



Full wwPDB X-ray Structure Validation Report ⓘ

Feb 1, 2016 – 04:41 PM GMT

PDB ID : 4FQV
Title : Crystal structure of broadly neutralizing antibody CR9114 bound to H7 influenza hemagglutinin
Authors : Ekiert, D.C.; Dreyfus, C.; Wilson, I.A.
Deposited on : 2012-06-25
Resolution : 5.75 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
<http://wwpdb.org/validation/2016/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
Mogul : 1.7 (RC4), CSD as536be (2015)
Xtriage (Phenix) : 1.9-1692
EDS : rb-20026688
Percentile statistics : 20151230.v01 (using entries in the PDB archive December 30th 2015)
Refmac : 5.8.0135
CCP4 : 6.5.0
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : trunk26865

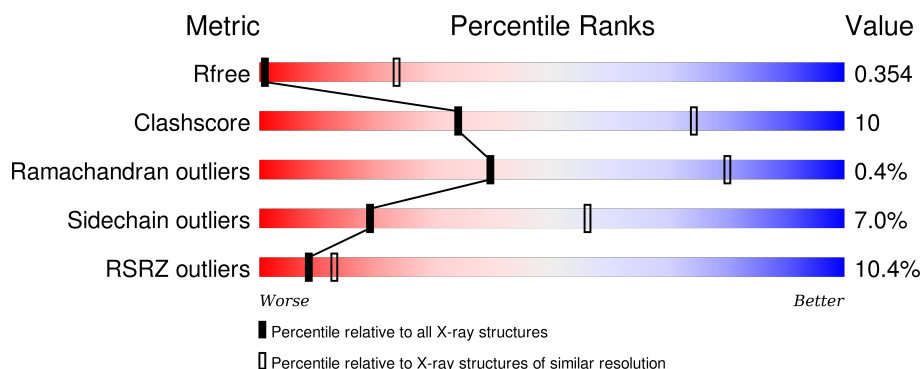
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 5.75 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}	91344	1012 (7.88-3.64)
Clashscore	102246	1042 (7.82-3.70)
Ramachandran outliers	100387	1016 (7.82-3.66)
Sidechain outliers	100360	1007 (7.88-3.64)
RSRZ outliers	91569	1011 (7.88-3.64)

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 on the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	327	<div> <div>19%</div> <div> <div></div> <div>75%</div> <div>18%</div> <div>...</div> </div> </div>
1	C	327	<div> <div>8%</div> <div> <div></div> <div>73%</div> <div>20%</div> <div>...</div> </div> </div>
1	E	327	<div> <div>11%</div> <div> <div></div> <div>79%</div> <div>15%</div> <div>..</div> </div> </div>
2	B	176	<div> <div>6%</div> <div> <div></div> <div>68%</div> <div>23%</div> <div>6%</div> <div>.</div> </div> </div>
2	D	176	<div> <div>11%</div> <div> <div></div> <div>66%</div> <div>27%</div> <div>5%</div> <div>.</div> </div> </div>

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Mol	Chain	Length	Quality of chain
2	F	176	<p>3% 69% 23% 5% •</p>
3	H	224	<p>21% 80% 15% • •</p>
3	I	224	<p>7% 86% 10% •</p>
3	J	224	<p>6% 87% 8% •</p>
4	L	216	<p>11% 77% 19% • •</p>
4	M	216	<p>7% 85% 11% • •</p>
4	N	216	<p>5% 81% 16% • •</p>

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 20938 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 Hemagglutinin HA1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	316	Total	C	N	O	S	0	0	0
			2423	1503	435	471	14			
1	C	316	Total	C	N	O	S	0	0	0
			2423	1503	435	471	14			
1	E	317	Total	C	N	O	S	0	0	0
			2427	1505	436	472	14			

There are 15 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	7	ALA	-	EXPRESSION TAG	UNP Q6VMK1
A	8	ASP	-	EXPRESSION TAG	UNP Q6VMK1
A	9	PRO	-	EXPRESSION TAG	UNP Q6VMK1
A	10	GLY	-	EXPRESSION TAG	UNP Q6VMK1
A	254	LEU	PRO	CONFLICT	UNP Q6VMK1
C	7	ALA	-	EXPRESSION TAG	UNP Q6VMK1
C	8	ASP	-	EXPRESSION TAG	UNP Q6VMK1
C	9	PRO	-	EXPRESSION TAG	UNP Q6VMK1
C	10	GLY	-	EXPRESSION TAG	UNP Q6VMK1
C	254	LEU	PRO	CONFLICT	UNP Q6VMK1
E	7	ALA	-	EXPRESSION TAG	UNP Q6VMK1
E	8	ASP	-	EXPRESSION TAG	UNP Q6VMK1
E	9	PRO	-	EXPRESSION TAG	UNP Q6VMK1
E	10	GLY	-	EXPRESSION TAG	UNP Q6VMK1
E	254	LEU	PRO	CONFLICT	UNP Q6VMK1

- Molecule 2 is a protein called Hemagglutinin HA2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	170	Total	C	N	O	S	0	0	0
			1380	851	243	279	7			

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	D	171	Total	C	N	O	S	0	0	0
			1388	857	244	280	7			
2	F	169	Total	C	N	O	S	0	0	0
			1369	845	239	278	7			

- Molecule 3 is a protein called Antibody CR9114 heavy chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	H	215	Total	C	N	O	S	0	2	0
			1608	1013	268	320	7			
3	I	215	Total	C	N	O	S	0	2	0
			1608	1013	268	320	7			
3	J	215	Total	C	N	O	S	0	2	0
			1608	1013	268	320	7			

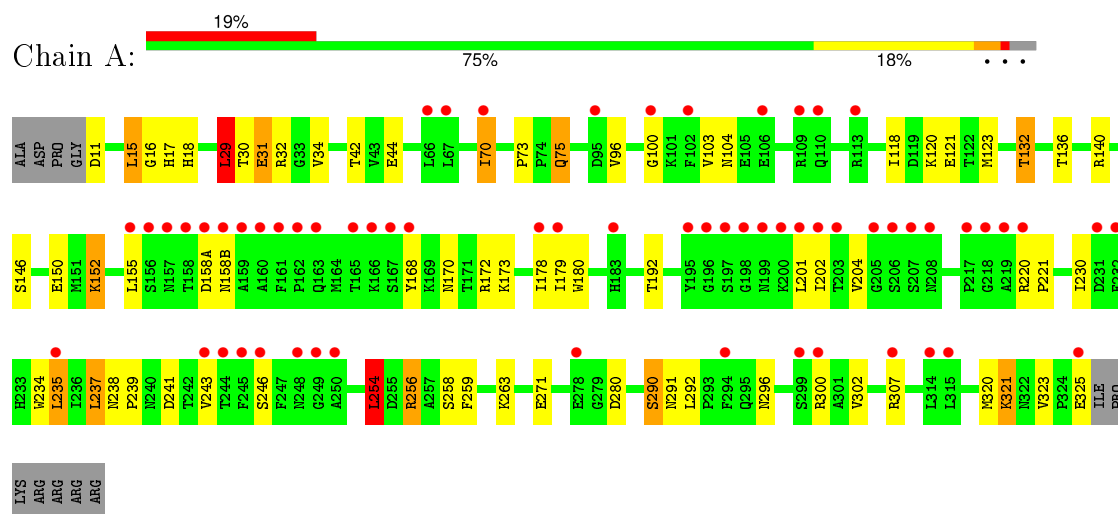
- Molecule 4 is a protein called Antibody CR9114 light chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
4	L	211	Total	C	N	O	S	0	0	0
			1568	978	266	320	4			
4	M	211	Total	C	N	O	S	0	0	0
			1568	978	266	320	4			
4	N	211	Total	C	N	O	S	0	0	0
			1568	978	266	320	4			

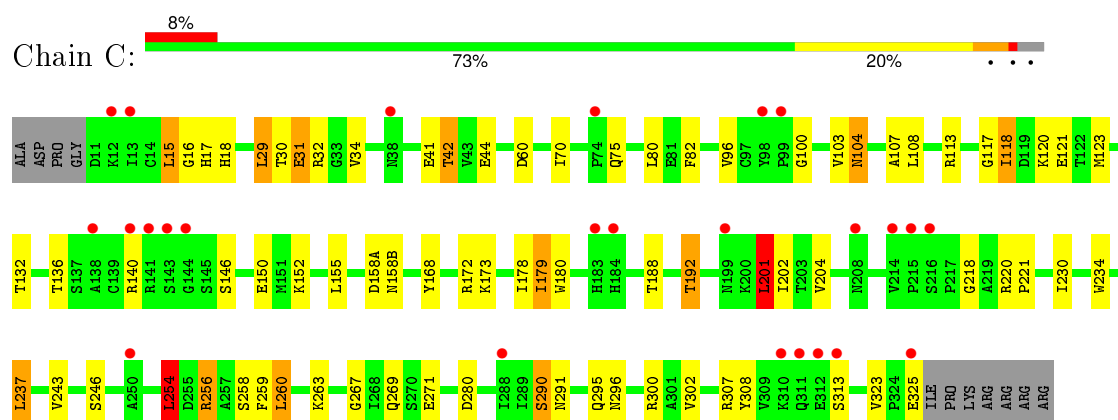
3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of errors 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.

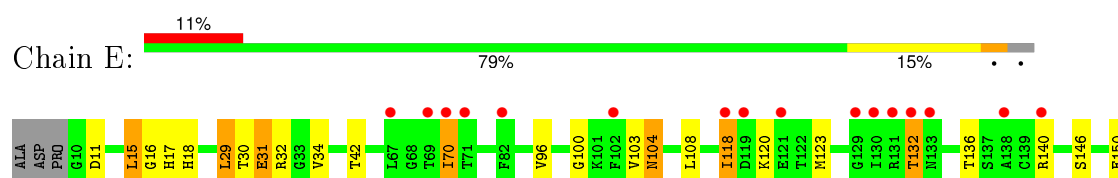
• Molecule 1: Hemagglutinin HA1

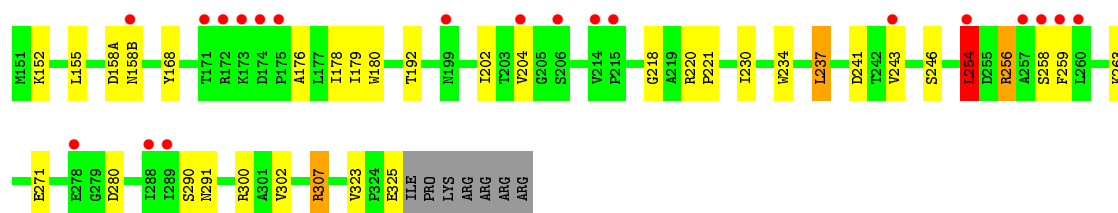


• Molecule 1: Hemagglutinin HA1



• Molecule 1: Hemagglutinin HA1





• Molecule 2: Hemagglutinin HA2



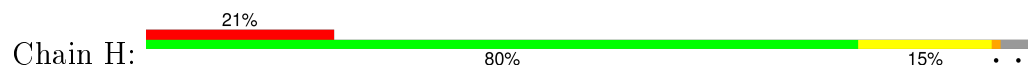
• Molecule 2: Hemagglutinin HA2



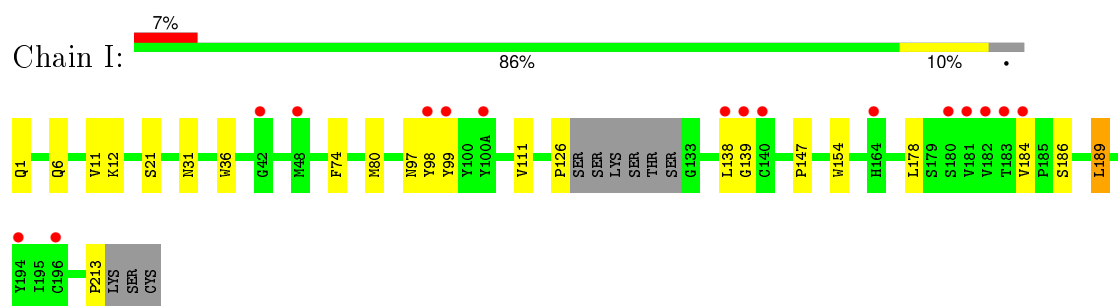
• Molecule 3: Antibody CR9114 heavy chain



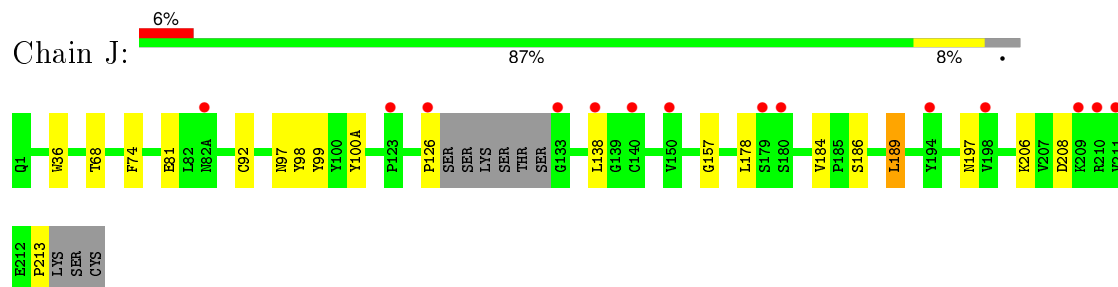
• Molecule 3: Antibody CR9114 heavy chain



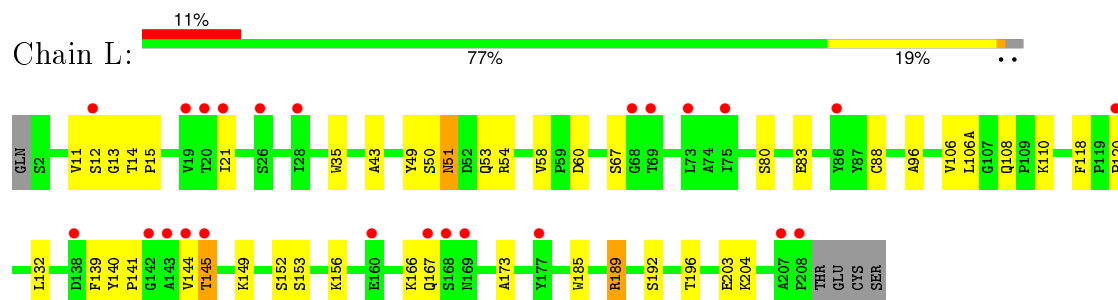
• Molecule 3: Antibody CR9114 heavy chain



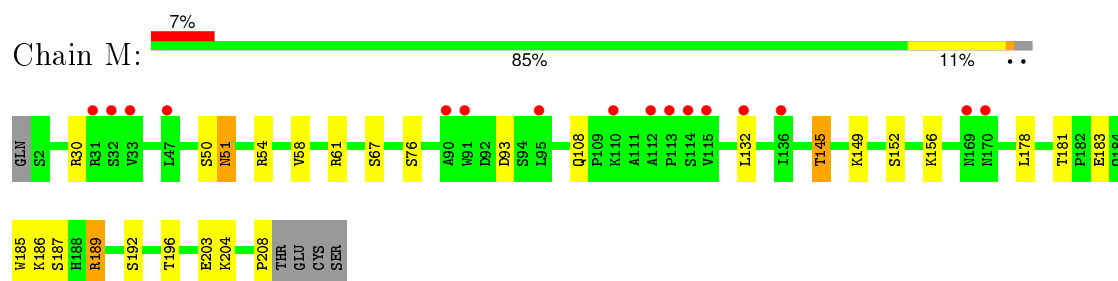
- Molecule 3: Antibody CR9114 heavy chain



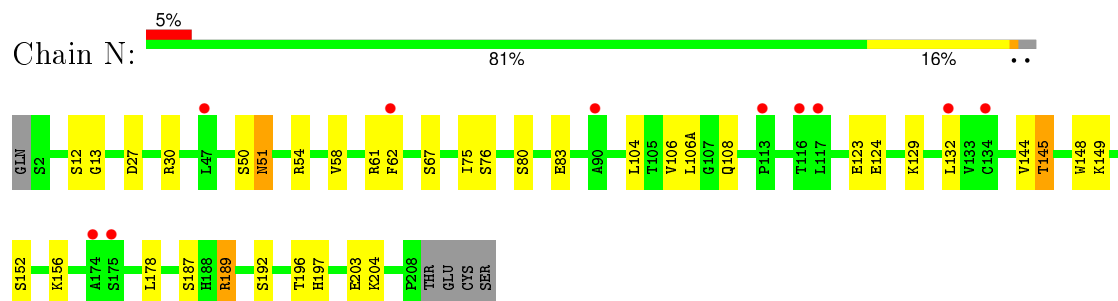
- Molecule 4: Antibody CR9114 light chain



- Molecule 4: Antibody CR9114 light chain



- Molecule 4: Antibody CR9114 light chain



4 Data and refinement statistics

Property	Value	Source
Space group	P 42 21 2	Depositor
Cell constants a, b, c, α , β , γ	197.57Å 197.57Å 223.62Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	49.35 – 5.75 49.35 – 5.75	Depositor EDS
% Data completeness (in resolution range)	99.4 (49.35-5.75) 99.0 (49.35-5.75)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.14	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.35 (at 5.73Å)	Xtriage
Refinement program	PHENIX (phenix.refine: 1.8_1069)	Depositor
R, R_{free}	0.314 , 0.339 0.342 , 0.354	Depositor DCC
R_{free} test set	No test flags present.	DCC
Wilson B-factor (Å ²)	319.3	Xtriage
Anisotropy	0.293	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.27 , 229.1	EDS
Estimated twinning fraction	No twinning to report.	Xtriage
L-test for twinning ²	$\langle L \rangle = 0.44$, $\langle L^2 \rangle = 0.26$	Xtriage
Outliers	0 of 13047 reflections	Xtriage
F_o, F_c correlation	0.81	EDS
Total number of atoms	20938	wwPDB-VP
Average B, all atoms (Å ²)	244.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.52% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.375 respectively for untwinned datasets, and 0.333, 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	0.32	0/2468	0.61	1/3336 (0.0%)
1	C	0.32	0/2468	0.63	2/3336 (0.1%)
1	E	0.32	0/2472	0.61	1/3341 (0.0%)
2	B	0.32	0/1404	0.53	0/1892
2	D	0.36	0/1412	0.56	0/1903
2	F	0.35	0/1393	0.54	0/1878
3	H	0.36	0/1647	0.75	1/2245 (0.0%)
3	I	0.33	0/1647	0.57	0/2245
3	J	0.37	0/1647	0.61	0/2245
4	L	0.33	0/1606	0.59	0/2193
4	M	0.38	0/1606	0.56	0/2193
4	N	0.31	0/1606	0.55	0/2193
All	All	0.34	0/21376	0.60	5/29000 (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	C	0	1
1	E	0	1
2	B	0	1
2	D	0	1
2	F	0	1
4	M	0	1
All	All	0	7

There are no bond length outliers.

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	E	254	LEU	CB-CG-CD1	-8.52	96.51	111.00
1	A	254	LEU	CB-CG-CD1	-7.97	97.45	111.00
1	C	254	LEU	CB-CG-CD1	-7.07	98.98	111.00
3	H	92	CYS	N-CA-C	-6.61	93.14	111.00
1	C	201	LEU	CA-CB-CG	5.40	127.72	115.30

There are no chirality outliers.

All (7) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	29	LEU	Peptide
2	B	56	ILE	Peptide
1	C	29	LEU	Peptide
2	D	56	ILE	Peptide
1	E	29	LEU	Peptide
2	F	56	ILE	Peptide
4	M	108	GLN	Sidechain

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	2423	0	2373	61	0
1	C	2423	0	2373	57	0
1	E	2427	0	2376	50	0
2	B	1380	0	1284	48	0
2	D	1388	0	1295	54	0
2	F	1369	0	1271	44	0
3	H	1608	0	1556	59	0
3	I	1608	0	1556	34	0
3	J	1608	0	1556	36	2
4	L	1568	0	1517	37	2
4	M	1568	0	1517	14	1
4	N	1568	0	1517	29	0
All	All	20938	0	20191	417	3

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 (417) 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)
2:B:19:ASP:OD2	3:H:100(A):TYR:OH	1.65	1.11
1:C:123:MET:SD	1:C:254:LEU:HD13	2.00	1.01
3:H:11:VAL:CG2	3:H:147:PRO:HG3	1.94	0.97
1:E:123:MET:SD	1:E:254:LEU:CD1	2.55	0.95
2:F:38:TYR:HE1	3:I:97:ASN:HB2	1.30	0.94
2:D:56:ILE:HG12	3:J:74:PHE:CE1	2.03	0.94
1:A:123:MET:SD	1:A:254:LEU:HD13	2.07	0.93
2:D:56:ILE:HG12	3:J:74:PHE:CD1	2.03	0.93
1:A:123:MET:SD	1:A:254:LEU:CD1	2.58	0.91
1:A:291:ASN:HD22	3:H:74:PHE:HB2	1.34	0.91
4:L:15:PRO:HD3	4:L:106(A):LEU:O	1.70	0.90
1:C:123:MET:SD	1:C:254:LEU:CD1	2.60	0.89
1:C:70:ILE:HG21	1:C:179:ILE:HD13	1.53	0.89
1:C:123:MET:HE3	1:C:168:TYR:CG	2.09	0.88
1:E:123:MET:SD	1:E:254:LEU:HD13	2.12	0.87
1:E:123:MET:HE3	1:E:168:TYR:CG	2.10	0.86
2:D:19:ASP:OD1	3:J:99:TYR:CD2	2.28	0.86
2:F:56:ILE:HG12	3:I:74:PHE:CD1	2.10	0.86
2:D:19:ASP:O	3:J:98:TYR:OH	1.95	0.85
2:F:38:TYR:CE1	3:I:97:ASN:HB2	2.12	0.84
1:E:123:MET:SD	1:E:254:LEU:HD11	2.17	0.84
2:D:56:ILE:CG1	3:J:74:PHE:CD1	2.62	0.82
3:H:11:VAL:HG21	3:H:147:PRO:HG3	1.62	0.81
1:A:123:MET:HE3	1:A:168:TYR:CG	2.16	0.80
3:H:206:LYS:NZ	3:H:208:ASP:OD1	2.16	0.79
1:C:291:ASN:HD22	3:J:74:PHE:HB2	1.47	0.77
4:M:187:SER:O	4:M:189:ARG:NH2	2.17	0.77
2:B:56:ILE:HG13	3:H:74:PHE:CD1	2.20	0.76
2:F:38:TYR:HE1	3:I:97:ASN:CB	1.97	0.76
2:B:19:ASP:OD1	3:H:99:TYR:CE2	2.38	0.75
4:L:13:GLY:CA	4:L:106(A):LEU:HD12	2.17	0.74
2:D:56:ILE:CG1	3:J:74:PHE:CE1	2.71	0.74
2:D:19:ASP:OD2	3:J:100(A):TYR:CZ	2.40	0.74
2:B:56:ILE:HG13	3:H:74:PHE:CE1	2.25	0.72
1:A:123:MET:SD	1:A:254:LEU:HD11	2.28	0.72
2:B:56:ILE:CG1	3:H:74:PHE:CE1	2.73	0.72
2:D:19:ASP:OD2	3:J:100(A):TYR:CE2	2.43	0.71
2:B:56:ILE:CG1	3:H:74:PHE:CD1	2.74	0.71
3:H:138:LEU:HD13	3:H:211:VAL:HG11	1.73	0.70
4:L:13:GLY:HA2	4:L:106(A):LEU:HD12	1.73	0.70

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:F:38:TYR:CE1	3:I:97:ASN:CB	2.74	0.70
4:M:181:THR:HB	4:M:183:GLU:OE1	1.92	0.70
1:E:123:MET:CE	1:E:168:TYR:CG	2.74	0.70
2:F:56:ILE:HG12	3:I:74:PHE:HD1	1.55	0.69
1:E:178:ILE:HG23	1:E:254:LEU:CD2	2.21	0.69
2:D:19:ASP:OD2	3:J:100(A):TYR:OH	2.09	0.69
1:E:179:ILE:O	1:E:254:LEU:HD23	1.93	0.69
2:D:124:ARG:HD3	2:F:134:GLY:HA2	1.74	0.69
1:A:179:ILE:O	1:A:254:LEU:HD23	1.93	0.69
1:E:158(A):ASP:O	1:E:158(B):ASN:HB2	1.93	0.69
1:A:158(A):ASP:O	1:A:158(B):ASN:HB2	1.92	0.69
1:E:178:ILE:HG23	1:E:254:LEU:HD21	1.74	0.68
1:A:291:ASN:ND2	3:H:74:PHE:HB2	2.07	0.68
2:F:19:ASP:OD1	3:I:99:TYR:CZ	2.47	0.68
2:B:124:ARG:HD3	2:D:134:GLY:HA2	1.74	0.68
4:N:13:GLY:HA2	4:N:106(A):LEU:CD1	2.23	0.67
1:C:158(A):ASP:O	1:C:158(B):ASN:HB2	1.94	0.67
1:C:123:MET:CE	1:C:168:TYR:CG	2.76	0.67
3:J:189:LEU:HD21	3:J:213:PRO:CG	2.25	0.67
2:F:56:ILE:HG12	3:I:74:PHE:CE1	2.28	0.67
1:A:15:LEU:HD22	1:A:15:LEU:H	1.59	0.67
1:A:291:ASN:CB	3:H:74:PHE:HB3	2.25	0.66
4:L:83:GLU:HG2	4:L:166:LYS:NZ	2.09	0.66
2:B:134:GLY:HA2	2:F:124:ARG:HD3	1.76	0.66
1:E:123:MET:HE1	1:E:168:TYR:CD2	2.30	0.66
1:A:178:ILE:HG23	1:A:254:LEU:CD2	2.26	0.66
4:L:106:VAL:HG12	4:L:108:GLN:HG3	1.76	0.66
4:N:12:SER:OG	4:N:106(A):LEU:HD21	1.95	0.65
4:N:13:GLY:N	4:N:106(A):LEU:HG	2.10	0.65
1:C:178:ILE:HG23	1:C:254:LEU:CD2	2.26	0.65
3:H:36:TRP:CE2	3:H:80:MET:HB2	2.31	0.65
3:I:36:TRP:CE2	3:I:80:MET:HB2	2.33	0.64
2:F:56:ILE:CG1	3:I:74:PHE:CD1	2.81	0.64
4:N:54:ARG:NH1	4:N:58:VAL:O	2.31	0.64
2:D:56:ILE:HG21	3:J:74:PHE:HD1	1.63	0.63
2:D:19:ASP:OD1	3:J:99:TYR:CG	2.51	0.63
1:E:123:MET:CE	1:E:168:TYR:CD2	2.82	0.63
1:E:302:VAL:HG11	2:F:65:LEU:HD13	1.80	0.63
1:C:254:LEU:HD12	1:C:254:LEU:O	1.99	0.63
3:I:189:LEU:HD21	3:I:213:PRO:CG	2.29	0.62
2:B:66:ILE:HD13	2:B:81:ILE:HG21	1.81	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:L:83:GLU:HB2	4:L:106:VAL:HG23	1.79	0.62
3:H:189:LEU:HD21	3:H:213:PRO:CG	2.30	0.61
2:B:128:GLU:O	2:B:170:ARG:NH1	2.33	0.61
4:L:145:THR:HG22	4:L:196:THR:OG1	2.00	0.61
1:C:179:ILE:O	1:C:254:LEU:HD23	2.01	0.61
1:A:70:ILE:CG2	1:A:179:ILE:HG13	2.31	0.61
4:L:15:PRO:CD	4:L:106(A):LEU:O	2.46	0.61
1:C:300:ARG:HH21	2:D:67:ASP:HB3	1.65	0.61
1:A:254:LEU:HD12	1:A:254:LEU:O	2.01	0.60
3:H:169:VAL:HG13	3:H:169:VAL:O	2.00	0.60
1:A:123:MET:HE3	1:A:168:TYR:CD2	2.36	0.60
1:A:123:MET:CE	1:A:168:TYR:CD2	2.85	0.60
1:E:15:LEU:H	1:E:15:LEU:HD22	1.64	0.60
1:E:254:LEU:O	1:E:254:LEU:HD12	2.01	0.60
4:L:106:VAL:HB	4:L:108:GLN:OE1	2.02	0.60
1:C:123:MET:SD	1:C:254:LEU:HD11	2.41	0.60
1:A:70:ILE:HG21	1:A:179:ILE:CD1	2.32	0.60
1:C:123:MET:CE	1:C:168:TYR:CD2	2.85	0.60
2:B:56:ILE:HG12	3:H:74:PHE:CE1	2.36	0.60
1:A:15:LEU:CD2	1:A:15:LEU:H	2.14	0.60
2:D:17:LEU:HD11	2:D:36:ALA:HB2	1.82	0.59
1:C:291:ASN:ND2	3:J:74:PHE:HB2	2.18	0.59
1:A:123:MET:CE	1:A:168:TYR:CG	2.85	0.59
3:J:126:PRO:HG3	3:J:138:LEU:HB3	1.83	0.59
1:A:302:VAL:HG11	2:B:65:LEU:HD13	1.84	0.59
2:F:41:THR:HG21	3:I:98:TYR:CZ	2.37	0.58
4:N:13:GLY:HA2	4:N:106(A):LEU:HD12	1.85	0.58
4:M:61:ARG:HB2	4:M:76:SER:O	2.02	0.58
1:C:17:HIS:HA	2:D:21:TRP:O	2.03	0.58
4:N:50:SER:O	4:N:51:ASN:HB2	2.03	0.58
2:B:56:ILE:CG2	3:H:74:PHE:HD1	2.16	0.58
2:D:99:LEU:O	2:D:103:GLU:HG2	2.04	0.58
1:C:15:LEU:HD22	1:C:15:LEU:H	1.68	0.58
1:C:44:GLU:OE1	1:C:290:SER:HB2	2.03	0.58
3:H:126:PRO:HG3	3:H:138:LEU:HB3	1.86	0.57
1:C:120:LYS:HE3	1:C:258:SER:OG	2.04	0.57
1:C:302:VAL:HG11	2:D:65:LEU:HD13	1.85	0.57
1:E:70:ILE:HG21	1:E:179:ILE:CD1	2.35	0.57
1:E:15:LEU:H	1:E:15:LEU:CD2	2.17	0.57
2:F:17:LEU:HD11	2:F:36:ALA:HB2	1.86	0.57
2:D:56:ILE:CG2	3:J:74:PHE:HD1	2.18	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:66:ILE:HD13	2:D:81:ILE:HG21	1.85	0.57
2:D:56:ILE:CG1	3:J:74:PHE:HD1	2.16	0.57
1:E:70:ILE:CG2	1:E:179:ILE:HG13	2.34	0.57
4:M:50:SER:O	4:M:51:ASN:HB2	2.04	0.57
2:B:17:LEU:HD11	2:B:36:ALA:HB2	1.86	0.56
4:M:145:THR:HG22	4:M:196:THR:OG1	2.04	0.56
2:B:4:GLY:O	2:B:8:GLY:HA3	2.04	0.56
1:A:291:ASN:HD22	3:H:74:PHE:CB	2.15	0.56
2:D:4:GLY:O	2:D:8:GLY:HA3	2.06	0.56
1:C:123:MET:HE1	1:C:168:TYR:CD2	2.40	0.56
2:F:163:ARG:O	2:F:167:ILE:HG13	2.06	0.55
2:D:56:ILE:HG12	3:J:74:PHE:HE1	1.65	0.55
2:B:56:ILE:CG1	3:H:74:PHE:HD1	2.19	0.55
1:E:100:GLY:HA3	1:E:230:ILE:O	2.07	0.55
2:D:163:ARG:O	2:D:167:ILE:HG13	2.07	0.55
2:B:19:ASP:OD2	3:H:100(A):TYR:CZ	2.58	0.55
1:A:172:ARG:HD3	1:A:259:PHE:CZ	2.42	0.55
2:B:61:GLN:OE1	2:D:90:GLU:HG2	2.06	0.55
1:A:180:TRP:HZ3	1:A:235:LEU:HD23	1.71	0.54
2:D:56:ILE:HG13	3:J:74:PHE:CD1	2.43	0.54
1:C:15:LEU:H	1:C:15:LEU:CD2	2.21	0.54
4:L:50:SER:O	4:L:51:ASN:HB2	2.08	0.54
1:C:237:LEU:HG	1:C:243:VAL:HG22	1.90	0.54
2:B:52:LEU:HD23	3:H:53:ILE:CD1	2.37	0.54
1:A:178:ILE:HG23	1:A:254:LEU:HD21	1.90	0.54
3:I:126:PRO:HG3	3:I:138:LEU:HB3	1.88	0.54
1:A:220:ARG:HB3	1:A:221:PRO:HD2	1.90	0.54
2:D:38:TYR:HE1	3:J:97:ASN:CB	2.20	0.54
4:L:167:GLN:OE1	4:L:173:ALA:HB2	2.07	0.53
3:I:11:VAL:HG21	3:I:147:PRO:HG3	1.91	0.53
4:M:183:GLU:O	4:M:186:LYS:HG2	2.09	0.53
1:E:325:GLU:N	1:E:325:GLU:OE1	2.42	0.53
1:C:172:ARG:HD3	1:C:259:PHE:CZ	2.44	0.53
1:A:291:ASN:HB3	3:H:74:PHE:HB3	1.89	0.52
1:E:120:LYS:HE3	1:E:258:SER:OG	2.09	0.52
1:A:291:ASN:ND2	3:H:74:PHE:CB	2.72	0.52
1:C:150:GLU:OE1	1:C:256:ARG:HD3	2.09	0.52
2:D:56:ILE:HG12	3:J:74:PHE:HD1	1.63	0.52
1:A:292:LEU:HD21	3:H:74:PHE:CZ	2.45	0.52
4:L:83:GLU:HG2	4:L:166:LYS:HZ1	1.73	0.52
4:N:62:PHE:CD1	4:N:75:ILE:HG12	2.44	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:56:ILE:CG1	3:H:74:PHE:HE1	2.18	0.52
4:N:13:GLY:CA	4:N:106(A):LEU:HG	2.40	0.52
1:C:201:LEU:HD12	1:E:218:GLY:HA3	1.92	0.52
2:B:129:ASN:OD1	2:B:129:ASN:N	2.42	0.52
1:A:121:GLU:OE2	1:A:172:ARG:HD2	2.10	0.52
4:N:80:SER:HA	4:N:106:VAL:HG21	1.92	0.52
2:D:47:GLN:OE1	2:D:110:LEU:HD11	2.10	0.52
2:F:38:TYR:CE1	3:I:97:ASN:ND2	2.77	0.52
1:A:73:PRO:HB2	1:A:75:GLN:OE1	2.09	0.52
1:C:123:MET:HE3	1:C:168:TYR:CD2	2.44	0.51
2:B:145:ASP:N	2:B:145:ASP:OD1	2.44	0.51
1:C:31:GLU:HG3	1:C:32:ARG:N	2.25	0.51
4:N:13:GLY:CA	4:N:106(A):LEU:CD1	2.87	0.51
2:B:128:GLU:OE1	2:D:170:ARG:NH2	2.44	0.51
1:A:237:LEU:HG	1:A:243:VAL:HG22	1.92	0.51
2:F:99:LEU:O	2:F:103:GLU:HG2	2.11	0.51
1:E:237:LEU:HG	1:E:243:VAL:HG22	1.93	0.51
1:C:100:GLY:HA3	1:C:230:ILE:O	2.10	0.51
3:H:11:VAL:HG21	3:H:147:PRO:CG	2.38	0.51
3:I:186:SER:O	3:I:189:LEU:HB2	2.10	0.51
2:D:129:ASN:OD1	2:D:129:ASN:N	2.43	0.51
1:C:220:ARG:HB3	1:C:221:PRO:HD2	1.92	0.51
1:A:150:GLU:OE1	1:A:256:ARG:HD3	2.10	0.51
2:B:163:ARG:O	2:B:167:ILE:HG13	2.11	0.51
2:B:56:ILE:HG12	3:H:74:PHE:CD1	2.46	0.50
1:A:291:ASN:CB	3:H:74:PHE:CB	2.89	0.50
1:E:220:ARG:HB3	1:E:221:PRO:HD2	1.93	0.50
2:D:145:ASP:OD1	2:D:145:ASP:N	2.43	0.50
4:N:145:THR:HG22	4:N:196:THR:OG1	2.12	0.50
2:B:41:THR:HG22	2:B:42:GLN:N	2.25	0.50
1:A:120:LYS:HE3	1:A:258:SER:OG	2.12	0.50
2:D:56:ILE:CG2	2:D:56:ILE:O	2.59	0.50
2:F:159:HIS:CG	2:F:160:SER:N	2.79	0.50
1:C:178:ILE:HG23	1:C:254:LEU:HD21	1.93	0.50
1:E:291:ASN:HD22	3:I:74:PHE:HB2	1.75	0.50
2:F:66:ILE:HD13	2:F:81:ILE:HG21	1.94	0.50
4:M:54:ARG:NH1	4:M:58:VAL:O	2.45	0.50
2:B:99:LEU:O	2:B:103:GLU:HG2	2.11	0.50
2:B:6:ILE:N	2:B:112:ASP:OD1	2.41	0.50
3:J:178:LEU:HD12	3:J:178:LEU:C	2.32	0.50
2:D:38:TYR:HE1	3:J:97:ASN:HB2	1.77	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:F:129:ASN:N	2:F:129:ASN:OD1	2.44	0.50
3:H:186:SER:O	3:H:189:LEU:HB2	2.12	0.49
2:B:19:ASP:OD1	3:H:99:TYR:CD2	2.64	0.49
1:A:44:GLU:OE1	1:A:290:SER:HB2	2.12	0.49
2:B:90:GLU:HG2	2:F:61:GLN:OE1	2.11	0.49
2:F:19:ASP:OD1	3:I:99:TYR:CE1	2.65	0.49
2:D:61:GLN:OE1	2:F:90:GLU:HG2	2.13	0.49
4:L:80:SER:HA	4:L:106:VAL:HG21	1.93	0.49
1:C:180:TRP:CH2	1:C:204:VAL:HG11	2.48	0.49
4:L:149:LYS:HB2	4:L:192:SER:HB2	1.94	0.49
4:M:149:LYS:HB2	4:M:192:SER:HB2	1.93	0.49
2:F:145:ASP:N	2:F:145:ASP:OD1	2.46	0.49
2:D:41:THR:HG22	2:D:42:GLN:N	2.27	0.49
1:A:17:HIS:HA	2:B:21:TRP:O	2.13	0.49
4:N:148:TRP:CE3	4:N:178:LEU:HD22	2.48	0.49
1:E:31:GLU:HG3	1:E:32:ARG:N	2.28	0.48
3:H:36:TRP:CD2	3:H:80:MET:HB2	2.48	0.48
4:L:49:TYR:O	4:L:53:GLN:HB2	2.13	0.48
1:A:31:GLU:HG3	1:A:32:ARG:N	2.29	0.48
1:C:80:LEU:O	1:C:120:LYS:NZ	2.46	0.48
3:I:178:LEU:HD12	3:I:178:LEU:C	2.34	0.48
2:F:41:THR:HG22	2:F:42:GLN:N	2.28	0.48
2:F:4:GLY:O	2:F:8:GLY:HA3	2.14	0.48
3:J:189:LEU:CD2	3:J:213:PRO:CG	2.92	0.48
4:L:139:PHE:CE2	4:L:144:VAL:HG13	2.49	0.48
1:E:178:ILE:CG2	1:E:254:LEU:HD21	2.42	0.48
4:L:83:GLU:HG2	4:L:166:LYS:HZ3	1.77	0.48
2:F:148:CYS:O	2:F:152:ILE:HG13	2.13	0.48
1:E:180:TRP:CE2	1:E:204:VAL:HG21	2.49	0.48
1:E:103:VAL:O	1:E:104:ASN:HB2	2.13	0.48
1:E:70:ILE:HG21	1:E:179:ILE:HD11	1.96	0.48
4:N:106:VAL:O	4:N:108:GLN:OE1	2.31	0.48
1:E:300:ARG:HH21	2:F:67:ASP:HB3	1.79	0.48
1:E:150:GLU:OE1	1:E:256:ARG:HD3	2.13	0.48
3:H:90:TYR:N	3:H:90:TYR:CD2	2.82	0.48
1:C:295:GLN:O	1:C:308:TYR:HA	2.14	0.48
2:B:23:GLY:HA3	2:B:36:ALA:HA	1.95	0.47
1:C:237:LEU:HD11	1:C:243:VAL:HG23	1.96	0.47
1:E:237:LEU:HD22	1:E:241:ASP:HB3	1.96	0.47
1:C:260:LEU:HD13	1:C:260:LEU:N	2.28	0.47
1:C:103:VAL:O	1:C:104:ASN:HB2	2.14	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:292:LEU:CD2	3:H:74:PHE:CZ	2.97	0.47
3:I:126:PRO:HD2	3:I:213:PRO:HA	1.96	0.47
1:A:123:MET:HE1	1:A:168:TYR:CD2	2.49	0.47
4:N:203:GLU:HG2	4:N:204:LYS:N	2.29	0.47
3:I:36:TRP:CD2	3:I:80:MET:HB2	2.50	0.47
1:C:41:GLU:OE1	1:C:313:SER:OG	2.17	0.47
3:H:141:LEU:HG	3:H:143:LYS:HG3	1.97	0.47
2:F:46:ASP:OD2	3:I:31:ASN:ND2	2.46	0.47
4:L:13:GLY:C	4:L:106(A):LEU:HB2	2.35	0.47
3:H:138:LEU:HD13	3:H:211:VAL:CG1	2.43	0.47
3:H:126:PRO:HD2	3:H:213:PRO:HA	1.97	0.47
3:J:189:LEU:HD21	3:J:213:PRO:HG3	1.95	0.47
1:A:16:GLY:HA3	2:B:14:TRP:CH2	2.50	0.47
1:C:178:ILE:CG2	1:C:254:LEU:CD2	2.93	0.46
1:E:123:MET:CE	1:E:168:TYR:CB	2.94	0.46
1:C:180:TRP:CE2	1:C:204:VAL:HG21	2.50	0.46
4:L:106:VAL:CB	4:L:108:GLN:OE1	2.62	0.46
1:A:100:GLY:HA3	1:A:230:ILE:O	2.16	0.46
2:F:41:THR:HG21	3:I:98:TYR:CE2	2.51	0.46
2:B:168:GLN:C	2:B:170:ARG:H	2.18	0.46
1:C:121:GLU:OE2	1:C:172:ARG:HD2	2.16	0.46
1:E:179:ILE:HD13	1:E:234:TRP:HB3	1.97	0.46
1:A:70:ILE:HG21	1:A:179:ILE:HD11	1.97	0.46
2:D:133:ASP:OD1	2:D:137:CYS:O	2.34	0.46
4:L:54:ARG:NH1	4:L:58:VAL:O	2.42	0.46
2:F:23:GLY:HA3	2:F:36:ALA:HA	1.97	0.46
1:E:237:LEU:HD11	1:E:243:VAL:HG23	1.96	0.46
1:A:201:LEU:CD2	1:C:218:GLY:HA3	2.46	0.46
1:A:132:THR:HG23	1:A:152:LYS:HD3	1.98	0.46
3:J:68:THR:HB	3:J:81:GLU:HB3	1.97	0.46
2:D:5:ALA:HB1	2:D:115:MET:HG2	1.98	0.46
2:B:19:ASP:OD1	3:H:99:TYR:CZ	2.69	0.46
4:N:156:LYS:HB2	4:N:156:LYS:HE3	1.77	0.46
1:E:254:LEU:HD12	1:E:254:LEU:C	2.37	0.46
4:L:13:GLY:O	4:L:106(A):LEU:N	2.46	0.46
3:J:186:SER:O	3:J:189:LEU:HB2	2.16	0.46
2:D:77:ILE:HD11	2:F:77:ILE:HD12	1.98	0.46
4:M:203:GLU:HG2	4:M:204:LYS:N	2.31	0.46
4:N:132:LEU:HB2	4:N:178:LEU:HB3	1.97	0.45
2:B:47:GLN:OE1	2:B:110:LEU:HD11	2.15	0.45
2:B:159:HIS:CG	2:B:160:SER:N	2.84	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:56:ILE:CG2	2:B:56:ILE:O	2.63	0.45
1:E:176:ALA:HB2	1:E:259:PHE:CE2	2.51	0.45
1:C:113:ARG:HB3	1:C:267:GLY:HA3	1.97	0.45
4:L:54:ARG:NE	4:L:60:ASP:HA	2.31	0.45
1:E:17:HIS:HA	2:F:21:TRP:O	2.17	0.45
1:E:108:LEU:HD22	1:E:234:TRP:CD1	2.51	0.45
2:D:127:ARG:HG3	2:D:159:HIS:CG	2.52	0.45
3:I:189:LEU:CD2	3:I:213:PRO:CG	2.94	0.45
4:L:110:LYS:HG3	4:L:141:PRO:HD3	1.98	0.45
2:F:56:ILE:CG1	3:I:74:PHE:HD1	2.22	0.45
4:N:12:SER:CB	4:N:106(A):LEU:HD21	2.46	0.45
1:C:188:THR:O	1:C:192:THR:HG23	2.17	0.45
4:N:187:SER:O	4:N:189:ARG:NH2	2.49	0.45
1:A:291:ASN:HB2	3:H:74:PHE:CG	2.52	0.45
2:D:19:ASP:OD1	3:J:99:TYR:CE2	2.67	0.44
4:N:12:SER:HB2	4:N:106(A):LEU:CD2	2.46	0.44
2:D:133:ASP:OD2	2:D:137:CYS:HB2	2.17	0.44
1:C:107:ALA:HB1	2:F:75:ARG:HB3	1.99	0.44
2:F:41:THR:CG2	3:I:98:TYR:CE2	3.01	0.44
3:I:6:GLN:HA	3:I:21:SER:O	2.17	0.44
3:H:184:VAL:HG11	3:H:194:TYR:OH	2.18	0.44
3:H:47:TRP:CG	4:L:96:ALA:HB3	2.52	0.44
3:H:139:GLY:HA2	3:H:154:TRP:CH2	2.53	0.44
2:D:106:HIS:O	2:D:110:LEU:HB2	2.18	0.44
1:E:307:ARG:HG2	2:F:92:TRP:CE2	2.53	0.44
4:N:149:LYS:HB2	4:N:192:SER:HB2	1.98	0.44
4:L:156:LYS:HB2	4:L:156:LYS:HE3	1.84	0.44
3:H:196:CYS:O	3:H:196:CYS:SG	2.75	0.44
2:F:56:ILE:CG2	2:F:56:ILE:O	2.64	0.44
2:D:56:ILE:HG21	3:J:74:PHE:CD1	2.48	0.44
3:H:189:LEU:CD2	3:H:213:PRO:CG	2.94	0.44
1:E:180:TRP:CH2	1:E:204:VAL:HG11	2.52	0.44
4:M:156:LYS:HB2	4:M:156:LYS:HE3	1.79	0.44
1:C:82:PHE:CE1	1:C:117:GLY:HA2	2.53	0.44
1:E:123:MET:HE3	1:E:168:TYR:CD2	2.48	0.44
1:C:202:ILE:N	1:C:202:ILE:HD12	2.33	0.44
3:H:11:VAL:HG23	3:H:147:PRO:HG3	1.90	0.44
1:E:70:ILE:CD1	1:E:118:ILE:HD12	2.48	0.44
1:C:108:LEU:HD22	1:C:234:TRP:CD1	2.53	0.44
1:E:178:ILE:CG2	1:E:254:LEU:CD2	2.93	0.43
1:A:201:LEU:HD23	1:C:218:GLY:HA3	2.00	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:F:6:ILE:N	2:F:112:ASP:OD1	2.45	0.43
1:A:325:GLU:HA	2:B:12:ASN:HD22	1.82	0.43
1:C:123:MET:CE	1:C:168:TYR:CB	2.96	0.43
1:E:291:ASN:HD22	3:I:74:PHE:CB	2.31	0.43
2:F:56:ILE:HG21	3:I:74:PHE:HA	2.01	0.43
3:H:139:GLY:HA2	3:H:154:TRP:CZ2	2.53	0.43
2:D:24:PHE:CD1	2:D:153:ARG:HG2	2.53	0.43
1:A:237:LEU:HD11	1:A:243:VAL:HG23	2.01	0.43
1:E:307:ARG:HG2	2:F:92:TRP:CD2	2.53	0.43
2:D:23:GLY:HA3	2:D:36:ALA:HA	2.00	0.43
4:L:13:GLY:C	4:L:106(A):LEU:HD12	2.39	0.43
1:A:170:ASN:HB2	1:A:237:LEU:HD13	2.00	0.43
1:A:300:ARG:HH21	2:B:67:ASP:HB3	1.83	0.43
1:A:202:ILE:HD12	1:A:202:ILE:N	2.33	0.43
4:L:120:PRO:HD3	4:L:132:LEU:HG	1.99	0.43
1:A:237:LEU:HD22	1:A:241:ASP:HB3	2.00	0.43
1:A:254:LEU:C	1:A:254:LEU:HD12	2.38	0.43
2:B:49:THR:OG1	3:H:53:ILE:HG21	2.18	0.43
1:A:103:VAL:O	1:A:104:ASN:HB2	2.18	0.43
1:C:123:MET:HE3	1:C:168:TYR:CD1	2.54	0.42
1:C:296:ASN:CG	1:C:296:ASN:O	2.57	0.42
4:N:61:ARG:HB2	4:N:76:SER:O	2.18	0.42
3:H:196:CYS:SG	3:H:209:LYS:HB3	2.59	0.42
4:M:185:TRP:CE2	4:M:208:PRO:HB3	2.53	0.42
3:H:91:PHE:CE1	4:L:43:ALA:HA	2.55	0.42
1:C:60:ASP:C	1:C:60:ASP:OD1	2.58	0.42
2:B:56:ILE:HG12	3:H:74:PHE:HE1	1.80	0.42
4:M:187:SER:O	4:M:189:ARG:CZ	2.67	0.42
3:H:8:GLY:O	3:H:107:THR:HG23	2.19	0.42
3:I:139:GLY:HA2	3:I:154:TRP:CH2	2.55	0.42
4:N:27:ASP:O	4:N:30:ARG:HD3	2.20	0.42
4:L:14:THR:HA	4:L:106(A):LEU:O	2.19	0.42
3:H:12:LYS:O	3:H:111:VAL:HA	2.20	0.42
1:E:202:ILE:HD12	1:E:202:ILE:N	2.34	0.42
4:L:11:VAL:HG21	4:L:21:ILE:HG12	2.01	0.42
3:J:189:LEU:CD2	3:J:213:PRO:HG2	2.49	0.42
1:A:180:TRP:HZ3	1:A:235:LEU:CD2	2.31	0.42
4:N:83:GLU:HG3	4:N:104:LEU:O	2.20	0.42
1:E:16:GLY:HA3	2:F:14:TRP:CH2	2.55	0.42
4:L:108:GLN:NE2	4:L:140:TYR:CE2	2.88	0.42
3:H:169:VAL:CG1	3:H:169:VAL:O	2.67	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:J:197:ASN:ND2	3:J:208:ASP:OD1	2.48	0.42
4:N:13:GLY:CA	4:N:106(A):LEU:HD12	2.47	0.42
3:J:126:PRO:HD2	3:J:213:PRO:HA	2.02	0.42
3:I:189:LEU:HD21	3:I:213:PRO:HG3	2.02	0.42
3:I:1:GLN:N	3:I:1:GLN:OE1	2.48	0.42
4:L:106:VAL:CG1	4:L:108:GLN:HG3	2.48	0.41
1:A:29:LEU:HD12	2:F:54:ARG:CZ	2.50	0.41
2:D:159:HIS:CG	2:D:160:SER:N	2.87	0.41
2:D:38:TYR:HE1	3:J:97:ASN:HB3	1.84	0.41
2:D:56:ILE:CG2	3:J:74:PHE:CD1	3.00	0.41
1:C:16:GLY:HA3	2:D:14:TRP:CH2	2.55	0.41
1:A:320:MET:HG3	1:A:321:LYS:O	2.20	0.41
1:C:70:ILE:HD13	1:C:118:ILE:HD12	2.03	0.41
1:A:180:TRP:CZ3	1:A:235:LEU:CD2	3.03	0.41
1:C:41:GLU:HG3	1:C:42:THR:N	2.34	0.41
4:L:120:PRO:HD2	4:L:185:TRP:CZ2	2.55	0.41
4:M:132:LEU:HB2	4:M:178:LEU:HB3	2.02	0.41
1:E:70:ILE:HD13	1:E:118:ILE:HD12	2.03	0.41
1:A:179:ILE:HD13	1:A:234:TRP:HB3	2.02	0.41
1:A:180:TRP:CE2	1:A:204:VAL:HG21	2.55	0.41
1:E:132:THR:O	1:E:132:THR:CG2	2.68	0.41
4:L:35:TRP:CH2	4:L:88:CYS:HB3	2.55	0.41
4:N:13:GLY:HA2	4:N:106(A):LEU:HD11	2.02	0.41
2:B:52:LEU:CD2	3:H:53:ILE:HD12	2.51	0.41
2:B:106:HIS:O	2:B:110:LEU:HB2	2.21	0.41
4:N:123:GLU:OE1	4:N:123:GLU:N	2.41	0.41
2:B:5:ALA:HB1	2:B:115:MET:HG2	2.02	0.41
4:N:124:GLU:HG2	4:N:129:LYS:O	2.21	0.41
1:C:325:GLU:HA	2:D:12:ASN:HD22	1.85	0.41
4:L:12:SER:HB2	4:L:106(A):LEU:HD21	2.03	0.41
2:D:170:ARG:O	2:D:171:ILE:HD13	2.21	0.41
2:D:51:LYS:NZ	2:D:103:GLU:O	2.54	0.41
3:H:124:LEU:HB3	4:L:118:PHE:CD1	2.56	0.41
3:I:12:LYS:O	3:I:111:VAL:HA	2.20	0.41
4:N:144:VAL:HG12	4:N:197:HIS:HB2	2.03	0.41
4:L:203:GLU:O	4:L:204:LYS:HG2	2.21	0.40
1:A:238:ASN:O	1:A:239:PRO:C	2.59	0.40
4:N:13:GLY:C	4:N:106(A):LEU:HG	2.42	0.40
2:B:66:ILE:HD13	2:B:81:ILE:CG2	2.49	0.40
3:H:195:ILE:HG23	3:H:209:LYS:O	2.22	0.40
1:A:296:ASN:O	1:A:296:ASN:CG	2.59	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:J:36:TRP:CZ3	3:J:92:CYS:HB3	2.56	0.40
4:M:30:ARG:NH1	4:M:93:ASP:OD2	2.53	0.40
2:F:56:ILE:HG21	3:I:74:PHE:HD1	1.86	0.40
3:H:197:ASN:HB3	3:H:206:LYS:NZ	2.36	0.40
2:B:49:THR:HG23	3:H:53:ILE:HG13	2.04	0.40
3:J:197:ASN:HB3	3:J:206:LYS:NZ	2.36	0.40
1:C:269:GLN:HB3	2:D:70:PHE:CE1	2.57	0.40
2:B:148:CYS:O	2:B:152:ILE:HG13	2.20	0.40

All (3) 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)
4:L:189:ARG:NH2	3:J:157:GLY:O[6_554]	1.99	0.21
4:L:189:ARG:NE	3:J:157:GLY:O[6_554]	2.10	0.10
4:M:187:SER:OG	4:M:187:SER:OG[2_465]	2.14	0.06

5.3 Torsion angles

5.3.1 Protein backbone

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	314/327 (96%)	295 (94%)	19 (6%)	0	100	100
1	C	314/327 (96%)	297 (95%)	17 (5%)	0	100	100
1	E	315/327 (96%)	296 (94%)	19 (6%)	0	100	100
2	B	168/176 (96%)	151 (90%)	14 (8%)	3 (2%)	11	53
2	D	169/176 (96%)	152 (90%)	14 (8%)	3 (2%)	11	53
2	F	167/176 (95%)	151 (90%)	14 (8%)	2 (1%)	16	61
3	H	213/224 (95%)	210 (99%)	3 (1%)	0	100	100
3	I	213/224 (95%)	212 (100%)	1 (0%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
3	J	213/224 (95%)	212 (100%)	1 (0%)	0	100	100
4	L	209/216 (97%)	204 (98%)	4 (2%)	1 (0%)	34	77
4	M	209/216 (97%)	206 (99%)	2 (1%)	1 (0%)	34	77
4	N	209/216 (97%)	205 (98%)	3 (1%)	1 (0%)	34	77
All	All	2713/2829 (96%)	2591 (96%)	111 (4%)	11 (0%)	39	80

All (11) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	B	57	GLU
2	D	57	GLU
2	F	57	GLU
2	B	119	TYR
2	D	119	TYR
2	F	119	TYR
2	B	169	ASN
2	D	169	ASN
4	L	51	ASN
4	M	51	ASN
4	N	51	ASN

5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	268/277 (97%)	236 (88%)	32 (12%)	6	31
1	C	268/277 (97%)	236 (88%)	32 (12%)	6	31
1	E	268/277 (97%)	239 (89%)	29 (11%)	8	36
2	B	145/151 (96%)	129 (89%)	16 (11%)	8	34
2	D	146/151 (97%)	131 (90%)	15 (10%)	9	37
2	F	144/151 (95%)	128 (89%)	16 (11%)	8	34
3	H	180/187 (96%)	177 (98%)	3 (2%)	68	87

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
3	I	180/187 (96%)	178 (99%)	2 (1%)	80	91
3	J	180/187 (96%)	178 (99%)	2 (1%)	80	91
4	L	175/180 (97%)	170 (97%)	5 (3%)	50	78
4	M	175/180 (97%)	171 (98%)	4 (2%)	58	83
4	N	175/180 (97%)	171 (98%)	4 (2%)	58	83
All	All	2304/2385 (97%)	2144 (93%)	160 (7%)	19	56

All (160) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	11	ASP
1	A	15	LEU
1	A	18	HIS
1	A	29	LEU
1	A	30	THR
1	A	31	GLU
1	A	34	VAL
1	A	42	THR
1	A	70	ILE
1	A	75	GLN
1	A	96	VAL
1	A	118	ILE
1	A	132	THR
1	A	136	THR
1	A	140	ARG
1	A	146	SER
1	A	152	LYS
1	A	155	LEU
1	A	173	LYS
1	A	192	THR
1	A	235	LEU
1	A	237	LEU
1	A	246	SER
1	A	254	LEU
1	A	256	ARG
1	A	263	LYS
1	A	271	GLU
1	A	280	ASP
1	A	290	SER
1	A	307	ARG

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Mol	Chain	Res	Type
1	A	321	LYS
1	A	323	VAL
2	B	2	LEU
2	B	11	GLU
2	B	34	THR
2	B	41	THR
2	B	52	LEU
2	B	57	GLU
2	B	65	LEU
2	B	67	ASP
2	B	71	THR
2	B	90	GLU
2	B	110	LEU
2	B	129	ASN
2	B	140	ILE
2	B	144	CYS
2	B	148	CYS
2	B	168	GLN
1	C	15	LEU
1	C	18	HIS
1	C	29	LEU
1	C	30	THR
1	C	31	GLU
1	C	34	VAL
1	C	42	THR
1	C	75	GLN
1	C	96	VAL
1	C	104	ASN
1	C	118	ILE
1	C	132	THR
1	C	136	THR
1	C	140	ARG
1	C	146	SER
1	C	152	LYS
1	C	155	LEU
1	C	173	LYS
1	C	179	ILE
1	C	192	THR
1	C	201	LEU
1	C	237	LEU
1	C	246	SER
1	C	254	LEU

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Mol	Chain	Res	Type
1	C	256	ARG
1	C	260	LEU
1	C	263	LYS
1	C	271	GLU
1	C	280	ASP
1	C	290	SER
1	C	307	ARG
1	C	323	VAL
2	D	2	LEU
2	D	11	GLU
2	D	34	THR
2	D	41	THR
2	D	52	LEU
2	D	57	GLU
2	D	65	LEU
2	D	71	THR
2	D	90	GLU
2	D	110	LEU
2	D	129	ASN
2	D	140	ILE
2	D	144	CYS
2	D	148	CYS
2	D	171	ILE
1	E	11	ASP
1	E	15	LEU
1	E	18	HIS
1	E	29	LEU
1	E	30	THR
1	E	31	GLU
1	E	34	VAL
1	E	42	THR
1	E	70	ILE
1	E	96	VAL
1	E	104	ASN
1	E	118	ILE
1	E	132	THR
1	E	136	THR
1	E	140	ARG
1	E	146	SER
1	E	152	LYS
1	E	155	LEU
1	E	192	THR

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Mol	Chain	Res	Type
1	E	237	LEU
1	E	246	SER
1	E	254	LEU
1	E	256	ARG
1	E	263	LYS
1	E	271	GLU
1	E	280	ASP
1	E	290	SER
1	E	307	ARG
1	E	323	VAL
2	F	2	LEU
2	F	11	GLU
2	F	34	THR
2	F	41	THR
2	F	52	LEU
2	F	57	GLU
2	F	65	LEU
2	F	67	ASP
2	F	71	THR
2	F	90	GLU
2	F	110	LEU
2	F	129	ASN
2	F	140	ILE
2	F	144	CYS
2	F	148	CYS
2	F	169	ASN
3	H	184	VAL
3	H	189	LEU
3	H	197	ASN
4	L	67	SER
4	L	145	THR
4	L	152	SER
4	L	153	SER
4	L	189	ARG
3	I	184	VAL
3	I	189	LEU
4	M	67	SER
4	M	145	THR
4	M	152	SER
4	M	189	ARG
3	J	184	VAL
3	J	189	LEU

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Mol	Chain	Res	Type
4	N	67	SER
4	N	145	THR
4	N	152	SER
4	N	189	ARG

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
3	H	164	HIS
4	N	108	GLN

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 carbohydrates 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, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q< 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	316/327 (96%)	0.80	63 (19%) 1 6	178, 369, 432, 457	0
1	C	316/327 (96%)	0.52	25 (7%) 15 18	145, 357, 410, 426	0
1	E	317/327 (96%)	0.56	36 (11%) 7 11	166, 309, 394, 402	0
2	B	170/176 (96%)	0.54	10 (5%) 26 26	175, 222, 260, 276	0
2	D	171/176 (97%)	0.82	19 (11%) 7 12	168, 211, 267, 300	0
2	F	169/176 (96%)	0.31	5 (2%) 54 48	166, 217, 262, 274	0
3	H	215/224 (95%)	0.93	48 (22%) 1 5	208, 233, 322, 341	0
3	I	215/224 (95%)	0.37	16 (7%) 17 20	118, 159, 190, 206	0
3	J	215/224 (95%)	0.37	14 (6%) 22 23	89, 143, 198, 232	0
4	L	211/216 (97%)	0.46	24 (11%) 7 11	218, 272, 365, 402	0
4	M	211/216 (97%)	0.26	16 (7%) 17 19	159, 188, 242, 274	0
4	N	211/216 (97%)	0.14	10 (4%) 35 34	116, 159, 194, 204	0
All	All	2737/2829 (96%)	0.52	286 (10%) 8 13	89, 223, 397, 457	0

All (286) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	B	67	ASP	11.5
1	A	250	ALA	11.0
1	E	172	ARG	8.9
2	F	19	ASP	8.6
1	A	158(A)	ASP	8.2
2	B	68	ASN	7.5
3	H	161	SER	7.5
1	C	143	SER	7.2
1	C	144	GLY	6.9
1	C	141	ARG	6.6
1	E	174	ASP	6.6

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Mol	Chain	Res	Type	RSRZ
1	E	199	ASN	6.5
1	E	71	THR	6.4
3	H	134	GLY	6.4
1	A	106	GLU	6.2
1	A	158	THR	6.1
2	D	131	GLU	6.1
3	H	208	ASP	6.1
3	H	150	VAL	5.8
3	H	10	GLU	5.7
3	H	11	VAL	5.7
1	A	158(B)	ASN	5.7
2	D	130	ALA	5.6
2	D	71	THR	5.6
1	A	102	PHE	5.5
1	E	258	SER	5.5
1	E	259	PHE	5.5
2	B	66	ILE	5.4
3	H	160	THR	5.3
1	A	245	PHE	5.3
3	H	152	VAL	5.2
1	A	218	GLY	5.1
4	L	19	VAL	5.1
1	A	219	ALA	5.0
3	H	133	GLY	5.0
3	J	211	VAL	4.9
1	A	244	THR	4.9
2	D	129	ASN	4.9
1	C	140	ARG	4.9
4	M	113	PRO	4.8
4	L	21	ILE	4.7
3	J	179	SER	4.7
1	E	175	PRO	4.7
3	H	147	PRO	4.7
1	C	215	PRO	4.7
4	L	20	THR	4.7
1	A	157	ASN	4.6
2	D	128	GLU	4.6
1	C	74	PRO	4.6
3	J	194	TYR	4.6
1	A	159	ALA	4.6
3	H	61	GLN	4.6
1	A	67	LEU	4.5

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Mol	Chain	Res	Type	RSRZ
1	E	289	ILE	4.4
1	A	167	SER	4.3
1	A	249	GLY	4.3
1	A	156	SER	4.2
4	L	144	VAL	4.2
2	B	65	LEU	4.2
1	A	196	GLY	4.2
3	H	26	GLY	4.2
1	A	220	ARG	4.1
3	H	198	VAL	4.1
2	D	140	ILE	4.1
3	H	1	GLN	4.0
1	A	198	GLY	4.0
3	I	181	VAL	4.0
1	E	171	THR	4.0
1	E	70	ILE	4.0
3	H	207	VAL	3.9
4	M	115	VAL	3.9
2	D	69	GLU	3.9
1	A	66	LEU	3.9
3	I	180	SER	3.8
1	A	203	THR	3.8
4	N	62	PHE	3.8
1	A	278	GLU	3.8
2	B	69	GLU	3.8
4	L	73	LEU	3.8
1	A	178	ILE	3.7
1	C	288	ILE	3.7
1	E	132	THR	3.7
1	E	118	ILE	3.7
4	L	169	ASN	3.7
1	E	204	VAL	3.7
3	I	182	VAL	3.6
1	E	121	GLU	3.6
1	E	173	LYS	3.6
2	D	90	GLU	3.6
1	C	183	HIS	3.6
4	M	136	ILE	3.6
1	A	248	ASN	3.6
3	I	194	TYR	3.6
1	A	109	ARG	3.5
1	A	165	THR	3.5

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Mol	Chain	Res	Type	RSRZ
2	D	170	ARG	3.5
4	L	68	GLY	3.5
1	A	232	PHE	3.5
3	I	138	LEU	3.5
1	E	288	ILE	3.5
1	A	235	LEU	3.4
4	M	170	ASN	3.4
1	C	199	ASN	3.4
3	H	110	THR	3.4
1	A	200	LYS	3.3
1	C	311	GLN	3.3
1	E	119	ASP	3.3
1	A	162	PRO	3.3
1	A	208	ASN	3.3
1	C	325	GLU	3.3
2	B	15	GLU	3.3
1	A	246	SER	3.3
3	H	62	LYS	3.3
1	E	69	THR	3.2
2	D	87	SER	3.2
1	A	160	ALA	3.2
4	L	142	GLY	3.2
3	H	148	GLU	3.2
1	E	67	LEU	3.2
4	M	47	LEU	3.2
1	E	129	GLY	3.1
1	C	208	ASN	3.1
3	H	151	THR	3.1
1	E	138	ALA	3.1
3	H	145	TYR	3.1
1	A	197	SER	3.1
3	H	159	LEU	3.1
2	D	139	GLU	3.1
1	A	243	VAL	3.1
3	H	146	PHE	3.1
1	C	13	ILE	3.1
1	A	100	GLY	3.0
2	D	70	PHE	3.0
4	L	69	THR	3.0
1	E	278	GLU	3.0
2	B	61	GLN	3.0
1	A	202	ILE	3.0

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Mol	Chain	Res	Type	RSRZ
3	H	109	VAL	3.0
1	C	184	HIS	3.0
1	C	214	VAL	3.0
1	E	214	VAL	3.0
4	L	207	ALA	3.0
1	A	300	ARG	3.0
1	A	179	ILE	2.9
3	I	99	TYR	2.9
3	H	143	LYS	2.9
2	D	138	PHE	2.9
1	E	257	ALA	2.9
3	J	150	VAL	2.9
3	H	48	MET	2.9
1	E	130	ILE	2.8
3	J	209	LYS	2.8
1	A	201	LEU	2.8
3	H	177	SER	2.8
2	F	73	VAL	2.8
1	A	195	TYR	2.8
4	L	208	PRO	2.8
1	A	231	ASP	2.8
4	M	110	LYS	2.8
2	D	79	ASN	2.7
3	H	60	ALA	2.7
1	A	307	ARG	2.7
3	H	206	LYS	2.7
2	F	72	GLU	2.7
3	J	138	LEU	2.7
1	A	294	PHE	2.7
1	A	110	GLN	2.7
2	D	141	PHE	2.7
2	D	142	HIS	2.7
3	J	180	SER	2.6
1	E	140	ARG	2.6
1	A	315	LEU	2.6
4	L	168	SER	2.6
2	D	68	ASN	2.6
1	A	207	SER	2.6
4	L	167	GLN	2.6
2	D	126	LEU	2.6
3	J	126	PRO	2.6
4	M	114	SER	2.5

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Mol	Chain	Res	Type	RSRZ
3	I	183	THR	2.5
3	I	100(A)	TYR	2.5
4	M	132	LEU	2.5
4	L	143	ALA	2.5
3	I	139	GLY	2.5
2	F	78	GLY	2.5
4	L	120	PRO	2.5
1	A	168	TYR	2.5
4	M	33	VAL	2.5
4	M	32	SER	2.5
3	I	48	MET	2.5
1	A	70	ILE	2.5
2	B	73	VAL	2.5
3	H	135	THR	2.5
1	E	131	ARG	2.5
1	A	299	SER	2.5
3	I	196	CYS	2.5
4	N	174	ALA	2.4
1	E	82	PHE	2.4
1	A	166	LYS	2.4
4	M	90	ALA	2.4
3	H	63	PHE	2.4
3	I	140	CYS	2.4
3	H	144	ASP	2.4
1	E	260	LEU	2.4
4	N	90	ALA	2.4
3	J	210	ARG	2.4
4	L	145	THR	2.4
2	F	82	ASN	2.4
4	N	175	SER	2.4
3	H	186	SER	2.3
1	E	254	LEU	2.3
3	I	98	TYR	2.3
3	J	140	CYS	2.3
3	I	42	GLY	2.3
1	A	206	SER	2.3
4	M	112	ALA	2.3
4	N	116	THR	2.3
1	A	205	GLY	2.3
1	C	99	PRO	2.3
4	M	91	TRP	2.3
3	H	86	ASP	2.3

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Mol	Chain	Res	Type	RSRZ
1	E	158(B)	ASN	2.3
1	E	206	SER	2.3
3	J	133	GLY	2.3
1	E	215	PRO	2.3
1	A	161	PHE	2.3
4	L	177	TYR	2.3
1	E	102	PHE	2.3
1	C	250	ALA	2.3
1	A	325	GLU	2.3
4	L	26	SER	2.2
2	B	71	THR	2.2
1	E	243	VAL	2.2
3	J	123	PRO	2.2
4	L	75	ILE	2.2
4	L	86	TYR	2.2
3	H	117	LYS	2.2
2	D	43	SER	2.2
3	H	8	GLY	2.2
1	C	98	TYR	2.2
1	C	310	LYS	2.2
3	H	178	LEU	2.2
4	N	47	LEU	2.2
3	H	199	ASN	2.2
1	C	38	ASN	2.2
4	L	160	GLU	2.2
1	C	12	LYS	2.2
1	A	95	ASP	2.2
1	A	155	LEU	2.1
3	H	163	VAL	2.1
1	A	163	GLN	2.1
3	J	82(A)	ASN	2.1
1	C	216	SER	2.1
1	A	183	HIS	2.1
1	A	199	ASN	2.1
1	A	217	PRO	2.1
2	B	58	LYS	2.1
3	I	164	HIS	2.1
3	H	187	SER	2.1
1	C	312	GLU	2.1
1	E	133	ASN	2.1
3	H	168	ALA	2.1
4	L	12	SER	2.1

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Mol	Chain	Res	Type	RSRZ
4	M	95	LEU	2.1
4	N	113	PRO	2.1
3	H	38	ARG	2.1
4	M	169	ASN	2.1
1	A	113	ARG	2.1
3	H	174	GLY	2.1
3	H	179	SER	2.1
3	H	196	CYS	2.1
3	H	142	VAL	2.1
1	C	138	ALA	2.1
3	H	9	ALA	2.1
4	N	134	CYS	2.1
4	N	117	LEU	2.1
1	C	313	SER	2.1
3	J	198	VAL	2.0
3	H	173	SER	2.0
4	M	31	ARG	2.0
4	L	138	ASP	2.0
4	L	28	ILE	2.0
3	I	184	VAL	2.0
1	A	314	LEU	2.0
4	N	132	LEU	2.0
3	H	197	ASN	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 carbohydrates 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.