WORLDWIDE PDB

PROTEIN DATA BANK

Full wwPDB X-ray Structure Validation Report ⓘ

Jun 13, 2024 – 09:12 AM EDT

PDB ID	:	4HH4
Title	:	Structure of the CcbJ Methyltransferase from Streptomyces caelestis
Authors	:	Bauer, J.A.; Ondrovicova, G.; Kutejova, E.; Janata, J.
Deposited on	:	2012-10-09
Resolution	:	2.90 Å(reported)

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

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

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

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

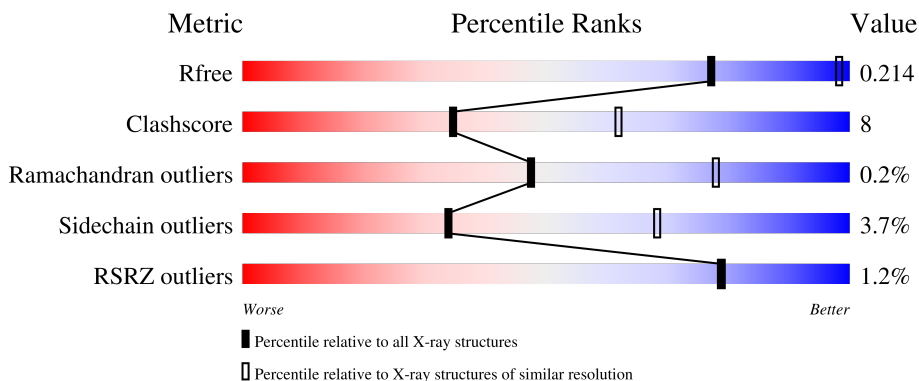|		
MolProbity	:	4.02b-467
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	1.20.1
EDS	:	2.36.2
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & 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 2.90 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.
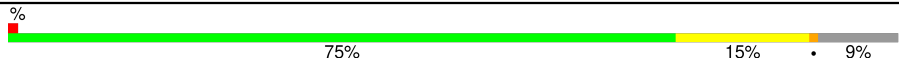
Metric	Percentile Ranks	Value
Rfree		0.214
Clashscore		8
Ramachandran outliers		0.2%
Sidechain outliers		3.7%
RSRZ outliers		1.2%

Worse .... *Better*

▊ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	1957 (2.90-2.90)
Clashscore	141614	2172 (2.90-2.90)
Ramachandran outliers	138981	2115 (2.90-2.90)
Sidechain outliers	138945	2117 (2.90-2.90)
RSRZ outliers	127900	1906 (2.90-2.90)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=5% The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	276	% 78% 12% · 8%
1	B	276	% 75% 15% · 9%
1	C	276	77% 14% · 7%
1	D	276	2% 79% 10% · 9%
1	E	276	81% 10% · 7%

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Mol	Chain	Length	Quality of chain
1	F	276	

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
5	EPE	B	305	-	-	X	-

2 Entry composition ⓘ

There are 6 unique types of molecules in this entry. The entry contains 12077 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 CcbJ.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	254	Total	C	N	O	S	0	0	0
			1952	1230	345	370	7			
1	B	251	Total	C	N	O	S	0	0	0
			1925	1215	338	366	6			
1	C	256	Total	C	N	O	S	0	0	0
			1968	1239	349	373	7			
1	D	251	Total	C	N	O	S	0	0	0
			1925	1215	338	366	6			
1	E	256	Total	C	N	O	S	0	0	0
			1968	1239	349	373	7			
1	F	251	Total	C	N	O	S	0	0	0
			1925	1215	338	366	6			

There are 120 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-19	MET	-	expression tag	UNP E9JES0
A	-18	GLY	-	expression tag	UNP E9JES0
A	-17	SER	-	expression tag	UNP E9JES0
A	-16	SER	-	expression tag	UNP E9JES0
A	-15	HIS	-	expression tag	UNP E9JES0
A	-14	HIS	-	expression tag	UNP E9JES0
A	-13	HIS	-	expression tag	UNP E9JES0
A	-12	HIS	-	expression tag	UNP E9JES0
A	-11	HIS	-	expression tag	UNP E9JES0
A	-10	HIS	-	expression tag	UNP E9JES0
A	-9	SER	-	expression tag	UNP E9JES0
A	-8	SER	-	expression tag	UNP E9JES0
A	-7	GLY	-	expression tag	UNP E9JES0
A	-6	LEU	-	expression tag	UNP E9JES0
A	-5	VAL	-	expression tag	UNP E9JES0
A	-4	PRO	-	expression tag	UNP E9JES0
A	-3	ARG	-	expression tag	UNP E9JES0

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Chain	Residue	Modelled	Actual	Comment	Reference
A	-2	GLY	-	expression tag	UNP E9JES0
A	-1	SER	-	expression tag	UNP E9JES0
A	0	HIS	-	expression tag	UNP E9JES0
B	-19	MET	-	expression tag	UNP E9JES0
B	-18	GLY	-	expression tag	UNP E9JES0
B	-17	SER	-	expression tag	UNP E9JES0
B	-16	SER	-	expression tag	UNP E9JES0
B	-15	HIS	-	expression tag	UNP E9JES0
B	-14	HIS	-	expression tag	UNP E9JES0
B	-13	HIS	-	expression tag	UNP E9JES0
B	-12	HIS	-	expression tag	UNP E9JES0
B	-11	HIS	-	expression tag	UNP E9JES0
B	-10	HIS	-	expression tag	UNP E9JES0
B	-9	SER	-	expression tag	UNP E9JES0
B	-8	SER	-	expression tag	UNP E9JES0
B	-7	GLY	-	expression tag	UNP E9JES0
B	-6	LEU	-	expression tag	UNP E9JES0
B	-5	VAL	-	expression tag	UNP E9JES0
B	-4	PRO	-	expression tag	UNP E9JES0
B	-3	ARG	-	expression tag	UNP E9JES0
B	-2	GLY	-	expression tag	UNP E9JES0
B	-1	SER	-	expression tag	UNP E9JES0
B	0	HIS	-	expression tag	UNP E9JES0
C	-19	MET	-	expression tag	UNP E9JES0
C	-18	GLY	-	expression tag	UNP E9JES0
C	-17	SER	-	expression tag	UNP E9JES0
C	-16	SER	-	expression tag	UNP E9JES0
C	-15	HIS	-	expression tag	UNP E9JES0
C	-14	HIS	-	expression tag	UNP E9JES0
C	-13	HIS	-	expression tag	UNP E9JES0
C	-12	HIS	-	expression tag	UNP E9JES0
C	-11	HIS	-	expression tag	UNP E9JES0
C	-10	HIS	-	expression tag	UNP E9JES0
C	-9	SER	-	expression tag	UNP E9JES0
C	-8	SER	-	expression tag	UNP E9JES0
C	-7	GLY	-	expression tag	UNP E9JES0
C	-6	LEU	-	expression tag	UNP E9JES0
C	-5	VAL	-	expression tag	UNP E9JES0
C	-4	PRO	-	expression tag	UNP E9JES0
C	-3	ARG	-	expression tag	UNP E9JES0
C	-2	GLY	-	expression tag	UNP E9JES0
C	-1	SER	-	expression tag	UNP E9JES0

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Chain	Residue	Modelled	Actual	Comment	Reference
C	0	HIS	-	expression tag	UNP E9JES0
D	-19	MET	-	expression tag	UNP E9JES0
D	-18	GLY	-	expression tag	UNP E9JES0
D	-17	SER	-	expression tag	UNP E9JES0
D	-16	SER	-	expression tag	UNP E9JES0
D	-15	HIS	-	expression tag	UNP E9JES0
D	-14	HIS	-	expression tag	UNP E9JES0
D	-13	HIS	-	expression tag	UNP E9JES0
D	-12	HIS	-	expression tag	UNP E9JES0
D	-11	HIS	-	expression tag	UNP E9JES0
D	-10	HIS	-	expression tag	UNP E9JES0
D	-9	SER	-	expression tag	UNP E9JES0
D	-8	SER	-	expression tag	UNP E9JES0
D	-7	GLY	-	expression tag	UNP E9JES0
D	-6	LEU	-	expression tag	UNP E9JES0
D	-5	VAL	-	expression tag	UNP E9JES0
D	-4	PRO	-	expression tag	UNP E9JES0
D	-3	ARG	-	expression tag	UNP E9JES0
D	-2	GLY	-	expression tag	UNP E9JES0
D	-1	SER	-	expression tag	UNP E9JES0
D	0	HIS	-	expression tag	UNP E9JES0
E	-19	MET	-	expression tag	UNP E9JES0
E	-18	GLY	-	expression tag	UNP E9JES0
E	-17	SER	-	expression tag	UNP E9JES0
E	-16	SER	-	expression tag	UNP E9JES0
E	-15	HIS	-	expression tag	UNP E9JES0
E	-14	HIS	-	expression tag	UNP E9JES0
E	-13	HIS	-	expression tag	UNP E9JES0
E	-12	HIS	-	expression tag	UNP E9JES0
E	-11	HIS	-	expression tag	UNP E9JES0
E	-10	HIS	-	expression tag	UNP E9JES0
E	-9	SER	-	expression tag	UNP E9JES0
E	-8	SER	-	expression tag	UNP E9JES0
E	-7	GLY	-	expression tag	UNP E9JES0
E	-6	LEU	-	expression tag	UNP E9JES0
E	-5	VAL	-	expression tag	UNP E9JES0
E	-4	PRO	-	expression tag	UNP E9JES0
E	-3	ARG	-	expression tag	UNP E9JES0
E	-2	GLY	-	expression tag	UNP E9JES0
E	-1	SER	-	expression tag	UNP E9JES0
E	0	HIS	-	expression tag	UNP E9JES0
F	-19	MET	-	expression tag	UNP E9JES0

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Chain	Residue	Modelled	Actual	Comment	Reference
F	-18	GLY	-	expression tag	UNP E9JES0
F	-17	SER	-	expression tag	UNP E9JES0
F	-16	SER	-	expression tag	UNP E9JES0
F	-15	HIS	-	expression tag	UNP E9JES0
F	-14	HIS	-	expression tag	UNP E9JES0
F	-13	HIS	-	expression tag	UNP E9JES0
F	-12	HIS	-	expression tag	UNP E9JES0
F	-11	HIS	-	expression tag	UNP E9JES0
F	-10	HIS	-	expression tag	UNP E9JES0
F	-9	SER	-	expression tag	UNP E9JES0
F	-8	SER	-	expression tag	UNP E9JES0
F	-7	GLY	-	expression tag	UNP E9JES0
F	-6	LEU	-	expression tag	UNP E9JES0
F	-5	VAL	-	expression tag	UNP E9JES0
F	-4	PRO	-	expression tag	UNP E9JES0
F	-3	ARG	-	expression tag	UNP E9JES0
F	-2	GLY	-	expression tag	UNP E9JES0
F	-1	SER	-	expression tag	UNP E9JES0
F	0	HIS	-	expression tag	UNP E9JES0

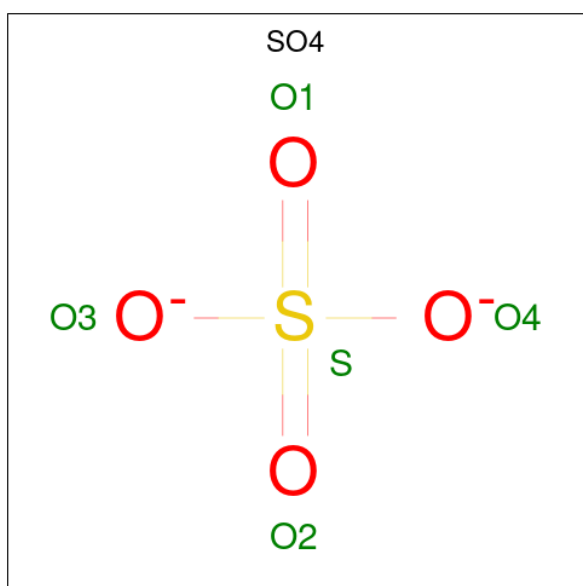- Molecule 2 is S-ADENOSYL-L-HOMOCYSTEINE (three-letter code: SAH) (formula: $C_{14}H_{20}N_6O_5S$).
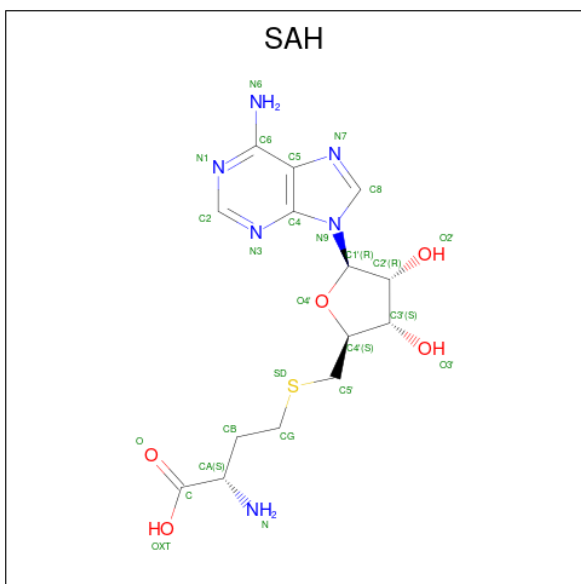
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	N	O	S		
2	A	1	26	14	6	5	1	0	0

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

- Molecule 3 is SULFATE ION (three-letter code: SO4) (formula: O_4S).

Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total 5	O 4	S 1	0	0
3	A	1	Total 5	O 4	S 1	0	0
3	A	1	Total 5	O 4	S 1	0	0
3	B	1	Total 5	O 4	S 1	0	0
3	B	1	Total 5	O 4	S 1	0	0
3	C	1	Total 5	O 4	S 1	0	0

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	C	1	Total 5	O 4	S 1	0	0
3	C	1	Total 5	O 4	S 1	0	0
3	C	1	Total 5	O 4	S 1	0	0
3	D	1	Total 5	O 4	S 1	0	0
3	D	1	Total 5	O 4	S 1	0	0
3	E	1	Total 5	O 4	S 1	0	0
3	E	1	Total 5	O 4	S 1	0	0
3	E	1	Total 5	O 4	S 1	0	0
3	E	1	Total 5	O 4	S 1	0	0
3	E	1	Total 5	O 4	S 1	0	0
3	E	1	Total 5	O 4	S 1	0	0
3	F	1	Total 5	O 4	S 1	0	0
3	F	1	Total 5	O 4	S 1	0	0
3	F	1	Total 5	O 4	S 1	0	0

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

GOL

C3
OH O3

C1 C2

HO
O1

OH
O2

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

- Molecule 5 is 4-(2-HYDROXYETHYL)-1-PIPERAZINE ETHANESULFONIC ACID (three-letter code: EPE) (formula: $C_8H_{18}N_2O_4S$).

W O R L D W I D E
PDB
PROTEIN DATA BANK

EPE
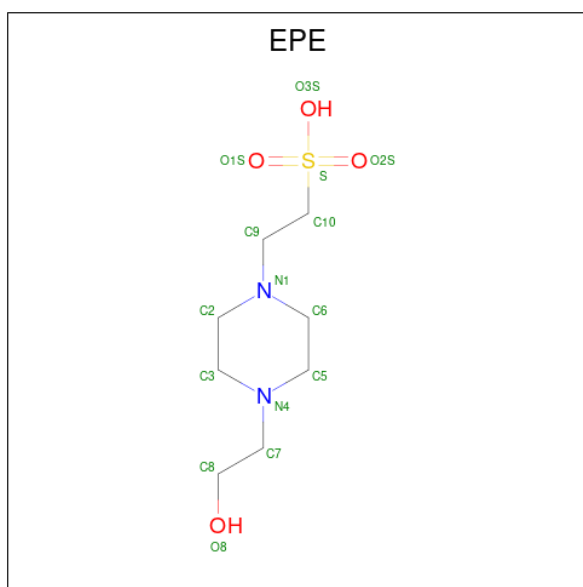
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	N	O	S		
5	B	1	15	8	2	4	1	0	0

- Molecule 6 is water.

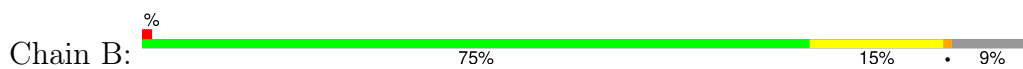| Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	21	Total 21	O 21	0	0
6	B	16	Total 16	O 16	0	0
6	C	22	Total 22	O 22	0	0
6	D	15	Total 15	O 15	0	0
6	E	21	Total 21	O 21	0	0
6	F	12	Total 12	O 12	0	0

3 Residue-property plots ⓘ

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.
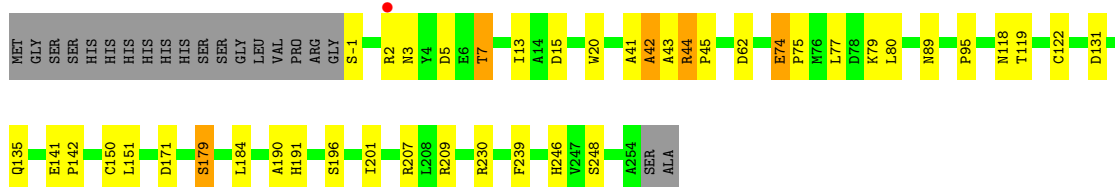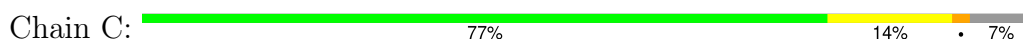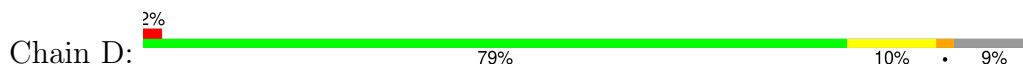
- Molecule 1: CcbJ

Chain A:

- Molecule 1: CcbJ

Chain B:

- Molecule 1: CcbJ

Chain C:

- Molecule 1: CcbJ

Chain D:

L140 E141 P142 L169 E170 D171 L184 S196 R207 L208 R230 R237 R238 F239 H246 V247 S248 A254 SER ALA
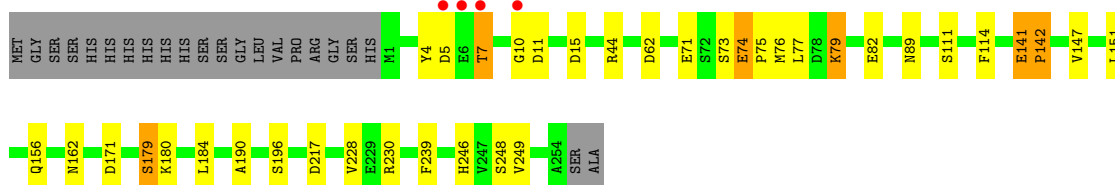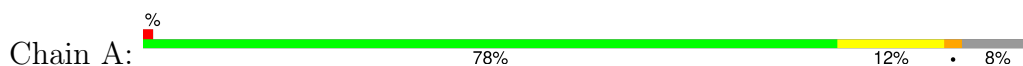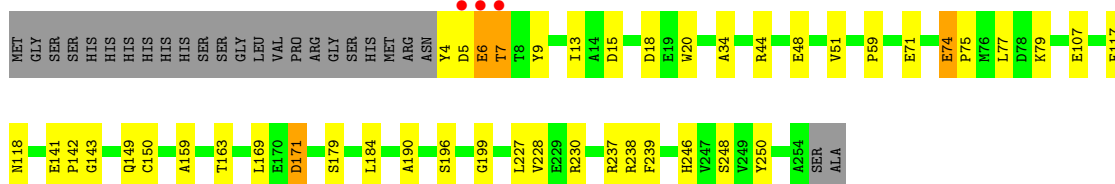
• Molecule 1: CcbJ

Chain E:

81% 10% · 7%

MET GLY SER SER HIS HIS HIS HIS HIS SER SER GLY LEU VAL PRO ARG GLY S-1 D5 E6 T7 Q12 A34 A41 R44 P45 P59 E71 E74 P75 M76 L77 D78 K79 S111 V112 E141 P142 L151 T160 L169 E170 D171 T172 L184

H191 S196 G199 R230 E235 R236 F239 H246 V247 S248 A254 SER ALA

• Molecule 1: CcbJ

Chain F:

%

75% 15% · 9%

MET GLY SER SER HIS HIS HIS HIS HIS SER SER GLY LEU VAL PRO ARG GLY SER HIS MET ARG ASN Y4 D5 E6 T7 D15 A43 R44 L47 E48 V51 R55 V56 P59 V70 S73 E74 P75 M76 L77 D78 K79 E107 F114 F117 N118

Q129 M133 R137 E141 P142 Q149 C150 L151 N152 P153 D171 L184 H191 S196 I201 A220 A223 G224 L225 V228 E229 R230 F239 H246 V247 S248 V249 A254 SER ALA
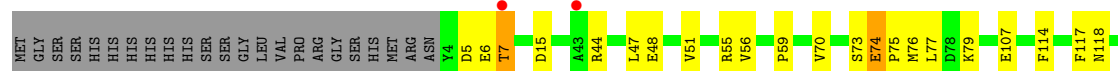
4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	C 2 2 21	Depositor
Cell constants a, b, c, α, β, γ	169.95Å 244.00Å 118.07Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	69.73 – 2.90 69.73 – 2.90	Depositor EDS
% Data completeness (in resolution range)	95.8 (69.73-2.90) 95.8 (69.73-2.90)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.02 (at 2.91Å)	Xtriage
Refinement program	REFMAC 5.5.0109	Depositor
R, R_{free}	0.183 , 0.221 0.176 , 0.214	Depositor DCC
R_{free} test set	2647 reflections (5.05%)	wwPDB-VP
Wilson B-factor (Å^2)	48.8	Xtriage
Anisotropy	0.471	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.33 , 30.6	EDS
L-test for twinning[2]	$< |L| > = 0.49, < L^2 > = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	12077	wwPDB-VP
Average B, all atoms (Å^2)	43.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.66% of the height of the origin peak. No significant pseudotranslation is detected.*

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[1]Intensities estimated from amplitudes.
[2]Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality ⓘ

5.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: GOL, SO4, EPE, 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	0.68	0/1995	0.73	0/2713
1	B	0.73	1/1968 (0.1%)	0.77	1/2678 (0.0%)
1	C	0.71	0/2012	0.78	1/2736 (0.0%)
1	D	0.63	0/1968	0.68	0/2678
1	E	0.70	0/2012	0.75	0/2736
1	F	0.63	1/1968 (0.1%)	0.69	0/2678
All	All	0.68	2/11923 (0.0%)	0.73	2/16219 (0.0%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand.A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	B	0	1

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	F	150	CYS	CB-SG	-6.49	1.71	1.82
1	B	150	CYS	CB-SG	-5.96	1.72	1.81

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	C	209	ARG	NE-CZ-NH1	5.46	123.03	120.30
1	B	18	ASP	CB-CG-OD1	5.28	123.05	118.30

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	B	143	GLY	Peptide

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	1952	0	1897	27	0
1	B	1925	0	1866	48	0
1	C	1968	0	1909	34	0
1	D	1925	0	1866	28	0
1	E	1968	0	1909	33	0
1	F	1925	0	1866	31	0
2	A	26	0	19	0	0
2	B	26	0	19	0	0
2	C	26	0	19	0	0
2	D	26	0	19	1	0
2	E	26	0	19	0	0
2	F	26	0	19	0	0
3	A	15	0	0	0	0
3	B	10	0	0	0	0
3	C	20	0	0	0	0
3	D	10	0	0	0	0
3	E	30	0	0	0	0
3	F	15	0	0	0	0
4	A	12	0	16	0	0
4	B	6	0	8	2	0
4	C	6	0	8	1	0
4	D	6	0	8	0	0
4	E	6	0	8	0	0
5	B	15	0	17	15	0
6	A	21	0	0	0	0
6	B	16	0	0	0	0
6	C	22	0	0	0	0
6	D	15	0	0	0	0
6	E	21	0	0	2	0
6	F	12	0	0	1	0
All	All	12077	0	11492	195	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 8.

All (195) 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:C:44:ARG:HE	1:C:45:PRO:HD2	1.25	0.98
1:F:74:GLU:HB3	1:F:75:PRO:HD3	1.52	0.92
5:B:305:EPE:H101	1:D:238:ARG:HG2	1.54	0.90
1:B:169:LEU:HD22	1:C:191:HIS:HD2	1.38	0.87
1:B:74:GLU:HA	1:B:74:GLU:OE1	1.75	0.86
1:C:-1:SER:HA	1:C:207:ARG:HH22	1.43	0.83
1:D:74:GLU:HB3	1:D:75:PRO:HD3	1.61	0.82
1:A:74:GLU:OE1	1:A:74:GLU:HA	1.80	0.81
1:B:141:GLU:HB2	1:B:142:PRO:HD2	1.63	0.79
1:C:74:GLU:HB3	1:C:75:PRO:HD3	1.66	0.77
1:B:238:ARG:HB2	5:B:305:EPE:H31	1.66	0.76
1:E:74:GLU:HB3	1:E:75:PRO:HD3	1.67	0.74
1:B:169:LEU:HD22	1:C:191:HIS:CD2	2.23	0.74
1:A:230:ARG:NH1	1:A:248:SER:OG	2.21	0.74
1:E:74:GLU:HA	1:E:74:GLU:OE1	1.86	0.73
1:F:44:ARG:HD2	1:F:141:GLU:OE1	1.90	0.72
1:B:74:GLU:CB	1:B:75:PRO:HD3	2.20	0.71
1:C:74:GLU:HA	1:C:74:GLU:OE1	1.91	0.71
1:D:74:GLU:HA	1:D:74:GLU:OE1	1.92	0.70
1:B:237:ARG:CG	5:B:305:EPE:H61	2.22	0.69
1:D:169:LEU:HD22	1:E:191:HIS:HD2	1.58	0.68
1:B:230:ARG:NH1	1:B:248:SER:OG	2.27	0.67
1:D:239:PHE:CE1	1:D:246:HIS:HB3	2.30	0.67
1:E:171:ASP:OD1	6:E:420:HOH:O	2.12	0.67
1:F:74:GLU:HA	1:F:74:GLU:OE1	1.95	0.67
1:C:44:ARG:NE	1:C:45:PRO:HD2	2.05	0.66
1:B:237:ARG:HD3	5:B:305:EPE:H61	1.76	0.66
1:E:230:ARG:NH1	1:E:248:SER:OG	2.28	0.66
1:F:141:GLU:HB2	1:F:142:PRO:HD2	1.76	0.65
1:E:44:ARG:HB3	1:E:45:PRO:HD2	1.79	0.65
1:E:44:ARG:HH11	1:E:141:GLU:HB3	1.62	0.65
1:E:141:GLU:HB2	1:E:142:PRO:HD2	1.78	0.64
1:A:74:GLU:CB	1:A:75:PRO:HD3	2.28	0.64
1:D:141:GLU:HB2	1:D:142:PRO:HD2	1.77	0.64
1:B:141:GLU:HB2	1:B:142:PRO:CD	2.28	0.64
1:B:237:ARG:CD	5:B:305:EPE:H61	2.28	0.63
1:B:237:ARG:HB3	5:B:305:EPE:H62	1.80	0.63
1:B:238:ARG:CB	5:B:305:EPE:H31	2.29	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:5:ASP:HB2	1:D:7:THR:HG22	1.80	0.63
1:F:230:ARG:NH1	1:F:248:SER:OG	2.32	0.63
1:C:230:ARG:NH1	1:C:248:SER:OG	2.32	0.62
1:E:239:PHE:CE1	1:E:246:HIS:HB3	2.37	0.60
5:B:305:EPE:H22	1:D:237:ARG:HD3	1.83	0.60
1:F:5:ASP:HB2	1:F:7:THR:HG22	1.83	0.60
1:B:74:GLU:HB2	1:B:75:PRO:HD3	1.84	0.60
1:C:239:PHE:CE1	1:C:246:HIS:HB3	2.37	0.60
1:C:44:ARG:HB3	1:C:45:PRO:HD2	1.83	0.59
1:D:6:GLU:CD	1:D:6:GLU:H	2.06	0.59
1:C:41:ALA:O	1:C:43:ALA:N	2.33	0.59
1:B:159:ALA:HB3	1:B:163:THR:HG21	1.86	0.58
1:C:-1:SER:HA	1:C:207:ARG:NH2	2.16	0.58
1:A:74:GLU:HB2	1:A:75:PRO:HD3	1.86	0.58
1:B:71:GLU:HB3	1:B:77:LEU:HD13	1.86	0.58
1:E:71:GLU:HB3	1:E:77:LEU:HD13	1.86	0.57
1:B:237:ARG:HG2	5:B:305:EPE:H61	1.86	0.57
1:D:34:ALA:HB2	1:D:59:PRO:HB2	1.86	0.57
1:F:239:PHE:CE1	1:F:246:HIS:HB3	2.39	0.57
1:C:151:LEU:HD12	1:C:151:LEU:O	2.04	0.57
1:C:5:ASP:HB3	1:C:7:THR:H	1.70	0.56
1:E:41:ALA:O	1:E:111:SER:OG	2.20	0.56
1:B:44:ARG:HD2	1:B:141:GLU:OE2	2.05	0.56
1:D:230:ARG:NH1	1:D:248:SER:OG	2.39	0.56
1:E:44:ARG:NH1	1:E:141:GLU:HB3	2.20	0.55
1:E:5:ASP:HB2	1:E:7:THR:HG22	1.88	0.55
1:E:199:GLY:HA2	1:F:201:ILE:HB	1.88	0.55
1:D:44:ARG:HD2	1:D:141:GLU:OE1	2.07	0.54
1:C:41:ALA:C	1:C:43:ALA:N	2.60	0.54
1:C:41:ALA:C	1:C:43:ALA:H	2.10	0.54
1:E:5:ASP:CB	1:E:7:THR:H	2.21	0.54
1:E:41:ALA:O	1:E:111:SER:CB	2.57	0.53
1:B:5:ASP:HB2	1:B:7:THR:HG22	1.89	0.53
1:A:5:ASP:HB2	1:A:7:THR:HG22	1.90	0.53
1:B:5:ASP:CB	1:B:7:THR:HG22	2.38	0.53
1:F:74:GLU:HB3	1:F:75:PRO:CD	2.32	0.53
1:A:79:LYS:HE3	1:A:82:GLU:OE1	2.10	0.52
1:E:169:LEU:HD22	1:F:191:HIS:HD2	1.75	0.52
1:A:239:PHE:CE1	1:A:246:HIS:HB3	2.44	0.52
1:A:228:VAL:HG12	1:A:249:VAL:O	2.10	0.52
1:B:44:ARG:NH1	1:B:141:GLU:OE1	2.38	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:237:ARG:HB3	5:B:305:EPE:C6	2.40	0.51
1:F:48:GLU:HB2	1:F:114:PHE:CZ	2.45	0.51
1:D:56:VAL:O	1:D:59:PRO:HD2	2.10	0.51
1:B:5:ASP:HB3	1:B:7:THR:H	1.76	0.50
1:E:172:THR:N	6:E:414:HOH:O	2.36	0.50
1:F:73:SER:HB3	1:F:76:MET:HB2	1.94	0.50
1:F:55:ARG:HB2	6:F:411:HOH:O	2.11	0.50
1:B:74:GLU:CB	1:B:75:PRO:CD	2.89	0.50
1:B:118:ASN:HB2	4:B:304:GOL:H31	1.93	0.50
1:E:6:GLU:H	1:E:6:GLU:CD	2.14	0.50
1:F:228:VAL:HG12	1:F:249:VAL:O	2.12	0.49
1:F:129:GLN:O	1:F:133:MET:HG3	2.12	0.49
1:A:15:ASP:OD1	1:A:15:ASP:N	2.39	0.49
1:B:5:ASP:CB	1:B:7:THR:H	2.25	0.48
1:C:151:LEU:HD12	1:C:151:LEU:C	2.34	0.48
1:D:56:VAL:C	1:D:59:PRO:HD2	2.34	0.48
1:D:15:ASP:OD1	1:D:15:ASP:N	2.38	0.48
1:F:117:PHE:H	1:F:149:GLN:HB3	1.79	0.48
1:C:184:LEU:HA	1:C:184:LEU:HD23	1.56	0.48
1:B:74:GLU:HB3	1:B:75:PRO:HD3	1.95	0.47
1:B:159:ALA:HB3	1:B:163:THR:CG2	2.43	0.47
1:F:184:LEU:HD23	1:F:184:LEU:HA	1.67	0.47
1:A:141:GLU:HB2	1:A:142:PRO:HD2	1.95	0.47
1:C:15:ASP:N	1:C:15:ASP:OD1	2.45	0.47
1:B:13:ILE:HD11	1:B:20:TRP:CZ3	2.49	0.47
1:C:80:LEU:HD23	1:C:95:PRO:HB3	1.96	0.47
1:A:44:ARG:HB2	1:A:111:SER:HB3	1.97	0.47
1:B:239:PHE:CE1	1:B:246:HIS:HB3	2.50	0.47
1:A:74:GLU:OE1	1:A:74:GLU:CA	2.60	0.47
1:A:114:PHE:HA	1:A:147:VAL:O	2.15	0.47
1:C:44:ARG:HE	1:C:45:PRO:CD	2.13	0.47
1:E:41:ALA:HA	1:E:112:VAL:HG23	1.97	0.47
1:B:6:GLU:H	1:B:6:GLU:CD	2.18	0.46
1:E:34:ALA:HB2	1:E:59:PRO:HB2	1.97	0.46
1:F:228:VAL:CG1	1:F:249:VAL:O	2.63	0.46
1:B:171:ASP:OD2	1:C:3:ASN:HB2	2.14	0.46
1:C:179:SER:HB2	1:C:190:ALA:HB2	1.98	0.46
1:B:117:PHE:H	1:B:149:GLN:HB3	1.80	0.46
1:D:184:LEU:HA	1:D:184:LEU:HD23	1.55	0.46
1:C:5:ASP:CB	1:C:7:THR:H	2.28	0.45
1:E:160:THR:HG23	1:E:160:THR:O	2.16	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:141:GLU:HB2	1:E:142:PRO:CD	2.46	0.45
1:F:48:GLU:OE1	1:F:51:VAL:HG23	2.16	0.45
1:F:220:ALA:HB1	1:F:225:LEU:HB2	1.97	0.45
1:B:9:TYR:CZ	4:B:304:GOL:H11	2.50	0.45
1:B:77:LEU:HD12	1:B:77:LEU:HA	1.76	0.45
1:E:44:ARG:HB3	1:E:45:PRO:CD	2.45	0.45
1:F:107:GLU:OE1	1:F:107:GLU:HA	2.16	0.45
1:A:5:ASP:CB	1:A:7:THR:HG22	2.47	0.45
1:B:237:ARG:CG	5:B:305:EPE:C6	2.95	0.45
1:E:235:GLU:O	1:E:236:ARG:HB2	2.17	0.45
1:D:5:ASP:CB	1:D:7:THR:HG22	2.46	0.45
1:B:34:ALA:HB2	1:B:59:PRO:HB2	1.97	0.44
1:F:47:LEU:HD11	1:F:70:VAL:HG23	1.99	0.44
1:B:237:ARG:HG2	5:B:305:EPE:C6	2.47	0.44
1:C:5:ASP:C	1:C:7:THR:H	2.20	0.44
1:A:5:ASP:CB	1:A:7:THR:H	2.31	0.44
1:D:107:GLU:HA	1:D:107:GLU:OE1	2.18	0.44
1:E:5:ASP:CB	1:E:7:THR:HG22	2.46	0.43
1:A:151:LEU:HD12	1:A:151:LEU:O	2.18	0.43
1:C:77:LEU:HD12	1:C:77:LEU:HA	1.71	0.43
1:E:184:LEU:HD23	1:E:184:LEU:HA	1.80	0.43
1:F:5:ASP:CB	1:F:7:THR:HG22	2.47	0.43
1:D:71:GLU:HB3	1:D:77:LEU:HD13	1.99	0.43
1:A:10:GLY:O	1:A:11:ASP:C	2.57	0.43
1:A:184:LEU:HD23	1:A:184:LEU:HA	1.77	0.43
1:B:48:GLU:OE1	1:B:51:VAL:HG23	2.18	0.43
1:B:107:GLU:OE1	1:B:107:GLU:HA	2.18	0.43
1:C:131:ASP:O	1:C:135:GLN:HG3	2.19	0.43
1:E:44:ARG:CB	1:E:45:PRO:HD2	2.45	0.43
1:F:15:ASP:OD1	1:F:15:ASP:N	2.39	0.43
1:A:74:GLU:CB	1:A:75:PRO:CD	2.95	0.43
1:C:150:CYS:HB2	1:C:246:HIS:CE1	2.53	0.43
1:D:44:ARG:HB3	1:D:45:PRO:HD2	2.01	0.43
1:C:13:ILE:HD11	1:C:20:TRP:CZ3	2.54	0.43
1:F:117:PHE:O	1:F:118:ASN:HB2	2.19	0.43
1:E:151:LEU:C	1:E:151:LEU:HD12	2.40	0.42
1:A:71:GLU:HG3	1:A:73:SER:H	1.85	0.42
1:F:77:LEU:HD12	1:F:77:LEU:HA	1.68	0.42
1:A:73:SER:HB3	1:A:76:MET:HB2	2.01	0.42
1:D:74:GLU:HB3	1:D:75:PRO:CD	2.41	0.42
1:F:56:VAL:C	1:F:59:PRO:HD2	2.40	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:4:TYR:CD2	1:A:5:ASP:O	2.73	0.42
1:A:162:ASN:OD1	1:A:180:LYS:HG2	2.20	0.41
1:B:184:LEU:HD23	1:B:184:LEU:HA	1.82	0.41
1:E:77:LEU:HD12	1:E:77:LEU:HA	1.72	0.41
1:A:77:LEU:HA	1:A:77:LEU:HD12	1.69	0.41
1:B:237:ARG:CB	5:B:305:EPE:C6	2.98	0.41
1:C:62:ASP:HA	1:C:89:ASN:HD22	1.85	0.41
1:B:4:TYR:CE2	1:B:5:ASP:O	2.73	0.41
1:D:5:ASP:CB	1:D:7:THR:H	2.32	0.41
1:B:15:ASP:OD1	1:B:15:ASP:N	2.53	0.41
1:E:44:ARG:CB	1:E:45:PRO:CD	2.98	0.41
1:A:62:ASP:HA	1:A:89:ASN:HD22	1.86	0.41
1:B:227:LEU:HB2	1:B:250:TYR:CE1	2.55	0.41
1:D:79:LYS:HD3	1:D:79:LYS:HA	1.77	0.41
1:F:230:ARG:HD2	1:F:239:PHE:CD2	2.55	0.41
1:B:237:ARG:HD3	5:B:305:EPE:H102	2.02	0.41
1:C:119:THR:O	1:C:122:CYS:HB2	2.21	0.41
1:D:77:LEU:HD12	1:D:77:LEU:HA	1.70	0.41
1:A:217:ASP:OD1	1:A:230:ARG:NH2	2.45	0.41
1:D:100:PHE:CD2	2:D:301:SAH:C2	3.04	0.41
1:E:141:GLU:CB	1:E:142:PRO:HD2	2.49	0.41
1:C:118:ASN:HD22	4:C:306:GOL:H11	1.86	0.40
1:D:58:PHE:N	1:D:59:PRO:CD	2.83	0.40
1:C:42:ALA:O	1:C:44:ARG:HG3	2.21	0.40
1:D:47:LEU:HB3	1:D:113:VAL:HG22	2.01	0.40
1:E:12:GLN:HA	1:E:12:GLN:OE1	2.22	0.40
1:F:137:ARG:HD3	1:F:223:ALA:O	2.21	0.40
1:F:152:ASN:HA	1:F:153:PRO:HD3	1.88	0.40
1:A:179:SER:HB2	1:A:190:ALA:HB2	2.02	0.40
5:B:305:EPE:H61	5:B:305:EPE:H102	1.79	0.40
1:D:207:ARG:O	1:D:208:LEU:HD23	2.21	0.40
1:B:179:SER:HB2	1:B:190:ALA:HB2	2.03	0.40
1:B:199:GLY:HA2	1:C:201:ILE:HB	2.04	0.40
1:F:6:GLU:H	1:F:6:GLU:CD	2.25	0.40

There are no symmetry-related clashes.

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	252/276 (91%)	240 (95%)	11 (4%)	1 (0%)	34	66
1	B	249/276 (90%)	242 (97%)	7 (3%)	0	100	100
1	C	254/276 (92%)	244 (96%)	8 (3%)	2 (1%)	19	51
1	D	249/276 (90%)	242 (97%)	7 (3%)	0	100	100
1	E	254/276 (92%)	246 (97%)	8 (3%)	0	100	100
1	F	249/276 (90%)	241 (97%)	8 (3%)	0	100	100
All	All	1507/1656 (91%)	1455 (96%)	49 (3%)	3 (0%)	47	78

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	42	ALA
1	C	142	PRO
1	A	142	PRO

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	199/217 (92%)	191 (96%)	8 (4%)	31	65
1	B	196/217 (90%)	189 (96%)	7 (4%)	35	69
1	C	201/217 (93%)	192 (96%)	9 (4%)	27	61
1	D	196/217 (90%)	189 (96%)	7 (4%)	35	69

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	E	201/217 (93%)	194 (96%)	7 (4%)	36	70
1	F	196/217 (90%)	190 (97%)	6 (3%)	40	74
All	All	1189/1302 (91%)	1145 (96%)	44 (4%)	34	68

All (44) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	7	THR
1	A	74	GLU
1	A	79	LYS
1	A	141	GLU
1	A	156	GLN
1	A	171	ASP
1	A	179	SER
1	A	196	SER
1	B	6	GLU
1	B	7	THR
1	B	74	GLU
1	B	79	LYS
1	B	171	ASP
1	B	196	SER
1	B	228	VAL
1	C	2	ARG
1	C	7	THR
1	C	44	ARG
1	C	74	GLU
1	C	79	LYS
1	C	141	GLU
1	C	171	ASP
1	C	179	SER
1	C	196	SER
1	D	6	GLU
1	D	7	THR
1	D	74	GLU
1	D	79	LYS
1	D	141	GLU
1	D	171	ASP
1	D	196	SER
1	E	6	GLU
1	E	7	THR
1	E	74	GLU

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Mol	Chain	Res	Type
1	E	79	LYS
1	E	141	GLU
1	E	171	ASP
1	E	196	SER
1	F	7	THR
1	F	74	GLU
1	F	79	LYS
1	F	141	GLU
1	F	171	ASP
1	F	196	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (9) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	3	ASN
1	A	89	ASN
1	A	156	GLN
1	B	156	GLN
1	C	156	GLN
1	D	156	GLN
1	D	186	GLN
1	E	156	GLN
1	F	156	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 monosaccharides in this entry.

5.6 Ligand geometry ⓘ

33 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	$\#|Z| > 2$
3	SO4	C	302	-	4,4,4	0.28	0	6,6,6	0.22	0
3	SO4	C	303	-	4,4,4	0.28	0	6,6,6	0.26	0
3	SO4	E	305	-	4,4,4	0.20	0	6,6,6	0.33	0
2	SAH	F	301	-	23,28,28	1.06	2 (8%)	22,40,40	1.89	2 (9%)
3	SO4	A	304	-	4,4,4	0.27	0	6,6,6	0.32	0
3	SO4	C	305	-	4,4,4	0.24	0	6,6,6	0.16	0
4	GOL	E	308	-	5,5,5	0.46	0	5,5,5	0.85	0
3	SO4	B	303	-	4,4,4	0.34	0	6,6,6	0.36	0
4	GOL	A	305	-	5,5,5	0.50	0	5,5,5	0.56	0
4	GOL	A	306	-	5,5,5	0.58	0	5,5,5	0.55	0
2	SAH	B	301	-	23,28,28	1.05	2 (8%)	22,40,40	1.55	3 (13%)
3	SO4	E	307	-	4,4,4	0.24	0	6,6,6	0.12	0
5	EPE	B	305	-	15,15,15	1.32	1 (6%)	19,20,20	1.98	6 (31%)
3	SO4	A	303	-	4,4,4	0.27	0	6,6,6	0.14	0
2	SAH	D	301	-	23,28,28	1.10	3 (13%)	22,40,40	1.76	3 (13%)
3	SO4	D	302	-	4,4,4	0.23	0	6,6,6	0.47	0
3	SO4	D	303	-	4,4,4	0.27	0	6,6,6	0.25	0
2	SAH	C	301	-	23,28,28	1.06	2 (8%)	22,40,40	1.51	3 (13%)
4	GOL	B	304	-	5,5,5	0.45	0	5,5,5	0.87	0
3	SO4	F	304	-	4,4,4	0.23	0	6,6,6	0.22	0
3	SO4	E	302	-	4,4,4	0.24	0	6,6,6	0.46	0
3	SO4	C	304	-	4,4,4	0.27	0	6,6,6	0.39	0
3	SO4	A	302	-	4,4,4	0.33	0	6,6,6	0.37	0
3	SO4	F	302	-	4,4,4	0.25	0	6,6,6	0.15	0
3	SO4	E	304	-	4,4,4	0.30	0	6,6,6	0.39	0
4	GOL	D	304	-	5,5,5	0.38	0	5,5,5	0.67	0
3	SO4	B	302	-	4,4,4	0.42	0	6,6,6	0.51	0
3	SO4	F	303	-	4,4,4	0.29	0	6,6,6	0.41	0
3	SO4	E	306	-	4,4,4	0.21	0	6,6,6	0.48	0
2	SAH	A	301	-	23,28,28	0.89	1 (4%)	22,40,40	1.71	3 (13%)
3	SO4	E	303	-	4,4,4	0.27	0	6,6,6	0.48	0
4	GOL	C	306	-	5,5,5	0.40	0	5,5,5	0.42	0
2	SAH	E	301	-	23,28,28	0.91	2 (8%)	22,40,40	1.59	4 (18%)

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
4	GOL	E	308	-	-	4/4/4/4	-
4	GOL	A	305	-	-	4/4/4/4	-
4	GOL	A	306	-	-	2/4/4/4	-
2	SAH	B	301	-	-	1/11/31/31	0/3/3/3
2	SAH	C	301	-	-	1/11/31/31	0/3/3/3
2	SAH	F	301	-	-	0/11/31/31	0/3/3/3
4	GOL	D	304	-	-	4/4/4/4	-
4	GOL	B	304	-	-	3/4/4/4	-
5	EPE	B	305	-	-	7/9/19/19	0/1/1/1
2	SAH	A	301	-	-	1/11/31/31	0/3/3/3
2	SAH	D	301	-	-	0/11/31/31	0/3/3/3
4	GOL	C	306	-	-	2/4/4/4	-
2	SAH	E	301	-	-	0/11/31/31	0/3/3/3

All (13) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	B	305	EPE	C10-S	4.56	1.84	1.77
2	D	301	SAH	OXT-C	-3.06	1.20	1.30
2	F	301	SAH	OXT-C	-2.90	1.21	1.30
2	C	301	SAH	OXT-C	-2.86	1.21	1.30
2	B	301	SAH	OXT-C	-2.81	1.21	1.30
2	A	301	SAH	OXT-C	-2.55	1.22	1.30
2	B	301	SAH	O4'-C1'	2.40	1.44	1.40
2	F	301	SAH	O4'-C1'	2.38	1.44	1.40
2	E	301	SAH	OXT-C	-2.18	1.23	1.30
2	D	301	SAH	O4'-C1'	2.08	1.43	1.40
2	C	301	SAH	O4'-C1'	2.06	1.43	1.40
2	E	301	SAH	C2-N3	2.06	1.35	1.32
2	D	301	SAH	C2-N3	2.02	1.35	1.32

All (24) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	F	301	SAH	OXT-C-O	-6.06	110.32	124.08
2	D	301	SAH	OXT-C-O	-5.62	111.33	124.08
2	A	301	SAH	OXT-C-O	-4.70	113.42	124.08

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	E	301	SAH	OXT-C-O	-4.60	113.65	124.08
5	B	305	EPE	C2-C3-N4	4.31	119.33	110.65
2	C	301	SAH	OXT-C-O	-4.27	114.39	124.08
2	A	301	SAH	N3-C2-N1	-3.96	123.30	128.67
2	B	301	SAH	OXT-C-O	-3.81	115.44	124.08
2	F	301	SAH	N3-C2-N1	-3.59	123.80	128.67
2	B	301	SAH	N3-C2-N1	-3.55	123.85	128.67
5	B	305	EPE	C7-N4-C3	3.54	120.66	111.24
2	D	301	SAH	N3-C2-N1	-3.40	124.06	128.67
5	B	305	EPE	C5-N4-C3	3.36	116.08	108.84
5	B	305	EPE	O3S-S-C10	3.22	112.30	106.00
2	C	301	SAH	N3-C2-N1	-2.79	124.88	128.67
2	D	301	SAH	C4-C5-N7	-2.75	106.44	109.34
2	B	301	SAH	C4'-C5'-SD	-2.65	104.34	113.78
2	E	301	SAH	C4-C5-N7	-2.64	106.55	109.34
5	B	305	EPE	O1S-S-C10	2.41	110.37	106.73
2	E	301	SAH	N3-C2-N1	-2.39	125.42	128.67
2	A	301	SAH	C4'-C5'-SD	-2.24	105.79	113.78
2	C	301	SAH	C4-C5-N7	-2.19	107.02	109.34
5	B	305	EPE	C3-C2-N1	2.13	114.94	110.65
2	E	301	SAH	N6-C6-N1	2.00	122.62	118.33

There are no chirality outliers.

All (29) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	305	GOL	O1-C1-C2-C3
4	A	305	GOL	C1-C2-C3-O3
4	D	304	GOL	C1-C2-C3-O3
4	E	308	GOL	O1-C1-C2-C3
4	E	308	GOL	C1-C2-C3-O3
4	E	308	GOL	O2-C2-C3-O3
5	B	305	EPE	C10-C9-N1-C6
5	B	305	EPE	S-C10-C9-N1
5	B	305	EPE	N4-C7-C8-O8
4	A	306	GOL	C1-C2-C3-O3
4	B	304	GOL	O1-C1-C2-C3
4	B	304	GOL	C1-C2-C3-O3
4	D	304	GOL	O1-C1-C2-C3
4	A	305	GOL	O1-C1-C2-O2
4	A	305	GOL	O2-C2-C3-O3
4	E	308	GOL	O1-C1-C2-O2

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Mol	Chain	Res	Type	Atoms
5	B	305	EPE	C8-C7-N4-C5
4	B	304	GOL	O1-C1-C2-O2
4	D	304	GOL	O2-C2-C3-O3
5	B	305	EPE	C9-C10-S-O3S
5	B	305	EPE	C9-C10-S-O1S
5	B	305	EPE	C9-C10-S-O2S
4	A	306	GOL	O2-C2-C3-O3
4	C	306	GOL	C1-C2-C3-O3
4	C	306	GOL	O2-C2-C3-O3
4	D	304	GOL	O1-C1-C2-O2
2	A	301	SAH	CB-CG-SD-C5'
2	B	301	SAH	CB-CG-SD-C5'
2	C	301	SAH	CB-CG-SD-C5'

There are no ring outliers.

4 monomers are involved in 19 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	B	305	EPE	15	0
2	D	301	SAH	1	0
4	B	304	GOL	2	0
4	C	306	GOL	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 then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

Ligand SAH F 301

Bond lengths

Bond angles

Torsions

Rings

Ligand SAH B 301

Bond lengths

Bond angles

Torsions

Rings

Ligand SAH D 301

Bond lengths

Bond angles

Torsions

Rings

Ligand SAH C 301

Bond lengths

Bond angles

Torsions

Rings

Ligand SAH A 301

Bond lengths

Bond angles

Torsions

Rings

Ligand SAH E 301

Bond lengths

Bond angles

Torsions

Rings
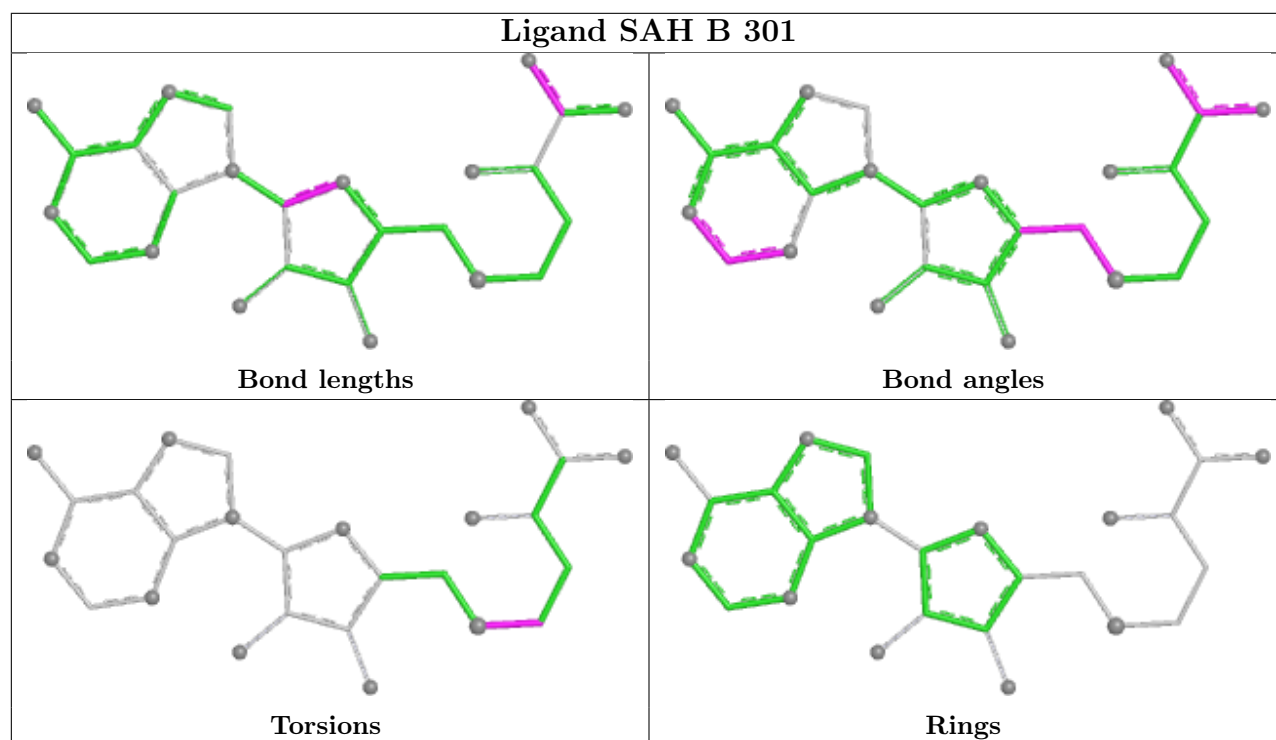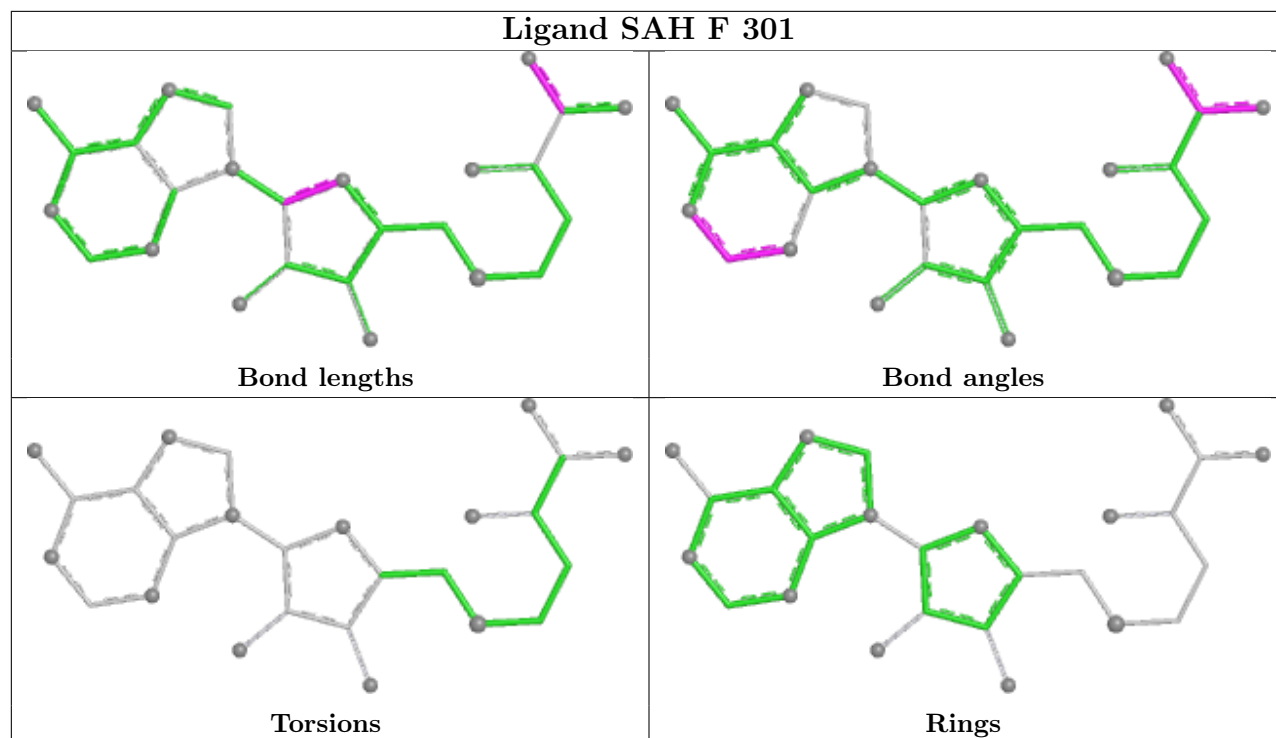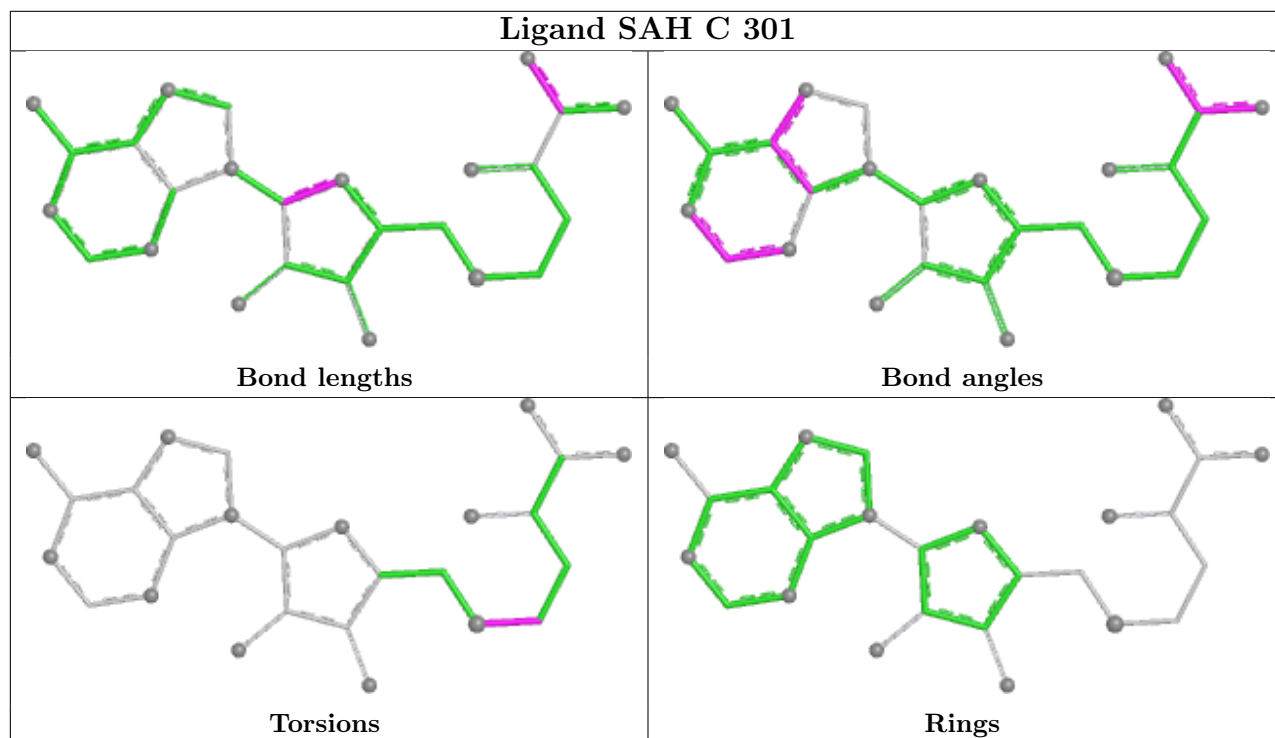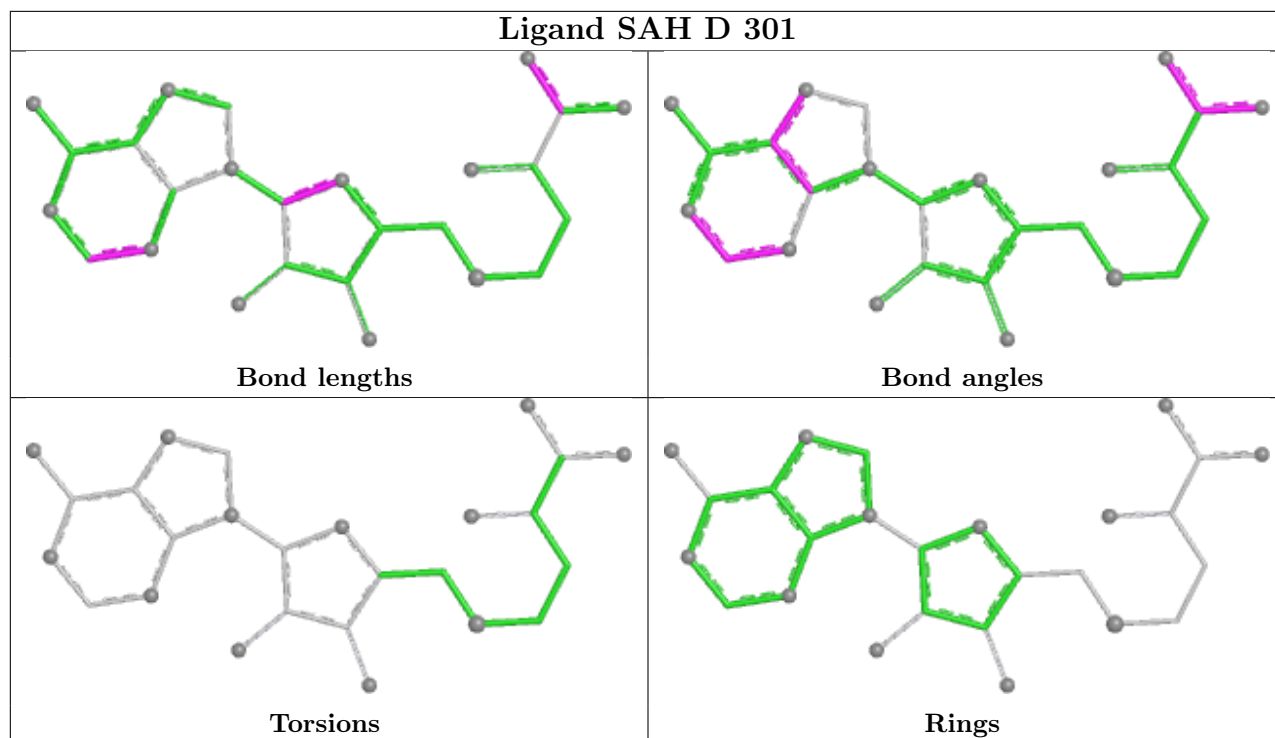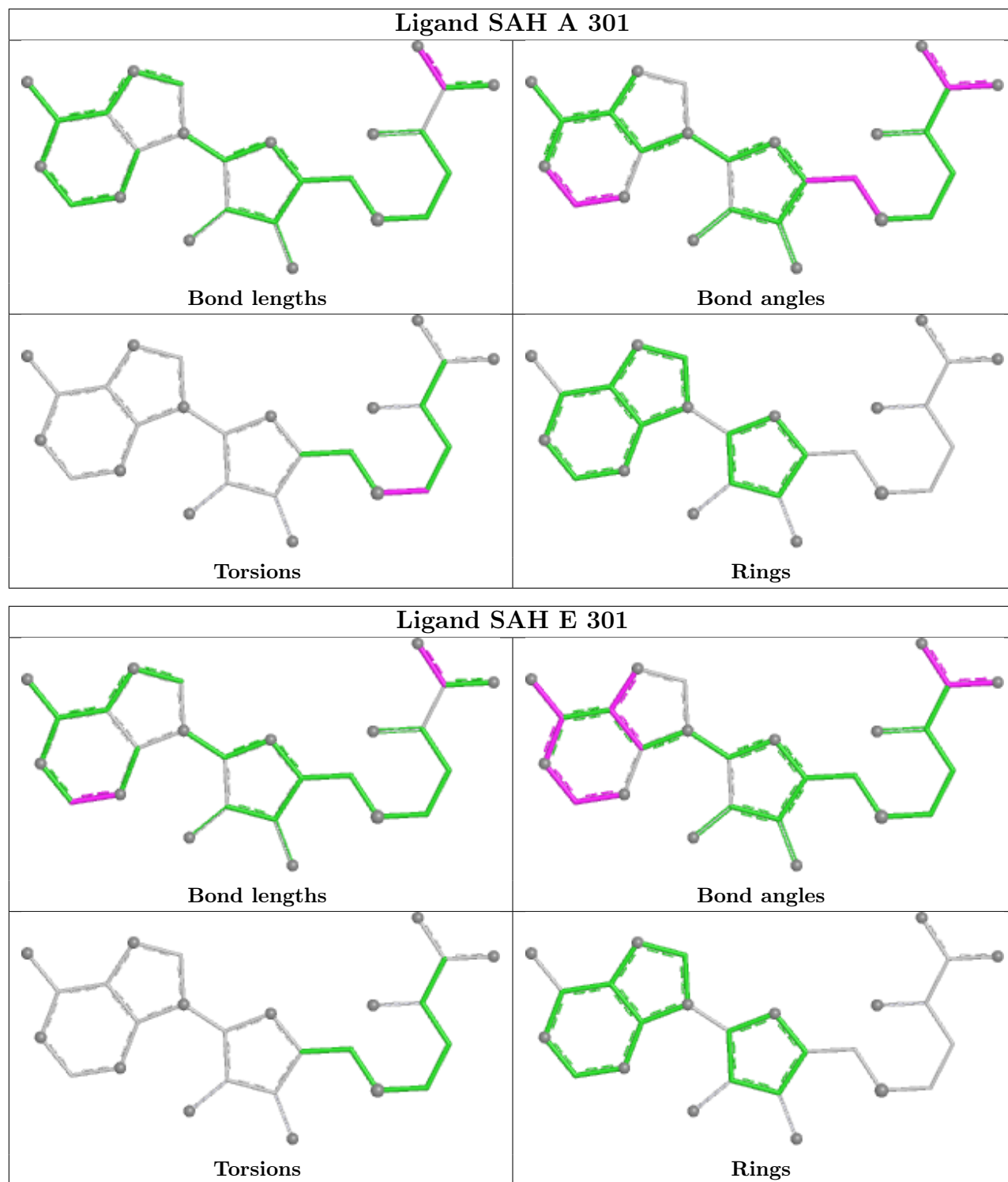
5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

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	254/276 (92%)	-0.15	4 (1%)	72	71	16, 34, 67, 119	0
1	B	251/276 (90%)	-0.17	3 (1%)	79	79	17, 35, 67, 90	0
1	C	256/276 (92%)	-0.26	1 (0%)	92	93	17, 35, 64, 125	0
1	D	251/276 (90%)	0.07	6 (2%)	59	56	19, 47, 90, 113	0
1	E	256/276 (92%)	-0.07	1 (0%)	92	93	17, 37, 72, 111	0
1	F	251/276 (90%)	-0.11	3 (1%)	79	79	22, 49, 88, 120	0
All	All	1519/1656 (91%)	-0.12	18 (1%)	79	79	16, 39, 80, 125	0

All (18) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	6	GLU	3.9
1	F	7	THR	3.9
1	B	5	ASP	3.7
1	D	6	GLU	3.3
1	A	6	GLU	3.1
1	F	43	ALA	2.8
1	E	254	ALA	2.8
1	D	43	ALA	2.7
1	A	7	THR	2.6
1	B	7	THR	2.4
1	F	254	ALA	2.4
1	D	140	LEU	2.3
1	C	2	ARG	2.3
1	D	254	ALA	2.2
1	D	114	PHE	2.1
1	D	105	LEU	2.1
1	A	5	ASP	2.0
1	A	10	GLY	2.0

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

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

6.3 Carbohydrates ⓘ

There are no monosaccharides in this entry.

6.4 Ligands ⓘ

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	EPE	B	305	15/15	0.78	0.30	81,101,115,115	0
4	GOL	D	304	6/6	0.80	0.22	55,60,64,65	0
4	GOL	E	308	6/6	0.81	0.28	60,69,72,74	0
3	SO4	C	305	5/5	0.82	0.28	100,102,104,104	0
4	GOL	A	306	6/6	0.83	0.22	48,68,71,75	0
4	GOL	C	306	6/6	0.85	0.24	56,60,60,61	0
3	SO4	E	304	5/5	0.87	0.21	84,88,92,97	0
3	SO4	E	306	5/5	0.87	0.32	100,102,104,104	0
3	SO4	E	307	5/5	0.87	0.39	108,109,110,112	0
3	SO4	A	303	5/5	0.87	0.17	94,99,100,101	0
3	SO4	B	303	5/5	0.88	0.35	91,92,95,99	0
3	SO4	A	304	5/5	0.88	0.53	100,102,104,106	0
3	SO4	C	302	5/5	0.89	0.26	94,96,97,98	0
4	GOL	A	305	6/6	0.90	0.22	49,59,60,61	0
3	SO4	B	302	5/5	0.90	0.23	71,74,78,82	0
3	SO4	C	304	5/5	0.91	0.18	85,87,91,91	0
3	SO4	F	302	5/5	0.91	0.17	86,86,87,89	0
3	SO4	F	304	5/5	0.91	0.22	100,100,103,104	0
3	SO4	E	302	5/5	0.92	0.17	61,67,71,74	0
3	SO4	E	305	5/5	0.92	0.27	77,80,84,86	0
3	SO4	E	303	5/5	0.92	0.14	69,76,78,78	0
3	SO4	D	303	5/5	0.93	0.34	91,92,93,94	0
4	GOL	B	304	6/6	0.93	0.17	38,47,51,56	0
3	SO4	F	303	5/5	0.94	0.15	76,78,81,84	0
3	SO4	D	302	5/5	0.95	0.18	68,79,82,83	0
3	SO4	A	302	5/5	0.95	0.14	60,65,72,73	0
3	SO4	C	303	5/5	0.95	0.17	71,71,75,76	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	SAH	F	301	26/26	0.96	0.20	49,54,57,64	0
2	SAH	D	301	26/26	0.97	0.18	45,51,54,58	0
2	SAH	E	301	26/26	0.97	0.20	36,40,46,48	0
2	SAH	A	301	26/26	0.98	0.20	31,37,40,46	0
2	SAH	B	301	26/26	0.98	0.19	39,42,48,49	0
2	SAH	C	301	26/26	0.98	0.16	29,34,42,45	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.
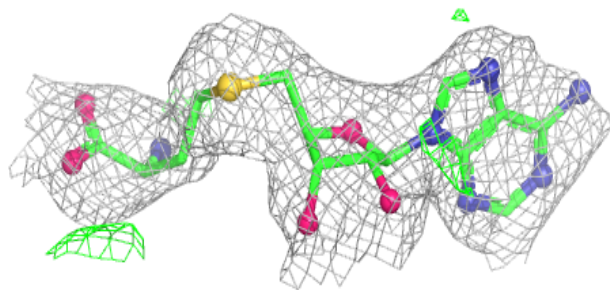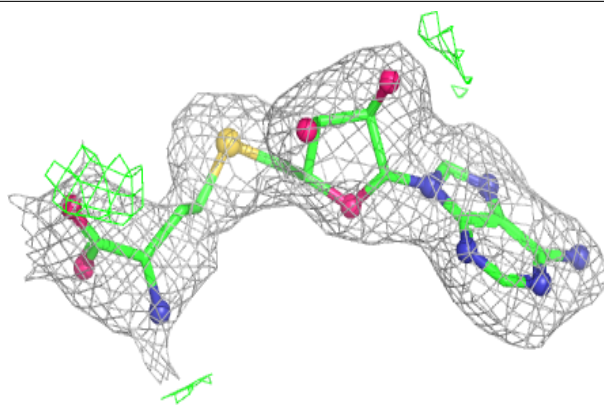

Electron density around SAH F 301:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
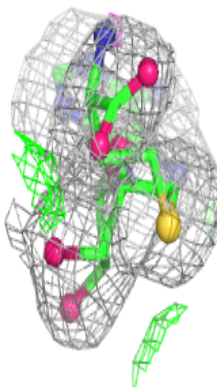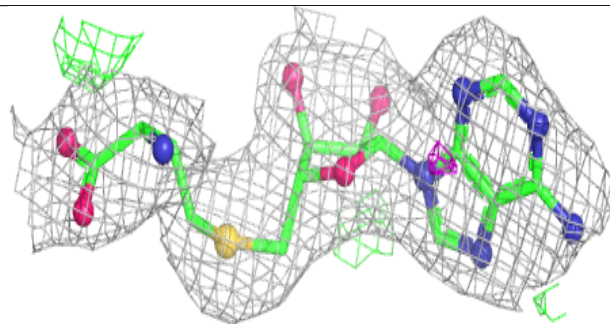mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative) and green (positive)
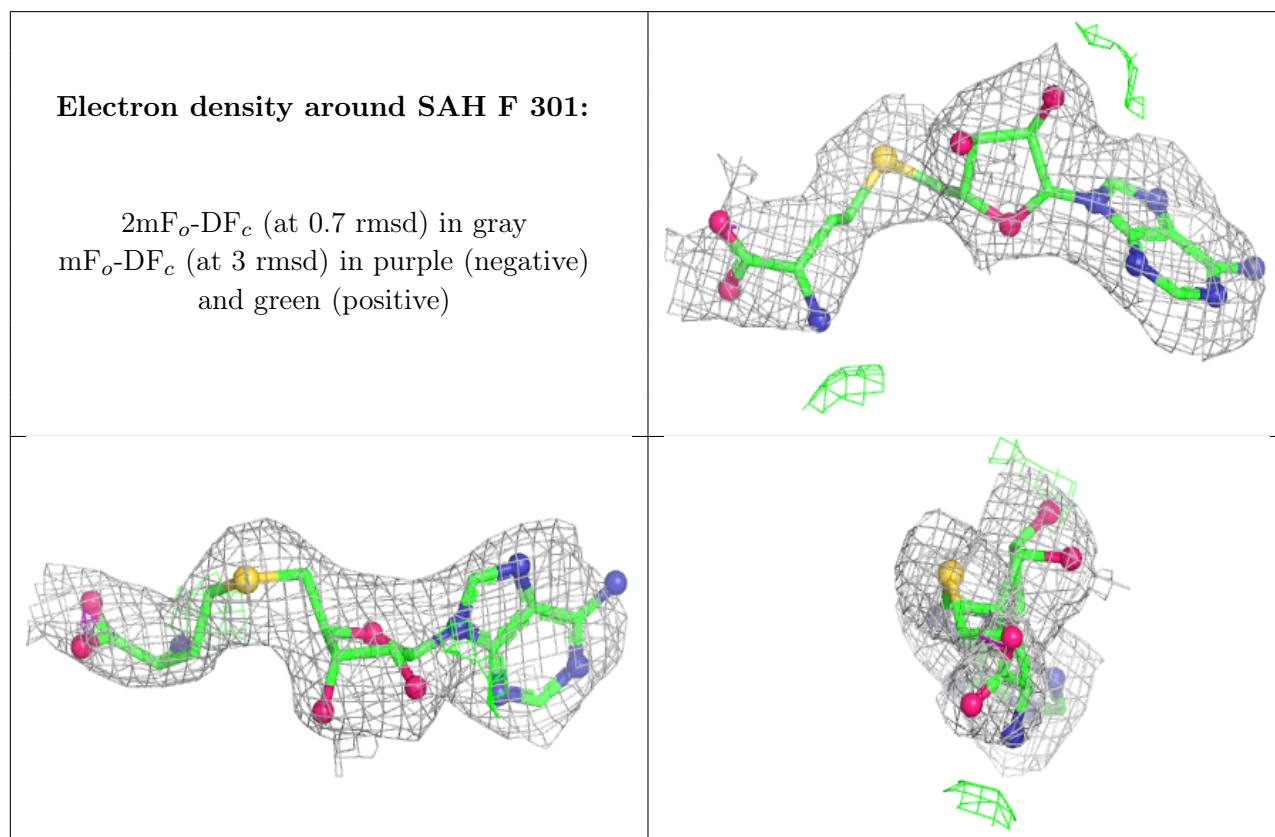
Electron density around SAH D 301:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
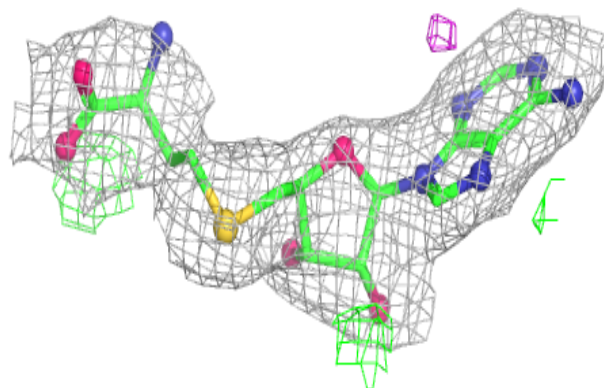and green (positive)
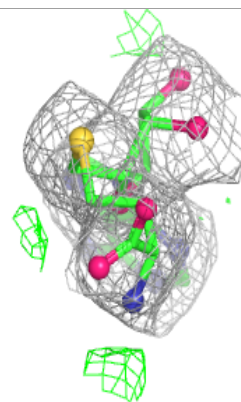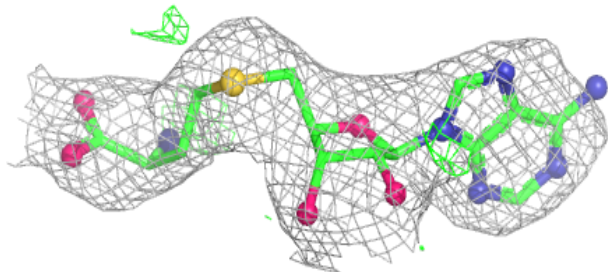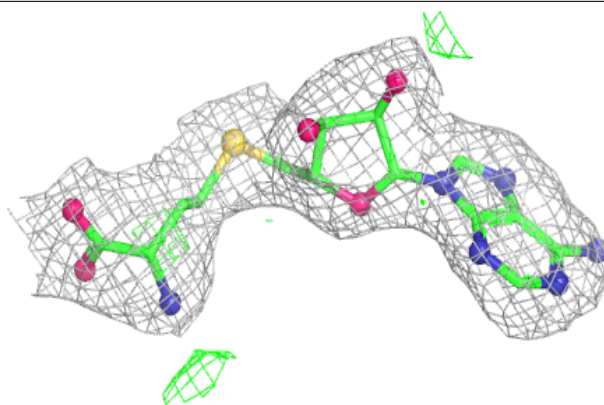
Electron density around SAH E 301:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
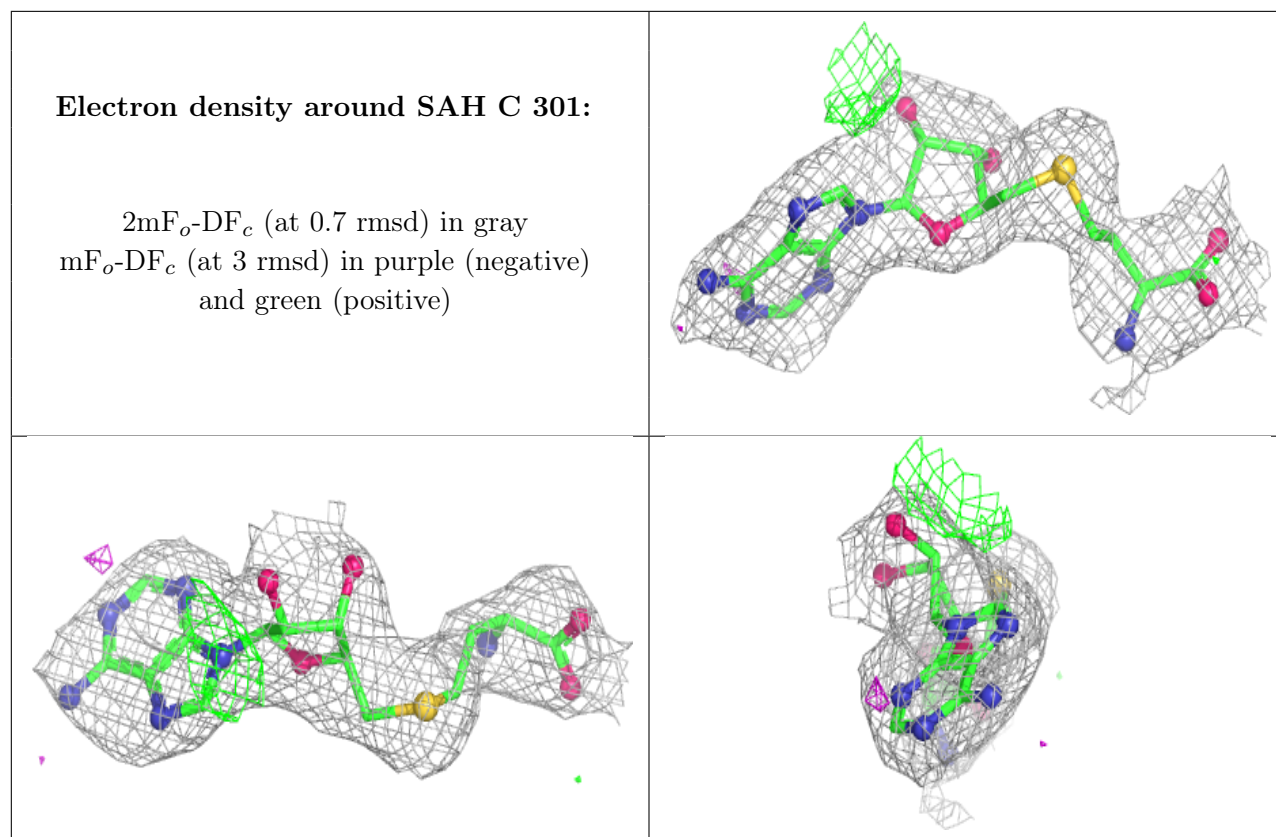mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)
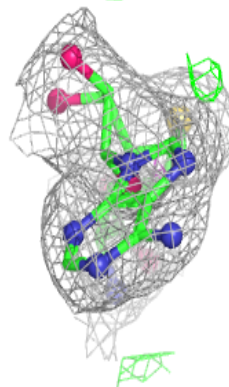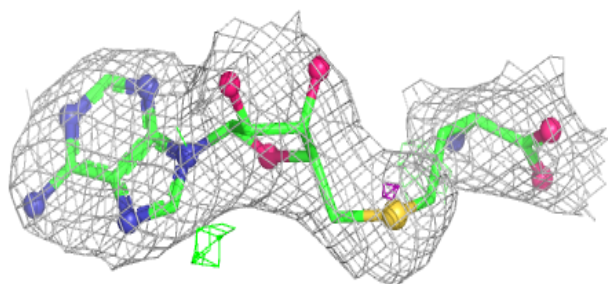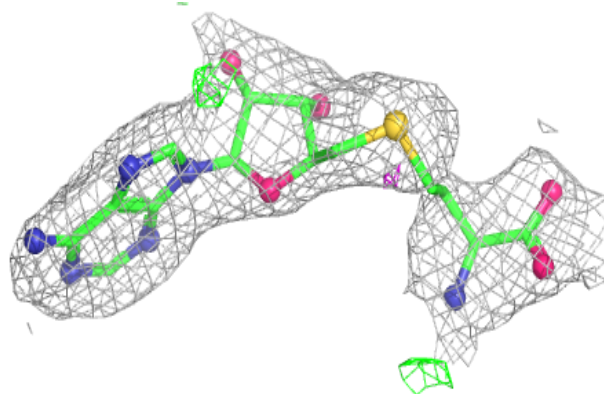
Electron density around SAH A 301:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative) and green (positive)
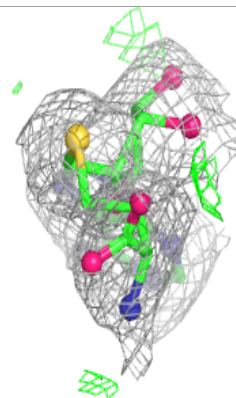
Electron density around SAH B 301:

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

Electron density around SAH C 301:

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

6.5 Other polymers ⓘ

There are no such residues in this entry.