



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 9, 2026 – 02:18 PM UTC

PDB ID : 4OAH / pdb_00004oah
Title : Crystal structure of the cytosolic domain of mouse MiD51 H201A mutant
Authors : Loson, O.C.; Kaiser, J.T.; Chan, D.C.
Deposited on : 2014-01-04
Resolution : 2.00 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 types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

MolProbity : 4-5-2 with Phenix2.0
Mogul : 2022.3.0, CSD as543be (2022)
Xtriage (Phenix) : 2.0
EDS : 3.0
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4 : 9.0.010 (Gargrove)
Density-Fitness : 1.0.12
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.49

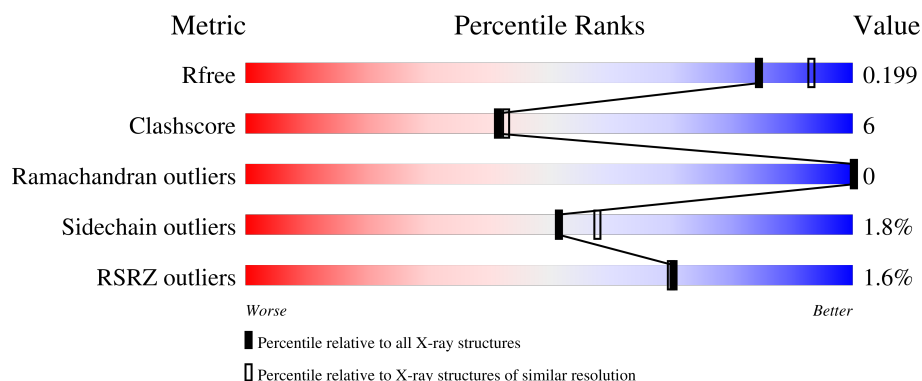
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.00 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)	Similar resolution (#Entries, resolution range(Å))
R_{free}	180053	10052 (2.00-2.00)
Clashscore	190562	11152 (2.00-2.00)
Ramachandran outliers	187476	11031 (2.00-2.00)
Sidechain outliers	187428	11029 (2.00-2.00)
RSRZ outliers	180081	10067 (2.00-2.00)

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 $\leq 5\%$. 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	335	88% 11% .
1	B	335	86% 11% ..
1	C	335	84% 13% ..
1	D	335	82% 15% .

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 11387 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 Mitochondrial dynamic protein MID51.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	330	Total	C	N	O	S	0	0	0
			2568	1645	432	480	11			
1	B	327	Total	C	N	O	S	0	0	0
			2555	1635	432	477	11			
1	C	327	Total	C	N	O	S	0	0	0
			2553	1632	431	479	11			
1	D	326	Total	C	N	O	S	0	0	0
			2524	1611	428	474	11			

There are 24 discrepancies between the modelled and reference sequences:

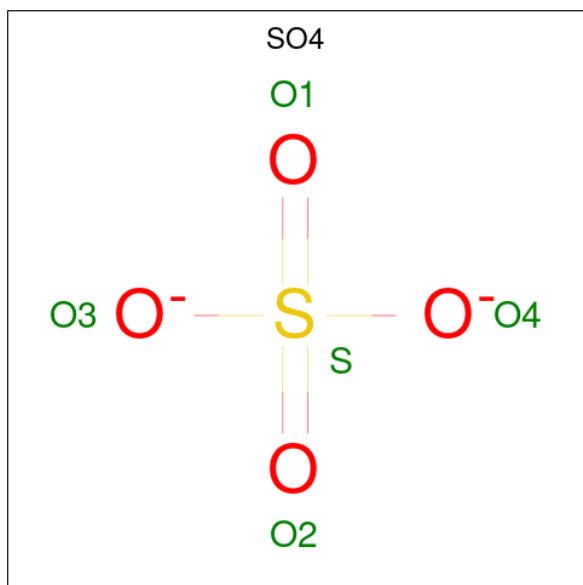
Chain	Residue	Modelled	Actual	Comment	Reference
A	129	GLY	-	expression tag	UNP Q8BGV8
A	130	PRO	-	expression tag	UNP Q8BGV8
A	131	LEU	-	expression tag	UNP Q8BGV8
A	132	GLY	-	expression tag	UNP Q8BGV8
A	133	SER	-	expression tag	UNP Q8BGV8
A	201	ALA	HIS	engineered mutation	UNP Q8BGV8
B	129	GLY	-	expression tag	UNP Q8BGV8
B	130	PRO	-	expression tag	UNP Q8BGV8
B	131	LEU	-	expression tag	UNP Q8BGV8
B	132	GLY	-	expression tag	UNP Q8BGV8
B	133	SER	-	expression tag	UNP Q8BGV8
B	201	ALA	HIS	engineered mutation	UNP Q8BGV8
C	129	GLY	-	expression tag	UNP Q8BGV8
C	130	PRO	-	expression tag	UNP Q8BGV8
C	131	LEU	-	expression tag	UNP Q8BGV8
C	132	GLY	-	expression tag	UNP Q8BGV8
C	133	SER	-	expression tag	UNP Q8BGV8
C	201	ALA	HIS	engineered mutation	UNP Q8BGV8
D	129	GLY	-	expression tag	UNP Q8BGV8
D	130	PRO	-	expression tag	UNP Q8BGV8
D	131	LEU	-	expression tag	UNP Q8BGV8

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Chain	Residue	Modelled	Actual	Comment	Reference
D	132	GLY	-	expression tag	UNP Q8BGV8
D	133	SER	-	expression tag	UNP Q8BGV8
D	201	ALA	HIS	engineered mutation	UNP Q8BGV8

- Molecule 2 is SULFATE ION (CCD ID: SO4) (formula: O₄S).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	A	1	Total	O	S	0	0
			5	4	1		
2	B	1	Total	O	S	0	0
			5	4	1		
2	B	1	Total	O	S	0	0
			5	4	1		
2	C	1	Total	O	S	0	0
			5	4	1		
2	C	1	Total	O	S	0	0
			5	4	1		
2	D	1	Total	O	S	0	0
			5	4	1		

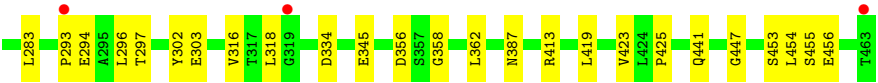
- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	352	Total	O	0	0
			352	352		
3	B	311	Total	O	0	0
			311	311		

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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	C	253	Total 253	O 253	0	0
3	D	241	Total 241	O 241	0	0



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	82.43Å 79.15Å 103.45Å 90.00° 98.04° 90.00°	Depositor
Resolution (Å)	31.51 – 2.00 31.51 – 2.00	Depositor EDS
% Data completeness (in resolution range)	97.9 (31.51-2.00) 90.4 (31.51-2.00)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	0.59 (at 1.85Å)	Xtriage
Refinement program	PHENIX 1.8.1_1168	Depositor
R, R_{free}	0.172 , 0.217 (Not available) , 0.199	Depositor DCC
R_{free} test set	2000 reflections (1.88%)	wwPDB-VP
Wilson B-factor (Å ²)	24.7	Xtriage
Anisotropy	0.584	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.35 , 51.4	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	11387	wwPDB-VP
Average B, all atoms (Å ²)	33.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 31.00 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 1.1901e-03. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: SO4

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	0.54	0/2625	0.84	1/3586 (0.0%)
1	B	0.49	0/2609	0.76	0/3559
1	C	0.51	0/2606	0.84	0/3555
1	D	0.48	0/2587	0.90	4/3535 (0.1%)
All	All	0.51	0/10427	0.84	5/14235 (0.0%)

There are no bond length outliers.

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	356	ASP	N-CA-C	10.06	129.09	113.19
1	D	283	LEU	N-CA-C	-8.95	97.62	110.59
1	A	269	VAL	N-CA-C	5.38	116.87	111.00
1	D	358	GLY	N-CA-C	5.15	121.01	112.66
1	D	213	ASN	N-CA-C	5.05	119.15	112.89

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	2568	0	2578	27	0
1	B	2555	0	2572	30	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	C	2553	0	2560	28	0
1	D	2524	0	2537	49	0
2	A	5	0	0	0	0
2	B	10	0	0	0	0
2	C	10	0	0	0	0
2	D	5	0	0	0	0
3	A	352	0	0	9	0
3	B	311	0	0	13	0
3	C	253	0	0	8	0
3	D	241	0	0	17	0
All	All	11387	0	10247	131	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 6.

All (131) 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:144:ARG:NH1	3:B:744:HOH:O	1.90	1.02
1:A:288:ARG:HH21	1:A:299:GLU:HG2	1.35	0.92
1:A:167:GLU:OE1	3:A:872:HOH:O	1.95	0.84
1:D:413:ARG:NH1	3:D:758:HOH:O	2.10	0.84
1:B:264:ASP:OD1	3:B:859:HOH:O	1.94	0.83
1:D:173:ARG:NH1	3:D:765:HOH:O	1.99	0.81
1:B:182:ARG:NH2	1:D:176:LEU:O	2.15	0.80
1:D:303:GLU:OE2	3:D:744:HOH:O	2.00	0.78
1:D:173:ARG:HH11	1:D:173:ARG:HG2	1.49	0.78
1:B:134:SER:N	3:B:603:HOH:O	2.16	0.77
1:D:260:LYS:HE2	1:D:334:ASP:HB2	1.69	0.75
1:D:455:SER:O	3:D:680:HOH:O	2.05	0.75
1:A:260:LYS:HE2	1:A:334:ASP:HB2	1.66	0.75
1:A:272:GLY:O	3:A:779:HOH:O	2.05	0.74
1:B:420:GLU:OE2	3:B:792:HOH:O	2.07	0.72
1:A:402:ASP:OD2	3:A:746:HOH:O	2.07	0.71
1:B:303:GLU:HG2	1:B:306:LYS:HB2	1.70	0.71
1:A:293:PRO:O	1:D:441:GLN:NE2	2.24	0.70
1:C:303:GLU:HB2	1:C:306:LYS:HB2	1.73	0.69
1:D:179:MET:HE3	1:D:248:TRP:HH2	1.57	0.68
1:D:419:LEU:O	3:D:811:HOH:O	2.12	0.68
1:D:191:TYR:OH	3:D:756:HOH:O	2.11	0.67
1:D:266:PHE:CE1	1:D:270:VAL:HG21	2.32	0.65

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:284:ASP:OD1	3:B:829:HOH:O	2.13	0.65
1:C:167:GLU:OE2	3:C:848:HOH:O	2.14	0.65
1:C:267:GLU:OE1	3:C:781:HOH:O	2.15	0.64
1:C:260:LYS:NZ	3:C:757:HOH:O	2.32	0.63
1:A:458:GLU:O	1:A:462:GLN:HG3	1.99	0.63
1:D:302:TYR:O	3:D:705:HOH:O	2.16	0.63
1:B:223:THR:OG1	1:B:225:MET:HG2	1.99	0.62
1:B:306:LYS:HA	3:B:861:HOH:O	1.99	0.61
1:C:356:ASP:HB3	1:C:358:GLY:N	2.16	0.61
1:D:260:LYS:NZ	3:D:789:HOH:O	2.15	0.61
1:D:134:SER:OG	3:D:813:HOH:O	1.87	0.59
1:B:219:PRO:HG2	1:B:222:ASP:OD2	2.02	0.59
1:D:173:ARG:HH11	1:D:173:ARG:CG	2.13	0.59
1:B:237:ASN:ND2	3:B:876:HOH:O	2.35	0.59
1:B:332:GLN:OE1	3:B:848:HOH:O	2.16	0.58
1:A:294:GLU:HA	1:A:295:ALA:C	2.28	0.58
1:D:266:PHE:O	1:D:270:VAL:HG22	2.03	0.58
1:D:184:MET:HE2	1:D:266:PHE:HZ	1.68	0.58
1:D:453:SER:OG	3:D:749:HOH:O	2.07	0.58
1:A:326:ARG:NH1	3:A:680:HOH:O	2.36	0.57
1:B:458:GLU:O	1:B:462:GLN:HG2	2.04	0.57
1:A:271:ALA:HA	1:A:274:ILE:HD12	1.86	0.56
1:D:176:LEU:HB3	1:D:179:MET:HB3	1.86	0.56
1:D:206:VAL:HG11	1:D:266:PHE:CE1	2.41	0.56
1:C:423:VAL:HG12	1:C:425:PRO:HD3	1.88	0.55
1:B:326:ARG:NE	3:B:647:HOH:O	2.11	0.55
1:D:260:LYS:HD3	1:D:334:ASP:O	2.07	0.55
1:B:453:SER:HB2	1:B:460:LEU:HD13	1.88	0.55
1:C:399:TRP:N	3:C:689:HOH:O	2.08	0.55
1:D:212:GLN:HG2	3:D:671:HOH:O	2.07	0.54
1:D:179:MET:HE3	1:D:248:TRP:CH2	2.40	0.54
1:A:293:PRO:HA	1:A:294:GLU:CB	2.38	0.53
1:A:306:LYS:NZ	3:A:922:HOH:O	2.13	0.53
1:A:299:GLU:HB2	3:A:851:HOH:O	2.08	0.53
1:C:267:GLU:HA	1:C:271:ALA:HB3	1.92	0.52
1:A:431:LYS:NZ	3:A:894:HOH:O	2.43	0.52
1:B:182:ARG:NH2	1:D:179:MET:O	2.44	0.51
1:C:413:ARG:HG2	3:C:827:HOH:O	2.10	0.51
1:D:294:GLU:OE2	1:D:297:THR:HG21	2.10	0.51
1:A:288:ARG:NH2	1:A:299:GLU:HG2	2.16	0.51
1:C:176:LEU:HD11	1:C:270:VAL:HG22	1.93	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:267:GLU:OE2	1:C:295:ALA:HB1	2.11	0.51
1:D:423:VAL:HG12	1:D:425:PRO:HD3	1.93	0.50
1:A:303:GLU:O	1:A:306:LYS:N	2.35	0.50
1:C:192:ASP:O	1:C:350:ARG:NH2	2.44	0.50
1:D:173:ARG:NH1	1:D:173:ARG:CG	2.74	0.50
1:A:299:GLU:OE2	1:A:307:HIS:HB3	2.11	0.49
1:D:425:PRO:HG2	3:D:739:HOH:O	2.12	0.49
1:B:184:MET:HE1	1:B:312:PHE:HE2	1.77	0.49
1:D:208:LEU:HB2	1:D:316:VAL:HG12	1.95	0.49
1:B:180:PRO:HG3	1:B:247:TYR:HB3	1.95	0.49
1:D:271:ALA:HA	1:D:274:ILE:HD12	1.95	0.49
1:D:266:PHE:CD1	1:D:270:VAL:HG21	2.48	0.48
1:B:164:ILE:O	1:B:168:LEU:HG	2.14	0.48
1:B:462:GLN:NE2	3:B:856:HOH:O	2.47	0.47
1:B:303:GLU:OE2	1:B:306:LYS:HG3	2.15	0.47
1:B:226:ASN:OD1	3:B:881:HOH:O	2.20	0.47
1:C:456:GLU:HB2	1:C:458:GLU:OE2	2.14	0.47
1:C:184:MET:HE1	1:C:270:VAL:HG11	1.98	0.45
1:D:228:PRO:HG2	3:D:610:HOH:O	2.15	0.45
1:B:462:GLN:HA	1:B:463:THR:HA	1.70	0.45
1:B:276:TRP:CH2	1:B:298:LEU:HD11	2.52	0.45
1:D:345:GLU:CD	1:D:387:ASN:HD21	2.24	0.45
1:C:219:PRO:HG2	1:C:222:ASP:OD2	2.17	0.45
1:C:333:TYR:HB3	1:C:336:LEU:HD12	1.98	0.45
1:D:217:CYS:SG	1:D:318:LEU:HB2	2.57	0.45
1:D:210:LEU:HD23	1:D:248:TRP:CD1	2.53	0.44
1:C:296:LEU:HD13	3:C:781:HOH:O	2.18	0.44
1:D:447:GLY:HA3	3:D:694:HOH:O	2.17	0.44
1:B:346:THR:O	1:B:350:ARG:HG3	2.18	0.44
1:B:401:PRO:HD2	3:B:711:HOH:O	2.17	0.43
1:A:169:ARG:HB2	3:A:665:HOH:O	2.19	0.43
1:D:168:LEU:HD21	1:D:276:TRP:CH2	2.53	0.43
1:B:225:MET:HB3	1:B:225:MET:HE3	1.83	0.43
1:D:413:ARG:HD3	3:D:655:HOH:O	2.18	0.43
1:A:313:LEU:HD11	1:A:326:ARG:HH11	1.84	0.43
1:C:269:VAL:HG21	3:C:687:HOH:O	2.19	0.43
1:C:462:GLN:NE2	3:C:692:HOH:O	2.51	0.43
1:A:285:TYR:CD1	1:A:302:TYR:HA	2.54	0.43
1:C:259:PRO:HD2	1:C:335:ASN:HA	2.01	0.43
1:D:267:GLU:OE2	1:D:296:LEU:HG	2.19	0.43
1:A:313:LEU:HD11	1:A:326:ARG:NH1	2.34	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:299:GLU:OE2	1:C:307:HIS:CD2	2.72	0.42
1:B:313:LEU:HD22	1:B:324:VAL:HB	2.01	0.42
1:A:228:PRO:HG2	3:A:672:HOH:O	2.19	0.42
1:A:288:ARG:HA	1:A:289:PRO:HD2	1.83	0.42
1:D:176:LEU:N	1:D:177:PRO:HD3	2.35	0.42
1:D:172:LEU:CD1	1:D:184:MET:HE3	2.50	0.42
1:A:292:PRO:HA	1:A:293:PRO:C	2.41	0.42
1:D:173:ARG:NH2	3:D:713:HOH:O	2.52	0.42
1:D:214:LEU:HD12	1:D:246:SER:HB2	2.02	0.41
1:B:290:ALA:HA	1:B:291:PRO:HD3	1.90	0.41
1:C:176:LEU:CD1	1:C:270:VAL:HG22	2.50	0.41
1:C:181:LEU:HD12	1:C:207:PRO:O	2.21	0.41
1:C:353:ASP:O	1:C:357:SER:HA	2.20	0.41
1:B:276:TRP:CD1	3:B:900:HOH:O	2.71	0.41
1:C:296:LEU:HG	1:C:312:PHE:HB2	2.01	0.41
1:C:218:ILE:HA	1:C:219:PRO:HD2	1.91	0.41
1:C:276:TRP:CZ2	1:C:298:LEU:HD11	2.56	0.41
1:D:184:MET:CE	1:D:266:PHE:HZ	2.32	0.41
1:A:453:SER:HB2	1:A:460:LEU:HD13	2.03	0.40
1:D:413:ARG:HA	1:D:413:ARG:HD2	1.95	0.40
1:D:456:GLU:HG2	3:D:680:HOH:O	2.20	0.40
1:A:179:MET:HA	1:A:180:PRO:HD3	1.85	0.40
1:D:413:ARG:HD3	1:D:454:LEU:HD11	2.02	0.40
1:A:313:LEU:HD22	1:A:324:VAL:HB	2.03	0.40
1:C:456:GLU:HG3	1:C:459:VAL:CG1	2.52	0.40
1:D:293:PRO:O	1:D:294:GLU:HB3	2.22	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	328/335 (98%)	324 (99%)	4 (1%)	0	100	100
1	B	323/335 (96%)	318 (98%)	5 (2%)	0	100	100
1	C	323/335 (96%)	317 (98%)	6 (2%)	0	100	100
1	D	324/335 (97%)	316 (98%)	8 (2%)	0	100	100
All	All	1298/1340 (97%)	1275 (98%)	23 (2%)	0	100	100

There are no Ramachandran outliers to report.

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	279/286 (98%)	275 (99%)	4 (1%)	59	66
1	B	278/286 (97%)	272 (98%)	6 (2%)	45	50
1	C	277/286 (97%)	270 (98%)	7 (2%)	42	45
1	D	275/286 (96%)	272 (99%)	3 (1%)	65	73
All	All	1109/1144 (97%)	1089 (98%)	20 (2%)	51	58

All (20) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	226	ASN
1	A	227	VAL
1	A	279	ILE
1	A	308	LEU
1	B	225	MET
1	B	226	ASN
1	B	267	GLU
1	B	273	SER
1	B	296	LEU
1	B	313	LEU
1	C	168	LEU
1	C	191	TYR
1	C	282	LEU

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Mol	Chain	Res	Type
1	C	283	LEU
1	C	286	VAL
1	C	356	ASP
1	C	456	GLU
1	D	270	VAL
1	D	273	SER
1	D	362	LEU

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

Mol	Chain	Res	Type
1	A	301	GLN
1	A	307	HIS
1	A	354	GLN
1	C	354	GLN
1	D	154	GLN
1	D	203	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 oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

6 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	SO4	C	502	-	4,4,4	0.28	0	6,6,6	0.42	0
2	SO4	B	502	-	4,4,4	0.27	0	6,6,6	0.25	0
2	SO4	C	501	-	4,4,4	0.24	0	6,6,6	0.14	0
2	SO4	D	501	-	4,4,4	0.22	0	6,6,6	0.27	0
2	SO4	B	501	-	4,4,4	0.24	0	6,6,6	0.17	0
2	SO4	A	501	-	4,4,4	0.32	0	6,6,6	0.14	0

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(Å ²)	Q<0.9
1	A	330/335 (98%)	-0.56	2 (0%) 85 85	12, 23, 46, 85	0
1	B	327/335 (97%)	-0.43	2 (0%) 85 85	13, 28, 57, 80	0
1	C	327/335 (97%)	-0.27	7 (2%) 63 63	15, 31, 60, 94	0
1	D	324/335 (96%)	-0.14	10 (3%) 51 50	21, 34, 65, 88	0
All	All	1308/1340 (97%)	-0.35	21 (1%) 70 70	12, 29, 59, 94	0

All (21) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	269	VAL	4.9
1	D	270	VAL	4.6
1	D	174	ALA	3.7
1	D	271	ALA	3.5
1	C	266	PHE	3.3
1	D	319	GLY	3.3
1	B	295	ALA	3.0
1	C	270	VAL	3.0
1	D	266	PHE	2.6
1	C	224	ILE	2.5
1	C	271	ALA	2.4
1	C	462	GLN	2.4
1	C	269	VAL	2.4
1	B	291	PRO	2.4
1	D	176	LEU	2.3
1	C	463	THR	2.3
1	A	293	PRO	2.1
1	D	272	GLY	2.1
1	A	295	ALA	2.1
1	D	463	THR	2.1
1	D	293	PRO	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 oligosaccharides 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, 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($\text{\AA}^2$)	Q<0.9
2	SO4	C	501	5/5	0.93	0.09	47,52,55,57	0
2	SO4	B	501	5/5	0.96	0.08	46,46,51,51	0
2	SO4	A	501	5/5	0.97	0.09	25,26,34,36	0
2	SO4	C	502	5/5	0.97	0.06	25,32,34,34	0
2	SO4	D	501	5/5	0.98	0.04	24,27,30,33	0
2	SO4	B	502	5/5	0.99	0.04	23,24,28,31	0

6.5 Other polymers [i](#)

There are no such residues in this entry.