



# Full wwPDB X-ray Structure Validation Report ⓘ

Sep 26, 2023 – 02:16 AM EDT

PDB ID : 6BI7  
Title : Crystal structure of Rev7-WT/Rev3 as a monomer under high-salt conditions  
Authors : Rizzo, A.A.; Korzhnev, D.M.; Hao, B.; Li, Y.  
Deposited on : 2017-11-01  
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  
Xtriage (Phenix) : 1.13  
EDS : 2.35.1  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Refmac : 5.8.0158  
CCP4 : 7.0.044 (Gargrove)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.35.1

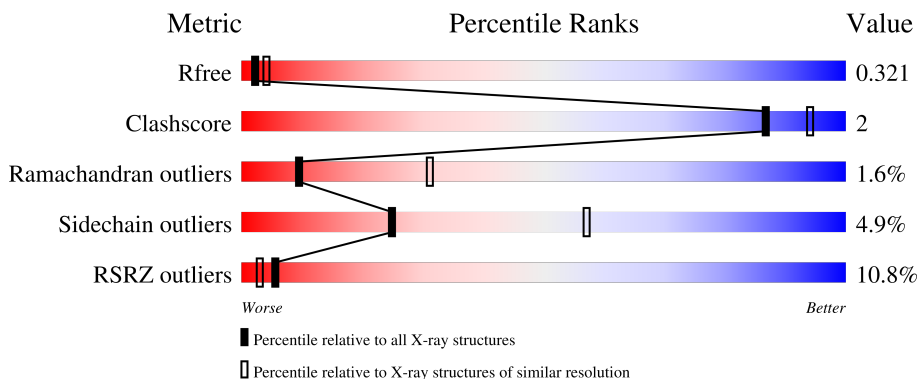
# 1 Overall quality at a glance

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.



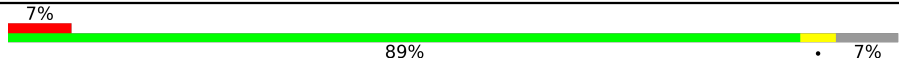
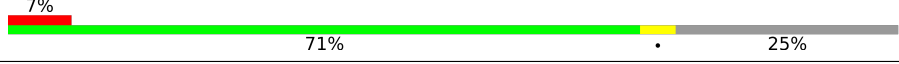
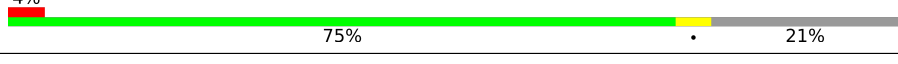
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	130704	3140 (2.80-2.80)
Clashscore	141614	3569 (2.80-2.80)
Ramachandran outliers	138981	3498 (2.80-2.80)
Sidechain outliers	138945	3500 (2.80-2.80)
RSRZ outliers	127900	3078 (2.80-2.80)

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	227	
1	C	227	
1	E	227	
1	G	227	
2	B	28	

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Mol	Chain	Length	Quality of chain
2	D	28	 <p>7% 89% 7%</p>
2	F	28	 <p>7% 71% 25%</p>
2	H	28	 <p>4% 75% 21%</p>

## 2 Entry composition i

There are 3 unique types of molecules in this entry. The entry contains 6445 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 Mitotic spindle assembly checkpoint protein MAD2B.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	186	1522	989	254	269	10	0	0	0
1	C	182	1498	971	252	265	10	0	0	0
1	E	174	1420	926	231	254	9	0	0	0
1	G	154	1257	823	204	222	8	0	0	0

There are 64 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-15	MET	-	initiating methionine	UNP Q9UI95
A	-14	GLY	-	expression tag	UNP Q9UI95
A	-13	SER	-	expression tag	UNP Q9UI95
A	-12	SER	-	expression tag	UNP Q9UI95
A	-11	HIS	-	expression tag	UNP Q9UI95
A	-10	HIS	-	expression tag	UNP Q9UI95
A	-9	HIS	-	expression tag	UNP Q9UI95
A	-8	HIS	-	expression tag	UNP Q9UI95
A	-7	HIS	-	expression tag	UNP Q9UI95
A	-6	HIS	-	expression tag	UNP Q9UI95
A	-5	SER	-	expression tag	UNP Q9UI95
A	-4	GLN	-	expression tag	UNP Q9UI95
A	-3	ASP	-	expression tag	UNP Q9UI95
A	-2	PRO	-	expression tag	UNP Q9UI95
A	-1	ASN	-	expression tag	UNP Q9UI95
A	0	SER	-	expression tag	UNP Q9UI95
C	-15	MET	-	initiating methionine	UNP Q9UI95
C	-14	GLY	-	expression tag	UNP Q9UI95
C	-13	SER	-	expression tag	UNP Q9UI95
C	-12	SER	-	expression tag	UNP Q9UI95
C	-11	HIS	-	expression tag	UNP Q9UI95

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Chain	Residue	Modelled	Actual	Comment	Reference
C	-10	HIS	-	expression tag	UNP Q9UI95
C	-9	HIS	-	expression tag	UNP Q9UI95
C	-8	HIS	-	expression tag	UNP Q9UI95
C	-7	HIS	-	expression tag	UNP Q9UI95
C	-6	HIS	-	expression tag	UNP Q9UI95
C	-5	SER	-	expression tag	UNP Q9UI95
C	-4	GLN	-	expression tag	UNP Q9UI95
C	-3	ASP	-	expression tag	UNP Q9UI95
C	-2	PRO	-	expression tag	UNP Q9UI95
C	-1	ASN	-	expression tag	UNP Q9UI95
C	0	SER	-	expression tag	UNP Q9UI95
E	-15	MET	-	initiating methionine	UNP Q9UI95
E	-14	GLY	-	expression tag	UNP Q9UI95
E	-13	SER	-	expression tag	UNP Q9UI95
E	-12	SER	-	expression tag	UNP Q9UI95
E	-11	HIS	-	expression tag	UNP Q9UI95
E	-10	HIS	-	expression tag	UNP Q9UI95
E	-9	HIS	-	expression tag	UNP Q9UI95
E	-8	HIS	-	expression tag	UNP Q9UI95
E	-7	HIS	-	expression tag	UNP Q9UI95
E	-6	HIS	-	expression tag	UNP Q9UI95
E	-5	SER	-	expression tag	UNP Q9UI95
E	-4	GLN	-	expression tag	UNP Q9UI95
E	-3	ASP	-	expression tag	UNP Q9UI95
E	-2	PRO	-	expression tag	UNP Q9UI95
E	-1	ASN	-	expression tag	UNP Q9UI95
E	0	SER	-	expression tag	UNP Q9UI95
G	-15	MET	-	initiating methionine	UNP Q9UI95
G	-14	GLY	-	expression tag	UNP Q9UI95
G	-13	SER	-	expression tag	UNP Q9UI95
G	-12	SER	-	expression tag	UNP Q9UI95
G	-11	HIS	-	expression tag	UNP Q9UI95
G	-10	HIS	-	expression tag	UNP Q9UI95
G	-9	HIS	-	expression tag	UNP Q9UI95
G	-8	HIS	-	expression tag	UNP Q9UI95
G	-7	HIS	-	expression tag	UNP Q9UI95
G	-6	HIS	-	expression tag	UNP Q9UI95
G	-5	SER	-	expression tag	UNP Q9UI95
G	-4	GLN	-	expression tag	UNP Q9UI95
G	-3	ASP	-	expression tag	UNP Q9UI95
G	-2	PRO	-	expression tag	UNP Q9UI95
G	-1	ASN	-	expression tag	UNP Q9UI95

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Chain	Residue	Modelled	Actual	Comment	Reference
G	0	SER	-	expression tag	UNP Q9UI95

- Molecule 2 is a protein called DNA polymerase zeta catalytic subunit.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	23	Total	C	N	O	S	0	1	0
			188	123	34	28	3			
2	D	26	Total	C	N	O	S	0	0	0
			208	134	37	34	3			
2	F	21	Total	C	N	O	S	0	0	0
			165	107	30	25	3			
2	H	22	Total	C	N	O	S	0	0	0
			174	112	31	28	3			

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	1987	MET	-	initiating methionine	UNP O60673
D	1987	MET	-	initiating methionine	UNP O60673
F	1987	MET	-	initiating methionine	UNP O60673
H	1987	MET	-	initiating methionine	UNP O60673

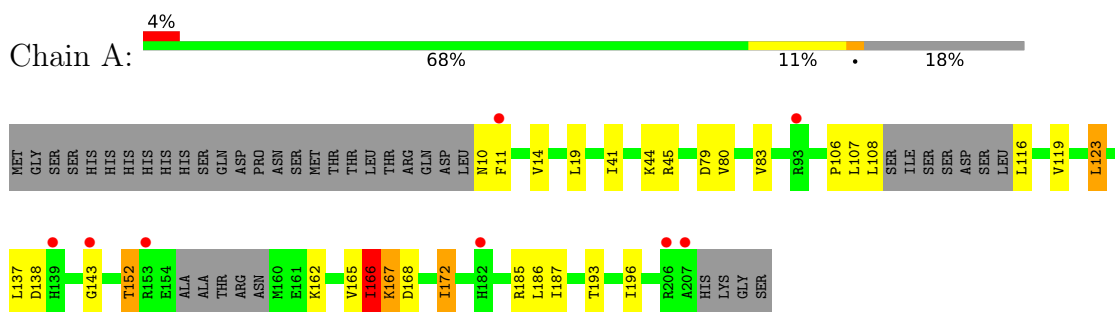
- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	5	Total	O	0	0
			5	5		
3	C	2	Total	O	0	0
			2	2		
3	E	3	Total	O	0	0
			3	3		
3	G	3	Total	O	0	0
			3	3		

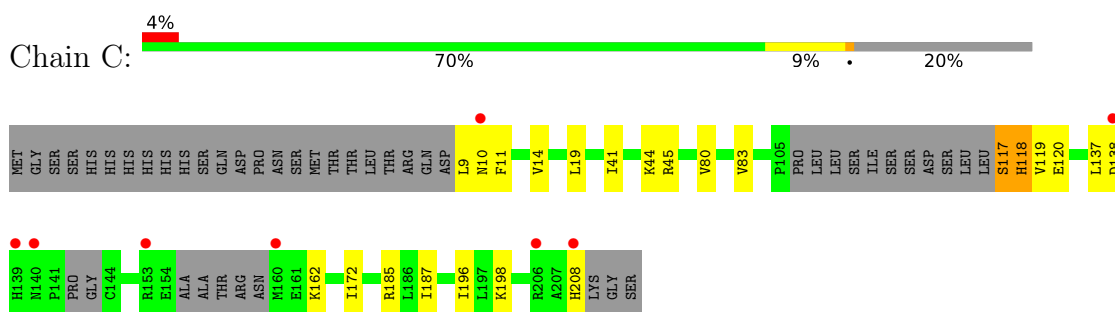
### 3 Residue-property plots [i](#)

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.

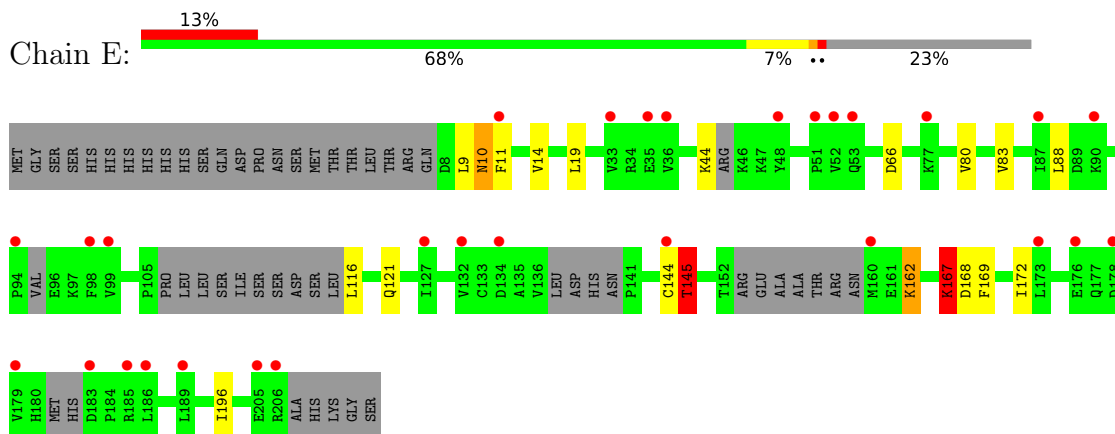
- Molecule 1: Mitotic spindle assembly checkpoint protein MAD2B



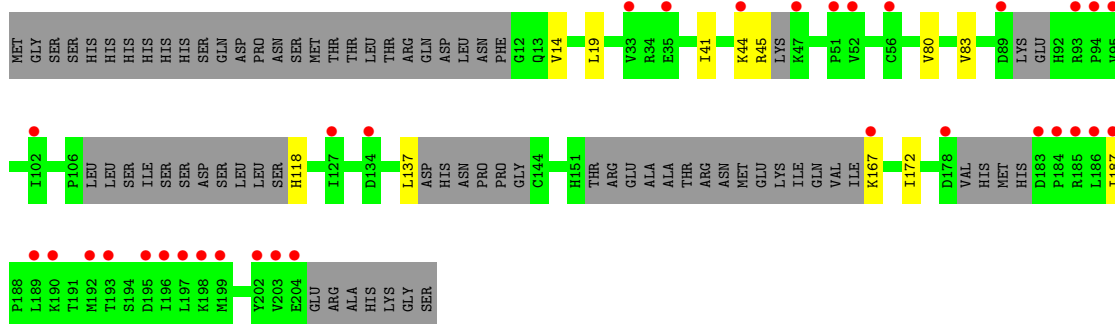
- Molecule 1: Mitotic spindle assembly checkpoint protein MAD2B



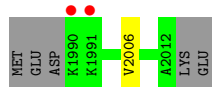
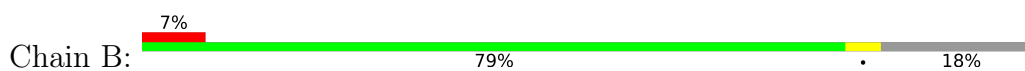
- Molecule 1: Mitotic spindle assembly checkpoint protein MAD2B



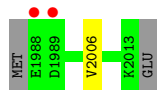
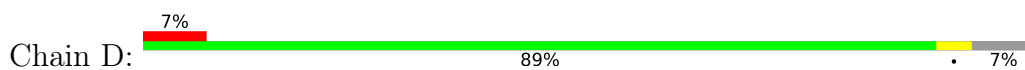
- Molecule 1: Mitotic spindle assembly checkpoint protein MAD2B



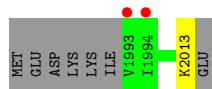
- Molecule 2: DNA polymerase zeta catalytic subunit



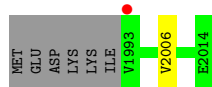
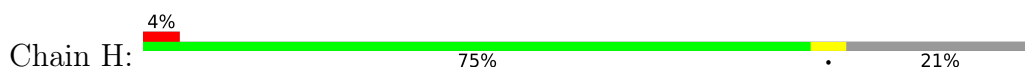
- Molecule 2: DNA polymerase zeta catalytic subunit



- Molecule 2: DNA polymerase zeta catalytic subunit



- Molecule 2: DNA polymerase zeta catalytic subunit





## 4 Data and refinement statistics

Property	Value	Source
Space group	P 31 2 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	89.70Å 89.70Å 284.84Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	284.84 – 2.80 47.47 – 2.80	Depositor EDS
% Data completeness (in resolution range)	99.8 (284.84-2.80) 99.8 (47.47-2.80)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.04 (at 2.81Å)	Xtrriage
Refinement program	REFMAC	Depositor
R, $R_{free}$	0.275 , 0.321 0.275 , 0.321	Depositor DCC
$R_{free}$ test set	1715 reflections (5.08%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	75.1	Xtrriage
Anisotropy	0.560	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.32 , 61.7	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.48$ , $\langle L^2 \rangle = 0.31$	Xtrriage
Estimated twinning fraction	0.036 for -h,-k,l	Xtrriage
$F_o, F_c$ correlation	0.91	EDS
Total number of atoms	6445	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	94.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.28% 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	0.57	0/1555	0.78	2/2111 (0.1%)
1	C	0.62	2/1529 (0.1%)	0.77	1/2072 (0.0%)
1	E	0.50	0/1446	0.76	2/1956 (0.1%)
1	G	0.44	0/1280	0.68	0/1735
2	B	0.52	0/194	0.69	0/261
2	D	0.48	0/211	0.68	0/283
2	F	0.50	0/168	0.69	0/227
2	H	0.46	0/177	0.60	0/239
All	All	0.54	2/6560 (0.0%)	0.74	5/8884 (0.1%)

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	C	0	1
1	E	0	1
All	All	0	2

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	117	SER	CA-CB	8.03	1.65	1.52
1	C	117	SER	CB-OG	5.06	1.48	1.42

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	186	LEU	CA-CB-CG	6.42	130.08	115.30
1	A	166	ILE	N-CA-C	-5.90	95.07	111.00
1	E	145	THR	N-CA-C	5.87	126.84	111.00
1	C	117	SER	CB-CA-C	5.81	121.13	110.10

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	E	162	LYS	CA-CB-CG	5.13	124.68	113.40

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	C	118	HIS	Peptide
1	E	9	LEU	Peptide

## 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	1522	0	1561	14	0
1	C	1498	0	1528	7	0
1	E	1420	0	1454	6	0
1	G	1257	0	1289	3	0
2	B	188	0	212	1	0
2	D	208	0	227	1	0
2	F	165	0	180	0	0
2	H	174	0	186	1	0
3	A	5	0	0	2	0
3	C	2	0	0	0	0
3	E	3	0	0	0	0
3	G	3	0	0	0	0
All	All	6445	0	6637	27	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 2.

All (27) 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:A:166:ILE:O	1:A:168:ASP:N	2.19	0.74
1:A:193:THR:OG1	1:C:185:ARG:NH2	2.24	0.70

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:167:LYS:O	1:E:169:PHE:N	2.34	0.61
1:A:166:ILE:HG22	1:A:167:LYS:H	1.70	0.57
1:A:137:LEU:HD23	1:A:187:ILE:HD13	1.88	0.56
1:A:165:VAL:C	1:A:166:ILE:O	2.43	0.56
1:G:41:ILE:HG21	2:H:2006:VAL:CG1	2.36	0.55
1:C:137:LEU:HD23	1:C:187:ILE:HD13	1.90	0.54
1:G:137:LEU:HD23	1:G:187:ILE:HD13	1.90	0.54
1:C:41:ILE:HG21	2:D:2006:VAL:CG1	2.40	0.51
1:E:88:LEU:O	1:E:144:CYS:O	2.27	0.51
1:E:11:PHE:CZ	1:E:196:ILE:HG22	2.48	0.48
1:C:118:HIS:HA	1:C:120:GLU:H	1.79	0.47
1:C:11:PHE:CZ	1:C:196:ILE:HG22	2.50	0.46
1:A:108:LEU:HD11	1:E:121:GLN:HE22	1.80	0.46
1:A:11:PHE:CZ	1:A:196:ILE:HG22	2.51	0.45
1:E:66:ASP:OD2	1:E:167:LYS:HE3	2.16	0.45
1:A:41:ILE:HG21	2:B:2006:VAL:CG1	2.47	0.44
1:A:172:ILE:HD13	3:A:304:HOH:O	2.17	0.44
1:A:79:ASP:O	1:A:152:THR:HG23	2.19	0.42
1:A:80:VAL:HG11	1:A:83:VAL:HG23	2.02	0.42
1:A:119:VAL:HG12	1:A:123:LEU:HD22	2.00	0.42
1:A:172:ILE:CD1	3:A:304:HOH:O	2.68	0.42
1:C:80:VAL:HG11	1:C:83:VAL:HG23	2.02	0.42
1:E:80:VAL:HG11	1:E:83:VAL:HG23	2.02	0.41
1:A:185:ARG:HH22	1:C:198:LYS:HZ3	1.67	0.41
1:G:80:VAL:HG11	1:G:83:VAL:HG23	2.03	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	180/227 (79%)	169 (94%)	6 (3%)	5 (3%)	<b>5</b> <b>17</b>

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	C	174/227 (77%)	166 (95%)	6 (3%)	2 (1%)	14	41
1	E	160/227 (70%)	149 (93%)	6 (4%)	5 (3%)	4	14
1	G	140/227 (62%)	135 (96%)	5 (4%)	0	100	100
2	B	22/28 (79%)	22 (100%)	0	0	100	100
2	D	24/28 (86%)	23 (96%)	1 (4%)	0	100	100
2	F	19/28 (68%)	18 (95%)	1 (5%)	0	100	100
2	H	20/28 (71%)	18 (90%)	2 (10%)	0	100	100
All	All	739/1020 (72%)	700 (95%)	27 (4%)	12 (2%)	9	31

All (12) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	166	ILE
1	A	167	LYS
1	E	10	ASN
1	E	145	THR
1	A	162	LYS
1	C	162	LYS
1	E	162	LYS
1	E	167	LYS
1	C	119	VAL
1	E	168	ASP
1	A	106	PRO
1	A	143	GLY

### 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	177/214 (83%)	166 (94%)	11 (6%)	18	47
1	C	174/214 (81%)	164 (94%)	10 (6%)	20	50
1	E	166/214 (78%)	158 (95%)	8 (5%)	25	58

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	G	147/214 (69%)	140 (95%)	7 (5%)	25	58
2	B	22/26 (85%)	22 (100%)	0	100	100
2	D	24/26 (92%)	24 (100%)	0	100	100
2	F	19/26 (73%)	18 (95%)	1 (5%)	22	54
2	H	20/26 (77%)	20 (100%)	0	100	100
All	All	749/960 (78%)	712 (95%)	37 (5%)	25	57

All (37) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	10	ASN
1	A	14	VAL
1	A	19	LEU
1	A	44	LYS
1	A	45	ARG
1	A	107	LEU
1	A	116	LEU
1	A	123	LEU
1	A	138	ASP
1	A	152	THR
1	A	172	ILE
1	C	9	LEU
1	C	10	ASN
1	C	14	VAL
1	C	19	LEU
1	C	44	LYS
1	C	45	ARG
1	C	117	SER
1	C	138	ASP
1	C	172	ILE
1	C	208	HIS
1	E	10	ASN
1	E	14	VAL
1	E	19	LEU
1	E	44	LYS
1	E	116	LEU
1	E	145	THR
1	E	167	LYS
1	E	172	ILE
2	F	2013	LYS

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Mol	Chain	Res	Type
1	G	14	VAL
1	G	19	LEU
1	G	44	LYS
1	G	45	ARG
1	G	118	HIS
1	G	167	LYS
1	G	172	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (6) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	13	GLN
1	C	13	GLN
1	E	13	GLN
1	E	57	HIS
1	E	121	GLN
1	G	13	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 monosaccharides 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

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	186/227 (81%)	0.16	8 (4%) 35 25	44, 71, 130, 161	0
1	C	182/227 (80%)	0.03	8 (4%) 34 24	40, 68, 126, 152	0
1	E	174/227 (76%)	0.83	29 (16%) 1 1	63, 112, 161, 172	0
1	G	154/227 (67%)	1.16	33 (21%) 0 0	61, 114, 169, 219	0
2	B	23/28 (82%)	0.25	2 (8%) 10 5	57, 71, 100, 123	0
2	D	26/28 (92%)	0.01	2 (7%) 13 7	57, 73, 115, 133	0
2	F	21/28 (75%)	0.14	2 (9%) 8 4	75, 91, 112, 125	0
2	H	22/28 (78%)	-0.08	1 (4%) 33 23	72, 92, 116, 143	0
All	All	788/1020 (77%)	0.46	85 (10%) 5 3	40, 89, 152, 219	0

All (85) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	G	95	VAL	6.1
1	G	185	ARG	5.7
1	G	52	VAL	5.4
1	G	186	LEU	5.3
1	G	94	PRO	5.0
2	D	1989	ASP	4.7
1	A	182	HIS	4.7
1	C	208	HIS	4.5
1	G	192	MET	4.4
1	G	183	ASP	4.3
1	E	185	ARG	4.3
1	G	35	GLU	4.3
1	G	204	GLU	4.2
1	G	89	ASP	4.2
1	G	197	LEU	4.2
1	G	184	PRO	4.0

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Mol	Chain	Res	Type	RSRZ
1	E	90	LYS	3.9
1	G	189	LEU	3.8
1	G	199	MET	3.8
1	E	11	PHE	3.8
1	E	53	GLN	3.8
1	E	176	GLU	3.8
1	C	139	HIS	3.7
1	G	178	ASP	3.7
1	E	36	VAL	3.7
1	A	139	HIS	3.6
1	G	33	VAL	3.6
1	G	203	VAL	3.6
1	G	102	ILE	3.6
1	A	93	ARG	3.5
2	B	1991	LYS	3.5
1	E	98	PHE	3.5
1	G	93	ARG	3.5
1	G	134	ASP	3.5
1	G	127	ILE	3.5
1	E	134	ASP	3.4
1	G	196	ILE	3.4
2	B	1990	LYS	3.3
1	A	153	ARG	3.3
2	F	1993	VAL	3.3
1	G	198	LYS	3.1
1	G	187	ILE	3.1
1	E	183	ASP	3.1
1	E	178	ASP	3.1
2	H	1993	VAL	2.9
1	C	206	ARG	2.9
1	E	51	PRO	2.9
1	G	202	TYR	2.9
1	A	206	ARG	2.8
1	A	143	GLY	2.8
1	E	189	LEU	2.8
1	G	167	LYS	2.8
1	E	33	VAL	2.7
1	E	205	GLU	2.7
1	E	179	VAL	2.7
1	C	10	ASN	2.7
1	E	99	VAL	2.6
1	C	138	ASP	2.6

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Mol	Chain	Res	Type	RSRZ
1	A	11	PHE	2.6
1	E	132	VAL	2.6
1	E	35	GLU	2.5
1	E	144	CYS	2.5
1	E	173	LEU	2.5
1	E	77	LYS	2.5
1	E	52	VAL	2.4
1	G	195	ASP	2.4
2	D	1988	GLU	2.4
1	G	193	THR	2.4
1	E	87	ILE	2.4
1	E	186	LEU	2.4
1	E	160	MET	2.4
1	A	207	ALA	2.3
1	G	51	PRO	2.3
2	F	1994	ILE	2.3
1	C	153	ARG	2.3
1	G	56	CYS	2.2
1	C	140	ASN	2.2
1	C	160	MET	2.2
1	E	127	ILE	2.2
1	E	206	ARG	2.1
1	E	94	PRO	2.1
1	E	48	TYR	2.1
1	G	47	LYS	2.1
1	G	44	LYS	2.0
1	G	190	LYS	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.