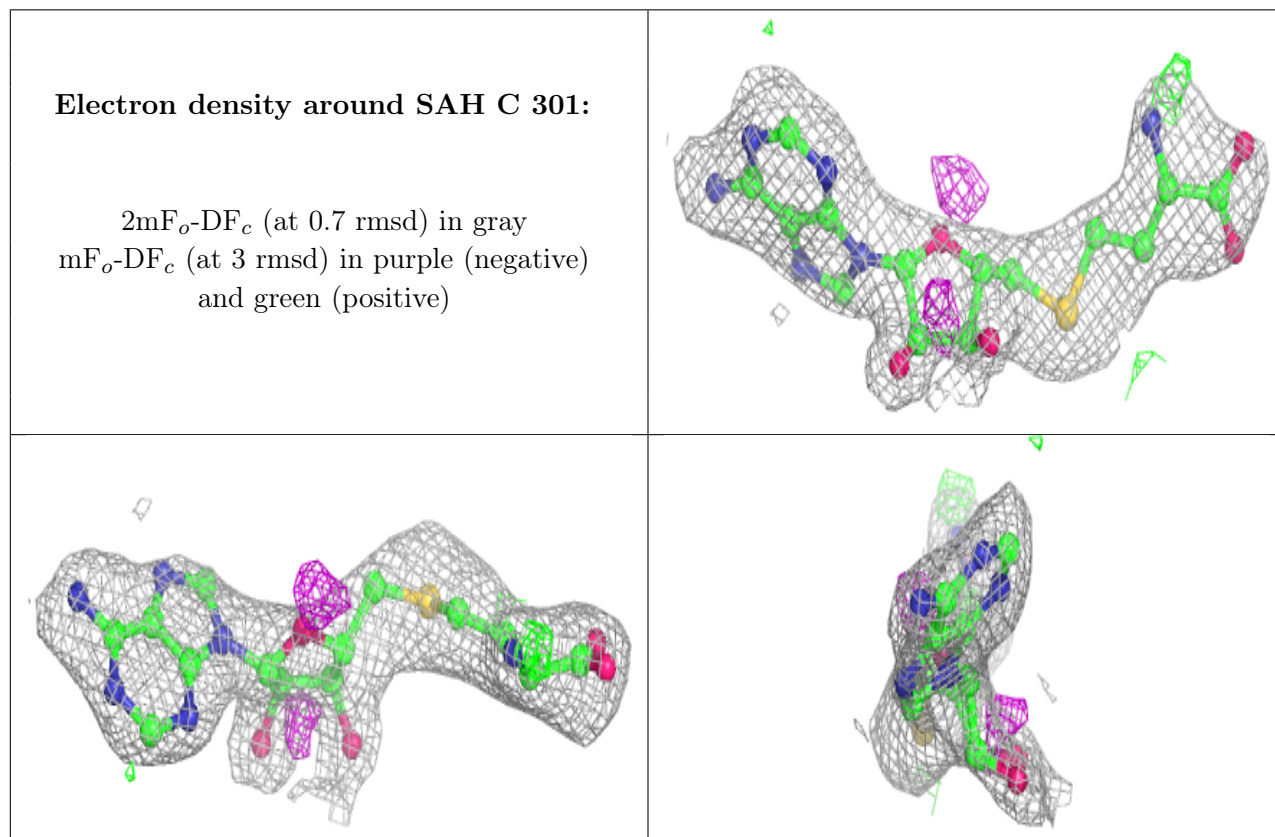
There are no monosaccharides in this entry.

## 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<sup>th</sup> 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.

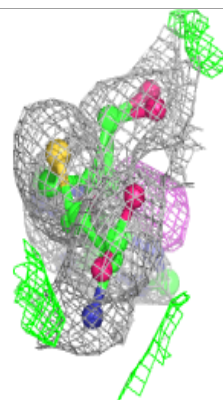
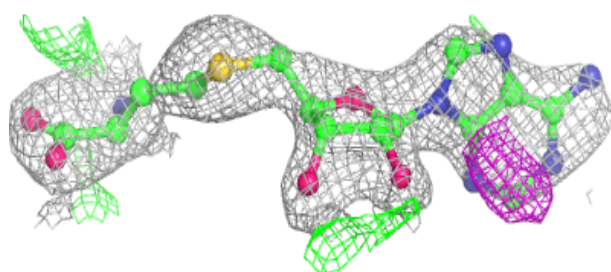
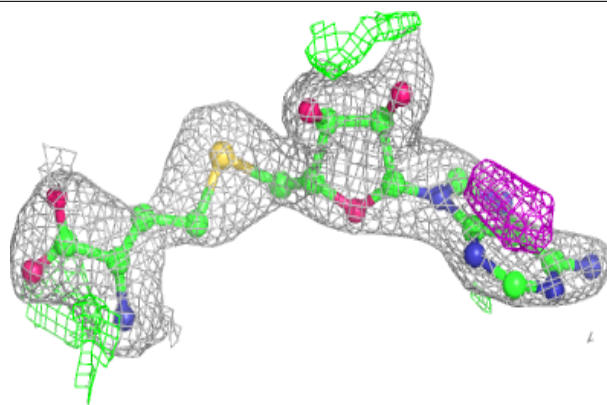
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
2	SAH	C	301	26/26	0.70	0.22	63,83,108,111	0
2	SAH	A	301	26/26	0.81	0.23	64,72,86,88	0
2	SAH	M	301	26/26	0.82	0.21	75,89,106,107	0
3	GOL	B	301	6/6	0.88	0.15	54,58,60,60	0

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.

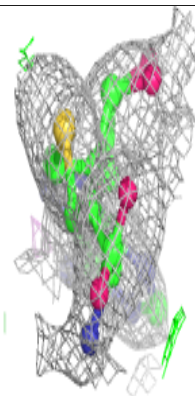
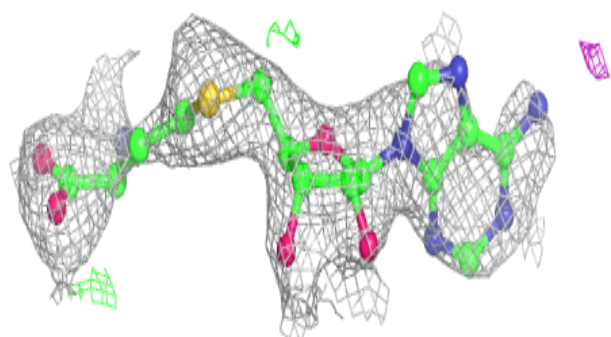
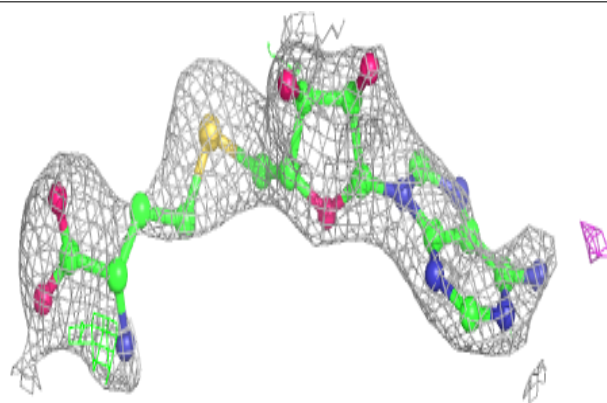


**Electron density around SAH A 301:**

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

**Electron density around SAH M 301:**

$2mF_o-DF_c$  (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.