



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 6, 2026 – 02:50 AM UTC

PDB ID : 2XCI / pdb_00002xci
Title : Membrane-embedded monofunctional glycosyltransferase WaaA of Aquifex aeolicus, substrate-free form
Authors : Schmidt, H.; Hansen, G.; Hilgenfeld, R.; Mamat, U.; Mesters, J.R.
Deposited on : 2010-04-26
Resolution : 2.00 Å(reported)

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

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

MolProbity : 4-5-2 with Phenix2.0
Mogul : 2022.3.0, CSD as543be (2022)
Xtriage (Phenix) : 2.0
EDS : 3.0
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

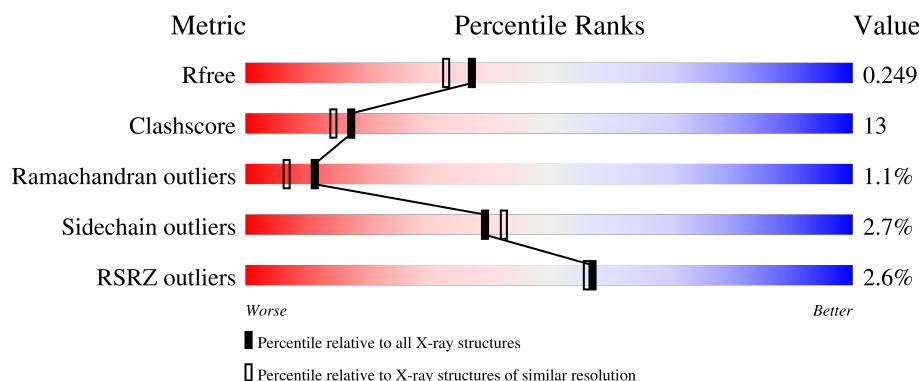
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.00 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	10052 (2.00-2.00)
Clashscore	190562	11152 (2.00-2.00)
Ramachandran outliers	187476	11031 (2.00-2.00)
Sidechain outliers	187428	11029 (2.00-2.00)
RSRZ outliers	180081	10067 (2.00-2.00)

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	374	 2% 69% 23% • 5%
1	B	374	 2% 72% 20% • 6%
1	C	374	 3% 70% 21% • 6%
1	D	374	 2% 77% 15% • 6%

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	PG4	D	1353	-	-	X	-
3	GOL	A	1356	-	-	X	-
3	GOL	A	1357	-	-	X	-
3	GOL	C	1353	-	-	X	-
3	GOL	C	1354	-	-	X	-
6	BME	C	1356	-	-	X	-

2 Entry composition

There are 7 unique types of molecules in this entry. The entry contains 11857 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 3-DEOXY-D-MANNO-2-OCTULOSONIC ACID TRANSFERASE.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	354	Total	C	N	O	S	0	0	0
			2888	1899	482	499	8			
1	B	352	Total	C	N	O	S	0	0	0
			2867	1887	475	497	8			
1	C	353	Total	C	N	O	S	0	0	0
			2877	1893	478	498	8			
1	D	352	Total	C	N	O	S	0	0	0
			2867	1887	475	497	8			

There are 84 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-20	MET	-	expression tag	UNP O66663
A	-19	GLY	-	expression tag	UNP O66663
A	-18	HIS	-	expression tag	UNP O66663
A	-17	HIS	-	expression tag	UNP O66663
A	-16	HIS	-	expression tag	UNP O66663
A	-15	HIS	-	expression tag	UNP O66663
A	-14	HIS	-	expression tag	UNP O66663
A	-13	HIS	-	expression tag	UNP O66663
A	-12	HIS	-	expression tag	UNP O66663
A	-11	HIS	-	expression tag	UNP O66663
A	-10	HIS	-	expression tag	UNP O66663
A	-9	HIS	-	expression tag	UNP O66663
A	-8	SER	-	expression tag	UNP O66663
A	-7	SER	-	expression tag	UNP O66663
A	-6	GLY	-	expression tag	UNP O66663
A	-5	HIS	-	expression tag	UNP O66663
A	-4	ILE	-	expression tag	UNP O66663
A	-3	GLU	-	expression tag	UNP O66663
A	-2	GLY	-	expression tag	UNP O66663
A	-1	ARG	-	expression tag	UNP O66663

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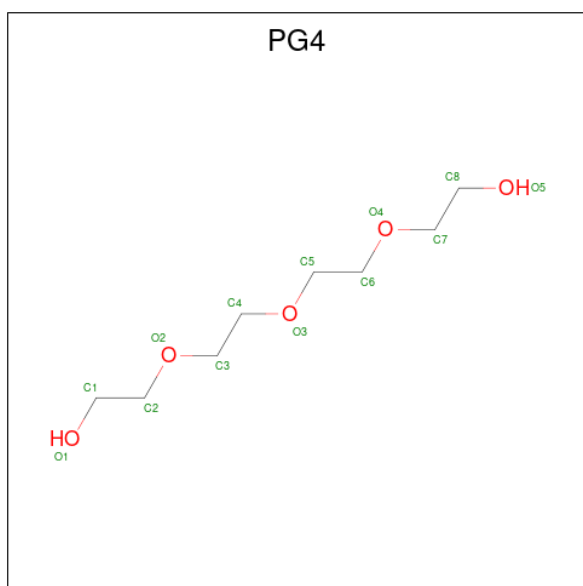
Chain	Residue	Modelled	Actual	Comment	Reference
A	0	HIS	-	expression tag	UNP O66663
B	-20	MET	-	expression tag	UNP O66663
B	-19	GLY	-	expression tag	UNP O66663
B	-18	HIS	-	expression tag	UNP O66663
B	-17	HIS	-	expression tag	UNP O66663
B	-16	HIS	-	expression tag	UNP O66663
B	-15	HIS	-	expression tag	UNP O66663
B	-14	HIS	-	expression tag	UNP O66663
B	-13	HIS	-	expression tag	UNP O66663
B	-12	HIS	-	expression tag	UNP O66663
B	-11	HIS	-	expression tag	UNP O66663
B	-10	HIS	-	expression tag	UNP O66663
B	-9	HIS	-	expression tag	UNP O66663
B	-8	SER	-	expression tag	UNP O66663
B	-7	SER	-	expression tag	UNP O66663
B	-6	GLY	-	expression tag	UNP O66663
B	-5	HIS	-	expression tag	UNP O66663
B	-4	ILE	-	expression tag	UNP O66663
B	-3	GLU	-	expression tag	UNP O66663
B	-2	GLY	-	expression tag	UNP O66663
B	-1	ARG	-	expression tag	UNP O66663
B	0	HIS	-	expression tag	UNP O66663
C	-20	MET	-	expression tag	UNP O66663
C	-19	GLY	-	expression tag	UNP O66663
C	-18	HIS	-	expression tag	UNP O66663
C	-17	HIS	-	expression tag	UNP O66663
C	-16	HIS	-	expression tag	UNP O66663
C	-15	HIS	-	expression tag	UNP O66663
C	-14	HIS	-	expression tag	UNP O66663
C	-13	HIS	-	expression tag	UNP O66663
C	-12	HIS	-	expression tag	UNP O66663
C	-11	HIS	-	expression tag	UNP O66663
C	-10	HIS	-	expression tag	UNP O66663
C	-9	HIS	-	expression tag	UNP O66663
C	-8	SER	-	expression tag	UNP O66663
C	-7	SER	-	expression tag	UNP O66663
C	-6	GLY	-	expression tag	UNP O66663
C	-5	HIS	-	expression tag	UNP O66663
C	-4	ILE	-	expression tag	UNP O66663
C	-3	GLU	-	expression tag	UNP O66663
C	-2	GLY	-	expression tag	UNP O66663
C	-1	ARG	-	expression tag	UNP O66663

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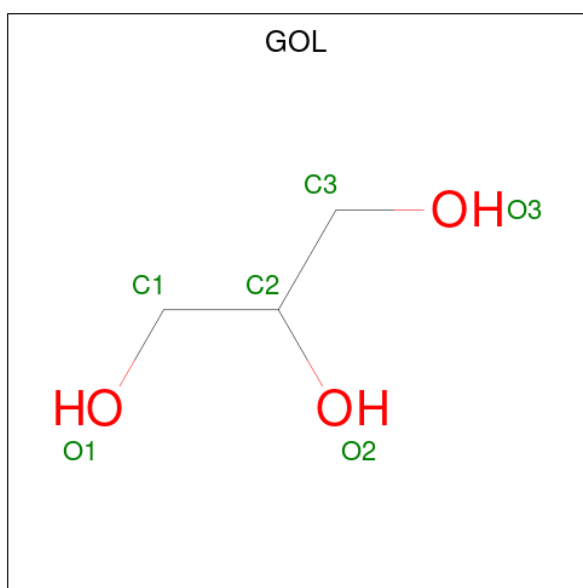
Chain	Residue	Modelled	Actual	Comment	Reference
C	0	HIS	-	expression tag	UNP O66663
D	-20	MET	-	expression tag	UNP O66663
D	-19	GLY	-	expression tag	UNP O66663
D	-18	HIS	-	expression tag	UNP O66663
D	-17	HIS	-	expression tag	UNP O66663
D	-16	HIS	-	expression tag	UNP O66663
D	-15	HIS	-	expression tag	UNP O66663
D	-14	HIS	-	expression tag	UNP O66663
D	-13	HIS	-	expression tag	UNP O66663
D	-12	HIS	-	expression tag	UNP O66663
D	-11	HIS	-	expression tag	UNP O66663
D	-10	HIS	-	expression tag	UNP O66663
D	-9	HIS	-	expression tag	UNP O66663
D	-8	SER	-	expression tag	UNP O66663
D	-7	SER	-	expression tag	UNP O66663
D	-6	GLY	-	expression tag	UNP O66663
D	-5	HIS	-	expression tag	UNP O66663
D	-4	ILE	-	expression tag	UNP O66663
D	-3	GLU	-	expression tag	UNP O66663
D	-2	GLY	-	expression tag	UNP O66663
D	-1	ARG	-	expression tag	UNP O66663
D	0	HIS	-	expression tag	UNP O66663

- Molecule 2 is TETRAETHYLENE GLYCOL (CCD ID: PG4) (formula: $C_8H_{18}O_5$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	A	1	Total	C	O	0	0
			7	4	3		
2	A	1	Total	C	O	0	0
			12	8	4		
2	D	1	Total	C	O	0	0
			13	8	5		
2	D	1	Total	C	O	0	0
			10	6	4		

- Molecule 3 is GLYCEROL (CCD ID: GOL) (formula: $C_3H_8O_3$).



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

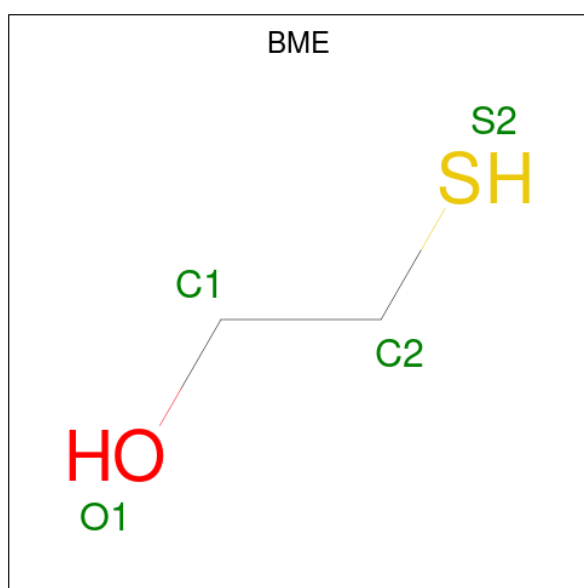
- Molecule 4 is NICKEL (II) ION (CCD ID: NI) (formula: Ni).

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

- Molecule 5 is CHLORIDE ION (CCD ID: CL) (formula: Cl).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	3	Total Cl 3 3	0	0
5	B	2	Total Cl 2 2	0	0
5	C	1	Total Cl 1 1	0	0
5	D	2	Total Cl 2 2	0	0

- Molecule 6 is BETA-MERCAPTOETHANOL (CCD ID: BME) (formula: C₂H₆OS).



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

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

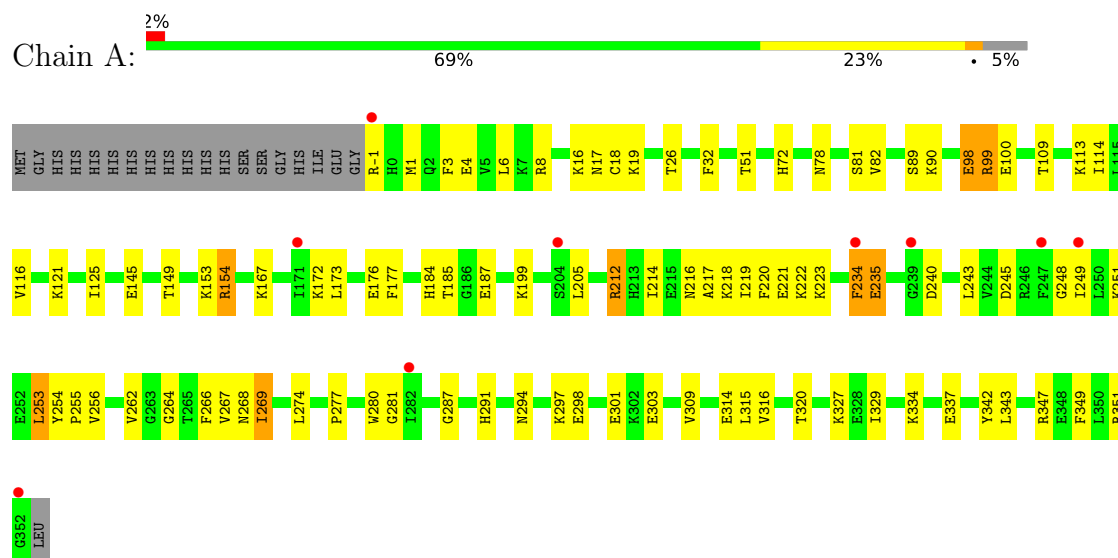
- Molecule 7 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	57	Total	O	0	0
			57	57		
7	B	69	Total	O	0	0
			69	69		
7	C	58	Total	O	0	0
			58	58		
7	D	64	Total	O	0	0
			64	64		

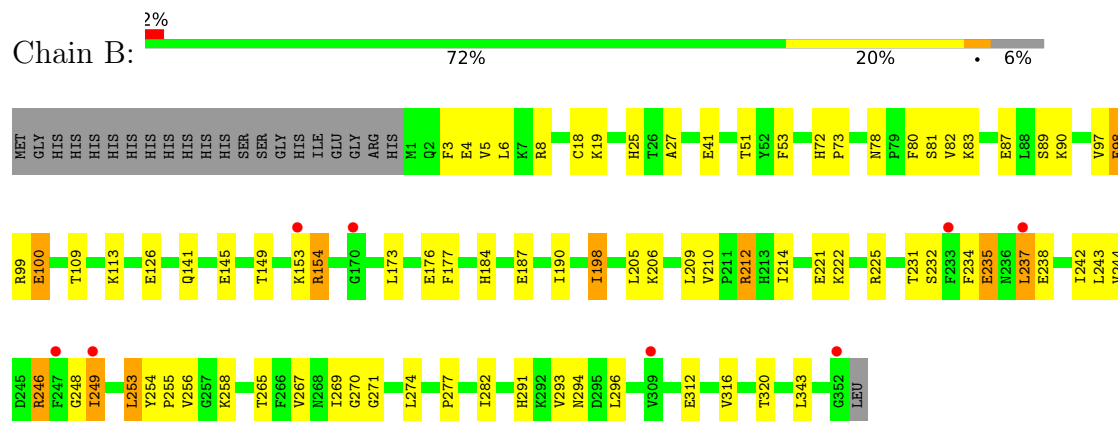
3 Residue-property plots

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.

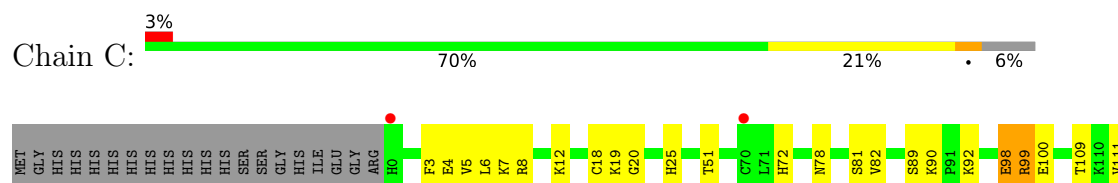
• Molecule 1: 3-DEOXY-D-MANNO-2-OCTULOSONIC ACID TRANSFERASE

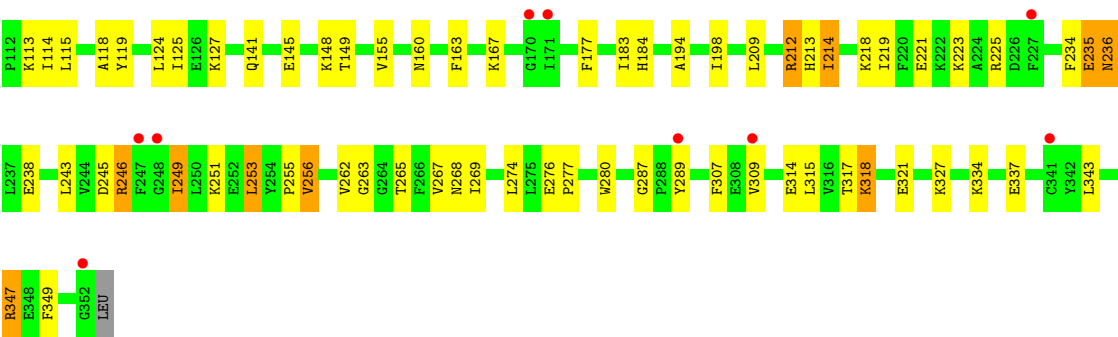


- Molecule 1: 3-DEOXY-D-MANNO-2-OCTULOSONIC ACID TRANSFERASE

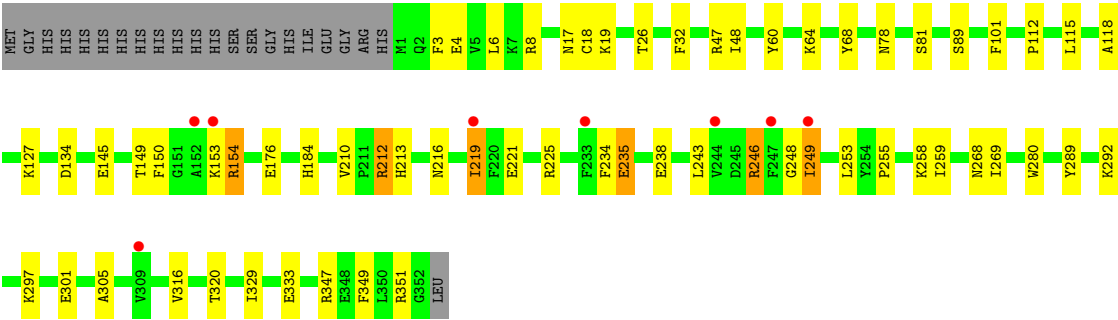
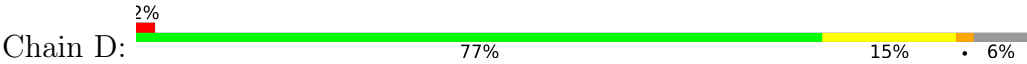


- Molecule 1: 3-DEOXY-D-MANNO-2-OCTULOSONIC ACID TRANSFERASE





● Molecule 1: 3-DEOXY-D-MANNO-2-OCTULOSONIC ACID TRANSFERASE



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	132.50Å 45.82Å 144.07Å 90.00° 97.23° 90.00°	Depositor
Resolution (Å)	29.85 – 2.00 29.85 – 2.00	Depositor EDS
% Data completeness (in resolution range)	98.9 (29.85-2.00) 98.8 (29.85-2.00)	Depositor EDS
R_{merge}	0.04	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.25 (at 2.00Å)	Xtriage
Refinement program	PHENIX (PHENIX.REFINE)	Depositor
R, R_{free}	0.207 , 0.254 0.203 , 0.249	Depositor DCC
R_{free} test set	5821 reflections (5.02%)	wwPDB-VP
Wilson B-factor (Å ²)	38.0	Xtriage
Anisotropy	0.712	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.36 , 61.2	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	11857	wwPDB-VP
Average B, all atoms (Å ²)	58.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.23% 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: BME, NI, GOL, CL, PG4

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	0/2952	0.84	4/3960 (0.1%)
1	B	0.49	0/2930	0.82	2/3931 (0.1%)
1	C	0.48	0/2941	0.83	2/3946 (0.1%)
1	D	0.48	0/2930	0.81	1/3931 (0.0%)
All	All	0.48	0/11753	0.82	9/15768 (0.1%)

There are no bond length outliers.

All (9) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	287	GLY	CA-C-N	6.90	126.61	119.64
1	A	287	GLY	C-N-CA	6.90	126.61	119.64
1	C	287	GLY	CA-C-N	5.80	125.42	119.56
1	C	287	GLY	C-N-CA	5.80	125.42	119.56
1	B	80	PHE	N-CA-C	5.69	117.56	111.36
1	A	264	GLY	N-CA-C	-5.61	107.51	115.30
1	A	234	PHE	N-CA-C	5.49	118.03	110.35
1	B	294	ASN	N-CA-C	5.43	117.20	111.28
1	D	210	VAL	N-CA-C	5.29	113.38	108.15

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	2888	0	3028	86	0
1	B	2867	0	3008	74	0
1	C	2877	0	3015	82	0
1	D	2867	0	3008	53	0
2	A	19	0	24	3	0
2	D	23	0	31	10	0
3	A	18	0	24	10	0
3	B	6	0	8	3	0
3	C	12	0	16	13	0
3	D	12	0	16	4	0
4	A	1	0	0	0	0
4	B	1	0	0	0	0
4	C	1	0	0	0	0
4	D	1	0	0	0	0
5	A	3	0	0	0	0
5	B	2	0	0	0	0
5	C	1	0	0	0	0
5	D	2	0	0	0	0
6	C	8	0	12	8	0
7	A	57	0	0	2	0
7	B	69	0	0	1	0
7	C	58	0	0	2	0
7	D	64	0	0	5	0
All	All	11857	0	12190	298	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 13.

All (298) 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:221:GLU:HG2	1:B:231:THR:HG21	1.37	1.03
3:A:1357:GOL:H12	6:C:1356:BME:S2	2.02	0.99
3:B:1353:GOL:H11	7:B:2004:HOH:O	1.73	0.88
1:B:5:VAL:HG21	2:D:1353:PG4:H81	1.56	0.88
3:D:1355:GOL:H11	7:D:2001:HOH:O	1.75	0.85
1:B:176:GLU:HG2	1:B:205:LEU:HD23	1.56	0.85
1:D:219:ILE:HD12	1:D:219:ILE:H	1.41	0.85
1:C:6:LEU:HB2	3:C:1354:GOL:H32	1.56	0.85
1:A:-1:ARG:HD2	1:C:119:TYR:OH	1.77	0.84
1:A:185:THR:H	3:A:1357:GOL:H32	1.41	0.84
1:A:219:ILE:H	1:A:219:ILE:HD12	1.42	0.84

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:209:LEU:HD23	1:C:243:LEU:HD21	1.61	0.83
1:B:248:GLY:O	1:B:249:ILE:HG22	1.77	0.83
1:A:6:LEU:H	3:A:1356:GOL:H2	1.42	0.82
1:D:184:HIS:CE1	1:D:269:ILE:HD13	2.17	0.80
1:D:6:LEU:H	3:D:1355:GOL:H2	1.46	0.80
1:A:212:ARG:HD3	1:A:212:ARG:C	2.06	0.79
1:B:19:LYS:HE3	1:B:90:LYS:HD2	1.65	0.79
1:D:216:ASN:HA	1:D:219:ILE:HD13	1.63	0.79
1:B:5:VAL:HG22	2:D:1353:PG4:H42	1.64	0.78
1:D:153:LYS:O	1:D:154:ARG:HB2	1.82	0.78
1:A:216:ASN:HA	1:A:219:ILE:HD13	1.65	0.76
1:B:246:ARG:HH22	1:B:249:ILE:HD13	1.51	0.76
1:B:5:VAL:CG2	2:D:1353:PG4:H81	2.15	0.76
1:C:307:PHE:CD1	1:C:318:LYS:HE2	2.22	0.74
3:A:1356:GOL:H11	1:C:125:ILE:HB	1.70	0.73
1:A:297:LYS:HE2	1:A:301:GLU:OE2	1.89	0.72
1:B:6:LEU:H	3:B:1353:GOL:H2	1.56	0.71
1:A:262:VAL:HG21	1:A:274:LEU:HD22	1.72	0.70
1:C:6:LEU:CB	3:C:1354:GOL:H32	2.20	0.70
1:B:246:ARG:HH11	1:B:246:ARG:H	1.39	0.70
1:C:6:LEU:HB2	3:C:1354:GOL:C3	2.22	0.69
1:C:262:VAL:HG21	1:C:274:LEU:HD23	1.73	0.69
1:B:109:THR:OG1	1:B:113:LYS:HE3	1.93	0.69
3:A:1357:GOL:C1	6:C:1356:BME:S2	2.80	0.69
1:A:116:VAL:HG13	1:A:342:TYR:CE1	2.28	0.69
1:A:212:ARG:HD3	1:A:212:ARG:O	1.93	0.69
1:A:116:VAL:HG13	1:A:342:TYR:HE1	1.59	0.68
1:A:125:ILE:HB	3:C:1354:GOL:H31	1.74	0.68
1:C:246:ARG:HH11	1:C:246:ARG:HB2	1.58	0.68
1:D:234:PHE:O	1:D:235:GLU:HB2	1.91	0.68
1:A:262:VAL:HG21	1:A:274:LEU:CD2	2.24	0.67
1:C:124:LEU:HA	1:C:127:LYS:HE3	1.77	0.67
1:B:25:HIS:NE2	1:B:100:GLU:OE1	2.28	0.67
1:B:153:LYS:O	1:B:154:ARG:HB2	1.94	0.66
1:C:255:PRO:HG3	1:C:280:TRP:CD2	2.30	0.66
1:C:262:VAL:HG21	1:C:274:LEU:CD2	2.25	0.65
1:D:18:CYS:HA	1:D:47:ARG:NH2	2.12	0.65
1:C:267:VAL:HG23	1:C:269:ILE:HG12	1.78	0.64
1:C:255:PRO:HG3	1:C:280:TRP:CE2	2.33	0.64
1:A:219:ILE:O	1:A:222:LYS:HG3	1.97	0.64
1:A:255:PRO:HG3	1:A:280:TRP:CE2	2.33	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:41:GLU:HG3	1:B:343:LEU:HD11	1.79	0.63
1:D:101:PHE:H	2:D:1353:PG4:H72	1.64	0.63
1:C:98:GLU:O	1:C:99:ARG:HB2	1.98	0.62
1:A:220:PHE:HB2	1:A:243:LEU:HD21	1.80	0.62
1:C:78:ASN:ND2	1:C:81:SER:H	1.97	0.62
1:B:209:LEU:HB3	1:B:243:LEU:HD23	1.81	0.62
1:B:293:VAL:HG22	1:B:296:LEU:HB3	1.80	0.61
1:C:99:ARG:O	1:C:99:ARG:HG2	2.00	0.61
1:C:234:PHE:O	1:C:235:GLU:HB2	1.99	0.61
1:A:-1:ARG:HD3	1:A:3:PHE:HE2	1.66	0.61
1:B:234:PHE:O	1:B:235:GLU:HG2	2.01	0.61
1:A:255:PRO:HG3	1:A:280:TRP:CD2	2.37	0.60
1:A:303:GLU:HG3	7:A:2055:HOH:O	2.00	0.59
1:A:218:LYS:O	1:A:222:LYS:HG2	2.02	0.59
1:D:219:ILE:HD12	1:D:219:ILE:N	2.13	0.59
1:B:25:HIS:CD2	1:B:100:GLU:OE1	2.56	0.59
1:B:254:TYR:N	1:B:255:PRO:HD2	2.18	0.59
1:D:219:ILE:H	1:D:219:ILE:CD1	2.13	0.59
1:C:221:GLU:HB2	1:C:243:LEU:HD12	1.84	0.59
1:D:212:ARG:HD3	1:D:212:ARG:C	2.28	0.59
1:C:4:GLU:HA	3:C:1354:GOL:H12	1.85	0.59
1:D:127:LYS:HG2	1:D:150:PHE:CE1	2.38	0.58
1:A:219:ILE:HG23	1:C:223:LYS:NZ	2.18	0.58
1:C:19:LYS:HA	1:C:89:SER:O	2.03	0.58
1:D:316:VAL:O	1:D:320:THR:HG23	2.03	0.58
3:A:1356:GOL:H11	1:C:125:ILE:CB	2.33	0.58
1:B:316:VAL:O	1:B:320:THR:HG23	2.04	0.58
3:A:1356:GOL:H11	1:C:125:ILE:CG2	2.34	0.57
1:D:213:HIS:ND1	3:D:1356:GOL:H31	2.19	0.57
1:D:154:ARG:HG3	7:D:2024:HOH:O	2.05	0.57
1:A:121:LYS:HZ3	3:C:1353:GOL:C3	2.17	0.57
1:A:248:GLY:O	1:A:249:ILE:HB	2.04	0.57
1:B:209:LEU:HD23	1:B:243:LEU:HD21	1.87	0.57
1:C:213:HIS:ND1	6:C:1356:BME:H21	2.20	0.57
1:A:82:VAL:CG1	1:A:109:THR:HG23	2.35	0.57
1:A:234:PHE:O	1:A:235:GLU:HB2	2.05	0.57
1:C:219:ILE:HD12	7:C:2038:HOH:O	2.05	0.56
1:A:281:GLY:HA2	1:A:329:ILE:HB	1.88	0.56
1:A:262:VAL:CG2	1:A:274:LEU:HD22	2.36	0.56
1:B:209:LEU:HB3	1:B:243:LEU:CD2	2.36	0.56
1:C:109:THR:OG1	1:C:113:LYS:HE3	2.05	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:248:GLY:O	1:D:249:ILE:HB	2.06	0.56
1:A:121:LYS:NZ	3:C:1353:GOL:C3	2.68	0.56
1:A:184:HIS:CE1	1:A:269:ILE:HD12	2.40	0.56
1:B:267:VAL:HG23	1:B:269:ILE:HG12	1.88	0.55
1:C:209:LEU:HB3	1:C:243:LEU:HD23	1.88	0.55
1:B:221:GLU:HB2	1:B:243:LEU:HD12	1.87	0.55
1:C:274:LEU:O	1:C:277:PRO:HD2	2.07	0.55
1:D:184:HIS:CE1	1:D:269:ILE:CD1	2.89	0.55
1:D:297:LYS:HE2	1:D:301:GLU:OE2	2.06	0.55
1:A:121:LYS:NZ	3:C:1353:GOL:H31	2.21	0.54
1:C:7:LYS:HG2	1:C:12:LYS:HG3	1.88	0.54
1:A:234:PHE:CD2	1:A:235:GLU:N	2.76	0.54
3:C:1353:GOL:H2	3:C:1354:GOL:O2	2.08	0.54
1:A:184:HIS:HB3	3:A:1357:GOL:H31	1.89	0.54
1:B:141:GLN:O	1:B:145:GLU:HG2	2.06	0.54
1:A:219:ILE:HG23	1:C:223:LYS:HZ1	1.71	0.54
1:B:19:LYS:HE3	1:B:90:LYS:CD	2.36	0.54
1:B:222:LYS:HG2	1:B:225:ARG:NH2	2.23	0.54
1:B:72:HIS:ND1	1:B:73:PRO:HD2	2.23	0.54
1:B:176:GLU:HG3	1:B:258:LYS:HD2	1.89	0.54
1:A:121:LYS:HZ3	3:C:1353:GOL:H32	1.73	0.54
1:A:153:LYS:O	1:A:154:ARG:HB2	2.07	0.53
1:B:3:PHE:CD1	2:D:1353:PG4:H62	2.43	0.53
1:B:3:PHE:HB2	2:D:1353:PG4:H82	1.89	0.53
1:A:268:ASN:OD1	1:A:291:HIS:HE1	1.91	0.53
1:A:267:VAL:HB	6:C:1355:BME:H12	1.91	0.53
1:D:212:ARG:HD3	1:D:212:ARG:O	2.09	0.53
1:D:19:LYS:HA	1:D:89:SER:O	2.08	0.52
1:A:221:GLU:HB2	1:A:243:LEU:HD22	1.90	0.52
1:C:78:ASN:HD21	1:C:81:SER:H	1.58	0.52
1:B:27:ALA:HB2	1:B:100:GLU:CD	2.35	0.52
1:C:213:HIS:ND1	6:C:1356:BME:C2	2.73	0.52
1:B:153:LYS:O	1:B:154:ARG:CB	2.58	0.52
1:C:268:ASN:HA	1:C:289:TYR:CD1	2.45	0.52
1:A:114:ILE:HD11	1:A:349:PHE:CD1	2.45	0.52
1:C:214:ILE:HG13	1:C:245:ASP:HA	1.91	0.51
1:C:218:LYS:HG3	7:C:2039:HOH:O	2.09	0.51
1:D:176:GLU:HG3	1:D:258:LYS:CE	2.40	0.51
1:D:255:PRO:HG3	1:D:280:TRP:CD2	2.45	0.51
1:D:18:CYS:HA	1:D:47:ARG:HH21	1.74	0.51
1:B:184:HIS:NE2	1:B:212:ARG:HG3	2.25	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:213:HIS:CE1	3:D:1356:GOL:H31	2.45	0.51
1:A:4:GLU:O	1:A:8:ARG:HG3	2.11	0.51
1:A:16:LYS:O	1:A:19:LYS:HG3	2.11	0.51
1:A:-1:ARG:HD3	1:A:3:PHE:CE2	2.46	0.51
1:B:83:LYS:O	1:B:87:GLU:HG2	2.11	0.51
1:D:255:PRO:HG3	1:D:280:TRP:CE2	2.45	0.50
1:A:309:VAL:HG11	1:A:315:LEU:HB2	1.94	0.50
2:A:1354:PG4:H52	1:C:5:VAL:HG22	1.93	0.50
1:B:78:ASN:ND2	1:B:81:SER:H	2.09	0.50
1:C:309:VAL:HG13	1:C:314:GLU:HB2	1.93	0.50
1:C:114:ILE:HD11	1:C:349:PHE:CE1	2.47	0.50
1:D:351:ARG:HB3	7:D:2064:HOH:O	2.11	0.50
1:A:109:THR:OG1	1:A:113:LYS:HE3	2.12	0.50
1:C:184:HIS:HA	6:C:1356:BME:H11	1.93	0.50
1:A:26:THR:HG21	1:A:32:PHE:HA	1.93	0.49
1:A:351:ARG:HD2	7:A:2057:HOH:O	2.11	0.49
1:C:25:HIS:CD2	1:C:100:GLU:HG3	2.47	0.49
1:C:82:VAL:CG1	1:C:109:THR:HG23	2.41	0.49
1:C:141:GLN:O	1:C:145:GLU:HG2	2.13	0.49
1:A:267:VAL:HG23	1:A:269:ILE:HG13	1.93	0.49
1:D:101:PHE:H	2:D:1353:PG4:C7	2.26	0.49
1:B:5:VAL:N	3:B:1353:GOL:H2	2.27	0.48
1:C:209:LEU:HB3	1:C:243:LEU:CD2	2.43	0.48
1:A:16:LYS:C	1:A:18:CYS:H	2.22	0.48
1:B:246:ARG:HB2	1:B:246:ARG:CZ	2.43	0.48
1:C:114:ILE:HD11	1:C:349:PHE:CD1	2.47	0.48
1:C:234:PHE:O	1:C:235:GLU:CB	2.61	0.48
1:D:246:ARG:HB3	1:D:246:ARG:NH1	2.29	0.48
1:A:172:LYS:O	1:A:173:LEU:HD23	2.14	0.48
1:C:317:THR:O	1:C:321:GLU:HG3	2.14	0.48
1:A:316:VAL:O	1:A:320:THR:HG23	2.14	0.48
1:C:145:GLU:O	1:C:149:THR:HG23	2.13	0.48
1:A:184:HIS:CE1	1:A:212:ARG:HG3	2.48	0.47
1:D:246:ARG:HB3	1:D:246:ARG:CZ	2.44	0.47
1:D:234:PHE:O	1:D:235:GLU:CB	2.61	0.47
1:A:262:VAL:CG2	1:A:274:LEU:CD2	2.92	0.47
1:C:51:THR:HA	1:C:72:HIS:O	2.15	0.47
1:C:309:VAL:HG11	1:C:315:LEU:HB2	1.95	0.47
1:B:253:LEU:O	1:B:256:VAL:HB	2.15	0.47
1:C:4:GLU:O	1:C:8:ARG:HG3	2.14	0.47
1:C:253:LEU:O	1:C:256:VAL:HB	2.15	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:262:VAL:CG2	1:C:274:LEU:HD23	2.44	0.47
1:A:145:GLU:O	1:A:149:THR:HG23	2.14	0.47
1:A:199:LYS:HE3	1:A:205:LEU:O	2.14	0.47
1:B:97:VAL:HG12	1:B:98:GLU:CG	2.45	0.47
1:B:265:THR:HG22	1:B:271:GLY:HA2	1.97	0.47
1:C:109:THR:HB	1:C:111:VAL:HG12	1.97	0.47
1:C:167:LYS:O	1:C:251:LYS:HE2	2.15	0.47
1:A:254:TYR:N	1:A:255:PRO:CD	2.78	0.47
1:C:249:ILE:HG22	1:C:253:LEU:HD22	1.95	0.47
1:A:274:LEU:O	1:A:277:PRO:HD2	2.15	0.47
1:A:-1:ARG:C	1:A:1:MET:H	2.22	0.46
1:B:19:LYS:HA	1:B:89:SER:O	2.14	0.46
1:A:262:VAL:O	1:A:262:VAL:HG23	2.16	0.46
3:A:1356:GOL:H11	1:C:125:ILE:HG22	1.97	0.46
1:A:121:LYS:NZ	3:C:1353:GOL:H32	2.31	0.46
1:C:20:GLY:O	1:C:92:LYS:HE2	2.16	0.46
1:B:267:VAL:HG23	1:B:269:ILE:CG1	2.46	0.46
1:B:293:VAL:CG2	1:B:296:LEU:HD23	2.46	0.46
1:C:89:SER:O	1:C:90:LYS:C	2.58	0.46
1:C:343:LEU:HG	1:C:347:ARG:CZ	2.46	0.46
1:A:214:ILE:HG21	1:A:245:ASP:O	2.16	0.46
1:A:187:GLU:HG2	1:A:266:PHE:HB2	1.98	0.46
1:D:4:GLU:O	1:D:8:ARG:HG3	2.16	0.46
1:B:244:VAL:HG11	1:B:249:ILE:HG21	1.98	0.46
3:A:1355:GOL:H11	3:A:1356:GOL:H12	1.98	0.46
1:B:187:GLU:HG2	1:B:267:VAL:HG13	1.98	0.46
1:C:183:ILE:O	6:C:1356:BME:H11	2.16	0.46
1:D:221:GLU:HA	1:D:243:LEU:HD11	1.97	0.46
1:D:268:ASN:HA	1:D:289:TYR:CG	2.51	0.46
1:B:265:THR:CG2	1:B:271:GLY:HA2	2.46	0.45
1:A:234:PHE:O	1:A:235:GLU:CB	2.63	0.45
1:B:198:ILE:HD12	1:B:316:VAL:HG13	1.98	0.45
1:B:221:GLU:N	1:B:243:LEU:HD11	2.32	0.45
1:B:312:GLU:O	1:B:316:VAL:HG23	2.17	0.45
1:C:262:VAL:CG2	1:C:274:LEU:CD2	2.95	0.45
1:D:60:TYR:CZ	1:D:64:LYS:HE3	2.52	0.45
1:D:249:ILE:HG23	1:D:253:LEU:CD2	2.46	0.45
1:A:99:ARG:O	1:A:100:GLU:C	2.58	0.45
1:A:176:GLU:HG3	1:A:205:LEU:HA	1.98	0.45
1:C:212:ARG:HB3	6:C:1356:BME:H21	1.99	0.45
1:A:177:PHE:CD2	1:A:256:VAL:HG12	2.52	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:115:LEU:HG	1:C:118:ALA:HB2	1.98	0.45
1:B:234:PHE:O	1:B:235:GLU:CB	2.63	0.45
1:A:219:ILE:H	1:A:219:ILE:CD1	2.16	0.45
1:B:3:PHE:CB	2:D:1353:PG4:H82	2.47	0.45
1:A:89:SER:O	1:A:90:LYS:C	2.60	0.45
1:C:3:PHE:HB2	3:C:1353:GOL:O3	2.17	0.45
1:C:263:GLY:O	1:C:265:THR:HG23	2.17	0.45
1:C:148:LYS:HG3	1:C:155:VAL:HG11	1.99	0.44
1:A:253:LEU:C	1:A:255:PRO:HD2	2.42	0.44
1:A:334:LYS:O	1:A:337:GLU:HB3	2.17	0.44
1:B:97:VAL:HG12	1:B:98:GLU:HG2	1.99	0.44
1:B:210:VAL:HG22	1:B:244:VAL:HG21	1.99	0.44
1:D:112:PRO:HA	1:D:134:ASP:OD2	2.16	0.44
1:A:51:THR:HA	1:A:72:HIS:O	2.18	0.44
1:B:109:THR:OG1	1:B:113:LYS:CE	2.65	0.44
1:D:153:LYS:O	1:D:154:ARG:CB	2.55	0.44
1:A:343:LEU:O	1:A:347:ARG:HG3	2.18	0.44
1:B:244:VAL:CG1	1:B:249:ILE:HG21	2.47	0.44
1:B:231:THR:HG22	1:B:232:SER:N	2.33	0.44
1:C:243:LEU:HD23	1:C:243:LEU:HA	1.65	0.44
1:B:177:PHE:CD1	1:B:206:LYS:HB2	2.53	0.44
1:B:246:ARG:HH22	1:B:249:ILE:CD1	2.25	0.44
1:A:217:ALA:O	1:A:243:LEU:CD2	2.66	0.43
2:A:1354:PG4:H52	1:C:5:VAL:CG2	2.48	0.43
1:B:53:PHE:CZ	2:D:1353:PG4:H21	2.53	0.43
1:A:294:ASN:O	1:A:298:GLU:HG3	2.18	0.43
1:D:176:GLU:HG3	1:D:258:LYS:HE2	2.01	0.43
1:A:-1:ARG:C	1:A:1:MET:N	2.75	0.43
1:B:51:THR:HA	1:B:72:HIS:O	2.19	0.43
1:A:78:ASN:ND2	1:A:81:SER:H	2.16	0.43
1:A:167:LYS:O	1:A:251:LYS:HE2	2.19	0.43
1:B:274:LEU:O	1:B:277:PRO:HD2	2.18	0.43
1:C:148:LYS:HG3	1:C:155:VAL:CG1	2.48	0.43
1:A:184:HIS:CE1	1:A:269:ILE:CD1	3.01	0.43
1:D:17:ASN:O	1:D:47:ARG:NH2	2.52	0.42
1:D:48:ILE:HB	1:D:68:TYR:HA	2.01	0.42
1:D:221:GLU:HB2	1:D:243:LEU:HD13	2.01	0.42
1:C:184:HIS:NE2	1:C:212:ARG:HG3	2.33	0.42
1:C:194:ALA:O	1:C:198:ILE:HG12	2.19	0.42
1:A:220:PHE:CB	1:A:243:LEU:HD21	2.47	0.42
1:D:47:ARG:HG3	1:D:47:ARG:HH11	1.83	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:258:LYS:HE2	1:B:258:LYS:HB3	1.77	0.42
1:C:262:VAL:HG21	1:C:274:LEU:HD22	2.00	0.42
1:A:153:LYS:O	1:A:154:ARG:CB	2.66	0.42
1:C:334:LYS:O	1:C:337:GLU:HB3	2.20	0.42
1:A:249:ILE:HG22	1:A:253:LEU:HD22	2.01	0.42
1:A:262:VAL:HG21	1:A:274:LEU:HD23	1.99	0.42
1:B:4:GLU:O	1:B:8:ARG:HG3	2.20	0.42
1:A:309:VAL:HG13	1:A:314:GLU:HB2	2.01	0.42
1:B:234:PHE:O	1:B:235:GLU:CG	2.68	0.42
1:C:219:ILE:HD12	1:C:219:ILE:H	1.85	0.42
1:D:292:LYS:HD3	7:D:2046:HOH:O	2.19	0.42
1:A:218:LYS:HG2	1:A:222:LYS:NZ	2.35	0.41
1:B:255:PRO:HA	1:B:282:ILE:HD11	2.01	0.41
1:D:78:ASN:ND2	1:D:81:SER:H	2.18	0.41
1:D:347:ARG:HG2	7:D:2006:HOH:O	2.19	0.41
1:C:177:PHE:CD2	1:C:256:VAL:HG13	2.55	0.41
1:A:199:LYS:NZ	1:A:240:ASP:OD2	2.52	0.41
1:D:3:PHE:HD1	2:D:1354:PG4:H32	1.84	0.41
1:C:7:LYS:HD3	1:C:12:LYS:CD	2.50	0.41
1:B:255:PRO:HA	1:B:282:ILE:CD1	2.50	0.41
1:B:221:GLU:CA	1:B:243:LEU:HD11	2.50	0.41
1:B:99:ARG:NH1	1:B:126:GLU:OE1	2.48	0.41
1:B:237:LEU:HA	1:B:242:ILE:HG12	2.03	0.41
1:B:237:LEU:N	1:B:237:LEU:HD23	2.36	0.41
1:C:236:ASN:HD22	1:C:236:ASN:HA	1.68	0.41
1:D:145:GLU:O	1:D:149:THR:HG23	2.21	0.41
1:A:153:LYS:HE2	1:A:153:LYS:HB3	1.94	0.41
1:B:173:LEU:HD12	1:B:256:VAL:HG11	2.02	0.41
1:D:154:ARG:HH11	1:D:349:PHE:HD2	1.67	0.41
1:D:221:GLU:OE2	1:D:225:ARG:NH1	2.54	0.41
1:D:305:ALA:HB2	1:D:329:ILE:HD12	2.03	0.41
1:C:4:GLU:HA	3:C:1354:GOL:C1	2.51	0.41
1:C:160:ASN:HB3	1:C:163:PHE:CD2	2.56	0.40
1:C:236:ASN:HB3	1:C:238:GLU:OE1	2.21	0.40
1:D:115:LEU:HG	1:D:118:ALA:HB2	2.03	0.40
1:D:258:LYS:C	1:D:259:ILE:HG13	2.46	0.40
1:D:26:THR:HG21	1:D:32:PHE:HA	2.03	0.40
1:A:114:ILE:HD11	1:A:349:PHE:CE1	2.56	0.40
2:A:1354:PG4:H32	1:C:8:ARG:CZ	2.51	0.40
1:B:145:GLU:O	1:B:149:THR:HG23	2.21	0.40
1:B:270:GLY:HA2	1:B:291:HIS:CE1	2.55	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	352/374 (94%)	336 (96%)	11 (3%)	5 (1%)	9	4
1	B	350/374 (94%)	333 (95%)	12 (3%)	5 (1%)	9	4
1	C	351/374 (94%)	340 (97%)	8 (2%)	3 (1%)	14	9
1	D	350/374 (94%)	341 (97%)	6 (2%)	3 (1%)	14	9
All	All	1403/1496 (94%)	1350 (96%)	37 (3%)	16 (1%)	11	7

All (16) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	100	GLU
1	B	235	GLU
1	C	99	ARG
1	D	154	ARG
1	D	235	GLU
1	A	154	ARG
1	A	235	GLU
1	B	154	ARG
1	C	235	GLU
1	D	249	ILE
1	A	17	ASN
1	B	98	GLU
1	A	98	GLU
1	A	99	ARG
1	C	249	ILE
1	B	249	ILE

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	317/334 (95%)	311 (98%)	6 (2%)	50	56
1	B	315/334 (94%)	305 (97%)	10 (3%)	34	35
1	C	316/334 (95%)	303 (96%)	13 (4%)	27	26
1	D	315/334 (94%)	310 (98%)	5 (2%)	55	62
All	All	1263/1336 (94%)	1229 (97%)	34 (3%)	39	42

All (34) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	98	GLU
1	A	212	ARG
1	A	223	LYS
1	A	253	LEU
1	A	269	ILE
1	A	327	LYS
1	B	18	CYS
1	B	82	VAL
1	B	190	ILE
1	B	198	ILE
1	B	212	ARG
1	B	214	ILE
1	B	237	LEU
1	B	238	GLU
1	B	246	ARG
1	B	253	LEU
1	C	18	CYS
1	C	98	GLU
1	C	212	ARG
1	C	214	ILE
1	C	225	ARG
1	C	236	ASN
1	C	246	ARG
1	C	253	LEU

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Mol	Chain	Res	Type
1	C	256	VAL
1	C	276	GLU
1	C	318	LYS
1	C	327	LYS
1	C	347	ARG
1	D	212	ARG
1	D	219	ILE
1	D	238	GLU
1	D	246	ARG
1	D	333	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (18) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	78	ASN
1	A	141	GLN
1	A	216	ASN
1	A	291	HIS
1	B	78	ASN
1	B	141	GLN
1	B	166	GLN
1	B	216	ASN
1	B	291	HIS
1	C	78	ASN
1	C	141	GLN
1	C	216	ASN
1	C	236	ASN
1	C	291	HIS
1	C	294	ASN
1	D	78	ASN
1	D	141	GLN
1	D	291	HIS

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 [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 26 ligands modelled in this entry, 12 are monoatomic - leaving 14 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	$\# Z > 2$
3	GOL	A	1355	-	5,5,5	0.36	0	5,5,5	0.55	0
3	GOL	B	1353	-	5,5,5	0.42	0	5,5,5	0.35	0
2	PG4	A	1354	-	11,11,12	0.54	0	10,10,11	1.28	0
3	GOL	A	1356	-	5,5,5	0.45	0	5,5,5	0.70	0
3	GOL	A	1357	-	5,5,5	0.40	0	5,5,5	0.47	0
6	BME	C	1355	-	3,3,3	0.38	0	2,2,2	0.34	0
3	GOL	D	1356	-	5,5,5	0.61	0	5,5,5	0.48	0
2	PG4	D	1354	-	9,9,12	0.52	0	8,8,11	1.46	0
3	GOL	C	1354	-	5,5,5	0.37	0	5,5,5	0.88	0
2	PG4	D	1353	-	12,12,12	0.50	0	11,11,11	1.82	4 (36%)
3	GOL	C	1353	-	5,5,5	0.36	0	5,5,5	0.45	0
2	PG4	A	1353	-	6,6,12	0.52	0	5,5,11	1.41	0
3	GOL	D	1355	-	5,5,5	0.45	0	5,5,5	0.61	0
6	BME	C	1356	-	3,3,3	0.36	0	2,2,2	0.62	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
3	GOL	A	1355	-	-	2/4/4/4	-
3	GOL	B	1353	-	-	4/4/4/4	-
2	PG4	A	1354	-	-	6/9/9/10	-
3	GOL	A	1356	-	-	2/4/4/4	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	GOL	A	1357	-	-	4/4/4/4	-
6	BME	C	1355	-	-	1/1/1/1	-
3	GOL	D	1356	-	-	0/4/4/4	-
2	PG4	D	1354	-	-	3/7/7/10	-
3	GOL	C	1354	-	-	3/4/4/4	-
2	PG4	D	1353	-	-	6/10/10/10	-
3	GOL	C	1353	-	-	2/4/4/4	-
2	PG4	A	1353	-	-	3/4/4/10	-
3	GOL	D	1355	-	-	4/4/4/4	-
6	BME	C	1356	-	-	0/1/1/1	-

There are no bond length outliers.

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	D	1353	PG4	O4-C7-C8	2.25	120.02	110.11
2	D	1353	PG4	C5-O3-C4	2.18	122.81	113.26
2	D	1353	PG4	O2-C3-C4	2.17	120.23	110.35
2	D	1353	PG4	O3-C5-C6	2.10	119.92	110.35

There are no chirality outliers.

All (40) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	1355	GOL	C1-C2-C3-O3
3	A	1356	GOL	C1-C2-C3-O3
3	A	1357	GOL	C1-C2-C3-O3
3	A	1357	GOL	O2-C2-C3-O3
3	B	1353	GOL	O1-C1-C2-C3
3	B	1353	GOL	C1-C2-C3-O3
3	C	1353	GOL	C1-C2-C3-O3
3	C	1354	GOL	C1-C2-C3-O3
3	D	1355	GOL	O1-C1-C2-C3
3	D	1355	GOL	C1-C2-C3-O3
3	D	1355	GOL	O2-C2-C3-O3
2	D	1353	PG4	C8-C7-O4-C6
2	D	1354	PG4	O2-C3-C4-O3
2	D	1353	PG4	O3-C5-C6-O4
3	C	1353	GOL	O2-C2-C3-O3

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Mol	Chain	Res	Type	Atoms
3	C	1354	GOL	O2-C2-C3-O3
2	A	1353	PG4	O2-C3-C4-O3
2	D	1353	PG4	C6-C5-O3-C4
3	A	1357	GOL	O1-C1-C2-C3
3	A	1355	GOL	O2-C2-C3-O3
3	A	1356	GOL	O2-C2-C3-O3
3	A	1357	GOL	O1-C1-C2-O2
3	B	1353	GOL	O1-C1-C2-O2
3	B	1353	GOL	O2-C2-C3-O3
3	D	1355	GOL	O1-C1-C2-O2
2	A	1354	PG4	O3-C5-C6-O4
2	D	1354	PG4	O3-C5-C6-O4
2	D	1353	PG4	C3-C4-O3-C5
6	C	1355	BME	O1-C1-C2-S2
2	A	1354	PG4	O1-C1-C2-O2
2	A	1354	PG4	C5-C6-O4-C7
2	D	1353	PG4	O4-C7-C8-O5
2	A	1354	PG4	C6-C5-O3-C4
2	A	1353	PG4	C4-C3-O2-C2
2	A	1354	PG4	C4-C3-O2-C2
2	D	1354	PG4	C4-C3-O2-C2
3	C	1354	GOL	O1-C1-C2-O2
2	A	1353	PG4	C1-C2-O2-C3
2	D	1353	PG4	C4-C3-O2-C2
2	A	1354	PG4	C8-C7-O4-C6

There are no ring outliers.

13 monomers are involved in 49 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	1355	GOL	1	0
3	B	1353	GOL	3	0
2	A	1354	PG4	3	0
3	A	1356	GOL	6	0
3	A	1357	GOL	4	0
6	C	1355	BME	1	0
3	D	1356	GOL	2	0
2	D	1354	PG4	1	0
3	C	1354	GOL	7	0
2	D	1353	PG4	9	0
3	C	1353	GOL	7	0
3	D	1355	GOL	2	0

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Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	C	1356	BME	7	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	354/374 (94%)	0.17	9 (2%) 58 58	28, 54, 85, 133	0
1	B	352/374 (94%)	0.19	8 (2%) 61 60	27, 56, 91, 117	0
1	C	353/374 (94%)	0.16	11 (3%) 51 50	28, 56, 90, 112	0
1	D	352/374 (94%)	0.17	8 (2%) 61 60	28, 56, 94, 123	0
All	All	1411/1496 (94%)	0.17	36 (2%) 57 56	27, 55, 91, 133	0

All (36) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	247	PHE	3.8
1	C	247	PHE	3.8
1	A	249	ILE	3.7
1	C	170	GLY	3.4
1	B	247	PHE	3.3
1	A	352	GLY	3.2
1	C	352	GLY	3.0
1	A	-1	ARG	2.8
1	A	171	ILE	2.6
1	D	249	ILE	2.5
1	D	153	LYS	2.5
1	C	0	HIS	2.5
1	B	309	VAL	2.4
1	C	289	TYR	2.4
1	A	234	PHE	2.4
1	D	247	PHE	2.3
1	D	152	ALA	2.3
1	A	282	ILE	2.3
1	C	309	VAL	2.2
1	C	70	CYS	2.2
1	B	153	LYS	2.2

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Mol	Chain	Res	Type	RSRZ
1	D	219	ILE	2.2
1	B	237	LEU	2.2
1	C	227	PHE	2.1
1	B	249	ILE	2.1
1	C	171	ILE	2.1
1	C	248	GLY	2.1
1	A	239	GLY	2.1
1	D	309	VAL	2.1
1	A	204	SER	2.1
1	B	170	GLY	2.0
1	B	352	GLY	2.0
1	B	233	PHE	2.0
1	D	233	PHE	2.0
1	D	244	VAL	2.0
1	C	341	CYS	2.0

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

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

6.3 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

6.4 Ligands [i](#)

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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
3	GOL	A	1356	6/6	0.68	0.17	48,56,60,64	0
3	GOL	C	1354	6/6	0.70	0.20	55,61,65,66	0
3	GOL	D	1356	6/6	0.77	0.15	40,53,56,57	0
3	GOL	A	1357	6/6	0.79	0.12	49,50,56,56	0
3	GOL	A	1355	6/6	0.81	0.15	42,51,66,71	0
6	BME	C	1356	4/4	0.82	0.19	44,45,51,67	0
6	BME	C	1355	4/4	0.83	0.16	66,67,67,68	0
3	GOL	C	1353	6/6	0.83	0.12	47,54,56,57	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
4	NI	B	1354	1/1	0.85	0.10	61,61,61,61	1
2	PG4	D	1354	10/13	0.86	0.15	51,57,71,72	0
2	PG4	A	1354	12/13	0.86	0.18	41,58,69,71	0
3	GOL	B	1353	6/6	0.87	0.11	45,53,56,59	0
5	CL	A	1360	1/1	0.87	0.18	86,86,86,86	0
5	CL	D	1359	1/1	0.87	0.15	74,74,74,74	0
3	GOL	D	1355	6/6	0.87	0.10	49,55,59,59	0
2	PG4	D	1353	13/13	0.87	0.13	43,58,61,66	0
5	CL	B	1356	1/1	0.89	0.19	93,93,93,93	0
4	NI	A	1358	1/1	0.89	0.11	64,64,64,64	1
4	NI	C	1357	1/1	0.90	0.11	60,60,60,60	1
2	PG4	A	1353	7/13	0.91	0.11	49,50,55,61	0
4	NI	D	1358	1/1	0.91	0.09	59,59,59,59	1
5	CL	C	1358	1/1	0.91	0.19	93,93,93,93	0
5	CL	A	1361	1/1	0.92	0.15	77,77,77,77	0
5	CL	A	1359	1/1	0.92	0.21	84,84,84,84	0
5	CL	D	1357	1/1	0.93	0.13	80,80,80,80	0
5	CL	B	1355	1/1	0.95	0.12	50,50,50,50	0

6.5 Other polymers [i](#)

There are no such residues in this entry.