Full wwPDB X-ray Structure Validation Report ⓘ

Nov 13, 2023 – 05:08 PM JST

PDB ID	:	5XOV
Title	:	Crystal structure of peptide-HLA-A24 bound to S19-2 V-delta/V-beta TCR
Authors	:	Shi, Y.; Qi, J.; Gao, G.F.
Deposited on	:	2017-05-31
Resolution	:	2.68 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/XrayValidationReportHelp
with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

The following versions of software and data (see references ⓘ) were used in the production of this report:

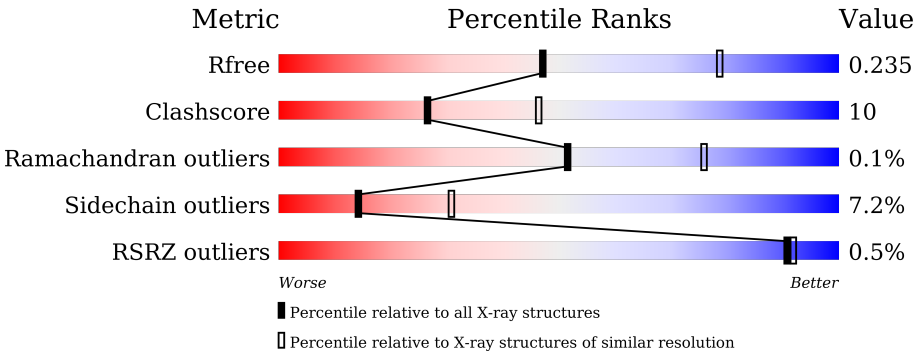
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.13
EDS	:	2.36
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 2.68 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	3863 (2.70-2.66)
Clashscore	141614	4210 (2.70-2.66)
Ramachandran outliers	138981	4141 (2.70-2.66)
Sidechain outliers	138945	4141 (2.70-2.66)
RSRZ outliers	127900	3780 (2.70-2.66)

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 <=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	274	75% 25%
1	D	274	73% 25%
2	B	100	77% 19%
2	E	100	79% 17%
3	C	10	40% 60%
3	F	10	50% 50%

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Mol	Chain	Length	Quality of chain
4	G	207	73% 23%
4	I	207	76% 18% 5%
5	H	245	79% 19%
5	J	245	% 80% 16%

2 Entry composition (i)

There are 6 unique types of molecules in this entry. The entry contains 13812 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 HLA class I histocompatibility antigen, A-24 alpha chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	274	Total	C	N	O	S	0	0	0
			2221	1382	403	426	10			
1	D	274	Total	C	N	O	S	0	0	0
			2221	1382	403	426	10			

- Molecule 2 is a protein called Beta-2-microglobulin.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	100	Total	C	N	O	S	0	0	0
			836	533	141	158	4			
2	E	100	Total	C	N	O	S	0	0	0
			836	533	141	158	4			

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	0	MET	-	initiating methionine	UNP P61769
E	0	MET	-	initiating methionine	UNP P61769

- Molecule 3 is a protein called HIV-1 Nef138-10 peptide.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	C	10	Total	C	N	O	S	0	0	0
			91	64	14	12	1			
3	F	10	Total	C	N	O	S	0	0	0
			91	64	14	12	1			

- Molecule 4 is a protein called V-delta chain of T cell receptor.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
4	I	207	Total	C	N	O	S	0	0	0
			1631	1033	270	319	9			

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
4	G	207	Total	C	N	O	S	0	0	0
			1631	1033	270	319	9			

- Molecule 5 is a protein called V-beta chain of T cell receptor.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
5	J	245	Total	C	N	O	S	0	0	0
			1929	1229	330	365	5			
5	H	245	Total	C	N	O	S	0	0	0
			1929	1229	330	365	5			

- Molecule 6 is water.

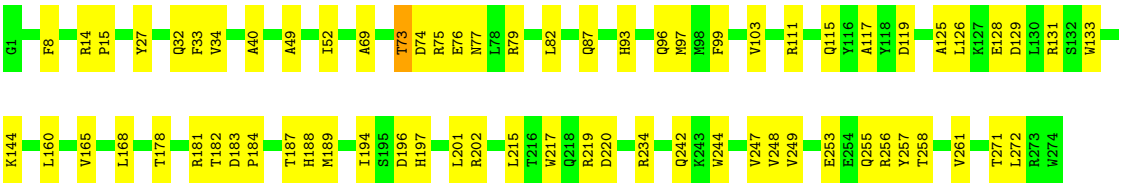
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	47	Total	O	0	0
			47	47		
6	B	24	Total	O	0	0
			24	24		
6	C	5	Total	O	0	0
			5	5		
6	D	49	Total	O	0	0
			49	49		
6	E	23	Total	O	0	0
			23	23		
6	F	2	Total	O	0	0
			2	2		
6	I	58	Total	O	0	0
			58	58		
6	J	57	Total	O	0	0
			57	57		
6	G	68	Total	O	0	0
			68	68		
6	H	63	Total	O	0	0
			63	63		

3 Residue-property plots (i)

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: HLA class I histocompatibility antigen, A-24 alpha chain

Chain A:

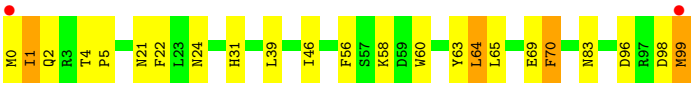


• Molecule 1: HLA class I histocompatibility antigen, A-24 alpha chain

Chain D:

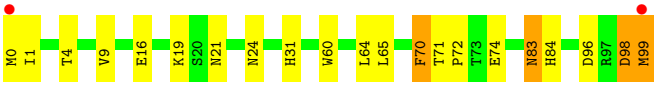
• Molecule 2: Beta-2-microglobulin

Chain B:



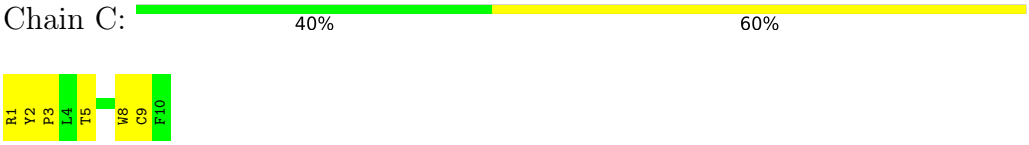
• Molecule 2: Beta-2-microglobulin

Chain E:



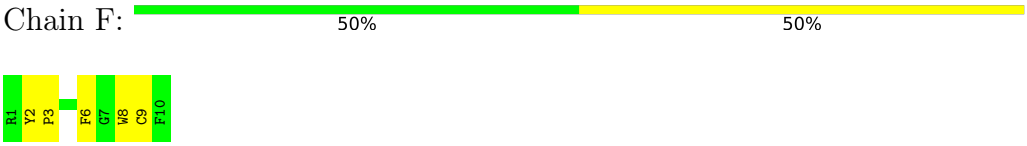
• Molecule 3: HIV-1 Nef138-10 peptide

Chain C:



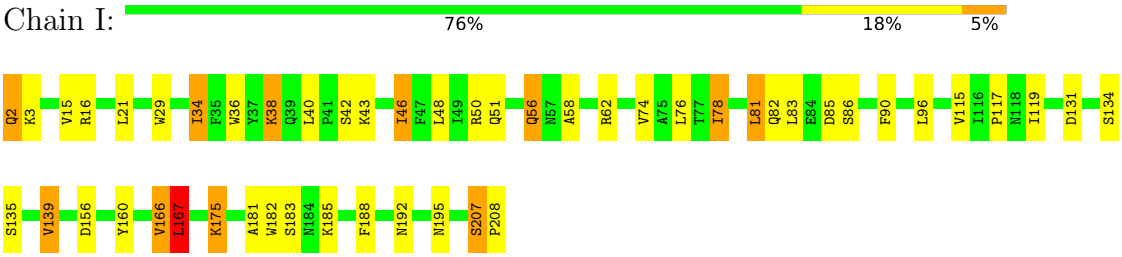
• Molecule 3: HIV-1 Nef138-10 peptide

Chain F:



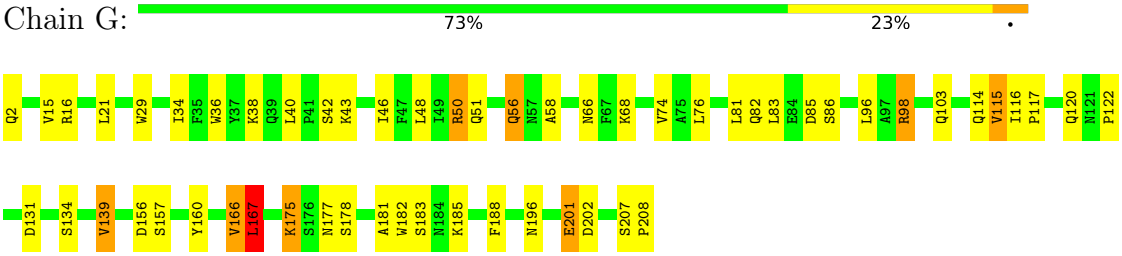
• Molecule 4: V-delta chain of T cell receptor

Chain I:



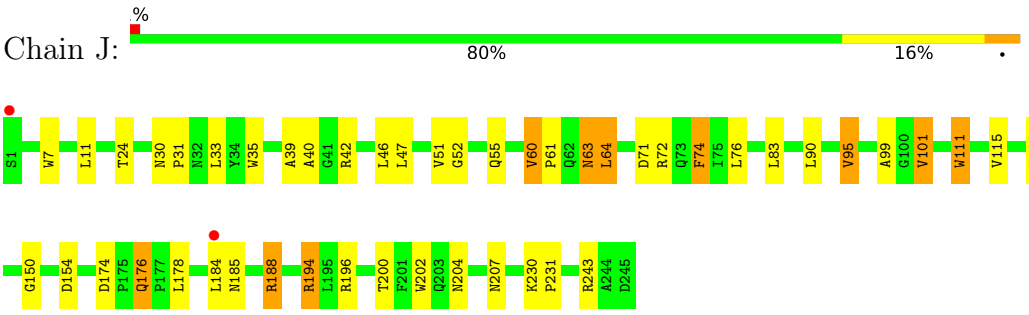
• Molecule 4: V-delta chain of T cell receptor

Chain G:



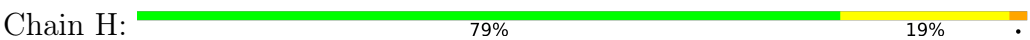
• Molecule 5: V-beta chain of T cell receptor

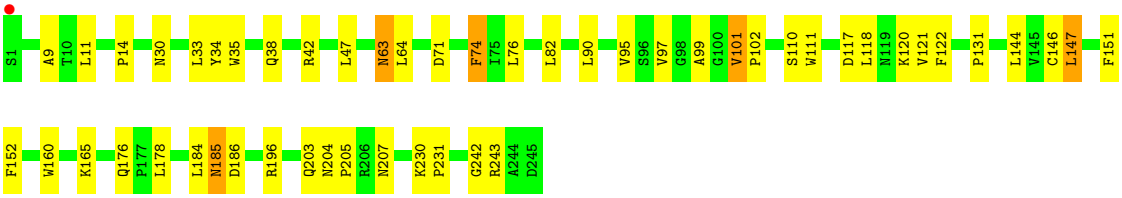
Chain J:



• Molecule 5: V-beta chain of T cell receptor

Chain H:




S1 A9 T10 L11 P14 N30 L33 Y34 W35 Q38 R42 L47 N63 L64 D71 F74 I75 L76 L82 L90 V95 S96 V97 G98 A99 G100 V101 P102 S110 W111 D117 L118 N119 K120 V121 F122 P131 L144 V145 C146 L147 F151
F152 W160 K165 Q176 P177 L178 L184 N185 D186 R196 Q203 N204 P205 R206 N207 K230 P231 G242 R243 A244 D245

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	101.99Å 73.79Å 163.78Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	38.00 – 2.68 40.31 – 2.68	Depositor EDS
% Data completeness (in resolution range)	99.7 (38.00-2.68) 99.7 (40.31-2.68)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.18 (at 2.69Å)	Xtriage
Refinement program	PHENIX (phenix.refine)	Depositor
R, R_{free}	0.203 , 0.245 0.195 , 0.235	Depositor DCC
R_{free} test set	3462 reflections (5.06%)	wwPDB-VP
Wilson B-factor (Å^2)	52.3	Xtriage
Anisotropy	0.191	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.34 , 30.9	EDS
L-test for twinning[2]	$< \|L\| > = 0.51$, $< L^2 > = 0.34$	Xtriage
Estimated twinning fraction	0.479 for h,-k,-l	Xtriage
F_o,F_c correlation	0.94	EDS
Total number of atoms	13812	wwPDB-VP
Average B, all atoms (Å^2)	52.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.94% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ 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	0.28	0/2281	0.45	0/3092
1	D	0.29	0/2281	0.48	0/3092
2	B	0.30	0/859	0.47	0/1162
2	E	0.29	0/859	0.46	0/1162
3	C	0.31	0/96	0.42	0/130
3	F	0.34	0/96	0.45	0/130
4	G	0.31	0/1667	0.50	1/2256 (0.0%)
4	I	0.31	0/1667	0.49	1/2256 (0.0%)
5	H	0.30	0/1985	0.47	0/2713
5	J	0.29	0/1985	0.47	0/2713
All	All	0.30	0/13776	0.47	2/18706 (0.0%)

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	I	167	LEU	CA-CB-CG	6.05	129.22	115.30
4	G	167	LEU	CA-CB-CG	5.13	127.11	115.30

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	2221	0	2082	44	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	D	2221	0	2082	62	0
2	B	836	0	803	15	0
2	E	836	0	803	15	0
3	C	91	0	85	5	0
3	F	91	0	85	7	0
4	G	1631	0	1587	38	0
4	I	1631	0	1587	42	0
5	H	1929	0	1853	40	0
5	J	1929	0	1853	33	0
6	A	47	0	0	3	0
6	B	24	0	0	0	0
6	C	5	0	0	2	0
6	D	49	0	0	2	0
6	E	23	0	0	0	0
6	F	2	0	0	1	0
6	G	68	0	0	4	0
6	H	63	0	0	1	0
6	I	58	0	0	3	0
6	J	57	0	0	2	0
All	All	13812	0	12820	271	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 10.

All (271) 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)
5:H:117:ASP:HB3	5:H:120:LYS:HD3	1.32	1.10
1:D:83:ARG:HG2	1:D:83:ARG:HH11	1.26	0.97
1:A:76:GLU:HG2	6:A:343:HOH:O	1.68	0.92
4:G:50:ARG:HH22	5:H:101:VAL:HG21	1.32	0.91
6:A:343:HOH:O	3:C:9:CYS:SG	2.29	0.90
1:D:111:ARG:HH11	1:D:111:ARG:HG2	1.36	0.89
2:B:96:ASP:HB3	2:B:99:MET:HB3	1.55	0.88
4:I:51:GLN:HE22	4:I:58:ALA:H	1.24	0.82
4:G:51:GLN:HE22	4:G:58:ALA:H	1.24	0.81
4:G:34:ILE:HG12	4:G:74:VAL:HG11	1.65	0.79
4:I:156:ASP:HB3	6:I:301:HOH:O	1.82	0.79
1:D:83:ARG:HG2	1:D:83:ARG:NH1	1.98	0.79
4:G:156:ASP:HB3	6:G:301:HOH:O	1.85	0.77
1:D:111:ARG:HH11	1:D:111:ARG:CG	1.96	0.76

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:J:63:ASN:ND2	5:J:63:ASN:H	1.83	0.75
4:I:43:LYS:HG3	5:J:111:TRP:CH2	2.22	0.73
1:D:21:ARG:HH11	1:D:21:ARG:CG	2.01	0.72
5:J:95:VAL:HG13	5:J:99:ALA:HB3	1.71	0.71
5:J:184:LEU:HG	6:J:301:HOH:O	1.91	0.70
2:B:96:ASP:O	2:B:99:MET:HG3	1.92	0.70
4:G:42:SER:O	4:G:43:LYS:HB2	1.92	0.69
4:I:90:PHE:HE1	5:J:42:ARG:O	1.75	0.68
6:D:342:HOH:O	3:F:9:CYS:SG	2.52	0.68
1:D:111:ARG:HG2	1:D:111:ARG:NH1	2.06	0.67
4:I:139:VAL:HG23	4:I:182:TRP:HB3	1.76	0.67
4:G:139:VAL:HG23	4:G:182:TRP:HB3	1.77	0.66
1:D:234:ARG:HH22	2:E:99:MET:HE1	1.61	0.65
4:I:43:LYS:HG3	5:J:111:TRP:CZ3	2.32	0.65
5:J:63:ASN:HD22	5:J:64:LEU:H	1.45	0.65
5:J:72:ARG:HD2	6:J:309:HOH:O	1.96	0.65
1:A:69:ALA:O	1:A:73:THR:HG23	1.98	0.64
1:D:234:ARG:HE	1:D:242:GLN:HE21	1.44	0.64
1:A:117:ALA:HB2	2:B:60:TRP:CE2	2.33	0.64
4:I:86:SER:OG	4:I:115:VAL:HG12	1.99	0.63
4:I:51:GLN:NE2	4:I:58:ALA:H	1.95	0.63
2:E:96:ASP:HB3	2:E:99:MET:HB3	1.81	0.62
4:G:51:GLN:NE2	4:G:58:ALA:H	1.96	0.62
4:G:167:LEU:HD11	5:H:196:ARG:HB2	1.82	0.61
4:G:207:SER:HA	4:G:208:PRO:C	2.21	0.61
5:J:63:ASN:H	5:J:63:ASN:HD22	1.47	0.60
1:D:21:ARG:HD2	1:D:39:ASP:OD2	2.01	0.60
4:I:34:ILE:HG12	4:I:74:VAL:HG11	1.83	0.60
4:I:131:ASP:HB3	4:I:134:SER:O	2.03	0.59
4:G:50:ARG:NH2	5:H:101:VAL:HG21	2.12	0.59
2:B:22:PHE:CE1	2:B:69:GLU:HG2	2.39	0.58
4:G:117:PRO:HG3	4:G:166:VAL:HG21	1.85	0.58
1:D:69:ALA:O	1:D:73:THR:HG23	2.04	0.58
4:G:43:LYS:HE3	5:H:111:TRP:CZ2	2.39	0.57
4:G:103:GLN:HE21	5:H:102:PRO:HB2	1.69	0.57
1:A:253:GLU:O	1:A:256:ARG:HB2	2.05	0.57
1:D:67:VAL:HG23	3:F:2:TYR:CZ	2.39	0.57
4:I:207:SER:CB	4:I:208:PRO:CD	2.83	0.57
1:D:93:HIS:HD2	1:D:119:ASP:OD2	1.87	0.57
4:I:42:SER:O	4:I:43:LYS:HB2	2.04	0.57
4:G:185:LYS:HE2	4:G:185:LYS:HA	1.87	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:189:MET:HE2	1:A:201:LEU:HD22	1.87	0.56
1:A:189:MET:CE	1:A:201:LEU:HD22	2.35	0.56
4:G:56:GLN:HE21	4:G:56:GLN:HA	1.70	0.56
4:I:185:LYS:HE2	4:I:185:LYS:HA	1.87	0.56
4:I:117:PRO:HG3	4:I:166:VAL:HG21	1.88	0.56
2:E:96:ASP:O	2:E:99:MET:HG3	2.06	0.56
2:B:24:ASN:HB3	2:B:65:LEU:HD11	1.88	0.56
4:I:167:LEU:HD11	5:J:196:ARG:HB2	1.89	0.55
1:A:202:ARG:HD3	1:A:244:TRP:CE3	2.41	0.55
4:I:207:SER:O	4:I:208:PRO:C	2.45	0.55
2:B:21:ASN:HB3	2:B:70:PHE:CE1	2.41	0.55
1:D:21:ARG:HH11	1:D:21:ARG:HG3	1.69	0.55
1:D:215:LEU:CD2	1:D:261:VAL:HG22	2.37	0.55
1:D:117:ALA:HB2	2:E:60:TRP:CE2	2.42	0.54
4:G:43:LYS:HE3	5:H:111:TRP:HZ2	1.73	0.54
1:A:8:PHE:HB3	2:B:56:PHE:CE2	2.43	0.54
1:A:73:THR:HG21	6:C:104:HOH:O	2.07	0.54
4:I:15:VAL:O	4:I:16:ARG:HB2	2.08	0.54
4:G:131:ASP:HB3	4:G:134:SER:O	2.07	0.54
4:I:90:PHE:CE1	5:J:42:ARG:O	2.60	0.53
5:H:184:LEU:CD2	5:H:186:ASP:H	2.21	0.53
1:D:234:ARG:HE	1:D:242:GLN:NE2	2.06	0.53
1:D:115:GLN:HG2	1:D:125:ALA:HB1	1.90	0.53
1:D:79:ARG:O	1:D:83:ARG:HG3	2.08	0.53
5:J:60:VAL:HG23	5:J:61:PRO:HD2	1.89	0.53
5:J:204:ASN:HB3	5:J:207:ASN:ND2	2.23	0.53
4:G:160:TYR:O	4:G:181:ALA:HA	2.10	0.52
1:A:115:GLN:HG2	1:A:125:ALA:HB1	1.92	0.52
1:D:21:ARG:NH1	1:D:37:ASP:OD1	2.43	0.52
1:A:96:GLN:OE1	2:B:31:HIS:HE1	1.93	0.52
1:D:21:ARG:CG	1:D:21:ARG:NH1	2.68	0.52
5:J:90:LEU:HD12	5:J:90:LEU:N	2.24	0.52
4:I:183:SER:HB3	4:I:188:PHE:CG	2.46	0.51
5:J:63:ASN:HD22	5:J:63:ASN:N	2.03	0.51
1:A:215:LEU:CD2	1:A:261:VAL:HG22	2.41	0.51
1:D:96:GLN:OE1	2:E:31:HIS:HE1	1.94	0.51
5:H:178:LEU:HD12	5:H:178:LEU:C	2.31	0.51
4:I:50:ARG:NH2	5:J:101:VAL:HG21	2.25	0.50
1:A:126:LEU:HB2	1:A:133:TRP:CZ3	2.46	0.50
4:G:82:GLN:O	4:G:85:ASP:HB2	2.11	0.50
1:A:49:ALA:O	1:A:52:ILE:HG22	2.11	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:H:90:LEU:HD12	5:H:90:LEU:N	2.27	0.50
1:A:40:ALA:HB3	6:A:310:HOH:O	2.12	0.50
1:D:28:VAL:HG11	1:D:179:LEU:HD13	1.94	0.50
5:J:63:ASN:ND2	5:J:63:ASN:N	2.51	0.49
5:H:63:ASN:ND2	5:H:63:ASN:H	2.09	0.49
5:H:204:ASN:HB3	5:H:207:ASN:ND2	2.27	0.49
1:A:187:THR:O	1:A:188:HIS:HB3	2.12	0.49
2:B:63:TYR:O	2:B:64:LEU:HD13	2.13	0.49
1:D:219:ARG:HD3	1:D:256:ARG:HH12	1.77	0.49
1:D:220:ASP:HB2	6:D:310:HOH:O	2.12	0.49
1:A:93:HIS:HD2	1:A:119:ASP:OD2	1.95	0.49
4:G:98:ARG:HH11	4:G:98:ARG:HB2	1.76	0.49
2:B:39:LEU:O	2:B:46:ILE:HG13	2.13	0.49
1:D:27:TYR:CE2	1:D:32:GLN:HB2	2.47	0.49
1:D:234:ARG:HH22	2:E:99:MET:CE	2.26	0.49
1:D:202:ARG:HD3	1:D:244:TRP:CE3	2.48	0.49
2:E:21:ASN:HB3	2:E:70:PHE:CE1	2.48	0.49
3:C:5:THR:HG22	3:C:8:TRP:CD2	2.48	0.49
1:A:271:THR:O	1:A:272:LEU:HD23	2.13	0.48
4:I:36:TRP:CE2	4:I:76:LEU:HB2	2.48	0.48
5:J:174:ASP:OD1	5:J:194:ARG:NH2	2.46	0.48
4:I:160:TYR:O	4:I:181:ALA:HA	2.14	0.48
4:I:117:PRO:CG	4:I:166:VAL:HG21	2.42	0.48
4:G:183:SER:HB3	4:G:188:PHE:CG	2.48	0.48
4:I:38:LYS:HB3	4:I:48:LEU:HD21	1.96	0.48
4:G:15:VAL:O	4:G:16:ARG:HB2	2.13	0.48
1:D:44:ARG:NH2	1:D:61:ASP:OD1	2.47	0.48
4:I:82:GLN:O	4:I:85:ASP:HB2	2.14	0.48
5:J:131:PRO:HD2	5:J:202:TRP:CZ2	2.49	0.48
5:J:178:LEU:HD12	5:J:178:LEU:C	2.34	0.48
4:G:38:LYS:HB2	4:G:48:LEU:HD11	1.96	0.48
1:D:189:MET:HE1	1:D:201:LEU:HD13	1.96	0.47
1:A:220:ASP:HB2	1:A:256:ARG:NH1	2.29	0.47
1:D:133:TRP:HB2	1:D:144:LYS:HG3	1.97	0.47
5:H:63:ASN:H	5:H:63:ASN:HD22	1.61	0.47
1:A:33:PHE:CD1	1:A:34:VAL:HG13	2.49	0.47
1:A:27:TYR:CE2	1:A:32:GLN:HB2	2.49	0.47
2:B:21:ASN:HB3	2:B:70:PHE:HE1	1.80	0.47
5:H:35:TRP:CD1	5:H:74:PHE:CE2	3.02	0.47
1:A:215:LEU:HD23	1:A:261:VAL:HG22	1.97	0.47
5:H:203:GLN:HA	5:H:243:ARG:O	2.14	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:189:MET:CE	1:D:201:LEU:HD22	2.45	0.46
5:H:9:ALA:O	5:H:110:SER:HA	2.14	0.46
1:A:111:ARG:NH2	1:A:128:GLU:HB2	2.30	0.46
1:D:83:ARG:NH1	1:D:83:ARG:CG	2.72	0.46
1:D:178:THR:O	1:D:181:ARG:HB3	2.15	0.46
1:D:191:HIS:HB2	1:D:274:TRP:CZ2	2.50	0.46
4:I:2:GLN:NE2	4:I:3:LYS:H	2.14	0.46
3:C:5:THR:HG22	3:C:8:TRP:CE3	2.51	0.46
4:I:183:SER:HB3	4:I:188:PHE:CD2	2.51	0.46
1:A:129:ASP:O	1:A:131:ARG:HG3	2.15	0.46
1:D:33:PHE:CD1	1:D:34:VAL:HG13	2.51	0.46
1:D:74:ASP:HA	1:D:77:ASN:HB2	1.98	0.46
2:E:24:ASN:HB3	2:E:65:LEU:HD11	1.97	0.46
4:G:167:LEU:HD11	5:H:196:ARG:CB	2.46	0.46
5:H:35:TRP:CE2	5:H:76:LEU:HB2	2.51	0.46
5:J:230:LYS:HA	5:J:231:PRO:HD3	1.76	0.45
1:D:196:ASP:OD2	1:D:196:ASP:N	2.49	0.45
4:I:78:ILE:HD11	4:I:85:ASP:OD2	2.16	0.45
4:I:119:ILE:HG23	6:I:327:HOH:O	2.14	0.45
4:G:51:GLN:HE22	4:G:58:ALA:N	2.04	0.45
1:A:197:HIS:O	1:A:197:HIS:CG	2.69	0.45
4:G:185:LYS:HD3	6:G:302:HOH:O	2.17	0.45
1:A:75:ARG:HE	1:A:75:ARG:HB2	1.55	0.45
1:A:234:ARG:HE	1:A:242:GLN:HE21	1.63	0.45
1:D:189:MET:HE2	1:D:201:LEU:HD22	1.98	0.45
3:F:2:TYR:CG	3:F:3:PRO:HD2	2.52	0.45
4:I:38:LYS:HE2	6:I:309:HOH:O	2.16	0.45
1:D:114:HIS:CE1	3:F:8:TRP:CH2	3.05	0.45
1:D:249:VAL:HG22	1:D:257:TYR:CE1	2.52	0.45
5:J:46:LEU:HD13	5:J:46:LEU:C	2.37	0.45
1:A:133:TRP:HB2	1:A:144:LYS:HG3	1.99	0.45
5:H:33:LEU:HD13	5:H:74:PHE:HB2	1.99	0.45
2:B:1:ILE:HD13	2:B:2:GLN:N	2.31	0.45
1:D:73:THR:HG21	6:F:102:HOH:O	2.15	0.44
1:D:111:ARG:HH11	1:D:111:ARG:CB	2.30	0.44
5:H:38:GLN:HG3	5:H:42:ARG:O	2.17	0.44
5:J:35:TRP:CE2	5:J:76:LEU:HB2	2.52	0.44
5:H:95:VAL:HB	5:H:99:ALA:HB3	1.99	0.44
4:I:207:SER:HB3	4:I:208:PRO:CD	2.46	0.44
5:H:131:PRO:HD3	5:H:144:LEU:HG	1.98	0.44
1:A:82:LEU:HD12	1:A:87:GLN:HB2	1.98	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:97:MET:SD	1:D:99:PHE:HB2	2.58	0.44
1:D:82:LEU:CD2	1:D:87:GLN:HB2	2.48	0.44
1:D:219:ARG:HD3	1:D:256:ARG:NH1	2.33	0.44
5:J:30:ASN:HA	5:J:71:ASP:OD2	2.18	0.44
5:J:52:GLY:O	5:J:55:GLN:HB2	2.18	0.44
4:G:36:TRP:CE2	4:G:76:LEU:HB2	2.52	0.44
4:G:157:SER:N	6:G:301:HOH:O	2.51	0.44
5:J:7:TRP:HH2	5:J:24:THR:HG1	1.66	0.43
4:G:66:ASN:ND2	4:G:68:LYS:HE3	2.33	0.43
5:H:122:PHE:O	5:H:151:PHE:HA	2.17	0.43
1:D:187:THR:O	1:D:188:HIS:HB3	2.19	0.43
1:A:234:ARG:HH22	2:B:99:MET:HE1	1.84	0.43
4:G:201:GLU:HG3	4:G:202:ASP:N	2.32	0.43
1:A:97:MET:SD	1:A:99:PHE:HB2	2.58	0.43
4:G:38:LYS:HD2	4:G:48:LEU:HD21	2.01	0.43
1:A:202:ARG:HD3	1:A:244:TRP:CD2	2.54	0.43
1:D:48:ARG:HD2	1:D:48:ARG:HA	1.90	0.43
1:A:103:VAL:HG13	1:A:168:LEU:HD23	2.01	0.43
1:A:189:MET:HE1	1:A:201:LEU:HB3	2.00	0.43
1:D:217:TRP:CD1	1:D:247:VAL:HG13	2.54	0.43
2:E:83:ASN:HD22	2:E:84:HIS:H	1.66	0.43
5:H:146:CYS:HB2	5:H:160:TRP:CZ2	2.54	0.43
3:C:2:TYR:CG	3:C:3:PRO:HD2	2.54	0.43
5:J:35:TRP:CD1	5:J:74:PHE:CE2	3.07	0.43
1:D:253:GLU:O	1:D:256:ARG:HB2	2.19	0.43
1:A:217:TRP:CD1	1:A:247:VAL:HG13	2.54	0.42
1:A:234:ARG:HE	1:A:242:GLN:NE2	2.17	0.42
1:D:59:TYR:O	1:D:63:GLU:HG2	2.20	0.42
4:I:2:GLN:CD	4:I:2:GLN:N	2.73	0.42
4:G:120:GLN:C	4:G:122:PRO:HD3	2.40	0.42
5:H:184:LEU:HD22	5:H:186:ASP:H	1.83	0.42
5:J:30:ASN:N	5:J:31:PRO:HD3	2.33	0.42
5:H:230:LYS:HA	5:H:231:PRO:HD3	1.81	0.42
1:D:51:TRP:O	1:D:54:GLN:HG2	2.19	0.42
4:I:192:ASN:HA	4:I:195:ASN:ND2	2.35	0.42
5:H:120:LYS:HE2	5:H:120:LYS:HB2	1.55	0.42
5:H:147:LEU:HD22	5:H:147:LEU:HA	1.84	0.42
2:B:58:LYS:HE3	2:B:58:LYS:HB2	1.71	0.42
1:D:192:HIS:CE1	2:E:98:ASP:HB2	2.55	0.42
2:E:71:THR:HA	2:E:72:PRO:HD3	1.85	0.42
4:I:50:ARG:HH22	5:J:101:VAL:HG21	1.85	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:E:16:GLU:HG3	2:E:19:LYS:HG3	2.00	0.42
4:G:175:LYS:HE2	6:G:328:HOH:O	2.20	0.42
5:H:178:LEU:HD12	5:H:178:LEU:O	2.20	0.42
1:A:271:THR:C	1:A:272:LEU:HD23	2.40	0.42
4:I:2:GLN:NE2	4:I:3:LYS:N	2.68	0.42
4:I:62:ARG:HH12	4:I:78:ILE:HD11	1.85	0.42
5:H:204:ASN:O	5:H:242:GLY:HA3	2.20	0.42
1:A:183:ASP:HA	1:A:184:PRO:HD2	1.91	0.42
1:D:111:ARG:NH2	1:D:128:GLU:HG2	2.34	0.42
5:H:30:ASN:HA	5:H:71:ASP:OD1	2.20	0.42
1:D:103:VAL:HG13	1:D:168:LEU:HD23	2.02	0.41
1:D:114:HIS:CE1	3:F:8:TRP:CZ2	3.08	0.41
1:D:250:PRO:HG2	1:D:253:GLU:CD	2.41	0.41
2:E:74:GLU:CD	2:E:74:GLU:H	2.22	0.41
4:I:167:LEU:HD23	4:I:167:LEU:C	2.39	0.41
5:J:150:GLY:HA2	5:J:188:ARG:HB3	2.02	0.41
5:H:204:ASN:HA	5:H:205:PRO:HD3	1.88	0.41
1:D:21:ARG:HH12	1:D:37:ASP:CG	2.24	0.41
1:D:67:VAL:HG23	3:F:2:TYR:CE2	2.55	0.41
4:I:56:GLN:NE2	4:I:56:GLN:HA	2.35	0.41
1:A:74:ASP:HA	1:A:77:ASN:HB2	2.02	0.41
5:H:121:VAL:HG13	5:H:152:PHE:O	2.21	0.41
1:A:111:ARG:HH21	1:A:128:GLU:HA	1.86	0.41
4:I:51:GLN:HE22	4:I:58:ALA:N	2.05	0.41
4:G:177:ASN:O	4:G:178:SER:HB3	2.20	0.41
5:H:184:LEU:HD23	5:H:185:ASN:N	2.35	0.41
5:H:184:LEU:HD23	5:H:186:ASP:H	1.84	0.41
1:A:219:ARG:HG2	1:A:256:ARG:HH11	1.86	0.41
3:C:1:ARG:HD3	6:C:105:HOH:O	2.20	0.41
4:I:46:ILE:O	4:I:46:ILE:HG13	2.17	0.41
1:D:202:ARG:HD3	1:D:244:TRP:CD2	2.56	0.41
4:I:74:VAL:HG13	4:I:74:VAL:O	2.21	0.41
4:I:175:LYS:N	4:I:175:LYS:HD3	2.34	0.41
5:J:39:ALA:O	5:J:40:ALA:HB3	2.21	0.41
4:G:116:ILE:HA	4:G:117:PRO:HD3	1.94	0.41
5:H:14:PRO:HB3	5:H:118:LEU:HD21	2.03	0.41
5:H:165:LYS:HB2	6:H:347:HOH:O	2.21	0.41
1:A:249:VAL:HG22	1:A:257:TYR:CE1	2.56	0.41
5:J:122:PHE:CD2	5:J:188:ARG:NH2	2.88	0.41
5:J:176:GLN:N	5:J:176:GLN:OE1	2.54	0.41
2:E:83:ASN:ND2	2:E:84:HIS:H	2.20	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:G:103:GLN:NE2	5:H:102:PRO:HB2	2.35	0.40
2:B:4:THR:HA	2:B:5:PRO:HD3	1.89	0.40
1:D:126:LEU:HB2	1:D:133:TRP:CZ3	2.57	0.40
4:G:182:TRP:CE2	5:H:147:LEU:HD11	2.56	0.40
1:A:14:ARG:HA	1:A:15:PRO:HD2	1.95	0.40
1:A:160:LEU:O	1:A:165:VAL:HG23	2.21	0.40
3:F:6:PHE:CD1	5:H:97:VAL:HG13	2.56	0.40
1:D:207:GLY:HA2	1:D:240:THR:HB	2.02	0.40
4:G:86:SER:OG	4:G:115:VAL:HG13	2.22	0.40
1:D:212:GLU:OE1	1:D:212:GLU:HA	2.22	0.40
2:E:64:LEU:HD12	2:E:64:LEU:HA	1.90	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	272/274 (99%)	266 (98%)	6 (2%)	0	100	100
1	D	272/274 (99%)	264 (97%)	8 (3%)	0	100	100
2	B	98/100 (98%)	94 (96%)	4 (4%)	0	100	100
2	E	98/100 (98%)	94 (96%)	4 (4%)	0	100	100
3	C	8/10 (80%)	7 (88%)	1 (12%)	0	100	100
3	F	8/10 (80%)	7 (88%)	1 (12%)	0	100	100
4	G	205/207 (99%)	197 (96%)	8 (4%)	0	100	100
4	I	205/207 (99%)	193 (94%)	10 (5%)	2 (1%)	15	34
5	H	243/245 (99%)	233 (96%)	10 (4%)	0	100	100
5	J	243/245 (99%)	233 (96%)	10 (4%)	0	100	100
All	All	1652/1672 (99%)	1588 (96%)	62 (4%)	2 (0%)	51	76

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
4	I	207	SER
4	I	81	LEU

5.3.2 Protein sidechains (i)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	A	230/230 (100%)	220 (96%)	10 (4%)	29 54
1	D	230/230 (100%)	218 (95%)	12 (5%)	23 46
2	B	95/95 (100%)	88 (93%)	7 (7%)	13 29
2	E	95/95 (100%)	87 (92%)	8 (8%)	11 22
3	C	9/9 (100%)	9 (100%)	0	100 100
3	F	9/9 (100%)	9 (100%)	0	100 100
4	G	184/184 (100%)	165 (90%)	19 (10%)	7 15
4	I	184/184 (100%)	167 (91%)	17 (9%)	9 19
5	H	212/212 (100%)	201 (95%)	11 (5%)	23 46
5	J	212/212 (100%)	191 (90%)	21 (10%)	8 16
All	All	1460/1460 (100%)	1355 (93%)	105 (7%)	14 31

All (105) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	73	THR
1	A	79	ARG
1	A	178	THR
1	A	181	ARG
1	A	182	THR
1	A	194	ILE
1	A	196	ASP
1	A	248	VAL
1	A	255	GLN
1	A	258	THR

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Mol	Chain	Res	Type
2	B	0	MET
2	B	1	ILE
2	B	64	LEU
2	B	70	PHE
2	B	83	ASN
2	B	98	ASP
2	B	99	MET
1	D	21	ARG
1	D	25	VAL
1	D	73	THR
1	D	83	ARG
1	D	98	MET
1	D	111	ARG
1	D	128	GLU
1	D	165	VAL
1	D	181	ARG
1	D	186	LYS
1	D	225	THR
1	D	255	GLN
2	E	0	MET
2	E	1	ILE
2	E	4	THR
2	E	9	VAL
2	E	70	PHE
2	E	83	ASN
2	E	98	ASP
2	E	99	MET
4	I	2	GLN
4	I	21	LEU
4	I	29	TRP
4	I	34	ILE
4	I	38	LYS
4	I	40	LEU
4	I	46	ILE
4	I	56	GLN
4	I	78	ILE
4	I	81	LEU
4	I	83	LEU
4	I	96	LEU
4	I	135	SER
4	I	139	VAL
4	I	166	VAL

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Mol	Chain	Res	Type
4	I	167	LEU
4	I	175	LYS
5	J	11	LEU
5	J	33	LEU
5	J	47	LEU
5	J	51	VAL
5	J	60	VAL
5	J	63	ASN
5	J	64	LEU
5	J	74	PHE
5	J	83	LEU
5	J	95	VAL
5	J	101	VAL
5	J	111	TRP
5	J	115	VAL
5	J	147	LEU
5	J	154	ASP
5	J	176	GLN
5	J	185	ASN
5	J	188	ARG
5	J	194	ARG
5	J	200	THR
5	J	243	ARG
4	G	2	GLN
4	G	21	LEU
4	G	29	TRP
4	G	40	LEU
4	G	46	ILE
4	G	50	ARG
4	G	56	GLN
4	G	81	LEU
4	G	83	LEU
4	G	96	LEU
4	G	98	ARG
4	G	114	GLN
4	G	115	VAL
4	G	139	VAL
4	G	166	VAL
4	G	167	LEU
4	G	175	LYS
4	G	196	ASN
4	G	201	GLU

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Mol	Chain	Res	Type
5	H	11	LEU
5	H	34	TYR
5	H	47	LEU
5	H	63	ASN
5	H	64	LEU
5	H	74	PHE
5	H	82	LEU
5	H	101	VAL
5	H	147	LEU
5	H	176	GLN
5	H	185	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (41) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	86	ASN
1	A	93	HIS
1	A	141	GLN
1	A	156	GLN
1	A	174	ASN
1	A	242	GLN
1	A	255	GLN
2	B	31	HIS
2	B	51	HIS
2	B	83	ASN
1	D	86	ASN
1	D	93	HIS
1	D	114	HIS
1	D	242	GLN
1	D	255	GLN
2	E	31	HIS
2	E	51	HIS
2	E	83	ASN
4	I	2	GLN
4	I	51	GLN
4	I	150	ASN
4	I	177	ASN
4	I	196	ASN
5	J	2	GLN
5	J	13	GLN
5	J	63	ASN
5	J	181	GLN

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Mol	Chain	Res	Type
5	J	214	GLN
4	G	51	GLN
4	G	56	GLN
4	G	103	GLN
4	G	118	ASN
4	G	150	ASN
4	G	177	ASN
4	G	184	ASN
4	G	196	ASN
5	H	2	GLN
5	H	63	ASN
5	H	70	GLN
5	H	119	ASN
5	H	214	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 monosaccharides in this entry.

5.6 Ligand geometry

There are no ligands in this entry.

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, 95^{th} 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	274/274 (100%)	-0.02	0 100 100	34, 51, 78, 101	0
1	D	274/274 (100%)	-0.00	2 (0%) 87 88	35, 50, 78, 104	0
2	B	100/100 (100%)	-0.08	2 (2%) 65 65	37, 53, 75, 88	0
2	E	100/100 (100%)	-0.05	2 (2%) 65 65	36, 53, 76, 83	0
3	C	10/10 (100%)	-0.03	0 100 100	37, 39, 44, 44	0
3	F	10/10 (100%)	0.04	0 100 100	37, 39, 44, 45	0
4	G	207/207 (100%)	-0.01	0 100 100	37, 49, 79, 92	0
4	I	207/207 (100%)	-0.01	0 100 100	37, 49, 78, 91	0
5	H	245/245 (100%)	-0.05	1 (0%) 92 93	37, 48, 71, 89	0
5	J	245/245 (100%)	-0.06	2 (0%) 86 86	35, 48, 71, 83	0
All	All	1672/1672 (100%)	-0.03	9 (0%) 91 92	34, 50, 76, 104	0

All (9) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	B	0	MET	4.3
2	E	0	MET	4.1
5	J	1	SER	3.6
2	E	99	MET	3.1
2	B	99	MET	2.5
5	H	1	SER	2.5
1	D	273	ARG	2.2
5	J	184	LEU	2.0
1	D	255	GLN	2.0

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

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

6.3 Carbohydrates (i)

There are no monosaccharides 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.