wwPDB X-ray Structure Validation Summary Report (i)

Jan 17, 2023 – 04:35 AM EST

PDB ID	:	2PRR
Title	:	Crystal structure of alkylhydroperoxidase AhpD core: uncharacterized peroxidase-related protein (YP_296737.1) from Ralstonia eutropha JMP134 at 2.15 A resolution
Authors	:	Joint Center for Structural Genomics (JCSG)
Deposited on	:	2007-05-04
Resolution	:	2.15 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:

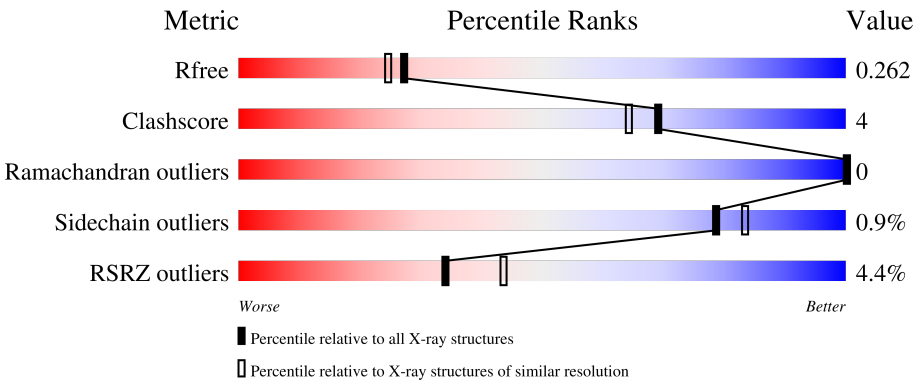
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.31.2
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.31.2

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 2.15 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	1479 (2.16-2.16)
Clashscore	141614	1585 (2.16-2.16)
Ramachandran outliers	138981	1560 (2.16-2.16)
Sidechain outliers	138945	1559 (2.16-2.16)
RSRZ outliers	127900	1456 (2.16-2.16)

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	197	4% 84% 12% • •
1	B	197	3% 85% 11% • •
1	C	197	3% 90% 5% • •
1	D	197	5% 91% 5% • •
1	E	197	2% 90% 6% • •

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Mol	Chain	Length	Quality of chain
1	F	197	4% 82% 14%
1	G	197	5% 89% 7%
1	H	197	3% 86% 10%
1	I	197	4% 88% 7%
1	J	197	6% 84% 11% 5%
1	K	197	5% 91% 6%
1	L	197	6% 88% 8%

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	PEG	C	199	-	-	-	X

2 Entry composition (i)

There are 4 unique types of molecules in this entry. The entry contains 19292 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 Alkylhydroperoxidase AhpD core: uncharacterized peroxidase-related protein.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
			Total	C	N	O	S	Se			
1	A	190	1497	960	260	268	3	6	0	1	0
1	B	190	1493	955	259	270	3	6	0	1	0
1	C	189	1483	951	257	266	3	6	0	0	0
1	D	191	1481	954	257	261	3	6	0	0	0
1	E	190	1486	952	260	265	3	6	0	0	0
1	F	190	1478	949	257	263	3	6	0	0	0
1	G	189	1474	945	256	264	3	6	0	0	0
1	H	190	1475	948	258	260	3	6	0	0	0
1	I	189	1462	935	255	263	3	6	0	0	0
1	J	188	1455	932	253	261	3	6	0	0	0
1	K	191	1463	937	257	260	3	6	0	0	0
1	L	189	1462	940	253	260	3	6	0	0	0

There are 96 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	0	GLY	-	expression tag	UNP Q46Y90
A	1	MSE	MET	modified residue	UNP Q46Y90
A	62	MSE	MET	modified residue	UNP Q46Y90
A	75	MSE	MET	modified residue	UNP Q46Y90

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Chain	Residue	Modelled	Actual	Comment	Reference
A	126	MSE	MET	modified residue	UNP Q46Y90
A	174	MSE	MET	modified residue	UNP Q46Y90
A	180	MSE	MET	modified residue	UNP Q46Y90
A	189	MSE	MET	modified residue	UNP Q46Y90
B	0	GLY	-	expression tag	UNP Q46Y90
B	1	MSE	MET	modified residue	UNP Q46Y90
B	62	MSE	MET	modified residue	UNP Q46Y90
B	75	MSE	MET	modified residue	UNP Q46Y90
B	126	MSE	MET	modified residue	UNP Q46Y90
B	174	MSE	MET	modified residue	UNP Q46Y90
B	180	MSE	MET	modified residue	UNP Q46Y90
B	189	MSE	MET	modified residue	UNP Q46Y90
C	0	GLY	-	expression tag	UNP Q46Y90
C	1	MSE	MET	modified residue	UNP Q46Y90
C	62	MSE	MET	modified residue	UNP Q46Y90
C	75	MSE	MET	modified residue	UNP Q46Y90
C	126	MSE	MET	modified residue	UNP Q46Y90
C	174	MSE	MET	modified residue	UNP Q46Y90
C	180	MSE	MET	modified residue	UNP Q46Y90
C	189	MSE	MET	modified residue	UNP Q46Y90
D	0	GLY	-	expression tag	UNP Q46Y90
D	1	MSE	MET	modified residue	UNP Q46Y90
D	62	MSE	MET	modified residue	UNP Q46Y90
D	75	MSE	MET	modified residue	UNP Q46Y90
D	126	MSE	MET	modified residue	UNP Q46Y90
D	174	MSE	MET	modified residue	UNP Q46Y90
D	180	MSE	MET	modified residue	UNP Q46Y90
D	189	MSE	MET	modified residue	UNP Q46Y90
E	0	GLY	-	expression tag	UNP Q46Y90
E	1	MSE	MET	modified residue	UNP Q46Y90
E	62	MSE	MET	modified residue	UNP Q46Y90
E	75	MSE	MET	modified residue	UNP Q46Y90
E	126	MSE	MET	modified residue	UNP Q46Y90
E	174	MSE	MET	modified residue	UNP Q46Y90
E	180	MSE	MET	modified residue	UNP Q46Y90
E	189	MSE	MET	modified residue	UNP Q46Y90
F	0	GLY	-	expression tag	UNP Q46Y90
F	1	MSE	MET	modified residue	UNP Q46Y90
F	62	MSE	MET	modified residue	UNP Q46Y90
F	75	MSE	MET	modified residue	UNP Q46Y90
F	126	MSE	MET	modified residue	UNP Q46Y90
F	174	MSE	MET	modified residue	UNP Q46Y90

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Chain	Residue	Modelled	Actual	Comment	Reference
F	180	MSE	MET	modified residue	UNP Q46Y90
F	189	MSE	MET	modified residue	UNP Q46Y90
G	0	GLY	-	expression tag	UNP Q46Y90
G	1	MSE	MET	modified residue	UNP Q46Y90
G	62	MSE	MET	modified residue	UNP Q46Y90
G	75	MSE	MET	modified residue	UNP Q46Y90
G	126	MSE	MET	modified residue	UNP Q46Y90
G	174	MSE	MET	modified residue	UNP Q46Y90
G	180	MSE	MET	modified residue	UNP Q46Y90
G	189	MSE	MET	modified residue	UNP Q46Y90
H	0	GLY	-	expression tag	UNP Q46Y90
H	1	MSE	MET	modified residue	UNP Q46Y90
H	62	MSE	MET	modified residue	UNP Q46Y90
H	75	MSE	MET	modified residue	UNP Q46Y90
H	126	MSE	MET	modified residue	UNP Q46Y90
H	174	MSE	MET	modified residue	UNP Q46Y90
H	180	MSE	MET	modified residue	UNP Q46Y90
H	189	MSE	MET	modified residue	UNP Q46Y90
I	0	GLY	-	expression tag	UNP Q46Y90
I	1	MSE	MET	modified residue	UNP Q46Y90
I	62	MSE	MET	modified residue	UNP Q46Y90
I	75	MSE	MET	modified residue	UNP Q46Y90
I	126	MSE	MET	modified residue	UNP Q46Y90
I	174	MSE	MET	modified residue	UNP Q46Y90
I	180	MSE	MET	modified residue	UNP Q46Y90
I	189	MSE	MET	modified residue	UNP Q46Y90
J	0	GLY	-	expression tag	UNP Q46Y90
J	1	MSE	MET	modified residue	UNP Q46Y90
J	62	MSE	MET	modified residue	UNP Q46Y90
J	75	MSE	MET	modified residue	UNP Q46Y90
J	126	MSE	MET	modified residue	UNP Q46Y90
J	174	MSE	MET	modified residue	UNP Q46Y90
J	180	MSE	MET	modified residue	UNP Q46Y90
J	189	MSE	MET	modified residue	UNP Q46Y90
K	0	GLY	-	expression tag	UNP Q46Y90
K	1	MSE	MET	modified residue	UNP Q46Y90
K	62	MSE	MET	modified residue	UNP Q46Y90
K	75	MSE	MET	modified residue	UNP Q46Y90
K	126	MSE	MET	modified residue	UNP Q46Y90
K	174	MSE	MET	modified residue	UNP Q46Y90
K	180	MSE	MET	modified residue	UNP Q46Y90
K	189	MSE	MET	modified residue	UNP Q46Y90

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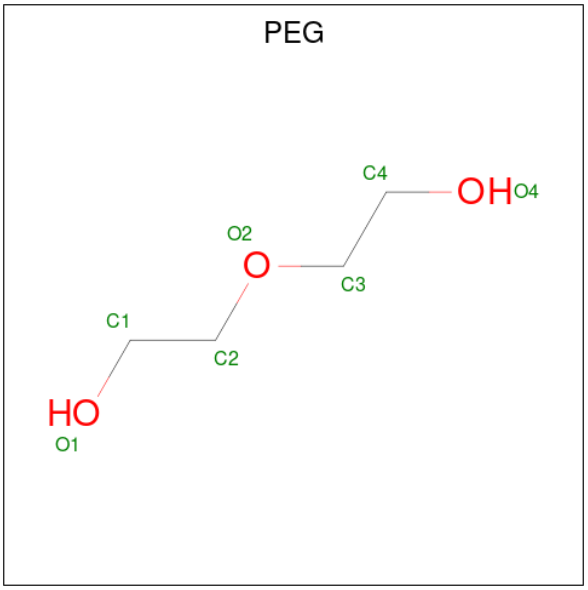
Chain	Residue	Modelled	Actual	Comment	Reference
L	0	GLY	-	expression tag	UNP Q46Y90
L	1	MSE	MET	modified residue	UNP Q46Y90
L	62	MSE	MET	modified residue	UNP Q46Y90
L	75	MSE	MET	modified residue	UNP Q46Y90
L	126	MSE	MET	modified residue	UNP Q46Y90
L	174	MSE	MET	modified residue	UNP Q46Y90
L	180	MSE	MET	modified residue	UNP Q46Y90
L	189	MSE	MET	modified residue	UNP Q46Y90

- Molecule 2 is DI(HYDROXYETHYL)ETHER (three-letter code: PEG) (formula: $C_4H_{10}O_3$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	O			
2	A	1	7	4	3		0	0
			Total	C	O			
2	A	1	7	4	3		0	0
			Total	C	O			
2	A	1	7	4	3		0	0
			Total	C	O			
2	B	1	7	4	3		0	0
			Total	C	O			
2	B	1	7	4	3		0	0
			Total	C	O			
2	C	1	7	4	3		0	0
			Total	C	O			
2	C	1	7	4	3		0	0

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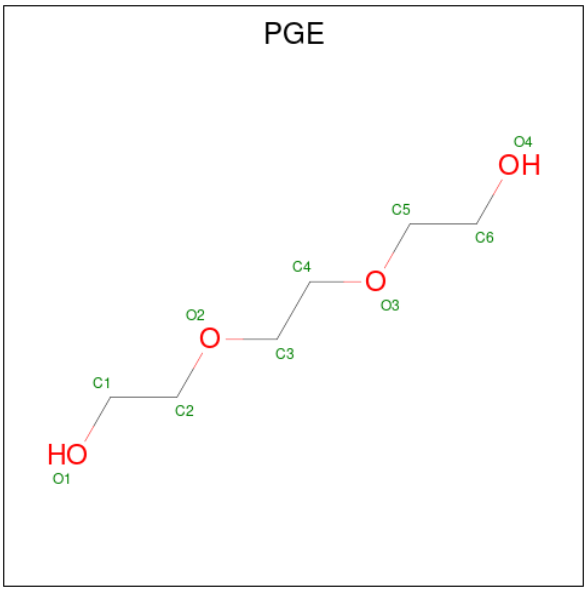
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
			Total	C	O		
2	C	1	7	4	3	0	0
2	D	1	7	4	3	0	0
2	E	1	7	4	3	0	0
2	E	1	7	4	3	0	0
2	E	1	7	4	3	0	0
2	F	1	7	4	3	0	0
2	F	1	7	4	3	0	0
2	G	1	7	4	3	0	0
2	G	1	7	4	3	0	0
2	H	1	7	4	3	0	0
2	H	1	7	4	3	0	0
2	I	1	7	4	3	0	0
2	J	1	7	4	3	0	0
2	J	1	7	4	3	0	0
2	J	1	7	4	3	0	0
2	K	1	7	4	3	0	0
2	K	1	7	4	3	0	0
2	L	1	7	4	3	0	0

- Molecule 3 is TRIETHYLENE GLYCOL (three-letter code: PGE) (formula: $C_6H_{14}O_4$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
			Total	C	O		
3	B	1	10	6	4	0	0
3	C	1	10	6	4	0	0
3	D	1	10	6	4	0	0
3	E	1	10	6	4	0	0
3	F	1	10	6	4	0	0
3	G	1	10	6	4	0	0
3	H	1	10	6	4	0	0

- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	O		
4	A	133	133	133	0	0
4	B	133	133	133	0	0
4	C	122	122	122	0	0
4	D	117	117	117	0	0
4	E	130	130	130	0	0

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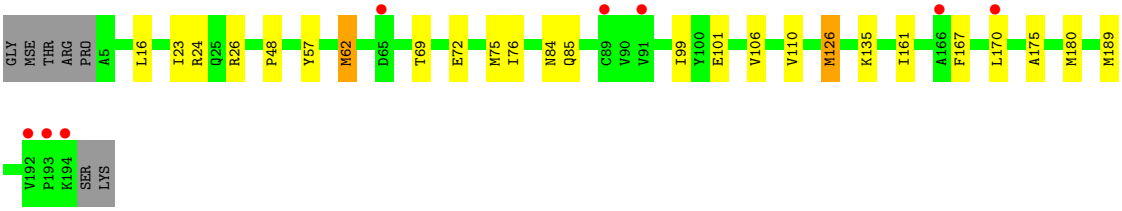
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	O		
4	F	116	116	116	0	0
			Total	O		
4	G	102	102	102	0	0
			Total	O		
4	H	130	130	130	0	0
			Total	O		
4	I	107	107	107	0	0
			Total	O		
4	J	81	81	81	0	0
			Total	O		
4	K	88	88	88	0	0
			Total	O		
4	L	79	79	79	0	0

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: Alkylhydroperoxidase AhpD core: uncharacterized peroxidase-related protein

Chain A:

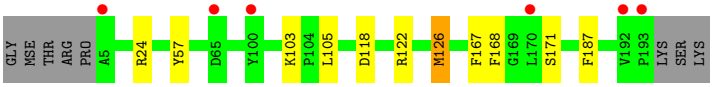


• Molecule 1: Alkylhydroperoxidase AhpD core: uncharacterized peroxidase-related protein

Chain B:

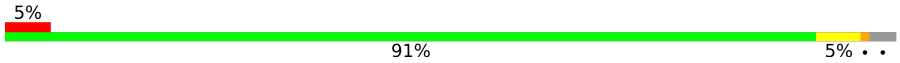
• Molecule 1: Alkylhydroperoxidase AhpD core: uncharacterized peroxidase-related protein

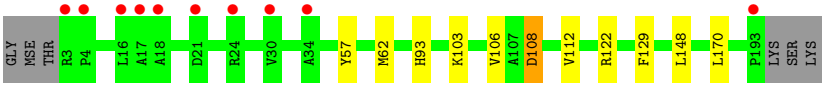
Chain C:



• Molecule 1: Alkylhydroperoxidase AhpD core: uncharacterized peroxidase-related protein

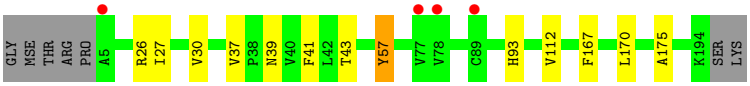
Chain D:





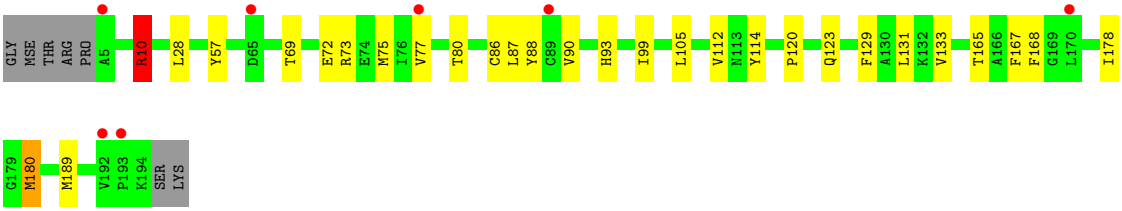
• Molecule 1: Alkylhydroperoxidase AhpD core: uncharacterized peroxidase-related protein

Chain E:



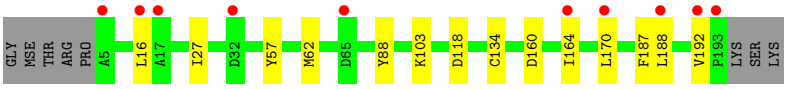
• Molecule 1: Alkylhydroperoxidase AhpD core: uncharacterized peroxidase-related protein

Chain F:



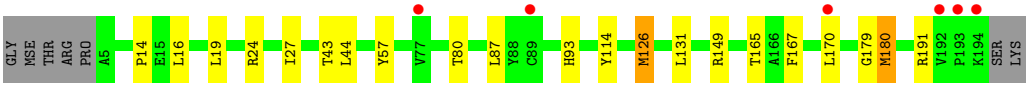
• Molecule 1: Alkylhydroperoxidase AhpD core: uncharacterized peroxidase-related protein

Chain G:



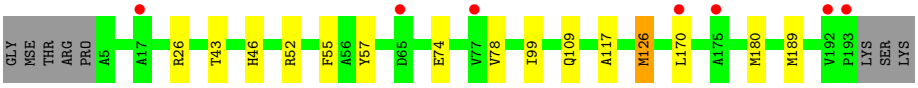
• Molecule 1: Alkylhydroperoxidase AhpD core: uncharacterized peroxidase-related protein

Chain H:



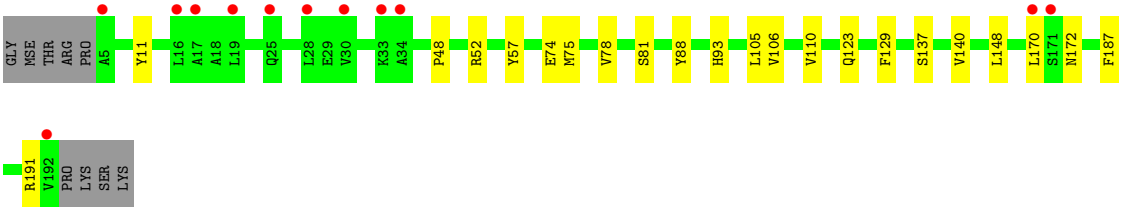
• Molecule 1: Alkylhydroperoxidase AhpD core: uncharacterized peroxidase-related protein

Chain I:



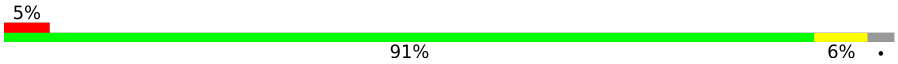
• Molecule 1: Alkylhydroperoxidase AhpD core: uncharacterized peroxidase-related protein

Chain J:



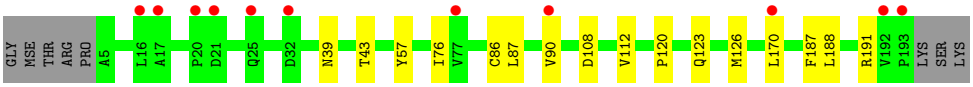
• Molecule 1: Alkylhydroperoxidase AhpD core: uncharacterized peroxidase-related protein

Chain K:



- Molecule 1: Alkylhydroperoxidase AhpD core: uncharacterized peroxidase-related protein

Chain L:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α, β, γ	65.11Å 93.95Å 120.90Å 84.26° 81.64° 77.73°	Depositor
Resolution (Å)	48.91 – 2.15 29.71 – 2.09	Depositor EDS
% Data completeness (in resolution range)	94.7 (48.91-2.15) 93.5 (29.71-2.09)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.03 (at 2.10Å)	Xtriage
Refinement program	REFMAC 5.2.0005	Depositor
R, R_{free}	0.211 , 0.262 0.213 , 0.262	Depositor DCC
R_{free} test set	7717 reflections (5.06%)	wwPDB-VP
Wilson B-factor (Å^2)	25.4	Xtriage
Anisotropy	0.152	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.33 , 55.2	EDS
L-test for twinning[2]	$< \|L\| > = 0.47$, $< L^2 > = 0.30$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.94	EDS
Total number of atoms	19292	wwPDB-VP
Average B, all atoms (Å^2)	36.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.67% of the height of the origin peak. No significant pseudotranslation is detected.*

[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 (i)

5.1 Standard geometry (i)

Bond lengths and bond angles in the following residue types are not validated in this section: PEG, PGE

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	0.76	2/1526 (0.1%)	0.81	2/2060 (0.1%)
1	B	0.79	1/1522 (0.1%)	0.86	4/2057 (0.2%)
1	C	0.69	1/1512 (0.1%)	0.81	2/2041 (0.1%)
1	D	0.74	1/1511 (0.1%)	0.79	0/2042
1	E	0.69	0/1515	0.78	0/2046
1	F	0.72	1/1507 (0.1%)	0.81	2/2036 (0.1%)
1	G	0.74	3/1503 (0.2%)	0.76	0/2030
1	H	0.70	2/1504 (0.1%)	0.80	3/2032 (0.1%)
1	I	0.72	1/1491 (0.1%)	0.81	1/2015 (0.0%)
1	J	0.71	1/1483 (0.1%)	0.75	0/2002
1	K	0.68	0/1493	0.76	0/2020
1	L	0.68	0/1491	0.77	0/2015
All	All	0.72	13/18058 (0.1%)	0.79	14/24396 (0.1%)

The worst 5 of 13 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	126	MSE	SE-CE	8.90	2.48	1.95
1	I	126	MSE	CG-SE	7.02	2.19	1.95
1	G	88	TYR	CD2-CE2	-6.77	1.29	1.39
1	G	88	TYR	CD1-CE1	-6.74	1.29	1.39
1	C	126	MSE	SE-CE	6.63	2.34	1.95

The worst 5 of 14 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	F	10	ARG	NE-CZ-NH1	7.82	124.21	120.30
1	B	122[A]	ARG	NE-CZ-NH2	6.91	123.75	120.30
1	B	122[B]	ARG	NE-CZ-NH2	6.91	123.75	120.30
1	B	191	ARG	NE-CZ-NH1	5.87	123.23	120.30
1	A	126	MSE	CG-SE-CE	5.81	111.68	98.90

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	1497	0	1475	17	0
1	B	1493	0	1450	17	0
1	C	1483	0	1458	6	0
1	D	1481	0	1450	6	0
1	E	1486	0	1459	11	0
1	F	1478	0	1445	23	0
1	G	1474	0	1438	10	0
1	H	1475	0	1444	14	0
1	I	1462	0	1410	10	0
1	J	1455	0	1406	15	0
1	K	1463	0	1405	6	0
1	L	1462	0	1423	10	0
2	A	21	0	30	0	0
2	B	14	0	20	1	0
2	C	21	0	30	0	0
2	D	7	0	10	1	0
2	E	21	0	30	4	0
2	F	14	0	20	1	0
2	G	14	0	20	0	0
2	H	14	0	20	1	0
2	I	7	0	10	0	0
2	J	21	0	30	1	0
2	K	14	0	20	0	0
2	L	7	0	10	0	0
3	B	10	0	14	0	0
3	C	10	0	14	0	0
3	D	10	0	14	0	0
3	E	10	0	14	0	0
3	F	10	0	14	2	0
3	G	10	0	14	0	0
3	H	10	0	14	0	0
4	A	133	0	0	1	0
4	B	133	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	C	122	0	0	0	0
4	D	117	0	0	1	0
4	E	130	0	0	1	0
4	F	116	0	0	0	0
4	G	102	0	0	0	0
4	H	130	0	0	0	0
4	I	107	0	0	1	0
4	J	81	0	0	0	0
4	K	88	0	0	0	0
4	L	79	0	0	0	0
All	All	19292	0	17611	132	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 132 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:180:MSE:CE	1:A:180:MSE:SE	2.16	1.43
1:I:126:MSE:SE	1:I:126:MSE:CG	2.19	1.41
1:H:180:MSE:SE	1:H:180:MSE:CE	2.25	1.34
1:H:126:MSE:SE	1:H:126:MSE:CE	2.30	1.29
1:A:62:MSE:CE	1:A:62:MSE:SE	2.30	1.28

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	189/197 (96%)	185 (98%)	4 (2%)	0	100	100
1	B	189/197 (96%)	185 (98%)	4 (2%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	C	187/197 (95%)	185 (99%)	2 (1%)	0	100	100
1	D	189/197 (96%)	184 (97%)	5 (3%)	0	100	100
1	E	188/197 (95%)	184 (98%)	4 (2%)	0	100	100
1	F	188/197 (95%)	186 (99%)	2 (1%)	0	100	100
1	G	187/197 (95%)	185 (99%)	2 (1%)	0	100	100
1	H	188/197 (95%)	184 (98%)	4 (2%)	0	100	100
1	I	187/197 (95%)	181 (97%)	6 (3%)	0	100	100
1	J	186/197 (94%)	183 (98%)	3 (2%)	0	100	100
1	K	189/197 (96%)	186 (98%)	3 (2%)	0	100	100
1	L	187/197 (95%)	182 (97%)	5 (3%)	0	100	100
All	All	2254/2364 (95%)	2210 (98%)	44 (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	152/154 (99%)	151 (99%)	1 (1%)	84	89
1	B	150/154 (97%)	149 (99%)	1 (1%)	84	89
1	C	150/154 (97%)	149 (99%)	1 (1%)	84	89
1	D	146/154 (95%)	144 (99%)	2 (1%)	67	72
1	E	150/154 (97%)	149 (99%)	1 (1%)	84	89
1	F	147/154 (96%)	144 (98%)	3 (2%)	55	59
1	G	147/154 (96%)	146 (99%)	1 (1%)	84	89
1	H	146/154 (95%)	145 (99%)	1 (1%)	84	89
1	I	144/154 (94%)	143 (99%)	1 (1%)	84	89
1	J	142/154 (92%)	141 (99%)	1 (1%)	84	89
1	K	142/154 (92%)	140 (99%)	2 (1%)	67	72

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	L	144/154 (94%)	143 (99%)	1 (1%)	84 89
All	All	1760/1848 (95%)	1744 (99%)	16 (1%)	78 83

5 of 16 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	K	108	ASP
1	K	57	TYR
1	F	57	TYR
1	J	57	TYR
1	F	28	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

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)

32 ligands are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
2	PEG	E	200	-	6,6,6	0.46	0	5,5,5	0.34	0
2	PEG	H	199	-	6,6,6	0.53	0	5,5,5	0.77	0
3	PGE	F	197	-	9,9,9	0.41	0	8,8,8	0.38	0
2	PEG	F	198	-	6,6,6	0.58	0	5,5,5	0.22	0
2	PEG	A	199	-	6,6,6	0.57	0	5,5,5	0.30	0
3	PGE	C	197	-	9,9,9	0.45	0	8,8,8	0.45	0
2	PEG	A	198	-	6,6,6	0.60	0	5,5,5	0.33	0
2	PEG	E	199	-	6,6,6	0.38	0	5,5,5	0.72	0
2	PEG	B	198	-	6,6,6	0.57	0	5,5,5	0.48	0
2	PEG	A	197	-	6,6,6	0.38	0	5,5,5	0.23	0
3	PGE	D	197	-	9,9,9	0.50	0	8,8,8	0.31	0
2	PEG	C	198	-	6,6,6	0.68	0	5,5,5	0.57	0
2	PEG	G	199	-	6,6,6	0.57	0	5,5,5	0.64	0
3	PGE	H	197	-	9,9,9	0.48	0	8,8,8	0.65	0
2	PEG	C	200	-	6,6,6	0.52	0	5,5,5	0.42	0
2	PEG	H	198	-	6,6,6	0.46	0	5,5,5	0.39	0
2	PEG	E	198	-	6,6,6	0.69	0	5,5,5	0.39	0
2	PEG	J	198	-	6,6,6	0.36	0	5,5,5	0.54	0
2	PEG	J	197	-	6,6,6	0.45	0	5,5,5	0.63	0
2	PEG	J	199	-	6,6,6	0.45	0	5,5,5	0.74	0
3	PGE	G	197	-	9,9,9	0.40	0	8,8,8	0.34	0
2	PEG	I	197	-	6,6,6	0.61	0	5,5,5	0.43	0
2	PEG	D	198	-	6,6,6	0.58	0	5,5,5	0.61	0
3	PGE	B	197	-	9,9,9	0.47	0	8,8,8	0.34	0
2	PEG	F	199	-	6,6,6	0.49	0	5,5,5	0.70	0
2	PEG	G	198	-	6,6,6	0.51	0	5,5,5	0.21	0
2	PEG	L	197	-	6,6,6	0.49	0	5,5,5	0.48	0
2	PEG	B	199	-	6,6,6	0.46	0	5,5,5	0.50	0
2	PEG	K	197	-	6,6,6	0.43	0	5,5,5	0.35	0
2	PEG	C	199	-	6,6,6	0.58	0	5,5,5	0.29	0
2	PEG	K	198	-	6,6,6	0.48	0	5,5,5	0.63	0
3	PGE	E	197	-	9,9,9	0.30	0	8,8,8	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
2	PEG	E	200	-	-	1/4/4/4	-
2	PEG	H	199	-	-	3/4/4/4	-
3	PGE	F	197	-	-	0/7/7/7	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	PEG	F	198	-	-	1/4/4/4	-
2	PEG	A	199	-	-	3/4/4/4	-
3	PGE	C	197	-	-	3/7/7/7	-
2	PEG	A	198	-	-	1/4/4/4	-
2	PEG	E	199	-	-	4/4/4/4	-
2	PEG	B	198	-	-	3/4/4/4	-
2	PEG	A	197	-	-	1/4/4/4	-
3	PGE	D	197	-	-	1/7/7/7	-
2	PEG	C	198	-	-	3/4/4/4	-
2	PEG	G	199	-	-	4/4/4/4	-
3	PGE	H	197	-	-	3/7/7/7	-
2	PEG	C	200	-	-	3/4/4/4	-
2	PEG	H	198	-	-	4/4/4/4	-
2	PEG	E	198	-	-	0/4/4/4	-
2	PEG	J	198	-	-	2/4/4/4	-
2	PEG	J	197	-	-	3/4/4/4	-
2	PEG	J	199	-	-	2/4/4/4	-
3	PGE	G	197	-	-	5/7/7/7	-
2	PEG	I	197	-	-	2/4/4/4	-
2	PEG	D	198	-	-	2/4/4/4	-
3	PGE	B	197	-	-	2/7/7/7	-
2	PEG	F	199	-	-	3/4/4/4	-
2	PEG	G	198	-	-	1/4/4/4	-
2	PEG	L	197	-	-	3/4/4/4	-
2	PEG	B	199	-	-	2/4/4/4	-
2	PEG	K	197	-	-	2/4/4/4	-
2	PEG	C	199	-	-	2/4/4/4	-
2	PEG	K	198	-	-	3/4/4/4	-
3	PGE	E	197	-	-	2/7/7/7	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

5 of 74 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	J	199	PEG	C4-C3-O2-C2
3	G	197	PGE	O2-C3-C4-O3
2	J	197	PEG	C1-C2-O2-C3
2	C	198	PEG	O2-C3-C4-O4
2	C	199	PEG	O1-C1-C2-O2

There are no ring outliers.

8 monomers are involved in 11 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	E	200	PEG	1	0
2	H	199	PEG	1	0
3	F	197	PGE	2	0
2	E	199	PEG	3	0
2	B	198	PEG	1	0
2	J	199	PEG	1	0
2	D	198	PEG	1	0
2	F	199	PEG	1	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 (i)

6.1 Protein, DNA and RNA chains (i)

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	184/197 (93%)	0.15	8 (4%)	35	45	15, 32, 48, 66	0
1	B	184/197 (93%)	0.15	6 (3%)	46	55	12, 33, 52, 74	0
1	C	183/197 (92%)	0.06	6 (3%)	46	55	19, 34, 50, 61	0
1	D	185/197 (93%)	0.22	10 (5%)	25	34	22, 34, 54, 68	0
1	E	184/197 (93%)	0.09	4 (2%)	62	69	22, 33, 53, 69	0
1	F	184/197 (93%)	0.07	7 (3%)	40	49	24, 34, 51, 71	0
1	G	183/197 (92%)	0.28	10 (5%)	25	34	22, 35, 52, 61	0
1	H	184/197 (93%)	0.17	6 (3%)	46	55	23, 33, 53, 71	0
1	I	183/197 (92%)	0.27	7 (3%)	40	49	23, 35, 53, 67	0
1	J	182/197 (92%)	0.37	12 (6%)	18	24	26, 36, 53, 59	0
1	K	185/197 (93%)	0.24	10 (5%)	25	34	21, 36, 54, 69	0
1	L	183/197 (92%)	0.30	11 (6%)	21	29	26, 36, 53, 67	0
All	All	2204/2364 (93%)	0.20	97 (4%)	34	43	12, 34, 53, 74	0

The worst 5 of 97 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	K	17	ALA	5.6
1	J	34	ALA	4.5
1	B	194	LYS	4.4
1	G	17	ALA	4.4
1	F	193	PRO	4.2

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	PEG	C	199	7/7	0.74	0.41	56,64,70,70	0
2	PEG	F	198	7/7	0.76	0.19	42,59,64,66	0
2	PEG	H	199	7/7	0.80	0.27	44,50,65,65	0
2	PEG	G	199	7/7	0.83	0.36	64,67,68,70	0
2	PEG	B	199	7/7	0.84	0.18	41,47,63,63	0
2	PEG	E	198	7/7	0.85	0.17	46,46,51,52	0
2	PEG	F	199	7/7	0.85	0.27	48,51,64,68	0
2	PEG	I	197	7/7	0.85	0.22	45,50,55,56	0
2	PEG	G	198	7/7	0.86	0.17	44,48,61,63	0
2	PEG	K	197	7/7	0.86	0.13	46,51,54,56	0
2	PEG	K	198	7/7	0.86	0.28	49,54,63,64	0
2	PEG	B	198	7/7	0.87	0.24	42,44,53,58	0
2	PEG	A	198	7/7	0.88	0.20	36,47,56,56	0
3	PGE	G	197	10/10	0.88	0.23	47,59,65,66	0
2	PEG	A	197	7/7	0.89	0.13	35,40,43,51	0
2	PEG	A	199	7/7	0.89	0.23	42,48,60,63	0
2	PEG	J	199	7/7	0.89	0.43	51,53,58,62	0
2	PEG	C	200	7/7	0.90	0.17	49,56,68,76	0
2	PEG	L	197	7/7	0.90	0.14	50,63,68,75	0
3	PGE	B	197	10/10	0.90	0.23	34,46,52,56	0
3	PGE	D	197	10/10	0.90	0.20	31,38,48,49	0
3	PGE	E	197	10/10	0.90	0.24	36,40,45,46	0
3	PGE	F	197	10/10	0.90	0.19	30,39,53,55	0
2	PEG	E	200	7/7	0.90	0.13	46,49,55,57	0
3	PGE	H	197	10/10	0.90	0.15	39,42,46,55	0
2	PEG	C	198	7/7	0.91	0.14	27,34,44,47	0
2	PEG	D	198	7/7	0.91	0.13	34,36,44,54	0
2	PEG	H	198	7/7	0.91	0.14	38,42,47,49	0
3	PGE	C	197	10/10	0.92	0.23	38,45,50,50	0
2	PEG	J	198	7/7	0.92	0.15	38,41,47,53	0
2	PEG	E	199	7/7	0.92	0.19	43,46,52,54	0
2	PEG	J	197	7/7	0.93	0.11	37,42,45,46	0

6.5 Other polymers (i)

There are no such residues in this entry.