



# Full wwPDB X-ray Structure Validation Report ⓘ

Aug 15, 2016 – 01:50 PM EDT

PDB ID : 5B2F  
Title : N,N'-diacetylchitobiose deacetylase from *Pyrococcus horikoshii* complexed with its inhibitor MPG (phosphate-containing condition)  
Authors : Nakamura, T.; Niiyama, M.; Ida, K.; Uegaki, K.  
Deposited on : 2016-01-15  
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](mailto: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.

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

MolProbity : 4.02b-467  
Mogul : 1.7.1 (RC1), CSD as537be (2016)  
Xtriage (Phenix) : 1.9-1692  
EDS : rb-20027939  
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) : rb-20027939

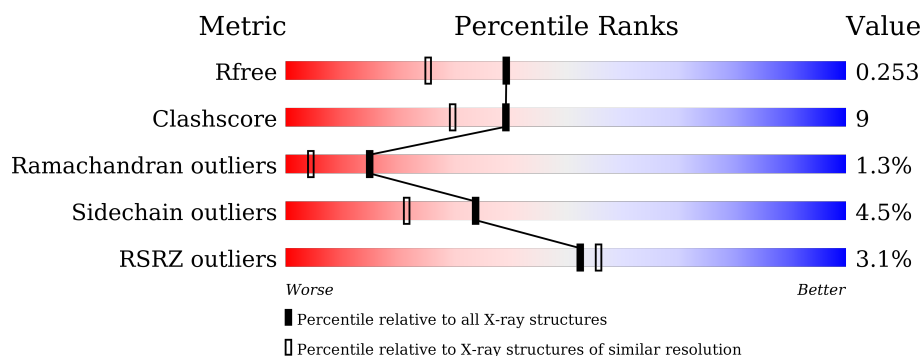
# 1 Overall quality at a glance

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  $\geq 3$ , 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	272	<div> <div>2%</div> <div> <div></div> <div>81%</div> <div>15%</div> <div>...</div> </div> </div>
1	B	272	<div> <div>4%</div> <div> <div></div> <div>78%</div> <div>16%</div> <div>..</div> </div> </div>
1	C	272	<div> <div>3%</div> <div> <div></div> <div>79%</div> <div>16%</div> <div>...</div> </div> </div>

## 2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 6859 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.

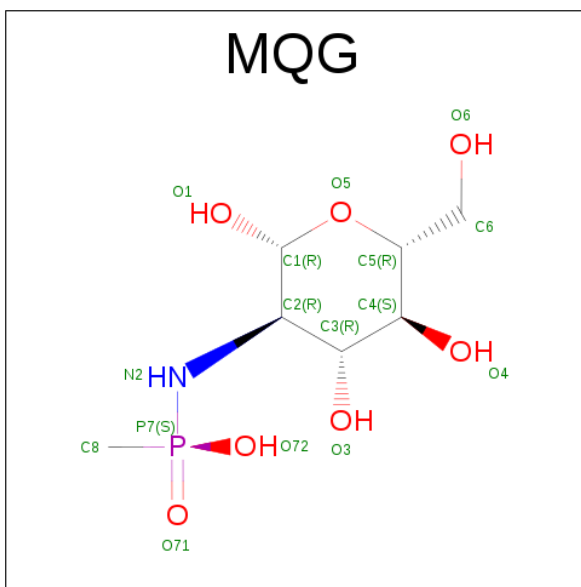
- Molecule 1 is a protein called Putative uncharacterized protein PH0499.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	267	Total	C	N	O	S	0	4	0
			2214	1426	364	414	10			
1	B	265	Total	C	N	O	S	0	4	0
			2194	1412	362	410	10			
1	C	267	Total	C	N	O	S	0	4	0
			2214	1426	364	414	10			

- Molecule 2 is ZINC ION (three-letter code: ZN) (formula: Zn).

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

- Molecule 3 is {N}-[(2 {R},3 {R},4 {R},5 {S},6 {R})-6-(hydroxymethyl)-2,4,5-tris(oxidanyl)oxan-3-yl]-methyl-phosphonamidic acid (three-letter code: MQG) (formula: C<sub>7</sub>H<sub>16</sub>NO<sub>7</sub>P).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total	C	N	O	P	0	0
			16	7	1	7	1		
3	B	1	Total	C	N	O	P	0	0
			16	7	1	7	1		
3	C	1	Total	C	N	O	P	0	0
			16	7	1	7	1		

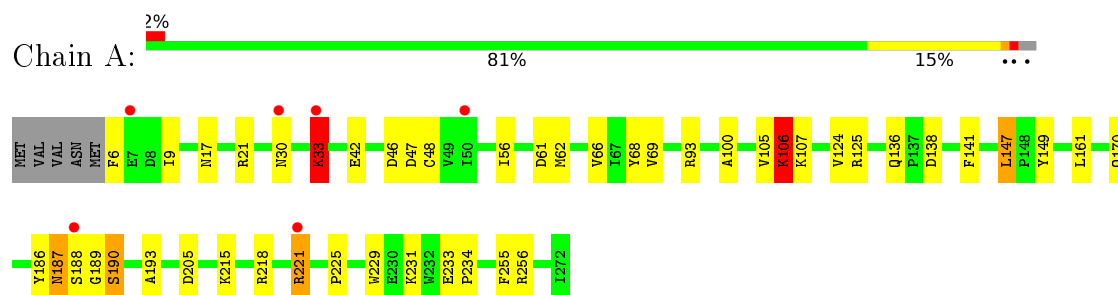
- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	84	Total	O	0	0
			84	84		
4	B	40	Total	O	0	0
			40	40		
4	C	62	Total	O	0	0
			62	62		

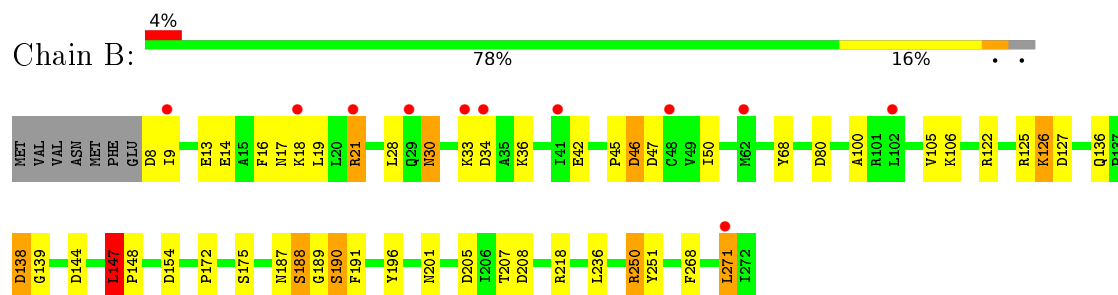
### 3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of errors 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.

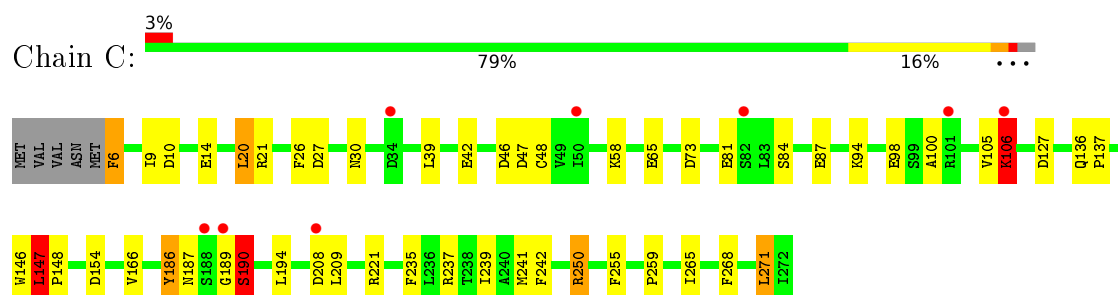
#### • Molecule 1: Putative uncharacterized protein PH0499



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## 4 Data and refinement statistics

Property	Value	Source
Space group	P 32 2 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	77.82Å 77.82Å 229.23Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	29.46 – 1.90 29.45 – 1.90	Depositor EDS
% Data completeness (in resolution range)	94.6 (29.46-1.90) 94.7 (29.45-1.90)	Depositor EDS
$R_{merge}$	0.06	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	4.63 (at 1.91Å)	Xtriage
Refinement program	REFMAC 5.5.0109	Depositor
R, $R_{free}$	0.218 , 0.270 0.203 , 0.253	Depositor DCC
$R_{free}$ test set	3087 reflections (5.34%)	DCC
Wilson B-factor (Å <sup>2</sup> )	28.1	Xtriage
Anisotropy	0.215	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.39 , 45.9	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.50$ , $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	0.027 for -h,-k,l	Xtriage
$F_o, F_c$ correlation	0.95	EDS
Total number of atoms	6859	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	35.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.85% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical values of  $\langle |L| \rangle$ ,  $\langle L^2 \rangle$  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: ZN, MQG

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	1.16	3/2273 (0.1%)	1.01	8/3076 (0.3%)
1	B	1.01	0/2252	0.96	8/3048 (0.3%)
1	C	1.04	0/2273	0.95	5/3076 (0.2%)
All	All	1.07	3/6798 (0.0%)	0.97	21/9200 (0.2%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	1
1	C	0	2
All	All	0	3

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	255	PHE	CE2-CZ	6.34	1.49	1.37
1	A	69	VAL	CB-CG2	6.19	1.65	1.52
1	A	125	ARG	CG-CD	5.11	1.64	1.51

All (21) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	144	ASP	CB-CG-OD2	7.40	124.96	118.30
1	A	205	ASP	CB-CG-OD1	7.22	124.80	118.30
1	B	127	ASP	CB-CG-OD1	7.13	124.72	118.30
1	A	147	LEU	CB-CG-CD2	7.13	123.12	111.00
1	A	215	LYS	CD-CE-NZ	-6.85	95.95	111.70

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	127	ASP	CB-CG-OD1	6.78	124.40	118.30
1	B	147	LEU	CA-CB-CG	6.69	130.69	115.30
1	A	61	ASP	CB-CG-OD2	-6.44	112.51	118.30
1	C	21	ARG	NE-CZ-NH2	6.36	123.48	120.30
1	B	205	ASP	CB-CG-OD1	6.21	123.89	118.30
1	A	256	ARG	NE-CZ-NH2	-5.99	117.31	120.30
1	C	154	ASP	CB-CG-OD2	5.71	123.44	118.30
1	A	61	ASP	CB-CG-OD1	5.57	123.31	118.30
1	B	125	ARG	NE-CZ-NH2	-5.51	117.55	120.30
1	B	138	ASP	CB-CG-OD2	-5.45	113.40	118.30
1	B	126	LYS	CD-CE-NZ	-5.21	99.71	111.70
1	C	73	ASP	CB-CG-OD1	5.21	122.98	118.30
1	B	154	ASP	CB-CG-OD2	5.17	122.95	118.30
1	A	147	LEU	CA-CB-CG	5.16	127.17	115.30
1	A	205	ASP	CB-CG-OD2	-5.13	113.69	118.30
1	C	147	LEU	CB-CG-CD2	5.01	119.53	111.00

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	187[A]	ASN	Peptide
1	C	106	LYS	Peptide
1	C	186	TYR	Peptide

## 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	2214	0	2162	35	0
1	B	2194	0	2147	52	1
1	C	2214	0	2162	33	0
2	A	1	0	0	0	0
2	B	1	0	0	0	0
2	C	1	0	0	0	0
3	A	16	0	0	0	0
3	B	16	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	C	16	0	0	0	0
4	A	84	0	0	1	0
4	B	40	0	0	0	0
4	C	62	0	0	2	0
All	All	6859	0	6471	117	1

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 9.

All (117) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:187[A]:ASN:CB	1:B:188[A]:SER:HB2	1.22	1.58
1:B:187[A]:ASN:HB2	1:B:188[A]:SER:CB	1.37	1.54
1:A:105:VAL:HA	1:A:106:LYS:HB2	1.19	1.16
1:C:189[B]:GLY:O	1:C:190[B]:SER:HB2	1.43	1.14
1:B:187[A]:ASN:CA	1:B:188[A]:SER:HB2	1.85	1.06
1:B:187[A]:ASN:CB	1:B:188[A]:SER:CB	2.11	1.03
1:C:187[A]:ASN:O	1:C:189[A]:GLY:N	1.92	1.02
1:B:100:ALA:HB1	1:B:105:VAL:HB	1.40	0.99
1:B:189[B]:GLY:O	1:B:190[B]:SER:CB	2.07	0.97
1:C:65:GLU:HG3	1:C:106:LYS:HG2	1.47	0.97
1:B:187[A]:ASN:CA	1:B:188[A]:SER:CB	2.43	0.95
1:C:189[B]:GLY:O	1:C:190[B]:SER:CB	2.21	0.87
1:A:9:ILE:H	1:A:9:ILE:HD12	1.38	0.85
1:A:105:VAL:CA	1:A:106:LYS:HB2	2.04	0.85
1:B:189[B]:GLY:O	1:B:190[B]:SER:HB2	1.75	0.84
1:A:17:ASN:OD1	1:A:21:ARG:NH1	2.11	0.83
1:A:136:GLN:HE22	1:A:187[A]:ASN:H	1.31	0.79
1:A:105:VAL:HA	1:A:106:LYS:CB	2.09	0.77
1:B:187[A]:ASN:CB	1:B:188[A]:SER:CA	2.64	0.76
1:C:136:GLN:HE22	1:C:187[B]:ASN:H	1.32	0.76
1:B:189[B]:GLY:O	1:B:190[B]:SER:HB3	1.87	0.74
1:C:250:ARG:HG2	1:C:250:ARG:HH21	1.53	0.73
1:A:9:ILE:O	1:B:250:ARG:NH1	2.24	0.71
1:B:187[B]:ASN:HB2	1:B:188[B]:SER:HB3	1.73	0.69
1:C:136:GLN:HE22	1:C:187[A]:ASN:H	1.39	0.67
1:C:20:LEU:HD22	1:C:26:PHE:HB3	1.76	0.67
1:B:136:GLN:HE22	1:B:187[B]:ASN:H	1.43	0.67
1:A:136:GLN:HE22	1:A:187[B]:ASN:H	1.42	0.66
1:B:187[A]:ASN:N	1:B:188[A]:SER:CB	2.59	0.65

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:268:PHE:HB2	1:C:271:LEU:HD22	1.78	0.65
1:C:30:ASN:ND2	4:C:402:HOH:O	2.29	0.65
1:A:100:ALA:HB1	1:A:105:VAL:HB	1.80	0.64
1:B:268:PHE:HB2	1:B:271:LEU:HD22	1.79	0.64
1:B:187[A]:ASN:HB2	1:B:188[A]:SER:CA	2.25	0.64
1:B:187[A]:ASN:H	1:B:188[A]:SER:HB3	1.62	0.63
1:C:39:LEU:HG	1:C:137:PRO:HG3	1.81	0.63
1:A:106:LYS:HD3	1:A:106:LYS:C	2.19	0.62
1:B:187[A]:ASN:N	1:B:188[A]:SER:HB3	2.15	0.62
1:C:147:LEU:HD22	1:C:148:PRO:HD2	1.82	0.61
1:B:187[A]:ASN:H	1:B:188[A]:SER:CB	2.12	0.61
1:C:106:LYS:HA	1:C:106:LYS:HE3	1.81	0.61
1:A:42:GLU:HB2	1:A:47:ASP:HB2	1.83	0.59
1:B:187[B]:ASN:C	1:B:187[B]:ASN:HD22	2.06	0.59
1:A:189[B]:GLY:O	1:A:190[B]:SER:O	2.21	0.59
1:B:187[A]:ASN:N	1:B:188[A]:SER:HB2	2.19	0.58
1:B:138:ASP:O	1:B:190[A]:SER:N	2.31	0.57
1:C:42:GLU:HB3	1:C:48:CYS:SG	2.44	0.57
1:B:50:ILE:HG23	1:B:236:LEU:HD21	1.85	0.57
1:B:187[B]:ASN:CB	1:B:188[B]:SER:HB3	2.37	0.55
1:B:187[B]:ASN:HA	1:B:188[B]:SER:CB	2.37	0.55
1:C:10:ASP:HB2	1:C:14:GLU:OE1	2.06	0.55
1:B:122:ARG:HG2	1:B:126:LYS:HE3	1.90	0.53
1:B:187[B]:ASN:ND2	1:B:187[B]:ASN:O	2.31	0.53
1:B:187[A]:ASN:HB2	1:B:188[A]:SER:HB2	0.55	0.52
1:B:139:GLY:HA3	1:B:191:PHE:CZ	2.45	0.52
1:A:136:GLN:HE22	1:A:187[A]:ASN:N	2.04	0.52
1:C:84:SER:OG	1:C:87:GLU:HG3	2.09	0.52
1:C:187[A]:ASN:C	1:C:189[A]:GLY:N	2.62	0.51
1:A:233:GLU:HB3	1:A:234:PRO:HD3	1.92	0.51
1:B:16:PHE:O	1:B:19:LEU:HB3	2.11	0.51
1:B:13:GLU:CD	1:B:13:GLU:H	2.13	0.50
1:C:250:ARG:NH2	1:C:250:ARG:HG2	2.25	0.50
1:A:66:VAL:O	1:A:106:LYS:HG3	2.12	0.50
1:B:68:TYR:CE1	1:B:105:VAL:HG21	2.48	0.48
1:B:30:ASN:HB3	1:B:33:LYS:HB2	1.95	0.48
1:C:100:ALA:HB1	1:C:105:VAL:HB	1.94	0.48
1:C:42:GLU:HB2	1:C:47:ASP:HB2	1.95	0.48
1:A:136:GLN:NE2	1:A:187[B]:ASN:H	2.11	0.48
1:A:33:LYS:HA	1:A:33:LYS:HE3	1.94	0.48
1:A:9:ILE:H	1:A:9:ILE:CD1	2.18	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:136:GLN:NE2	1:A:187[A]:ASN:H	2.04	0.47
1:B:139:GLY:HA3	1:B:191:PHE:CE1	2.49	0.47
1:B:136:GLN:HE22	1:B:187[A]:ASN:H	1.62	0.47
1:C:26:PHE:CD1	1:C:259:PRO:HD3	2.51	0.46
1:A:42:GLU:HB3	1:A:48:CYS:SG	2.56	0.46
1:B:187[B]:ASN:CA	1:B:188[B]:SER:CB	2.93	0.46
1:C:6:PHE:O	1:C:9:ILE:HG12	2.16	0.46
1:B:147:LEU:HG	1:B:196:TYR:O	2.15	0.46
1:A:124:VAL:HG11	1:A:161:LEU:HD13	1.97	0.45
1:A:136:GLN:HB3	1:A:188[A]:SER:OG	2.16	0.45
1:C:6:PHE:HA	1:C:9:ILE:HG12	1.97	0.45
1:B:9:ILE:HG12	1:B:14:GLU:HB3	1.99	0.45
1:B:42:GLU:HB2	1:B:47:ASP:HB2	1.97	0.45
1:B:17:ASN:O	1:B:21:ARG:HB2	2.17	0.45
1:A:141:PHE:CD2	1:A:193:ALA:HB3	2.51	0.45
1:A:9:ILE:N	1:A:9:ILE:HD12	2.19	0.45
1:C:190[B]:SER:HB2	4:C:401:HOH:O	2.16	0.44
1:A:48:CYS:HB3	1:A:56:ILE:HD11	2.00	0.44
1:B:136:GLN:HE21	1:B:136:GLN:HB3	1.51	0.44
1:C:166:VAL:HG13	1:C:186:TYR:HE2	1.83	0.44
1:A:68:TYR:CE1	1:A:105:VAL:HG21	2.53	0.44
1:C:237:ARG:O	1:C:241:MET:HG3	2.18	0.43
1:B:187[B]:ASN:CA	1:B:188[B]:SER:HB3	2.48	0.43
1:C:58:LYS:HG3	1:C:209:LEU:HD11	2.01	0.43
1:C:235:PHE:CZ	1:C:239:ILE:HD11	2.54	0.43
1:B:147:LEU:HD22	1:B:148:PRO:HD2	2.00	0.42
1:A:170:GLN:HG2	1:A:186:TYR:O	2.19	0.42
1:A:221:ARG:HH21	1:A:225:PRO:HA	1.84	0.42
1:C:136:GLN:NE2	1:C:187[B]:ASN:H	2.09	0.42
1:A:218:ARG:HD2	1:A:229:TRP:CE2	2.55	0.42
1:A:188[B]:SER:HB3	4:A:415:HOH:O	2.19	0.42
1:B:187[B]:ASN:HA	1:B:188[B]:SER:HB2	2.01	0.41
1:B:187[A]:ASN:HB3	1:B:188[A]:SER:CA	2.48	0.41
1:C:194:LEU:O	1:C:255:PHE:HA	2.19	0.41
1:B:45:PRO:O	1:B:46:ASP:CG	2.59	0.41
1:B:36:LYS:HD3	1:B:36:LYS:HA	1.64	0.41
1:B:172:PRO:HB3	1:C:81:GLU:HG2	2.02	0.41
1:B:50:ILE:HG23	1:B:236:LEU:CD2	2.49	0.41
1:A:106:LYS:HD3	1:A:107:LYS:N	2.35	0.41
1:B:126:LYS:HG2	1:B:175:SER:HB2	2.03	0.41
1:C:239:ILE:O	1:C:242:PHE:HB3	2.21	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:138:ASP:HA	1:A:189[A]:GLY:HA2	2.03	0.41
1:A:149:TYR:HA	1:C:146:TRP:CZ2	2.56	0.41
1:B:207:THR:HA	1:B:251:TYR:HB2	2.02	0.41
1:A:218:ARG:HG3	1:A:229:TRP:CZ2	2.56	0.40
1:A:105:VAL:CA	1:A:106:LYS:CB	2.81	0.40
1:B:28:LEU:HD13	1:B:201:ASN:O	2.20	0.40

All (1) 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)
1:B:36:LYS:NZ	1:B:80:ASP:OD2[4_545]	2.12	0.08

## 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	269/272 (99%)	260 (97%)	4 (2%)	5 (2%)	10	2
1	B	267/272 (98%)	252 (94%)	10 (4%)	5 (2%)	10	2
1	C	269/272 (99%)	259 (96%)	6 (2%)	4 (2%)	13	3
All	All	805/816 (99%)	771 (96%)	20 (2%)	14 (2%)	15	2

All (14) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	106	LYS
1	A	190[A]	SER
1	A	190[B]	SER
1	B	188[A]	SER
1	B	188[B]	SER
1	B	190[A]	SER

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Mol	Chain	Res	Type
1	B	190[B]	SER
1	C	46	ASP
1	A	46	ASP
1	A	33	LYS
1	B	46	ASP
1	C	190[A]	SER
1	C	190[B]	SER
1	C	265	ILE

### 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	242/244 (99%)	233 (96%)	9 (4%)	41	29
1	B	240/244 (98%)	229 (95%)	11 (5%)	33	21
1	C	242/244 (99%)	229 (95%)	13 (5%)	27	15
All	All	724/732 (99%)	691 (95%)	33 (5%)	34	21

All (33) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	6	PHE
1	A	30	ASN
1	A	33	LYS
1	A	62	MET
1	A	93	ARG
1	A	106	LYS
1	A	147	LEU
1	A	221	ARG
1	A	231	LYS
1	B	8	ASP
1	B	18	LYS
1	B	21	ARG
1	B	30	ASN
1	B	34	ASP

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Mol	Chain	Res	Type
1	B	106	LYS
1	B	147	LEU
1	B	208	ASP
1	B	218	ARG
1	B	250	ARG
1	B	271	LEU
1	C	6	PHE
1	C	20	LEU
1	C	27	ASP
1	C	94	LYS
1	C	98	GLU
1	C	106	LYS
1	C	147	LEU
1	C	190[A]	SER
1	C	190[B]	SER
1	C	208	ASP
1	C	221	ARG
1	C	250	ARG
1	C	271	LEU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	30	ASN
1	A	136	GLN
1	B	136	GLN
1	C	136	GLN

### 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 carbohydrates in this entry.

## 5.6 Ligand geometry

Of 6 ligands modelled in this entry, 3 are monoatomic - leaving 3 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	MQG	A	302	2	14,16,16	1.62	5 (35%)	14,24,24	1.57	2 (14%)
3	MQG	B	302	2	14,16,16	0.62	0	14,24,24	1.93	4 (28%)
3	MQG	C	302	2	14,16,16	1.01	1 (7%)	14,24,24	1.29	2 (14%)

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	MQG	A	302	2	-	0/2/27/27	0/1/1/1
3	MQG	B	302	2	-	0/2/27/27	0/1/1/1
3	MQG	C	302	2	-	0/2/27/27	0/1/1/1

All (6) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	302	MQG	O5-C1	-2.61	1.38	1.43
3	A	302	MQG	C2-N2	-2.47	1.45	1.48
3	C	302	MQG	C2-N2	-2.36	1.45	1.48
3	A	302	MQG	C4-C5	2.04	1.57	1.53
3	A	302	MQG	P7-O71	2.34	1.53	1.47
3	A	302	MQG	C1-C2	2.60	1.56	1.53

All (8) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	302	MQG	C1-O5-C5	-4.12	105.66	113.54
3	A	302	MQG	O1-C1-O5	-3.21	101.37	110.33
3	C	302	MQG	O1-C1-O5	-2.87	102.32	110.33

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	302	MQG	C4-C3-C2	-2.39	106.75	110.37
3	A	302	MQG	C1-O5-C5	-2.30	109.14	113.54
3	C	302	MQG	O3-C3-C2	-2.11	105.20	109.57
3	B	302	MQG	O72-P7-C8	2.03	115.77	107.45
3	B	302	MQG	C3-C2-N2	3.81	118.55	110.70

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.



## 6 Fit of model and data ⓘ

### 6.1 Protein, DNA and RNA chains ⓘ

In the following table, the column labelled ‘#RSRZ> 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	267/272 (98%)	-0.09	6 (2%) 65 68	22, 30, 48, 66	0
1	B	265/272 (97%)	0.07	11 (4%) 40 44	23, 36, 55, 63	0
1	C	267/272 (98%)	-0.03	8 (2%) 54 57	25, 35, 50, 55	0
All	All	799/816 (97%)	-0.02	25 (3%) 52 56	22, 34, 52, 66	0

All (25) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	33	LYS	4.7
1	A	33	LYS	4.4
1	C	34	ASP	3.9
1	B	9	ILE	3.7
1	C	188[A]	SER	3.2
1	A	50	ILE	2.9
1	B	21	ARG	2.8
1	B	271	LEU	2.7
1	B	62	MET	2.7
1	A	7	GLU	2.4
1	B	41	ILE	2.4
1	A	30	ASN	2.4
1	B	29	GLN	2.3
1	C	101	ARG	2.3
1	A	188[A]	SER	2.2
1	C	82	SER	2.2
1	C	208	ASP	2.2
1	B	18	LYS	2.1
1	B	102	LEU	2.1
1	A	221	ARG	2.1
1	C	106	LYS	2.1
1	B	34	ASP	2.1
1	B	48	CYS	2.1

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Mol	Chain	Res	Type	RSRZ
1	C	189[A]	GLY	2.1
1	C	50	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, 95<sup>th</sup> 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( $\text{\AA}^2$ )	Q<0.9
3	MQG	B	302	16/16	0.96	0.13	0.78	24,29,35,35	0
3	MQG	A	302	16/16	0.98	0.14	0.63	24,27,34,36	0
3	MQG	C	302	16/16	0.97	0.12	0.22	26,32,36,37	0
2	ZN	A	301	1/1	0.99	0.09	-1.36	26,26,26,26	0
2	ZN	B	301	1/1	1.00	0.09	-1.40	28,28,28,28	0
2	ZN	C	301	1/1	1.00	0.08	-1.82	32,32,32,32	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.