



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 8, 2026 – 03:30 AM UTC

PDB ID : 3WVO / pdb_00003wvo
Title : Crystal structure of Thermobifida fusca Cse1
Authors : Yuan, Y.A.; Tay, M.
Deposited on : 2014-06-02
Resolution : 3.31 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

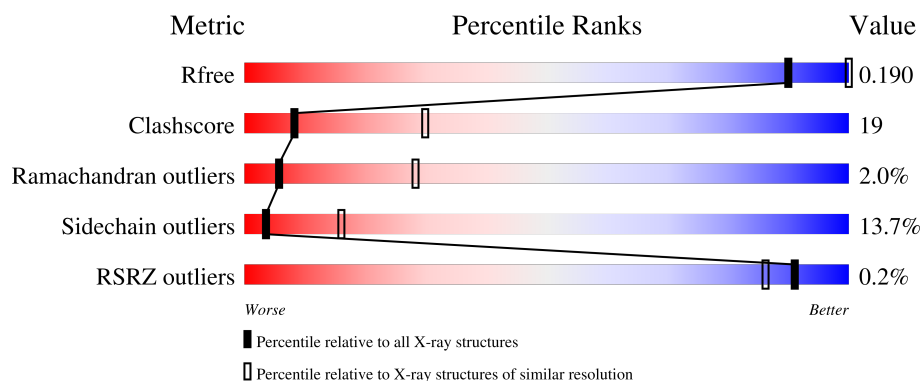
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.31 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	1153 (3.34-3.30)
Clashscore	190562	1193 (3.34-3.30)
Ramachandran outliers	187476	1172 (3.34-3.30)
Sidechain outliers	187428	1171 (3.34-3.30)
RSRZ outliers	180081	1153 (3.34-3.30)

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	558	54% 34% 8% ..
1	B	558	59% 31% 6% ..
1	C	558	58% 31% 7% ..

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 12784 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 CRISPR-associated protein, Cse1 family.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	543	Total	C	N	O	S	0	0	0
			4261	2697	763	793	8			
1	B	542	Total	C	N	O	S	0	0	0
			4255	2693	763	791	8			
1	C	540	Total	C	N	O	S	0	0	0
			4240	2684	760	788	8			

There are 9 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-2	GLY	-	expression tag	UNP Q47PI4
A	-1	SER	-	expression tag	UNP Q47PI4
A	0	HIS	-	expression tag	UNP Q47PI4
B	-2	GLY	-	expression tag	UNP Q47PI4
B	-1	SER	-	expression tag	UNP Q47PI4
B	0	HIS	-	expression tag	UNP Q47PI4
C	-2	GLY	-	expression tag	UNP Q47PI4
C	-1	SER	-	expression tag	UNP Q47PI4
C	0	HIS	-	expression tag	UNP Q47PI4

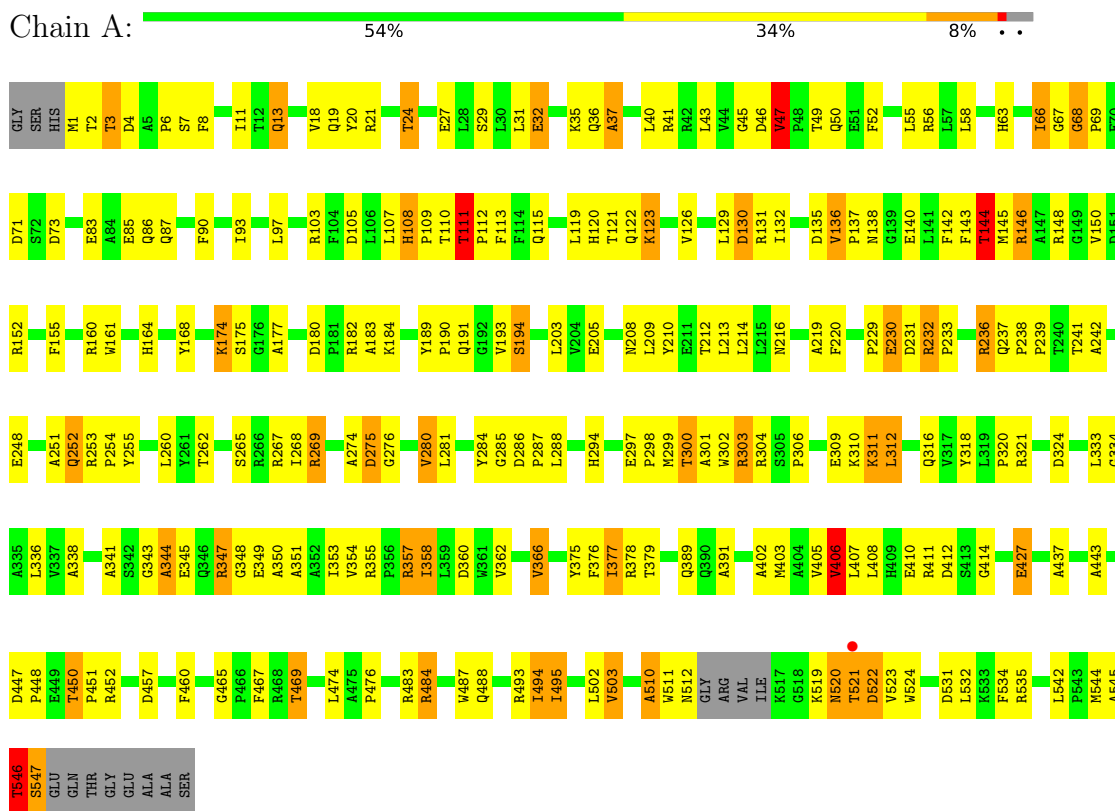
- Molecule 2 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	7	Total	O	0	0
			7	7		
2	B	13	Total	O	0	0
			13	13		
2	C	8	Total	O	0	0
			8	8		

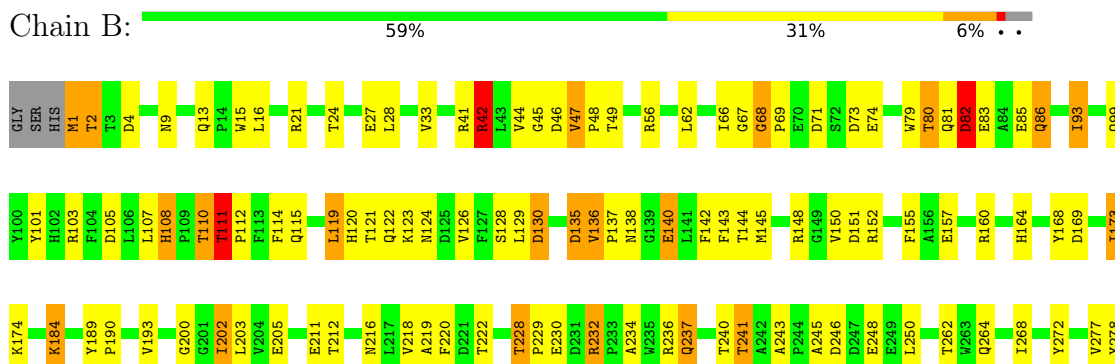
3 Residue-property plots

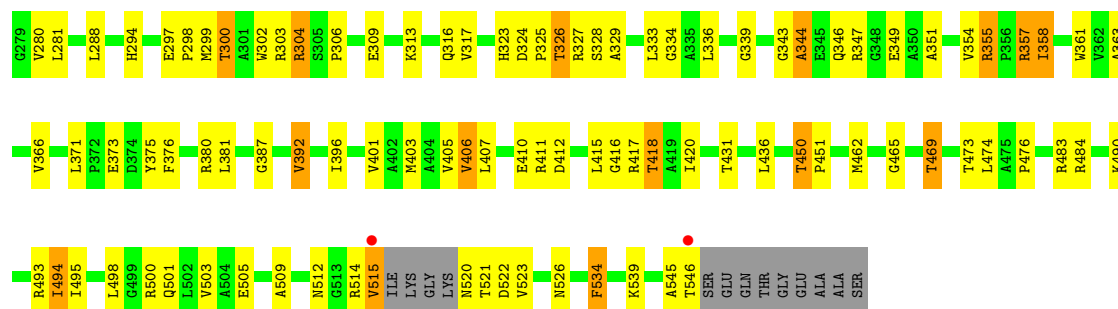
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. 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: CRISPR-associated protein, Cse1 family



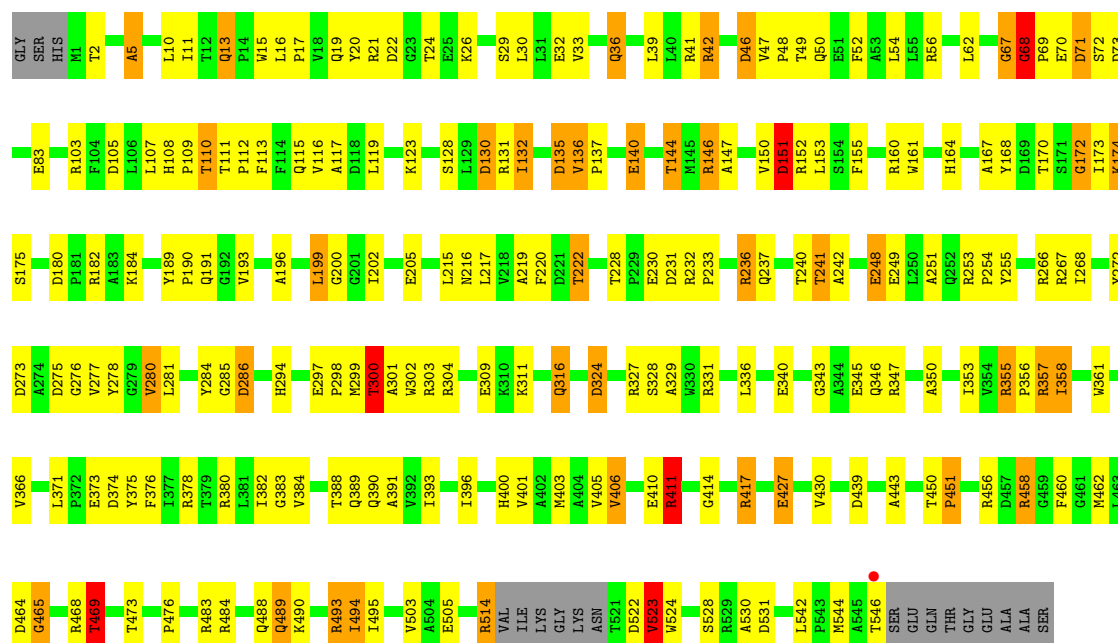
- Molecule 1: CRISPR-associated protein, Cse1 family





- Molecule 1: CRISPR-associated protein, Cse1 family

Chain C: 58% 31% 7% ..



4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	207.30Å 132.53Å 102.96Å 90.00° 93.75° 90.00°	Depositor
Resolution (Å)	48.37 – 3.31 48.37 – 3.31	Depositor EDS
% Data completeness (in resolution range)	89.4 (48.37-3.31) 89.4 (48.37-3.31)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	4.61 (at 3.33Å)	Xtriage
Refinement program	REFMAC 5.7.0029	Depositor
R, R_{free}	0.156 , 0.210 (Not available) , 0.190	Depositor DCC
R_{free} test set	1873 reflections (4.52%)	wwPDB-VP
Wilson B-factor (Å ²)	69.4	Xtriage
Anisotropy	0.163	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.31 , 54.1	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.31$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	12784	wwPDB-VP
Average B, all atoms (Å ²)	73.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.85% 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

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	0.88	2/4365 (0.0%)	1.26	21/5942 (0.4%)
1	B	0.81	0/4359	1.19	20/5936 (0.3%)
1	C	0.92	0/4344	1.27	35/5915 (0.6%)
All	All	0.87	2/13068 (0.0%)	1.24	76/17793 (0.4%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	1
1	C	0	2
All	All	0	3

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	546	THR	N-CA	5.12	1.52	1.46
1	A	546	THR	CA-CB	5.04	1.61	1.53

All (76) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	108	HIS	CA-C-N	11.16	132.04	119.32
1	A	108	HIS	C-N-CA	11.16	132.04	119.32
1	C	136	VAL	CA-C-N	10.94	130.90	119.85
1	C	136	VAL	C-N-CA	10.94	130.90	119.85
1	A	136	VAL	CA-C-N	9.55	129.49	120.03
1	A	136	VAL	C-N-CA	9.55	129.49	120.03
1	A	111	THR	CA-C-N	-8.52	111.96	120.31
1	A	111	THR	C-N-CA	-8.52	111.96	120.31
1	B	545	ALA	N-CA-C	7.92	121.06	111.40

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	465	GLY	CA-C-N	7.69	127.24	119.24
1	C	465	GLY	C-N-CA	7.69	127.24	119.24
1	A	47	VAL	CA-C-N	7.66	129.41	119.84
1	A	47	VAL	C-N-CA	7.66	129.41	119.84
1	A	203	LEU	CB-CA-C	-7.38	97.23	110.36
1	C	117	ALA	N-CA-C	7.08	119.00	111.28
1	C	299	MET	N-CA-C	7.08	120.47	112.97
1	B	326	THR	CB-CA-C	-7.06	98.68	110.68
1	C	132	ILE	CB-CA-C	-6.97	103.16	111.94
1	C	278	TYR	CA-C-N	-6.96	115.98	122.17
1	C	278	TYR	C-N-CA	-6.96	115.98	122.17
1	B	237	GLN	CA-C-N	-6.80	114.77	119.66
1	B	237	GLN	C-N-CA	-6.80	114.77	119.66
1	C	411	ARG	N-CA-C	6.80	118.69	111.28
1	C	46	ASP	N-CA-C	-6.72	105.05	113.18
1	C	36	GLN	N-CA-C	6.61	121.36	113.16
1	C	151	ASP	N-CA-C	-6.54	104.23	111.36
1	B	119	LEU	N-CA-C	6.49	119.77	110.10
1	A	93	ILE	N-CA-C	6.41	116.52	110.30
1	C	67	GLY	CA-C-N	6.39	131.90	121.87
1	C	67	GLY	C-N-CA	6.39	131.90	121.87
1	C	110	THR	CB-CA-C	-6.26	100.26	110.08
1	C	280	VAL	CB-CA-C	-6.20	99.31	110.48
1	A	510	ALA	N-CA-C	6.17	120.36	112.34
1	C	173	ILE	N-CA-C	-6.16	101.60	109.30
1	C	523	VAL	CB-CA-C	-6.15	101.21	111.29
1	C	300	THR	CB-CA-C	-6.10	96.65	110.07
1	B	108	HIS	CA-C-N	6.03	126.47	119.47
1	B	108	HIS	C-N-CA	6.03	126.47	119.47
1	C	232	ARG	CA-C-N	-6.02	114.07	120.03
1	C	232	ARG	C-N-CA	-6.02	114.07	120.03
1	B	111	THR	CA-C-N	-6.01	114.42	120.31
1	B	111	THR	C-N-CA	-6.01	114.42	120.31
1	A	8	PHE	N-CA-C	5.93	118.97	108.24
1	B	228	THR	CA-C-N	5.76	127.04	119.84
1	B	228	THR	C-N-CA	5.76	127.04	119.84
1	C	68	GLY	CA-C-N	-5.67	113.25	120.23
1	C	68	GLY	C-N-CA	-5.67	113.25	120.23
1	C	135	ASP	N-CA-C	-5.67	106.32	113.18
1	A	66	ILE	CB-CA-C	-5.60	105.16	110.65
1	B	173	ILE	N-CA-C	-5.59	101.51	108.89
1	B	120	HIS	N-CA-C	5.52	117.45	109.07

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	406	VAL	CB-CA-C	-5.51	102.25	111.29
1	B	136	VAL	N-CA-C	5.50	114.55	108.05
1	C	67	GLY	N-CA-C	-5.47	100.20	113.18
1	A	366	VAL	CB-CA-C	-5.45	105.00	111.81
1	C	406	VAL	CB-CA-C	-5.44	104.11	112.05
1	B	151	ASP	N-CA-C	-5.34	105.46	111.28
1	C	403	MET	N-CA-C	5.33	116.64	108.42
1	B	2	THR	N-CA-C	-5.33	106.28	112.89
1	C	355	ARG	CA-C-N	5.33	125.64	119.93
1	C	355	ARG	C-N-CA	5.33	125.64	119.93
1	A	144	THR	N-CA-C	5.31	117.18	108.52
1	C	72	SER	N-CA-C	-5.31	106.31	112.89
1	B	28	LEU	N-CA-C	5.28	117.20	109.24
1	C	42	ARG	N-CA-C	5.23	116.47	108.42
1	A	450	THR	CA-C-N	-5.22	113.53	119.28
1	A	450	THR	C-N-CA	-5.22	113.53	119.28
1	A	121	THR	N-CA-C	-5.20	102.30	110.36
1	C	236	ARG	N-CA-C	-5.20	106.17	112.88
1	A	336	LEU	N-CA-C	5.11	116.93	111.36
1	C	39	LEU	N-CA-C	-5.09	107.24	113.50
1	B	42	ARG	N-CA-C	5.09	116.03	108.60
1	B	99	GLN	N-CA-C	5.09	116.51	111.07
1	A	148	ARG	N-CA-C	5.06	117.36	110.88
1	C	469	THR	CB-CA-C	5.04	119.93	110.70
1	B	93	ILE	N-CA-C	5.04	115.26	110.42

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	344	ALA	Peptide
1	C	172	GLY	Peptide
1	C	199	LEU	Peptide

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	4261	0	4181	186	0
1	B	4255	0	4172	150	0
1	C	4240	0	4157	155	0
2	A	7	0	0	0	0
2	B	13	0	0	1	0
2	C	8	0	0	1	0
All	All	12784	0	12510	488	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 (488) 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:366:VAL:HG21	1:B:405:VAL:CG1	1.73	1.18
1:B:366:VAL:HG21	1:B:405:VAL:HG11	1.26	1.11
1:A:49:THR:HG22	1:A:168:TYR:CE1	1.90	1.06
1:C:132:ILE:HG22	1:C:161:TRP:HB3	1.39	1.05
1:C:103:ARG:NH2	1:C:237:GLN:O	1.93	1.01
1:B:366:VAL:CG2	1:B:405:VAL:HG11	1.91	1.01
1:B:501:GLN:O	1:B:505:GLU:HG3	1.63	0.99
1:A:132:ILE:HG22	1:A:161:TRP:HB3	1.47	0.95
1:B:103:ARG:NH2	1:B:237:GLN:O	1.99	0.94
1:A:110:THR:O	1:A:112:PRO:HD3	1.66	0.94
1:C:128:SER:HB3	1:C:130:ASP:OD1	1.69	0.92
1:A:103:ARG:HD3	1:A:111:THR:HG21	1.53	0.90
1:C:241:THR:HG22	1:C:242:ALA:H	1.36	0.88
1:B:339:GLY:O	1:B:354:VAL:HG21	1.74	0.88
1:B:169:ASP:OD2	1:B:174:LYS:NZ	2.08	0.87
1:A:49:THR:HG22	1:A:168:TYR:CD1	2.10	0.87
1:B:56:ARG:HH22	1:B:297:GLU:CD	1.83	0.86
1:A:4:ASP:O	1:A:7:SER:HB3	1.76	0.85
1:B:115:GLN:HB2	1:B:268:ILE:O	1.75	0.85
1:C:46:ASP:OD2	1:C:160:ARG:NH1	2.10	0.84
1:A:182:ARG:HD2	1:A:191:GLN:HE22	1.42	0.83
1:C:132:ILE:CG2	1:C:161:TRP:HB3	2.07	0.83
1:A:103:ARG:CD	1:A:111:THR:HG21	2.09	0.82
1:B:309:GLU:HG3	1:B:317:VAL:HG23	1.60	0.81
1:C:108:HIS:HD2	1:C:110:THR:H	1.28	0.81
1:C:343:GLY:O	1:C:346:GLN:HB2	1.82	0.80
1:A:2:THR:O	1:A:6:PRO:CD	2.30	0.79
1:C:170:THR:O	1:C:174:LYS:NZ	2.13	0.78

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:366:VAL:HG21	1:B:405:VAL:HG12	1.66	0.77
1:C:366:VAL:HG21	1:C:405:VAL:HG12	1.63	0.77
1:C:49:THR:HB	1:C:164:HIS:HE1	1.50	0.77
1:C:49:THR:CG2	1:C:168:TYR:CE1	2.68	0.76
1:A:484:ARG:HG2	1:A:484:ARG:HH11	1.50	0.76
1:C:366:VAL:HG21	1:C:405:VAL:CG1	2.16	0.76
1:A:108:HIS:HD2	1:A:110:THR:H	1.34	0.75
1:A:316:GLN:HE21	1:A:318:TYR:HE2	1.34	0.75
1:A:2:THR:O	1:A:6:PRO:HD2	1.88	0.74
1:A:49:THR:CG2	1:A:168:TYR:CE1	2.69	0.74
1:A:37:ALA:HA	1:A:40:LEU:HD12	1.68	0.74
1:B:121:THR:HG22	1:B:122:GLN:H	1.53	0.74
1:B:484:ARG:HG2	1:B:484:ARG:HH11	1.52	0.73
1:A:21:ARG:O	1:A:41:ARG:NH2	2.20	0.73
1:B:108:HIS:HD2	1:B:110:THR:H	1.37	0.73
1:A:103:ARG:HD2	1:A:111:THR:CG2	2.18	0.73
1:B:1:MET:O	1:B:4:ASP:HB2	1.86	0.73
1:B:373:GLU:HB3	1:B:406:VAL:HG22	1.70	0.72
1:B:351:ALA:HA	1:B:354:VAL:HG22	1.69	0.72
1:B:304:ARG:HH21	1:B:316:GLN:HA	1.54	0.72
1:C:19:GLN:NE2	1:C:41:ARG:HH11	1.88	0.72
1:C:56:ARG:NH2	1:C:297:GLU:OE2	2.20	0.72
1:A:545:ALA:O	1:A:547:SER:N	2.22	0.72
1:A:488:GLN:OE1	1:A:544:MET:HB2	1.88	0.71
1:C:410:GLU:HB3	1:C:414:GLY:HA3	1.73	0.71
1:B:339:GLY:CA	1:B:354:VAL:HG23	2.21	0.71
1:C:62:LEU:HD23	1:C:217:LEU:HD13	1.71	0.71
1:A:32:GLU:HG2	1:A:36:GLN:HE21	1.54	0.70
1:B:103:ARG:HD3	1:B:111:THR:HG21	1.72	0.70
1:A:152:ARG:NH1	1:A:276:GLY:HA3	2.06	0.70
1:C:411:ARG:O	1:C:417:ARG:NH1	2.24	0.70
1:A:132:ILE:CG2	1:A:161:TRP:HB3	2.21	0.70
1:A:2:THR:O	1:A:6:PRO:HD3	1.91	0.70
1:B:56:ARG:NH2	1:B:297:GLU:OE1	2.26	0.69
1:B:121:THR:HG22	1:B:122:GLN:N	2.07	0.69
1:B:309:GLU:OE2	1:B:316:GLN:HA	1.93	0.69
1:C:108:HIS:CD2	1:C:111:THR:H	2.10	0.69
1:B:339:GLY:O	1:B:354:VAL:CG2	2.41	0.69
1:A:316:GLN:NE2	1:A:318:TYR:HE2	1.90	0.68
1:C:19:GLN:HE22	1:C:41:ARG:HH11	1.40	0.68
1:C:473:THR:HG21	1:C:483:ARG:NH1	2.08	0.68

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:108:HIS:CD2	1:A:110:THR:H	2.11	0.68
1:B:49:THR:CG2	1:B:168:TYR:CD1	2.76	0.68
1:A:130:ASP:OD1	1:A:130:ASP:N	2.26	0.68
1:A:103:ARG:CD	1:A:111:THR:CG2	2.72	0.68
1:C:49:THR:HG22	1:C:168:TYR:CE1	2.28	0.68
1:C:108:HIS:CD2	1:C:110:THR:H	2.09	0.68
1:A:510:ALA:HB1	1:A:523:VAL:CG2	2.25	0.67
1:A:103:ARG:NH2	1:A:237:GLN:O	2.26	0.67
1:C:147:ALA:HA	2:C:603:HOH:O	1.95	0.67
1:C:439:ASP:HB3	1:C:530:ALA:HB1	1.75	0.67
1:B:49:THR:HG23	1:B:168:TYR:CD1	2.30	0.66
1:C:355:ARG:O	1:C:357:ARG:NH1	2.29	0.66
1:B:49:THR:HG23	1:B:168:TYR:CE1	2.31	0.66
1:A:174:LYS:HG3	1:A:284:TYR:CE1	2.31	0.66
1:B:339:GLY:HA3	1:B:354:VAL:HG23	1.77	0.66
1:A:410:GLU:HB3	1:A:414:GLY:HA3	1.79	0.65
1:C:174:LYS:HG3	1:C:284:TYR:CE1	2.30	0.65
1:B:27:GLU:OE2	1:B:160:ARG:NH2	2.29	0.65
1:A:294:HIS:HA	1:A:302:TRP:CZ2	2.31	0.65
1:C:298:PRO:HA	1:C:357:ARG:HB2	1.78	0.65
1:A:231:ASP:HA	1:A:255:TYR:HB2	1.78	0.65
1:C:49:THR:CG2	1:C:168:TYR:CD1	2.79	0.65
1:A:443:ALA:O	1:A:523:VAL:HG12	1.97	0.65
1:B:241:THR:HB	1:B:243:ALA:H	1.62	0.65
1:A:47:VAL:O	1:A:50:GLN:HB2	1.97	0.65
1:A:6:PRO:HA	1:A:107:LEU:HB2	1.80	0.64
1:C:450:THR:HB	1:C:451:PRO:CD	2.28	0.64
1:A:294:HIS:HA	1:A:302:TRP:CE2	2.33	0.63
1:B:9:ASN:HA	1:B:105:ASP:HA	1.80	0.63
1:C:231:ASP:HA	1:C:255:TYR:HB2	1.80	0.63
1:B:1:MET:N	1:B:1:MET:HE2	2.13	0.63
1:A:111:THR:HG22	1:A:111:THR:O	1.96	0.63
1:B:128:SER:HB3	1:B:130:ASP:OD1	1.99	0.63
1:B:294:HIS:HA	1:B:302:TRP:CE2	2.34	0.63
1:A:108:HIS:HD2	1:A:110:THR:N	1.97	0.63
1:B:108:HIS:CD2	1:B:110:THR:H	2.17	0.63
1:B:298:PRO:HA	1:B:357:ARG:HB2	1.80	0.62
1:B:138:ASN:ND2	1:B:140:GLU:HG3	2.13	0.62
1:C:49:THR:HG22	1:C:168:TYR:CD1	2.34	0.62
1:A:107:LEU:HD11	1:A:155:PHE:CE2	2.35	0.62
1:B:56:ARG:NH2	1:B:297:GLU:CD	2.56	0.62

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:113:PHE:O	1:A:115:GLN:HG2	2.00	0.62
1:B:473:THR:HG21	1:B:483:ARG:NE	2.14	0.62
1:B:68:GLY:HA3	1:B:220:PHE:CZ	2.35	0.61
1:A:355:ARG:HH21	1:A:408:LEU:HB3	1.66	0.61
1:A:108:HIS:CD2	1:A:111:THR:H	2.19	0.61
1:B:230:GLU:O	1:B:232:ARG:HG3	2.01	0.61
1:C:105:ASP:HB3	1:C:108:HIS:HB2	1.83	0.61
1:B:71:ASP:HB3	1:B:73:ASP:H	1.64	0.60
1:C:130:ASP:OD1	1:C:130:ASP:N	2.30	0.60
1:C:20:TYR:HB3	1:C:22:ASP:OD1	2.00	0.60
1:C:152:ARG:NH2	1:C:273:ASP:OD2	2.35	0.60
1:B:234:ALA:H	1:B:262:THR:HG21	1.67	0.60
1:C:11:ILE:HA	1:C:30:LEU:HB2	1.84	0.60
1:C:49:THR:HB	1:C:164:HIS:CE1	2.35	0.60
1:C:462:MET:HE2	1:C:462:MET:HA	1.84	0.60
1:B:110:THR:O	1:B:112:PRO:HD3	2.01	0.59
1:C:46:ASP:HB2	1:C:50:GLN:NE2	2.17	0.59
1:A:32:GLU:HG2	1:A:36:GLN:NE2	2.17	0.59
1:C:10:LEU:HD22	1:C:15:TRP:CE2	2.37	0.59
1:A:230:GLU:CD	1:A:230:GLU:H	2.11	0.59
1:A:510:ALA:CB	1:A:523:VAL:CG2	2.81	0.59
1:C:29:SER:O	1:C:33:VAL:HG23	2.03	0.59
1:A:105:ASP:HB3	1:A:108:HIS:HB2	1.84	0.59
1:A:49:THR:CG2	1:A:168:TYR:CD1	2.86	0.58
1:A:232:ARG:HB2	1:A:236:ARG:HD2	1.86	0.58
1:B:41:ARG:HD3	1:B:42:ARG:HD3	1.86	0.58
1:A:355:ARG:NH2	1:A:408:LEU:HB3	2.19	0.58
1:B:130:ASP:OD1	1:B:130:ASP:N	2.17	0.58
1:B:202:ILE:O	1:B:299:MET:HG2	2.04	0.58
1:A:56:ARG:NH2	1:A:297:GLU:OE2	2.34	0.58
1:C:464:ASP:OD1	1:C:464:ASP:C	2.46	0.58
1:A:216:ASN:HA	1:A:358:ILE:HD11	1.86	0.58
1:A:20:TYR:HD1	1:A:24:THR:HB	1.68	0.58
1:B:200:GLY:O	1:B:300:THR:HG23	2.04	0.58
1:A:11:ILE:HG22	1:A:31:LEU:HG	1.86	0.57
1:A:182:ARG:O	1:A:184:LYS:N	2.36	0.57
1:C:2:THR:HA	1:C:5:ALA:HB3	1.86	0.57
1:A:362:VAL:O	1:A:366:VAL:HG23	2.04	0.57
1:A:510:ALA:CB	1:A:523:VAL:HG21	2.34	0.57
1:A:144:THR:HG21	1:B:135:ASP:OD1	2.03	0.57
1:A:306:PRO:HA	1:A:309:GLU:OE1	2.05	0.57

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:251:ALA:HB3	1:A:252:GLN:NE2	2.20	0.57
1:A:405:VAL:O	1:A:406:VAL:C	2.45	0.57
1:C:189:TYR:O	1:C:191:GLN:HG3	2.04	0.57
1:C:294:HIS:HA	1:C:302:TRP:CZ2	2.40	0.56
1:A:231:ASP:HA	1:A:255:TYR:CB	2.35	0.56
1:A:11:ILE:O	1:A:29:SER:HB2	2.05	0.56
1:A:302:TRP:O	1:A:354:VAL:HG13	2.05	0.56
1:A:465:GLY:O	1:A:469:THR:HG23	2.05	0.56
1:C:108:HIS:CD2	1:C:109:PRO:HD2	2.41	0.56
1:B:358:ILE:O	1:B:361:TRP:HB3	2.05	0.56
1:C:151:ASP:OD1	1:C:151:ASP:N	2.38	0.56
1:C:443:ALA:O	1:C:523:VAL:HA	2.05	0.56
1:C:375:TYR:O	1:C:405:VAL:HG23	2.04	0.56
1:B:484:ARG:HG2	1:B:484:ARG:NH1	2.21	0.56
1:C:20:TYR:OH	1:C:36:GLN:NE2	2.38	0.56
1:C:331:ARG:HD2	1:C:427:GLU:OE2	2.05	0.56
1:B:490:LYS:HG3	1:B:494:ILE:HD12	1.88	0.55
1:C:108:HIS:HD2	1:C:110:THR:N	2.01	0.55
1:C:115:GLN:HB2	1:C:268:ILE:O	2.07	0.55
1:C:119:LEU:HD23	1:C:281:LEU:HD23	1.88	0.55
1:A:474:LEU:CD2	1:A:483:ARG:HG3	2.37	0.55
1:B:406:VAL:HG21	1:B:476:PRO:HG3	1.87	0.55
1:A:108:HIS:HB3	1:A:112:PRO:HA	1.89	0.55
1:C:241:THR:HG22	1:C:242:ALA:N	2.14	0.55
1:A:457:ASP:OD2	1:B:189:TYR:HE2	1.90	0.55
1:C:272:TYR:HB2	1:C:276:GLY:O	2.07	0.55
1:A:112:PRO:HG2	1:A:115:GLN:HG3	1.89	0.54
1:C:219:ALA:O	1:C:222:THR:HB	2.08	0.54
1:A:520:ASN:O	1:A:523:VAL:HG22	2.07	0.54
1:C:113:PHE:O	1:C:115:GLN:HG2	2.07	0.54
1:C:115:GLN:CB	1:C:268:ILE:O	2.55	0.54
1:C:266:ARG:HA	1:C:285:GLY:N	2.23	0.54
1:C:430:VAL:HG11	1:C:460:PHE:CE1	2.42	0.53
1:A:233:PRO:HG2	1:A:236:ARG:HB2	1.89	0.53
1:B:406:VAL:CG2	1:B:476:PRO:HG3	2.38	0.53
1:B:406:VAL:HG21	1:B:476:PRO:HD3	1.90	0.53
1:A:484:ARG:HH11	1:A:484:ARG:CG	2.20	0.53
1:C:343:GLY:HA3	1:C:347:ARG:NH2	2.23	0.53
1:C:48:PRO:HG2	1:C:396:ILE:HG21	1.91	0.53
1:C:228:THR:C	1:C:230:GLU:H	2.17	0.52
1:B:115:GLN:CB	1:B:268:ILE:O	2.54	0.52

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:142:PHE:O	1:B:143:PHE:HB2	2.08	0.52
1:B:49:THR:CG2	1:B:164:HIS:CE1	2.92	0.52
1:A:427:GLU:HG3	1:A:460:PHE:HZ	1.74	0.52
1:C:430:VAL:HG12	1:C:456:ARG:HG2	1.89	0.52
1:A:71:ASP:HB3	1:A:73:ASP:H	1.75	0.52
1:B:80:THR:HB	1:B:82:ASP:H	1.73	0.52
1:A:85:GLU:O	1:A:86:GLN:C	2.53	0.52
1:A:510:ALA:HB1	1:A:523:VAL:HG23	1.92	0.52
1:B:79:TRP:CH2	1:B:371:LEU:HD22	2.45	0.52
1:B:462:MET:HG3	1:B:498:LEU:HD22	1.90	0.52
1:A:298:PRO:HA	1:A:357:ARG:HB2	1.91	0.52
1:C:56:ARG:NH2	1:C:297:GLU:CD	2.68	0.52
1:A:209:LEU:HD12	1:A:209:LEU:O	2.10	0.52
1:B:262:THR:O	1:B:262:THR:HG22	2.10	0.52
1:B:13:GLN:OE1	1:B:13:GLN:HA	2.10	0.51
1:B:294:HIS:HA	1:B:302:TRP:CZ2	2.45	0.51
1:A:253:ARG:HA	1:A:254:PRO:C	2.36	0.51
1:B:418:THR:CG2	1:B:484:ARG:HB2	2.39	0.51
1:C:180:ASP:OD1	1:C:182:ARG:HB2	2.11	0.51
1:A:20:TYR:CD2	1:A:40:LEU:HD23	2.45	0.51
1:A:194:SER:HB3	1:A:265:SER:HB3	1.91	0.51
1:A:437:ALA:HB3	1:A:452:ARG:HA	1.92	0.51
1:C:71:ASP:HB2	1:C:73:ASP:H	1.76	0.51
1:C:189:TYR:HB3	1:C:190:PRO:CD	2.41	0.51
1:C:172:GLY:H	1:C:174:LYS:HE3	1.75	0.51
1:B:85:GLU:O	1:B:86:GLN:C	2.53	0.51
1:B:406:VAL:HG21	1:B:476:PRO:CD	2.40	0.51
1:B:323:HIS:CE1	1:B:381:LEU:HD22	2.46	0.51
1:C:69:PRO:O	1:C:219:ALA:HA	2.11	0.51
1:C:167:ALA:O	1:C:196:ALA:HB3	2.11	0.51
1:A:350:ALA:HB3	1:A:353:ILE:HD12	1.93	0.51
1:C:112:PRO:HG2	1:C:115:GLN:HG3	1.93	0.51
1:C:152:ARG:O	1:C:153:LEU:HD23	2.11	0.51
1:B:436:LEU:HD13	1:B:534:PHE:HB3	1.93	0.50
1:C:180:ASP:C	1:C:182:ARG:H	2.18	0.50
1:C:450:THR:HB	1:C:451:PRO:HD2	1.92	0.50
1:C:465:GLY:O	1:C:469:THR:HG22	2.11	0.50
1:A:142:PHE:O	1:A:143:PHE:HB2	2.10	0.50
1:C:524:TRP:HA	1:C:524:TRP:CE3	2.46	0.50
1:A:45:GLY:C	1:A:47:VAL:H	2.20	0.50
1:B:415:LEU:HD22	1:B:474:LEU:HB3	1.93	0.50

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:56:ARG:HH22	1:C:297:GLU:CD	2.18	0.50
1:A:304:ARG:NH1	1:A:348:GLY:O	2.44	0.50
1:A:484:ARG:HG2	1:A:484:ARG:NH1	2.22	0.50
1:A:484:ARG:CG	1:A:484:ARG:NH1	2.75	0.50
1:B:129:LEU:HD11	1:B:278:TYR:O	2.11	0.50
1:C:439:ASP:HB3	1:C:530:ALA:CB	2.39	0.50
1:C:152:ARG:HH22	1:C:273:ASP:CG	2.18	0.50
1:A:182:ARG:HD2	1:A:191:GLN:NE2	2.20	0.50
1:A:300:THR:HG21	1:A:320:PRO:HB3	1.93	0.50
1:B:490:LYS:HG3	1:B:494:ILE:CD1	2.42	0.50
1:C:128:SER:CB	1:C:130:ASP:OD1	2.52	0.50
1:C:389:GLN:OE1	1:C:389:GLN:HA	2.12	0.50
1:C:488:GLN:OE1	1:C:544:MET:HB2	2.12	0.50
1:A:343:GLY:HA3	1:A:347:ARG:NH2	2.27	0.49
1:C:107:LEU:HD11	1:C:155:PHE:CE2	2.47	0.49
1:C:205:GLU:OE2	1:C:380:ARG:HD2	2.12	0.49
1:A:35:LYS:HB2	1:A:90:PHE:CE1	2.48	0.49
1:A:230:GLU:CD	1:A:230:GLU:N	2.69	0.49
1:B:232:ARG:HD2	1:B:237:GLN:HG3	1.95	0.49
1:B:520:ASN:N	2:B:608:HOH:O	2.44	0.49
1:B:110:THR:C	1:B:112:PRO:HD3	2.38	0.49
1:B:121:THR:CG2	1:B:122:GLN:H	2.24	0.49
1:B:212:THR:O	1:B:216:ASN:ND2	2.46	0.49
1:B:355:ARG:HH21	1:B:363:ALA:HB2	1.77	0.49
1:B:514:ARG:O	1:B:515:VAL:HG23	2.13	0.49
1:C:297:GLU:OE1	1:C:298:PRO:HD2	2.12	0.49
1:A:146:ARG:NH1	1:B:157:GLU:OE2	2.46	0.49
1:B:79:TRP:CH2	1:B:371:LEU:CD2	2.96	0.49
1:B:129:LEU:HD11	1:B:278:TYR:C	2.38	0.48
1:B:189:TYR:HB3	1:B:190:PRO:CD	2.42	0.48
1:A:194:SER:HB3	1:A:265:SER:CB	2.43	0.48
1:C:21:ARG:O	1:C:41:ARG:NH2	2.46	0.48
1:B:1:MET:HE2	1:B:1:MET:H1	1.77	0.48
1:C:19:GLN:NE2	1:C:41:ARG:NH1	2.57	0.48
1:A:376:PHE:HE2	1:A:402:ALA:HB1	1.79	0.48
1:B:189:TYR:HB3	1:B:190:PRO:HD3	1.95	0.48
1:B:245:ALA:HB3	1:B:250:LEU:HD21	1.95	0.48
1:B:71:ASP:HB2	1:B:74:GLU:H	1.78	0.48
1:A:355:ARG:O	1:A:357:ARG:NH1	2.45	0.48
1:A:375:TYR:HB3	1:A:405:VAL:HG21	1.95	0.48
1:C:300:THR:HG22	1:C:301:ALA:N	2.29	0.48

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:338:ALA:HB2	1:A:411:ARG:HB2	1.96	0.48
1:B:1:MET:HE2	1:B:1:MET:H3	1.78	0.48
1:C:366:VAL:CG2	1:C:405:VAL:CG1	2.90	0.48
1:A:49:THR:HB	1:A:164:HIS:HE1	1.79	0.47
1:A:66:ILE:O	1:A:66:ILE:HG22	2.14	0.47
1:B:522:ASP:O	1:B:526:ASN:HB2	2.14	0.47
1:A:280:VAL:HG12	1:A:281:LEU:N	2.28	0.47
1:C:146:ARG:O	1:C:146:ARG:HG2	2.14	0.47
1:B:272:TYR:C	1:B:278:TYR:HE2	2.22	0.47
1:B:473:THR:HG21	1:B:483:ARG:HE	1.79	0.47
1:C:21:ARG:HH22	1:C:83:GLU:HG2	1.79	0.47
1:C:119:LEU:CD2	1:C:281:LEU:HD23	2.43	0.47
1:C:374:ASP:HB3	1:C:476:PRO:HD2	1.97	0.47
1:B:69:PRO:O	1:B:219:ALA:HA	2.15	0.47
1:A:520:ASN:C	1:A:522:ASP:H	2.22	0.47
1:C:340:GLU:OE2	1:C:417:ARG:NH2	2.48	0.47
1:C:357:ARG:HA	1:C:357:ARG:HD3	1.75	0.47
1:A:532:LEU:HA	1:A:535:ARG:HD2	1.97	0.47
1:C:241:THR:CG2	1:C:242:ALA:H	2.16	0.47
1:C:382:ILE:HG22	1:C:383:GLY:N	2.29	0.47
1:A:37:ALA:HA	1:A:40:LEU:CD1	2.43	0.46
1:A:205:GLU:HA	1:A:212:THR:HG23	1.97	0.46
1:C:524:TRP:HA	1:C:524:TRP:HE3	1.81	0.46
1:C:54:LEU:HA	1:C:54:LEU:HD23	1.58	0.46
1:C:233:PRO:HD2	1:C:236:ARG:HD3	1.95	0.46
1:A:357:ARG:O	1:A:360:ASP:HB2	2.15	0.46
1:A:503:VAL:HG21	1:A:531:ASP:HB2	1.96	0.46
1:B:9:ASN:ND2	1:B:101:TYR:CZ	2.84	0.46
1:A:129:LEU:C	1:A:131:ARG:N	2.74	0.46
1:C:462:MET:HB3	1:C:494:ILE:HG23	1.97	0.46
1:A:267:ARG:HG2	1:A:285:GLY:HA2	1.98	0.46
1:A:511:TRP:O	1:A:511:TRP:CD1	2.69	0.46
1:B:79:TRP:HH2	1:B:81:GLN:HE21	1.61	0.46
1:B:306:PRO:HA	1:B:309:GLU:OE1	2.16	0.46
1:C:67:GLY:O	1:C:68:GLY:O	2.32	0.46
1:A:49:THR:CG2	1:A:168:TYR:CZ	2.98	0.46
1:A:67:GLY:O	1:A:68:GLY:O	2.33	0.46
1:C:49:THR:HG21	1:C:168:TYR:CD1	2.50	0.46
1:C:294:HIS:HA	1:C:302:TRP:CE2	2.51	0.46
1:C:384:VAL:HG11	1:C:393:ILE:HG12	1.97	0.46
1:C:388:THR:C	1:C:390:GLN:N	2.72	0.46

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:521:THR:HG23	1:A:524:TRP:HE3	1.81	0.46
1:B:297:GLU:HA	1:B:298:PRO:HD2	1.88	0.46
1:A:45:GLY:C	1:A:47:VAL:N	2.72	0.45
1:A:366:VAL:HG21	1:A:405:VAL:HG12	1.97	0.45
1:B:324:ASP:OD1	1:B:324:ASP:C	2.58	0.45
1:B:465:GLY:O	1:B:469:THR:HG23	2.16	0.45
1:C:68:GLY:HA3	1:C:220:PHE:CZ	2.51	0.45
1:C:202:ILE:HD11	1:C:336:LEU:HD21	1.97	0.45
1:A:260:LEU:C	1:A:262:THR:H	2.23	0.45
1:B:108:HIS:CD2	1:B:111:THR:H	2.34	0.45
1:B:262:THR:O	1:B:264:GLN:NE2	2.48	0.45
1:C:170:THR:HB	1:C:391:ALA:HA	1.99	0.45
1:C:324:ASP:OD1	1:C:324:ASP:C	2.60	0.45
1:B:232:ARG:HB3	1:B:236:ARG:NH2	2.31	0.45
1:C:144:THR:HG22	1:C:146:ARG:HB3	1.99	0.45
1:B:329:ALA:HB3	1:B:401:VAL:HG23	1.99	0.45
1:B:357:ARG:HD3	1:B:357:ARG:HA	1.80	0.45
1:B:373:GLU:HB3	1:B:476:PRO:HG3	1.99	0.45
1:B:403:MET:HB2	1:B:407:LEU:HD12	1.99	0.45
1:B:304:ARG:HB3	1:B:349:GLU:CG	2.47	0.45
1:B:417:ARG:HA	1:B:417:ARG:HD3	1.69	0.45
1:C:350:ALA:HB3	1:C:353:ILE:HD12	1.99	0.45
1:B:49:THR:HG21	1:B:164:HIS:CE1	2.52	0.45
1:C:358:ILE:O	1:C:361:TRP:HB3	2.17	0.45
1:C:366:VAL:CG2	1:C:405:VAL:HG11	2.46	0.45
1:C:458:ARG:NH2	1:C:505:GLU:OE1	2.44	0.45
1:A:119:LEU:O	1:A:269:ARG:NH1	2.50	0.44
1:A:519:LYS:O	1:A:522:ASP:HB2	2.17	0.44
1:B:1:MET:H2	1:B:4:ASP:H	1.64	0.44
1:B:48:PRO:HG2	1:B:396:ILE:HG21	1.98	0.44
1:B:324:ASP:HA	1:B:325:PRO:HD3	1.83	0.44
1:A:55:LEU:HA	1:A:55:LEU:HD23	1.70	0.44
1:B:406:VAL:HG21	1:B:476:PRO:CG	2.47	0.44
1:B:82:ASP:HB3	1:B:85:GLU:HB2	1.98	0.44
1:B:121:THR:CG2	1:B:122:GLN:N	2.75	0.44
1:C:136:VAL:HG21	1:C:150:VAL:HG21	2.00	0.44
1:C:267:ARG:NH2	1:C:286:ASP:OD1	2.48	0.44
1:C:329:ALA:HB1	1:C:401:VAL:HG23	1.97	0.44
1:A:333:LEU:O	1:A:334:GLY:C	2.61	0.44
1:B:41:ARG:HD3	1:B:42:ARG:HG2	1.98	0.44
1:B:45:GLY:C	1:B:47:VAL:H	2.24	0.44

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:11:ILE:O	1:C:29:SER:HB2	2.17	0.44
1:A:120:HIS:ND1	1:A:120:HIS:N	2.66	0.44
1:A:347:ARG:NH1	1:A:349:GLU:CD	2.75	0.44
1:B:9:ASN:ND2	1:B:101:TYR:CE2	2.85	0.44
1:B:355:ARG:O	1:B:357:ARG:NH1	2.42	0.44
1:C:343:GLY:HA3	1:C:347:ARG:CZ	2.47	0.44
1:A:520:ASN:C	1:A:522:ASP:N	2.76	0.44
1:A:18:VAL:HG12	1:A:43:LEU:HD23	1.99	0.43
1:B:339:GLY:CA	1:B:354:VAL:CG2	2.94	0.43
1:C:136:VAL:HA	1:C:137:PRO:HD2	1.48	0.43
1:C:52:PHE:CE2	1:C:56:ARG:HD2	2.53	0.43
1:C:216:ASN:HA	1:C:358:ILE:HD11	2.01	0.43
1:C:514:ARG:HB3	1:C:514:ARG:NH1	2.32	0.43
1:B:387:GLY:N	1:B:392:VAL:O	2.42	0.43
1:A:11:ILE:HG23	1:A:97:LEU:HD13	2.00	0.43
1:A:27:GLU:OE2	1:A:160:ARG:NH2	2.51	0.43
1:A:68:GLY:HA3	1:A:220:PHE:CZ	2.54	0.43
1:B:41:ARG:HD3	1:B:42:ARG:CD	2.47	0.43
1:B:205:GLU:OE1	1:B:380:ARG:HD2	2.19	0.43
1:B:329:ALA:HB2	1:B:381:LEU:HD12	2.01	0.43
1:C:71:ASP:HB2	1:C:73:ASP:N	2.33	0.43
1:C:131:ARG:HH21	1:C:140:GLU:CD	2.26	0.43
1:C:388:THR:O	1:C:389:GLN:C	2.62	0.43
1:C:489:GLN:HE21	1:C:546:THR:H	1.65	0.43
1:A:357:ARG:HA	1:A:357:ARG:HD3	1.80	0.43
1:A:389:GLN:O	1:A:391:ALA:N	2.52	0.43
1:C:105:ASP:O	1:C:112:PRO:HA	2.19	0.43
1:A:4:ASP:O	1:A:7:SER:CB	2.59	0.43
1:A:189:TYR:HB3	1:A:190:PRO:CD	2.49	0.43
1:B:46:ASP:OD2	1:B:160:ARG:NH1	2.46	0.43
1:A:49:THR:HB	1:A:164:HIS:CE1	2.53	0.43
1:A:311:LYS:HD3	1:A:312:LEU:HD23	2.01	0.43
1:A:375:TYR:O	1:A:405:VAL:HG23	2.18	0.43
1:A:450:THR:N	1:A:451:PRO:HD2	2.33	0.43
1:C:300:THR:O	1:C:356:PRO:HA	2.19	0.43
1:A:3:THR:C	1:A:6:PRO:HD2	2.44	0.43
1:A:377:ILE:HD12	1:A:405:VAL:HG22	2.01	0.43
1:C:16:LEU:HA	1:C:17:PRO:HD3	1.94	0.43
1:C:249:GLU:C	1:C:251:ALA:N	2.77	0.43
1:C:400:HIS:O	1:C:468:ARG:NH1	2.50	0.43
1:A:87:GLN:O	1:A:210:TYR:HE1	2.01	0.42

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:16:LEU:HD23	1:C:54:LEU:HD13	2.01	0.42
1:C:514:ARG:HB3	1:C:514:ARG:HH11	1.84	0.42
1:A:136:VAL:HA	1:A:137:PRO:HD2	1.58	0.42
1:A:341:ALA:O	1:A:344:ALA:HB2	2.19	0.42
1:B:343:GLY:O	1:B:344:ALA:C	2.62	0.42
1:C:304:ARG:NE	1:C:309:GLU:OE2	2.52	0.42
1:A:304:ARG:HD3	1:A:347:ARG:O	2.19	0.42
1:A:6:PRO:HB3	1:A:109:PRO:HD3	2.01	0.42
1:A:123:LYS:HE2	1:A:123:LYS:HB3	1.77	0.42
1:A:150:VAL:O	1:A:150:VAL:HG12	2.18	0.42
1:A:447:ASP:HA	1:A:448:PRO:HD3	1.86	0.42
1:B:411:ARG:HA	1:B:416:GLY:HA3	2.02	0.42
1:C:248:GLU:H	1:C:248:GLU:HG3	1.56	0.42
1:C:406:VAL:HG21	1:C:476:PRO:HD3	2.00	0.42
1:C:484:ARG:HG2	1:C:484:ARG:HH11	1.84	0.42
1:A:40:LEU:HD12	1:A:209:LEU:HD23	2.02	0.42
1:A:115:GLN:CB	1:A:268:ILE:O	2.67	0.42
1:B:272:TYR:CD2	1:B:272:TYR:N	2.87	0.42
1:B:333:LEU:O	1:B:334:GLY:C	2.63	0.42
1:C:304:ARG:HH21	1:C:316:GLN:HA	1.84	0.42
1:A:63:HIS:O	1:A:68:GLY:N	2.50	0.42
1:A:214:LEU:HD23	1:A:214:LEU:HA	1.84	0.42
1:A:262:THR:HG22	1:A:262:THR:O	2.20	0.42
1:A:303:ARG:HB2	1:A:321:ARG:NH1	2.34	0.42
1:A:155:PHE:HE1	1:A:275:ASP:HA	1.83	0.42
1:C:116:VAL:HG12	1:C:119:LEU:HB2	2.02	0.42
1:A:182:ARG:CD	1:A:191:GLN:HE22	2.20	0.42
1:B:62:LEU:CD1	1:B:93:ILE:HD11	2.49	0.42
1:B:136:VAL:HA	1:B:137:PRO:HD3	1.91	0.42
1:B:294:HIS:ND1	1:B:294:HIS:N	2.67	0.42
1:B:304:ARG:HB3	1:B:349:GLU:HG3	2.02	0.42
1:A:510:ALA:CA	1:A:523:VAL:HG21	2.49	0.42
1:B:280:VAL:HG12	1:B:281:LEU:N	2.35	0.42
1:A:52:PHE:CE2	1:A:56:ARG:HD2	2.55	0.42
1:A:241:THR:HB	1:A:242:ALA:H	1.71	0.42
1:A:379:THR:OG1	1:A:403:MET:HE3	2.19	0.42
1:A:452:ARG:HH11	1:A:452:ARG:HD2	1.62	0.41
1:B:462:MET:HB3	1:B:462:MET:HE3	1.80	0.41
1:A:142:PHE:CD1	1:A:142:PHE:N	2.88	0.41
1:A:484:ARG:HD2	1:A:484:ARG:HA	1.63	0.41
1:B:67:GLY:O	1:B:68:GLY:O	2.37	0.41

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:324:ASP:OD1	1:A:324:ASP:C	2.63	0.41
1:A:510:ALA:HA	1:A:523:VAL:HG21	2.02	0.41
1:B:152:ARG:HD3	1:B:152:ARG:HA	1.89	0.41
1:A:252:GLN:H	1:A:252:GLN:CD	2.28	0.41
1:A:338:ALA:O	1:A:351:ALA:HB1	2.20	0.41
1:A:343:GLY:H	1:A:347:ARG:NH2	2.19	0.41
1:B:450:THR:N	1:B:451:PRO:HD2	2.35	0.41
1:C:528:SER:O	1:C:531:ASP:HB3	2.20	0.41
1:A:493:ARG:O	1:A:494:ILE:C	2.63	0.41
1:A:41:ARG:HA	1:A:208:ASN:HA	2.01	0.41
1:A:69:PRO:O	1:A:219:ALA:HA	2.21	0.41
1:A:347:ARG:HH11	1:A:349:GLU:CD	2.29	0.41
1:C:249:GLU:C	1:C:251:ALA:H	2.28	0.41
1:C:450:THR:O	1:C:451:PRO:C	2.64	0.41
1:A:32:GLU:O	1:A:36:GLN:HG3	2.21	0.41
1:A:531:ASP:O	1:A:534:PHE:HB3	2.21	0.41
1:B:107:LEU:HD11	1:B:155:PHE:CE2	2.56	0.41
1:B:138:ASN:HD22	1:B:140:GLU:HG3	1.84	0.41
1:B:375:TYR:O	1:B:405:VAL:HG23	2.21	0.41
1:C:253:ARG:HA	1:C:254:PRO:C	2.45	0.41
1:A:7:SER:O	1:A:13:GLN:NE2	2.54	0.41
1:A:103:ARG:HA	1:A:111:THR:HG22	2.03	0.41
1:A:177:ALA:HB3	1:A:180:ASP:HB2	2.03	0.41
1:A:427:GLU:HG3	1:A:460:PHE:CZ	2.55	0.41
1:A:510:ALA:CB	1:A:523:VAL:HG23	2.49	0.41
1:B:16:LEU:HD12	1:B:33:VAL:HG21	2.03	0.41
1:B:140:GLU:H	1:B:140:GLU:HG2	1.44	0.41
1:B:323:HIS:HE1	1:B:381:LEU:HD22	1.83	0.41
1:C:493:ARG:O	1:C:494:ILE:C	2.64	0.41
1:A:238:PRO:HA	1:A:239:PRO:HD3	1.95	0.40
1:A:494:ILE:HG22	1:A:495:ILE:N	2.35	0.40
1:B:211:GLU:O	1:B:212:THR:C	2.64	0.40
1:C:215:LEU:HD23	1:C:215:LEU:HA	1.83	0.40
1:C:371:LEU:HD23	1:C:371:LEU:HA	1.91	0.40
1:A:213:LEU:HD23	1:A:213:LEU:HA	1.91	0.40
1:A:405:VAL:O	1:A:407:LEU:N	2.55	0.40
1:A:467:PHE:HA	1:A:487:TRP:CZ3	2.56	0.40
1:C:490:LYS:HD2	1:C:490:LYS:HA	1.95	0.40
1:A:286:ASP:HA	1:A:287:PRO:HD2	1.96	0.40
1:B:45:GLY:C	1:B:47:VAL:N	2.79	0.40
1:B:62:LEU:HD12	1:B:62:LEU:HA	1.87	0.40

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:534:PHE:CD2	1:B:534:PHE:C	2.98	0.40
1:C:13:GLN:H	1:C:13:GLN:HG2	1.73	0.40
1:A:52:PHE:CE1	1:A:299:MET:HE3	2.56	0.40
1:A:58:LEU:HA	1:A:58:LEU:HD23	1.82	0.40
1:B:228:THR:HB	1:B:230:GLU:OE1	2.21	0.40
1:B:336:LEU:O	1:B:355:ARG:HD2	2.21	0.40
1:C:112:PRO:CG	1:C:115:GLN:HG3	2.50	0.40
1:C:355:ARG:HG3	1:C:356:PRO:HD2	2.04	0.40
1:A:300:THR:HG22	1:A:301:ALA:N	2.36	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	539/558 (97%)	485 (90%)	43 (8%)	11 (2%)	6	28
1	B	538/558 (96%)	477 (89%)	47 (9%)	14 (3%)	4	24
1	C	536/558 (96%)	482 (90%)	47 (9%)	7 (1%)	9	35
All	All	1613/1674 (96%)	1444 (90%)	137 (8%)	32 (2%)	6	28

All (32) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	68	GLY
1	A	111	THR
1	A	183	ALA
1	A	345	GLU
1	A	546	THR
1	B	68	GLY
1	B	344	ALA
1	C	68	GLY

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	C	523	VAL
1	A	274	ALA
1	B	15	TRP
1	B	86	GLN
1	B	184	LYS
1	B	412	ASP
1	B	509	ALA
1	C	146	ARG
1	C	200	GLY
1	A	412	ASP
1	A	140	GLU
1	A	520	ASN
1	B	82	ASP
1	B	114	PHE
1	B	410	GLU
1	C	5	ALA
1	C	451	PRO
1	A	46	ASP
1	B	83	GLU
1	B	229	PRO
1	A	37	ALA
1	B	111	THR
1	C	494	ILE
1	B	406	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	433/443 (98%)	377 (87%)	56 (13%)	4	18
1	B	432/443 (98%)	364 (84%)	68 (16%)	2	12
1	C	430/443 (97%)	377 (88%)	53 (12%)	4	19
All	All	1295/1329 (97%)	1118 (86%)	177 (14%)	3	16

All (177) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	1	MET
1	A	3	THR
1	A	13	GLN
1	A	19	GLN
1	A	24	THR
1	A	32	GLU
1	A	47	VAL
1	A	83	GLU
1	A	122	GLN
1	A	123	LYS
1	A	126	VAL
1	A	130	ASP
1	A	135	ASP
1	A	138	ASN
1	A	144	THR
1	A	145	MET
1	A	146	ARG
1	A	174	LYS
1	A	175	SER
1	A	193	VAL
1	A	194	SER
1	A	229	PRO
1	A	230	GLU
1	A	232	ARG
1	A	236	ARG
1	A	248	GLU
1	A	252	GLN
1	A	269	ARG
1	A	275	ASP
1	A	280	VAL
1	A	288	LEU
1	A	300	THR
1	A	303	ARG
1	A	310	LYS
1	A	311	LYS
1	A	312	LEU
1	A	347	ARG
1	A	357	ARG
1	A	358	ILE
1	A	377	ILE
1	A	378	ARG
1	A	406	VAL
1	A	427	GLU

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	A	469	THR
1	A	476	PRO
1	A	484	ARG
1	A	494	ILE
1	A	495	ILE
1	A	502	LEU
1	A	503	VAL
1	A	512	ASN
1	A	521	THR
1	A	522	ASP
1	A	542	LEU
1	A	546	THR
1	A	547	SER
1	B	1	MET
1	B	2	THR
1	B	21	ARG
1	B	24	THR
1	B	42	ARG
1	B	44	VAL
1	B	47	VAL
1	B	66	ILE
1	B	80	THR
1	B	82	ASP
1	B	110	THR
1	B	111	THR
1	B	119	LEU
1	B	123	LYS
1	B	124	ASN
1	B	126	VAL
1	B	130	ASP
1	B	135	ASP
1	B	140	GLU
1	B	144	THR
1	B	145	MET
1	B	148	ARG
1	B	150	VAL
1	B	173	ILE
1	B	184	LYS
1	B	193	VAL
1	B	202	ILE
1	B	203	LEU
1	B	218	VAL

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	B	222	THR
1	B	232	ARG
1	B	240	THR
1	B	241	THR
1	B	246	ASP
1	B	248	GLU
1	B	277	VAL
1	B	288	LEU
1	B	300	THR
1	B	303	ARG
1	B	304	ARG
1	B	313	LYS
1	B	326	THR
1	B	327	ARG
1	B	328	SER
1	B	346	GLN
1	B	347	ARG
1	B	355	ARG
1	B	357	ARG
1	B	358	ILE
1	B	376	PHE
1	B	392	VAL
1	B	418	THR
1	B	420	ILE
1	B	431	THR
1	B	450	THR
1	B	469	THR
1	B	493	ARG
1	B	494	ILE
1	B	495	ILE
1	B	500	ARG
1	B	503	VAL
1	B	512	ASN
1	B	515	VAL
1	B	521	THR
1	B	523	VAL
1	B	534	PHE
1	B	539	LYS
1	B	546	THR
1	C	13	GLN
1	C	24	THR
1	C	26	LYS

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	C	32	GLU
1	C	42	ARG
1	C	47	VAL
1	C	70	GLU
1	C	71	ASP
1	C	123	LYS
1	C	130	ASP
1	C	135	ASP
1	C	140	GLU
1	C	144	THR
1	C	151	ASP
1	C	174	LYS
1	C	175	SER
1	C	184	LYS
1	C	193	VAL
1	C	199	LEU
1	C	222	THR
1	C	240	THR
1	C	241	THR
1	C	248	GLU
1	C	275	ASP
1	C	277	VAL
1	C	280	VAL
1	C	286	ASP
1	C	300	THR
1	C	303	ARG
1	C	311	LYS
1	C	316	GLN
1	C	324	ASP
1	C	327	ARG
1	C	328	SER
1	C	345	GLU
1	C	357	ARG
1	C	358	ILE
1	C	373	GLU
1	C	376	PHE
1	C	378	ARG
1	C	411	ARG
1	C	417	ARG
1	C	427	GLU
1	C	458	ARG
1	C	469	THR

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	C	489	GLN
1	C	493	ARG
1	C	495	ILE
1	C	503	VAL
1	C	514	ARG
1	C	522	ASP
1	C	523	VAL
1	C	542	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (28) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	13	GLN
1	A	86	GLN
1	A	108	HIS
1	A	164	HIS
1	A	191	GLN
1	A	252	GLN
1	A	409	HIS
1	A	520	ASN
1	B	36	GLN
1	B	108	HIS
1	B	124	ASN
1	B	138	ASN
1	B	164	HIS
1	B	191	GLN
1	B	271	HIS
1	B	291	HIS
1	B	292	ASN
1	B	296	HIS
1	B	492	HIS
1	B	512	ASN
1	B	520	ASN
1	C	19	GLN
1	C	36	GLN
1	C	99	GLN
1	C	108	HIS
1	C	164	HIS
1	C	308	GLN
1	C	409	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 oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

There are no ligands in this entry.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data [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	543/558 (97%)	-0.76	1 (0%) 91 86	37, 67, 107, 185	0
1	B	542/558 (97%)	-0.64	2 (0%) 88 79	43, 81, 116, 184	0
1	C	540/558 (96%)	-0.81	1 (0%) 91 86	30, 62, 105, 170	0
All	All	1625/1674 (97%)	-0.74	4 (0%) 91 86	30, 70, 112, 185	0

All (4) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	515	VAL	4.7
1	B	546	THR	2.8
1	A	521	THR	2.7
1	C	546	THR	2.5

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.