



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 10, 2026 – 01:58 PM UTC

PDB ID : 1ZKM / pdb_00001zkm
Title : Structural Analysis of Escherichia Coli ThiF
Authors : Duda, D.M.; Walden, H.; Sfondouris, J.; Schulman, B.A.
Deposited on : 2005-05-03
Resolution : 2.95 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

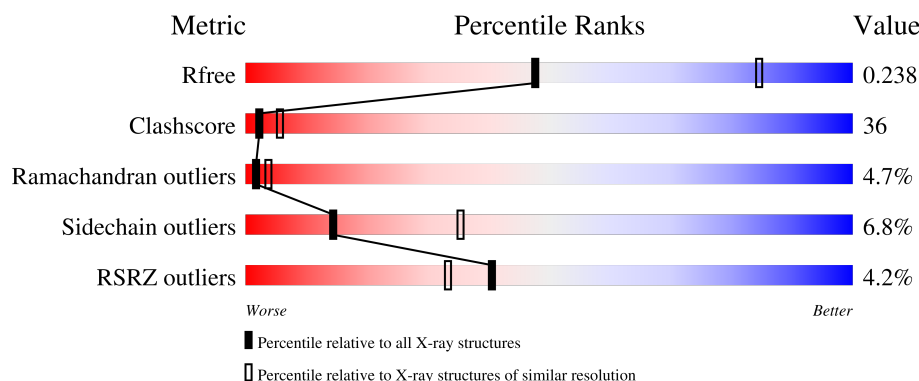
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.95 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	1130 (2.98-2.94)
Clashscore	190562	1157 (2.98-2.94)
Ramachandran outliers	187476	1101 (2.98-2.94)
Sidechain outliers	187428	1101 (2.98-2.94)
RSRZ outliers	180081	1130 (2.98-2.94)

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	253	6% 38% 49% 9%
1	B	253	3% 40% 44% 6% 9%
1	C	253	4% 43% 45% 8%
1	D	253	3% 47% 39% 6% 7%

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 7189 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 Adenylyltransferase thiF.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	244	Total	C	N	O	S	0	0	0
			1841	1144	329	356	12			
1	B	231	Total	C	N	O	S	0	0	0
			1737	1086	307	333	11			
1	C	243	Total	C	N	O	S	0	0	0
			1837	1142	328	355	12			
1	D	236	Total	C	N	O	S	0	0	0
			1770	1104	313	342	11			

There are 8 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-1	GLY	-	cloning artifact	UNP P30138
A	0	SER	-	cloning artifact	UNP P30138
B	-1	GLY	-	cloning artifact	UNP P30138
B	0	SER	-	cloning artifact	UNP P30138
C	-1	GLY	-	cloning artifact	UNP P30138
C	0	SER	-	cloning artifact	UNP P30138
D	-1	GLY	-	cloning artifact	UNP P30138
D	0	SER	-	cloning artifact	UNP P30138

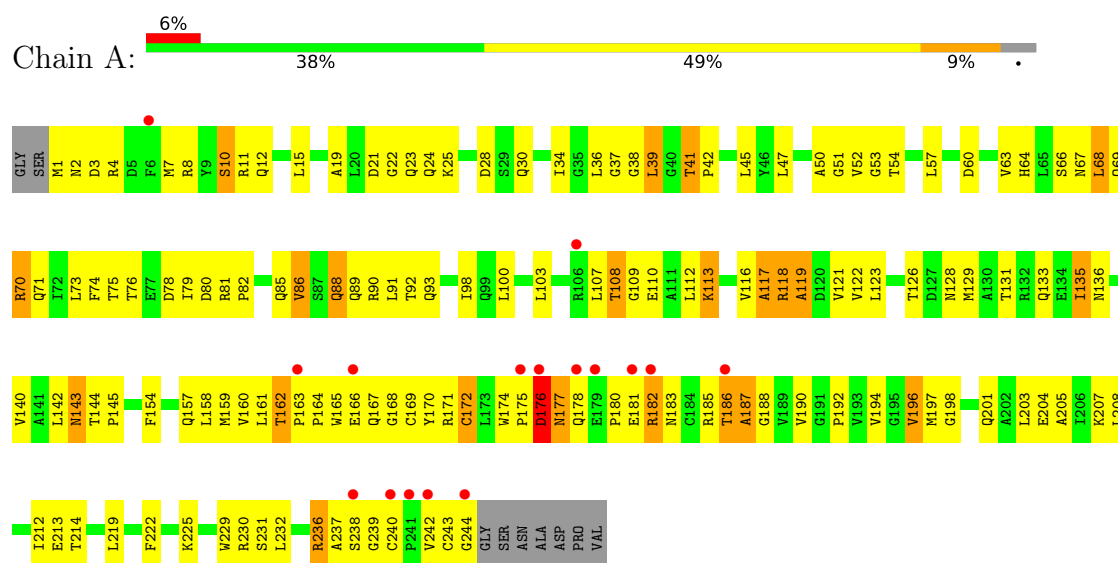
- Molecule 2 is ZINC ION (CCD ID: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	1	Total	Zn	0	0
			1	1		
2	B	1	Total	Zn	0	0
			1	1		
2	C	1	Total	Zn	0	0
			1	1		
2	D	1	Total	Zn	0	0
			1	1		

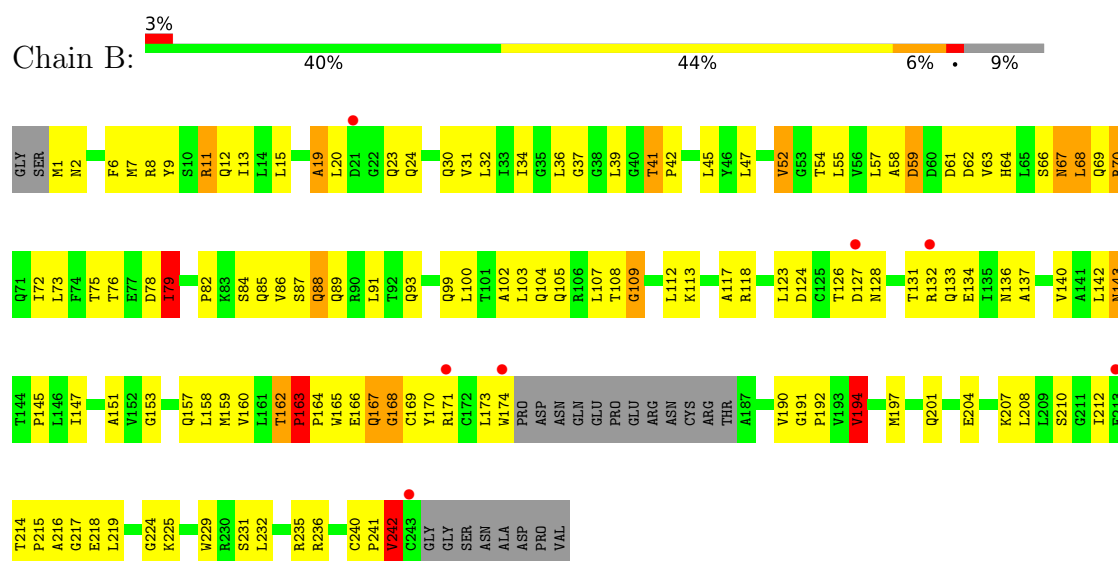
3 Residue-property plots

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

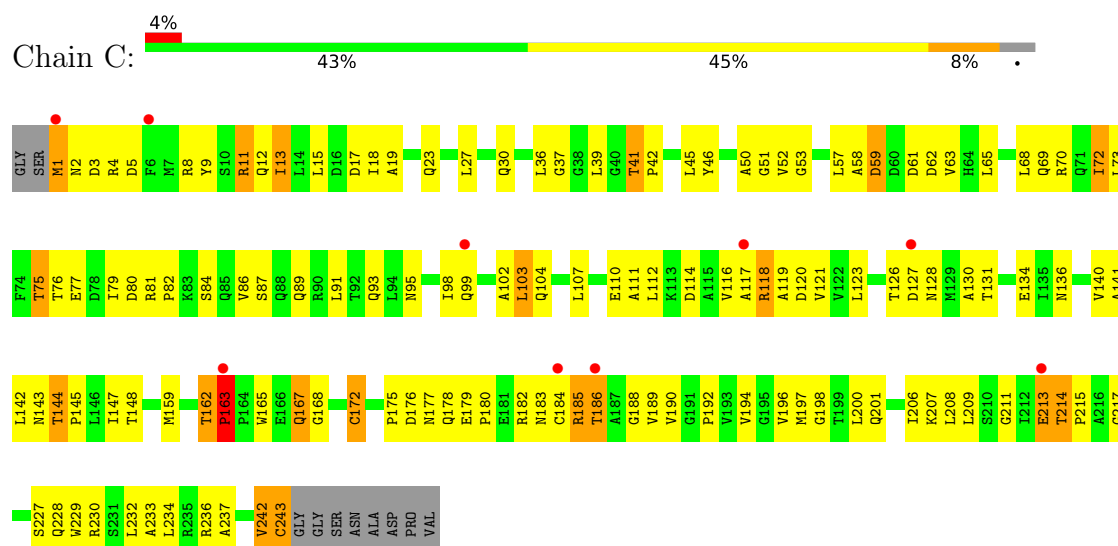
• Molecule 1: Adenylyltransferase thiF



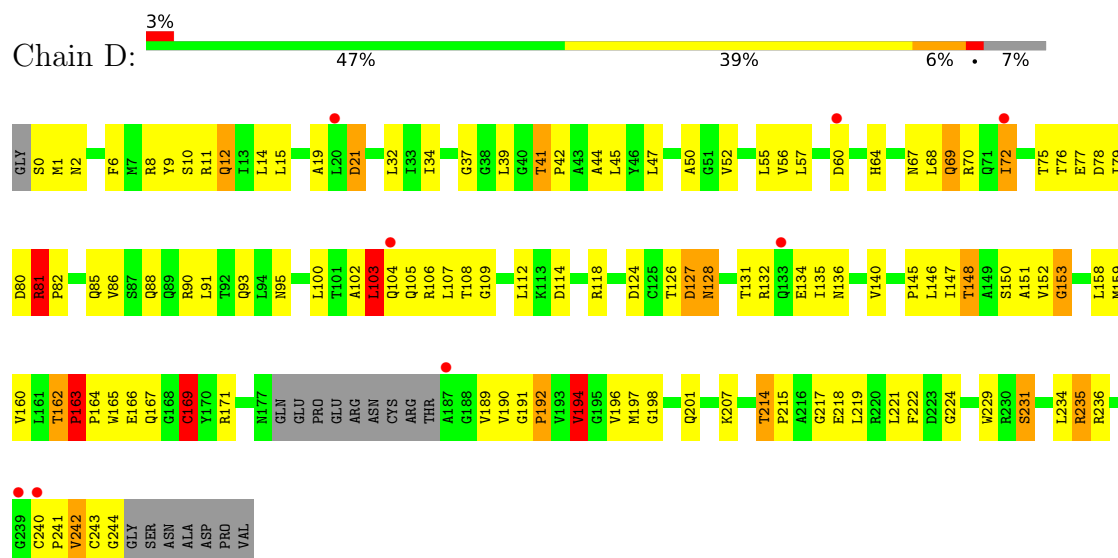
• Molecule 1: Adenylyltransferase thiF



• Molecule 1: Adenylyltransferase thiF



• Molecule 1: Adenylyltransferase thiF



4 Data and refinement statistics

Property	Value	Source
Space group	F 41 3 2	Depositor
Cell constants a, b, c, α , β , γ	360.17Å 360.17Å 360.17Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	20.00 – 2.95 20.00 – 2.95	Depositor EDS
% Data completeness (in resolution range)	(Not available) (20.00-2.95) 99.2 (20.00-2.95)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	3.53 (at 2.86Å)	Xtriage
Refinement program	CNS 1.0	Depositor
R, R_{free}	0.229 , 0.280 0.234 , 0.238	Depositor DCC
R_{free} test set	2357 reflections (5.02%)	wwPDB-VP
Wilson B-factor (Å ²)	85.9	Xtriage
Anisotropy	0.000	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.30 , 55.2	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.34$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	7189	wwPDB-VP
Average B, all atoms (Å ²)	85.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 1.35% 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

5.1 Standard geometry

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

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	0/1865	1.02	10/2534 (0.4%)
1	B	0.47	0/1758	1.05	11/2387 (0.5%)
1	C	0.45	0/1861	1.05	12/2529 (0.5%)
1	D	0.53	0/1792	1.08	10/2434 (0.4%)
All	All	0.48	0/7276	1.05	43/9884 (0.4%)

There are no bond length outliers.

All (43) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	162	THR	CA-C-N	9.64	130.31	120.38
1	B	162	THR	C-N-CA	9.64	130.31	120.38
1	D	162	THR	CA-C-N	9.46	130.13	120.38
1	D	162	THR	C-N-CA	9.46	130.13	120.38
1	C	162	THR	CA-C-N	8.77	129.41	120.38
1	C	162	THR	C-N-CA	8.77	129.41	120.38
1	D	72	ILE	N-CA-C	8.24	121.35	111.05
1	A	182	ARG	N-CA-C	-7.05	104.25	112.92
1	B	163	PRO	N-CA-C	6.99	119.23	110.70
1	B	2	ASN	N-CA-C	6.90	118.75	110.19
1	D	81	ARG	CA-C-N	6.90	127.31	119.93
1	D	81	ARG	C-N-CA	6.90	127.31	119.93
1	A	236	ARG	N-CA-C	6.79	119.33	110.43
1	C	183	ASN	N-CA-C	-6.59	103.72	111.03
1	D	163	PRO	N-CA-C	6.56	118.70	110.70
1	C	144	THR	CA-C-N	6.44	126.47	119.90
1	C	144	THR	C-N-CA	6.44	126.47	119.90
1	C	18	ILE	N-CA-C	-6.41	106.56	111.62
1	D	21	ASP	N-CA-C	-6.34	97.29	110.80
1	A	154	PHE	CA-C-N	-6.26	117.76	122.33

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	154	PHE	C-N-CA	-6.26	117.76	122.33
1	D	12	GLN	N-CA-C	-6.16	105.89	113.41
1	B	67	ASN	N-CA-C	6.08	118.43	111.02
1	B	79	ILE	N-CA-C	6.00	121.83	109.34
1	D	194	VAL	CB-CA-C	-5.99	103.95	112.22
1	A	135	ILE	N-CA-C	-5.89	104.61	110.62
1	C	72	ILE	N-CA-C	5.82	121.45	109.34
1	B	168	GLY	N-CA-C	5.78	119.32	112.33
1	C	68	LEU	N-CA-C	5.70	121.24	113.37
1	C	163	PRO	N-CA-C	5.67	117.62	110.70
1	A	74	PHE	N-CA-C	5.58	117.72	110.53
1	A	162	THR	CA-C-N	5.55	126.09	120.38
1	A	162	THR	C-N-CA	5.55	126.09	120.38
1	D	169	CYS	N-CA-C	-5.55	100.50	108.60
1	A	172	CYS	N-CA-C	-5.45	105.68	112.93
1	B	163	PRO	CA-C-N	-5.45	113.03	119.84
1	B	163	PRO	C-N-CA	-5.45	113.03	119.84
1	B	194	VAL	CB-CA-C	-5.34	104.85	112.22
1	C	13	ILE	N-CA-C	5.20	115.92	110.62
1	C	172	CYS	N-CA-C	-5.18	106.91	113.18
1	C	17	ASP	N-CA-C	5.13	119.16	113.01
1	B	52	VAL	N-CA-C	-5.05	102.22	108.89
1	A	231	SER	N-CA-C	5.04	117.28	108.76

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	1841	0	1860	180	1
1	B	1737	0	1766	140	0
1	C	1837	0	1856	137	0
1	D	1770	0	1791	125	0
2	A	1	0	0	0	0
2	B	1	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	C	1	0	0	0	0
2	D	1	0	0	0	0
All	All	7189	0	7273	526	1

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 36.

All (526) 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:145:PRO:HG3	1:A:163:PRO:HD3	1.27	1.11
1:D:132:ARG:HH22	1:D:150:SER:HB3	1.25	0.99
1:C:242:VAL:HG12	1:C:243:CYS:H	1.27	0.99
1:D:105:GLN:HG2	1:D:106:ARG:H	1.25	0.98
1:A:69:GLN:HG3	1:A:70:ARG:HD3	1.47	0.96
1:C:81:ARG:HH22	1:C:89:GLN:HE22	0.99	0.96
1:C:128:ASN:HD21	1:C:130:ALA:HB3	1.32	0.92
1:A:64:HIS:H	1:A:67:ASN:ND2	1.68	0.91
1:A:37:GLY:O	1:A:41:THR:HB	1.72	0.90
1:B:11:ARG:HG3	1:B:11:ARG:HH11	1.37	0.89
1:B:128:ASN:ND2	1:B:131:THR:H	1.71	0.89
1:C:12:GLN:HE22	1:C:50:ALA:HA	1.37	0.88
1:C:45:LEU:HD21	1:D:72:ILE:HG21	1.57	0.87
1:D:8:ARG:HH12	1:D:95:ASN:HA	1.39	0.87
1:C:11:ARG:HH11	1:C:11:ARG:HG3	1.40	0.86
1:B:236:ARG:HH21	1:C:176:ASP:HB2	1.41	0.85
1:A:145:PRO:HG3	1:A:163:PRO:CD	2.07	0.84
1:A:64:HIS:H	1:A:67:ASN:HD22	1.24	0.84
1:B:39:LEU:O	1:B:42:PRO:HD2	1.78	0.84
1:A:196:VAL:HG12	1:A:197:MET:HE2	1.58	0.83
1:A:12:GLN:HE22	1:A:50:ALA:HA	1.44	0.83
1:D:219:LEU:HB2	1:D:234:LEU:HD21	1.60	0.82
1:C:39:LEU:O	1:C:42:PRO:HD2	1.79	0.82
1:C:81:ARG:NH2	1:C:89:GLN:HE22	1.77	0.82
1:A:197:MET:HE1	1:A:229:TRP:CH2	2.15	0.82
1:C:8:ARG:HH12	1:C:95:ASN:HA	1.43	0.81
1:A:159:MET:HE2	1:A:219:LEU:HD13	1.63	0.81
1:B:235:ARG:NH2	1:C:175:PRO:HG3	1.96	0.81
1:C:81:ARG:HH22	1:C:89:GLN:NE2	1.76	0.81
1:C:117:ALA:HB2	1:C:142:LEU:HD13	1.62	0.81
1:D:132:ARG:NH2	1:D:150:SER:HB3	1.94	0.81

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:69:GLN:OE1	1:B:70:ARG:HD3	1.81	0.80
1:B:137:ALA:HB2	1:B:171:ARG:NH2	1.96	0.80
1:C:198:GLY:HA2	1:C:201:GLN:HE21	1.46	0.79
1:A:207:LYS:HE2	1:A:214:THR:OG1	1.82	0.78
1:B:37:GLY:O	1:B:41:THR:HB	1.84	0.78
1:A:140:VAL:HA	1:A:165:TRP:CZ2	2.19	0.78
1:A:45:LEU:HD13	1:A:73:LEU:HD13	1.66	0.77
1:A:197:MET:HE1	1:A:229:TRP:HH2	1.48	0.77
1:D:39:LEU:O	1:D:42:PRO:HD2	1.84	0.77
1:C:12:GLN:NE2	1:C:50:ALA:HA	2.00	0.77
1:A:185:ARG:C	1:A:187:ALA:H	1.90	0.76
1:C:123:LEU:HD23	1:C:147:ILE:HB	1.67	0.76
1:B:204:GLU:OE1	1:B:214:THR:HG21	1.86	0.76
1:C:76:THR:O	1:C:79:ILE:HG13	1.86	0.76
1:C:128:ASN:ND2	1:C:130:ALA:HB3	1.99	0.75
1:D:105:GLN:HG2	1:D:106:ARG:N	2.02	0.75
1:D:107:LEU:HD22	1:D:112:LEU:HA	1.68	0.75
1:C:186:THR:HG22	1:C:188:GLY:H	1.52	0.75
1:D:167:GLN:HG3	1:D:217:GLY:HA3	1.68	0.74
1:C:12:GLN:HE22	1:C:50:ALA:CA	2.01	0.74
1:A:198:GLY:HA2	1:A:201:GLN:HE21	1.53	0.74
1:C:140:VAL:HG13	1:C:165:TRP:NE1	2.02	0.74
1:D:69:GLN:HE21	1:D:70:ARG:HG2	1.53	0.73
1:C:72:ILE:HB	1:D:45:LEU:HD13	1.68	0.73
1:B:158:LEU:HD12	1:B:159:MET:H	1.53	0.73
1:C:69:GLN:NE2	1:C:70:ARG:HG2	2.04	0.72
1:A:45:LEU:CD2	1:B:72:ILE:HB	2.20	0.72
1:D:69:GLN:NE2	1:D:70:ARG:HG2	2.05	0.72
1:A:204:GLU:OE2	1:A:214:THR:HG21	1.89	0.72
1:A:171:ARG:O	1:A:171:ARG:HG3	1.89	0.71
1:A:51:GLY:HA2	1:A:98:ILE:HD11	1.72	0.71
1:A:158:LEU:HD12	1:A:159:MET:H	1.55	0.71
1:C:242:VAL:HG12	1:C:243:CYS:N	2.04	0.71
1:B:105:GLN:NE2	1:B:107:LEU:HD23	2.04	0.70
1:C:186:THR:HG21	1:D:15:LEU:HD23	1.73	0.70
1:A:45:LEU:HD23	1:B:72:ILE:HB	1.74	0.70
1:A:75:THR:HG22	1:A:78:ASP:OD2	1.92	0.70
1:D:126:THR:O	1:D:128:ASN:N	2.24	0.70
1:B:45:LEU:HD13	1:B:73:LEU:HD13	1.74	0.69
1:C:197:MET:HE1	1:C:229:TRP:CH2	2.28	0.69
1:C:45:LEU:CD2	1:D:72:ILE:HG21	2.21	0.69

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:51:GLY:HA2	1:C:98:ILE:HD11	1.71	0.69
1:A:12:GLN:HE22	1:A:50:ALA:CA	2.06	0.69
1:C:37:GLY:O	1:C:41:THR:HB	1.93	0.69
1:C:145:PRO:HG3	1:C:163:PRO:HD3	1.73	0.68
1:C:82:PRO:O	1:C:86:VAL:HG23	1.94	0.68
1:A:232:LEU:HD22	1:D:231:SER:HB2	1.75	0.68
1:C:11:ARG:HH11	1:C:11:ARG:CG	2.07	0.67
1:B:30:GLN:NE2	1:B:118:ARG:O	2.27	0.67
1:B:231:SER:HB2	1:C:232:LEU:HD22	1.76	0.67
1:B:124:ASP:OD2	1:B:132:ARG:HG3	1.95	0.67
1:B:137:ALA:HB2	1:B:171:ARG:HH22	1.59	0.67
1:C:45:LEU:HD21	1:D:72:ILE:CG2	2.25	0.67
1:C:140:VAL:HA	1:C:165:TRP:CZ2	2.29	0.67
1:C:65:LEU:HD11	1:D:8:ARG:HE	1.60	0.66
1:D:107:LEU:HB3	1:D:112:LEU:HD13	1.77	0.66
1:A:142:LEU:O	1:A:144:THR:HG23	1.95	0.66
1:B:218:GLU:CD	1:C:230:ARG:HH22	2.04	0.66
1:A:12:GLN:HG3	1:B:69:GLN:HE21	1.60	0.66
1:A:112:LEU:O	1:A:116:VAL:HG23	1.95	0.66
1:A:181:GLU:HG3	1:D:166:GLU:OE2	1.95	0.66
1:C:12:GLN:O	1:C:15:LEU:HB2	1.96	0.65
1:A:7:MET:O	1:A:10:SER:HB3	1.96	0.65
1:A:136:ASN:HD21	1:A:169:CYS:HB2	1.60	0.65
1:A:107:LEU:HB3	1:A:112:LEU:HD13	1.77	0.65
1:D:12:GLN:HE22	1:D:50:ALA:HA	1.61	0.65
1:A:103:LEU:HD13	1:A:107:LEU:HD21	1.79	0.65
1:B:207:LYS:HE2	1:B:214:THR:OG1	1.97	0.65
1:B:41:THR:HG22	1:B:42:PRO:HD3	1.78	0.65
1:A:12:GLN:HG3	1:B:69:GLN:NE2	2.12	0.64
1:A:108:THR:HG22	1:A:109:GLY:H	1.63	0.64
1:D:214:THR:HG23	1:D:215:PRO:HD2	1.80	0.64
1:A:82:PRO:O	1:A:86:VAL:HG23	1.98	0.64
1:A:110:GLU:OE1	1:A:113:LYS:HD2	1.98	0.64
1:B:219:LEU:HD23	1:B:232:LEU:HD12	1.80	0.63
1:D:124:ASP:OD2	1:D:132:ARG:HG2	1.98	0.63
1:A:12:GLN:NE2	1:A:50:ALA:HA	2.13	0.63
1:C:102:ALA:O	1:C:103:LEU:HB2	1.96	0.63
1:C:186:THR:HG21	1:D:15:LEU:HA	1.78	0.63
1:B:102:ALA:O	1:B:103:LEU:HD23	1.99	0.63
1:A:131:THR:HG22	1:A:135:ILE:HD11	1.81	0.63
1:D:219:LEU:HG	1:D:221:LEU:HD21	1.80	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:185:ARG:O	1:A:187:ALA:N	2.31	0.63
1:B:82:PRO:CB	1:B:104:GLN:HE21	2.12	0.63
1:B:235:ARG:HD3	1:C:237:ALA:HB2	1.81	0.62
1:A:69:GLN:CG	1:A:70:ARG:HD3	2.26	0.62
1:C:142:LEU:O	1:C:144:THR:HG23	1.98	0.62
1:D:136:ASN:O	1:D:140:VAL:HG23	1.98	0.62
1:B:128:ASN:ND2	1:B:131:THR:OG1	2.32	0.62
1:A:37:GLY:C	1:A:71:GLN:HG2	2.24	0.62
1:C:23:GLN:O	1:C:27:LEU:HD12	1.99	0.62
1:C:57:LEU:HD11	1:C:91:LEU:HD12	1.81	0.62
1:B:153:GLY:O	1:B:190:VAL:HG23	1.99	0.62
1:D:57:LEU:HD11	1:D:91:LEU:HD12	1.82	0.62
1:B:11:ARG:HH11	1:B:11:ARG:CG	2.10	0.61
1:C:93:GLN:HG2	1:D:77:GLU:OE1	2.00	0.61
1:D:8:ARG:NH1	1:D:95:ASN:HA	2.12	0.61
1:A:117:ALA:HB2	1:A:142:LEU:HD13	1.82	0.61
1:B:31:VAL:HG23	1:B:52:VAL:HG11	1.81	0.61
1:D:114:ASP:O	1:D:118:ARG:HG3	2.00	0.61
1:C:186:THR:CG2	1:D:15:LEU:HD23	2.31	0.61
1:D:79:ILE:O	1:D:80:ASP:HB2	2.00	0.61
1:A:169:CYS:O	1:A:172:CYS:HB2	2.01	0.61
1:A:203:LEU:HD11	1:A:207:LYS:HD2	1.83	0.61
1:A:171:ARG:HH12	1:A:177:ASN:HD22	1.48	0.61
1:A:166:GLU:HB3	1:A:167:GLN:NE2	2.16	0.60
1:C:196:VAL:HG12	1:C:197:MET:HE2	1.83	0.60
1:D:37:GLY:O	1:D:41:THR:HB	2.00	0.60
1:D:222:PHE:HB2	1:D:229:TRP:CZ3	2.36	0.60
1:A:39:LEU:HD13	1:A:201:GLN:HE22	1.67	0.60
1:D:151:ALA:HB3	1:D:194:VAL:HG13	1.83	0.60
1:B:151:ALA:HB3	1:B:194:VAL:HG13	1.82	0.60
1:D:235:ARG:HD2	1:D:235:ARG:O	2.02	0.59
1:C:145:PRO:HG3	1:C:163:PRO:CD	2.32	0.59
1:A:103:LEU:CD1	1:A:107:LEU:HD21	2.32	0.59
1:B:160:VAL:HB	1:B:216:ALA:HB1	1.83	0.59
1:C:8:ARG:NH1	1:C:95:ASN:HA	2.16	0.59
1:B:34:ILE:HG22	1:B:126:THR:CG2	2.33	0.59
1:B:82:PRO:O	1:B:86:VAL:HG23	2.02	0.59
1:A:21:ASP:O	1:A:25:LYS:HG3	2.03	0.59
1:A:136:ASN:ND2	1:A:170:TYR:H	2.00	0.59
1:B:236:ARG:NH2	1:C:176:ASP:HB2	2.15	0.59
1:A:207:LYS:HE3	1:B:225:LYS:HA	1.84	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:240:CYS:C	1:A:242:VAL:H	2.10	0.58
1:B:240:CYS:SG	1:B:242:VAL:HG23	2.43	0.58
1:C:242:VAL:O	1:C:243:CYS:C	2.45	0.58
1:A:190:VAL:HG12	1:A:192:PRO:HD2	1.83	0.58
1:D:153:GLY:O	1:D:190:VAL:HG23	2.03	0.58
1:A:168:GLY:HA2	1:A:243:CYS:SG	2.43	0.58
1:A:207:LYS:HB3	1:A:214:THR:OG1	2.04	0.58
1:C:36:LEU:HD13	1:C:87:SER:OG	2.03	0.58
1:C:176:ASP:OD2	1:C:178:GLN:HB3	2.03	0.58
1:B:30:GLN:HG3	1:B:54:THR:HB	1.84	0.58
1:B:191:GLY:O	1:B:194:VAL:HG23	2.03	0.58
1:C:123:LEU:CD2	1:C:147:ILE:HB	2.33	0.58
1:D:82:PRO:O	1:D:86:VAL:HG23	2.03	0.58
1:B:137:ALA:HB2	1:B:171:ARG:CZ	2.32	0.58
1:D:124:ASP:HB3	1:D:148:THR:HG22	1.85	0.58
1:B:197:MET:HE1	1:B:229:TRP:CH2	2.38	0.58
1:C:185:ARG:O	1:C:186:THR:C	2.45	0.58
1:D:196:VAL:HG12	1:D:197:MET:HE2	1.86	0.58
1:C:8:ARG:HG2	1:C:9:TYR:CD2	2.38	0.58
1:C:168:GLY:HA2	1:C:236:ARG:HB3	1.85	0.57
1:A:45:LEU:HD13	1:A:73:LEU:CD1	2.34	0.57
1:B:82:PRO:HG3	1:B:104:GLN:NE2	2.19	0.57
1:B:214:THR:O	1:B:215:PRO:C	2.48	0.57
1:D:128:ASN:ND2	1:D:131:THR:OG1	2.36	0.57
1:B:34:ILE:HG22	1:B:126:THR:HG23	1.86	0.57
1:B:151:ALA:HB3	1:B:194:VAL:CG1	2.35	0.57
1:D:159:MET:HE2	1:D:219:LEU:HD13	1.87	0.57
1:B:105:GLN:HE21	1:B:107:LEU:HD23	1.69	0.57
1:A:39:LEU:HD13	1:A:201:GLN:NE2	2.20	0.57
1:B:128:ASN:HD21	1:B:131:THR:H	1.47	0.57
1:A:230:ARG:NH2	1:D:218:GLU:OE2	2.38	0.56
1:C:167:GLN:HG3	1:C:217:GLY:HA3	1.87	0.56
1:D:6:PHE:O	1:D:10:SER:HB3	2.05	0.56
1:B:67:ASN:O	1:B:69:GLN:N	2.38	0.56
1:C:2:ASN:OD1	1:C:4:ARG:HB3	2.05	0.56
1:C:8:ARG:HH11	1:C:95:ASN:ND2	2.02	0.56
1:D:124:ASP:CB	1:D:148:THR:HG22	2.36	0.56
1:D:39:LEU:HD23	1:D:194:VAL:HG12	1.88	0.56
1:B:159:MET:HG3	1:B:219:LEU:CD1	2.36	0.56
1:B:20:LEU:HG	1:B:24:GLN:NE2	2.19	0.56
1:C:126:THR:O	1:C:128:ASN:N	2.33	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:88:GLN:HG2	1:A:89:GLN:N	2.20	0.56
1:D:88:GLN:HB2	1:D:102:ALA:HB2	1.87	0.56
1:B:63:VAL:O	1:B:79:ILE:O	2.23	0.56
1:B:136:ASN:O	1:B:140:VAL:HG23	2.06	0.56
1:A:136:ASN:O	1:A:140:VAL:HG23	2.06	0.55
1:A:186:THR:O	1:A:186:THR:HG22	2.06	0.55
1:B:235:ARG:HD2	1:C:172:CYS:O	2.05	0.55
1:D:197:MET:O	1:D:201:GLN:HG3	2.05	0.55
1:B:158:LEU:HD12	1:B:159:MET:N	2.21	0.55
1:C:58:ALA:O	1:C:59:ASP:HB2	2.07	0.55
1:C:53:GLY:O	1:C:98:ILE:HG23	2.06	0.55
1:B:108:THR:HG22	1:B:109:GLY:N	2.22	0.55
1:C:184:CYS:O	1:C:185:ARG:C	2.50	0.55
1:A:207:LYS:NZ	1:A:214:THR:HG23	2.21	0.55
1:A:76:THR:HG23	1:B:93:GLN:O	2.06	0.54
1:B:159:MET:HG3	1:B:219:LEU:HD12	1.89	0.54
1:B:54:THR:HG23	1:B:99:GLN:CG	2.38	0.54
1:D:163:PRO:HB2	1:D:164:PRO:HD3	1.88	0.54
1:A:136:ASN:HD21	1:A:170:TYR:H	1.55	0.54
1:B:11:ARG:HG3	1:B:11:ARG:NH1	2.17	0.54
1:D:60:ASP:HB2	1:D:106:ARG:HB2	1.89	0.54
1:B:136:ASN:CG	1:B:170:TYR:H	2.16	0.54
1:B:162:THR:HB	1:B:163:PRO:HD2	1.89	0.54
1:B:235:ARG:NH1	1:C:172:CYS:HA	2.22	0.54
1:D:162:THR:HB	1:D:163:PRO:HD2	1.89	0.54
1:D:235:ARG:HG3	1:D:235:ARG:HH11	1.73	0.54
1:A:158:LEU:HD12	1:A:159:MET:N	2.23	0.53
1:C:45:LEU:HD13	1:C:73:LEU:HD13	1.90	0.53
1:C:141:ALA:O	1:C:142:LEU:HD23	2.08	0.53
1:A:45:LEU:HD12	1:A:91:LEU:HD23	1.89	0.53
1:A:53:GLY:O	1:A:98:ILE:HG23	2.09	0.53
1:A:237:ALA:O	1:A:239:GLY:N	2.36	0.53
1:D:243:CYS:O	1:D:244:GLY:C	2.51	0.53
1:A:242:VAL:HG12	1:A:243:CYS:N	2.23	0.53
1:D:91:LEU:HB2	1:D:100:LEU:HD13	1.91	0.53
1:B:9:TYR:HB3	1:B:23:GLN:OE1	2.09	0.53
1:B:218:GLU:OE1	1:C:230:ARG:NH2	2.41	0.53
1:D:34:ILE:HD12	1:D:135:ILE:HD13	1.89	0.53
1:A:230:ARG:NH2	1:D:218:GLU:OE1	2.40	0.53
1:C:79:ILE:C	1:C:81:ARG:H	2.16	0.53
1:B:41:THR:HG22	1:B:42:PRO:CD	2.39	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:171:ARG:HD2	1:B:242:VAL:HG21	1.91	0.53
1:B:1:MET:HE3	1:B:6:PHE:HB2	1.89	0.52
1:D:41:THR:HG22	1:D:42:PRO:HD3	1.91	0.52
1:D:44:ALA:HB1	1:D:91:LEU:HD11	1.90	0.52
1:A:22:GLY:HA2	1:A:25:LYS:HD3	1.91	0.52
1:A:163:PRO:N	1:A:164:PRO:HD2	2.23	0.52
1:B:11:ARG:CD	1:B:11:ARG:N	2.73	0.52
1:C:11:ARG:CG	1:C:11:ARG:NH1	2.70	0.52
1:C:112:LEU:O	1:C:116:VAL:HG23	2.10	0.52
1:B:126:THR:C	1:B:128:ASN:H	2.18	0.52
1:D:34:ILE:HG22	1:D:126:THR:CG2	2.39	0.52
1:B:82:PRO:HG2	1:B:85:GLN:HB3	1.92	0.52
1:A:34:ILE:HD12	1:A:135:ILE:HD13	1.92	0.52
1:A:107:LEU:CB	1:A:112:LEU:HD13	2.39	0.52
1:A:168:GLY:CA	1:A:236:ARG:HB3	2.40	0.52
1:C:207:LYS:NZ	1:D:224:GLY:O	2.40	0.52
1:A:207:LYS:HZ1	1:A:214:THR:HG23	1.76	0.51
1:A:230:ARG:NH2	1:D:218:GLU:CD	2.69	0.51
1:D:39:LEU:CD2	1:D:194:VAL:HG12	2.40	0.51
1:A:237:ALA:HB3	1:A:240:CYS:HB2	1.91	0.51
1:C:95:ASN:OD1	1:C:98:ILE:HG13	2.10	0.51
1:A:81:ARG:HH22	1:A:89:GLN:HE22	1.59	0.51
1:A:45:LEU:HD12	1:A:91:LEU:CD2	2.41	0.51
1:A:171:ARG:NH1	1:A:177:ASN:HD22	2.07	0.51
1:A:169:CYS:SG	1:A:171:ARG:HB3	2.51	0.51
1:A:75:THR:HG22	1:A:78:ASP:CG	2.36	0.51
1:A:131:THR:HG22	1:A:135:ILE:CD1	2.40	0.51
1:D:197:MET:HE1	1:D:229:TRP:CH2	2.46	0.51
1:A:75:THR:OG1	1:B:93:GLN:HB3	2.11	0.51
1:A:140:VAL:HA	1:A:165:TRP:HZ2	1.75	0.50
1:D:240:CYS:SG	1:D:241:PRO:HD2	2.51	0.50
1:A:242:VAL:O	1:A:243:CYS:HB3	2.10	0.50
1:C:140:VAL:HG13	1:C:165:TRP:CD1	2.47	0.50
1:C:182:ARG:HA	1:C:185:ARG:HB2	1.93	0.50
1:C:167:GLN:O	1:C:236:ARG:HB3	2.11	0.50
1:D:82:PRO:HB2	1:D:85:GLN:HG2	1.93	0.50
1:A:237:ALA:HA	1:D:235:ARG:HH21	1.76	0.50
1:B:163:PRO:C	1:B:165:TRP:N	2.68	0.50
1:B:210:SER:OG	1:B:212:ILE:HG13	2.11	0.50
1:A:140:VAL:HG11	1:A:242:VAL:HG12	1.93	0.50
1:D:145:PRO:HG3	1:D:163:PRO:CD	2.42	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:76:THR:O	1:A:79:ILE:HG13	2.12	0.50
1:A:168:GLY:HA3	1:A:236:ARG:HB3	1.92	0.50
1:B:108:THR:HG22	1:B:109:GLY:H	1.77	0.50
1:B:163:PRO:O	1:B:164:PRO:C	2.52	0.50
1:B:232:LEU:HD23	1:C:233:ALA:HB3	1.94	0.50
1:B:13:ILE:C	1:B:15:LEU:H	2.20	0.50
1:C:84:SER:OG	1:C:104:GLN:HG2	2.12	0.50
1:A:88:GLN:CG	1:A:89:GLN:N	2.74	0.49
1:D:70:ARG:HB3	1:D:191:GLY:HA2	1.94	0.49
1:A:30:GLN:HG3	1:A:54:THR:HB	1.94	0.49
1:A:118:ARG:O	1:A:119:ALA:C	2.55	0.49
1:B:58:ALA:O	1:B:59:ASP:HB2	2.12	0.49
1:D:82:PRO:HG2	1:D:104:GLN:NE2	2.27	0.49
1:B:84:SER:O	1:B:88:GLN:HB3	2.11	0.49
1:C:117:ALA:C	1:C:119:ALA:H	2.20	0.49
1:B:235:ARG:O	1:B:235:ARG:HG3	2.12	0.49
1:B:163:PRO:O	1:B:165:TRP:CD1	2.65	0.49
1:D:108:THR:HG22	1:D:109:GLY:N	2.28	0.49
1:D:147:ILE:HG12	1:D:160:VAL:HG22	1.93	0.49
1:A:188:GLY:HA3	1:B:11:ARG:O	2.13	0.49
1:D:76:THR:O	1:D:79:ILE:HG13	2.13	0.49
1:D:140:VAL:HA	1:D:165:TRP:CZ2	2.48	0.49
1:C:128:ASN:ND2	1:C:131:THR:H	2.11	0.49
1:A:240:CYS:C	1:A:242:VAL:N	2.68	0.49
1:A:41:THR:HG22	1:A:42:PRO:HD3	1.95	0.48
1:C:5:ASP:O	1:C:8:ARG:N	2.46	0.48
1:C:61:ASP:OD1	1:C:62:ASP:N	2.42	0.48
1:D:198:GLY:O	1:D:201:GLN:HB2	2.14	0.48
1:A:176:ASP:CG	1:D:236:ARG:HH21	2.21	0.48
1:D:169:CYS:SG	1:D:171:ARG:N	2.85	0.48
1:A:41:THR:HG22	1:A:42:PRO:N	2.28	0.48
1:A:109:GLY:O	1:A:113:LYS:HG3	2.14	0.48
1:A:198:GLY:HA2	1:A:201:GLN:NE2	2.25	0.48
1:B:12:GLN:O	1:B:15:LEU:HB2	2.13	0.48
1:B:20:LEU:HG	1:B:24:GLN:HE21	1.78	0.48
1:C:168:GLY:CA	1:C:236:ARG:HB3	2.43	0.48
1:B:36:LEU:HD13	1:B:87:SER:OG	2.14	0.48
1:D:0:SER:O	1:D:1:MET:HG3	2.12	0.48
1:C:75:THR:HG23	1:C:76:THR:N	2.29	0.48
1:C:120:ASP:O	1:C:145:PRO:HD2	2.14	0.48
1:D:235:ARG:HD2	1:D:235:ARG:C	2.39	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:54:THR:HG23	1:B:99:GLN:HG3	1.96	0.47
1:C:227:SER:OG	1:D:207:LYS:NZ	2.47	0.47
1:B:159:MET:HE2	1:B:219:LEU:HD13	1.96	0.47
1:D:41:THR:HG21	1:D:72:ILE:N	2.29	0.47
1:C:207:LYS:CE	1:D:224:GLY:O	2.63	0.47
1:B:167:GLN:HG3	1:B:217:GLY:CA	2.44	0.47
1:C:107:LEU:O	1:C:112:LEU:HB2	2.14	0.47
1:C:15:LEU:HD21	1:D:153:GLY:HA2	1.97	0.47
1:A:51:GLY:CA	1:A:98:ILE:HD11	2.40	0.47
1:C:30:GLN:OE1	1:C:118:ARG:O	2.33	0.47
1:C:52:VAL:O	1:C:98:ILE:HG21	2.14	0.47
1:C:186:THR:C	1:C:188:GLY:H	2.23	0.47
1:D:64:HIS:H	1:D:67:ASN:ND2	2.12	0.47
1:A:162:THR:O	1:A:165:TRP:CE3	2.68	0.47
1:A:171:ARG:NH1	1:A:177:ASN:ND2	2.63	0.47
1:C:140:VAL:HA	1:C:165:TRP:HZ2	1.75	0.47
1:A:172:CYS:O	1:A:175:PRO:HD3	2.15	0.47
1:D:1:MET:O	1:D:2:ASN:HB3	2.15	0.47
1:A:85:GLN:O	1:A:86:VAL:C	2.58	0.47
1:B:61:ASP:OD1	1:B:62:ASP:N	2.49	0.46
1:D:112:LEU:CD2	1:D:134:GLU:HG2	2.45	0.46
1:D:214:THR:HG22	1:D:215:PRO:O	2.15	0.46
1:A:207:LYS:NZ	1:B:224:GLY:O	2.42	0.46
1:C:93:GLN:O	1:D:75:THR:HB	2.15	0.46
1:B:68:LEU:CD1	1:B:76:THR:HG22	2.45	0.46
1:B:117:ALA:HB2	1:B:142:LEU:HD13	1.98	0.46
1:A:63:VAL:HG23	1:A:81:ARG:O	2.15	0.46
1:A:166:GLU:HB3	1:A:167:GLN:HE22	1.80	0.46
1:A:174:TRP:C	1:A:176:ASP:H	2.22	0.46
1:B:108:THR:O	1:B:109:GLY:C	2.58	0.46
1:C:126:THR:C	1:C:128:ASN:H	2.20	0.46
1:A:108:THR:N	1:A:112:LEU:HB2	2.30	0.46
1:A:123:LEU:HD21	1:A:205:ALA:HB2	1.97	0.46
1:A:176:ASP:HB3	1:D:236:ARG:HH21	1.81	0.46
1:C:84:SER:OG	1:C:104:GLN:CG	2.64	0.46
1:C:103:LEU:HD21	1:C:107:LEU:HD21	1.98	0.46
1:A:160:VAL:O	1:A:161:LEU:HD23	2.16	0.46
1:A:162:THR:C	1:A:164:PRO:HD2	2.41	0.46
1:A:174:TRP:C	1:A:176:ASP:N	2.74	0.46
1:C:114:ASP:O	1:C:118:ARG:HG3	2.16	0.46
1:C:121:VAL:HG23	1:C:209:LEU:HD21	1.98	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:51:GLY:C	1:A:98:ILE:HD11	2.41	0.45
1:B:171:ARG:C	1:B:173:LEU:N	2.71	0.45
1:B:235:ARG:CZ	1:C:175:PRO:HG3	2.46	0.45
1:A:2:ASN:OD1	1:A:3:ASP:N	2.49	0.45
1:B:197:MET:O	1:B:201:GLN:HG3	2.16	0.45
1:C:185:ARG:O	1:C:186:THR:O	2.34	0.45
1:D:132:ARG:HH22	1:D:150:SER:CB	2.12	0.45
1:A:60:ASP:OD1	1:A:60:ASP:O	2.34	0.45
1:C:63:VAL:O	1:C:79:ILE:HG23	2.16	0.45
1:C:75:THR:CG2	1:C:76:THR:N	2.79	0.45
1:A:126:THR:C	1:A:128:ASN:H	2.25	0.45
1:D:103:LEU:C	1:D:105:GLN:H	2.24	0.45
1:B:123:LEU:HD23	1:B:147:ILE:HB	1.97	0.45
1:A:69:GLN:HE21	1:A:70:ARG:CD	2.29	0.45
1:A:174:TRP:N	1:A:175:PRO:HD3	2.32	0.45
1:B:142:LEU:O	1:B:143:ASN:C	2.60	0.45
1:A:51:GLY:HA2	1:A:98:ILE:CD1	2.45	0.45
1:B:57:LEU:HD11	1:B:91:LEU:HD12	1.99	0.45
1:C:136:ASN:O	1:C:140:VAL:HG23	2.17	0.45
1:D:90:ARG:HA	1:D:93:GLN:HE21	1.81	0.45
1:B:13:ILE:O	1:B:19:ALA:HA	2.17	0.45
1:B:55:LEU:HB2	1:B:100:LEU:HD23	1.99	0.45
1:B:11:ARG:CG	1:B:11:ARG:NH1	2.74	0.45
1:C:11:ARG:N	1:C:11:ARG:HD3	2.31	0.45
1:C:186:THR:HG21	1:D:15:LEU:CA	2.47	0.45
1:A:41:THR:HG22	1:A:42:PRO:CD	2.47	0.44
1:A:116:VAL:O	1:A:117:ALA:C	2.59	0.44
1:A:203:LEU:HB2	1:B:192:PRO:HB2	1.99	0.44
1:B:30:GLN:HA	1:B:54:THR:O	2.17	0.44
1:C:11:ARG:N	1:C:11:ARG:CD	2.79	0.44
1:D:47:LEU:O	1:D:52:VAL:HG23	2.17	0.44
1:A:8:ARG:HH21	1:B:68:LEU:HD12	1.81	0.44
1:B:39:LEU:C	1:B:42:PRO:HD2	2.41	0.44
1:B:54:THR:HA	1:B:99:GLN:HB3	2.00	0.44
1:B:123:LEU:CD2	1:B:147:ILE:HB	2.47	0.44
1:B:145:PRO:HG3	1:B:163:PRO:CD	2.48	0.44
1:D:81:ARG:HH11	1:D:81:ARG:CB	2.30	0.44
1:A:39:LEU:HD23	1:A:194:VAL:HG22	2.00	0.44
1:B:11:ARG:N	1:B:11:ARG:HD2	2.32	0.44
1:D:235:ARG:HG3	1:D:235:ARG:NH1	2.33	0.44
1:A:212:ILE:HG22	1:A:213:GLU:N	2.33	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:32:LEU:HD12	1:D:56:VAL:HB	1.99	0.44
1:A:133:GLN:O	1:A:136:ASN:HB3	2.17	0.44
1:A:165:TRP:CE3	1:A:165:TRP:HA	2.53	0.44
1:B:240:CYS:C	1:B:242:VAL:H	2.26	0.44
1:D:167:GLN:CG	1:D:217:GLY:HA3	2.41	0.44
1:D:190:VAL:HG12	1:D:192:PRO:HD2	2.00	0.44
1:B:88:GLN:HG3	1:B:89:GLN:N	2.32	0.44
1:A:36:LEU:HD21	1:A:57:LEU:HB3	1.99	0.43
1:A:157:GLN:CG	1:A:219:LEU:HD11	2.49	0.43
1:B:112:LEU:CD2	1:B:134:GLU:HG2	2.48	0.43
1:B:136:ASN:HD21	1:B:169:CYS:HB2	1.83	0.43
1:C:75:THR:HG22	1:C:77:GLU:N	2.32	0.43
1:D:82:PRO:CG	1:D:104:GLN:NE2	2.81	0.43
1:A:163:PRO:C	1:A:165:TRP:N	2.76	0.43
1:C:206:ILE:O	1:C:207:LYS:C	2.62	0.43
1:A:12:GLN:HE22	1:A:50:ALA:CB	2.30	0.43
1:A:22:GLY:HA2	1:A:25:LYS:CD	2.47	0.43
1:C:167:GLN:HB3	1:C:234:LEU:O	2.18	0.43
1:C:190:VAL:HG12	1:C:192:PRO:HD2	2.00	0.43
1:D:8:ARG:HH11	1:D:95:ASN:ND2	2.15	0.43
1:D:81:ARG:HA	1:D:82:PRO:HD3	1.83	0.43
1:A:121:VAL:HG22	1:A:208:LEU:HD23	2.00	0.43
1:A:183:ASN:OD1	1:A:183:ASN:O	2.37	0.43
1:A:230:ARG:HH21	1:D:218:GLU:CD	2.26	0.43
1:B:109:GLY:O	1:B:113:LYS:HG3	2.18	0.43
1:C:46:TYR:CE1	1:D:72:ILE:HD11	2.54	0.43
1:C:186:THR:HG23	1:D:14:LEU:O	2.18	0.43
1:A:68:LEU:HD11	1:A:76:THR:HA	2.01	0.43
1:A:242:VAL:C	1:A:244:GLY:H	2.26	0.43
1:B:20:LEU:O	1:B:24:GLN:HB2	2.18	0.43
1:C:57:LEU:CD1	1:C:91:LEU:HD12	2.46	0.43
1:C:186:THR:HG22	1:C:188:GLY:N	2.25	0.43
1:D:163:PRO:O	1:D:164:PRO:C	2.60	0.43
1:A:165:TRP:HA	1:A:165:TRP:HE3	1.84	0.43
1:A:90:ARG:HG2	1:A:90:ARG:HH11	1.82	0.43
1:C:179:GLU:HA	1:C:180:PRO:HD3	1.83	0.43
1:A:45:LEU:HD21	1:B:72:ILE:HB	1.99	0.43
1:C:148:THR:HG23	1:C:159:MET:HB2	2.01	0.43
1:A:57:LEU:HD11	1:A:91:LEU:HD12	2.01	0.43
1:A:79:ILE:O	1:A:80:ASP:HB2	2.19	0.43
1:B:117:ALA:CA	1:B:142:LEU:HD13	2.49	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:133:GLN:OE1	1:B:171:ARG:HG3	2.19	0.42
1:A:52:VAL:O	1:A:98:ILE:HD13	2.20	0.42
1:B:171:ARG:C	1:B:173:LEU:H	2.27	0.42
1:C:69:GLN:HE21	1:C:70:ARG:HG2	1.81	0.42
1:C:176:ASP:CG	1:C:177:ASN:H	2.28	0.42
1:D:41:THR:HG22	1:D:42:PRO:CD	2.49	0.42
1:D:146:LEU:HD12	1:D:147:ILE:N	2.35	0.42
1:A:67:ASN:HB3	1:A:71:GLN:CD	2.45	0.42
1:A:167:GLN:CD	1:A:167:GLN:N	2.78	0.42
1:A:222:PHE:HB2	1:A:229:TRP:CH2	2.54	0.42
1:C:81:ARG:NH2	1:C:89:GLN:NE2	2.51	0.42
1:D:242:VAL:HG22	1:D:243:CYS:N	2.33	0.42
1:A:107:LEU:C	1:A:112:LEU:HB2	2.44	0.42
1:D:8:ARG:HG2	1:D:9:TYR:CE2	2.54	0.42
1:D:146:LEU:HD12	1:D:147:ILE:H	1.83	0.42
1:A:15:LEU:HD21	1:B:153:GLY:HA2	2.02	0.42
1:B:34:ILE:HA	1:B:58:ALA:HB3	2.02	0.42
1:C:162:THR:HB	1:C:163:PRO:HD2	2.01	0.42
1:D:8:ARG:HD3	1:D:95:ASN:ND2	2.35	0.42
1:D:196:VAL:CG1	1:D:197:MET:HE2	2.49	0.42
1:B:82:PRO:HB3	1:B:104:GLN:HE21	1.83	0.42
1:C:4:ARG:O	1:C:5:ASP:C	2.63	0.42
1:A:92:THR:OG1	1:A:100:LEU:HD12	2.19	0.41
1:C:41:THR:HG22	1:C:42:PRO:CD	2.50	0.41
1:D:11:ARG:HA	1:D:11:ARG:HD3	1.89	0.41
1:D:152:VAL:HG23	1:D:152:VAL:O	2.20	0.41
1:A:4:ARG:O	1:A:7:MET:N	2.54	0.41
1:A:230:ARG:HD2	1:C:228:GLN:HG3	2.03	0.41
1:B:32:LEU:HG	1:B:34:ILE:HG13	2.01	0.41
1:C:65:LEU:HD11	1:D:8:ARG:HB2	2.01	0.41
1:D:219:LEU:HG	1:D:221:LEU:CD2	2.47	0.41
1:A:129:MET:HE1	1:A:170:TYR:OH	2.19	0.41
1:B:166:GLU:HB3	1:B:167:GLN:NE2	2.35	0.41
1:D:103:LEU:HD22	1:D:105:GLN:HB3	2.02	0.41
1:A:116:VAL:HG13	1:A:122:VAL:HG21	2.03	0.41
1:A:222:PHE:HB2	1:A:229:TRP:CZ3	2.56	0.41
1:C:45:LEU:CD2	1:D:72:ILE:CG2	2.94	0.41
1:C:126:THR:C	1:C:128:ASN:N	2.77	0.41
1:C:213:GLU:O	1:C:213:GLU:HG3	2.19	0.41
1:A:140:VAL:HG13	1:A:165:TRP:NE1	2.36	0.41
1:B:58:ALA:HA	1:B:103:LEU:HB2	2.01	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:98:ILE:HG22	1:C:99:GLN:N	2.35	0.41
1:A:1:MET:HE1	1:A:23:GLN:HG3	2.02	0.41
1:B:63:VAL:CG1	1:B:79:ILE:HA	2.51	0.41
1:B:63:VAL:HG12	1:B:79:ILE:HA	2.03	0.41
1:B:159:MET:HE1	1:B:170:TYR:CE1	2.56	0.41
1:B:168:GLY:N	1:B:236:ARG:HB3	2.36	0.41
1:C:110:GLU:O	1:C:111:ALA:C	2.63	0.41
1:A:12:GLN:HE21	1:B:69:GLN:HE21	1.68	0.41
1:A:24:GLN:HG3	1:A:28:ASP:OD2	2.20	0.41
1:A:75:THR:OG1	1:B:93:GLN:CB	2.69	0.41
1:A:117:ALA:O	1:A:144:THR:HG21	2.20	0.41
1:A:163:PRO:O	1:A:164:PRO:C	2.64	0.41
1:A:190:VAL:CG1	1:A:192:PRO:HD2	2.51	0.41
1:A:240:CYS:O	1:A:242:VAL:N	2.54	0.41
1:D:41:THR:HG21	1:D:72:ILE:H	1.86	0.41
1:D:78:ASP:O	1:D:81:ARG:HG2	2.21	0.41
1:A:140:VAL:HA	1:A:165:TRP:CE2	2.55	0.41
1:B:137:ALA:HB2	1:B:171:ARG:NH1	2.36	0.41
1:C:112:LEU:CD2	1:C:134:GLU:HG2	2.51	0.41
1:A:11:ARG:HA	1:A:11:ARG:HD3	1.90	0.40
1:A:38:GLY:N	1:A:71:GLN:HG2	2.36	0.40
1:A:68:LEU:N	1:A:68:LEU:HD23	2.36	0.40
1:B:8:ARG:HG3	1:B:9:TYR:N	2.37	0.40
1:B:64:HIS:H	1:B:67:ASN:ND2	2.19	0.40
1:D:55:LEU:HD12	1:D:100:LEU:CD2	2.51	0.40
1:A:47:LEU:HD23	1:A:47:LEU:HA	1.90	0.40
1:A:140:VAL:HG11	1:A:242:VAL:CG1	2.51	0.40
1:A:170:TYR:C	1:A:172:CYS:H	2.28	0.40
1:B:47:LEU:HD22	1:B:52:VAL:HG21	2.03	0.40
1:B:134:GLU:O	1:B:137:ALA:HB3	2.22	0.40
1:C:172:CYS:HB3	1:C:236:ARG:HA	2.02	0.40
1:C:214:THR:HG22	1:C:215:PRO:O	2.21	0.40
1:A:70:ARG:HH11	1:A:70:ARG:HG3	1.86	0.40
1:A:93:GLN:O	1:B:75:THR:HB	2.21	0.40
1:A:108:THR:O	1:A:109:GLY:C	2.64	0.40
1:A:180:PRO:HB2	1:A:182:ARG:HG2	2.02	0.40
1:B:45:LEU:HA	1:B:45:LEU:HD12	1.90	0.40
1:C:79:ILE:HG22	1:C:80:ASP:N	2.36	0.40
1:C:200:LEU:HD23	1:C:200:LEU:HA	1.95	0.40
1:D:82:PRO:CB	1:D:104:GLN:NE2	2.84	0.40
1:D:197:MET:HE1	1:D:229:TRP:HH2	1.86	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:142:LEU:O	1:A:143:ASN:C	2.64	0.40
1:C:1:MET:HE2	1:C:1:MET:HA	2.04	0.40
1:D:124:ASP:HB3	1:D:148:THR:HA	2.04	0.40

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:118:ARG:NH2	1:A:118:ARG:NH2[52_565]	1.87	0.33

5.3 Torsion angles

5.3.1 Protein backbone

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	242/253 (96%)	201 (83%)	27 (11%)	14 (6%)	1	2
1	B	227/253 (90%)	199 (88%)	18 (8%)	10 (4%)	2	4
1	C	241/253 (95%)	190 (79%)	38 (16%)	13 (5%)	1	3
1	D	232/253 (92%)	190 (82%)	35 (15%)	7 (3%)	3	9
All	All	942/1012 (93%)	780 (83%)	118 (12%)	44 (5%)	2	4

All (44) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	19	ALA
1	A	177	ASN
1	A	186	THR
1	B	68	LEU
1	C	103	LEU
1	C	143	ASN
1	D	127	ASP

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Mol	Chain	Res	Type
1	A	68	LEU
1	A	119	ALA
1	A	176	ASP
1	A	178	GLN
1	A	187	ALA
1	C	19	ALA
1	C	59	ASP
1	C	167	GLN
1	C	186	THR
1	C	211	GLY
1	D	19	ALA
1	D	21	ASP
1	D	103	LEU
1	D	153	GLY
1	A	118	ARG
1	A	143	ASN
1	A	238	SER
1	B	19	ALA
1	B	59	ASP
1	C	127	ASP
1	C	213	GLU
1	D	68	LEU
1	D	163	PRO
1	A	113	LYS
1	A	117	ALA
1	B	143	ASN
1	B	241	PRO
1	B	79	ILE
1	B	127	ASP
1	B	163	PRO
1	C	118	ARG
1	C	163	PRO
1	C	185	ARG
1	B	242	VAL
1	A	86	VAL
1	B	109	GLY
1	C	242	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	199/205 (97%)	189 (95%)	10 (5%)	22	47
1	B	187/205 (91%)	172 (92%)	15 (8%)	11	28
1	C	199/205 (97%)	188 (94%)	11 (6%)	19	43
1	D	191/205 (93%)	174 (91%)	17 (9%)	9	24
All	All	776/820 (95%)	723 (93%)	53 (7%)	14	35

All (53) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	10	SER
1	A	39	LEU
1	A	41	THR
1	A	66	SER
1	A	70	ARG
1	A	88	GLN
1	A	108	THR
1	A	176	ASP
1	A	196	VAL
1	A	225	LYS
1	B	7	MET
1	B	11	ARG
1	B	41	THR
1	B	66	SER
1	B	70	ARG
1	B	78	ASP
1	B	79	ILE
1	B	88	GLN
1	B	157	GLN
1	B	163	PRO
1	B	167	GLN
1	B	174	TRP
1	B	194	VAL
1	B	208	LEU
1	B	242	VAL
1	C	1	MET
1	C	3	ASP
1	C	11	ARG

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Mol	Chain	Res	Type
1	C	13	ILE
1	C	41	THR
1	C	75	THR
1	C	189	VAL
1	C	194	VAL
1	C	208	LEU
1	C	214	THR
1	C	243	CYS
1	D	41	THR
1	D	69	GLN
1	D	81	ARG
1	D	103	LEU
1	D	127	ASP
1	D	128	ASN
1	D	148	THR
1	D	158	LEU
1	D	163	PRO
1	D	169	CYS
1	D	189	VAL
1	D	192	PRO
1	D	194	VAL
1	D	214	THR
1	D	231	SER
1	D	235	ARG
1	D	242	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (32) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	12	GLN
1	A	67	ASN
1	A	69	GLN
1	A	88	GLN
1	A	95	ASN
1	A	136	ASN
1	A	143	ASN
1	A	167	GLN
1	A	177	ASN
1	A	201	GLN
1	B	24	GLN
1	B	67	ASN
1	B	85	GLN

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Mol	Chain	Res	Type
1	B	93	GLN
1	B	104	GLN
1	B	105	GLN
1	B	128	ASN
1	B	167	GLN
1	B	201	GLN
1	C	12	GLN
1	C	64	HIS
1	C	69	GLN
1	C	89	GLN
1	C	93	GLN
1	C	128	ASN
1	C	167	GLN
1	C	201	GLN
1	D	12	GLN
1	D	85	GLN
1	D	93	GLN
1	D	104	GLN
1	D	133	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 4 ligands modelled in this entry, 4 are monoatomic - leaving 0 for Mogul analysis.

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

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

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	244/253 (96%)	0.25	16 (6%) 24 21	39, 80, 145, 198	0
1	B	231/253 (91%)	0.00	7 (3%) 52 45	42, 74, 128, 167	0
1	C	243/253 (96%)	0.20	9 (3%) 45 37	44, 82, 141, 171	0
1	D	236/253 (93%)	0.14	8 (3%) 48 41	38, 76, 139, 182	0
All	All	954/1012 (94%)	0.15	40 (4%) 40 33	38, 78, 140, 198	0

All (40) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	243	CYS	5.2
1	A	175	PRO	4.6
1	D	104	GLN	4.0
1	A	176	ASP	3.9
1	C	6	PHE	3.7
1	B	213	GLU	3.6
1	D	20	LEU	3.4
1	B	127	ASP	3.4
1	C	1	MET	3.4
1	B	171	ARG	3.3
1	C	99	GLN	3.1
1	A	241	PRO	3.1
1	A	186	THR	3.1
1	C	117	ALA	3.0
1	A	182	ARG	3.0
1	C	163	PRO	3.0
1	A	242	VAL	2.9
1	D	187	ALA	2.9
1	A	178	GLN	2.8
1	A	244	GLY	2.7
1	C	127	ASP	2.6

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Mol	Chain	Res	Type	RSRZ
1	A	238	SER	2.5
1	C	186	THR	2.5
1	D	239	GLY	2.5
1	D	133	GLN	2.5
1	D	60	ASP	2.4
1	C	213	GLU	2.3
1	B	132	ARG	2.3
1	A	6	PHE	2.3
1	A	181	GLU	2.3
1	B	21	ASP	2.2
1	A	163	PRO	2.2
1	C	184	CYS	2.2
1	D	240	CYS	2.2
1	B	174	TRP	2.1
1	A	240	CYS	2.1
1	A	166	GLU	2.1
1	D	72	ILE	2.1
1	A	106	ARG	2.0
1	A	179	GLU	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	ZN	B	252	1/1	0.98	0.04	81,81,81,81	0
2	ZN	D	252	1/1	0.98	0.10	81,81,81,81	0
2	ZN	C	252	1/1	0.99	0.11	81,81,81,81	0
2	ZN	A	252	1/1	0.99	0.13	81,81,81,81	0

6.5 Other polymers [i](#)

There are no such residues in this entry.