Full wwPDB X-ray Structure Validation Report ⓘ

May 29, 2020 – 11:53 pm BST

PDB ID	:	4BEV
Title	:	ATPase crystal structure with bound phosphate analogue
Authors	:	Mattle, D.; Drachmann, N.D.; Liu, X.Y.; Gourdon, P.; Pedersen, B.P.; Morth, P.; Wang, J.; Nissen, P.
Deposited on	:	2013-03-12
Resolution	:	3.58 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 ⓘ symbol.

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

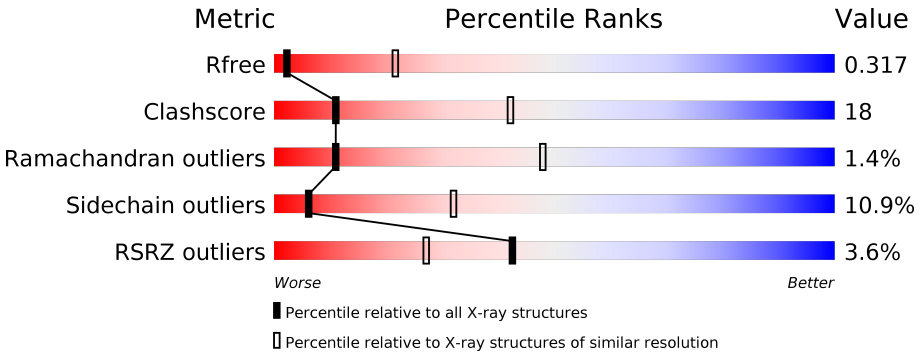
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.11
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.11

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 3.58 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}	130704	1094 (3.66-3.50)
Clashscore	141614	1181 (3.66-3.50)
Ramachandran outliers	138981	1143 (3.66-3.50)
Sidechain outliers	138945	1143 (3.66-3.50)
RSRZ outliers	127900	1012 (3.66-3.50)

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 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	736	3% 62% 24% • 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:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
3	MGF	A	950	-	-	X	-

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 4941 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.

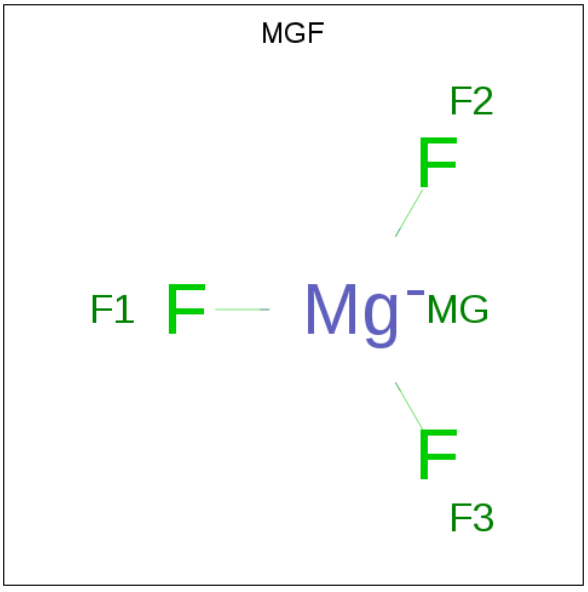
- Molecule 1 is a protein called COPPER EFFLUX ATPASE.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	663	Total	C	N	O	S	0	0	0
			4934	3156	844	909	25			

- 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		

- Molecule 3 is TRIFLUOROMAGNESATE (three-letter code: MGF) (formula: F_3Mg).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	F	Mg	0	0
			4	3	1		

- Molecule 4 is water.

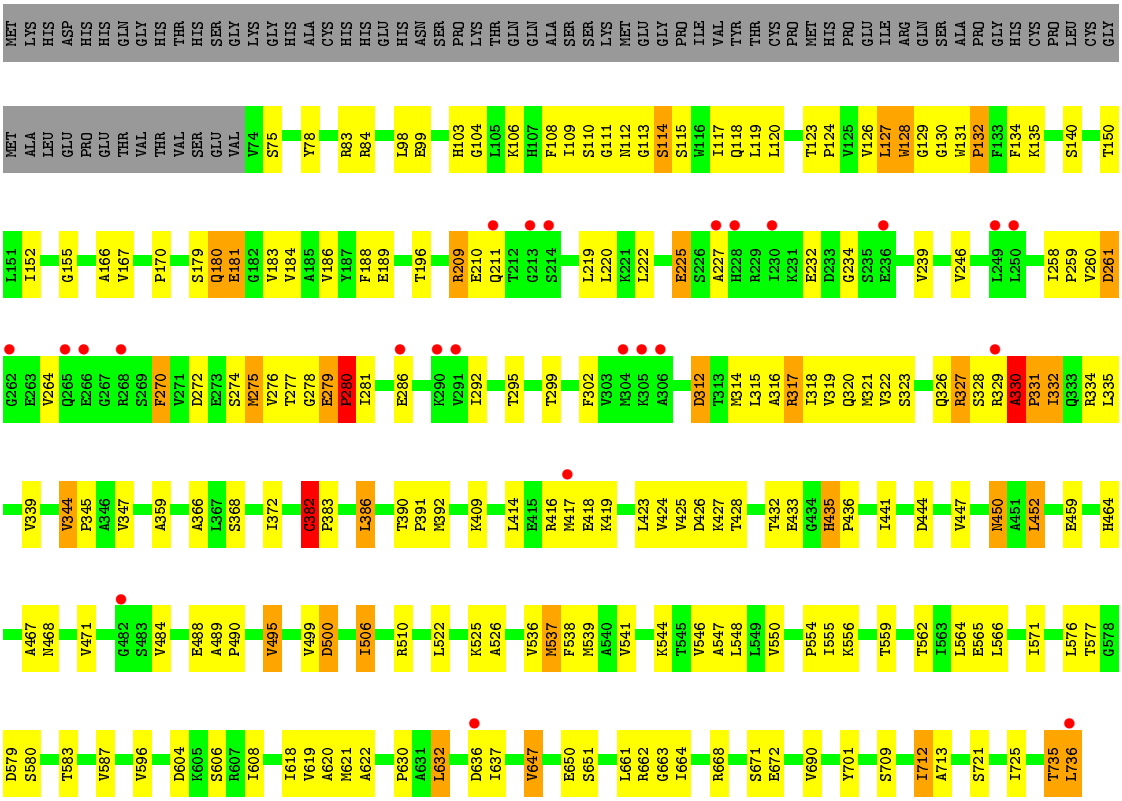
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	2	Total O 2 2	0	0

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 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: COPPER EFFLUX ATPASE

Chain A:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	44.36Å 72.65Å 328.79Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	29.45 – 3.58 48.75 – 3.60	Depositor EDS
% Data completeness (in resolution range)	96.5 (29.45-3.58) 98.0 (48.75-3.60)	Depositor EDS
R_{merge}	0.12	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.44 (at 3.57Å)	Xtriage
Refinement program	PHENIX (PHENIX.REFINE: 1.8_1069)	Depositor
R, R_{free}	0.270 , 0.315 0.285 , 0.317	Depositor DCC
R_{free} test set	644 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å^2)	128.6	Xtriage
Anisotropy	0.446	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.29 , 92.6	EDS
L-test for twinning[2]	$< \|L\| > = 0.47$, $< L^2 > = 0.30$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.88	EDS
Total number of atoms	4941	wwPDB-VP
Average B, all atoms (Å^2)	155.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.40% of the height of the origin peak. No significant pseudotranslation is detected.*

[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: MG, MGF

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	0.53	5/5017 (0.1%)	0.73	12/6812 (0.2%)

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	435	HIS	C-N	17.55	1.67	1.34
1	A	332	ILE	C-N	-15.64	0.98	1.34
1	A	210	GLU	C-N	-6.12	1.20	1.34
1	A	671	SER	C-N	-5.58	1.21	1.34
1	A	280	PRO	N-CD	5.16	1.55	1.47

All (12) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	330	ALA	C-N-CD	-30.95	52.52	120.60
1	A	327	ARG	O-C-N	13.12	143.70	122.70
1	A	327	ARG	CA-C-N	-11.83	91.17	117.20
1	A	327	ARG	C-N-CA	-10.92	94.40	121.70
1	A	210	GLU	O-C-N	-9.33	107.77	122.70
1	A	326	GLN	O-C-N	-7.29	111.04	122.70
1	A	210	GLU	C-N-CA	6.81	138.72	121.70
1	A	332	ILE	O-C-N	-6.70	111.97	122.70
1	A	210	GLU	CA-C-N	6.51	131.53	117.20
1	A	382	CYS	C-N-CD	6.29	141.61	128.40
1	A	279	GLU	C-N-CD	6.13	141.27	128.40
1	A	131	TRP	C-N-CD	5.49	139.93	128.40

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	4934	0	5122	182	0
2	A	1	0	0	0	0
3	A	4	0	0	3	0
4	A	2	0	0	0	0
All	All	4941	0	5122	182	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 18.

All (182) 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:435:HIS:C	1:A:436:PRO:N	1.67	1.46
1:A:130:GLY:CA	1:A:134:PHE:HE1	1.23	1.41
1:A:441:ILE:CD1	1:A:452:LEU:HD22	1.53	1.39
1:A:123:THR:CG2	1:A:127:LEU:HD11	1.63	1.25
1:A:123:THR:HG22	1:A:127:LEU:CD1	1.67	1.24
1:A:441:ILE:HD11	1:A:452:LEU:CD2	1.66	1.23
1:A:274:SER:CA	1:A:278:GLY:HA2	1.71	1.21
1:A:130:GLY:CA	1:A:134:PHE:CE1	2.13	1.19
1:A:123:THR:O	1:A:127:LEU:CD1	1.89	1.17
1:A:130:GLY:HA3	1:A:134:PHE:CE1	1.78	1.14
1:A:123:THR:HG23	1:A:127:LEU:HD11	1.15	1.14
1:A:123:THR:O	1:A:127:LEU:HD12	0.97	1.14
1:A:123:THR:C	1:A:127:LEU:HD12	1.69	1.12
1:A:123:THR:CG2	1:A:127:LEU:CD1	2.23	1.08
1:A:130:GLY:HA3	1:A:134:PHE:HE1	0.97	1.06
1:A:327:ARG:O	1:A:328:SER:OG	1.74	1.06
1:A:274:SER:HA	1:A:278:GLY:HA2	1.11	1.05
1:A:111:GLY:HA3	1:A:183:VAL:HG11	1.40	1.03
1:A:536:VAL:HG22	1:A:550:VAL:HG12	1.39	1.02
1:A:126:VAL:O	1:A:130:GLY:HA3	1.61	1.00
1:A:123:THR:HG22	1:A:127:LEU:HD13	1.45	0.99
1:A:274:SER:HA	1:A:278:GLY:CA	1.92	0.99
1:A:447:VAL:CG2	1:A:450:ASN:HB2	1.97	0.94

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:280:PRO:CD	1:A:281:ILE:H	1.79	0.94
1:A:280:PRO:CG	1:A:281:ILE:H	1.80	0.93
1:A:441:ILE:CD1	1:A:452:LEU:CD2	2.35	0.92
1:A:277:THR:HG22	1:A:279:GLU:HB2	1.51	0.91
1:A:276:VAL:O	1:A:277:THR:HB	1.70	0.90
1:A:441:ILE:HD11	1:A:452:LEU:HD22	0.90	0.89
1:A:277:THR:CG2	1:A:279:GLU:HB2	2.06	0.85
1:A:113:GLY:O	1:A:117:ILE:HG13	1.77	0.85
1:A:277:THR:HG22	1:A:279:GLU:H	1.42	0.84
1:A:274:SER:C	1:A:278:GLY:HA2	1.97	0.84
1:A:180:GLN:HG2	1:A:181:GLU:OE1	1.78	0.83
1:A:130:GLY:HA2	1:A:134:PHE:HE1	1.44	0.82
1:A:276:VAL:C	1:A:278:GLY:H	1.82	0.81
1:A:280:PRO:HG2	1:A:281:ILE:H	1.44	0.81
1:A:447:VAL:HG22	1:A:450:ASN:HB2	1.61	0.79
1:A:327:ARG:C	1:A:328:SER:HG	1.84	0.79
1:A:280:PRO:HD2	1:A:281:ILE:H	1.47	0.79
1:A:280:PRO:CG	1:A:281:ILE:N	2.43	0.78
1:A:327:ARG:C	1:A:328:SER:OG	2.20	0.78
1:A:126:VAL:O	1:A:130:GLY:CA	2.31	0.78
1:A:315:LEU:O	1:A:318:ILE:HB	1.85	0.76
1:A:536:VAL:HG22	1:A:550:VAL:CG1	2.16	0.76
1:A:276:VAL:C	1:A:278:GLY:N	2.36	0.76
1:A:735:THR:HA	1:A:736:LEU:HB2	1.66	0.75
1:A:129:GLY:O	1:A:132:PRO:HD2	1.87	0.74
1:A:495:VAL:HG23	1:A:506:ILE:HG23	1.69	0.72
1:A:111:GLY:HA3	1:A:183:VAL:CG1	2.16	0.72
1:A:99:GLU:HG2	1:A:118:GLN:HE22	1.54	0.71
1:A:275:MET:HE1	1:A:315:LEU:HD23	1.73	0.71
1:A:114:SER:O	1:A:118:GLN:HG3	1.91	0.70
1:A:500:ASP:OD1	1:A:500:ASP:N	2.24	0.70
1:A:106:LYS:H	1:A:109:ILE:HD13	1.56	0.70
1:A:280:PRO:HG2	1:A:281:ILE:N	2.05	0.69
1:A:181:GLU:N	1:A:181:GLU:OE1	2.26	0.69
1:A:435:HIS:C	1:A:436:PRO:CA	2.60	0.69
1:A:577:THR:HA	3:A:950:MGF:F1	1.82	0.69
1:A:274:SER:O	1:A:278:GLY:HA2	1.92	0.69
1:A:280:PRO:CD	1:A:281:ILE:N	2.46	0.68
1:A:119:LEU:C	1:A:119:LEU:HD23	2.13	0.68
1:A:274:SER:O	1:A:278:GLY:CA	2.42	0.68
1:A:344:VAL:HG13	1:A:345:PRO:HD3	1.76	0.67

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:383:PRO:HD2	1:A:386:LEU:HD11	1.75	0.67
1:A:186:VAL:HG21	1:A:188:PHE:CD2	2.29	0.67
1:A:276:VAL:O	1:A:277:THR:CB	2.43	0.67
1:A:276:VAL:O	1:A:278:GLY:N	2.25	0.67
1:A:130:GLY:HA2	1:A:134:PHE:CE1	2.25	0.64
1:A:277:THR:HG22	1:A:279:GLU:CB	2.27	0.63
1:A:123:THR:C	1:A:127:LEU:CD1	2.54	0.63
1:A:155:GLY:HA3	1:A:382:CYS:SG	2.38	0.62
1:A:506:ILE:HD11	1:A:537:MET:HB3	1.83	0.61
1:A:186:VAL:CG2	1:A:188:PHE:CD2	2.83	0.61
1:A:426:ASP:OD2	3:A:950:MGF:F2	2.07	0.61
1:A:111:GLY:CA	1:A:183:VAL:HG11	2.25	0.61
1:A:416:ARG:HB2	1:A:637:ILE:HD11	1.82	0.61
1:A:314:MET:CE	1:A:317:ARG:NH2	2.64	0.60
1:A:98:LEU:HB3	1:A:118:GLN:HE21	1.66	0.60
1:A:124:PRO:O	1:A:128:TRP:HB2	2.02	0.59
1:A:662:ARG:N	1:A:663:GLY:HA3	2.17	0.59
1:A:84:ARG:NH1	1:A:132:PRO:HD3	2.18	0.59
1:A:447:VAL:HG23	1:A:450:ASN:H	1.67	0.59
1:A:128:TRP:O	1:A:132:PRO:HD3	2.04	0.58
1:A:314:MET:HE3	1:A:317:ARG:NH2	2.20	0.57
1:A:279:GLU:OE2	1:A:428:THR:OG1	2.07	0.57
1:A:435:HIS:CA	1:A:436:PRO:N	2.63	0.57
1:A:170:PRO:HB3	1:A:184:VAL:HG23	1.86	0.56
1:A:258:ILE:HD12	1:A:295:THR:HB	1.87	0.56
1:A:606:SER:HB2	1:A:630:PRO:HB2	1.87	0.56
1:A:277:THR:HG22	1:A:279:GLU:N	2.18	0.56
1:A:425:VAL:HG12	1:A:622:ALA:HB3	1.87	0.56
1:A:359:ALA:HA	1:A:366:ALA:HB1	1.88	0.56
1:A:134:PHE:H	1:A:134:PHE:HD1	1.51	0.56
1:A:272:ASP:OD1	1:A:280:PRO:O	2.24	0.55
1:A:166:ALA:HB1	1:A:184:VAL:HB	1.88	0.55
1:A:280:PRO:HD2	1:A:281:ILE:N	2.16	0.55
1:A:166:ALA:HB1	1:A:184:VAL:CG1	2.38	0.54
1:A:261:ASP:HB3	1:A:292:ILE:HA	1.89	0.54
1:A:219:LEU:HD12	1:A:650:GLU:HG3	1.89	0.54
1:A:126:VAL:O	1:A:130:GLY:N	2.41	0.54
1:A:419:LYS:HB3	1:A:618:ILE:HD13	1.91	0.53
1:A:447:VAL:HG23	1:A:450:ASN:HB2	1.89	0.53
1:A:318:ILE:O	1:A:322:VAL:HG23	2.09	0.53
1:A:316:ALA:HA	1:A:319:VAL:HG22	1.90	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:468:ASN:HA	1:A:471:VAL:HG22	1.90	0.52
1:A:124:PRO:O	1:A:128:TRP:CB	2.58	0.52
1:A:386:LEU:HD12	1:A:386:LEU:H	1.75	0.52
1:A:418:GLU:HG3	1:A:672:GLU:HG2	1.90	0.51
1:A:75:SER:HB3	1:A:78:TYR:HB3	1.91	0.51
1:A:280:PRO:O	1:A:281:ILE:C	2.50	0.51
1:A:409:LYS:NZ	1:A:650:GLU:OE1	2.43	0.51
1:A:426:ASP:CG	3:A:950:MGF:F2	2.40	0.50
1:A:316:ALA:O	1:A:319:VAL:HG22	2.13	0.49
1:A:417:MET:HG3	1:A:668:ARG:HA	1.94	0.49
1:A:314:MET:O	1:A:318:ILE:HG12	2.12	0.49
1:A:427:LYS:HD2	1:A:587:VAL:HG11	1.95	0.49
1:A:183:VAL:HG23	1:A:183:VAL:O	2.12	0.49
1:A:209:ARG:HH12	1:A:334:ARG:HH21	1.59	0.49
1:A:418:GLU:HG3	1:A:672:GLU:CG	2.43	0.49
1:A:417:MET:HE2	1:A:637:ILE:HG21	1.95	0.49
1:A:274:SER:O	1:A:278:GLY:HA3	2.11	0.49
1:A:319:VAL:HG23	1:A:320:GLN:N	2.27	0.49
1:A:330:ALA:O	1:A:331:PRO:CB	2.55	0.49
1:A:134:PHE:CD1	1:A:134:PHE:N	2.78	0.48
1:A:621:MET:HG3	1:A:632:LEU:HD13	1.95	0.48
1:A:140:SER:HG	1:A:150:THR:HG1	1.61	0.48
1:A:441:ILE:HD12	1:A:452:LEU:CD2	2.38	0.48
1:A:112:ASN:N	1:A:112:ASN:OD1	2.46	0.48
1:A:484:VAL:HG12	1:A:499:VAL:HG22	1.96	0.48
1:A:432:THR:OG1	1:A:554:PRO:O	2.31	0.47
1:A:562:THR:HG21	1:A:662:ARG:HA	1.94	0.47
1:A:576:LEU:HD21	1:A:608:ILE:HB	1.96	0.47
1:A:292:ILE:O	1:A:295:THR:OG1	2.26	0.47
1:A:433:GLU:HG2	1:A:433:GLU:H	1.60	0.47
1:A:709:SER:HB3	1:A:712:ILE:HG23	1.96	0.47
1:A:459:GLU:HB3	1:A:467:ALA:HB1	1.97	0.46
1:A:84:ARG:NH1	1:A:128:TRP:O	2.45	0.46
1:A:390:THR:HB	1:A:391:PRO:HD3	1.98	0.46
1:A:314:MET:HE1	1:A:317:ARG:HH22	1.81	0.45
1:A:314:MET:HE1	1:A:317:ARG:NH2	2.32	0.45
1:A:522:LEU:HB3	1:A:548:LEU:HD13	1.99	0.45
1:A:526:ALA:HB2	1:A:548:LEU:HD21	1.98	0.45
1:A:721:SER:O	1:A:725:ILE:HG12	2.15	0.45
1:A:225:GLU:H	1:A:225:GLU:HG2	1.53	0.45
1:A:499:VAL:HA	1:A:500:ASP:HA	1.66	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:84:ARG:NH1	1:A:132:PRO:CD	2.80	0.44
1:A:329:ARG:O	1:A:330:ALA:HB3	2.17	0.44
1:A:99:GLU:HG3	1:A:189:GLU:HB2	1.98	0.44
1:A:317:ARG:O	1:A:321:MET:HG3	2.17	0.44
1:A:128:TRP:O	1:A:132:PRO:CD	2.66	0.44
1:A:562:THR:CG2	1:A:662:ARG:HA	2.47	0.43
1:A:368:SER:O	1:A:372:ILE:HG12	2.19	0.43
1:A:119:LEU:HD23	1:A:120:LEU:N	2.33	0.43
1:A:277:THR:C	1:A:279:GLU:N	2.72	0.42
1:A:330:ALA:O	1:A:331:PRO:HB3	2.19	0.42
1:A:566:LEU:HB3	1:A:571:ILE:HB	2.02	0.42
1:A:103:HIS:CG	1:A:109:ILE:HG21	2.53	0.42
1:A:166:ALA:HB1	1:A:184:VAL:CB	2.50	0.42
1:A:264:VAL:HG13	1:A:302:PHE:HB2	2.02	0.42
1:A:129:GLY:C	1:A:132:PRO:HD2	2.39	0.42
1:A:556:LYS:HB2	1:A:559:THR:OG1	2.20	0.42
1:A:332:ILE:HG13	1:A:332:ILE:H	1.69	0.42
1:A:335:LEU:O	1:A:339:VAL:HG12	2.19	0.42
1:A:579:ASP:OD1	1:A:580:SER:N	2.43	0.41
1:A:604:ASP:O	1:A:608:ILE:HG12	2.19	0.41
1:A:506:ILE:HD12	1:A:538:PHE:O	2.21	0.41
1:A:152:ILE:HD11	1:A:386:LEU:HD13	2.03	0.41
1:A:270:PHE:HE1	1:A:464:HIS:CE1	2.39	0.41
1:A:123:THR:O	1:A:127:LEU:CG	2.64	0.41
1:A:115:SER:HB3	1:A:167:VAL:HG22	2.02	0.41
1:A:227:ALA:HB3	1:A:239:VAL:HG23	2.03	0.41
1:A:98:LEU:O	1:A:103:HIS:NE2	2.53	0.41
1:A:539:MET:HB3	1:A:547:ALA:HB3	2.03	0.41
1:A:423:LEU:HD12	1:A:620:ALA:O	2.20	0.41
1:A:220:LEU:HD13	1:A:647:VAL:HG21	2.03	0.41
1:A:489:ALA:HA	1:A:490:PRO:HD3	1.82	0.41
1:A:661:LEU:H	1:A:661:LEU:HD23	1.85	0.41
1:A:444:ASP:N	1:A:444:ASP:OD1	2.53	0.41
1:A:712:ILE:HG13	1:A:713:ALA:N	2.34	0.40
1:A:103:HIS:HA	1:A:104:GLY:HA3	1.85	0.40
1:A:544:LYS:O	1:A:546:VAL:HG13	2.21	0.40

There are no symmetry-related clashes.

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	661/736 (90%)	611 (92%)	41 (6%)	9 (1%)	11 48

All (9) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	330	ALA
1	A	331	PRO
1	A	280	PRO
1	A	232	GLU
1	A	108	PHE
1	A	299	THR
1	A	312	ASP
1	A	259	PRO
1	A	234	GLY

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	523/586 (89%)	466 (89%)	57 (11%)	6 32

All (57) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	83	ARG
1	A	110	SER

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Mol	Chain	Res	Type
1	A	114	SER
1	A	127	LEU
1	A	128	TRP
1	A	132	PRO
1	A	135	LYS
1	A	179	SER
1	A	180	GLN
1	A	181	GLU
1	A	196	THR
1	A	209	ARG
1	A	211	GLN
1	A	222	LEU
1	A	225	GLU
1	A	246	VAL
1	A	260	VAL
1	A	261	ASP
1	A	270	PHE
1	A	275	MET
1	A	286	GLU
1	A	312	ASP
1	A	317	ARG
1	A	323	SER
1	A	344	VAL
1	A	347	VAL
1	A	382	CYS
1	A	386	LEU
1	A	392	MET
1	A	414	LEU
1	A	424	VAL
1	A	450	ASN
1	A	452	LEU
1	A	488	GLU
1	A	495	VAL
1	A	500	ASP
1	A	506	ILE
1	A	510	ARG
1	A	525	LYS
1	A	537	MET
1	A	541	VAL
1	A	555	ILE
1	A	564	LEU
1	A	565	GLU

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Mol	Chain	Res	Type
1	A	583	THR
1	A	596	VAL
1	A	619	VAL
1	A	632	LEU
1	A	636	ASP
1	A	647	VAL
1	A	651	SER
1	A	664	ILE
1	A	690	VAL
1	A	701	TYR
1	A	712	ILE
1	A	735	THR
1	A	736	LEU

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

Mol	Chain	Res	Type
1	A	118	GLN
1	A	464	HIS

5.3.3 RNA

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates

There are no carbohydrates in this entry.

5.6 Ligand geometry

Of 2 ligands modelled in this entry, 1 is monoatomic - leaving 1 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	MGF	A	950	1,4	0,3,3	0.00	-	-		

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

1 monomer is involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	950	MGF	3	0

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
1	A	3

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	A	435:HIS	C	436:PRO	N	1.67
1	A	210:GLU	C	211:GLN	N	1.20
1	A	332:ILE	C	333:GLN	N	0.98

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^{th} 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	663/736 (90%)	0.02	24 (3%) 42 27	86, 148, 227, 293	0

All (24) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	262	GLY	5.3
1	A	230	ILE	4.2
1	A	736	LEU	3.6
1	A	265	GLN	3.3
1	A	291	VAL	3.2
1	A	306	ALA	3.1
1	A	266	GLU	3.1
1	A	304	MET	3.0
1	A	236	GLU	2.9
1	A	305	LYS	2.7
1	A	482	GLY	2.7
1	A	213	GLY	2.6
1	A	417	MET	2.6
1	A	636	ASP	2.6
1	A	211	GLN	2.5
1	A	329	ARG	2.4
1	A	214	SER	2.4
1	A	286	GLU	2.4
1	A	290	LYS	2.3
1	A	268	ARG	2.2
1	A	227	ALA	2.2
1	A	228	HIS	2.1
1	A	249	LEU	2.1
1	A	250	LEU	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. The B-factors column lists the minimum, median, 95^{th} 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
2	MG	A	900	1/1	0.86	0.16	101,101,101,101	0
3	MGF	A	950	4/4	0.92	0.20	110,129,141,173	0

6.5 Other polymers (i)

There are no such residues in this entry.