WORLDWIDE wwPDB PROTEIN DATA BANK

Full wwPDB X-ray Structure Validation Report (i)

Nov 12, 2024 – 03:05 PM EST

PDB ID	:	3OS4
Title	:	The Crystal Structure of Nicotinate Phosphoribosyltransferase from Yersinia pestis
Authors	:	Maltseva, N.; Kim, Y.; Gu, M.; Anderson, W.F.; Joachimiak, A.; Center for Structural Genomics of Infectious Diseases (CSGID)
Deposited on	:	2010-09-08
Resolution	:	1.60 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 (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 ⓘ

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 1.60 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	Percentile Ranks	Value
Rfree		0.191
Clashscore		15
Ramachandran outliers		0.1%
Sidechain outliers		2.2%
RSRZ outliers		2.8%

Worse   *Better*

▮ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution
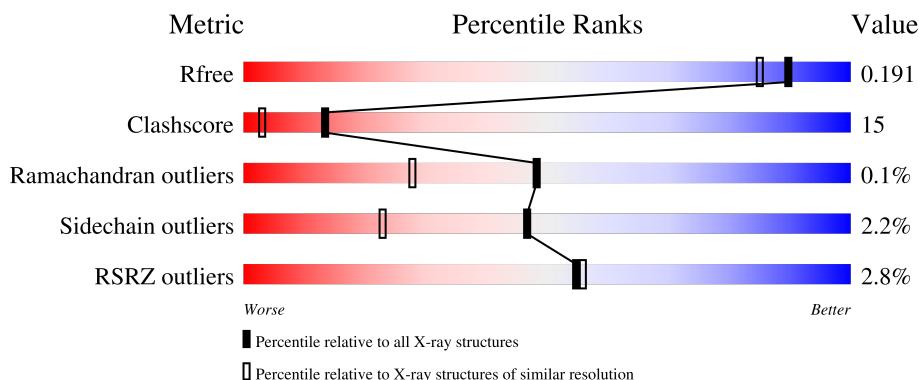
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R$_{free}$	164625	4274 (1.60-1.60)
Clashscore	180529	4682 (1.60-1.60)
Ramachandran outliers	177936	4583 (1.60-1.60)
Sidechain outliers	177891	4582 (1.60-1.60)
RSRZ outliers	164620	4272 (1.60-1.60)

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	407	3% / 77% / 19% / •
1	B	407	2% / 69% / 19% / • / 10%
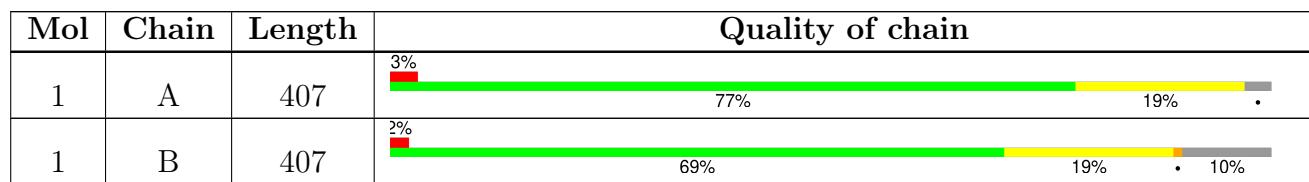
The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

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Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
4	PEG	A	412	-	-	X	-
4	PEG	A	422	-	-	X	-
5	FMT	A	421	-	-	X	-
6	ACY	A	415	-	-	X	-

2 Entry composition ⓘ

There are 8 unique types of molecules in this entry. The entry contains 7855 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 Nicotinate phosphoribosyltransferase.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	393	Total	C	N	O	S	Se	0	47	0
			3577	2274	635	652	6	10			
1	B	365	Total	C	N	O	S	Se	0	44	0
			3337	2115	594	614	6	8			

There are 12 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	402	GLU	-	expression tag	UNP Q8ZG93
A	403	ASN	-	expression tag	UNP Q8ZG93
A	404	LEU	-	expression tag	UNP Q8ZG93
A	405	TYR	-	expression tag	UNP Q8ZG93
A	406	PHE	-	expression tag	UNP Q8ZG93
A	407	GLN	-	expression tag	UNP Q8ZG93
B	402	GLU	-	expression tag	UNP Q8ZG93
B	403	ASN	-	expression tag	UNP Q8ZG93
B	404	LEU	-	expression tag	UNP Q8ZG93
B	405	TYR	-	expression tag	UNP Q8ZG93
B	406	PHE	-	expression tag	UNP Q8ZG93
B	407	GLN	-	expression tag	UNP Q8ZG93

- Molecule 2 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	1	Total	Mg	0	0
			1	1		
2	B	1	Total	Mg	0	0
			1	1		

- Molecule 3 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$).

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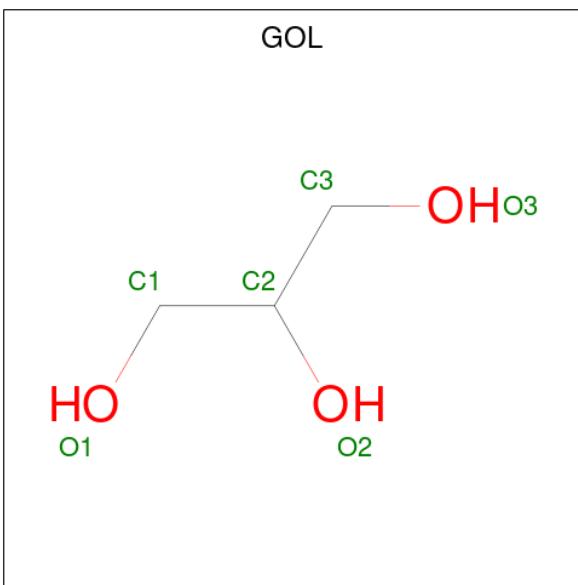
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total 6	C 3	O 3	0	0
3	A	1	Total 6	C 3	O 3	0	0
3	B	1	Total 6	C 3	O 3	0	0
3	B	1	Total 6	C 3	O 3	0	0
3	B	1	Total 6	C 3	O 3	0	0

- Molecule 4 is DI(HYDROXYETHYL)ETHER (three-letter code: PEG) (formula: $C_4H_{10}O_3$).

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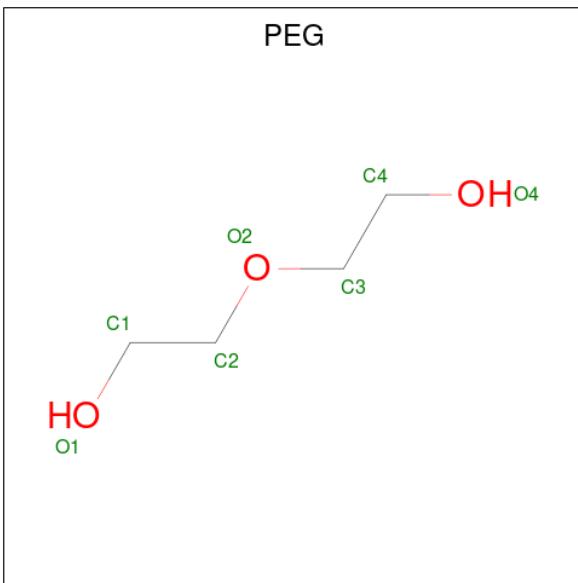
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total 7	C 4	O 3	0	0
4	A	1	Total 7	C 4	O 3	0	0
4	B	1	Total 7	C 4	O 3	0	0

- Molecule 5 is FORMIC ACID (three-letter code: FMT) (formula: CH_2O_2).
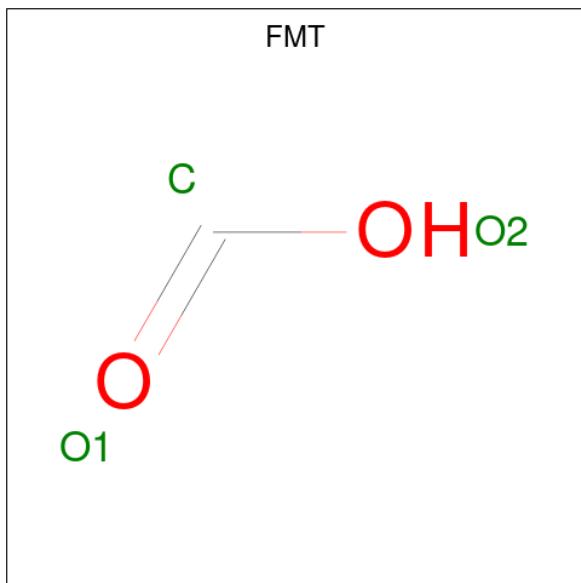
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	A	1	Total 3	C 1	O 2	0	0
5	A	1	Total 3	C 1	O 2	0	0
5	B	1	Total 3	C 1	O 2	0	0

- Molecule 6 is ACETIC ACID (three-letter code: ACY) (formula: $C_2H_4O_2$).
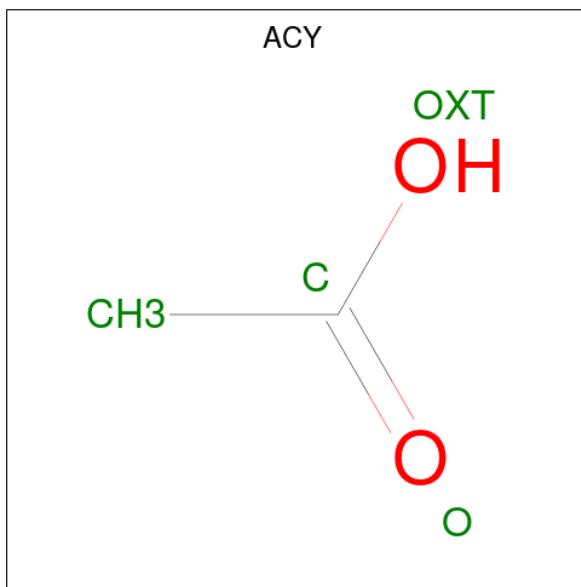
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	A	1	Total 4	C 2	O 2	0	0

- Molecule 7 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	3	Total 3	Cl 3	0	0
7	B	2	Total 2	Cl 2	0	0

- Molecule 8 is water.

| Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
8	A	518	Total 518	O 518	0	0
8	B	352	Total 352	O 352	0	0

3 Residue-property plots ⓘ

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density (RSRZ > 2). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

• Molecule 1: Nicotinate phosphoribosyltransferase
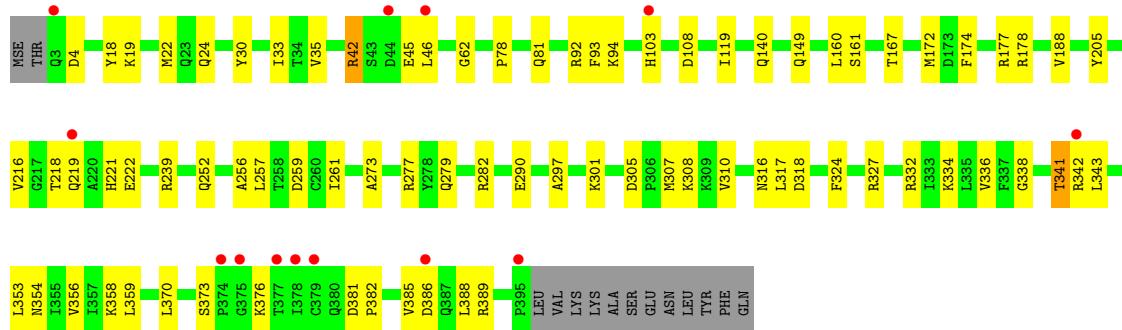
• Molecule 1: Nicotinate phosphoribosyltransferase
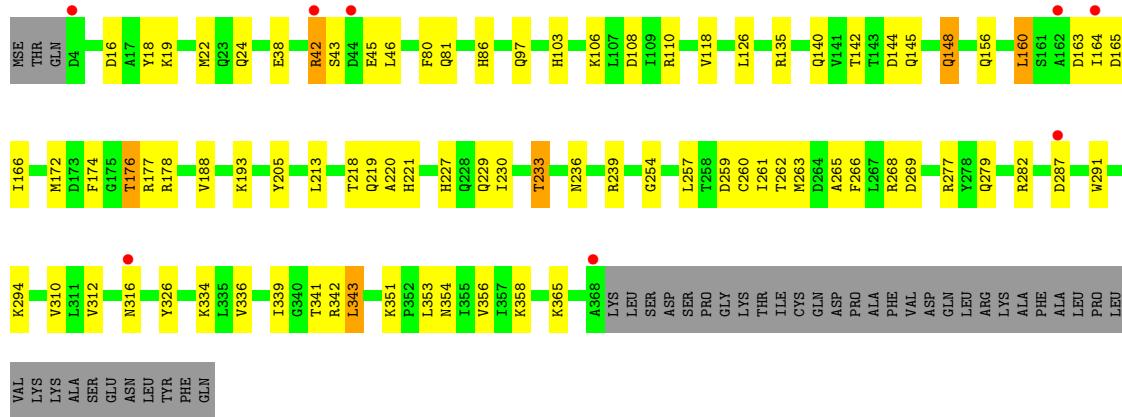
4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α, β, γ	47.39Å 50.68Å 87.18Å 81.95° 83.39° 71.95°	Depositor
Resolution (Å)	33.93 – 1.60 33.93 – 1.60	Depositor EDS
% Data completeness (in resolution range)	91.6 (33.93-1.60) 91.6 (33.93-1.60)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.06	Depositor
$< I/\sigma(I) >$ [1]	3.75 (at 1.60Å)	Xtriage
Refinement program	PHENIX (phenix.refine: 1.6.2_432)	Depositor
R, R_{free}	0.162 , 0.193 0.159 , 0.191	Depositor DCC
R_{free} test set	2000 reflections (2.18%)	wwPDB-VP
Wilson B-factor (Å^2)	15.5	Xtriage
Anisotropy	0.259	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.36 , 53.4	EDS
L-test for twinning[2]	$< |L| > = 0.49, < L^2 > = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.97	EDS
Total number of atoms	7855	wwPDB-VP
Average B, all atoms (Å^2)	22.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.66% of the height of the origin peak. No significant pseudotranslation is detected.*

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[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: PEG, CL, GOL, MG, ACY, FMT

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	0.57	0/3656	0.69	0/4943
1	B	0.47	0/3408	0.60	0/4608
All	All	0.52	0/7064	0.65	0/9551

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 ⓘ

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	3577	0	3537	95	0
1	B	3337	0	3280	102	0
2	A	1	0	0	0	0
2	B	1	0	0	0	0
3	A	12	0	16	2	0
3	B	18	0	24	1	0
4	A	14	0	20	10	0
4	B	7	0	10	1	0
5	A	6	0	2	3	0
5	B	3	0	1	0	0
6	A	4	0	3	2	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
7	A	3	0	0	0	0
7	B	2	0	0	1	0
8	A	518	0	0	19	0
8	B	352	0	0	29	0
All	All	7855	0	6893	203	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 15.

All (203) 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:172[B]:MSE:SE	1:A:174:PHE:CE1	2.40	1.25
1:A:172[B]:MSE:SE	1:A:174:PHE:CZ	2.39	1.25
1:B:22[A]:MSE:HE1	1:B:220:ALA:HB3	1.21	1.12
1:A:19:LYS:HD3	8:A:684:HOH:O	1.64	0.93
1:B:22[A]:MSE:HE1	1:B:220:ALA:CB	1.99	0.93
4:A:412:PEG:H42	8:A:680:HOH:O	1.72	0.88
1:A:30:TYR:HB3	1:A:33:ILE:HD12	1.55	0.88
1:B:24:GLN:HE22	1:B:81:GLN:H	1.21	0.87
1:B:188[B]:VAL:CG1	1:B:343:LEU:HD22	2.06	0.86
1:B:19[A]:LYS:HD3	8:B:567:HOH:O	1.74	0.85
1:B:294:LYS:HD2	8:B:833:HOH:O	1.76	0.84
1:A:24:GLN:HE22	1:A:81:GLN:H	1.26	0.84
1:B:188[B]:VAL:HG11	1:B:343:LEU:HD22	1.59	0.83
1:A:324:PHE:CD1	8:A:734:HOH:O	2.32	0.82
1:B:176[A]:THR:HG22	8:B:457:HOH:O	1.76	0.82
1:B:263[A]:MSE:SE	8:B:655:HOH:O	2.47	0.82
1:B:218[B]:THR:HG22	1:B:219:GLN:HG3	1.63	0.79
1:A:42:ARG:HG2	1:A:42:ARG:HH11	1.48	0.79
1:B:266:PHE:HB3	8:B:655:HOH:O	1.85	0.76
1:B:261:ILE:HD12	8:B:832:HOH:O	1.86	0.74
1:A:42:ARG:HG2	1:A:42:ARG:NH1	2.03	0.74
1:B:356:VAL:HB	1:B:358[B]:LYS:HE2	1.68	0.74
1:B:178[B]:ARG:HG3	1:B:178[B]:ARG:NH2	2.02	0.73
1:A:149[B]:GLN:HE21	1:A:149[B]:GLN:HA	1.54	0.73
1:A:310[B]:VAL:HG12	1:A:334:LYS:HB2	1.69	0.73
1:B:239:ARG:HB2	1:B:269[B]:ASP:OD2	1.89	0.73
1:B:260[B]:CYS:O	1:B:263[B]:MSE:HE3	1.90	0.72
1:B:265:ALA:HA	1:B:268[B]:ARG:NH1	2.04	0.72
1:A:221:HIS:HE1	1:A:259:ASP:OD1	1.73	0.72

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:287:ASP:HB3	8:B:846:HOH:O	1.89	0.71
1:A:318:ASP:HB3	1:A:342[A]:ARG:HD3	1.73	0.71
1:B:178[B]:ARG:HG3	1:B:178[B]:ARG:HH21	1.57	0.70
1:B:140:GLN:HA	8:B:752:HOH:O	1.91	0.70
1:B:268[B]:ARG:NH1	8:B:511:HOH:O	2.24	0.69
1:B:236[A]:ASN:OD1	8:B:519:HOH:O	2.09	0.69
1:A:359[B]:LEU:HD23	3:A:418:GOL:H11	1.75	0.68
1:A:370[B]:LEU:HD11	1:A:388:LEU:CD2	2.24	0.67
1:A:103[B]:HIS:HD2	1:A:108[B]:ASP:OD2	1.76	0.67
1:B:266:PHE:CD1	8:B:655:HOH:O	2.48	0.67
1:A:282[A]:ARG:HD3	5:A:414:FMT:H	1.78	0.66
1:A:324:PHE:HD1	8:A:734:HOH:O	1.72	0.66
1:B:310[B]:VAL:HG12	1:B:334:LYS:HB2	1.76	0.66
1:A:370[B]:LEU:HD11	1:A:388:LEU:HD23	1.78	0.66
1:A:317:LEU:O	1:A:342[A]:ARG:HD2	1.96	0.66
1:A:160:LEU:O	1:A:327[A]:ARG:NH1	2.29	0.66
1:A:327[A]:ARG:HD2	8:A:734:HOH:O	1.96	0.65
1:B:178[B]:ARG:HH21	1:B:178[B]:ARG:CG	2.09	0.64
1:B:135[B]:ARG:CG	1:B:135[B]:ARG:HH21	2.11	0.64
1:A:92:ARG:HB3	4:A:422:PEG:H11	1.79	0.63
1:A:279:GLN:NE2	8:A:752:HOH:O	2.31	0.63
1:B:156[B]:GLN:HG3	8:B:790:HOH:O	1.98	0.63
1:A:103[B]:HIS:CD2	1:A:108[B]:ASP:OD2	2.51	0.63
1:B:233[A]:THR:HG21	8:B:652:HOH:O	1.98	0.62
1:B:260[B]:CYS:HA	1:B:263[B]:MSE:HG2	1.82	0.62
1:B:229:GLN:HE22	1:B:365:LYS:NZ	1.98	0.61
1:A:18:TYR:OH	1:A:177[B]:ARG:NH1	2.33	0.61
1:B:260[B]:CYS:SG	8:B:654:HOH:O	2.56	0.61
1:A:318:ASP:HB3	1:A:342[A]:ARG:CD	2.31	0.61
1:A:178[B]:ARG:HD2	1:A:353:LEU:O	2.01	0.60
1:A:24:GLN:NE2	1:A:81:GLN:H	1.97	0.59
1:B:236[A]:ASN:ND2	1:B:269[A]:ASP:OD1	2.36	0.59
1:B:135[B]:ARG:NH2	8:B:750:HOH:O	2.33	0.59
1:B:178[A]:ARG:HB2	1:B:341[A]:THR:HG22	1.83	0.59
1:A:172[B]:MSE:HG3	1:A:338:GLY:HA2	1.83	0.59
1:B:80:PHE:HB2	8:B:788:HOH:O	2.03	0.58
1:B:38:GLU:OE2	1:B:110[B]:ARG:HD2	2.04	0.58
1:B:188[B]:VAL:HG13	1:B:343:LEU:HD22	1.85	0.58
1:B:22[A]:MSE:HE2	1:B:220:ALA:N	2.18	0.58
1:A:318:ASP:OD2	1:A:342[A]:ARG:NH2	2.37	0.58
1:B:24:GLN:NE2	1:B:81:GLN:H	1.95	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:172[A]:MSE:HE2	1:A:336:VAL:HG12	1.85	0.57
1:B:103:HIS:HD2	1:B:108[A]:ASP:OD2	1.86	0.57
1:A:178[B]:ARG:HB2	1:A:341[B]:THR:HG22	1.86	0.56
1:A:373[A]:SER:OG	1:A:376:LYS:HD2	2.05	0.56
1:B:97:GLN:OE1	1:B:118[B]:VAL:HG12	2.06	0.56
1:B:259[A]:ASP:OD1	1:B:262:THR:OG1	2.23	0.56
4:A:412:PEG:H31	8:A:731:HOH:O	2.05	0.56
1:B:45[B]:GLU:OE1	1:B:353:LEU:HD12	2.05	0.56
1:B:263[A]:MSE:CE	8:B:833:HOH:O	2.53	0.56
1:B:16:ASP:OD1	1:B:176[A]:THR:HG23	2.06	0.56
1:A:42:ARG:HH11	1:A:42:ARG:CG	2.17	0.56
1:A:290[B]:GLU:HG2	6:A:415:ACY:O	2.06	0.56
4:A:412:PEG:H11	8:A:729:HOH:O	2.05	0.56
1:B:144:ASP:O	1:B:148:GLN:HG2	2.06	0.55
1:B:42[A]:ARG:HB2	1:B:354:ASN:ND2	2.22	0.55
1:B:266:PHE:CG	8:B:655:HOH:O	2.60	0.55
1:B:148:GLN:HE21	1:B:148:GLN:HA	1.71	0.55
1:B:312:VAL:HG21	4:B:410:PEG:H22	1.88	0.55
1:B:188[B]:VAL:CG1	1:B:343:LEU:CD2	2.84	0.54
1:B:263[A]:MSE:HE2	8:B:833:HOH:O	2.07	0.54
4:A:412:PEG:H41	8:A:729:HOH:O	2.07	0.54
1:A:310[B]:VAL:CG1	1:A:334:LYS:HE3	2.37	0.54
1:A:327[B]:ARG:HD3	8:A:734:HOH:O	2.07	0.54
1:A:327[B]:ARG:CD	8:A:734:HOH:O	2.56	0.54
1:A:273:ALA:O	1:A:277[B]:ARG:HG2	2.07	0.54
1:A:359[B]:LEU:CD2	3:A:418:GOL:H11	2.38	0.54
1:B:254:GLY:H	1:B:279:GLN:HE22	1.57	0.53
1:A:35:VAL:HB	1:A:359[A]:LEU:HD11	1.90	0.53
1:A:370[B]:LEU:N	1:A:370[B]:LEU:HD12	2.23	0.53
1:B:18:TYR:HD1	1:B:22[A]:MSE:HE3	1.73	0.53
1:B:16:ASP:OD1	1:B:176[A]:THR:CG2	2.57	0.52
1:B:221:HIS:CE1	1:B:257:LEU:HD21	2.45	0.52
1:A:18:TYR:CE2	1:A:177[B]:ARG:NH1	2.76	0.52
1:A:172[A]:MSE:HE2	1:A:336:VAL:CG1	2.40	0.52
1:A:341[A]:THR:HG22	8:A:620:HOH:O	2.09	0.52
1:A:22[A]:MSE:HE3	1:A:119:ILE:HD11	1.92	0.51
1:B:259[A]:ASP:HB2	8:B:832:HOH:O	2.10	0.51
1:A:178[B]:ARG:CB	1:A:341[B]:THR:HG22	2.40	0.51
1:A:221:HIS:HD2	8:A:776:HOH:O	1.92	0.51
1:B:22[A]:MSE:HE2	1:B:220:ALA:H	1.75	0.51
1:A:316[A]:ASN:O	1:A:342[A]:ARG:NH1	2.44	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:22[B]:MSE:HG2	1:A:119:ILE:CD1	2.41	0.50
1:B:259[B]:ASP:CG	8:B:832:HOH:O	2.50	0.50
1:B:339[B]:ILE:HG22	1:B:343:LEU:HB2	1.92	0.50
1:A:219[A]:GLN:HE22	1:A:256:ALA:HA	1.77	0.50
1:B:103:HIS:CD2	1:B:108[A]:ASP:OD2	2.66	0.49
1:A:22[B]:MSE:SE	1:A:222:GLU:HG3	2.63	0.48
1:A:297:ALA:O	1:A:301[B]:LYS:HG3	2.13	0.48
1:B:42[B]:ARG:HB2	1:B:354:ASN:ND2	2.27	0.48
1:B:43[B]:SER:HG	1:B:45[B]:GLU:CD	2.16	0.48
1:B:43[B]:SER:OG	1:B:45[B]:GLU:CD	2.52	0.48
1:B:172:MSE:HE2	1:B:336:VAL:HG12	1.95	0.48
1:B:239:ARG:HB2	1:B:269[B]:ASP:CG	2.33	0.48
1:A:239[B]:ARG:CG	8:A:718:HOH:O	2.61	0.48
1:A:218[A]:THR:HG22	1:A:219[A]:GLN:OE1	2.14	0.48
1:B:277:ARG:HD3	3:B:412:GOL:O2	2.13	0.48
1:A:290[B]:GLU:OE1	6:A:415:ACY:H2	2.13	0.48
1:B:22[A]:MSE:CE	1:B:220:ALA:CB	2.83	0.48
1:B:263[A]:MSE:HE2	1:B:291:TRP:CD1	2.49	0.48
1:A:239[B]:ARG:HG2	8:A:718:HOH:O	2.13	0.48
1:A:45:GLU:C	1:A:46:LEU:HD23	2.34	0.47
1:A:93:PHE:O	4:A:422:PEG:H12	2.14	0.47
1:B:135[B]:ARG:HH21	1:B:135[B]:ARG:HG3	1.77	0.47
1:A:219[A]:GLN:NE2	1:A:256:ALA:HA	2.28	0.47
1:B:263[B]:MSE:H	1:B:263[B]:MSE:HG3	1.50	0.47
1:A:92:ARG:CB	4:A:422:PEG:H11	2.45	0.47
1:A:178[B]:ARG:CD	1:A:353:LEU:O	2.62	0.47
1:A:22[B]:MSE:CG	1:A:119:ILE:HD11	2.44	0.47
1:B:193:LYS:HD2	1:B:213:LEU:HD21	1.96	0.47
1:B:229:GLN:HE22	1:B:365:LYS:HZ2	1.62	0.47
1:A:310[B]:VAL:HG12	1:A:334:LYS:CB	2.42	0.47
1:A:178[B]:ARG:HB2	1:A:341[B]:THR:CG2	2.43	0.47
1:B:316[A]:ASN:CG	1:B:316[A]:ASN:O	2.53	0.47
1:B:218[B]:THR:HG22	1:B:219:GLN:N	2.30	0.47
1:A:317:LEU:C	1:A:342[A]:ARG:HD2	2.35	0.46
1:B:178[B]:ARG:HD3	1:B:353:LEU:O	2.15	0.46
1:A:45:GLU:O	1:A:46:LEU:HD23	2.16	0.46
1:A:342[A]:ARG:NE	8:A:735:HOH:O	2.48	0.46
7:B:418:CL:CL	8:B:797:HOH:O	2.58	0.46
1:A:385:VAL:O	1:A:389[A]:ARG:HG3	2.15	0.46
1:A:376:LYS:C	8:A:673:HOH:O	2.54	0.46
1:A:218[B]:THR:OG1	1:A:219[B]:GLN:N	2.48	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:62:GLY:O	4:A:422:PEG:H31	2.16	0.45
1:A:94:LYS:CE	5:A:421:FMT:O2	2.64	0.45
1:B:174:PHE:CE2	1:B:282[A]:ARG:NH2	2.84	0.45
1:B:18:TYR:CE1	1:B:220:ALA:HB2	2.52	0.45
1:B:177[A]:ARG:HB2	8:B:435:HOH:O	2.17	0.45
1:B:178[A]:ARG:NH1	1:B:354:ASN:OD1	2.46	0.45
1:B:18:TYR:CE1	1:B:19[A]:LYS:HE3	2.52	0.45
1:A:310[B]:VAL:HG13	1:A:334:LYS:HE3	1.98	0.44
1:A:318:ASP:CA	1:A:342[A]:ARG:HD2	2.47	0.44
1:B:86:HIS:HE1	8:B:561:HOH:O	1.99	0.44
1:B:172:MSE:HE3	1:B:174:PHE:CZ	2.52	0.44
4:A:412:PEG:C1	8:A:729:HOH:O	2.64	0.44
1:B:316[B]:ASN:OD1	1:B:341[B]:THR:HG22	2.17	0.44
1:A:219[B]:GLN:NE2	1:A:257:LEU:H	2.15	0.44
1:A:167[A]:THR:O	1:A:167[A]:THR:HG22	2.18	0.44
1:A:305:ASP:HB3	1:A:308:LYS:HE2	2.00	0.44
1:A:22[B]:MSE:SE	1:A:119:ILE:HD11	2.68	0.44
1:B:227:HIS:HA	1:B:230:ILE:HG12	2.00	0.44
1:A:327[B]:ARG:NH2	8:A:452:HOH:O	2.47	0.43
1:B:254:GLY:H	1:B:279:GLN:NE2	2.15	0.43
1:A:30:TYR:CB	1:A:33:ILE:HD12	2.39	0.43
1:A:188[B]:VAL:HG11	1:A:343:LEU:HG	2.00	0.43
1:B:188[B]:VAL:HG13	1:B:343:LEU:CD2	2.47	0.43
1:B:287:ASP:HB3	8:B:847:HOH:O	2.19	0.43
1:B:166:ILE:HD12	1:B:326:TYR:CE2	2.54	0.43
1:B:178[B]:ARG:NH1	8:B:580:HOH:O	2.48	0.43
1:B:46:LEU:HD22	1:B:106:LYS:HG2	2.01	0.42
1:A:93:PHE:O	4:A:422:PEG:C1	2.67	0.42
1:A:188[B]:VAL:CG1	1:A:343:LEU:HD11	2.49	0.42
1:A:356:VAL:HB	1:A:358:LYS:HE2	2.01	0.42
1:A:42:ARG:HB3	1:A:354:ASN:ND2	2.34	0.42
1:A:318:ASP:HB3	1:A:342[A]:ARG:HH21	1.85	0.42
1:B:126:LEU:CD1	1:B:177[A]:ARG:HD3	2.49	0.42
1:A:307[B]:MSE:HG2	1:A:332:ARG:O	2.20	0.41
1:A:172[B]:MSE:HB2	1:A:216:VAL:HG21	2.02	0.41
1:B:236[B]:ASN:OD1	8:B:575:HOH:O	2.22	0.41
1:A:161:SER:HA	1:A:327[A]:ARG:HH11	1.85	0.41
1:B:142:THR:OG1	1:B:145:GLN:HG3	2.21	0.41
1:A:22[B]:MSE:HG2	1:A:119:ILE:HD11	2.02	0.41
1:B:268[B]:ARG:NH2	8:B:555:HOH:O	2.41	0.41
1:B:22[A]:MSE:CE	1:B:220:ALA:N	2.83	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:156[A]:GLN:HG2	1:B:160:LEU:HD22	2.02	0.41
1:B:163:ASP:OD2	1:B:163:ASP:C	2.59	0.41
1:A:78:PRO:HB2	1:A:252[A]:GLN:HE22	1.86	0.41
1:A:94:LYS:HE2	5:A:421:FMT:O2	2.21	0.41
1:B:46:LEU:HD21	1:B:106:LYS:HE2	2.02	0.41
1:B:164:ILE:HG12	1:B:165:ASP:N	2.36	0.41
1:A:310[B]:VAL:HG12	1:A:334:LYS:HE3	2.02	0.41
1:A:381:ASP:HA	1:A:382:PRO:HD2	1.97	0.40
1:B:229:GLN:NE2	1:B:365:LYS:HZ2	2.19	0.40
1:B:266:PHE:CB	8:B:655:HOH:O	2.56	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	438/407 (108%)	424 (97%)	12 (3%)	2 (0%)	25	10
1	B	407/407 (100%)	393 (97%)	14 (3%)	0	100	100
All	All	845/814 (104%)	817 (97%)	26 (3%)	2 (0%)	48	25

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	261[A]	ILE
1	A	261[B]	ILE

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	394/353 (112%)	387 (98%)	7 (2%)	54	31
1	B	367/353 (104%)	354 (96%)	13 (4%)	31	10
All	All	761/706 (108%)	741 (97%)	20 (3%)	47	17

All (20) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	4	ASP
1	A	42	ARG
1	A	140	GLN
1	A	205	TYR
1	A	341[A]	THR
1	A	341[B]	THR
1	A	386	ASP
1	B	42[A]	ARG
1	B	42[B]	ARG
1	B	148	GLN
1	B	160	LEU
1	B	176[A]	THR
1	B	176[B]	THR
1	B	205	TYR
1	B	233[A]	THR
1	B	233[B]	THR
1	B	342[A]	ARG
1	B	342[B]	ARG
1	B	343	LEU
1	B	351	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (14) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	24	GLN
1	A	156	GLN
1	A	186	HIS
1	A	221	HIS
1	A	387	GLN
1	B	24	GLN
1	B	86	HIS

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Mol	Chain	Res	Type
1	B	103	HIS
1	B	148	GLN
1	B	186	HIS
1	B	228	GLN
1	B	229	GLN
1	B	238	GLN
1	B	279	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 oligosaccharides in this entry.

5.6   Ligand geometry ⓘ

Of 19 ligands modelled in this entry, 7 are monoatomic - leaving 12 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	$\#|Z| > 2$
4	PEG	B	410	-	6,6,6	0.43	0	5,5,5	0.35	0
3	GOL	A	418	-	5,5,5	0.37	0	5,5,5	0.64	0
3	GOL	B	417	-	5,5,5	0.52	0	5,5,5	0.65	0
5	FMT	A	414	-	2,2,2	0.99	0	1,1,1	0.01	0
5	FMT	A	421	-	2,2,2	0.78	0	1,1,1	0.19	0
3	GOL	B	412	-	5,5,5	0.45	0	5,5,5	0.40	0
4	PEG	A	412	-	6,6,6	0.49	0	5,5,5	0.33	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
4	PEG	A	422	-	6,6,6	0.88	0	5,5,5	1.64	1 (20%)
3	GOL	A	411	-	5,5,5	0.43	0	5,5,5	0.28	0
5	FMT	B	416	-	2,2,2	0.72	0	1,1,1	0.28	0
6	ACY	A	415	-	3,3,3	0.73	0	3,3,3	0.99	0
3	GOL	B	411	-	5,5,5	0.46	0	5,5,5	0.30	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
4	PEG	B	410	-	-	3/4/4/4	-
3	GOL	A	418	-	-	0/4/4/4	-
3	GOL	B	417	-	-	0/4/4/4	-
3	GOL	B	412	-	-	0/4/4/4	-
4	PEG	A	412	-	-	4/4/4/4	-
4	PEG	A	422	-	-	3/4/4/4	-
3	GOL	A	411	-	-	2/4/4/4	-
3	GOL	B	411	-	-	2/4/4/4	-

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	A	422	PEG	C3-O2-C2	3.04	126.56	113.26

There are no chirality outliers.

All (14) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	B	411	GOL	O1-C1-C2-C3
4	A	412	PEG	O1-C1-C2-O2
4	A	422	PEG	O1-C1-C2-O2
4	B	410	PEG	O1-C1-C2-O2
3	A	411	GOL	O1-C1-C2-C3
3	B	411	GOL	O1-C1-C2-O2
4	B	410	PEG	O2-C3-C4-O4
3	A	411	GOL	O1-C1-C2-O2
4	B	410	PEG	C4-C3-O2-C2

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Mol	Chain	Res	Type	Atoms
4	A	422	PEG	O2-C3-C4-O4
4	A	412	PEG	O2-C3-C4-O4
4	A	412	PEG	C1-C2-O2-C3
4	A	412	PEG	C4-C3-O2-C2
4	A	422	PEG	C1-C2-O2-C3

There are no ring outliers.

8 monomers are involved in 19 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	B	410	PEG	1	0
3	A	418	GOL	2	0
5	A	414	FMT	1	0
5	A	421	FMT	2	0
3	B	412	GOL	1	0
4	A	412	PEG	5	0
4	A	422	PEG	5	0
6	A	415	ACY	2	0

5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

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	387/407 (95%)	-0.40	13 (3%)	48	49	5, 14, 40, 79	43 (11%)
1	B	359/407 (88%)	-0.08	8 (2%)	62	65	7, 21, 40, 64	42 (11%)
All	All	746/814 (91%)	-0.24	21 (2%)	55	56	5, 18, 40, 79	85 (11%)

All (21) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	378	ILE	4.7
1	B	287	ASP	3.6
1	A	3	GLN	3.6
1	B	316[A]	ASN	3.5
1	A	44	ASP	3.2
1	A	374	PRO	3.1
1	B	162	ALA	3.0
1	B	368	ALA	2.9
1	A	395	PRO	2.9
1	B	4	ASP	2.9
1	A	342[A]	ARG	2.8
1	A	103[A]	HIS	2.8
1	B	164	ILE	2.8
1	A	377	THR	2.7
1	A	375	GLY	2.6
1	A	386	ASP	2.5
1	A	379	CYS	2.2
1	A	46	LEU	2.2
1	B	42[A]	ARG	2.1
1	B	44	ASP	2.1
1	A	219[A]	GLN	2.0

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

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

6.3　Carbohydrates ⓘ

There are no monosaccharides in this entry.

6.4　Ligands ⓘ

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
6	ACY	A	415	4/4	0.73	0.16	31,34,38,43	0
4	PEG	A	412	7/7	0.77	0.13	30,36,44,46	0
4	PEG	B	410	7/7	0.80	0.14	26,38,50,55	0
5	FMT	B	416	3/3	0.81	0.13	54,54,54,55	0
4	PEG	A	422	7/7	0.85	0.13	23,32,38,42	0
3	GOL	A	411	6/6	0.86	0.13	39,41,44,45	0
3	GOL	B	412	6/6	0.87	0.11	34,35,36,37	0
5	FMT	A	421	3/3	0.88	0.17	42,42,43,45	0
3	GOL	B	411	6/6	0.91	0.09	39,42,44,49	0
2	MG	B	419	1/1	0.93	0.14	43,43,43,43	0
3	GOL	B	417	6/6	0.93	0.10	20,26,34,44	0
7	CL	A	419	1/1	0.93	0.16	59,59,59,59	0
2	MG	A	410	1/1	0.94	0.13	26,26,26,26	0
3	GOL	A	418	6/6	0.94	0.09	15,25,31,39	0
7	CL	A	420	1/1	0.95	0.08	27,27,27,27	0
7	CL	B	418	1/1	0.95	0.08	39,39,39,39	0
7	CL	A	417	1/1	0.97	0.08	32,32,32,32	0
5	FMT	A	414	3/3	0.97	0.07	13,13,21,31	0
7	CL	B	415	1/1	0.99	0.05	31,31,31,31	0

6.5　Other polymers ⓘ

There are no such residues in this entry.