Full wwPDB X-ray Structure Validation Report ⓘ

Oct 27, 2023 – 03:21 AM EDT

PDB ID	:	3LCX
Title	:	L-KDO aldolase
Authors	:	Chou, C.-Y.; Huang, K.-F.; Wang, A.H.-J.; Ko, T.-P.
Deposited on	:	2010-01-12
Resolution	:	1.98 Å(reported)

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

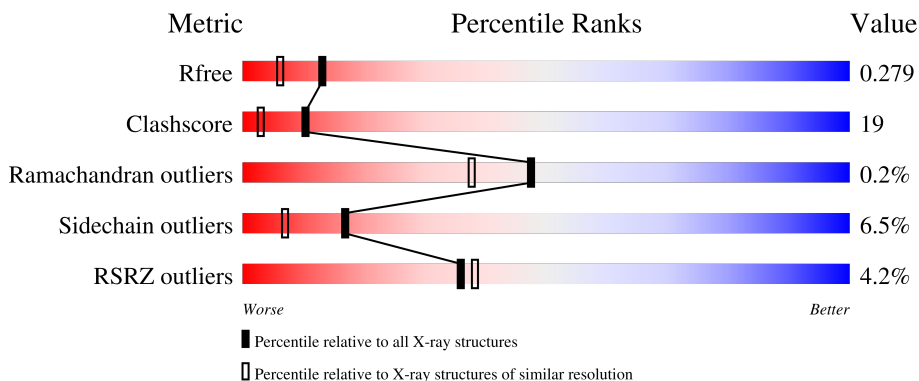|		
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.36
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 1.98 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		0.279
Clashscore		19
Ramachandran outliers		0.2%
Sidechain outliers		6.5%
RSRZ outliers		4.2%

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	11647 (2.00-1.96)
Clashscore	141614	1014 (1.98-1.98)
Ramachandran outliers	138981	1006 (1.98-1.98)
Sidechain outliers	138945	1006 (1.98-1.98)
RSRZ outliers	127900	11410 (2.00-1.96)

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	319	3% / 66% 22% · 9%
1	B	319	4% / 62% 26% · 9%
1	C	319	4% / 55% 32% · 9%
1	D	319	4% / 64% 24% ·· 9%

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
2	SO4	C	1798	-	-	X	-
2	SO4	D	1796	-	-	X	-

2 Entry composition ⓘ

There are 3 unique types of molecules in this entry. The entry contains 9754 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 N-acetylneuraminate lyase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	291	Total	C	N	O	S	71	0	0
			2234	1425	380	418	11			
1	B	291	Total	C	N	O	S	70	0	0
			2234	1425	380	418	11			
1	C	291	Total	C	N	O	S	68	0	0
			2234	1425	380	418	11			
1	D	291	Total	C	N	O	S	54	0	0
			2234	1425	380	418	11			

There are 120 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-21	MET	-	expression tag	UNP P0A6L4
A	-20	GLY	-	expression tag	UNP P0A6L4
A	-19	HIS	-	expression tag	UNP P0A6L4
A	-18	HIS	-	expression tag	UNP P0A6L4
A	-17	HIS	-	expression tag	UNP P0A6L4
A	-16	HIS	-	expression tag	UNP P0A6L4
A	-15	HIS	-	expression tag	UNP P0A6L4
A	-14	HIS	-	expression tag	UNP P0A6L4
A	-13	HIS	-	expression tag	UNP P0A6L4
A	-12	HIS	-	expression tag	UNP P0A6L4
A	-11	HIS	-	expression tag	UNP P0A6L4
A	-10	HIS	-	expression tag	UNP P0A6L4
A	-9	SER	-	expression tag	UNP P0A6L4
A	-8	SER	-	expression tag	UNP P0A6L4
A	-7	GLY	-	expression tag	UNP P0A6L4
A	-6	HIS	-	expression tag	UNP P0A6L4
A	-5	ILE	-	expression tag	UNP P0A6L4
A	-4	GLU	-	expression tag	UNP P0A6L4
A	-3	GLY	-	expression tag	UNP P0A6L4
A	-2	ARG	-	expression tag	UNP P0A6L4
A	-1	HIS	-	expression tag	UNP P0A6L4

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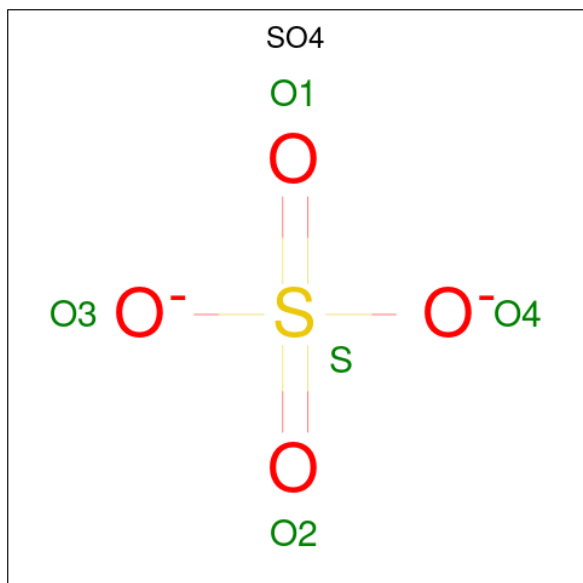
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Chain	Residue	Modelled	Actual	Comment	Reference
A	0	MET	-	expression tag	UNP P0A6L4
A	60	ALA	GLU	engineered mutation	UNP P0A6L4
A	98	HIS	TYR	engineered mutation	UNP P0A6L4
A	115	LEU	PHE	engineered mutation	UNP P0A6L4
A	150	GLY	ASP	engineered mutation	UNP P0A6L4
A	153	TYR	ASN	engineered mutation	UNP P0A6L4
A	251	ILE	VAL	engineered mutation	UNP P0A6L4
A	265	ILE	VAL	engineered mutation	UNP P0A6L4
A	281	CYS	TYR	engineered mutation	UNP P0A6L4
B	-21	MET	-	expression tag	UNP P0A6L4
B	-20	GLY	-	expression tag	UNP P0A6L4
B	-19	HIS	-	expression tag	UNP P0A6L4
B	-18	HIS	-	expression tag	UNP P0A6L4
B	-17	HIS	-	expression tag	UNP P0A6L4
B	-16	HIS	-	expression tag	UNP P0A6L4
B	-15	HIS	-	expression tag	UNP P0A6L4
B	-14	HIS	-	expression tag	UNP P0A6L4
B	-13	HIS	-	expression tag	UNP P0A6L4
B	-12	HIS	-	expression tag	UNP P0A6L4
B	-11	HIS	-	expression tag	UNP P0A6L4
B	-10	HIS	-	expression tag	UNP P0A6L4
B	-9	SER	-	expression tag	UNP P0A6L4
B	-8	SER	-	expression tag	UNP P0A6L4
B	-7	GLY	-	expression tag	UNP P0A6L4
B	-6	HIS	-	expression tag	UNP P0A6L4
B	-5	ILE	-	expression tag	UNP P0A6L4
B	-4	GLU	-	expression tag	UNP P0A6L4
B	-3	GLY	-	expression tag	UNP P0A6L4
B	-2	ARG	-	expression tag	UNP P0A6L4
B	-1	HIS	-	expression tag	UNP P0A6L4
B	0	MET	-	expression tag	UNP P0A6L4
B	60	ALA	GLU	engineered mutation	UNP P0A6L4
B	98	HIS	TYR	engineered mutation	UNP P0A6L4
B	115	LEU	PHE	engineered mutation	UNP P0A6L4
B	150	GLY	ASP	engineered mutation	UNP P0A6L4
B	153	TYR	ASN	engineered mutation	UNP P0A6L4
B	251	ILE	VAL	engineered mutation	UNP P0A6L4
B	265	ILE	VAL	engineered mutation	UNP P0A6L4
B	281	CYS	TYR	engineered mutation	UNP P0A6L4
C	-21	MET	-	expression tag	UNP P0A6L4
C	-20	GLY	-	expression tag	UNP P0A6L4
C	-19	HIS	-	expression tag	UNP P0A6L4

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Full wwPDB X-ray Structure Validation Report

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Chain	Residue	Modelled	Actual	Comment	Reference
C	-18	HIS	-	expression tag	UNP P0A6L4
C	-17	HIS	-	expression tag	UNP P0A6L4
C	-16	HIS	-	expression tag	UNP P0A6L4
C	-15	HIS	-	expression tag	UNP P0A6L4
C	-14	HIS	-	expression tag	UNP P0A6L4
C	-13	HIS	-	expression tag	UNP P0A6L4
C	-12	HIS	-	expression tag	UNP P0A6L4
C	-11	HIS	-	expression tag	UNP P0A6L4
C	-10	HIS	-	expression tag	UNP P0A6L4
C	-9	SER	-	expression tag	UNP P0A6L4
C	-8	SER	-	expression tag	UNP P0A6L4
C	-7	GLY	-	expression tag	UNP P0A6L4
C	-6	HIS	-	expression tag	UNP P0A6L4
C	-5	ILE	-	expression tag	UNP P0A6L4
C	-4	GLU	-	expression tag	UNP P0A6L4
C	-3	GLY	-	expression tag	UNP P0A6L4
C	-2	ARG	-	expression tag	UNP P0A6L4
C	-1	HIS	-	expression tag	UNP P0A6L4
C	0	MET	-	expression tag	UNP P0A6L4
C	60	ALA	GLU	engineered mutation	UNP P0A6L4
C	98	HIS	TYR	engineered mutation	UNP P0A6L4
C	115	LEU	PHE	engineered mutation	UNP P0A6L4
C	150	GLY	ASP	engineered mutation	UNP P0A6L4
C	153	TYR	ASN	engineered mutation	UNP P0A6L4
C	251	ILE	VAL	engineered mutation	UNP P0A6L4
C	265	ILE	VAL	engineered mutation	UNP P0A6L4
C	281	CYS	TYR	engineered mutation	UNP P0A6L4
D	-21	MET	-	expression tag	UNP P0A6L4
D	-20	GLY	-	expression tag	UNP P0A6L4
D	-19	HIS	-	expression tag	UNP P0A6L4
D	-18	HIS	-	expression tag	UNP P0A6L4
D	-17	HIS	-	expression tag	UNP P0A6L4
D	-16	HIS	-	expression tag	UNP P0A6L4
D	-15	HIS	-	expression tag	UNP P0A6L4
D	-14	HIS	-	expression tag	UNP P0A6L4
D	-13	HIS	-	expression tag	UNP P0A6L4
D	-12	HIS	-	expression tag	UNP P0A6L4
D	-11	HIS	-	expression tag	UNP P0A6L4
D	-10	HIS	-	expression tag	UNP P0A6L4
D	-9	SER	-	expression tag	UNP P0A6L4
D	-8	SER	-	expression tag	UNP P0A6L4
D	-7	GLY	-	expression tag	UNP P0A6L4

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Chain	Residue	Modelled	Actual	Comment	Reference
D	-6	HIS	-	expression tag	UNP P0A6L4
D	-5	ILE	-	expression tag	UNP P0A6L4
D	-4	GLU	-	expression tag	UNP P0A6L4
D	-3	GLY	-	expression tag	UNP P0A6L4
D	-2	ARG	-	expression tag	UNP P0A6L4
D	-1	HIS	-	expression tag	UNP P0A6L4
D	0	MET	-	expression tag	UNP P0A6L4
D	60	ALA	GLU	engineered mutation	UNP P0A6L4
D	98	HIS	TYR	engineered mutation	UNP P0A6L4
D	115	LEU	PHE	engineered mutation	UNP P0A6L4
D	150	GLY	ASP	engineered mutation	UNP P0A6L4
D	153	TYR	ASN	engineered mutation	UNP P0A6L4
D	251	ILE	VAL	engineered mutation	UNP P0A6L4
D	265	ILE	VAL	engineered mutation	UNP P0A6L4
D	281	CYS	TYR	engineered mutation	UNP P0A6L4

- Molecule 2 is SULFATE ION (three-letter code: SO4) (formula: O_4S).

| Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	A	1	Total 5	O 4	S 1	0	0
2	A	1	Total 5	O 4	S 1	0	0
2	B	1	Total 5	O 4	S 1	0	0
2	B	1	Total 5	O 4	S 1	0	0

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	C	1	Total 5	O 4	S 1	0	0
2	C	1	Total 5	O 4	S 1	0	0
2	D	1	Total 5	O 4	S 1	0	0
2	D	1	Total 5	O 4	S 1	0	0

- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	226	Total 226	O 226	0	0
3	B	174	Total 174	O 174	0	0
3	C	173	Total 173	O 173	0	0
3	D	205	Total 205	O 205	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.
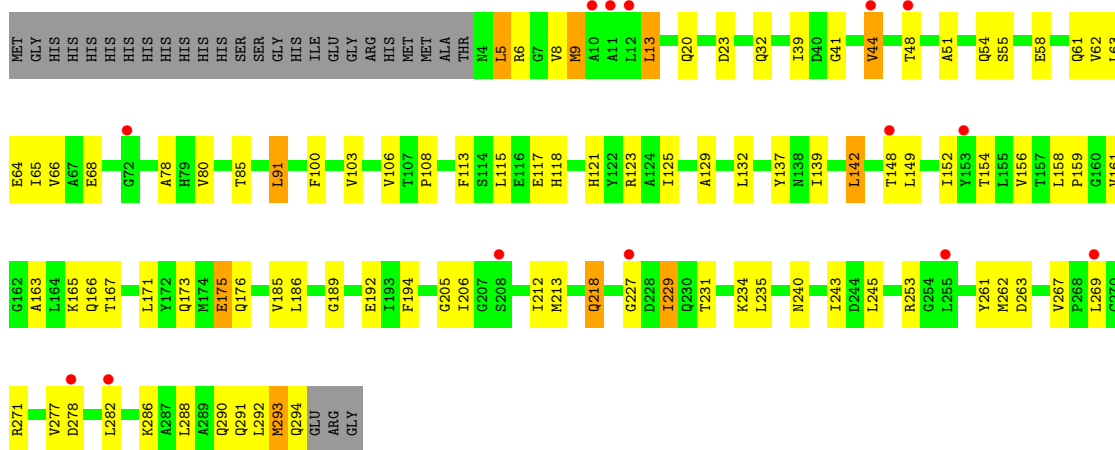
• Molecule 1: N-acetylneuraminate lyase
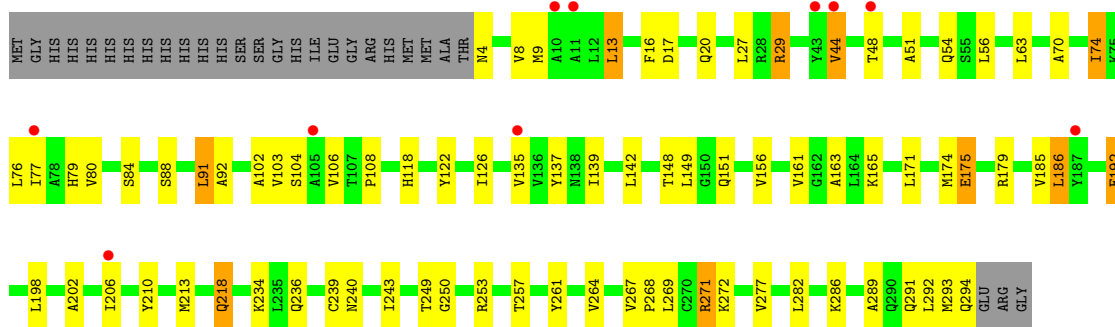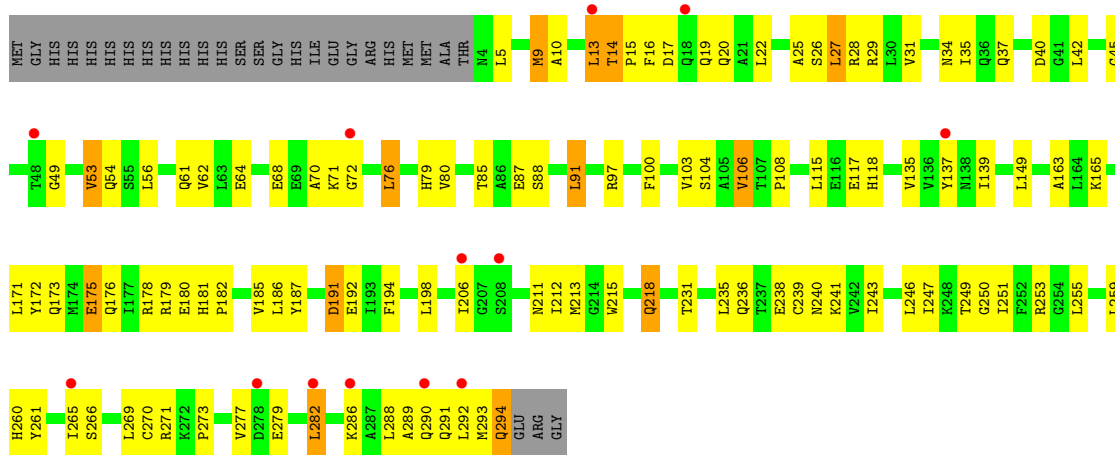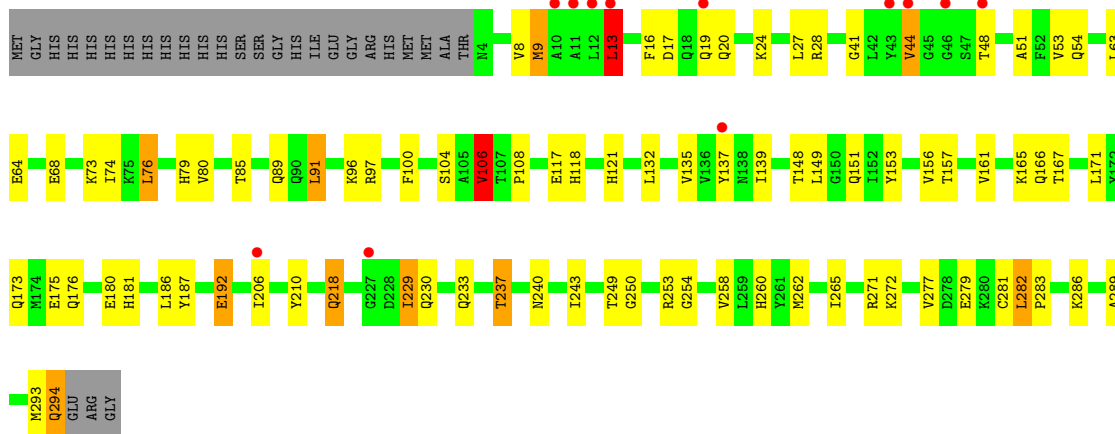

• Molecule 1: N-acetylneuraminate lyase

• Molecule 1: N-acetylneuraminate lyase

• Molecule 1: N-acetylneuraminate lyase

Chain D:

4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 32 2 1	Depositor
Cell constants a, b, c, α, β, γ	120.81Å 120.81Å 196.29Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	30.00 – 1.98 29.85 – 1.98	Depositor EDS
% Data completeness (in resolution range)	88.2 (30.00-1.98) 93.0 (29.85-1.98)	Depositor EDS
R_{merge}	0.05	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	3.23 (at 1.98Å)	Xtriage
Refinement program	CNS	Depositor
R, R_{free}	0.233 , 0.279 0.234 , 0.279	Depositor DCC
R_{free} test set	5790 reflections (5.04%)	wwPDB-VP
Wilson B-factor (Å^2)	40.8	Xtriage
Anisotropy	0.146	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.35 , 61.6	EDS
L-test for twinning[2]	$< \lvert L \rvert > = 0.49, < L^2 > = 0.33$	Xtriage
Estimated twinning fraction	0.019 for -h,-k,l	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	9754	wwPDB-VP
Average B, all atoms (Å^2)	47.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.91% 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 $< \lvert L \rvert >$, $< L^2 >$ 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: SO4

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	0.61	0/2273	0.82	5/3076 (0.2%)
1	B	0.57	1/2273 (0.0%)	0.77	1/3076 (0.0%)
1	C	0.54	1/2273 (0.0%)	0.75	1/3076 (0.0%)
1	D	0.62	0/2273	0.81	3/3076 (0.1%)
All	All	0.59	2/9092 (0.0%)	0.79	10/12304 (0.1%)

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	282	LEU	C-N	7.91	1.49	1.34
1	B	282	LEU	C-N	7.36	1.48	1.34

All (10) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	106	VAL	CB-CA-C	-6.78	98.52	111.40
1	D	13	LEU	CA-CB-CG	6.55	130.36	115.30
1	A	13	LEU	CA-CB-CG	6.50	130.25	115.30
1	A	250	GLY	N-CA-C	-6.47	96.92	113.10
1	D	250	GLY	N-CA-C	-6.26	97.44	113.10
1	A	17	ASP	CB-CG-OD1	6.18	123.86	118.30
1	B	13	LEU	CA-CB-CG	6.06	129.23	115.30
1	A	29	ARG	NE-CZ-NH2	-5.82	117.39	120.30
1	C	250	GLY	N-CA-C	-5.52	99.29	113.10
1	A	271	ARG	NE-CZ-NH1	5.30	122.95	120.30

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts ⓘ

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	2234	0	2270	73	0
1	B	2234	0	2270	77	0
1	C	2234	0	2270	118	0
1	D	2234	0	2270	70	0
2	A	10	0	0	0	0
2	B	10	0	0	0	0
2	C	10	0	0	2	0
2	D	10	0	0	2	0
3	A	226	0	0	2	1
3	B	174	0	0	4	0
3	C	173	0	0	8	0
3	D	205	0	0	5	0
All	All	9754	0	9080	325	1

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 19.

All (325) 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:A:70:ALA:HB1	1:A:74:ILE:HD11	1.35	1.03
1:A:84:SER:HB2	1:D:53:VAL:HG23	1.45	0.96
1:B:5:LEU:HD23	1:B:5:LEU:H	1.31	0.92
1:C:218:GLN:HE21	1:C:218:GLN:HA	1.34	0.92
1:A:218:GLN:HE21	1:A:218:GLN:HA	1.34	0.91
1:A:267:VAL:HG12	1:A:269:LEU:HD23	1.53	0.90
1:C:286:LYS:O	1:C:290:GLN:HG2	1.72	0.90
1:A:192:GLU:HG3	1:A:243:ILE:HG21	1.55	0.89
1:C:79:HIS:HE1	1:C:106:VAL:H	1.21	0.86
1:D:79:HIS:HE1	1:D:106:VAL:H	1.21	0.86
1:A:139:ILE:HD11	1:A:142:LEU:HD22	1.56	0.85
1:B:20:GLN:NE2	1:B:271:ARG:HA	1.91	0.85
1:A:70:ALA:HB1	1:A:74:ILE:CD1	2.06	0.85
1:B:64:GLU:O	1:B:68:GLU:HG3	1.78	0.82
1:C:282:LEU:O	1:C:286:LYS:HG3	1.80	0.81

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:137:TYR:CE1	1:B:165:LYS:HD3	2.15	0.80
1:A:74:ILE:HD13	1:A:74:ILE:H	1.46	0.80
1:C:236:GLN:HE21	1:C:240:ASN:ND2	1.81	0.79
1:C:236:GLN:HE21	1:C:240:ASN:HD21	1.30	0.77
1:B:80:VAL:HG22	1:B:91:LEU:HB3	1.66	0.77
1:C:261:TYR:CE2	1:C:286:LYS:HG2	2.18	0.77
1:C:192:GLU:HG3	1:C:243:ILE:HG21	1.67	0.76
1:D:229:ILE:HD13	1:D:229:ILE:H	1.51	0.76
1:B:218:GLN:HE21	1:B:218:GLN:HA	1.51	0.75
1:A:20:GLN:HE22	1:A:272:LYS:H	1.32	0.74
1:C:22:LEU:HD23	1:C:61:GLN:OE1	1.87	0.73
1:A:218:GLN:HA	1:A:218:GLN:NE2	2.04	0.72
1:B:267:VAL:CG1	1:B:269:LEU:HD23	2.20	0.72
1:C:180:GLU:HG3	3:C:1604:HOH:O	1.89	0.72
1:A:51:ALA:HA	1:A:54:GLN:HE21	1.54	0.72
1:A:79:HIS:HE1	1:A:106:VAL:H	1.38	0.71
1:D:192:GLU:HG3	1:D:243:ILE:HG21	1.71	0.71
1:C:213:MET:HE1	1:C:239:CYS:HA	1.73	0.71
1:B:267:VAL:HG12	1:B:269:LEU:HD23	1.72	0.69
1:A:74:ILE:HD13	1:A:74:ILE:N	2.05	0.69
1:C:291:GLN:O	1:C:294:GLN:HG2	1.91	0.69
1:B:115:LEU:HD12	3:B:1226:HOH:O	1.91	0.69
1:C:20:GLN:HE21	1:C:269:LEU:HD11	1.58	0.69
1:C:218:GLN:HA	1:C:218:GLN:NE2	2.08	0.69
1:D:253:ARG:HD3	1:D:277:VAL:HG22	1.74	0.69
1:C:9:MET:HE2	1:C:40:ASP:HB2	1.74	0.69
1:D:16:PHE:CE2	1:D:271:ARG:HG3	2.27	0.68
1:A:137:TYR:CE1	1:A:165:LYS:HD3	2.28	0.68
1:A:253:ARG:HD3	1:A:277:VAL:HG22	1.75	0.68
1:B:286:LYS:O	1:B:290:GLN:HG2	1.93	0.68
1:D:108:PRO:HD2	1:D:118:HIS:HD2	1.58	0.68
1:A:236:GLN:HE21	1:A:240:ASN:HD21	1.41	0.68
1:A:70:ALA:CB	1:A:74:ILE:HD11	2.20	0.68
1:D:173:GLN:HA	1:D:176:GLN:HE21	1.57	0.68
1:D:229:ILE:HD13	1:D:229:ILE:N	2.08	0.67
1:B:292:LEU:C	1:B:294:GLN:H	1.96	0.67
1:C:53:VAL:O	1:C:53:VAL:HG13	1.94	0.67
1:C:282:LEU:HD12	1:C:282:LEU:N	2.09	0.67
1:D:249:THR:O	1:D:253:ARG:HD2	1.96	0.66
1:C:15:PRO:HB3	1:C:265:ILE:HG23	1.77	0.65
1:B:212:ILE:HD12	1:B:292:LEU:HD11	1.78	0.65

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:108:PRO:HD2	1:A:118:HIS:HD2	1.61	0.65
1:C:137:TYR:CE1	1:C:165:LYS:HD3	2.32	0.64
1:C:80:VAL:HG13	1:C:91:LEU:HB3	1.80	0.64
1:D:13:LEU:HD13	1:D:48:THR:CG2	2.28	0.64
1:D:279:GLU:HA	1:D:282:LEU:HD22	1.80	0.64
1:C:15:PRO:HG3	1:C:265:ILE:CD1	2.28	0.63
1:D:9:MET:HG3	1:D:41:GLY:C	2.18	0.63
1:A:13:LEU:HD13	1:A:48:THR:HG22	1.79	0.63
1:B:5:LEU:HD23	1:B:5:LEU:N	2.09	0.63
1:D:13:LEU:HD13	1:D:48:THR:HG22	1.80	0.63
1:D:96:LYS:HD3	1:D:132:LEU:HD13	1.80	0.63
1:D:289:ALA:O	1:D:293:MET:HG3	1.99	0.63
1:C:236:GLN:NE2	1:C:240:ASN:HD21	1.96	0.63
1:A:192:GLU:CG	1:A:243:ILE:HG21	2.28	0.63
1:C:218:GLN:HE21	1:C:218:GLN:CA	2.09	0.63
1:B:20:GLN:HE22	1:B:271:ARG:HA	1.62	0.63
1:A:267:VAL:CG1	1:A:269:LEU:HD23	2.27	0.62
1:C:31:VAL:O	1:C:35:ILE:HD13	1.99	0.62
1:B:5:LEU:H	1:B:5:LEU:CD2	2.11	0.61
1:C:289:ALA:O	1:C:293:MET:HG3	2.00	0.61
1:D:218:GLN:HE21	1:D:218:GLN:HA	1.64	0.61
1:C:192:GLU:HG3	1:C:243:ILE:HD13	1.82	0.61
1:B:113:PHE:CZ	1:C:273:PRO:HG2	2.35	0.61
1:D:79:HIS:HE1	1:D:106:VAL:N	1.96	0.61
1:A:236:GLN:HE21	1:A:240:ASN:ND2	1.99	0.60
1:C:28:ARG:HD2	3:C:1669:HOH:O	2.01	0.60
1:C:80:VAL:HG13	1:C:91:LEU:CB	2.32	0.60
1:B:115:LEU:HD11	1:B:154:THR:HG21	1.84	0.60
1:C:53:VAL:O	1:C:53:VAL:CG1	2.49	0.60
1:C:70:ALA:O	1:C:72:GLY:N	2.35	0.60
1:A:149:LEU:HD23	1:A:149:LEU:O	2.01	0.60
1:D:272:LYS:HE3	3:D:1697:HOH:O	2.02	0.60
1:B:262:MET:O	1:B:263:ASP:HB2	2.02	0.59
1:C:192:GLU:CG	1:C:243:ILE:HG21	2.30	0.59
1:A:171:LEU:HD12	1:C:171:LEU:HD12	1.84	0.59
1:C:282:LEU:H	1:C:282:LEU:CD1	2.15	0.59
1:A:240:ASN:OD1	1:C:175:GLU:HG2	2.02	0.59
1:C:261:TYR:CD2	1:C:286:LYS:HA	2.38	0.59
1:C:282:LEU:HD12	1:C:282:LEU:H	1.66	0.59
1:D:80:VAL:HB	1:D:91:LEU:HB3	1.85	0.59
1:C:243:ILE:O	1:C:247:ILE:HG12	2.02	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:108:PRO:HD2	1:A:118:HIS:CD2	2.37	0.58
1:A:13:LEU:HD13	1:A:48:THR:CG2	2.33	0.58
1:C:9:MET:CE	1:C:40:ASP:HB2	2.32	0.58
1:A:20:GLN:HB3	1:A:271:ARG:HD2	1.85	0.58
1:B:171:LEU:HD12	1:D:171:LEU:HD12	1.84	0.58
1:D:229:ILE:H	1:D:229:ILE:CD1	2.16	0.58
1:C:25:ALA:C	1:C:29:ARG:HH21	2.07	0.58
1:A:79:HIS:HE1	1:A:106:VAL:N	2.01	0.57
1:B:192:GLU:HG3	1:B:243:ILE:HG21	1.86	0.57
1:C:97:ARG:NH1	2:C:1798:SO4:S	2.77	0.57
1:C:165:LYS:HE2	1:C:206:ILE:HG21	1.85	0.57
1:D:51:ALA:HA	1:D:54:GLN:HE21	1.69	0.57
1:C:20:GLN:HG2	1:C:269:LEU:HD21	1.87	0.57
1:A:291:GLN:HG3	1:A:292:LEU:N	2.18	0.57
1:A:8:VAL:HG13	1:A:210:TYR:CE2	2.39	0.57
1:B:115:LEU:HD13	1:B:115:LEU:C	2.25	0.57
1:C:97:ARG:NH2	3:C:1590:HOH:O	2.38	0.57
1:C:108:PRO:HD2	1:C:118:HIS:HD2	1.70	0.56
1:D:108:PRO:HD2	1:D:118:HIS:CD2	2.39	0.56
1:C:182:PRO:HB3	3:C:1720:HOH:O	2.05	0.56
1:C:173:GLN:HA	1:C:176:GLN:HE21	1.71	0.56
1:D:258:VAL:O	1:D:262:MET:HG3	2.06	0.56
1:B:137:TYR:CD1	1:B:165:LYS:HD3	2.40	0.56
1:C:26:SER:N	1:C:29:ARG:HH21	2.03	0.56
1:D:192:GLU:HA	1:D:240:ASN:HD21	1.71	0.55
1:C:294:GLN:HG3	1:C:294:GLN:O	2.05	0.55
1:D:281:CYS:SG	3:D:1546:HOH:O	2.58	0.55
1:A:139:ILE:CD1	1:A:142:LEU:HD22	2.31	0.55
1:B:108:PRO:HD2	1:B:118:HIS:HD2	1.71	0.55
1:B:156:VAL:HA	1:B:161:VAL:HG11	1.87	0.55
1:A:106:VAL:HA	1:A:137:TYR:HB3	1.88	0.55
1:A:122:TYR:O	1:A:126:ILE:HG13	2.07	0.55
1:B:9:MET:O	1:B:206:ILE:HA	2.07	0.55
1:A:84:SER:CB	1:D:53:VAL:HG23	2.27	0.55
1:B:9:MET:HG3	1:B:41:GLY:C	2.28	0.55
1:C:56:LEU:HD11	1:C:87:GLU:HG2	1.89	0.55
1:B:229:ILE:C	1:B:229:ILE:HD13	2.28	0.55
1:A:148:THR:OG1	1:A:151:GLN:HG3	2.06	0.54
1:C:165:LYS:HE2	1:C:206:ILE:CG2	2.36	0.54
1:C:163:ALA:HB2	1:C:185:VAL:HB	1.88	0.54
1:D:85:THR:OG1	1:D:121:HIS:HD2	1.91	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:96:LYS:HD3	1:D:132:LEU:CD1	2.37	0.54
1:B:175:GLU:HG2	1:D:240:ASN:OD1	2.08	0.54
1:C:80:VAL:CG1	1:C:88:SER:O	2.55	0.54
1:B:227:GLY:HA2	1:D:229:ILE:HD12	1.89	0.54
1:D:253:ARG:HG3	1:D:254:GLY:N	2.23	0.54
1:A:20:GLN:HE22	1:A:272:LYS:N	2.03	0.53
1:B:8:VAL:HG12	1:B:39:ILE:HD11	1.89	0.53
1:D:180:GLU:HG3	3:D:1175:HOH:O	2.09	0.53
1:D:181:HIS:HE1	3:D:1046:HOH:O	1.91	0.53
1:B:13:LEU:HD13	1:B:48:THR:HG22	1.90	0.53
1:D:121:HIS:HE1	3:D:1396:HOH:O	1.91	0.53
1:C:288:LEU:HA	1:C:291:GLN:HG2	1.90	0.53
1:A:149:LEU:HD21	3:A:1302:HOH:O	2.08	0.53
1:B:261:TYR:CD2	1:B:286:LYS:HA	2.44	0.53
1:C:282:LEU:N	1:C:282:LEU:CD1	2.72	0.53
1:D:97:ARG:NH1	2:D:1796:SO4:S	2.81	0.53
1:D:79:HIS:CE1	1:D:106:VAL:H	2.12	0.53
1:C:175:GLU:OE2	1:C:179:ARG:NH2	2.38	0.53
1:D:97:ARG:NH1	2:D:1796:SO4:O1	2.42	0.52
1:A:249:THR:O	1:A:253:ARG:HD2	2.10	0.52
1:A:289:ALA:O	1:A:293:MET:HG3	2.09	0.52
1:C:14:THR:CG2	1:C:49:GLY:O	2.57	0.52
1:C:247:ILE:HD13	1:C:251:ILE:HD11	1.92	0.52
1:C:20:GLN:NE2	1:C:269:LEU:HD11	2.25	0.52
1:C:137:TYR:CD1	1:C:165:LYS:HD3	2.44	0.52
1:A:137:TYR:CD1	1:A:165:LYS:HD3	2.45	0.52
1:B:117:GLU:OE2	1:C:253:ARG:NH2	2.42	0.52
1:B:231:THR:O	1:B:235:LEU:HG	2.10	0.52
1:A:56:LEU:HD22	1:A:91:LEU:HD22	1.91	0.52
1:A:4:ASN:HB2	3:A:1249:HOH:O	2.09	0.52
1:A:74:ILE:CD1	1:A:74:ILE:N	2.73	0.51
1:D:53:VAL:O	1:D:53:VAL:HG22	2.09	0.51
1:B:253:ARG:NH2	1:C:117:GLU:OE2	2.43	0.51
1:C:14:THR:HG21	1:C:54:GLN:HE22	1.76	0.51
1:B:23:ASP:OD1	1:B:23:ASP:C	2.49	0.51
1:B:173:GLN:HA	1:B:176:GLN:HE21	1.76	0.51
1:D:139:ILE:O	1:D:139:ILE:HG23	2.11	0.51
1:B:294:GLN:O	1:B:294:GLN:HG3	2.10	0.51
1:B:13:LEU:HD13	1:B:48:THR:CG2	2.41	0.50
1:C:25:ALA:HA	3:C:1669:HOH:O	2.11	0.50
1:B:61:GLN:O	1:B:65:ILE:HD12	2.12	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:106:VAL:HA	1:B:137:TYR:HB3	1.94	0.50
1:A:253:ARG:NH2	1:D:117:GLU:OE2	2.45	0.50
1:B:108:PRO:HD2	1:B:118:HIS:CD2	2.47	0.50
1:A:257:THR:HG22	1:A:261:TYR:CE2	2.47	0.50
1:B:292:LEU:C	1:B:294:GLN:N	2.63	0.49
1:C:212:ILE:HG13	1:C:213:MET:HG2	1.93	0.49
1:C:246:LEU:HD13	1:C:255:LEU:HD21	1.94	0.49
1:B:5:LEU:N	1:B:5:LEU:CD2	2.73	0.49
1:B:148:THR:O	1:B:152:ILE:HG13	2.11	0.49
1:D:44:VAL:HG22	1:D:63:LEU:HD23	1.94	0.49
1:C:15:PRO:HG3	1:C:265:ILE:HD13	1.94	0.49
1:A:84:SER:HB2	1:D:53:VAL:CG2	2.31	0.49
1:D:104:SER:HB2	1:D:135:VAL:HB	1.93	0.49
1:D:137:TYR:CE1	1:D:165:LYS:HD3	2.47	0.49
1:B:212:ILE:HG13	1:B:213:MET:HG2	1.94	0.49
1:C:247:ILE:CD1	1:C:251:ILE:HD11	2.42	0.49
1:B:277:VAL:HG12	1:B:278:ASP:N	2.28	0.49
1:C:25:ALA:CB	1:C:29:ARG:HH21	2.26	0.49
1:C:192:GLU:CD	1:C:192:GLU:H	2.16	0.49
1:B:159:PRO:HG2	3:B:1533:HOH:O	2.13	0.49
1:B:55:SER:OG	1:B:58:GLU:HG3	2.13	0.49
1:B:292:LEU:O	1:B:294:GLN:N	2.43	0.49
1:B:129:ALA:O	1:B:132:LEU:HD13	2.13	0.48
1:C:19:GLN:CD	1:C:19:GLN:N	2.66	0.48
1:C:106:VAL:HG13	1:C:137:TYR:CD2	2.48	0.48
1:B:85:THR:OG1	1:B:121:HIS:HD2	1.96	0.48
1:B:152:ILE:O	1:B:156:VAL:HG22	2.13	0.48
1:C:64:GLU:O	1:C:68:GLU:HG3	2.12	0.48
1:C:49:GLY:O	1:C:54:GLN:NE2	2.47	0.48
1:D:282:LEU:N	1:D:283:PRO:HD2	2.28	0.48
1:A:80:VAL:HG21	1:A:92:ALA:HA	1.96	0.48
1:A:293:MET:O	1:A:294:GLN:HB2	2.12	0.48
1:B:291:GLN:O	1:B:294:GLN:HB3	2.14	0.47
1:D:260:HIS:HD2	1:D:265:ILE:O	1.97	0.47
1:A:103:VAL:CG1	1:A:104:SER:N	2.78	0.47
1:A:218:GLN:HE21	1:A:218:GLN:CA	2.09	0.47
1:A:261:TYR:CE2	1:A:286:LYS:HG2	2.50	0.47
1:A:149:LEU:HD23	1:A:149:LEU:C	2.35	0.47
1:B:245:LEU:HD23	1:B:288:LEU:HD22	1.97	0.47
1:A:44:VAL:HG22	1:A:63:LEU:HD23	1.96	0.47
1:A:80:VAL:HG22	1:A:91:LEU:HB3	1.97	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:167:THR:HA	1:B:189:GLY:HA3	1.97	0.47
1:C:45:GLY:O	1:C:79:HIS:HD2	1.97	0.47
1:C:103:VAL:CG1	1:C:104:SER:N	2.77	0.47
1:B:78:ALA:HB2	1:B:100:PHE:CD2	2.50	0.46
1:B:121:HIS:HE1	3:B:1416:HOH:O	1.97	0.46
1:C:261:TYR:CZ	1:C:286:LYS:HG2	2.50	0.46
1:D:156:VAL:HA	1:D:161:VAL:HG11	1.96	0.46
1:D:9:MET:O	1:D:206:ILE:HA	2.16	0.46
1:D:229:ILE:N	1:D:229:ILE:CD1	2.77	0.46
1:B:212:ILE:HD12	1:B:292:LEU:CD1	2.45	0.46
1:C:9:MET:O	1:C:206:ILE:HA	2.14	0.46
1:C:27:LEU:HD11	1:C:62:VAL:HG13	1.97	0.46
1:A:9:MET:O	1:A:206:ILE:HA	2.16	0.46
1:B:51:ALA:HA	1:B:54:GLN:HE21	1.80	0.46
1:B:192:GLU:HA	1:B:240:ASN:HD21	1.81	0.46
1:C:194:PHE:CE2	1:C:198:LEU:HD11	2.51	0.46
1:D:148:THR:OG1	1:D:151:GLN:HG3	2.15	0.46
1:C:135:VAL:HG22	1:C:163:ALA:HB3	1.98	0.46
1:C:279:GLU:O	1:C:282:LEU:HD13	2.14	0.46
1:B:121:HIS:CE1	1:B:125:ILE:HD11	2.51	0.46
1:C:240:ASN:N	1:C:240:ASN:HD22	2.14	0.46
1:D:20:GLN:HB3	1:D:271:ARG:HD2	1.98	0.46
1:B:163:ALA:HB2	1:B:185:VAL:HB	1.98	0.45
1:C:249:THR:O	1:C:253:ARG:HD2	2.15	0.45
1:C:238:GLU:OE2	1:C:241:LYS:NZ	2.49	0.45
1:A:253:ARG:HD3	1:A:277:VAL:CG2	2.46	0.45
1:B:139:ILE:HD11	1:B:142:LEU:HD22	1.97	0.45
1:D:17:ASP:OD1	1:D:19:GLN:N	2.48	0.45
1:D:165:LYS:HA	1:D:187:TYR:HB2	1.99	0.45
1:B:20:GLN:HB3	1:B:271:ARG:HD2	1.99	0.45
1:C:253:ARG:HD3	1:C:277:VAL:HG22	1.98	0.45
1:D:41:GLY:HA2	1:D:74:ILE:HB	1.98	0.45
1:C:139:ILE:HG23	1:C:139:ILE:O	2.16	0.45
1:C:269:LEU:HD12	1:C:270:CYS:O	2.17	0.45
1:C:231:THR:O	1:C:235:LEU:HG	2.17	0.45
1:D:85:THR:O	1:D:89:GLN:HG3	2.17	0.45
1:D:139:ILE:HD12	1:D:167:THR:HG21	1.99	0.45
1:A:156:VAL:HA	1:A:161:VAL:HG11	1.98	0.44
1:A:213:MET:HE1	1:A:239:CYS:HA	1.99	0.44
1:D:230:GLN:HA	1:D:230:GLN:HE21	1.82	0.44
1:D:76:LEU:HB3	1:D:100:PHE:CD2	2.52	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:233:GLN:O	1:D:237:THR:HG23	2.18	0.44
1:A:91:LEU:HD12	1:A:91:LEU:HA	1.92	0.44
1:B:139:ILE:HG23	1:B:139:ILE:O	2.17	0.44
1:D:153:TYR:O	1:D:157:THR:HG23	2.18	0.44
1:C:13:LEU:CD2	1:C:211:ASN:ND2	2.81	0.44
1:C:106:VAL:HA	1:C:137:TYR:HB3	1.99	0.44
1:C:215:TRP:CZ2	1:C:292:LEU:HD12	2.52	0.44
1:B:123:ARG:NH2	3:B:1218:HOH:O	2.51	0.44
1:D:64:GLU:O	1:D:68:GLU:HG3	2.18	0.43
1:C:16:PHE:CE1	1:C:271:ARG:HD3	2.54	0.43
1:D:24:LYS:O	1:D:28:ARG:HG3	2.18	0.43
1:D:230:GLN:HA	1:D:230:GLN:NE2	2.34	0.43
1:A:80:VAL:CG1	1:A:88:SER:O	2.66	0.43
1:C:212:ILE:HG22	1:C:259:LEU:CD2	2.49	0.43
1:A:198:LEU:HA	1:A:202:ALA:HB3	2.01	0.43
1:A:282:LEU:HD23	1:A:282:LEU:HA	1.80	0.43
1:B:32:GLN:HA	1:B:32:GLN:NE2	2.33	0.43
1:B:218:GLN:HA	1:B:218:GLN:NE2	2.28	0.43
1:D:8:VAL:HG13	1:D:210:TYR:CE2	2.53	0.43
1:C:25:ALA:HB3	1:C:29:ARG:NH2	2.34	0.43
1:C:79:HIS:CE1	1:C:106:VAL:H	2.14	0.43
1:B:192:GLU:HG3	1:B:243:ILE:HD13	2.00	0.43
1:A:135:VAL:HG22	1:A:163:ALA:HB3	2.00	0.43
1:C:10:ALA:HB3	1:C:42:LEU:CD2	2.49	0.43
1:C:97:ARG:NH1	2:C:1798:SO4:O3	2.52	0.43
1:D:167:THR:HG22	1:D:167:THR:O	2.19	0.43
1:B:165:LYS:HE2	1:B:206:ILE:HB	2.00	0.42
1:C:181:HIS:HE1	3:C:1336:HOH:O	2.01	0.42
1:C:191:ASP:OD1	1:C:191:ASP:N	2.52	0.42
1:B:194:PHE:HE1	1:B:205:GLY:HA3	1.84	0.42
1:C:13:LEU:HD23	1:C:211:ASN:ND2	2.34	0.42
1:C:14:THR:HG23	1:C:49:GLY:O	2.19	0.42
1:A:163:ALA:HB2	1:A:185:VAL:HB	2.00	0.42
1:C:10:ALA:HB3	1:C:42:LEU:HD23	2.00	0.42
1:C:85:THR:O	1:C:88:SER:HB2	2.18	0.42
1:C:260:HIS:HD2	1:C:266:SER:O	2.02	0.42
1:C:163:ALA:CB	1:C:185:VAL:HB	2.49	0.42
1:C:259:LEU:HD23	1:C:259:LEU:HA	1.83	0.42
1:A:16:PHE:CE2	1:A:271:ARG:HG3	2.54	0.42
1:A:20:GLN:NE2	1:A:271:ARG:HA	2.35	0.42
1:D:230:GLN:HE21	1:D:230:GLN:CA	2.33	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:44:VAL:CG2	1:B:63:LEU:HD23	2.49	0.42
1:B:132:LEU:HD12	1:B:132:LEU:N	2.35	0.41
1:C:212:ILE:HG22	1:C:259:LEU:HD21	2.02	0.41
1:A:77:ILE:HG12	1:A:102:ALA:HB3	2.01	0.41
1:C:28:ARG:NH2	3:C:1670:HOH:O	2.44	0.41
1:B:8:VAL:HG12	1:B:39:ILE:CD1	2.50	0.41
1:B:62:VAL:O	1:B:66:VAL:HG12	2.20	0.41
1:D:294:GLN:CG	1:D:294:GLN:O	2.68	0.41
1:C:15:PRO:HB3	1:C:265:ILE:CG2	2.46	0.41
1:B:121:HIS:O	1:B:125:ILE:HG13	2.21	0.41
1:C:28:ARG:NE	3:C:1670:HOH:O	2.40	0.41
1:A:103:VAL:HG12	1:A:104:SER:N	2.35	0.41
1:C:17:ASP:O	1:C:269:LEU:HD23	2.20	0.41
1:C:76:LEU:HB3	1:C:100:PHE:CD2	2.56	0.41
1:D:104:SER:CB	1:D:135:VAL:HB	2.51	0.41
1:A:174:MET:SD	1:A:186:LEU:HD13	2.61	0.40
1:A:29:ARG:HD2	1:A:264:VAL:O	2.21	0.40
1:A:192:GLU:HB3	1:C:172:TYR:CD1	2.56	0.40
1:C:165:LYS:HA	1:C:187:TYR:HB2	2.02	0.40
1:C:178:ARG:HA	1:C:178:ARG:HD3	1.94	0.40
1:C:213:MET:HE1	1:C:239:CYS:CA	2.48	0.40
1:A:175:GLU:OE2	1:A:179:ARG:NH2	2.46	0.40
1:C:34:ASN:HA	1:C:37:GLN:HE21	1.85	0.40

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:1786:HOH:O	3:A:1786:HOH:O[4_555]	1.66	0.54

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	289/319 (91%)	285 (99%)	4 (1%)	0	100	100
1	B	289/319 (91%)	281 (97%)	7 (2%)	1 (0%)	41	29
1	C	289/319 (91%)	275 (95%)	13 (4%)	1 (0%)	41	29
1	D	289/319 (91%)	283 (98%)	6 (2%)	0	100	100
All	All	1156/1276 (91%)	1124 (97%)	30 (3%)	2 (0%)	47	38

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	71	LYS
1	B	293	MET

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	238/261 (91%)	227 (95%)	11 (5%)	27	14
1	B	238/261 (91%)	222 (93%)	16 (7%)	16	6
1	C	238/261 (91%)	222 (93%)	16 (7%)	16	6
1	D	238/261 (91%)	219 (92%)	19 (8%)	12	3
All	All	952/1044 (91%)	890 (94%)	62 (6%)	17	7

All (62) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	27	LEU
1	A	44	VAL
1	A	74	ILE
1	A	76	LEU
1	A	91	LEU
1	A	175	GLU
1	A	186	LEU
1	A	192	GLU
1	A	218	GLN

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Mol	Chain	Res	Type
1	A	234	LYS
1	A	268	PRO
1	B	5	LEU
1	B	6	ARG
1	B	9	MET
1	B	44	VAL
1	B	91	LEU
1	B	103	VAL
1	B	142	LEU
1	B	149	LEU
1	B	158	LEU
1	B	166	GLN
1	B	175	GLU
1	B	186	LEU
1	B	218	GLN
1	B	229	ILE
1	B	234	LYS
1	B	293	MET
1	C	5	LEU
1	C	9	MET
1	C	13	LEU
1	C	14	THR
1	C	27	LEU
1	C	53	VAL
1	C	76	LEU
1	C	91	LEU
1	C	106	VAL
1	C	115	LEU
1	C	149	LEU
1	C	175	GLU
1	C	186	LEU
1	C	191	ASP
1	C	218	GLN
1	C	294	GLN
1	D	9	MET
1	D	13	LEU
1	D	27	LEU
1	D	44	VAL
1	D	73	LYS
1	D	76	LEU
1	D	91	LEU
1	D	106	VAL

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Mol	Chain	Res	Type
1	D	149	LEU
1	D	166	GLN
1	D	175	GLU
1	D	186	LEU
1	D	192	GLU
1	D	218	GLN
1	D	229	ILE
1	D	237	THR
1	D	282	LEU
1	D	286	LYS
1	D	294	GLN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (57) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	18	GLN
1	A	20	GLN
1	A	54	GLN
1	A	61	GLN
1	A	79	HIS
1	A	90	GLN
1	A	118	HIS
1	A	138	ASN
1	A	166	GLN
1	A	218	GLN
1	A	240	ASN
1	B	18	GLN
1	B	20	GLN
1	B	32	GLN
1	B	37	GLN
1	B	54	GLN
1	B	61	GLN
1	B	90	GLN
1	B	98	HIS
1	B	118	HIS
1	B	121	HIS
1	B	138	ASN
1	B	166	GLN
1	B	176	GLN
1	B	218	GLN
1	B	230	GLN
1	B	240	ASN

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Mol	Chain	Res	Type
1	B	260	HIS
1	B	294	GLN
1	C	18	GLN
1	C	20	GLN
1	C	37	GLN
1	C	54	GLN
1	C	79	HIS
1	C	118	HIS
1	C	176	GLN
1	C	218	GLN
1	C	240	ASN
1	C	260	HIS
1	C	291	GLN
1	C	294	GLN
1	D	4	ASN
1	D	18	GLN
1	D	54	GLN
1	D	79	HIS
1	D	90	GLN
1	D	118	HIS
1	D	121	HIS
1	D	138	ASN
1	D	166	GLN
1	D	176	GLN
1	D	218	GLN
1	D	230	GLN
1	D	240	ASN
1	D	260	HIS
1	D	290	GLN
1	D	294	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 ⓘ

8 ligands are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#|Z| > 2	Counts	RMSZ	#|Z| > 2
2	SO4	D	1796	-	4,4,4	0.36	0	6,6,6	0.19	0
2	SO4	D	1792	-	4,4,4	0.40	0	6,6,6	0.24	0
2	SO4	A	1791	-	4,4,4	0.25	0	6,6,6	0.17	0
2	SO4	C	1794	-	4,4,4	0.28	0	6,6,6	0.32	0
2	SO4	B	1797	-	4,4,4	0.20	0	6,6,6	0.24	0
2	SO4	A	1795	-	4,4,4	0.20	0	6,6,6	0.14	0
2	SO4	C	1798	-	4,4,4	0.26	0	6,6,6	0.15	0
2	SO4	B	1793	-	4,4,4	0.27	0	6,6,6	0.25	0

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

2 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	D	1796	SO4	2	0
2	C	1798	SO4	2	0

5.7 Other polymers ⓘ

There are no such residues in this entry.

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

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	291/319 (91%)	0.01	10 (3%)	45	48	30, 41, 57, 72	16 (5%)
1	B	291/319 (91%)	0.23	14 (4%)	30	32	36, 47, 66, 83	16 (5%)
1	C	291/319 (91%)	0.25	13 (4%)	33	35	36, 51, 72, 94	16 (5%)
1	D	291/319 (91%)	-0.04	12 (4%)	37	39	27, 40, 56, 68	13 (4%)
All	All	1164/1276 (91%)	0.11	49 (4%)	36	38	27, 45, 66, 94	61 (5%)

All (49) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	227	GLY	4.1
1	B	48	THR	3.8
1	B	153	TYR	3.8
1	B	72	GLY	3.6
1	C	206	ILE	3.2
1	D	13	LEU	3.1
1	B	12	LEU	3.1
1	C	290	GLN	3.1
1	A	44	VAL	3.0
1	D	206	ILE	3.0
1	B	11	ALA	3.0
1	D	48	THR	3.0
1	C	72	GLY	2.9
1	C	13	LEU	2.9
1	C	282	LEU	2.9
1	A	206	ILE	2.9
1	C	18	GLN	2.9
1	D	11	ALA	2.9
1	B	255	LEU	2.7
1	B	208	SER	2.7
1	B	10	ALA	2.7

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Mol	Chain	Res	Type	RSRZ
1	C	278	ASP	2.6
1	A	43	TYR	2.6
1	B	278	ASP	2.6
1	A	11	ALA	2.6
1	D	46	GLY	2.5
1	A	105	ALA	2.5
1	B	269	LEU	2.4
1	A	10	ALA	2.4
1	D	19	GLN	2.4
1	A	77	ILE	2.4
1	C	292	LEU	2.4
1	D	12	LEU	2.4
1	C	208	SER	2.4
1	D	44	VAL	2.4
1	B	282	LEU	2.3
1	C	48	THR	2.3
1	D	227	GLY	2.3
1	D	10	ALA	2.2
1	A	187	TYR	2.1
1	C	137	TYR	2.1
1	D	43	TYR	2.1
1	A	135	VAL	2.1
1	A	48	THR	2.1
1	B	148	THR	2.1
1	C	265	ILE	2.1
1	D	137	TYR	2.1
1	B	44	VAL	2.1
1	C	286	LYS	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
2	SO4	C	1798	5/5	0.94	0.15	55,55,57,58	5
2	SO4	B	1797	5/5	0.95	0.10	58,58,59,59	5
2	SO4	D	1796	5/5	0.97	0.07	46,47,49,51	0
2	SO4	A	1795	5/5	0.98	0.09	49,50,51,51	5
2	SO4	C	1794	5/5	0.98	0.19	49,50,52,54	0
2	SO4	A	1791	5/5	0.99	0.10	35,35,40,40	0
2	SO4	D	1792	5/5	0.99	0.15	36,39,40,42	0
2	SO4	B	1793	5/5	0.99	0.16	46,46,49,50	0

6.5 Other polymers ⓘ

There are no such residues in this entry.