



# Full wwPDB X-ray Structure Validation Report ⓘ

Oct 22, 2024 – 01:53 AM EDT

PDB ID : 3HVE  
Title : Structures of SPOP-Substrate Complexes: Insights into Molecular Architectures of BTB-Cul3 Ubiquitin Ligases: GigaxoninBTB/3-box  
Authors : Zhuang, M.; Schulman, B.A.  
Deposited on : 2009-06-16  
Resolution : 2.80 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

<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>.

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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 : 2022.3.0, CSD as543be (2022)  
Xtriage (Phenix) : 1.20.1  
EDS : 3.0  
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)  
CCP4 : 9.0.003 (Gargrove)  
Density-Fitness : 1.0.11  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.39

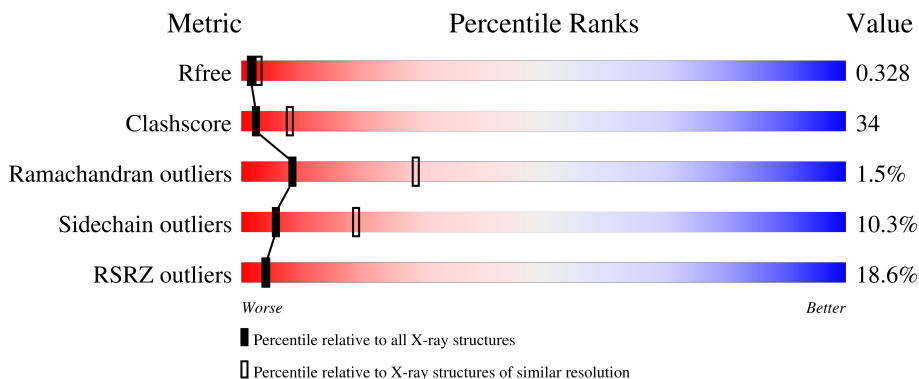
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.80 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))
$R_{free}$	164625	3657 (2.80-2.80)
Clashscore	180529	4123 (2.80-2.80)
Ramachandran outliers	177936	4071 (2.80-2.80)
Sidechain outliers	177891	4073 (2.80-2.80)
RSRZ outliers	164620	3659 (2.80-2.80)

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  $\geq 3$ , 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  $\leq 5\%$ . 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	256	
2	B	256	

## 2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 3049 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 Gigaxonin.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
			Total	C	N	O	S	Se			
1	A	216	1636	1050	279	296	6	5	0	0	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-1	GLY	-	expression tag	UNP Q9H2C0
A	0	SER	-	expression tag	UNP Q9H2C0

- Molecule 2 is a protein called Gigaxonin.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
			Total	C	N	O	S	Se			
2	B	195	1413	900	245	257	6	5	0	0	0

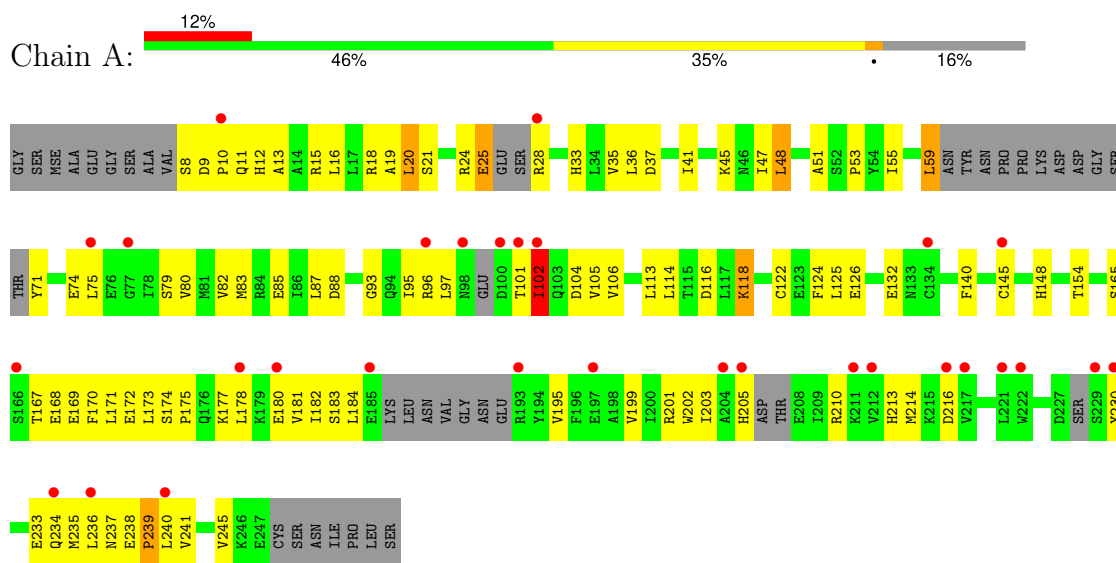
There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	-1	GLY	-	expression tag	UNP Q9H2C0
B	0	SER	-	expression tag	UNP Q9H2C0

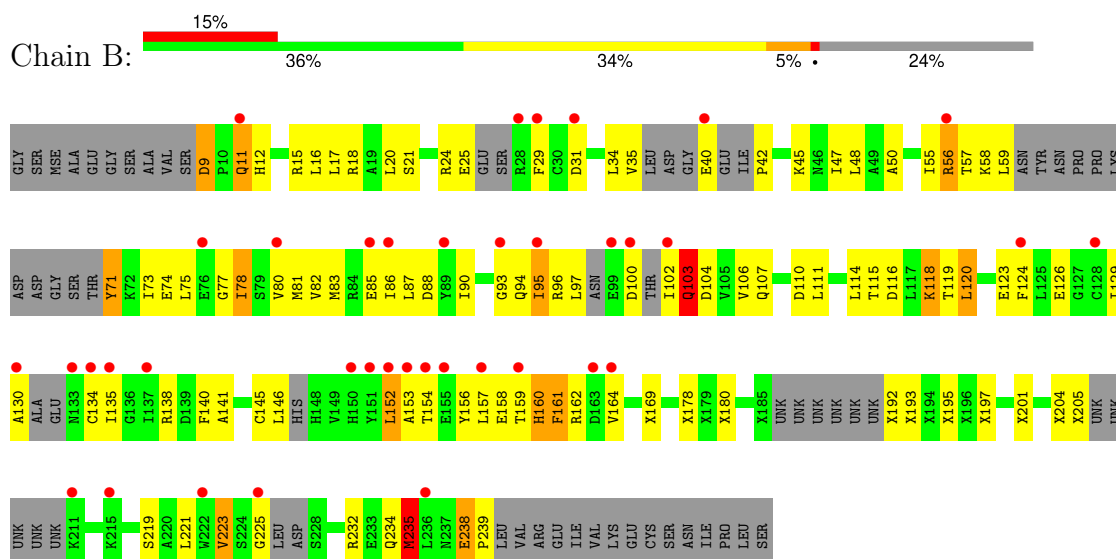
### 3 Residue-property plots [i](#)

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: Gigaxonin



#### • Molecule 2: Gigaxonin



## 4 Data and refinement statistics i

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	46.48Å 55.60Å 120.60Å 90.00° 91.10° 90.00°	Depositor
Resolution (Å)	50.00 – 2.80 50.00 – 2.81	Depositor EDS
% Data completeness (in resolution range)	88.0 (50.00-2.80) 91.0 (50.00-2.81)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	0.06	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	5.74 (at 2.81Å)	Xtrriage
Refinement program	CNS 1.1	Depositor
R, $R_{free}$	0.302 , 0.333 0.297 , 0.328	Depositor DCC
$R_{free}$ test set	692 reflections (4.97%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	77.7	Xtrriage
Anisotropy	0.428	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.28 , 68.6	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.50$ , $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	0.024 for h,-k,-l	Xtrriage
$F_o, F_c$ correlation	0.89	EDS
Total number of atoms	3049	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	88.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.88% of the height of the origin peak. No significant pseudotranslation is detected.*

<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, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

## 5 Model quality [i](#)

### 5.1 Standard geometry [i](#)

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	0.58	0/1656	0.71	0/2238
2	B	0.46	2/1247 (0.2%)	0.71	3/1668 (0.2%)
All	All	0.53	2/2903 (0.1%)	0.71	3/3906 (0.1%)

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	223	VAL	CB-CG2	-5.26	1.41	1.52
2	B	235	MSE	CG-SE	-5.20	1.77	1.95

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	238	GLU	C-N-CD	-5.31	108.92	120.60
2	B	78	ILE	N-CA-C	-5.08	97.27	111.00
2	B	77	GLY	N-CA-C	5.07	125.77	113.10

There are no chirality outliers.

There are no planarity outliers.

### 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	1636	0	1547	100	0
2	B	1413	0	1238	121	0
All	All	3049	0	2785	201	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 34.

All (201) 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:75:LEU:HD13	2:B:83:MSE:CE	1.74	1.18
2:B:238:GLU:HB2	2:B:239:PRO:HD2	1.27	1.16
2:B:75:LEU:HD13	2:B:83:MSE:HE1	1.32	1.06
2:B:238:GLU:CB	2:B:239:PRO:HD2	1.78	1.06
2:B:75:LEU:CD1	2:B:83:MSE:HE3	1.91	1.00
1:A:172:GLU:HA	1:A:210:ARG:HH22	1.26	0.97
1:A:95:ILE:CG1	1:A:97:LEU:HD11	1.94	0.96
2:B:75:LEU:CD1	2:B:83:MSE:CE	2.46	0.94
1:A:75:LEU:CD1	1:A:83:MSE:CE	2.47	0.92
1:A:75:LEU:CD1	1:A:83:MSE:HE1	2.01	0.91
1:A:203:ILE:HD12	1:A:214:MSE:HE2	1.52	0.89
1:A:75:LEU:HD12	1:A:83:MSE:HE3	1.52	0.89
1:A:95:ILE:HG23	1:A:97:LEU:HD13	1.55	0.89
1:A:75:LEU:HD12	1:A:83:MSE:CE	2.02	0.88
2:B:95:ILE:HD12	2:B:95:ILE:H	1.38	0.87
1:A:95:ILE:HG13	1:A:97:LEU:CD1	2.04	0.86
1:A:8:SER:HA	2:B:94:GLN:NE2	1.91	0.86
2:B:75:LEU:HD12	2:B:83:MSE:HE3	1.57	0.85
2:B:35:VAL:CG1	2:B:74:GLU:HA	2.07	0.84
1:A:28:ARG:NH1	2:B:59:LEU:HD13	1.92	0.84
1:A:28:ARG:HH11	2:B:59:LEU:HD13	1.43	0.84
1:A:95:ILE:HG13	1:A:97:LEU:HD11	1.60	0.84
1:A:8:SER:HA	2:B:94:GLN:CD	1.99	0.83
1:A:21:SER:O	1:A:24:ARG:HG3	1.79	0.81
1:A:9:ASP:H	2:B:94:GLN:HE21	1.25	0.80
1:A:20:LEU:HG	1:A:47:ILE:HD11	1.63	0.80
1:A:95:ILE:HG12	1:A:97:LEU:HD11	1.64	0.80
2:B:35:VAL:HG12	2:B:74:GLU:HA	1.65	0.79
1:A:45:LYS:HG2	1:A:59:LEU:HD21	1.68	0.76
1:A:93:GLY:HA2	2:B:12:HIS:ND1	2.02	0.74
2:B:126:GLU:HG3	2:B:152:LEU:HD22	1.70	0.74
1:A:28:ARG:HH11	2:B:59:LEU:CD1	2.00	0.74
1:A:36:LEU:HD11	1:A:75:LEU:HD12	1.70	0.71
1:A:230:TYR:O	1:A:234:GLN:HG3	1.90	0.71
1:A:75:LEU:CD1	1:A:83:MSE:HE3	2.18	0.71
2:B:115:THR:HG23	2:B:116:ASP:H	1.56	0.70
2:B:20:LEU:HD13	2:B:47:ILE:HD11	1.73	0.70

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:238:GLU:CB	2:B:239:PRO:CD	2.66	0.70
1:A:241:VAL:O	1:A:245:VAL:HG23	1.91	0.69
2:B:100:ASP:HA	2:B:102:ILE:HD12	1.73	0.69
2:B:104:ASP:HA	2:B:107:GLN:HB3	1.75	0.68
1:A:95:ILE:CG1	1:A:97:LEU:CD1	2.66	0.68
1:A:167:THR:HG22	1:A:169:GLU:H	1.59	0.68
1:A:102:ILE:HD13	1:A:124:PHE:HE2	1.56	0.68
1:A:95:ILE:HG23	1:A:97:LEU:CD1	2.23	0.68
2:B:204:UNK:O	2:B:205:UNK:CB	2.41	0.67
1:A:11:GLN:O	1:A:15:ARG:HB2	1.95	0.67
2:B:238:GLU:CG	2:B:239:PRO:HD2	2.24	0.66
2:B:160:HIS:N	2:B:160:HIS:CD2	2.64	0.66
1:A:75:LEU:HD13	1:A:83:MSE:HE1	1.78	0.66
2:B:219:SER:O	2:B:223:VAL:HG23	1.96	0.66
1:A:36:LEU:HG	1:A:75:LEU:HB2	1.78	0.65
2:B:118:LYS:NZ	2:B:118:LYS:HB3	2.12	0.65
2:B:129:ILE:O	2:B:130:ALA:HB2	1.95	0.65
2:B:129:ILE:O	2:B:130:ALA:CB	2.45	0.64
1:A:79:SER:OG	1:A:82:VAL:HG23	1.97	0.64
1:A:9:ASP:OD2	1:A:15:ARG:NH1	2.32	0.63
2:B:102:ILE:HD12	2:B:102:ILE:N	2.14	0.63
2:B:103:GLN:NE2	2:B:103:GLN:H	1.95	0.63
1:A:45:LYS:CG	1:A:59:LEU:HD21	2.29	0.63
1:A:126:GLU:OE1	1:A:148:HIS:HD2	1.81	0.63
2:B:56:ARG:HH11	2:B:56:ARG:HG3	1.64	0.63
1:A:203:ILE:HD12	1:A:214:MSE:CE	2.25	0.62
1:A:37:ASP:OD2	1:A:80:VAL:HG23	2.00	0.62
2:B:130:ALA:O	2:B:134:CYS:HB3	2.00	0.61
1:A:48:LEU:HD22	1:A:55:ILE:HG13	1.83	0.61
1:A:177:LYS:O	1:A:181:VAL:HG23	2.01	0.60
2:B:11:GLN:O	2:B:15:ARG:HG3	2.00	0.60
2:B:159:THR:HB	2:B:160:HIS:HD2	1.67	0.60
2:B:238:GLU:HG3	2:B:239:PRO:HG2	1.84	0.60
2:B:104:ASP:HA	2:B:107:GLN:CB	2.32	0.60
1:A:180:GLU:O	1:A:183:SER:HB3	2.03	0.59
1:A:203:ILE:CD1	1:A:214:MSE:HE2	2.28	0.59
1:A:132:GLU:HA	1:A:167:THR:HG21	1.84	0.59
2:B:85:GLU:OE1	2:B:97:LEU:HD11	2.02	0.59
1:A:95:ILE:HG13	1:A:97:LEU:HD12	1.82	0.59
2:B:141:ALA:HA	2:B:146:LEU:HD12	1.84	0.59
1:A:12:HIS:CD2	2:B:93:GLY:HA2	2.38	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:82:VAL:O	2:B:85:GLU:HB2	2.04	0.58
1:A:102:ILE:HD13	1:A:124:PHE:CE2	2.37	0.57
1:A:59:LEU:HD23	2:B:29:PHE:CE2	2.40	0.57
2:B:160:HIS:O	2:B:164:VAL:HG23	2.05	0.57
2:B:78:ILE:HD11	2:B:111:LEU:HD23	1.85	0.57
1:A:12:HIS:CG	2:B:93:GLY:HA2	2.39	0.56
1:A:35:VAL:HB	1:A:74:GLU:HA	1.87	0.56
1:A:182:ILE:HD11	1:A:199:VAL:HG22	1.88	0.56
2:B:78:ILE:CD1	2:B:111:LEU:HD23	2.35	0.56
1:A:173:LEU:HG	1:A:174:SER:N	2.21	0.56
1:A:102:ILE:CD1	1:A:124:PHE:HE2	2.18	0.56
1:A:97:LEU:HD12	1:A:97:LEU:N	2.21	0.56
1:A:238:GLU:C	1:A:240:LEU:H	2.09	0.55
2:B:96:ARG:O	2:B:96:ARG:HG3	2.06	0.55
1:A:173:LEU:HG	1:A:174:SER:H	1.71	0.55
2:B:95:ILE:HD12	2:B:95:ILE:N	2.16	0.55
1:A:122:CYS:O	1:A:126:GLU:HG3	2.06	0.55
2:B:135:ILE:HD12	2:B:169:UNK:CB	2.37	0.55
1:A:173:LEU:HD23	1:A:178:LEU:HB2	1.87	0.55
2:B:104:ASP:O	2:B:107:GLN:HB3	2.08	0.54
1:A:8:SER:CA	2:B:94:GLN:NE2	2.68	0.54
2:B:161:PHE:HE2	2:B:195:UNK:HA	1.72	0.54
2:B:238:GLU:O	2:B:239:PRO:C	2.45	0.54
2:B:234:GLN:O	2:B:238:GLU:HB3	2.08	0.53
1:A:9:ASP:N	2:B:94:GLN:HE21	2.01	0.53
2:B:34:LEU:HD12	2:B:73:ILE:O	2.09	0.53
1:A:96:ARG:C	1:A:97:LEU:HD12	2.29	0.53
2:B:103:GLN:HA	2:B:140:PHE:CZ	2.44	0.52
1:A:168:GLU:O	1:A:172:GLU:HG2	2.09	0.52
1:A:8:SER:HA	2:B:94:GLN:CG	2.39	0.52
2:B:197:UNK:O	2:B:201:UNK:N	2.42	0.52
1:A:95:ILE:CG2	1:A:97:LEU:CD1	2.88	0.51
1:A:105:VAL:HG12	1:A:105:VAL:O	2.10	0.51
2:B:138:ARG:HB2	2:B:153:ALA:HB1	1.91	0.51
2:B:78:ILE:CG2	2:B:82:VAL:HB	2.39	0.51
2:B:100:ASP:HA	2:B:102:ILE:CD1	2.40	0.51
1:A:36:LEU:HD21	1:A:83:MSE:HE2	1.92	0.51
2:B:86:ILE:O	2:B:90:ILE:HG13	2.11	0.51
2:B:11:GLN:O	2:B:11:GLN:HG3	2.11	0.50
2:B:115:THR:HG23	2:B:116:ASP:N	2.24	0.50
2:B:159:THR:HB	2:B:160:HIS:CD2	2.47	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:154:THR:O	2:B:158:GLU:HB3	2.12	0.49
1:A:18:ARG:O	1:A:21:SER:HB3	2.12	0.49
2:B:80:VAL:HG23	2:B:81:MSE:N	2.27	0.49
2:B:192:UNK:O	2:B:195:UNK:N	2.46	0.49
2:B:118:LYS:HB3	2:B:118:LYS:HZ3	1.77	0.49
2:B:86:ILE:HG21	2:B:114:LEU:HD11	1.94	0.49
1:A:13:ALA:HB2	2:B:17:LEU:CD2	2.43	0.49
1:A:178:LEU:C	1:A:178:LEU:HD23	2.33	0.49
1:A:36:LEU:CG	1:A:75:LEU:HB2	2.43	0.48
2:B:35:VAL:HG13	2:B:74:GLU:HA	1.92	0.48
1:A:93:GLY:CA	2:B:12:HIS:ND1	2.76	0.48
2:B:238:GLU:CG	2:B:239:PRO:CD	2.90	0.48
1:A:59:LEU:HD23	2:B:29:PHE:HE2	1.78	0.48
1:A:13:ALA:HB2	2:B:17:LEU:HD23	1.96	0.47
1:A:16:LEU:O	1:A:19:ALA:HB3	2.14	0.47
2:B:118:LYS:NZ	2:B:118:LYS:CB	2.76	0.47
2:B:160:HIS:N	2:B:160:HIS:HD2	2.10	0.47
2:B:160:HIS:O	2:B:162:ARG:N	2.48	0.47
1:A:102:ILE:O	1:A:106:VAL:HG23	2.15	0.47
2:B:102:ILE:HD11	2:B:124:PHE:HE2	1.80	0.46
1:A:51:ALA:HB2	2:B:16:LEU:CD1	2.46	0.46
2:B:81:MSE:O	2:B:85:GLU:HG2	2.15	0.46
2:B:21:SER:O	2:B:24:ARG:HG3	2.15	0.46
2:B:178:UNK:C	2:B:180:UNK:N	2.77	0.46
1:A:51:ALA:HB2	2:B:16:LEU:HD11	1.97	0.46
1:A:235:MSE:C	1:A:237:ASN:H	2.19	0.46
2:B:57:THR:HG22	2:B:57:THR:O	2.16	0.46
2:B:238:GLU:HG3	2:B:239:PRO:CG	2.45	0.46
2:B:160:HIS:C	2:B:162:ARG:N	2.69	0.45
2:B:35:VAL:CG1	2:B:74:GLU:CA	2.88	0.45
2:B:221:LEU:O	2:B:225:GLY:N	2.46	0.45
2:B:34:LEU:H	2:B:42:PRO:N	2.15	0.45
1:A:132:GLU:N	1:A:132:GLU:CD	2.70	0.45
2:B:59:LEU:HD23	2:B:71:TYR:CE1	2.52	0.45
1:A:172:GLU:HA	1:A:210:ARG:NH2	2.10	0.45
1:A:238:GLU:CB	1:A:239:PRO:HD2	2.46	0.45
2:B:11:GLN:O	2:B:11:GLN:CG	2.64	0.44
2:B:93:GLY:O	2:B:94:GLN:HG3	2.17	0.44
2:B:145:CYS:O	2:B:145:CYS:SG	2.76	0.44
2:B:118:LYS:HB3	2:B:118:LYS:HZ2	1.83	0.44
2:B:232:ARG:O	2:B:235:MSE:HB2	2.18	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:238:GLU:HG3	2:B:239:PRO:CD	2.48	0.43
2:B:157:LEU:HD12	2:B:164:VAL:HG11	2.00	0.43
1:A:213:HIS:O	1:A:216:ASP:N	2.52	0.43
1:A:171:LEU:C	1:A:173:LEU:H	2.21	0.43
2:B:192:UNK:O	2:B:193:UNK:C	2.64	0.43
2:B:31:ASP:OD1	2:B:45:LYS:CB	2.67	0.43
2:B:56:ARG:HH11	2:B:56:ARG:CG	2.31	0.42
2:B:58:LYS:O	2:B:59:LEU:HB3	2.19	0.42
1:A:125:LEU:HD11	1:A:140:PHE:CE2	2.54	0.42
2:B:160:HIS:CD2	2:B:160:HIS:H	2.35	0.42
2:B:9:ASP:O	2:B:11:GLN:N	2.53	0.42
2:B:9:ASP:C	2:B:11:GLN:H	2.23	0.42
2:B:102:ILE:HG22	2:B:106:VAL:HG23	2.02	0.42
2:B:34:LEU:O	2:B:40:GLU:HA	2.19	0.42
2:B:9:ASP:C	2:B:11:GLN:N	2.74	0.41
2:B:130:ALA:H	2:B:134:CYS:HB3	1.85	0.41
2:B:119:THR:O	2:B:123:GLU:HG3	2.19	0.41
2:B:120:LEU:HD12	2:B:120:LEU:HA	1.88	0.41
1:A:114:LEU:O	1:A:118:LYS:HB2	2.19	0.41
1:A:180:GLU:HG3	1:A:181:VAL:N	2.35	0.41
1:A:238:GLU:O	1:A:240:LEU:N	2.53	0.41
2:B:160:HIS:C	2:B:162:ARG:H	2.23	0.41
2:B:129:ILE:HG21	2:B:156:TYR:CG	2.56	0.41
1:A:101:THR:O	1:A:104:ASP:HB2	2.19	0.41
1:A:165:SER:HA	1:A:170:PHE:CD2	2.56	0.41
1:A:87:LEU:HD23	1:A:87:LEU:HA	1.85	0.41
2:B:48:LEU:CD2	2:B:55:ILE:HD13	2.50	0.41
1:A:19:ALA:CB	2:B:50:ALA:HB1	2.51	0.41
1:A:10:PRO:C	1:A:12:HIS:H	2.24	0.41
1:A:53:PRO:HD2	1:A:113:LEU:O	2.20	0.41
1:A:182:ILE:HD11	1:A:199:VAL:CG2	2.50	0.41
1:A:182:ILE:HG23	1:A:195:VAL:HG11	2.03	0.41
2:B:15:ARG:O	2:B:18:ARG:HB3	2.20	0.41
2:B:96:ARG:C	2:B:97:LEU:HG	2.41	0.41
1:A:33:HIS:HA	1:A:41:ILE:O	2.20	0.41
1:A:205:HIS:O	1:A:210:ARG:N	2.50	0.40
2:B:104:ASP:CA	2:B:107:GLN:HB3	2.47	0.40
1:A:24:ARG:C	1:A:25:GLU:CG	2.88	0.40
1:A:83:MSE:O	1:A:87:LEU:N	2.48	0.40
1:A:37:ASP:HB2	1:A:80:VAL:CG2	2.51	0.40
1:A:175:PRO:HB3	1:A:202:TRP:CH2	2.57	0.40

There are no symmetry-related clashes.

## 5.3 Torsion angles [i](#)

### 5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	202/256 (79%)	176 (87%)	23 (11%)	3 (2%)	8	29
2	B	140/256 (55%)	121 (86%)	17 (12%)	2 (1%)	9	30
All	All	342/512 (67%)	297 (87%)	40 (12%)	5 (2%)	8	29

All (5) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	236	LEU
2	B	161	PHE
2	B	103	GLN
1	A	102	ILE
1	A	239	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	162/222 (73%)	147 (91%)	15 (9%)	7	23
2	B	129/179 (72%)	114 (88%)	15 (12%)	4	15
All	All	291/401 (73%)	261 (90%)	30 (10%)	6	19

All (30) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	20	LEU
1	A	25	GLU
1	A	48	LEU
1	A	59	LEU
1	A	71	TYR
1	A	85	GLU
1	A	88	ASP
1	A	102	ILE
1	A	116	ASP
1	A	118	LYS
1	A	145	CYS
1	A	154	THR
1	A	184	LEU
1	A	201	ARG
1	A	233	GLU
2	B	9	ASP
2	B	11	GLN
2	B	25	GLU
2	B	56	ARG
2	B	71	TYR
2	B	87	LEU
2	B	88	ASP
2	B	95	ILE
2	B	103	GLN
2	B	110	ASP
2	B	118	LYS
2	B	120	LEU
2	B	152	LEU
2	B	160	HIS
2	B	235	MSE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (9) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	94	GLN
1	A	148	HIS
1	A	160	HIS
1	A	234	GLN
1	A	237	ASN
2	B	11	GLN
2	B	94	GLN
2	B	103	GLN
2	B	160	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<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	211/256 (82%)	0.81	30 (14%) <b>7</b> <b>6</b>	39, 71, 113, 136	0
2	B	155/256 (60%)	1.36	38 (24%) <b>2</b> <b>2</b>	45, 100, 137, 144	0
All	All	366/512 (71%)	1.05	68 (18%) <b>4</b> <b>4</b>	39, 84, 134, 144	0

All (68) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	B	100	ASP	7.5
2	B	155	GLU	6.4
2	B	85	GLU	5.1
1	A	229	SER	4.8
1	A	98	ASN	4.7
2	B	222	TRP	4.3
2	B	236	LEU	4.3
1	A	134	CYS	4.1
2	B	86	ILE	4.1
2	B	153	ALA	4.0
1	A	185	GLU	3.8
2	B	102	ILE	3.7
2	B	130	ALA	3.6
1	A	217	VAL	3.4
2	B	163	ASP	3.4
2	B	150	HIS	3.4
1	A	102	ILE	3.3
2	B	134	CYS	3.2
1	A	211	LYS	3.1
1	A	222	TRP	3.1
1	A	10	PRO	3.1
2	B	40	GLU	3.1
1	A	166	SER	3.0
2	B	128	CYS	2.9

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
2	B	80	VAL	2.9
2	B	76	GLU	2.9
2	B	137	ILE	2.9
2	B	225	GLY	2.8
2	B	159	THR	2.7
2	B	29	PHE	2.7
1	A	101	THR	2.7
2	B	99	GLU	2.6
2	B	154	THR	2.6
2	B	95	ILE	2.6
2	B	215	LYS	2.5
2	B	135	ILE	2.5
1	A	205	HIS	2.5
1	A	100	ASP	2.5
2	B	211	LYS	2.5
1	A	234	GLN	2.5
1	A	77	GLY	2.4
2	B	93	GLY	2.4
2	B	133	ASN	2.4
1	A	193	ARG	2.4
1	A	216	ASP	2.4
1	A	145	CYS	2.3
1	A	180	GLU	2.3
1	A	178	LEU	2.3
1	A	230	TYR	2.2
2	B	89	TYR	2.2
1	A	221	LEU	2.2
2	B	28	ARG	2.2
1	A	75	LEU	2.2
2	B	157	LEU	2.2
2	B	164	VAL	2.2
1	A	197	GLU	2.2
1	A	240	LEU	2.2
2	B	56	ARG	2.1
2	B	124	PHE	2.1
1	A	204	ALA	2.1
1	A	96	ARG	2.1
1	A	236	LEU	2.1
2	B	152	LEU	2.0
2	B	11	GLN	2.0
1	A	28	ARG	2.0
2	B	31	ASP	2.0

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Mol	Chain	Res	Type	RSRZ
2	B	151	TYR	2.0
1	A	212	VAL	2.0

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

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

## 6.3 Carbohydrates [i](#)

There are no monosaccharides in this entry.

## 6.4 Ligands [i](#)

There are no ligands in this entry.

## 6.5 Other polymers [i](#)

There are no such residues in this entry.