



Full wwPDB X-ray Structure Validation Report ⓘ

Feb 1, 2016 – 02:09 PM GMT

PDB ID : 3W6X
Title : Yeast N-acetyltransferase Mpr1 in complex with CHOP
Authors : Nasuno, R.; Hirano, Y.; Itoh, T.; Hakoshima, T.; Hibi, T.; Takagi, H.
Deposited on : 2013-02-25
Resolution : 2.30 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

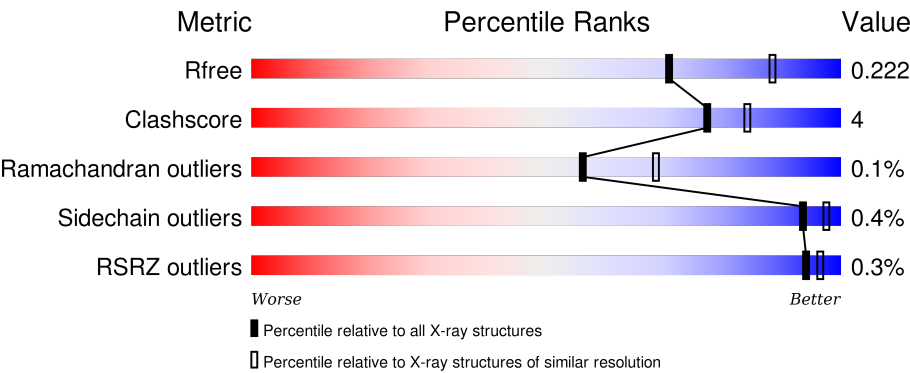
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.30 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	3852 (2.30-2.30)
Clashscore	102246	4452 (2.30-2.30)
Ramachandran outliers	100387	4410 (2.30-2.30)
Sidechain outliers	100360	4409 (2.30-2.30)
RSRZ outliers	91569	3857 (2.30-2.30)

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	229	<div><div></div><div>90%9%</div></div>
1	B	229	<div><div></div><div>91%7%</div></div>
1	C	229	<div><div></div><div>86%12%</div></div>
1	D	229	<div><div></div><div>%83%14%</div></div>
1	E	229	<div><div></div><div>93%5%</div></div>

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Mol	Chain	Length	Quality of chain
1	F	229	 88% 10%
1	G	229	 92% 7%
1	H	229	 91% 7%
1	I	229	 87% 11%
1	J	229	 93% 6%
1	K	229	 87% 10%
1	L	229	 90% 9%

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
2	HZP	A	301	-	-	-	X
2	HZP	B	301	-	-	-	X
2	HZP	C	301	-	-	-	X
2	HZP	F	301	-	-	-	X
3	P6G	A	302	-	-	-	X
3	P6G	B	302	-	-	-	X
3	P6G	C	302	-	-	-	X
3	P6G	D	301	-	-	-	X
3	P6G	E	301	-	-	-	X
3	P6G	F	302	-	-	-	X
3	P6G	G	301	-	-	-	X
3	P6G	H	301	-	-	-	X
3	P6G	I	301	-	-	-	X
3	P6G	J	301	-	-	-	X
3	P6G	K	301	-	-	-	X
3	P6G	L	301	-	-	-	X

2 Entry composition

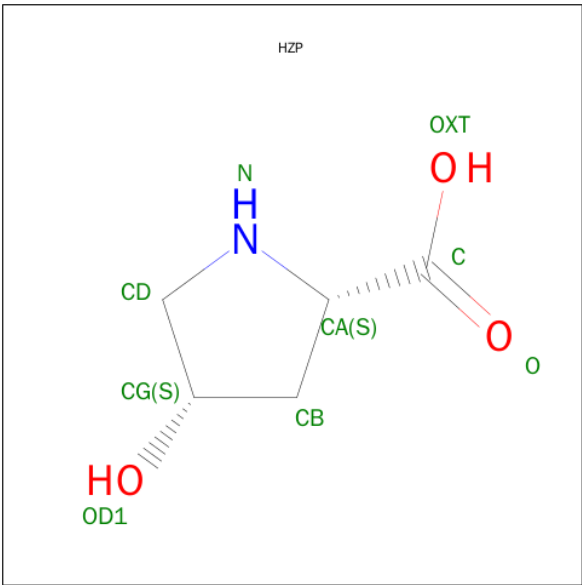
There are 5 unique types of molecules in this entry. The entry contains 22584 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 MPR1 protein.

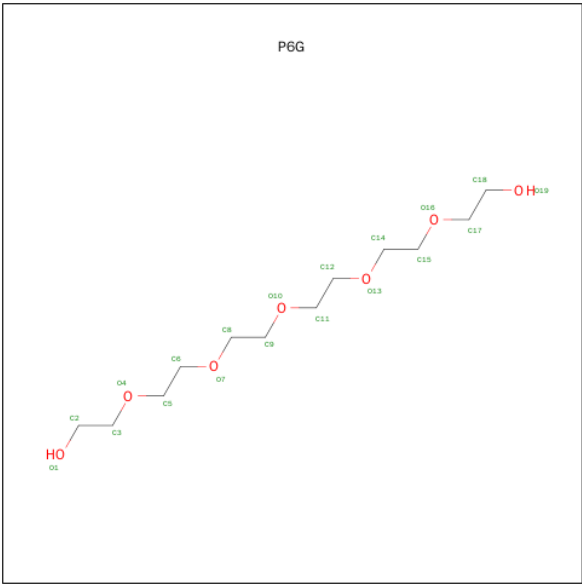
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	225	Total	C	N	O	S	0	0	0
			1805	1195	289	318	3			
1	B	225	Total	C	N	O	S	0	0	0
			1819	1200	295	321	3			
1	C	225	Total	C	N	O	S	0	0	0
			1797	1190	290	314	3			
1	D	224	Total	C	N	O	S	0	0	0
			1797	1188	291	315	3			
1	E	225	Total	C	N	O	S	0	0	0
			1821	1201	293	324	3			
1	F	224	Total	C	N	O	S	0	0	0
			1808	1197	290	318	3			
1	G	225	Total	C	N	O	S	0	1	0
			1821	1202	293	323	3			
1	H	225	Total	C	N	O	S	0	0	0
			1823	1203	297	320	3			
1	I	225	Total	C	N	O	S	0	1	0
			1829	1205	297	324	3			
1	J	225	Total	C	N	O	S	0	0	0
			1823	1202	294	324	3			
1	K	224	Total	C	N	O	S	0	0	0
			1815	1198	292	322	3			
1	L	225	Total	C	N	O	S	0	0	0
			1821	1201	295	322	3			

- Molecule 2 is (4S)-4-HYDROXY-L-PROLINE (three-letter code: HZP) (formula: C₅H₉NO₃).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total	C	N	O	0	0
			9	5	1	3		
2	B	1	Total	C	N	O	0	0
			9	5	1	3		
2	C	1	Total	C	N	O	0	0
			9	5	1	3		
2	F	1	Total	C	N	O	0	0
			8	4	1	3		

- Molecule 3 is HEXAETHYLENE GLYCOL (three-letter code: P6G) (formula: C₁₂H₂₆O₇).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total C O 11 8 3	0	0
3	B	1	Total C O 11 7 4	0	0
3	C	1	Total C O 14 10 4	0	0
3	D	1	Total C O 14 10 4	0	0
3	E	1	Total C O 15 10 5	0	0
3	F	1	Total C O 14 10 4	0	0
3	G	1	Total C O 13 8 5	0	0
3	H	1	Total C O 15 10 5	0	0
3	I	1	Total C O 14 10 4	0	0
3	J	1	Total C O 14 10 4	0	0
3	K	1	Total C O 14 10 4	0	0
3	L	1	Total C O 15 10 5	0	0

- Molecule 4 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	H	1	Total Cl 1 1	0	0
4	G	1	Total Cl 1 1	0	0
4	D	1	Total Cl 1 1	0	0
4	E	1	Total Cl 1 1	0	0

- Molecule 5 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	64	Total O 64 64	0	0
5	B	76	Total O 76 76	0	0

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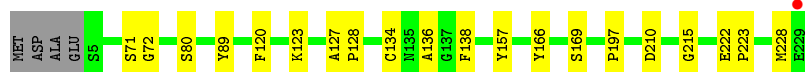
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	C	52	Total 52	O 52	0	0
5	D	47	Total 47	O 47	0	0
5	E	56	Total 56	O 56	0	0
5	F	53	Total 53	O 53	0	0
5	G	72	Total 72	O 72	0	0
5	H	38	Total 38	O 38	0	0
5	I	49	Total 49	O 49	0	0
5	J	38	Total 38	O 38	0	0
5	K	31	Total 31	O 31	0	0
5	L	26	Total 26	O 26	0	0

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.

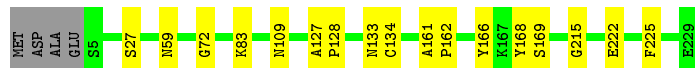
- Molecule 1: MPR1 protein

Chain A: 




- Molecule 1: MPR1 protein

Chain B: 




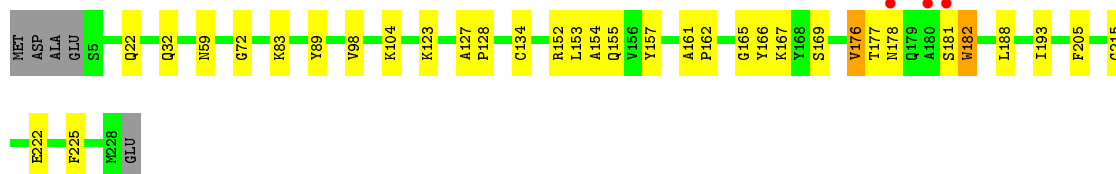
- Molecule 1: MPR1 protein

Chain C: 



- Molecule 1: MPR1 protein

Chain D: 




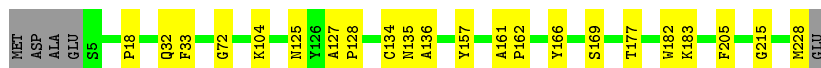
- Molecule 1: MPR1 protein

Chain E: 



- Molecule 1: MPR1 protein

Chain F:  88% 10%



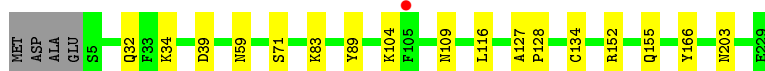
- Molecule 1: MPR1 protein

Chain G:  92% 7%




- Molecule 1: MPR1 protein

Chain H:  91% 7%



- Molecule 1: MPR1 protein

Chain I:  87% 11%




- Molecule 1: MPR1 protein

Chain J:  93% 6%




- Molecule 1: MPR1 protein

Chain K:  87% 10%



- Molecule 1: MPR1 protein

Chain L:  90% 9%



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	80.34Å 229.34Å 84.75Å 90.00° 90.94° 90.00°	Depositor
Resolution (Å)	56.95 – 2.30 58.78 – 2.30	Depositor EDS
% Data completeness (in resolution range)	98.9 (56.95-2.30) 94.9 (58.78-2.30)	Depositor EDS
R_{merge}	0.10	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.92 (at 2.29Å)	Xtriage
Refinement program	PHENIX (phenix.refine: 1.8.1_1168)	Depositor
R, R_{free}	0.166 , 0.214 0.180 , 0.222	Depositor DCC
R_{free} test set	6746 reflections (5.52%)	DCC
Wilson B-factor (Å ²)	25.2	Xtriage
Anisotropy	0.592	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.34 , 40.3	EDS
Estimated twinning fraction	0.039 for h,-k,-l	Xtriage
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtriage
Outliers	0 of 134134 reflections	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	22584	wwPDB-VP
Average B, all atoms (Å ²)	38.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.70% 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: HZP, P6G, CL

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	0.71	0/1862	0.70	0/2540
1	B	0.71	0/1876	0.70	0/2555
1	C	0.68	0/1854	0.68	0/2530
1	D	0.72	0/1854	0.69	0/2530
1	E	0.72	0/1878	0.71	1/2558 (0.0%)
1	F	0.72	0/1865	0.68	0/2541
1	G	0.72	0/1878	0.69	0/2561
1	H	0.68	0/1880	0.67	0/2561
1	I	0.66	0/1886	0.65	0/2569
1	J	0.72	0/1880	0.67	0/2560
1	K	0.70	0/1872	0.68	0/2551
1	L	0.69	0/1878	0.68	0/2560
All	All	0.70	0/22463	0.68	1/30616 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	E	210	ASP	CB-CG-OD1	5.00	122.81	118.30

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	1805	0	1752	13	0
1	B	1819	0	1779	9	0
1	C	1797	0	1747	15	0
1	D	1797	0	1738	25	0
1	E	1821	0	1778	8	0
1	F	1808	0	1770	14	0
1	G	1821	0	1770	8	0
1	H	1823	0	1792	14	0
1	I	1829	0	1783	19	0
1	J	1823	0	1785	9	0
1	K	1815	0	1776	16	0
1	L	1821	0	1778	13	0
2	A	9	0	8	0	0
2	B	9	0	9	0	0
2	C	9	0	9	2	0
2	F	8	0	4	0	0
3	A	11	0	12	3	0
3	B	11	0	13	0	0
3	C	14	0	16	0	0
3	D	14	0	16	2	0
3	E	15	0	19	2	0
3	F	14	0	16	0	0
3	G	13	0	17	0	0
3	H	15	0	19	3	0
3	I	14	0	16	3	0
3	J	14	0	16	0	0
3	K	14	0	16	1	0
3	L	15	0	19	0	0
4	D	1	0	0	0	0
4	E	1	0	0	0	0
4	G	1	0	0	0	0
4	H	1	0	0	0	0
5	A	64	0	0	2	0
5	B	76	0	0	1	0
5	C	52	0	0	1	0
5	D	47	0	0	2	0
5	E	56	0	0	1	0
5	F	53	0	0	1	0
5	G	72	0	0	0	0
5	H	38	0	0	1	0
5	I	49	0	0	0	0
5	J	38	0	0	1	0
5	K	31	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
5	L	26	0	0	1	0
All	All	22584	0	21473	162	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 4.

All (162) 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:123:LYS:HE2	3:A:302:P6G:H52	1.63	0.80
1:I:103:GLU:HG3	1:I:107:GLN:NE2	2.00	0.76
1:D:134:CYS:HB3	1:D:166:TYR:CD1	2.24	0.72
1:F:134:CYS:HB3	1:F:166:TYR:CD1	2.29	0.68
1:E:134:CYS:HB3	1:E:166:TYR:CD1	2.30	0.66
1:J:59:ASN:OD1	1:J:83:LYS:HE3	1.96	0.65
1:B:59:ASN:OD1	1:B:83:LYS:HE3	1.97	0.64
1:J:134:CYS:HB3	1:J:166:TYR:CD1	2.34	0.62
1:D:176:VAL:HG23	1:D:177:THR:H	1.65	0.62
1:J:134:CYS:HB3	1:J:166:TYR:CG	2.34	0.62
1:A:123:LYS:CE	3:A:302:P6G:H52	2.31	0.61
1:D:134:CYS:HB3	1:D:166:TYR:CG	2.36	0.60
1:D:181:SER:O	1:D:182:TRP:HB3	2.01	0.60
1:D:32:GLN:NE2	1:D:104:LYS:HD3	2.16	0.60
1:I:89:TYR:CE1	3:I:301:P6G:H61	2.37	0.60
1:D:177:THR:CB	1:D:205:PHE:CE2	2.87	0.57
1:G:59:ASN:OD1	1:G:83:LYS:HE3	2.04	0.57
1:D:127:ALA:HB1	1:D:128:PRO:HD2	1.86	0.57
1:H:127:ALA:HB1	1:H:128:PRO:HD2	1.86	0.56
1:L:134:CYS:HB3	1:L:166:TYR:CD1	2.40	0.55
1:I:134:CYS:HB3	1:I:166:TYR:CD1	2.40	0.55
1:H:89:TYR:CD2	3:H:301:P6G:H61	2.42	0.55
1:I:141:ASN:OD1	1:I:142:GLY:N	2.39	0.55
1:H:134:CYS:HB3	1:H:166:TYR:CD1	2.42	0.55
1:K:182:TRP:CH2	1:K:183:LYS:HE3	2.42	0.54
1:F:134:CYS:HB3	1:F:166:TYR:CG	2.43	0.54
1:K:169:SER:O	1:K:215:GLY:HA2	2.08	0.54
1:D:165:GLY:O	1:D:167:LYS:HE2	2.08	0.53
1:A:71:SER:HB2	5:A:451:HOH:O	2.07	0.53
1:B:127:ALA:HB1	1:B:128:PRO:HD2	1.90	0.53
1:C:116:LEU:HD13	1:C:116:LEU:C	2.29	0.53
1:D:154:ALA:O	1:D:157:TYR:HB3	2.08	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:134:CYS:HB3	1:B:166:TYR:CG	2.44	0.53
1:H:134:CYS:HB3	1:H:166:TYR:CG	2.44	0.53
1:I:103:GLU:HG3	1:I:107:GLN:HE21	1.72	0.53
1:C:127:ALA:HB1	1:C:128:PRO:HD2	1.90	0.53
1:I:162:PRO:HG3	1:I:218:LEU:HB3	1.90	0.53
1:C:18:PRO:HD3	1:C:166:TYR:CZ	2.44	0.52
1:A:127:ALA:HB1	1:A:128:PRO:CD	2.40	0.52
1:L:59:ASN:OD1	1:L:83:LYS:HE3	2.09	0.52
1:B:134:CYS:HB3	1:B:166:TYR:CD1	2.44	0.52
1:G:127:ALA:HB1	1:G:128:PRO:CD	2.40	0.52
1:I:179:GLN:CB	1:I:183:LYS:HE2	2.40	0.52
1:D:176:VAL:O	1:D:177:THR:C	2.42	0.52
1:L:127:ALA:HB1	1:L:128:PRO:CD	2.40	0.52
1:D:123:LYS:HD3	3:D:301:P6G:H62	1.91	0.52
1:D:89:TYR:CE1	3:D:301:P6G:H51	2.46	0.51
2:C:301:HZIP:HD	5:C:421:HOH:O	2.10	0.51
1:J:116:LEU:C	1:J:116:LEU:HD13	2.31	0.51
1:B:72:GLY:HA2	5:B:469:HOH:O	2.11	0.51
1:H:59:ASN:OD1	1:H:83:LYS:HE3	2.10	0.51
1:K:127:ALA:HB1	1:K:128:PRO:CD	2.40	0.51
1:A:72:GLY:HA2	5:A:413:HOH:O	2.10	0.51
1:L:134:CYS:HB3	1:L:166:TYR:CG	2.46	0.50
1:L:169:SER:O	1:L:215:GLY:HA2	2.11	0.50
1:A:127:ALA:HB1	1:A:128:PRO:HD2	1.93	0.50
1:J:127:ALA:HB1	1:J:128:PRO:HD2	1.92	0.50
1:E:134:CYS:HB3	1:E:166:TYR:CG	2.45	0.50
1:K:177:THR:HG21	1:K:205:PHE:CZ	2.47	0.50
1:K:134:CYS:HB3	1:K:166:TYR:CG	2.47	0.50
1:H:116:LEU:C	1:H:116:LEU:HD13	2.32	0.50
1:G:169:SER:O	1:G:215:GLY:HA2	2.13	0.49
1:I:169:SER:O	1:I:215:GLY:HA2	2.12	0.49
1:E:127:ALA:HB1	1:E:128:PRO:HD2	1.94	0.49
1:E:89:TYR:CE2	3:E:301:P6G:H61	2.47	0.49
1:G:161:ALA:N	1:G:162:PRO:CD	2.75	0.49
1:C:161:ALA:HB3	1:C:162:PRO:HD3	1.94	0.49
1:A:89:TYR:CE2	3:A:302:P6G:H62	2.48	0.49
1:K:120:PHE:HB3	1:K:138:PHE:CD2	2.47	0.48
1:D:181:SER:O	1:D:182:TRP:CB	2.59	0.48
1:I:141:ASN:OD1	1:I:141:ASN:C	2.51	0.48
1:K:128:PRO:HA	1:K:131:SER:HB3	1.95	0.48
1:C:59:ASN:OD1	1:C:83:LYS:HE3	2.14	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:134:CYS:HB3	1:G:166:TYR:CD1	2.48	0.48
1:J:127:ALA:HB1	1:J:128:PRO:CD	2.44	0.48
1:F:169:SER:O	1:F:215:GLY:HA2	2.14	0.47
1:D:72:GLY:HA2	5:D:442:HOH:O	2.14	0.47
1:A:120:PHE:HB3	1:A:138:PHE:CD2	2.49	0.47
1:J:72:GLY:HA2	5:J:409:HOH:O	2.15	0.47
1:K:134:CYS:HB3	1:K:166:TYR:CD1	2.50	0.47
1:I:116:LEU:C	1:I:116:LEU:HD13	2.35	0.47
1:J:125:ASN:OD1	1:J:135:ASN:HB2	2.15	0.47
1:D:127:ALA:HB1	1:D:128:PRO:CD	2.44	0.47
1:L:127:ALA:HB1	1:L:128:PRO:HD2	1.96	0.47
1:G:222:GLU:HB2	1:G:225:PHE:CD2	2.50	0.47
1:I:123:LYS:HD3	3:I:301:P6G:H82	1.97	0.46
1:K:41:VAL:HG11	1:K:102:ASP:HB3	1.97	0.46
1:I:127:ALA:HB1	1:I:128:PRO:HD2	1.97	0.46
1:I:103:GLU:HG3	1:I:107:GLN:HE22	1.80	0.46
1:C:9:LYS:NZ	1:C:29:GLU:OE1	2.42	0.46
1:C:99:LEU:HD22	1:C:115:VAL:HG12	1.98	0.45
1:A:169:SER:O	1:A:215:GLY:HA2	2.16	0.45
1:L:57:LEU:HD13	1:L:112:TRP:CE3	2.51	0.45
1:C:75:TYR:CE2	2:C:301:HZIP:HG	2.52	0.45
1:B:133:ASN:HA	1:B:168:TYR:O	2.16	0.45
1:F:177:THR:HG21	1:F:205:PHE:CE2	2.52	0.45
1:D:176:VAL:HG23	1:D:177:THR:N	2.31	0.45
1:K:161:ALA:N	1:K:162:PRO:CD	2.78	0.45
1:D:98:VAL:HG21	1:D:153:LEU:HD23	1.98	0.45
1:H:71:SER:HB2	5:H:431:HOH:O	2.16	0.45
1:D:22:GLN:OE1	5:D:427:HOH:O	2.21	0.45
1:F:182:TRP:CH2	1:F:183:LYS:HE3	2.52	0.45
1:B:169:SER:O	1:B:215:GLY:HA2	2.17	0.44
1:A:134:CYS:HB3	1:A:166:TYR:CD1	2.52	0.44
1:E:88:ASN:O	1:E:92:HIS:HB2	2.18	0.44
1:I:32:GLN:HG2	1:I:43:THR:OG1	2.17	0.44
1:B:161:ALA:HB3	1:B:162:PRO:HD3	1.98	0.44
1:A:197:PRO:HA	1:A:210:ASP:OD1	2.17	0.44
1:I:123:LYS:HE2	3:I:301:P6G:H62	2.00	0.44
1:K:98:VAL:HG21	1:K:153:LEU:CD2	2.47	0.44
1:D:161:ALA:N	1:D:162:PRO:CD	2.80	0.44
1:E:154:ALA:O	1:E:157:TYR:HB3	2.18	0.44
1:D:59:ASN:OD1	1:D:83:LYS:HE3	2.18	0.44
1:C:195:LEU:HD12	1:C:211:ALA:O	2.17	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:72:GLY:HA2	5:E:410:HOH:O	2.17	0.44
1:K:123:LYS:HE2	3:K:301:P6G:H52	1.99	0.44
1:L:162:PRO:HG3	1:L:218:LEU:HB3	2.00	0.43
1:F:72:GLY:HA2	5:F:408:HOH:O	2.18	0.43
1:D:169:SER:O	1:D:215:GLY:HA2	2.18	0.43
1:F:32:GLN:NE2	1:F:104:LYS:HD3	2.33	0.43
1:G:128:PRO:HA	1:G:131:SER:HB3	2.01	0.43
1:F:33:PHE:CD1	1:F:228:MET:HE2	2.54	0.43
1:A:136:ALA:HB2	1:A:157:TYR:CE1	2.54	0.43
1:D:222:GLU:HB2	1:D:225:PHE:CD2	2.54	0.43
1:A:222:GLU:HA	1:A:223:PRO:HD2	1.85	0.42
1:C:121:TYR:CE2	1:C:137:GLY:HA3	2.54	0.42
1:G:76:PRO:HB2	1:H:127:ALA:HB3	2.00	0.42
1:K:182:TRP:CZ2	1:K:183:LYS:HE3	2.54	0.42
1:C:77:GLN:NE2	1:C:89:TYR:CE2	2.87	0.42
1:L:66:ASN:O	1:L:70:GLU:HG2	2.19	0.42
1:C:194:GLY:HA2	1:D:193:ILE:O	2.19	0.42
1:B:222:GLU:HB2	1:B:225:PHE:CD2	2.53	0.42
1:L:75:TYR:HB3	1:L:77:GLN:OE1	2.18	0.42
1:D:188:LEU:HD23	1:D:225:PHE:CD1	2.55	0.42
1:H:127:ALA:HB1	1:H:128:PRO:CD	2.49	0.42
1:I:134:CYS:HB3	1:I:166:TYR:CG	2.54	0.42
1:C:169:SER:O	1:C:215:GLY:HA2	2.20	0.42
1:H:152:ARG:HD3	1:H:155:GLN:OE1	2.20	0.42
1:L:124:PRO:HD3	1:L:166:TYR:OH	2.20	0.41
1:L:125:ASN:OD1	1:L:135:ASN:HB2	2.20	0.41
1:F:127:ALA:HB1	1:F:128:PRO:CD	2.50	0.41
1:I:53:ILE:HD11	1:I:58:ILE:HG12	2.02	0.41
1:H:89:TYR:CE2	3:H:301:P6G:H61	2.55	0.41
1:F:127:ALA:HB1	1:F:128:PRO:HD2	2.02	0.41
1:K:125:ASN:OD1	1:K:135:ASN:HB2	2.20	0.41
1:F:18:PRO:HD3	1:F:166:TYR:CZ	2.56	0.41
1:E:89:TYR:CD2	3:E:301:P6G:H61	2.56	0.41
1:F:136:ALA:HB2	1:F:157:TYR:CE1	2.56	0.41
1:H:89:TYR:CE2	3:H:301:P6G:H51	2.55	0.41
1:F:161:ALA:N	1:F:162:PRO:CD	2.84	0.41
1:H:32:GLN:NE2	1:H:104:LYS:HD3	2.36	0.41
1:C:53:ILE:HB	1:C:54:PRO:HD2	2.03	0.41
1:I:65:PHE:CE2	1:I:69:ILE:HD11	2.56	0.41
1:K:19:THR:OG1	1:K:128:PRO:HB3	2.21	0.41
1:F:125:ASN:OD1	1:F:135:ASN:HB2	2.21	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:J:121:TYR:C	1:J:121:TYR:CD1	2.95	0.40
1:H:34:LYS:HD3	1:H:39:ASP:HA	2.04	0.40
1:D:152:ARG:HD3	1:D:155:GLN:OE1	2.21	0.40
1:C:202:LEU:HD12	1:C:209:VAL:HG21	2.03	0.40
1:I:151:TYR:O	1:I:155:GLN:HG3	2.21	0.40
1:L:72:GLY:HA2	5:L:425:HOH:O	2.20	0.40
1:K:33:PHE:CD1	1:K:33:PHE:N	2.89	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	223/229 (97%)	219 (98%)	4 (2%)	0	100	100
1	B	223/229 (97%)	218 (98%)	5 (2%)	0	100	100
1	C	223/229 (97%)	216 (97%)	7 (3%)	0	100	100
1	D	222/229 (97%)	212 (96%)	7 (3%)	3 (1%)	14	13
1	E	223/229 (97%)	218 (98%)	5 (2%)	0	100	100
1	F	222/229 (97%)	219 (99%)	3 (1%)	0	100	100
1	G	224/229 (98%)	219 (98%)	5 (2%)	0	100	100
1	H	223/229 (97%)	219 (98%)	4 (2%)	0	100	100
1	I	224/229 (98%)	220 (98%)	4 (2%)	0	100	100
1	J	223/229 (97%)	218 (98%)	5 (2%)	0	100	100
1	K	222/229 (97%)	217 (98%)	5 (2%)	0	100	100
1	L	223/229 (97%)	215 (96%)	8 (4%)	0	100	100
All	All	2675/2748 (97%)	2610 (98%)	62 (2%)	3 (0%)	56	68

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	D	178	ASN
1	D	182	TRP
1	D	176	VAL

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	190/201 (94%)	188 (99%)	2 (1%)	80	90
1	B	194/201 (96%)	192 (99%)	2 (1%)	82	91
1	C	189/201 (94%)	189 (100%)	0	100	100
1	D	188/201 (94%)	188 (100%)	0	100	100
1	E	195/201 (97%)	195 (100%)	0	100	100
1	F	192/201 (96%)	192 (100%)	0	100	100
1	G	194/201 (96%)	193 (100%)	1 (0%)	92	97
1	H	196/201 (98%)	194 (99%)	2 (1%)	82	91
1	I	195/201 (97%)	195 (100%)	0	100	100
1	J	196/201 (98%)	194 (99%)	2 (1%)	82	91
1	K	195/201 (97%)	195 (100%)	0	100	100
1	L	195/201 (97%)	195 (100%)	0	100	100
All	All	2319/2412 (96%)	2310 (100%)	9 (0%)	93	97

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

Mol	Chain	Res	Type
1	A	80	SER
1	A	228	MET
1	B	27	SER
1	B	109	ASN
1	G	228	MET
1	H	109	ASN
1	H	203	ASN
1	J	38	SER

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Mol	Chain	Res	Type
1	J	68	GLU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	198	HIS
1	I	107	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 [i](#)

Of 20 ligands modelled in this entry, 4 are monoatomic - leaving 16 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	$\# Z > 2$
2	HZP	A	301	-	6,9,9	0.58	0	5,12,12	1.27	1 (20%)
3	P6G	A	302	-	10,10,18	0.47	0	9,9,17	2.11	5 (55%)
2	HZP	B	301	-	6,9,9	0.74	0	5,12,12	1.42	1 (20%)
3	P6G	B	302	-	10,10,18	0.43	0	9,9,17	2.03	5 (55%)
2	HZP	C	301	-	6,9,9	0.47	0	5,12,12	0.90	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
3	P6G	C	302	-	13,13,18	0.47	0	12,12,17	2.11	8 (66%)
3	P6G	D	301	-	13,13,18	0.52	0	12,12,17	1.98	5 (41%)
3	P6G	E	301	-	14,14,18	0.49	0	13,13,17	2.11	5 (38%)
2	HZP	F	301	-	4,7,9	0.89	0	3,7,12	0.46	0
3	P6G	F	302	-	13,13,18	0.47	0	12,12,17	2.14	6 (50%)
3	P6G	G	301	-	12,12,18	0.42	0	11,11,17	2.02	4 (36%)
3	P6G	H	301	-	14,14,18	0.49	0	13,13,17	2.11	8 (61%)
3	P6G	I	301	-	13,13,18	0.45	0	12,12,17	2.31	9 (75%)
3	P6G	J	301	-	13,13,18	0.51	0	12,12,17	2.09	7 (58%)
3	P6G	K	301	-	13,13,18	0.38	0	12,12,17	2.49	9 (75%)
3	P6G	L	301	-	14,14,18	0.53	0	13,13,17	1.88	6 (46%)

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	HZP	A	301	-	-	0/0/13/13	0/1/1/1
3	P6G	A	302	-	-	0/8/8/16	0/0/0/0
2	HZP	B	301	-	-	0/0/13/13	0/1/1/1
3	P6G	B	302	-	-	0/8/8/16	0/0/0/0
2	HZP	C	301	-	-	0/0/13/13	0/1/1/1
3	P6G	C	302	-	-	0/11/11/16	0/0/0/0
3	P6G	D	301	-	-	0/11/11/16	0/0/0/0
3	P6G	E	301	-	-	0/12/12/16	0/0/0/0
2	HZP	F	301	-	-	0/3/5/13	0/0/0/1
3	P6G	F	302	-	-	0/11/11/16	0/0/0/0
3	P6G	G	301	-	-	0/10/10/16	0/0/0/0
3	P6G	H	301	-	-	0/12/12/16	0/0/0/0
3	P6G	I	301	-	-	0/11/11/16	0/0/0/0
3	P6G	J	301	-	-	0/11/11/16	0/0/0/0
3	P6G	K	301	-	-	0/11/11/16	0/0/0/0
3	P6G	L	301	-	-	0/12/12/16	0/0/0/0

There are no bond length outliers.

All (79) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	302	P6G	C8-O7-C6	2.00	121.91	113.31

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	D	301	P6G	C14-O13-C12	2.01	120.48	112.80
3	I	301	P6G	O10-C11-C12	2.01	119.29	110.36
3	I	301	P6G	O7-C6-C5	2.01	119.30	110.36
3	J	301	P6G	O4-C5-C6	2.02	119.34	110.36
3	C	302	P6G	O10-C9-C8	2.02	119.34	110.36
3	C	302	P6G	O7-C8-C9	2.03	119.39	110.36
3	B	302	P6G	O4-C3-C2	2.04	119.83	110.43
3	H	301	P6G	O10-C11-C12	2.07	119.55	110.36
3	C	302	P6G	O13-C12-C11	2.07	119.57	110.36
3	F	302	P6G	O4-C5-C6	2.08	119.60	110.36
3	H	301	P6G	O4-C3-C2	2.08	120.00	110.43
3	I	301	P6G	O13-C12-C11	2.09	119.67	110.36
3	L	301	P6G	O10-C11-C12	2.10	119.72	110.36
3	J	301	P6G	O10-C11-C12	2.12	119.78	110.36
3	D	301	P6G	O13-C12-C11	2.13	119.82	110.36
3	H	301	P6G	O4-C5-C6	2.14	119.89	110.36
3	L	301	P6G	C14-O13-C12	2.15	121.04	112.80
3	J	301	P6G	O7-C6-C5	2.16	119.96	110.36
3	L	301	P6G	O13-C12-C11	2.17	119.99	110.36
3	J	301	P6G	C11-O10-C9	2.17	122.62	113.31
3	H	301	P6G	C14-O13-C12	2.18	121.14	112.80
2	B	301	HZP	OD1-CG-CD	2.19	115.22	110.47
3	G	301	P6G	C11-O10-C9	2.20	122.76	113.31
3	C	302	P6G	O7-C6-C5	2.24	120.31	110.36
3	F	302	P6G	O13-C12-C11	2.25	120.35	110.36
3	C	302	P6G	C11-O10-C9	2.25	123.00	113.31
3	G	301	P6G	O4-C5-C6	2.27	120.48	110.36
3	H	301	P6G	O13-C12-C11	2.28	120.48	110.36
3	I	301	P6G	O7-C8-C9	2.30	120.59	110.36
3	I	301	P6G	O4-C5-C6	2.32	120.66	110.36
2	A	301	HZP	CB-CG-CD	2.32	106.01	103.14
3	K	301	P6G	C8-O7-C6	2.33	123.33	113.31
3	I	301	P6G	C14-O13-C12	2.36	121.82	112.80
3	F	302	P6G	C14-O13-C12	2.36	121.85	112.80
3	A	302	P6G	O10-C9-C8	2.38	120.94	110.36
3	A	302	P6G	C3-O4-C5	2.41	122.01	112.80
3	E	301	P6G	C11-O10-C9	2.41	123.67	113.31
3	D	301	P6G	C11-O10-C9	2.44	123.79	113.31
3	K	301	P6G	C3-O4-C5	2.47	122.27	112.80
3	C	302	P6G	O4-C5-C6	2.48	121.40	110.36
3	E	301	P6G	O13-C12-C11	2.49	121.44	110.36
3	H	301	P6G	C11-O10-C9	2.50	124.04	113.31

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	K	301	P6G	O10-C9-C8	2.51	121.53	110.36
3	A	302	P6G	C11-O10-C9	2.52	122.43	112.80
3	J	301	P6G	O13-C12-C11	2.52	121.57	110.36
3	C	302	P6G	C8-O7-C6	2.53	124.17	113.31
3	L	301	P6G	C8-O7-C6	2.53	124.19	113.31
3	E	301	P6G	O4-C5-C6	2.53	121.63	110.36
3	B	302	P6G	O7-C8-C9	2.54	121.66	110.36
3	K	301	P6G	O10-C11-C12	2.55	121.71	110.36
3	A	302	P6G	C8-O7-C6	2.56	124.32	113.31
3	G	301	P6G	C5-O4-C3	2.60	124.49	113.31
3	J	301	P6G	C8-O7-C6	2.61	124.53	113.31
3	D	301	P6G	C8-O7-C6	2.62	124.56	113.31
3	B	302	P6G	O4-C5-C6	2.62	122.03	110.36
3	L	301	P6G	C11-O10-C9	2.65	124.71	113.31
3	L	301	P6G	C5-O4-C3	2.66	124.75	113.31
3	K	301	P6G	C11-O10-C9	2.75	125.12	113.31
3	K	301	P6G	O4-C5-C6	2.75	122.60	110.36
3	E	301	P6G	C5-O4-C3	2.79	125.29	113.31
3	B	302	P6G	O7-C6-C5	2.79	122.76	110.36
3	H	301	P6G	C8-O7-C6	2.87	125.64	113.31
3	H	301	P6G	C5-O4-C3	2.87	125.66	113.31
3	G	301	P6G	C8-O7-C6	2.87	125.67	113.31
3	K	301	P6G	O7-C8-C9	2.88	123.18	110.36
3	I	301	P6G	C8-O7-C6	2.89	125.75	113.31
3	K	301	P6G	O7-C6-C5	2.93	123.37	110.36
3	A	302	P6G	O4-C5-C6	2.93	123.40	110.36
3	F	302	P6G	C11-O10-C9	3.07	126.49	113.31
3	F	302	P6G	C8-O7-C6	3.07	126.50	113.31
3	I	301	P6G	C11-O10-C9	3.07	126.52	113.31
3	C	302	P6G	C3-O4-C5	3.21	125.08	112.80
3	D	301	P6G	C3-O4-C5	3.26	125.27	112.80
3	E	301	P6G	C8-O7-C6	3.29	127.47	113.31
3	F	302	P6G	C3-O4-C5	3.50	126.21	112.80
3	J	301	P6G	C3-O4-C5	3.52	126.27	112.80
3	K	301	P6G	C14-O13-C12	3.63	126.70	112.80
3	I	301	P6G	C3-O4-C5	3.71	127.01	112.80

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

7 monomers are involved in 16 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	302	P6G	3	0
2	C	301	HZP	2	0
3	D	301	P6G	2	0
3	E	301	P6G	2	0
3	H	301	P6G	3	0
3	I	301	P6G	3	0
3	K	301	P6G	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	225/229 (98%)	-0.35	1 (0%) 93 95	24, 34, 53, 72	0
1	B	225/229 (98%)	-0.41	0 100 100	25, 34, 50, 78	0
1	C	225/229 (98%)	-0.25	0 100 100	26, 38, 58, 65	0
1	D	224/229 (97%)	-0.32	3 (1%) 79 84	25, 36, 57, 75	0
1	E	225/229 (98%)	-0.37	0 100 100	22, 33, 49, 75	0
1	F	224/229 (97%)	-0.37	0 100 100	23, 34, 52, 62	0
1	G	225/229 (98%)	-0.35	0 100 100	24, 36, 54, 64	0
1	H	225/229 (98%)	-0.32	1 (0%) 93 95	25, 38, 59, 68	0
1	I	225/229 (98%)	-0.14	3 (1%) 79 84	22, 40, 63, 82	0
1	J	225/229 (98%)	-0.34	0 100 100	25, 36, 52, 79	0
1	K	224/229 (97%)	-0.32	0 100 100	26, 37, 55, 72	0
1	L	225/229 (98%)	-0.29	0 100 100	26, 38, 57, 75	0
All	All	2697/2748 (98%)	-0.32	8 (0%) 94 96	22, 36, 56, 82	0

All (8) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	I	182	TRP	3.0
1	A	229	GLU	2.9
1	D	178	ASN	2.3
1	D	180	ALA	2.3
1	I	229	GLU	2.1
1	I	180	ALA	2.0
1	H	105	PHE	2.0
1	D	181	SER	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
3	P6G	A	302	11/19	0.83	0.22	9.46	54,58,62,63	0
3	P6G	C	302	14/19	0.84	0.20	8.52	48,56,63,63	0
3	P6G	K	301	14/19	0.78	0.22	7.93	47,53,66,67	0
3	P6G	I	301	14/19	0.76	0.19	7.74	51,57,60,60	0
3	P6G	J	301	14/19	0.79	0.23	6.08	48,58,69,69	0
3	P6G	D	301	14/19	0.77	0.21	5.96	57,62,73,73	0
2	HZP	B	301	9/9	0.88	0.20	5.15	52,55,58,58	0
3	P6G	F	302	14/19	0.83	0.20	4.63	43,54,57,60	0
3	P6G	L	301	15/19	0.83	0.17	4.49	53,55,67,67	0
3	P6G	H	301	15/19	0.84	0.17	4.41	51,57,62,62	0
3	P6G	E	301	15/19	0.88	0.19	3.76	46,51,57,58	0
2	HZP	C	301	9/9	0.93	0.16	3.61	56,64,71,73	0
2	HZP	A	301	9/9	0.93	0.16	3.47	43,46,51,54	0
3	P6G	G	301	13/19	0.85	0.15	2.80	48,54,58,58	0
2	HZP	F	301	8/9	0.84	0.14	2.68	41,50,52,52	0
3	P6G	B	302	11/19	0.86	0.16	2.49	49,50,53,54	0
4	CL	G	302	1/1	0.98	0.06	-	45,45,45,45	0
4	CL	D	302	1/1	0.99	0.08	-	42,42,42,42	0
4	CL	H	302	1/1	0.95	0.07	-	42,42,42,42	0
4	CL	E	302	1/1	0.99	0.05	-	39,39,39,39	0

6.5 Other polymers [i](#)

There are no such residues in this entry.