



Full wwPDB X-ray Structure Validation Report ⓘ

Nov 13, 2023 – 01:23 PM JST

PDB ID : 5XAM
Title : Crystal structure of SecDF in I form at 4 Å resolution
Authors : Tsukazaki, T.; Tanaka, Y.; Furukawa, A.
Deposited on : 2017-03-14
Resolution : 4.00 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 : 4.02b-467
Xtriage (Phenix) : 1.13
EDS : 2.36
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) : 2.36

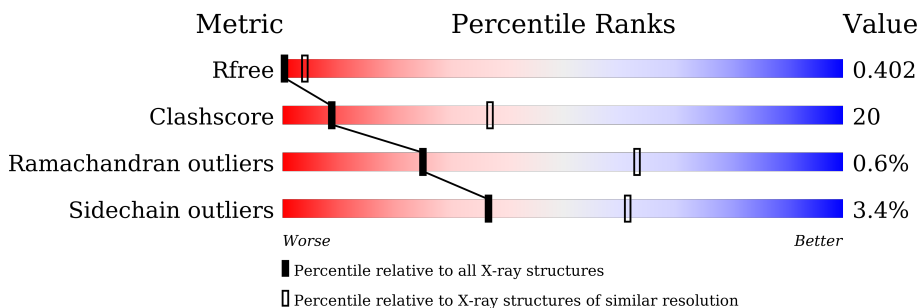
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 4.00 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}	130704	1087 (4.30-3.70)
Clashscore	141614	1148 (4.30-3.70)
Ramachandran outliers	138981	1108 (4.30-3.70)
Sidechain outliers	138945	1099 (4.30-3.70)

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 $\leq 5\%$.

Mol	Chain	Length	Quality of chain
1	A	750	
1	B	750	

2 Entry composition i

There is only 1 type of molecule in this entry. The entry contains 9852 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 Protein translocase subunit SecD.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	727	5000	3215	830	947	8	0	0	0
1	B	684	4852	3140	801	900	11	0	0	0

There are 18 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	27	MET	-	expression tag	UNP Q9RTE3
A	769	HIS	-	expression tag	UNP Q9RTE3
A	770	HIS	-	expression tag	UNP Q9RTE3
A	771	HIS	-	expression tag	UNP Q9RTE3
A	772	HIS	-	expression tag	UNP Q9RTE3
A	773	HIS	-	expression tag	UNP Q9RTE3
A	774	HIS	-	expression tag	UNP Q9RTE3
A	775	HIS	-	expression tag	UNP Q9RTE3
A	776	HIS	-	expression tag	UNP Q9RTE3
B	27	MET	-	expression tag	UNP Q9RTE3
B	769	HIS	-	expression tag	UNP Q9RTE3
B	770	HIS	-	expression tag	UNP Q9RTE3
B	771	HIS	-	expression tag	UNP Q9RTE3
B	772	HIS	-	expression tag	UNP Q9RTE3
B	773	HIS	-	expression tag	UNP Q9RTE3
B	774	HIS	-	expression tag	UNP Q9RTE3
B	775	HIS	-	expression tag	UNP Q9RTE3
B	776	HIS	-	expression tag	UNP Q9RTE3

4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	93.32Å 62.26Å 181.71Å 90.00° 101.71° 90.00°	Depositor
Resolution (Å)	47.98 – 4.00 47.99 – 3.92	Depositor EDS
% Data completeness (in resolution range)	96.6 (47.98-4.00) 93.3 (47.99-3.92)	Depositor EDS
R_{merge}	0.16	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	0.95 (at 3.88Å)	Xtrriage
Refinement program	PHENIX 1.10.1_2155	Depositor
R, R_{free}	0.333 , 0.402 0.333 , 0.402	Depositor DCC
R_{free} test set	1762 reflections (10.02%)	wwPDB-VP
Wilson B-factor (Å ²)	150.3	Xtrriage
Anisotropy	0.356	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.19 , 176.0	EDS
L-test for twinning ²	$\langle L \rangle = 0.39$, $\langle L^2 \rangle = 0.22$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.79	EDS
Total number of atoms	9852	wwPDB-VP
Average B, all atoms (Å ²)	242.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 14.44% 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	0.27	1/5071 (0.0%)	0.48	1/6964 (0.0%)
1	B	0.26	0/4926	0.48	0/6735
All	All	0.27	1/9997 (0.0%)	0.48	1/13699 (0.0%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	51	ARG	C-N	7.32	1.48	1.34

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	576	LEU	CA-CB-CG	5.41	127.75	115.30

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	5000	0	4921	195	0
1	B	4852	0	4894	208	0
All	All	9852	0	9815	403	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 (403) 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:30:PRO:HG2	1:A:448:GLN:HG2	1.48	0.92
1:B:690:VAL:HG21	1:B:750:VAL:HG11	1.60	0.83
1:B:561:LEU:HB2	1:B:565:GLU:HB3	1.61	0.82
1:A:34:THR:HA	1:A:37:LEU:HB3	1.60	0.82
1:A:404:ALA:HA	1:A:407:LEU:HB2	1.62	0.80
1:B:438:SER:HA	1:B:442:PHE:HB3	1.62	0.80
1:B:531:VAL:HB	1:B:534:VAL:HG12	1.63	0.79
1:A:368:VAL:O	1:A:372:GLU:N	2.13	0.78
1:B:619:ASP:HB3	1:B:675:ARG:HH22	1.48	0.76
1:A:591:VAL:HA	1:A:594:GLU:HB2	1.68	0.75
1:B:618:PHE:HZ	1:B:668:ILE:HA	1.52	0.74
1:A:641:PHE:HE2	1:A:648:PHE:HB3	1.52	0.74
1:B:35:ALA:HB2	1:B:445:TRP:CH2	2.24	0.73
1:A:561:LEU:HB2	1:A:565:GLU:HG3	1.71	0.73
1:B:531:VAL:HG12	1:B:533:LYS:H	1.52	0.73
1:B:137:GLN:NE2	1:B:286:SER:OG	2.22	0.72
1:B:741:SER:HA	1:B:745:VAL:HB	1.73	0.71
1:B:368:VAL:O	1:B:372:GLU:N	2.21	0.71
1:B:100:LYS:HG2	1:B:117:VAL:HG21	1.72	0.71
1:B:70:MET:HG3	1:B:342:GLY:HA3	1.72	0.70
1:A:205:VAL:HG12	1:A:206:VAL:H	1.56	0.70
1:A:641:PHE:CE2	1:A:648:PHE:HB3	2.26	0.70
1:B:399:ILE:HD11	1:B:439:ASN:HB3	1.71	0.70
1:A:662:TYR:O	1:A:665:ASN:ND2	2.24	0.69
1:B:472:LYS:HG3	1:B:473:PRO:HD3	1.74	0.69
1:B:712:LEU:HD12	1:B:731:LEU:HB3	1.74	0.69
1:A:673:ARG:NH2	1:A:693:ALA:O	2.26	0.68
1:A:513:VAL:HB	1:A:579:GLY:HA3	1.76	0.68
1:B:719:GLY:HA2	1:B:723:LEU:HD22	1.76	0.68
1:A:396:THR:O	1:A:400:LEU:N	2.16	0.68
1:A:618:PHE:HE1	1:A:668:ILE:HG12	1.59	0.67
1:A:491:LEU:HA	1:A:495:ARG:HB3	1.76	0.67
1:B:401:ASP:OD1	1:B:613:TYR:OH	2.13	0.67
1:B:368:VAL:HA	1:B:371:PHE:HB3	1.75	0.67
1:A:402:VAL:O	1:A:406:HIS:ND1	2.29	0.66
1:B:134:PRO:HA	1:B:137:GLN:HB3	1.78	0.65
1:A:611:LEU:HA	1:A:614:VAL:HG12	1.79	0.65
1:B:720:GLY:H	1:B:723:LEU:HD13	1.62	0.64
1:B:231:ALA:HA	1:B:241:VAL:HG21	1.78	0.64
1:B:476:VAL:HA	1:B:479:THR:HG22	1.79	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:744:ILE:HG23	1:A:748:LEU:HD22	1.80	0.64
1:A:604:LEU:O	1:A:608:GLY:N	2.29	0.63
1:A:561:LEU:HD13	1:A:565:GLU:HB2	1.80	0.63
1:B:96:LEU:HB2	1:B:125:VAL:HG21	1.81	0.62
1:B:319:GLY:HA2	1:B:460:PRO:HD2	1.81	0.62
1:B:628:ILE:O	1:B:632:HIS:N	2.28	0.62
1:B:374:ILE:HD12	1:B:388:ILE:HA	1.82	0.62
1:B:51:ARG:HH21	1:B:343:GLY:HA3	1.64	0.62
1:A:57:ASN:HD22	1:A:64:ASN:HB2	1.64	0.61
1:A:742:ILE:HG23	1:A:743:TYR:HD1	1.65	0.61
1:B:86:PRO:HB3	1:B:277:ILE:HG21	1.82	0.61
1:A:30:PRO:HG2	1:A:448:GLN:CG	2.27	0.61
1:B:630:ALA:HB1	1:B:660:ILE:HD12	1.82	0.61
1:B:428:LEU:O	1:B:432:VAL:HG12	2.00	0.61
1:A:618:PHE:CE1	1:A:668:ILE:HG12	2.35	0.60
1:A:403:ASN:O	1:A:407:LEU:N	2.35	0.60
1:B:527:ILE:HD12	1:B:536:GLY:HA2	1.83	0.60
1:A:666:ASP:OD1	1:A:741:SER:OG	2.14	0.59
1:A:735:LEU:O	1:A:739:TYR:HB3	2.01	0.59
1:A:664:LEU:O	1:A:668:ILE:HG13	2.02	0.59
1:A:413:LEU:HD23	1:A:657:LEU:HD11	1.85	0.59
1:B:513:VAL:HG11	1:B:576:LEU:HD23	1.83	0.59
1:A:45:SER:OG	1:A:335:ILE:O	2.21	0.59
1:B:691:ASN:O	1:B:695:ASN:ND2	2.36	0.59
1:B:506:GLY:N	1:B:587:VAL:HG11	2.18	0.59
1:A:513:VAL:HG21	1:A:576:LEU:HG	1.83	0.58
1:B:435:SER:OG	1:B:439:ASN:ND2	2.36	0.58
1:A:407:LEU:O	1:A:411:LEU:N	2.36	0.58
1:B:633:ASP:OD2	1:B:663:SER:OG	2.22	0.58
1:A:186:THR:OG1	1:A:189:THR:OG1	2.17	0.58
1:B:374:ILE:HG21	1:B:388:ILE:HG22	1.86	0.58
1:A:673:ARG:HH21	1:A:697:THR:HG23	1.69	0.57
1:B:325:VAL:HG22	1:B:446:PHE:HE2	1.70	0.57
1:B:72:LEU:HB2	1:B:77:LYS:HD3	1.86	0.57
1:B:404:ALA:HA	1:B:407:LEU:HB2	1.86	0.57
1:B:724:ARG:HA	1:B:727:SER:HB3	1.85	0.57
1:A:369:ILE:O	1:A:373:ARG:N	2.34	0.57
1:A:360:ILE:O	1:A:364:VAL:HG22	2.04	0.57
1:A:367:ASN:HA	1:A:439:ASN:OD1	2.03	0.56
1:A:610:ILE:O	1:A:614:VAL:N	2.26	0.56
1:B:508:THR:HG22	1:B:557:LYS:HG2	1.86	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:514:ASP:HB3	1:B:578:GLN:HB2	1.88	0.56
1:A:418:THR:HG22	1:A:419:GLY:H	1.70	0.56
1:B:546:THR:HA	1:B:720:GLY:HA2	1.86	0.56
1:B:719:GLY:O	1:B:724:ARG:NH1	2.38	0.56
1:A:186:THR:HG1	1:A:189:THR:HG1	1.51	0.56
1:B:440:LEU:HG	1:B:441:VAL:HG13	1.87	0.56
1:B:505:PRO:HA	1:B:587:VAL:HG21	1.86	0.56
1:B:701:THR:HG21	1:B:742:ILE:HD11	1.88	0.56
1:B:424:PHE:O	1:B:428:LEU:HG	2.05	0.55
1:B:566:VAL:O	1:B:569:ILE:HG13	2.06	0.55
1:A:667:SER:HA	1:A:670:VAL:HG12	1.88	0.55
1:A:477:ILE:HG13	1:A:743:TYR:CD2	2.41	0.55
1:B:473:PRO:HB2	1:B:477:ILE:HG13	1.88	0.55
1:A:96:LEU:HB2	1:A:125:VAL:HG21	1.89	0.55
1:B:421:VAL:HG21	1:B:650:VAL:HB	1.89	0.55
1:A:736:VAL:HG22	1:A:740:SER:HB3	1.89	0.55
1:B:736:VAL:HA	1:B:739:TYR:CD1	2.42	0.55
1:B:76:LEU:HD11	1:B:350:LEU:HG	1.89	0.54
1:B:669:ILE:HG21	1:B:700:ARG:HB3	1.89	0.54
1:A:356:LEU:O	1:A:359:THR:OG1	2.21	0.54
1:A:371:PHE:O	1:A:375:LYS:NZ	2.40	0.54
1:A:408:LEU:HD11	1:A:609:LEU:HB3	1.90	0.54
1:A:340:ILE:HD13	1:A:430:ILE:HG13	1.89	0.54
1:A:673:ARG:NH2	1:A:697:THR:HG23	2.22	0.54
1:B:308:GLY:HA2	1:B:311:PHE:CE2	2.42	0.54
1:B:390:ALA:HA	1:B:393:GLU:HB2	1.89	0.54
1:B:677:ASN:HB3	1:B:689:ILE:HD11	1.89	0.54
1:B:694:ILE:CG2	1:B:742:ILE:HG23	2.38	0.54
1:A:31:ASN:OD1	1:A:31:ASN:N	2.38	0.54
1:A:370:SER:HG	1:A:392:TYR:HE1	1.54	0.54
1:A:609:LEU:O	1:A:613:TYR:N	2.41	0.54
1:B:715:LEU:HD23	1:B:727:SER:HB2	1.90	0.54
1:A:738:THR:O	1:A:742:ILE:HG22	2.08	0.53
1:A:57:ASN:N	1:A:57:ASN:OD1	2.41	0.53
1:B:322:PHE:HB3	1:B:371:PHE:CE2	2.43	0.53
1:A:593:LYS:HA	1:A:596:THR:HG22	1.89	0.53
1:B:627:ILE:O	1:B:631:ILE:HG12	2.09	0.53
1:A:477:ILE:HG21	1:A:743:TYR:HB3	1.91	0.53
1:A:503:PHE:HE1	1:A:650:VAL:HG22	1.74	0.53
1:B:720:GLY:N	1:B:723:LEU:HD13	2.23	0.53
1:A:666:ASP:HA	1:A:669:ILE:HB	1.89	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:51:ARG:HH11	1:B:53:TRP:HE1	1.56	0.53
1:B:413:LEU:HB3	1:B:425:ALA:HB2	1.90	0.53
1:A:513:VAL:HG13	1:A:514:ASP:H	1.73	0.53
1:A:577:PRO:O	1:A:578:GLN:HB2	2.09	0.52
1:A:614:VAL:O	1:A:618:PHE:HB2	2.09	0.52
1:A:491:LEU:O	1:A:642:SER:OG	2.23	0.52
1:B:697:THR:HA	1:B:700:ARG:HG3	1.90	0.52
1:A:502:ASP:HB3	1:A:595:LEU:HD13	1.91	0.52
1:B:357:VAL:HG11	1:B:715:LEU:HD22	1.90	0.52
1:B:513:VAL:HA	1:B:579:GLY:HA2	1.90	0.52
1:B:607:LEU:HA	1:B:610:ILE:HG12	1.89	0.52
1:B:624:LEU:HA	1:B:627:ILE:HB	1.89	0.52
1:A:477:ILE:HG13	1:A:743:TYR:HD2	1.74	0.52
1:A:598:LYS:HA	1:A:601:TYR:HD2	1.74	0.52
1:B:396:THR:HA	1:B:399:ILE:HG22	1.90	0.52
1:A:341:LEU:HD11	1:A:427:THR:HG22	1.91	0.52
1:B:86:PRO:HA	1:B:279:ILE:HG22	1.91	0.52
1:B:641:PHE:CD2	1:B:729:ILE:HD11	2.45	0.52
1:B:368:VAL:HG11	1:B:703:MET:HB3	1.92	0.52
1:A:609:LEU:HA	1:A:612:VAL:HB	1.92	0.52
1:A:637:ALA:HB1	1:A:656:LEU:HD22	1.91	0.52
1:A:507:THR:HG23	1:A:560:GLU:HA	1.92	0.52
1:A:513:VAL:HG11	1:A:576:LEU:HG	1.91	0.51
1:A:95:GLU:O	1:A:99:VAL:HG23	2.10	0.51
1:B:399:ILE:CD1	1:B:439:ASN:HB3	2.38	0.51
1:A:406:HIS:HE1	1:A:665:ASN:HB2	1.76	0.51
1:B:362:ALA:HA	1:B:365:ASP:HB3	1.93	0.51
1:B:400:LEU:O	1:B:404:ALA:N	2.41	0.51
1:B:512:ARG:NH2	1:B:550:GLN:HG2	2.26	0.51
1:A:117:VAL:HG13	1:A:127:VAL:HG22	1.92	0.51
1:B:463:ILE:HD11	1:B:465:HIS:HD2	1.75	0.51
1:B:557:LYS:NZ	1:B:647:GLU:OE1	2.43	0.51
1:A:359:THR:O	1:A:363:ALA:N	2.41	0.51
1:A:513:VAL:HG13	1:A:514:ASP:N	2.26	0.51
1:B:306:GLY:HA2	1:B:714:SER:HB3	1.93	0.51
1:B:670:VAL:HG11	1:B:746:ALA:HB2	1.92	0.50
1:B:304:LEU:O	1:B:308:GLY:N	2.44	0.50
1:B:655:ALA:HB2	1:B:726:PHE:HB3	1.93	0.50
1:B:739:TYR:O	1:B:743:TYR:HB2	2.12	0.50
1:B:515:ARG:HA	1:B:552:GLN:HG3	1.93	0.50
1:B:96:LEU:HA	1:B:99:VAL:HG12	1.94	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:364:VAL:O	1:B:368:VAL:HG23	2.11	0.50
1:B:673:ARG:HA	1:B:676:GLU:OE2	2.11	0.50
1:A:353:ILE:HD12	1:A:354:ALA:N	2.25	0.50
1:B:36:LEU:H	1:B:36:LEU:HD12	1.76	0.50
1:B:319:GLY:HA3	1:B:322:PHE:HB2	1.94	0.50
1:B:619:ASP:HB3	1:B:675:ARG:NH2	2.23	0.50
1:A:659:LEU:HD11	1:A:733:GLY:HA3	1.92	0.50
1:A:690:VAL:O	1:A:694:ILE:HG12	2.12	0.50
1:A:742:ILE:HG23	1:A:743:TYR:CD1	2.46	0.50
1:B:641:PHE:HZ	1:B:648:PHE:HA	1.76	0.50
1:A:746:ALA:HB3	1:A:747:PRO:HD3	1.93	0.50
1:A:638:MET:O	1:A:642:SER:N	2.45	0.50
1:A:752:PHE:O	1:A:756:ARG:N	2.36	0.50
1:B:330:LEU:HD12	1:B:331:LEU:N	2.27	0.50
1:B:438:SER:O	1:B:443:ALA:N	2.43	0.50
1:A:673:ARG:NH1	1:A:696:GLN:HB3	2.26	0.49
1:B:75:ASP:OD1	1:B:75:ASP:N	2.41	0.49
1:B:499:TYR:CB	1:B:648:PHE:HB2	2.42	0.49
1:B:597:GLN:HG2	1:B:601:TYR:CD2	2.47	0.49
1:A:736:VAL:HA	1:A:739:TYR:HD2	1.77	0.49
1:B:45:SER:O	1:B:49:ILE:HG22	2.12	0.49
1:B:469:ASP:HB3	1:B:472:LYS:HE3	1.94	0.49
1:B:518:THR:HG22	1:B:520:GLU:H	1.78	0.49
1:A:712:LEU:HD21	1:A:727:SER:O	2.13	0.49
1:B:307:ILE:HD11	1:B:330:LEU:HD13	1.93	0.49
1:B:410:ALA:HB1	1:B:429:ILE:HG12	1.95	0.49
1:B:302:ALA:HB1	1:B:715:LEU:HA	1.95	0.49
1:B:370:SER:O	1:B:374:ILE:HG12	2.12	0.49
1:A:595:LEU:HD12	1:A:596:THR:N	2.28	0.49
1:A:640:LEU:O	1:A:643:LEU:HG	2.13	0.48
1:A:732:VAL:O	1:A:736:VAL:HG12	2.13	0.48
1:A:35:ALA:HB2	1:A:445:TRP:CZ2	2.49	0.48
1:A:440:LEU:HD23	1:A:441:VAL:HG23	1.95	0.48
1:A:729:ILE:HD12	1:A:730:LEU:N	2.28	0.48
1:B:358:LEU:HD13	1:B:730:LEU:HD21	1.95	0.48
1:A:502:ASP:HB3	1:A:595:LEU:CD1	2.44	0.48
1:B:664:LEU:O	1:B:668:ILE:HG13	2.14	0.48
1:A:359:THR:HA	1:A:362:ALA:HB3	1.93	0.48
1:A:359:THR:HG23	1:A:428:LEU:HD23	1.96	0.48
1:B:51:ARG:O	1:B:55:HIS:NE2	2.47	0.48
1:A:45:SER:O	1:A:49:ILE:HG13	2.14	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:308:GLY:HA2	1:B:311:PHE:CZ	2.49	0.48
1:B:322:PHE:HB3	1:B:371:PHE:HE2	1.79	0.48
1:A:439:ASN:O	1:A:443:ALA:HB3	2.14	0.48
1:A:502:ASP:C	1:A:595:LEU:HD11	2.34	0.48
1:A:633:ASP:OD2	1:A:737:GLY:HA2	2.14	0.48
1:B:34:THR:O	1:B:38:LEU:N	2.39	0.48
1:B:50:TRP:O	1:B:52:PRO:HD3	2.13	0.48
1:B:64:ASN:H	1:B:64:ASN:HD22	1.62	0.48
1:B:73:GLY:N	1:B:348:LEU:O	2.46	0.48
1:B:411:LEU:HD12	1:B:412:ALA:N	2.29	0.48
1:B:666:ASP:OD2	1:B:701:THR:HG23	2.14	0.48
1:A:570:GLY:O	1:A:574:GLY:N	2.45	0.48
1:A:608:GLY:O	1:A:611:LEU:HG	2.13	0.48
1:B:699:SER:O	1:B:703:MET:HG2	2.13	0.48
1:A:105:ASN:HA	1:A:108:ASN:HD22	1.78	0.47
1:A:310:VAL:HG13	1:A:314:LEU:HD12	1.96	0.47
1:A:332:PHE:O	1:A:336:ILE:HG13	2.14	0.47
1:B:485:ALA:HA	1:B:636:ILE:HG12	1.94	0.47
1:A:43:LEU:HD23	1:A:46:LEU:HD12	1.96	0.47
1:A:364:VAL:HG23	1:A:707:SER:HB2	1.95	0.47
1:B:512:ARG:HH22	1:B:550:GLN:H	1.60	0.47
1:A:712:LEU:CD2	1:A:731:LEU:HB2	2.44	0.47
1:B:38:LEU:O	1:B:41:THR:OG1	2.30	0.47
1:B:522:LEU:HD13	1:B:576:LEU:HD22	1.95	0.47
1:A:744:ILE:O	1:A:748:LEU:HB2	2.14	0.47
1:B:432:VAL:O	1:B:436:THR:HG23	2.14	0.47
1:A:435:SER:O	1:A:438:SER:OG	2.32	0.47
1:B:376:GLU:OE2	1:B:696:GLN:NE2	2.47	0.47
1:B:746:ALA:HB3	1:B:747:PRO:HD3	1.96	0.47
1:A:150:LEU:HB3	1:A:187:GLY:HA2	1.96	0.47
1:A:62:LEU:HD11	1:A:68:GLN:O	2.14	0.47
1:B:410:ALA:HA	1:B:428:LEU:HD13	1.97	0.47
1:B:686:TYR:HE1	1:B:754:GLU:HB2	1.80	0.47
1:A:354:ALA:HA	1:A:357:VAL:HG22	1.97	0.47
1:A:406:HIS:HB3	1:A:432:VAL:HG11	1.95	0.47
1:B:513:VAL:HG12	1:B:514:ASP:OD1	2.15	0.47
1:B:586:THR:HG22	1:B:587:VAL:H	1.80	0.47
1:B:638:MET:O	1:B:642:SER:N	2.48	0.47
1:B:744:ILE:O	1:B:748:LEU:N	2.45	0.47
1:A:155:VAL:HG21	1:A:229:LEU:HD12	1.96	0.47
1:B:503:PHE:HB2	1:B:596:THR:HB	1.97	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:646:LEU:HD21	1:B:725:ASP:HB3	1.96	0.47
1:B:34:THR:HG23	1:B:445:TRP:CE3	2.50	0.47
1:B:717:ILE:HG13	1:B:718:PHE:CD2	2.50	0.47
1:A:364:VAL:O	1:A:368:VAL:N	2.48	0.46
1:B:205:VAL:HG12	1:B:206:VAL:H	1.79	0.46
1:B:487:ALA:O	1:B:491:LEU:HG	2.14	0.46
1:B:317:TYR:HE2	1:B:703:MET:SD	2.38	0.46
1:B:697:THR:O	1:B:701:THR:N	2.48	0.46
1:A:712:LEU:HD21	1:A:731:LEU:HB2	1.97	0.46
1:B:491:LEU:HB3	1:B:495:ARG:HD2	1.97	0.46
1:A:191:ALA:HB1	1:A:209:LYS:O	2.15	0.46
1:A:324:LEU:HD11	1:A:328:LEU:HD12	1.97	0.46
1:B:332:PHE:HD2	1:B:438:SER:HB2	1.80	0.46
1:B:350:LEU:O	1:B:353:ILE:HG22	2.16	0.46
1:B:618:PHE:CE2	1:B:671:SER:HB3	2.51	0.46
1:A:233:VAL:HG22	1:A:238:ILE:HG12	1.97	0.46
1:A:392:TYR:O	1:A:396:THR:HG23	2.16	0.46
1:A:606:GLY:O	1:A:610:ILE:HB	2.16	0.46
1:A:660:ILE:O	1:A:664:LEU:N	2.39	0.46
1:B:291:LEU:H	1:B:582:LEU:HD21	1.80	0.46
1:B:337:ILE:HD11	1:B:431:GLY:HA2	1.98	0.46
1:B:624:LEU:HD12	1:B:627:ILE:HB	1.98	0.46
1:A:415:ASN:OD1	1:A:416:TYR:N	2.49	0.46
1:A:488:GLY:HA2	1:A:491:LEU:HB2	1.97	0.46
1:A:632:HIS:O	1:A:636:ILE:HG12	2.16	0.46
1:A:96:LEU:H	1:A:96:LEU:HD23	1.80	0.46
1:A:189:THR:OG1	1:A:189:THR:O	2.32	0.46
1:B:80:LEU:HB2	1:B:285:ARG:O	2.16	0.46
1:B:472:LYS:HG3	1:B:473:PRO:CD	2.44	0.46
1:A:233:VAL:HG22	1:A:238:ILE:HG23	1.98	0.46
1:B:229:LEU:HD13	1:B:229:LEU:O	2.16	0.46
1:B:313:MET:HE1	1:B:317:TYR:CD2	2.50	0.46
1:B:591:VAL:O	1:B:595:LEU:HB2	2.16	0.46
1:B:634:VAL:HA	1:B:637:ALA:HB3	1.97	0.46
1:A:337:ILE:HD11	1:A:431:GLY:HA2	1.98	0.45
1:A:619:ASP:HB2	1:A:622:MET:HB3	1.98	0.45
1:A:240:SER:OG	1:A:254:ILE:HD12	2.16	0.45
1:A:417:SER:OG	1:A:421:VAL:HG23	2.16	0.45
1:B:328:LEU:HD21	1:B:446:PHE:CD2	2.52	0.45
1:A:364:VAL:CG2	1:A:707:SER:HB2	2.46	0.45
1:A:401:ASP:OD1	1:A:668:ILE:HG21	2.17	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:133:THR:HB	1:B:136:VAL:HG23	1.98	0.45
1:B:326:GLY:O	1:B:330:LEU:N	2.48	0.45
1:A:501:VAL:O	1:A:587:VAL:HG21	2.16	0.45
1:B:293:ALA:O	1:B:297:ARG:HG2	2.17	0.45
1:B:433:ILE:O	1:B:436:THR:OG1	2.28	0.45
1:B:599:THR:OG1	1:B:600:ILE:N	2.50	0.45
1:B:734:ILE:O	1:B:738:THR:HG23	2.17	0.45
1:B:358:LEU:HD21	1:B:662:TYR:HE2	1.82	0.45
1:B:518:THR:HB	1:B:521:GLN:HB2	1.98	0.45
1:B:525:SER:OG	1:B:572:ALA:HB1	2.17	0.45
1:A:79:GLY:N	1:A:131:GLY:H	2.15	0.45
1:A:397:ALA:HA	1:A:400:LEU:HB3	1.99	0.45
1:A:656:LEU:HD23	1:A:729:ILE:HD13	1.99	0.45
1:A:492:VAL:O	1:A:496:GLY:HA2	2.16	0.44
1:A:699:SER:O	1:A:703:MET:HG2	2.17	0.44
1:B:139:ARG:O	1:B:143:ILE:HG12	2.17	0.44
1:A:515:ARG:HA	1:A:552:GLN:N	2.32	0.44
1:B:392:TYR:O	1:B:396:THR:N	2.50	0.44
1:A:721:PRO:O	1:A:724:ARG:N	2.51	0.44
1:A:392:TYR:HA	1:A:395:SER:HB3	1.99	0.44
1:B:472:LYS:CG	1:B:473:PRO:HD3	2.45	0.44
1:B:634:VAL:HG12	1:B:659:LEU:HD23	1.98	0.44
1:A:64:ASN:OD1	1:A:65:ASP:N	2.48	0.44
1:B:305:VAL:HA	1:B:308:GLY:HA3	1.99	0.44
1:B:110:LEU:HB3	1:B:112:VAL:HG23	1.98	0.44
1:A:328:LEU:HB3	1:A:446:PHE:CZ	2.53	0.44
1:B:735:LEU:O	1:B:738:THR:OG1	2.31	0.44
1:A:310:VAL:HG22	1:A:710:LEU:HD12	2.00	0.43
1:A:593:LYS:O	1:A:597:GLN:HG3	2.18	0.43
1:A:715:LEU:HD11	1:A:723:LEU:HG	2.00	0.43
1:B:268:LEU:HD23	1:B:268:LEU:HA	1.74	0.43
1:B:303:ALA:O	1:B:307:ILE:N	2.48	0.43
1:B:669:ILE:H	1:B:669:ILE:HG13	1.55	0.43
1:B:99:VAL:HA	1:B:102:VAL:HG22	2.01	0.43
1:B:310:VAL:HG22	1:B:710:LEU:HB2	2.00	0.43
1:B:332:PHE:CD2	1:B:438:SER:HB2	2.53	0.43
1:B:597:GLN:O	1:B:601:TYR:HB2	2.18	0.43
1:B:629:ALA:HA	1:B:632:HIS:HB3	2.01	0.43
1:A:335:ILE:HD12	1:A:335:ILE:HA	1.92	0.43
1:A:403:ASN:OD1	1:A:404:ALA:N	2.51	0.43
1:A:266:LEU:O	1:A:270:LEU:HG	2.17	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:618:PHE:CD2	1:A:623:GLY:HA2	2.53	0.43
1:B:290:SER:HB2	1:B:582:LEU:HD21	2.00	0.43
1:A:402:VAL:HG23	1:A:669:ILE:HD11	2.00	0.43
1:A:408:LEU:HD13	1:A:613:TYR:HB2	2.01	0.43
1:B:38:LEU:HD13	1:B:445:TRP:CD1	2.53	0.43
1:A:79:GLY:O	1:A:287:ILE:HD12	2.18	0.43
1:A:107:ILE:HD11	1:A:115:PRO:HG3	2.01	0.43
1:B:665:ASN:HA	1:B:668:ILE:HD12	1.99	0.43
1:A:117:VAL:HG22	1:A:127:VAL:HG13	2.00	0.43
1:A:425:ALA:O	1:A:429:ILE:HG13	2.19	0.42
1:B:369:ILE:HG12	1:B:402:VAL:HG21	2.01	0.42
1:A:388:ILE:HG13	1:A:389:GLY:N	2.35	0.42
1:A:400:LEU:HA	1:A:403:ASN:HD21	1.84	0.42
1:A:403:ASN:HB3	1:A:436:THR:HG21	2.02	0.42
1:A:545:THR:HG22	1:A:553:ASN:N	2.35	0.42
1:B:595:LEU:HD12	1:B:598:LYS:HD3	2.01	0.42
1:B:716:LEU:HD23	1:B:724:ARG:HG2	2.01	0.42
1:A:162:ASP:O	1:A:166:ARG:N	2.53	0.42
1:A:725:ASP:O	1:A:729:ILE:HG13	2.19	0.42
1:B:641:PHE:CE2	1:B:646:LEU:HD23	2.54	0.42
1:A:49:ILE:HD11	1:A:335:ILE:O	2.19	0.42
1:A:572:ALA:HA	1:A:575:LYS:NZ	2.34	0.42
1:B:64:ASN:H	1:B:64:ASN:ND2	2.17	0.42
1:A:119:VAL:HA	1:A:125:VAL:HA	2.02	0.42
1:B:34:THR:HG23	1:B:445:TRP:HE3	1.84	0.42
1:B:441:VAL:O	1:B:445:TRP:N	2.52	0.42
1:B:48:TYR:HA	1:B:51:ARG:HD3	2.01	0.42
1:A:71:THR:HB	1:A:346:ALA:O	2.19	0.42
1:A:359:THR:HG21	1:A:431:GLY:HA3	2.02	0.42
1:A:375:LYS:O	1:A:378:LEU:HG	2.19	0.42
1:A:713:ILE:O	1:A:717:ILE:HG13	2.19	0.42
1:A:422:LYS:O	1:A:425:ALA:HB3	2.20	0.42
1:A:503:PHE:CE1	1:A:650:VAL:HG22	2.54	0.42
1:A:712:LEU:HA	1:A:715:LEU:HB3	2.01	0.42
1:A:721:PRO:O	1:A:724:ARG:HG2	2.20	0.42
1:B:351:PRO:HG3	1:B:420:ALA:HB1	2.02	0.42
1:B:612:VAL:O	1:B:616:PHE:N	2.50	0.42
1:B:352:GLY:HA2	1:B:423:GLY:C	2.40	0.41
1:A:104:GLU:HG2	1:A:117:VAL:HG21	2.02	0.41
1:B:561:LEU:HB2	1:B:565:GLU:CB	2.43	0.41
1:A:443:ALA:HA	1:A:446:PHE:CD2	2.55	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:662:TYR:CA	1:A:665:ASN:HD22	2.33	0.41
1:B:629:ALA:HB2	1:B:745:VAL:HG21	2.01	0.41
1:B:649:THR:O	1:B:652:SER:HB2	2.20	0.41
1:A:191:ALA:HB1	1:A:210:THR:HA	2.02	0.41
1:A:518:THR:HA	1:A:522:LEU:HD12	2.01	0.41
1:A:730:LEU:HD12	1:A:730:LEU:HA	1.95	0.41
1:B:641:PHE:HD2	1:B:729:ILE:HD11	1.83	0.41
1:A:375:LYS:HA	1:A:375:LYS:HD3	1.86	0.41
1:B:327:ALA:O	1:B:331:LEU:HB2	2.20	0.41
1:B:390:ALA:O	1:B:394:HIS:N	2.43	0.41
1:B:397:ALA:O	1:B:401:ASP:N	2.54	0.41
1:B:231:ALA:HA	1:B:241:VAL:HG11	2.03	0.41
1:A:328:LEU:HD13	1:A:446:PHE:CD1	2.56	0.41
1:B:370:SER:HB3	1:B:399:ILE:HD12	2.02	0.41
1:B:571:ALA:O	1:B:575:LYS:HD3	2.21	0.41
1:A:472:LYS:HB2	1:A:473:PRO:HD3	2.02	0.41
1:A:665:ASN:CG	1:A:666:ASP:N	2.73	0.41
1:B:420:ALA:O	1:B:423:GLY:N	2.43	0.41
1:B:441:VAL:HA	1:B:444:LYS:HB3	2.03	0.41
1:A:79:GLY:HA3	1:A:130:PRO:HA	2.03	0.41
1:A:662:TYR:C	1:A:665:ASN:HD22	2.21	0.41
1:A:712:LEU:HD11	1:A:730:LEU:HB3	2.03	0.41
1:B:79:GLY:HA2	1:B:131:GLY:HA2	2.02	0.41
1:B:636:ILE:HG22	1:B:640:LEU:HD13	2.03	0.40
1:A:34:THR:HG23	1:A:37:LEU:HD23	2.03	0.40
1:A:73:GLY:HA2	1:A:348:LEU:O	2.21	0.40
1:A:406:HIS:HA	1:A:409:SER:HG	1.86	0.40
1:B:631:ILE:HA	1:B:634:VAL:HG22	2.03	0.40
1:A:110:LEU:HD22	1:A:112:VAL:HG22	2.03	0.40
1:A:326:GLY:O	1:A:330:LEU:HD13	2.22	0.40
1:A:527:ILE:HG21	1:A:536:GLY:HA2	2.03	0.40
1:B:495:ARG:CZ	1:B:642:SER:HB3	2.52	0.40
1:B:587:VAL:HG22	1:B:588:GLY:H	1.85	0.40
1:A:646:LEU:HD12	1:A:646:LEU:HA	1.93	0.40
1:A:488:GLY:O	1:A:492:VAL:N	2.55	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	721/750 (96%)	656 (91%)	59 (8%)	6 (1%)	19	58
1	B	672/750 (90%)	622 (93%)	47 (7%)	3 (0%)	34	71
All	All	1393/1500 (93%)	1278 (92%)	106 (8%)	9 (1%)	25	63

All (9) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	578	GLN
1	A	721	PRO
1	B	51	ARG
1	A	446	PHE
1	B	420	ALA
1	A	276	PRO
1	B	153	ARG
1	A	460	PRO
1	A	455	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 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	481/603 (80%)	462 (96%)	19 (4%)	31	57
1	B	484/603 (80%)	470 (97%)	14 (3%)	42	65
All	All	965/1206 (80%)	932 (97%)	33 (3%)	37	61

All (33) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	53	TRP
1	A	69	PHE
1	A	96	LEU
1	A	198	ASP
1	A	204	TRP
1	A	315	PHE
1	A	385	LYS
1	A	442	PHE
1	A	472	LYS
1	A	503	PHE
1	A	561	LEU
1	A	618	PHE
1	A	638	MET
1	A	641	PHE
1	A	682	ARG
1	A	688	GLU
1	A	726	PHE
1	A	739	TYR
1	A	751	TYR
1	B	70	MET
1	B	407	LEU
1	B	414	TYR
1	B	448	GLN
1	B	495	ARG
1	B	552	GLN
1	B	616	PHE
1	B	648	PHE
1	B	666	ASP
1	B	676	GLU
1	B	678	MET
1	B	687	ARG
1	B	739	TYR
1	B	752	PHE

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	66	GLN
1	A	108	ASN
1	B	31	ASN
1	B	137	GLN

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Mol	Chain	Res	Type
1	B	448	GLN
1	B	465	HIS

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 monosaccharides 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

Unable to reproduce the depositors R factor - this section is therefore empty.

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

Unable to reproduce the depositors R factor - this section is therefore empty.

6.3 Carbohydrates

Unable to reproduce the depositors R factor - this section is therefore empty.

6.4 Ligands

Unable to reproduce the depositors R factor - this section is therefore empty.

6.5 Other polymers

Unable to reproduce the depositors R factor - this section is therefore empty.