



# Full wwPDB X-ray Structure Validation Report

Feb 27, 2014 – 01:51 PM GMT

PDB ID : 1VHK  
Title : Crystal structure of an hypothetical protein  
Authors : Structural GenomiX  
Deposited on : 2003-12-01  
Resolution : 2.60 Å(reported)

This is a full wwPDB 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/ValidationPDFNotes.html>

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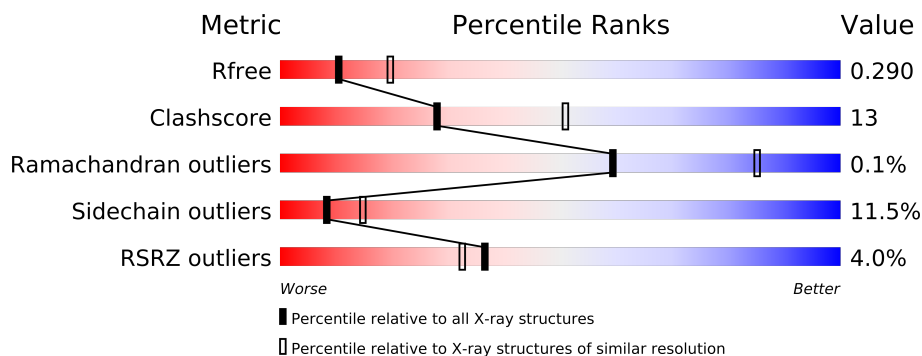
The following versions of software and data (see [references](#)) were used in the production of this report:

MolProbity : 4.02b-467  
Mogul : 1.15 2013  
Xtriage (Phenix) : dev-1323  
EDS : stable22639  
Percentile statistics : 21963  
Refmac : 5.8.0049  
CCP4 : 6.3.0 (Settle)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et. al. (1996)  
Validation Pipeline (wwPDB-VP) : stable22683

# 1 Overall quality at a glance

The reported resolution of this entry is 2.60 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))
$R_{free}$	66092	1718 (2.60-2.60)
Clashscore	79885	2154 (2.60-2.60)
Ramachandran outliers	78287	2113 (2.60-2.60)
Sidechain outliers	78261	2113 (2.60-2.60)
RSRZ outliers	66119	1718 (2.60-2.60)

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. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density.

Mol	Chain	Length	Quality of chain
1	A	268	
1	B	268	
1	C	268	
1	D	268	

## 2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 6788 atoms, of which 0 are hydrogen and 0 are deuterium.

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 Hypothetical protein yqeU.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	235	Total	C	N	O	S	Se	0	0	0
			1847	1168	314	355	6	4			
1	B	196	Total	C	N	O	S	Se	0	0	0
			1534	975	262	289	6	2			
1	C	244	Total	C	N	O	S	Se	0	1	0
			1923	1216	331	366	6	4			
1	D	178	Total	C	N	O	S	Se	0	0	0
			1397	886	241	264	4	2			

There are 68 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-1	MSE	-	cloning artifact	UNP P54461
A	0	SER	-	cloning artifact	UNP P54461
A	1	LEU	-	cloning artifact	UNP P54461
A	33	MSE	MET	modified residue	UNP P54461
A	35	MSE	MET	modified residue	UNP P54461
A	152	MSE	MET	modified residue	UNP P54461
A	164	MSE	MET	modified residue	UNP P54461
A	257	GLU	-	cloning artifact	UNP P54461
A	258	GLY	-	cloning artifact	UNP P54461
A	259	GLY	-	cloning artifact	UNP P54461
A	260	SER	-	cloning artifact	UNP P54461
A	261	HIS	-	cloning artifact	UNP P54461
A	262	HIS	-	cloning artifact	UNP P54461
A	263	HIS	-	cloning artifact	UNP P54461
A	264	HIS	-	cloning artifact	UNP P54461
A	265	HIS	-	cloning artifact	UNP P54461
A	266	HIS	-	cloning artifact	UNP P54461
B	-1	MSE	-	cloning artifact	UNP P54461
B	0	SER	-	cloning artifact	UNP P54461
B	1	LEU	-	cloning artifact	UNP P54461
B	33	MSE	MET	modified residue	UNP P54461

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Chain	Residue	Modelled	Actual	Comment	Reference
B	35	MSE	MET	modified residue	UNP P54461
B	152	MSE	MET	modified residue	UNP P54461
B	164	MSE	MET	modified residue	UNP P54461
B	257	GLU	-	cloning artifact	UNP P54461
B	258	GLY	-	cloning artifact	UNP P54461
B	259	GLY	-	cloning artifact	UNP P54461
B	260	SER	-	cloning artifact	UNP P54461
B	261	HIS	-	cloning artifact	UNP P54461
B	262	HIS	-	cloning artifact	UNP P54461
B	263	HIS	-	cloning artifact	UNP P54461
B	264	HIS	-	cloning artifact	UNP P54461
B	265	HIS	-	cloning artifact	UNP P54461
B	266	HIS	-	cloning artifact	UNP P54461
C	-1	MSE	-	cloning artifact	UNP P54461
C	0	SER	-	cloning artifact	UNP P54461
C	1	LEU	-	cloning artifact	UNP P54461
C	33	MSE	MET	modified residue	UNP P54461
C	35	MSE	MET	modified residue	UNP P54461
C	152	MSE	MET	modified residue	UNP P54461
C	164	MSE	MET	modified residue	UNP P54461
C	257	GLU	-	cloning artifact	UNP P54461
C	258	GLY	-	cloning artifact	UNP P54461
C	259	GLY	-	cloning artifact	UNP P54461
C	260	SER	-	cloning artifact	UNP P54461
C	261	HIS	-	cloning artifact	UNP P54461
C	262	HIS	-	cloning artifact	UNP P54461
C	263	HIS	-	cloning artifact	UNP P54461
C	264	HIS	-	cloning artifact	UNP P54461
C	265	HIS	-	cloning artifact	UNP P54461
C	266	HIS	-	cloning artifact	UNP P54461
D	-1	MSE	-	cloning artifact	UNP P54461
D	0	SER	-	cloning artifact	UNP P54461
D	1	LEU	-	cloning artifact	UNP P54461
D	33	MSE	MET	modified residue	UNP P54461
D	35	MSE	MET	modified residue	UNP P54461
D	152	MSE	MET	modified residue	UNP P54461
D	164	MSE	MET	modified residue	UNP P54461
D	257	GLU	-	cloning artifact	UNP P54461
D	258	GLY	-	cloning artifact	UNP P54461
D	259	GLY	-	cloning artifact	UNP P54461
D	260	SER	-	cloning artifact	UNP P54461
D	261	HIS	-	cloning artifact	UNP P54461

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Chain	Residue	Modelled	Actual	Comment	Reference
D	262	HIS	-	cloning artifact	UNP P54461
D	263	HIS	-	cloning artifact	UNP P54461
D	264	HIS	-	cloning artifact	UNP P54461
D	265	HIS	-	cloning artifact	UNP P54461
D	266	HIS	-	cloning artifact	UNP P54461

- Molecule 2 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	21	Total O 21 21	0	0
2	B	24	Total O 24 24	0	0
2	C	32	Total O 32 32	0	0
2	D	10	Total O 10 10	0	0



HIS  
HIS  
HIS  
HIS  
HIS  
HIS

● Molecule 1: Hypothetical protein yqeU

Chain D:

MSE  
SER  
LEU  
Q2  
R3  
I6  
GLU  
LEU  
THR  
LYS  
GLN  
GLN  
ILE  
GLU  
ALA  
PRO  
THR  
PHE  
SER  
ILE  
THR  
GLY  
GLU  
GLU  
VAL  
HIS  
HIS  
ILE  
VAL  
ASN  
VAL  
MSE  
ARG  
MSE  
ASN  
GLU  
GLY  
ASP  
GLN  
ILE  
ILE  
C43  
C44  
S45  
Q46  
D47  
G48  
F49  
E50  
A51  
LYS  
CYS  
GLU  
LEU  
GLN  
VAL  
SER

LYS  
ASP  
VAL  
SER  
CYS  
LEU  
VAL  
ILE  
GLU  
TRP  
THR  
ASN  
E73  
R74  
R75  
L77  
I78  
P78  
I79  
L87  
K92  
L93  
E94  
W95  
K99  
G104  
A105  
I109  
V117  
VAL  
LYS  
LEU  
ASP  
ASP  
LYS  
LYS  
ALA  
LYS  
LYS  
K128  
R129  
W132  
E141  
E147  
V148  
P149  
R150  
V151  
M152  
D153

V164  
L161  
Q165  
E176  
SER  
SER  
LYS  
GLN  
GLY  
GLU  
ILE  
S184  
S187  
A188  
I189  
V190  
S191  
S192  
L193  
P194  
K195  
E206  
R216  
Q220  
L227  
Q228  
P229  
R233  
T234  
E235  
T236  
A237  
P238  
S246  
Y247  
Q248  
T249  
R253  
GLY  
ASP  
GLN  
GLU  
GLY  
GLY  
SER  
HIS  
HIS  
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HIS

HIS  
HIS

## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	62.71 Å 145.05 Å 66.01 Å 90.00° 109.40° 90.00°	Depositor
Resolution (Å)	38.19 – 2.60 38.19 – 2.60	Depositor EDS
% Data completeness (in resolution range)	(Not available) (38.19-2.60) 99.6 (38.19-2.60)	Depositor EDS
$R_{merge}$	0.11	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	3.62 (at 2.61 Å)	Xtriage
Refinement program	REFMAC 4	Depositor
R, $R_{free}$	0.270 , 0.327 0.240 , 0.290	Depositor DCC
$R_{free}$ test set	1684 reflections (5.20%)	DCC
Wilson B-factor (Å <sup>2</sup> )	43.6	Xtriage
Anisotropy	0.133	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.36 , 39.8	EDS
Estimated twinning fraction	No twinning to report.	Xtriage
L-test for twinning	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.32$	Xtriage
Outliers	0 of 34054 reflections	Xtriage
$F_o, F_c$ correlation	0.90	EDS
Total number of atoms	6788	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	43.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.28% of the height of the origin peak. No significant pseudotranslation is detected.*

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



## 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	0.59	0/1874	1.03	3/2524 (0.1%)
1	B	0.67	0/1557	1.08	5/2099 (0.2%)
1	C	0.63	0/1956	1.07	6/2631 (0.2%)
1	D	0.59	0/1418	0.98	1/1907 (0.1%)
All	All	0.62	0/6805	1.04	15/9161 (0.2%)

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
All	All	0	2

There are no bond length outliers.

All (15) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	75	ARG	NE-CZ-NH1	-7.38	116.61	120.30
1	B	75	ARG	NE-CZ-NH1	6.96	123.78	120.30
1	C	230	ARG	NE-CZ-NH2	6.92	123.76	120.30
1	A	242	LEU	CA-CB-CG	6.27	129.71	115.30
1	C	47	ASP	CB-CG-OD2	6.09	123.78	118.30
1	C	252	LEU	CA-CB-CG	5.92	128.93	115.30
1	C	129	ARG	CD-NE-CZ	5.88	131.84	123.60
1	B	47	ASP	CB-CG-OD1	5.72	123.44	118.30
1	B	216	ARG	NE-CZ-NH2	-5.71	117.45	120.30
1	B	75	ARG	NE-CZ-NH2	-5.46	117.57	120.30
1	A	234	THR	CA-CB-CG2	-5.41	104.83	112.40
1	B	3	ARG	NE-CZ-NH1	-5.37	117.62	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	46	GLN	CA-CB-CG	5.24	124.93	113.40
1	C	233	ARG	NE-CZ-NH2	5.19	122.89	120.30
1	D	233	ARG	NE-CZ-NH1	-5.12	117.74	120.30

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	81	VAL	Mainchain
1	C	201	ILE	Mainchain

## 5.2 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 hydrogens added by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, and the number in parentheses is this value normalized per 1000 atoms of the molecule in the chain. The Symm-Clashes column gives symmetry related clashes, in the same way as for the Clashes column.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1847	0	1837	55	0
1	B	1534	0	1521	41	0
1	C	1923	0	1932	53	0
1	D	1397	0	1383	28	0
2	A	21	0	0	2	0
2	B	24	0	0	1	0
2	C	32	0	0	1	0
2	D	10	0	0	1	0
All	All	6788	0	6673	170	0

Clashscore is defined as the number of clashes calculated for the entry per 1000 atoms (including hydrogens) of the entry. The overall clashscore for this entry is 13.

All (170) close contacts within the same asymmetric unit are listed below.

Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:C:75:ARG:HG2	1:D:229:PRO:HB2	1.39	1.01
1:A:57:SER:HB3	1:A:64:SER:HB2	1.46	0.94
1:C:9:THR:HG22	1:C:12:GLN:H	1.40	0.84
1:B:210:THR:HG22	1:B:213:GLU:H	1.42	0.83
1:B:6:ILE:HD11	1:B:43:CYS:HB3	1.61	0.83

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Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:C:171:VAL:HG12	1:C:199:LEU:HD11	1.65	0.76
1:C:170:CYS:SG	1:C:200:LEU:HD23	2.25	0.76
1:A:210:THR:HG22	1:A:213:GLU:H	1.49	0.76
1:A:35:MSE:HE2	1:A:39:ASP:HB3	1.66	0.76
1:B:129:ARG:NH2	1:B:129:ARG:HB2	2.06	0.71
1:A:78:PRO:HG2	1:A:249:THR:HB	1.73	0.71
1:A:184:SER:HA	2:A:272:HOH:O	1.91	0.70
1:C:58:VAL:HA	1:C:63:VAL:HG22	1.74	0.69
1:A:171:VAL:HG13	1:A:199:LEU:HD11	1.74	0.68
1:B:3:ARG:HH11	1:B:144:TYR:HD1	1.43	0.66
1:C:212:ALA:O	1:C:216:ARG:HG2	1.95	0.66
1:C:4:TYR:HD2	1:C:25:GLU:HG3	1.59	0.66
1:A:152:MSE:HE1	1:A:163:ARG:NH2	2.11	0.66
1:A:171:VAL:HG22	1:A:201:ILE:HG23	1.79	0.64
1:D:195:LYS:HD2	1:D:253:ARG:NH2	2.12	0.64
1:C:4:TYR:CD2	1:C:25:GLU:HG3	2.33	0.64
1:C:16:ALA:HB1	1:C:17:PRO:HD2	1.80	0.64
1:D:78:PRO:HG2	1:D:249:THR:HB	1.80	0.63
1:B:94:GLU:HG3	2:B:272:HOH:O	1.98	0.63
1:C:115:ARG:HD3	1:C:207:GLY:O	1.97	0.63
1:B:150:ARG:NH2	1:B:152:MSE:HE2	2.14	0.62
1:A:237:ALA:HB3	1:A:238:PRO:HD3	1.80	0.61
1:C:220:GLN:HA	1:C:220:GLN:HE21	1.65	0.61
1:A:16:ALA:HB1	1:A:17:PRO:CD	2.31	0.60
1:A:30:VAL:O	1:A:34:ARG:HA	2.00	0.60
1:D:187:SER:O	1:D:191:SER:HB2	2.02	0.59
1:C:93:LEU:HD12	1:C:132:TRP:CZ2	2.37	0.59
1:C:185:ALA:O	1:C:189:ILE:HG23	2.01	0.59
1:A:185:ALA:HB3	1:A:225:CYS:SG	2.42	0.59
1:B:129:ARG:HH21	1:B:129:ARG:HB2	1.66	0.59
1:C:9:THR:CG2	1:C:12:GLN:H	2.13	0.59
1:B:9:THR:OG1	1:B:10:LYS:N	2.36	0.58
1:B:117:VAL:HG12	1:B:117:VAL:O	2.03	0.58
1:D:3:ARG:HD3	1:D:141:GLU:HA	1.84	0.58
1:D:190:VAL:HA	1:D:193:LEU:HD12	1.86	0.58
1:B:87:LEU:HD23	1:B:112:GLN:HE21	1.68	0.58
1:B:97:ILE:HD12	1:B:108:PHE:CG	2.38	0.57
1:D:79:ILE:HD13	1:D:193:LEU:HD13	1.86	0.57
1:A:26:VAL:HG21	1:A:61:ASP:HA	1.87	0.57
1:D:93:LEU:HD23	1:D:132:TRP:CZ2	2.40	0.57
1:B:187:SER:O	1:B:191:SER:HB2	2.05	0.57
1:B:3:ARG:NH1	1:B:50:GLU:OE1	2.37	0.56

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Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:B:94:GLU:HG2	1:B:135:ILE:CD1	2.36	0.56
1:B:129:ARG:HG3	1:B:130:GLU:N	2.21	0.55
1:C:150:ARG:NH2	1:C:152:MSE:HE3	2.22	0.55
1:D:77:LEU:HD21	1:D:246:SER:HB2	1.89	0.55
1:B:161:LEU:HD22	1:B:220:GLN:HG3	1.89	0.55
1:A:35:MSE:CE	1:A:39:ASP:HB3	2.37	0.55
1:B:8:LEU:H	1:B:8:LEU:HD22	1.71	0.55
1:C:211:GLU:O	1:C:215:GLU:HG3	2.08	0.54
1:A:204:GLY:O	1:A:234:THR:HG22	2.08	0.54
1:B:87:LEU:HG	1:B:118:VAL:HG11	1.88	0.54
1:A:185:ALA:O	1:A:189:ILE:HG23	2.09	0.53
1:B:220:GLN:O	1:B:221:ASP:HB2	2.08	0.53
1:C:125:ALA:HB1	1:C:154:VAL:CG2	2.38	0.53
1:A:59:SER:OG	1:A:60:LYS:N	2.41	0.53
1:A:240:TYR:HA	1:B:243:SER:OG	2.09	0.53
1:A:220:GLN:O	1:A:221:ASP:HB2	2.09	0.53
1:C:210:THR:O	1:C:214:VAL:HG23	2.09	0.52
1:A:210:THR:CG2	1:A:213:GLU:H	2.20	0.52
1:D:109:ILE:HG12	1:D:152:MSE:SE	2.59	0.52
1:A:3:ARG:HD3	1:A:141:GLU:HA	1.91	0.51
1:C:220:GLN:O	1:C:221:ASP:HB2	2.10	0.51
1:D:161:LEU:HD11	1:D:216:ARG:HD2	1.90	0.51
1:C:220:GLN:HA	1:C:220:GLN:NE2	2.24	0.51
1:B:93:LEU:HD23	1:B:132:TRP:CZ2	2.45	0.51
1:A:205:PRO:HA	1:A:234:THR:HG21	1.93	0.51
1:C:152:MSE:HE1	1:C:163:ARG:NH2	2.26	0.51
1:D:161:LEU:O	1:D:165:GLN:NE2	2.44	0.50
1:A:89:LYS:HZ1	1:A:117:VAL:HG11	1.75	0.50
1:D:195:LYS:HD3	1:D:195:LYS:N	2.27	0.50
1:C:156:SER:OG	1:C:159:GLN:HG3	2.12	0.50
1:C:169:LYS:HD2	1:C:193:LEU:HD21	1.95	0.49
1:D:237:ALA:HB3	1:D:238:PRO:HD3	1.94	0.49
1:B:210:THR:CG2	1:B:213:GLU:H	2.18	0.49
1:B:152:MSE:SE	1:B:163:ARG:NH2	2.96	0.49
1:A:216:ARG:NH2	1:A:219:GLU:OE2	2.45	0.49
1:B:109:ILE:HG12	1:B:152:MSE:SE	2.63	0.49
1:C:120:LEU:O	1:C:120:LEU:HD23	2.12	0.49
1:C:248:GLN:HB2	1:D:247:TYR:CE2	2.47	0.49
1:C:50:GLU:OE1	1:C:75:ARG:NH1	2.46	0.48
1:A:89:LYS:HZ2	1:A:117:VAL:HG21	1.78	0.48
1:D:104:GLY:O	1:D:105:ALA:C	2.51	0.48
1:C:218:THR:HA	1:C:222:GLY:O	2.12	0.48

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Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:C:168:ASP:OD1	1:C:197:SER:HB2	2.13	0.48
1:C:237:ALA:HB3	1:C:238:PRO:HD3	1.96	0.48
1:B:112:GLN:NE2	1:B:118:VAL:HG12	2.28	0.48
1:B:3:ARG:HD2	1:B:144:TYR:CD1	2.48	0.48
1:A:248:GLN:NE2	1:B:247:TYR:OH	2.46	0.48
1:A:8:LEU:O	1:A:46:GLN:HG3	2.13	0.48
1:C:150:ARG:CZ	1:C:152:MSE:HE3	2.44	0.48
1:A:52:LYS:HB2	1:A:52:LYS:HE2	1.63	0.48
1:B:164:MSE:SE	1:B:217:LEU:HD23	2.64	0.48
1:A:101:THR:HG23	1:A:149:PRO:CG	2.44	0.47
1:C:125:ALA:HB1	1:C:154:VAL:HG21	1.95	0.47
1:B:247:TYR:HD1	1:B:251:LEU:HD12	1.80	0.47
1:A:89:LYS:HZ2	1:A:117:VAL:CG2	2.28	0.47
1:C:238:PRO:O	1:C:242:LEU:HD22	2.15	0.47
1:B:51:ALA:HB2	1:B:70:TRP:CE3	2.50	0.47
1:A:248:GLN:O	1:A:253:ARG:HG3	2.15	0.47
1:B:246:SER:O	1:B:250:GLU:HB2	2.15	0.47
1:C:158:GLN:O	1:C:162:GLN:HG3	2.15	0.47
1:C:235:GLU:HG2	1:D:99:LYS:HE3	1.97	0.46
1:A:152:MSE:HE1	1:A:163:ARG:CZ	2.45	0.46
1:D:6:ILE:O	1:D:46:GLN:HG3	2.15	0.46
1:C:80:LYS:HZ2	1:C:106:HIS:CE1	2.33	0.46
1:D:147:GLU:HG2	1:D:148:VAL:N	2.30	0.46
1:B:174:TYR:CE1	1:B:176:GLU:HG2	2.50	0.46
1:D:92:LYS:HE3	1:D:206:GLU:OE1	2.17	0.45
1:C:193:LEU:HA	1:C:194:PRO:HD3	1.77	0.45
1:C:23:GLY:O	1:C:26:VAL:HG13	2.17	0.45
1:C:186:PHE:O	1:C:190:VAL:HG23	2.17	0.45
1:B:220:GLN:HA	1:B:220:GLN:HE21	1.81	0.45
1:A:89:LYS:NZ	1:A:117:VAL:HG21	2.31	0.45
1:C:143:SER:O	1:C:144:TYR:HB2	2.17	0.45
1:A:171:VAL:CG2	1:A:201:ILE:HG23	2.47	0.44
1:C:146:ASN:O	1:C:147:GLU:HG3	2.18	0.44
1:A:129:ARG:HA	1:A:132:TRP:CE3	2.52	0.44
1:B:111:PHE:CD2	1:B:160:LEU:HD22	2.53	0.44
1:B:3:ARG:HA	1:B:42:ILE:O	2.18	0.44
1:B:129:ARG:HH12	1:B:151:VAL:HB	1.83	0.43
1:A:10:LYS:HG3	1:A:70:TRP:CH2	2.53	0.43
1:C:6:ILE:HD12	1:C:21:ILE:HG12	2.01	0.43
1:B:174:TYR:CE1	1:B:214:VAL:HG21	2.54	0.43
1:A:89:LYS:HG2	1:A:206:GLU:OE2	2.18	0.43
1:D:147:GLU:HG2	1:D:148:VAL:H	1.84	0.43

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Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:C:71:THR:O	1:C:72:ASN:HB2	2.18	0.43
1:C:127:LYS:HG3	1:C:128:LYS:N	2.32	0.43
1:D:129:ARG:HG2	1:D:129:ARG:HH21	1.84	0.43
1:A:78:PRO:HG2	1:A:249:THR:CB	2.46	0.42
1:A:189:ILE:HD11	1:A:199:LEU:HD13	2.01	0.42
1:A:30:VAL:HG21	1:A:59:SER:O	2.18	0.42
1:A:210:THR:N	1:A:213:GLU:OE2	2.47	0.42
1:C:155:HIS:NE2	1:C:163:ARG:HD2	2.34	0.42
1:C:247:TYR:HD2	1:D:247:TYR:HD2	1.68	0.42
1:D:220:GLN:HG3	2:D:270:HOH:O	2.20	0.42
1:A:216:ARG:HD2	2:A:283:HOH:O	2.19	0.42
1:A:19:PHE:CZ	1:A:65:CYS:HB2	2.55	0.42
1:A:3:ARG:NH1	1:A:3:ARG:HG3	2.34	0.42
1:C:51:ALA:HB2	1:C:70:TRP:CE3	2.55	0.42
1:A:25:GLU:OE1	1:A:137:LYS:NZ	2.50	0.42
1:A:86:GLY:O	1:A:87:LEU:C	2.59	0.42
1:A:16:ALA:HB1	1:A:17:PRO:HD2	2.00	0.41
1:B:7:GLU:O	1:B:46:GLN:NE2	2.53	0.41
1:D:129:ARG:NH2	1:D:153:ASP:OD1	2.53	0.41
1:C:129:ARG:HB3	1:C:129:ARG:HE	1.59	0.41
1:A:56:GLN:HE21	1:A:56:GLN:HB2	1.62	0.41
1:A:193:LEU:HA	1:A:194:PRO:HD3	1.79	0.41
1:C:99:LYS:HB2	1:C:239:LEU:HD11	2.03	0.41
1:C:56:GLN:HB2	1:C:56:GLN:HE21	1.62	0.41
1:C:231:ILE:HA	1:C:231:ILE:HD13	1.84	0.41
1:A:84:ALA:HA	1:A:109:ILE:O	2.21	0.41
1:C:2:GLN:NE2	2:C:278:HOH:O	2.53	0.41
1:C:204:GLY:HA3	1:C:209:LEU:HG	2.03	0.41
1:D:50:GLU:OE1	1:D:75:ARG:NH1	2.53	0.41
1:A:75:ARG:HD3	1:B:229:PRO:O	2.20	0.41
1:A:3:ARG:NH2	1:A:50:GLU:OE1	2.48	0.41
1:C:78:PRO:HD2	1:C:249:THR:CG2	2.51	0.41
1:A:212:ALA:O	1:A:216:ARG:HG2	2.21	0.40
1:B:101:THR:HG23	1:B:149:PRO:HG3	2.03	0.40
1:A:215:GLU:O	1:A:219:GLU:HG2	2.21	0.40
1:D:216:ARG:HE	1:D:216:ARG:HB2	1.74	0.40
1:A:210:THR:HG23	1:A:212:ALA:H	1.86	0.40
1:B:77:LEU:HD23	1:B:250:GLU:OE1	2.21	0.40
1:D:95:TRP:HE3	1:D:235:GLU:HG3	1.86	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	229/268 (85%)	217 (95%)	12 (5%)	0	100	100
1	B	186/268 (69%)	178 (96%)	8 (4%)	0	100	100
1	C	241/268 (90%)	228 (95%)	12 (5%)	1 (0%)	43	72
1	D	168/268 (63%)	160 (95%)	8 (5%)	0	100	100
All	All	824/1072 (77%)	783 (95%)	40 (5%)	1 (0%)	59	85

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	61	ASP

### 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	202/227 (89%)	177 (88%)	25 (12%)	7	13
1	B	164/227 (72%)	149 (91%)	15 (9%)	14	25
1	C	210/227 (92%)	177 (84%)	33 (16%)	4	6
1	D	148/227 (65%)	138 (93%)	10 (7%)	22	43
All	All	724/908 (80%)	641 (88%)	83 (12%)	8	15

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

Mol	Chain	Res	Type
1	A	8	LEU
1	A	26	VAL

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Mol	Chain	Res	Type
1	A	55	LEU
1	A	59	SER
1	A	62	LYS
1	A	67	VAL
1	A	81	VAL
1	A	87	LEU
1	A	89	LYS
1	A	93	LEU
1	A	95	TRP
1	A	99	LYS
1	A	158	GLN
1	A	161	LEU
1	A	163	ARG
1	A	164	MSE
1	A	165	GLN
1	A	171	VAL
1	A	189	ILE
1	A	210	THR
1	A	216	ARG
1	A	218	THR
1	A	232	LEU
1	A	239	LEU
1	A	242	LEU
1	B	6	ILE
1	B	9	THR
1	B	66	LEU
1	B	68	ILE
1	B	87	LEU
1	B	99	LYS
1	B	118	VAL
1	B	129	ARG
1	B	131	ARG
1	B	150	ARG
1	B	176	GLU
1	B	191	SER
1	B	198	SER
1	B	210	THR
1	B	227	LEU
1	C	8	LEU
1	C	9	THR
1	C	15	GLU
1	C	26	VAL

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Mol	Chain	Res	Type
1	C	36	ASN
1	C	47	ASP
1	C	52	LYS
1	C	56	GLN
1	C	59	SER
1	C	67	VAL
1	C	81	VAL
1	C	87	LEU
1	C	93	LEU
1	C	95	TRP
1	C	118	VAL
1	C	119	LYS
1	C	120	LEU
1	C	123	LYS
1	C	127	LYS
1	C	129	ARG
1	C	158	GLN
1	C	161	LEU
1	C	164	MSE
1	C	171	VAL
1	C	187	SER
1	C	189	ILE
1	C	192	SER
1	C	216	ARG
1	C	230	ARG
1	C	234	THR
1	C	239	LEU
1	C	242	LEU
1	C	249	THR
1	D	44	CYS
1	D	87	LEU
1	D	150	ARG
1	D	154	VAL
1	D	165	GLN
1	D	189	ILE
1	D	191	SER
1	D	195	LYS
1	D	227	LEU
1	D	246	SER

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (11) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	2	GLN
1	A	56	GLN
1	A	248	GLN
1	B	46	GLN
1	B	112	GLN
1	B	162	GLN
1	B	220	GLN
1	C	56	GLN
1	C	106	HIS
1	C	220	GLN
1	D	165	GLN

### 5.3.3 RNA ⓘ

There are no RNA chains in this entry.

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

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

## 5.5 Carbohydrates ⓘ

There are no carbohydrates in this entry.

## 5.6 Ligand geometry ⓘ

There are no ligands in this entry.

## 5.7 Other polymers ⓘ

There are no such residues in this entry.

## 5.8 Polymer linkage issues

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	235/268 (87%)	0.09	11 (4%) 30 27	17, 40, 76, 92	0
1	B	196/268 (73%)	0.12	14 (7%) 16 12	17, 34, 71, 92	0
1	C	244/268 (91%)	-0.00	1 (0%) 90 91	21, 41, 61, 70	0
1	D	178/268 (66%)	0.18	8 (4%) 32 28	22, 45, 80, 91	0
All	All	853/1072 (79%)	0.09	34 (3%) 36 32	17, 40, 73, 92	0

All (34) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	66	LEU	4.7
1	B	65	CYS	4.7
1	B	41	ILE	4.3
1	B	40	GLN	3.8
1	B	43	CYS	3.5
1	B	53	CYS	3.5
1	A	23	GLY	3.4
1	B	118	VAL	3.4
1	A	61	ASP	3.4
1	D	51	ALA	3.3
1	D	47	ASP	3.2
1	B	67	VAL	3.0
1	B	4	TYR	2.9
1	A	129	ARG	2.8
1	D	45	SER	2.8
1	A	34	ARG	2.7
1	A	62	LYS	2.6
1	C	95	TRP	2.5
1	D	6	ILE	2.5
1	D	176	GLU	2.5
1	A	27	HIS	2.5

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Mol	Chain	Res	Type	RSRZ
1	A	26	VAL	2.5
1	D	49	PHE	2.5
1	A	22	THR	2.4
1	B	176	GLU	2.4
1	A	60	LYS	2.3
1	A	24	GLU	2.3
1	D	74	ASN	2.3
1	A	95	TRP	2.3
1	B	2	GLN	2.2
1	B	52	LYS	2.2
1	B	129	ARG	2.1
1	B	68	ILE	2.1
1	D	46	GLN	2.1

## 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.