wwPDB X-ray Structure Validation Summary Report (i)

Oct 12, 2024 – 09:02 PM EDT

PDB ID	:	9CG8
Title	:	CRYSTAL STRUCTURE OF THE P285S VARIANT OF SERINE HYDRO XYMETHYLTRANSFERASE 8 FROM SOYBEAN CULTIVAR FORREST
Authors	:	Beamer, L.J.; Samarakoon, V.; Owuocha, L.F.
Deposited on	:	2024-06-28
Resolution	:	1.90 Å(reported)

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

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/XrayValidationReportHelp
with specific help available everywhere you see the (i) 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 (i)) were used in the production of this report:

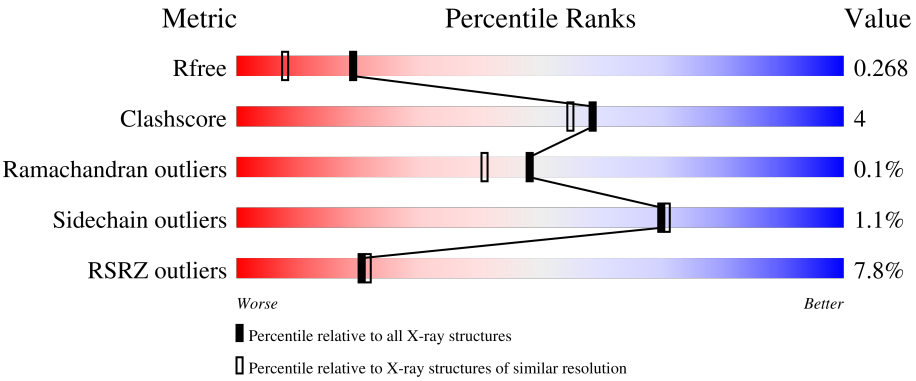
MolProbity	:	4.02b-467
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	1.20.1
EDS	:	3.0
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.003 (Gargrove)
Density-Fitness	:	1.0.11
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.39

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 1.90 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}	164625	7293 (1.90-1.90)
Clashscore	180529	8090 (1.90-1.90)
Ramachandran outliers	177936	8022 (1.90-1.90)
Sidechain outliers	177891	8022 (1.90-1.90)
RSRZ outliers	164620	7292 (1.90-1.90)

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	492	7% 82% 9% 8%
1	B	492	15% 80% 11% 8%
1	C	492	6% 83% 9% 8%
1	D	492	5% 83% 9% 8%
1	E	492	5% 81% 12% 7%

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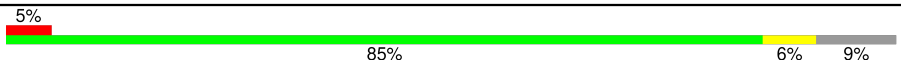
Mol	Chain	Length	Quality of chain
1	F	492	

2 Entry composition (i)

There are 2 unique types of molecules in this entry. The entry contains 21398 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 hydroxymethyltransferase.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	451	Total	C	N	O	P	S	0	1	0
			3397	2155	580	644	1	17			
1	B	451	Total	C	N	O	P	S	0	2	0
			3358	2120	576	643	1	18			
1	C	452	Total	C	N	O	P	S	0	1	0
			3411	2168	585	640	1	17			
1	D	454	Total	C	N	O	P	S	0	1	0
			3476	2209	593	656	1	17			
1	E	458	Total	C	N	O	P	S	0	3	0
			3472	2204	589	659	1	19			
1	F	450	Total	C	N	O	P	S	0	2	0
			3419	2170	583	647	1	18			

There are 132 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-20	MET	-	expression tag	UNP K4FW35
A	-19	GLY	-	expression tag	UNP K4FW35
A	-18	SER	-	expression tag	UNP K4FW35
A	-17	SER	-	expression tag	UNP K4FW35
A	-16	HIS	-	expression tag	UNP K4FW35
A	-15	HIS	-	expression tag	UNP K4FW35
A	-14	HIS	-	expression tag	UNP K4FW35
A	-13	HIS	-	expression tag	UNP K4FW35
A	-12	HIS	-	expression tag	UNP K4FW35
A	-11	HIS	-	expression tag	UNP K4FW35
A	-10	HIS	-	expression tag	UNP K4FW35
A	-9	SER	-	expression tag	UNP K4FW35
A	-8	SER	-	expression tag	UNP K4FW35
A	-7	GLY	-	expression tag	UNP K4FW35
A	-6	LEU	-	expression tag	UNP K4FW35
A	-5	VAL	-	expression tag	UNP K4FW35
A	-4	PRO	-	expression tag	UNP K4FW35

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Chain	Residue	Modelled	Actual	Comment	Reference
A	-3	ARG	-	expression tag	UNP K4FW35
A	-2	GLY	-	expression tag	UNP K4FW35
A	-1	SER	-	expression tag	UNP K4FW35
A	0	HIS	-	expression tag	UNP K4FW35
A	285	SER	PRO	engineered mutation	UNP K4FW35
B	-20	MET	-	expression tag	UNP K4FW35
B	-19	GLY	-	expression tag	UNP K4FW35
B	-18	SER	-	expression tag	UNP K4FW35
B	-17	SER	-	expression tag	UNP K4FW35
B	-16	HIS	-	expression tag	UNP K4FW35
B	-15	HIS	-	expression tag	UNP K4FW35
B	-14	HIS	-	expression tag	UNP K4FW35
B	-13	HIS	-	expression tag	UNP K4FW35
B	-12	HIS	-	expression tag	UNP K4FW35
B	-11	HIS	-	expression tag	UNP K4FW35
B	-10	HIS	-	expression tag	UNP K4FW35
B	-9	SER	-	expression tag	UNP K4FW35
B	-8	SER	-	expression tag	UNP K4FW35
B	-7	GLY	-	expression tag	UNP K4FW35
B	-6	LEU	-	expression tag	UNP K4FW35
B	-5	VAL	-	expression tag	UNP K4FW35
B	-4	PRO	-	expression tag	UNP K4FW35
B	-3	ARG	-	expression tag	UNP K4FW35
B	-2	GLY	-	expression tag	UNP K4FW35
B	-1	SER	-	expression tag	UNP K4FW35
B	0	HIS	-	expression tag	UNP K4FW35
B	285	SER	PRO	engineered mutation	UNP K4FW35
C	-20	MET	-	expression tag	UNP K4FW35
C	-19	GLY	-	expression tag	UNP K4FW35
C	-18	SER	-	expression tag	UNP K4FW35
C	-17	SER	-	expression tag	UNP K4FW35
C	-16	HIS	-	expression tag	UNP K4FW35
C	-15	HIS	-	expression tag	UNP K4FW35
C	-14	HIS	-	expression tag	UNP K4FW35
C	-13	HIS	-	expression tag	UNP K4FW35
C	-12	HIS	-	expression tag	UNP K4FW35
C	-11	HIS	-	expression tag	UNP K4FW35
C	-10	HIS	-	expression tag	UNP K4FW35
C	-9	SER	-	expression tag	UNP K4FW35
C	-8	SER	-	expression tag	UNP K4FW35
C	-7	GLY	-	expression tag	UNP K4FW35
C	-6	LEU	-	expression tag	UNP K4FW35

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Chain	Residue	Modelled	Actual	Comment	Reference
C	-5	VAL	-	expression tag	UNP K4FW35
C	-4	PRO	-	expression tag	UNP K4FW35
C	-3	ARG	-	expression tag	UNP K4FW35
C	-2	GLY	-	expression tag	UNP K4FW35
C	-1	SER	-	expression tag	UNP K4FW35
C	0	HIS	-	expression tag	UNP K4FW35
C	285	SER	PRO	engineered mutation	UNP K4FW35
D	-20	MET	-	expression tag	UNP K4FW35
D	-19	GLY	-	expression tag	UNP K4FW35
D	-18	SER	-	expression tag	UNP K4FW35
D	-17	SER	-	expression tag	UNP K4FW35
D	-16	HIS	-	expression tag	UNP K4FW35
D	-15	HIS	-	expression tag	UNP K4FW35
D	-14	HIS	-	expression tag	UNP K4FW35
D	-13	HIS	-	expression tag	UNP K4FW35
D	-12	HIS	-	expression tag	UNP K4FW35
D	-11	HIS	-	expression tag	UNP K4FW35
D	-10	HIS	-	expression tag	UNP K4FW35
D	-9	SER	-	expression tag	UNP K4FW35
D	-8	SER	-	expression tag	UNP K4FW35
D	-7	GLY	-	expression tag	UNP K4FW35
D	-6	LEU	-	expression tag	UNP K4FW35
D	-5	VAL	-	expression tag	UNP K4FW35
D	-4	PRO	-	expression tag	UNP K4FW35
D	-3	ARG	-	expression tag	UNP K4FW35
D	-2	GLY	-	expression tag	UNP K4FW35
D	-1	SER	-	expression tag	UNP K4FW35
D	0	HIS	-	expression tag	UNP K4FW35
D	285	SER	PRO	engineered mutation	UNP K4FW35
E	-20	MET	-	expression tag	UNP K4FW35
E	-19	GLY	-	expression tag	UNP K4FW35
E	-18	SER	-	expression tag	UNP K4FW35
E	-17	SER	-	expression tag	UNP K4FW35
E	-16	HIS	-	expression tag	UNP K4FW35
E	-15	HIS	-	expression tag	UNP K4FW35
E	-14	HIS	-	expression tag	UNP K4FW35
E	-13	HIS	-	expression tag	UNP K4FW35
E	-12	HIS	-	expression tag	UNP K4FW35
E	-11	HIS	-	expression tag	UNP K4FW35
E	-10	HIS	-	expression tag	UNP K4FW35
E	-9	SER	-	expression tag	UNP K4FW35
E	-8	SER	-	expression tag	UNP K4FW35

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Chain	Residue	Modelled	Actual	Comment	Reference
E	-7	GLY	-	expression tag	UNP K4FW35
E	-6	LEU	-	expression tag	UNP K4FW35
E	-5	VAL	-	expression tag	UNP K4FW35
E	-4	PRO	-	expression tag	UNP K4FW35
E	-3	ARG	-	expression tag	UNP K4FW35
E	-2	GLY	-	expression tag	UNP K4FW35
E	-1	SER	-	expression tag	UNP K4FW35
E	0	HIS	-	expression tag	UNP K4FW35
E	285	SER	PRO	engineered mutation	UNP K4FW35
F	-20	MET	-	expression tag	UNP K4FW35
F	-19	GLY	-	expression tag	UNP K4FW35
F	-18	SER	-	expression tag	UNP K4FW35
F	-17	SER	-	expression tag	UNP K4FW35
F	-16	HIS	-	expression tag	UNP K4FW35
F	-15	HIS	-	expression tag	UNP K4FW35
F	-14	HIS	-	expression tag	UNP K4FW35
F	-13	HIS	-	expression tag	UNP K4FW35
F	-12	HIS	-	expression tag	UNP K4FW35
F	-11	HIS	-	expression tag	UNP K4FW35
F	-10	HIS	-	expression tag	UNP K4FW35
F	-9	SER	-	expression tag	UNP K4FW35
F	-8	SER	-	expression tag	UNP K4FW35
F	-7	GLY	-	expression tag	UNP K4FW35
F	-6	LEU	-	expression tag	UNP K4FW35
F	-5	VAL	-	expression tag	UNP K4FW35
F	-4	PRO	-	expression tag	UNP K4FW35
F	-3	ARG	-	expression tag	UNP K4FW35
F	-2	GLY	-	expression tag	UNP K4FW35
F	-1	SER	-	expression tag	UNP K4FW35
F	0	HIS	-	expression tag	UNP K4FW35
F	285	SER	PRO	engineered mutation	UNP K4FW35

- Molecule 2 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	154	Total O 154 154	0	0
2	B	82	Total O 82 82	0	0
2	C	140	Total O 140 140	0	0
2	D	164	Total O 164 164	0	0

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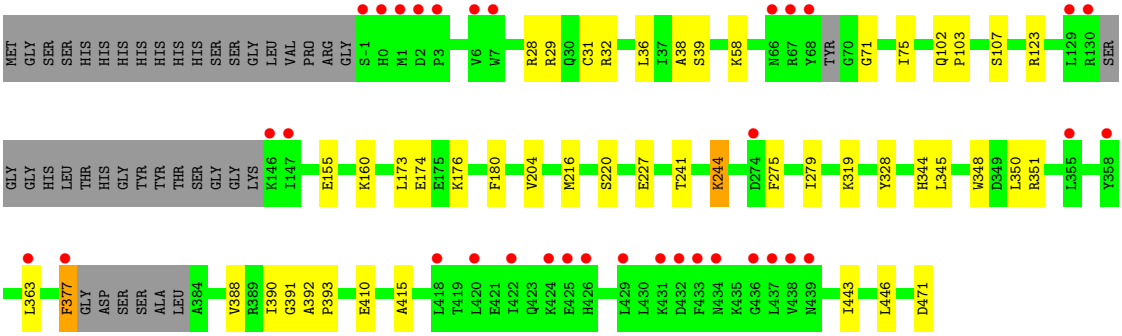
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	E	166	Total O 166 166	0	0
2	F	159	Total O 159 159	0	0

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.

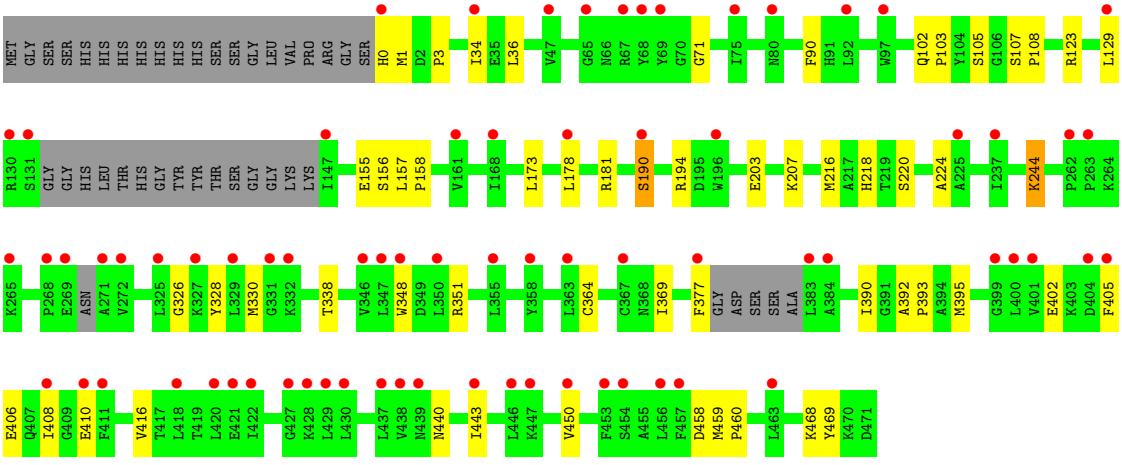
• Molecule 1: Serine hydroxymethyltransferase

Chain A:



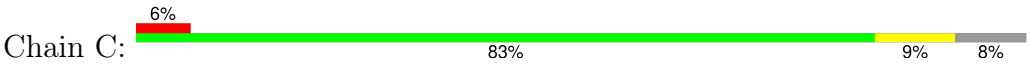
• Molecule 1: Serine hydroxymethyltransferase

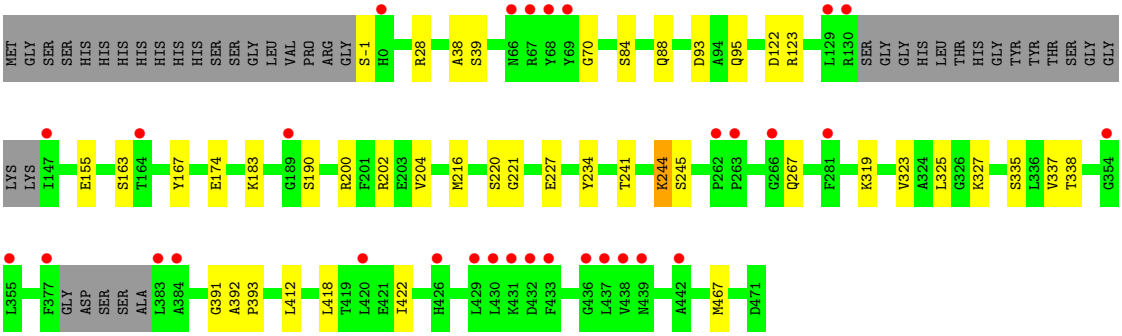
Chain B:



• Molecule 1: Serine hydroxymethyltransferase

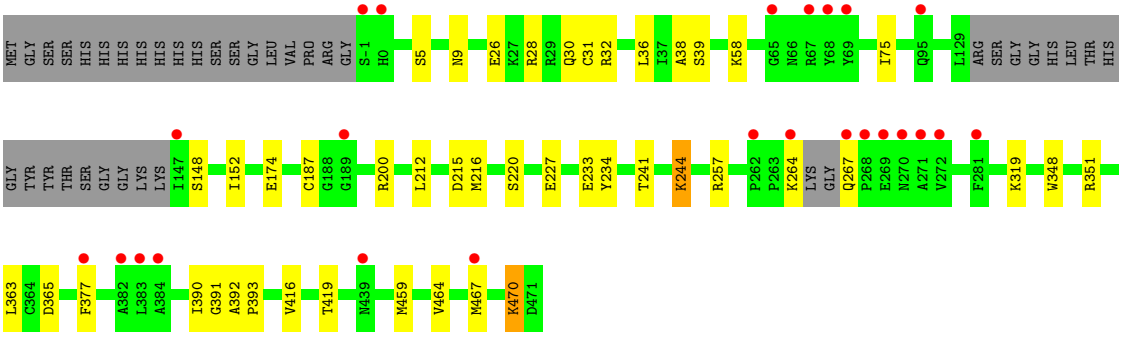
Chain C:





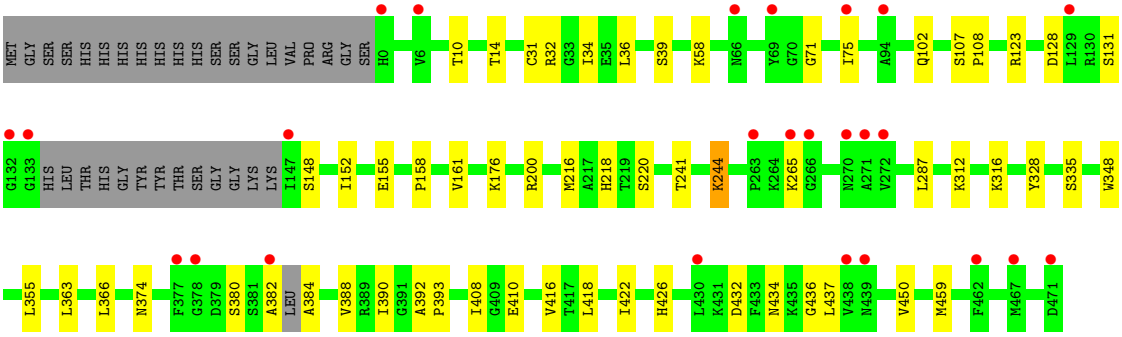
• Molecule 1: Serine hydroxymethyltransferase

Chain D:



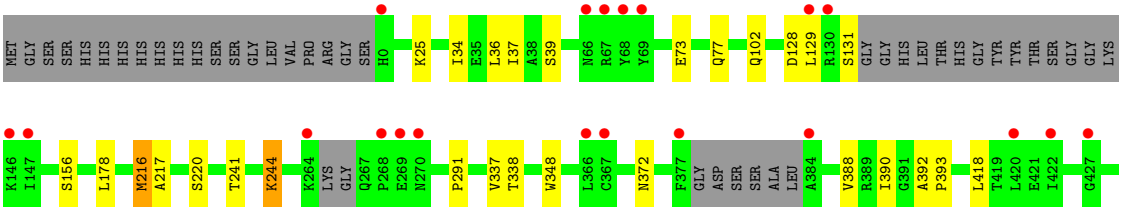
• Molecule 1: Serine hydroxymethyltransferase

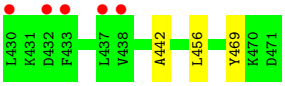
Chain E:



• Molecule 1: Serine hydroxymethyltransferase

Chain F:




L430
K431
D432
F433
L437
V438
A442
L456
Y469
K470
D471

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 31 2 1	Depositor
Cell constants a, b, c, α, β, γ	174.18Å 174.18Å 183.66Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	48.50 – 1.90 48.50 – 1.90	Depositor EDS
% Data completeness (in resolution range)	99.7 (48.50-1.90) 99.6 (48.50-1.90)	Depositor EDS
R_{merge}	0.13	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	3.26 (at 1.90Å)	Xtriage
Refinement program	PHENIX 1.20.1_4487	Depositor
R, R_{free}	0.227 , 0.266 0.231 , 0.268	Depositor DCC
R_{free} test set	12686 reflections (5.04%)	wwPDB-VP
Wilson B-factor (Å^2)	30.4	Xtriage
Anisotropy	0.422	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.35 , 34.1	EDS
L-test for twinning[2]	$< \|L\| > = 0.49$, $< L^2 > = 0.33$	Xtriage
Estimated twinning fraction	0.006 for -h,-k,l	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	21398	wwPDB-VP
Average B, all atoms (Å^2)	40.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 35.98 % 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 5.3619e-04. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ 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: LLP

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	0.41	1/3437 (0.0%)	0.61	0/4665
1	B	0.36	0/3403	0.58	0/4629
1	C	0.41	0/3453	0.61	0/4685
1	D	0.43	0/3518	0.62	0/4767
1	E	0.44	0/3518	0.63	0/4774
1	F	0.41	0/3464	0.62	0/4701
All	All	0.41	1/20793 (0.0%)	0.61	0/28221

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	31	CYS	CB-SG	-6.05	1.72	1.82

There are no bond angle outliers.

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	3397	0	3209	30	0
1	B	3358	0	3064	37	0
1	C	3411	0	3244	24	0
1	D	3476	0	3365	30	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	E	3472	0	3311	34	0
1	F	3419	0	3245	18	0
2	A	154	0	0	0	0
2	B	82	0	0	0	0
2	C	140	0	0	1	0
2	D	164	0	0	1	0
2	E	166	0	0	0	0
2	F	159	0	0	0	0
All	All	21398	0	19438	170	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 4.

The worst 5 of 170 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:0:HIS:HD2	1:B:1:MET:H	1.29	0.80
1:B:34:ILE:HG13	1:B:450:VAL:HG13	1.67	0.75
1:F:216:MET:HG3	1:F:220:SER:HB3	1.68	0.74
1:B:0:HIS:CD2	1:B:1:MET:H	2.05	0.74
1:E:34:ILE:HG13	1:E:450:VAL:HG13	1.69	0.72

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	442/492 (90%)	433 (98%)	9 (2%)	0	100	100
1	B	443/492 (90%)	423 (96%)	20 (4%)	0	100	100
1	C	445/492 (90%)	437 (98%)	8 (2%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	D	447/492 (91%)	431 (96%)	16 (4%)	0	100	100
1	E	453/492 (92%)	439 (97%)	13 (3%)	1 (0%)	44	36
1	F	442/492 (90%)	429 (97%)	12 (3%)	1 (0%)	44	36
All	All	2672/2952 (90%)	2592 (97%)	78 (3%)	2 (0%)	48	41

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	F	128	ASP
1	E	265	LYS

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	334/402 (83%)	329 (98%)	5 (2%)	60	59
1	B	320/402 (80%)	316 (99%)	4 (1%)	65	65
1	C	336/402 (84%)	331 (98%)	5 (2%)	60	59
1	D	354/402 (88%)	352 (99%)	2 (1%)	84	86
1	E	348/402 (87%)	344 (99%)	4 (1%)	70	71
1	F	341/402 (85%)	338 (99%)	3 (1%)	75	77
All	All	2033/2412 (84%)	2010 (99%)	23 (1%)	70	71

5 of 23 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	D	241	THR
1	E	241	THR
1	E	176	LYS
1	E	374	ASN
1	B	190	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 8 such sidechains are listed below:

Mol	Chain	Res	Type
1	F	434	ASN
1	E	9	ASN
1	C	267	GLN
1	C	88	GLN
1	D	9	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)

12 non-standard protein/DNA/RNA residues 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	$\#\|Z\| > 2$
1	LLP	D	244[B]	1	7,8,25	0.71	0	3,8,34	0.50	0
1	LLP	C	244[B]	1	7,8,25	0.66	0	3,8,34	0.60	0
1	LLP	C	244[A]	1	23,24,25	2.53	6 (26%)	25,32,34	1.28	3 (12%)
1	LLP	A	244[A]	1	23,24,25	2.54	6 (26%)	25,32,34	1.55	5 (20%)
1	LLP	A	244[B]	1	7,8,25	0.73	0	3,8,34	0.56	0
1	LLP	D	244[A]	1	23,24,25	2.58	7 (30%)	25,32,34	1.48	6 (24%)
1	LLP	E	244[A]	1	23,24,25	2.51	6 (26%)	25,32,34	1.57	6 (24%)
1	LLP	E	244[B]	1	7,8,25	0.69	0	3,8,34	0.66	0
1	LLP	F	244[A]	1	23,24,25	2.63	6 (26%)	25,32,34	1.40	4 (16%)
1	LLP	F	244[B]	1	7,8,25	0.66	0	3,8,34	0.58	0
1	LLP	B	244[B]	1	7,8,25	0.68	0	3,8,34	0.63	0
1	LLP	B	244[A]	1	23,24,25	2.59	6 (26%)	25,32,34	1.60	6 (24%)

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
1	LLP	D	244[B]	1	-	1/6/7/19	-
1	LLP	C	244[B]	1	-	2/6/7/19	-
1	LLP	C	244[A]	1	-	4/16/17/19	0/1/1/1
1	LLP	A	244[A]	1	-	7/16/17/19	0/1/1/1
1	LLP	A	244[B]	1	-	1/6/7/19	-
1	LLP	D	244[A]	1	-	4/16/17/19	0/1/1/1
1	LLP	E	244[A]	1	-	7/16/17/19	0/1/1/1
1	LLP	E	244[B]	1	-	2/6/7/19	-
1	LLP	F	244[A]	1	-	2/16/17/19	0/1/1/1
1	LLP	F	244[B]	1	-	1/6/7/19	-
1	LLP	B	244[B]	1	-	2/6/7/19	-
1	LLP	B	244[A]	1	-	6/16/17/19	0/1/1/1

The worst 5 of 37 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	F	244[A]	LLP	C4-C4'	7.79	1.63	1.46
1	D	244[A]	LLP	C4-C4'	7.54	1.62	1.46
1	C	244[A]	LLP	C4-C4'	7.49	1.62	1.46
1	E	244[A]	LLP	C4-C4'	7.38	1.62	1.46
1	B	244[A]	LLP	C4-C4'	7.16	1.61	1.46

The worst 5 of 30 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	244[A]	LLP	C4-C4'-NZ	-3.56	107.64	124.04
1	B	244[A]	LLP	C4-C4'-NZ	-3.32	108.70	124.04
1	D	244[A]	LLP	C4-C4'-NZ	-3.16	109.48	124.04
1	C	244[A]	LLP	C4-C4'-NZ	-3.14	109.53	124.04
1	D	244[A]	LLP	CE-NZ-C4'	-3.14	108.65	118.72

There are no chirality outliers.

5 of 39 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	A	244[A]	LLP	C5'-OP4-P-OP2
1	A	244[A]	LLP	C5'-OP4-P-OP3
1	A	244[A]	LLP	O-C-CA-CB

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Mol	Chain	Res	Type	Atoms
1	A	244[B]	LLP	O-C-CA-CB
1	B	244[A]	LLP	C5'-OP4-P-OP1

There are no ring outliers.

12 monomers are involved in 20 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	D	244[B]	LLP	1	0
1	C	244[B]	LLP	1	0
1	C	244[A]	LLP	2	0
1	A	244[A]	LLP	3	0
1	A	244[B]	LLP	1	0
1	D	244[A]	LLP	2	0
1	E	244[A]	LLP	1	0
1	E	244[B]	LLP	2	0
1	F	244[A]	LLP	1	0
1	F	244[B]	LLP	1	0
1	B	244[B]	LLP	1	0
1	B	244[A]	LLP	4	0

5.5 Carbohydrates (i)

There are no oligosaccharides in this entry.

5.6 Ligand geometry (i)

There are no ligands in this entry.

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, 95^{th} 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	450/492 (91%)	0.56	34 (7%)	21	22	23, 38, 63, 82	0
1	B	450/492 (91%)	1.14	73 (16%)	5	5	25, 47, 72, 81	1 (0%)
1	C	451/492 (91%)	0.63	31 (6%)	24	25	24, 38, 67, 82	0
1	D	453/492 (92%)	0.38	24 (5%)	33	34	22, 35, 56, 80	0
1	E	457/492 (92%)	0.51	25 (5%)	32	33	18, 34, 56, 83	2 (0%)
1	F	449/492 (91%)	0.50	25 (5%)	31	32	21, 37, 62, 75	1 (0%)
All	All	2710/2952 (91%)	0.62	212 (7%)	20	21	18, 38, 65, 83	4 (0%)

The worst 5 of 212 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	383	LEU	6.4
1	A	422	ILE	4.7
1	F	377	PHE	4.5
1	D	147	ILE	4.3
1	B	129	LEU	4.3

6.2 Non-standard residues in protein, DNA, RNA chains

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, 95^{th} 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
1	LLP	B	244[A]	24/25	0.80	0.17	37,51,59,66	24
1	LLP	B	244[B]	9/25	0.80	0.17	37,39,46,50	9
1	LLP	F	244[A]	24/25	0.87	0.15	28,44,57,60	24
1	LLP	F	244[B]	9/25	0.87	0.15	28,29,37,42	9

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
1	LLP	C	244[A]	24/25	0.89	0.12	28,40,51,52	24
1	LLP	C	244[B]	9/25	0.89	0.12	28,30,36,39	9
1	LLP	E	244[A]	24/25	0.89	0.12	25,38,47,53	24
1	LLP	E	244[B]	9/25	0.89	0.12	24,28,35,37	9
1	LLP	A	244[A]	24/25	0.89	0.13	27,42,51,53	24
1	LLP	A	244[B]	9/25	0.89	0.13	29,32,36,39	9
1	LLP	D	244[A]	24/25	0.90	0.11	25,37,45,48	24
1	LLP	D	244[B]	9/25	0.90	0.11	24,28,34,35	9

6.3 Carbohydrates (i)

There are no monosaccharides in this entry.

6.4 Ligands (i)

There are no ligands in this entry.

6.5 Other polymers (i)

There are no such residues in this entry.