



Full wwPDB X-ray Structure Validation Report ⓘ

Feb 1, 2016 – 08:14 PM GMT

PDB ID : 4R7W
Title : Crystal structure of 5-methylcytosine deaminase from *Klebsiella pneumoniae* liganded with phosphonocytosine
Authors : Fedorov, A.A.; Fedorov, E.V.; Hitchcock, D.S.; Raushel, F.M.; Almo, S.C.
Deposited on : 2014-08-28
Resolution : 1.90 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
<http://wwpdb.org/validation/2016/XrayValidationReportHelp>
with specific help available everywhere you see the ⓘ symbol.

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

MolProbity : 4.02b-467
Mogul : 1.7 (RC4), CSD as536be (2015)
Xtriage (Phenix) : 1.9-1692
EDS : rb-20026688
Percentile statistics : 20151230.v01 (using entries in the PDB archive December 30th 2015)
Refmac : 5.8.0135
CCP4 : 6.5.0
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : trunk26865

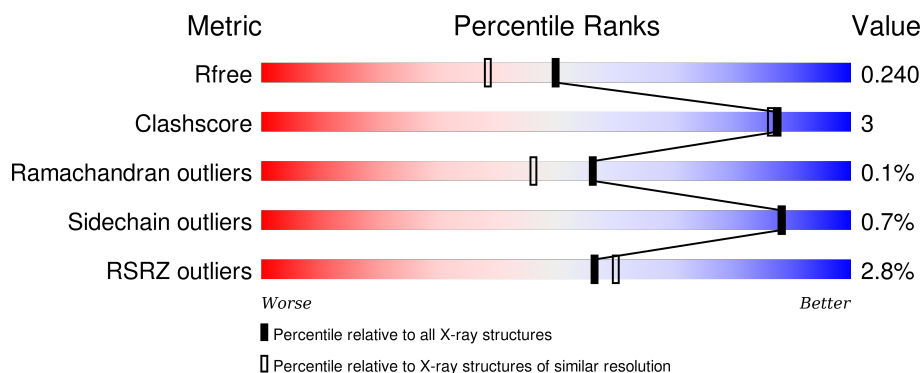
1 Overall quality at a glance ⓘ

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 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}	91344	4755 (1.90-1.90)
Clashscore	102246	5398 (1.90-1.90)
Ramachandran outliers	100387	5338 (1.90-1.90)
Sidechain outliers	100360	5339 (1.90-1.90)
RSRZ outliers	91569	4766 (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 on the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria. 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	431	<div> <div>89%</div> <div>6% 5%</div> </div>
1	B	431	<div> <div>3%</div> <div>91%</div> <div>5% .</div> </div>
1	C	431	<div> <div>3%</div> <div>86%</div> <div>9% 5%</div> </div>
1	D	431	<div> <div>3%</div> <div>89%</div> <div>6% .</div> </div>
1	E	431	<div> <div>%</div> <div>88%</div> <div>7% 5%</div> </div>

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Mol	Chain	Length	Quality of chain
1	F	431	

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
4	PEG	A	503	-	-	-	X
4	PEG	C	504	-	-	X	X
4	PEG	C	505	-	-	-	X
4	PEG	D	503	-	-	-	X
5	EDO	A	504	-	-	-	X
5	EDO	B	503	-	-	-	X
5	EDO	E	503	-	-	-	X
6	GOL	C	503	-	-	-	X

2 Entry composition

There are 7 unique types of molecules in this entry. The entry contains 20980 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 Cytosine deaminase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	411	Total	C	N	O	S	0	1	0
			3228	2012	596	602	18			
1	B	412	Total	C	N	O	S	0	0	0
			3222	2009	593	602	18			
1	C	411	Total	C	N	O	S	0	0	0
			3217	2006	592	601	18			
1	D	412	Total	C	N	O	S	0	2	0
			3242	2020	598	606	18			
1	E	410	Total	C	N	O	S	0	0	0
			3208	2001	591	598	18			
1	F	411	Total	C	N	O	S	0	0	0
			3217	2006	592	601	18			

There are 114 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	413	ASN	-	EXPRESSION TAG	UNP W8V4R8
A	414	SER	-	EXPRESSION TAG	UNP W8V4R8
A	415	SER	-	EXPRESSION TAG	UNP W8V4R8
A	416	SER	-	EXPRESSION TAG	UNP W8V4R8
A	417	VAL	-	EXPRESSION TAG	UNP W8V4R8
A	418	ASP	-	EXPRESSION TAG	UNP W8V4R8
A	419	LYS	-	EXPRESSION TAG	UNP W8V4R8
A	420	LEU	-	EXPRESSION TAG	UNP W8V4R8
A	421	ALA	-	EXPRESSION TAG	UNP W8V4R8
A	422	ALA	-	EXPRESSION TAG	UNP W8V4R8
A	423	ALA	-	EXPRESSION TAG	UNP W8V4R8
A	424	LEU	-	EXPRESSION TAG	UNP W8V4R8
A	425	GLU	-	EXPRESSION TAG	UNP W8V4R8
A	426	HIS	-	EXPRESSION TAG	UNP W8V4R8
A	427	HIS	-	EXPRESSION TAG	UNP W8V4R8
A	428	HIS	-	EXPRESSION TAG	UNP W8V4R8
A	429	HIS	-	EXPRESSION TAG	UNP W8V4R8

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Chain	Residue	Modelled	Actual	Comment	Reference
A	430	HIS	-	EXPRESSION TAG	UNP W8V4R8
A	431	HIS	-	EXPRESSION TAG	UNP W8V4R8
B	413	ASN	-	EXPRESSION TAG	UNP W8V4R8
B	414	SER	-	EXPRESSION TAG	UNP W8V4R8
B	415	SER	-	EXPRESSION TAG	UNP W8V4R8
B	416	SER	-	EXPRESSION TAG	UNP W8V4R8
B	417	VAL	-	EXPRESSION TAG	UNP W8V4R8
B	418	ASP	-	EXPRESSION TAG	UNP W8V4R8
B	419	LYS	-	EXPRESSION TAG	UNP W8V4R8
B	420	LEU	-	EXPRESSION TAG	UNP W8V4R8
B	421	ALA	-	EXPRESSION TAG	UNP W8V4R8
B	422	ALA	-	EXPRESSION TAG	UNP W8V4R8
B	423	ALA	-	EXPRESSION TAG	UNP W8V4R8
B	424	LEU	-	EXPRESSION TAG	UNP W8V4R8
B	425	GLU	-	EXPRESSION TAG	UNP W8V4R8
B	426	HIS	-	EXPRESSION TAG	UNP W8V4R8
B	427	HIS	-	EXPRESSION TAG	UNP W8V4R8
B	428	HIS	-	EXPRESSION TAG	UNP W8V4R8
B	429	HIS	-	EXPRESSION TAG	UNP W8V4R8
B	430	HIS	-	EXPRESSION TAG	UNP W8V4R8
B	431	HIS	-	EXPRESSION TAG	UNP W8V4R8
C	413	ASN	-	EXPRESSION TAG	UNP W8V4R8
C	414	SER	-	EXPRESSION TAG	UNP W8V4R8
C	415	SER	-	EXPRESSION TAG	UNP W8V4R8
C	416	SER	-	EXPRESSION TAG	UNP W8V4R8
C	417	VAL	-	EXPRESSION TAG	UNP W8V4R8
C	418	ASP	-	EXPRESSION TAG	UNP W8V4R8
C	419	LYS	-	EXPRESSION TAG	UNP W8V4R8
C	420	LEU	-	EXPRESSION TAG	UNP W8V4R8
C	421	ALA	-	EXPRESSION TAG	UNP W8V4R8
C	422	ALA	-	EXPRESSION TAG	UNP W8V4R8
C	423	ALA	-	EXPRESSION TAG	UNP W8V4R8
C	424	LEU	-	EXPRESSION TAG	UNP W8V4R8
C	425	GLU	-	EXPRESSION TAG	UNP W8V4R8
C	426	HIS	-	EXPRESSION TAG	UNP W8V4R8
C	427	HIS	-	EXPRESSION TAG	UNP W8V4R8
C	428	HIS	-	EXPRESSION TAG	UNP W8V4R8
C	429	HIS	-	EXPRESSION TAG	UNP W8V4R8
C	430	HIS	-	EXPRESSION TAG	UNP W8V4R8
C	431	HIS	-	EXPRESSION TAG	UNP W8V4R8
D	413	ASN	-	EXPRESSION TAG	UNP W8V4R8
D	414	SER	-	EXPRESSION TAG	UNP W8V4R8

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Chain	Residue	Modelled	Actual	Comment	Reference
D	415	SER	-	EXPRESSION TAG	UNP W8V4R8
D	416	SER	-	EXPRESSION TAG	UNP W8V4R8
D	417	VAL	-	EXPRESSION TAG	UNP W8V4R8
D	418	ASP	-	EXPRESSION TAG	UNP W8V4R8
D	419	LYS	-	EXPRESSION TAG	UNP W8V4R8
D	420	LEU	-	EXPRESSION TAG	UNP W8V4R8
D	421	ALA	-	EXPRESSION TAG	UNP W8V4R8
D	422	ALA	-	EXPRESSION TAG	UNP W8V4R8
D	423	ALA	-	EXPRESSION TAG	UNP W8V4R8
D	424	LEU	-	EXPRESSION TAG	UNP W8V4R8
D	425	GLU	-	EXPRESSION TAG	UNP W8V4R8
D	426	HIS	-	EXPRESSION TAG	UNP W8V4R8
D	427	HIS	-	EXPRESSION TAG	UNP W8V4R8
D	428	HIS	-	EXPRESSION TAG	UNP W8V4R8
D	429	HIS	-	EXPRESSION TAG	UNP W8V4R8
D	430	HIS	-	EXPRESSION TAG	UNP W8V4R8
D	431	HIS	-	EXPRESSION TAG	UNP W8V4R8
E	413	ASN	-	EXPRESSION TAG	UNP W8V4R8
E	414	SER	-	EXPRESSION TAG	UNP W8V4R8
E	415	SER	-	EXPRESSION TAG	UNP W8V4R8
E	416	SER	-	EXPRESSION TAG	UNP W8V4R8
E	417	VAL	-	EXPRESSION TAG	UNP W8V4R8
E	418	ASP	-	EXPRESSION TAG	UNP W8V4R8
E	419	LYS	-	EXPRESSION TAG	UNP W8V4R8
E	420	LEU	-	EXPRESSION TAG	UNP W8V4R8
E	421	ALA	-	EXPRESSION TAG	UNP W8V4R8
E	422	ALA	-	EXPRESSION TAG	UNP W8V4R8
E	423	ALA	-	EXPRESSION TAG	UNP W8V4R8
E	424	LEU	-	EXPRESSION TAG	UNP W8V4R8
E	425	GLU	-	EXPRESSION TAG	UNP W8V4R8
E	426	HIS	-	EXPRESSION TAG	UNP W8V4R8
E	427	HIS	-	EXPRESSION TAG	UNP W8V4R8
E	428	HIS	-	EXPRESSION TAG	UNP W8V4R8
E	429	HIS	-	EXPRESSION TAG	UNP W8V4R8
E	430	HIS	-	EXPRESSION TAG	UNP W8V4R8
E	431	HIS	-	EXPRESSION TAG	UNP W8V4R8
F	413	ASN	-	EXPRESSION TAG	UNP W8V4R8
F	414	SER	-	EXPRESSION TAG	UNP W8V4R8
F	415	SER	-	EXPRESSION TAG	UNP W8V4R8
F	416	SER	-	EXPRESSION TAG	UNP W8V4R8
F	417	VAL	-	EXPRESSION TAG	UNP W8V4R8
F	418	ASP	-	EXPRESSION TAG	UNP W8V4R8

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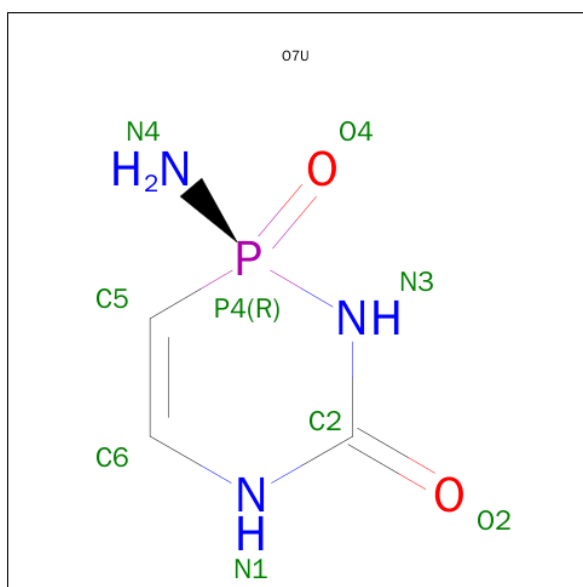
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Chain	Residue	Modelled	Actual	Comment	Reference
F	419	LYS	-	EXPRESSION TAG	UNP W8V4R8
F	420	LEU	-	EXPRESSION TAG	UNP W8V4R8
F	421	ALA	-	EXPRESSION TAG	UNP W8V4R8
F	422	ALA	-	EXPRESSION TAG	UNP W8V4R8
F	423	ALA	-	EXPRESSION TAG	UNP W8V4R8
F	424	LEU	-	EXPRESSION TAG	UNP W8V4R8
F	425	GLU	-	EXPRESSION TAG	UNP W8V4R8
F	426	HIS	-	EXPRESSION TAG	UNP W8V4R8
F	427	HIS	-	EXPRESSION TAG	UNP W8V4R8
F	428	HIS	-	EXPRESSION TAG	UNP W8V4R8
F	429	HIS	-	EXPRESSION TAG	UNP W8V4R8
F	430	HIS	-	EXPRESSION TAG	UNP W8V4R8
F	431	HIS	-	EXPRESSION TAG	UNP W8V4R8

- Molecule 2 is FE (II) ION (three-letter code: FE2) (formula: Fe).

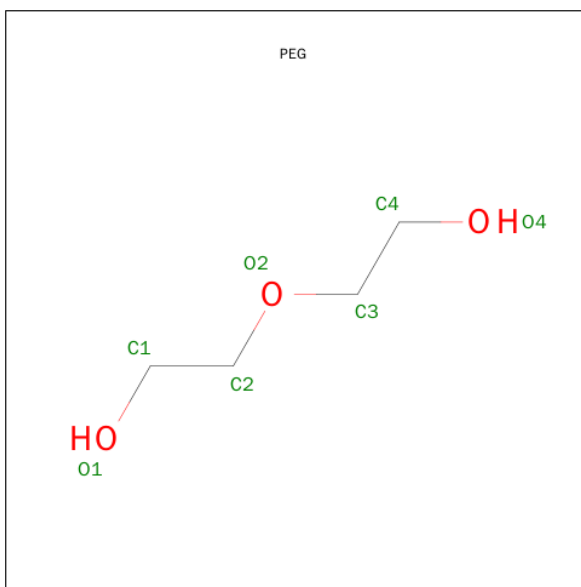
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	D	1	Total Fe 1 1	0	0
2	E	1	Total Fe 1 1	0	0
2	B	1	Total Fe 1 1	0	0
2	C	1	Total Fe 1 1	0	0
2	A	1	Total Fe 1 1	0	0
2	F	1	Total Fe 1 1	0	0

- Molecule 3 is (2R)-2-AMINO-2,5-DIHYDRO-1,5,2-DIAZAPHOSPHININ-6(1H)-ONE 2-OXIDE (three-letter code: O7U) (formula: C₃H₆N₃O₂P).



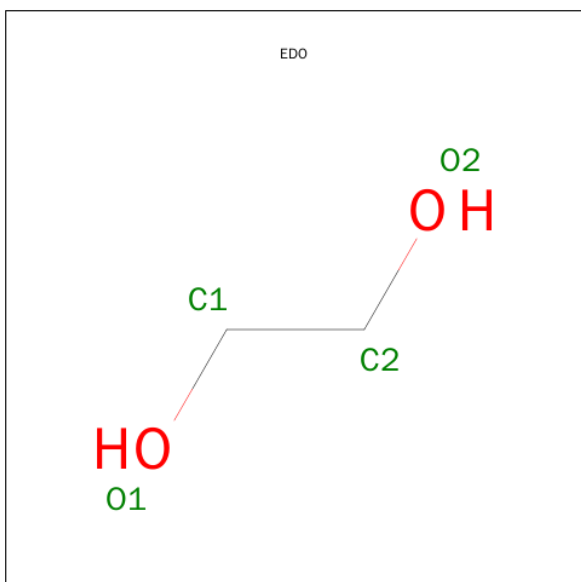
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total	C	N	O	P	0	0
			9	3	3	2	1		
3	B	1	Total	C	N	O	P	0	0
			9	3	3	2	1		
3	C	1	Total	C	N	O	P	0	0
			9	3	3	2	1		
3	D	1	Total	C	N	O	P	0	0
			9	3	3	2	1		
3	E	1	Total	C	N	O	P	0	0
			9	3	3	2	1		
3	F	1	Total	C	N	O	P	0	0
			9	3	3	2	1		

- Molecule 4 is DI(HYDROXYETHYL)ETHER (three-letter code: PEG) (formula: C₄H₁₀O₃).



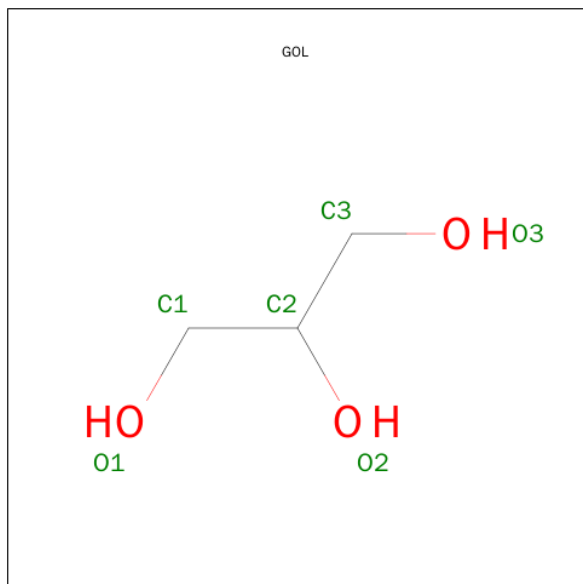
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total	C	O	0	0
			7	4	3		
4	C	1	Total	C	O	0	0
			7	4	3		
4	C	1	Total	C	O	0	0
			7	4	3		
4	D	1	Total	C	O	0	0
			7	4	3		
4	E	1	Total	C	O	0	0
			7	4	3		

- Molecule 5 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: $C_2H_6O_2$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	1	Total C O 4 2 2	0	0
5	A	1	Total C O 4 2 2	0	0
5	B	1	Total C O 4 2 2	0	0
5	C	1	Total C O 4 2 2	0	0
5	D	1	Total C O 4 2 2	0	0
5	E	1	Total C O 4 2 2	0	0

- Molecule 6 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$).



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

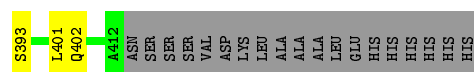
- Molecule 7 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	A	304	Total O 305 305	0	1
7	B	256	Total O 258 258	0	2
7	C	240	Total O 241 241	0	1

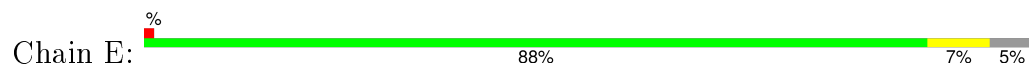
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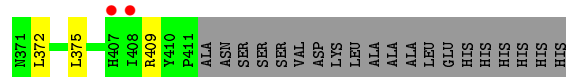
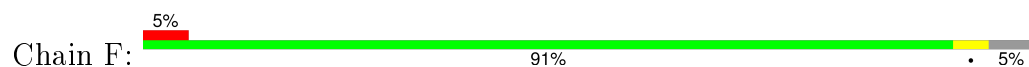
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	D	234	Total 235	O 235	0	1
7	E	255	Total 256	O 256	0	1
7	F	225	Total 226	O 226	0	1



- Molecule 1: Cytosine deaminase



- Molecule 1: Cytosine deaminase



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	102.17Å 147.81Å 185.34Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	49.78 – 1.90 49.78 – 1.90	Depositor EDS
% Data completeness (in resolution range)	97.6 (49.78-1.90) 97.1 (49.78-1.90)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	3.06 (at 1.90Å)	Xtriage
Refinement program	PHENIX (phenix.refine: 1.8_1069)	Depositor
R, R_{free}	0.198 , 0.242 0.199 , 0.240	Depositor DCC
R_{free} test set	6480 reflections (3.13%)	DCC
Wilson B-factor (Å ²)	23.1	Xtriage
Anisotropy	0.673	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.34 , 46.2	EDS
Estimated twinning fraction	No twinning to report.	Xtriage
L-test for twinning ²	$\langle L \rangle = 0.45$, $\langle L^2 \rangle = 0.28$	Xtriage
Outliers	0 of 214559 reflections	Xtriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	20980	wwPDB-VP
Average B, all atoms (Å ²)	20.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.48% 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, 0.375 respectively for untwinned datasets, and 0.333, 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: O7U, GOL, PEG, FE2, EDO

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	0.38	0/3286	0.55	0/4450
1	B	0.38	0/3280	0.53	0/4443
1	C	0.36	0/3275	0.53	0/4436
1	D	0.36	0/3300	0.52	0/4469
1	E	0.37	0/3265	0.53	0/4421
1	F	0.34	0/3275	0.51	0/4436
All	All	0.37	0/19681	0.53	0/26655

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	3228	0	3205	15	0
1	B	3222	0	3198	13	0
1	C	3217	0	3193	28	0
1	D	3242	0	3215	15	0
1	E	3208	0	3186	19	0
1	F	3217	0	3193	13	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	9	0	6	0	0
3	B	9	0	6	0	0
3	C	9	0	6	0	0
3	D	9	0	6	0	0
3	E	9	0	6	0	0
3	F	9	0	6	0	0
4	A	7	0	10	2	0
4	C	14	0	20	7	0
4	D	7	0	10	1	0
4	E	7	0	10	0	0
5	A	8	0	12	2	0
5	B	4	0	6	1	0
5	C	4	0	6	0	0
5	D	4	0	6	0	0
5	E	4	0	6	1	0
6	C	6	0	8	0	0
7	A	305	0	0	2	0
7	B	258	0	0	4	0
7	C	241	0	0	3	0
7	D	235	0	0	1	0
7	E	256	0	0	5	0
7	F	226	0	0	3	0
All	All	20980	0	19320	99	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 3.

All (99) 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)
4:C:504:PEG:H32	1:E:328:ALA:HA	1.67	0.74
1:B:258:ARG:HH21	5:B:503:EDO:H11	1.57	0.69
1:C:328:ALA:HB2	4:C:504:PEG:H21	1.76	0.68
1:C:255:LYS:NZ	7:C:652:HOH:O	2.26	0.67
4:A:503:PEG:H31	1:B:328:ALA:HB2	1.77	0.67
1:A:388:ALA:HA	5:A:505:EDO:H12	1.81	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:201:ARG:NH2	7:B:750:HOH:O	2.26	0.63
1:B:147:VAL:HG22	1:B:174:VAL:HB	1.81	0.62
1:E:255:LYS:NZ	7:E:683:HOH:O	2.29	0.62
1:D:9:ARG:HB3	1:D:10:ARG:HG3	1.81	0.62
1:A:7[A]:ARG:NH1	7:A:847:HOH:O	2.33	0.60
1:C:96:ARG:NH2	1:C:137:GLU:OE2	2.32	0.60
1:D:255:LYS:NZ	7:D:698:HOH:O	2.35	0.60
1:B:376:ASP:O	1:B:386:ARG:NH1	2.36	0.58
1:E:119:ASP:OD2	1:E:121:THR:HG23	2.05	0.56
1:C:46:ARG:HD3	1:C:376:ASP:HA	1.87	0.56
1:F:20:GLN:NE2	7:F:682:HOH:O	2.35	0.55
1:E:324:ARG:HB2	5:E:503:EDO:H11	1.88	0.55
4:A:503:PEG:H22	1:B:328:ALA:HA	1.88	0.55
1:F:168:ILE:O	1:F:204:ARG:NH2	2.40	0.53
1:A:46:ARG:HD3	1:A:376:ASP:HA	1.91	0.53
1:A:147:VAL:HG22	1:A:174:VAL:HB	1.91	0.52
1:E:50:PRO:HD3	1:E:364:LEU:HG	1.92	0.52
1:D:297:ASP:OD1	1:D:343:ARG:NH2	2.43	0.52
1:C:376:ASP:O	1:C:386:ARG:NH1	2.41	0.51
1:B:132:LEU:HD23	1:B:146:ILE:HD12	1.93	0.51
1:C:46:ARG:NE	1:C:376:ASP:OD1	2.44	0.50
1:D:87:LYS:HA	1:D:90:ILE:HG12	1.92	0.50
1:E:26:ARG:NH1	1:E:366:GLU:OE2	2.42	0.50
1:D:312:ASP:HB2	1:D:313:PRO:HD2	1.94	0.50
1:D:174:VAL:HG22	1:D:205:LEU:HB2	1.95	0.49
1:C:255:LYS:HE3	1:D:180:HIS:O	2.12	0.49
1:C:328:ALA:HB1	4:C:504:PEG:H41	1.95	0.48
1:E:391:LEU:HA	1:E:403:ARG:HB2	1.96	0.48
1:A:372:LEU:HD11	1:A:394:ILE:HD12	1.96	0.47
1:B:46:ARG:HB3	1:B:375:LEU:O	2.14	0.47
1:F:46:ARG:HB3	1:F:375:LEU:O	2.14	0.47
1:A:3:ILE:HB	1:A:17:LEU:HB2	1.97	0.46
1:F:409:ARG:NH1	7:F:798:HOH:O	2.47	0.46
1:C:393:SER:HB3	1:C:401:LEU:HB3	1.98	0.46
1:C:226:GLU:OE2	1:D:187:LYS:NZ	2.41	0.46
1:D:393:SER:HB3	1:D:401:LEU:HB3	1.98	0.46
1:C:125:LEU:HD12	1:C:166:ARG:HD2	1.98	0.46
1:C:245:MET:HA	1:C:248:TYR:CD2	2.51	0.46
1:A:18:ASP:HB3	1:A:26:ARG:HB2	1.97	0.46
1:D:402:GLN:HB3	1:F:409:ARG:HG3	1.98	0.45
1:E:245:MET:HA	1:E:248:TYR:CD2	2.51	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:46:ARG:HB3	1:C:375:LEU:O	2.17	0.45
1:B:389:ARG:NH2	1:B:404:GLU:O	2.48	0.45
1:C:298:ARG:HD2	7:C:697:HOH:O	2.16	0.45
1:C:389:ARG:HD3	1:C:403:ARG:HG2	1.98	0.45
1:A:234:GLY:HA3	1:A:263:SER:O	2.17	0.45
1:F:19:LEU:HD13	1:F:370:ALA:HB1	1.98	0.45
1:C:87:LYS:HA	1:C:90:ILE:HG12	1.98	0.44
1:A:393:SER:HB3	1:A:401:LEU:HB3	1.99	0.44
1:F:12:GLU:HB3	7:F:718:HOH:O	2.18	0.44
4:C:504:PEG:H11	7:E:677:HOH:O	2.17	0.43
1:E:168:ILE:HG12	1:E:198:LEU:HD21	2.00	0.43
1:C:176:GLY:HA2	1:C:207:ASP:O	2.18	0.43
1:C:179:PRO:HD2	1:C:209:HIS:O	2.17	0.43
1:E:46:ARG:HB3	1:E:375:LEU:O	2.18	0.43
1:C:201:ARG:HE	1:C:201:ARG:HB2	1.65	0.43
1:E:123:PRO:HA	1:E:163:LEU:HD21	2.01	0.43
1:F:173:ASP:OD1	1:F:174:VAL:HG23	2.18	0.43
1:B:348:VAL:HA	7:B:603:HOH:O	2.18	0.43
1:D:1:MET:HE3	1:D:19:LEU:HD12	2.01	0.43
1:C:258:ARG:NH2	1:D:77:PHE:O	2.51	0.43
1:B:261:LYS:NZ	1:B:300:GLY:O	2.52	0.42
1:C:307:GLN:OE1	7:C:835:HOH:O	2.21	0.42
1:A:386:ARG:NH2	5:A:505:EDO:H21	2.33	0.42
1:E:121:THR:HG22	7:E:850:HOH:O	2.18	0.42
1:F:19:LEU:HD11	1:F:372:LEU:HD21	2.00	0.42
1:C:288:ARG:HG3	1:E:286:LYS:O	2.19	0.42
1:D:118:VAL:HG22	1:D:131:LEU:HD12	2.00	0.42
1:E:84:SER:HA	1:E:87:LYS:HE2	2.00	0.42
1:C:411:PRO:HG2	1:E:399:VAL:HG12	2.01	0.42
1:F:147:VAL:HG22	1:F:174:VAL:HB	2.02	0.41
1:C:220:PHE:CZ	4:C:505:PEG:H12	2.55	0.41
1:B:178:ILE:O	1:B:178:ILE:HG23	2.20	0.41
4:D:503:PEG:H41	1:F:331:HIS:CG	2.56	0.41
1:A:140:ASP:OD1	1:A:140:ASP:N	2.53	0.41
4:C:504:PEG:H32	4:C:504:PEG:H12	1.67	0.41
1:C:372:LEU:HD11	1:C:394:ILE:HD12	2.02	0.41
1:A:334:HIS:HA	7:B:642:HOH:O	2.20	0.41
1:D:51:PRO:HD3	1:D:371:ASN:O	2.21	0.41
1:C:67:GLU:HA	1:C:68:PRO:HA	1.89	0.41
1:A:119:ASP:HA	1:A:149:PHE:O	2.21	0.41
1:E:63:LEU:HD13	1:E:101:LYS:HD2	2.02	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:85:GLN:HG3	7:E:735:HOH:O	2.21	0.40
1:F:2:LYS:HB2	1:F:2:LYS:HE3	1.92	0.40
1:A:255:LYS:HE2	4:C:505:PEG:H32	2.03	0.40
1:A:72:ARG:NE	7:A:796:HOH:O	2.53	0.40
1:C:119:ASP:HA	1:C:149:PHE:O	2.21	0.40
1:E:160:GLY:N	7:E:678:HOH:O	2.54	0.40
1:F:51:PRO:HB3	1:F:112:GLN:HG3	2.04	0.40
1:D:45:GLY:O	1:D:378:GLU:HG2	2.21	0.40
1:C:312:ASP:HB2	1:C:313:PRO:HD2	2.03	0.40
1:B:361:ASN:HB3	7:B:782:HOH:O	2.22	0.40
1:E:117:HIS:HA	1:E:147:VAL:HB	2.04	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	410/431 (95%)	395 (96%)	15 (4%)	0	100	100
1	B	410/431 (95%)	396 (97%)	13 (3%)	1 (0%)	52	42
1	C	409/431 (95%)	394 (96%)	15 (4%)	0	100	100
1	D	412/431 (96%)	400 (97%)	12 (3%)	0	100	100
1	E	406/431 (94%)	395 (97%)	10 (2%)	1 (0%)	52	42
1	F	409/431 (95%)	392 (96%)	17 (4%)	0	100	100
All	All	2456/2586 (95%)	2372 (97%)	82 (3%)	2 (0%)	56	46

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	241	HIS
1	E	241	HIS

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	340/355 (96%)	336 (99%)	4 (1%)	78	76
1	B	339/355 (96%)	338 (100%)	1 (0%)	94	95
1	C	339/355 (96%)	337 (99%)	2 (1%)	90	90
1	D	341/355 (96%)	338 (99%)	3 (1%)	84	83
1	E	338/355 (95%)	336 (99%)	2 (1%)	90	90
1	F	339/355 (96%)	337 (99%)	2 (1%)	90	90
All	All	2036/2130 (96%)	2022 (99%)	14 (1%)	88	88

All (14) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	343	ARG
1	A	375	LEU
1	A	403	ARG
1	A	407	HIS
1	B	343	ARG
1	C	21	ASP
1	C	343	ARG
1	D	173	ASP
1	D	185	ARG
1	D	343	ARG
1	E	185	ARG
1	E	343	ARG
1	F	1	MET
1	F	101	LYS

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

Mol	Chain	Res	Type
1	B	136	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

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

5.5 Carbohydrates ⓘ

There are no carbohydrates in this entry.

5.6 Ligand geometry ⓘ

Of 24 ligands modelled in this entry, 6 are monoatomic - leaving 18 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	O7U	A	502	2	4,9,9	4.76	3 (75%)	3,13,13	3.00	2 (66%)
4	PEG	A	503	-	6,6,6	0.36	0	5,5,5	0.46	0
5	EDO	A	504	-	3,3,3	0.48	0	2,2,2	0.44	0
5	EDO	A	505	-	3,3,3	0.39	0	2,2,2	0.53	0
3	O7U	B	502	2	4,9,9	3.81	3 (75%)	3,13,13	2.76	2 (66%)
5	EDO	B	503	-	3,3,3	0.47	0	2,2,2	0.45	0
3	O7U	C	502	2	4,9,9	3.93	3 (75%)	3,13,13	2.23	2 (66%)
6	GOL	C	503	-	5,5,5	0.30	0	5,5,5	0.32	0
4	PEG	C	504	-	6,6,6	0.55	0	5,5,5	0.74	0
4	PEG	C	505	-	6,6,6	0.45	0	5,5,5	0.31	0
5	EDO	C	506	-	3,3,3	0.49	0	2,2,2	0.56	0
3	O7U	D	502	2	4,9,9	4.01	3 (75%)	3,13,13	2.55	3 (100%)
4	PEG	D	503	-	6,6,6	0.39	0	5,5,5	0.83	0
5	EDO	D	504	-	3,3,3	0.48	0	2,2,2	0.44	0
3	O7U	E	502	2	4,9,9	3.75	3 (75%)	3,13,13	2.53	2 (66%)
5	EDO	E	503	-	3,3,3	0.52	0	2,2,2	0.40	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
4	PEG	E	504	-	6,6,6	0.48	0	5,5,5	0.17	0
3	O7U	F	502	2	4,9,9	3.84	3 (75%)	3,13,13	2.48	2 (66%)

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	O7U	A	502	2	-	0/0/12/12	0/0/1/1
4	PEG	A	503	-	-	0/4/4/4	0/0/0/0
5	EDO	A	504	-	-	0/1/1/1	0/0/0/0
5	EDO	A	505	-	-	0/1/1/1	0/0/0/0
3	O7U	B	502	2	-	0/0/12/12	0/0/1/1
5	EDO	B	503	-	-	0/1/1/1	0/0/0/0
3	O7U	C	502	2	-	0/0/12/12	0/0/1/1
6	GOL	C	503	-	-	0/4/4/4	0/0/0/0
4	PEG	C	504	-	-	0/4/4/4	0/0/0/0
4	PEG	C	505	-	-	0/4/4/4	0/0/0/0
5	EDO	C	506	-	-	0/1/1/1	0/0/0/0
3	O7U	D	502	2	-	0/0/12/12	0/0/1/1
4	PEG	D	503	-	-	0/4/4/4	0/0/0/0
5	EDO	D	504	-	-	0/1/1/1	0/0/0/0
3	O7U	E	502	2	-	0/0/12/12	0/0/1/1
5	EDO	E	503	-	-	0/1/1/1	0/0/0/0
4	PEG	E	504	-	-	0/4/4/4	0/0/0/0
3	O7U	F	502	2	-	0/0/12/12	0/0/1/1

All (18) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	502	O7U	P4-O4	-5.43	1.42	1.48
3	F	502	O7U	P4-O4	-3.51	1.44	1.48
3	D	502	O7U	P4-O4	-3.18	1.44	1.48
3	E	502	O7U	P4-O4	-2.50	1.45	1.48
3	C	502	O7U	P4-O4	-2.34	1.45	1.48
3	B	502	O7U	P4-O4	-2.14	1.45	1.48
3	F	502	O7U	C2-N1	2.16	1.39	1.36
3	D	502	O7U	C2-N1	2.35	1.39	1.36
3	C	502	O7U	C2-N1	2.39	1.39	1.36
3	E	502	O7U	C2-N1	2.58	1.40	1.36
3	B	502	O7U	C2-N1	2.75	1.40	1.36

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	502	O7U	C2-N1	4.09	1.41	1.36
3	F	502	O7U	C6-N1	6.43	1.46	1.36
3	E	502	O7U	C6-N1	6.54	1.46	1.36
3	A	502	O7U	C6-N1	6.63	1.46	1.36
3	B	502	O7U	C6-N1	6.74	1.46	1.36
3	D	502	O7U	C6-N1	6.93	1.47	1.36
3	C	502	O7U	C6-N1	7.09	1.47	1.36

All (13) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	D	502	O7U	O2-C2-N1	2.07	124.81	122.67
3	C	502	O7U	O2-C2-N1	2.09	124.83	122.67
3	F	502	O7U	C6-N1-C2	2.17	123.69	122.19
3	D	502	O7U	C6-N1-C2	2.30	123.77	122.19
3	E	502	O7U	O2-C2-N1	2.89	125.66	122.67
3	E	502	O7U	C5-C6-N1	3.04	129.26	121.25
3	D	502	O7U	C5-C6-N1	3.15	129.54	121.25
3	B	502	O7U	O2-C2-N1	3.21	125.99	122.67
3	C	502	O7U	C5-C6-N1	3.24	129.78	121.25
3	F	502	O7U	C5-C6-N1	3.34	130.04	121.25
3	B	502	O7U	C5-C6-N1	3.42	130.27	121.25
3	A	502	O7U	C5-C6-N1	3.56	130.63	121.25
3	A	502	O7U	O2-C2-N1	3.78	126.58	122.67

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

7 monomers are involved in 14 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	A	503	PEG	2	0
5	A	505	EDO	2	0
5	B	503	EDO	1	0
4	C	504	PEG	5	0
4	C	505	PEG	2	0
4	D	503	PEG	1	0
5	E	503	EDO	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 ⓘ

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	411/431 (95%)	-0.04	4 (0%) 84 86	8, 14, 30, 58	0
1	B	412/431 (95%)	0.08	12 (2%) 55 59	9, 17, 38, 66	0
1	C	411/431 (95%)	0.16	15 (3%) 46 50	9, 19, 39, 61	0
1	D	412/431 (95%)	0.13	11 (2%) 58 61	9, 17, 42, 68	0
1	E	410/431 (95%)	-0.02	6 (1%) 76 79	8, 16, 35, 66	0
1	F	411/431 (95%)	0.34	22 (5%) 29 33	10, 21, 45, 67	0
All	All	2467/2586 (95%)	0.11	70 (2%) 56 60	8, 17, 39, 68	0

All (70) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	E	10	ARG	6.8
1	C	38	ALA	6.7
1	F	38	ALA	6.6
1	D	38	ALA	5.3
1	C	39	GLY	4.8
1	F	27	ILE	4.7
1	B	31	ALA	4.6
1	B	38	ALA	4.3
1	D	13	ALA	3.9
1	F	36	ALA	3.5
1	F	124	SER	3.4
1	C	20	GLN	3.4
1	A	38	ALA	3.4
1	C	90	ILE	3.2
1	E	157	TYR	3.2
1	F	33	MET	3.1
1	B	23	ILE	3.1
1	F	32	ALA	3.0
1	B	18	ASP	3.0

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Mol	Chain	Res	Type	RSRZ
1	E	12	GLU	2.9
1	D	90	ILE	2.9
1	D	40	ALA	2.9
1	A	407	HIS	2.8
1	C	25	HIS	2.8
1	E	407	HIS	2.8
1	F	31	ALA	2.8
1	D	12	GLU	2.7
1	F	14	LEU	2.7
1	C	88	ALA	2.6
1	F	12	GLU	2.6
1	B	21	ASP	2.6
1	B	25	HIS	2.5
1	C	37	ASP	2.5
1	B	17	LEU	2.5
1	D	28	THR	2.5
1	F	168	ILE	2.5
1	F	407	HIS	2.5
1	C	40	ALA	2.5
1	C	36	ALA	2.4
1	D	25	HIS	2.4
1	F	23	ILE	2.4
1	C	35	THR	2.4
1	D	92	PRO	2.4
1	C	41	ILE	2.4
1	F	90	ILE	2.3
1	F	366	GLU	2.3
1	F	37	ASP	2.3
1	F	170	MET	2.3
1	B	39	GLY	2.3
1	F	201	ARG	2.3
1	D	37	ASP	2.3
1	C	91	THR	2.2
1	B	32	ALA	2.2
1	F	68	PRO	2.2
1	A	12	GLU	2.2
1	F	360	ASP	2.2
1	D	11	GLN	2.2
1	D	26	ARG	2.2
1	E	156	SER	2.2
1	B	28	THR	2.1
1	E	338	TYR	2.1

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Mol	Chain	Res	Type	RSRZ
1	B	407	HIS	2.1
1	A	411	PRO	2.1
1	F	97	GLN	2.1
1	C	26	ARG	2.0
1	F	166	ARG	2.0
1	B	372	LEU	2.0
1	C	14	LEU	2.0
1	C	157	TYR	2.0
1	F	408	ILE	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 carbohydrates 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. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. 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	LLDF	B-factors(Å ²)	Q<0.9
5	EDO	B	503	4/4	0.76	0.37	10.27	41,42,43,46	0
4	PEG	C	505	7/7	0.83	0.25	9.91	9,14,22,23	7
4	PEG	A	503	7/7	0.85	0.20	6.41	20,23,27,35	0
4	PEG	C	504	7/7	0.87	0.21	4.24	20,26,35,39	0
5	EDO	A	504	4/4	0.94	0.24	4.03	14,21,27,28	0
6	GOL	C	503	6/6	0.86	0.16	3.33	21,26,35,41	0
4	PEG	D	503	7/7	0.88	0.19	3.22	25,29,30,31	0
5	EDO	E	503	4/4	0.84	0.17	2.03	17,20,25,33	0
3	O7U	C	502	9/9	0.97	0.10	1.22	10,13,17,18	0
5	EDO	D	504	4/4	0.85	0.18	1.06	36,37,39,41	0
4	PEG	E	504	7/7	0.88	0.12	0.97	30,35,37,38	0
5	EDO	C	506	4/4	0.86	0.17	0.65	25,27,31,34	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	LLDF	B-factors(\AA^2)	Q<0.9
3	O7U	D	502	9/9	0.97	0.10	0.29	9,12,16,18	0
3	O7U	F	502	9/9	0.97	0.11	0.18	11,14,16,18	0
3	O7U	A	502	9/9	0.96	0.09	-0.25	7,8,10,10	0
3	O7U	B	502	9/9	0.98	0.09	-0.70	8,10,13,15	0
3	O7U	E	502	9/9	0.98	0.08	-1.26	9,12,15,18	0
2	FE2	E	501	1/1	1.00	0.04	-2.19	18,18,18,18	0
2	FE2	C	501	1/1	0.99	0.06	-2.94	21,21,21,21	0
2	FE2	A	501	1/1	0.99	0.03	-4.45	15,15,15,15	0
2	FE2	F	501	1/1	0.99	0.04	-4.55	16,16,16,16	1
2	FE2	D	501	1/1	0.99	0.07	-	22,22,22,22	0
2	FE2	B	501	1/1	0.99	0.04	-	18,18,18,18	0
5	EDO	A	505	4/4	0.94	0.21	-	28,32,35,37	0

6.5 Other polymers [i](#)

There are no such residues in this entry.