



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 8, 2026 – 11:27 AM UTC

PDB ID : 7W6L / pdb_00007w6l
Title : The crystal structure of MLL3-RBBP5-ASH2L in complex with H3K4me0 peptide
Authors : Zhao, L.; Li, Y.; Chen, Y.
Deposited on : 2021-12-01
Resolution : 2.26 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

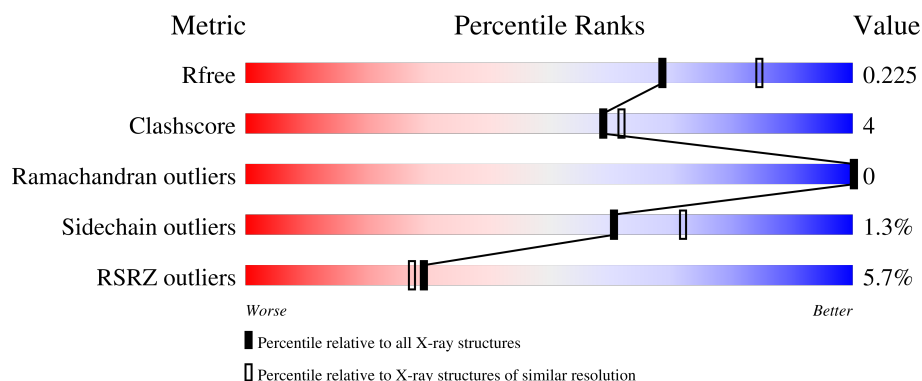
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.26 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.



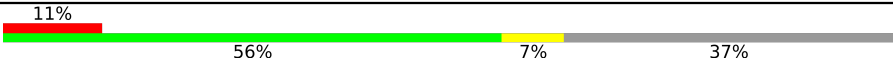
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	180053	1898 (2.26-2.26)
Clashscore	190562	2005 (2.26-2.26)
Ramachandran outliers	187476	1965 (2.26-2.26)
Sidechain outliers	187428	1966 (2.26-2.26)
RSRZ outliers	180081	1898 (2.26-2.26)

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	184	2% 82% 14% .
1	B	184	3% 88% 8% ..
2	C	159	9% 90% 8% ..
2	E	159	6% 75% 17% • 5%
3	D	27	7% 70% 30%

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
3	F	27	
4	M	9	

2 Entry composition

There are 7 unique types of molecules in this entry. The entry contains 5944 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 Set1/Ash2 histone methyltransferase complex subunit ASH2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	176	Total	C	N	O	S	0	0	0
			1388	898	234	250	6			
1	B	178	Total	C	N	O	S	0	0	0
			1412	910	236	260	6			

There are 14 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	285	SER	-	expression tag	UNP Q9UBL3
A	439	ILE	-	linker	UNP Q9UBL3
A	440	SER	-	linker	UNP Q9UBL3
A	441	GLY	-	linker	UNP Q9UBL3
A	442	ARG	-	linker	UNP Q9UBL3
A	443	GLY	-	linker	UNP Q9UBL3
A	444	SER	-	linker	UNP Q9UBL3
B	285	SER	-	expression tag	UNP Q9UBL3
B	439	ILE	-	linker	UNP Q9UBL3
B	440	SER	-	linker	UNP Q9UBL3
B	441	GLY	-	linker	UNP Q9UBL3
B	442	ARG	-	linker	UNP Q9UBL3
B	443	GLY	-	linker	UNP Q9UBL3
B	444	SER	-	linker	UNP Q9UBL3

- Molecule 2 is a protein called Histone-lysine N-methyltransferase 2C.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	C	158	Total	C	N	O	S	0	0	0
			1285	802	237	235	11			
2	E	151	Total	C	N	O	S	0	1	0
			1207	756	225	214	12			

There are 8 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	4753	GLY	-	expression tag	UNP Q8NEZ4
C	4754	PRO	-	expression tag	UNP Q8NEZ4
C	4755	LEU	-	expression tag	UNP Q8NEZ4
C	4756	GLY	-	expression tag	UNP Q8NEZ4
E	4753	GLY	-	expression tag	UNP Q8NEZ4
E	4754	PRO	-	expression tag	UNP Q8NEZ4
E	4755	LEU	-	expression tag	UNP Q8NEZ4
E	4756	GLY	-	expression tag	UNP Q8NEZ4

- Molecule 3 is a protein called Retinoblastoma-binding protein 5.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
3	D	19	Total	C	N	O	0	0	0
			170	106	24	40			
3	F	17	Total	C	N	O	0	0	0
			150	91	21	38			

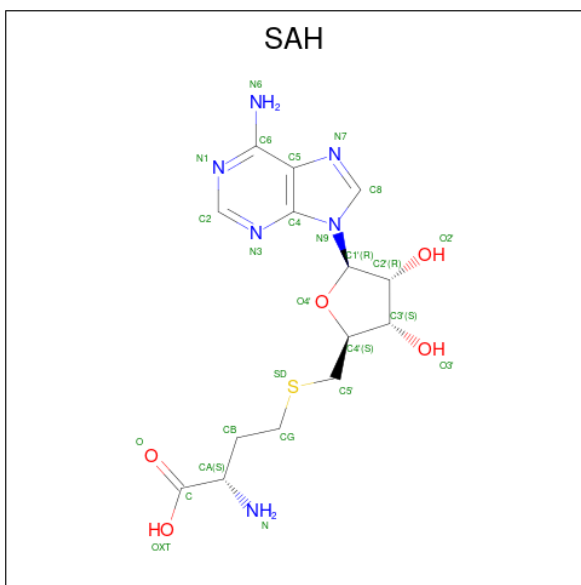
- Molecule 4 is a protein called Histone H3.3C.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
4	M	7	Total	C	N	O	0	0	0
			53	31	12	10			

- Molecule 5 is ZINC ION (CCD ID: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	C	1	Total	Zn	0	0
			1	1		
5	E	1	Total	Zn	0	0
			1	1		

- Molecule 6 is S-ADENOSYL-L-HOMOCYSTEINE (CCD ID: SAH) (formula: C₁₄H₂₀N₆O₅S) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
6	C	1	Total	C	N	O	S	0	0
			26	14	6	5	1		
6	E	1	Total	C	N	O	S	0	0
			26	14	6	5	1		

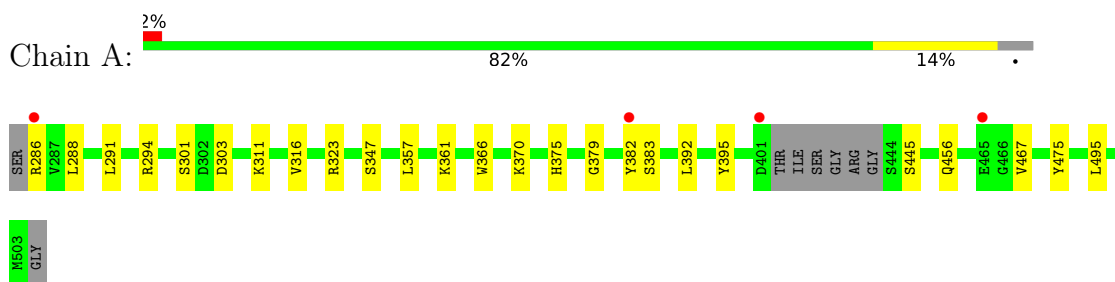
- Molecule 7 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	82	Total	O	0	0
			82	82		
7	B	50	Total	O	0	0
			50	50		
7	C	37	Total	O	0	0
			37	37		
7	D	17	Total	O	0	0
			17	17		
7	E	26	Total	O	0	0
			26	26		
7	F	12	Total	O	0	0
			12	12		
7	M	1	Total	O	0	0
			1	1		

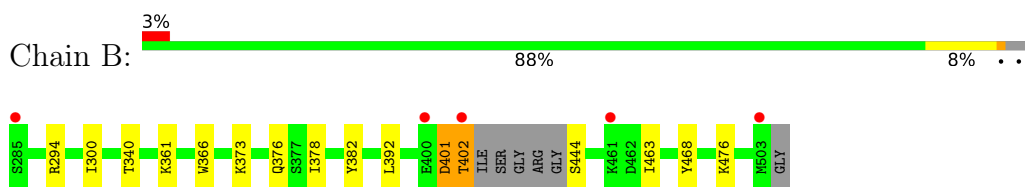
3 Residue-property plots [i](#)

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.

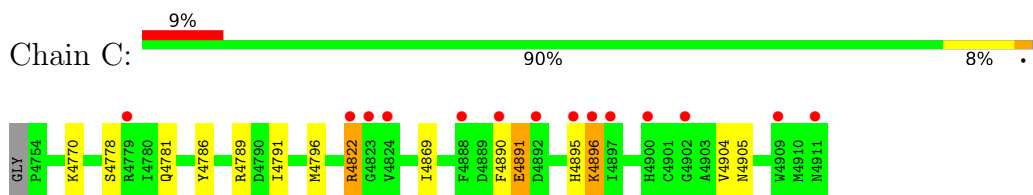
- Molecule 1: Set1/Ash2 histone methyltransferase complex subunit ASH2



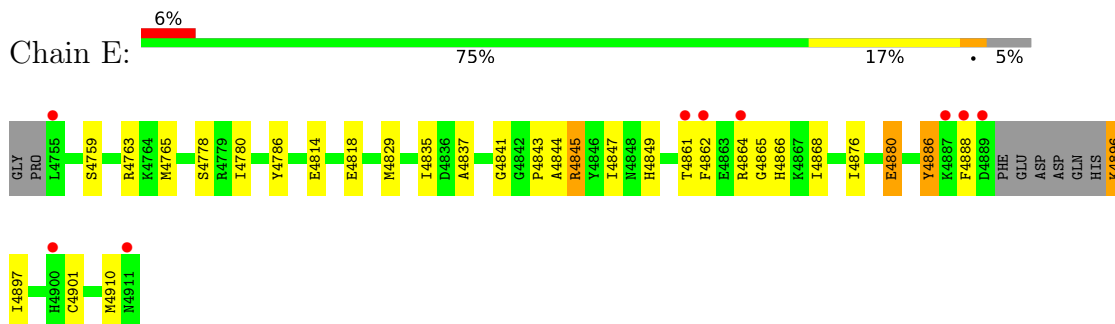
- Molecule 1: Set1/Ash2 histone methyltransferase complex subunit ASH2



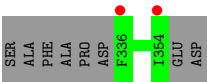
- Molecule 2: Histone-lysine N-methyltransferase 2C



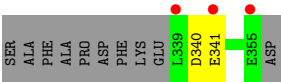
- Molecule 2: Histone-lysine N-methyltransferase 2C



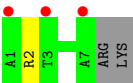
- Molecule 3: Retinoblastoma-binding protein 5



● Molecule 3: Retinoblastoma-binding protein 5



● Molecule 4: Histone H3.3C



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 2	Depositor
Cell constants a, b, c, α , β , γ	80.37Å 236.14Å 44.45Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	44.45 – 2.26 44.45 – 2.26	Depositor EDS
% Data completeness (in resolution range)	95.3 (44.45-2.26) 95.3 (44.45-2.26)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	4.37 (at 2.27Å)	Xtriage
Refinement program	PHENIX 1.18.2_3874	Depositor
R, R_{free}	0.187 , 0.223 0.190 , 0.225	Depositor DCC
R_{free} test set	1841 reflections (4.51%)	wwPDB-VP
Wilson B-factor (Å ²)	32.2	Xtriage
Anisotropy	0.148	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.34 , 45.4	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.34$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	5944	wwPDB-VP
Average B, all atoms (Å ²)	41.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 7.62% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: ZN, SAH

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	0.79	7/1429 (0.5%)	0.68	0/1934
1	B	0.59	1/1453 (0.1%)	0.62	1/1966 (0.1%)
2	C	0.59	1/1311 (0.1%)	0.75	3/1760 (0.2%)
2	E	0.66	4/1232 (0.3%)	0.74	4/1654 (0.2%)
3	D	0.19	0/172	0.47	0/229
3	F	0.89	0/151	0.94	1/202 (0.5%)
4	M	0.38	0/52	0.47	0/68
All	All	0.66	13/5800 (0.2%)	0.70	9/7813 (0.1%)

All (13) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	383	SER	C-O	-6.65	1.15	1.24
1	A	375	HIS	CE1-NE2	-6.52	1.26	1.32
2	E	4843	PRO	C-O	-6.37	1.15	1.24
1	A	475	TYR	C-O	-6.09	1.17	1.24
1	A	445	SER	C-O	-6.03	1.16	1.23
1	A	311	LYS	C-O	-5.73	1.18	1.24
2	E	4844	ALA	C-O	-5.73	1.17	1.24
1	B	378	ILE	C-O	-5.38	1.18	1.24
1	A	379	GLY	C-O	-5.28	1.18	1.23
1	A	370	LYS	C-O	-5.23	1.14	1.24
2	C	4791	ILE	C-O	-5.10	1.18	1.24
2	E	4845	ARG	C-O	-5.09	1.17	1.24
2	E	4847	ILE	C-O	-5.05	1.18	1.24

All (9) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	4895	HIS	N-CA-C	6.82	118.71	111.28

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	4891	GLU	N-CA-C	6.38	116.70	108.34
2	E	4886	TYR	CA-C-N	-6.25	113.37	122.19
2	E	4886	TYR	C-N-CA	-6.25	113.37	122.19
2	E	4888	PHE	N-CA-C	6.12	119.51	109.72
1	B	401	ASP	N-CA-C	5.67	118.81	110.59
2	E	4880	GLU	N-CA-C	-5.66	101.05	110.17
2	C	4890	PHE	CB-CA-C	5.56	118.58	109.90
3	F	340	ASP	N-CA-C	5.46	119.24	112.58

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	1388	0	1346	12	0
1	B	1412	0	1368	8	0
2	C	1285	0	1263	12	0
2	E	1207	0	1194	17	0
3	D	170	0	144	0	0
3	F	150	0	122	0	0
4	M	53	0	60	1	0
5	C	1	0	0	0	0
5	E	1	0	0	0	0
6	C	26	0	19	1	0
6	E	26	0	19	0	0
7	A	82	0	0	1	0
7	B	50	0	0	0	0
7	C	37	0	0	2	0
7	D	17	0	0	0	0
7	E	26	0	0	0	0
7	F	12	0	0	0	0
7	M	1	0	0	0	0
All	All	5944	0	5535	49	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 (49) 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)
2:C:4822:ARG:HH11	2:C:4822:ARG:HG3	1.30	0.93
2:C:4822:ARG:HH11	2:C:4822:ARG:CG	2.00	0.72
2:C:4822:ARG:HG3	2:C:4822:ARG:NH1	2.05	0.69
1:A:323:ARG:HG2	1:A:467:VAL:HG22	1.75	0.68
2:E:4861:THR:HG23	2:E:4866:HIS:HE1	1.62	0.64
2:E:4861:THR:HG23	2:E:4866:HIS:CE1	2.33	0.63
2:E:4814:GLU:O	2:E:4818:GLU:HG3	1.98	0.62
1:A:294:ARG:HB3	1:A:316:VAL:HG23	1.84	0.59
2:C:4891:GLU:OE2	4:M:2:ARG:NH2	2.37	0.57
2:C:4789:ARG:NH2	7:C:5102:HOH:O	2.37	0.55
1:A:361:LYS:NZ	7:A:601:HOH:O	2.25	0.55
1:B:366:TRP:CZ3	1:B:392:LEU:HD12	2.42	0.55
1:A:301:SER:OG	1:A:303:ASP:OD1	2.21	0.54
1:B:373:LYS:HD3	1:B:382:TYR:HB2	1.90	0.54
1:A:286:ARG:HE	1:A:288:LEU:HD21	1.74	0.52
2:E:4864:ARG:HG3	2:E:4865:GLY:N	2.25	0.52
2:E:4829:MET:HG2	2:E:4868:ILE:HD11	1.92	0.51
1:B:463:ILE:HD12	1:B:468:TYR:CZ	2.47	0.49
1:A:395:TYR:CE1	1:A:495:LEU:HD13	2.47	0.49
2:C:4781:GLN:O	6:C:5002:SAH:N	2.46	0.49
2:E:4896:LYS:HA	2:E:4910:MET:O	2.13	0.48
2:E:4849:HIS:HB2	2:E:4886:TYR:CG	2.48	0.48
1:A:366:TRP:CZ3	1:A:392:LEU:HD12	2.48	0.48
1:A:382:TYR:OH	1:A:456:GLN:HB2	2.12	0.48
1:B:361:LYS:HG2	1:B:376:GLN:NE2	2.29	0.47
2:E:4849:HIS:HB2	2:E:4886:TYR:CD1	2.49	0.47
2:E:4780:ILE:HG12	2:E:4901:CYS:HA	1.95	0.47
2:E:4876:ILE:HG23	2:E:4880:GLU:OE1	2.15	0.46
2:C:4822:ARG:CG	2:C:4822:ARG:NH1	2.70	0.46
1:B:340:THR:HG22	1:B:476:LYS:HB2	1.99	0.45
1:A:347:SER:HB2	1:A:357:LEU:HD11	1.97	0.45
2:C:4778:SER:HA	2:C:4786:TYR:OH	2.17	0.45
2:E:4778:SER:HA	2:E:4786:TYR:OH	2.18	0.44
2:E:4759:SER:O	2:E:4763:ARG:HG3	2.17	0.44
2:E:4837:ALA:HB1	2:E:4841:GLY:HA3	1.99	0.44
2:C:4896:LYS:HB2	2:C:4896:LYS:HE2	1.74	0.43
2:E:4897:ILE:HG13	2:E:4910:MET:HB2	2.00	0.43
1:A:291:LEU:HD12	1:A:291:LEU:HA	1.82	0.43

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:4770:LYS:NZ	7:C:5103:HOH:O	2.40	0.43
2:E:4765:MET:HE3	2:E:4765:MET:HB3	1.92	0.42
1:A:323:ARG:CG	1:A:467:VAL:HG22	2.47	0.42
2:E:4862:PHE:HB2	2:E:4865:GLY:O	2.19	0.42
2:E:4829:MET:HG3	2:E:4835:ILE:HG13	2.02	0.42
2:C:4796:MET:HG2	2:C:4869:ILE:HG21	2.02	0.41
1:A:286:ARG:HE	1:A:288:LEU:CD2	2.33	0.41
1:B:294:ARG:HD2	1:B:300:ILE:HD11	2.04	0.40
1:B:294:ARG:HD2	1:B:300:ILE:CD1	2.50	0.40
1:B:402:THR:HG23	1:B:402:THR:O	2.21	0.40
2:C:4904:VAL:HG12	2:C:4905:ASN:ND2	2.36	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	172/184 (94%)	167 (97%)	5 (3%)	0	100	100
1	B	174/184 (95%)	166 (95%)	8 (5%)	0	100	100
2	C	156/159 (98%)	152 (97%)	4 (3%)	0	100	100
2	E	148/159 (93%)	142 (96%)	6 (4%)	0	100	100
3	D	17/27 (63%)	17 (100%)	0	0	100	100
3	F	15/27 (56%)	14 (93%)	1 (7%)	0	100	100
4	M	5/9 (56%)	5 (100%)	0	0	100	100
All	All	687/749 (92%)	663 (96%)	24 (4%)	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	146/155 (94%)	146 (100%)	0	100	100
1	B	151/155 (97%)	148 (98%)	3 (2%)	48	59
2	C	139/139 (100%)	137 (99%)	2 (1%)	59	70
2	E	128/139 (92%)	126 (98%)	2 (2%)	55	66
3	D	19/25 (76%)	19 (100%)	0	100	100
3	F	17/25 (68%)	16 (94%)	1 (6%)	18	18
4	M	5/7 (71%)	5 (100%)	0	100	100
All	All	605/645 (94%)	597 (99%)	8 (1%)	61	72

All (8) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	401	ASP
1	B	402	THR
1	B	444	SER
2	C	4822	ARG
2	C	4896	LYS
2	E	4845	ARG
2	E	4896	LYS
3	F	341	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	292	HIS
2	C	4772	ASN
2	C	4905	ASN
2	E	4877	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 4 ligands modelled in this entry, 2 are monoatomic - leaving 2 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	$\# Z > 2$
6	SAH	E	5002	-	27,28,28	1.06	4 (14%)	36,40,40	1.92	10 (27%)
6	SAH	C	5002	-	27,28,28	1.08	4 (14%)	36,40,40	1.97	10 (27%)

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
6	SAH	E	5002	-	-	2/15/31/31	0/3/3/3
6	SAH	C	5002	-	-	4/15/31/31	0/3/3/3

All (8) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	C	5002	SAH	C2-N3	2.59	1.38	1.33

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	E	5002	SAH	C2-N1	2.57	1.38	1.33
6	C	5002	SAH	C2-N1	2.56	1.38	1.33
6	E	5002	SAH	C2-N3	2.44	1.38	1.33
6	C	5002	SAH	OXT-C	-2.12	1.23	1.30
6	C	5002	SAH	C8-N7	2.11	1.35	1.31
6	E	5002	SAH	OXT-C	-2.10	1.23	1.30
6	E	5002	SAH	C8-N7	2.08	1.35	1.31

All (20) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	E	5002	SAH	N3-C2-N1	-5.43	120.37	128.58
6	C	5002	SAH	N3-C2-N1	-5.40	120.41	128.58
6	C	5002	SAH	C5-C4-N3	-4.47	120.56	126.72
6	E	5002	SAH	C5-C4-N3	-4.40	120.66	126.72
6	C	5002	SAH	N9-C8-N7	-3.60	108.83	113.94
6	E	5002	SAH	N9-C8-N7	-3.50	108.97	113.94
6	C	5002	SAH	C2-N3-C4	3.29	119.87	111.83
6	E	5002	SAH	C2-N3-C4	3.29	119.86	111.83
6	E	5002	SAH	C5-N7-C8	3.23	108.53	103.45
6	C	5002	SAH	C5'-SD-CG	-3.16	92.87	102.26
6	C	5002	SAH	C5-N7-C8	3.14	108.38	103.45
6	C	5002	SAH	N3-C4-N9	3.04	132.33	127.17
6	C	5002	SAH	OXT-C-O	-2.88	117.55	124.08
6	E	5002	SAH	N3-C4-N9	2.75	131.85	127.17
6	E	5002	SAH	C5'-SD-CG	-2.65	94.41	102.26
6	E	5002	SAH	OXT-C-O	-2.59	118.20	124.08
6	E	5002	SAH	C2'-C1'-N9	-2.42	107.28	113.30
6	E	5002	SAH	C4-C5-N7	-2.38	107.86	110.58
6	C	5002	SAH	C2'-C1'-N9	-2.31	107.57	113.30
6	C	5002	SAH	C4-C5-N7	-2.12	108.15	110.58

There are no chirality outliers.

All (6) torsion outliers are listed below:

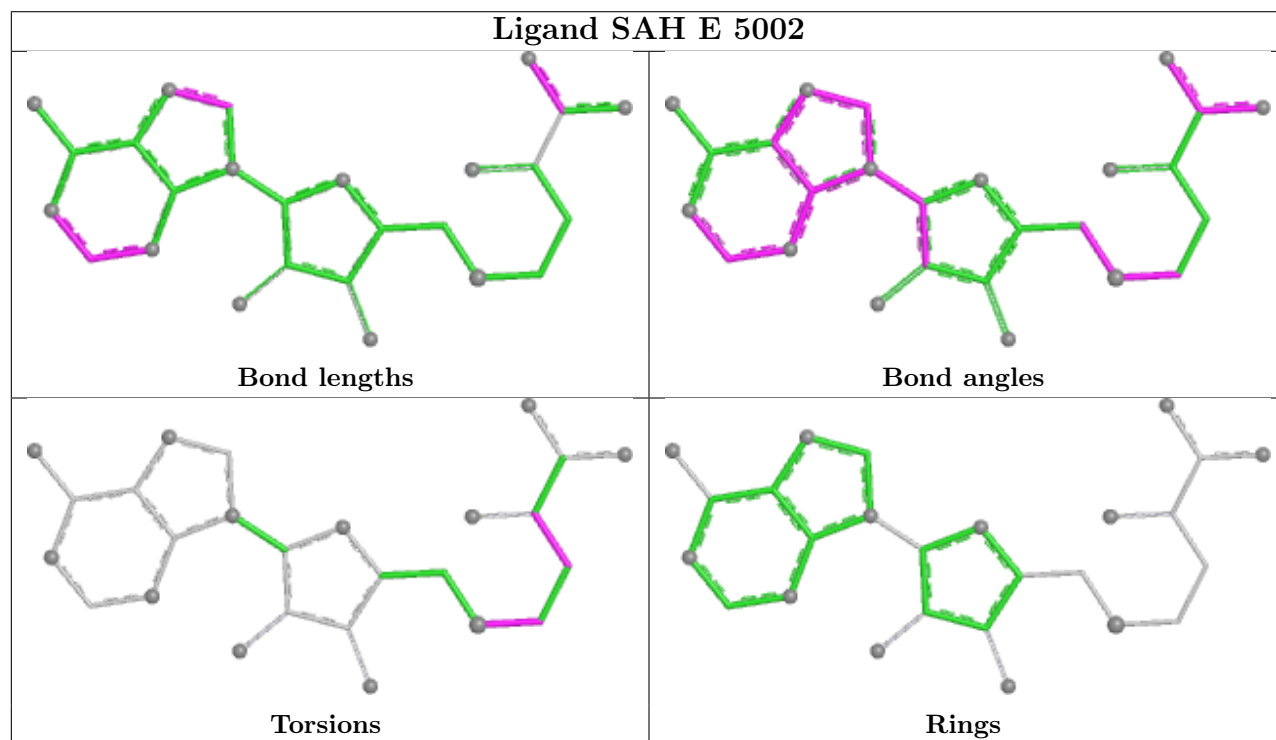
Mol	Chain	Res	Type	Atoms
6	C	5002	SAH	CA-CB-CG-SD
6	C	5002	SAH	C-CA-CB-CG
6	E	5002	SAH	C-CA-CB-CG
6	C	5002	SAH	CB-CG-SD-C5'
6	E	5002	SAH	CB-CG-SD-C5'
6	C	5002	SAH	C3'-C4'-C5'-SD

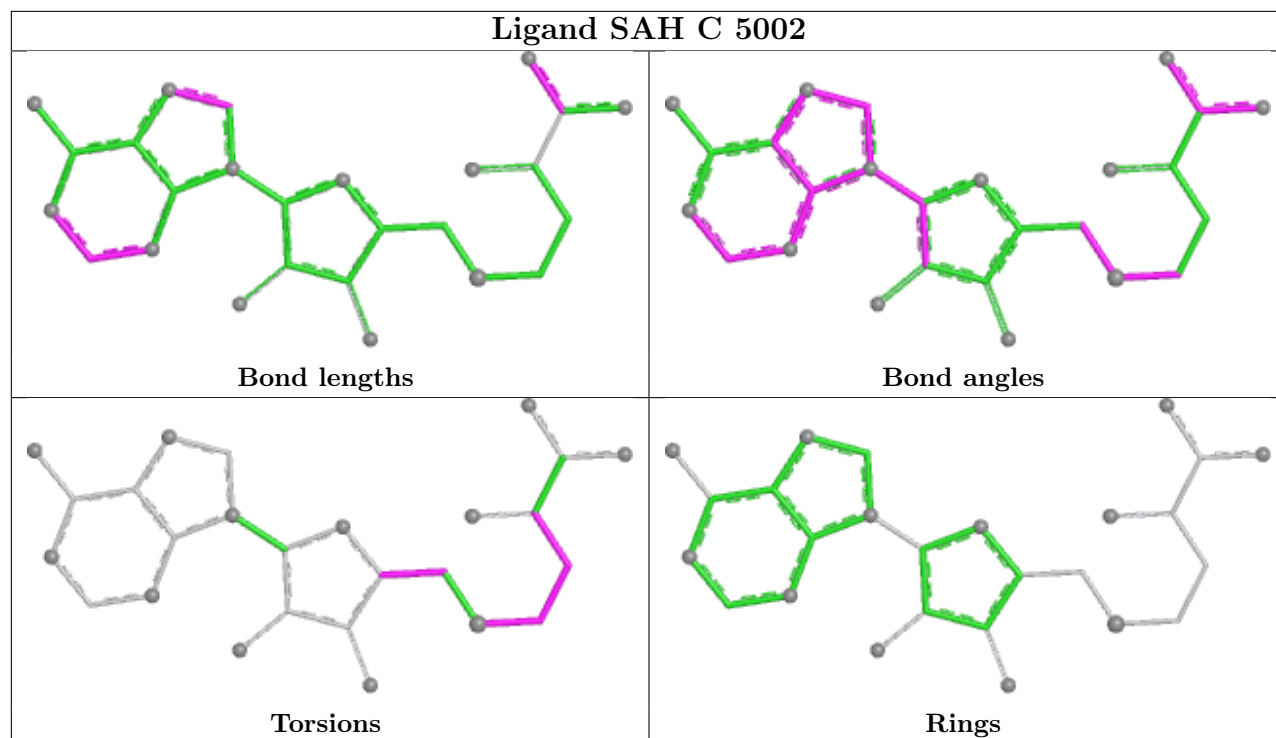
There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	C	5002	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, 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	176/184 (95%)	-0.30	4 (2%) 61 61	17, 27, 45, 68	0
1	B	178/184 (96%)	0.12	5 (2%) 55 55	24, 40, 65, 110	0
2	C	158/159 (99%)	0.47	14 (8%) 15 14	27, 44, 92, 134	0
2	E	151/159 (94%)	0.32	9 (5%) 27 25	25, 42, 69, 91	1 (0%)
3	D	19/27 (70%)	0.35	2 (10%) 11 11	32, 38, 73, 78	0
3	F	17/27 (62%)	0.34	3 (17%) 4 3	26, 35, 68, 81	0
4	M	7/9 (77%)	2.19	3 (42%) 0 0	56, 62, 76, 86	0
All	All	706/749 (94%)	0.17	40 (5%) 29 27	17, 38, 73, 134	1 (0%)

All (40) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
4	M	7	ALA	5.5
2	C	4823	GLY	4.1
2	E	4755	LEU	3.8
2	E	4911	ASN	3.7
2	C	4824	VAL	3.4
3	F	339	LEU	3.4
2	C	4890	PHE	3.4
2	E	4888	PHE	3.3
2	E	4864	ARG	3.1
4	M	1	ALA	3.1
2	C	4896	LYS	2.9
1	A	401	ASP	2.9
2	C	4779	ARG	2.9
2	C	4897	ILE	2.9
1	A	286	ARG	2.8
1	B	402	THR	2.7
3	D	336	PHE	2.6

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
2	E	4861	THR	2.6
2	C	4822	ARG	2.6
2	C	4900	HIS	2.6
2	E	4889	ASP	2.6
2	C	4892	ASP	2.5
2	E	4862	PHE	2.5
4	M	3	THR	2.5
3	F	355	GLU	2.5
2	C	4902	GLY	2.4
3	F	341	GLU	2.4
2	E	4900	HIS	2.3
2	C	4895	HIS	2.3
2	C	4911	ASN	2.3
3	D	354	ILE	2.3
1	B	461	LYS	2.2
2	C	4909	TRP	2.1
2	E	4887	LYS	2.1
1	A	465	GLU	2.1
1	B	400	GLU	2.1
1	A	382	TYR	2.1
1	B	503	MET	2.0
2	C	4888	PHE	2.0
1	B	285	SER	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](#)

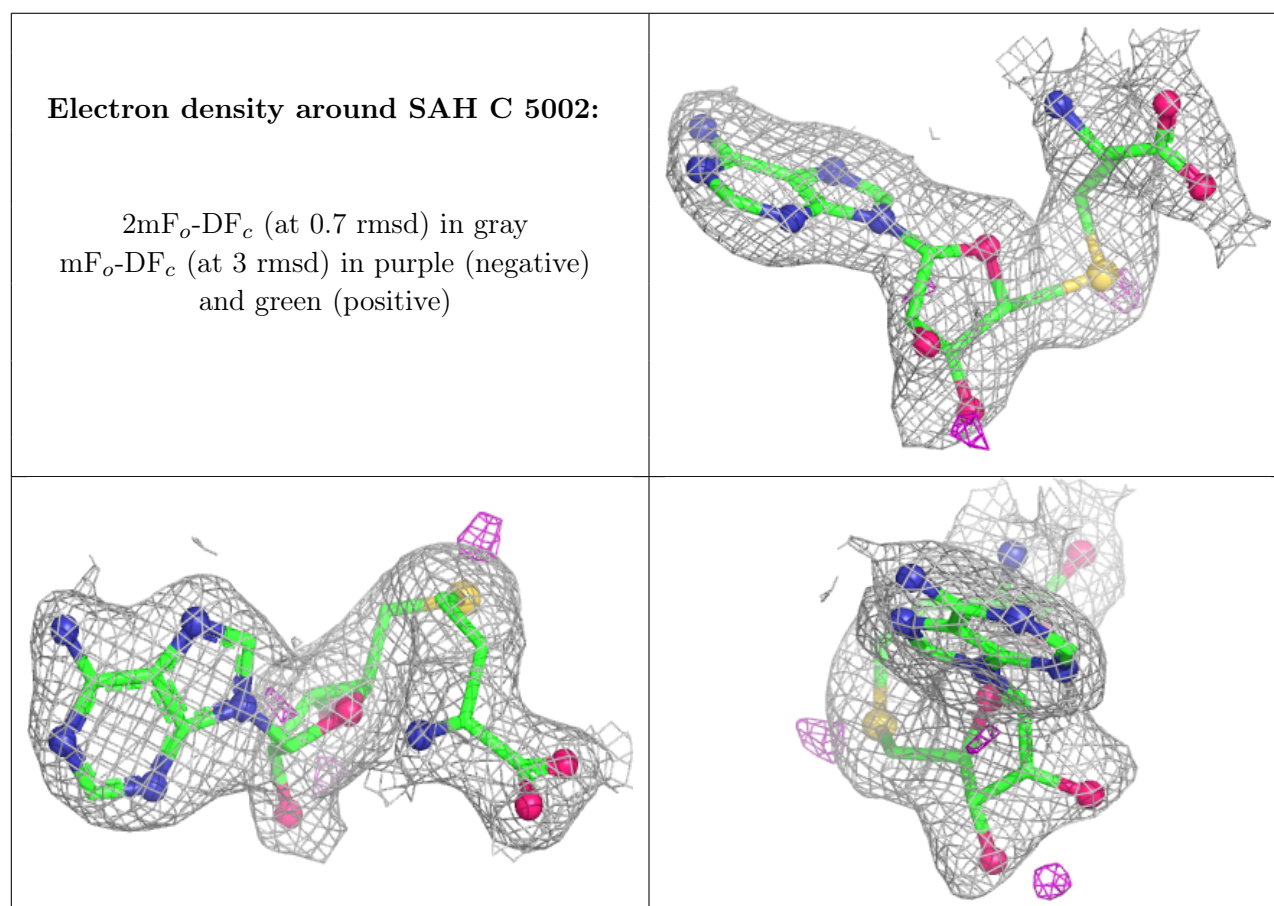
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

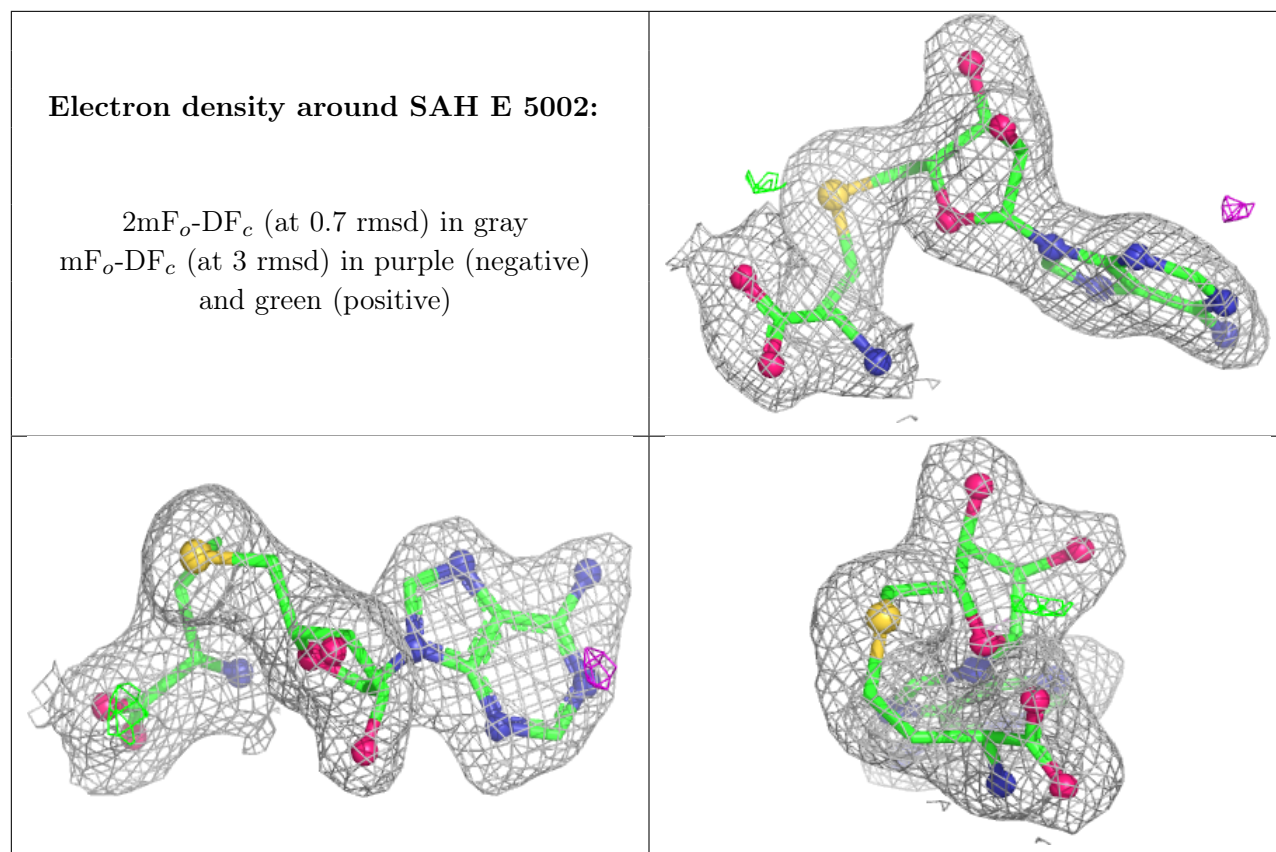
Continued on next page...

Continued from previous page...

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
6	SAH	C	5002	26/26	0.90	0.10	40,49,56,57	0
6	SAH	E	5002	26/26	0.95	0.07	36,40,43,45	0
5	ZN	C	5001	1/1	0.99	0.06	53,53,53,53	0
5	ZN	E	5001	1/1	0.99	0.07	37,37,37,37	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.





6.5 Other polymers [i](#)

There are no such residues in this entry.