Full wwPDB X-ray Structure Validation Report ⓘ

Oct 11, 2021 – 03:46 PM EDT

PDB ID	:	2HTL
Title	:	Structure of the Escherichia coli ClC chloride channel Y445F mutant and Fab complex
Authors	:	Accardi, A.; Lobet, S.; Williams, C.; Miller, C.; Dutzler, R.
Deposited on	:	2006-07-26
Resolution	:	3.40 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 following versions of software and data (see references ⓘ) were used in the production of this report:

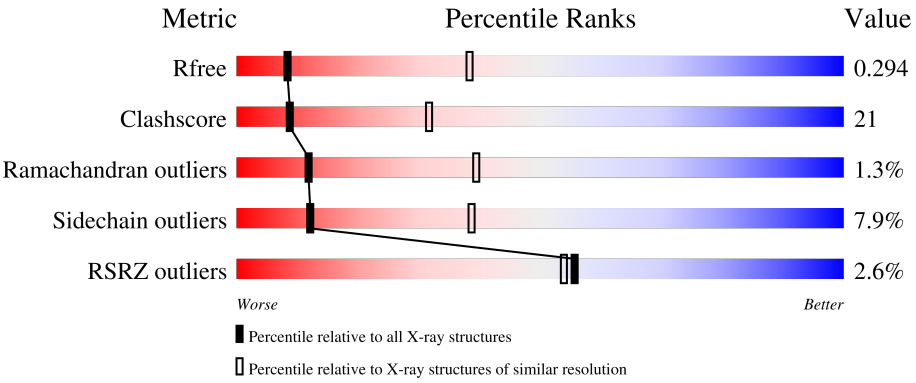
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.13
EDS	:	2.23.2
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.23.2

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 3.40 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	1026 (3.48-3.32)
Clashscore	141614	1055 (3.48-3.32)
Ramachandran outliers	138981	1038 (3.48-3.32)
Sidechain outliers	138945	1038 (3.48-3.32)
RSRZ outliers	127900	2173 (3.50-3.30)

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 <=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	473	58% 33% · 6%
1	B	473	2% 58% 32% · 7%
2	C	221	5% 67% 29% ·
2	E	221	3% 66% 30% 5%
3	D	211	3% 64% 33% ·

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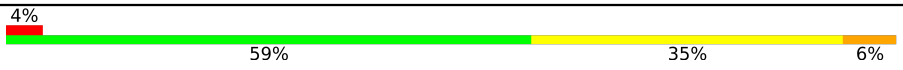
Mol	Chain	Length	Quality of chain
3	F	211	

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
4	BR	A	474	-	-	-	X
4	BR	A	475	-	-	X	-
4	BR	B	474	-	-	X	-
4	BR	B	475	-	-	X	-

2 Entry composition (i)

There are 4 unique types of molecules in this entry. The entry contains 13225 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 H(+)/Cl(-) exchange transporter clcA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	444	Total	C	N	O	S	0	0	0
			3332	2190	560	562	20			
1	B	441	Total	C	N	O	S	0	0	0
			3303	2174	553	556	20			

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	445	PHE	TYR	engineered mutation	UNP P37019
B	445	PHE	TYR	engineered mutation	UNP P37019

- Molecule 2 is a protein called Fab fragment, Heavy chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	C	221	Total	C	N	O	S	0	0	0
			1672	1077	274	315	6			
2	E	221	Total	C	N	O	S	0	0	0
			1672	1077	274	315	6			

- Molecule 3 is a protein called Fab fragment, Light chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	D	211	Total	C	N	O	S	0	0	0
			1621	1008	271	334	8			
3	F	211	Total	C	N	O	S	0	0	0
			1621	1008	271	334	8			

- Molecule 4 is BROMIDE ION (three-letter code: BR) (formula: Br).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	2	Total	Br	0	0
			2	2		

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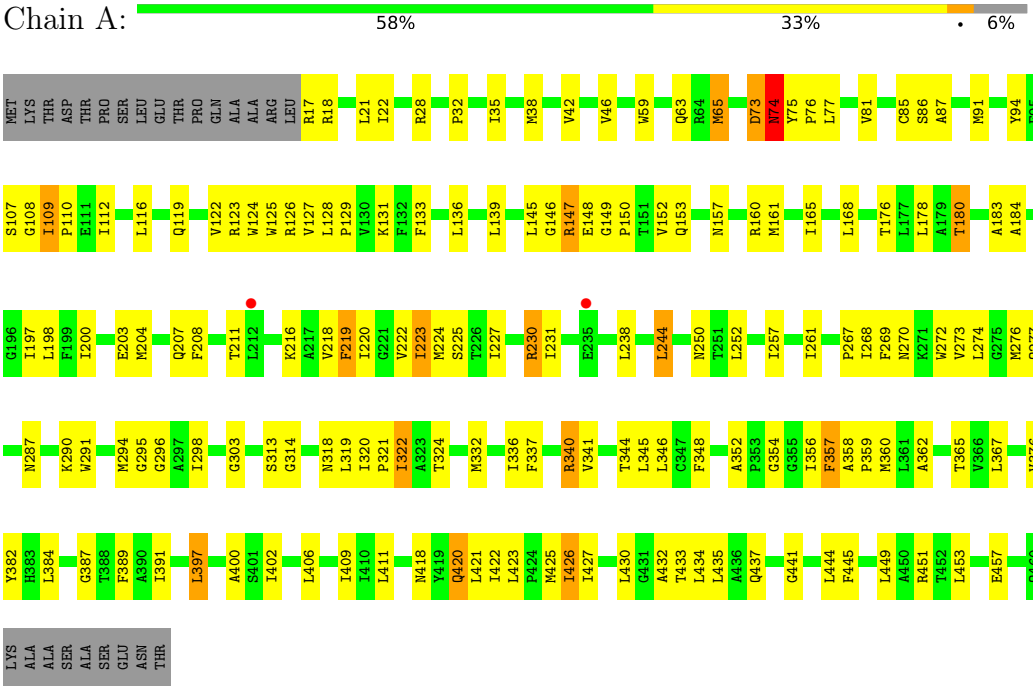
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	B	2	Total Br 2 2	0	0

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.

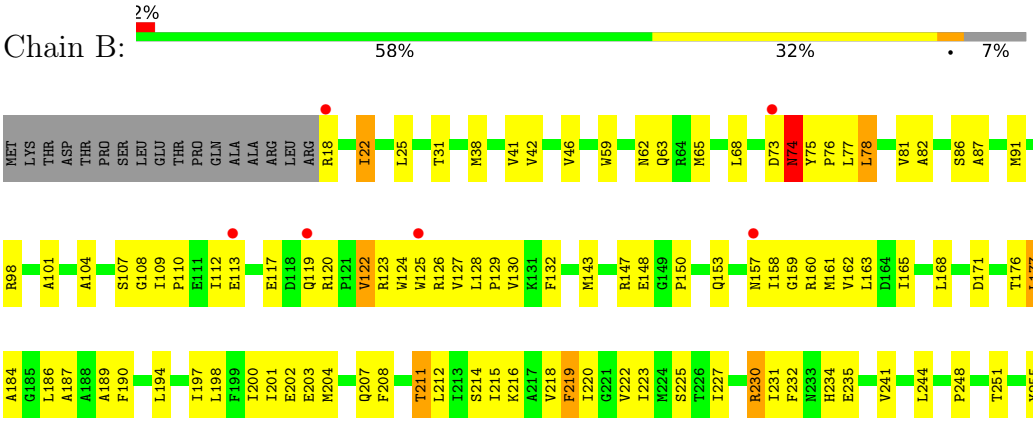
• Molecule 1: H(+)/Cl(-) exchange transporter clcA

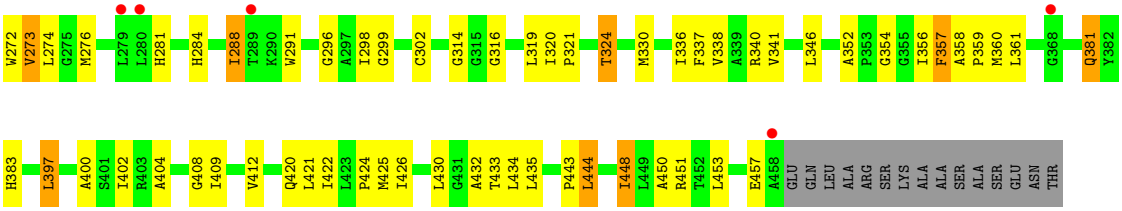
Chain A:



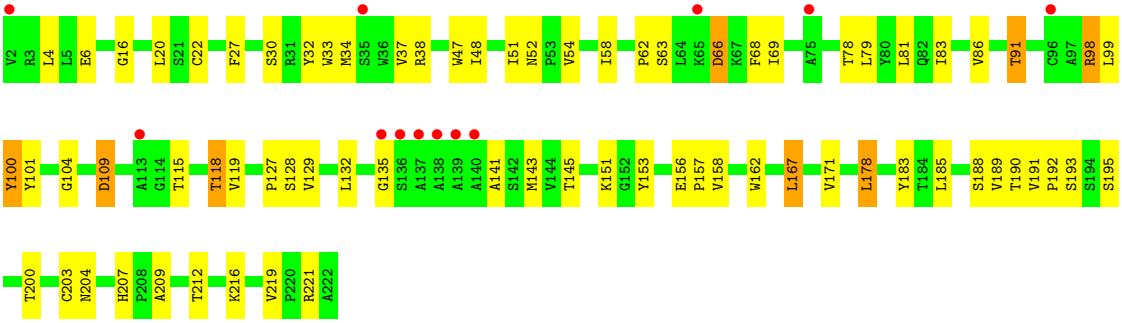
• Molecule 1: H(+)/Cl(-) exchange transporter clcA

Chain B:

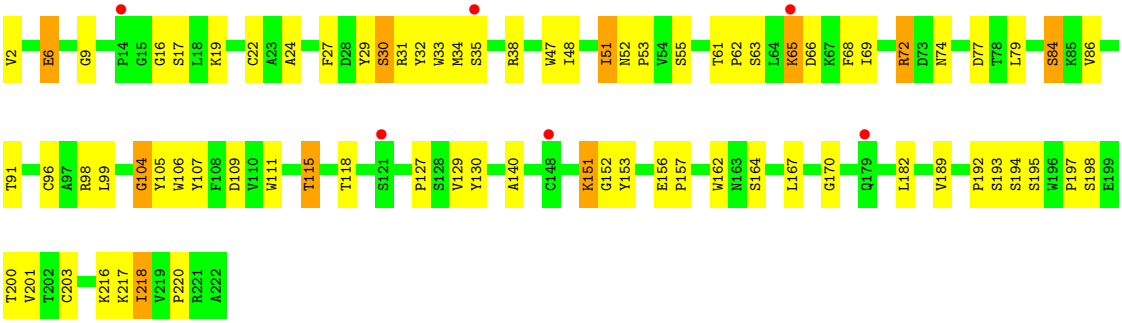




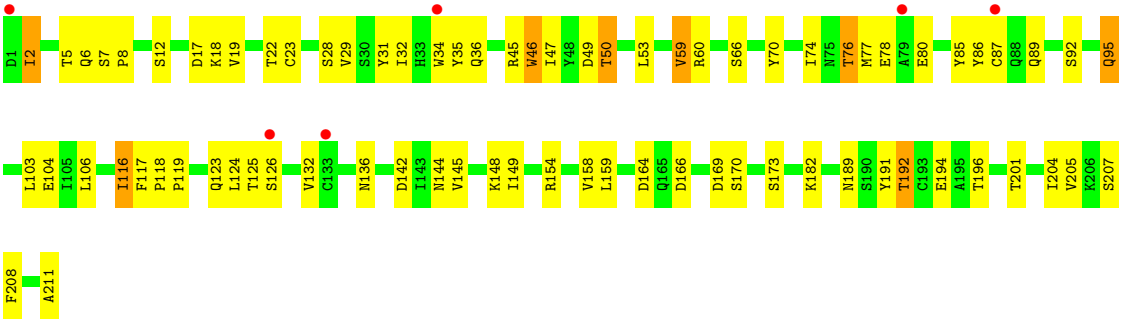
• Molecule 2: Fab fragment, Heavy chain



• Molecule 2: Fab fragment, Heavy chain

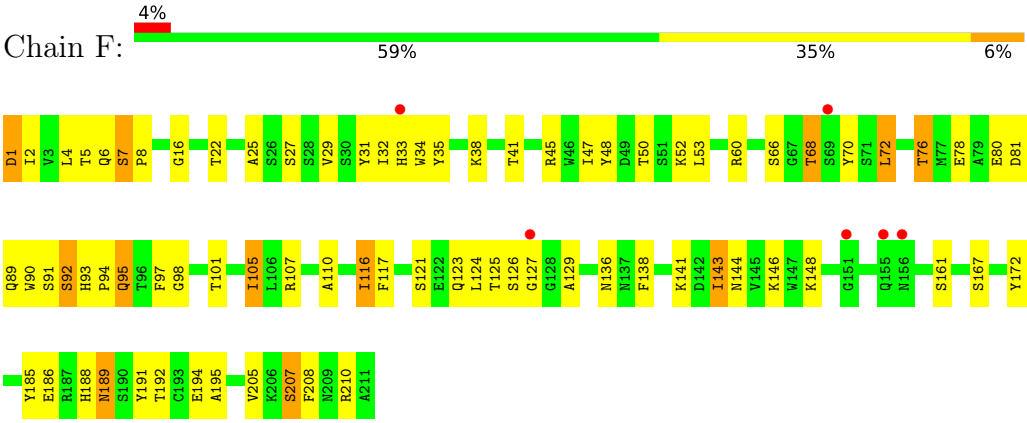


• Molecule 3: Fab fragment, Light chain



• Molecule 3: Fab fragment, Light chain

Chain F:


4%
59%
35%
6%
D1 I2 V3 L4 T5 Q6 S7 P8 G16 T22 A25 S26 S27 S28 V29 S30 Y31 I32 H33 W34 Y35 K38 T41 R45 W46 I47 Y48 D49 T50 S51 K52 L53 R60 S66 G67 T68 S69 Y70 S71 L72 T76 M77 E78 A79 E80 D81 A82 Y86 C87 Q88
Q89 W90 S91 S92 H93 P94 Q95 T96 F97 G98 T101 I105 L106 R107 A110 I116 F117 S121 E122 Q123 L124 T125 S126 G127 G128 A129 N136 N137 F138 K141 D142 I143 N144 V145 K146 W147 K148 G151 Q155 N156 S161 S167 Y172 S173 L180 T181 K182
Y185 E186 R187 H188 N189 S190 Y191 T192 C193 E194 A195 V205 K206 S207 F208 W209 R210 A211

4 Data and refinement statistics (i)

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α, β, γ	232.53Å 98.86Å 171.80Å 90.00° 131.54° 90.00°	Depositor
Resolution (Å)	40.00 – 3.40 19.99 – 3.40	Depositor EDS
% Data completeness (in resolution range)	99.2 (40.00-3.40) 99.3 (19.99-3.40)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.73 (at 3.36Å)	Xtriage
Refinement program	REFMAC 5.2.0005	Depositor
R, R_{free}	0.259 , 0.302 0.245 , 0.294	Depositor DCC
R_{free} test set	1972 reflections (4.91%)	wwPDB-VP
Wilson B-factor (Å^2)	128.9	Xtriage
Anisotropy	0.080	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.26 , 73.7	EDS
L-test for twinning[2]	$< \|L\| > = 0.47$, $< L^2 > = 0.30$	Xtriage
Estimated twinning fraction	0.015 for h,-k,-h-l	Xtriage
F_o,F_c correlation	0.93	EDS
Total number of atoms	13225	wwPDB-VP
Average B, all atoms (Å^2)	124.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.54% 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

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

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	0.40	0/3404	0.57	0/4619
1	B	0.44	0/3375	0.58	2/4581 (0.0%)
2	C	0.46	0/1721	0.60	0/2355
2	E	0.50	1/1721 (0.1%)	0.61	0/2355
3	D	0.42	0/1660	0.58	0/2257
3	F	0.42	0/1660	0.61	0/2257
All	All	0.44	1/13541 (0.0%)	0.59	2/18424 (0.0%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	E	19	LYS	CE-NZ	6.17	1.64	1.49

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	177	LEU	CA-CB-CG	5.15	127.14	115.30
1	B	78	LEU	CA-CB-CG	5.13	127.09	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	3332	0	3484	178	0
1	B	3303	0	3457	173	0
2	C	1672	0	1654	40	0
2	E	1672	0	1654	65	0
3	D	1621	0	1546	64	0
3	F	1621	0	1546	76	0
4	A	2	0	0	5	0
4	B	2	0	0	8	0
All	All	13225	0	13341	545	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 21.

All (545) 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:110:PRO:HG2	4:A:475:BR:BR	1.87	1.30
1:B:107:SER:HB3	4:B:475:BR:BR	1.90	1.27
1:B:112:ILE:HD11	1:B:153:GLN:HA	1.33	1.10
1:A:22:ILE:HD11	1:B:453:LEU:HB3	1.13	1.05
1:B:110:PRO:HG2	4:B:475:BR:BR	2.11	1.05
1:A:112:ILE:HD11	1:A:153:GLN:HA	1.39	1.04
1:B:298:ILE:HD12	1:B:346:LEU:HD23	1.37	1.03
1:A:320:ILE:HD11	1:A:362:ALA:HA	1.39	1.03
1:B:201:ILE:HG21	1:B:215:ILE:HD11	1.38	1.02
1:A:381:GLN:H	1:A:381:GLN:HE21	1.04	0.96
3:F:7:SER:HB3	3:F:8:PRO:HD3	1.43	0.96
2:E:51:ILE:CD1	2:E:72:ARG:HE	1.79	0.95
1:B:444:LEU:O	1:B:448:ILE:HD13	1.64	0.95
1:B:381:GLN:H	1:B:381:GLN:HE21	1.12	0.93
3:F:143:ILE:HD13	3:F:144:ASN:H	1.34	0.93
1:A:107:SER:OG	1:A:109:ILE:HD13	1.67	0.92
1:A:422:ILE:O	1:A:426:ILE:HD13	1.69	0.91
1:B:201:ILE:CG2	1:B:215:ILE:HD11	1.99	0.91
1:A:110:PRO:CG	4:A:475:BR:BR	2.74	0.90
2:E:51:ILE:HD13	2:E:52:ASN:O	1.73	0.89
3:F:6:GLN:HE21	3:F:98:GLY:HA3	1.34	0.88
1:A:268:ILE:O	1:A:272:TRP:CD1	2.28	0.87
3:F:143:ILE:HD13	3:F:144:ASN:N	1.90	0.87
2:E:218:ILE:HD12	2:E:218:ILE:H	1.39	0.87
3:D:6:GLN:HE22	3:D:86:TYR:HA	1.38	0.87
3:D:116:ILE:HD13	3:D:117:PHE:N	1.91	0.86

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:F:7:SER:HB2	3:F:22:THR:HB	1.57	0.86
3:D:2:ILE:HD12	3:D:2:ILE:H	1.42	0.85
3:F:7:SER:CB	3:F:8:PRO:HD3	2.07	0.84
3:F:116:ILE:HD13	3:F:117:PHE:N	1.91	0.84
1:B:112:ILE:HD11	1:B:153:GLN:CA	2.08	0.83
1:A:22:ILE:HD11	1:B:453:LEU:CB	2.05	0.82
1:B:110:PRO:CG	4:B:475:BR:BR	2.83	0.82
1:B:38:MET:O	1:B:42:VAL:HG23	1.78	0.81
1:A:112:ILE:HD11	1:A:153:GLN:CA	2.09	0.81
3:F:38:LYS:O	3:F:41:THR:HG22	1.80	0.81
1:B:112:ILE:CD1	1:B:153:GLN:HA	2.10	0.80
1:A:337:PHE:HE1	1:A:367:LEU:HB2	1.47	0.80
1:B:107:SER:CB	4:B:475:BR:BR	2.80	0.80
1:A:227:ILE:O	1:A:231:ILE:HG12	1.82	0.80
2:E:162:TRP:HZ3	2:E:218:ILE:HD11	1.45	0.79
1:A:274:LEU:HA	1:A:277:GLN:HE21	1.46	0.79
1:A:430:LEU:HD23	1:B:220:ILE:HD13	1.65	0.78
2:E:51:ILE:HD12	2:E:72:ARG:HE	1.45	0.78
1:B:219:PHE:O	1:B:223:ILE:HD13	1.83	0.78
1:A:322:ILE:H	1:A:322:ILE:CD1	1.96	0.78
1:A:220:ILE:HD13	1:B:430:LEU:HD23	1.64	0.77
3:D:95:GLN:CD	3:D:95:GLN:N	2.38	0.76
1:B:183:ALA:HB2	1:B:200:ILE:HD13	1.67	0.76
1:A:200:ILE:HA	1:A:204:MET:HB2	1.67	0.75
1:A:116:LEU:HG	1:A:178:LEU:HD23	1.68	0.75
3:D:194:GLU:HG2	3:D:205:VAL:HG12	1.68	0.75
1:B:18:ARG:O	1:B:22:ILE:HD13	1.86	0.75
2:E:127:PRO:HB3	2:E:153:TYR:HB3	1.69	0.74
1:A:409:ILE:HD12	1:A:425:MET:HB3	1.69	0.74
2:E:38:ARG:HB3	2:E:48:ILE:HD11	1.69	0.74
1:B:150:PRO:HD3	1:B:354:GLY:HA2	1.70	0.74
3:D:95:GLN:CD	3:D:95:GLN:H	1.90	0.74
2:E:91:THR:HG23	2:E:118:THR:HA	1.69	0.74
1:B:38:MET:HG3	1:B:168:LEU:HD11	1.69	0.73
2:E:218:ILE:HD12	2:E:218:ILE:N	2.03	0.73
3:D:2:ILE:HD13	3:D:89:GLN:HE22	1.54	0.73
2:E:201:VAL:O	2:E:218:ILE:HD13	1.89	0.73
3:F:2:ILE:HD13	3:F:29:VAL:CG1	2.18	0.73
3:D:148:LYS:HB2	3:D:192:THR:OG1	1.89	0.72
1:A:112:ILE:CD1	1:A:153:GLN:HA	2.18	0.72
1:A:318:ASN:O	1:A:322:ILE:HD13	1.89	0.72

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:D:46:TRP:HB3	3:D:47:ILE:HD12	1.72	0.71
1:B:180:THR:HG22	1:B:218:VAL:HA	1.71	0.71
1:B:148:GLU:CD	1:B:148:GLU:H	1.92	0.71
1:A:190:PHE:CD1	1:A:411:LEU:HD11	2.26	0.71
1:A:320:ILE:HD12	1:A:365:THR:CB	2.21	0.71
3:F:146:LYS:HB3	3:F:194:GLU:HB2	1.72	0.70
1:B:198:LEU:HD13	1:B:201:ILE:HD11	1.74	0.70
1:A:109:ILE:HD11	1:A:149:GLY:HA2	1.72	0.70
1:A:124:TRP:HA	1:A:157:ASN:HD22	1.57	0.70
1:A:220:ILE:HD11	1:B:434:LEU:HD11	1.74	0.70
1:A:322:ILE:CD1	1:A:322:ILE:N	2.54	0.69
1:A:387:GLY:O	1:A:391:ILE:HD13	1.93	0.69
2:C:135:GLY:HA2	2:C:221:ARG:HD3	1.74	0.69
1:B:113:GLU:OE2	1:B:203:GLU:HG3	1.93	0.69
1:A:322:ILE:N	1:A:322:ILE:HD12	2.07	0.69
3:F:110:ALA:O	3:F:138:PHE:HA	1.93	0.69
1:B:187:ALA:CB	1:B:222:VAL:HG13	2.23	0.68
1:A:190:PHE:HD1	1:A:411:LEU:HD11	1.59	0.68
1:B:75:TYR:HB3	1:B:76:PRO:HD3	1.75	0.68
1:A:183:ALA:HB2	1:A:200:ILE:HD13	1.76	0.68
1:B:187:ALA:HB2	1:B:222:VAL:HG13	1.74	0.68
1:B:272:TRP:O	1:B:276:MET:HB2	1.93	0.68
2:C:156:GLU:OE1	2:C:157:PRO:HA	1.94	0.68
1:A:197:ILE:HD13	1:A:219:PHE:CE1	2.29	0.68
3:F:7:SER:HB3	3:F:8:PRO:CD	2.19	0.68
2:E:52:ASN:HB2	2:E:53:PRO:CD	2.24	0.68
1:A:150:PRO:HD3	1:A:354:GLY:HA2	1.76	0.68
2:E:52:ASN:HB2	2:E:53:PRO:HD3	1.75	0.68
2:E:218:ILE:H	2:E:218:ILE:CD1	2.07	0.68
3:F:2:ILE:HD13	3:F:29:VAL:HG12	1.76	0.68
1:A:109:ILE:N	1:A:109:ILE:HD12	2.10	0.67
1:A:434:LEU:HD11	1:B:220:ILE:HD11	1.75	0.67
1:B:109:ILE:HD12	4:B:474:BR:BR	2.50	0.66
1:B:274:LEU:HD21	1:B:448:ILE:HD12	1.78	0.66
1:A:402:ILE:HD12	1:A:445:PHE:CD1	2.29	0.66
3:D:192:THR:HA	3:D:207:SER:HB3	1.77	0.66
2:E:51:ILE:CD1	2:E:72:ARG:NE	2.58	0.66
1:A:38:MET:HG3	1:A:168:LEU:HD11	1.78	0.66
1:A:287:ASN:HD22	1:A:290:LYS:HE3	1.60	0.66
2:E:16:GLY:O	2:E:86:VAL:HG23	1.95	0.66
1:A:219:PHE:HE2	1:B:426:ILE:HD12	1.61	0.66

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:381:GLN:HE21	1:A:381:GLN:N	1.88	0.65
1:B:200:ILE:HA	1:B:204:MET:HB2	1.78	0.65
1:A:123:ARG:HE	1:A:126:ARG:HD2	1.61	0.65
1:A:197:ILE:HG13	1:A:222:VAL:HG21	1.79	0.65
2:E:51:ILE:CD1	2:E:52:ASN:O	2.43	0.65
1:B:219:PHE:C	1:B:223:ILE:HD13	2.16	0.65
3:D:124:LEU:C	3:D:126:SER:H	1.99	0.65
1:B:288:ILE:O	1:B:288:ILE:HD13	1.97	0.65
3:D:95:GLN:H	3:D:95:GLN:NE2	1.95	0.64
3:F:2:ILE:HD12	3:F:89:GLN:CD	2.18	0.64
1:A:336:ILE:O	1:A:340:ARG:HG3	1.98	0.64
1:B:184:ALA:HB1	1:B:225:SER:HB3	1.80	0.64
2:E:162:TRP:CZ3	2:E:218:ILE:HD11	2.30	0.63
1:B:383:HIS:HD2	2:E:33:TRP:CE3	2.16	0.63
2:C:66:ASP:O	2:C:69:ILE:HD11	1.98	0.63
3:F:16:GLY:HA2	3:F:76:THR:HG23	1.80	0.63
1:B:298:ILE:CD1	1:B:346:LEU:HD23	2.22	0.63
3:D:2:ILE:HD12	3:D:2:ILE:N	2.13	0.62
1:B:161:MET:HG2	1:B:165:ILE:HD12	1.81	0.61
1:B:381:GLN:HE21	1:B:381:GLN:N	1.93	0.61
1:A:409:ILE:HD11	1:A:425:MET:O	2.00	0.61
3:D:31:TYR:HA	3:D:50:THR:OG1	2.00	0.61
1:A:420:GLN:HE22	1:A:421:LEU:HG	1.66	0.61
1:A:109:ILE:CD1	1:A:149:GLY:HA2	2.30	0.61
1:A:184:ALA:HB1	1:A:225:SER:HB3	1.82	0.61
1:A:268:ILE:O	1:A:272:TRP:HD1	1.81	0.61
1:A:434:LEU:HD11	1:B:220:ILE:CD1	2.31	0.61
1:B:337:PHE:O	1:B:341:VAL:HG23	2.00	0.61
2:E:105:TYR:CD2	3:F:91:SER:HA	2.35	0.61
3:F:47:ILE:HD13	3:F:72:LEU:HD12	1.81	0.61
1:B:409:ILE:HG21	1:B:426:ILE:CD1	2.30	0.61
2:E:162:TRP:CZ3	2:E:203:CYS:HB3	2.35	0.61
1:A:332:MET:HE1	1:A:336:ILE:HD11	1.83	0.61
1:A:32:PRO:HB2	1:A:35:ILE:HD13	1.83	0.61
3:F:7:SER:CB	3:F:8:PRO:CD	2.76	0.61
2:C:98:ARG:HG2	2:C:109:ASP:HB3	1.82	0.61
3:D:31:TYR:HB3	3:D:49:ASP:HA	1.83	0.61
1:B:98:ARG:HD2	1:B:291:TRP:CD2	2.36	0.60
3:D:32:ILE:HD11	3:D:34:TRP:NE1	2.16	0.60
1:B:42:VAL:HG22	1:B:162:VAL:HG21	1.84	0.60
1:A:148:GLU:CD	1:A:148:GLU:H	2.04	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:34:MET:HB3	2:C:79:LEU:HD22	1.83	0.59
1:A:98:ARG:HD2	1:A:291:TRP:CE3	2.38	0.59
1:B:219:PHE:HD2	1:B:223:ILE:HD11	1.68	0.59
1:A:402:ILE:HD13	1:A:444:LEU:HB3	1.83	0.59
3:D:189:ASN:HD21	3:D:211:ALA:H	1.49	0.59
3:D:12:SER:HA	3:D:104:GLU:O	2.03	0.59
1:A:400:ALA:HB2	1:A:432:ALA:HB1	1.85	0.59
1:B:38:MET:HA	1:B:41:VAL:HG12	1.84	0.58
1:B:400:ALA:HB2	1:B:432:ALA:HB1	1.85	0.58
1:A:332:MET:CE	1:A:336:ILE:HD11	2.33	0.58
1:A:146:GLY:HA3	1:A:148:GLU:OE2	2.03	0.58
1:A:381:GLN:H	1:A:381:GLN:NE2	1.86	0.58
3:F:127:GLY:HA2	3:F:182:LYS:HB2	1.86	0.58
1:A:161:MET:HG2	1:A:165:ILE:HD12	1.86	0.58
1:A:457:GLU:HG3	1:B:18:ARG:HD3	1.86	0.58
1:B:128:LEU:HB2	1:B:129:PRO:HD3	1.85	0.58
1:A:109:ILE:CD1	1:A:109:ILE:H	2.17	0.57
1:B:358:ALA:HA	1:B:361:LEU:HD12	1.86	0.57
3:D:7:SER:HB3	3:D:8:PRO:HD3	1.87	0.57
1:A:313:SER:OG	1:A:314:GLY:N	2.36	0.57
1:B:421:LEU:O	1:B:425:MET:HG3	2.03	0.57
2:C:33:TRP:CH2	2:C:52:ASN:HB3	2.39	0.57
1:A:270:ASN:HA	1:A:273:VAL:HG12	1.87	0.57
1:B:74:ASN:HB3	1:B:77:LEU:HB3	1.87	0.57
3:F:2:ILE:HD11	3:F:92:SER:OG	2.05	0.57
1:A:127:VAL:HB	1:A:157:ASN:ND2	2.20	0.56
2:C:127:PRO:HB3	2:C:153:TYR:HB3	1.86	0.56
1:B:281:HIS:HA	1:B:284:HIS:CE1	2.40	0.56
2:C:30:SER:C	2:C:32:TYR:H	2.08	0.56
2:E:156:GLU:OE1	2:E:157:PRO:HA	2.05	0.56
3:F:185:TYR:HA	3:F:191:TYR:OH	2.05	0.56
2:C:100:TYR:HD2	2:C:101:TYR:H	1.50	0.56
1:A:430:LEU:HD21	1:B:219:PHE:HB3	1.87	0.56
1:A:109:ILE:HD12	1:A:109:ILE:H	1.70	0.56
1:A:18:ARG:NH1	1:B:457:GLU:HB3	2.21	0.56
1:A:28:ARG:NE	1:B:207:GLN:HG2	2.21	0.56
1:A:344:THR:CG2	1:A:356:ILE:HD11	2.35	0.56
1:A:322:ILE:H	1:A:322:ILE:HD13	1.71	0.56
2:E:107:TYR:HB3	3:F:33:HIS:CD2	2.41	0.56
1:A:219:PHE:HB3	1:B:430:LEU:HD21	1.88	0.56
1:B:241:VAL:HG11	1:B:324:THR:HG21	1.89	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:F:2:ILE:HD11	3:F:92:SER:CB	2.36	0.55
1:A:320:ILE:HD12	1:A:365:THR:OG1	2.05	0.55
2:E:201:VAL:O	2:E:218:ILE:CD1	2.54	0.55
3:F:192:THR:HA	3:F:207:SER:HB3	1.88	0.55
1:B:358:ALA:HB3	1:B:359:PRO:HD3	1.88	0.55
1:A:59:TRP:O	1:A:63:GLN:HG2	2.07	0.55
1:A:208:PHE:HE1	1:B:25:LEU:HD23	1.72	0.55
3:F:47:ILE:HD13	3:F:72:LEU:CD1	2.36	0.55
1:A:449:LEU:O	1:A:453:LEU:HB2	2.07	0.55
1:B:128:LEU:HB2	1:B:129:PRO:CD	2.37	0.55
1:A:320:ILE:HB	1:A:321:PRO:HD3	1.89	0.55
1:B:59:TRP:O	1:B:63:GLN:HG2	2.07	0.55
2:C:22:CYS:O	2:C:78:THR:HG23	2.07	0.55
2:C:33:TRP:HB2	2:C:99:LEU:HB2	1.89	0.55
1:A:320:ILE:HD12	1:A:365:THR:HB	1.89	0.54
2:C:167:LEU:HD21	2:C:191:VAL:HG12	1.89	0.54
2:E:24:ALA:HB1	2:E:27:PHE:CE1	2.42	0.54
3:F:82:ALA:HB2	3:F:105:ILE:HD11	1.88	0.54
1:B:22:ILE:HD13	1:B:22:ILE:H	1.71	0.54
1:A:197:ILE:HD13	1:A:219:PHE:CD1	2.42	0.54
1:A:28:ARG:HE	1:B:207:GLN:HG2	1.72	0.54
1:A:109:ILE:N	1:A:109:ILE:CD1	2.71	0.54
1:A:341:VAL:O	1:A:345:LEU:HG	2.08	0.54
1:A:180:THR:HG22	1:A:218:VAL:HA	1.89	0.54
1:A:216:LYS:HE2	1:B:433:THR:HG22	1.89	0.54
1:A:423:LEU:HD13	1:B:230:ARG:NH2	2.23	0.54
1:B:320:ILE:HB	1:B:321:PRO:HD3	1.89	0.54
3:F:95:GLN:H	3:F:95:GLN:CD	2.11	0.53
1:A:281:HIS:HA	1:A:284:HIS:CE1	2.43	0.53
1:A:422:ILE:HD11	1:B:194:LEU:HD11	1.90	0.53
1:B:122:VAL:HB	1:B:160:ARG:HG2	1.89	0.53
1:B:180:THR:CG2	1:B:218:VAL:HA	2.37	0.53
3:D:2:ILE:CD1	3:D:92:SER:HB2	2.38	0.53
1:B:22:ILE:N	1:B:22:ILE:CD1	2.72	0.53
2:C:83:ILE:HD12	2:C:83:ILE:N	2.24	0.53
3:D:2:ILE:HD13	3:D:89:GLN:NE2	2.21	0.53
3:D:166:ASP:O	3:D:170:SER:HA	2.09	0.53
2:E:152:GLY:HA2	2:E:182:LEU:HD13	1.90	0.53
1:A:94:TYR:CZ	1:A:352:ALA:HB2	2.43	0.53
1:A:220:ILE:CD1	1:B:434:LEU:HD11	2.38	0.53
1:B:107:SER:N	4:B:475:BR:BR	2.94	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:207:HIS:NE2	2:C:209:ALA:HB3	2.24	0.53
1:B:109:ILE:CD1	4:B:474:BR:BR	3.12	0.53
1:B:127:VAL:HB	1:B:157:ASN:ND2	2.23	0.53
1:A:379:PHE:HB3	1:A:382:TYR:CD1	2.44	0.53
3:D:2:ILE:HD11	3:D:92:SER:HB2	1.91	0.53
3:F:8:PRO:O	3:F:101:THR:HG23	2.10	0.52
1:B:123:ARG:HE	1:B:126:ARG:HD2	1.75	0.52
1:B:171:ASP:HB3	1:B:212:LEU:HD13	1.91	0.52
1:A:357:PHE:HD1	4:A:474:BR:BR	2.47	0.52
1:B:148:GLU:HG2	1:B:357:PHE:HB3	1.92	0.52
2:E:47:TRP:CE3	3:F:95:GLN:OE1	2.63	0.52
3:F:2:ILE:HD11	3:F:92:SER:HB2	1.92	0.52
1:A:198:LEU:HD12	1:A:406:LEU:HG	1.90	0.52
1:B:68:LEU:HD21	1:B:82:ALA:HB2	1.92	0.52
1:B:143:MET:HA	1:B:302:CYS:SG	2.50	0.52
1:B:356:ILE:HG23	1:B:360:MET:HE1	1.91	0.52
2:E:51:ILE:CD1	2:E:72:ARG:HG2	2.40	0.52
1:B:381:GLN:H	1:B:381:GLN:NE2	1.94	0.52
2:E:17:SER:HB3	2:E:84:SER:HA	1.92	0.52
1:A:219:PHE:CE2	1:B:426:ILE:HD12	2.43	0.52
2:E:105:TYR:HD2	3:F:91:SER:HA	1.72	0.52
3:F:31:TYR:HA	3:F:50:THR:OG1	2.10	0.52
1:A:257:ILE:O	1:A:261:ILE:HG13	2.09	0.52
1:B:356:ILE:HG23	1:B:360:MET:CE	2.40	0.52
1:B:409:ILE:HG21	1:B:426:ILE:HD13	1.90	0.52
2:C:6:GLU:HA	2:C:22:CYS:HA	1.90	0.51
2:C:37:VAL:HG22	2:C:47:TRP:HA	1.92	0.51
1:A:112:ILE:HD13	1:A:152:VAL:HG12	1.92	0.51
1:A:107:SER:HB3	4:A:475:BR:BR	2.65	0.51
1:B:78:LEU:HA	1:B:81:VAL:HG22	1.91	0.51
1:B:150:PRO:CD	1:B:354:GLY:HA2	2.39	0.51
2:C:91:THR:HG23	2:C:118:THR:HA	1.91	0.51
3:D:17:ASP:H	3:D:77:MET:H	1.59	0.51
1:B:202:GLU:OE1	1:B:404:ALA:HB1	2.11	0.51
1:A:198:LEU:HD21	1:B:198:LEU:HD11	1.91	0.51
1:B:125:TRP:HD1	1:B:126:ARG:HG3	1.76	0.51
1:A:28:ARG:HD3	1:B:443:PRO:HG2	1.93	0.51
2:E:98:ARG:NH1	2:E:109:ASP:OD2	2.41	0.51
2:C:16:GLY:O	2:C:86:VAL:HG23	2.11	0.51
2:E:30:SER:O	2:E:32:TYR:N	2.44	0.51
2:C:158:VAL:HG12	2:C:207:HIS:HB2	1.93	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:F:7:SER:HB2	3:F:22:THR:CB	2.36	0.50
2:E:29:TYR:CD2	2:E:77:ASP:HA	2.47	0.50
3:F:95:GLN:CD	3:F:95:GLN:N	2.63	0.50
1:A:344:THR:HG22	1:A:356:ILE:HD11	1.94	0.50
1:B:124:TRP:CZ3	1:B:161:MET:HG3	2.46	0.50
1:B:98:ARG:HD2	1:B:291:TRP:CE3	2.46	0.50
3:D:149:ILE:HG12	3:D:191:TYR:CE2	2.47	0.50
3:F:93:HIS:ND1	3:F:94:PRO:HA	2.26	0.50
3:F:116:ILE:HD13	3:F:116:ILE:C	2.30	0.50
2:E:162:TRP:HZ3	2:E:218:ILE:CD1	2.19	0.50
2:E:170:GLY:O	2:E:189:VAL:HA	2.10	0.50
3:F:66:SER:HA	3:F:70:TYR:CZ	2.46	0.50
1:A:81:VAL:O	1:A:85:CYS:SG	2.66	0.50
1:A:319:LEU:HD12	1:A:320:ILE:HD13	1.93	0.50
3:D:116:ILE:HD12	3:D:208:PHE:CD2	2.47	0.50
3:D:118:PRO:HB3	3:D:208:PHE:CE1	2.46	0.50
3:D:124:LEU:HD22	3:D:182:LYS:HG3	1.93	0.50
1:B:119:GLN:HB3	1:B:453:LEU:HD11	1.93	0.50
2:E:72:ARG:HD3	2:E:74:ASN:OD1	2.12	0.50
3:F:48:TYR:CE2	3:F:52:LYS:HB2	2.46	0.50
1:B:42:VAL:O	1:B:46:VAL:HG23	2.12	0.50
1:B:147:ARG:N	1:B:148:GLU:OE2	2.44	0.50
2:E:107:TYR:HE2	3:F:48:TYR:HD1	1.60	0.50
1:B:409:ILE:HG21	1:B:426:ILE:HD11	1.93	0.50
2:E:34:MET:HB3	2:E:79:LEU:HD22	1.94	0.50
2:E:72:ARG:O	2:E:72:ARG:HG3	2.12	0.49
2:E:111:TRP:HE1	3:F:35:TYR:HE2	1.60	0.49
1:A:321:PRO:HB2	1:A:322:ILE:HD12	1.93	0.49
3:D:29:VAL:HG23	3:D:70:TYR:CE1	2.47	0.49
2:E:68:PHE:C	2:E:69:ILE:HD12	2.33	0.49
3:F:141:LYS:HB3	3:F:172:TYR:CE1	2.47	0.49
1:A:298:ILE:HD12	1:A:346:LEU:HD23	1.94	0.49
1:A:337:PHE:CE1	1:A:367:LEU:HB2	2.37	0.49
1:A:358:ALA:HB3	1:A:359:PRO:HD3	1.93	0.49
1:B:38:MET:O	1:B:41:VAL:HG13	2.12	0.49
2:E:104:GLY:O	2:E:106:TRP:CD1	2.65	0.49
3:F:80:GLU:HA	3:F:167:SER:O	2.12	0.49
1:A:176:THR:O	1:A:180:THR:HG23	2.12	0.49
1:B:124:TRP:HA	1:B:157:ASN:HD22	1.77	0.49
3:D:66:SER:HA	3:D:70:TYR:CZ	2.46	0.49
1:A:119:GLN:HB3	1:A:453:LEU:HD11	1.95	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:D:53:LEU:HD11	3:D:59:VAL:HA	1.95	0.49
3:F:6:GLN:NE2	3:F:87:CYS:H	2.11	0.49
3:F:107:ARG:NH2	3:F:110:ALA:HB2	2.27	0.49
1:B:422:ILE:HD12	1:B:425:MET:HE3	1.94	0.49
3:D:46:TRP:C	3:D:47:ILE:HD12	2.33	0.49
1:B:150:PRO:HD3	1:B:354:GLY:CA	2.42	0.49
1:A:91:MET:CG	1:A:296:GLY:HA3	2.43	0.48
1:A:274:LEU:O	1:A:277:GLN:HB2	2.13	0.48
1:B:109:ILE:N	1:B:110:PRO:CD	2.76	0.48
1:A:360:MET:HG2	1:A:397:LEU:HD12	1.94	0.48
2:E:6:GLU:HA	2:E:22:CYS:HA	1.94	0.48
2:E:69:ILE:HD12	2:E:69:ILE:N	2.28	0.48
1:B:360:MET:HG2	1:B:397:LEU:HD12	1.94	0.48
1:A:434:LEU:HD23	1:B:216:LYS:HD3	1.94	0.48
1:B:316:GLY:O	1:B:319:LEU:HG	2.12	0.48
3:F:143:ILE:HD11	3:F:195:ALA:HB1	1.95	0.48
1:B:110:PRO:CD	4:B:475:BR:BR	3.17	0.48
2:E:61:THR:O	2:E:63:SER:N	2.46	0.48
2:E:66:ASP:O	2:E:69:ILE:HD11	2.13	0.48
3:F:60:ARG:NH2	3:F:81:ASP:OD2	2.47	0.48
1:A:148:GLU:CG	1:A:190:PHE:CZ	2.97	0.48
1:A:274:LEU:HA	1:A:277:GLN:NE2	2.23	0.48
1:B:38:MET:HA	1:B:41:VAL:CG1	2.44	0.48
1:B:214:SER:O	1:B:218:VAL:HG23	2.14	0.48
3:F:29:VAL:HG11	3:F:89:GLN:HG2	1.95	0.48
3:F:78:GLU:O	3:F:81:ASP:HB2	2.14	0.48
1:A:65:MET:HA	1:A:65:MET:CE	2.43	0.48
1:A:324:THR:HG21	1:A:391:ILE:HD11	1.96	0.48
3:D:204:ILE:HD12	3:D:204:ILE:N	2.28	0.48
1:A:74:ASN:ND2	1:A:76:PRO:HD2	2.29	0.47
1:A:74:ASN:HD22	1:A:77:LEU:H	1.62	0.47
2:C:192:PRO:HD2	2:C:195:SER:HB2	1.96	0.47
3:D:47:ILE:HD12	3:D:47:ILE:N	2.29	0.47
3:F:148:LYS:HB2	3:F:192:THR:OG1	2.13	0.47
1:A:94:TYR:CE1	1:A:295:GLY:HA3	2.49	0.47
1:A:94:TYR:CD1	1:A:295:GLY:HA3	2.48	0.47
1:B:101:ALA:HB3	1:B:130:VAL:HG11	1.96	0.47
2:C:69:ILE:HD12	2:C:69:ILE:N	2.29	0.47
3:D:19:VAL:HG11	3:D:103:LEU:HD11	1.97	0.47
3:D:192:THR:HA	3:D:207:SER:CB	2.42	0.47
2:E:218:ILE:N	2:E:218:ILE:CD1	2.72	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:125:TRP:CD1	1:A:126:ARG:HG3	2.49	0.47
1:B:104:ALA:HB2	1:B:127:VAL:HG22	1.96	0.47
3:F:88:GLN:HB2	3:F:97:PHE:CD1	2.50	0.47
1:A:191:ASN:OD1	1:A:230:ARG:NH1	2.47	0.47
1:B:108:GLY:O	1:B:112:ILE:HD12	2.15	0.47
1:B:197:ILE:HD13	1:B:219:PHE:CD1	2.49	0.47
1:B:201:ILE:HD12	1:B:201:ILE:O	2.13	0.47
1:B:248:PRO:O	1:B:251:THR:HB	2.14	0.47
2:E:51:ILE:HD11	2:E:72:ARG:HG2	1.96	0.47
3:F:90:TRP:CG	3:F:95:GLN:HB3	2.49	0.47
1:A:18:ARG:HG3	1:B:119:GLN:OE1	2.14	0.47
1:A:75:TYR:HB3	1:A:76:PRO:HD3	1.96	0.47
1:A:252:LEU:HD13	1:B:227:ILE:HD12	1.97	0.47
1:A:422:ILE:HA	1:A:425:MET:HE3	1.97	0.47
2:E:129:VAL:O	2:E:216:LYS:HE3	2.14	0.47
1:A:86:SER:OG	1:A:303:GLY:HA3	2.15	0.47
2:C:162:TRP:CZ3	2:C:203:CYS:HB3	2.49	0.47
1:B:409:ILE:HD11	1:B:425:MET:O	2.15	0.47
3:F:90:TRP:CD2	3:F:95:GLN:HB3	2.49	0.47
1:A:195:ALA:CB	1:A:411:LEU:HD12	2.44	0.47
1:A:324:THR:HG23	1:A:391:ILE:CD1	2.45	0.47
2:C:171:VAL:HA	2:C:188:SER:O	2.15	0.47
2:C:171:VAL:HG22	2:C:189:VAL:HG23	1.96	0.47
1:A:356:ILE:HG23	1:A:360:MET:HE2	1.97	0.46
1:B:86:SER:HB3	1:B:299:GLY:O	2.15	0.46
3:D:18:LYS:HA	3:D:74:ILE:O	2.15	0.46
3:D:124:LEU:C	3:D:126:SER:N	2.68	0.46
1:A:356:ILE:HG23	1:A:360:MET:CE	2.44	0.46
1:B:251:THR:HG22	1:B:255:TYR:HE1	1.79	0.46
3:D:118:PRO:HA	3:D:119:PRO:HD2	1.80	0.46
2:E:107:TYR:CE2	3:F:48:TYR:HD1	2.33	0.46
1:A:250:ASN:OD1	2:C:104:GLY:HA3	2.15	0.46
1:A:87:ALA:O	1:A:91:MET:HG3	2.16	0.46
1:A:216:LYS:HE2	1:B:433:THR:CG2	2.45	0.46
3:D:158:VAL:O	3:D:159:LEU:HD23	2.15	0.46
1:B:336:ILE:O	1:B:340:ARG:HG3	2.15	0.46
3:D:36:GLN:HB2	3:D:85:TYR:HE2	1.81	0.46
3:F:186:GLU:HA	3:F:210:ARG:CZ	2.45	0.46
2:C:30:SER:O	2:C:32:TYR:N	2.49	0.46
1:A:252:LEU:HD22	1:A:427:ILE:HD12	1.97	0.46
1:A:270:ASN:HA	1:A:273:VAL:CG1	2.45	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:28:ARG:HB2	1:B:208:PHE:HZ	1.79	0.46
3:D:46:TRP:CB	3:D:47:ILE:HD12	2.45	0.46
3:F:87:CYS:O	3:F:98:GLY:N	2.49	0.46
1:B:22:ILE:H	1:B:22:ILE:CD1	2.29	0.46
2:C:68:PHE:C	2:C:69:ILE:HD12	2.36	0.46
2:E:200:THR:HG23	2:E:217:LYS:HE3	1.98	0.46
3:F:4:LEU:HD23	3:F:25:ALA:HB2	1.97	0.46
1:A:139:LEU:HD11	1:A:145:LEU:O	2.15	0.46
1:B:125:TRP:CD1	1:B:126:ARG:HG3	2.51	0.46
1:B:148:GLU:HG2	1:B:357:PHE:CB	2.46	0.46
1:B:264:ILE:HD12	1:B:265:PHE:N	2.31	0.46
1:A:318:ASN:O	1:A:322:ILE:CD1	2.60	0.45
1:A:430:LEU:CD2	1:B:219:PHE:HB3	2.45	0.45
3:F:25:ALA:O	3:F:68:THR:HG22	2.16	0.45
1:A:110:PRO:CD	4:A:475:BR:BR	3.19	0.45
1:A:148:GLU:HG2	1:A:190:PHE:CZ	2.51	0.45
1:B:124:TRP:CE3	1:B:161:MET:HG3	2.52	0.45
2:C:51:ILE:HG13	2:C:58:ILE:HG12	1.99	0.45
3:F:124:LEU:C	3:F:126:SER:H	2.20	0.45
3:F:189:ASN:HD22	3:F:189:ASN:C	2.19	0.45
1:B:94:TYR:CZ	1:B:352:ALA:HB2	2.51	0.45
3:F:1:ASP:HB3	3:F:94:PRO:HD2	1.99	0.45
3:F:136:ASN:HD22	3:F:173:SER:HB3	1.82	0.45
1:A:21:LEU:HD13	1:B:117:GLU:OE2	2.16	0.45
1:A:430:LEU:HD12	1:A:430:LEU:HA	1.71	0.45
1:B:197:ILE:HD13	1:B:219:PHE:CE1	2.51	0.45
1:B:409:ILE:HG13	1:B:426:ILE:HD13	1.99	0.45
3:D:189:ASN:ND2	3:D:211:ALA:H	2.15	0.45
1:A:122:VAL:HB	1:A:160:ARG:HG2	1.98	0.45
2:E:52:ASN:CB	2:E:53:PRO:CD	2.91	0.45
1:B:186:LEU:O	1:B:189:ALA:HB3	2.16	0.45
1:A:348:PHE:CG	1:A:356:ILE:HD13	2.52	0.44
3:D:35:TYR:HD2	3:D:45:ARG:HA	1.82	0.44
2:E:107:TYR:CE2	3:F:48:TYR:CD1	3.05	0.44
1:A:430:LEU:CD2	1:B:220:ILE:HD13	2.43	0.44
1:B:241:VAL:HG12	1:B:241:VAL:O	2.17	0.44
3:D:35:TYR:CD2	3:D:45:ARG:HA	2.52	0.44
1:A:42:VAL:O	1:A:46:VAL:HG23	2.17	0.44
3:F:48:TYR:CD2	3:F:52:LYS:HB2	2.52	0.44
3:D:6:GLN:NE2	3:D:87:CYS:H	2.16	0.44
3:D:60:ARG:CZ	3:D:78:GLU:HG2	2.47	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:94:TYR:CE1	1:A:295:GLY:CA	3.01	0.44
2:C:145:THR:HG22	3:D:117:PHE:HZ	1.83	0.44
1:A:274:LEU:HD23	1:A:277:GLN:HE22	1.82	0.44
1:B:163:LEU:HD12	1:B:168:LEU:HB2	2.00	0.44
2:E:162:TRP:CH2	2:E:203:CYS:HB3	2.52	0.44
1:A:129:PRO:O	1:A:133:PHE:HD2	2.00	0.44
1:B:234:HIS:HD1	1:B:235:GLU:HG2	1.81	0.44
2:E:65:LYS:H	2:E:65:LYS:HG3	1.64	0.44
3:F:34:TRP:HA	3:F:86:TYR:O	2.18	0.44
3:D:136:ASN:HD22	3:D:173:SER:HB3	1.83	0.44
3:D:144:ASN:HB2	3:D:196:THR:HB	1.98	0.44
1:A:219:PHE:CD2	1:B:430:LEU:HD13	2.53	0.43
1:A:244:LEU:HB2	1:A:418:ASN:OD1	2.18	0.43
1:B:264:ILE:HD12	1:B:264:ILE:C	2.38	0.43
1:B:274:LEU:HD21	1:B:448:ILE:CD1	2.44	0.43
3:D:19:VAL:HG11	3:D:103:LEU:CD1	2.48	0.43
1:A:203:GLU:OE2	1:A:445:PHE:HB2	2.18	0.43
2:C:143:MET:HB3	2:C:190:THR:CG2	2.49	0.43
1:A:109:ILE:N	1:A:110:PRO:CD	2.81	0.43
1:A:223:ILE:HG22	1:A:224:MET:N	2.33	0.43
1:A:422:ILE:CD1	1:B:194:LEU:HD11	2.48	0.43
1:B:91:MET:CG	1:B:296:GLY:HA3	2.48	0.43
1:B:211:THR:HG22	1:B:212:LEU:H	1.84	0.43
3:D:32:ILE:C	3:D:32:ILE:HD12	2.38	0.43
3:F:90:TRP:CZ2	3:F:95:GLN:NE2	2.87	0.43
1:A:91:MET:HG2	1:A:296:GLY:HA3	2.01	0.43
1:A:453:LEU:HD23	1:B:22:ILE:HD12	2.01	0.43
1:A:324:THR:CG2	1:A:391:ILE:HD11	2.49	0.43
2:C:127:PRO:HD2	2:C:212:THR:HG21	1.99	0.43
3:D:22:THR:HG22	3:D:23:CYS:N	2.33	0.43
3:D:36:GLN:HB2	3:D:85:TYR:CE2	2.53	0.43
2:E:9:GLY:H	2:E:115:THR:HG21	1.84	0.43
1:B:87:ALA:O	1:B:91:MET:HG3	2.18	0.42
1:B:148:GLU:HG3	1:B:190:PHE:CZ	2.53	0.42
1:B:273:VAL:CG1	1:B:444:LEU:HD21	2.49	0.42
2:E:197:PRO:HB3	2:E:220:PRO:HG3	2.00	0.42
1:A:423:LEU:HD23	1:B:227:ILE:HD13	2.00	0.42
1:B:108:GLY:H	1:B:110:PRO:HD2	1.84	0.42
2:E:35:SER:HB2	2:E:99:LEU:HD11	2.00	0.42
3:F:32:ILE:C	3:F:32:ILE:HD12	2.39	0.42
1:B:176:THR:O	1:B:180:THR:HG23	2.18	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:201:ILE:HG23	1:B:215:ILE:HD11	1.93	0.42
3:D:2:ILE:HD11	3:D:92:SER:CB	2.48	0.42
1:A:267:PRO:HB3	1:A:441:GLY:HA3	2.02	0.42
3:F:141:LYS:HB2	3:F:141:LYS:HE3	1.79	0.42
1:A:128:LEU:HB2	1:A:129:PRO:HD3	2.00	0.42
1:A:269:PHE:O	1:A:273:VAL:HG12	2.20	0.42
1:A:22:ILE:HD12	1:B:450:ALA:HA	2.00	0.42
3:D:12:SER:HB3	3:D:106:LEU:HB2	2.02	0.42
1:A:108:GLY:H	1:A:110:PRO:HD2	1.84	0.42
2:C:38:ARG:CG	2:C:48:ILE:HD11	2.50	0.42
2:C:143:MET:HB3	2:C:190:THR:HG22	2.02	0.42
3:D:124:LEU:O	3:D:126:SER:N	2.53	0.42
1:A:294:MET:O	1:A:298:ILE:HG12	2.20	0.42
1:B:251:THR:HG22	1:B:255:TYR:CE1	2.54	0.42
3:D:34:TRP:HB2	3:D:47:ILE:HB	2.02	0.42
2:E:130:TYR:CE2	3:F:123:GLN:HG3	2.55	0.42
1:A:38:MET:O	1:A:42:VAL:HG23	2.19	0.42
2:E:192:PRO:O	2:E:195:SER:HB3	2.20	0.42
3:F:191:TYR:HB2	3:F:208:PHE:CE2	2.55	0.42
1:B:159:GLY:HA3	1:B:177:LEU:O	2.20	0.41
1:B:255:TYR:CE2	1:B:424:PRO:HB3	2.55	0.41
1:B:330:MET:HE2	1:B:330:MET:O	2.20	0.41
2:C:132:LEU:HD13	3:D:132:VAL:HG11	2.02	0.41
2:C:4:LEU:HD21	2:C:27:PHE:HZ	1.85	0.41
2:E:33:TRP:HB3	2:E:99:LEU:HD12	2.02	0.41
1:B:46:VAL:HA	1:B:158:ILE:HD13	2.01	0.41
2:C:129:VAL:O	2:C:216:LYS:HE3	2.20	0.41
3:F:6:GLN:HE22	3:F:86:TYR:HA	1.86	0.41
3:F:32:ILE:HD11	3:F:34:TRP:NE1	2.35	0.41
1:A:107:SER:O	1:A:131:LYS:NZ	2.53	0.41
3:D:123:GLN:O	3:D:126:SER:HB2	2.21	0.41
2:E:127:PRO:CB	2:E:153:TYR:HB3	2.45	0.41
1:A:437:GLN:NE2	1:B:31:THR:H	2.19	0.41
1:B:299:GLY:O	1:B:302:CYS:HB2	2.21	0.41
3:D:46:TRP:HB3	3:D:47:ILE:CD1	2.47	0.41
1:A:147:ARG:N	1:A:148:GLU:OE2	2.54	0.41
1:A:272:TRP:O	1:A:276:MET:HB2	2.21	0.41
1:A:409:ILE:HD13	1:A:409:ILE:HA	1.95	0.41
1:B:120:ARG:HE	1:B:120:ARG:HB3	1.59	0.41
1:B:127:VAL:O	1:B:128:LEU:C	2.59	0.41
1:B:223:ILE:CD1	1:B:223:ILE:H	2.34	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:356:ILE:HG12	1:B:360:MET:HG3	2.03	0.41
2:C:20:LEU:HD12	2:C:81:LEU:HD23	2.03	0.41
3:D:17:ASP:OD1	3:D:18:LYS:N	2.54	0.41
1:A:108:GLY:O	1:A:112:ILE:HD12	2.20	0.41
1:A:284:HIS:O	1:A:290:LYS:HD2	2.21	0.41
2:C:167:LEU:HD21	2:C:191:VAL:CG1	2.49	0.41
2:E:130:TYR:HE2	2:E:151:LYS:HD3	1.86	0.41
3:F:188:HIS:O	3:F:210:ARG:NE	2.53	0.41
3:F:93:HIS:CG	3:F:94:PRO:HA	2.56	0.40
3:F:129:ALA:HB3	3:F:180:LEU:HB2	2.03	0.40
3:F:194:GLU:HG2	3:F:205:VAL:HG12	2.03	0.40
1:A:420:GLN:NE2	1:A:421:LEU:HG	2.33	0.40
1:B:200:ILE:HG22	1:B:201:ILE:HG23	2.04	0.40
3:D:34:TRP:CZ3	3:D:87:CYS:HB3	2.57	0.40
3:D:149:ILE:CD1	3:D:154:ARG:HG2	2.51	0.40
1:A:384:LEU:HD22	1:A:389:PHE:CE1	2.56	0.40
1:B:122:VAL:HG21	1:B:160:ARG:HD3	2.04	0.40
2:C:178:LEU:HB2	2:C:183:TYR:CE2	2.57	0.40
2:E:22:CYS:HB3	2:E:79:LEU:HB3	2.03	0.40
2:E:189:VAL:HG13	2:E:189:VAL:O	2.20	0.40
1:A:422:ILE:HA	1:A:425:MET:CE	2.52	0.40
1:B:231:ILE:HG22	1:B:232:PHE:CD1	2.55	0.40
1:B:408:GLY:O	1:B:412:VAL:HG23	2.22	0.40
2:C:86:VAL:HG12	2:C:119:VAL:HG11	2.04	0.40
2:E:107:TYR:HE2	3:F:48:TYR:CD1	2.38	0.40
1:A:453:LEU:HD23	1:B:22:ILE:CD1	2.52	0.40
1:B:314:GLY:O	1:B:340:ARG:NH2	2.53	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	442/473 (93%)	405 (92%)	35 (8%)	2 (0%)	29	61
1	B	439/473 (93%)	404 (92%)	33 (8%)	2 (0%)	29	61
2	C	219/221 (99%)	193 (88%)	22 (10%)	4 (2%)	8	32
2	E	219/221 (99%)	181 (83%)	31 (14%)	7 (3%)	4	22
3	D	209/211 (99%)	181 (87%)	23 (11%)	5 (2%)	6	28
3	F	209/211 (99%)	188 (90%)	18 (9%)	3 (1%)	11	37
All	All	1737/1810 (96%)	1552 (89%)	162 (9%)	23 (1%)	12	39

All (23) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
3	D	169	ASP
2	E	62	PRO
3	F	7	SER
1	A	74	ASN
1	B	74	ASN
3	D	80	GLU
3	D	125	THR
2	E	31	ARG
2	E	164	SER
2	C	62	PRO
2	E	140	ALA
1	A	73	ASP
2	C	91	THR
2	C	109	ASP
2	C	141	ALA
2	E	65	LYS
3	F	45	ARG
3	F	76	THR
3	D	50	THR
3	D	76	THR
2	E	194	SER
1	B	132	PHE
2	E	104	GLY

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	335/358 (94%)	308 (92%)	27 (8%)	11 38
1	B	332/358 (93%)	308 (93%)	24 (7%)	14 43
2	C	181/181 (100%)	165 (91%)	16 (9%)	10 33
2	E	181/181 (100%)	167 (92%)	14 (8%)	13 40
3	D	185/185 (100%)	172 (93%)	13 (7%)	15 44
3	F	185/185 (100%)	168 (91%)	17 (9%)	9 31
All	All	1399/1448 (97%)	1288 (92%)	111 (8%)	12 39

All (111) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	17	ARG
1	A	65	MET
1	A	73	ASP
1	A	74	ASN
1	A	96	LEU
1	A	109	ILE
1	A	136	LEU
1	A	147	ARG
1	A	180	THR
1	A	207	GLN
1	A	211	THR
1	A	219	PHE
1	A	223	ILE
1	A	230	ARG
1	A	238	LEU
1	A	244	LEU
1	A	322	ILE
1	A	340	ARG
1	A	357	PHE
1	A	376	VAL
1	A	381	GLN
1	A	397	LEU
1	A	420	GLN
1	A	426	ILE
1	A	433	THR
1	A	435	LEU
1	A	451	ARG

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Mol	Chain	Res	Type
1	B	22	ILE
1	B	62	ASN
1	B	65	MET
1	B	73	ASP
1	B	74	ASN
1	B	96	LEU
1	B	122	VAL
1	B	211	THR
1	B	219	PHE
1	B	230	ARG
1	B	244	LEU
1	B	273	VAL
1	B	288	ILE
1	B	324	THR
1	B	338	VAL
1	B	357	PHE
1	B	381	GLN
1	B	397	LEU
1	B	402	ILE
1	B	420	GLN
1	B	435	LEU
1	B	444	LEU
1	B	448	ILE
1	B	451	ARG
2	C	54	VAL
2	C	63	SER
2	C	66	ASP
2	C	98	ARG
2	C	100	TYR
2	C	115	THR
2	C	118	THR
2	C	128	SER
2	C	151	LYS
2	C	167	LEU
2	C	178	LEU
2	C	185	LEU
2	C	193	SER
2	C	200	THR
2	C	204	ASN
2	C	219	VAL
3	D	2	ILE
3	D	5	THR

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Mol	Chain	Res	Type
3	D	28	SER
3	D	46	TRP
3	D	59	VAL
3	D	76	THR
3	D	95	GLN
3	D	116	ILE
3	D	142	ASP
3	D	145	VAL
3	D	164	ASP
3	D	192	THR
3	D	201	THR
2	E	2	VAL
2	E	6	GLU
2	E	30	SER
2	E	51	ILE
2	E	55	SER
2	E	72	ARG
2	E	84	SER
2	E	96	CYS
2	E	115	THR
2	E	151	LYS
2	E	167	LEU
2	E	193	SER
2	E	198	SER
2	E	218	ILE
3	F	1	ASP
3	F	5	THR
3	F	27	SER
3	F	53	LEU
3	F	68	THR
3	F	72	LEU
3	F	92	SER
3	F	95	GLN
3	F	105	ILE
3	F	116	ILE
3	F	121	SER
3	F	125	THR
3	F	143	ILE
3	F	161	SER
3	F	181	THR
3	F	189	ASN
3	F	207	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (27) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	74	ASN
1	A	119	GLN
1	A	153	GLN
1	A	157	ASN
1	A	207	GLN
1	A	270	ASN
1	A	277	GLN
1	A	327	ASN
1	A	381	GLN
1	A	420	GLN
1	B	62	ASN
1	B	74	ASN
1	B	157	ASN
1	B	270	ASN
1	B	277	GLN
1	B	287	ASN
1	B	327	ASN
1	B	381	GLN
1	B	383	HIS
1	B	420	GLN
1	B	437	GLN
2	C	163	ASN
3	D	6	GLN
3	D	136	ASN
3	D	189	ASN
3	F	6	GLN
3	F	136	ASN

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 (i)

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 (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

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	444/473 (93%)	-0.24	2 (0%)	91	90	76, 122, 168, 207	0
1	B	441/473 (93%)	-0.12	11 (2%)	57	55	62, 128, 179, 210	0
2	C	221/221 (100%)	0.03	12 (5%)	25	26	65, 115, 178, 200	0
2	E	221/221 (100%)	-0.12	6 (2%)	54	53	59, 112, 169, 195	0
3	D	211/211 (100%)	0.13	6 (2%)	53	51	75, 136, 178, 194	0
3	F	211/211 (100%)	0.02	8 (3%)	40	39	54, 108, 167, 203	0
All	All	1749/1810 (96%)	-0.08	45 (2%)	56	54	54, 122, 174, 210	0

All (45) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	C	139	ALA	7.0
2	C	137	ALA	5.5
2	C	138	ALA	4.4
3	D	87	CYS	4.4
2	E	35	SER	4.2
1	B	73	ASP	3.9
3	D	79	ALA	3.5
1	A	212	LEU	3.4
2	C	140	ALA	3.2
1	B	279	LEU	3.2
2	C	35	SER	3.2
2	C	136	SER	3.2
3	F	155	GLN	3.0
3	F	87	CYS	3.0
3	F	127	GLY	2.9
1	B	119	GLN	2.9
2	E	148	CYS	2.8
2	E	14	PRO	2.8
2	E	121	SER	2.7

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Mol	Chain	Res	Type	RSRZ
1	B	157	ASN	2.7
3	D	1	ASP	2.6
1	B	280	LEU	2.6
1	B	125	TRP	2.6
1	B	368	GLY	2.6
2	C	113	ALA	2.5
2	E	65	LYS	2.5
2	C	135	GLY	2.5
1	B	18	ARG	2.5
2	E	179	GLN	2.4
1	A	235	GLU	2.4
2	C	65	LYS	2.4
1	B	458	ALA	2.3
3	D	126	SER	2.3
3	D	34	TRP	2.3
1	B	289	THR	2.3
3	F	33	HIS	2.2
2	C	2	VAL	2.2
1	B	113	GLU	2.2
2	C	75	ALA	2.1
2	C	96	CYS	2.1
3	F	151	GLY	2.1
3	F	69	SER	2.1
3	F	156	ASN	2.0
3	F	86	TYR	2.0
3	D	133	CYS	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 monosaccharides 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, 95^{th} 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(Å^2)	Q<0.9
4	BR	B	474	1/1	0.61	0.37	96,96,96,96	0
4	BR	A	474	1/1	0.77	0.43	96,96,96,96	0
4	BR	B	475	1/1	0.94	0.27	86,86,86,86	0
4	BR	A	475	1/1	0.97	0.37	86,86,86,86	0

6.5 Other polymers (i)

There are no such residues in this entry.