



# Full wwPDB X-ray Structure Validation Report ⓘ

Mar 8, 2026 – 07:29 AM UTC

PDB ID : 5X5Y / pdb\_00005x5y  
Title : A membrane protein complex  
Authors : Luo, Q.; Yang, X.; Huang, Y.  
Deposited on : 2017-02-18  
Resolution : 3.46 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	:	4-5-2 with Phenix2.0
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

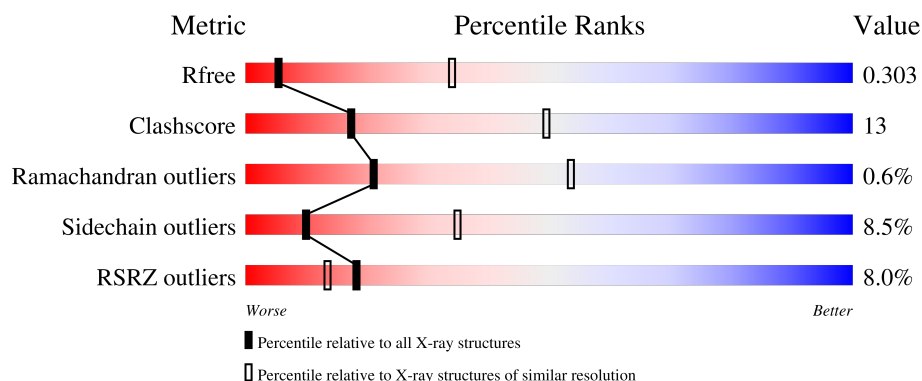
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 3.46 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	180053	1070 (3.50-3.42)
Clashscore	190562	1128 (3.50-3.42)
Ramachandran outliers	187476	1101 (3.50-3.42)
Sidechain outliers	187428	1102 (3.50-3.42)
RSRZ outliers	180081	1070 (3.50-3.42)

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	247	 8% 64% 30% . .
1	B	247	 7% 62% 34% . .
2	G	355	 8% 71% 23% 5% .
3	F	362	 7% 62% 31% . .

## 2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 9178 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 Probable ATP-binding component of ABC transporter.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	B	239	Total	C	N	O	S	0	0	0
			1841	1153	336	345	7			
1	A	239	Total	C	N	O	S	0	0	0
			1841	1153	336	345	7			

There are 12 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	242	HIS	-	expression tag	UNP Q9HVV6
B	243	HIS	-	expression tag	UNP Q9HVV6
B	244	HIS	-	expression tag	UNP Q9HVV6
B	245	HIS	-	expression tag	UNP Q9HVV6
B	246	HIS	-	expression tag	UNP Q9HVV6
B	247	HIS	-	expression tag	UNP Q9HVV6
A	242	HIS	-	expression tag	UNP Q9HVV6
A	243	HIS	-	expression tag	UNP Q9HVV6
A	244	HIS	-	expression tag	UNP Q9HVV6
A	245	HIS	-	expression tag	UNP Q9HVV6
A	246	HIS	-	expression tag	UNP Q9HVV6
A	247	HIS	-	expression tag	UNP Q9HVV6

- Molecule 2 is a protein called Uncharacterized protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	G	351	Total	C	N	O	S	0	0	0
			2734	1782	468	473	11			

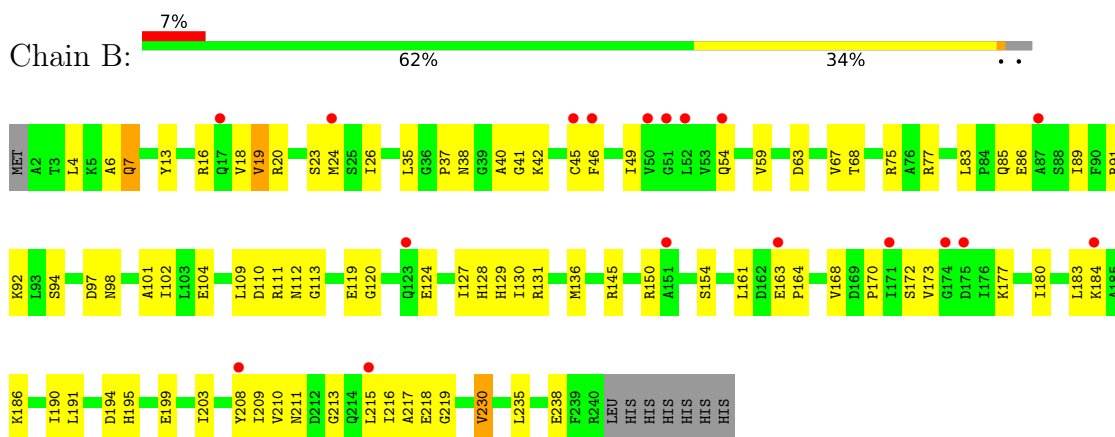
- Molecule 3 is a protein called Uncharacterized protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	F	351	Total	C	N	O	S	0	0	0
			2762	1815	461	475	11			

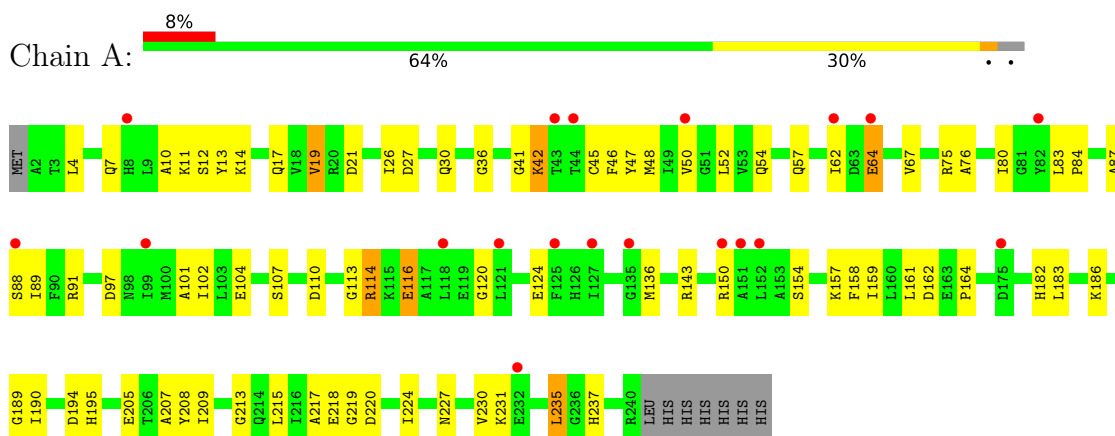
### 3 Residue-property plots [i](#)

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.

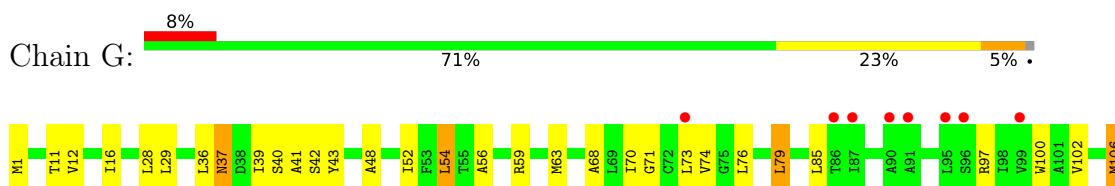
- Molecule 1: Probable ATP-binding component of ABC transporter

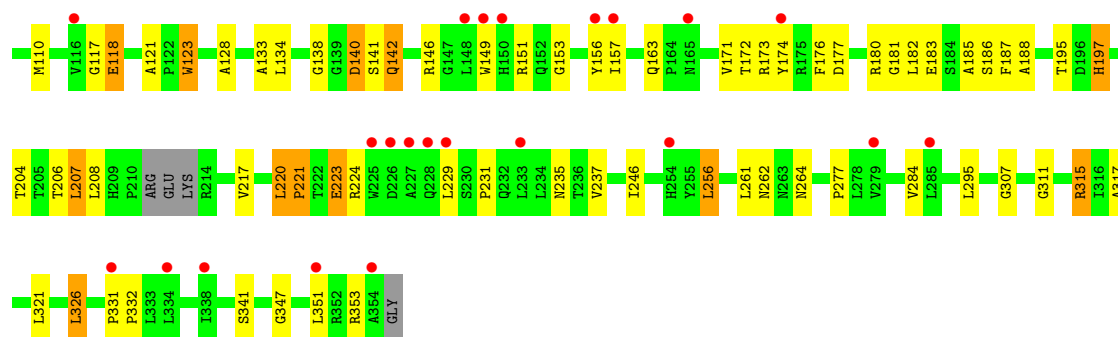


- Molecule 1: Probable ATP-binding component of ABC transporter

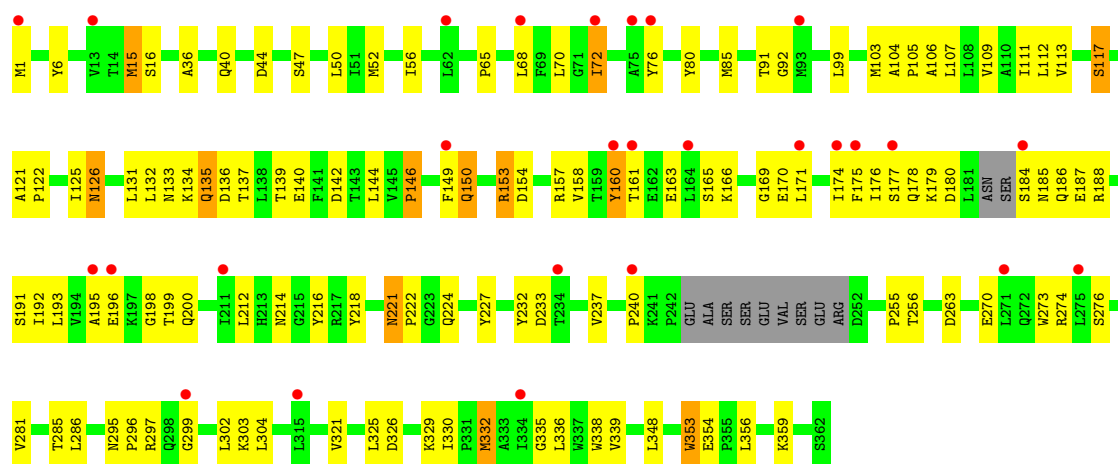


- Molecule 2: Uncharacterized protein





• Molecule 3: Uncharacterized protein



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	69.95Å 159.87Å 166.79Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	45.64 – 3.46 45.64 – 3.46	Depositor EDS
% Data completeness (in resolution range)	97.7 (45.64-3.46) 97.6 (45.64-3.46)	Depositor EDS
$R_{merge}$	0.15	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.51 (at 3.48Å)	Xtriage
Refinement program	PHENIX 1.11.1_2575	Depositor
R, $R_{free}$	0.269 , 0.304 0.272 , 0.303	Depositor DCC
$R_{free}$ test set	1200 reflections (4.79%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	135.7	Xtriage
Anisotropy	0.429	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.29 , 95.5	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.43$ , $\langle L^2 \rangle = 0.26$	Xtriage
Estimated twinning fraction	0.039 for -h,l,k	Xtriage
$F_o, F_c$ correlation	0.88	EDS
Total number of atoms	9178	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	145.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.79% 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	0.14	0/1867	0.40	0/2517
1	B	0.13	0/1867	0.37	0/2517
2	G	0.13	0/2796	0.36	0/3807
3	F	0.13	0/2820	0.38	0/3826
All	All	0.13	0/9350	0.38	0/12667

There are no bond length outliers.

There are no bond angle outliers.

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	1841	0	1869	51	0
1	B	1841	0	1869	54	1
2	G	2734	0	2814	64	1
3	F	2762	0	2891	78	0
All	All	9178	0	9443	233	1

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 13.

All (233) 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)
3:F:132:LEU:O	3:F:136:ASP:HB2	1.70	0.92
2:G:117:GLY:O	2:G:121:ALA:HB3	1.77	0.83
2:G:106:MET:HE1	2:G:284:VAL:HG11	1.64	0.80
2:G:182:LEU:HD11	2:G:185:ALA:HB2	1.66	0.77
3:F:133:ASN:O	3:F:137:THR:HB	1.83	0.77
3:F:65:PRO:HB3	3:F:281:VAL:HG22	1.66	0.75
3:F:174:ILE:HB	3:F:195:ALA:HB3	1.70	0.74
1:B:102:ILE:HD11	1:B:154:SER:HB2	1.69	0.73
2:G:134:LEU:HA	2:G:138:GLY:HA3	1.72	0.72
2:G:54:LEU:HB3	2:G:128:ALA:HB2	1.73	0.71
2:G:97:ARG:HH21	2:G:100:TRP:HD1	1.38	0.71
1:B:68:THR:O	1:B:75:ARG:NH2	2.23	0.70
3:F:99:LEU:O	3:F:103:MET:HB2	1.92	0.70
2:G:68:ALA:HB1	2:G:106:MET:HE2	1.72	0.69
3:F:135:GLN:O	3:F:139:THR:HB	1.92	0.69
3:F:135:GLN:O	3:F:139:THR:CB	2.41	0.69
2:G:37:ASN:N	2:G:37:ASN:OD1	2.27	0.68
3:F:47:SER:HB2	3:F:50:LEU:HD12	1.76	0.68
2:G:180:ARG:HH12	3:F:196:GLU:HB2	1.60	0.67
1:A:231:LYS:HA	1:A:235:LEU:HB2	1.75	0.66
3:F:160:TYR:CD1	3:F:175:PHE:HB3	2.30	0.66
2:G:151:ARG:NH1	2:G:153:GLY:O	2.29	0.66
1:B:41:GLY:O	1:B:45:CYS:CB	2.44	0.66
3:F:175:PHE:HA	3:F:193:LEU:O	1.95	0.66
3:F:325:LEU:HD12	3:F:330:ILE:HB	1.77	0.65
1:B:120:GLY:O	1:B:124:GLU:HB2	1.97	0.63
1:B:209:ILE:HG21	1:B:230:VAL:HG13	1.79	0.63
2:G:117:GLY:O	2:G:121:ALA:CB	2.46	0.63
1:A:4:LEU:HD12	1:A:62:ILE:HB	1.80	0.63
3:F:195:ALA:HB2	3:F:212:LEU:HD13	1.81	0.63
1:B:67:VAL:HG22	1:B:75:ARG:HG2	1.80	0.63
1:A:120:GLY:O	1:A:124:GLU:HB2	1.99	0.63
1:A:89:ILE:HD13	1:A:143:ARG:HG2	1.80	0.62
1:B:102:ILE:HG13	3:F:91:THR:HG21	1.80	0.62
1:A:11:LYS:H	1:A:19:VAL:HG13	1.64	0.62
1:B:89:ILE:HA	1:B:150:ARG:HH22	1.65	0.61
1:B:19:VAL:HB	1:B:41:GLY:HA3	1.82	0.61
3:F:169:GLY:O	3:F:200:GLN:N	2.33	0.61
1:B:102:ILE:HG21	1:B:150:ARG:HG3	1.83	0.60
1:A:50:VAL:HG23	1:A:52:LEU:H	1.67	0.60
2:G:207:LEU:HD22	2:G:208:LEU:H	1.67	0.59
3:F:144:LEU:HB3	3:F:146:PRO:HA	1.82	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:209:ILE:HB	1:B:217:ALA:HB3	1.83	0.59
2:G:206:THR:OG1	3:F:222:PRO:O	2.20	0.59
2:G:142:GLN:HE22	3:F:179:LYS:HD2	1.67	0.59
1:A:64:GLU:O	1:A:64:GLU:HG2	2.03	0.59
3:F:113:VAL:O	3:F:117:SER:HB3	2.03	0.58
3:F:122:PRO:O	3:F:126:ASN:HB2	2.02	0.58
3:F:126:ASN:ND2	3:F:256:THR:O	2.36	0.58
1:B:77:ARG:NH2	3:F:92:GLY:O	2.34	0.58
1:A:19:VAL:HA	1:A:213:GLY:HA2	1.83	0.58
1:A:182:HIS:CE1	1:A:186:LYS:HE3	2.39	0.58
3:F:171:LEU:N	3:F:198:GLY:O	2.34	0.57
1:B:109:LEU:HD22	1:B:113:GLY:HA3	1.85	0.57
1:B:208:TYR:HB3	1:B:215:LEU:HD11	1.86	0.57
1:B:199:GLU:N	1:B:199:GLU:OE1	2.38	0.56
2:G:220:LEU:HG	2:G:221:PRO:HD2	1.86	0.56
1:B:41:GLY:O	1:B:45:CYS:HB3	2.05	0.56
1:A:161:LEU:HB3	1:A:164:PRO:HG3	1.86	0.56
3:F:221:ASN:OD1	3:F:221:ASN:N	2.40	0.55
1:B:85:GLN:HB3	1:B:163:GLU:HB2	1.88	0.55
1:A:194:ASP:OD1	1:A:195:HIS:N	2.39	0.55
3:F:325:LEU:HG	3:F:332:MET:HE2	1.86	0.55
2:G:48:ALA:O	2:G:52:ILE:HG12	2.06	0.55
1:B:41:GLY:O	1:B:45:CYS:HB2	2.06	0.55
3:F:131:LEU:O	3:F:135:GLN:HG2	2.06	0.55
3:F:170:GLU:HA	3:F:199:THR:HA	1.87	0.55
1:B:94:SER:O	1:B:98:ASN:ND2	2.38	0.54
3:F:176:ILE:O	3:F:192:ILE:HA	2.07	0.54
2:G:28:LEU:HD21	2:G:56:ALA:HB2	1.88	0.54
2:G:39:ILE:HG22	2:G:41:ALA:H	1.73	0.54
3:F:198:GLY:HA2	3:F:212:LEU:HA	1.89	0.53
1:B:6:ALA:O	1:B:23:SER:HA	2.08	0.53
1:A:104:GLU:HA	1:A:114:ARG:HD2	1.91	0.53
1:A:91:ARG:HB3	1:A:136:MET:HB3	1.90	0.53
1:A:102:ILE:HD11	1:A:154:SER:HB3	1.90	0.53
1:B:194:ASP:OD1	1:B:195:HIS:N	2.41	0.53
3:F:157:ARG:HB2	3:F:178:GLN:HG2	1.90	0.52
2:G:142:GLN:NE2	3:F:179:LYS:HD2	2.25	0.52
1:A:47:TYR:HA	1:A:50:VAL:HG22	1.92	0.52
3:F:136:ASP:O	3:F:140:GLU:CB	2.57	0.52
3:F:68:LEU:O	3:F:72:ILE:HG12	2.10	0.52
1:A:110:ASP:O	1:A:114:ARG:N	2.37	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:G:1:MET:HE2	2:G:97:ARG:HG2	1.92	0.52
2:G:73:LEU:HD21	2:G:307:GLY:HA3	1.91	0.52
2:G:177:ASP:OD1	2:G:181:GLY:N	2.43	0.52
3:F:165:SER:HB2	3:F:170:GLU:HB2	1.90	0.52
2:G:311:GLY:O	2:G:315:ARG:HB2	2.10	0.51
3:F:184:SER:OG	3:F:185:ASN:N	2.39	0.51
1:B:211:ASN:HB3	1:B:216:ILE:HG21	1.93	0.51
1:A:209:ILE:HD11	1:A:224:ILE:HD13	1.93	0.51
3:F:106:ALA:HB2	3:F:285:THR:HG21	1.92	0.51
3:F:135:GLN:O	3:F:139:THR:OG1	2.28	0.51
3:F:286:LEU:HD21	3:F:348:LEU:HD22	1.93	0.51
3:F:165:SER:OG	3:F:166:LYS:N	2.43	0.51
1:B:183:LEU:HB3	1:B:190:ILE:HD11	1.93	0.50
1:A:52:LEU:HD12	2:G:295:LEU:HD12	1.94	0.50
3:F:335:GLY:O	3:F:338:TRP:HB3	2.11	0.50
1:B:210:VAL:HG22	1:B:215:LEU:HD12	1.92	0.50
2:G:204:THR:HG23	2:G:217:VAL:HG22	1.93	0.50
3:F:121:ALA:HB3	3:F:122:PRO:HD3	1.94	0.50
3:F:157:ARG:HA	3:F:177:SER:O	2.12	0.50
1:A:10:ALA:HA	1:A:19:VAL:HG22	1.94	0.49
1:B:24:MET:HE3	1:B:49:ILE:HD11	1.95	0.49
2:G:180:ARG:HH12	3:F:196:GLU:CB	2.25	0.49
1:B:35:LEU:HB2	1:B:209:ILE:HD13	1.94	0.49
3:F:80:TYR:CZ	3:F:85:MET:HG2	2.47	0.49
1:B:86:GLU:HG2	3:F:297:ARG:NH1	2.28	0.49
2:G:149:TRP:NE1	3:F:158:VAL:HG21	2.27	0.49
2:G:140:ASP:OD1	2:G:140:ASP:N	2.42	0.49
2:G:173:ARG:HB2	2:G:186:SER:OG	2.12	0.49
3:F:125:ILE:HG21	3:F:255:PRO:HB2	1.94	0.49
1:A:87:ALA:HA	1:A:143:ARG:HH21	1.77	0.49
1:B:16:ARG:HD2	1:B:18:VAL:HG22	1.95	0.48
3:F:70:LEU:HG	3:F:304:LEU:HD22	1.96	0.48
1:A:183:LEU:HD23	1:A:190:ILE:HD11	1.95	0.48
1:A:227:ASN:O	1:A:231:LYS:NZ	2.37	0.48
1:B:161:LEU:HB3	1:B:164:PRO:HG3	1.94	0.48
1:A:46:PHE:O	1:A:50:VAL:HG13	2.14	0.48
1:A:218:GLU:HG2	1:A:219:GLY:N	2.27	0.48
2:G:11:THR:HG21	2:G:79:LEU:HD13	1.95	0.48
3:F:136:ASP:O	3:F:140:GLU:HB2	2.13	0.47
3:F:191:SER:HA	3:F:218:TYR:O	2.14	0.47
1:A:182:HIS:HE1	1:A:186:LYS:HE3	1.78	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:208:TYR:HB3	1:A:215:LEU:HD11	1.97	0.47
2:G:16:ILE:HG12	2:G:71:GLY:HA3	1.96	0.47
2:G:141:SER:HA	2:G:187:PHE:HE2	1.78	0.47
2:G:176:PHE:HE1	2:G:182:LEU:HD12	1.80	0.47
3:F:295:ASN:N	3:F:296:PRO:HD2	2.30	0.47
2:G:171:VAL:HB	2:G:188:ALA:HB3	1.96	0.47
2:G:256:LEU:HB3	2:G:261:LEU:HB3	1.96	0.46
2:G:133:ALA:O	2:G:138:GLY:N	2.48	0.46
1:B:4:LEU:HB3	1:B:26:ILE:HG23	1.97	0.46
2:G:73:LEU:CD2	2:G:307:GLY:HA3	2.45	0.46
1:A:205:GLU:O	1:A:220:ASP:HA	2.16	0.46
3:F:214:ASN:HA	3:F:233:ASP:HA	1.97	0.46
1:B:177:LYS:HD3	1:B:203:ILE:HD12	1.97	0.46
1:A:11:LYS:N	1:A:19:VAL:HG13	2.30	0.46
1:A:4:LEU:CD1	1:A:80:ILE:HD11	2.46	0.46
3:F:52:MET:O	3:F:56:ILE:HG13	2.16	0.45
3:F:107:LEU:O	3:F:111:ILE:HG12	2.15	0.45
3:F:353:TRP:O	3:F:356:LEU:HG	2.16	0.45
3:F:158:VAL:O	3:F:176:ILE:HA	2.15	0.45
1:A:113:GLY:HA2	1:A:116:GLU:OE1	2.17	0.45
3:F:354:GLU:OE2	3:F:354:GLU:N	2.50	0.45
1:B:218:GLU:HG2	1:B:219:GLY:N	2.32	0.45
2:G:317:ALA:O	2:G:321:LEU:HB2	2.16	0.45
2:G:264:ASN:HB3	2:G:326:LEU:HG	1.99	0.45
3:F:171:LEU:HB2	3:F:174:ILE:HD11	1.99	0.45
2:G:118:GLU:HG3	2:G:246:ILE:HG13	1.98	0.45
2:G:176:PHE:HD1	2:G:182:LEU:HA	1.82	0.45
1:B:180:ILE:HG23	1:B:190:ILE:HD13	1.99	0.45
3:F:132:LEU:O	3:F:136:ASP:CB	2.53	0.45
2:G:70:ILE:O	2:G:74:VAL:HG23	2.17	0.45
3:F:221:ASN:HB2	3:F:224:GLN:HG3	1.98	0.45
2:G:229:LEU:HD12	2:G:229:LEU:HA	1.90	0.44
1:A:27:ASP:O	1:A:30:GLN:HG2	2.18	0.44
1:B:129:HIS:ND1	1:B:130:ILE:HG23	2.33	0.44
1:A:207:ALA:O	1:A:218:GLU:HA	2.18	0.44
3:F:44:ASP:CG	3:F:47:SER:HG	2.26	0.44
1:A:11:LYS:HB2	1:A:48:MET:SD	2.58	0.44
2:G:197:HIS:CD2	2:G:223:GLU:HG2	2.53	0.44
1:B:92:LYS:HB2	3:F:6:TYR:CE1	2.53	0.43
1:A:158:PHE:CD1	1:A:189:GLY:HA3	2.53	0.43
3:F:161:THR:HG22	3:F:163:GLU:H	1.83	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:173:VAL:O	1:B:177:LYS:HG2	2.18	0.43
3:F:144:LEU:HD11	3:F:150:GLN:HB2	2.01	0.43
1:B:128:HIS:CD2	1:B:131:ARG:HH21	2.36	0.43
3:F:321:VAL:HG11	3:F:339:VAL:HG21	2.01	0.43
1:B:38:ASN:OD1	1:B:38:ASN:N	2.52	0.43
2:G:110:MET:HB3	2:G:277:PRO:HG3	1.99	0.43
1:A:76:ALA:HA	1:A:80:ILE:O	2.18	0.43
2:G:106:MET:HE3	2:G:106:MET:HB2	1.80	0.43
1:A:97:ASP:O	1:A:101:ALA:HB2	2.18	0.43
3:F:15:MET:HG3	3:F:16:SER:N	2.33	0.43
3:F:273:TRP:HA	3:F:276:SER:HB3	2.01	0.43
1:A:230:VAL:O	1:A:235:LEU:N	2.40	0.43
2:G:142:GLN:OE1	3:F:179:LYS:HB2	2.18	0.43
2:G:151:ARG:HB2	3:F:149:PHE:HZ	1.84	0.43
1:B:91:ARG:HE	1:B:136:MET:HB3	1.84	0.42
1:B:37:PRO:HD2	1:B:210:VAL:O	2.19	0.42
1:B:184:LYS:HE2	1:B:184:LYS:HB3	1.92	0.42
1:A:14:LYS:HD3	1:A:14:LYS:HA	1.71	0.42
1:B:7:GLN:CG	1:B:59:VAL:HB	2.50	0.42
1:A:36:GLY:O	1:A:42:LYS:HE2	2.19	0.42
1:B:7:GLN:H	1:B:7:GLN:HG2	1.67	0.42
2:G:123:TRP:CD1	2:G:123:TRP:C	2.98	0.42
2:G:1:MET:HG2	2:G:97:ARG:HD3	2.02	0.42
1:B:37:PRO:HG2	1:B:40:ALA:HB2	2.01	0.42
1:B:104:GLU:OE2	3:F:1:MET:N	2.45	0.42
1:A:41:GLY:O	1:A:45:CYS:HB2	2.20	0.42
2:G:40:SER:C	2:G:42:SER:H	2.28	0.42
2:G:331:PRO:HA	2:G:332:PRO:HD3	1.91	0.42
1:A:67:VAL:HB	1:A:75:ARG:HG2	2.00	0.42
1:A:227:ASN:HB3	1:A:230:VAL:HG22	2.02	0.42
3:F:104:ALA:HB3	3:F:105:PRO:HD3	2.02	0.42
1:B:119:GLU:OE1	1:B:131:ARG:NH2	2.52	0.41
2:G:157:ILE:HA	2:G:172:THR:O	2.19	0.41
2:G:326:LEU:HA	2:G:326:LEU:HD13	1.75	0.41
1:A:88:SER:O	1:A:150:ARG:NH2	2.49	0.41
2:G:12:VAL:HG21	2:G:102:VAL:HG13	2.03	0.41
1:A:97:ASP:O	1:A:101:ALA:CB	2.69	0.41
1:A:208:TYR:HD2	1:A:215:LEU:HD21	1.84	0.41
2:G:76:LEU:HD11	2:G:102:VAL:HG21	2.02	0.41
3:F:221:ASN:O	3:F:227:TYR:HE1	2.04	0.41
1:A:4:LEU:HB3	1:A:26:ILE:HG23	2.01	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:84:PRO:HA	1:A:162:ASP:HB3	2.03	0.41
3:F:36:ALA:O	3:F:40:GLN:HG3	2.20	0.41
3:F:72:ILE:O	3:F:76:TYR:HB2	2.21	0.41
1:B:127:ILE:HG22	1:B:145:ARG:HH21	1.86	0.41
1:B:168:VAL:HG13	1:B:172:SER:HB2	2.01	0.41
3:F:72:ILE:HG12	3:F:72:ILE:H	1.60	0.41
3:F:134:LYS:O	3:F:137:THR:HG22	2.21	0.41
1:B:18:VAL:O	1:B:213:GLY:HA2	2.21	0.41
1:A:159:ILE:HB	1:A:190:ILE:HD13	2.01	0.41
1:B:97:ASP:O	1:B:101:ALA:HB2	2.21	0.41
2:G:156:TYR:HB2	2:G:174:TYR:HB2	2.02	0.41
1:B:46:PHE:HE1	1:B:191:LEU:HD22	1.86	0.41
3:F:212:LEU:HD11	3:F:232:TYR:OH	2.21	0.41
1:B:170:PRO:O	1:B:173:VAL:HG22	2.22	0.40
1:A:12:SER:HB3	1:A:17:GLN:HE21	1.86	0.40
2:G:176:PHE:CE1	2:G:182:LEU:HD12	2.56	0.40
2:G:231:PRO:O	2:G:235:ASN:HB2	2.21	0.40
1:B:7:GLN:HG2	1:B:59:VAL:HB	2.02	0.40
1:A:26:ILE:HD11	1:A:190:ILE:N	2.36	0.40
2:G:12:VAL:HG21	2:G:102:VAL:HG22	2.03	0.40
3:F:109:VAL:O	3:F:113:VAL:HG23	2.21	0.40
1:A:209:ILE:HB	1:A:217:ALA:HB3	2.03	0.40
2:G:54:LEU:HD13	2:G:54:LEU:HA	1.91	0.40
2:G:347:GLY:O	2:G:351:LEU:HG	2.21	0.40
2:G:182:LEU:HD23	2:G:207:LEU:HD23	2.04	0.40
1:B:230:VAL:HG12	1:B:235:LEU:HD13	2.03	0.40
2:G:28:LEU:HD12	2:G:59:ARG:HD2	2.03	0.40

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

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:112:ASN:ND2	2:G:262:ASN:OD1[2_455]	2.18	0.02

## 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	237/247 (96%)	233 (98%)	3 (1%)	1 (0%)	30	62
1	B	237/247 (96%)	231 (98%)	6 (2%)	0	100	100
2	G	347/355 (98%)	328 (94%)	17 (5%)	2 (1%)	21	53
3	F	345/362 (95%)	318 (92%)	23 (7%)	4 (1%)	10	41
All	All	1166/1211 (96%)	1110 (95%)	49 (4%)	7 (1%)	21	53

All (7) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
3	F	153	ARG
3	F	240	PRO
1	A	237	HIS
2	G	221	PRO
2	G	195	THR
3	F	146	PRO
3	F	299	GLY

### 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	196/204 (96%)	182 (93%)	14 (7%)	13	40
1	B	196/204 (96%)	183 (93%)	13 (7%)	15	43
2	G	287/290 (99%)	260 (91%)	27 (9%)	8	31
3	F	292/302 (97%)	263 (90%)	29 (10%)	7	30
All	All	971/1000 (97%)	888 (92%)	83 (8%)	10	35

All (83) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	7	GLN
1	B	13	TYR
1	B	19	VAL
1	B	20	ARG
1	B	42	LYS
1	B	54	GLN
1	B	63	ASP
1	B	83	LEU
1	B	110	ASP
1	B	111	ARG
1	B	186	LYS
1	B	230	VAL
1	B	238	GLU
1	A	7	GLN
1	A	13	TYR
1	A	19	VAL
1	A	21	ASP
1	A	42	LYS
1	A	54	GLN
1	A	57	GLN
1	A	64	GLU
1	A	83	LEU
1	A	107	SER
1	A	114	ARG
1	A	116	GLU
1	A	157	LYS
1	A	235	LEU
2	G	29	LEU
2	G	36	LEU
2	G	37	ASN
2	G	43	TYR
2	G	54	LEU
2	G	63	MET
2	G	79	LEU
2	G	85	LEU
2	G	106	MET
2	G	118	GLU
2	G	123	TRP
2	G	140	ASP
2	G	142	GLN
2	G	146	ARG
2	G	163	GLN
2	G	183	GLU

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Mol	Chain	Res	Type
2	G	197	HIS
2	G	207	LEU
2	G	220	LEU
2	G	223	GLU
2	G	224	ARG
2	G	237	VAL
2	G	256	LEU
2	G	315	ARG
2	G	326	LEU
2	G	341	SER
2	G	353	ARG
3	F	15	MET
3	F	72	ILE
3	F	112	LEU
3	F	117	SER
3	F	126	ASN
3	F	135	GLN
3	F	142	ASP
3	F	150	GLN
3	F	153	ARG
3	F	154	ASP
3	F	160	TYR
3	F	180	ASP
3	F	186	GLN
3	F	187	GLU
3	F	188	ARG
3	F	216	TYR
3	F	221	ASN
3	F	237	VAL
3	F	263	ASP
3	F	270	GLU
3	F	274	ARG
3	F	302	LEU
3	F	303	LYS
3	F	326	ASP
3	F	329	LYS
3	F	332	MET
3	F	336	LEU
3	F	353	TRP
3	F	359	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (8) such sidechains are listed below:



Mol	Chain	Res	Type
1	B	66	ASN
1	A	17	GLN
1	A	128	HIS
1	A	182	HIS
1	A	237	HIS
2	G	163	GLN
2	G	209	HIS
3	F	135	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 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	239/247 (96%)	0.38	19 (7%) 18 13	103, 144, 182, 206	0
1	B	239/247 (96%)	0.47	18 (7%) 20 14	100, 137, 163, 193	0
2	G	351/355 (98%)	0.36	30 (8%) 16 12	83, 143, 190, 220	0
3	F	351/362 (96%)	0.53	27 (7%) 19 14	93, 150, 209, 230	0
All	All	1180/1211 (97%)	0.44	94 (7%) 18 13	83, 143, 194, 230	0

All (94) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
3	F	174	ILE	8.1
2	G	165	ASN	7.5
1	A	152	LEU	6.1
3	F	62	LEU	6.0
2	G	91	ALA	5.8
3	F	160	TYR	5.5
1	B	52	LEU	5.2
1	B	215	LEU	5.1
1	A	125	PHE	5.1
1	B	54	GLN	4.9
2	G	87	ILE	4.8
2	G	90	ALA	4.7
1	A	82	TYR	4.5
2	G	229	LEU	4.5
1	B	24	MET	4.5
2	G	157	ILE	4.3
2	G	351	LEU	4.1
3	F	271	LEU	4.1
2	G	233	LEU	4.0
1	B	51	GLY	4.0
3	F	161	THR	4.0

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Mol	Chain	Res	Type	RSRZ
3	F	240	PRO	3.9
2	G	334	LEU	3.8
1	A	44	THR	3.8
3	F	76	TYR	3.8
2	G	285	LEU	3.8
3	F	175	PHE	3.6
3	F	13	VAL	3.6
1	A	121	LEU	3.6
2	G	354	ALA	3.6
2	G	226	ASP	3.4
1	A	127	ILE	3.4
1	B	17	GLN	3.4
2	G	99	VAL	3.3
3	F	1	MET	3.3
2	G	150	HIS	3.3
1	B	175	ASP	3.3
3	F	93	MET	3.2
1	B	151	ALA	3.1
1	A	64	GLU	3.1
1	B	46	PHE	3.0
2	G	156	TYR	3.0
1	A	118	LEU	2.9
3	F	72	ILE	2.9
3	F	334	ILE	2.9
3	F	68	LEU	2.9
1	A	232	GLU	2.8
3	F	75	ALA	2.8
3	F	299	GLY	2.8
1	A	150	ARG	2.8
2	G	279	VAL	2.7
2	G	73	LEU	2.7
1	B	163	GLU	2.7
1	A	88	SER	2.6
1	B	208	TYR	2.6
1	B	123	GLN	2.6
1	B	171	ILE	2.5
2	G	174	TYR	2.5
2	G	228	GLN	2.5
2	G	116	VAL	2.5
3	F	196	GLU	2.5
3	F	275	LEU	2.5
3	F	184	SER	2.5

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Mol	Chain	Res	Type	RSRZ
2	G	86	THR	2.5
3	F	315	LEU	2.5
1	A	62	ILE	2.4
2	G	96	SER	2.4
2	G	149	TRP	2.4
1	A	151	ALA	2.4
3	F	149	PHE	2.4
1	B	45	CYS	2.4
2	G	331	PRO	2.4
1	B	87	ALA	2.4
3	F	177	SER	2.4
1	A	50	VAL	2.3
2	G	227	ALA	2.3
3	F	195	ALA	2.3
1	A	43	THR	2.3
2	G	95	LEU	2.2
1	B	50	VAL	2.2
2	G	338	ILE	2.2
2	G	225	TRP	2.2
3	F	234	THR	2.2
1	A	135	GLY	2.2
1	B	184	LYS	2.2
1	A	99	ILE	2.1
3	F	164	LEU	2.1
1	A	8	HIS	2.1
1	A	175	ASP	2.1
2	G	254	HIS	2.1
2	G	148	LEU	2.1
3	F	211	ILE	2.1
3	F	171	LEU	2.0
1	B	174	GLY	2.0

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

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

## 6.3 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

## 6.4 Ligands

There are no ligands in this entry.

## 6.5 Other polymers

There are no such residues in this entry.