



Full wwPDB X-ray Structure Validation Report ⓘ

Aug 27, 2017 – 10:36 AM EDT

PDB ID : 5O4H
Title : HcgC from Methanococcus maripaludis cocrystallized with SAM and pyridinol
Authors : Wagner, T.; Bai, L.; Xu, T.; Hu, X.; Ermler, U.; Shima, S.
Deposited on : unknown
Resolution : 1.75 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

<http://wwpdb.org/validation/2016/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

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

MolProbity : 4.02b-467
Mogul : 1.7.2 (RC1), CSD as538be (2017)
Xtriage (Phenix) : 1.9-1692
EDS : rb-20029824
Percentile statistics : 20161228.v01 (using entries in the PDB archive December 28th 2016)
Refmac : 5.8.0135
CCP4 : 6.5.0
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : rb-20029824

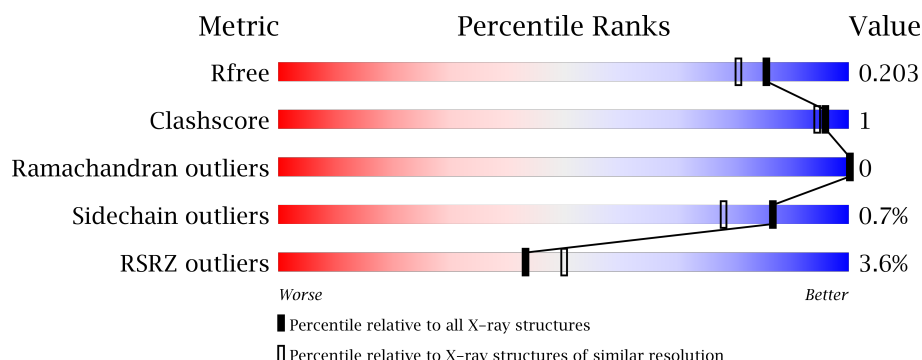
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.75 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}	100719	1762 (1.76-1.76)
Clashscore	112137	1889 (1.76-1.76)
Ramachandran outliers	110173	1868 (1.76-1.76)
Sidechain outliers	110143	1868 (1.76-1.76)
RSRZ outliers	101464	1770 (1.76-1.76)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments on the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria. 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	274	<div> <div>4%</div> <div>93%</div> <div>5%</div> </div>
1	B	274	<div> <div>4%</div> <div>90%</div> <div>5%</div> </div>
1	C	274	<div> <div>3%</div> <div>91%</div> <div>•</div> </div>
1	D	274	<div> <div>3%</div> <div>91%</div> <div>• 6%</div> </div>

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 crite-

ria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
3	SO4	A	303	-	-	-	X
3	SO4	D	303	-	-	-	X
4	ACT	C	302	-	-	-	X
5	PE4	B	305	-	-	-	X
5	PE4	B	306	-	-	-	X

2 Entry composition

There are 7 unique types of molecules in this entry. The entry contains 9179 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 HcgC.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	260	Total	C	N	O	S	0	1	0
			2056	1318	332	399	7			
1	B	259	Total	C	N	O	S	0	0	0
			2040	1308	331	394	7			
1	C	262	Total	C	N	O	S	0	8	0
			2110	1359	336	407	8			
1	D	258	Total	C	N	O	S	0	6	0
			2074	1332	336	399	7			

There are 56 discrepancies between the modelled and reference sequences:

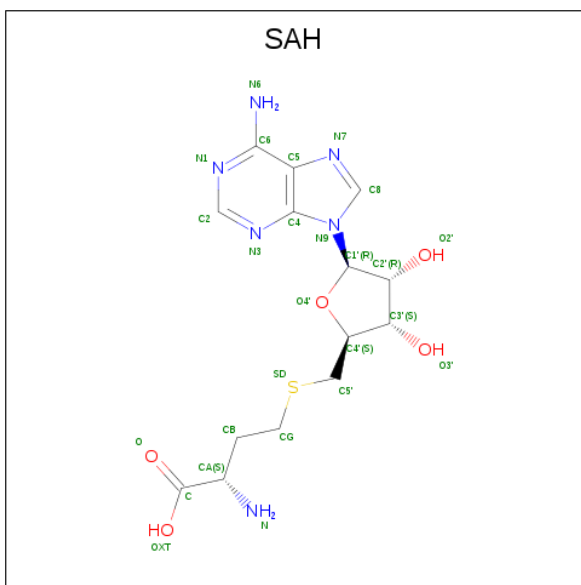
Chain	Residue	Modelled	Actual	Comment	Reference
A	261	ASP	-	expression tag	UNP Q6LX54
A	262	LYS	-	expression tag	UNP Q6LX54
A	263	LEU	-	expression tag	UNP Q6LX54
A	264	ALA	-	expression tag	UNP Q6LX54
A	265	ALA	-	expression tag	UNP Q6LX54
A	266	ALA	-	expression tag	UNP Q6LX54
A	267	LEU	-	expression tag	UNP Q6LX54
A	268	GLU	-	expression tag	UNP Q6LX54
A	269	HIS	-	expression tag	UNP Q6LX54
A	270	HIS	-	expression tag	UNP Q6LX54
A	271	HIS	-	expression tag	UNP Q6LX54
A	272	HIS	-	expression tag	UNP Q6LX54
A	273	HIS	-	expression tag	UNP Q6LX54
A	274	HIS	-	expression tag	UNP Q6LX54
B	261	ASP	-	expression tag	UNP Q6LX54
B	262	LYS	-	expression tag	UNP Q6LX54
B	263	LEU	-	expression tag	UNP Q6LX54
B	264	ALA	-	expression tag	UNP Q6LX54
B	265	ALA	-	expression tag	UNP Q6LX54
B	266	ALA	-	expression tag	UNP Q6LX54
B	267	LEU	-	expression tag	UNP Q6LX54

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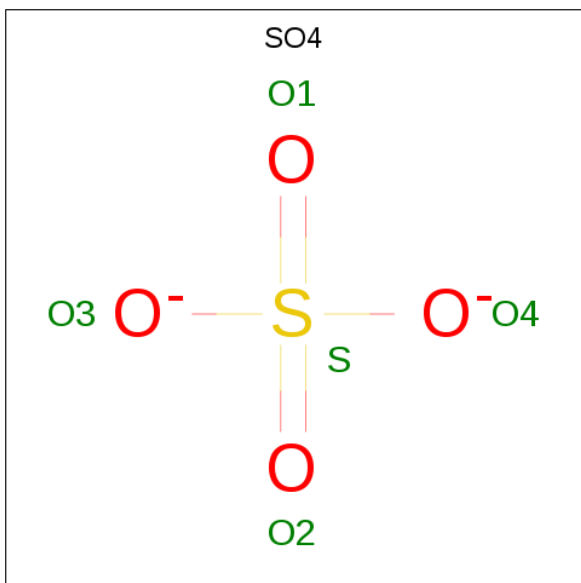
Chain	Residue	Modelled	Actual	Comment	Reference
B	268	GLU	-	expression tag	UNP Q6LX54
B	269	HIS	-	expression tag	UNP Q6LX54
B	270	HIS	-	expression tag	UNP Q6LX54
B	271	HIS	-	expression tag	UNP Q6LX54
B	272	HIS	-	expression tag	UNP Q6LX54
B	273	HIS	-	expression tag	UNP Q6LX54
B	274	HIS	-	expression tag	UNP Q6LX54
C	261	ASP	-	expression tag	UNP Q6LX54
C	262	LYS	-	expression tag	UNP Q6LX54
C	263	LEU	-	expression tag	UNP Q6LX54
C	264	ALA	-	expression tag	UNP Q6LX54
C	265	ALA	-	expression tag	UNP Q6LX54
C	266	ALA	-	expression tag	UNP Q6LX54
C	267	LEU	-	expression tag	UNP Q6LX54
C	268	GLU	-	expression tag	UNP Q6LX54
C	269	HIS	-	expression tag	UNP Q6LX54
C	270	HIS	-	expression tag	UNP Q6LX54
C	271	HIS	-	expression tag	UNP Q6LX54
C	272	HIS	-	expression tag	UNP Q6LX54
C	273	HIS	-	expression tag	UNP Q6LX54
C	274	HIS	-	expression tag	UNP Q6LX54
D	261	ASP	-	expression tag	UNP Q6LX54
D	262	LYS	-	expression tag	UNP Q6LX54
D	263	LEU	-	expression tag	UNP Q6LX54
D	264	ALA	-	expression tag	UNP Q6LX54
D	265	ALA	-	expression tag	UNP Q6LX54
D	266	ALA	-	expression tag	UNP Q6LX54
D	267	LEU	-	expression tag	UNP Q6LX54
D	268	GLU	-	expression tag	UNP Q6LX54
D	269	HIS	-	expression tag	UNP Q6LX54
D	270	HIS	-	expression tag	UNP Q6LX54
D	271	HIS	-	expression tag	UNP Q6LX54
D	272	HIS	-	expression tag	UNP Q6LX54
D	273	HIS	-	expression tag	UNP Q6LX54
D	274	HIS	-	expression tag	UNP Q6LX54

- Molecule 2 is S-ADENOSYL-L-HOMOCYSTEINE (three-letter code: SAH) (formula: C₁₄H₂₀N₆O₅S).



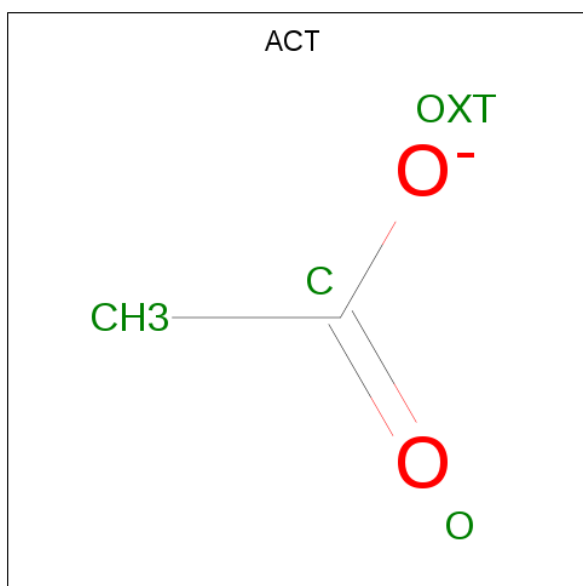
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	N	O	S	0	0
			26	14	6	5	1		
2	B	1	Total	C	N	O	S	0	0
			26	14	6	5	1		
2	C	1	Total	C	N	O	S	0	0
			26	14	6	5	1		
2	D	1	Total	C	N	O	S	0	0
			26	14	6	5	1		

- Molecule 3 is SULFATE ION (three-letter code: SO₄) (formula: O₄S).



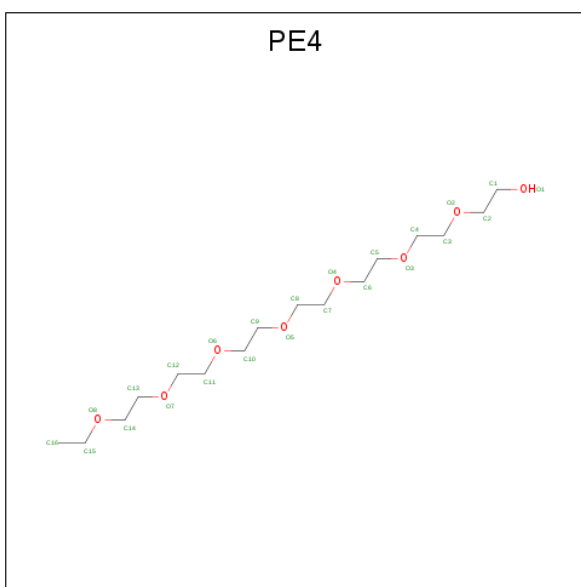
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total O S 5 4 1	0	0
3	A	1	Total O S 5 4 1	0	0
3	B	1	Total O S 5 4 1	0	0
3	B	1	Total O S 5 4 1	0	0
3	D	1	Total O S 5 4 1	0	0

- Molecule 4 is ACETATE ION (three-letter code: ACT) (formula: $C_2H_3O_2$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total C O 4 2 2	0	0
4	A	1	Total C O 4 2 2	0	0
4	B	1	Total C O 4 2 2	0	0
4	C	1	Total C O 4 2 2	0	0
4	D	1	Total C O 4 2 2	0	0

- Molecule 5 is 2-{2-[2-(2-{2-[2-(2-ETHOXY-ETHOXY)-ETHOXY]-ETHOXY}-ETHOXY)-ETHOXY]-ETHOXY}-ETHANOL (three-letter code: PE4) (formula: $C_{16}H_{34}O_8$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	A	1	Total 15	C 10	O 5	0	0
5	B	1	Total 11	C 7	O 4	0	0
5	B	1	Total 14	C 9	O 5	0	0
5	C	1	Total 10	C 7	O 3	0	0

- Molecule 6 is SODIUM ION (three-letter code: NA) (formula: Na).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	D	1	Total Na 1 1	0	0

- Molecule 7 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	A	157	Total O 157 157	0	0
7	B	182	Total O 182 182	0	0
7	C	184	Total O 184 184	0	0
7	D	176	Total O 176 176	0	0

3 Residue-property plots [i](#)

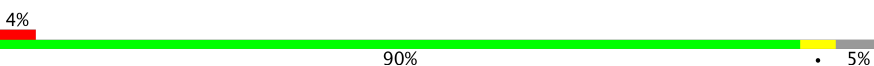
These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are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

Chain A: 



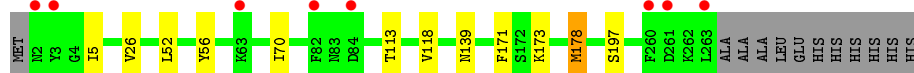
• Molecule 1: HcgC

Chain B: 



• Molecule 1: HcgC

Chain C: 



• Molecule 1: HcgC

Chain D: 



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	73.17Å 77.74Å 100.99Å 90.00° 110.87° 90.00°	Depositor
Resolution (Å)	47.85 – 1.75 47.85 – 1.75	Depositor EDS
% Data completeness (in resolution range)	99.6 (47.85-1.75) 99.6 (47.85-1.75)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.91 (at 1.75Å)	Xtriage
Refinement program	BUSTER 2.10.1	Depositor
R, R_{free}	0.168 , 0.193 0.180 , 0.203	Depositor DCC
R_{free} test set	5307 reflections (5.26%)	DCC
Wilson B-factor (Å ²)	26.4	Xtriage
Anisotropy	0.205	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.33 , 45.5	EDS
L-test for twinning ²	$\langle L \rangle = 0.47$, $\langle L^2 \rangle = 0.30$	Xtriage
Estimated twinning fraction	0.026 for h,-k,-h-l	Xtriage
F_o, F_c correlation	0.97	EDS
Total number of atoms	9179	wwPDB-VP
Average B, all atoms (Å ²)	37.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.40% 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: PE4, NA, SAH, SO4, ACT

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	0.49	0/2088	0.68	0/2810
1	B	0.47	0/2069	0.68	0/2785
1	C	0.48	0/2165	0.70	2/2915 (0.1%)
1	D	0.46	0/2121	0.68	0/2854
All	All	0.47	0/8443	0.69	2/11364 (0.0%)

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	178[A]	MET	CB-CG-SD	5.10	127.69	112.40
1	C	178[B]	MET	CB-CG-SD	5.10	127.69	112.40

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	2056	0	2127	3	0
1	B	2040	0	2107	9	0
1	C	2110	0	2193	8	0
1	D	2074	0	2163	6	0
2	A	26	0	19	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	B	26	0	19	1	0
2	C	26	0	19	0	0
2	D	26	0	19	1	0
3	A	10	0	0	0	0
3	B	10	0	0	0	0
3	D	5	0	0	0	0
4	A	8	0	6	0	0
4	B	4	0	3	0	0
4	C	4	0	3	0	0
4	D	4	0	3	0	0
5	A	15	0	18	1	0
5	B	25	0	28	1	0
5	C	10	0	13	0	0
6	D	1	0	0	0	0
7	A	157	0	0	0	0
7	B	182	0	0	1	0
7	C	184	0	0	0	0
7	D	176	0	0	1	0
All	All	9179	0	8740	22	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 1.

All (22) 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:169:SER:OG	7:B:401:HOH:O	2.18	0.53
1:B:171:PHE:CZ	1:D:169:SER:HA	2.47	0.50
1:D:26[B]:VAL:CG1	1:D:56:TYR:HB3	2.42	0.48
1:C:139[A]:ASN:HB2	1:C:171[A]:PHE:CE2	2.48	0.48
1:C:5:ILE:HG12	1:D:213:PHE:CE2	2.48	0.48
1:A:5:ILE:HG21	2:B:301:SAH:H5'1	1.97	0.47
1:C:26[A]:VAL:CG1	1:C:56:TYR:HB3	2.44	0.47
1:B:154:LEU:HD11	1:B:162:VAL:CG2	2.44	0.46
1:B:139:ASN:HB2	1:B:171:PHE:CE2	2.51	0.44
1:B:154:LEU:HD11	1:B:162:VAL:HG22	2.00	0.44
1:D:139:ASN:HB2	1:D:171:PHE:CE2	2.53	0.44
1:B:113:THR:HG21	1:B:118:VAL:HG13	2.00	0.43
1:D:113:THR:HG21	1:D:118:VAL:HG13	2.01	0.43
1:C:52:LEU:HD22	1:C:178[A]:MET:HG2	2.01	0.43
1:C:5:ILE:HG21	2:D:301:SAH:H5'1	1.99	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:169:SER:OG	1:C:173:LYS:HE2	2.20	0.42
1:A:56:TYR:CE1	5:A:306:PE4:H32	2.54	0.42
1:C:178[B]:MET:HE1	7:D:499:HOH:O	2.19	0.42
1:B:82:PHE:HB3	5:B:306:PE4:H122	2.03	0.41
1:C:113:THR:HG21	1:C:118[B]:VAL:HG23	2.03	0.41
1:B:135:ASP:HB2	1:B:162:VAL:CG1	2.52	0.40
1:B:173:LYS:HE2	1:D:169:SER:OG	2.20	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	259/274 (94%)	258 (100%)	1 (0%)	0	100	100
1	B	257/274 (94%)	255 (99%)	2 (1%)	0	100	100
1	C	268/274 (98%)	267 (100%)	1 (0%)	0	100	100
1	D	262/274 (96%)	260 (99%)	2 (1%)	0	100	100
All	All	1046/1096 (95%)	1040 (99%)	6 (1%)	0	100	100

There are no Ramachandran outliers to report.

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	239/249 (96%)	238 (100%)	1 (0%)	93	89
1	B	235/249 (94%)	233 (99%)	2 (1%)	82	71
1	C	248/249 (100%)	246 (99%)	2 (1%)	85	75
1	D	243/249 (98%)	241 (99%)	2 (1%)	85	75
All	All	965/996 (97%)	958 (99%)	7 (1%)	87	78

All (7) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	70	ILE
1	B	70	ILE
1	B	227	MET
1	C	70	ILE
1	C	197	SER
1	D	53	SER
1	D	70	ILE

Some 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 carbohydrates in this entry.

5.6 Ligand geometry [i](#)

Of 19 ligands modelled in this entry, 1 is monoatomic - leaving 18 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
2	SAH	A	301	-	20,28,28	1.21	2 (10%)	20,40,40	1.97	3 (15%)
3	SO4	A	302	-	4,4,4	0.40	0	6,6,6	0.12	0
3	SO4	A	303	-	4,4,4	0.43	0	6,6,6	0.18	0
4	ACT	A	304	-	1,3,3	7.02	1 (100%)	0,3,3	0.00	-
4	ACT	A	305	-	1,3,3	4.39	1 (100%)	0,3,3	0.00	-
5	PE4	A	306	-	14,14,23	0.51	0	13,13,22	0.45	0
2	SAH	B	301	-	20,28,28	1.23	1 (5%)	20,40,40	2.15	5 (25%)
3	SO4	B	302	-	4,4,4	0.44	0	6,6,6	0.16	0
3	SO4	B	303	-	4,4,4	0.42	0	6,6,6	0.05	0
4	ACT	B	304	-	1,3,3	7.46	1 (100%)	0,3,3	0.00	-
5	PE4	B	305	-	10,10,23	0.59	0	9,9,22	0.27	0
5	PE4	B	306	-	13,13,23	0.55	0	12,12,22	0.44	0
2	SAH	C	301	-	20,28,28	1.17	1 (5%)	20,40,40	2.18	4 (20%)
4	ACT	C	302	-	1,3,3	6.06	1 (100%)	0,3,3	0.00	-
5	PE4	C	303	-	9,9,23	0.53	0	8,8,22	0.52	0
2	SAH	D	301	-	20,28,28	1.21	2 (10%)	20,40,40	2.18	5 (25%)
3	SO4	D	303	-	4,4,4	0.39	0	6,6,6	0.19	0
4	ACT	D	304	-	1,3,3	5.27	1 (100%)	0,3,3	0.00	-

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	A	301	-	-	0/7/31/31	0/3/3/3
3	SO4	A	302	-	-	0/0/0/0	0/0/0/0
3	SO4	A	303	-	-	0/0/0/0	0/0/0/0
4	ACT	A	304	-	-	0/0/0/0	0/0/0/0
4	ACT	A	305	-	-	0/0/0/0	0/0/0/0
5	PE4	A	306	-	-	0/12/12/21	0/0/0/0
2	SAH	B	301	-	-	0/7/31/31	0/3/3/3
3	SO4	B	302	-	-	0/0/0/0	0/0/0/0
3	SO4	B	303	-	-	0/0/0/0	0/0/0/0
4	ACT	B	304	-	-	0/0/0/0	0/0/0/0
5	PE4	B	305	-	-	0/8/8/21	0/0/0/0

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	PE4	B	306	-	-	0/11/11/21	0/0/0/0
2	SAH	C	301	-	-	0/7/31/31	0/3/3/3
4	ACT	C	302	-	-	0/0/0/0	0/0/0/0
5	PE4	C	303	-	-	0/7/7/21	0/0/0/0
2	SAH	D	301	-	-	0/7/31/31	0/3/3/3
3	SO4	D	303	-	-	0/0/0/0	0/0/0/0
4	ACT	D	304	-	-	0/0/0/0	0/0/0/0

All (11) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	D	301	SAH	C2-N3	2.10	1.35	1.32
2	A	301	SAH	O4'-C1'	2.54	1.44	1.41
2	C	301	SAH	C5-C4	2.69	1.46	1.40
2	D	301	SAH	C5-C4	2.84	1.46	1.40
2	A	301	SAH	C5-C4	2.95	1.47	1.40
2	B	301	SAH	C5-C4	3.15	1.47	1.40
4	A	305	ACT	CH3-C	4.39	1.54	1.48
4	D	304	ACT	CH3-C	5.27	1.55	1.48
4	C	302	ACT	CH3-C	6.06	1.56	1.48
4	A	304	ACT	CH3-C	7.02	1.57	1.48
4	B	304	ACT	CH3-C	7.46	1.58	1.48

All (17) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	301	SAH	N3-C2-N1	-7.84	122.03	128.86
2	D	301	SAH	N3-C2-N1	-7.77	122.09	128.86
2	B	301	SAH	N3-C2-N1	-7.61	122.23	128.86
2	A	301	SAH	N3-C2-N1	-7.12	122.66	128.86
2	A	301	SAH	C1'-N9-C4	-3.03	121.41	126.64
2	C	301	SAH	C1'-N9-C4	-2.88	121.66	126.64
2	B	301	SAH	C1'-N9-C4	-2.70	121.97	126.64
2	D	301	SAH	C1'-N9-C4	-2.67	122.02	126.64
2	B	301	SAH	C4-C5-N7	-2.30	107.19	109.41
2	D	301	SAH	C4-C5-N7	-2.26	107.22	109.41
2	C	301	SAH	C4-C5-N7	-2.14	107.34	109.41
2	C	301	SAH	C2-N1-C6	2.04	122.34	118.77
2	A	301	SAH	C2-N1-C6	2.09	122.42	118.77
2	B	301	SAH	C2-N1-C6	2.21	122.64	118.77
2	D	301	SAH	C2-N1-C6	2.25	122.71	118.77
2	D	301	SAH	N6-C6-N1	2.26	123.24	118.77

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Mol	Chain	Res	Type	Atoms	Z	Observed($^{\circ}$)	Ideal($^{\circ}$)
2	B	301	SAH	C4'-O4'-C1'	2.38	112.30	109.77

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

4 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	A	306	PE4	1	0
2	B	301	SAH	1	0
5	B	306	PE4	1	0
2	D	301	SAH	1	0

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	260/274 (94%)	-0.04	10 (3%) 41 48	19, 31, 59, 123	0
1	B	259/274 (94%)	0.08	11 (4%) 37 44	22, 34, 68, 113	0
1	C	262/274 (95%)	-0.05	8 (3%) 49 57	20, 34, 61, 97	0
1	D	258/274 (94%)	-0.09	8 (3%) 49 57	20, 33, 60, 97	0
All	All	1039/1096 (94%)	-0.02	37 (3%) 43 50	19, 33, 61, 123	0

All (37) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	102	THR	8.2
1	C	82	PHE	5.9
1	B	264	ALA	5.3
1	A	262	LYS	5.1
1	C	3	TYR	5.0
1	A	260	PHE	4.8
1	D	7	GLU	4.4
1	B	263	LEU	4.4
1	A	6	THR	4.0
1	B	99	ARG	3.9
1	D	260	PHE	3.9
1	A	5	ILE	3.9
1	A	102	THR	3.7
1	A	82	PHE	3.7
1	D	261	ASP	3.7
1	D	82	PHE	3.5
1	B	104	ILE	3.4
1	A	263	LEU	3.4
1	B	100	ASN	3.3
1	C	2	ASN	3.3
1	C	260	PHE	3.2

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Mol	Chain	Res	Type	RSRZ
1	B	96	LEU	3.1
1	B	103	SER	2.9
1	D	262	LYS	2.8
1	D	6	THR	2.7
1	C	263	LEU	2.7
1	C	84	ASP	2.7
1	A	7	GLU	2.6
1	B	101	GLY	2.5
1	A	99	ARG	2.4
1	C	261	ASP	2.3
1	D	263	LEU	2.2
1	B	124	SER	2.2
1	D	190[A]	ARG	2.1
1	B	240	TYR	2.1
1	A	127	ASN	2.0
1	C	63	LYS	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 carbohydrates 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. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. 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	LLDF	B-factors(\AA^2)	Q<0.9
3	SO4	D	303	5/5	0.91	0.24	25.34	52,58,63,65	0
5	PE4	B	306	14/24	0.64	0.23	9.20	78,80,82,82	0
4	ACT	C	302	4/4	0.88	0.20	7.42	33,48,53,56	0
3	SO4	A	303	5/5	0.82	0.21	3.13	81,82,86,86	0
5	PE4	B	305	11/24	0.69	0.14	2.85	62,67,68,69	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	LLDF	B-factors(\AA^2)	Q<0.9
4	ACT	B	304	4/4	0.94	0.14	1.49	28,38,45,47	0
4	ACT	A	305	4/4	0.84	0.22	1.40	62,62,62,63	0
5	PE4	A	306	15/24	0.78	0.15	1.34	56,60,68,70	0
5	PE4	C	303	10/24	0.76	0.14	0.46	75,77,78,78	0
2	SAH	A	301	26/26	0.96	0.07	0.38	24,27,30,34	0
2	SAH	B	301	26/26	0.97	0.06	-0.60	27,30,34,36	0
2	SAH	C	301	26/26	0.98	0.06	-0.60	23,27,29,30	0
3	SO4	B	302	5/5	0.91	0.10	-1.02	78,79,80,81	0
2	SAH	D	301	26/26	0.98	0.05	-1.10	25,29,31,33	0
4	ACT	A	304	4/4	0.95	0.12	-	35,38,38,45	0
3	SO4	A	302	5/5	0.93	0.11	-	119,120,120,120	0
6	NA	D	302	1/1	0.95	0.14	-	32,32,32,32	0
4	ACT	D	304	4/4	0.70	0.22	-	63,64,66,69	0
3	SO4	B	303	5/5	0.88	0.23	-	75,75,76,76	5

6.5 Other polymers [i](#)

There are no such residues in this entry.