WORLDWIDE PDB
PROTEIN DATA BANK

Full wwPDB X-ray Structure Validation Report (i)

Oct 31, 2023 – 02:48 PM JST

PDB ID	:	5FB4
Title	:	Crystal structure of the bacteriophage phi29 tail knob protein gp9 truncation variant
Authors	:	Xu, J.W.; Gui, M.; Wang, D.H.; Xiang, Y.
Deposited on	:	2015-12-14
Resolution	:	2.04 Å(reported)

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	:	2.36
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)	:	2.36

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 2.04 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		0.184
Clashscore		6
Ramachandran outliers		0
Sidechain outliers		0.6%
RSRZ outliers		2.9%

Worse .... Better

▌ Percentile relative to all X-ray structures

◻ Percentile relative to X-ray structures of similar resolution
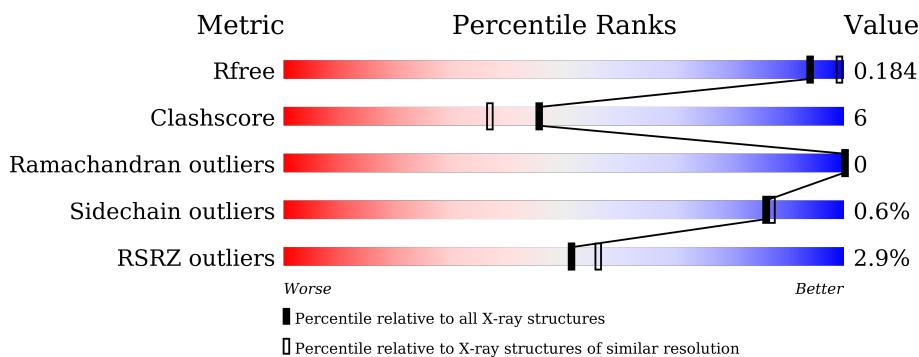
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R$_{free}$	130704	1692 (2.04-2.04)
Clashscore	141614	1773 (2.04-2.04)
Ramachandran outliers	138981	1752 (2.04-2.04)
Sidechain outliers	138945	1752 (2.04-2.04)
RSRZ outliers	127900	1672 (2.04-2.04)

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	605	.% 74% 11% 16%
1	B	605	2% 77% 8% 15%
1	C	605	4% 75% 11% 15%
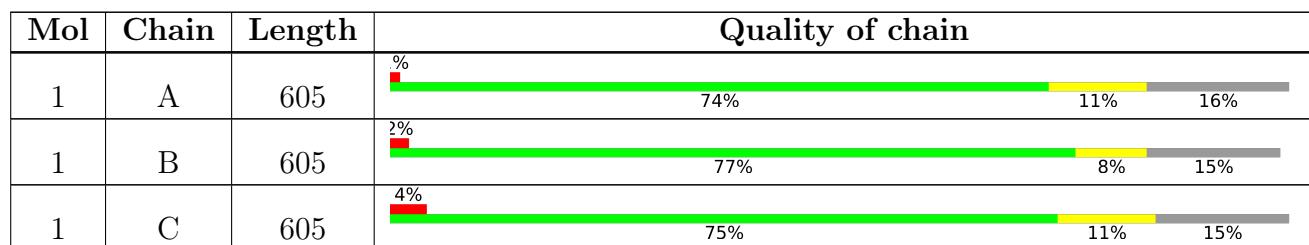
2   Entry composition ⓘ

There are 3 unique types of molecules in this entry. The entry contains 13867 atoms, of which 30 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 Distal tube protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	511	Total 4143	C 2641	N 686	O 799	S 17	0	0	0
1	B	515	Total 4180	C 2666	N 690	O 806	S 18	0	1	0
1	C	516	Total 4181	C 2665	N 691	O 808	S 17	0	0	0

There are 24 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	41	SER	ARG	see sequence details	UNP P04331
A	121	ILE	MET	see sequence details	UNP P04331
A	600	HIS	-	expression tag	UNP P04331
A	601	HIS	-	expression tag	UNP P04331
A	602	HIS	-	expression tag	UNP P04331
A	603	HIS	-	expression tag	UNP P04331
A	604	HIS	-	expression tag	UNP P04331
A	605	HIS	-	expression tag	UNP P04331
B	41	SER	ARG	see sequence details	UNP P04331
B	121	ILE	MET	see sequence details	UNP P04331
B	600	HIS	-	expression tag	UNP P04331
B	601	HIS	-	expression tag	UNP P04331
B	602	HIS	-	expression tag	UNP P04331
B	603	HIS	-	expression tag	UNP P04331
B	604	HIS	-	expression tag	UNP P04331
B	605	HIS	-	expression tag	UNP P04331
C	41	SER	ARG	see sequence details	UNP P04331
C	121	ILE	MET	see sequence details	UNP P04331
C	600	HIS	-	expression tag	UNP P04331
C	601	HIS	-	expression tag	UNP P04331
C	602	HIS	-	expression tag	UNP P04331
C	603	HIS	-	expression tag	UNP P04331
C	604	HIS	-	expression tag	UNP P04331

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Chain	Residue	Modelled	Actual	Comment	Reference
C	605	HIS	-	expression tag	UNP P04331

- Molecule 2 is DI(HYDROXYETHYL)ETHER (three-letter code: PEG) (formula: $C_4H_{10}O_3$).
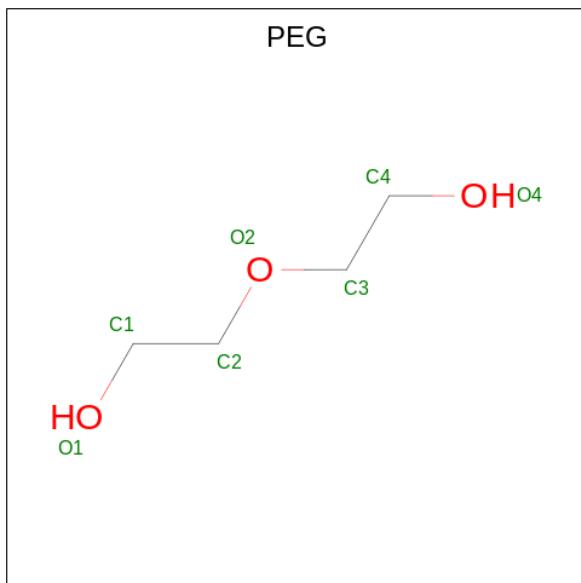
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total 17	C 4	H 10	O 3	0	0
2	B	1	Total 17	C 4	H 10	O 3	0	0
2	C	1	Total 17	C 4	H 10	O 3	0	0

- Molecule 3 is water.

| Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	460	Total 460	O 460	0	0
3	B	425	Total 425	O 425	0	0
3	C	427	Total 427	O 427	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: Distal tube protein
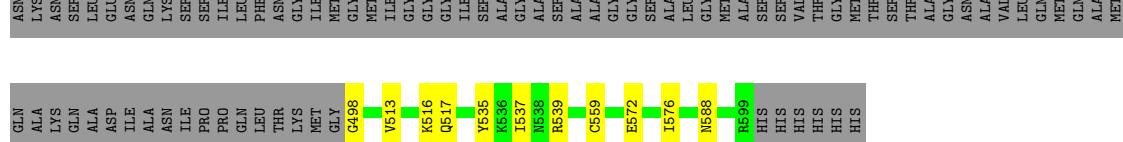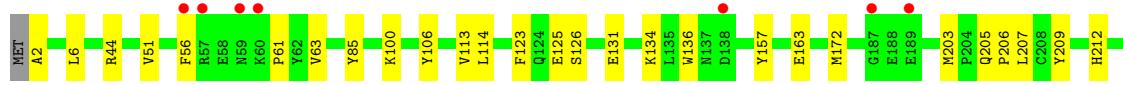
- Molecule 1: Distal tube protein
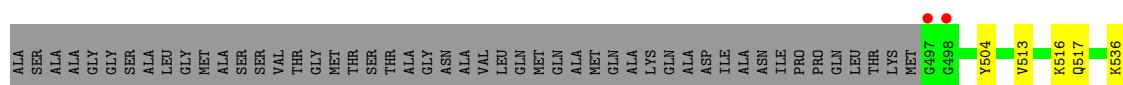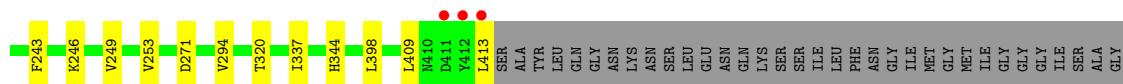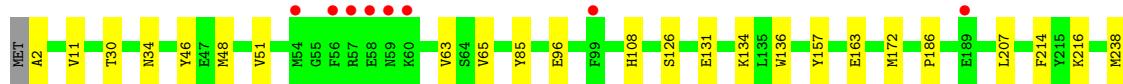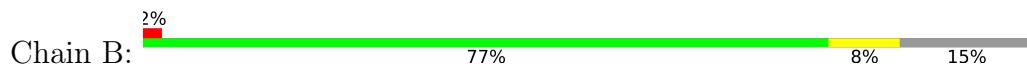
- Molecule 1: Distal tube protein
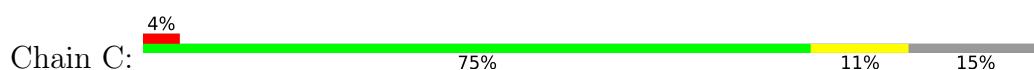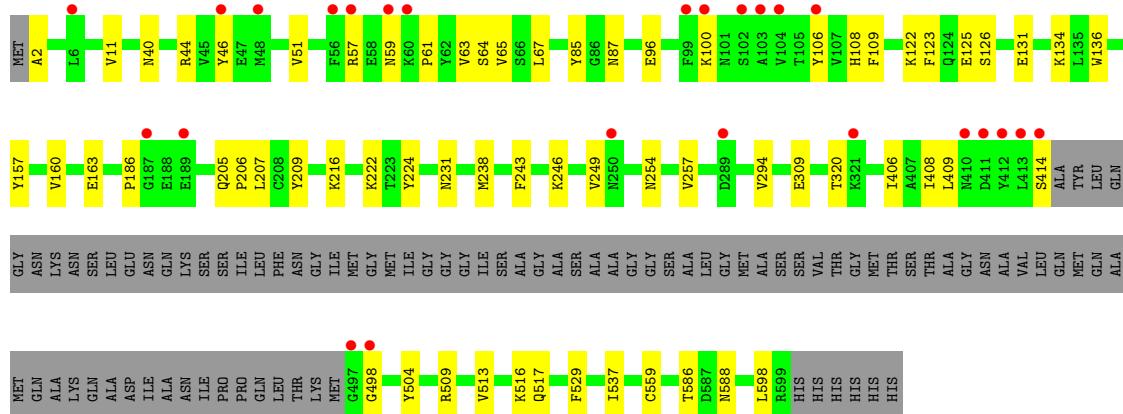
4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	I 2 2 2	Depositor
Cell constants a, b, c, α, β, γ	94.60Å 135.16Å 313.43Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	43.32 – 2.04	Depositor
	43.32 – 2.04	EDS
% Data completeness	99.3 (43.32-2.04)	Depositor
(in resolution range)	97.7 (43.32-2.04)	EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	7.96 (at 2.05Å)	Xtriage
Refinement program	PHENIX 1.9_1692	Depositor
R, R_{free}	0.153 , 0.183	Depositor
	0.155 , 0.184	DCC
R_{free} test set	6371 reflections (5.02%)	wwPDB-VP
Wilson B-factor (Å^2)	21.0	Xtriage
Anisotropy	0.518	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.36 , 55.0	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	0.96	EDS
Total number of atoms	13867	wwPDB-VP
Average B, all atoms (Å^2)	28.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.96% 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 (i)

5.1 Standard geometry (i)

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

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	0.40	0/4240	0.53	0/5738
1	B	0.39	0/4281	0.52	0/5793
1	C	0.41	0/4279	0.53	0/5791
All	All	0.40	0/12800	0.53	0/17322

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	4143	0	4005	62	0
1	B	4180	0	4041	54	0
1	C	4181	0	4037	51	0
2	A	7	10	10	0	0
2	B	7	10	10	0	0
2	C	7	10	10	2	0
3	A	460	0	0	6	4
3	B	425	0	0	9	0
3	C	427	0	0	10	3
All	All	13837	30	12113	158	4

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 6.

All (158) 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:212:HIS:HD2	1:A:296:THR:HG23	1.05	1.15
1:B:253:VAL:HG23	1:C:414:SER:HA	1.37	1.05
1:A:212:HIS:CD2	1:A:296:THR:HG23	1.91	1.04
1:B:163:GLU:OE2	3:B:801:HOH:O	1.89	0.91
1:B:413:LEU:O	3:B:802:HOH:O	1.95	0.85
1:A:231:ASN:OD1	3:A:801:HOH:O	1.98	0.82
1:A:296:THR:HG22	1:A:297:ILE:H	1.42	0.82
1:C:320:THR:HG23	1:C:517:GLN:HE22	1.42	0.82
1:C:51:VAL:HG21	1:C:63:VAL:HG23	1.63	0.80
1:B:172:MET:SD	1:B:504:TYR:HE1	2.06	0.78
1:A:51:VAL:HG21	1:A:63:VAL:CG2	2.14	0.78
1:A:498:GLY:O	3:A:802:HOH:O	2.02	0.76
1:A:205:GLN:NE2	1:A:207:LEU:H	1.85	0.74
1:C:498:GLY:O	3:C:801:HOH:O	2.06	0.74
1:C:320:THR:CG2	1:C:517:GLN:HE22	2.00	0.74
1:C:238:MET:HG3	1:C:294:VAL:HG13	1.70	0.74
1:A:320:THR:HG23	1:A:517:GLN:HE22	1.52	0.73
1:C:205:GLN:NE2	1:C:207:LEU:H	1.88	0.72
1:A:255:MET:SD	1:A:406:ILE:HD11	2.29	0.71
1:A:205:GLN:NE2	1:A:207:LEU:HB2	2.05	0.71
1:C:51:VAL:HG21	1:C:63:VAL:CG2	2.21	0.71
1:C:100:LYS:HD2	1:C:106:TYR:CZ	2.25	0.71
1:C:205:GLN:NE2	1:C:207:LEU:HB2	2.06	0.70
1:A:320:THR:CG2	1:A:517:GLN:HE22	2.05	0.70
1:B:320:THR:CG2	1:B:517:GLN:HE22	2.05	0.70
1:C:257:VAL:HG13	1:C:406:ILE:HD11	1.74	0.69
1:B:51:VAL:HG21	1:B:63:VAL:CG2	2.24	0.68
1:B:246:LYS:HA	1:B:249:VAL:HG22	1.75	0.68
1:B:320:THR:HG23	1:B:517:GLN:HE22	1.58	0.67
1:A:51:VAL:HG21	1:A:63:VAL:HG23	1.76	0.67
1:B:238:MET:HG3	1:B:294:VAL:HG13	1.76	0.67
1:A:207:LEU:CD2	1:B:409:LEU:HD21	2.25	0.65
1:B:271:ASP:OD2	3:B:804:HOH:O	2.14	0.65
1:A:51:VAL:HG21	1:A:63:VAL:HG21	1.79	0.64
1:A:238:MET:HG3	1:A:294:VAL:HG13	1.77	0.64
1:C:122:LYS:NZ	3:C:805:HOH:O	2.29	0.64
1:B:549:LYS:HD2	1:B:597:GLU:OE2	1.97	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:344:HIS:HA	1:B:398:LEU:HD11	1.79	0.64
1:B:172:MET:SD	1:B:504:TYR:CE1	2.91	0.63
1:A:207:LEU:HD21	1:B:409:LEU:HD21	1.81	0.63
1:A:56:PHE:CE1	1:A:61:PRO:HB3	2.33	0.63
1:B:517:GLN:OE1	3:B:806:HOH:O	2.15	0.63
1:C:205:GLN:HG2	1:C:206:PRO:HD2	1.80	0.63
1:A:246:LYS:HA	1:A:249:VAL:CG1	2.30	0.61
1:B:2:ALA:N	1:B:85:TYR:HH	1.98	0.61
1:B:11:VAL:HG21	1:B:51:VAL:CG1	2.31	0.60
1:B:207:LEU:CD2	1:C:409:LEU:HD21	2.32	0.60
1:B:557:LYS:HD3	2:C:701:PEG:H31	1.83	0.60
1:B:46:TYR:CE2	1:B:65:VAL:HG13	2.36	0.60
1:B:51:VAL:HG21	1:B:63:VAL:HG23	1.84	0.59
1:A:264:LYS:O	3:A:803:HOH:O	2.16	0.58
1:C:131:GLU:HG2	1:C:537:ILE:HG13	1.85	0.58
1:C:216:LYS:NZ	3:C:804:HOH:O	2.27	0.58
1:C:243:PHE:HA	1:C:249:VAL:CG1	2.34	0.58
1:C:46:TYR:CE2	1:C:65:VAL:HG13	2.38	0.58
1:A:205:GLN:HE22	1:A:207:LEU:HB2	1.67	0.58
1:A:406:ILE:HD12	1:A:407:ALA:O	2.04	0.58
1:A:51:VAL:CG2	1:A:63:VAL:HG23	2.34	0.58
1:A:246:LYS:HA	1:A:249:VAL:HG12	1.86	0.57
1:B:131:GLU:HG2	1:B:537:ILE:HG13	1.86	0.57
1:C:246:LYS:HG2	3:C:818:HOH:O	2.05	0.57
1:B:11:VAL:HG21	1:B:51:VAL:HG12	1.87	0.56
1:A:2:ALA:N	1:A:85:TYR:HH	2.02	0.56
1:A:308:LEU:C	1:A:308:LEU:HD23	2.26	0.56
1:C:205:GLN:HE22	1:C:207:LEU:HB2	1.69	0.56
1:B:186:PRO:HD3	3:B:1158:HOH:O	2.06	0.55
1:B:216:LYS:HD2	3:B:1167:HOH:O	2.06	0.55
1:C:231:ASN:OD1	3:C:802:HOH:O	2.18	0.55
1:C:320:THR:HG23	1:C:517:GLN:NE2	2.20	0.54
1:B:51:VAL:HG21	1:B:63:VAL:HG21	1.89	0.54
1:A:44:ARG:HD2	3:A:921:HOH:O	2.07	0.53
1:C:205:GLN:NE2	1:C:209:TYR:HE1	2.07	0.53
1:A:205:GLN:HG2	1:A:206:PRO:HD2	1.89	0.53
1:A:131:GLU:HG2	1:A:537:ILE:HG13	1.90	0.53
1:C:100:LYS:HD2	1:C:106:TYR:OH	2.08	0.53
1:B:253:VAL:HG23	1:C:414:SER:CA	2.24	0.52
1:A:113:VAL:HG21	1:A:572:GLU:HG2	1.91	0.52
1:C:2:ALA:N	1:C:85:TYR:HH	2.07	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:134:LYS:HE2	1:A:136:TRP:O	2.11	0.51
1:A:205:GLN:NE2	1:A:209:TYR:HE1	2.09	0.50
1:B:516:LYS:NZ	3:B:819:HOH:O	2.43	0.50
1:A:6:LEU:HD22	1:A:56:PHE:CD2	2.47	0.50
1:A:125:GLU:HG3	3:A:1066:HOH:O	2.11	0.50
1:B:126:SER:HB3	1:B:559:CYS:HA	1.94	0.50
1:B:344:HIS:CA	1:B:398:LEU:HD11	2.40	0.50
1:B:207:LEU:HD23	1:C:409:LEU:HD21	1.93	0.50
1:B:207:LEU:HD21	1:C:409:LEU:HD21	1.93	0.49
1:B:243:PHE:HA	1:B:249:VAL:CG1	2.42	0.49
1:B:134:LYS:HE2	1:B:136:TRP:O	2.13	0.49
1:A:212:HIS:HD2	1:A:296:THR:CG2	1.99	0.49
1:C:11:VAL:HG21	1:C:51:VAL:HG12	1.95	0.48
1:A:341:LYS:NZ	3:A:814:HOH:O	2.46	0.48
1:B:539:ARG:HD2	3:C:956:HOH:O	2.13	0.48
1:A:245:GLN:O	1:A:249:VAL:HG12	2.14	0.48
1:A:203:MET:HB3	1:B:504:TYR:CD2	2.49	0.48
1:C:51:VAL:CG2	1:C:63:VAL:HG23	2.41	0.47
1:A:384:LEU:O	1:A:389:ARG:HD2	2.14	0.47
1:A:207:LEU:HD23	1:B:409:LEU:HD21	1.93	0.47
1:B:172:MET:HG3	1:B:214:PHE:CZ	2.50	0.47
1:C:222:LYS:HE2	1:C:224:TYR:OH	2.14	0.47
1:C:134:LYS:HE2	1:C:136:TRP:O	2.14	0.47
1:A:320:THR:HG23	1:A:517:GLN:NE2	2.27	0.47
1:B:51:VAL:CG2	1:B:63:VAL:HG23	2.45	0.47
1:A:126:SER:HB3	1:A:559:CYS:HA	1.98	0.46
1:A:212:HIS:HE1	1:A:233:SER:O	1.98	0.46
1:C:163:GLU:CG	1:C:513:VAL:HB	2.44	0.46
1:A:296:THR:HG22	1:A:297:ILE:N	2.21	0.46
1:A:100:LYS:HD2	1:A:106:TYR:CZ	2.51	0.46
1:C:160:VAL:HG11	1:C:517:GLN:CD	2.36	0.46
1:A:273:GLU:OE2	1:A:275:LYS:HE3	2.16	0.45
1:A:537:ILE:HG22	1:A:539:ARG:HB2	1.99	0.45
1:C:96:GLU:HB3	1:C:108:HIS:HB2	1.97	0.45
1:A:114:LEU:HD11	1:A:576:ILE:HG21	1.98	0.45
1:C:529:PHE:HE1	2:C:701:PEG:H41	1.81	0.45
1:A:56:PHE:CD1	1:A:61:PRO:HB3	2.52	0.45
1:C:87:ASN:HB2	3:C:1135:HOH:O	2.17	0.44
1:B:536:LYS:HE2	3:B:1200:HOH:O	2.18	0.44
1:C:309:GLU:OE1	3:C:803:HOH:O	2.21	0.44
1:A:6:LEU:CD2	1:A:56:PHE:HD2	2.31	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:255:MET:HG2	1:A:406:ILE:HG12	1.99	0.43
1:B:549:LYS:HD3	3:B:990:HOH:O	2.17	0.43
1:A:56:PHE:HE1	1:A:61:PRO:HB3	1.80	0.43
1:B:11:VAL:HG21	1:B:51:VAL:HG11	1.99	0.43
1:A:345:MET:HG2	1:A:398:LEU:CD1	2.48	0.43
1:A:6:LEU:CD2	1:A:56:PHE:CD2	3.02	0.43
1:A:6:LEU:HD22	1:A:56:PHE:HD2	1.84	0.42
1:B:246:LYS:HA	1:B:249:VAL:CG2	2.47	0.42
1:C:125:GLU:HG2	3:C:1158:HOH:O	2.19	0.42
1:C:46:TYR:CD1	1:C:67:LEU:HD11	2.53	0.42
1:C:57:ARG:C	1:C:59:ASN:H	2.23	0.42
1:C:163:GLU:HG2	1:C:513:VAL:HB	2.02	0.42
1:A:163:GLU:HG2	1:A:513:VAL:HB	2.02	0.42
1:B:163:GLU:HG2	1:B:513:VAL:HB	2.01	0.42
1:C:126:SER:HB3	1:C:559:CYS:HA	2.00	0.42
1:C:61:PRO:HG2	1:C:109:PHE:O	2.20	0.42
1:C:504:TYR:CE1	1:C:509:ARG:HD3	2.55	0.42
1:A:296:THR:CG2	1:A:297:ILE:H	2.17	0.42
1:A:330:TYR:CG	1:A:331:PRO:HA	2.54	0.41
1:C:40:ASN:OD1	1:C:44:ARG:NH2	2.49	0.41
1:B:537:ILE:HG22	1:B:539:ARG:HB2	2.02	0.41
1:A:205:GLN:NE2	1:A:207:LEU:N	2.60	0.41
1:B:320:THR:HG23	1:B:517:GLN:NE2	2.31	0.41
1:C:134:LYS:HG3	1:C:598:LEU:HD22	2.02	0.41
1:A:326:LYS:HB2	1:A:535:TYR:CZ	2.54	0.41
1:B:320:THR:HG21	1:B:517:GLN:HE22	1.85	0.41
1:A:157:TYR:HB3	1:A:516:LYS:HB3	2.02	0.41
1:B:46:TYR:CE2	1:B:48:MET:HG3	2.56	0.41
1:A:254:ASN:HA	1:A:408:ILE:HD11	2.02	0.41
1:C:157:TYR:HB3	1:C:516:LYS:HB3	2.01	0.41
1:A:205:GLN:NE2	1:A:207:LEU:CB	2.81	0.41
1:B:30:THR:OG1	1:B:34:ASN:ND2	2.53	0.41
1:B:46:TYR:HE2	1:B:48:MET:SD	2.44	0.41
1:B:96:GLU:HB3	1:B:108:HIS:HB2	2.03	0.41
1:C:254:ASN:HA	1:C:408:ILE:HD11	2.03	0.41
1:C:246:LYS:N	1:C:246:LYS:HD3	2.35	0.41
1:B:157:TYR:HB3	1:B:516:LYS:HB3	2.02	0.40
1:B:337:ILE:HG22	1:B:398:LEU:HD22	2.04	0.40
1:C:186:PRO:HD3	3:C:1156:HOH:O	2.22	0.40

All (4) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:1044:HOH:O	3:C:921:HOH:O[2_755]	1.93	0.27
3:A:1214:HOH:O	3:C:1061:HOH:O[7_755]	2.08	0.12
3:A:1179:HOH:O	3:A:1231:HOH:O[3_755]	2.18	0.02
3:A:1214:HOH:O	3:C:839:HOH:O[7_755]	2.18	0.02

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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	507/605 (84%)	495 (98%)	12 (2%)	0	100	100
1	B	512/605 (85%)	499 (98%)	13 (2%)	0	100	100
1	C	512/605 (85%)	500 (98%)	12 (2%)	0	100	100
All	All	1531/1815 (84%)	1494 (98%)	37 (2%)	0	100	100

There are no Ramachandran outliers to report.

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	460/528 (87%)	456 (99%)	4 (1%)	78	79
1	B	464/528 (88%)	463 (100%)	1 (0%)	93	94
1	C	464/528 (88%)	460 (99%)	4 (1%)	78	79
All	All	1388/1584 (88%)	1379 (99%)	9 (1%)	86	87

All (9) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	123	PHE
1	A	172	MET
1	A	365	LEU
1	A	588	ASN
1	B	586	THR
1	C	64	SER
1	C	123	PHE
1	C	586	THR
1	C	588	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (6) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	205	GLN
1	A	212	HIS
1	C	10	ASN
1	C	145	ASN
1	C	205	GLN
1	C	517	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 monosaccharides in this entry.

5.6 Ligand geometry ⓘ

3 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	C	701	-	6,6,6	0.57	0	5,5,5	0.32	0
2	PEG	A	701	-	6,6,6	0.48	0	5,5,5	0.20	0
2	PEG	B	701	-	6,6,6	0.54	0	5,5,5	0.15	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	C	701	-	-	4/4/4/4	-
2	PEG	A	701	-	-	0/4/4/4	-
2	PEG	B	701	-	-	3/4/4/4	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (7) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	C	701	PEG	O1-C1-C2-O2
2	B	701	PEG	O2-C3-C4-O4
2	B	701	PEG	O1-C1-C2-O2
2	C	701	PEG	O2-C3-C4-O4
2	C	701	PEG	C4-C3-O2-C2
2	C	701	PEG	C1-C2-O2-C3
2	B	701	PEG	C1-C2-O2-C3

There are no ring outliers.

1 monomer is involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	C	701	PEG	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	511/605 (84%)	-0.32	7 (1%) 75	78	12, 23, 45, 75	0
1	B	515/605 (85%)	-0.19	13 (2%) 57	61	13, 24, 56, 81	0
1	C	516/605 (85%)	-0.06	25 (4%) 30	33	13, 24, 59, 82	0
All	All	1542/1815 (84%)	-0.19	45 (2%) 51	56	12, 24, 55, 82	0

All (45) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	412	TYR	8.3
1	B	412	TYR	7.5
1	B	57	ARG	5.3
1	C	57	ARG	5.2
1	A	56	PHE	5.0
1	C	189	GLU	4.9
1	C	497	GLY	4.8
1	A	57	ARG	4.2
1	C	56	PHE	4.2
1	C	99	PHE	4.2
1	B	189	GLU	4.0
1	B	411	ASP	3.9
1	B	56	PHE	3.7
1	A	59	ASN	3.6
1	B	413	LEU	3.4
1	C	104	VAL	3.4
1	C	498	GLY	3.4
1	C	414	SER	3.4
1	C	187	GLY	3.2
1	C	100	LYS	3.2
1	C	413	LEU	3.1
1	C	411	ASP	3.1
1	A	187	GLY	3.0

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Mol	Chain	Res	Type	RSRZ
1	C	60	LYS	2.9
1	C	250	ASN	2.8
1	C	59	ASN	2.7
1	B	498	GLY	2.7
1	B	99	PHE	2.7
1	C	102	SER	2.7
1	B	60	LYS	2.7
1	A	138	ASP	2.6
1	B	54[A]	MET	2.6
1	B	497	GLY	2.6
1	B	59	ASN	2.6
1	C	6	LEU	2.5
1	C	46	TYR	2.5
1	C	48	MET	2.4
1	B	58	GLU	2.4
1	A	60	LYS	2.4
1	C	289	ASP	2.4
1	C	103	ALA	2.4
1	A	189	GLU	2.3
1	C	321	LYS	2.2
1	C	106	TYR	2.2
1	C	410	ASN	2.1

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(Å²)	Q<0.9
2	PEG	B	701	7/7	0.53	0.23	45,54,59,64	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	PEG	C	701	7/7	0.63	0.21	48,58,65,65	0
2	PEG	A	701	7/7	0.83	0.14	37,46,57,59	0

6.5　Other polymers ⓘ

There are no such residues in this entry.