Full wwPDB/EMDataBank EM Map/Model Validation Report (i)

Nov 10, 2016 – 08:07 AM EST

PDB ID	:	5LW7
EMDB ID:	:	EMD-4113
Title	:	S. solfataricus ABCE1 post-splitting state
Authors	:	Heuer, A.; Gerovac, M.; Beckmann, R.; Tampe, R.
Deposited on	:	2016-09-15
Resolution	:	17.00 Å(reported)

This is a Full wwPDB/EMDataBank EM Map/Model Validation Report for a publicly released PDB/EMDB entry.

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
http://wwpdb.org/validation/2016/EMValidationReportHelp
with specific help available everywhere you see the (i) symbol.

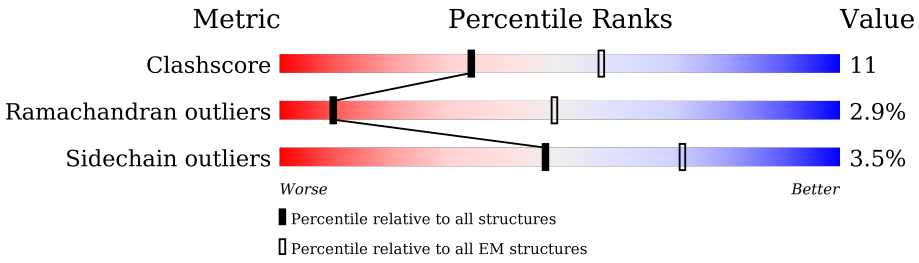
MolProbity	:	4.02b-467
Mogul	:	1.7.1 (RC1), CSD as537be (2016)
Percentile statistics	:	20151230.v01 (using entries in the PDB archive December 30th 2015)
EM map analysis	:	NOT EXECUTED
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et. al. (1996)
Validation Pipeline (wwPDB-VP)	:	rb-20028320

1 Overall quality at a glance

The following experimental techniques were used to determine the structure:
ELECTRON MICROSCOPY

The reported resolution of this entry is 17.00 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)	EM structures (#Entries)
Clashscore	114402	924
Ramachandran outliers	111179	726
Sidechain outliers	111093	686

The table below summarises the geometric issues observed across the polymeric chains. The red, orange, yellow and green segments on the 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 <=5%

Mol	Chain	Length	Quality of chain
1	B	593	69% 25% 6%

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	SF4	B	601	-	-	X	-
2	SF4	B	602	-	-	X	-

2 Entry composition

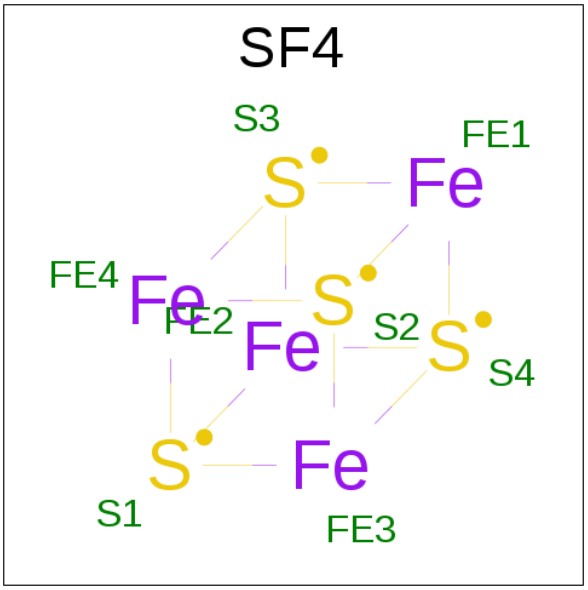
There are 2 unique types of molecules in this entry. The entry contains 4745 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, 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 ABC transporter ATP-binding protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	B	593	Total	C	N	O	S	0	0
			4729	3003	826	880	20		

- Molecule 2 is IRON/SULFUR CLUSTER (three-letter code: SF4) (formula: Fe_4S_4).



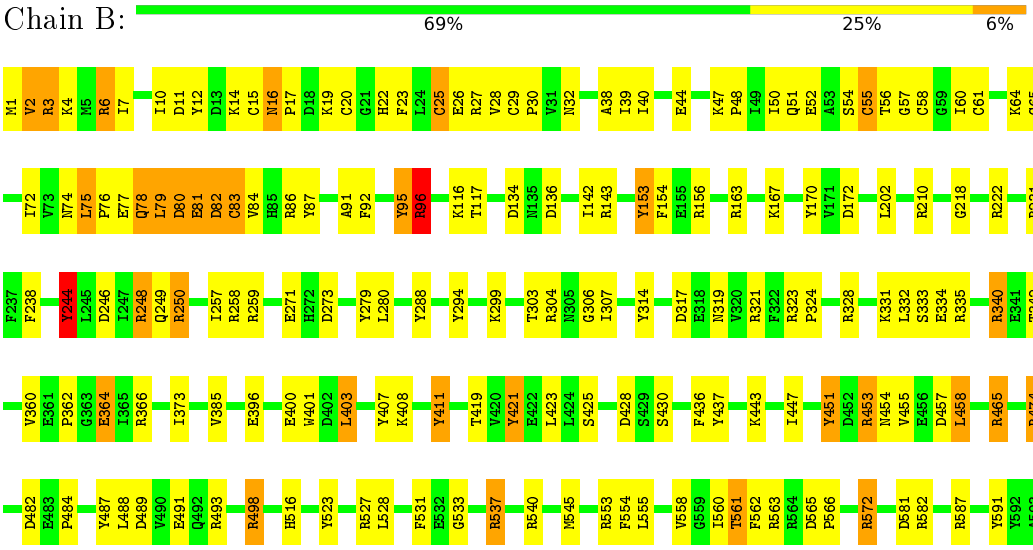
Mol	Chain	Residues	Atoms				AltConf
2	B	1	Total	Fe	S		0
			16	8	8		
2	B	1	Total	Fe	S		0
			16	8	8		

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. 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. 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: ABC transporter ATP-binding protein

Chain B:



4 Experimental information (i)

Property	Value	Source
Reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	Depositor
Number of particles used	19500	Depositor
Resolution determination method	FSC 0.5 CUT-OFF	Depositor
CTF correction method	Not provided	Depositor
Microscope	FEI TECNAI SPIRIT	Depositor
Voltage (kV)	120	Depositor
Electron dose ($e^-/Å^2$)	Not provided	Depositor
Minimum defocus (nm)	Not provided	Depositor
Maximum defocus (nm)	35000	Depositor
Magnification	Not provided	Depositor
Image detector	Not provided	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: SF4

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	#$\|Z\|>2$	RMSZ	#$\|Z\|>2$
1	B	1.65	42/4815 (0.9%)	1.88	107/6499 (1.6%)

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	B	0	19

All (42) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	453	ARG	NE-CZ	7.92	1.43	1.33
1	B	563	ARG	CD-NE	6.93	1.58	1.46
1	B	154	PHE	CE2-CZ	6.88	1.50	1.37
1	B	540	ARG	NE-CZ	6.76	1.41	1.33
1	B	453	ARG	CZ-NH1	6.56	1.41	1.33
1	B	294	TYR	CZ-OH	6.56	1.49	1.37
1	B	294	TYR	CE1-CZ	6.44	1.47	1.38
1	B	430	SER	CA-CB	6.35	1.62	1.52
1	B	484	PRO	CA-C	-6.19	1.40	1.52
1	B	279	TYR	CE2-CZ	6.13	1.46	1.38
1	B	288	TYR	CG-CD2	6.03	1.47	1.39
1	B	537	ARG	NE-CZ	5.98	1.40	1.33
1	B	328	ARG	NE-CZ	5.94	1.40	1.33
1	B	582	ARG	NE-CZ	5.94	1.40	1.33
1	B	335	ARG	CZ-NH2	5.91	1.40	1.33
1	B	360	VAL	CA-CB	-5.85	1.42	1.54
1	B	421	TYR	CD1-CE1	5.84	1.48	1.39
1	B	170	TYR	CG-CD1	5.83	1.46	1.39

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	340	ARG	CZ-NH1	5.82	1.40	1.33
1	B	323	ARG	CZ-NH2	5.77	1.40	1.33
1	B	323	ARG	CZ-NH1	5.60	1.40	1.33
1	B	364	GLU	CD-OE2	5.58	1.31	1.25
1	B	222	ARG	CZ-NH1	5.56	1.40	1.33
1	B	465	ARG	NE-CZ	5.48	1.40	1.33
1	B	96	ARG	CZ-NH1	5.43	1.40	1.33
1	B	233	ALA	N-CA	-5.42	1.35	1.46
1	B	531	PHE	CB-CG	5.41	1.60	1.51
1	B	304	ARG	NE-CZ	5.37	1.40	1.33
1	B	334	GLU	CB-CG	5.35	1.62	1.52
1	B	591	TYR	CE1-CZ	5.24	1.45	1.38
1	B	537	ARG	CD-NE	5.18	1.55	1.46
1	B	92	PHE	CB-CG	-5.14	1.42	1.51
1	B	236	TYR	CB-CG	-5.13	1.44	1.51
1	B	498	ARG	CZ-NH2	5.12	1.39	1.33
1	B	572	ARG	CZ-NH1	5.12	1.39	1.33
1	B	86	ARG	NE-CZ	5.11	1.39	1.33
1	B	271	GLU	CB-CG	5.11	1.61	1.52
1	B	411	TYR	CE2-CZ	5.11	1.45	1.38
1	B	306	GLY	N-CA	-5.09	1.38	1.46
1	B	523	TYR	CE2-CZ	5.09	1.45	1.38
1	B	400	GLU	CA-CB	5.08	1.65	1.53
1	B	582	ARG	CZ-NH1	5.04	1.39	1.33

All (107) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	453	ARG	NE-CZ-NH1	-14.76	112.92	120.30
1	B	86	ARG	NE-CZ-NH1	-14.59	113.00	120.30
1	B	487	TYR	CB-CG-CD2	-14.13	112.52	121.00
1	B	163	ARG	NE-CZ-NH2	-12.41	114.09	120.30
1	B	210	ARG	NE-CZ-NH2	-12.10	114.25	120.30
1	B	248	ARG	NE-CZ-NH1	-12.00	114.30	120.30
1	B	210	ARG	NE-CZ-NH1	11.35	125.97	120.30
1	B	493	ARG	NE-CZ-NH1	-10.81	114.89	120.30
1	B	407	TYR	CB-CG-CD2	-10.73	114.56	121.00
1	B	222	ARG	NE-CZ-NH1	10.41	125.50	120.30
1	B	244	TYR	CB-CG-CD2	-9.77	115.14	121.00
1	B	279	TYR	CB-CG-CD1	-9.62	115.22	121.00
1	B	335	ARG	NE-CZ-NH2	-9.61	115.49	120.30
1	B	340	ARG	NE-CZ-NH2	9.47	125.03	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	366	ARG	NE-CZ-NH1	9.27	124.93	120.30
1	B	366	ARG	NE-CZ-NH2	-8.48	116.06	120.30
1	B	582	ARG	NE-CZ-NH2	-8.34	116.13	120.30
1	B	587	ARG	NE-CZ-NH2	-8.29	116.15	120.30
1	B	555	LEU	CB-CG-CD2	8.03	124.65	111.00
1	B	477	ASP	CB-CG-OD1	-7.96	111.13	118.30
1	B	451	TYR	CB-CG-CD2	7.95	125.77	121.00
1	B	443	LYS	N-CA-CB	7.70	124.46	110.60
1	B	474	ARG	NE-CZ-NH2	-7.65	116.48	120.30
1	B	250	ARG	NE-CZ-NH1	7.63	124.11	120.30
1	B	531	PHE	CB-CG-CD1	7.62	126.13	120.80
1	B	153	TYR	CB-CG-CD2	-7.53	116.48	121.00
1	B	143	ARG	NE-CZ-NH2	-7.45	116.58	120.30
1	B	163	ARG	NE-CZ-NH1	7.36	123.98	120.30
1	B	95	TYR	CB-CG-CD2	-7.32	116.61	121.00
1	B	321	ARG	NE-CZ-NH1	-7.18	116.71	120.30
1	B	163	ARG	N-CA-CB	7.10	123.39	110.60
1	B	487	TYR	CB-CG-CD1	7.04	125.22	121.00
1	B	437	TYR	CZ-CE2-CD2	7.03	126.13	119.80
1	B	91	ALA	N-CA-CB	7.02	119.93	110.10
1	B	250	ARG	NE-CZ-NH2	-7.01	116.80	120.30
1	B	362	PRO	N-CA-CB	6.92	111.61	103.30
1	B	317	ASP	CB-CG-OD1	-6.92	112.07	118.30
1	B	259	ARG	NE-CZ-NH1	6.84	123.72	120.30
1	B	451	TYR	CB-CG-CD1	-6.79	116.92	121.00
1	B	271	GLU	OE1-CD-OE2	6.77	131.43	123.30
1	B	479	TYR	CB-CG-CD2	-6.76	116.95	121.00
1	B	482	ASP	CB-CG-OD1	6.59	124.23	118.30
1	B	335	ARG	NE-CZ-NH1	6.58	123.59	120.30
1	B	451	TYR	CG-CD2-CE2	6.49	126.49	121.30
1	B	328	ARG	NE-CZ-NH2	6.46	123.53	120.30
1	B	458	LEU	CB-CG-CD1	6.44	121.95	111.00
1	B	400	GLU	OE1-CD-OE2	6.40	130.98	123.30
1	B	87	TYR	CG-CD2-CE2	-6.37	116.21	121.30
1	B	356	PHE	CB-CG-CD1	-6.24	116.43	120.80
1	B	531	PHE	CB-CG-CD2	-6.23	116.44	120.80
1	B	537	ARG	NE-CZ-NH1	-6.16	117.22	120.30
1	B	523	TYR	CB-CG-CD2	-6.12	117.33	121.00
1	B	231	ARG	NE-CZ-NH2	6.12	123.36	120.30
1	B	482	ASP	CB-CG-OD2	-6.10	112.81	118.30
1	B	244	TYR	CB-CG-CD1	6.07	124.64	121.00
1	B	163	ARG	N-CA-C	-6.06	94.63	111.00

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	553	ARG	NE-CZ-NH1	6.04	123.32	120.30
1	B	527	ARG	N-CA-CB	6.03	121.45	110.60
1	B	488	LEU	CB-CG-CD2	6.03	121.24	111.00
1	B	328	ARG	CG-CD-NE	-6.01	99.18	111.80
1	B	396	GLU	CB-CA-C	-5.97	98.46	110.40
1	B	561	THR	CA-CB-CG2	-5.93	104.10	112.40
1	B	385	VAL	CG1-CB-CG2	-5.84	101.55	110.90
1	B	533	GLY	N-CA-C	-5.84	98.50	113.10
1	B	84	VAL	CG1-CB-CG2	-5.74	101.72	110.90
1	B	477	ASP	CB-CG-OD2	5.73	123.46	118.30
1	B	288	TYR	CB-CG-CD2	-5.72	117.57	121.00
1	B	436	PHE	CB-CG-CD1	-5.68	116.82	120.80
1	B	489	ASP	CB-CG-OD2	-5.66	113.20	118.30
1	B	288	TYR	CG-CD2-CE2	-5.64	116.79	121.30
1	B	238	PHE	CB-CG-CD2	-5.59	116.89	120.80
1	B	288	TYR	CD1-CE1-CZ	-5.54	114.81	119.80
1	B	403	LEU	CB-CG-CD2	5.53	120.40	111.00
1	B	86	ARG	NE-CZ-NH2	5.52	123.06	120.30
1	B	248	ARG	NE-CZ-NH2	5.50	123.05	120.30
1	B	324	PRO	N-CD-CG	5.49	111.43	103.20
1	B	257	ILE	CB-CA-C	5.48	122.56	111.60
1	B	425	SER	N-CA-CB	5.43	118.65	110.50
1	B	465	ARG	NE-CZ-NH2	-5.41	117.60	120.30
1	B	87	TYR	CB-CG-CD2	-5.40	117.76	121.00
1	B	479	TYR	CB-CG-CD1	5.40	124.24	121.00
1	B	142	ILE	CA-CB-CG2	5.36	121.62	110.90
1	B	437	TYR	N-CA-CB	5.36	120.24	110.60
1	B	202	LEU	CB-CA-C	-5.33	100.07	110.20
1	B	565	ASP	CA-C-O	-5.32	108.94	120.10
1	B	258	ARG	NE-CZ-NH2	-5.30	117.65	120.30
1	B	493	ARG	NH1-CZ-NH2	5.30	125.23	119.40
1	B	373	ILE	N-CA-CB	5.30	122.98	110.80
1	B	537	ARG	NE-CZ-NH2	5.30	122.95	120.30
1	B	554	PHE	CB-CG-CD2	-5.26	117.12	120.80
1	B	465	ARG	NE-CZ-NH1	5.23	122.91	120.30
1	B	491	GLU	OE1-CD-OE2	5.22	129.56	123.30
1	B	273	ASP	N-CA-C	-5.17	97.05	111.00
1	B	572	ARG	NE-CZ-NH1	5.16	122.88	120.30
1	B	116	LYS	N-CA-CB	5.16	119.88	110.60
1	B	95	TYR	CG-CD2-CE2	-5.16	117.17	121.30
1	B	451	TYR	CD1-CE1-CZ	5.15	124.44	119.80
1	B	236	TYR	N-CA-CB	5.10	119.78	110.60

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	236	TYR	CB-CG-CD2	5.10	124.06	121.00
1	B	95	TYR	CB-CG-CD1	5.09	124.05	121.00
1	B	333	SER	C-N-CA	5.08	134.41	121.70
1	B	591	TYR	CB-CG-CD1	5.06	124.03	121.00
1	B	299	LYS	CA-CB-CG	5.02	124.44	113.40
1	B	273	ASP	N-CA-CB	5.01	119.63	110.60
1	B	170	TYR	CG-CD1-CE1	-5.01	117.29	121.30
1	B	562	PHE	CD1-CE1-CZ	-5.01	114.09	120.10
1	B	545	MET	CA-CB-CG	5.00	121.81	113.30

There are no chirality outliers.

All (19) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	B	153	TYR	Sidechain
1	B	156	ARG	Sidechain
1	B	236	TYR	Sidechain
1	B	244	TYR	Sidechain
1	B	248	ARG	Sidechain
1	B	250	ARG	Sidechain
1	B	280	LEU	Peptide
1	B	314	TYR	Sidechain
1	B	340	ARG	Sidechain
1	B	411	TYR	Sidechain
1	B	421	TYR	Sidechain
1	B	451	TYR	Sidechain
1	B	465	ARG	Sidechain
1	B	474	ARG	Sidechain
1	B	479	TYR	Sidechain
1	B	498	ARG	Sidechain
1	B	537	ARG	Sidechain
1	B	572	ARG	Sidechain
1	B	95	TYR	Sidechain

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	B	4729	0	4783	102	0
2	B	16	0	0	17	0
All	All	4745	0	4783	102	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 11.

All (102) 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:72:ILE:HD12	2:B:601:SF4:S1	1.43	1.55
1:B:7:ILE:CG2	1:B:319:ASN:ND2	2.00	1.23
1:B:7:ILE:HG21	1:B:319:ASN:ND2	1.58	1.17
1:B:72:ILE:CD1	2:B:601:SF4:S1	2.33	1.15
1:B:58:CYS:N	2:B:601:SF4:S3	2.23	1.11
1:B:78:GLN:HG2	1:B:96:ARG:NH1	1.69	1.08
1:B:7:ILE:CG2	1:B:319:ASN:HD22	1.64	1.04
1:B:7:ILE:HG23	1:B:319:ASN:HD22	1.13	1.04
1:B:3:ARG:HB3	1:B:80:ASP:CB	1.92	1.00
1:B:48:PRO:HG3	2:B:602:SF4:S3	2.02	0.99
1:B:22:HIS:H	1:B:27:ARG:NH1	1.67	0.92
1:B:6:ARG:NH2	1:B:74:ASN:HD21	1.69	0.91
1:B:7:ILE:HG23	1:B:319:ASN:ND2	1.74	0.88
1:B:7:ILE:CG2	1:B:319:ASN:HD21	1.88	0.87
1:B:3:ARG:HB3	1:B:80:ASP:HB3	1.55	0.86
1:B:15:CYS:HG	2:B:602:SF4:FE4	0.59	0.85
1:B:77:GLU:HA	1:B:81:GLU:HB2	1.59	0.84
1:B:72:ILE:CG2	2:B:601:SF4:S1	2.65	0.84
1:B:82:ASP:O	1:B:83:CYS:O	1.95	0.83
1:B:72:ILE:HG21	2:B:601:SF4:S1	2.19	0.82
1:B:15:CYS:SG	2:B:602:SF4:FE4	1.72	0.82
1:B:7:ILE:HG21	1:B:319:ASN:HD21	1.44	0.81
1:B:61:CYS:SG	2:B:601:SF4:S2	2.79	0.81
1:B:15:CYS:HB2	2:B:602:SF4:S2	2.20	0.80
1:B:57:GLY:C	2:B:601:SF4:S3	2.44	0.80
1:B:78:GLN:HG2	1:B:96:ARG:HH11	1.44	0.79
1:B:25:CYS:SG	2:B:602:SF4:S4	2.82	0.78
1:B:2:VAL:O	1:B:3:ARG:HB2	1.84	0.75
1:B:25:CYS:HB3	1:B:39:ILE:HD13	1.68	0.75
1:B:57:GLY:HA2	2:B:601:SF4:S3	2.06	0.74
1:B:6:ARG:CZ	1:B:74:ASN:HD21	2.01	0.73
1:B:78:GLN:HG2	1:B:96:ARG:HH12	1.53	0.72

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:74:ASN:HB3	1:B:76:PRO:HD3	1.72	0.72
1:B:3:ARG:CB	1:B:80:ASP:CB	2.67	0.71
1:B:82:ASP:O	1:B:83:CYS:C	2.34	0.66
1:B:22:HIS:H	1:B:27:ARG:HH12	1.40	0.66
1:B:79:LEU:HD12	1:B:79:LEU:O	1.97	0.65
1:B:48:PRO:CG	2:B:602:SF4:S3	2.84	0.64
1:B:74:ASN:HB3	1:B:76:PRO:CD	2.27	0.64
1:B:7:ILE:CD1	1:B:75:LEU:HD11	2.28	0.64
1:B:74:ASN:HB3	1:B:76:PRO:HG3	1.80	0.63
1:B:67:PHE:O	1:B:68:ASN:HB2	1.99	0.62
1:B:72:ILE:HG23	2:B:601:SF4:S1	2.38	0.62
1:B:4:LYS:HG3	1:B:76:PRO:N	2.13	0.62
1:B:6:ARG:HD2	1:B:55:CYS:O	2.00	0.61
1:B:78:GLN:CG	1:B:96:ARG:NH1	2.57	0.61
1:B:77:GLU:HG3	1:B:81:GLU:HG2	1.84	0.60
1:B:3:ARG:CB	1:B:80:ASP:HB3	2.31	0.59
1:B:19:LYS:HD3	1:B:67:PHE:HZ	1.66	0.59
1:B:78:GLN:O	1:B:96:ARG:NH1	2.36	0.58
1:B:10:ILE:HG23	1:B:69:ALA:O	2.04	0.57
1:B:4:LYS:HE2	1:B:74:ASN:HB3	1.85	0.57
1:B:54:SER:O	1:B:55:CYS:C	2.44	0.56
1:B:22:HIS:H	1:B:27:ARG:HH11	1.50	0.56
1:B:7:ILE:HD12	1:B:75:LEU:HD11	1.88	0.55
1:B:6:ARG:CZ	1:B:74:ASN:ND2	2.70	0.55
1:B:6:ARG:NH2	1:B:74:ASN:ND2	2.49	0.55
1:B:72:ILE:CG1	2:B:601:SF4:S1	2.94	0.55
1:B:74:ASN:HB3	1:B:76:PRO:CG	2.37	0.54
1:B:40:ILE:HD12	1:B:51:GLN:OE1	2.06	0.54
1:B:78:GLN:CG	1:B:96:ARG:HH12	2.16	0.53
1:B:38:ALA:HA	1:B:54:SER:HB2	1.90	0.52
1:B:78:GLN:HE21	1:B:96:ARG:HH12	1.56	0.52
1:B:28:VAL:CG1	1:B:60:ILE:HG22	2.40	0.52
1:B:7:ILE:HD11	1:B:75:LEU:HD11	1.91	0.51
1:B:15:CYS:CB	2:B:602:SF4:S2	2.96	0.51
1:B:26:GLU:CG	1:B:32:ASN:HD22	2.23	0.51
1:B:16:ASN:C	1:B:16:ASN:HD22	2.14	0.50
1:B:453:ARG:HH21	1:B:457:ASP:HB3	1.77	0.50
1:B:82:ASP:OD2	1:B:96:ARG:HG2	2.12	0.50
1:B:58:CYS:SG	1:B:60:ILE:HG13	2.53	0.49
1:B:344:VAL:HG21	1:B:401:TRP:CE3	2.49	0.48
1:B:39:ILE:HG12	1:B:50:ILE:HG12	1.96	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:74:ASN:CB	1:B:76:PRO:CD	2.88	0.47
1:B:54:SER:O	1:B:55:CYS:O	2.33	0.47
1:B:20:CYS:HB3	1:B:66:PRO:HG3	1.97	0.47
1:B:423:LEU:HD22	1:B:455:VAL:HG21	1.97	0.47
1:B:558:VAL:O	1:B:560:ILE:HG12	2.15	0.47
1:B:26:GLU:HG3	1:B:32:ASN:HD22	1.80	0.46
1:B:78:GLN:HE21	1:B:96:ARG:NH1	2.14	0.46
1:B:419:THR:HA	1:B:454:ASN:HA	1.98	0.45
1:B:3:ARG:NH2	1:B:80:ASP:OD1	2.46	0.45
1:B:3:ARG:HB3	1:B:80:ASP:HB2	1.93	0.44
1:B:4:LYS:CG	1:B:76:PRO:CD	2.96	0.43
1:B:64:LYS:O	1:B:65:CYS:C	2.57	0.42
1:B:28:VAL:HG11	1:B:64:LYS:HG2	2.01	0.42
1:B:11:ASP:OD1	1:B:14:LYS:HE2	2.19	0.42
1:B:561:THR:OG1	1:B:581:ASP:HA	2.20	0.42
1:B:28:VAL:HG12	1:B:60:ILE:HG22	2.01	0.42
1:B:17:PRO:HB3	1:B:23:PHE:CE1	2.54	0.42
1:B:218:GLY:CA	1:B:249:GLN:HE22	2.33	0.42
1:B:12:TYR:C	1:B:14:LYS:H	2.23	0.41
1:B:1:MET:O	1:B:2:VAL:HG13	2.20	0.41
1:B:342:THR:HG23	1:B:364:GLU:HG3	2.01	0.41
1:B:344:VAL:HG21	1:B:401:TRP:CD2	2.55	0.41
1:B:218:GLY:HA3	1:B:249:GLN:HE22	1.86	0.41
1:B:303:THR:O	1:B:307:ILE:HG13	2.20	0.41
1:B:29:CYS:HB2	1:B:39:ILE:HD12	2.02	0.41
1:B:6:ARG:NH2	1:B:56:THR:O	2.54	0.41
1:B:10:ILE:HA	1:B:69:ALA:O	2.21	0.41
1:B:30:PRO:HD3	1:B:60:ILE:HD12	2.03	0.40
1:B:12:TYR:C	1:B:14:LYS:N	2.74	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 PDB entries followed by that with respect to all EM entries.

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	B	591/593 (100%)	523 (88%)	51 (9%)	17 (3%)	6 43

All (17) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	3	ARG
1	B	55	CYS
1	B	68	ASN
1	B	75	LEU
1	B	83	CYS
1	B	134	ASP
1	B	44	GLU
1	B	428	ASP
1	B	25	CYS
1	B	96	ARG
1	B	331	LYS
1	B	516	HIS
1	B	52	GLU
1	B	172	ASP
1	B	244	TYR
1	B	332	LEU
1	B	566	PRO

5.3.2 Protein sidechains (i)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM entries.

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	B	512/512 (100%)	494 (96%)	18 (4%)	43 74

All (18) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	2	VAL
1	B	6	ARG
1	B	16	ASN
1	B	47	LYS

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Mol	Chain	Res	Type
1	B	78	GLN
1	B	79	LEU
1	B	80	ASP
1	B	81	GLU
1	B	82	ASP
1	B	117	THR
1	B	136	ASP
1	B	167	LYS
1	B	246	ASP
1	B	403	LEU
1	B	408	LYS
1	B	447	ILE
1	B	458	LEU
1	B	528	LEU

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

Mol	Chain	Res	Type
1	B	16	ASN
1	B	74	ASN
1	B	85	HIS
1	B	90	ASN
1	B	249	GLN
1	B	319	ASN

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)

2 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	SF4	B	601	1	0,12,12	0.00	-	0,24,24	0.00	-
2	SF4	B	602	-	0,12,12	0.00	-	0,24,24	0.00	-

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	SF4	B	601	1	-	0/0/48/48	0/6/5/5
2	SF4	B	602	-	-	0/0/48/48	0/6/5/5

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.

2 monomers are involved in 17 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	601	SF4	10	0
2	B	602	SF4	7	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.