



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 9, 2026 – 10:25 AM UTC

PDB ID : 1L7C / pdb_0000117c
Title : alpha-catenin fragment, residues 385-651
Authors : Pokutta, S.; Drees, F.; Takai, Y.; Nelson, W.J.; Weis, W.I.
Deposited on : 2002-03-14
Resolution : 2.50 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

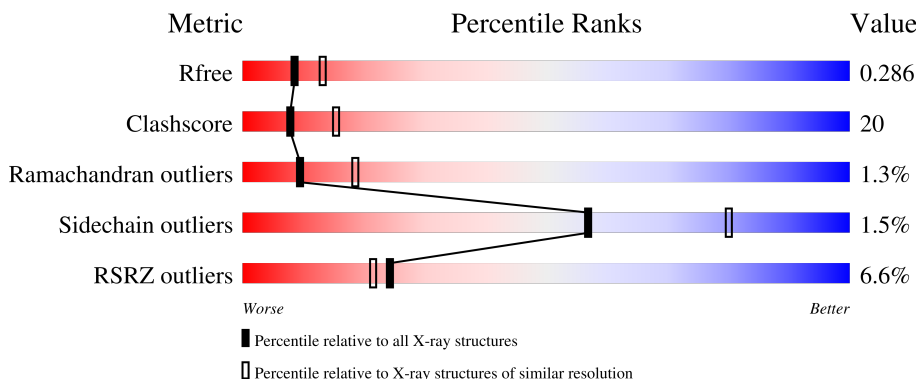
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.50 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	5829 (2.50-2.50)
Clashscore	190562	6492 (2.50-2.50)
Ramachandran outliers	187476	6378 (2.50-2.50)
Sidechain outliers	187428	6380 (2.50-2.50)
RSRZ outliers	180081	5833 (2.50-2.50)

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 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	269	% 64% 25% 11%
1	B	269	7% 50% 33% • 15%
1	C	269	9% 48% 35% • 13%

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 5544 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 Alpha E-catenin.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	240	Total	C	N	O	S	Se	0	0	0
			1866	1162	319	376	3	6			
1	B	229	Total	C	N	O	S	Se	0	0	0
			1777	1107	306	356	3	5			
1	C	233	Total	C	N	O	S	Se	0	0	0
			1811	1131	310	362	3	5			

There are 24 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	383	GLY	-	cloning artifact	UNP P35221
A	384	SER	-	cloning artifact	UNP P35221
A	452	MSE	MET	modified residue	UNP P35221
A	484	MSE	MET	modified residue	UNP P35221
A	560	MSE	MET	modified residue	UNP P35221
A	584	MSE	MET	modified residue	UNP P35221
A	606	MSE	MET	modified residue	UNP P35221
A	631	MSE	MET	modified residue	UNP P35221
B	383	GLY	-	cloning artifact	UNP P35221
B	384	SER	-	cloning artifact	UNP P35221
B	452	MSE	MET	modified residue	UNP P35221
B	484	MSE	MET	modified residue	UNP P35221
B	560	MSE	MET	modified residue	UNP P35221
B	584	MSE	MET	modified residue	UNP P35221
B	606	MSE	MET	modified residue	UNP P35221
B	631	MSE	MET	modified residue	UNP P35221
C	383	GLY	-	cloning artifact	UNP P35221
C	384	SER	-	cloning artifact	UNP P35221
C	452	MSE	MET	modified residue	UNP P35221
C	484	MSE	MET	modified residue	UNP P35221
C	560	MSE	MET	modified residue	UNP P35221
C	584	MSE	MET	modified residue	UNP P35221
C	606	MSE	MET	modified residue	UNP P35221

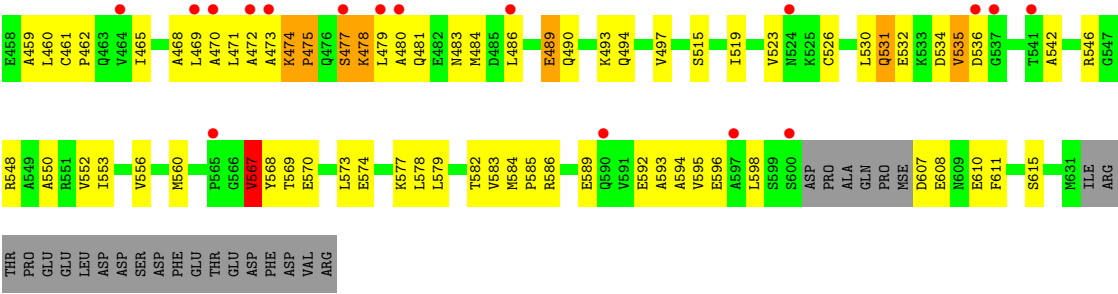
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Chain	Residue	Modelled	Actual	Comment	Reference
C	631	MSE	MET	modified residue	UNP P35221

- Molecule 2 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	43	Total 43	O 43	0	0
2	B	26	Total 26	O 26	0	0
2	C	21	Total 21	O 21	0	0



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	64.78Å 105.29Å 123.91Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	29.95 – 2.50 29.95 – 2.50	Depositor EDS
% Data completeness (in resolution range)	97.2 (29.95-2.50) 97.1 (29.95-2.50)	Depositor EDS
R_{merge}	0.04	Depositor
R_{sym}	0.04	Depositor
$\langle I/\sigma(I) \rangle$ ¹	6.43 (at 2.51Å)	Xtriage
Refinement program	CNS	Depositor
R, R_{free}	0.238 , 0.273 0.249 , 0.286	Depositor DCC
R_{free} test set	5596 reflections (9.93%)	wwPDB-VP
Wilson B-factor (Å ²)	46.5	Xtriage
Anisotropy	0.229	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.34 , 50.0	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.93	EDS
Total number of atoms	5544	wwPDB-VP
Average B, all atoms (Å ²)	59.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.62% 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, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality [i](#)

5.1 Standard geometry [i](#)

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	0.51	0/1880	0.95	3/2535 (0.1%)
1	B	0.42	0/1787	0.90	5/2406 (0.2%)
1	C	0.42	0/1824	0.93	9/2459 (0.4%)
All	All	0.45	0/5491	0.93	17/7400 (0.2%)

There are no bond length outliers.

All (17) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	583	VAL	N-CA-C	8.38	118.41	110.53
1	A	564	GLU	N-CA-C	-6.82	101.05	109.65
1	C	583	VAL	N-CA-C	6.54	116.64	110.30
1	C	486	LEU	N-CA-C	-6.33	105.54	113.20
1	C	474	LYS	CA-C-N	6.01	127.35	119.84
1	C	474	LYS	C-N-CA	6.01	127.35	119.84
1	B	474	LYS	CA-C-N	5.96	126.38	119.47
1	B	474	LYS	C-N-CA	5.96	126.38	119.47
1	C	483	ASN	N-CA-C	-5.90	105.17	112.90
1	C	436	LEU	N-CA-C	-5.68	104.99	111.07
1	B	399	VAL	CB-CA-C	-5.58	108.44	114.35
1	B	525	LYS	N-CA-C	-5.40	106.54	113.23
1	C	407	ALA	N-CA-C	-5.27	108.11	114.75
1	C	478	LYS	N-CA-C	-5.20	107.00	113.19
1	C	420	ALA	N-CA-C	-5.06	106.36	112.54
1	A	398	ASN	N-CA-C	-5.04	105.83	112.94
1	B	440	ILE	N-CA-C	5.02	117.80	112.83

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	1866	0	1863	46	0
1	B	1777	0	1786	72	0
1	C	1811	0	1821	101	0
2	A	43	0	0	1	0
2	B	26	0	0	1	0
2	C	21	0	0	1	0
All	All	5544	0	5470	216	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 20.

All (216) 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:C:560:MSE:HE2	1:C:569:THR:HA	1.42	1.01
1:B:553:ILE:HD11	1:B:579:LEU:HD23	1.47	0.97
1:B:560:MSE:HE2	1:B:569:THR:HG22	1.44	0.97
1:B:628:ALA:HA	1:B:631:MSE:HE2	1.49	0.94
1:C:420:ALA:HB1	1:C:465:ILE:HD11	1.49	0.93
1:C:567:VAL:HG13	1:C:568:TYR:H	1.39	0.86
1:A:461:CYS:HB3	1:A:462:PRO:HD3	1.58	0.84
1:B:591:VAL:O	1:B:595:VAL:HG23	1.85	0.77
1:C:468:ALA:HA	1:C:484:MSE:HE1	1.66	0.76
1:C:542:ALA:O	1:C:546:ARG:HG3	1.86	0.76
1:A:415:GLU:HA	1:A:418:GLU:HG3	1.66	0.75
1:C:461:CYS:HB3	1:C:462:PRO:HD3	1.68	0.75
1:B:586:ARG:O	1:B:590:GLN:HG2	1.85	0.75
1:C:399:VAL:HB	1:C:400:PRO:HD3	1.69	0.73
1:B:549:ALA:O	1:B:553:ILE:HG12	1.89	0.73
1:C:459:ALA:O	1:C:462:PRO:HD2	1.89	0.73
1:B:574:GLU:O	1:B:578:LEU:HG	1.88	0.73
1:C:460:LEU:HD21	1:C:490:GLN:HG3	1.70	0.72
1:A:553:ILE:HD13	1:A:580:SER:HB3	1.71	0.71
1:A:488:LYS:O	1:A:492:GLU:HG3	1.91	0.71
1:C:523:VAL:HG13	1:C:615:SER:HB3	1.72	0.70

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:579:LEU:HD12	1:B:583:VAL:HB	1.74	0.70
1:A:447:VAL:O	1:A:451:ARG:HG2	1.91	0.70
1:B:461:CYS:HB3	1:B:462:PRO:HD3	1.74	0.68
1:A:594:ALA:HA	1:A:606:MSE:HE2	1.73	0.68
1:B:421:GLN:O	1:B:425:GLU:HG3	1.93	0.67
1:C:531:GLN:O	1:C:531:GLN:HG2	1.96	0.65
1:B:520:LEU:O	1:B:523:VAL:HG12	1.95	0.64
1:C:462:PRO:O	1:C:465:ILE:HG22	1.97	0.64
1:B:625:ILE:O	1:B:629:VAL:HG23	1.97	0.63
1:B:512:LEU:HD13	1:B:626:ARG:HA	1.79	0.63
1:A:584:MSE:HB2	1:A:585:PRO:HD3	1.80	0.63
1:C:535:VAL:HG13	1:C:595:VAL:HG12	1.80	0.63
1:B:553:ILE:HG23	1:B:576:THR:HG23	1.81	0.62
1:C:422:VAL:HG23	1:C:423:PHE:N	2.13	0.62
1:C:421:GLN:HE22	1:C:424:ARG:HH12	1.48	0.62
1:C:515:SER:O	1:C:519:ILE:HG12	1.99	0.62
1:C:421:GLN:O	1:C:425:GLU:HG3	2.00	0.61
1:C:570:GLU:O	1:C:574:GLU:HG3	2.01	0.60
1:B:560:MSE:HA	1:B:560:MSE:HE3	1.83	0.60
1:B:566:GLY:N	1:B:569:THR:HG1	1.99	0.60
1:B:416:VAL:HG21	1:B:472:ALA:HB2	1.84	0.60
1:C:420:ALA:CB	1:C:465:ILE:HD11	2.27	0.60
1:C:471:LEU:HD11	1:C:481:GLN:HG2	1.84	0.59
1:B:584:MSE:HB2	1:B:585:PRO:HD3	1.84	0.59
1:A:412:ASN:O	1:A:416:VAL:HG23	2.02	0.59
1:B:493:LYS:O	1:B:497:VAL:HG23	2.03	0.58
1:A:621:GLY:O	1:A:625:ILE:HG13	2.03	0.58
1:B:575:ALA:HA	1:B:578:LEU:HD12	1.86	0.58
1:C:419:TYR:O	1:C:422:VAL:HG22	2.03	0.58
1:B:541:THR:O	1:B:545:ILE:HG13	2.04	0.57
1:B:584:MSE:SE	1:B:618:VAL:HG13	2.53	0.57
1:B:574:GLU:OE2	1:B:578:LEU:HD21	2.04	0.57
1:B:399:VAL:O	1:B:403:VAL:HG23	2.05	0.57
1:C:465:ILE:O	1:C:469:LEU:HD13	2.04	0.57
1:A:392:ASP:O	1:A:396:GLU:HG2	2.05	0.57
1:B:508:ILE:HD12	1:B:559:GLU:HG3	1.86	0.57
1:B:592:GLU:O	1:B:595:VAL:HB	2.05	0.56
1:C:489:GLU:HG3	1:C:490:GLN:N	2.20	0.56
1:B:438:CYS:HA	1:B:447:VAL:HG22	1.87	0.56
1:B:518:HIS:HA	1:B:521:GLU:HG2	1.88	0.56
1:C:560:MSE:HE1	1:C:568:TYR:CE2	2.41	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:445:GLU:O	1:C:449:LEU:HD23	2.05	0.56
1:A:558:SER:O	1:A:561:ASP:HB2	2.05	0.56
1:A:586:ARG:NH1	2:A:718:HOH:O	2.39	0.56
1:C:567:VAL:HG13	1:C:568:TYR:N	2.15	0.55
1:C:535:VAL:HG12	1:C:535:VAL:O	2.07	0.55
1:C:474:LYS:HG3	1:C:477:SER:HB3	1.88	0.55
1:C:560:MSE:HE2	1:C:569:THR:CA	2.28	0.55
1:C:493:LYS:O	1:C:497:VAL:HG23	2.07	0.55
1:C:530:LEU:CD1	1:C:594:ALA:HB1	2.37	0.55
1:C:397:THR:HG23	1:C:400:PRO:HD2	1.88	0.55
1:C:548:ARG:HD3	2:C:751:HOH:O	2.07	0.54
1:B:628:ALA:HA	1:B:631:MSE:CE	2.32	0.54
1:C:422:VAL:HG23	1:C:423:PHE:H	1.71	0.54
1:C:474:LYS:N	1:C:475:PRO:HD3	2.22	0.54
1:A:403:VAL:HG12	1:A:419:TYR:CD1	2.43	0.54
1:B:578:LEU:O	1:B:582:THR:HB	2.08	0.54
1:C:585:PRO:O	1:C:589:GLU:HG3	2.07	0.54
1:A:517:ASN:O	1:A:521:GLU:HG3	2.08	0.54
1:B:590:GLN:OE1	1:B:610:GLU:HB3	2.08	0.53
1:B:612:ILE:O	1:B:616:ARG:HG3	2.07	0.53
1:A:527:VAL:O	1:A:531:GLN:HG3	2.09	0.53
1:A:429:LYS:O	1:A:433:VAL:HG23	2.08	0.53
1:A:399:VAL:HG11	1:B:436:LEU:HD13	1.91	0.53
1:C:478:LYS:HA	1:C:481:GLN:HB2	1.90	0.53
1:C:523:VAL:CG1	1:C:615:SER:HB3	2.39	0.53
1:C:401:LEU:O	1:C:404:LEU:HB3	2.08	0.52
1:C:399:VAL:HG13	1:C:403:VAL:HG21	1.90	0.52
1:A:399:VAL:HB	1:A:400:PRO:HD3	1.92	0.52
1:C:530:LEU:HD13	1:C:594:ALA:HB1	1.91	0.51
1:C:474:LYS:HB2	1:C:477:SER:HB2	1.92	0.51
1:C:550:ALA:HA	1:C:553:ILE:HD12	1.93	0.51
1:C:594:ALA:O	1:C:598:LEU:HG	2.11	0.51
1:A:520:LEU:HD23	1:B:462:PRO:HB2	1.93	0.50
1:A:466:ASN:N	1:A:466:ASN:HD22	2.10	0.50
1:C:471:LEU:C	1:C:473:ALA:H	2.19	0.50
1:B:524:ASN:O	1:B:528:ILE:HG12	2.11	0.50
1:A:515:SER:O	1:A:519:ILE:HG12	2.11	0.50
1:C:471:LEU:C	1:C:471:LEU:HD23	2.36	0.50
1:C:489:GLU:OE2	1:C:493:LYS:HD2	2.12	0.49
1:A:415:GLU:HA	1:A:418:GLU:CG	2.37	0.49
1:C:399:VAL:CB	1:C:400:PRO:HD3	2.39	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:443:ASN:C	1:C:443:ASN:HD22	2.19	0.49
1:C:449:LEU:HD13	1:C:452:MSE:HE2	1.93	0.49
1:C:592:GLU:O	1:C:596:GLU:HB2	2.11	0.49
1:C:534:ASP:C	1:C:536:ASP:H	2.21	0.49
1:A:407:ALA:HB1	1:A:415:GLU:HG3	1.93	0.49
1:A:512:LEU:HD13	1:A:626:ARG:HA	1.94	0.49
1:B:554:HIS:ND1	1:B:554:HIS:C	2.70	0.49
1:A:593:ALA:O	1:A:596:GLU:HB3	2.13	0.48
1:C:593:ALA:O	1:C:596:GLU:HB3	2.14	0.48
1:C:478:LYS:HD2	1:C:481:GLN:HB2	1.96	0.48
1:C:448:LYS:O	1:C:452:MSE:HG3	2.14	0.48
1:B:587:PHE:O	1:B:591:VAL:HG23	2.13	0.48
1:A:402:LEU:HD11	1:B:432:GLU:OE2	2.13	0.48
1:B:425:GLU:O	1:B:429:LYS:HG3	2.14	0.48
1:A:461:CYS:HB3	1:A:462:PRO:CD	2.35	0.48
1:B:452:MSE:O	1:B:456:GLN:HG3	2.13	0.48
1:B:582:THR:O	1:B:585:PRO:HD2	2.12	0.48
1:C:415:GLU:O	1:C:419:TYR:HD1	1.96	0.47
1:C:477:SER:C	1:C:479:LEU:H	2.21	0.47
1:C:477:SER:OG	1:C:479:LEU:HB3	2.14	0.47
1:B:523:VAL:O	1:B:527:VAL:HG23	2.14	0.47
1:C:560:MSE:HE1	1:C:568:TYR:CD2	2.48	0.47
1:C:427:ALA:O	1:C:431:ILE:HG13	2.14	0.47
1:C:409:LYS:HE3	1:C:410:ASN:OD1	2.13	0.47
1:C:607:ASP:O	1:C:610:GLU:HB3	2.15	0.47
1:C:477:SER:HG	1:C:479:LEU:HB3	1.79	0.47
1:C:578:LEU:HD12	1:C:582:THR:HB	1.97	0.47
1:C:444:GLU:HG2	1:C:448:LYS:HE3	1.97	0.47
1:B:536:ASP:O	1:B:540:ARG:HG2	2.15	0.46
1:C:414:LYS:O	1:C:418:GLU:HB2	2.15	0.46
1:C:415:GLU:O	1:C:418:GLU:HB3	2.15	0.46
1:C:474:LYS:HE2	1:C:477:SER:OG	2.15	0.46
1:B:615:SER:O	1:B:618:VAL:HB	2.16	0.46
1:C:582:THR:O	1:C:586:ARG:HG2	2.15	0.46
1:A:403:VAL:CG1	1:A:419:TYR:CE1	2.99	0.46
1:A:590:GLN:HG3	1:A:614:ALA:CB	2.45	0.46
1:B:579:LEU:HG	1:B:584:MSE:HG2	1.97	0.46
1:C:494:GLN:HA	1:C:494:GLN:NE2	2.31	0.46
1:A:405:ILE:HG12	1:A:484:MSE:HE2	1.98	0.45
1:C:420:ALA:HB1	1:C:465:ILE:CD1	2.35	0.45
1:C:526:CYS:SG	1:C:611:PHE:HZ	2.39	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:569:THR:O	1:B:573:LEU:HD12	2.16	0.45
1:C:468:ALA:HA	1:C:484:MSE:CE	2.40	0.45
1:C:552:VAL:O	1:C:556:VAL:HG23	2.15	0.45
1:A:389:HIS:N	1:A:389:HIS:CD2	2.84	0.45
1:B:395:LEU:C	1:B:395:LEU:CD2	2.89	0.45
1:C:399:VAL:HG13	1:C:403:VAL:CG2	2.47	0.45
1:C:406:GLU:HG2	1:C:406:GLU:O	2.17	0.45
1:A:546:ARG:HG3	1:A:546:ARG:HH11	1.80	0.45
1:B:395:LEU:CD2	1:B:430:LEU:HD23	2.47	0.45
1:B:451:ARG:NH2	2:B:743:HOH:O	2.50	0.44
1:C:530:LEU:C	1:C:532:GLU:H	2.25	0.44
1:A:438:CYS:SG	1:A:447:VAL:HG13	2.58	0.44
1:C:465:ILE:O	1:C:468:ALA:HB3	2.17	0.44
1:A:531:GLN:HG2	1:A:608:GLU:OE2	2.18	0.44
1:C:399:VAL:O	1:C:401:LEU:N	2.50	0.44
1:B:623:ARG:O	1:B:627:LYS:HG3	2.18	0.44
1:C:471:LEU:HD23	1:C:471:LEU:O	2.18	0.44
1:C:471:LEU:HD12	1:C:480:ALA:O	2.17	0.44
1:C:573:LEU:O	1:C:577:LYS:HG3	2.17	0.44
1:B:395:LEU:C	1:B:395:LEU:HD22	2.42	0.43
1:A:597:ALA:O	1:A:598:LEU:C	2.61	0.43
1:A:460:LEU:O	1:A:461:CYS:C	2.62	0.43
1:C:579:LEU:O	1:C:584:MSE:HG2	2.18	0.43
1:C:408:ALA:HA	1:C:416:VAL:HG21	1.99	0.43
1:A:412:ASN:CG	1:A:415:GLU:HG2	2.43	0.43
1:A:431:ILE:HD13	1:A:458:GLU:HG3	1.99	0.43
1:B:527:VAL:O	1:B:531:GLN:HG3	2.18	0.43
1:A:457:LEU:HD23	1:A:457:LEU:HA	1.87	0.43
1:B:474:LYS:N	1:B:475:PRO:HD3	2.33	0.43
1:B:551:ARG:O	1:B:555:VAL:HG23	2.18	0.43
1:C:436:LEU:O	1:C:439:SER:HB3	2.18	0.43
1:A:594:ALA:CA	1:A:606:MSE:HE2	2.47	0.43
1:C:470:ALA:O	1:C:473:ALA:HB3	2.18	0.43
1:C:471:LEU:C	1:C:473:ALA:N	2.77	0.42
1:B:529:ALA:HA	1:B:532:GLU:HG2	1.99	0.42
1:B:546:ARG:HA	1:B:584:MSE:CE	2.49	0.42
1:B:593:ALA:C	1:B:595:VAL:H	2.28	0.42
1:C:421:GLN:NE2	1:C:424:ARG:HH12	2.14	0.42
1:C:477:SER:C	1:C:479:LEU:N	2.76	0.42
1:A:407:ALA:CB	1:A:415:GLU:HG3	2.49	0.42
1:B:488:LYS:O	1:B:492:GLU:HG3	2.20	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:579:LEU:HD21	1:B:622:ILE:CD1	2.49	0.42
1:C:546:ARG:HA	1:C:584:MSE:HE2	2.01	0.42
1:C:584:MSE:HB2	1:C:585:PRO:HD3	2.01	0.42
1:B:579:LEU:HD21	1:B:622:ILE:HD13	2.02	0.42
1:C:457:LEU:HD13	1:C:494:GLN:HG3	2.02	0.42
1:A:391:SER:OG	1:A:393:SER:HB3	2.20	0.42
1:B:619:TYR:CD2	1:B:619:TYR:C	2.98	0.42
1:B:535:VAL:O	1:B:539:ASP:OD2	2.38	0.42
1:A:472:ALA:O	1:A:475:PRO:HD3	2.20	0.42
1:B:403:VAL:HG12	1:B:419:TYR:CE1	2.55	0.42
1:B:436:LEU:O	1:B:439:SER:HB3	2.20	0.42
1:B:556:VAL:O	1:B:560:MSE:HB2	2.20	0.42
1:A:594:ALA:HA	1:A:606:MSE:CE	2.44	0.41
1:A:466:ASN:HD22	1:A:466:ASN:H	1.66	0.41
1:B:582:THR:HG23	1:B:586:ARG:CZ	2.51	0.41
1:B:522:ASP:O	1:B:526:CYS:HB2	2.21	0.41
1:B:403:VAL:HG12	1:B:419:TYR:CD1	2.56	0.41
1:C:416:VAL:HG21	1:C:472:ALA:HB2	2.02	0.41
1:C:523:VAL:O	1:C:526:CYS:HB3	2.21	0.41
1:C:608:GLU:O	1:C:611:PHE:HB3	2.21	0.41
1:C:449:LEU:HA	1:C:452:MSE:HE2	2.03	0.41
1:C:473:ALA:C	1:C:475:PRO:HD3	2.45	0.41
1:B:559:GLU:C	1:B:561:ASP:N	2.79	0.41
1:B:582:THR:C	1:B:585:PRO:HD2	2.45	0.41
1:C:567:VAL:O	1:C:568:TYR:C	2.63	0.41
1:C:409:LYS:HE2	1:C:409:LYS:HB3	1.91	0.40
1:B:525:LYS:O	1:B:529:ALA:HB2	2.22	0.40
1:C:408:ALA:HA	1:C:416:VAL:CG2	2.51	0.40
1:A:401:LEU:HD21	1:A:488:LYS:HG3	2.03	0.40
1:B:559:GLU:O	1:B:561:ASP:N	2.54	0.40
1:C:569:THR:O	1:C:573:LEU:HG	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	236/269 (88%)	221 (94%)	14 (6%)	1 (0%)	30	49
1	B	223/269 (83%)	206 (92%)	16 (7%)	1 (0%)	30	49
1	C	229/269 (85%)	197 (86%)	25 (11%)	7 (3%)	3	5
All	All	688/807 (85%)	624 (91%)	55 (8%)	9 (1%)	9	18

All (9) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	411	GLY
1	B	560	MSE
1	C	477	SER
1	A	477	SER
1	C	531	GLN
1	C	535	VAL
1	C	567	VAL
1	C	475	PRO
1	C	400	PRO

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	206/226 (91%)	204 (99%)	2 (1%)	68	86
1	B	195/226 (86%)	190 (97%)	5 (3%)	40	68
1	C	199/226 (88%)	197 (99%)	2 (1%)	68	86
All	All	600/678 (88%)	591 (98%)	9 (2%)	57	80

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

Mol	Chain	Res	Type
1	A	466	ASN

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Mol	Chain	Res	Type
1	A	600	SER
1	B	395	LEU
1	B	397	THR
1	B	412	ASN
1	B	447	VAL
1	B	568	TYR
1	C	489	GLU
1	C	567	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (20) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	389	HIS
1	A	398	ASN
1	A	442	ASN
1	A	466	ASN
1	A	494	GLN
1	B	398	ASN
1	B	412	ASN
1	B	426	HIS
1	B	466	ASN
1	B	494	GLN
1	B	524	ASN
1	B	609	ASN
1	C	398	ASN
1	C	421	GLN
1	C	435	ASN
1	C	443	ASN
1	C	456	GLN
1	C	466	ASN
1	C	481	GLN
1	C	517	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 [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

There are no ligands in this entry.

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	234/269 (86%)	0.19	4 (1%) 69 65	25, 43, 71, 84	0
1	B	224/269 (83%)	0.60	18 (8%) 18 16	27, 57, 105, 111	0
1	C	228/269 (84%)	0.75	23 (10%) 12 10	27, 64, 100, 112	0
All	All	686/807 (85%)	0.51	45 (6%) 24 21	25, 54, 100, 112	0

All (45) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	561	ASP	4.5
1	B	595	VAL	4.1
1	C	400	PRO	4.0
1	B	566	GLY	3.9
1	C	479	LEU	3.7
1	B	567	VAL	3.4
1	B	568	TYR	3.4
1	B	476	GLN	3.1
1	C	404	LEU	3.1
1	C	600	SER	3.0
1	C	413	GLU	2.8
1	A	425	GLU	2.8
1	B	593	ALA	2.7
1	C	470	ALA	2.7
1	C	412	ASN	2.7
1	C	486	LEU	2.6
1	C	473	ALA	2.6
1	C	480	ALA	2.6
1	B	614	ALA	2.5
1	C	469	LEU	2.4
1	C	597	ALA	2.4
1	B	612	ILE	2.4
1	A	568	TYR	2.4

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Mol	Chain	Res	Type	RSRZ
1	B	562	ASN	2.4
1	C	537	GLY	2.3
1	B	527	VAL	2.3
1	B	591	VAL	2.3
1	B	392	ASP	2.3
1	C	402	LEU	2.2
1	B	611	PHE	2.2
1	C	407	ALA	2.2
1	C	472	ALA	2.2
1	B	610	GLU	2.2
1	B	629	VAL	2.2
1	C	464	VAL	2.2
1	C	541	THR	2.2
1	B	597	ALA	2.1
1	C	477	SER	2.1
1	A	442	ASN	2.1
1	C	524	ASN	2.1
1	C	590	GLN	2.1
1	B	617	LEU	2.1
1	C	565	PRO	2.1
1	A	392	ASP	2.0
1	C	536	ASP	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](#)

There are no ligands in this entry.

6.5 Other polymers [i](#)

There are no such residues in this entry.