



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 20, 2026 – 03:44 AM UTC

PDB ID : 3ZD6 / pdb_00003zd6
Title : Snapshot 1 of RIG-I scanning on RNA duplex
Authors : Luo, D.; Pyle, A.M.
Deposited on : 2012-11-25
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

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	:	4-5-2 with Phenix2.0
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

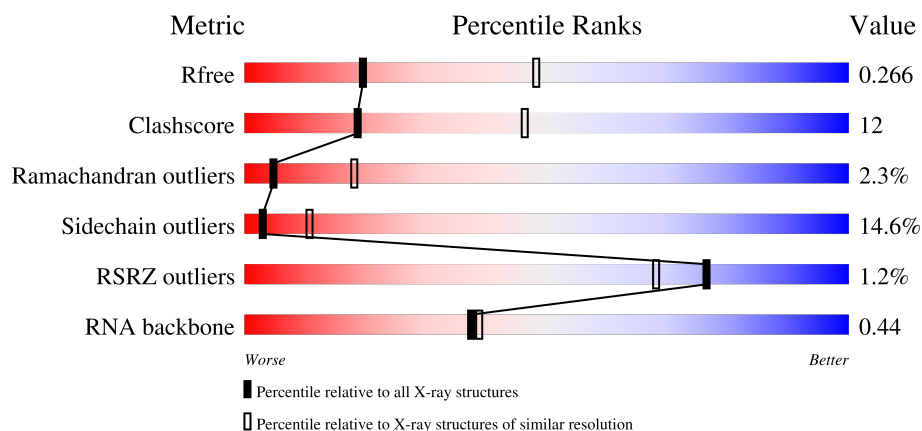
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 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}	180053	3866 (2.80-2.80)
Clashscore	190562	4276 (2.80-2.80)
Ramachandran outliers	187476	4196 (2.80-2.80)
Sidechain outliers	187428	4198 (2.80-2.80)
RSRZ outliers	180081	3869 (2.80-2.80)
RNA backbone	3983	1114 (3.00-2.60)

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 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 $\leq 5\%$. 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	696	59% 27% 5% 9%
2	C	10	70% 30%
2	D	10	70% 30%

2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 5380 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called PROBABLE ATP-DEPENDENT RNA HELICASE DDX58.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	632	Total	C	N	O	S	0	0	0
			4946	3182	833	902	29			

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	287	ASN	GLN	conflict	UNP O95786
A	306	ASN	GLN	conflict	UNP O95786
A	696	LEU	ALA	conflict	UNP O95786

- Molecule 2 is a RNA chain called RNA DUPLEX.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	C	10	Total	C	N	O	P	0	0	0
			212	95	40	68	9			
2	D	10	Total	C	N	O	P	0	0	0
			212	95	40	68	9			

- Molecule 3 is ZINC ION (CCD ID: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	1	Total	Zn	0	0
			1	1		

- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	7	Total	O	0	0
			7	7		
4	C	1	Total	O	0	0
			1	1		

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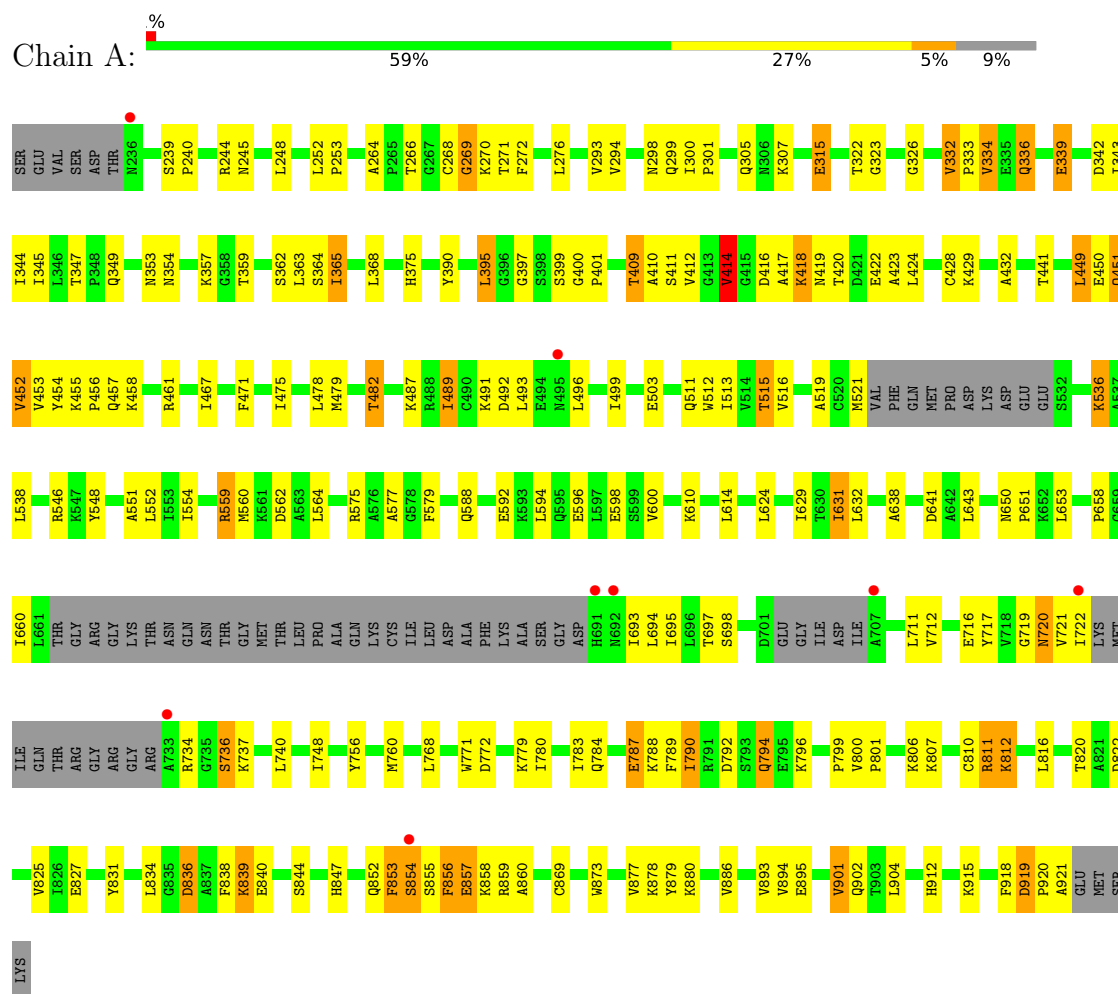
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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	D	1	Total	O	0	0
			1	1		

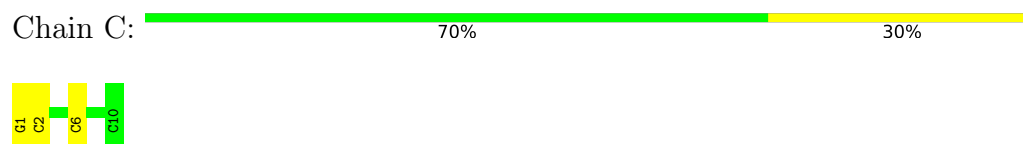
3 Residue-property plots

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density ($RSRZ > 2$). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

• Molecule 1: PROBABLE ATP-DEPENDENT RNA HELICASE DDX58



• Molecule 2: RNA DUPLEX



• Molecule 2: RNA DUPLEX



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	48.47Å 78.02Å 225.10Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	25.00 – 2.80 25.00 – 2.80	Depositor EDS
% Data completeness (in resolution range)	99.2 (25.00-2.80) 99.1 (25.00-2.80)	Depositor EDS
R_{merge}	0.06	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.00 (at 2.80Å)	Xtriage
Refinement program	REFMAC 5.5.0109	Depositor
R, R_{free}	0.222 , 0.279 0.214 , 0.266	Depositor DCC
R_{free} test set	1108 reflections (5.07%)	wwPDB-VP
Wilson B-factor (Å ²)	74.5	Xtriage
Anisotropy	0.116	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.30 , 56.0	EDS
L-test for twinning ²	$\langle L \rangle = 0.47$, $\langle L^2 \rangle = 0.30$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	5380	wwPDB-VP
Average B, all atoms (Å ²)	74.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.78% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical 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

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section:
ZN

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	0.80	0/5049	1.03	9/6835 (0.1%)
2	C	0.82	0/236	1.49	1/367 (0.3%)
2	D	0.76	0/236	1.40	3/367 (0.8%)
All	All	0.80	0/5521	1.08	13/7569 (0.2%)

There are no bond length outliers.

All (13) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	6	C	C4'-C3'-C2'	-7.43	95.17	102.60
2	D	8	C	C4'-C3'-C2'	-7.31	95.29	102.60
1	A	736	SER	N-CA-C	5.90	118.79	110.23
1	A	698	SER	N-CA-C	5.72	117.23	108.42
1	A	575	ARG	N-CA-C	-5.66	105.25	111.82
2	D	10	C	C4'-C3'-O3'	-5.62	104.57	113.00
1	A	855	SER	N-CA-C	-5.60	100.34	108.07
2	D	9	G	C4'-C3'-O3'	-5.59	104.61	113.00
1	A	347	THR	N-CA-C	-5.56	103.07	110.07
1	A	492	ASP	N-CA-C	-5.54	106.11	112.92
1	A	912	HIS	N-CA-C	5.49	117.96	107.75
1	A	298	ASN	N-CA-C	5.29	118.20	111.69
1	A	441	THR	N-CA-C	-5.04	101.76	108.86

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-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 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	4946	0	4852	122	0
2	C	212	0	112	2	0
2	D	212	0	112	0	0
3	A	1	0	0	0	0
4	A	7	0	0	1	0
4	C	1	0	0	0	0
4	D	1	0	0	0	0
All	All	5380	0	5076	124	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 12.

All (124) 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:919:ASP:HB3	1:A:920:PRO:CD	1.87	1.04
1:A:919:ASP:CG	1:A:920:PRO:HD3	1.94	0.91
1:A:428:CYS:SG	1:A:779:LYS:NZ	2.43	0.91
1:A:239:SER:HB2	1:A:240:PRO:HD2	1.53	0.89
1:A:375:HIS:HD2	1:A:409:THR:HG23	1.37	0.88
1:A:919:ASP:CB	1:A:920:PRO:HD3	2.05	0.86
1:A:919:ASP:CB	1:A:920:PRO:CD	2.53	0.86
1:A:332:VAL:HG22	1:A:333:PRO:HD2	1.59	0.83
1:A:919:ASP:HB3	1:A:920:PRO:HD2	1.61	0.82
1:A:856:PHE:HB2	1:A:878:LYS:O	1.79	0.82
1:A:364:SER:HB3	1:A:401:PRO:O	1.81	0.80
1:A:836:ASP:HA	1:A:839:LYS:HB2	1.67	0.76
1:A:478:LEU:O	1:A:482:THR:HG23	1.86	0.76
1:A:919:ASP:HB3	1:A:920:PRO:HD3	1.63	0.75
1:A:299:GLN:HB3	1:A:301:PRO:HD2	1.69	0.74
1:A:409:THR:HG22	1:A:411:SER:H	1.52	0.74
1:A:414:VAL:HG13	1:A:417:ALA:HB3	1.71	0.70
1:A:268:CYS:HB3	1:A:272:PHE:CE2	2.27	0.69
1:A:268:CYS:O	1:A:269:GLY:C	2.34	0.69
1:A:512:TRP:O	1:A:516:VAL:HG23	1.94	0.68

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:375:HIS:CD2	1:A:409:THR:HG23	2.26	0.67
1:A:794:GLN:O	1:A:794:GLN:HG2	1.95	0.67
1:A:264:ALA:O	1:A:410:ALA:HA	1.97	0.65
1:A:806:LYS:O	1:A:820:THR:HG23	1.97	0.64
1:A:429:LYS:HD2	1:A:787:GLU:OE2	1.96	0.64
1:A:333:PRO:HB2	1:A:336:GLN:HG2	1.79	0.62
1:A:252:LEU:HB3	1:A:253:PRO:HD3	1.81	0.61
1:A:895:GLU:HA	1:A:901:VAL:O	2.00	0.61
1:A:610:LYS:NZ	1:A:716:GLU:OE2	2.29	0.61
1:A:559:ARG:HG3	1:A:562:ASP:OD2	2.01	0.60
1:A:454:TYR:HA	1:A:455:LYS:CB	2.31	0.60
1:A:847:HIS:H	1:A:860:ALA:HA	1.67	0.60
1:A:836:ASP:N	1:A:836:ASP:OD1	2.33	0.59
1:A:856:PHE:HB3	1:A:879:TYR:HA	1.85	0.58
1:A:307:LYS:HA	1:A:345:ILE:HD13	1.85	0.58
1:A:315:GLU:HA	4:A:2003:HOH:O	2.03	0.58
1:A:918:PHE:O	1:A:919:ASP:HB2	2.03	0.58
1:A:554:ILE:HD11	1:A:638:ALA:HB1	1.86	0.57
1:A:811:ARG:HD2	1:A:904:LEU:HD22	1.87	0.57
2:C:1:G:H2'	2:C:2:C:C6	2.40	0.57
1:A:362:SER:O	1:A:365:ILE:HG13	2.05	0.56
1:A:293:VAL:HG22	1:A:368:LEU:HB3	1.87	0.55
1:A:920:PRO:O	1:A:921:ALA:HB2	2.06	0.55
1:A:432:ALA:HA	1:A:780:ILE:HG23	1.87	0.55
1:A:471:PHE:HB3	1:A:560:MET:HE2	1.88	0.55
1:A:375:HIS:HD2	1:A:409:THR:CG2	2.15	0.55
1:A:812:LYS:HE2	1:A:869:CYS:HA	1.89	0.54
1:A:307:LYS:HA	1:A:345:ILE:CD1	2.38	0.54
1:A:349:GLN:NE2	1:A:353:ASN:OD1	2.41	0.54
1:A:487:LYS:O	1:A:491:LYS:N	2.40	0.53
1:A:717:TYR:CD2	1:A:719:GLY:HA2	2.44	0.53
1:A:475:ILE:HG23	1:A:548:TYR:CD1	2.44	0.53
1:A:339:GLU:OE1	1:A:339:GLU:HA	2.08	0.53
1:A:511:GLN:O	1:A:515:THR:HG23	2.08	0.53
1:A:721:VAL:O	1:A:722:ILE:CB	2.57	0.52
1:A:596:GLU:O	1:A:600:VAL:HG23	2.10	0.52
1:A:414:VAL:HG22	1:A:423:ALA:HB1	1.91	0.52
1:A:375:HIS:CD2	1:A:409:THR:CG2	2.93	0.52
1:A:812:LYS:HB3	1:A:869:CYS:SG	2.50	0.51
1:A:323:GLY:HA2	1:A:345:ILE:O	2.11	0.50
1:A:719:GLY:C	1:A:720:ASN:HD22	2.19	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:825:VAL:HG21	1:A:915:LYS:HB3	1.93	0.50
1:A:334:VAL:HG11	1:A:354:ASN:OD1	2.12	0.50
1:A:856:PHE:CD2	1:A:879:TYR:HD1	2.29	0.50
1:A:449:LEU:O	1:A:451:GLN:N	2.39	0.50
1:A:478:LEU:O	1:A:482:THR:CG2	2.58	0.50
1:A:790:ILE:O	1:A:794:GLN:HB3	2.12	0.49
1:A:856:PHE:CB	1:A:879:TYR:HA	2.41	0.49
1:A:270:LYS:HG3	1:A:271:THR:N	2.27	0.49
1:A:419:ASN:OD1	1:A:422:GLU:HG3	2.13	0.49
1:A:364:SER:CB	1:A:401:PRO:O	2.58	0.48
1:A:536:LYS:HE3	1:A:536:LYS:HA	1.95	0.48
1:A:894:VAL:O	1:A:902:GLN:HA	2.13	0.47
1:A:838:PHE:C	1:A:840:GLU:H	2.21	0.47
1:A:838:PHE:C	1:A:840:GLU:N	2.72	0.47
1:A:300:ILE:O	1:A:301:PRO:C	2.56	0.47
1:A:357:LYS:HB3	1:A:359:THR:HG23	1.96	0.47
1:A:455:LYS:N	1:A:456:PRO:HD3	2.30	0.47
1:A:806:LYS:HB2	1:A:820:THR:HG21	1.97	0.47
1:A:853:PHE:O	1:A:854:SER:C	2.58	0.46
1:A:856:PHE:CD2	1:A:879:TYR:CD1	3.03	0.46
1:A:349:GLN:HE21	1:A:353:ASN:CG	2.23	0.46
1:A:756:TYR:O	1:A:760:MET:HG3	2.15	0.46
1:A:252:LEU:CB	1:A:253:PRO:HD3	2.46	0.46
1:A:847:HIS:NE2	1:A:858:LYS:HE2	2.31	0.45
2:C:1:G:H2'	2:C:2:C:H6	1.81	0.45
1:A:395:LEU:HD23	1:A:788:LYS:HD2	1.98	0.45
1:A:631:ILE:HG22	1:A:712:VAL:HG22	1.99	0.45
1:A:399:SER:HA	1:A:400:GLY:O	2.17	0.45
1:A:858:LYS:HA	1:A:877:VAL:HG12	1.99	0.45
1:A:783:ILE:O	1:A:784:GLN:C	2.58	0.44
1:A:588:GLN:O	1:A:592:GLU:HG3	2.17	0.44
1:A:857:GLU:HG2	1:A:859:ARG:HE	1.82	0.44
1:A:893:VAL:HA	1:A:904:LEU:HD23	1.99	0.44
1:A:489:ILE:O	1:A:489:ILE:HG23	2.16	0.44
1:A:789:PHE:CD1	1:A:789:PHE:C	2.96	0.44
1:A:471:PHE:C	1:A:471:PHE:CD1	2.96	0.43
1:A:239:SER:HB2	1:A:240:PRO:CD	2.35	0.43
1:A:252:LEU:HB3	1:A:253:PRO:CD	2.47	0.43
1:A:920:PRO:O	1:A:921:ALA:CB	2.67	0.43
1:A:244:ARG:O	1:A:245:ASN:C	2.61	0.43
1:A:395:LEU:C	1:A:397:GLY:H	2.26	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:810:CYS:HB2	1:A:873:TRP:HZ2	1.84	0.43
1:A:452:VAL:O	1:A:452:VAL:HG13	2.18	0.43
1:A:658:PRO:HA	1:A:695:ILE:O	2.19	0.43
1:A:344:ILE:HD12	1:A:344:ILE:N	2.33	0.43
1:A:363:LEU:HD12	1:A:390:TYR:HB2	2.00	0.43
1:A:252:LEU:HA	1:A:252:LEU:HD12	1.65	0.42
1:A:416:ASP:OD1	1:A:416:ASP:N	2.50	0.42
1:A:457:GLN:HE21	1:A:737:LYS:HG2	1.83	0.42
1:A:800:VAL:HA	1:A:801:PRO:HD3	1.87	0.42
1:A:239:SER:CB	1:A:240:PRO:HD2	2.36	0.42
1:A:395:LEU:C	1:A:397:GLY:N	2.78	0.42
1:A:831:TYR:O	1:A:886:VAL:HA	2.19	0.42
1:A:271:THR:O	1:A:272:PHE:C	2.61	0.42
1:A:515:THR:O	1:A:519:ALA:HB2	2.20	0.42
1:A:650:ASN:HA	1:A:651:PRO:HD3	1.95	0.42
1:A:807:LYS:HD3	1:A:816:LEU:HD13	2.00	0.42
1:A:548:TYR:O	1:A:551:ALA:HB3	2.19	0.42
1:A:416:ASP:O	1:A:418:LYS:HD2	2.19	0.42
1:A:475:ILE:O	1:A:479:MET:HG3	2.20	0.42
1:A:880:LYS:HA	1:A:880:LYS:HD3	1.89	0.41
1:A:342:ASP:C	1:A:343:ILE:HG13	2.46	0.41
1:A:414:VAL:HG22	1:A:423:ALA:CB	2.51	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	622/696 (89%)	558 (90%)	50 (8%)	14 (2%)	5 18

All (14) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	450	GLU
1	A	919	ASP
1	A	414	VAL
1	A	453	VAL
1	A	856	PHE
1	A	269	GLY
1	A	326	GLY
1	A	577	ALA
1	A	854	SER
1	A	451	GLN
1	A	734	ARG
1	A	796	LYS
1	A	660	ILE
1	A	799	PRO

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	527/625 (84%)	450 (85%)	77 (15%)	3 11

All (77) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	248	LEU
1	A	266	THR
1	A	276	LEU
1	A	294	VAL
1	A	305	GLN
1	A	315	GLU
1	A	322	THR
1	A	332	VAL
1	A	334	VAL
1	A	336	GLN
1	A	339	GLU
1	A	365	ILE
1	A	395	LEU

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Mol	Chain	Res	Type
1	A	409	THR
1	A	412	VAL
1	A	414	VAL
1	A	418	LYS
1	A	420	THR
1	A	424	LEU
1	A	449	LEU
1	A	452	VAL
1	A	458	LYS
1	A	461	ARG
1	A	467	ILE
1	A	482	THR
1	A	489	ILE
1	A	493	LEU
1	A	496	LEU
1	A	499	ILE
1	A	503	GLU
1	A	513	ILE
1	A	515	THR
1	A	521	MET
1	A	536	LYS
1	A	538	LEU
1	A	546	ARG
1	A	552	LEU
1	A	559	ARG
1	A	564	LEU
1	A	579	PHE
1	A	594	LEU
1	A	598	GLU
1	A	614	LEU
1	A	624	LEU
1	A	629	ILE
1	A	631	ILE
1	A	632	LEU
1	A	641	ASP
1	A	643	LEU
1	A	653	LEU
1	A	693	ILE
1	A	694	LEU
1	A	697	THR
1	A	711	LEU
1	A	720	ASN

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Mol	Chain	Res	Type
1	A	736	SER
1	A	740	LEU
1	A	748	ILE
1	A	768	LEU
1	A	771	TRP
1	A	772	ASP
1	A	787	GLU
1	A	790	ILE
1	A	792	ASP
1	A	794	GLN
1	A	811	ARG
1	A	812	LYS
1	A	822	ASP
1	A	827	GLU
1	A	834	LEU
1	A	836	ASP
1	A	839	LYS
1	A	844	SER
1	A	852	GLN
1	A	853	PHE
1	A	857	GLU
1	A	901	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (9) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	305	GLN
1	A	341	ASN
1	A	349	GLN
1	A	375	HIS
1	A	457	GLN
1	A	517	GLN
1	A	720	ASN
1	A	871	HIS
1	A	876	HIS

5.3.3 RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
2	C	9/10 (90%)	0	0

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Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
2	D	9/10 (90%)	3 (33%)	0
All	All	18/20 (90%)	3 (16%)	0

All (3) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
2	D	8	C
2	D	9	G
2	D	10	C

There are no RNA pucker outliers to report.

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](#)

Of 1 ligands modelled in this entry, 1 is monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

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 [i](#)

6.1 Protein, DNA and RNA chains [i](#)

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, 95th 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	632/696 (90%)	-0.19	8 (1%) 75 66	33, 75, 113, 167	0
2	C	10/10 (100%)	-0.95	0 100 100	42, 57, 91, 101	0
2	D	10/10 (100%)	-0.67	0 100 100	51, 77, 88, 105	0
All	All	652/716 (91%)	-0.21	8 (1%) 76 68	33, 75, 113, 167	0

All (8) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	236	ASN	4.3
1	A	733	ALA	4.1
1	A	722	ILE	3.1
1	A	854	SER	2.7
1	A	707	ALA	2.7
1	A	495	ASN	2.2
1	A	691	HIS	2.2
1	A	692	ASN	2.0

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

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

6.3 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum,

median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
3	ZN	A	927	1/1	0.99	0.03	71,71,71,71	0

6.5 Other polymers [i](#)

There are no such residues in this entry.