



Full wwPDB X-ray Structure Validation Report ⓘ

Oct 8, 2023 – 06:58 PM EDT

PDB ID : 6WYE
Title : Crystal structure of Neisseria gonorrhoeae serine acetyltransferase (CysE)
Authors : Hicks, J.L.; Oldham, K.E.; Summers, E.L.; Prentice, E.J.
Deposited on : 2020-05-12
Resolution : 2.01 Å(reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

MolProbity : 4.02b-467
Mogul : 1.8.5 (274361), CSD as541be (2020)
Xtrriage (Phenix) : 1.13
EDS : 2.35.1
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) : 2.35.1

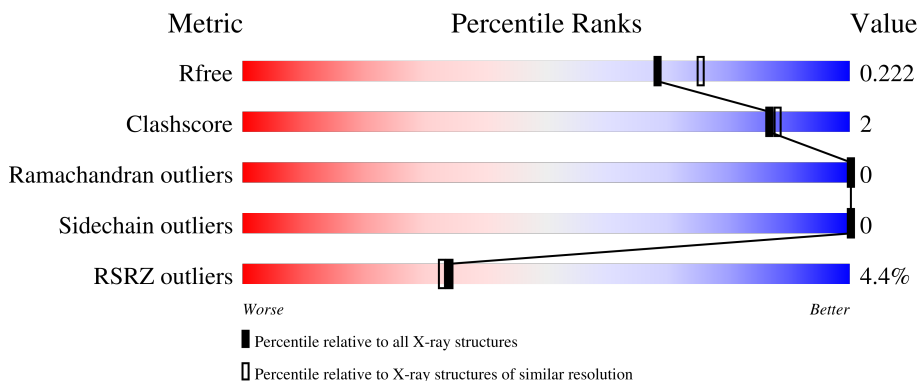
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.01 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}	130704	8085 (2.00-2.00)
Clashscore	141614	9178 (2.00-2.00)
Ramachandran outliers	138981	9054 (2.00-2.00)
Sidechain outliers	138945	9053 (2.00-2.00)
RSRZ outliers	127900	7900 (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	293	 2% 84% 5% 11%
1	B	293	 3% 83% 13%
1	C	293	 7% 83% 13%
1	D	293	 3% 78% 8% 15%
1	E	293	 3% 84% 13%

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Mol	Chain	Length	Quality of chain
1	F	293	 <p>A horizontal bar chart representing the quality of chain. The bar is divided into four segments: a small red segment on the left labeled '4%', a large green segment labeled '83%', a small yellow segment labeled '5%', and a grey segment on the right labeled '12%'.</p>

2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 11756 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 Serine acetyltransferase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	261	Total 1906	C 1210	N 336	O 352	S 8	0	1	0
1	B	255	Total 1831	C 1159	N 318	O 346	S 8	0	0	0
1	C	254	Total 1847	C 1172	N 324	O 343	S 8	0	0	0
1	D	250	Total 1843	C 1173	N 322	O 340	S 8	0	1	0
1	E	256	Total 1862	C 1183	N 326	O 345	S 8	0	0	0
1	F	258	Total 1869	C 1184	N 330	O 348	S 7	0	0	0

There are 126 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-20	MET	-	initiating methionine	UNP A0A1D3FX11
A	-19	GLY	-	expression tag	UNP A0A1D3FX11
A	-18	SER	-	expression tag	UNP A0A1D3FX11
A	-17	SER	-	expression tag	UNP A0A1D3FX11
A	-16	HIS	-	expression tag	UNP A0A1D3FX11
A	-15	HIS	-	expression tag	UNP A0A1D3FX11
A	-14	HIS	-	expression tag	UNP A0A1D3FX11
A	-13	HIS	-	expression tag	UNP A0A1D3FX11
A	-12	HIS	-	expression tag	UNP A0A1D3FX11
A	-11	HIS	-	expression tag	UNP A0A1D3FX11
A	-10	SER	-	expression tag	UNP A0A1D3FX11
A	-9	SER	-	expression tag	UNP A0A1D3FX11
A	-8	GLY	-	expression tag	UNP A0A1D3FX11
A	-7	LEU	-	expression tag	UNP A0A1D3FX11
A	-6	VAL	-	expression tag	UNP A0A1D3FX11
A	-5	PRO	-	expression tag	UNP A0A1D3FX11
A	-4	ARG	-	expression tag	UNP A0A1D3FX11

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Chain	Residue	Modelled	Actual	Comment	Reference
A	-3	GLY	-	expression tag	UNP A0A1D3FX11
A	-2	SER	-	expression tag	UNP A0A1D3FX11
A	-1	HIS	-	expression tag	UNP A0A1D3FX11
A	0	MET	-	expression tag	UNP A0A1D3FX11
B	-20	MET	-	initiating methionine	UNP A0A1D3FX11
B	-19	GLY	-	expression tag	UNP A0A1D3FX11
B	-18	SER	-	expression tag	UNP A0A1D3FX11
B	-17	SER	-	expression tag	UNP A0A1D3FX11
B	-16	HIS	-	expression tag	UNP A0A1D3FX11
B	-15	HIS	-	expression tag	UNP A0A1D3FX11
B	-14	HIS	-	expression tag	UNP A0A1D3FX11
B	-13	HIS	-	expression tag	UNP A0A1D3FX11
B	-12	HIS	-	expression tag	UNP A0A1D3FX11
B	-11	HIS	-	expression tag	UNP A0A1D3FX11
B	-10	SER	-	expression tag	UNP A0A1D3FX11
B	-9	SER	-	expression tag	UNP A0A1D3FX11
B	-8	GLY	-	expression tag	UNP A0A1D3FX11
B	-7	LEU	-	expression tag	UNP A0A1D3FX11
B	-6	VAL	-	expression tag	UNP A0A1D3FX11
B	-5	PRO	-	expression tag	UNP A0A1D3FX11
B	-4	ARG	-	expression tag	UNP A0A1D3FX11
B	-3	GLY	-	expression tag	UNP A0A1D3FX11
B	-2	SER	-	expression tag	UNP A0A1D3FX11
B	-1	HIS	-	expression tag	UNP A0A1D3FX11
B	0	MET	-	expression tag	UNP A0A1D3FX11
C	-20	MET	-	initiating methionine	UNP A0A1D3FX11
C	-19	GLY	-	expression tag	UNP A0A1D3FX11
C	-18	SER	-	expression tag	UNP A0A1D3FX11
C	-17	SER	-	expression tag	UNP A0A1D3FX11
C	-16	HIS	-	expression tag	UNP A0A1D3FX11
C	-15	HIS	-	expression tag	UNP A0A1D3FX11
C	-14	HIS	-	expression tag	UNP A0A1D3FX11
C	-13	HIS	-	expression tag	UNP A0A1D3FX11
C	-12	HIS	-	expression tag	UNP A0A1D3FX11
C	-11	HIS	-	expression tag	UNP A0A1D3FX11
C	-10	SER	-	expression tag	UNP A0A1D3FX11
C	-9	SER	-	expression tag	UNP A0A1D3FX11
C	-8	GLY	-	expression tag	UNP A0A1D3FX11
C	-7	LEU	-	expression tag	UNP A0A1D3FX11
C	-6	VAL	-	expression tag	UNP A0A1D3FX11
C	-5	PRO	-	expression tag	UNP A0A1D3FX11
C	-4	ARG	-	expression tag	UNP A0A1D3FX11

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Chain	Residue	Modelled	Actual	Comment	Reference
C	-3	GLY	-	expression tag	UNP A0A1D3FX11
C	-2	SER	-	expression tag	UNP A0A1D3FX11
C	-1	HIS	-	expression tag	UNP A0A1D3FX11
C	0	MET	-	expression tag	UNP A0A1D3FX11
D	-20	MET	-	initiating methionine	UNP A0A1D3FX11
D	-19	GLY	-	expression tag	UNP A0A1D3FX11
D	-18	SER	-	expression tag	UNP A0A1D3FX11
D	-17	SER	-	expression tag	UNP A0A1D3FX11
D	-16	HIS	-	expression tag	UNP A0A1D3FX11
D	-15	HIS	-	expression tag	UNP A0A1D3FX11
D	-14	HIS	-	expression tag	UNP A0A1D3FX11
D	-13	HIS	-	expression tag	UNP A0A1D3FX11
D	-12	HIS	-	expression tag	UNP A0A1D3FX11
D	-11	HIS	-	expression tag	UNP A0A1D3FX11
D	-10	SER	-	expression tag	UNP A0A1D3FX11
D	-9	SER	-	expression tag	UNP A0A1D3FX11
D	-8	GLY	-	expression tag	UNP A0A1D3FX11
D	-7	LEU	-	expression tag	UNP A0A1D3FX11
D	-6	VAL	-	expression tag	UNP A0A1D3FX11
D	-5	PRO	-	expression tag	UNP A0A1D3FX11
D	-4	ARG	-	expression tag	UNP A0A1D3FX11
D	-3	GLY	-	expression tag	UNP A0A1D3FX11
D	-2	SER	-	expression tag	UNP A0A1D3FX11
D	-1	HIS	-	expression tag	UNP A0A1D3FX11
D	0	MET	-	expression tag	UNP A0A1D3FX11
E	-20	MET	-	initiating methionine	UNP A0A1D3FX11
E	-19	GLY	-	expression tag	UNP A0A1D3FX11
E	-18	SER	-	expression tag	UNP A0A1D3FX11
E	-17	SER	-	expression tag	UNP A0A1D3FX11
E	-16	HIS	-	expression tag	UNP A0A1D3FX11
E	-15	HIS	-	expression tag	UNP A0A1D3FX11
E	-14	HIS	-	expression tag	UNP A0A1D3FX11
E	-13	HIS	-	expression tag	UNP A0A1D3FX11
E	-12	HIS	-	expression tag	UNP A0A1D3FX11
E	-11	HIS	-	expression tag	UNP A0A1D3FX11
E	-10	SER	-	expression tag	UNP A0A1D3FX11
E	-9	SER	-	expression tag	UNP A0A1D3FX11
E	-8	GLY	-	expression tag	UNP A0A1D3FX11
E	-7	LEU	-	expression tag	UNP A0A1D3FX11
E	-6	VAL	-	expression tag	UNP A0A1D3FX11
E	-5	PRO	-	expression tag	UNP A0A1D3FX11
E	-4	ARG	-	expression tag	UNP A0A1D3FX11

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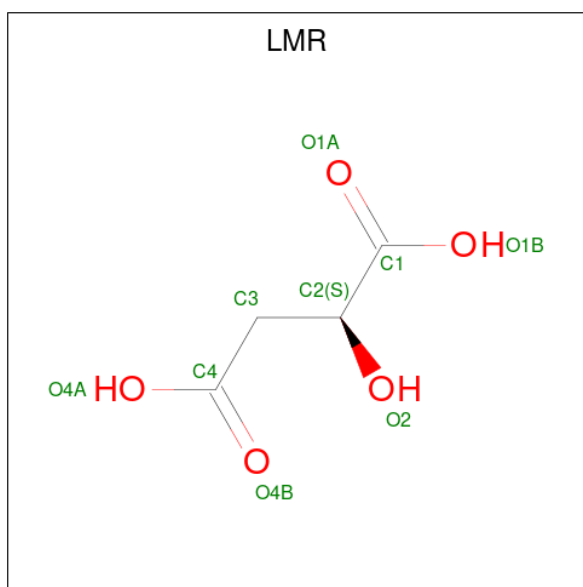
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Chain	Residue	Modelled	Actual	Comment	Reference
E	-3	GLY	-	expression tag	UNP A0A1D3FX11
E	-2	SER	-	expression tag	UNP A0A1D3FX11
E	-1	HIS	-	expression tag	UNP A0A1D3FX11
E	0	MET	-	expression tag	UNP A0A1D3FX11
F	-20	MET	-	initiating methionine	UNP A0A1D3FX11
F	-19	GLY	-	expression tag	UNP A0A1D3FX11
F	-18	SER	-	expression tag	UNP A0A1D3FX11
F	-17	SER	-	expression tag	UNP A0A1D3FX11
F	-16	HIS	-	expression tag	UNP A0A1D3FX11
F	-15	HIS	-	expression tag	UNP A0A1D3FX11
F	-14	HIS	-	expression tag	UNP A0A1D3FX11
F	-13	HIS	-	expression tag	UNP A0A1D3FX11
F	-12	HIS	-	expression tag	UNP A0A1D3FX11
F	-11	HIS	-	expression tag	UNP A0A1D3FX11
F	-10	SER	-	expression tag	UNP A0A1D3FX11
F	-9	SER	-	expression tag	UNP A0A1D3FX11
F	-8	GLY	-	expression tag	UNP A0A1D3FX11
F	-7	LEU	-	expression tag	UNP A0A1D3FX11
F	-6	VAL	-	expression tag	UNP A0A1D3FX11
F	-5	PRO	-	expression tag	UNP A0A1D3FX11
F	-4	ARG	-	expression tag	UNP A0A1D3FX11
F	-3	GLY	-	expression tag	UNP A0A1D3FX11
F	-2	SER	-	expression tag	UNP A0A1D3FX11
F	-1	HIS	-	expression tag	UNP A0A1D3FX11
F	0	MET	-	expression tag	UNP A0A1D3FX11

- Molecule 2 is SODIUM ION (three-letter code: NA) (formula: Na).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	1	Total Na 1 1	0	0
2	B	1	Total Na 1 1	0	0
2	C	1	Total Na 1 1	0	0
2	D	1	Total Na 1 1	0	0
2	E	1	Total Na 1 1	0	0
2	F	1	Total Na 1 1	0	0

- Molecule 3 is (2S)-2-hydroxybutanedioic acid (three-letter code: LMR) (formula: C₄H₆O₅).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total C O 9 4 5	0	0
3	A	1	Total C O 9 4 5	0	0
3	B	1	Total C O 9 4 5	0	0
3	D	1	Total C O 9 4 5	0	0
3	E	1	Total C O 9 4 5	0	0
3	F	1	Total C O 9 4 5	0	0

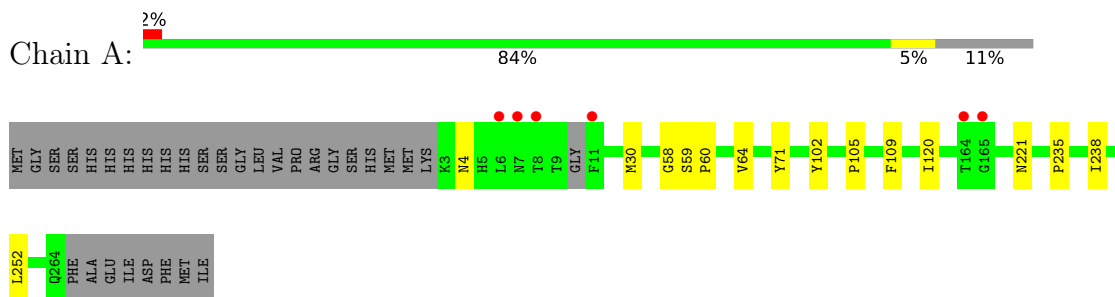
- Molecule 4 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	93	Total O 93 93	0	0
4	B	78	Total O 78 78	0	0
4	C	99	Total O 99 99	0	0
4	D	98	Total O 98 98	0	0
4	E	87	Total O 87 87	0	0
4	F	83	Total O 83 83	0	0

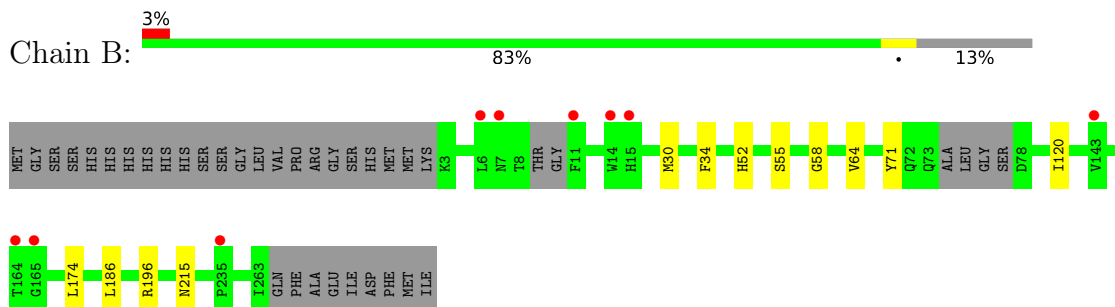
3 Residue-property plots [i](#)

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.

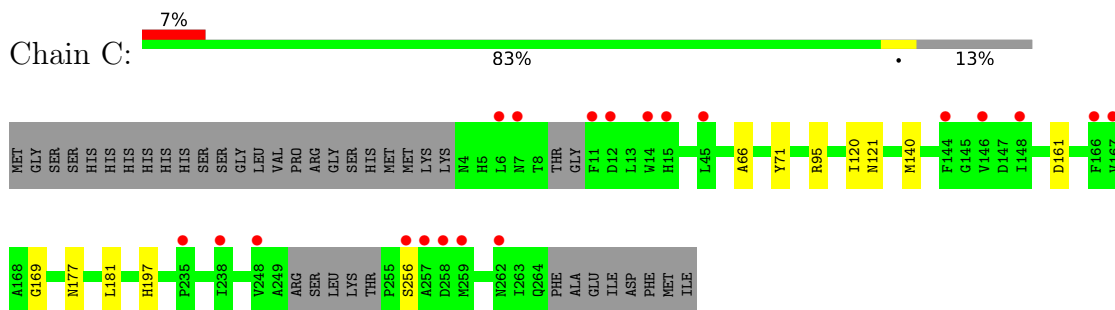
- Molecule 1: Serine acetyltransferase



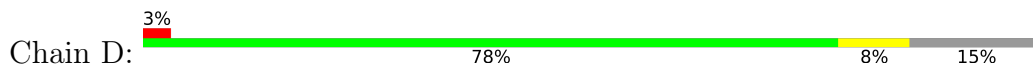
- Molecule 1: Serine acetyltransferase

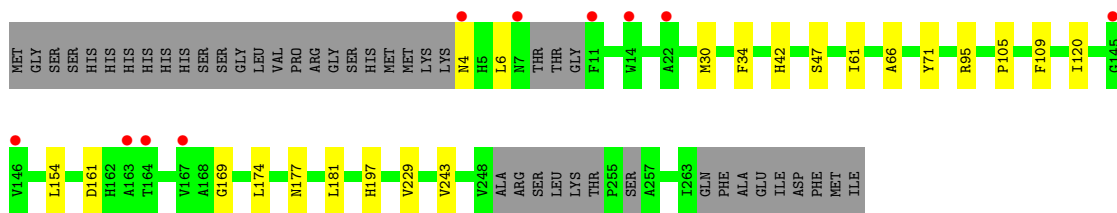


- Molecule 1: Serine acetyltransferase

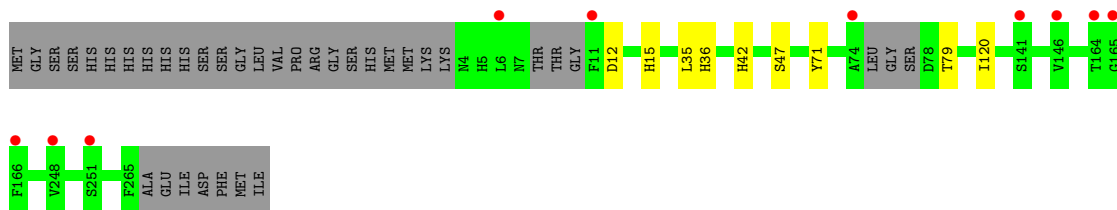
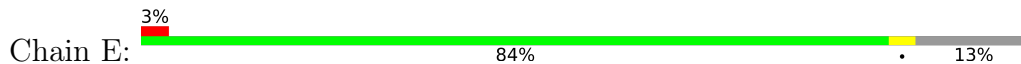


- Molecule 1: Serine acetyltransferase

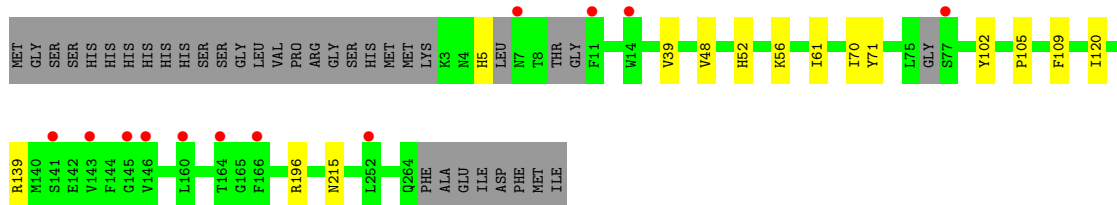
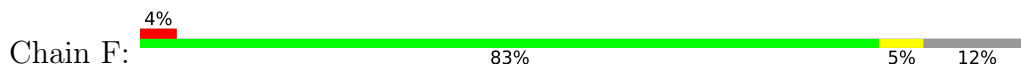




• Molecule 1: Serine acetyltransferase



• Molecule 1: Serine acetyltransferase



4 Data and refinement statistics i

Property	Value	Source
Space group	P 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	77.90Å 93.87Å 102.02Å 90.00° 91.29° 90.00°	Depositor
Resolution (Å)	43.11 – 2.01 46.93 – 2.01	Depositor EDS
% Data completeness (in resolution range)	99.6 (43.11-2.01) 99.7 (46.93-2.01)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	3.66 (at 2.01Å)	Xtrriage
Refinement program	PHENIX (1.16_3549)	Depositor
R, R_{free}	0.183 , 0.222 0.183 , 0.222	Depositor DCC
R_{free} test set	4755 reflections (4.88%)	wwPDB-VP
Wilson B-factor (Å ²)	34.8	Xtrriage
Anisotropy	0.300	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.34 , 49.5	EDS
L-test for twinning ²	$\langle L \rangle = 0.51$, $\langle L^2 \rangle = 0.34$	Xtrriage
Estimated twinning fraction	0.000 for h,-k,-l	Xtrriage
F_o, F_c correlation	0.97	EDS
Total number of atoms	11756	wwPDB-VP
Average B, all atoms (Å ²)	38.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 48.18 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 8.9202e-05. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

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: LMR, NA

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	0.39	0/1946	0.55	0/2645
1	B	0.35	0/1869	0.53	0/2539
1	C	0.38	0/1885	0.55	0/2558
1	D	0.38	0/1879	0.55	0/2548
1	E	0.41	0/1900	0.55	0/2583
1	F	0.37	0/1906	0.53	0/2589
All	All	0.38	0/11385	0.54	0/15462

There are no bond length outliers.

There are no bond angle outliers.

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	1906	0	1835	8	0
1	B	1831	0	1709	8	0
1	C	1847	0	1768	7	0
1	D	1843	0	1782	14	0
1	E	1862	0	1783	6	0
1	F	1869	0	1773	9	0
2	A	1	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	B	1	0	0	0	0
2	C	1	0	0	0	0
2	D	1	0	0	0	0
2	E	1	0	0	0	0
2	F	1	0	0	0	0
3	A	18	0	8	0	0
3	B	9	0	4	0	0
3	D	9	0	4	0	0
3	E	9	0	4	0	0
3	F	9	0	4	0	0
4	A	93	0	0	0	0
4	B	78	0	0	0	0
4	C	99	0	0	0	0
4	D	98	0	0	0	0
4	E	87	0	0	2	0
4	F	83	0	0	0	0
All	All	11756	0	10674	46	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 2.

All (46) 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:30:MET:HE1	1:D:66:ALA:HB1	1.70	0.73
1:A:30:MET:HE1	1:C:66:ALA:HB1	1.79	0.65
1:A:235:PRO:HG2	1:A:238:ILE:HG13	1.79	0.64
1:C:121:ASN:ND2	1:C:140:MET:SD	2.73	0.61
1:C:95:ARG:HD3	1:C:256:SER:O	2.03	0.58
1:D:42:HIS:HD1	1:D:47:SER:HG	1.50	0.57
1:A:221:ASN:HB3	1:A:252:LEU:HD21	1.87	0.55
1:C:71:TYR:CD1	1:C:120:ILE:HG21	2.43	0.54
1:F:39:VAL:HA	1:F:48:VAL:HG22	1.90	0.53
1:A:71:TYR:CD1	1:A:120:ILE:HG21	2.47	0.50
1:B:196:ARG:HA	1:B:215:ASN:HB2	1.94	0.49
1:A:59:SER:HB2	1:A:60:PRO:HD2	1.94	0.49
1:D:161:ASP:HB3	1:D:181:LEU:HD13	1.94	0.48
1:D:71:TYR:CD1	1:D:120:ILE:HG21	2.49	0.48
1:E:79:THR:HA	4:E:451:HOH:O	2.14	0.47
1:B:58:GLY:HA3	1:B:64:VAL:HG12	1.97	0.47
1:D:30:MET:SD	1:F:70:ILE:HD11	2.55	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:71:TYR:CD1	1:B:120:ILE:HG21	2.51	0.46
1:A:58:GLY:HA3	1:A:64:VAL:HG12	1.97	0.45
1:E:12:ASP:HB3	1:E:15:HIS:HB3	1.98	0.45
1:D:105:PRO:HA	1:D:109:PHE:HB2	1.98	0.45
1:C:95:ARG:HH22	1:C:177:ASN:HA	1.82	0.44
1:F:5:HIS:ND1	1:F:102:TYR:OH	2.38	0.44
1:E:42:HIS:ND1	1:E:47:SER:OG	2.42	0.44
1:C:161:ASP:HB3	1:C:181:LEU:HD13	1.99	0.43
1:D:4:ASN:OD1	1:D:6:LEU:N	2.48	0.43
1:D:95:ARG:HH22	1:D:177:ASN:HA	1.83	0.43
1:F:196:ARG:HA	1:F:215:ASN:HB2	2.01	0.43
1:B:52:HIS:O	1:B:55:SER:HB2	2.19	0.43
1:D:34:PHE:HB2	1:F:61:ILE:HG23	2.01	0.42
1:B:174:LEU:HD11	1:B:186:LEU:CD1	2.49	0.42
1:D:229:VAL:HG23	1:D:243:VAL:HG22	2.02	0.42
1:B:34:PHE:HB2	1:D:61:ILE:HG23	2.02	0.42
1:F:71:TYR:CD1	1:F:120:ILE:HG21	2.55	0.41
1:B:34:PHE:CD1	1:D:61:ILE:HD13	2.55	0.41
1:F:105:PRO:HA	1:F:109:PHE:HB2	2.01	0.41
1:A:4:ASN:HB2	1:A:102:TYR:OH	2.20	0.41
1:D:154:LEU:HD22	1:D:174:LEU:HD22	2.02	0.41
1:E:35:LEU:HD23	1:E:35:LEU:HA	1.91	0.41
1:E:36:HIS:HB2	4:E:480:HOH:O	2.21	0.41
1:A:105:PRO:HA	1:A:109:PHE:HB2	2.02	0.41
1:F:139:ARG:HD2	1:F:139:ARG:HA	1.87	0.41
1:C:169:GLY:HA3	1:C:197:HIS:NE2	2.36	0.41
1:E:71:TYR:CD1	1:E:120:ILE:HG21	2.56	0.40
1:D:169:GLY:HA3	1:D:197:HIS:NE2	2.36	0.40
1:F:52:HIS:O	1:F:56:LYS:HG2	2.22	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	258/293 (88%)	252 (98%)	6 (2%)	0	100	100
1	B	249/293 (85%)	244 (98%)	5 (2%)	0	100	100
1	C	248/293 (85%)	239 (96%)	9 (4%)	0	100	100
1	D	245/293 (84%)	240 (98%)	5 (2%)	0	100	100
1	E	250/293 (85%)	246 (98%)	4 (2%)	0	100	100
1	F	250/293 (85%)	245 (98%)	5 (2%)	0	100	100
All	All	1500/1758 (85%)	1466 (98%)	34 (2%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains [i](#)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	187/235 (80%)	187 (100%)	0	100	100
1	B	174/235 (74%)	174 (100%)	0	100	100
1	C	180/235 (77%)	180 (100%)	0	100	100
1	D	183/235 (78%)	183 (100%)	0	100	100
1	E	181/235 (77%)	181 (100%)	0	100	100
1	F	182/235 (77%)	182 (100%)	0	100	100
All	All	1087/1410 (77%)	1087 (100%)	0	100	100

There are no protein residues with a non-rotameric sidechain to report.

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	138	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 monosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 12 ligands modelled in this entry, 6 are monoatomic - leaving 6 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	LMR	A	302	-	8,8,8	1.70	2 (25%)	10,10,10	1.49	2 (20%)
3	LMR	B	302	-	8,8,8	1.80	2 (25%)	10,10,10	1.00	0
3	LMR	F	302	-	8,8,8	1.63	2 (25%)	10,10,10	1.19	1 (10%)
3	LMR	D	302	-	8,8,8	1.19	0	10,10,10	1.51	2 (20%)
3	LMR	A	303	-	8,8,8	1.80	2 (25%)	10,10,10	1.40	2 (20%)
3	LMR	E	302	-	8,8,8	1.80	2 (25%)	10,10,10	1.35	2 (20%)

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	LMR	A	302	-	-	6/8/8/8	-
3	LMR	B	302	-	-	0/8/8/8	-
3	LMR	F	302	-	-	0/8/8/8	-
3	LMR	D	302	-	-	0/8/8/8	-
3	LMR	A	303	-	-	6/8/8/8	-
3	LMR	E	302	-	-	6/8/8/8	-

All (10) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	B	302	LMR	O4A-C4	-3.52	1.18	1.30
3	A	303	LMR	O4A-C4	-3.41	1.19	1.30
3	E	302	LMR	O1B-C1	-3.37	1.19	1.30
3	A	303	LMR	O1B-C1	-3.26	1.19	1.30
3	E	302	LMR	O4A-C4	-3.24	1.19	1.30
3	B	302	LMR	O1B-C1	-3.17	1.20	1.30
3	A	302	LMR	O4A-C4	-3.13	1.20	1.30
3	F	302	LMR	O1B-C1	-3.08	1.20	1.30
3	A	302	LMR	O1B-C1	-3.05	1.20	1.30
3	F	302	LMR	O4A-C4	-2.94	1.20	1.30

All (9) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	D	302	LMR	O1B-C1-C2	3.35	120.08	112.72
3	A	302	LMR	O1A-C1-C2	-3.02	116.64	122.54
3	A	302	LMR	O1B-C1-C2	2.80	118.88	112.72
3	A	303	LMR	O1B-C1-C2	2.74	118.74	112.72
3	A	303	LMR	O1A-C1-C2	-2.69	117.28	122.54
3	E	302	LMR	O1A-C1-C2	-2.31	118.03	122.54
3	E	302	LMR	O1B-C1-C2	2.14	117.43	112.72
3	F	302	LMR	O1A-C1-C2	-2.09	118.45	122.54
3	D	302	LMR	O4A-C4-O4B	-2.01	118.30	123.30

There are no chirality outliers.

All (18) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	302	LMR	O1A-C1-C2-C3
3	A	302	LMR	O1B-C1-C2-C3
3	A	303	LMR	O1A-C1-C2-C3
3	A	303	LMR	O1B-C1-C2-C3
3	E	302	LMR	O1A-C1-C2-C3
3	E	302	LMR	O1B-C1-C2-C3
3	A	303	LMR	C2-C3-C4-O4A
3	A	303	LMR	C2-C3-C4-O4B
3	E	302	LMR	C2-C3-C4-O4A
3	E	302	LMR	C2-C3-C4-O4B
3	A	302	LMR	C2-C3-C4-O4B
3	A	302	LMR	C2-C3-C4-O4A
3	A	302	LMR	O1A-C1-C2-O2

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Mol	Chain	Res	Type	Atoms
3	A	302	LMR	O1B-C1-C2-O2
3	A	303	LMR	O1A-C1-C2-O2
3	A	303	LMR	O1B-C1-C2-O2
3	E	302	LMR	O1A-C1-C2-O2
3	E	302	LMR	O1B-C1-C2-O2

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	261/293 (89%)	-0.00	6 (2%) 60 59	26, 38, 54, 69	0
1	B	255/293 (87%)	0.09	9 (3%) 44 43	27, 41, 58, 69	0
1	C	254/293 (86%)	0.16	20 (7%) 12 11	25, 36, 53, 75	0
1	D	250/293 (85%)	0.13	10 (4%) 38 37	26, 37, 51, 73	0
1	E	256/293 (87%)	0.06	10 (3%) 39 38	24, 36, 52, 65	0
1	F	258/293 (88%)	0.17	12 (4%) 31 30	25, 38, 54, 74	0
All	All	1534/1758 (87%)	0.10	67 (4%) 34 33	24, 37, 54, 75	0

All (67) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	E	11	PHE	4.6
1	F	11	PHE	4.3
1	D	11	PHE	4.3
1	C	6	LEU	3.8
1	C	11	PHE	3.8
1	A	8	THR	3.4
1	D	164	THR	3.4
1	B	11	PHE	3.3
1	F	7	ASN	3.3
1	C	256	SER	3.2
1	B	6	LEU	3.2
1	F	146	VAL	3.2
1	A	6	LEU	3.1
1	E	164	THR	3.1
1	C	15	HIS	3.1
1	B	7	ASN	3.0
1	C	238	ILE	2.9
1	C	14	TRP	2.9
1	D	4	ASN	2.8

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Mol	Chain	Res	Type	RSRZ
1	E	6	LEU	2.8
1	C	146	VAL	2.7
1	D	14	TRP	2.7
1	A	7	ASN	2.7
1	E	146	VAL	2.7
1	F	77	SER	2.7
1	C	258	ASP	2.6
1	A	11	PHE	2.6
1	B	235	PRO	2.5
1	F	145	GLY	2.5
1	B	165	GLY	2.5
1	C	167	VAL	2.4
1	F	164	THR	2.4
1	E	166	PHE	2.4
1	D	146	VAL	2.4
1	E	74	ALA	2.4
1	B	164	THR	2.4
1	C	166	PHE	2.4
1	C	148	ILE	2.4
1	C	12	ASP	2.4
1	F	14	TRP	2.4
1	C	235	PRO	2.3
1	B	143	VAL	2.3
1	F	166	PHE	2.3
1	D	163	ALA	2.3
1	C	262	ASN	2.3
1	C	7	ASN	2.2
1	D	145	GLY	2.2
1	E	165	GLY	2.2
1	F	160	LEU	2.2
1	B	15	HIS	2.2
1	D	167	VAL	2.2
1	B	14	TRP	2.2
1	C	248	VAL	2.2
1	A	164	THR	2.2
1	C	45	LEU	2.1
1	F	252	LEU	2.1
1	C	144	PHE	2.1
1	C	257	ALA	2.1
1	D	7	ASN	2.1
1	A	165	GLY	2.1
1	E	251	SER	2.1

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Mol	Chain	Res	Type	RSRZ
1	F	141	SER	2.1
1	E	141	SER	2.0
1	C	259	MET	2.0
1	E	248	VAL	2.0
1	D	22	ALA	2.0
1	F	143	VAL	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 monosaccharides 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(Å ²)	Q<0.9
2	NA	F	301	1/1	0.91	0.16	45,45,45,45	0
2	NA	A	301	1/1	0.92	0.13	43,43,43,43	0
2	NA	E	301	1/1	0.93	0.13	42,42,42,42	0
2	NA	B	301	1/1	0.94	0.18	44,44,44,44	0
3	LMR	D	302	9/9	0.94	0.12	30,34,37,39	0
3	LMR	A	302	9/9	0.95	0.10	31,34,38,38	0
3	LMR	E	302	9/9	0.95	0.10	33,34,39,41	0
3	LMR	F	302	9/9	0.95	0.08	34,38,41,41	0
3	LMR	B	302	9/9	0.96	0.09	33,35,36,38	0
3	LMR	A	303	9/9	0.96	0.09	32,34,37,38	0
2	NA	C	301	1/1	0.98	0.08	41,41,41,41	0
2	NA	D	301	1/1	0.98	0.06	42,42,42,42	0

6.5 Other polymers [i](#)

There are no such residues in this entry.