Full wwPDB X-ray Structure Validation Report (i)

Jun 17, 2024 – 05:27 AM EDT

PDB ID	:	5KH0
Title	:	Crystal Structure of HydF from thermosipho melanesiensis in complex with a [4Fe-4S] cluster
Authors	:	Caserta, G.; Pecqueur, L.; Fontecave, M.
Deposited on	:	2016-06-14
Resolution	:	2.80 Å(reported)

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

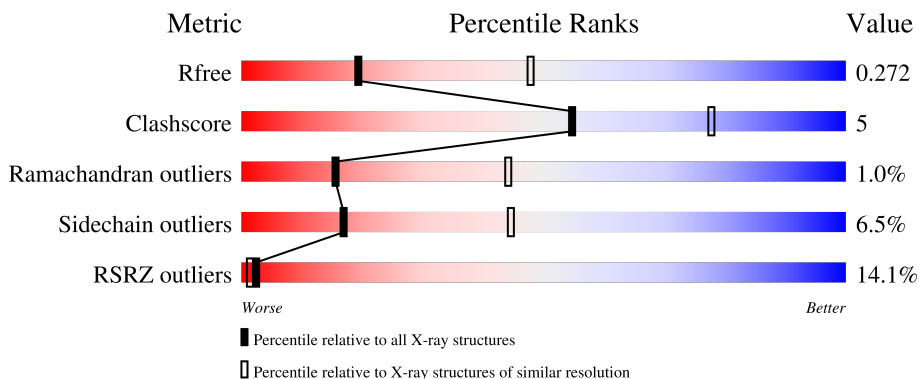|		
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.37.1
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.37.1

1 Overall quality at a glance ⓘ

The following experimental techniques were used to determine the structure:
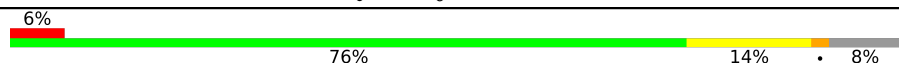*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.80 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.

Metric	Percentile Ranks	Value
Rfree		0.272
Clashscore		5
Ramachandran outliers		1.0%
Sidechain outliers		6.5%
RSRZ outliers		14.1%

Worse *Better*

▉ Percentile relative to all X-ray structures
▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	3140 (2.80-2.80)
Clashscore	141614	3569 (2.80-2.80)
Ramachandran outliers	138981	3498 (2.80-2.80)
Sidechain outliers	138945	3500 (2.80-2.80)
RSRZ outliers	127900	3078 (2.80-2.80)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=5% The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

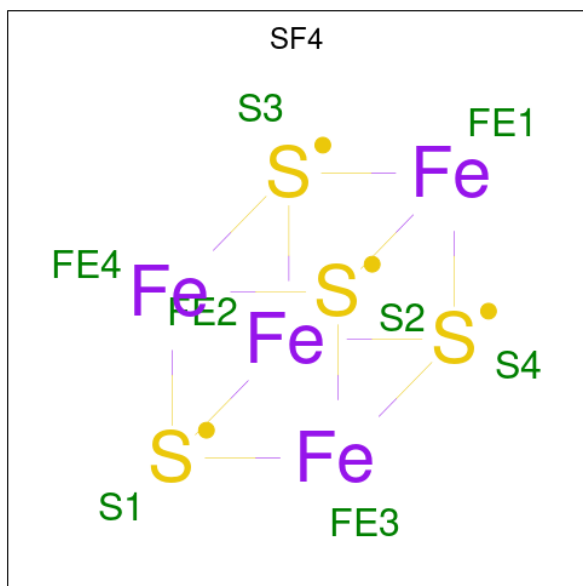| Mol	Chain	Length	Quality of chain
1	A	396	6% / 76% 14% · 8%
1	B	396	7% / 76% 15% · 8%
1	C	396	23% / 76% 13% · 10%
1	D	396	15% / 71% 17% · 10%

2 Entry composition ⓘ

There are 2 unique types of molecules in this entry. The entry contains 11371 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 Small GTP-binding protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	363	Total	C	N	O	S	0	0	0
			2863	1833	489	525	16			
1	B	363	Total	C	N	O	S	0	0	0
			2854	1829	486	523	16			
1	C	356	Total	C	N	O	S	0	0	0
			2807	1798	482	511	16			
1	D	356	Total	C	N	O	S	0	0	0
			2815	1804	482	513	16			

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

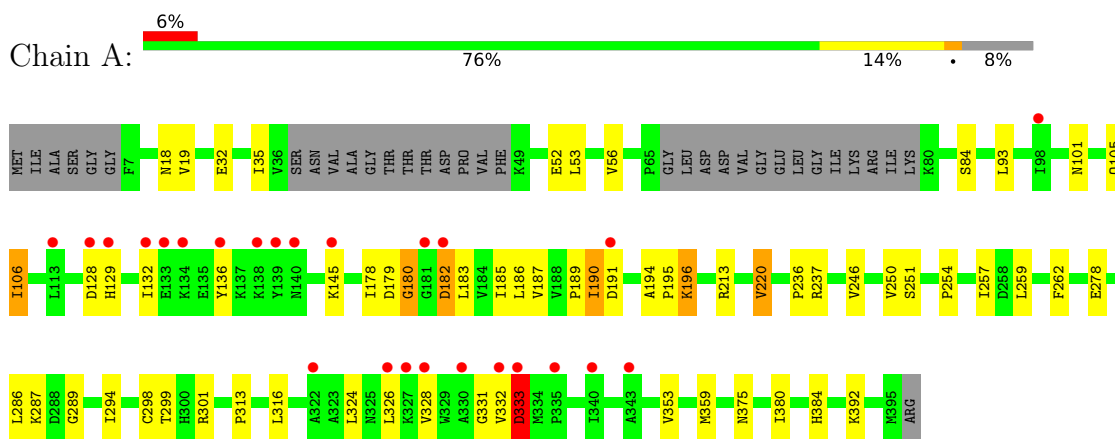| Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	A	1	Total	Fe	S	0	0
			8	4	4		
2	B	1	Total	Fe	S	0	0
			8	4	4		

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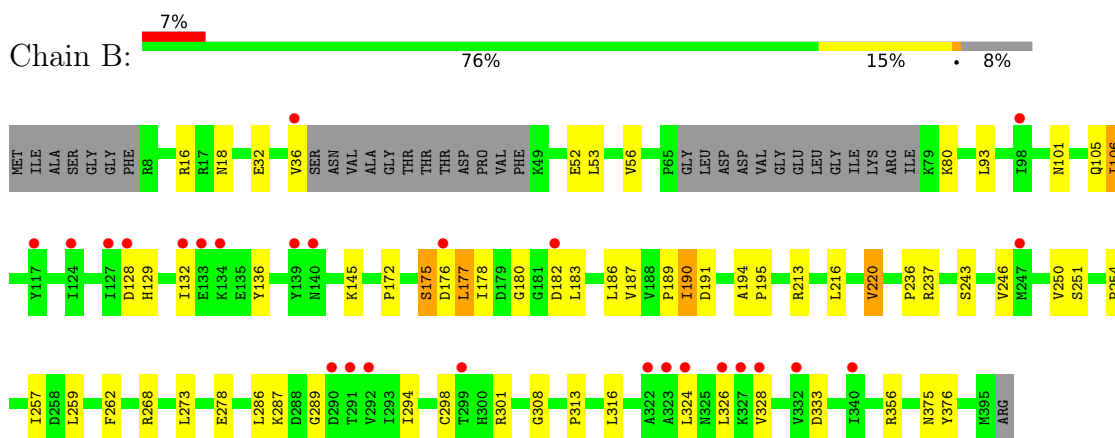| Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	C	1	Total Fe S 8 4 4			0	0
2	D	1	Total Fe S 8 4 4			0	0

3 Residue-property plots ⓘ

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density (RSRZ > 2). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.
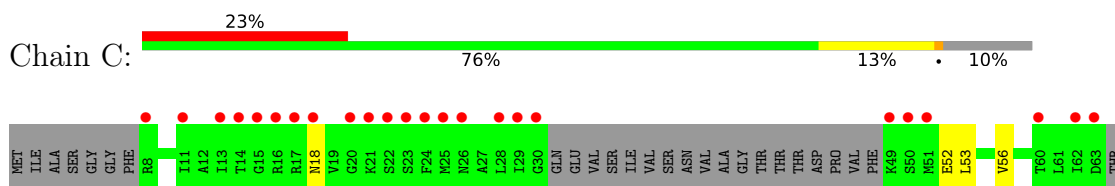
- Molecule 1: Small GTP-binding protein

Chain A:

- Molecule 1: Small GTP-binding protein

Chain B:

- Molecule 1: Small GTP-binding protein

Chain C:

• Molecule 1: Small GTP-binding protein

Chain D:

4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	72.01Å 173.48Å 89.32Å 90.00° 110.01° 90.00°	Depositor
Resolution (Å)	47.62 – 2.80 47.62 – 2.80	Depositor EDS
% Data completeness (in resolution range)	95.2 (47.62-2.80) 95.1 (47.62-2.80)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$<I/\sigma(I)>$ [1]	1.92 (at 2.81Å)	Xtriage
Refinement program	BUSTER 2.10.2	Depositor
R, R_{free}	0.233 , 0.262 0.245 , 0.272	Depositor DCC
R_{free} test set	1948 reflections (4.04%)	wwPDB-VP
Wilson B-factor (Å²)	77.5	Xtriage
Anisotropy	0.038	Xtriage
Bulk solvent k_{sol}(e/Å³), B_{sol}(Å²)	0.38 , 67.9	EDS
L-test for twinning [2]	$<|L|> = 0.49$, $<L^2> = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.92	EDS
Total number of atoms	11371	wwPDB-VP
Average B, all atoms (Å²)	86.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.14% of the height of the origin peak. No significant pseudotranslation is detected.*

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[1]Intensities estimated from amplitudes.
[2]Theoretical values of $<|L|>$, $<L^2>$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality ⓘ

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	#$\|Z\|$ >5	RMSZ	#$\|Z\|$ >5
1	A	0.47	0/2907	0.69	0/3924
1	B	0.46	0/2898	0.69	0/3913
1	C	0.46	0/2850	0.68	0/3843
1	D	0.48	0/2858	0.69	0/3854
All	All	0.47	0/11513	0.69	0/15534

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts ⓘ

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	2863	0	2987	27	0
1	B	2854	0	2974	31	0
1	C	2807	0	2929	24	0
1	D	2815	0	2947	39	0
2	A	8	0	0	0	0
2	B	8	0	0	0	0
2	C	8	0	0	0	0
2	D	8	0	0	0	0
All	All	11371	0	11837	120	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 5.

All (120) 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:D:189:PRO:HD2	1:D:220:VAL:O	1.69	0.92
1:A:189:PRO:HD2	1:A:220:VAL:O	1.70	0.92
1:C:189:PRO:HD2	1:C:220:VAL:O	1.71	0.90
1:B:189:PRO:HD2	1:B:220:VAL:O	1.73	0.89
1:D:11:ILE:CD1	1:D:59:ILE:HG13	2.03	0.88
1:A:194:ALA:HB1	1:A:195:PRO:HD2	1.63	0.80
1:C:194:ALA:HB1	1:C:195:PRO:HD2	1.64	0.80
1:B:93:LEU:HD13	1:B:106:ILE:HD11	1.61	0.79
1:B:16:ARG:HE	1:B:18:ASN:HD21	1.31	0.79
1:D:194:ALA:HB1	1:D:195:PRO:HD2	1.69	0.75
1:B:194:ALA:HB1	1:B:195:PRO:HD2	1.67	0.74
1:D:183:LEU:HD21	1:D:237:ARG:HH11	1.55	0.71
1:D:11:ILE:HD13	1:D:59:ILE:HG13	1.71	0.71
1:B:183:LEU:HD13	1:B:237:ARG:HG2	1.72	0.71
1:A:129:HIS:HA	1:A:145:LYS:HE3	1.75	0.68
1:B:129:HIS:HA	1:B:145:LYS:HE3	1.75	0.68
1:C:129:HIS:HA	1:C:145:LYS:HE3	1.76	0.68
1:D:177:LEU:HD13	1:D:268:ARG:NH2	2.09	0.67
1:D:129:HIS:HA	1:D:145:LYS:HE3	1.77	0.65
1:D:180:GLY:H	1:D:183:LEU:HD22	1.63	0.62
1:C:351:GLY:HA3	1:C:354:MET:HE2	1.81	0.62
1:B:186:LEU:HD13	1:B:236:PRO:HB3	1.84	0.59
1:D:186:LEU:HD13	1:D:236:PRO:HB3	1.85	0.58
1:C:187:VAL:HG13	1:C:262:PHE:HZ	1.69	0.58
1:D:187:VAL:HG13	1:D:262:PHE:HZ	1.69	0.58
1:B:194:ALA:HB1	1:B:195:PRO:CD	2.34	0.58
1:D:194:ALA:HB1	1:D:195:PRO:CD	2.34	0.57
1:B:254:PRO:HD2	1:B:257:ILE:HD12	1.86	0.57
1:C:186:LEU:HD13	1:C:236:PRO:HB3	1.86	0.57
1:A:186:LEU:HD13	1:A:236:PRO:HB3	1.86	0.57
1:A:187:VAL:HG13	1:A:262:PHE:HZ	1.70	0.57
1:A:380:ILE:O	1:A:384:HIS:HD2	1.88	0.56
1:D:254:PRO:HD2	1:D:257:ILE:HD12	1.87	0.56
1:A:196:LYS:HE2	1:A:196:LYS:H	1.70	0.56
1:A:254:PRO:HD2	1:A:257:ILE:HD12	1.88	0.55
1:A:183:LEU:HD13	1:A:237:ARG:HG2	1.88	0.55
1:C:194:ALA:HB1	1:C:195:PRO:CD	2.35	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:179:ASP:HB2	1:C:237:ARG:HH12	1.72	0.54
1:B:132:ILE:HB	1:B:145:LYS:HE2	1.90	0.54
1:B:93:LEU:HD13	1:B:106:ILE:CD1	2.35	0.54
1:B:187:VAL:HG13	1:B:262:PHE:HZ	1.72	0.54
1:A:132:ILE:HB	1:A:145:LYS:HE2	1.90	0.53
1:C:132:ILE:HB	1:C:145:LYS:HE2	1.91	0.53
1:C:254:PRO:HD2	1:C:257:ILE:HD12	1.90	0.53
1:B:180:GLY:H	1:B:183:LEU:HD12	1.74	0.53
1:D:294:ILE:HB	1:D:328:VAL:HG22	1.91	0.52
1:B:183:LEU:HD13	1:B:237:ARG:CG	2.40	0.52
1:C:183:LEU:HD13	1:C:237:ARG:HG2	1.91	0.52
1:D:313:PRO:HB3	1:D:326:LEU:HG	1.90	0.52
1:D:148:ALA:HA	1:D:154:PHE:HE1	1.75	0.52
1:A:178:ILE:C	1:A:180:GLY:H	2.12	0.51
1:C:93:LEU:HD13	1:C:106:ILE:HG21	1.92	0.51
1:A:179:ASP:HA	1:A:213:ARG:NH2	2.26	0.51
1:C:313:PRO:HB3	1:C:326:LEU:HG	1.93	0.51
1:B:101:ASN:O	1:B:105:GLN:HB2	2.10	0.51
1:A:101:ASN:O	1:A:105:GLN:HB2	2.11	0.51
1:A:313:PRO:HB3	1:A:326:LEU:HG	1.92	0.51
1:D:8:ARG:HB3	1:D:58:PRO:HB2	1.91	0.50
1:A:194:ALA:HB1	1:A:195:PRO:CD	2.35	0.50
1:B:172:PRO:HB2	1:B:177:LEU:HG	1.93	0.50
1:B:313:PRO:HB3	1:B:326:LEU:HG	1.93	0.50
1:B:190:ILE:HD12	1:B:190:ILE:H	1.77	0.50
1:C:101:ASN:O	1:C:105:GLN:HB2	2.12	0.50
1:D:132:ILE:HB	1:D:145:LYS:HE2	1.93	0.50
1:D:101:ASN:O	1:D:105:GLN:HB2	2.12	0.49
1:D:177:LEU:HD13	1:D:268:ARG:CZ	2.43	0.48
1:A:332:VAL:O	1:A:333:ASP:HB2	2.13	0.48
1:B:268:ARG:HH21	1:B:356:ARG:HH12	1.61	0.48
1:A:190:ILE:HD12	1:A:190:ILE:H	1.79	0.47
1:B:183:LEU:HD11	1:B:237:ARG:HH11	1.79	0.47
1:A:183:LEU:HD11	1:A:237:ARG:HH11	1.81	0.46
1:C:190:ILE:H	1:C:190:ILE:HD12	1.79	0.46
1:D:154:PHE:HD2	1:D:157:ILE:CD1	2.28	0.46
1:D:336:GLU:HB2	1:D:339:GLU:HG3	1.97	0.46
1:A:53:LEU:O	1:A:56:VAL:O	2.34	0.46
1:D:190:ILE:H	1:D:190:ILE:HD12	1.80	0.46
1:B:182:ASP:CB	1:D:300:HIS:O	2.63	0.46
1:C:190:ILE:H	1:C:190:ILE:CD1	2.30	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:93:LEU:HD13	1:D:106:ILE:HG21	1.98	0.45
1:B:268:ARG:NH2	1:B:356:ARG:HH12	2.14	0.45
1:A:93:LEU:HD13	1:A:106:ILE:HG21	1.98	0.45
1:B:180:GLY:N	1:B:183:LEU:HD12	2.31	0.45
1:D:351:GLY:HA3	1:D:354:MET:CE	2.47	0.45
1:C:246:VAL:O	1:C:250:VAL:HG23	2.16	0.45
1:B:268:ARG:HD2	1:B:273:LEU:HB3	1.99	0.45
1:A:246:VAL:O	1:A:250:VAL:HG23	2.17	0.45
1:A:287:LYS:HD3	1:A:289:GLY:H	1.82	0.45
1:A:294:ILE:HB	1:A:328:VAL:HG22	1.99	0.44
1:B:246:VAL:O	1:B:250:VAL:HG23	2.17	0.44
1:D:190:ILE:H	1:D:190:ILE:CD1	2.30	0.44
1:C:270:ARG:HD2	1:C:350:GLY:O	2.17	0.44
1:C:53:LEU:O	1:C:56:VAL:O	2.36	0.44
1:D:119:ILE:HD13	1:D:136:TYR:CD1	2.53	0.44
1:D:286:LEU:HB3	1:D:324:LEU:HD21	2.00	0.44
1:A:380:ILE:O	1:A:384:HIS:CD2	2.68	0.43
1:B:172:PRO:HB3	1:B:175:SER:OG	2.17	0.43
1:C:287:LYS:HD3	1:C:289:GLY:H	1.83	0.43
1:D:287:LYS:HD3	1:D:289:GLY:H	1.83	0.43
1:C:354:MET:HE2	1:C:354:MET:HB2	1.79	0.43
1:D:351:GLY:HA3	1:D:354:MET:HE2	2.00	0.43
1:B:53:LEU:O	1:B:56:VAL:O	2.35	0.43
1:B:286:LEU:HB3	1:B:324:LEU:HD21	2.00	0.43
1:A:286:LEU:HB3	1:A:324:LEU:HD21	2.01	0.43
1:D:246:VAL:O	1:D:250:VAL:HG23	2.18	0.43
1:B:287:LYS:HD3	1:B:289:GLY:H	1.82	0.43
1:D:98:ILE:HG13	1:D:99:PRO:HD2	2.01	0.43
1:C:286:LEU:HB3	1:C:324:LEU:HD21	2.00	0.43
1:D:308:GLY:HA3	1:D:376:TYR:CZ	2.54	0.42
1:D:270:ARG:HD2	1:D:350:GLY:O	2.20	0.42
1:D:297:GLY:HA3	1:D:354:MET:SD	2.59	0.42
1:B:294:ILE:HB	1:B:328:VAL:HG22	2.01	0.42
1:D:53:LEU:O	1:D:56:VAL:O	2.37	0.42
1:C:308:GLY:HA3	1:C:376:TYR:CZ	2.55	0.41
1:A:299:THR:CG2	1:A:331:GLY:HA2	2.50	0.41
1:B:308:GLY:HA3	1:B:376:TYR:CZ	2.55	0.41
1:D:8:ARG:CB	1:D:58:PRO:HB2	2.51	0.41
1:C:186:LEU:HG	1:C:218:LEU:HD23	2.03	0.40
1:A:180:GLY:C	1:A:182:ASP:H	2.25	0.40
1:D:172:PRO:HB2	1:D:177:LEU:HD12	2.03	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:183:LEU:HD23	1:D:237:ARG:HG2	2.04	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	357/396 (90%)	335 (94%)	18 (5%)	4 (1%)	14	41
1	B	357/396 (90%)	338 (95%)	15 (4%)	4 (1%)	14	41
1	C	350/396 (88%)	330 (94%)	18 (5%)	2 (1%)	25	56
1	D	350/396 (88%)	327 (93%)	19 (5%)	4 (1%)	14	41
All	All	1414/1584 (89%)	1330 (94%)	70 (5%)	14 (1%)	15	44

All (14) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	175	SER
1	B	177	LEU
1	C	179	ASP
1	D	19	VAL
1	D	175	SER
1	B	176	ASP
1	D	176	ASP
1	A	180	GLY
1	A	333	ASP
1	A	136	TYR
1	A	182	ASP
1	B	136	TYR
1	C	136	TYR
1	D	136	TYR

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	321/348 (92%)	297 (92%)	24 (8%)	13	37
1	B	319/348 (92%)	298 (93%)	21 (7%)	16	44
1	C	312/348 (90%)	293 (94%)	19 (6%)	18	48
1	D	315/348 (90%)	297 (94%)	18 (6%)	20	50
All	All	1267/1392 (91%)	1185 (94%)	82 (6%)	17	44

All (82) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	18	ASN
1	A	19	VAL
1	A	32	GLU
1	A	35	ILE
1	A	52	GLU
1	A	84	SER
1	A	106	ILE
1	A	128	ASP
1	A	185	ILE
1	A	190	ILE
1	A	191	ASP
1	A	196	LYS
1	A	220	VAL
1	A	251	SER
1	A	259	LEU
1	A	278	GLU
1	A	298	CYS
1	A	301	ARG
1	A	316	LEU
1	A	333	ASP
1	A	353	VAL
1	A	359	MET
1	A	375	ASN
1	A	392	LYS

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Mol	Chain	Res	Type
1	B	32	GLU
1	B	36	VAL
1	B	52	GLU
1	B	80	LYS
1	B	106	ILE
1	B	128	ASP
1	B	178	ILE
1	B	190	ILE
1	B	191	ASP
1	B	213	ARG
1	B	216	LEU
1	B	220	VAL
1	B	243	SER
1	B	251	SER
1	B	259	LEU
1	B	278	GLU
1	B	298	CYS
1	B	301	ARG
1	B	316	LEU
1	B	333	ASP
1	B	375	ASN
1	C	18	ASN
1	C	52	GLU
1	C	106	ILE
1	C	128	ASP
1	C	185	ILE
1	C	190	ILE
1	C	191	ASP
1	C	201	MET
1	C	216	LEU
1	C	220	VAL
1	C	230	GLU
1	C	243	SER
1	C	251	SER
1	C	259	LEU
1	C	301	ARG
1	C	316	LEU
1	C	333	ASP
1	C	353	VAL
1	C	375	ASN
1	D	19	VAL
1	D	51	MET

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Mol	Chain	Res	Type
1	D	52	GLU
1	D	78	ILE
1	D	97	ASP
1	D	106	ILE
1	D	128	ASP
1	D	131	ASN
1	D	178	ILE
1	D	190	ILE
1	D	191	ASP
1	D	220	VAL
1	D	230	GLU
1	D	251	SER
1	D	259	LEU
1	D	301	ARG
1	D	316	LEU
1	D	353	VAL

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

Mol	Chain	Res	Type
1	A	384	HIS
1	B	18	ASN
1	C	244	GLN
1	D	375	ASN

5.3.3   RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5   Carbohydrates ⓘ

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

4 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	D	401	1	0,12,12	-	-	-		
2	SF4	C	401	1	0,12,12	-	-	-		
2	SF4	A	401	1	0,12,12	-	-	-		
2	SF4	B	401	1	0,12,12	-	-	-		

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	D	401	1	-	-	0/6/5/5
2	SF4	C	401	1	-	-	0/6/5/5
2	SF4	A	401	1	-	-	0/6/5/5
2	SF4	B	401	1	-	-	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.

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, 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(Å²)	Q<0.9
1	A	363/396 (91%)	0.59	25 (6%)	16	10	50, 76, 108, 143	0
1	B	363/396 (91%)	0.73	26 (7%)	15	8	50, 81, 118, 152	0
1	C	356/396 (89%)	1.38	92 (25%)	0	0	48, 85, 161, 179	0
1	D	356/396 (89%)	0.97	60 (16%)	1	1	47, 74, 145, 167	0
All	All	1438/1584 (90%)	0.91	203 (14%)	2	1	47, 79, 146, 179	0

All (203) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	134	LYS	12.4
1	C	148	ALA	9.3
1	D	149	LEU	9.1
1	B	134	LYS	8.2
1	C	149	LEU	8.1
1	D	134	LYS	7.5
1	C	21	LYS	7.4
1	C	50	SER	7.2
1	D	133	GLU	7.1
1	C	22	SER	7.1
1	C	17	ARG	7.1
1	C	132	ILE	7.1
1	D	98	ILE	7.0
1	C	25	MET	6.9
1	A	134	LYS	6.8
1	D	124	ILE	6.8
1	C	133	GLU	6.7
1	D	25	MET	6.7
1	C	95	VAL	6.5
1	C	136	TYR	6.3
1	C	150	LYS	6.1

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Mol	Chain	Res	Type	RSRZ
1	C	120	ALA	6.0
1	C	26	ASN	6.0
1	D	122	ASN	5.8
1	C	126	THR	5.8
1	B	133	GLU	5.5
1	C	127	ILE	5.4
1	D	49	LYS	5.3
1	B	176	ASP	5.3
1	D	126	THR	5.2
1	D	148	ALA	5.2
1	B	132	ILE	5.2
1	B	128	ASP	5.1
1	C	135	GLU	5.1
1	C	94	ILE	5.0
1	C	124	ILE	5.0
1	C	18	ASN	5.0
1	D	176	ASP	4.9
1	C	101	ASN	4.8
1	A	133	GLU	4.8
1	A	326	LEU	4.6
1	C	29	ILE	4.6
1	D	145	LYS	4.5
1	C	98	ILE	4.5
1	D	127	ILE	4.4
1	A	327	LYS	4.4
1	C	24	PHE	4.3
1	D	150	LYS	4.3
1	D	136	TYR	4.2
1	A	182	ASP	4.2
1	C	102	PHE	4.1
1	C	51	MET	4.1
1	C	92	ILE	4.1
1	C	128	ASP	4.0
1	C	330	ALA	4.0
1	C	121	ILE	4.0
1	D	144	LEU	4.0
1	C	157	ILE	4.0
1	D	152	ILE	4.0
1	C	146	VAL	4.0
1	C	303	LEU	4.0
1	C	49	LYS	4.0
1	C	96	ASP	3.9

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Mol	Chain	Res	Type	RSRZ
1	B	327	LYS	3.9
1	C	131	ASN	3.8
1	C	145	LYS	3.8
1	D	78	ILE	3.8
1	D	15	GLY	3.8
1	B	326	LEU	3.7
1	C	16	ARG	3.7
1	B	291	THR	3.7
1	C	144	LEU	3.7
1	C	28	LEU	3.7
1	C	119	ILE	3.7
1	C	23	SER	3.7
1	C	117	TYR	3.6
1	C	154	PHE	3.6
1	C	123	LYS	3.5
1	D	182	ASP	3.5
1	C	326	LEU	3.5
1	C	100	GLY	3.4
1	B	36	VAL	3.4
1	C	97	ASP	3.4
1	D	51	MET	3.4
1	C	105	GLN	3.4
1	B	292	VAL	3.4
1	D	22	SER	3.3
1	C	20	GLY	3.3
1	A	322	ALA	3.3
1	C	181	GLY	3.3
1	C	14	THR	3.3
1	D	14	THR	3.3
1	B	324	LEU	3.2
1	D	154	PHE	3.2
1	A	333	ASP	3.2
1	D	28	LEU	3.1
1	C	152	ILE	3.1
1	C	180	GLY	3.1
1	D	16	ARG	3.1
1	D	125	ASP	3.1
1	D	151	LYS	3.1
1	A	140	ASN	3.1
1	B	98	ILE	3.1
1	C	13	ILE	3.1
1	B	299	THR	3.1

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Mol	Chain	Res	Type	RSRZ
1	D	97	ASP	3.0
1	C	118	PHE	3.0
1	C	110	PHE	3.0
1	D	108	LYS	3.0
1	C	327	LYS	3.0
1	D	121	ILE	3.0
1	C	142	PRO	3.0
1	A	340	ILE	2.9
1	D	123	LYS	2.9
1	C	93	LEU	2.9
1	C	331	GLY	2.9
1	D	61	LEU	2.9
1	D	95	VAL	2.9
1	D	107	ILE	2.8
1	C	11	ILE	2.8
1	D	132	ILE	2.8
1	A	128	ASP	2.8
1	C	122	ASN	2.8
1	C	143	ILE	2.8
1	B	139	TYR	2.7
1	C	179	ASP	2.7
1	C	342	ASP	2.7
1	C	106	ILE	2.7
1	C	340	ILE	2.7
1	D	128	ASP	2.7
1	A	181	GLY	2.7
1	C	15	GLY	2.7
1	C	82	LYS	2.7
1	D	30	GLY	2.7
1	C	8	ARG	2.7
1	D	96	ASP	2.6
1	C	164	ILE	2.6
1	A	335	PRO	2.6
1	C	151	LYS	2.6
1	C	139	TYR	2.6
1	D	17	ARG	2.6
1	D	137	LYS	2.6
1	D	135	GLU	2.6
1	A	132	ILE	2.6
1	A	139	TYR	2.6
1	B	328	VAL	2.6
1	C	125	ASP	2.6

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Mol	Chain	Res	Type	RSRZ
1	C	138	LYS	2.5
1	B	124	ILE	2.5
1	C	62	ILE	2.5
1	D	19	VAL	2.5
1	D	24	PHE	2.5
1	B	323	ALA	2.5
1	C	103	GLU	2.5
1	C	165	LEU	2.5
1	A	129	HIS	2.5
1	C	147	SER	2.5
1	D	157	ILE	2.5
1	D	13	ILE	2.5
1	D	50	SER	2.5
1	A	145	LYS	2.4
1	D	18	ASN	2.4
1	C	99	PRO	2.4
1	D	26	ASN	2.4
1	A	138	LYS	2.4
1	B	140	ASN	2.4
1	D	94	ILE	2.4
1	C	129	HIS	2.4
1	C	332	VAL	2.4
1	C	162	ASN	2.4
1	D	322	ALA	2.4
1	D	146	VAL	2.4
1	D	131	ASN	2.3
1	C	63	ASP	2.3
1	B	340	ILE	2.3
1	B	182	ASP	2.3
1	A	113	LEU	2.3
1	A	191	ASP	2.3
1	C	60	THR	2.3
1	D	129	HIS	2.2
1	B	332	VAL	2.2
1	D	93	LEU	2.2
1	D	101	ASN	2.2
1	B	117	TYR	2.2
1	D	330	ALA	2.2
1	C	287	LYS	2.2
1	A	98	ILE	2.1
1	B	247	MET	2.1
1	C	338	SER	2.1

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Mol	Chain	Res	Type	RSRZ
1	A	328	VAL	2.1
1	A	136	TYR	2.1
1	D	326	LEU	2.1
1	B	290	ASP	2.1
1	B	322	ALA	2.1
1	D	106	ILE	2.1
1	A	330	ALA	2.0
1	C	30	GLY	2.0
1	C	166	PRO	2.0
1	D	190	ILE	2.0
1	A	332	VAL	2.0
1	B	127	ILE	2.0
1	C	107	ILE	2.0
1	A	343	ALA	2.0

6.2 Non-standard residues in protein, DNA, RNA chains ⓘ

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

6.3 Carbohydrates ⓘ

There are no monosaccharides in this entry.

6.4 Ligands ⓘ

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($Å^2$)	Q<0.9
2	SF4	B	401	8/8	0.98	0.21	75,77,78,78	8
2	SF4	A	401	8/8	0.99	0.21	68,69,70,72	8
2	SF4	C	401	8/8	0.99	0.19	65,65,66,67	8
2	SF4	D	401	8/8	0.99	0.19	47,50,53,53	8

6.5 Other polymers ⓘ

There are no such residues in this entry.