



wwPDB X-ray Structure Validation Summary Report ⓘ

Mar 6, 2026 – 11:27 PM UTC

PDB ID : 6ET9 / pdb_00006et9
Title : Structure of the acetoacetyl-CoA-thiolase/HMG-CoA-synthase complex from Methanothermococcus thermolithotrophicus at 2.75 Å
Authors : Engilberge, S.; Voegeli, B.; Girard, E.; Riobe, F.; Maury, O.; Erb, T.J.; Shima, S.; Wagner, T.
Deposited on : 2017-10-25
Resolution : 2.75 Å(reported)

This is a wwPDB X-ray Structure Validation Summary 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
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

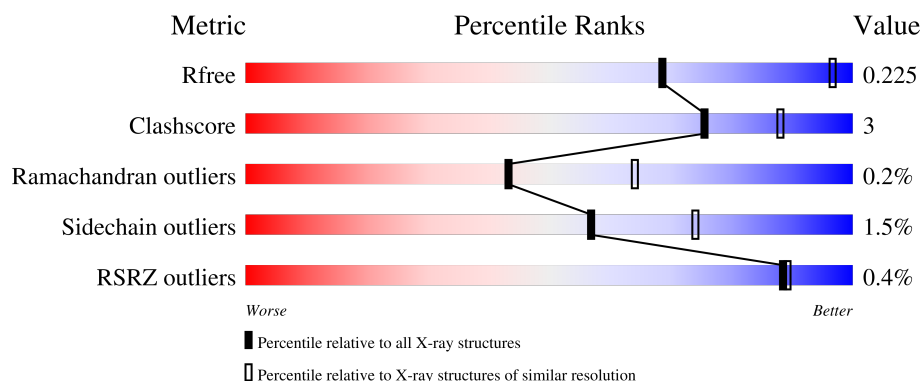
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.75 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.



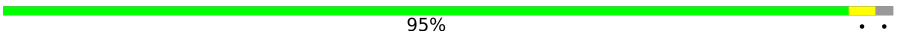
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	180053	1009 (2.76-2.76)
Clashscore	190562	1044 (2.76-2.76)
Ramachandran outliers	187476	1024 (2.76-2.76)
Sidechain outliers	187428	1024 (2.76-2.76)
RSRZ outliers	180081	1009 (2.76-2.76)

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

Mol	Chain	Length	Quality of chain
1	A	392	% 89%11%
1	B	392	91%9%
1	C	392	90%8%..
1	D	392	% 92%8%
2	E	130	2% 92%6%.

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Mol	Chain	Length	Quality of chain
2	F	130	 95% . .
2	G	130	 89% 9% .
2	H	130	 92% 6% .
3	I	349	 94% 5% ..
3	J	349	 91% 7% .
3	K	349	 91% 7% ..
3	L	349	 91% 7% ..

2 Entry composition

There are 11 unique types of molecules in this entry. The entry contains 26928 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 Acetyl-CoA acetyltransferase thiolase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	392	Total	C	N	O	S	0	0	0
			2932	1839	496	578	19			
1	B	392	Total	C	N	O	S	0	0	0
			2932	1839	496	578	19			
1	C	389	Total	C	N	O	S	0	0	0
			2905	1821	490	575	19			
1	D	392	Total	C	N	O	S	0	0	0
			2932	1839	496	578	19			

- Molecule 2 is a protein called Pfam DUF35.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	E	128	Total	C	N	O	S	0	0	0
			1028	662	176	184	6			
2	F	128	Total	C	N	O	S	0	0	0
			1028	662	176	184	6			
2	G	128	Total	C	N	O	S	0	0	0
			1028	662	176	184	6			
2	H	128	Total	C	N	O	S	0	0	0
			1028	662	176	184	6			

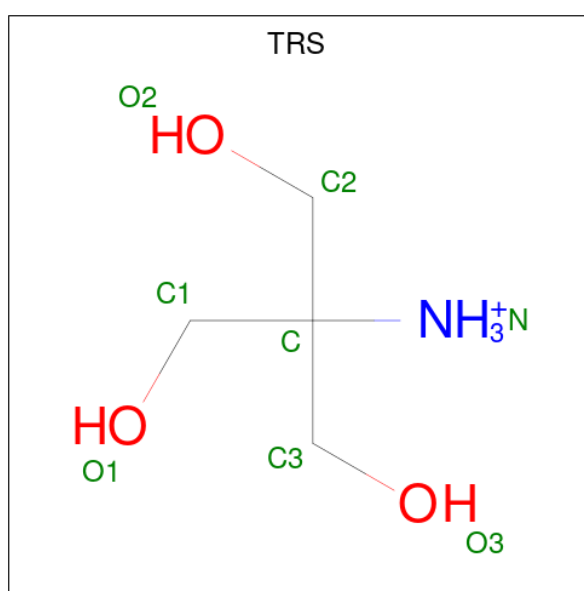
- Molecule 3 is a protein called HydroxyMethylGlutaryl-CoA synthase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	I	347	Total	C	N	O	S	0	0	0
			2623	1674	435	505	9			
3	J	348	Total	C	N	O	S	0	0	0
			2632	1680	437	506	9			
3	K	347	Total	C	N	O	S	0	0	0
			2623	1674	435	505	9			
3	L	347	Total	C	N	O	S	0	0	0
			2623	1674	435	505	9			

- Molecule 4 is SODIUM ION (CCD ID: NA) (formula: Na).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	1	Total	Na	0	0
			1	1		
4	D	1	Total	Na	0	0
			1	1		
4	J	1	Total	Na	0	0
			1	1		

- Molecule 5 is 2-AMINO-2-HYDROXYMETHYL-PROPANE-1,3-DIOL (CCD ID: TRS) (formula: C₄H₁₂NO₃).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
5	A	1	Total	C	N	O	0	0
			8	4	1	3		
5	A	1	Total	C	N	O	0	0
			8	4	1	3		
5	A	1	Total	C	N	O	0	0
			8	4	1	3		
5	B	1	Total	C	N	O	0	0
			8	4	1	3		
5	B	1	Total	C	N	O	0	0
			8	4	1	3		
5	C	1	Total	C	N	O	0	0
			8	4	1	3		
5	C	1	Total	C	N	O	0	0
			8	4	1	3		

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Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
5	D	1	Total	C	N	O	0	0
			8	4	1	3		
5	F	1	Total	C	N	O	0	0
			8	4	1	3		
5	G	1	Total	C	N	O	0	0
			8	4	1	3		
5	H	1	Total	C	N	O	0	0
			8	4	1	3		

- Molecule 6 is POTASSIUM ION (CCD ID: K) (formula: K).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	1	Total	K	0	0
			1	1		
6	B	1	Total	K	0	0
			1	1		
6	C	1	Total	K	0	0
			1	1		
6	D	1	Total	K	0	0
			1	1		
6	I	2	Total	K	0	0
			2	2		
6	J	1	Total	K	0	0
			1	1		
6	K	1	Total	K	0	0
			1	1		

- Molecule 7 is CHLORIDE ION (CCD ID: CL) (formula: Cl).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	C	1	Total	Cl	0	0
			1	1		
7	E	2	Total	Cl	0	0
			2	2		
7	G	1	Total	Cl	0	0
			1	1		
7	H	1	Total	Cl	0	0
			1	1		
7	I	1	Total	Cl	0	0
			1	1		

- Molecule 8 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
8	D	1	Total	Mg	0	0
			1	1		

- Molecule 9 is GLYCEROL (CCD ID: GOL) (formula: $C_3H_8O_3$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
9	D	1	Total	C	O	0	0
			6	3	3		
9	I	1	Total	C	O	0	0
			6	3	3		
9	I	1	Total	C	O	0	0
			6	3	3		
9	J	1	Total	C	O	0	0
			6	3	3		
9	K	1	Total	C	O	0	0
			6	3	3		
9	L	1	Total	C	O	0	0
			6	3	3		

- Molecule 10 is ZINC ION (CCD ID: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
10	E	1	Total	Zn	0	0
			1	1		
10	F	1	Total	Zn	0	0
			1	1		
10	G	1	Total	Zn	0	0
			1	1		

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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
10	H	1	Total	Zn	0	0
			1	1		

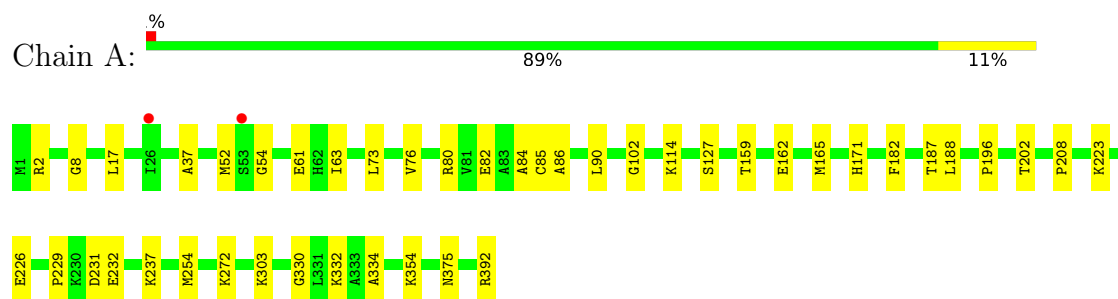
- Molecule 11 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
11	A	30	Total	O	0	0
			30	30		
11	B	66	Total	O	0	0
			66	66		
11	C	23	Total	O	0	0
			23	23		
11	D	66	Total	O	0	0
			66	66		
11	E	28	Total	O	0	0
			28	28		
11	F	20	Total	O	0	0
			20	20		
11	G	35	Total	O	0	0
			35	35		
11	H	8	Total	O	0	0
			8	8		
11	I	71	Total	O	0	0
			71	71		
11	J	43	Total	O	0	0
			43	43		
11	K	47	Total	O	0	0
			47	47		
11	L	31	Total	O	0	0
			31	31		

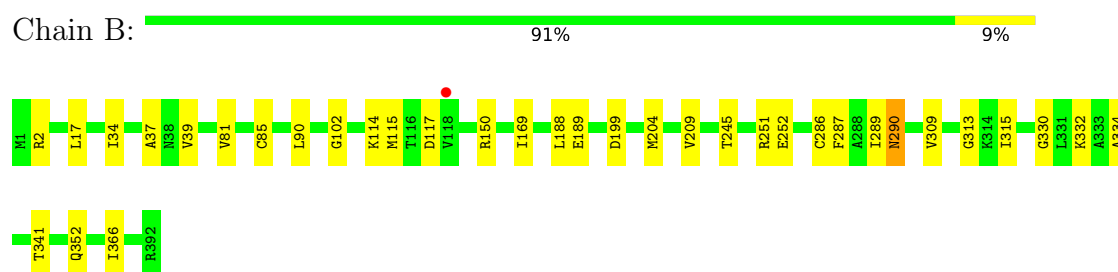
3 Residue-property plots

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.

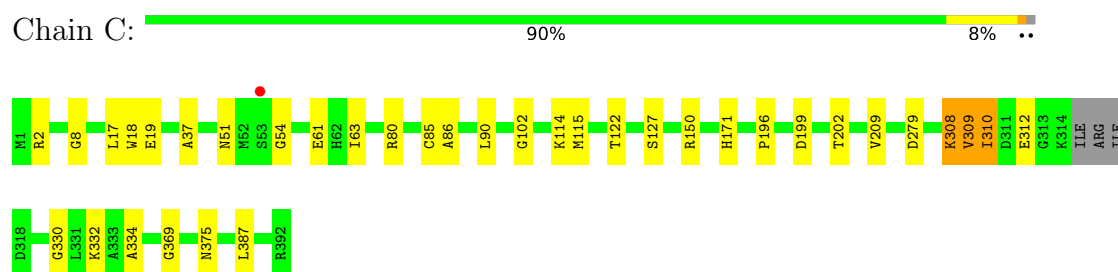
- Molecule 1: Acetyl-CoA acetyltransferase thiolase



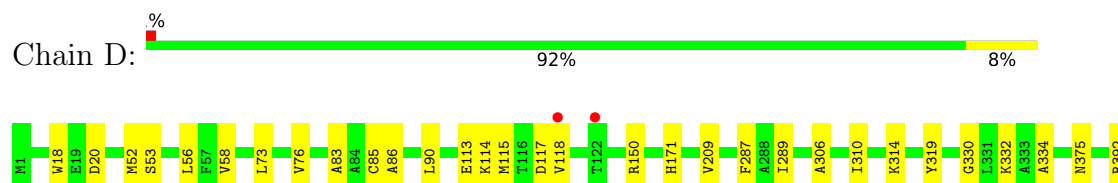
- Molecule 1: Acetyl-CoA acetyltransferase thiolase



- Molecule 1: Acetyl-CoA acetyltransferase thiolase



- Molecule 1: Acetyl-CoA acetyltransferase thiolase



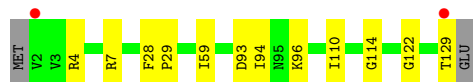
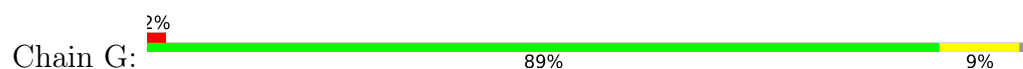
● Molecule 2: Pfam DUF35



● Molecule 2: Pfam DUF35



● Molecule 2: Pfam DUF35



● Molecule 2: Pfam DUF35



● Molecule 3: HydroxyMethylGlutaryl-CoA synthase



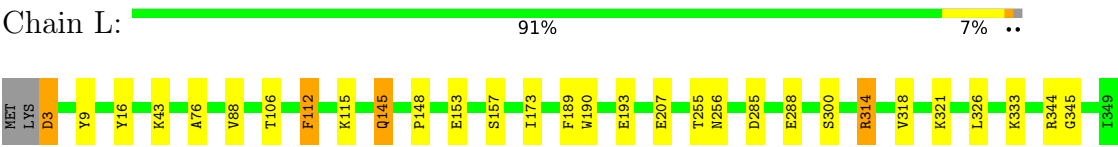
● Molecule 3: HydroxyMethylGlutaryl-CoA synthase



● Molecule 3: HydroxyMethylGlutaryl-CoA synthase



● Molecule 3: HydroxyMethylGlutaryl-CoA synthase



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	106.62Å 144.01Å 230.59Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	48.39 – 2.75 48.39 – 2.75	Depositor EDS
% Data completeness (in resolution range)	100.0 (48.39-2.75) 100.0 (48.39-2.75)	Depositor EDS
R_{merge}	0.28	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.80 (at 2.77Å)	Xtriage
Refinement program	PHENIX (1.10.1_2155: ???)	Depositor
R, R_{free}	0.190 , 0.225 0.194 , 0.225	Depositor DCC
R_{free} test set	4636 reflections (4.99%)	wwPDB-VP
Wilson B-factor (Å ²)	49.5	Xtriage
Anisotropy	0.232	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.32 , 58.4	EDS
L-test for twinning ²	$\langle L \rangle = 0.47$, $\langle L^2 \rangle = 0.29$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	26928	wwPDB-VP
Average B, all atoms (Å ²)	52.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.38% 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

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: ZN, GOL, TRS, CL, K, NA, MG

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	0.28	0/2981	0.42	0/4032
1	B	0.36	0/2981	0.45	0/4032
1	C	0.30	0/2953	0.42	0/3993
1	D	0.37	0/2981	0.46	0/4032
2	E	0.31	0/1051	0.52	0/1417
2	F	0.34	0/1051	0.52	0/1417
2	G	0.38	0/1051	0.54	0/1417
2	H	0.26	0/1051	0.50	0/1417
3	I	0.37	0/2679	0.46	0/3627
3	J	0.31	0/2688	0.47	1/3638 (0.0%)
3	K	0.38	0/2679	0.47	1/3627 (0.0%)
3	L	0.32	0/2679	0.45	0/3627
All	All	0.33	0/26825	0.46	2/36276 (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
3	J	0	1
3	K	0	1
All	All	0	2

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	K	301	GLY	N-CA-C	-5.70	99.66	113.18
3	J	301	GLY	N-CA-C	-5.55	100.02	113.18

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
3	J	301	GLY	Peptide
3	K	301	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	2932	0	2884	24	0
1	B	2932	0	2884	17	0
1	C	2905	0	2848	18	0
1	D	2932	0	2884	21	0
2	E	1028	0	1050	6	0
2	F	1028	0	1050	1	0
2	G	1028	0	1050	8	0
2	H	1028	0	1050	4	0
3	I	2623	0	2608	17	0
3	J	2632	0	2621	20	0
3	K	2623	0	2608	16	0
3	L	2623	0	2608	22	0
4	A	1	0	0	0	0
4	D	1	0	0	0	0
4	J	1	0	0	0	0
5	A	24	0	36	0	0
5	B	16	0	24	0	0
5	C	16	0	24	0	0
5	D	8	0	12	0	0
5	F	8	0	12	0	0
5	G	8	0	12	0	0
5	H	8	0	12	0	0
6	A	1	0	0	0	0
6	B	1	0	0	0	0
6	C	1	0	0	0	0
6	D	1	0	0	0	0
6	I	2	0	0	0	0
6	J	1	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
6	K	1	0	0	0	0
7	C	1	0	0	0	0
7	E	2	0	0	1	0
7	G	1	0	0	0	0
7	H	1	0	0	0	0
7	I	1	0	0	0	0
8	D	1	0	0	0	0
9	D	6	0	8	0	0
9	I	12	0	16	0	0
9	J	6	0	8	0	0
9	K	6	0	8	0	0
9	L	6	0	8	0	0
10	E	1	0	0	0	0
10	F	1	0	0	0	0
10	G	1	0	0	0	0
10	H	1	0	0	0	0
11	A	30	0	0	0	0
11	B	66	0	0	0	0
11	C	23	0	0	1	0
11	D	66	0	0	2	0
11	E	28	0	0	3	0
11	F	20	0	0	0	0
11	G	35	0	0	0	0
11	H	8	0	0	0	0
11	I	71	0	0	1	0
11	J	43	0	0	0	0
11	K	47	0	0	0	0
11	L	31	0	0	0	0
All	All	26928	0	26325	156	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 3.

The worst 5 of 156 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)
7:E:203:CL:CL	11:E:318:HOH:O	2.24	0.92
3:L:3:ASP:N	3:L:3:ASP:OD1	2.16	0.79
3:K:186:THR:N	3:K:301:GLY:O	2.24	0.70
1:D:117:ASP:OD1	2:G:7:ARG:NH1	2.27	0.67
1:C:17:LEU:O	1:C:114:LYS:NZ	2.27	0.67

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	390/392 (100%)	379 (97%)	10 (3%)	1 (0%)	36	56
1	B	390/392 (100%)	376 (96%)	14 (4%)	0	100	100
1	C	385/392 (98%)	374 (97%)	10 (3%)	1 (0%)	36	56
1	D	390/392 (100%)	381 (98%)	9 (2%)	0	100	100
2	E	126/130 (97%)	122 (97%)	4 (3%)	0	100	100
2	F	126/130 (97%)	124 (98%)	2 (2%)	0	100	100
2	G	126/130 (97%)	123 (98%)	3 (2%)	0	100	100
2	H	126/130 (97%)	123 (98%)	3 (2%)	0	100	100
3	I	345/349 (99%)	333 (96%)	11 (3%)	1 (0%)	36	56
3	J	346/349 (99%)	335 (97%)	9 (3%)	2 (1%)	21	38
3	K	345/349 (99%)	333 (96%)	10 (3%)	2 (1%)	21	38
3	L	345/349 (99%)	334 (97%)	10 (3%)	1 (0%)	36	56
All	All	3440/3484 (99%)	3337 (97%)	95 (3%)	8 (0%)	43	64

5 of 8 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	54	GLY
3	K	302	ALA
3	I	112	PHE
3	J	112	PHE
3	J	302	ALA

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	302/303 (100%)	296 (98%)	6 (2%)	48	69
1	B	302/303 (100%)	295 (98%)	7 (2%)	44	66
1	C	299/303 (99%)	291 (97%)	8 (3%)	39	62
1	D	302/303 (100%)	300 (99%)	2 (1%)	76	86
2	E	113/115 (98%)	112 (99%)	1 (1%)	70	82
2	F	113/115 (98%)	111 (98%)	2 (2%)	51	71
2	G	113/115 (98%)	112 (99%)	1 (1%)	70	82
2	H	113/115 (98%)	113 (100%)	0	100	100
3	I	265/267 (99%)	264 (100%)	1 (0%)	84	91
3	J	266/267 (100%)	263 (99%)	3 (1%)	65	79
3	K	265/267 (99%)	259 (98%)	6 (2%)	44	66
3	L	265/267 (99%)	260 (98%)	5 (2%)	50	70
All	All	2718/2740 (99%)	2676 (98%)	42 (2%)	57	74

5 of 42 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
3	J	170	ASP
3	K	288	GLU
3	J	326	LEU
3	K	170	ASP
3	L	3	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 27 such sidechains are listed below:

Mol	Chain	Res	Type
1	D	368	ASN
2	F	47	GLN
3	K	256	ASN
2	E	14	ASN

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Mol	Chain	Res	Type
2	G	14	ASN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 39 ligands modelled in this entry, 22 are monoatomic - leaving 17 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	$\# Z > 2$
9	GOL	J	403	-	5,5,5	0.40	0	5,5,5	0.26	0
9	GOL	D	405	-	5,5,5	0.38	0	5,5,5	0.45	0
5	TRS	C	404	-	7,7,7	0.44	0	9,9,9	0.83	0
5	TRS	B	401	-	7,7,7	0.42	0	9,9,9	1.02	0
5	TRS	D	403	-	7,7,7	0.51	0	9,9,9	0.56	0
9	GOL	K	402	-	5,5,5	0.40	0	5,5,5	0.25	0
9	GOL	L	401	-	5,5,5	0.41	0	5,5,5	0.30	0
9	GOL	I	405	-	5,5,5	0.35	0	5,5,5	0.25	0
5	TRS	A	402	-	7,7,7	0.51	0	9,9,9	1.14	1 (11%)
5	TRS	F	202	-	7,7,7	0.34	0	9,9,9	1.13	1 (11%)
5	TRS	G	202	-	7,7,7	0.45	0	9,9,9	0.67	0
9	GOL	I	404	-	5,5,5	0.37	0	5,5,5	0.27	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
5	TRS	C	401	-	7,7,7	0.56	0	9,9,9	0.56	0
5	TRS	H	202	-	7,7,7	0.30	0	9,9,9	0.97	1 (11%)
5	TRS	A	403	-	7,7,7	0.69	0	9,9,9	0.61	0
5	TRS	B	402	-	7,7,7	0.72	0	9,9,9	1.60	3 (33%)
5	TRS	A	404	-	7,7,7	0.61	0	9,9,9	0.52	0

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
9	GOL	J	403	-	-	0/4/4/4	-
9	GOL	D	405	-	-	4/4/4/4	-
5	TRS	C	404	-	-	3/9/9/9	-
5	TRS	B	401	-	-	5/9/9/9	-
5	TRS	D	403	-	-	1/9/9/9	-
9	GOL	K	402	-	-	2/4/4/4	-
9	GOL	L	401	-	-	4/4/4/4	-
9	GOL	I	405	-	-	2/4/4/4	-
5	TRS	A	402	-	-	6/9/9/9	-
5	TRS	F	202	-	-	4/9/9/9	-
5	TRS	G	202	-	-	9/9/9/9	-
9	GOL	I	404	-	-	0/4/4/4	-
5	TRS	C	401	-	-	5/9/9/9	-
5	TRS	H	202	-	-	2/9/9/9	-
5	TRS	A	403	-	-	0/9/9/9	-
5	TRS	B	402	-	-	2/9/9/9	-
5	TRS	A	404	-	-	4/9/9/9	-

There are no bond length outliers.

The worst 5 of 6 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	B	402	TRS	O1-C1-C	-3.09	102.27	110.88
5	A	402	TRS	O2-C2-C	-2.98	102.56	110.88
5	H	202	TRS	O1-C1-C	-2.51	103.89	110.88
5	F	202	TRS	O3-C3-C	-2.31	104.43	110.88

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	B	402	TRS	C1-C-N	-2.13	102.75	108.17

There are no chirality outliers.

5 of 53 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	B	401	TRS	C2-C-C1-O1
5	C	404	TRS	C2-C-C1-O1
5	G	202	TRS	N-C-C2-O2
9	I	405	GOL	O2-C2-C3-O3
9	D	405	GOL	O1-C1-C2-C3

There are no ring outliers.

No monomer is involved in short contacts.

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	392/392 (100%)	-0.11	2 (0%) 87 87	37, 61, 95, 120	0
1	B	392/392 (100%)	-0.43	1 (0%) 90 91	28, 41, 78, 124	0
1	C	389/392 (99%)	-0.12	1 (0%) 90 91	38, 58, 90, 125	0
1	D	392/392 (100%)	-0.43	2 (0%) 87 87	24, 39, 67, 117	0
2	E	128/130 (98%)	-0.01	3 (2%) 61 59	39, 59, 98, 124	0
2	F	128/130 (98%)	-0.33	0 100 100	30, 47, 96, 126	0
2	G	128/130 (98%)	-0.21	2 (1%) 70 69	27, 48, 85, 107	0
2	H	128/130 (98%)	0.03	2 (1%) 70 69	47, 69, 117, 137	0
3	I	347/349 (99%)	-0.58	0 100 100	26, 38, 62, 83	0
3	J	348/349 (99%)	-0.28	0 100 100	37, 53, 75, 106	0
3	K	347/349 (99%)	-0.54	0 100 100	25, 38, 64, 80	0
3	L	347/349 (99%)	-0.30	0 100 100	34, 54, 86, 123	0
All	All	3466/3484 (99%)	-0.31	13 (0%) 88 89	24, 49, 86, 137	0

The worst 5 of 13 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	118	VAL	2.8
1	A	53	SER	2.5
2	H	2	VAL	2.4
2	E	50	GLY	2.4
1	D	122	THR	2.4

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 oligosaccharides 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
9	GOL	I	405	6/6	0.58	0.13	57,61,64,66	0
5	TRS	B	401	8/8	0.59	0.12	42,44,50,51	0
5	TRS	A	404	8/8	0.64	0.11	45,48,51,52	0
9	GOL	D	405	6/6	0.65	0.12	51,53,60,60	0
5	TRS	C	404	8/8	0.67	0.12	36,42,48,48	0
5	TRS	F	202	8/8	0.68	0.16	37,40,47,51	0
6	K	C	402	1/1	0.71	0.14	113,113,113,113	0
9	GOL	I	404	6/6	0.72	0.13	51,54,55,55	0
5	TRS	A	403	8/8	0.78	0.11	40,43,46,47	0
6	K	K	401	1/1	0.79	0.11	82,82,82,82	0
5	TRS	B	402	8/8	0.79	0.11	36,42,46,47	0
9	GOL	K	402	6/6	0.80	0.11	52,54,55,56	0
5	TRS	D	403	8/8	0.81	0.10	34,41,45,47	0
5	TRS	H	202	8/8	0.81	0.11	47,50,53,53	0
5	TRS	A	402	8/8	0.82	0.14	31,32,35,36	0
9	GOL	J	403	6/6	0.82	0.12	47,50,52,52	0
5	TRS	C	401	8/8	0.82	0.09	39,40,45,45	0
5	TRS	G	202	8/8	0.83	0.10	35,39,40,44	0
9	GOL	L	401	6/6	0.84	0.10	54,59,59,60	0
8	MG	D	401	1/1	0.86	0.27	53,53,53,53	0
7	CL	E	202	1/1	0.87	0.11	73,73,73,73	0
7	CL	H	203	1/1	0.87	0.08	87,87,87,87	0
6	K	A	405	1/1	0.87	0.12	110,110,110,110	0
6	K	D	404	1/1	0.89	0.10	61,61,61,61	0
6	K	I	402	1/1	0.90	0.09	92,92,92,92	0
6	K	B	403	1/1	0.92	0.11	64,64,64,64	0
4	NA	J	401	1/1	0.92	0.11	58,58,58,58	0
6	K	J	402	1/1	0.93	0.11	60,60,60,60	0
6	K	I	401	1/1	0.94	0.12	55,55,55,55	0
10	ZN	H	201	1/1	0.95	0.07	108,108,108,108	0
4	NA	A	401	1/1	0.96	0.04	58,58,58,58	0
7	CL	I	403	1/1	0.97	0.06	47,47,47,47	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
4	NA	D	402	1/1	0.97	0.05	42,42,42,42	0
10	ZN	F	201	1/1	0.97	0.04	81,81,81,81	0
7	CL	C	403	1/1	0.97	0.13	53,53,53,53	0
7	CL	E	203	1/1	0.98	0.07	30,30,30,30	0
7	CL	G	203	1/1	0.99	0.08	33,33,33,33	0
10	ZN	G	201	1/1	0.99	0.04	61,61,61,61	0
10	ZN	E	201	1/1	0.99	0.03	93,93,93,93	0

6.5 Other polymers [i](#)

There are no such residues in this entry.