



# Full wwPDB X-ray Structure Validation Report ⓘ

Feb 1, 2016 – 07:14 PM GMT

PDB ID : 4O8U  
Title : Structure of PF2046  
Authors : Su, J.; Liu, Z.-J.  
Deposited on : 2013-12-30  
Resolution : 2.35 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.

---

The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity : 4.02b-467  
Mogul : 1.7 (RC4), CSD as536be (2015)  
Xtriage (Phenix) : 1.9-1692  
EDS : rb-20026688  
Percentile statistics : 20151230.v01 (using entries in the PDB archive December 30th 2015)  
Refmac : 5.8.0135  
CCP4 : 6.5.0  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : trunk26865

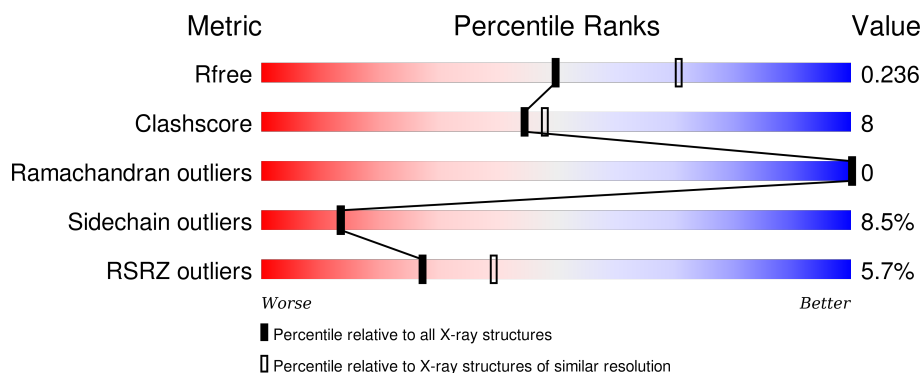
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

## *X-RAY DIFFRACTION*

The reported resolution of this entry is 2.35 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	91344	1406 (2.36-2.32)
Clashscore	102246	1509 (2.36-2.32)
Ramachandran outliers	100387	1490 (2.36-2.32)
Sidechain outliers	100360	1491 (2.36-2.32)
RSRZ outliers	91569	1412 (2.36-2.32)

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	229	<div> <div>3%</div> <div>79%</div> <div>18%</div> <div>..</div> </div>
1	B	229	<div> <div>2%</div> <div>81%</div> <div>17%</div> <div>..</div> </div>
1	C	229	<div> <div>12%</div> <div>73%</div> <div>24%</div> <div>..</div> </div>
1	D	229	<div> <div>6%</div> <div>74%</div> <div>22%</div> <div>..</div> </div>
1	E	229	<div> <div>%</div> <div>78%</div> <div>18%</div> <div>..</div> </div>

*Continued on next page...*

Continued from previous page...

Mol	Chain	Length	Quality of chain
1	F	229	<div><div></div><div>9%</div><div></div><div>76%</div><div></div><div>19%</div><div></div><div></div></div>

## 2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 10864 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 Uncharacterized protein PF2046.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	227	Total	C	N	O	Se	0	0	0
			1757	1132	296	326	3			
1	B	227	Total	C	N	O	Se	0	0	0
			1757	1132	296	326	3			
1	C	227	Total	C	N	O	Se	0	0	0
			1757	1132	296	326	3			
1	D	227	Total	C	N	O	Se	0	0	0
			1757	1132	296	326	3			
1	E	227	Total	C	N	O	Se	0	0	0
			1757	1132	296	326	3			
1	F	227	Total	C	N	O	Se	0	0	0
			1757	1132	296	326	3			

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	9	SER	-	EXPRESSION TAG	UNP Q8TZE9
B	9	SER	-	EXPRESSION TAG	UNP Q8TZE9
C	9	SER	-	EXPRESSION TAG	UNP Q8TZE9
D	9	SER	-	EXPRESSION TAG	UNP Q8TZE9
E	9	SER	-	EXPRESSION TAG	UNP Q8TZE9
F	9	SER	-	EXPRESSION TAG	UNP Q8TZE9

- Molecule 2 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	56	Total	O	0	0
			56	56		
2	B	50	Total	O	0	0
			50	50		
2	C	53	Total	O	0	0
			53	53		

*Continued on next page...*

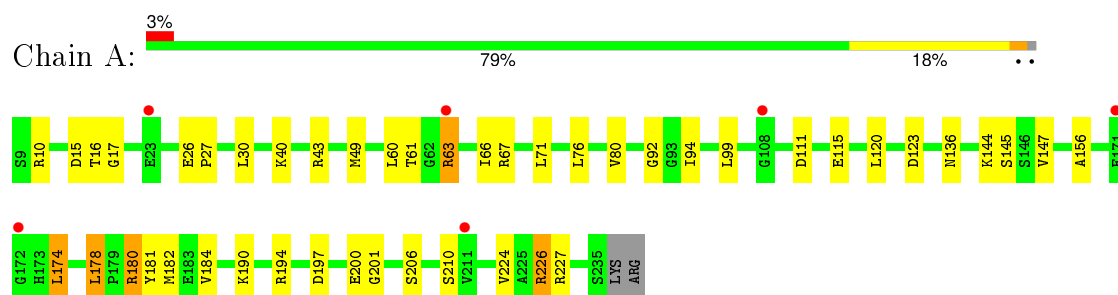
*Continued from previous page...*

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	D	51	Total 51	O 51	0	0
2	E	60	Total 60	O 60	0	0
2	F	52	Total 52	O 52	0	0

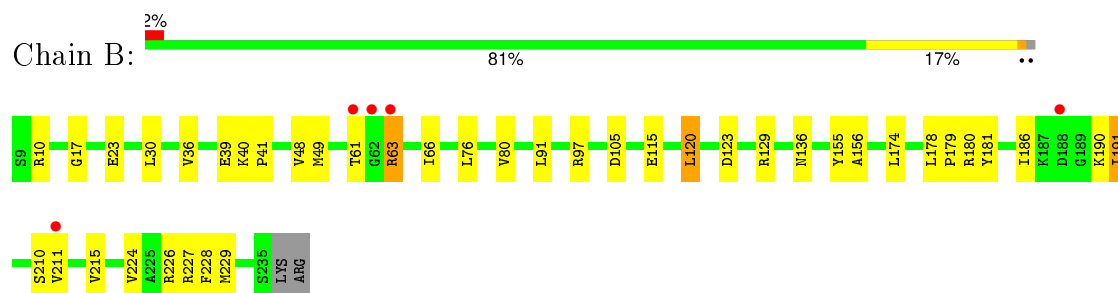
### 3 Residue-property plots [i](#)

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.

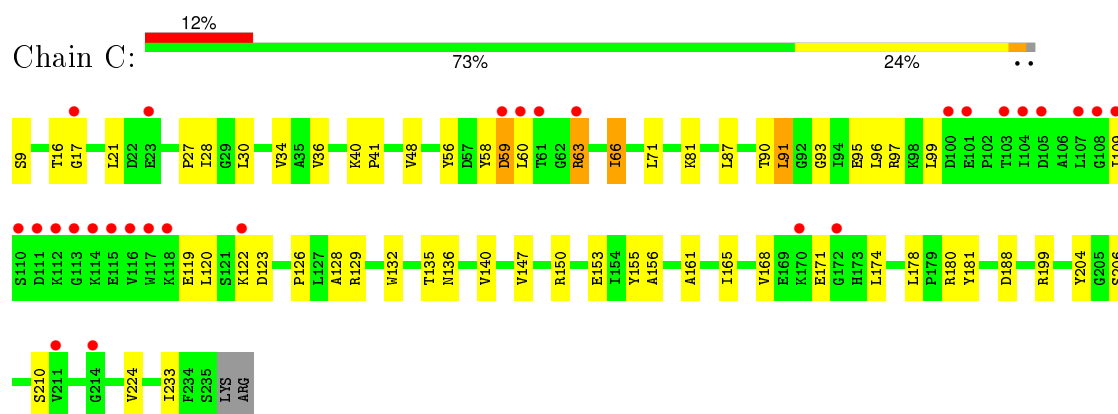
#### • Molecule 1: Uncharacterized protein PF2046



#### • Molecule 1: Uncharacterized protein PF2046

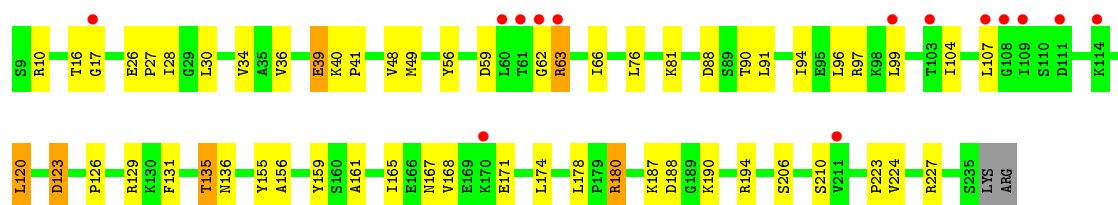


#### • Molecule 1: Uncharacterized protein PF2046

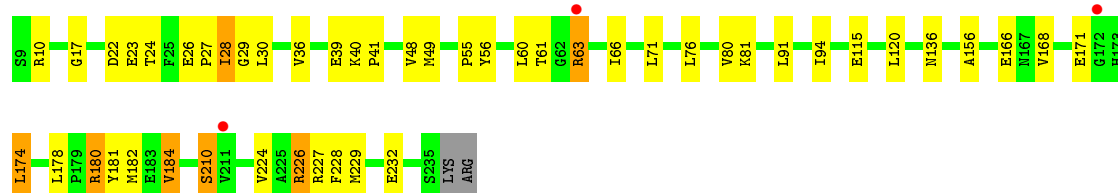
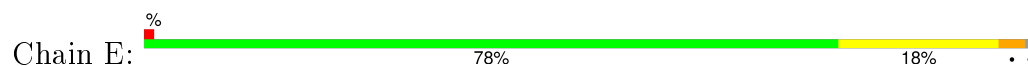


#### • Molecule 1: Uncharacterized protein PF2046

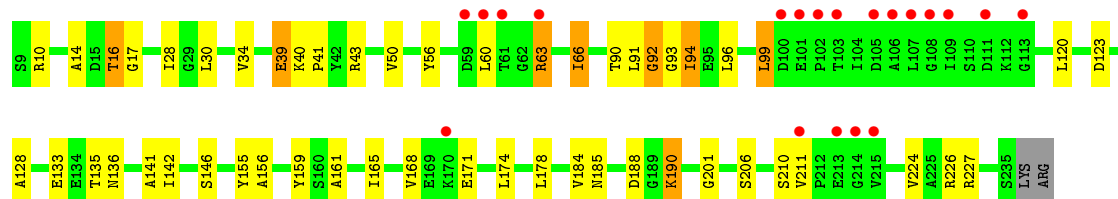
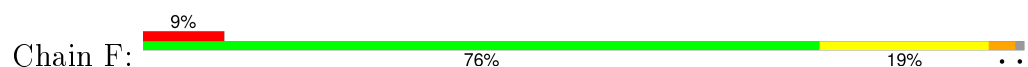




• Molecule 1: Uncharacterized protein PF2046



• Molecule 1: Uncharacterized protein PF2046



## 4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	218.38Å 125.64Å 94.04Å 90.00° 102.86° 90.00°	Depositor
Resolution (Å)	36.07 – 2.35 36.07 – 2.35	Depositor EDS
% Data completeness (in resolution range)	85.1 (36.07-2.35) 81.0 (36.07-2.35)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	3.03 (at 2.34Å)	Xtriage
Refinement program	PHENIX (phenix.refine: 1.8.2_1309)	Depositor
R, $R_{free}$	0.201 , 0.238 0.200 , 0.236	Depositor DCC
$R_{free}$ test set	1909 reflections (2.28%)	DCC
Wilson B-factor (Å <sup>2</sup> )	35.2	Xtriage
Anisotropy	0.659	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.30 , 40.0	EDS
Estimated twinning fraction	No twinning to report.	Xtriage
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.50$ , $\langle L^2 \rangle = 0.33$	Xtriage
Outliers	0 of 88098 reflections	Xtriage
$F_o, F_c$ correlation	0.94	EDS
Total number of atoms	10864	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	52.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.22% 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, 0.375 respectively for untwinned datasets, and 0.333, 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	0.57	0/1788	0.69	1/2420 (0.0%)
1	B	0.54	0/1788	0.67	1/2420 (0.0%)
1	C	0.57	0/1788	0.68	0/2420
1	D	0.59	0/1788	0.71	1/2420 (0.0%)
1	E	0.60	0/1788	0.67	0/2420
1	F	0.55	0/1788	0.68	1/2420 (0.0%)
All	All	0.57	0/10728	0.68	4/14520 (0.0%)

There are no bond length outliers.

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	91	LEU	N-CA-C	-9.07	86.52	111.00
1	D	180	ARG	CB-CA-C	-6.40	97.60	110.40
1	A	178	LEU	C-N-CD	6.13	141.26	128.40
1	F	92	GLY	N-CA-C	5.74	127.44	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	1757	0	1781	28	0
1	B	1757	0	1781	20	0
1	C	1757	0	1781	31	0

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	D	1757	0	1781	34	0
1	E	1757	0	1781	34	0
1	F	1757	0	1781	37	0
2	A	56	0	0	6	0
2	B	50	0	0	2	0
2	C	53	0	0	1	0
2	D	51	0	0	5	0
2	E	60	0	0	4	0
2	F	52	0	0	5	0
All	All	10864	0	10686	167	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 8.

All (167) 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:F:185:ASN:HB2	2:F:344:HOH:O	1.66	0.94
1:E:210:SER:OG	2:E:353:HOH:O	1.86	0.94
1:F:161:ALA:O	1:F:165:ILE:HD12	1.70	0.92
1:F:90:THR:O	1:F:91:LEU:HD23	1.77	0.84
1:F:159:TYR:OH	2:F:343:HOH:O	1.98	0.81
1:D:168:VAL:O	1:D:171:GLU:O	1.96	0.81
1:F:63:ARG:HB3	1:F:66:ILE:HG22	1.63	0.80
1:E:115:GLU:OE2	1:F:190:LYS:HD2	1.82	0.80
1:E:61:THR:HG23	1:F:188:ASP:HB3	1.63	0.79
1:B:10:ARG:NH1	1:B:80:VAL:O	2.17	0.77
1:D:90:THR:O	1:D:91:LEU:HD23	1.85	0.76
1:D:159:TYR:OH	2:D:308:HOH:O	2.04	0.74
1:C:17:GLY:HA2	1:C:156:ALA:HB1	1.68	0.74
1:C:168:VAL:O	1:C:171:GLU:O	2.05	0.73
1:D:88:ASP:OD2	2:D:347:HOH:O	2.06	0.73
1:D:17:GLY:HA2	1:D:156:ALA:HB1	1.71	0.73
1:E:17:GLY:HA2	1:E:156:ALA:HB1	1.70	0.73
1:E:182:MSE:HE2	1:E:184:VAL:HG23	1.71	0.72
1:F:17:GLY:HA2	1:F:156:ALA:HB1	1.72	0.71
1:E:226:ARG:O	1:E:227:ARG:HB2	1.89	0.71
1:C:63:ARG:HB3	1:C:66:ILE:HG22	1.71	0.71
1:F:66:ILE:HG21	1:F:120:LEU:HD21	1.72	0.71
1:C:66:ILE:HG21	1:C:120:LEU:HD21	1.70	0.70
1:A:182:MSE:HE2	1:A:184:VAL:HG23	1.74	0.70

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:59:ASP:OD1	2:D:325:HOH:O	2.09	0.69
1:A:15:ASP:OD1	2:A:317:HOH:O	2.09	0.69
1:C:90:THR:O	1:C:91:LEU:HD23	1.91	0.69
1:B:17:GLY:HA2	1:B:156:ALA:HB1	1.73	0.69
1:A:200:GLU:O	2:A:302:HOH:O	2.11	0.68
1:D:167:ASN:ND2	2:D:332:HOH:O	2.22	0.68
1:A:10:ARG:NH1	1:A:80:VAL:O	2.21	0.68
1:E:166:GLU:OE2	2:E:353:HOH:O	2.12	0.68
1:D:188:ASP:N	2:D:338:HOH:O	2.27	0.68
1:E:10:ARG:NH1	1:E:80:VAL:O	2.26	0.68
1:F:168:VAL:O	1:F:171:GLU:O	2.12	0.67
1:D:66:ILE:HG21	1:D:120:LEU:HD21	1.77	0.66
1:E:115:GLU:OE2	1:F:190:LYS:CD	2.44	0.65
1:B:155:TYR:OH	2:B:348:HOH:O	2.15	0.65
1:A:180:ARG:HG3	1:A:181:TYR:CE2	2.33	0.64
1:E:22:ASP:HB3	1:E:24:THR:H	1.61	0.64
1:A:17:GLY:HA2	1:A:156:ALA:HB1	1.80	0.64
1:F:94:ILE:HG21	1:F:99:LEU:HD21	1.80	0.63
1:B:61:THR:HG23	1:C:188:ASP:HB3	1.81	0.62
1:B:180:ARG:HG3	1:B:181:TYR:CE2	2.36	0.61
1:B:115:GLU:HG3	1:C:206:SER:HB2	1.83	0.60
1:A:190:LYS:HE2	1:A:206:SER:OG	2.01	0.60
1:E:63:ARG:HB3	1:E:66:ILE:HG22	1.82	0.60
1:E:115:GLU:CD	1:F:190:LYS:HD2	2.21	0.60
1:F:43:ARG:NH2	2:F:315:HOH:O	2.35	0.59
1:D:123:ASP:N	1:D:123:ASP:OD1	2.33	0.59
1:D:34:VAL:HG11	1:D:155:TYR:HB3	1.85	0.59
1:E:23:GLU:CD	1:E:23:GLU:H	2.05	0.58
1:F:92:GLY:N	1:F:93:GLY:HA2	2.19	0.58
1:F:211:VAL:O	1:F:211:VAL:HG23	2.04	0.57
1:C:40:LYS:HG3	1:C:41:PRO:HA	1.85	0.57
1:A:182:MSE:CE	1:A:184:VAL:HG23	2.35	0.57
1:A:92:GLY:N	2:A:330:HOH:O	2.12	0.56
1:F:142:ILE:HD13	1:F:146:SER:HB2	1.87	0.56
1:B:40:LYS:HG3	1:B:41:PRO:HA	1.88	0.56
1:D:36:VAL:HG12	1:D:48:VAL:HG22	1.86	0.56
1:E:180:ARG:HG3	1:E:181:TYR:CE2	2.41	0.55
1:C:97:ARG:HG2	1:C:129:ARG:HA	1.89	0.55
1:C:199:ARG:O	1:D:227:ARG:HB3	2.07	0.55
1:B:36:VAL:HG12	1:B:48:VAL:HG22	1.90	0.54
1:A:67:ARG:NH1	2:A:346:HOH:O	2.29	0.54

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:161:ALA:O	1:D:165:ILE:HD12	2.07	0.53
1:C:180:ARG:HG3	1:C:181:TYR:CE2	2.43	0.53
1:A:115:GLU:HG3	1:D:206:SER:HB2	1.91	0.53
1:C:36:VAL:HG12	1:C:48:VAL:HG22	1.90	0.53
1:F:94:ILE:HD13	1:F:99:LEU:HD23	1.89	0.53
1:A:43:ARG:HD3	1:A:201:GLY:O	2.09	0.53
1:E:168:VAL:O	1:E:171:GLU:O	2.27	0.53
1:C:9:SER:N	2:C:302:HOH:O	2.41	0.52
1:C:34:VAL:HG11	1:C:155:TYR:HB3	1.91	0.52
1:D:10:ARG:NH1	1:D:81:LYS:O	2.42	0.52
1:F:10:ARG:HD2	1:F:39:GLU:OE1	2.10	0.52
1:E:182:MSE:CE	1:E:184:VAL:HG23	2.40	0.51
1:A:63:ARG:HB3	1:A:66:ILE:HG22	1.93	0.51
1:B:49:MSE:HE3	1:B:76:LEU:HD13	1.93	0.51
1:D:40:LYS:HG3	1:D:41:PRO:HA	1.92	0.51
1:D:96:LEU:HD12	1:D:99:LEU:HD12	1.93	0.50
1:A:67:ARG:NH2	2:A:346:HOH:O	2.43	0.50
1:D:90:THR:C	1:D:91:LEU:HD23	2.31	0.49
1:C:95:GLU:HG3	1:C:140:VAL:HG12	1.94	0.49
1:D:131:PHE:O	1:D:135:THR:OG1	2.25	0.49
1:C:90:THR:C	1:C:91:LEU:HD23	2.32	0.49
1:B:63:ARG:HB3	1:B:66:ILE:HG22	1.93	0.49
1:E:49:MSE:HE3	1:E:76:LEU:HD13	1.95	0.49
1:A:147:VAL:HG22	1:E:226:ARG:HG2	1.95	0.48
1:F:91:LEU:C	1:F:93:GLY:HA2	2.34	0.48
1:F:40:LYS:HG3	1:F:41:PRO:HA	1.95	0.48
1:E:36:VAL:HG12	1:E:48:VAL:HG22	1.96	0.48
1:C:91:LEU:C	1:C:93:GLY:H	2.16	0.48
1:C:123:ASP:OD1	1:C:123:ASP:N	2.46	0.48
1:B:105:ASP:OD1	1:C:204:TYR:OH	2.27	0.47
1:B:10:ARG:HD2	1:B:39:GLU:OE1	2.13	0.47
1:B:97:ARG:HG2	1:B:129:ARG:HA	1.96	0.47
1:E:22:ASP:HB3	1:E:24:THR:N	2.28	0.47
1:B:226:ARG:O	1:B:227:ARG:HB2	2.15	0.47
1:D:97:ARG:HG2	1:D:129:ARG:HA	1.96	0.47
1:E:91:LEU:N	2:E:350:HOH:O	2.47	0.47
1:F:96:LEU:HD23	1:F:128:ALA:HB2	1.97	0.46
1:E:115:GLU:HG3	1:F:206:SER:OG	2.15	0.46
1:C:96:LEU:HD23	1:C:128:ALA:HB2	1.97	0.46
1:C:91:LEU:O	1:C:93:GLY:N	2.49	0.46
1:A:180:ARG:O	1:A:180:ARG:HG2	2.16	0.46

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:228:PHE:C	1:E:229:MSE:HE2	2.36	0.46
1:F:50:VAL:HG21	1:F:159:TYR:CD2	2.52	0.45
1:E:76:LEU:O	1:E:80:VAL:HG22	2.16	0.45
1:F:226:ARG:O	1:F:227:ARG:HB2	2.17	0.45
1:D:49:MSE:HE3	1:D:76:LEU:HD13	1.99	0.45
1:E:40:LYS:HG3	1:E:41:PRO:HA	1.97	0.45
1:B:186:ILE:HG12	1:B:191:ILE:HG23	1.97	0.45
1:A:123:ASP:OD1	1:A:123:ASP:N	2.49	0.45
1:F:50:VAL:HG21	1:F:159:TYR:CE2	2.52	0.45
1:A:197:ASP:OD2	1:E:227:ARG:NH1	2.50	0.45
1:F:94:ILE:HD13	1:F:99:LEU:CD2	2.47	0.45
1:B:190:LYS:HE3	1:B:190:LYS:HB2	1.77	0.44
1:C:161:ALA:O	1:C:165:ILE:HD12	2.17	0.44
1:A:115:GLU:HB3	1:D:190:LYS:HE2	2.00	0.44
1:E:29:GLY:HA3	1:E:55:PRO:O	2.17	0.44
1:D:10:ARG:HD2	1:D:39:GLU:OE1	2.17	0.44
1:B:228:PHE:C	1:B:229:MSE:HE2	2.38	0.44
1:B:66:ILE:HG21	1:B:120:LEU:HD21	2.00	0.43
1:C:123:ASP:C	1:C:126:PRO:HD2	2.37	0.43
1:C:119:GLU:HA	1:C:122:LYS:HD3	1.99	0.43
1:E:81:LYS:NZ	2:E:331:HOH:O	2.14	0.43
1:F:94:ILE:CG2	1:F:99:LEU:HD21	2.46	0.43
1:B:123:ASP:N	1:B:123:ASP:OD1	2.51	0.43
1:C:168:VAL:HG21	1:C:233:ILE:HG22	2.01	0.43
1:E:180:ARG:HG3	1:E:181:TYR:CZ	2.54	0.43
1:F:14:ALA:O	2:F:302:HOH:O	2.21	0.43
1:E:24:THR:HG22	1:E:24:THR:O	2.19	0.43
1:A:174:LEU:HA	1:A:174:LEU:HD12	1.88	0.43
1:C:28:ILE:HD11	1:C:56:TYR:CD1	2.54	0.43
1:A:226:ARG:O	1:A:227:ARG:HB2	2.19	0.43
1:C:97:ARG:HD3	1:C:132:TRP:CE3	2.54	0.42
1:E:174:LEU:HD12	1:E:174:LEU:HA	1.90	0.42
1:A:111:ASP:OD2	1:D:194:ARG:HD2	2.19	0.42
1:C:58:TYR:CD1	1:C:59:ASP:N	2.87	0.42
1:D:104:ILE:O	1:D:107:LEU:HB2	2.20	0.42
1:F:16:THR:HG22	1:F:17:GLY:HA3	2.02	0.42
1:C:150:ARG:NH1	1:C:153:GLU:OE1	2.50	0.42
1:A:49:MSE:HE3	1:A:76:LEU:HD13	2.02	0.42
1:D:62:GLY:C	1:D:63:ARG:NE	2.73	0.42
1:E:26:GLU:HA	1:E:27:PRO:HD3	1.90	0.41
1:E:28:ILE:HD11	1:E:56:TYR:CE1	2.55	0.41

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:21:LEU:HD23	1:C:27:PRO:HA	2.01	0.41
1:F:34:VAL:HG11	1:F:155:TYR:HB3	2.01	0.41
1:A:26:GLU:HA	1:A:27:PRO:HD3	1.92	0.41
1:D:123:ASP:C	1:D:126:PRO:HD2	2.41	0.41
1:F:165:ILE:HG21	1:F:211:VAL:HG12	2.03	0.41
1:F:43:ARG:HD3	1:F:201:GLY:O	2.20	0.41
1:A:40:LYS:NZ	1:E:232:GLU:OE1	2.52	0.41
1:A:99:LEU:HA	1:A:99:LEU:HD23	1.96	0.41
1:F:93:GLY:HA3	1:F:141:ALA:O	2.20	0.41
1:D:28:ILE:HD11	1:D:56:TYR:CD1	2.55	0.41
1:D:187:LYS:O	1:D:188:ASP:HB2	2.20	0.40
1:F:28:ILE:HD11	1:F:56:TYR:CE1	2.56	0.40
1:B:179:PRO:O	2:B:310:HOH:O	2.22	0.40
1:A:61:THR:HG23	1:D:188:ASP:HB3	2.03	0.40
1:A:92:GLY:CA	2:A:330:HOH:O	2.64	0.40
1:F:133:GLU:CG	2:F:338:HOH:O	2.68	0.40
1:D:26:GLU:HA	1:D:27:PRO:HD3	1.94	0.40
1:C:147:VAL:HB	1:D:223:PRO:HA	2.03	0.40
1:D:49:MSE:HE3	1:D:76:LEU:CD1	2.52	0.40
1:F:123:ASP:N	1:F:123:ASP:OD1	2.54	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	225/229 (98%)	218 (97%)	7 (3%)	0	100	100
1	B	225/229 (98%)	219 (97%)	6 (3%)	0	100	100
1	C	225/229 (98%)	219 (97%)	6 (3%)	0	100	100
1	D	225/229 (98%)	218 (97%)	7 (3%)	0	100	100

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	E	225/229 (98%)	219 (97%)	6 (3%)	0	100	100
1	F	225/229 (98%)	217 (96%)	8 (4%)	0	100	100
All	All	1350/1374 (98%)	1310 (97%)	40 (3%)	0	100	100

There are no Ramachandran outliers to report.

### 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	183/189 (97%)	166 (91%)	17 (9%)	11	10
1	B	183/189 (97%)	171 (93%)	12 (7%)	21	23
1	C	183/189 (97%)	165 (90%)	18 (10%)	10	9
1	D	183/189 (97%)	169 (92%)	14 (8%)	16	17
1	E	183/189 (97%)	167 (91%)	16 (9%)	13	12
1	F	183/189 (97%)	167 (91%)	16 (9%)	13	12
All	All	1098/1134 (97%)	1005 (92%)	93 (8%)	13	13

All (93) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	16	THR
1	A	30	LEU
1	A	60	LEU
1	A	63	ARG
1	A	71	LEU
1	A	94	ILE
1	A	120	LEU
1	A	136	ASN
1	A	144	LYS
1	A	145	SER
1	A	174	LEU
1	A	178	LEU

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type
1	A	180	ARG
1	A	194	ARG
1	A	210	SER
1	A	224	VAL
1	A	226	ARG
1	B	23	GLU
1	B	30	LEU
1	B	63	ARG
1	B	120	LEU
1	B	136	ASN
1	B	174	LEU
1	B	178	LEU
1	B	191	ILE
1	B	210	SER
1	B	211	VAL
1	B	215	VAL
1	B	224	VAL
1	C	16	THR
1	C	30	LEU
1	C	59	ASP
1	C	60	LEU
1	C	63	ARG
1	C	66	ILE
1	C	71	LEU
1	C	81	LYS
1	C	87	LEU
1	C	91	LEU
1	C	99	LEU
1	C	109	ILE
1	C	135	THR
1	C	136	ASN
1	C	174	LEU
1	C	178	LEU
1	C	210	SER
1	C	224	VAL
1	D	16	THR
1	D	30	LEU
1	D	39	GLU
1	D	63	ARG
1	D	94	ILE
1	D	120	LEU
1	D	123	ASP

*Continued on next page...*



*Continued from previous page...*

Mol	Chain	Res	Type
1	D	135	THR
1	D	136	ASN
1	D	174	LEU
1	D	178	LEU
1	D	180	ARG
1	D	210	SER
1	D	224	VAL
1	E	28	ILE
1	E	30	LEU
1	E	39	GLU
1	E	60	LEU
1	E	63	ARG
1	E	71	LEU
1	E	94	ILE
1	E	120	LEU
1	E	136	ASN
1	E	174	LEU
1	E	178	LEU
1	E	180	ARG
1	E	184	VAL
1	E	210	SER
1	E	224	VAL
1	E	226	ARG
1	F	16	THR
1	F	30	LEU
1	F	39	GLU
1	F	60	LEU
1	F	63	ARG
1	F	66	ILE
1	F	94	ILE
1	F	99	LEU
1	F	135	THR
1	F	136	ASN
1	F	174	LEU
1	F	178	LEU
1	F	184	VAL
1	F	190	LYS
1	F	210	SER
1	F	224	VAL

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such sidechains are listed below:

Mol	Chain	Res	Type
1	D	173	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 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	224/229 (97%)	0.09	6 (2%) 58 69	27, 47, 72, 102	0
1	B	224/229 (97%)	0.03	5 (2%) 65 76	26, 46, 73, 96	0
1	C	224/229 (97%)	0.62	28 (12%) 5 9	25, 48, 118, 148	0
1	D	224/229 (97%)	0.57	14 (6%) 23 34	26, 48, 108, 131	0
1	E	224/229 (97%)	0.05	3 (1%) 79 86	25, 48, 71, 106	0
1	F	224/229 (97%)	0.49	20 (8%) 12 18	25, 49, 107, 131	0
All	All	1344/1374 (97%)	0.31	76 (5%) 27 39	25, 48, 95, 148	0

All (76) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	109	ILE	8.4
1	C	107	LEU	6.7
1	C	61	THR	6.6
1	C	111	ASP	6.6
1	C	108	GLY	6.6
1	D	109	ILE	6.3
1	D	107	LEU	6.2
1	F	61	THR	5.4
1	D	111	ASP	5.4
1	D	61	THR	5.4
1	D	108	GLY	5.3
1	D	60	LEU	5.2
1	C	60	LEU	5.2
1	F	108	GLY	4.8
1	F	107	LEU	4.7
1	F	106	ALA	4.7
1	C	115	GLU	4.5
1	F	101	GLU	4.4
1	F	109	ILE	4.2

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type	RSRZ
1	C	117	TRP	4.1
1	C	105	ASP	3.9
1	F	63	ARG	3.9
1	F	103	THR	3.9
1	F	60	LEU	3.6
1	C	104	ILE	3.5
1	A	63	ARG	3.4
1	C	63	ARG	3.4
1	C	114	LYS	3.4
1	F	105	ASP	3.4
1	E	211	VAL	3.2
1	C	113	GLY	3.2
1	A	172	GLY	3.1
1	B	63	ARG	2.9
1	B	61	THR	2.8
1	B	62	GLY	2.8
1	C	122	LYS	2.8
1	A	108	GLY	2.7
1	D	63	ARG	2.7
1	C	110	SER	2.7
1	A	171	GLU	2.7
1	B	211	VAL	2.7
1	F	100	ASP	2.6
1	D	211	VAL	2.6
1	C	170	LYS	2.6
1	C	23	GLU	2.6
1	C	112	LYS	2.5
1	D	62	GLY	2.5
1	F	59	ASP	2.5
1	D	99	LEU	2.5
1	A	211	VAL	2.5
1	F	111	ASP	2.5
1	C	17	GLY	2.4
1	A	23	GLU	2.4
1	C	101	GLU	2.4
1	F	113	GLY	2.4
1	E	63	ARG	2.4
1	B	188	ASP	2.4
1	D	170	LYS	2.4
1	F	211	VAL	2.4
1	D	103	THR	2.4
1	F	214	GLY	2.3

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type	RSRZ
1	C	103	THR	2.3
1	C	116	VAL	2.3
1	E	172	GLY	2.3
1	F	170	LYS	2.3
1	C	172	GLY	2.3
1	C	211	VAL	2.3
1	F	215	VAL	2.3
1	D	114	LYS	2.2
1	D	17	GLY	2.1
1	C	59	ASP	2.1
1	C	118	LYS	2.1
1	C	214	GLY	2.1
1	F	213	GLU	2.1
1	C	100	ASP	2.1
1	F	102	PRO	2.0

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

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

## 6.3 Carbohydrates [i](#)

There are no carbohydrates in this entry.

## 6.4 Ligands [i](#)

There are no ligands in this entry.

## 6.5 Other polymers [i](#)

There are no such residues in this entry.