



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 5, 2026 – 01:13 PM UTC

PDB ID : 5W0V / pdb_00005w0v
Title : Crystal structure of full-length Kluyveromyces lactis Kap123 with histone H4 1-34
Authors : An, S.; Yoon, J.; Song, J.-J.; Cho, U.-S.
Deposited on : 2017-05-31
Resolution : 2.82 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
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

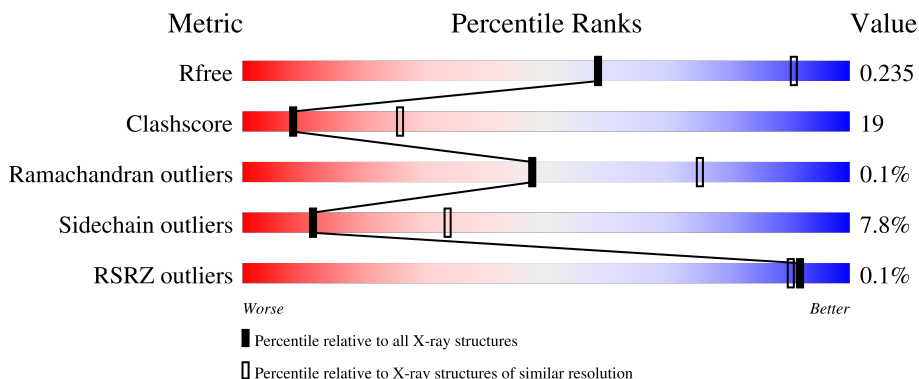
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.82 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	4591 (2.84-2.80)
Clashscore	190562	5010 (2.84-2.80)
Ramachandran outliers	187476	4916 (2.84-2.80)
Sidechain outliers	187428	4918 (2.84-2.80)
RSRZ outliers	180081	4594 (2.84-2.80)

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 $\leq 5\%$. 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	1116	
1	B	1116	
2	C	34	
2	D	34	

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 15787 atoms, of which 38 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 Kap123.

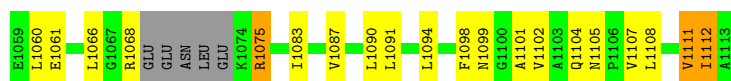
Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	1017	Total	C	H	N	O	S	0	0	0
			7910	5020	38	1288	1543	21			
1	B	1003	Total	C	N	O	S		0	0	0
			7773	4957	1266	1529	21				

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-2	SER	-	expression tag	UNP Q6CMF0
A	-1	ASN	-	expression tag	UNP Q6CMF0
A	0	ALA	-	expression tag	UNP Q6CMF0
B	-2	SER	-	expression tag	UNP Q6CMF0
B	-1	ASN	-	expression tag	UNP Q6CMF0
B	0	ALA	-	expression tag	UNP Q6CMF0

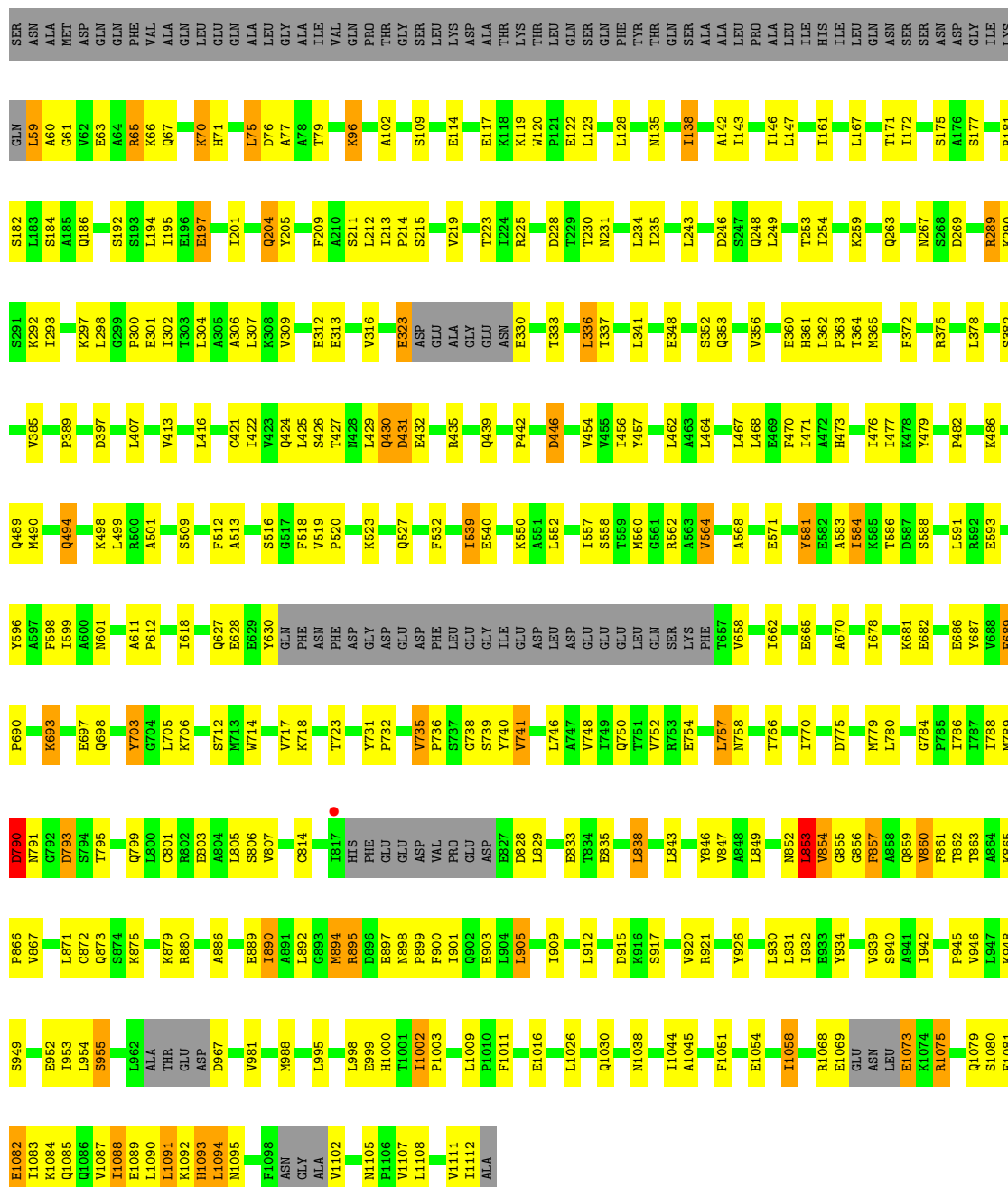
- Molecule 2 is a protein called Histone H4 1-34.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
2	C	7	Total	C	N	O	0	0	0
			54	31	16	7			
2	D	6	Total	C	N	O	0	0	0
			50	29	15	6			



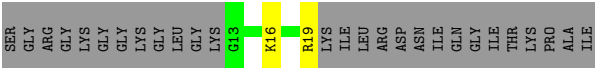
• Molecule 1: Kap123

Chain B: 58% 27% 10%



• Molecule 2: Histone H4 1-34

Chain C: 15% 6% 79%



● Molecule 2: Histone H4 1-34



4 Data and refinement statistics

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α , β , γ	78.79Å 87.70Å 101.62Å 79.59° 81.45° 71.70°	Depositor
Resolution (Å)	33.79 – 2.82 33.79 – 2.82	Depositor EDS
% Data completeness (in resolution range)	98.3 (33.79-2.82) 98.3 (33.79-2.82)	Depositor EDS
R_{merge}	0.04	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.79 (at 2.81Å)	Xtriage
Refinement program	PHENIX 1.11.1 _2575	Depositor
R, R_{free}	0.170 , 0.234 0.173 , 0.235	Depositor DCC
R_{free} test set	2000 reflections (3.29%)	wwPDB-VP
Wilson B-factor (Å ²)	75.8	Xtriage
Anisotropy	0.512	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.30 , 54.4	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.97	EDS
Total number of atoms	15787	wwPDB-VP
Average B, all atoms (Å ²)	83.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.38% 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	0.46	0/7990	0.63	6/10843 (0.1%)
1	B	0.53	8/7889 (0.1%)	0.67	11/10705 (0.1%)
2	C	0.41	0/54	0.96	0/68
2	D	0.44	0/50	0.93	0/63
All	All	0.49	8/15983 (0.1%)	0.65	17/21679 (0.1%)

All (8) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	426	SER	C-O	-6.12	1.16	1.24
1	B	432	GLU	C-O	-5.74	1.17	1.24
1	B	427	THR	C-O	-5.68	1.17	1.24
1	B	892	LEU	C-O	-5.53	1.17	1.24
1	B	895	ARG	C-O	-5.39	1.19	1.24
1	B	425	LEU	C-O	-5.21	1.18	1.24
1	B	429	LEU	C-O	-5.13	1.16	1.23
1	B	857	PHE	CA-C	5.08	1.59	1.52

All (17) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	430	GLN	N-CA-C	12.35	124.28	111.07
1	A	430	GLN	N-CA-C	11.43	123.43	110.97
1	B	581	TYR	CA-CB-CG	8.87	129.87	113.90
1	B	854	VAL	N-CA-CB	8.87	125.86	111.23
1	B	793	ASP	N-CA-C	7.71	122.09	110.14
1	B	853	LEU	CB-CA-C	7.16	121.09	109.07
1	B	856	GLY	N-CA-C	-7.03	103.77	112.77
1	B	790	ASP	N-CA-C	6.47	124.58	110.80
1	B	828	ASP	N-CA-C	6.41	120.09	111.24
1	A	852	ASN	CB-CA-C	-6.30	97.41	109.95
1	B	430	GLN	N-CA-CB	-5.92	101.43	110.01
1	B	895	ARG	CB-CA-C	-5.50	110.24	116.63

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	853	LEU	N-CA-CB	5.43	119.67	110.49
1	B	894	MET	N-CA-C	5.39	118.08	111.82
1	A	1098	PHE	N-CA-C	5.39	119.01	111.90
1	A	430	GLN	N-CA-CB	-5.12	102.43	109.91
1	A	856	GLY	N-CA-C	-5.04	108.71	115.32

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	7872	38	7970	286	0
1	B	7773	0	7854	322	0
2	C	54	0	56	9	0
2	D	50	0	53	3	0
All	All	15749	38	15933	607	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 19.

All (607) 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:736:PRO:HD2	1:B:789:MET:CE	1.56	1.33
1:B:739:SER:N	1:B:791:ASN:OD1	1.61	1.32
1:B:738:GLY:HA2	1:B:791:ASN:OD1	1.29	1.24
1:B:738:GLY:HA2	1:B:791:ASN:CG	1.64	1.23
1:B:738:GLY:CA	1:B:791:ASN:OD1	1.86	1.21
1:B:736:PRO:CD	1:B:789:MET:HE2	1.70	1.20
1:B:738:GLY:C	1:B:791:ASN:OD1	1.95	1.08
1:B:735:VAL:HG12	1:B:789:MET:HE1	1.11	1.08
1:B:736:PRO:CD	1:B:789:MET:CE	2.30	1.08
1:A:593:GLU:OE2	2:C:19:ARG:NH2	1.90	1.05
1:B:333:THR:HB	1:B:336:LEU:HD22	1.43	1.01

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:735:VAL:CG1	1:B:789:MET:HE1	1.89	1.01
1:A:306:ALA:HB2	1:A:341:LEU:HD23	1.40	1.01
1:B:512:PHE:CE2	1:B:1068:ARG:HD3	1.96	0.99
1:B:735:VAL:HG12	1:B:789:MET:CE	1.92	0.99
1:A:678:ILE:HD13	1:A:719:ALA:HB2	1.44	0.99
1:B:946:VAL:HG11	1:B:988:MET:HE1	1.45	0.96
1:A:707:GLU:HG2	1:A:768:MET:HE3	1.48	0.95
1:B:486:LYS:HG3	1:B:490:MET:HE2	1.48	0.95
1:A:946:VAL:HG11	1:A:988:MET:HE1	1.46	0.95
1:B:564:VAL:HG13	1:B:568:ALA:HB3	1.49	0.92
1:A:707:GLU:HG2	1:A:768:MET:CE	2.00	0.91
1:A:509:SER:OG	2:C:16:LYS:NZ	2.04	0.91
1:B:290:LYS:NZ	1:B:835:GLU:OE2	2.04	0.89
1:A:593:GLU:HG3	1:A:665:GLU:HA	1.54	0.89
1:A:1032:GLN:HA	1:A:1037:ILE:HD11	1.54	0.89
1:A:382:SER:O	1:A:424:GLN:HG2	1.73	0.88
1:A:1026:LEU:HD23	1:A:1090:LEU:HD22	1.55	0.87
1:B:946:VAL:CG1	1:B:988:MET:HE1	2.04	0.87
1:A:766:THR:HG22	1:A:814:CYS:HB2	1.56	0.86
1:A:946:VAL:CG1	1:A:988:MET:HE1	2.06	0.86
1:B:509:SER:OG	2:D:16:LYS:HE2	1.77	0.84
1:A:1044:ILE:HD11	1:A:1102:VAL:HA	1.61	0.83
1:A:707:GLU:OE1	1:A:767:SER:HB3	1.79	0.83
1:B:213:ILE:HG21	1:B:253:THR:HG21	1.59	0.82
1:B:96:LYS:NZ	1:B:96:LYS:HA	1.94	0.82
1:B:1026:LEU:HD23	1:B:1090:LEU:HD22	1.60	0.82
1:B:790:ASP:N	1:B:790:ASP:OD1	2.13	0.81
1:B:254:ILE:HD12	1:B:254:ILE:H	1.45	0.81
1:A:195:ILE:HD13	1:A:195:ILE:C	2.05	0.81
1:A:161:ILE:HD11	1:A:194:LEU:HB3	1.60	0.81
1:A:707:GLU:HA	1:A:768:MET:HE1	1.62	0.81
1:B:853:LEU:HD12	1:B:857:PHE:HA	1.64	0.80
1:B:431:ASP:OD1	1:B:431:ASP:N	2.14	0.80
1:B:693:LYS:HE2	1:B:693:LYS:HA	1.63	0.80
1:B:519:VAL:HG22	1:B:564:VAL:HG22	1.64	0.79
1:A:191:VAL:O	1:A:195:ILE:HG22	1.83	0.79
1:A:343:SER:HB2	1:A:383:VAL:CG2	2.13	0.78
1:B:1090:LEU:O	1:B:1094:LEU:HD22	1.83	0.78
1:A:486:LYS:O	1:A:490:MET:HG3	1.84	0.78
1:A:532:PHE:O	1:A:550:LYS:HG2	1.83	0.78
1:B:564:VAL:HG13	1:B:568:ALA:CB	2.15	0.77

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:323:GLU:HB2	1:B:498:LYS:HE2	1.65	0.77
1:B:486:LYS:HG3	1:B:490:MET:CE	2.15	0.77
1:A:955:SER:OG	1:B:204:GLN:NE2	2.17	0.77
1:A:343:SER:HB2	1:A:383:VAL:HG21	1.65	0.77
1:B:1088:ILE:HA	1:B:1091:LEU:HD22	1.67	0.76
1:A:1108:LEU:HA	1:A:1111:VAL:HG13	1.67	0.76
1:A:593:GLU:OE2	2:C:19:ARG:HD3	1.86	0.76
1:A:476:ILE:HD13	1:A:513:ALA:HB3	1.67	0.75
1:B:805:LEU:HD21	1:B:863:THR:HG22	1.69	0.75
1:A:382:SER:HB3	1:A:421:CYS:HA	1.68	0.75
1:A:630:TYR:CE1	1:A:658:VAL:HG23	2.22	0.74
1:B:143:ILE:HD11	1:B:171:THR:HG21	1.69	0.74
1:B:293:ILE:HG23	1:B:298:LEU:HB2	1.69	0.74
1:A:1044:ILE:HD11	1:A:1102:VAL:HG22	1.69	0.74
1:B:736:PRO:CD	1:B:789:MET:HE3	2.14	0.74
1:B:738:GLY:HA2	1:B:791:ASN:CB	2.17	0.73
1:B:736:PRO:HD2	1:B:789:MET:HE2	0.79	0.73
1:A:233:LYS:HD3	1:A:277:PHE:CZ	2.22	0.73
1:A:53:ASN:HB3	1:A:56:ILE:HG13	1.69	0.73
1:A:1108:LEU:HA	1:A:1111:VAL:CG1	2.19	0.72
1:A:768:MET:HE2	1:A:768:MET:HA	1.72	0.72
1:A:475:ASP:O	1:A:478:LYS:HG3	1.90	0.72
1:A:518:PHE:CE2	1:A:560:MET:HG2	2.24	0.72
1:A:1032:GLN:CA	1:A:1037:ILE:HD11	2.18	0.72
1:A:513:ALA:HA	1:A:1068:ARG:HH12	1.55	0.71
1:A:780:LEU:HD21	1:A:788:ILE:HG22	1.71	0.71
1:B:59:LEU:HD13	1:B:60:ALA:H	1.55	0.71
1:A:498:LYS:HG3	1:A:545:ASP:OD2	1.89	0.71
1:A:431:ASP:N	1:A:431:ASP:OD1	2.20	0.71
1:A:678:ILE:CD1	1:A:719:ALA:HB2	2.19	0.71
1:B:1051:PHE:HE2	1:B:1091:LEU:HD21	1.56	0.71
1:A:318:ASP:OD1	1:A:322:ASN:HB3	1.91	0.71
1:A:954:LEU:HG	1:A:981:VAL:HG11	1.74	0.70
1:B:954:LEU:HG	1:B:981:VAL:HG11	1.73	0.70
1:B:494:GLN:HG3	1:B:499:LEU:HD12	1.72	0.70
1:B:96:LYS:HA	1:B:96:LYS:HZ2	1.55	0.70
1:B:793:ASP:OD1	1:B:793:ASP:N	2.22	0.70
1:A:1044:ILE:CD1	1:A:1102:VAL:HA	2.22	0.70
1:B:494:GLN:CG	1:B:499:LEU:HD12	2.21	0.70
1:B:718:LYS:HB2	1:B:779:MET:HE1	1.73	0.70
1:A:952:GLU:O	1:A:956:VAL:HG13	1.91	0.69

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1091:LEU:HB3	1:A:1112:ILE:HD11	1.74	0.69
1:A:586:THR:HG21	1:A:591:LEU:HB3	1.74	0.69
1:B:766:THR:HG22	1:B:814:CYS:HB2	1.75	0.69
1:A:289:ARG:HD2	1:A:292:LYS:HD3	1.75	0.69
1:B:865:LYS:NZ	1:B:903:GLU:OE2	2.26	0.68
1:B:307:LEU:HG	1:B:365:MET:HE1	1.74	0.68
1:A:630:TYR:CZ	1:A:658:VAL:HG23	2.29	0.68
1:B:746:LEU:HD12	1:B:746:LEU:O	1.94	0.68
1:B:65:ARG:HD2	1:B:109:SER:OG	1.94	0.68
1:B:182:SER:O	1:B:186:GLN:HG3	1.93	0.68
1:A:946:VAL:HG11	1:A:988:MET:CE	2.25	0.67
1:B:201:ILE:HD11	1:B:248:GLN:OE1	1.94	0.67
1:A:741:VAL:CG1	1:A:745:ALA:HB3	2.24	0.67
1:B:584:ILE:HD11	1:B:599:ILE:HD12	1.76	0.67
1:B:297:LYS:O	1:B:297:LYS:HG3	1.96	0.66
1:B:316:VAL:HG13	1:B:413:VAL:CG2	2.26	0.66
1:B:161:ILE:HD13	1:B:195:ILE:HD13	1.77	0.66
1:B:586:THR:HG23	1:B:588:SER:H	1.60	0.66
1:B:564:VAL:CG1	1:B:568:ALA:HB3	2.25	0.66
1:A:206:ALA:CB	1:A:249:LEU:HD13	2.26	0.65
1:B:289:ARG:HH21	1:B:292:LYS:NZ	1.94	0.65
1:B:693:LYS:HD3	1:B:693:LYS:O	1.96	0.65
1:B:1083:ILE:O	1:B:1087:VAL:HG23	1.96	0.65
1:A:780:LEU:HD21	1:A:788:ILE:CG2	2.27	0.65
1:B:736:PRO:N	1:B:789:MET:CE	2.59	0.65
1:B:243:LEU:O	1:B:289:ARG:NH1	2.29	0.65
1:A:201:ILE:HD11	1:A:248:GLN:CD	2.22	0.64
1:A:768:MET:CE	1:A:768:MET:HA	2.28	0.64
1:B:766:THR:CG2	1:B:814:CYS:HB2	2.27	0.64
1:B:942:ILE:C	1:B:945:PRO:HD2	2.22	0.64
1:A:898:ASN:O	1:A:901:ILE:HG13	1.98	0.64
1:B:59:LEU:HD13	1:B:60:ALA:N	2.12	0.64
1:B:397:ASP:HB3	1:B:967:ASP:HB2	1.78	0.64
1:A:142:ALA:O	1:A:146:ILE:HG13	1.98	0.63
1:A:1019:ASP:OD2	1:A:1023:LYS:HE3	1.99	0.63
1:B:717:VAL:HG22	1:B:748:VAL:HG12	1.81	0.63
1:B:630:TYR:HH	1:B:703:TYR:HE2	1.43	0.63
1:B:297:LYS:HD2	1:B:353:GLN:OE1	1.99	0.63
1:A:250:THR:O	1:A:253:THR:OG1	2.16	0.63
1:B:853:LEU:HD12	1:B:857:PHE:CA	2.29	0.62
1:A:195:ILE:HD13	1:A:195:ILE:O	1.99	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:128:LEU:HD23	1:B:167:LEU:HD22	1.82	0.62
1:B:75:LEU:H	1:B:75:LEU:HD22	1.65	0.62
1:B:564:VAL:HG12	1:B:564:VAL:O	1.98	0.62
1:B:766:THR:HG22	1:B:814:CYS:SG	2.39	0.62
1:A:409:ASP:OD1	1:A:410:SER:N	2.33	0.62
1:A:580:ALA:O	1:A:584:ILE:HG12	2.00	0.62
1:B:949:SER:O	1:B:953:ILE:HG13	1.98	0.61
1:B:946:VAL:HG11	1:B:988:MET:CE	2.25	0.61
1:A:475:ASP:OD1	1:A:478:LYS:HE2	2.00	0.61
1:B:479:TYR:O	1:B:482:PRO:HD2	2.01	0.61
1:A:699:VAL:O	1:A:706:LYS:HE2	1.99	0.61
1:B:1095:ASN:CG	1:B:1102:VAL:HB	2.25	0.61
1:B:738:GLY:H	1:B:791:ASN:HA	1.65	0.61
1:A:192:SER:HB3	1:A:209:PHE:CE2	2.36	0.61
1:B:539:ILE:HD11	1:B:591:LEU:CD2	2.31	0.61
1:A:119:LYS:HG3	1:A:120:TRP:H	1.65	0.60
1:A:707:GLU:CA	1:A:768:MET:HE1	2.29	0.60
1:A:1101:ALA:HA	1:A:1104:GLN:CD	2.27	0.60
1:A:182:SER:O	1:A:186:GLN:HG3	2.01	0.60
1:A:905:LEU:O	1:A:909:ILE:HG13	2.02	0.60
1:B:939:VAL:HB	1:B:942:ILE:HD11	1.83	0.60
1:A:717:VAL:HG22	1:A:748:VAL:HG12	1.84	0.59
1:A:53:ASN:HB3	1:A:56:ILE:CG1	2.31	0.59
1:A:300:PRO:HD3	1:A:353:GLN:OE1	2.02	0.59
1:B:740:TYR:OH	1:B:786:ILE:HG22	2.02	0.59
1:A:119:LYS:CG	1:A:120:TRP:H	2.16	0.59
1:A:1090:LEU:O	1:A:1094:LEU:HG	2.02	0.59
1:B:805:LEU:HD11	1:B:867:VAL:HG21	1.84	0.59
1:A:513:ALA:HA	1:A:1068:ARG:NH1	2.16	0.59
1:B:915:ASP:O	1:B:921:ARG:HD2	2.02	0.59
1:A:1033:ASN:O	1:A:1037:ILE:HG13	2.01	0.59
1:B:142:ALA:O	1:B:146:ILE:HG13	2.02	0.59
1:B:120:TRP:CD1	1:B:122:GLU:HG2	2.38	0.59
1:B:298:LEU:O	1:B:302:ILE:HG13	2.02	0.59
1:B:471:ILE:CG2	1:B:476:ILE:HB	2.32	0.59
1:A:721:LEU:HD21	1:A:749:ILE:HD11	1.85	0.59
1:B:172:ILE:CD1	1:B:184:SER:HB2	2.34	0.58
1:A:150:LEU:HD23	1:A:157:LEU:HD13	1.83	0.58
1:A:409:ASP:OD2	1:A:414:VAL:HG21	2.03	0.58
1:A:599:ILE:N	1:A:599:ILE:HD13	2.18	0.58
1:B:65:ARG:CB	1:B:65:ARG:HH11	2.15	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:484:MET:HE3	1:A:488:PHE:CE2	2.39	0.58
1:B:871:LEU:CD2	1:B:879:LYS:HE3	2.34	0.58
1:A:689:GLU:HB2	1:A:690:PRO:HD3	1.85	0.58
1:A:898:ASN:HB3	1:A:901:ILE:CG1	2.34	0.58
1:A:1083:ILE:O	1:A:1087:VAL:HG23	2.04	0.58
1:A:586:THR:HG23	1:A:588:SER:H	1.69	0.57
1:A:602:MET:HE2	1:A:602:MET:HA	1.86	0.57
1:A:484:MET:HE3	1:A:488:PHE:HE2	1.68	0.57
1:A:789:MET:HE3	1:A:794:SER:HA	1.87	0.57
1:B:161:ILE:HG21	1:B:205:TYR:CD2	2.39	0.57
1:A:54:ASP:OD1	1:A:57:LYS:NZ	2.35	0.57
1:B:323:GLU:HG3	1:B:498:LYS:NZ	2.18	0.57
1:B:682:GLU:HG3	1:B:723:THR:HG23	1.86	0.57
1:A:172:ILE:HD11	1:A:216:VAL:HG22	1.87	0.56
1:A:382:SER:CB	1:A:421:CYS:HA	2.34	0.56
1:B:1084:LYS:O	1:B:1088:ILE:HG13	2.05	0.56
1:B:942:ILE:O	1:B:945:PRO:HD2	2.05	0.56
1:A:259:LYS:NZ	1:A:301:GLU:OE1	2.39	0.56
1:B:430:GLN:HB3	1:B:470:PHE:CD1	2.40	0.56
1:B:512:PHE:CZ	1:B:1068:ARG:HD3	2.40	0.56
1:A:230:THR:O	1:A:234:LEU:HD12	2.06	0.56
1:A:847:VAL:HG13	1:A:889:GLU:HB3	1.88	0.56
1:B:172:ILE:HD12	1:B:184:SER:HB2	1.88	0.56
1:A:307:LEU:HG	1:A:365:MET:HE1	1.87	0.56
1:A:1044:ILE:HD11	1:A:1102:VAL:CA	2.32	0.56
1:A:998:LEU:O	1:A:1002:ILE:HG12	2.06	0.56
1:A:1054:GLU:O	1:A:1058:ILE:HD12	2.05	0.56
1:B:1081:GLU:O	1:B:1085:GLN:HG2	2.06	0.55
1:A:789:MET:HE1	1:A:794:SER:HB3	1.88	0.55
1:B:161:ILE:HG21	1:B:195:ILE:CD1	2.35	0.55
1:B:738:GLY:N	1:B:791:ASN:HA	2.21	0.55
1:A:710:LEU:CD2	1:A:772:VAL:HG22	2.37	0.55
1:B:766:THR:HG22	1:B:814:CYS:CB	2.36	0.55
1:B:382:SER:O	1:B:424:GLN:HG2	2.07	0.55
1:B:562:ARG:HD2	1:B:601:ASN:OD1	2.07	0.55
1:B:735:VAL:CB	1:B:789:MET:HE1	2.34	0.55
1:B:1088:ILE:HA	1:B:1091:LEU:CD2	2.36	0.55
1:A:562:ARG:HD2	1:A:604:LYS:HD2	1.87	0.55
1:B:905:LEU:HA	1:B:931:LEU:HD13	1.88	0.55
1:B:940:SER:HA	1:B:995:LEU:HD13	1.88	0.55
1:B:746:LEU:HD12	1:B:750:GLN:HG3	1.88	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:471:ILE:HG21	1:B:476:ILE:HB	1.88	0.55
1:B:689:GLU:HB3	1:B:690:PRO:HD3	1.89	0.55
1:A:119:LYS:HG3	1:A:120:TRP:N	2.22	0.55
1:A:537:SER:OG	1:A:582:GLU:HG2	2.06	0.55
1:A:195:ILE:C	1:A:195:ILE:CD1	2.77	0.55
1:A:710:LEU:HD21	1:A:772:VAL:HG22	1.89	0.55
1:A:780:LEU:CD2	1:A:788:ILE:HG22	2.37	0.55
1:A:530:GLN:HA	1:A:533:ILE:HD11	1.89	0.54
1:B:516:SER:O	1:B:519:VAL:HG23	2.07	0.54
1:A:583:ALA:O	1:A:586:THR:HG22	2.08	0.54
1:B:197:GLU:OE2	1:B:197:GLU:HA	2.07	0.54
1:B:780:LEU:HD22	1:B:852:ASN:ND2	2.23	0.54
1:A:692:LEU:CD1	1:A:716:ILE:HG21	2.37	0.54
1:B:67:GLN:OE1	1:B:70:LYS:NZ	2.29	0.54
1:A:880:ARG:NH1	1:A:915:ASP:OD2	2.35	0.54
1:B:932:ILE:CD1	1:B:988:MET:HE3	2.38	0.54
1:B:736:PRO:N	1:B:789:MET:HE3	2.20	0.54
1:B:898:ASN:HB3	1:B:901:ILE:HG13	1.90	0.54
1:B:1080:SER:OG	1:B:1083:ILE:HG22	2.08	0.54
1:B:532:PHE:O	1:B:550:LYS:HG2	2.07	0.54
1:B:703:TYR:CD1	1:B:703:TYR:C	2.86	0.54
1:A:320:LEU:O	1:A:455:VAL:HB	2.08	0.54
1:A:352:SER:HA	1:A:356:VAL:CG2	2.38	0.54
1:A:876:SER:HB3	1:A:879:LYS:HD2	1.90	0.54
1:B:231:ASN:O	1:B:235:ILE:HG12	2.07	0.54
1:B:593:GLU:OE2	2:D:19:ARG:NH1	2.40	0.54
1:B:795:THR:O	1:B:799:GLN:OE1	2.25	0.54
1:B:1073:GLU:CD	1:B:1075:ARG:HG3	2.33	0.54
1:A:554:PHE:HZ	1:A:579:ALA:HB1	1.73	0.53
1:A:712:SER:O	1:A:716:ILE:HD13	2.07	0.53
1:A:1040:ALA:N	1:A:1041:PRO:HD2	2.23	0.53
1:B:807:VAL:HG11	1:B:838:LEU:HD12	1.89	0.53
1:A:382:SER:O	1:A:424:GLN:CG	2.49	0.53
1:B:330:GLU:O	1:B:336:LEU:HD23	2.09	0.53
1:B:1107:VAL:O	1:B:1111:VAL:HG23	2.08	0.53
1:B:323:GLU:HG3	1:B:498:LYS:HZ3	1.74	0.53
1:B:627:GLN:OE1	1:B:662:ILE:HD12	2.08	0.53
1:B:61:GLY:HA3	1:B:102:ALA:HB1	1.91	0.53
1:B:807:VAL:HG11	1:B:838:LEU:CD1	2.38	0.53
1:A:474:ASN:O	1:A:478:LYS:NZ	2.39	0.53
1:A:858:ALA:HA	1:A:894:MET:HE1	1.91	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:932:ILE:HD12	1:B:988:MET:HE3	1.91	0.53
1:A:406:GLY:HA3	1:A:418:ALA:HB2	1.91	0.53
1:B:1051:PHE:CE2	1:B:1091:LEU:HD21	2.41	0.53
1:A:192:SER:O	1:A:195:ILE:HG23	2.08	0.53
1:B:246:ASP:OD1	1:B:248:GLN:HG3	2.09	0.53
1:B:805:LEU:HB2	1:B:846:TYR:OH	2.09	0.53
1:A:530:GLN:HA	1:A:533:ILE:CG1	2.38	0.53
1:A:918:LEU:HD22	1:A:956:VAL:CG2	2.38	0.53
1:A:847:VAL:CG1	1:A:889:GLU:HB3	2.39	0.53
1:A:942:ILE:C	1:A:945:PRO:HD2	2.34	0.53
1:A:465:ASP:OD1	1:A:509:SER:OG	2.21	0.52
1:A:468:LEU:O	1:A:471:ILE:HG22	2.09	0.52
1:A:1026:LEU:HD23	1:A:1090:LEU:CD2	2.34	0.52
1:A:1044:ILE:HD11	1:A:1102:VAL:CG2	2.37	0.52
1:B:905:LEU:O	1:B:909:ILE:HG13	2.09	0.52
1:B:917:SER:HB3	1:B:920:VAL:HG23	1.89	0.52
1:B:693:LYS:HE2	1:B:693:LYS:CA	2.37	0.52
1:A:306:ALA:CB	1:A:341:LEU:HD23	2.26	0.52
1:B:195:ILE:HD12	1:B:205:TYR:HB3	1.92	0.52
1:B:479:TYR:C	1:B:482:PRO:HD2	2.35	0.52
1:A:1038:ASN:HD22	1:A:1038:ASN:C	2.15	0.52
1:B:1095:ASN:HB2	1:B:1102:VAL:HB	1.90	0.52
1:A:430:GLN:HB3	1:A:470:PHE:CG	2.44	0.52
1:B:254:ILE:HD12	1:B:254:ILE:N	2.22	0.52
1:B:899:PRO:HG2	1:B:900:PHE:CE1	2.45	0.52
1:B:895:ARG:HA	1:B:934:TYR:CE2	2.45	0.52
1:B:805:LEU:HD12	1:B:805:LEU:O	2.10	0.51
1:B:628:GLU:HG3	1:B:630:TYR:H	1.75	0.51
1:A:1038:ASN:O	1:A:1038:ASN:ND2	2.31	0.51
1:B:1069:GLU:OE2	1:B:1075:ARG:NH2	2.42	0.51
1:A:593:GLU:CD	2:C:19:ARG:NH2	2.67	0.51
1:A:41:LEU:HD22	1:A:71:HIS:HB2	1.93	0.51
1:B:738:GLY:CA	1:B:791:ASN:HA	2.41	0.51
1:A:488:PHE:HZ	1:A:525:SER:HG	1.57	0.51
1:A:518:PHE:HE2	1:A:560:MET:HG2	1.74	0.51
1:B:917:SER:O	1:B:921:ARG:HG3	2.10	0.51
1:B:717:VAL:HG22	1:B:748:VAL:CG1	2.41	0.51
1:B:1044:ILE:HG13	1:B:1045:ALA:N	2.26	0.50
1:B:523:LYS:NZ	1:B:571:GLU:OE2	2.44	0.50
1:B:705:LEU:O	1:B:705:LEU:HG	2.12	0.50
1:A:58:GLN:O	1:A:62:VAL:HG23	2.11	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:393:LEU:HA	1:A:396:PHE:CD1	2.46	0.50
1:A:558:SER:HB3	1:A:598:PHE:CD2	2.46	0.50
1:B:430:GLN:HG2	1:B:470:PHE:CZ	2.47	0.50
1:B:1082:GLU:HG2	1:B:1083:ILE:N	2.25	0.50
1:B:289:ARG:HH21	1:B:292:LYS:HZ1	1.59	0.50
1:B:1054:GLU:O	1:B:1058:ILE:HD12	2.12	0.50
1:B:853:LEU:CD1	1:B:857:PHE:HA	2.39	0.50
1:A:421:CYS:O	1:A:425:LEU:HG	2.12	0.50
1:B:735:VAL:CA	1:B:789:MET:HE1	2.41	0.50
1:A:233:LYS:HD3	1:A:277:PHE:CE1	2.46	0.50
1:A:897:GLU:O	1:A:899:PRO:HD3	2.10	0.50
1:A:932:ILE:O	1:A:991:LYS:HE2	2.11	0.50
1:B:486:LYS:CG	1:B:490:MET:HE2	2.30	0.50
1:B:611:ALA:N	1:B:612:PRO:HD2	2.27	0.50
1:B:509:SER:HG	2:D:16:LYS:HE2	1.77	0.49
1:B:872:CYS:O	1:B:880:ARG:HD2	2.12	0.49
1:A:195:ILE:HD11	1:A:201:ILE:HB	1.94	0.49
1:B:518:PHE:CE2	1:B:560:MET:HG2	2.47	0.49
1:A:122:GLU:C	1:A:125:PRO:HD2	2.37	0.49
1:A:699:VAL:O	1:A:706:LYS:HG2	2.12	0.49
1:A:740:TYR:CE1	1:A:786:ILE:HB	2.47	0.49
1:A:872:CYS:O	1:A:880:ARG:HG2	2.12	0.49
1:A:1094:LEU:HB2	1:A:1102:VAL:HG21	1.94	0.49
1:A:628:GLU:HG3	1:A:629:GLU:N	2.28	0.49
1:B:63:GLU:CD	1:B:66:LYS:HE2	2.37	0.49
1:B:1095:ASN:CB	1:B:1102:VAL:HB	2.42	0.49
1:A:47:ILE:HG23	1:A:51:SER:OG	2.12	0.49
1:A:53:ASN:HB3	1:A:56:ILE:CD1	2.43	0.49
1:A:564:VAL:O	1:A:564:VAL:HG23	2.13	0.49
1:B:494:GLN:HG2	1:B:499:LEU:HD12	1.93	0.49
1:B:746:LEU:CD1	1:B:750:GLN:HG3	2.42	0.49
1:B:431:ASP:O	1:B:435:ARG:HG3	2.13	0.49
1:B:581:TYR:HA	1:B:584:ILE:HG13	1.94	0.49
1:A:323:GLU:OE1	1:A:498:LYS:NZ	2.40	0.49
1:A:586:THR:HG21	1:A:591:LEU:HD23	1.95	0.49
1:B:454:VAL:HG22	1:B:499:LEU:HD21	1.94	0.49
1:B:630:TYR:CE1	1:B:658:VAL:HG22	2.48	0.49
1:B:309:VAL:O	1:B:312:GLU:HG3	2.13	0.49
1:B:519:VAL:CG2	1:B:564:VAL:HG22	2.40	0.49
1:B:586:THR:HG21	1:B:591:LEU:HD23	1.94	0.49
1:B:1087:VAL:O	1:B:1091:LEU:HD13	2.13	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:887:LEU:HD22	1:A:904:LEU:HD22	1.94	0.48
1:B:259:LYS:O	1:B:263:GLN:HG3	2.12	0.48
1:B:735:VAL:HA	1:B:789:MET:CE	2.43	0.48
1:A:228:ASP:OD2	1:A:231:ASN:HB2	2.13	0.48
1:A:318:ASP:O	1:A:322:ASN:ND2	2.37	0.48
1:A:430:GLN:HB3	1:A:470:PHE:CD1	2.48	0.48
1:A:430:GLN:HB3	1:A:470:PHE:CD2	2.48	0.48
1:B:442:PRO:O	1:B:446:ASP:HB2	2.13	0.48
1:B:805:LEU:CD2	1:B:863:THR:HG22	2.42	0.48
1:B:1084:LYS:O	1:B:1088:ILE:CG1	2.61	0.48
1:A:692:LEU:HD11	1:A:716:ILE:HG21	1.95	0.48
1:A:990:LEU:HD21	1:A:1024:LEU:HA	1.94	0.48
1:B:795:THR:O	1:B:799:GLN:HG3	2.14	0.48
1:A:556:ASN:OD1	2:C:16:LYS:HE3	2.12	0.48
1:B:63:GLU:HA	1:B:66:LYS:HG3	1.96	0.48
1:A:246:ASP:OD1	1:A:248:GLN:HG3	2.13	0.48
1:A:727:LYS:HE2	1:A:730:GLU:OE2	2.12	0.48
1:B:735:VAL:HA	1:B:789:MET:HE2	1.95	0.48
1:B:917:SER:HB3	1:B:920:VAL:CG2	2.44	0.48
1:B:1089:GLU:HA	1:B:1092:LYS:HD2	1.95	0.48
1:B:304:LEU:HD21	1:B:361:HIS:CE1	2.48	0.48
1:B:316:VAL:HG13	1:B:413:VAL:HG21	1.95	0.48
1:B:703:TYR:C	1:B:703:TYR:HD1	2.22	0.48
1:B:254:ILE:H	1:B:254:ILE:CD1	2.21	0.48
1:A:593:GLU:CD	2:C:19:ARG:HD3	2.38	0.48
1:B:1085:GLN:HA	1:B:1088:ILE:CD1	2.43	0.48
1:A:316:VAL:HG22	1:A:413:VAL:HG11	1.96	0.48
1:A:940:SER:HA	1:A:995:LEU:HD13	1.96	0.48
1:A:549:LEU:HD12	1:A:549:LEU:O	2.14	0.47
1:A:892:LEU:HB2	1:A:930:LEU:HD13	1.96	0.47
1:B:464:LEU:HD11	1:B:468:LEU:HD11	1.96	0.47
1:A:627:GLN:OE1	1:A:662:ILE:HD12	2.13	0.47
1:B:886:ALA:O	1:B:890:ILE:HG13	2.14	0.47
1:B:899:PRO:HG2	1:B:900:PHE:CZ	2.50	0.47
1:B:952:GLU:HA	1:B:955:SER:OG	2.13	0.47
1:B:898:ASN:HB3	1:B:901:ILE:CG1	2.44	0.47
1:B:735:VAL:CA	1:B:789:MET:CE	2.93	0.47
1:A:803:GLU:O	1:A:807:VAL:HG23	2.14	0.47
1:A:1075:ARG:HG3	1:A:1075:ARG:HH11	1.79	0.47
1:A:119:LYS:CG	1:A:120:TRP:N	2.77	0.47
1:A:1036:ILE:HD12	1:A:1036:ILE:HA	1.73	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:583:ALA:O	1:B:586:THR:HG22	2.15	0.47
1:B:855:GLY:HA3	1:B:897:GLU:OE2	2.15	0.47
1:B:999:GLU:HG3	1:B:1000:HIS:N	2.30	0.47
1:A:757:LEU:HD13	1:A:757:LEU:HA	1.73	0.47
1:A:971:LYS:NZ	1:A:975:ASP:OD2	2.46	0.47
1:B:473:HIS:O	1:B:477:ILE:HG12	2.14	0.47
1:A:602:MET:HB3	1:A:610:PHE:CE1	2.50	0.47
1:B:686:GLU:HG3	1:B:687:TYR:CD2	2.50	0.47
1:A:343:SER:CB	1:A:383:VAL:CG2	2.89	0.47
1:A:374:ARG:HH21	1:A:409:ASP:CG	2.22	0.47
1:B:230:THR:O	1:B:234:LEU:HD12	2.14	0.47
1:B:313:GLU:HG3	1:B:372:PHE:CE2	2.50	0.47
1:B:757:LEU:HA	1:B:757:LEU:HD13	1.50	0.47
1:A:297:LYS:HD3	1:A:297:LYS:N	2.30	0.46
1:A:41:LEU:HB3	1:A:42:PRO:HD3	1.98	0.46
1:B:161:ILE:CG2	1:B:195:ILE:CD1	2.92	0.46
1:B:998:LEU:O	1:B:1002:ILE:HG13	2.14	0.46
1:B:416:LEU:HB2	1:B:456:ILE:CD1	2.45	0.46
1:B:416:LEU:HB2	1:B:456:ILE:HD13	1.96	0.46
1:A:120:TRP:N	1:A:121:PRO:HD3	2.30	0.46
1:A:135:ASN:HB3	1:A:138:ILE:HB	1.98	0.46
1:A:693:LYS:HE2	1:A:693:LYS:HB3	1.79	0.46
1:A:161:ILE:CD1	1:A:194:LEU:HB3	2.37	0.46
1:A:552:LEU:HD23	1:A:590:ARG:NH1	2.31	0.46
1:B:430:GLN:HB3	1:B:470:PHE:CE1	2.51	0.46
1:A:543:SER:O	1:A:547:ILE:HD12	2.15	0.46
1:B:681:LYS:HB3	1:B:723:THR:OG1	2.16	0.46
1:B:838:LEU:HD12	1:B:838:LEU:O	2.16	0.46
1:B:1026:LEU:O	1:B:1030:GLN:HB2	2.16	0.46
1:A:131:ALA:O	1:A:139:ARG:HD2	2.15	0.46
1:A:435:ARG:HB3	1:A:435:ARG:CZ	2.45	0.46
1:A:687:TYR:C	1:A:690:PRO:HD2	2.40	0.46
1:B:905:LEU:CA	1:B:931:LEU:HD13	2.46	0.46
1:B:843:LEU:O	1:B:847:VAL:HG23	2.15	0.46
1:A:124:ILE:N	1:A:125:PRO:CD	2.79	0.46
1:A:565:LYS:HD2	1:A:565:LYS:N	2.30	0.46
1:B:76:ASP:OD1	1:B:77:ALA:N	2.49	0.46
1:B:746:LEU:HG	1:B:750:GLN:OE1	2.16	0.46
1:A:689:GLU:HA	1:A:689:GLU:OE1	2.16	0.45
1:A:562:ARG:NE	1:A:1066:LEU:O	2.50	0.45
1:B:161:ILE:CG2	1:B:195:ILE:HD11	2.46	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:300:PRO:HD3	1:B:353:GLN:OE1	2.17	0.45
1:B:739:SER:OG	1:B:741:VAL:HG22	2.17	0.45
1:A:362:LEU:HA	1:A:377:ILE:HG12	1.98	0.45
1:A:780:LEU:HD23	1:A:787:ILE:HB	1.99	0.45
1:B:120:TRP:NE1	1:B:122:GLU:HG2	2.32	0.45
1:B:1073:GLU:CD	1:B:1075:ARG:CG	2.89	0.45
1:B:356:VAL:O	1:B:360:GLU:HG3	2.16	0.45
1:A:114:GLU:HA	1:A:117:GLU:OE1	2.16	0.45
1:A:590:ARG:NH2	2:C:19:ARG:HH22	2.13	0.45
1:A:593:GLU:OE2	2:C:19:ARG:CD	2.61	0.45
1:A:1002:ILE:HB	1:A:1003:PRO:HD3	1.98	0.45
1:A:625:LEU:O	1:A:666:LYS:HE2	2.16	0.45
1:A:898:ASN:HD21	1:A:904:LEU:HD12	1.82	0.45
1:A:982:CYS:SG	1:A:1005:LEU:HD12	2.57	0.45
1:B:135:ASN:HB3	1:B:138:ILE:HD13	1.98	0.45
1:B:306:ALA:HB2	1:B:341:LEU:HD23	1.98	0.45
1:B:740:TYR:CE1	1:B:786:ILE:HB	2.52	0.45
1:B:1105:ASN:HB3	1:B:1108:LEU:HD12	1.98	0.45
1:A:257:LEU:HD23	1:A:257:LEU:HA	1.75	0.45
1:B:407:LEU:HD11	1:B:422:ILE:CD1	2.46	0.45
1:B:228:ASP:OD2	1:B:231:ASN:HB2	2.17	0.45
1:B:293:ILE:HD13	1:B:302:ILE:HD11	1.99	0.45
1:A:41:LEU:HB3	1:A:42:PRO:CD	2.46	0.44
1:A:48:LEU:HA	1:A:57:LYS:HA	1.99	0.44
1:A:103:ASN:O	1:A:107:ILE:HG13	2.17	0.44
1:A:262:LEU:O	1:A:266:VAL:HG22	2.17	0.44
1:A:454:VAL:HG23	1:A:499:LEU:HD11	1.99	0.44
1:B:732:PRO:HD2	1:B:740:TYR:CD2	2.52	0.44
1:A:362:LEU:N	1:A:363:PRO:HD2	2.32	0.44
1:A:780:LEU:HB3	1:A:852:ASN:HD21	1.81	0.44
1:B:735:VAL:HG12	1:B:789:MET:SD	2.57	0.44
1:B:847:VAL:HG13	1:B:889:GLU:HB3	1.99	0.44
1:B:926:TYR:CZ	1:B:930:LEU:HD11	2.52	0.44
1:A:161:ILE:HG21	1:A:205:TYR:CD2	2.51	0.44
1:A:768:MET:O	1:A:772:VAL:HG23	2.18	0.44
1:A:1105:ASN:OD1	1:A:1107:VAL:HB	2.18	0.44
1:A:1112:ILE:N	1:A:1112:ILE:HD13	2.33	0.44
1:B:382:SER:HB3	1:B:421:CYS:HA	2.00	0.44
1:B:523:LYS:HE3	1:B:527:GLN:NE2	2.32	0.44
1:B:693:LYS:HD3	1:B:693:LYS:C	2.42	0.44
1:B:225:ARG:HE	1:B:225:ARG:HB2	1.67	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:557:ILE:O	1:B:560:MET:HB2	2.17	0.44
1:A:533:ILE:HG23	1:A:553:THR:CG2	2.47	0.44
1:B:213:ILE:HB	1:B:214:PRO:HD3	1.99	0.44
1:A:313:GLU:HG3	1:A:372:PHE:CE2	2.53	0.44
1:A:777:SER:O	1:A:781:ARG:HG3	2.17	0.44
1:A:400:ILE:HB	1:A:401:PRO:HD3	1.99	0.44
1:A:430:GLN:HG2	1:A:470:PHE:CZ	2.53	0.44
1:B:539:ILE:HD11	1:B:591:LEU:HD22	1.99	0.44
1:B:1087:VAL:O	1:B:1091:LEU:HD22	2.17	0.44
1:A:64:ALA:O	1:A:68:VAL:HG23	2.18	0.43
1:A:368:SER:O	1:A:374:ARG:HD3	2.18	0.43
1:B:63:GLU:OE1	1:B:66:LYS:HE2	2.18	0.43
1:A:72:TRP:CH2	1:A:80:GLN:HB3	2.53	0.43
1:A:343:SER:CB	1:A:383:VAL:HG22	2.49	0.43
1:A:59:LEU:N	1:A:59:LEU:HD13	2.33	0.43
1:A:576:LEU:HB3	1:A:598:PHE:CZ	2.53	0.43
1:B:766:THR:O	1:B:770:ILE:HG13	2.18	0.43
1:B:75:LEU:HD13	1:B:75:LEU:N	2.33	0.43
1:A:48:LEU:O	1:A:57:LYS:HD2	2.17	0.43
1:A:286:LEU:O	1:A:290:LYS:HB3	2.18	0.43
1:B:117:GLU:N	1:B:117:GLU:OE1	2.52	0.43
1:A:91:ALA:O	1:A:100:ARG:HG2	2.18	0.43
1:A:932:ILE:CD1	1:A:988:MET:CE	2.96	0.43
1:B:714:TRP:CD1	1:B:775:ASP:HB3	2.54	0.43
1:A:488:PHE:HZ	1:A:525:SER:OG	2.02	0.43
1:A:664:TYR:CD1	2:C:19:ARG:HD2	2.53	0.43
1:A:741:VAL:HG12	1:A:745:ALA:HB3	2.00	0.43
1:B:161:ILE:HG23	1:B:195:ILE:HD11	2.01	0.43
1:B:717:VAL:HG23	1:B:752:VAL:HG21	2.00	0.43
1:A:41:LEU:N	1:A:42:PRO:HD2	2.34	0.43
1:B:201:ILE:HD12	1:B:249:LEU:CD1	2.49	0.43
1:B:194:LEU:HD23	1:B:194:LEU:HA	1.86	0.43
1:B:732:PRO:HD2	1:B:740:TYR:CE2	2.54	0.43
1:B:899:PRO:HG2	1:B:900:PHE:CD1	2.54	0.43
1:A:353:GLN:O	1:A:357:PRO:HG2	2.18	0.42
1:A:789:MET:HE3	1:A:794:SER:CA	2.47	0.42
1:A:1015:PHE:O	1:A:1018:TYR:HB2	2.19	0.42
1:B:932:ILE:CD1	1:B:988:MET:CE	2.97	0.42
1:A:942:ILE:O	1:A:945:PRO:HD2	2.19	0.42
1:B:512:PHE:CD2	1:B:1068:ARG:HD3	2.51	0.42
1:B:584:ILE:HD13	1:B:596:TYR:CE1	2.54	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:593:GLU:HG3	1:B:665:GLU:HA	2.01	0.42
1:B:1054:GLU:OE1	1:B:1084:LYS:NZ	2.48	0.42
1:A:424:GLN:O	1:A:428:ASN:ND2	2.43	0.42
1:B:717:VAL:CG2	1:B:752:VAL:HG21	2.48	0.42
1:B:746:LEU:HD12	1:B:746:LEU:C	2.43	0.42
1:B:1002:ILE:HB	1:B:1003:PRO:HD3	2.02	0.42
1:A:255:ALA:O	1:A:259:LYS:HG3	2.19	0.42
1:A:611:ALA:N	1:A:612:PRO:HD2	2.35	0.42
1:A:807:VAL:CG1	1:A:838:LEU:HG	2.49	0.42
1:B:201:ILE:CD1	1:B:248:GLN:HB2	2.49	0.42
1:B:382:SER:O	1:B:385:VAL:HG12	2.19	0.42
1:B:803:GLU:O	1:B:806:SER:HB3	2.19	0.42
1:B:857:PHE:CE2	1:B:861:PHE:HB2	2.53	0.42
1:A:714:TRP:CD1	1:A:775:ASP:HB3	2.54	0.42
1:A:740:TYR:CZ	1:A:786:ILE:HB	2.55	0.42
1:B:558:SER:HB3	1:B:598:PHE:CD2	2.54	0.42
1:B:564:VAL:CG1	1:B:568:ALA:CB	2.89	0.42
1:A:487:LEU:HB3	1:A:507:ILE:CG1	2.50	0.42
1:A:212:LEU:HD23	1:A:212:LEU:HA	1.85	0.42
1:A:530:GLN:HA	1:A:533:ILE:CD1	2.49	0.42
1:B:457:TYR:OH	1:B:490:MET:HB3	2.19	0.42
1:B:471:ILE:HG23	1:B:476:ILE:HB	2.01	0.42
1:B:905:LEU:CD2	1:B:909:ILE:HG13	2.50	0.42
1:A:106:VAL:O	1:A:110:ILE:HG13	2.19	0.42
1:A:205:TYR:O	1:A:208:LYS:HB2	2.19	0.42
1:A:221:ASP:HB3	1:A:225:ARG:NH2	2.35	0.42
1:A:880:ARG:NH1	1:A:915:ASP:CG	2.78	0.42
1:B:213:ILE:CG2	1:B:253:THR:HG21	2.41	0.42
1:B:219:VAL:O	1:B:223:THR:HG23	2.20	0.42
1:B:389:PRO:HD2	1:B:833:GLU:OE1	2.20	0.42
1:B:467:LEU:HD23	1:B:467:LEU:HA	1.89	0.42
1:B:476:ILE:HD13	1:B:513:ALA:HB3	2.02	0.42
1:B:670:ALA:HB1	1:B:712:SER:OG	2.20	0.42
1:A:211:SER:O	1:A:214:PRO:HD2	2.20	0.42
1:A:352:SER:HA	1:A:356:VAL:HG21	2.01	0.42
1:A:807:VAL:HG11	1:A:838:LEU:HG	2.01	0.42
1:A:1028:LEU:HA	1:A:1028:LEU:HD23	1.57	0.42
1:B:70:LYS:C	1:B:70:LYS:HD2	2.45	0.42
1:A:356:VAL:HB	1:A:357:PRO:HD3	2.01	0.41
1:B:172:ILE:HD13	1:B:184:SER:HB2	2.01	0.41
1:B:352:SER:HA	1:B:356:VAL:CG2	2.50	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:246:ASP:OD1	1:A:247:SER:N	2.53	0.41
1:A:291:SER:O	1:A:295:GLN:HG3	2.21	0.41
1:A:393:LEU:HA	1:A:396:PHE:CE1	2.55	0.41
1:A:468:LEU:HD13	1:A:510:CYS:SG	2.60	0.41
1:A:857:PHE:CE2	1:A:861:PHE:HB2	2.55	0.41
1:B:65:ARG:CD	1:B:109:SER:OG	2.64	0.41
1:B:215:SER:O	1:B:219:VAL:HG23	2.20	0.41
1:B:290:LYS:HE2	1:B:348:GLU:O	2.20	0.41
1:A:114:GLU:OE2	1:A:119:LYS:HG3	2.20	0.41
1:A:345:ALA:C	1:A:354:VAL:HG21	2.45	0.41
1:B:120:TRP:CD2	1:B:123:LEU:HB2	2.55	0.41
1:B:738:GLY:HA2	1:B:791:ASN:CA	2.50	0.41
1:B:880:ARG:NE	1:B:915:ASP:OD2	2.43	0.41
1:B:501:ALA:HB1	1:B:552:LEU:HD12	2.01	0.41
1:A:296:ALA:HB3	1:A:298:LEU:HG	2.03	0.41
1:B:96:LYS:HA	1:B:96:LYS:HZ1	1.81	0.41
1:B:114:GLU:OE1	1:B:119:LYS:HG3	2.20	0.41
1:B:849:LEU:HD23	1:B:849:LEU:HA	1.89	0.41
1:A:697:GLU:OE2	1:A:697:GLU:HA	2.21	0.41
1:A:887:LEU:HD23	1:A:887:LEU:HA	1.83	0.41
1:B:192:SER:HB3	1:B:209:PHE:CZ	2.56	0.41
1:B:211:SER:O	1:B:214:PRO:HD2	2.21	0.41
1:B:519:VAL:HB	1:B:520:PRO:HD3	2.02	0.41
1:B:740:TYR:CZ	1:B:786:ILE:HB	2.56	0.41
1:B:865:LYS:N	1:B:866:PRO:HD2	2.35	0.41
1:A:722:LEU:HA	1:A:722:LEU:HD23	1.81	0.41
1:A:932:ILE:CD1	1:A:988:MET:HE3	2.51	0.41
1:B:362:LEU:N	1:B:363:PRO:HD2	2.36	0.41
1:B:378:LEU:HD23	1:B:378:LEU:HA	1.89	0.41
1:B:1009:LEU:HD23	1:B:1011:PHE:CE1	2.56	0.41
1:A:169:ALA:HA	1:A:212:LEU:HD21	2.03	0.41
1:A:192:SER:HB3	1:A:209:PHE:CZ	2.55	0.41
1:A:776:LEU:HD23	1:A:776:LEU:HA	1.80	0.41
1:A:898:ASN:HB3	1:A:901:ILE:HG12	2.01	0.41
1:A:1047:PHE:CZ	1:A:1087:VAL:HG13	2.56	0.41
1:B:212:LEU:HD23	1:B:212:LEU:HA	1.92	0.41
1:B:435:ARG:HB3	1:B:435:ARG:CZ	2.50	0.41
1:B:847:VAL:CG1	1:B:889:GLU:HB3	2.50	0.41
1:A:467:LEU:O	1:A:468:LEU:C	2.63	0.41
1:B:738:GLY:HA2	1:B:791:ASN:HA	2.03	0.41
1:A:717:VAL:HG22	1:A:748:VAL:CG1	2.51	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:267:ASN:OD1	1:B:269:ASP:N	2.54	0.40
1:B:801:CYS:SG	1:B:860:VAL:CG2	3.09	0.40
1:B:1087:VAL:C	1:B:1091:LEU:HD22	2.45	0.40
1:A:789:MET:CE	1:A:794:SER:HB3	2.50	0.40
1:B:586:THR:HG21	1:B:591:LEU:HB3	2.04	0.40
1:B:630:TYR:CZ	1:B:658:VAL:HG22	2.56	0.40
1:B:731:TYR:CD2	1:B:784:GLY:HA3	2.56	0.40
1:B:766:THR:HG23	1:B:814:CYS:HB2	2.02	0.40
1:B:1093:HIS:ND1	1:B:1093:HIS:N	2.69	0.40
1:A:143:ILE:HD11	1:A:171:THR:HG21	2.01	0.40
1:A:217:VAL:HG13	1:A:260:LEU:HD22	2.03	0.40
1:A:217:VAL:HG13	1:A:260:LEU:CD2	2.51	0.40
1:B:197:GLU:OE2	1:B:197:GLU:CA	2.69	0.40
1:B:375:ARG:HD2	1:B:413:VAL:HG12	2.04	0.40
1:B:584:ILE:HD11	1:B:599:ILE:CD1	2.46	0.40
1:B:912:LEU:CD1	1:B:953:ILE:HD11	2.51	0.40
1:A:581:TYR:O	1:A:585:LYS:HG2	2.21	0.40
1:A:793:ASP:OD1	1:A:793:ASP:C	2.63	0.40
1:B:323:GLU:HB2	1:B:498:LYS:CE	2.43	0.40
1:A:164:PHE:HB3	1:A:168:PHE:CE2	2.56	0.40
1:B:172:ILE:HD12	1:B:181:ARG:O	2.21	0.40
1:B:788:ILE:O	1:B:788:ILE:HG13	2.21	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	1003/1116 (90%)	983 (98%)	19 (2%)	1 (0%)	48	75
1	B	989/1116 (89%)	968 (98%)	20 (2%)	1 (0%)	48	75
2	C	5/34 (15%)	5 (100%)	0	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
2	D	4/34 (12%)	4 (100%)	0	0	100	100
All	All	2001/2300 (87%)	1960 (98%)	39 (2%)	2 (0%)	48	75

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	854	VAL
1	B	854	VAL

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	873/958 (91%)	806 (92%)	67 (8%)	12	34
1	B	863/958 (90%)	794 (92%)	69 (8%)	11	32
2	C	4/23 (17%)	4 (100%)	0	100	100
2	D	4/23 (17%)	4 (100%)	0	100	100
All	All	1744/1962 (89%)	1608 (92%)	136 (8%)	11	34

All (136) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	41	LEU
1	A	48	LEU
1	A	57	LYS
1	A	59	LEU
1	A	65	ARG
1	A	70	LYS
1	A	109	SER
1	A	159	LEU
1	A	175	SER
1	A	195	ILE
1	A	211	SER
1	A	234	LEU

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Mol	Chain	Res	Type
1	A	247	SER
1	A	253	THR
1	A	297	LYS
1	A	308	LYS
1	A	313	GLU
1	A	333	THR
1	A	336	LEU
1	A	337	THR
1	A	340	ARG
1	A	410	SER
1	A	413	VAL
1	A	426	SER
1	A	431	ASP
1	A	435	ARG
1	A	439	GLN
1	A	462	LEU
1	A	478	LYS
1	A	483	LEU
1	A	538	GLN
1	A	559	THR
1	A	586	THR
1	A	599	ILE
1	A	628	GLU
1	A	657	THR
1	A	658	VAL
1	A	678	ILE
1	A	681	LYS
1	A	685	LEU
1	A	693	LYS
1	A	754	GLU
1	A	757	LEU
1	A	764	VAL
1	A	766	THR
1	A	767	SER
1	A	768	MET
1	A	829	LEU
1	A	830	ASP
1	A	844	ASP
1	A	862	THR
1	A	863	THR
1	A	894	MET
1	A	918	LEU

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Mol	Chain	Res	Type
1	A	956	VAL
1	A	970	THR
1	A	1030	GLN
1	A	1036	ILE
1	A	1038	ASN
1	A	1044	ILE
1	A	1058	ILE
1	A	1060	LEU
1	A	1061	GLU
1	A	1075	ARG
1	A	1099	ASN
1	A	1111	VAL
1	A	1112	ILE
1	B	59	LEU
1	B	65	ARG
1	B	70	LYS
1	B	71	HIS
1	B	75	LEU
1	B	79	THR
1	B	96	LYS
1	B	138	ILE
1	B	147	LEU
1	B	175	SER
1	B	177	SER
1	B	197	GLU
1	B	204	GLN
1	B	289	ARG
1	B	301	GLU
1	B	323	GLU
1	B	336	LEU
1	B	337	THR
1	B	364	THR
1	B	431	ASP
1	B	439	GLN
1	B	446	ASP
1	B	462	LEU
1	B	489	GLN
1	B	494	GLN
1	B	539	ILE
1	B	540	GLU
1	B	564	VAL
1	B	584	ILE

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Mol	Chain	Res	Type
1	B	618	ILE
1	B	678	ILE
1	B	689	GLU
1	B	693	LYS
1	B	697	GLU
1	B	698	GLN
1	B	703	TYR
1	B	706	LYS
1	B	735	VAL
1	B	741	VAL
1	B	754	GLU
1	B	757	LEU
1	B	758	ASN
1	B	790	ASP
1	B	829	LEU
1	B	838	LEU
1	B	853	LEU
1	B	859	GLN
1	B	860	VAL
1	B	862	THR
1	B	873	GLN
1	B	875	LYS
1	B	890	ILE
1	B	894	MET
1	B	905	LEU
1	B	948	LYS
1	B	955	SER
1	B	1002	ILE
1	B	1016	GLU
1	B	1038	ASN
1	B	1058	ILE
1	B	1073	GLU
1	B	1075	ARG
1	B	1079	GLN
1	B	1082	GLU
1	B	1088	ILE
1	B	1091	LEU
1	B	1093	HIS
1	B	1094	LEU
1	B	1112	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (19) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	67	GLN
1	A	71	HIS
1	A	156	ASN
1	A	173	ASN
1	A	240	ASN
1	A	248	GLN
1	A	361	HIS
1	A	538	GLN
1	A	683	HIS
1	A	852	ASN
1	A	914	ASN
1	A	992	HIS
1	A	1033	ASN
1	A	1077	GLN
1	B	204	GLN
1	B	395	GLN
1	B	453	HIS
1	B	698	GLN
1	B	799	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](#)

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 ⓘ

There are no chain breaks in this entry.

6 Fit of model and data [i](#)

6.1 Protein, DNA and RNA chains [i](#)

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	1017/1116 (91%)	-0.74	1 (0%) 92 90	49, 77, 116, 142	0
1	B	1003/1116 (89%)	-0.70	1 (0%) 92 90	45, 82, 126, 152	0
2	C	7/34 (20%)	0.05	0 100 100	73, 98, 103, 104	0
2	D	6/34 (17%)	-0.15	0 100 100	64, 85, 88, 91	0
All	All	2033/2300 (88%)	-0.72	2 (0%) 92 90	45, 79, 122, 152	0

All (2) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	817	ILE	2.5
1	B	817	ILE	2.2

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.