Full wwPDB X-ray Structure Validation Report ⓘ

Feb 10, 2025 – 10:03 AM EST

PDB ID	:	8VY5
Title	:	Crystal structure of human SAE1
Authors	:	Huang, X.; Qian, J.; Yang, Y.
Deposited on	:	2024-02-07
Resolution	:	2.01 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*
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.

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

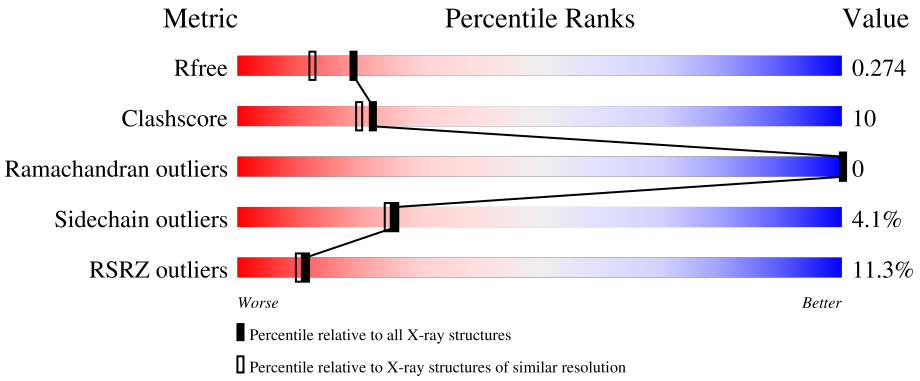
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.21
EDS	:	3.0
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.004 (Gargrove)
Density-Fitness	:	1.0.11
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.40

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 2.01 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	164625	9409 (2.00-2.00)
Clashscore	180529	10737 (2.00-2.00)
Ramachandran outliers	177936	10628 (2.00-2.00)
Sidechain outliers	177891	10627 (2.00-2.00)
RSRZ outliers	164620	9409 (2.00-2.00)

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 >=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 <=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	320	11% 69% 20% · 8%
1	B	320	9% 64% 16% •• 18%

2 Entry composition (i)

There are 2 unique types of molecules in this entry. The entry contains 4436 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 SUMO-activating enzyme subunit 1, N-terminally processed.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	293	Total	C	N	O	S	0	0	0
			2290	1454	388	435	13			
1	B	264	Total	C	N	O	S	0	0	0
			2060	1307	348	393	12			

There are 56 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	4	GLY	-	expression tag	UNP Q9UBE0
A	5	ALA	-	expression tag	UNP Q9UBE0
A	6	MET	-	expression tag	UNP Q9UBE0
A	7	GLY	-	expression tag	UNP Q9UBE0
A	8	SER	-	expression tag	UNP Q9UBE0
A	?	-	LYS	deletion	UNP Q9UBE0
A	?	-	VAL	deletion	UNP Q9UBE0
A	?	-	ALA	deletion	UNP Q9UBE0
A	?	-	LYS	deletion	UNP Q9UBE0
A	?	-	VAL	deletion	UNP Q9UBE0
A	?	-	SER	deletion	UNP Q9UBE0
A	?	-	GLN	deletion	UNP Q9UBE0
A	?	-	GLY	deletion	UNP Q9UBE0
A	?	-	VAL	deletion	UNP Q9UBE0
A	?	-	GLU	deletion	UNP Q9UBE0
A	?	-	ASP	deletion	UNP Q9UBE0
A	?	-	GLY	deletion	UNP Q9UBE0
A	?	-	PRO	deletion	UNP Q9UBE0
A	?	-	ASP	deletion	UNP Q9UBE0
A	?	-	THR	deletion	UNP Q9UBE0
A	?	-	LYS	deletion	UNP Q9UBE0
A	?	-	ARG	deletion	UNP Q9UBE0
A	?	-	ALA	deletion	UNP Q9UBE0
A	?	-	LYS	deletion	UNP Q9UBE0
A	?	-	LEU	deletion	UNP Q9UBE0

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Chain	Residue	Modelled	Actual	Comment	Reference
A	?	-	ASP	deletion	UNP Q9UBE0
A	?	-	SER	deletion	UNP Q9UBE0
A	?	-	SER	deletion	UNP Q9UBE0
B	4	GLY	-	expression tag	UNP Q9UBE0
B	5	ALA	-	expression tag	UNP Q9UBE0
B	6	MET	-	expression tag	UNP Q9UBE0
B	7	GLY	-	expression tag	UNP Q9UBE0
B	8	SER	-	expression tag	UNP Q9UBE0
B	?	-	LYS	deletion	UNP Q9UBE0
B	?	-	VAL	deletion	UNP Q9UBE0
B	?	-	ALA	deletion	UNP Q9UBE0
B	?	-	LYS	deletion	UNP Q9UBE0
B	?	-	VAL	deletion	UNP Q9UBE0
B	?	-	SER	deletion	UNP Q9UBE0
B	?	-	GLN	deletion	UNP Q9UBE0
B	?	-	GLY	deletion	UNP Q9UBE0
B	?	-	VAL	deletion	UNP Q9UBE0
B	?	-	GLU	deletion	UNP Q9UBE0
B	?	-	ASP	deletion	UNP Q9UBE0
B	?	-	GLY	deletion	UNP Q9UBE0
B	?	-	PRO	deletion	UNP Q9UBE0
B	?	-	ASP	deletion	UNP Q9UBE0
B	?	-	THR	deletion	UNP Q9UBE0
B	?	-	LYS	deletion	UNP Q9UBE0
B	?	-	ARG	deletion	UNP Q9UBE0
B	?	-	ALA	deletion	UNP Q9UBE0
B	?	-	LYS	deletion	UNP Q9UBE0
B	?	-	LEU	deletion	UNP Q9UBE0
B	?	-	ASP	deletion	UNP Q9UBE0
B	?	-	SER	deletion	UNP Q9UBE0
B	?	-	SER	deletion	UNP Q9UBE0

- Molecule 2 is water.

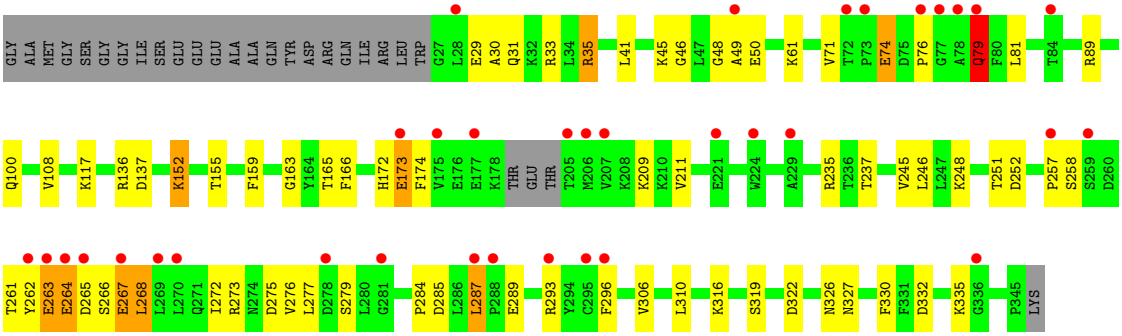
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	38	Total O 38 38	0	0
2	B	48	Total O 48 48	0	0

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.

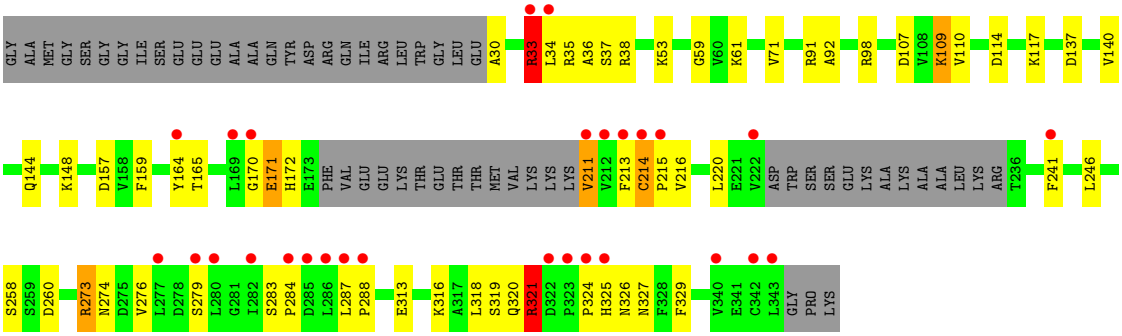
• Molecule 1: SUMO-activating enzyme subunit 1, N-terminally processed

Chain A:



• Molecule 1: SUMO-activating enzyme subunit 1, N-terminally processed

Chain B:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α, β, γ	103.20Å 70.19Å 87.59Å 90.00° 108.92° 90.00°	Depositor
Resolution (Å)	28.29 – 2.01 28.29 – 2.01	Depositor EDS
% Data completeness (in resolution range)	95.5 (28.29-2.01) 95.6 (28.29-2.01)	Depositor EDS
R_{merge}	0.05	Depositor
R_{sym}	0.06	Depositor
$< I/\sigma(I) >$ [1]	1.29 (at 2.01Å)	Xtriage
Refinement program	PHENIX 1.20.1_4487, PHENIX 1.20.1_4487	Depositor
R, R_{free}	0.231 , 0.274 0.231 , 0.274	Depositor DCC
R_{free} test set	1978 reflections (4.99%)	wwPDB-VP
Wilson B-factor (Å^2)	45.1	Xtriage
Anisotropy	0.270	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.34 , 47.5	EDS
L-test for twinning[2]	$< \|L\| > = 0.50$, $< L^2 > = 0.34$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	4436	wwPDB-VP
Average B, all atoms (Å^2)	69.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.60% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ 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	0.46	3/2330 (0.1%)	0.75	8/3142 (0.3%)
1	B	0.31	0/2095	0.67	6/2829 (0.2%)
All	All	0.39	3/4425 (0.1%)	0.71	14/5971 (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	B	0	3

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	263	GLU	CB-CG	9.01	1.69	1.52
1	A	264	GLU	CB-CG	5.91	1.63	1.52
1	A	79	GLN	CB-CG	-5.13	1.38	1.52

All (14) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	264	GLU	CA-CB-CG	11.54	138.79	113.40
1	A	264	GLU	N-CA-CB	9.75	128.16	110.60
1	B	33	ARG	CG-CD-NE	-9.19	92.49	111.80
1	A	79	GLN	CA-CB-CG	-9.00	93.61	113.40
1	B	33	ARG	CB-CG-CD	8.97	134.92	111.60
1	A	264	GLU	CB-CA-C	-7.16	96.08	110.40
1	A	172	HIS	C-N-CA	7.13	139.52	121.70
1	A	173	GLU	N-CA-CB	-6.38	99.13	110.60
1	B	171	GLU	N-CA-CB	-6.31	99.24	110.60
1	A	136	ARG	NE-CZ-NH1	5.72	123.16	120.30
1	B	321	ARG	CG-CD-NE	5.61	123.58	111.80

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	171	GLU	CA-CB-CG	5.44	125.37	113.40
1	A	173	GLU	OE1-CD-OE2	-5.30	116.94	123.30
1	B	33	ARG	CD-NE-CZ	5.15	130.81	123.60

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	B	321	ARG	Sidechain
1	B	33	ARG	Sidechain
1	B	98	ARG	Sidechain

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	2290	0	2294	48	0
1	B	2060	0	2048	43	0
2	A	38	0	0	4	0
2	B	48	0	0	2	0
All	All	4436	0	4342	90	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 10.

All (90) 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:B:30:ALA:N	2:B:401:HOH:O	2.05	0.88
1:A:50:GLU:OE2	1:B:53:LYS:NZ	2.15	0.78
1:A:45:LYS:O	1:A:79:GLN:NE2	2.16	0.77
1:B:258:SER:OG	1:B:260:ASP:OD2	2.05	0.75
1:A:46:GLY:HA2	1:A:79:GLN:HG3	1.71	0.71
1:B:170:GLY:N	1:B:213:PHE:HB2	2.05	0.71
1:B:170:GLY:H	1:B:213:PHE:HB2	1.56	0.70

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:137:ASP:OD2	2:B:402:HOH:O	2.10	0.69
1:A:262:TYR:HA	1:A:296:PHE:CE2	2.29	0.68
1:A:29:GLU:OE1	1:A:33:ARG:NH1	2.30	0.65
1:B:33:ARG:NH2	1:B:319:SER:O	2.29	0.65
1:A:31:GLN:HG2	1:A:35:ARG:HD3	1.78	0.64
1:A:265:ASP:HB2	1:A:296:PHE:CZ	2.33	0.64
1:B:140:VAL:O	1:B:144:GLN:HG3	1.99	0.63
1:B:213:PHE:HZ	1:B:324:PRO:HB2	1.63	0.62
1:A:155:THR:HG22	1:A:166:PHE:HB3	1.83	0.61
1:A:316:LYS:HD3	1:A:322:ASP:HB2	1.84	0.60
1:A:258:SER:N	1:A:265:ASP:OD2	2.29	0.59
1:B:114:ASP:HB3	1:B:117:LYS:HG3	1.85	0.59
1:A:264:GLU:O	1:A:267:GLU:HB3	2.03	0.58
1:B:107:ASP:OD2	1:B:109:LYS:NZ	2.40	0.55
1:B:287:LEU:HD12	1:B:288:PRO:HD2	1.90	0.54
1:A:262:TYR:OH	1:A:293:ARG:HG2	2.09	0.53
1:B:172:HIS:O	1:B:211:VAL:N	2.40	0.53
1:B:273:ARG:NH1	1:B:274:ASN:OD1	2.41	0.53
1:A:137:ASP:OD1	2:A:401:HOH:O	2.19	0.52
1:B:241:PHE:HD1	1:B:287:LEU:HB2	1.74	0.52
1:B:241:PHE:CD1	1:B:287:LEU:HB2	2.45	0.51
1:A:257:PRO:HB3	1:A:265:ASP:HB3	1.93	0.51
1:A:100:GLN:HE22	1:A:108:VAL:H	1.59	0.51
1:A:265:ASP:HB2	1:A:296:PHE:HZ	1.74	0.51
1:A:273:ARG:NH2	1:A:289:GLU:HG2	2.25	0.50
1:A:165:THR:HB	1:A:310:LEU:HD13	1.93	0.50
1:A:248:LYS:HE2	1:A:252:ASP:OD1	2.11	0.50
1:B:241:PHE:HE2	1:B:276:VAL:HG12	1.77	0.50
1:A:251:THR:OG1	2:A:401:HOH:O	2.20	0.50
1:B:71:VAL:HG22	1:B:91:ARG:HG2	1.94	0.49
1:A:152:LYS:NZ	2:A:405:HOH:O	2.45	0.49
1:A:30:ALA:HB1	1:A:319:SER:HB2	1.95	0.49
1:B:33:ARG:O	1:B:36:ALA:N	2.45	0.49
1:B:159:PHE:CG	1:B:246:LEU:HD13	2.48	0.49
1:B:33:ARG:CZ	1:B:319:SER:O	2.61	0.48
1:A:264:GLU:O	1:A:267:GLU:CB	2.62	0.48
1:A:273:ARG:HH22	1:A:289:GLU:HG2	1.77	0.47
1:B:213:PHE:CZ	1:B:324:PRO:HB2	2.47	0.47
1:B:53:LYS:HE3	1:B:53:LYS:HB3	1.79	0.47
1:B:38:ARG:HH21	1:B:109:LYS:HE2	1.79	0.46
1:B:313:GLU:CD	1:B:325:HIS:CD2	2.89	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:326:ASN:HA	1:B:327:ASN:HA	1.62	0.46
1:B:316:LYS:O	1:B:320:GLN:N	2.48	0.46
1:A:49:ALA:HB1	1:A:81:LEU:HG	1.98	0.46
1:A:74:GLU:OE1	1:A:74:GLU:N	2.48	0.46
1:A:163:GLY:HA3	1:A:306:VAL:HG21	1.98	0.46
1:A:332:ASP:OD2	1:A:335:LYS:HG3	2.16	0.45
1:A:159:PHE:CG	1:A:246:LEU:HD13	2.51	0.45
1:B:33:ARG:HG3	1:B:318:LEU:O	2.16	0.45
1:A:76:PRO:HB3	2:A:404:HOH:O	2.17	0.45
1:B:313:GLU:OE2	1:B:325:HIS:CD2	2.70	0.45
1:B:92:ALA:HB1	1:B:110:VAL:HG23	1.96	0.45
1:B:37:SER:HB3	1:B:318:LEU:HD22	1.99	0.45
1:A:265:ASP:HB2	1:A:296:PHE:CE2	2.51	0.45
1:A:272:ILE:O	1:A:276:VAL:HG22	2.15	0.45
1:A:174:PHE:HE1	1:A:211:VAL:HG23	1.82	0.44
1:A:261:THR:C	1:A:263:GLU:N	2.70	0.44
1:A:277:LEU:HD11	1:A:287:LEU:HD22	1.98	0.44
1:A:237:THR:HG21	1:A:330:PHE:CD2	2.51	0.44
1:B:276:VAL:HA	1:B:279:SER:OG	2.17	0.44
1:A:245:VAL:HG13	1:A:272:ILE:HB	2.00	0.44
1:A:326:ASN:HA	1:A:327:ASN:HA	1.56	0.44
1:A:89:ARG:HH11	1:A:89:ARG:HG2	1.83	0.44
1:B:30:ALA:HA	1:B:33:ARG:CZ	2.48	0.43
1:B:92:ALA:CB	1:B:110:VAL:HG23	2.49	0.43
1:B:157:ASP:HB2	1:B:164:TYR:HE1	1.84	0.43
1:A:173:GLU:H	1:A:173:GLU:HG2	1.19	0.43
1:A:209:LYS:HD3	1:A:209:LYS:HA	1.73	0.43
1:B:165:THR:OG1	1:B:329:PHE:HB3	2.19	0.43
1:A:41:LEU:HD21	1:A:48:GLY:O	2.19	0.42
1:B:216:VAL:HG22	1:B:220:LEU:HD12	2.02	0.42
1:A:275:ASP:O	1:A:279:SER:HB3	2.19	0.42
1:B:35:ARG:NH2	1:B:59:GLY:HA3	2.35	0.42
1:A:273:ARG:NH1	1:A:284:PRO:O	2.53	0.42
1:B:283:SER:HA	1:B:284:PRO:HD3	1.95	0.41
1:A:277:LEU:HD23	1:A:277:LEU:HA	1.89	0.41
1:A:35:ARG:N	1:A:35:ARG:HD2	2.35	0.41
1:B:37:SER:O	1:B:61:LYS:HB3	2.20	0.41
1:A:71:VAL:N	1:A:89:ARG:O	2.42	0.41
1:B:34:LEU:HD12	1:B:34:LEU:HA	1.90	0.41
1:B:107:ASP:CG	1:B:109:LYS:HZ2	2.23	0.41
1:B:214:CYS:HA	1:B:215:PRO:HD2	1.91	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:267:GLU:CG	1:A:268:LEU:N	2.84	0.41

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	289/320 (90%)	279 (96%)	10 (4%)	0	100	100
1	B	258/320 (81%)	251 (97%)	7 (3%)	0	100	100
All	All	547/640 (86%)	530 (97%)	17 (3%)	0	100	100

There are no Ramachandran outliers to report.

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	253/273 (93%)	241 (95%)	12 (5%)	22	20
1	B	229/273 (84%)	221 (96%)	8 (4%)	31	31
All	All	482/546 (88%)	462 (96%)	20 (4%)	26	25

All (20) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	35	ARG
1	A	61	LYS
1	A	74	GLU
1	A	79	GLN
1	A	117	LYS
1	A	152	LYS
1	A	235	ARG
1	A	266	SER
1	A	267	GLU
1	A	268	LEU
1	A	285	ASP
1	A	287	LEU
1	B	33	ARG
1	B	109	LYS
1	B	148	LYS
1	B	171	GLU
1	B	211	VAL
1	B	214	CYS
1	B	273	ARG
1	B	321	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (3) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	100	GLN
1	B	172	HIS
1	B	325	HIS

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates (i)

There are no oligosaccharides in this entry.

5.6 Ligand geometry (i)

There are no ligands in this entry.

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95^{th} 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^2)	Q<0.9
1	A	293/320 (91%)	0.64	35 (11%)	10	9	38, 64, 114, 141	0
1	B	264/320 (82%)	0.61	28 (10%)	13	12	38, 61, 115, 147	0
All	All	557/640 (87%)	0.63	63 (11%)	11	10	38, 62, 116, 147	0

All (63) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	79	GLN	7.1
1	B	211	VAL	4.7
1	B	214	CYS	4.0
1	A	78	ALA	3.9
1	B	343	LEU	3.9
1	B	164	TYR	3.6
1	A	263	GLU	3.6
1	B	241	PHE	3.4
1	A	207	VAL	3.3
1	A	77	GLY	3.3
1	A	265	ASP	3.1
1	B	285	ASP	3.1
1	B	325	HIS	3.1
1	B	324	PRO	3.0
1	B	288	PRO	2.9
1	A	84	THR	2.9
1	A	206	MET	2.8
1	B	33	ARG	2.8
1	B	342	CYS	2.8
1	A	281	GLY	2.8
1	A	296	PHE	2.7
1	A	72	THR	2.7
1	B	215	PRO	2.7
1	B	280	LEU	2.7

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Mol	Chain	Res	Type	RSRZ
1	A	270	LEU	2.7
1	B	170	GLY	2.7
1	B	213	PHE	2.6
1	B	34	LEU	2.6
1	A	264	GLU	2.6
1	B	323	PRO	2.6
1	A	287	LEU	2.6
1	A	177	GLU	2.5
1	A	205	THR	2.5
1	B	279	SER	2.5
1	B	212	VAL	2.5
1	A	262	TYR	2.4
1	B	169	LEU	2.4
1	A	288	PRO	2.4
1	A	293	ARG	2.4
1	A	269	LEU	2.4
1	B	277	LEU	2.4
1	A	224	TRP	2.4
1	B	222	VAL	2.4
1	A	267	GLU	2.3
1	A	49	ALA	2.3
1	A	229	ALA	2.3
1	A	295	CYS	2.3
1	A	257	PRO	2.3
1	B	284	PRO	2.3
1	A	175	VAL	2.3
1	A	336	GLY	2.3
1	A	76	PRO	2.2
1	A	278	ASP	2.2
1	B	340	VAL	2.2
1	A	259	SER	2.2
1	A	28	LEU	2.1
1	B	287	LEU	2.1
1	B	322	ASP	2.1
1	B	282	ILE	2.1
1	B	286	LEU	2.1
1	A	173	GLU	2.1
1	A	73	PRO	2.1
1	A	221	GLU	2.1

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.