Full wwPDB X-ray Structure Validation Report ⓘ

Mar 5, 2026 – 05:44 PM UTC

PDB ID	:	8RLJ / pdb_00008rlj
Title	:	Structure of the apo form of PIB-1 in an Orthorombic space group
Authors	:	Medrano, F.J.; Romero, A.
Deposited on	:	2024-01-03
Resolution	:	2.45 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:

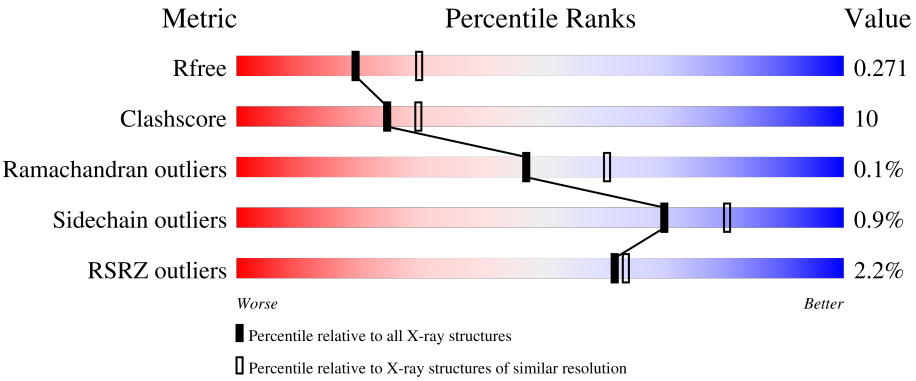
MolProbity	:	4-5-2 with Phenix2.0
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 2.45 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	1190 (2.46-2.46)
Clashscore	190562	1229 (2.46-2.46)
Ramachandran outliers	187476	1218 (2.46-2.46)
Sidechain outliers	187428	1218 (2.46-2.46)
RSRZ outliers	180081	1190 (2.46-2.46)

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	391	2% 68% 19% · 12%
1	B	391	% 78% 21% ·
1	C	391	% 82% 16% ··
1	D	391	% 77% 20% ··
1	E	391	% 78% 20% ··

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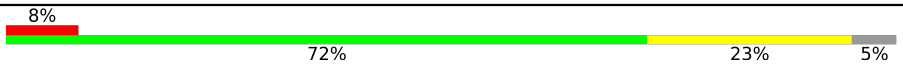
Mol	Chain	Length	Quality of chain
1	F	391	

2 Entry composition (i)

There are 2 unique types of molecules in this entry. The entry contains 18086 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 Class C beta-lactamase-related serine hydrolase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	346	Total	C	N	O	S	0	0	0
			2739	1730	488	514	7			
1	B	385	Total	C	N	O	S	0	0	0
			3041	1927	536	571	7			
1	C	386	Total	C	N	O	S	0	0	0
			3048	1932	537	572	7			
1	D	382	Total	C	N	O	S	0	0	0
			3020	1916	533	564	7			
1	E	383	Total	C	N	O	S	0	0	0
			3033	1923	534	569	7			
1	F	372	Total	C	N	O	S	0	0	0
			2953	1874	520	552	7			

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	25	PRO	ALA	cloning artifact	UNP A0A1J0J3U4
B	25	PRO	ALA	cloning artifact	UNP A0A1J0J3U4
C	25	PRO	ALA	cloning artifact	UNP A0A1J0J3U4
D	25	PRO	ALA	cloning artifact	UNP A0A1J0J3U4
E	25	PRO	ALA	cloning artifact	UNP A0A1J0J3U4
F	25	PRO	ALA	cloning artifact	UNP A0A1J0J3U4

- Molecule 2 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	37	Total	O	0	0
			37	37		
2	B	43	Total	O	0	0
			43	43		
2	C	63	Total	O	0	0
			63	63		

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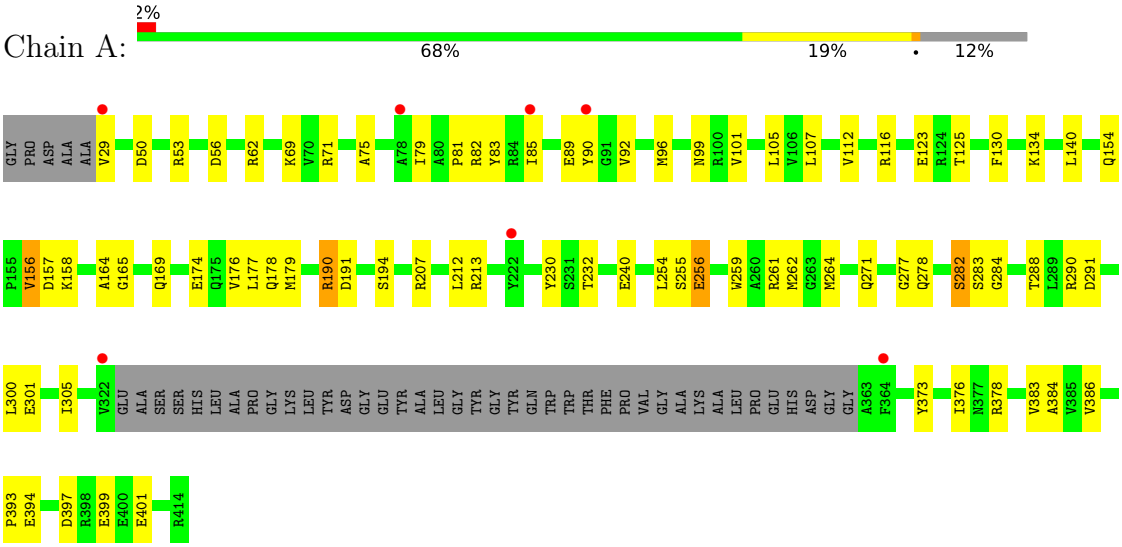
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	D	51	Total O 51 51	0	0
2	E	35	Total O 35 35	0	0
2	F	23	Total O 23 23	0	0

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.

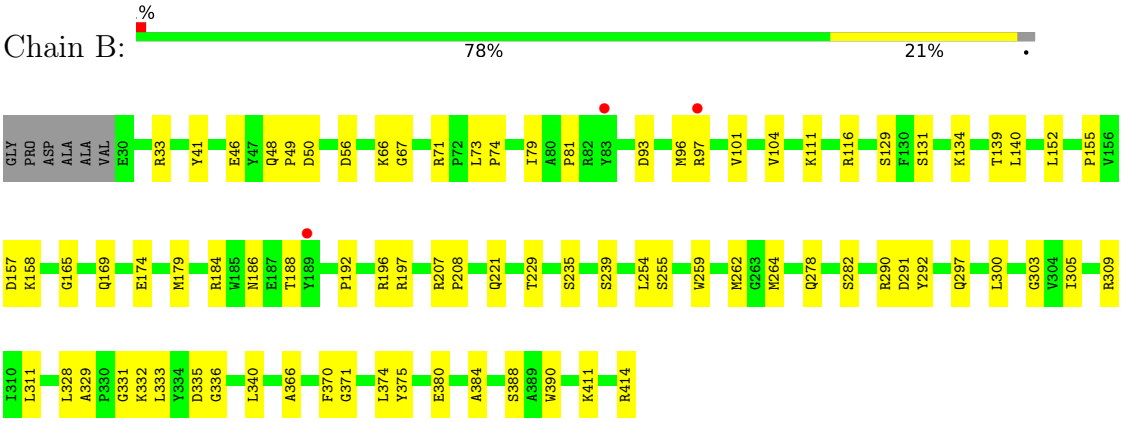
• Molecule 1: Class C beta-lactamase-related serine hydrolase

Chain A:



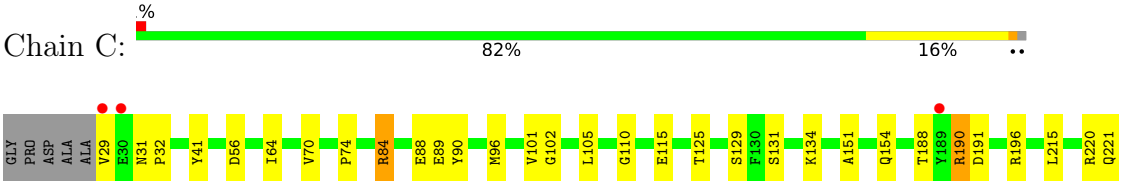
• Molecule 1: Class C beta-lactamase-related serine hydrolase

Chain B:



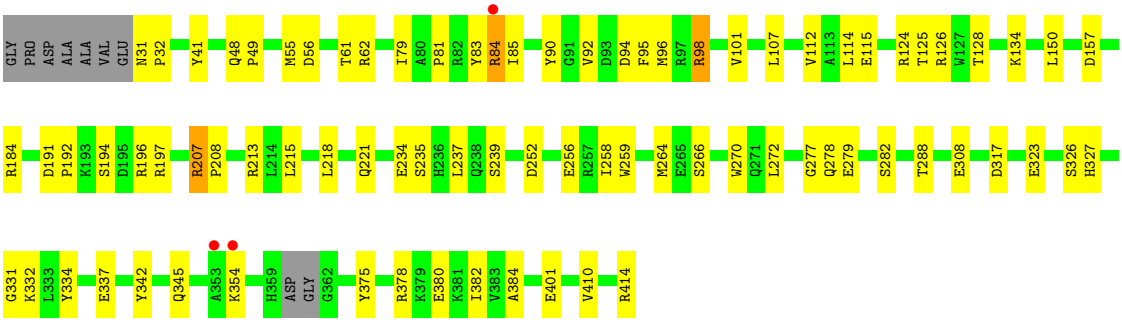
• Molecule 1: Class C beta-lactamase-related serine hydrolase

Chain C:



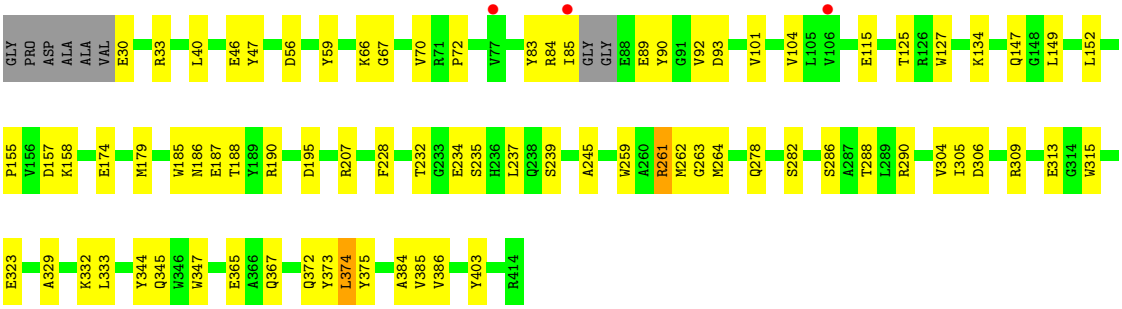
• Molecule 1: Class C beta-lactamase-related serine hydrolase

Chain D:



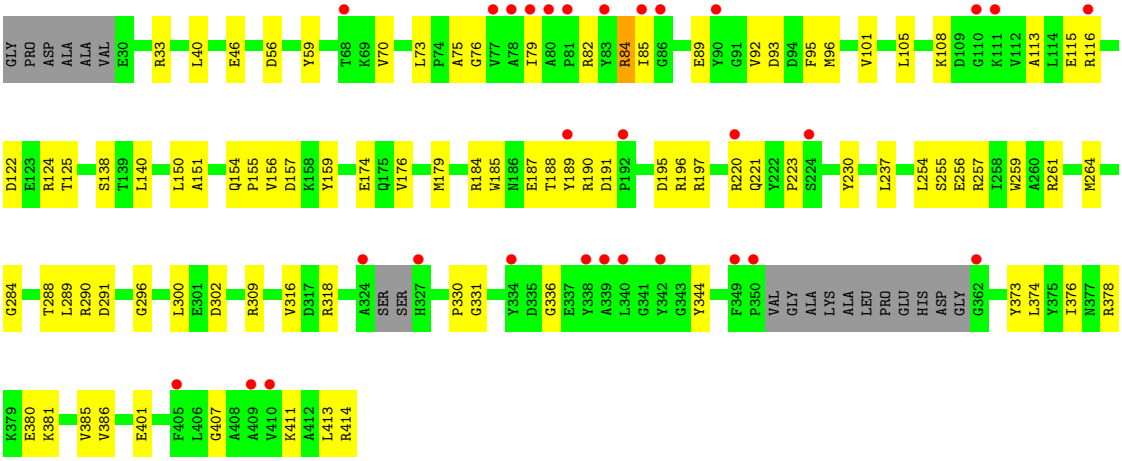
• Molecule 1: Class C beta-lactamase-related serine hydrolase

Chain E:



• Molecule 1: Class C beta-lactamase-related serine hydrolase

Chain F:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	77.76Å 100.82Å 269.67Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	49.55 – 2.45 49.55 – 2.45	Depositor EDS
% Data completeness (in resolution range)	99.8 (49.55-2.45) 89.4 (49.55-2.45)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	0.64 (at 2.45Å)	Xtriage
Refinement program	PHENIX dev_4746, PHENIX dev_4746	Depositor
R, R_{free}	0.222 , 0.271 0.222 , 0.271	Depositor DCC
R_{free} test set	2000 reflections (2.53%)	wwPDB-VP
Wilson B-factor (Å^2)	37.2	Xtriage
Anisotropy	0.464	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.34 , 36.9	EDS
L-test for twinning[2]	$< \|L\| > = 0.47$, $< L^2 > = 0.29$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.93	EDS
Total number of atoms	18086	wwPDB-VP
Average B, all atoms (Å^2)	51.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.64% 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	0.41	0/2800	0.64	0/3790
1	B	0.45	0/3117	0.74	0/4225
1	C	0.43	0/3124	0.65	0/4235
1	D	0.46	0/3095	0.73	1/4194 (0.0%)
1	E	0.39	1/3108 (0.0%)	0.61	0/4212
1	F	0.44	0/3025	0.71	0/4097
All	All	0.43	1/18269 (0.0%)	0.68	1/24753 (0.0%)

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	B	0	1
1	C	0	3
1	D	0	5
1	E	0	2
1	F	0	3
All	All	0	15

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	E	374	LEU	C-N	-5.45	1.25	1.33

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	D	327	HIS	N-CA-C	-5.51	106.54	113.20

There are no chirality outliers.

All (15) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	190	ARG	Sidechain
1	B	309	ARG	Sidechain
1	C	190	ARG	Sidechain
1	C	261	ARG	Sidechain
1	C	84	ARG	Sidechain
1	D	124	ARG	Sidechain
1	D	207	ARG	Sidechain
1	D	213	ARG	Sidechain
1	D	84	ARG	Sidechain
1	D	98	ARG	Sidechain
1	E	207	ARG	Sidechain
1	E	261	ARG	Sidechain
1	F	190	ARG	Sidechain
1	F	220	ARG	Sidechain
1	F	84	ARG	Sidechain

5.2 Too-close contacts (i)

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	2739	0	2696	67	0
1	B	3041	0	2964	54	1
1	C	3048	0	2973	55	0
1	D	3020	0	2950	68	0
1	E	3033	0	2957	55	0
1	F	2953	0	2877	82	1
2	A	37	0	0	1	0
2	B	43	0	0	2	0
2	C	63	0	0	1	0
2	D	51	0	0	3	0
2	E	35	0	0	1	0
2	F	23	0	0	3	0
All	All	18086	0	17417	347	1

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 10.

All (347) 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:164:ALA:HB3	1:D:354:LYS:CE	1.46	1.42
1:A:164:ALA:CB	1:D:354:LYS:HE3	1.47	1.41
1:B:93:ASP:HB3	1:B:97:ARG:NH1	1.40	1.32
1:C:221:GLN:HG3	1:D:84:ARG:NH1	1.46	1.29
1:F:184:ARG:CZ	1:F:221:GLN:CD	2.07	1.25
1:F:184:ARG:NH1	1:F:221:GLN:CD	1.97	1.22
1:C:221:GLN:CG	1:D:84:ARG:HH12	1.53	1.21
1:F:184:ARG:HH12	1:F:221:GLN:NE2	1.43	1.13
1:F:184:ARG:NH1	1:F:221:GLN:NE2	1.97	1.11
1:C:261:ARG:HH11	1:C:308:GLU:CD	1.59	1.10
1:C:261:ARG:NH1	1:C:308:GLU:OE2	1.86	1.08
1:D:85:ILE:HD11	1:D:401:GLU:HG3	1.36	1.06
1:A:164:ALA:CB	1:D:354:LYS:CE	2.17	1.06
1:B:93:ASP:CB	1:B:97:ARG:HH12	1.73	1.02
1:F:184:ARG:NH1	1:F:221:GLN:OE1	1.94	0.99
1:A:29:VAL:HG13	1:F:76:GLY:O	1.60	0.99
1:A:164:ALA:HB1	1:D:354:LYS:HE3	1.39	0.98
1:B:93:ASP:HB3	1:B:97:ARG:HH12	0.80	0.96
1:B:33:ARG:HH11	1:B:46:GLU:HB2	1.28	0.95
1:A:164:ALA:HB3	1:D:354:LYS:HE3	1.02	0.94
1:F:184:ARG:NH2	1:F:221:GLN:HG3	1.81	0.94
1:D:85:ILE:CD1	1:D:401:GLU:CD	2.44	0.91
1:F:184:ARG:HH12	1:F:221:GLN:HE22	1.11	0.91
1:C:261:ARG:NH1	1:C:308:GLU:CD	2.28	0.90
1:A:75:ALA:HB3	1:E:313:GLU:OE1	1.72	0.88
1:A:29:VAL:CG1	1:F:76:GLY:O	2.23	0.87
1:C:221:GLN:HG3	1:D:84:ARG:HH12	0.73	0.84
1:C:84:ARG:NH2	1:C:89:GLU:OE1	2.11	0.84
1:C:261:ARG:HD3	1:C:308:GLU:OE1	1.78	0.83
1:D:85:ILE:HD11	1:D:401:GLU:CG	2.09	0.81
1:B:33:ARG:NH1	1:B:46:GLU:HB2	1.94	0.81
1:F:184:ARG:NH2	1:F:221:GLN:CD	2.37	0.81
1:D:62:ARG:NH2	1:D:277:GLY:O	2.13	0.80
1:F:184:ARG:NH2	1:F:221:GLN:CG	2.44	0.80
1:D:126:ARG:NH1	2:D:501:HOH:O	2.13	0.80
1:A:134:LYS:NZ	1:A:230:TYR:OH	2.14	0.79
1:A:164:ALA:HB3	1:D:354:LYS:NZ	1.98	0.78
1:D:79:ILE:HD12	1:D:81:PRO:HG3	1.66	0.78
1:A:75:ALA:CB	1:E:313:GLU:OE1	2.32	0.77
1:F:184:ARG:CZ	1:F:221:GLN:OE1	2.27	0.77
1:D:85:ILE:HD13	1:D:401:GLU:CD	2.08	0.77

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:92:VAL:HG21	1:F:116:ARG:HD2	1.67	0.76
1:F:116:ARG:NH2	2:F:502:HOH:O	2.18	0.76
1:E:85:ILE:HG22	1:E:90:TYR:HE2	1.51	0.76
1:F:184:ARG:HG3	1:F:221:GLN:OE1	1.85	0.76
1:A:164:ALA:CB	1:D:354:LYS:HE2	2.16	0.75
1:B:329:ALA:HB3	1:B:332:LYS:HD2	1.69	0.74
1:B:158:LYS:NZ	2:B:502:HOH:O	2.21	0.73
1:B:93:ASP:CB	1:B:97:ARG:NH1	2.36	0.73
1:C:29:VAL:CG1	1:F:309:ARG:NH2	2.51	0.73
1:C:265:GLU:HG3	1:C:294:ARG:CZ	2.18	0.73
1:C:261:ARG:NH1	1:C:308:GLU:OE1	2.15	0.72
1:F:92:VAL:CG2	1:F:116:ARG:HD2	2.21	0.71
1:F:318:ARG:HD3	1:F:344:TYR:OH	1.91	0.71
1:E:134:LYS:HE2	1:E:282:SER:HB2	1.72	0.70
1:A:85:ILE:HB	1:A:90:TYR:HE2	1.55	0.70
1:D:55:MET:HE2	1:D:128:THR:HG21	1.74	0.69
1:F:82:ARG:HD2	1:F:89:GLU:OE2	1.92	0.69
1:D:259:TRP:HA	1:D:264:MET:HG2	1.75	0.68
1:F:184:ARG:CZ	1:F:221:GLN:CG	2.71	0.68
1:D:317:ASP:OD1	1:D:378:ARG:NH1	2.27	0.67
1:B:303:GLY:HA3	1:B:311:LEU:HB2	1.76	0.67
1:B:93:ASP:OD1	1:B:116:ARG:NH1	2.27	0.67
1:B:104:VAL:HG12	1:B:116:ARG:HB2	1.75	0.67
1:F:122:ASP:OD2	1:F:124:ARG:NH1	2.27	0.67
1:D:380:GLU:OE2	1:D:414:ARG:NH1	2.28	0.67
1:B:380:GLU:OE2	1:B:414:ARG:NH1	2.28	0.67
1:A:92:VAL:HG23	2:A:503:HOH:O	1.94	0.66
1:B:411:LYS:HA	1:B:414:ARG:HG3	1.77	0.66
1:B:375:TYR:HB3	1:B:384:ALA:HB3	1.78	0.66
1:C:134:LYS:HE2	1:C:282:SER:HB2	1.76	0.66
1:C:329:ALA:HB3	1:C:332:LYS:HD2	1.77	0.66
1:A:164:ALA:HB3	1:D:354:LYS:HE2	1.65	0.65
1:D:191:ASP:HB3	1:D:194:SER:HB3	1.79	0.65
1:D:85:ILE:CD1	1:D:401:GLU:CG	2.73	0.65
1:F:184:ARG:CZ	1:F:221:GLN:NE2	2.47	0.65
1:E:374:LEU:HD13	1:E:385:VAL:HG22	1.79	0.65
1:F:256:GLU:OE1	1:F:257:ARG:NE	2.24	0.65
1:E:85:ILE:HG22	1:E:90:TYR:CE2	2.32	0.65
1:D:134:LYS:NZ	1:D:282:SER:O	2.29	0.64
1:D:92:VAL:HG23	2:D:512:HOH:O	1.98	0.62
1:F:79:ILE:HG12	1:F:113:ALA:HB1	1.80	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:83:TYR:HE2	1:D:85:ILE:HD11	1.65	0.61
1:A:71:ARG:NH2	1:A:301:GLU:OE2	2.33	0.61
1:B:165:GLY:O	2:B:501:HOH:O	2.16	0.61
1:A:262:MET:HB3	1:A:305:ILE:HD13	1.82	0.61
1:F:115:GLU:OE1	1:F:290:ARG:NH2	2.34	0.60
1:A:154:GLN:HG3	1:A:158:LYS:HD3	1.82	0.60
1:F:184:ARG:NH2	1:F:221:GLN:NE2	2.50	0.60
1:E:92:VAL:HG23	1:E:93:ASP:N	2.17	0.59
1:D:83:TYR:HE2	1:D:85:ILE:CD1	2.16	0.59
1:B:239:SER:OG	1:B:278:GLN:NE2	2.31	0.59
1:C:235:SER:HB3	1:C:282:SER:HB3	1.83	0.59
1:A:256:GLU:OE2	1:A:261:ARG:NH2	2.35	0.58
1:E:375:TYR:HB3	1:E:384:ALA:HB3	1.84	0.58
1:F:140:LEU:HD11	1:F:254:LEU:HB2	1.85	0.58
1:E:92:VAL:HG23	1:E:93:ASP:H	1.68	0.58
1:A:75:ALA:HB2	1:E:313:GLU:CD	2.29	0.58
1:E:66:LYS:NZ	1:E:67:GLY:O	2.29	0.58
1:F:184:ARG:NH1	1:F:221:GLN:HE22	1.83	0.58
1:B:41:TYR:OH	1:B:196:ARG:NH2	2.36	0.58
1:F:300:LEU:HD12	1:F:378:ARG:HG2	1.85	0.58
1:F:196:ARG:NH1	2:F:501:HOH:O	2.15	0.58
1:A:174:GLU:OE2	1:A:178:GLN:NE2	2.37	0.58
1:A:123:GLU:HG3	1:A:290:ARG:HH22	1.68	0.57
1:D:41:TYR:OH	1:D:196:ARG:NH2	2.37	0.57
1:F:95:PHE:CE2	1:F:101:VAL:HG21	2.39	0.57
1:C:261:ARG:HD3	1:C:308:GLU:CD	2.28	0.57
1:D:85:ILE:CD1	1:D:401:GLU:HG3	2.22	0.57
1:D:85:ILE:CD1	1:D:401:GLU:OE2	2.52	0.57
1:A:169:GLN:HG2	1:D:332:LYS:HE3	1.85	0.57
1:B:331:GLY:O	1:B:336:GLY:HA2	2.05	0.57
1:D:96:MET:HA	1:D:101:VAL:HB	1.87	0.57
1:E:313:GLU:HG3	2:E:527:HOH:O	2.05	0.56
1:A:82:ARG:NH1	1:A:89:GLU:HG2	2.21	0.56
1:E:365:GLU:OE2	1:E:403:TYR:OH	2.24	0.56
1:E:374:LEU:CD1	1:E:385:VAL:HG22	2.36	0.55
1:F:155:PRO:HB2	1:F:157:ASP:OD1	2.06	0.55
1:D:215:LEU:HA	1:D:218:LEU:HD13	1.89	0.55
1:E:304:VAL:HG12	1:E:309:ARG:HG2	1.89	0.55
1:F:122:ASP:OD1	1:F:124:ARG:HG2	2.06	0.55
1:E:40:LEU:HB2	1:E:59:TYR:OH	2.07	0.55
1:F:302:ASP:HA	1:F:316:VAL:HG21	1.89	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:300:LEU:HD11	1:F:381:LYS:HA	1.88	0.55
1:A:75:ALA:CB	1:E:313:GLU:CD	2.80	0.54
1:E:185:TRP:CZ3	1:E:195:ASP:HB3	2.42	0.54
1:F:374:LEU:HD13	1:F:385:VAL:HG22	1.89	0.54
1:C:265:GLU:HG3	1:C:294:ARG:NH2	2.23	0.54
1:F:108:LYS:HB2	1:F:413:LEU:HD13	1.89	0.54
1:B:104:VAL:CG1	1:B:116:ARG:HB2	2.37	0.54
1:D:184:ARG:O	1:D:218:LEU:HD23	2.08	0.53
1:A:50:ASP:OD1	1:A:53:ARG:NH2	2.42	0.53
1:C:221:GLN:CD	1:D:84:ARG:HH12	2.15	0.53
1:F:256:GLU:OE2	1:F:261:ARG:NH2	2.42	0.53
1:B:79:ILE:HD12	1:B:81:PRO:HD3	1.90	0.53
1:B:235:SER:HB3	1:B:282:SER:HB3	1.90	0.53
1:C:151:ALA:HB3	1:C:154:GLN:HG2	1.90	0.53
1:A:62:ARG:NH2	1:A:277:GLY:O	2.32	0.53
1:A:125:THR:O	1:A:288:THR:HA	2.10	0.52
1:F:318:ARG:CD	1:F:344:TYR:OH	2.56	0.52
1:C:88:GLU:OE1	1:C:90:TYR:OH	2.27	0.52
1:F:189:TYR:HD1	1:F:196:ARG:HG3	1.73	0.52
1:E:259:TRP:HA	1:E:264:MET:HG2	1.90	0.52
1:F:184:ARG:HB2	1:F:221:GLN:HB2	1.92	0.52
1:B:186:ASN:OD1	1:B:188:THR:HG23	2.10	0.52
1:E:149:LEU:HB3	1:E:245:ALA:HB1	1.91	0.52
1:E:306:ASP:HA	1:F:70:VAL:HB	1.92	0.52
1:E:152:LEU:HD21	1:E:315:TRP:HZ3	1.74	0.51
1:A:376:ILE:HG12	1:A:383:VAL:HG22	1.92	0.51
1:A:79:ILE:HD12	1:A:81:PRO:HD3	1.91	0.51
1:A:264:MET:HB3	1:A:291:ASP:CG	2.35	0.51
1:B:139:THR:HG23	1:B:311:LEU:HD11	1.91	0.51
1:C:70:VAL:HG11	1:C:265:GLU:HG2	1.93	0.51
1:C:265:GLU:HG3	1:C:294:ARG:NH1	2.26	0.51
1:C:373:TYR:HB2	1:C:386:VAL:HB	1.93	0.51
1:A:29:VAL:HG13	1:F:76:GLY:C	2.35	0.51
1:C:265:GLU:CD	1:C:294:ARG:HH22	2.17	0.51
1:A:271:GLN:HB3	1:A:284:GLY:HA3	1.93	0.51
1:A:191:ASP:HB3	1:A:194:SER:HB3	1.92	0.50
1:A:373:TYR:HB2	1:A:386:VAL:HB	1.92	0.50
1:C:371:GLY:HA3	1:C:388:SER:HB2	1.93	0.50
1:D:125:THR:O	1:D:288:THR:HA	2.12	0.50
1:F:256:GLU:CD	1:F:257:ARG:HE	2.17	0.50
1:D:85:ILE:HD12	1:D:401:GLU:OE2	2.12	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:234:GLU:O	1:D:237:LEU:HB2	2.12	0.49
1:F:296:GLY:HA2	1:F:376:ILE:HD11	1.93	0.49
1:B:48:GLN:HB2	1:B:49:PRO:HD3	1.94	0.49
1:C:215:LEU:HD13	1:C:237:LEU:HG	1.93	0.49
1:E:152:LEU:HB3	1:E:174:GLU:HB2	1.94	0.49
1:D:235:SER:HB3	1:D:282:SER:HB3	1.95	0.49
1:F:373:TYR:HB2	1:F:386:VAL:HB	1.94	0.49
1:C:358:GLU:CD	1:C:411:LYS:HB2	2.38	0.49
1:A:116:ARG:NH1	1:E:147:GLN:HB3	2.28	0.49
1:A:393:PRO:HB2	1:A:394:GLU:OE1	2.13	0.49
1:B:129:SER:HB3	1:B:292:TYR:OH	2.13	0.49
1:C:397:ASP:OD1	1:C:398:ARG:N	2.45	0.49
1:A:207:ARG:HD3	1:A:213:ARG:HH21	1.78	0.49
1:C:190:ARG:O	1:C:191:ASP:C	2.55	0.49
1:B:371:GLY:HA3	1:B:388:SER:HB2	1.94	0.49
1:B:152:LEU:HB3	1:B:174:GLU:HB2	1.94	0.48
1:E:134:LYS:HB3	1:E:345:GLN:OE1	2.13	0.48
1:C:331:GLY:O	1:C:336:GLY:HA2	2.12	0.48
1:C:221:GLN:CG	1:D:84:ARG:NH1	2.33	0.48
1:F:380:GLU:OE2	1:F:414:ARG:NH1	2.45	0.48
1:B:184:ARG:HG3	1:B:221:GLN:OE1	2.13	0.48
1:F:407:GLY:O	1:F:411:LYS:HG2	2.13	0.48
1:A:179:MET:HE3	1:A:230:TYR:CD1	2.49	0.48
1:B:74:PRO:HB2	1:B:111:LYS:HE2	1.96	0.48
1:C:220:ARG:HG2	2:C:535:HOH:O	2.13	0.48
1:C:221:GLN:HE21	1:D:84:ARG:HH22	1.59	0.48
1:A:207:ARG:HD3	1:A:213:ARG:NH2	2.29	0.48
1:D:192:PRO:HA	1:D:197:ARG:HD2	1.95	0.48
1:F:184:ARG:HH22	1:F:221:GLN:NE2	2.11	0.48
1:E:373:TYR:HB2	1:E:386:VAL:HB	1.95	0.48
1:C:115:GLU:OE1	1:C:290:ARG:NH2	2.47	0.47
1:C:261:ARG:CZ	1:C:308:GLU:OE2	2.56	0.47
1:E:83:TYR:O	1:E:89:GLU:HG3	2.14	0.47
1:A:83:TYR:CE1	1:A:90:TYR:HB2	2.49	0.47
1:B:96:MET:HG2	1:B:101:VAL:HB	1.96	0.47
1:F:82:ARG:CD	1:F:89:GLU:OE2	2.62	0.47
1:F:331:GLY:O	1:F:336:GLY:HA2	2.14	0.47
1:C:347:TRP:CD1	1:C:367:GLN:HG2	2.49	0.47
1:B:255:SER:HA	1:B:259:TRP:HB3	1.97	0.47
1:D:107:LEU:HD23	1:D:112:VAL:HA	1.96	0.47
1:D:239:SER:OG	1:D:278:GLN:NE2	2.45	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:56:ASP:N	1:B:56:ASP:OD1	2.48	0.46
1:D:98:ARG:HB3	1:D:98:ARG:HH11	1.81	0.46
1:D:308:GLU:OE2	2:D:502:HOH:O	2.21	0.46
1:E:56:ASP:OD1	1:E:56:ASP:N	2.47	0.46
1:F:93:ASP:OD1	1:F:116:ARG:NH1	2.49	0.46
1:F:284:GLY:N	2:F:503:HOH:O	2.49	0.46
1:B:71:ARG:HD2	1:B:262:MET:HE2	1.98	0.46
1:C:41:TYR:OH	1:C:196:ARG:NH2	2.49	0.46
1:C:221:GLN:NE2	1:D:84:ARG:HH22	2.14	0.46
1:D:114:LEU:HD23	1:D:115:GLU:N	2.31	0.46
1:B:73:LEU:HB2	1:B:290:ARG:HH12	1.80	0.46
1:C:56:ASP:OD1	1:C:56:ASP:N	2.49	0.46
1:F:150:LEU:HD23	1:F:159:TYR:CZ	2.50	0.46
1:E:115:GLU:OE2	1:E:290:ARG:NH1	2.46	0.46
1:B:328:LEU:HA	1:B:333:LEU:HD21	1.98	0.45
1:C:74:PRO:HD2	1:C:110:GLY:O	2.15	0.45
1:F:96:MET:HA	1:F:101:VAL:HB	1.98	0.45
1:F:189:TYR:CD1	1:F:196:ARG:HG3	2.51	0.45
1:D:375:TYR:HB3	1:D:384:ALA:HB3	1.98	0.45
1:E:84:ARG:HG2	1:E:89:GLU:HB2	1.98	0.45
1:B:73:LEU:HB2	1:B:290:ARG:NH1	2.32	0.45
1:B:157:ASP:OD2	1:B:169:GLN:NE2	2.50	0.45
1:E:187:GLU:OE2	1:E:232:THR:OG1	2.33	0.45
1:F:255:SER:HA	1:F:259:TRP:HB3	1.99	0.45
1:A:164:ALA:HB3	1:D:354:LYS:HZ1	1.76	0.45
1:D:56:ASP:N	1:D:56:ASP:OD1	2.48	0.45
1:E:125:THR:O	1:E:288:THR:HA	2.16	0.45
1:B:179:MET:HE1	1:B:235:SER:HB2	1.98	0.45
1:B:262:MET:HB3	1:B:305:ILE:HD13	1.98	0.45
1:C:338:TYR:CE2	1:C:340:LEU:HB2	2.51	0.45
1:F:73:LEU:HD23	1:F:73:LEU:HA	1.83	0.45
1:F:188:THR:HG22	1:F:191:ASP:H	1.81	0.45
1:C:29:VAL:HG13	1:F:309:ARG:NH2	2.32	0.44
1:A:262:MET:HB3	1:A:305:ILE:CD1	2.45	0.44
1:E:101:VAL:HG11	1:E:104:VAL:HG23	1.98	0.44
1:F:156:VAL:HG11	1:F:176:VAL:HG21	1.99	0.44
1:A:207:ARG:CD	1:A:213:ARG:NH2	2.81	0.44
1:F:187:GLU:O	1:F:187:GLU:HG3	2.17	0.44
1:B:155:PRO:HB2	1:B:157:ASP:OD1	2.17	0.44
1:D:334:TYR:O	1:D:337:GLU:HG2	2.18	0.44
1:A:240:GLU:OE1	1:A:278:GLN:HG2	2.17	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:99:ASN:HD21	1:A:401:GLU:HG2	1.83	0.44
1:B:192:PRO:HA	1:B:197:ARG:NH1	2.33	0.44
1:B:366:ALA:HB3	1:B:374:LEU:HB3	1.99	0.44
1:E:261:ARG:HG2	1:E:305:ILE:HG21	2.00	0.44
1:A:96:MET:HA	1:A:101:VAL:HB	2.00	0.44
1:D:48:GLN:HB2	1:D:49:PRO:HD3	1.99	0.44
1:A:56:ASP:OD1	1:A:56:ASP:N	2.51	0.43
1:A:82:ARG:HD3	1:E:158:LYS:HE2	2.00	0.43
1:F:264:MET:HB3	1:F:291:ASP:CG	2.43	0.43
1:A:130:PHE:HA	1:A:283:SER:OG	2.18	0.43
1:F:33:ARG:HD2	1:F:46:GLU:O	2.18	0.43
1:E:234:GLU:O	1:E:237:LEU:HB2	2.17	0.43
1:E:235:SER:HB3	1:E:282:SER:HB3	2.00	0.43
1:A:154:GLN:CG	1:A:158:LYS:HD3	2.46	0.43
1:B:157:ASP:OD1	1:B:157:ASP:N	2.52	0.43
1:E:127:TRP:O	1:E:286:SER:HA	2.18	0.43
1:A:105:LEU:O	1:A:384:ALA:HA	2.18	0.43
1:D:61:THR:HA	1:D:270:TRP:O	2.19	0.43
1:E:185:TRP:NE1	1:E:187:GLU:OE1	2.45	0.43
1:E:186:ASN:OD1	1:E:188:THR:HG22	2.18	0.43
1:E:347:TRP:CD1	1:E:367:GLN:HG2	2.53	0.43
1:E:155:PRO:HB2	1:E:157:ASP:OD1	2.18	0.43
1:A:29:VAL:HG11	1:F:76:GLY:O	2.15	0.43
1:C:366:ALA:HB3	1:C:374:LEU:HB3	2.01	0.43
1:D:252:ASP:O	1:D:256:GLU:HG3	2.17	0.43
1:E:157:ASP:OD1	1:E:157:ASP:N	2.51	0.43
1:E:228:PHE:CD2	1:E:333:LEU:HD22	2.54	0.43
1:C:131:SER:OG	1:C:134:LYS:HE3	2.19	0.42
1:C:188:THR:HG22	1:C:190:ARG:H	1.84	0.42
1:B:66:LYS:NZ	1:B:67:GLY:O	2.41	0.42
1:B:131:SER:OG	1:B:134:LYS:NZ	2.52	0.42
1:C:265:GLU:CG	1:C:294:ARG:NH2	2.83	0.42
1:B:179:MET:HB3	1:B:229:THR:O	2.20	0.42
1:B:264:MET:HB3	1:B:291:ASP:CG	2.43	0.42
1:D:323:GLU:HB2	1:D:326:SER:HB3	2.00	0.42
1:F:82:ARG:CG	1:F:89:GLU:OE2	2.67	0.42
1:A:165:GLY:HA2	1:D:331:GLY:O	2.19	0.42
1:A:255:SER:HA	1:A:259:TRP:HB3	2.02	0.42
1:E:46:GLU:HG3	1:E:47:TYR:HD1	1.85	0.42
1:E:179:MET:HE1	1:E:235:SER:HB2	2.02	0.42
1:D:272:LEU:HD23	1:D:279:GLU:HA	2.02	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:64:ILE:HG21	1:C:254:LEU:HD23	2.02	0.42
1:C:234:GLU:O	1:C:237:LEU:HB2	2.20	0.42
1:C:358:GLU:HG2	1:C:414:ARG:HE	1.85	0.42
1:E:70:VAL:HA	1:E:263:GLY:HA3	2.02	0.42
1:F:82:ARG:HB3	1:F:89:GLU:OE2	2.18	0.42
1:A:300:LEU:HD12	1:A:378:ARG:HG2	2.02	0.41
1:A:157:ASP:OD1	1:A:157:ASP:N	2.53	0.41
1:C:96:MET:HA	1:C:101:VAL:CG2	2.50	0.41
1:C:125:THR:O	1:C:288:THR:HA	2.19	0.41
1:D:207:ARG:HA	1:D:208:PRO:HD3	1.96	0.41
1:D:259:TRP:CD2	1:D:264:MET:HG3	2.56	0.41
1:D:342:TYR:OH	1:D:345:GLN:HA	2.20	0.41
1:F:125:THR:O	1:F:288:THR:HA	2.20	0.41
1:F:237:LEU:HD23	1:F:237:LEU:HA	1.86	0.41
1:B:297:GLN:NE2	1:B:300:LEU:HD23	2.35	0.41
1:C:31:ASN:HA	1:C:32:PRO:HD3	1.85	0.41
1:C:105:LEU:O	1:C:384:ALA:HA	2.20	0.41
1:F:151:ALA:HB3	1:F:154:GLN:CD	2.45	0.41
1:F:187:GLU:O	1:F:188:THR:C	2.63	0.41
1:A:82:ARG:HB2	1:E:158:LYS:HE2	2.03	0.41
1:B:96:MET:HA	1:B:101:VAL:HB	2.03	0.41
1:D:150:LEU:HA	1:D:150:LEU:HD23	1.88	0.41
1:D:184:ARG:HB2	1:D:221:GLN:HB2	2.02	0.41
1:E:174:GLU:OE2	1:E:344:TYR:OH	2.28	0.41
1:F:174:GLU:OE2	1:F:344:TYR:OH	2.12	0.41
1:A:29:VAL:CG2	1:F:75:ALA:HB1	2.50	0.41
1:E:239:SER:OG	1:E:278:GLN:NE2	2.38	0.41
1:F:40:LEU:HB2	1:F:59:TYR:OH	2.21	0.41
1:A:140:LEU:HD11	1:A:254:LEU:HB2	2.03	0.41
1:D:95:PHE:CE2	1:D:101:VAL:HG21	2.54	0.41
1:F:411:LYS:HD3	1:F:414:ARG:HE	1.86	0.41
1:A:83:TYR:O	1:A:89:GLU:HA	2.21	0.41
1:A:232:THR:HG23	1:A:282:SER:HB2	2.01	0.41
1:B:140:LEU:HD11	1:B:254:LEU:HB2	2.01	0.41
1:B:33:ARG:O	1:B:50:ASP:HB2	2.21	0.41
1:B:140:LEU:HD11	1:B:254:LEU:HD13	2.02	0.41
1:D:382:ILE:CD1	1:D:410:VAL:HG22	2.51	0.41
1:E:46:GLU:HG3	1:E:47:TYR:CD1	2.56	0.41
1:E:329:ALA:HB3	1:E:332:LYS:HE3	2.02	0.41
1:F:56:ASP:OD1	1:F:56:ASP:N	2.51	0.41
1:E:30:GLU:OE1	1:E:33:ARG:NH1	2.52	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:105:LEU:HB2	1:F:289:LEU:HG	2.02	0.41
1:F:185:TRP:CZ3	1:F:195:ASP:HB3	2.55	0.41
1:A:212:LEU:HD23	1:A:212:LEU:HA	1.88	0.40
1:C:358:GLU:OE1	1:C:411:LYS:HB2	2.22	0.40
1:E:72:PRO:HB3	1:F:124:ARG:HA	2.04	0.40
1:F:189:TYR:CE1	1:F:197:ARG:HD3	2.56	0.40
1:A:107:LEU:HD23	1:A:112:VAL:HA	2.04	0.40
1:A:156:VAL:HG21	1:A:176:VAL:HG21	2.03	0.40
1:D:90:TYR:HB3	1:D:94:ASP:HB2	2.03	0.40
1:F:179:MET:HE3	1:F:230:TYR:CD1	2.56	0.40
1:A:174:GLU:HA	1:A:177:LEU:HD12	2.02	0.40
1:A:373:TYR:OH	1:A:399:GLU:HG2	2.20	0.40
1:C:102:GLY:N	1:C:387:TRP:O	2.44	0.40
1:D:31:ASN:HA	1:D:32:PRO:HD3	1.79	0.40
1:C:129:SER:HB3	1:C:292:TYR:OH	2.21	0.40
1:F:92:VAL:HG22	1:F:116:ARG:HD2	1.99	0.40
1:B:207:ARG:HA	1:B:208:PRO:HD3	1.95	0.40
1:B:370:PHE:HA	1:B:390:TRP:HB2	2.03	0.40
1:E:367:GLN:HA	1:E:372:GLN:O	2.22	0.40

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

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:414:ARG:O	1:F:159:TYR:OH[1_455]	2.19	0.01

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	342/391 (88%)	336 (98%)	6 (2%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	B	383/391 (98%)	374 (98%)	9 (2%)	0	100	100
1	C	384/391 (98%)	374 (97%)	10 (3%)	0	100	100
1	D	378/391 (97%)	371 (98%)	7 (2%)	0	100	100
1	E	379/391 (97%)	370 (98%)	8 (2%)	1 (0%)	36	45
1	F	366/391 (94%)	349 (95%)	15 (4%)	2 (0%)	24	32
All	All	2232/2346 (95%)	2174 (97%)	55 (2%)	3 (0%)	48	61

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	F	223	PRO
1	E	190	ARG
1	F	330	PRO

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	285/315 (90%)	279 (98%)	6 (2%)	47	62
1	B	312/315 (99%)	310 (99%)	2 (1%)	78	86
1	C	313/315 (99%)	313 (100%)	0	100	100
1	D	310/315 (98%)	307 (99%)	3 (1%)	68	77
1	E	312/315 (99%)	310 (99%)	2 (1%)	78	86
1	F	303/315 (96%)	299 (99%)	4 (1%)	61	73
All	All	1835/1890 (97%)	1818 (99%)	17 (1%)	70	81

All (17) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	69	LYS
1	A	156	VAL
1	A	190	ARG

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Mol	Chain	Res	Type
1	A	256	GLU
1	A	282	SER
1	A	397	ASP
1	B	335	ASP
1	B	340	LEU
1	D	157	ASP
1	D	258	ILE
1	D	266	SER
1	E	262	MET
1	E	323	GLU
1	F	84	ARG
1	F	85	ILE
1	F	138	SER
1	F	401	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (14) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	65	HIS
1	A	221	GLN
1	B	147	GLN
1	B	271	GLN
1	C	198	GLN
1	C	221	GLN
1	D	297	GLN
1	E	154	GLN
1	E	271	GLN
1	F	99	ASN
1	F	198	GLN
1	F	203	GLN
1	F	221	GLN
1	F	243	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

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	346/391 (88%)	0.24	7 (2%)	65	66	33, 47, 73, 92	0
1	B	385/391 (98%)	0.16	3 (0%)	82	83	32, 45, 64, 86	0
1	C	386/391 (98%)	0.15	4 (1%)	79	80	31, 45, 67, 98	0
1	D	382/391 (97%)	0.17	3 (0%)	82	83	31, 44, 71, 93	0
1	E	383/391 (97%)	0.23	3 (0%)	82	83	35, 48, 70, 95	0
1	F	372/391 (95%)	0.76	30 (8%)	18	16	37, 66, 97, 123	0
All	All	2254/2346 (96%)	0.28	50 (2%)	62	64	31, 47, 80, 123	0

All (50) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	F	189	TYR	5.2
1	D	354	LYS	3.5
1	F	83	TYR	3.5
1	F	409	ALA	3.4
1	F	324	ALA	3.3
1	C	308	GLU	3.1
1	F	362	GLY	3.0
1	C	29	VAL	2.9
1	F	116	ARG	2.9
1	A	322	VAL	2.9
1	F	327	HIS	2.8
1	F	338	TYR	2.7
1	E	77	VAL	2.7
1	B	83	TYR	2.7
1	F	81	PRO	2.7
1	D	353	ALA	2.7
1	A	29	VAL	2.6
1	F	77	VAL	2.6
1	C	189	TYR	2.6

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Mol	Chain	Res	Type	RSRZ
1	F	220	ARG	2.5
1	F	80	ALA	2.5
1	F	339	ALA	2.5
1	F	224	SER	2.4
1	F	79	ILE	2.4
1	E	85	ILE	2.3
1	F	340	LEU	2.3
1	F	334	TYR	2.3
1	B	189	TYR	2.2
1	F	342	TYR	2.2
1	C	30	GLU	2.2
1	B	97	ARG	2.2
1	D	84	ARG	2.2
1	F	110	GLY	2.2
1	F	192	PRO	2.2
1	F	405	PHE	2.2
1	F	78	ALA	2.1
1	F	111	LYS	2.1
1	A	364	PHE	2.1
1	A	78	ALA	2.1
1	F	68	THR	2.1
1	F	86	GLY	2.1
1	A	90	TYR	2.1
1	E	106	VAL	2.1
1	F	349	PHE	2.0
1	F	410	VAL	2.0
1	A	85	ILE	2.0
1	F	90	TYR	2.0
1	F	350	PRO	2.0
1	F	85	ILE	2.0
1	A	222	TYR	2.0

6.2 Non-standard residues in protein, DNA, RNA chains (i)

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

6.3 Carbohydrates (i)

There are no oligosaccharides in this entry.

6.4 Ligands

There are no ligands in this entry.

6.5 Other polymers

There are no such residues in this entry.