



# Full wwPDB X-ray Structure Validation Report ⓘ

Feb 1, 2016 – 05:17 PM GMT

PDB ID : 4HRE  
Title : Crystal Structure of p11/Annexin A2 Heterotetramer in Complex with SMARCA3 Peptide  
Authors : Gao, P.; Patel, D.J.  
Deposited on : 2012-10-27  
Resolution : 2.79 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](mailto: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.

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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

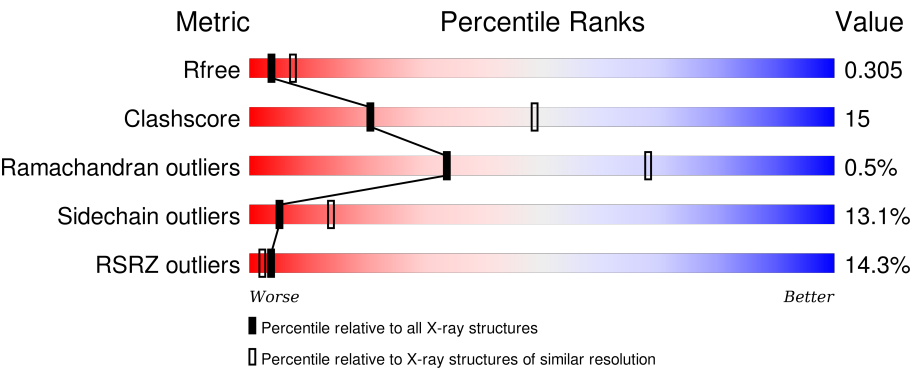
# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.79 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 <sub>free</sub>	91344	3004 (2.80-2.76)
Clashscore	102246	3480 (2.80-2.76)
Ramachandran outliers	100387	3423 (2.80-2.76)
Sidechain outliers	100360	3425 (2.80-2.76)
RSRZ outliers	91569	3016 (2.80-2.76)

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  $\geq 3$ , 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	339	<div><div>6%</div><div>69%27%.</div></div>
1	B	339	<div><div>5%</div><div>70%25%.</div></div>
1	C	339	<div><div>6%</div><div>67%27%6%.</div></div>
1	D	339	<div><div>5%</div><div>64%32%.</div></div>
2	E	97	<div><div>41%</div><div>42%45%6%6%.</div></div>

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Mol	Chain	Length	Quality of chain
2	F	97	<div><div><div>43%</div><div>49%</div><div>34%</div><div>10%</div><div>6%</div></div></div>
2	I	97	<div><div><div>34%</div><div>48%</div><div>37%</div><div>8%</div><div>6%</div></div></div>
2	J	97	<div><div><div>41%</div><div>47%</div><div>35%</div><div>10%</div><div>6%</div></div></div>
3	G	14	<div><div><div>36%</div><div>14%</div><div>36%</div><div>14%</div><div>36%</div></div></div>
3	H	14	<div><div><div>36%</div><div>21%</div><div>29%</div><div>14%</div><div>36%</div></div></div>
3	K	14	<div><div><div>50%</div><div>50%</div><div>14%</div><div>36%</div></div></div>
3	L	14	<div><div><div>36%</div><div>29%</div><div>21%</div><div>14%</div><div>36%</div></div></div>

## 2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 14088 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 Annexin A2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	338	Total	C	N	O	S	0	0	0
			2705	1700	463	529	13			
1	C	338	Total	C	N	O	S	0	0	0
			2705	1700	463	529	13			
1	B	338	Total	C	N	O	S	0	0	0
			2705	1700	463	529	13			
1	D	338	Total	C	N	O	S	0	0	0
			2701	1699	463	526	13			

- Molecule 2 is a protein called Protein S100-A10.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	E	91	Total	C	N	O	S	0	0	0
			733	472	118	134	9			
2	F	91	Total	C	N	O	S	0	0	0
			733	472	118	134	9			
2	I	91	Total	C	N	O	S	0	0	0
			733	472	118	134	9			
2	J	91	Total	C	N	O	S	0	0	0
			733	472	118	134	9			

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
E	0	SER	-	EXPRESSION TAG	UNP P60903
F	0	SER	-	EXPRESSION TAG	UNP P60903
I	0	SER	-	EXPRESSION TAG	UNP P60903
J	0	SER	-	EXPRESSION TAG	UNP P60903

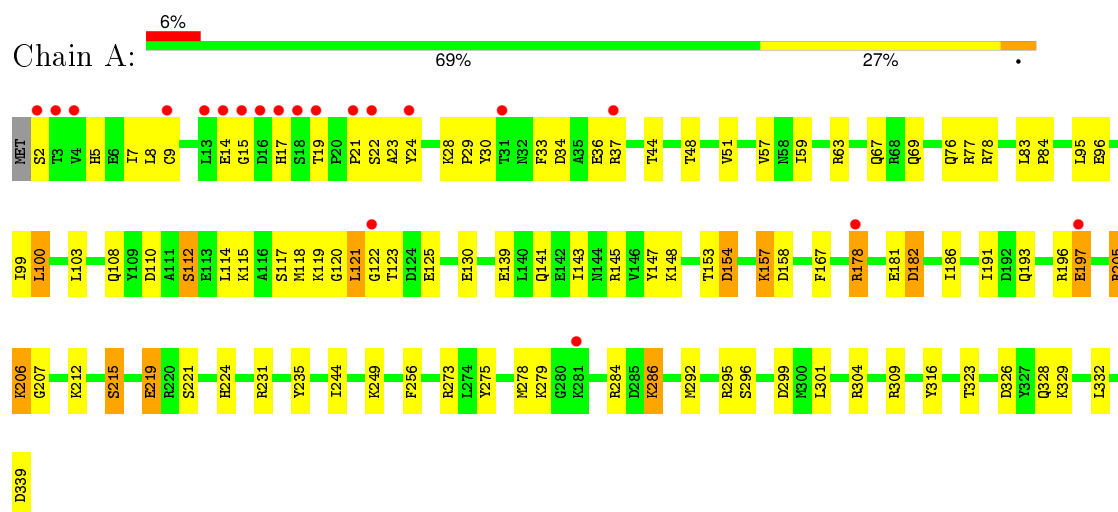
- Molecule 3 is a protein called Helicase-like transcription factor.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
3	G	9	Total	C	N	O	0	0	0
			85	61	12	12			
3	H	9	Total	C	N	O	0	0	0
			85	61	12	12			
3	K	9	Total	C	N	O	0	0	0
			85	61	12	12			
3	L	9	Total	C	N	O	0	0	0
			85	61	12	12			

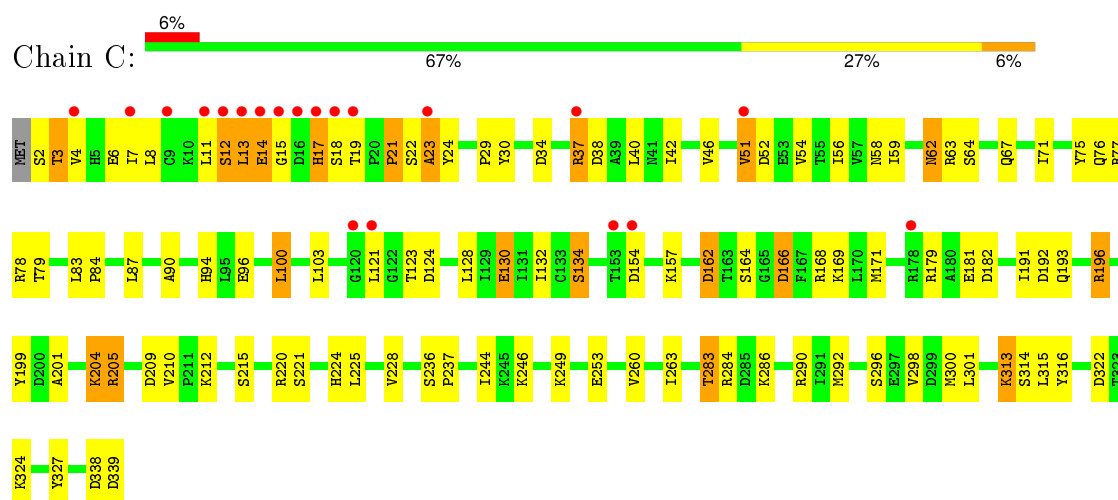
### 3 Residue-property plots [i](#)

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.

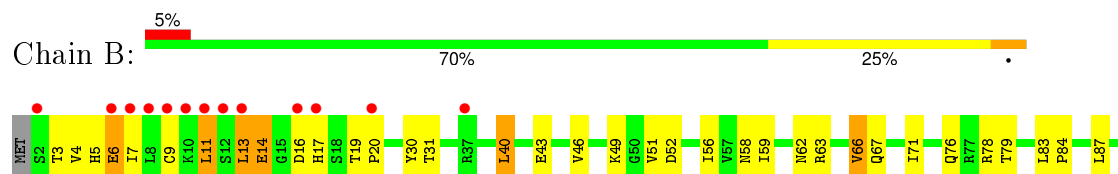
#### • Molecule 1: Annexin A2

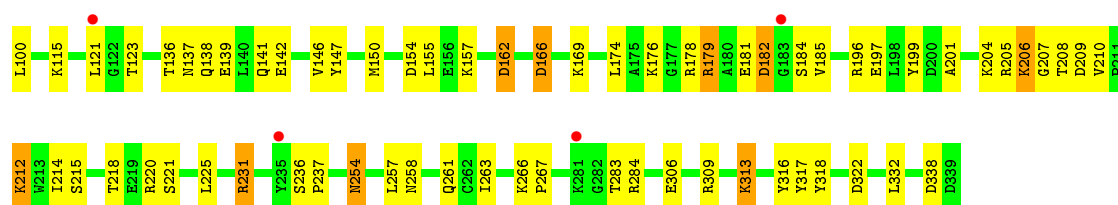


#### • Molecule 1: Annexin A2

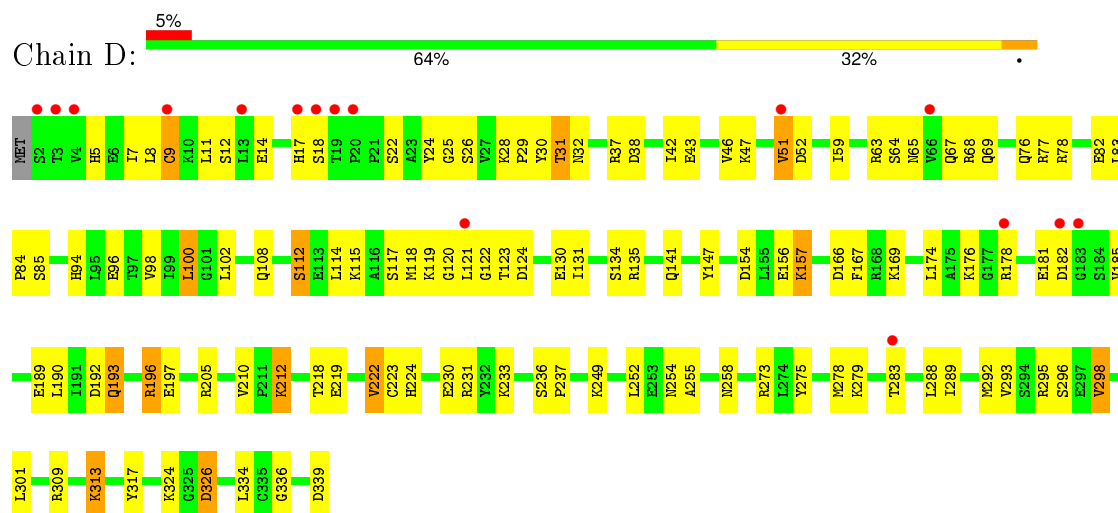


#### • Molecule 1: Annexin A2

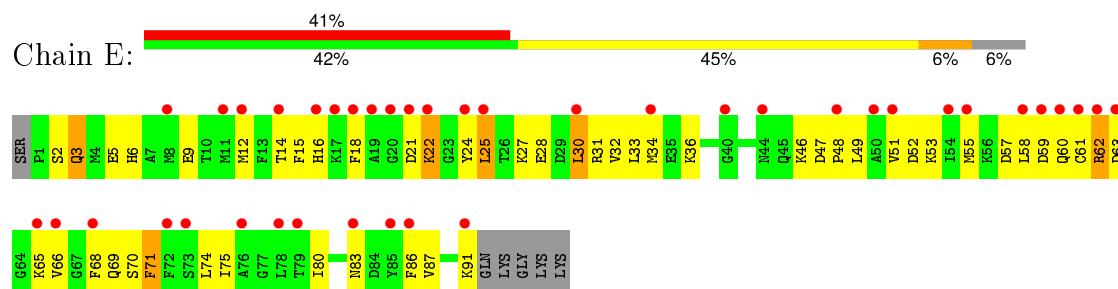




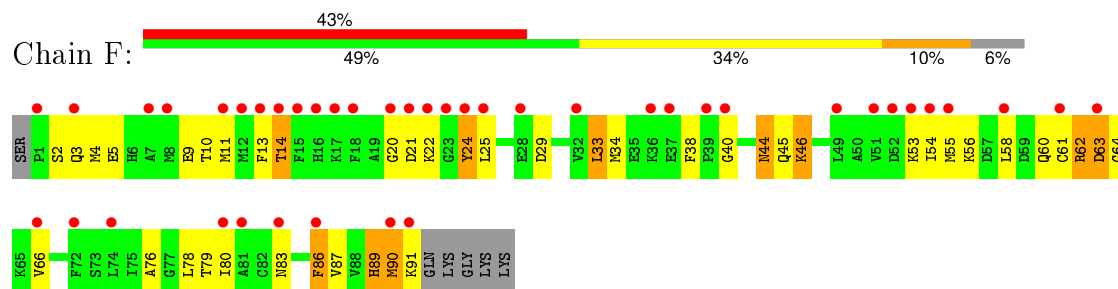
• Molecule 1: Annexin A2



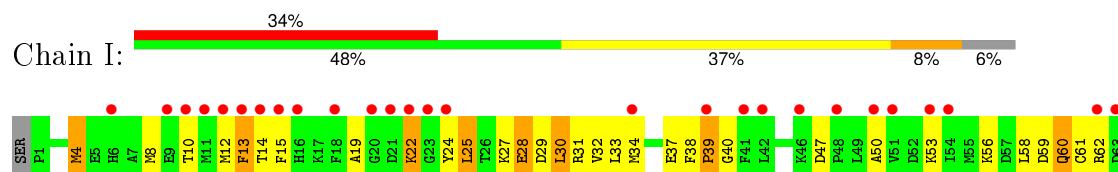
• Molecule 2: Protein S100-A10



• Molecule 2: Protein S100-A10

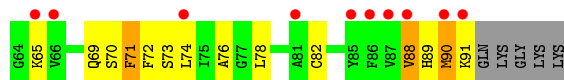
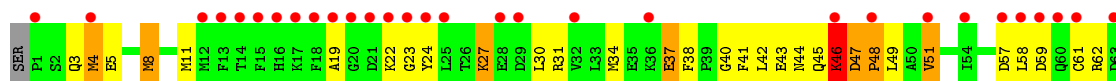
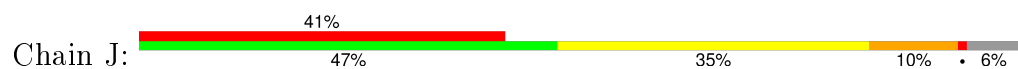


• Molecule 2: Protein S100-A10





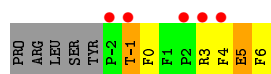
- Molecule 2: Protein S100-A10



- Molecule 3: Helicase-like transcription factor



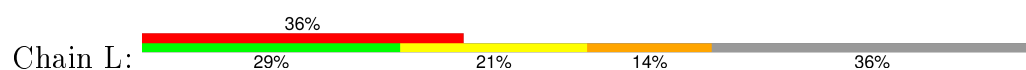
- Molecule 3: Helicase-like transcription factor



- Molecule 3: Helicase-like transcription factor



- Molecule 3: Helicase-like transcription factor





## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	50.79Å 74.35Å 154.47Å 90.14° 96.56° 108.37°	Depositor
Resolution (Å)	47.34 – 2.79 47.34 – 2.79	Depositor EDS
% Data completeness (in resolution range)	95.2 (47.34-2.79) 94.1 (47.34-2.79)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	3.31 (at 2.77Å)	Xtriage
Refinement program	PHENIX (phenix.refine: 1.7.3_928)	Depositor
R, $R_{free}$	0.249 , 0.296 0.261 , 0.305	Depositor DCC
$R_{free}$ test set	2586 reflections (5.36%)	DCC
Wilson B-factor (Å <sup>2</sup> )	44.1	Xtriage
Anisotropy	0.426	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.30 , 41.6	EDS
Estimated twinning fraction	0.000 for -h,h+k,-l	Xtriage
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.52$ , $\langle L^2 \rangle = 0.36$	Xtriage
Outliers	0 of 50819 reflections	Xtriage
$F_o, F_c$ correlation	0.92	EDS
Total number of atoms	14088	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	79.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 44.79 % of the origin peak, indicating pseudo translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo translational symmetry is equal to 1.4504e-04. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

<sup>1</sup> Intensities estimated from amplitudes.

<sup>2</sup> Theoretical 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	0.38	0/2744	0.59	0/3687
1	B	0.39	0/2744	0.61	0/3687
1	C	0.38	0/2744	0.61	0/3687
1	D	0.39	0/2740	0.62	1/3682 (0.0%)
2	E	0.32	0/749	0.57	0/1000
2	F	0.33	0/749	0.57	0/1000
2	I	0.31	0/749	0.57	0/1000
2	J	0.41	1/749 (0.1%)	0.70	2/1000 (0.2%)
3	G	0.44	0/90	0.51	0/120
3	H	0.35	0/90	0.62	0/120
3	K	0.43	0/90	0.51	0/120
3	L	0.36	0/90	0.51	0/120
All	All	0.38	1/14328 (0.0%)	0.61	3/19223 (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	D	0	3
2	J	0	1
3	H	0	1
All	All	0	7

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	J	48	PRO	N-CD	6.88	1.57	1.47

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	12	SER	CB-CA-C	9.10	127.39	110.10
2	J	47	ASP	C-N-CD	-7.49	104.13	120.60
2	J	47	ASP	CB-CA-C	5.91	122.23	110.40

There are no chirality outliers.

All (7) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	181	GLU	Peptide
1	C	15	GLY	Peptide
1	D	120	GLY	Peptide
1	D	121	LEU	Peptide
1	D	181	GLU	Peptide
3	H	-1	THR	Peptide
2	J	46	LYS	Peptide

## 5.2 Too-close contacts

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	2705	0	2737	81	0
1	B	2705	0	2737	69	0
1	C	2705	0	2737	73	0
1	D	2701	0	2732	69	0
2	E	733	0	723	39	0
2	F	733	0	723	32	0
2	I	733	0	723	33	0
2	J	733	0	723	36	0
3	G	85	0	78	9	0
3	H	85	0	78	5	0
3	K	85	0	78	0	0
3	L	85	0	78	2	0
All	All	14088	0	14147	410	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 15.

All (410) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:197:GLU:OE1	1:B:212:LYS:CE	1.82	1.27
1:A:118:MET:O	1:A:123:THR:HG21	1.42	1.17
1:A:120:GLY:CA	1:A:123:THR:HG22	1.76	1.16
1:A:120:GLY:HA3	1:A:123:THR:HG22	1.28	1.11
2:I:4:MET:HB2	2:J:37:GLU:HG3	1.14	1.11
1:B:197:GLU:OE1	1:B:212:LYS:HE2	1.47	1.09
1:B:197:GLU:OE1	1:B:212:LYS:HE3	1.50	1.07
1:B:6:GLU:HA	1:B:9:CYS:SG	1.94	1.06
2:I:4:MET:CB	2:J:37:GLU:HG3	1.87	1.04
1:A:215:SER:O	1:A:219:GLU:HG3	1.63	0.99
2:F:86:PHE:O	2:F:90:MET:HB3	1.62	0.99
1:C:23:ALA:O	1:C:301:LEU:HD12	1.68	0.94
2:I:4:MET:HG3	2:J:37:GLU:HG2	1.53	0.91
1:A:120:GLY:HA3	1:A:122:GLY:O	1.70	0.91
1:D:5:HIS:O	1:D:9:CYS:SG	2.33	0.86
1:D:30:TYR:N	1:D:67:GLN:HE22	1.75	0.85
1:A:5:HIS:O	1:A:9:CYS:SG	2.35	0.85
1:A:121:LEU:HB3	1:A:122:GLY:HA3	1.56	0.85
1:D:30:TYR:H	1:D:67:GLN:HE22	1.24	0.83
1:A:120:GLY:CA	1:A:122:GLY:O	2.25	0.83
2:F:25:LEU:HB2	2:F:66:VAL:HB	1.62	0.82
1:D:5:HIS:CD2	1:D:9:CYS:SG	2.72	0.82
1:A:197:GLU:HG2	1:A:212:LYS:HZ2	1.43	0.82
2:I:4:MET:CG	2:J:37:GLU:HG2	2.10	0.81
2:I:38:PHE:HD1	2:J:5:GLU:OE2	1.62	0.80
2:I:58:LEU:HD11	2:I:74:LEU:HD12	1.65	0.79
2:E:66:VAL:HG13	2:E:70:SER:HB2	1.63	0.79
2:E:31:ARG:HA	2:E:51:VAL:HG11	1.65	0.78
2:I:4:MET:CG	2:J:37:GLU:CG	2.62	0.78
1:A:215:SER:O	1:A:219:GLU:CG	2.32	0.78
1:D:222:VAL:HG12	1:D:223:CYS:N	1.97	0.78
1:A:120:GLY:CA	1:A:123:THR:CG2	2.62	0.77
2:I:4:MET:HB2	2:J:37:GLU:CG	2.06	0.76
2:F:86:PHE:O	2:F:90:MET:CB	2.33	0.76
1:A:120:GLY:N	1:A:123:THR:HG22	2.01	0.76
1:B:83:LEU:N	1:B:84:PRO:HD2	2.01	0.75
1:C:19:THR:C	1:C:21:PRO:HD3	2.06	0.75
1:C:192:ASP:O	1:C:196:ARG:HG3	1.87	0.74
1:A:197:GLU:HG2	1:A:212:LYS:NZ	2.02	0.74
1:C:23:ALA:O	1:C:301:LEU:CD1	2.35	0.73
1:D:83:LEU:N	1:D:84:PRO:HD2	2.04	0.73
1:D:192:ASP:O	1:D:196:ARG:HG3	1.87	0.73

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:316:TYR:HB3	1:C:338:ASP:HB3	1.70	0.73
2:I:4:MET:CB	2:J:37:GLU:CG	2.67	0.72
1:C:13:LEU:HD13	1:C:14:GLU:H	1.53	0.71
1:D:30:TYR:H	1:D:67:GLN:NE2	1.88	0.70
1:C:8:LEU:HD21	2:F:78:LEU:HD23	1.74	0.69
1:C:42:ILE:O	1:C:46:VAL:HG23	1.93	0.69
1:D:156:GLU:OE2	1:D:176:LYS:HE3	1.93	0.68
1:D:222:VAL:CG1	1:D:223:CYS:N	2.57	0.68
1:C:14:GLU:HB3	1:C:17:HIS:HB2	1.75	0.68
1:B:5:HIS:O	1:B:9:CYS:SG	2.50	0.68
1:B:6:GLU:CA	1:B:9:CYS:SG	2.79	0.67
2:I:4:MET:HG3	2:J:37:GLU:CG	2.24	0.67
2:F:86:PHE:HD2	2:F:90:MET:HG2	1.60	0.67
1:C:13:LEU:HD22	1:C:14:GLU:HG2	1.75	0.67
1:D:82:GLU:HB2	1:D:85:SER:OG	1.95	0.67
1:A:117:SER:O	1:A:123:THR:HB	1.94	0.66
1:A:96:GLU:HG2	1:A:100:LEU:HD23	1.78	0.66
1:B:306:GLU:OE2	1:B:309:ARG:NH2	2.28	0.66
1:A:17:HIS:ND1	1:A:19:THR:OG1	2.24	0.65
1:A:118:MET:O	1:A:123:THR:CG2	2.35	0.65
2:F:89:HIS:O	2:F:90:MET:HB2	1.96	0.65
1:C:164:SER:HA	1:C:168:ARG:HH21	1.62	0.65
1:A:121:LEU:CB	1:A:122:GLY:HA3	2.21	0.64
2:I:76:ALA:HA	2:J:72:PHE:CE1	2.33	0.64
1:A:24:TYR:O	1:A:301:LEU:HG	1.96	0.64
1:D:130:GLU:OE1	1:D:273:ARG:NH2	2.31	0.64
1:A:83:LEU:N	1:A:84:PRO:HD2	2.13	0.64
1:C:182:ASP:HB2	1:C:221:SER:OG	1.97	0.64
1:B:197:GLU:CD	1:B:212:LYS:HE2	2.19	0.63
1:D:154:ASP:HB2	1:D:157:LYS:HD3	1.80	0.62
1:A:120:GLY:HA3	1:A:123:THR:CG2	2.19	0.62
2:F:62:ARG:NH1	2:F:63:ASP:OD1	2.32	0.62
1:C:13:LEU:HB2	3:H:4:PHE:HD1	1.65	0.62
1:A:206:LYS:HD3	1:A:207:GLY:H	1.64	0.62
1:C:59:ILE:O	1:C:63:ARG:HG2	2.00	0.62
2:I:38:PHE:CD1	2:J:5:GLU:OE2	2.51	0.61
1:B:51:VAL:O	1:B:52:ASP:C	2.37	0.61
2:J:46:LYS:HD3	2:J:46:LYS:H	1.66	0.61
1:D:17:HIS:N	1:D:18:SER:HA	2.16	0.60
1:D:42:ILE:O	1:D:46:VAL:HG23	2.01	0.60
2:E:18:PHE:CZ	2:E:36:LYS:HG3	2.36	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:286:LYS:H	1:A:286:LYS:HE3	1.66	0.60
1:C:83:LEU:HB3	1:C:84:PRO:HD3	1.82	0.60
1:A:120:GLY:C	1:A:122:GLY:O	2.40	0.60
1:B:316:TYR:CB	1:B:338:ASP:HB3	2.31	0.60
1:B:56:ILE:HG21	1:B:87:LEU:HD21	1.84	0.60
2:J:19:ALA:HB1	2:J:23:GLY:HA2	1.84	0.59
2:E:18:PHE:HB2	2:E:33:LEU:HD12	1.84	0.59
1:A:14:GLU:H	1:A:15:GLY:HA2	1.67	0.59
1:D:5:HIS:HA	1:D:8:LEU:HD12	1.82	0.59
1:A:30:TYR:N	1:A:67:GLN:HE22	1.98	0.59
1:B:166:ASP:OD1	1:B:166:ASP:N	2.35	0.59
1:C:316:TYR:CB	1:C:338:ASP:HB3	2.31	0.59
1:A:33:PHE:CE1	1:A:67:GLN:HB3	2.38	0.59
1:A:121:LEU:N	1:A:122:GLY:O	2.36	0.58
1:D:313:LYS:HA	1:D:313:LYS:HE2	1.85	0.58
2:E:59:ASP:HA	3:G:0:PHE:HD1	1.67	0.58
1:C:124:ASP:OD1	1:C:286:LYS:NZ	2.32	0.58
1:D:230:GLU:OE2	1:D:233:LYS:NZ	2.26	0.58
2:F:46:LYS:H	2:F:46:LYS:HD3	1.69	0.58
1:B:63:ARG:HG3	1:B:71:ILE:HD11	1.86	0.58
3:G:1:PHE:H	3:G:1:PHE:HD1	1.51	0.58
1:C:58:ASN:O	1:C:62:ASN:HB2	2.04	0.58
1:A:28:LYS:HB3	1:A:29:PRO:HD2	1.86	0.58
2:E:71:PHE:CZ	2:E:75:ILE:HD11	2.39	0.58
1:C:12:SER:HB3	2:F:45:GLN:HG3	1.86	0.58
1:C:179:ARG:NH1	1:C:220:ARG:O	2.33	0.58
1:B:225:LEU:HD13	1:B:263:ILE:HD13	1.86	0.58
1:C:30:TYR:N	1:C:67:GLN:HE22	2.02	0.58
1:B:283:THR:CG2	1:B:322:ASP:HB3	2.34	0.57
2:E:32:VAL:O	2:E:36:LYS:HG2	2.05	0.57
3:G:-1:THR:H	3:H:-1:THR:HG22	1.70	0.57
3:G:-2:PRO:HA	3:H:0:PHE:HA	1.86	0.57
2:I:4:MET:O	2:I:8:MET:HG2	2.04	0.57
1:D:176:LYS:HD2	1:D:178:ARG:NH2	2.19	0.57
1:A:191:ILE:HG13	1:A:224:HIS:CE1	2.39	0.56
1:D:96:GLU:HG2	1:D:100:LEU:HD23	1.87	0.56
2:I:59:ASP:HB2	2:I:70:SER:HA	1.88	0.56
1:B:40:LEU:HG	1:B:78:ARG:NH1	2.21	0.56
2:E:16:HIS:HE1	2:F:83:ASN:HD21	1.51	0.56
1:A:44:THR:O	1:A:48:THR:OG1	2.23	0.56
2:J:59:ASP:OD2	2:J:69:GLN:NE2	2.39	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:224:HIS:O	1:C:228:VAL:HG23	2.05	0.56
2:J:31:ARG:HB2	2:J:51:VAL:HG21	1.88	0.56
2:F:2:SER:HB3	2:F:5:GLU:HG3	1.87	0.56
1:A:182:ASP:HB2	1:A:221:SER:OG	2.07	0.55
1:C:96:GLU:HG2	1:C:100:LEU:HD23	1.89	0.55
1:D:102:LEU:HD23	1:D:293:VAL:HG13	1.88	0.55
3:G:1:PHE:O	3:G:3:ARG:NH1	2.40	0.55
2:J:41:PHE:O	2:J:45:GLN:HG2	2.07	0.55
1:D:222:VAL:HG12	1:D:223:CYS:H	1.70	0.55
2:J:74:LEU:O	2:J:78:LEU:HB2	2.06	0.55
1:A:154:ASP:OD1	1:A:154:ASP:N	2.37	0.55
1:A:110:ASP:HB2	1:A:143:ILE:HD12	1.89	0.55
1:B:30:TYR:N	1:B:67:GLN:HE22	2.05	0.54
2:F:86:PHE:HA	2:F:90:MET:HB2	1.88	0.54
1:D:59:ILE:O	1:D:63:ARG:HG2	2.07	0.54
1:C:83:LEU:N	1:C:84:PRO:CD	2.70	0.54
1:A:14:GLU:HB3	1:A:15:GLY:C	2.28	0.54
1:B:154:ASP:HB2	1:B:157:LYS:HD3	1.89	0.54
1:C:3:THR:O	1:C:7:ILE:HG12	2.08	0.54
1:C:7:ILE:HD11	2:F:90:MET:SD	2.48	0.54
1:A:34:ASP:OD2	1:A:36:GLU:HG3	2.08	0.54
2:F:76:ALA:O	2:F:80:ILE:HG13	2.08	0.54
1:C:29:PRO:HA	1:C:64:SER:HB3	1.89	0.53
1:A:120:GLY:N	1:A:123:THR:CG2	2.71	0.53
2:E:49:LEU:HB3	2:E:53:LYS:HE3	1.90	0.53
1:A:197:GLU:HG2	1:A:212:LYS:CE	2.38	0.53
1:A:83:LEU:N	1:A:84:PRO:CD	2.71	0.53
1:A:22:SER:O	1:A:23:ALA:HB3	2.07	0.53
1:C:130:GLU:O	1:C:134:SER:OG	2.26	0.53
1:D:326:ASP:OD1	1:D:326:ASP:N	2.39	0.53
2:E:80:ILE:HD12	3:G:1:PHE:HE2	1.72	0.53
2:E:57:ASP:N	2:E:61:CYS:SG	2.82	0.53
2:J:40:GLY:O	2:J:44:ASN:HB2	2.09	0.53
1:C:128:LEU:O	1:C:132:ILE:HG12	2.08	0.53
2:I:22:LYS:HB2	2:I:24:TYR:CZ	2.43	0.53
1:D:197:GLU:HG2	1:D:212:LYS:HG2	1.90	0.53
2:F:60:GLN:HB3	2:F:62:ARG:CZ	2.38	0.52
1:C:244:ILE:HD11	1:C:260:VAL:HG21	1.91	0.52
1:B:313:LYS:HB2	1:B:318:TYR:HE1	1.74	0.52
1:C:83:LEU:N	1:C:84:PRO:HD2	2.25	0.52
1:A:21:PRO:O	1:A:22:SER:OG	2.28	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:295:ARG:HA	1:D:298:VAL:HG23	1.90	0.52
1:A:33:PHE:CZ	1:A:67:GLN:HB3	2.45	0.52
1:C:24:TYR:HB2	1:C:298:VAL:O	2.10	0.52
1:D:7:ILE:O	1:D:11:LEU:HG	2.10	0.52
2:E:2:SER:N	2:E:5:GLU:OE1	2.42	0.51
1:B:206:LYS:HD3	1:B:207:GLY:H	1.75	0.51
1:D:108:GLN:O	1:D:112:SER:OG	2.28	0.51
1:D:131:ILE:O	1:D:135:ARG:HG2	2.09	0.51
2:E:16:HIS:HE1	2:F:83:ASN:ND2	2.08	0.51
1:D:134:SER:OG	1:D:135:ARG:NH1	2.43	0.51
2:I:60:GLN:HE22	2:I:62:ARG:HG3	1.75	0.51
1:C:283:THR:HG21	1:C:322:ASP:HB3	1.92	0.51
2:J:73:SER:OG	3:L:0:PHE:O	2.25	0.51
1:C:130:GLU:OE1	1:C:290:ARG:NH2	2.28	0.51
1:C:51:VAL:O	1:C:52:ASP:C	2.48	0.51
2:J:3:GLN:C	2:J:5:GLU:H	2.13	0.51
1:B:59:ILE:O	1:B:63:ARG:HG2	2.11	0.51
1:A:316:TYR:CD2	1:A:332:LEU:HD22	2.45	0.51
1:B:146:VAL:HG12	1:B:150:MET:SD	2.51	0.51
1:C:30:TYR:OH	1:D:219:GLU:OE1	2.21	0.51
2:J:30:LEU:O	2:J:34:MET:HG3	2.10	0.51
2:I:28:GLU:H	2:I:28:GLU:CD	2.14	0.51
2:F:24:TYR:H	2:F:24:TYR:HD1	1.58	0.50
1:A:196:ARG:HD2	1:A:235:TYR:CZ	2.46	0.50
1:B:182:ASP:HB2	1:B:221:SER:OG	2.11	0.50
2:J:22:LYS:HG2	2:J:24:TYR:HD1	1.76	0.50
1:B:16:ASP:HB3	1:B:17:HIS:HA	1.93	0.50
2:I:30:LEU:HA	2:I:33:LEU:HD23	1.93	0.50
1:A:21:PRO:HG3	1:A:29:PRO:HD3	1.92	0.50
1:B:206:LYS:HD3	1:B:207:GLY:N	2.26	0.50
1:C:51:VAL:HG12	1:C:51:VAL:O	2.12	0.50
1:B:174:LEU:HD23	1:B:218:THR:HG22	1.93	0.50
1:C:56:ILE:HG21	1:C:87:LEU:HD21	1.93	0.50
1:D:83:LEU:N	1:D:84:PRO:CD	2.74	0.50
1:B:40:LEU:HG	1:B:78:ARG:HH12	1.77	0.50
2:J:58:LEU:HB3	2:J:70:SER:HB3	1.93	0.50
1:A:292:MET:O	1:A:296:SER:HB3	2.12	0.50
1:B:83:LEU:N	1:B:84:PRO:CD	2.73	0.50
1:B:137:ASN:ND2	1:B:179:ARG:O	2.45	0.49
1:B:58:ASN:O	1:B:62:ASN:ND2	2.45	0.49
1:B:316:TYR:CD1	1:B:332:LEU:HD22	2.46	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:F:10:THR:O	2:F:14:THR:OG1	2.30	0.49
1:C:166:ASP:HA	1:C:169:LYS:HB2	1.94	0.49
1:A:121:LEU:N	1:A:122:GLY:CA	2.74	0.49
2:E:16:HIS:CE1	2:F:83:ASN:HD21	2.29	0.49
2:J:71:PHE:O	2:J:74:LEU:HB3	2.11	0.49
1:A:139:GLU:O	1:A:143:ILE:HG12	2.12	0.49
1:D:166:ASP:HB2	1:D:252:LEU:HD22	1.95	0.49
1:C:17:HIS:HA	1:C:18:SER:HA	1.50	0.49
1:A:182:ASP:H	1:A:221:SER:HB3	1.77	0.49
1:D:94:HIS:O	1:D:98:VAL:HG23	2.12	0.49
2:E:3:GLN:HB2	2:F:10:THR:HG21	1.94	0.48
1:A:328:GLN:OE1	1:A:329:LYS:HE3	2.13	0.48
1:A:121:LEU:HB3	1:A:122:GLY:CA	2.35	0.48
1:D:26:SER:HB2	1:D:336:GLY:HA3	1.96	0.48
2:I:10:THR:HA	2:I:13:PHE:CE1	2.49	0.48
2:E:24:TYR:CG	2:E:65:LYS:HD2	2.49	0.48
1:A:95:LEU:HD22	1:A:326:ASP:HB3	1.95	0.48
1:B:5:HIS:CE1	2:I:40:GLY:H	2.31	0.48
1:C:87:LEU:HD12	1:C:103:LEU:HD11	1.96	0.48
1:B:197:GLU:CG	1:B:212:LYS:HE2	2.44	0.48
2:E:25:LEU:HD11	2:E:33:LEU:HD13	1.95	0.48
2:J:8:MET:HA	2:J:11:MET:HG3	1.96	0.48
1:D:122:GLY:O	1:D:123:THR:OG1	2.29	0.48
1:C:292:MET:O	1:C:296:SER:HB3	2.14	0.48
2:I:13:PHE:HD1	2:I:14:THR:N	2.12	0.48
1:C:4:VAL:HB	2:E:9:GLU:HB2	1.95	0.48
1:B:136:THR:OG1	1:B:139:GLU:HG3	2.14	0.47
2:E:22:LYS:HB2	2:E:24:TYR:CE2	2.49	0.47
2:J:42:LEU:H	2:J:42:LEU:HD12	1.79	0.47
1:B:257:LEU:O	1:B:261:GLN:HG3	2.14	0.47
1:D:190:LEU:HD23	1:D:224:HIS:CE1	2.49	0.47
1:C:13:LEU:HB2	3:H:4:PHE:CD1	2.49	0.47
2:E:47:ASP:OD2	2:E:53:LYS:NZ	2.40	0.47
2:J:22:LYS:HD3	2:J:24:TYR:HB2	1.96	0.47
1:B:179:ARG:HD3	1:B:220:ARG:O	2.15	0.47
1:C:2:SER:HB2	1:C:4:VAL:HG12	1.95	0.47
1:A:120:GLY:C	1:A:123:THR:CG2	2.83	0.47
1:C:22:SER:O	1:C:24:TYR:N	2.47	0.47
1:D:174:LEU:HD23	1:D:218:THR:HG22	1.97	0.47
1:D:25:GLY:O	1:D:28:LYS:HE2	2.14	0.47
1:D:22:SER:O	1:D:28:LYS:NZ	2.47	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:I:15:PHE:CG	2:I:68:PHE:HD1	2.32	0.47
1:B:316:TYR:HB3	1:B:338:ASP:HB3	1.95	0.47
2:E:6:HIS:HA	2:E:9:GLU:HB3	1.96	0.47
2:E:15:PHE:CD2	2:E:68:PHE:HD2	2.33	0.47
1:A:178:ARG:HE	1:A:178:ARG:HB2	1.41	0.47
2:E:27:LYS:HB3	2:E:55:MET:SD	2.55	0.47
1:A:57:VAL:HG22	1:A:99:ILE:HD11	1.97	0.47
1:B:13:LEU:HD12	2:I:53:LYS:HB3	1.96	0.47
1:A:59:ILE:O	1:A:63:ARG:HG2	2.14	0.47
1:D:64:SER:O	1:D:68:ARG:HG3	2.14	0.47
1:A:275:TYR:O	1:A:279:LYS:HB3	2.14	0.47
1:B:49:LYS:HE2	1:B:49:LYS:HB3	1.63	0.47
1:C:62:ASN:HD21	1:D:178:ARG:HD2	1.80	0.46
1:B:30:TYR:HB2	1:B:63:ARG:HD3	1.98	0.46
2:E:22:LYS:H	2:E:22:LYS:HG2	1.49	0.46
2:J:88:VAL:O	2:J:91:LYS:NZ	2.43	0.46
1:A:83:LEU:HB3	1:A:84:PRO:HD3	1.97	0.46
1:D:28:LYS:HB3	1:D:29:PRO:HD2	1.97	0.46
2:F:20:GLY:HA3	2:F:22:LYS:HE3	1.98	0.46
1:C:13:LEU:HD23	3:H:5:GLU:HG3	1.96	0.46
2:I:66:VAL:HG13	2:I:70:SER:OG	2.15	0.46
2:E:80:ILE:HD12	3:G:1:PHE:CE2	2.49	0.46
2:E:25:LEU:HB2	2:E:66:VAL:O	2.16	0.46
2:E:24:TYR:HB2	2:E:65:LYS:HB3	1.98	0.46
1:C:132:ILE:HG13	1:C:171:MET:HE3	1.98	0.46
1:A:304:ARG:HB3	1:A:339:ASP:OD2	2.16	0.46
1:A:96:GLU:O	1:A:100:LEU:HB2	2.15	0.45
1:D:24:TYR:HA	1:D:301:LEU:HD12	1.98	0.45
1:D:292:MET:O	1:D:296:SER:HB3	2.16	0.45
2:I:22:LYS:H	2:I:22:LYS:HG2	1.55	0.45
2:J:3:GLN:C	2:J:5:GLU:N	2.69	0.45
1:C:283:THR:CG2	1:C:322:ASP:HB3	2.45	0.45
2:E:87:VAL:HA	2:E:91:LYS:HB2	1.97	0.45
1:B:13:LEU:HD22	1:B:14:GLU:H	1.81	0.45
2:I:70:SER:O	2:I:73:SER:OG	2.22	0.45
1:B:19:THR:HB	1:B:20:PRO:HD2	1.99	0.45
1:B:43:GLU:OE1	1:B:79:THR:HG22	2.17	0.45
1:B:197:GLU:HG2	1:B:212:LYS:HE2	1.98	0.45
1:A:21:PRO:O	1:A:22:SER:CB	2.65	0.45
1:A:295:ARG:HH21	1:A:299:ASP:CG	2.19	0.45
1:D:115:LYS:HD2	1:D:147:TYR:OH	2.17	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:323:THR:O	1:A:328:GLN:NE2	2.50	0.45
2:J:47:ASP:HB2	2:J:49:LEU:HB2	1.98	0.45
1:B:11:LEU:HD21	2:I:81:ALA:HB1	2.00	0.44
1:A:154:ASP:HB2	1:A:157:LYS:HD3	1.99	0.44
1:B:174:LEU:CD2	1:B:218:THR:HG22	2.47	0.44
1:B:17:HIS:HB2	1:B:66:VAL:HG11	2.00	0.44
2:F:53:LYS:O	2:F:56:LYS:HG2	2.17	0.44
1:A:2:SER:HA	2:F:9:GLU:OE1	2.17	0.44
1:C:34:ASP:HB3	1:C:37:ARG:HD3	1.98	0.44
1:B:5:HIS:NE2	2:I:39:PRO:HG2	2.32	0.44
2:F:55:MET:O	2:F:61:CYS:HB2	2.17	0.44
2:E:28:GLU:O	2:E:31:ARG:HB2	2.18	0.44
1:B:142:GLU:O	1:B:146:VAL:HG23	2.18	0.44
1:D:166:ASP:HA	1:D:169:LYS:HG3	2.00	0.44
1:B:210:VAL:O	1:B:214:ILE:HG13	2.18	0.44
1:A:197:GLU:HG2	1:A:212:LYS:HE3	1.98	0.44
2:F:11:MET:HA	2:F:14:THR:OG1	2.18	0.44
1:A:77:ARG:HE	1:A:77:ARG:HB3	1.53	0.44
1:D:114:LEU:O	1:D:118:MET:HG2	2.18	0.44
1:A:121:LEU:C	1:A:121:LEU:CD2	2.86	0.44
1:C:313:LYS:NZ	1:C:314:SER:H	2.16	0.43
1:A:125:GLU:HG2	1:A:167:PHE:CE2	2.53	0.43
1:C:54:VAL:HG21	1:D:182:ASP:HA	1.99	0.43
1:C:46:VAL:HG13	1:C:90:ALA:HB2	1.99	0.43
1:A:316:TYR:CE2	1:A:332:LEU:HD22	2.53	0.43
1:A:125:GLU:HG2	1:A:167:PHE:CZ	2.53	0.43
2:E:34:MET:SD	2:E:51:VAL:HG13	2.57	0.43
1:B:231:ARG:HA	1:B:231:ARG:HD3	1.86	0.43
1:A:130:GLU:OE1	1:A:273:ARG:NH2	2.25	0.43
1:A:244:ILE:HD13	1:A:256:PHE:HB3	1.99	0.43
1:B:283:THR:HG22	1:B:322:ASP:HB3	2.00	0.43
2:F:40:GLY:O	2:F:44:ASN:HB2	2.18	0.43
1:C:236:SER:HA	1:C:237:PRO:HD3	1.89	0.43
1:B:123:THR:OG1	1:B:162:ASP:OD2	2.29	0.43
1:D:51:VAL:HG12	1:D:51:VAL:O	2.18	0.43
2:I:71:PHE:HZ	2:J:4:MET:CE	2.31	0.43
1:D:38:ASP:O	1:D:42:ILE:HG13	2.19	0.43
1:B:201:ALA:HB1	1:B:209:ASP:HB3	2.00	0.43
1:C:75:TYR:CZ	1:C:79:THR:HG21	2.53	0.43
1:A:206:LYS:HD3	1:A:207:GLY:N	2.31	0.43
2:F:11:MET:O	2:F:14:THR:OG1	2.33	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:63:ARG:HG3	1:C:71:ILE:HD11	2.01	0.43
1:D:42:ILE:CG1	1:D:59:ILE:HD11	2.49	0.43
1:B:166:ASP:HA	1:B:169:LYS:HB2	1.99	0.43
1:D:117:SER:HB2	1:D:124:ASP:HB3	2.01	0.43
1:D:254:ASN:O	1:D:258:ASN:ND2	2.49	0.43
1:A:147:TYR:OH	1:A:158:ASP:OD2	2.29	0.43
1:A:108:GLN:O	1:A:112:SER:HB3	2.19	0.42
2:J:27:LYS:HE2	2:J:27:LYS:HB2	1.76	0.42
1:B:266:LYS:HB3	1:B:267:PRO:HD3	1.99	0.42
2:E:69:GLN:HE21	3:G:-1:THR:HG22	1.84	0.42
1:B:147:TYR:CE1	1:B:155:LEU:HA	2.53	0.42
1:B:212:LYS:HA	1:B:212:LYS:HD3	1.88	0.42
2:F:58:LEU:HD12	2:F:61:CYS:SG	2.59	0.42
1:D:167:PHE:HE1	1:D:255:ALA:HB2	1.85	0.42
2:E:71:PHE:O	2:E:74:LEU:HB3	2.20	0.42
1:C:199:TYR:CE2	1:C:204:LYS:HB2	2.54	0.42
2:E:60:GLN:HA	2:E:62:ARG:NH1	2.34	0.42
1:B:316:TYR:CG	1:B:338:ASP:HB3	2.54	0.42
1:C:249:LYS:HA	1:C:253:GLU:OE1	2.20	0.42
1:C:225:LEU:HD13	1:C:263:ILE:HD13	2.00	0.42
1:B:51:VAL:O	1:B:51:VAL:HG12	2.19	0.42
1:C:100:LEU:HA	1:C:100:LEU:HD13	1.85	0.42
2:J:90:MET:HE3	2:J:90:MET:HB2	1.82	0.42
2:J:24:TYR:HB3	2:J:65:LYS:HB3	2.01	0.42
1:C:205:ARG:HH21	1:C:209:ASP:HB2	1.85	0.42
1:C:199:TYR:CZ	1:C:204:LYS:HB2	2.55	0.42
1:A:148:LYS:HB3	1:A:148:LYS:HE2	1.91	0.42
2:E:47:ASP:HA	2:E:48:PRO:HD3	1.86	0.41
1:B:313:LYS:HD3	1:B:317:TYR:CD2	2.55	0.41
2:E:27:LYS:O	2:E:30:LEU:HB3	2.20	0.41
1:D:43:GLU:O	1:D:47:LYS:HG3	2.20	0.41
2:F:90:MET:O	2:F:91:LYS:C	2.58	0.41
1:C:191:ILE:HG13	1:C:224:HIS:CE1	2.55	0.41
1:D:98:VAL:HG22	1:D:289:ILE:HG12	2.02	0.41
1:B:199:TYR:CE2	1:B:204:LYS:HG3	2.55	0.41
2:E:46:LYS:HB2	2:E:46:LYS:HE3	1.72	0.41
2:I:47:ASP:O	2:I:50:ALA:HB2	2.21	0.41
2:F:29:ASP:O	2:F:33:LEU:HB2	2.20	0.41
1:C:22:SER:C	1:C:24:TYR:N	2.72	0.41
2:I:27:LYS:O	2:I:30:LEU:N	2.53	0.41
1:D:189:GLU:O	1:D:193:GLN:HB2	2.21	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:137:ASN:HD21	1:B:179:ARG:N	2.19	0.41
1:C:300:MET:HE1	1:C:315:LEU:HD23	2.01	0.41
1:D:65:ASN:O	1:D:69:GLN:HG2	2.21	0.41
1:D:210:VAL:HG11	1:D:252:LEU:HD21	2.02	0.41
3:L:2:PRO:HA	3:L:3:ARG:NH1	2.36	0.41
2:I:19:ALA:HA	2:I:25:LEU:HD23	2.02	0.41
1:D:102:LEU:HD11	1:D:334:LEU:HD11	2.01	0.41
1:D:51:VAL:O	1:D:52:ASP:C	2.58	0.41
1:C:19:THR:O	1:C:21:PRO:HD3	2.19	0.41
2:J:72:PHE:O	2:J:76:ALA:N	2.52	0.41
1:B:283:THR:HG21	1:B:322:ASP:HB3	2.02	0.41
2:E:63:ASP:C	2:E:65:LYS:H	2.24	0.41
1:C:201:ALA:HB1	1:C:209:ASP:HB3	2.02	0.41
1:A:121:LEU:N	1:A:122:GLY:HA3	2.36	0.41
2:J:65:LYS:HE3	2:J:65:LYS:HB2	1.73	0.41
2:I:27:LYS:NZ	2:I:31:ARG:HE	2.19	0.41
2:F:61:CYS:O	2:F:64:GLY:N	2.31	0.41
1:B:254:ASN:O	1:B:258:ASN:ND2	2.43	0.41
1:C:246:LYS:HE2	1:C:246:LYS:HB3	1.90	0.41
1:A:103:LEU:HD23	1:A:103:LEU:HA	1.92	0.41
1:C:123:THR:OG1	1:C:162:ASP:OD2	2.27	0.41
3:G:1:PHE:N	3:G:1:PHE:CD1	2.86	0.41
1:C:94:HIS:HB3	1:C:327:TYR:CE1	2.56	0.41
1:A:205:ARG:HD2	1:A:207:GLY:O	2.21	0.40
1:B:67:GLN:O	1:B:71:ILE:HG13	2.20	0.40
2:E:12:MET:HA	2:E:68:PHE:CE2	2.56	0.40
1:D:288:LEU:O	1:D:292:MET:HG2	2.21	0.40
1:B:115:LYS:HD2	1:B:115:LYS:HA	1.89	0.40
1:D:275:TYR:O	1:D:279:LYS:HB3	2.21	0.40
2:F:62:ARG:H	2:F:62:ARG:HG3	1.66	0.40
1:D:313:LYS:HD3	1:D:317:TYR:CG	2.56	0.40
1:D:96:GLU:HG2	1:D:100:LEU:CD2	2.50	0.40
1:D:236:SER:HA	1:D:237:PRO:HD3	1.91	0.40
2:E:83:ASN:O	2:E:86:PHE:HB3	2.21	0.40
1:D:5:HIS:NE2	1:D:9:CYS:SG	2.93	0.40
1:C:38:ASP:O	1:C:42:ILE:HG13	2.21	0.40
1:C:166:ASP:HB3	1:C:210:VAL:HG11	2.03	0.40
1:D:334:LEU:HA	1:D:334:LEU:HD23	1.83	0.40
1:A:114:LEU:O	1:A:118:MET:HB2	2.21	0.40
1:B:236:SER:HA	1:B:237:PRO:HD3	1.92	0.40

There are no symmetry-related clashes.

## 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	336/339 (99%)	319 (95%)	16 (5%)	1 (0%)	46	78
1	B	336/339 (99%)	328 (98%)	8 (2%)	0	100	100
1	C	336/339 (99%)	316 (94%)	16 (5%)	4 (1%)	16	44
1	D	336/339 (99%)	318 (95%)	16 (5%)	2 (1%)	30	63
2	E	89/97 (92%)	81 (91%)	8 (9%)	0	100	100
2	F	89/97 (92%)	82 (92%)	7 (8%)	0	100	100
2	I	89/97 (92%)	78 (88%)	10 (11%)	1 (1%)	17	47
2	J	89/97 (92%)	74 (83%)	15 (17%)	0	100	100
3	G	7/14 (50%)	7 (100%)	0	0	100	100
3	H	7/14 (50%)	7 (100%)	0	0	100	100
3	K	7/14 (50%)	7 (100%)	0	0	100	100
3	L	7/14 (50%)	7 (100%)	0	0	100	100
All	All	1728/1800 (96%)	1624 (94%)	96 (6%)	8 (0%)	34	68

All (8) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	23	ALA
1	C	21	PRO
1	C	130	GLU
1	D	31	THR
1	D	51	VAL
1	A	51	VAL
1	C	51	VAL
2	I	39	PRO

### 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	300/301 (100%)	269 (90%)	31 (10%)	9	24
1	B	300/301 (100%)	265 (88%)	35 (12%)	7	19
1	C	300/301 (100%)	268 (89%)	32 (11%)	8	22
1	D	298/301 (99%)	269 (90%)	29 (10%)	10	27
2	E	80/85 (94%)	70 (88%)	10 (12%)	6	16
2	F	80/85 (94%)	61 (76%)	19 (24%)	1	2
2	I	80/85 (94%)	62 (78%)	18 (22%)	1	3
2	J	80/85 (94%)	63 (79%)	17 (21%)	1	3
3	G	9/14 (64%)	5 (56%)	4 (44%)	0	0
3	H	9/14 (64%)	6 (67%)	3 (33%)	0	0
3	K	9/14 (64%)	7 (78%)	2 (22%)	1	3
3	L	9/14 (64%)	5 (56%)	4 (44%)	0	0
All	All	1554/1600 (97%)	1350 (87%)	204 (13%)	5	14

All (204) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	7	ILE
1	A	8	LEU
1	A	37	ARG
1	A	69	GLN
1	A	76	GLN
1	A	78	ARG
1	A	100	LEU
1	A	112	SER
1	A	115	LYS
1	A	119	LYS
1	A	121	LEU
1	A	141	GLN
1	A	145	ARG
1	A	153	THR

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Mol	Chain	Res	Type
1	A	154	ASP
1	A	157	LYS
1	A	178	ARG
1	A	182	ASP
1	A	186	ILE
1	A	193	GLN
1	A	197	GLU
1	A	205	ARG
1	A	206	LYS
1	A	215	SER
1	A	219	GLU
1	A	231	ARG
1	A	249	LYS
1	A	278	MET
1	A	284	ARG
1	A	286	LYS
1	A	309	ARG
1	C	3	THR
1	C	6	GLU
1	C	11	LEU
1	C	12	SER
1	C	13	LEU
1	C	14	GLU
1	C	17	HIS
1	C	37	ARG
1	C	40	LEU
1	C	62	ASN
1	C	76	GLN
1	C	77	ARG
1	C	78	ARG
1	C	100	LEU
1	C	121	LEU
1	C	134	SER
1	C	154	ASP
1	C	157	LYS
1	C	162	ASP
1	C	166	ASP
1	C	181	GLU
1	C	193	GLN
1	C	196	ARG
1	C	204	LYS
1	C	205	ARG

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Mol	Chain	Res	Type
1	C	212	LYS
1	C	215	SER
1	C	283	THR
1	C	284	ARG
1	C	313	LYS
1	C	324	LYS
1	C	339	ASP
2	E	3	GLN
2	E	14	THR
2	E	21	ASP
2	E	22	LYS
2	E	25	LEU
2	E	30	LEU
2	E	52	ASP
2	E	58	LEU
2	E	62	ARG
2	E	71	PHE
2	F	3	GLN
2	F	4	MET
2	F	13	PHE
2	F	14	THR
2	F	21	ASP
2	F	24	TYR
2	F	33	LEU
2	F	34	MET
2	F	38	PHE
2	F	44	ASN
2	F	46	LYS
2	F	54	ILE
2	F	62	ARG
2	F	63	ASP
2	F	79	THR
2	F	86	PHE
2	F	87	VAL
2	F	89	HIS
2	F	90	MET
3	G	0	PHE
3	G	1	PHE
3	G	5	GLU
3	G	6	PHE
3	H	3	ARG
3	H	5	GLU

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Mol	Chain	Res	Type
3	H	6	PHE
1	B	3	THR
1	B	4	VAL
1	B	6	GLU
1	B	7	ILE
1	B	11	LEU
1	B	13	LEU
1	B	14	GLU
1	B	31	THR
1	B	40	LEU
1	B	46	VAL
1	B	66	VAL
1	B	76	GLN
1	B	100	LEU
1	B	121	LEU
1	B	138	GLN
1	B	141	GLN
1	B	162	ASP
1	B	166	ASP
1	B	176	LYS
1	B	178	ARG
1	B	179	ARG
1	B	181	GLU
1	B	182	ASP
1	B	184	SER
1	B	185	VAL
1	B	196	ARG
1	B	205	ARG
1	B	206	LYS
1	B	208	THR
1	B	212	LYS
1	B	215	SER
1	B	231	ARG
1	B	254	ASN
1	B	284	ARG
1	B	313	LYS
1	D	9	CYS
1	D	14	GLU
1	D	31	THR
1	D	32	ASN
1	D	37	ARG
1	D	76	GLN

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Mol	Chain	Res	Type
1	D	77	ARG
1	D	78	ARG
1	D	100	LEU
1	D	112	SER
1	D	119	LYS
1	D	141	GLN
1	D	157	LYS
1	D	185	VAL
1	D	193	GLN
1	D	196	ARG
1	D	205	ARG
1	D	212	LYS
1	D	222	VAL
1	D	231	ARG
1	D	249	LYS
1	D	278	MET
1	D	283	THR
1	D	298	VAL
1	D	309	ARG
1	D	313	LYS
1	D	324	LYS
1	D	326	ASP
1	D	339	ASP
2	I	4	MET
2	I	12	MET
2	I	13	PHE
2	I	22	LYS
2	I	25	LEU
2	I	28	GLU
2	I	29	ASP
2	I	30	LEU
2	I	32	VAL
2	I	34	MET
2	I	37	GLU
2	I	56	LYS
2	I	60	GLN
2	I	61	CYS
2	I	65	LYS
2	I	78	LEU
2	I	84	ASP
2	I	89	HIS
2	J	4	MET

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Mol	Chain	Res	Type
2	J	8	MET
2	J	27	LYS
2	J	37	GLU
2	J	38	PHE
2	J	43	GLU
2	J	46	LYS
2	J	48	PRO
2	J	51	VAL
2	J	57	ASP
2	J	61	CYS
2	J	62	ARG
2	J	71	PHE
2	J	82	CYS
2	J	88	VAL
2	J	89	HIS
2	J	90	MET
3	K	0	PHE
3	K	6	PHE
3	L	-1	THR
3	L	0	PHE
3	L	3	ARG
3	L	5	GLU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (19) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	69	GLN
1	A	76	GLN
1	A	254	ASN
1	C	76	GLN
1	C	141	GLN
1	C	321	GLN
2	E	3	GLN
2	E	16	HIS
2	E	45	GLN
2	F	69	GLN
1	B	32	ASN
1	B	58	ASN
1	B	76	GLN
1	B	141	GLN
1	D	5	HIS
2	I	69	GLN

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Mol	Chain	Res	Type
2	J	3	GLN
2	J	45	GLN
2	J	69	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, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	338/339 (99%)	0.44	20 (5%) 26 18	27, 54, 112, 197	0
1	B	338/339 (99%)	0.34	17 (5%) 32 24	26, 55, 124, 168	0
1	C	338/339 (99%)	0.36	20 (5%) 26 18	25, 51, 128, 188	0
1	D	338/339 (99%)	0.33	16 (4%) 35 27	23, 50, 111, 210	0
2	E	91/97 (93%)	2.00	40 (43%) 0 0	88, 146, 209, 277	0
2	F	91/97 (93%)	2.12	42 (46%) 0 0	77, 139, 204, 267	0
2	I	91/97 (93%)	2.11	33 (36%) 0 0	69, 142, 204, 291	0
2	J	91/97 (93%)	2.15	40 (43%) 0 0	85, 139, 182, 217	0
3	G	9/14 (64%)	2.59	5 (55%) 0 0	105, 118, 159, 193	0
3	H	9/14 (64%)	4.32	5 (55%) 0 0	136, 156, 169, 211	0
3	K	9/14 (64%)	2.62	7 (77%) 0 0	90, 122, 150, 166	0
3	L	9/14 (64%)	2.86	5 (55%) 0 0	106, 126, 152, 158	0
All	All	1752/1800 (97%)	0.78	250 (14%) 4 2	23, 60, 168, 291	0

All (250) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	18	SER	19.2
2	F	13	PHE	14.2
2	I	39	PRO	10.9
3	H	-2	PRO	10.3
1	A	16	ASP	9.6
3	H	4	PHE	9.4
2	J	66	VAL	8.5
3	L	4	PHE	8.1
1	A	2	SER	7.8
2	I	21	ASP	7.8
2	J	21	ASP	7.6

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Mol	Chain	Res	Type	RSRZ
1	A	14	GLU	7.1
3	H	2	PRO	7.0
1	C	121	LEU	7.0
2	F	91	LYS	7.0
2	I	12	MET	6.8
2	J	63	ASP	6.8
2	E	24	TYR	6.8
2	J	74	LEU	6.5
1	D	4	VAL	6.5
3	G	-1	THR	6.5
2	E	60	GLN	6.4
2	J	58	LEU	6.3
1	C	15	GLY	6.1
2	I	54	ILE	6.1
2	J	61	CYS	6.0
2	I	23	GLY	5.9
1	A	15	GLY	5.8
1	D	19	THR	5.6
2	E	65	LYS	5.5
2	J	20	GLY	5.5
2	F	49	LEU	5.5
2	E	72	PHE	5.4
2	J	65	LYS	5.4
2	I	16	HIS	5.4
2	J	25	LEU	5.4
1	A	9	CYS	5.3
2	J	17	LYS	5.2
1	D	9	CYS	5.2
2	I	51	VAL	5.1
2	F	83	ASN	5.1
2	E	20	GLY	5.1
1	A	22	SER	5.0
1	D	17	HIS	5.0
1	A	17	HIS	5.0
1	A	19	THR	4.9
2	J	51	VAL	4.9
2	I	34	MET	4.9
1	A	21	PRO	4.9
1	B	9	CYS	4.8
2	I	48	PRO	4.8
2	F	63	ASP	4.8
2	E	54	ILE	4.7

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Mol	Chain	Res	Type	RSRZ
2	J	48	PRO	4.7
1	C	16	ASP	4.6
2	J	24	TYR	4.6
2	E	59	ASP	4.6
2	F	86	PHE	4.5
2	F	66	VAL	4.5
2	E	18	PHE	4.5
2	I	13	PHE	4.4
2	E	17	LYS	4.4
3	K	0	PHE	4.4
1	D	3	THR	4.3
3	L	3	ARG	4.3
2	J	1	PRO	4.3
2	F	18	PHE	4.3
3	K	4	PHE	4.3
2	E	68	PHE	4.3
2	F	25	LEU	4.3
2	I	72	PHE	4.2
2	F	21	ASP	4.2
2	F	51	VAL	4.2
2	J	14	THR	4.2
1	D	18	SER	4.2
1	C	9	CYS	4.2
2	I	20	GLY	4.1
2	E	12	MET	4.1
2	E	11	MET	4.1
2	J	91	LYS	4.1
2	E	16	HIS	4.0
2	F	36	LYS	4.0
2	E	76	ALA	4.0
2	F	61	CYS	3.9
2	F	20	GLY	3.9
2	J	59	ASP	3.9
2	I	50	ALA	3.9
2	J	87	VAL	3.8
1	B	281	LYS	3.8
2	I	11	MET	3.8
1	B	183	GLY	3.8
2	J	85	TYR	3.7
3	G	0	PHE	3.7
1	D	2	SER	3.7
3	L	6	PHE	3.7

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Mol	Chain	Res	Type	RSRZ
2	F	39	PRO	3.7
1	C	19	THR	3.6
3	L	2	PRO	3.6
2	J	28	GLU	3.6
2	F	24	TYR	3.6
1	A	3	THR	3.5
2	F	72	PHE	3.5
2	E	62	ARG	3.5
1	D	20	PRO	3.5
2	E	19	ALA	3.5
2	F	90	MET	3.5
2	I	24	TYR	3.5
2	I	18	PHE	3.5
2	E	61	CYS	3.4
2	E	79	THR	3.4
2	F	11	MET	3.4
2	E	14	THR	3.4
2	J	16	HIS	3.4
3	K	1	PHE	3.3
2	J	13	PHE	3.3
2	I	53	LYS	3.3
2	E	21	ASP	3.2
2	I	75	ILE	3.2
3	H	-1	THR	3.2
2	J	88	VAL	3.1
2	E	73	SER	3.1
1	B	13	LEU	3.1
1	C	17	HIS	3.1
2	I	84	ASP	3.1
1	A	122	GLY	3.1
3	L	5	GLU	3.1
1	A	281	LYS	3.1
2	J	57	ASP	3.1
2	F	7	ALA	3.0
1	C	13	LEU	3.0
1	B	8	LEU	3.0
2	I	41	PHE	3.0
2	I	15	PHE	3.0
2	F	14	THR	2.9
2	J	18	PHE	2.9
2	J	90	MET	2.9
2	J	23	GLY	2.9

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Mol	Chain	Res	Type	RSRZ
2	J	36	LYS	2.9
2	I	86	PHE	2.9
2	E	25	LEU	2.9
2	J	32	VAL	2.9
2	J	29	ASP	2.9
2	E	50	ALA	2.8
2	F	12	MET	2.8
2	J	54	ILE	2.8
1	C	154	ASP	2.8
1	A	4	VAL	2.8
2	I	91	LYS	2.8
2	F	17	LYS	2.8
2	F	53	LYS	2.8
2	J	86	PHE	2.8
1	A	178	ARG	2.7
2	F	81	ALA	2.7
2	J	19	ALA	2.7
2	F	54	ILE	2.7
1	B	235	TYR	2.7
2	I	62	ARG	2.7
2	I	46	LYS	2.7
2	F	58	LEU	2.7
1	A	37	ARG	2.7
1	C	178	ARG	2.6
2	F	52	ASP	2.6
2	J	12	MET	2.6
2	F	40	GLY	2.6
1	C	23	ALA	2.6
1	C	14	GLU	2.6
3	H	3	ARG	2.6
3	K	-1	THR	2.6
1	B	17	HIS	2.6
2	I	22	LYS	2.6
1	B	6	GLU	2.6
1	D	13	LEU	2.5
1	D	51	VAL	2.5
2	F	1	PRO	2.5
2	I	10	THR	2.5
2	E	51	VAL	2.5
2	E	78	LEU	2.5
2	E	85	TYR	2.5
3	G	6	PHE	2.5

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Mol	Chain	Res	Type	RSRZ
1	B	11	LEU	2.5
2	E	34	MET	2.5
2	E	40	GLY	2.5
2	F	74	LEU	2.5
2	J	81	ALA	2.5
2	F	16	HIS	2.5
1	B	2	SER	2.5
2	E	48	PRO	2.5
1	A	13	LEU	2.5
2	I	14	THR	2.5
2	F	8	MET	2.5
2	J	4	MET	2.5
2	E	83	ASN	2.5
3	K	2	PRO	2.5
1	C	120	GLY	2.4
2	I	6	HIS	2.4
3	K	-2	PRO	2.4
1	D	121	LEU	2.4
2	I	9	GLU	2.4
2	E	91	LYS	2.4
1	C	37	ARG	2.4
2	F	80	ILE	2.4
2	E	22	LYS	2.4
2	E	63	ASP	2.4
1	B	121	LEU	2.3
3	G	-2	PRO	2.3
1	D	178	ARG	2.3
1	B	16	ASP	2.3
2	F	22	LYS	2.3
1	D	283	THR	2.3
2	F	28	GLU	2.3
2	E	30	LEU	2.3
1	D	182	ASP	2.3
1	C	4	VAL	2.3
1	A	197	GLU	2.3
1	B	20	PRO	2.3
2	F	23	GLY	2.3
2	I	42	LEU	2.3
1	C	7	ILE	2.3
1	C	18	SER	2.3
3	K	3	ARG	2.2
1	A	31	THR	2.2

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Mol	Chain	Res	Type	RSRZ
1	B	7	ILE	2.2
2	F	32	VAL	2.2
1	A	24	TYR	2.2
3	G	3	ARG	2.2
2	E	8	MET	2.2
1	D	66	VAL	2.2
2	E	55	MET	2.2
2	E	58	LEU	2.2
2	F	15	PHE	2.2
2	J	15	PHE	2.2
2	F	55	MET	2.2
2	E	86	PHE	2.1
2	F	37	GLU	2.1
1	C	153	THR	2.1
2	E	44	ASN	2.1
1	B	10	LYS	2.1
2	J	46	LYS	2.1
2	F	3	GLN	2.1
2	J	22	LYS	2.1
1	C	12	SER	2.1
1	C	51	VAL	2.1
2	I	85	TYR	2.1
1	D	183	GLY	2.1
1	C	11	LEU	2.1
1	B	12	SER	2.0
2	J	60	GLN	2.0
2	E	66	VAL	2.0
1	B	37	ARG	2.0
2	I	63	ASP	2.0

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

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

## 6.3 Carbohydrates ⓘ

There are no carbohydrates 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.