Full wwPDB X-ray Structure Validation Report ⓘ

Nov 3, 2024 – 01:34 PM JST

PDB ID	:	5WTI
Title	:	Crystal structure of the CRISPR-associated protein in complex with crRNA and DNA
Authors	:	Wu, D.; Guan, X.; Zhu, Y.; Huang, Z.
Deposited on	:	2016-12-13
Resolution	:	2.68 Å(reported)

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

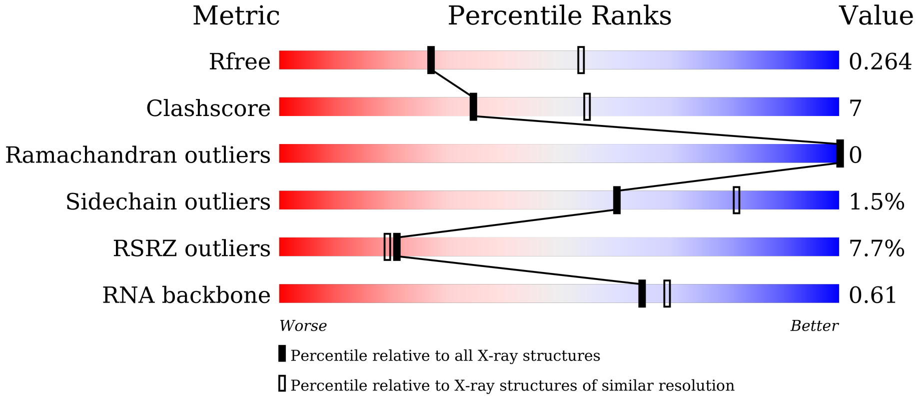
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.13
EDS	:	3.0
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.003 (Gargrove)
Density-Fitness	:	1.0.11
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.39

1 Overall quality at a glance (i)

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

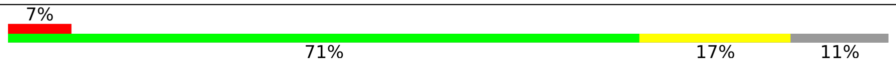
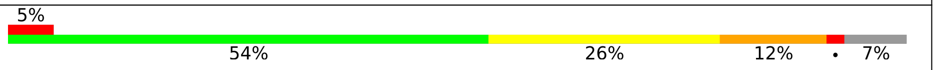
The reported resolution of this entry is 2.68 Å.

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	4708 (2.70-2.66)
Clashscore	180529	5138 (2.70-2.66)
Ramachandran outliers	177936	5071 (2.70-2.66)
Sidechain outliers	177891	5071 (2.70-2.66)
RSRZ outliers	164620	4708 (2.70-2.66)
RNA backbone	3690	1001 (2.90-2.46)

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	E	29	
2	H	12	
3	Z	1108	
4	B	123	

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
5	MG	B	201	-	-	-	X
5	MG	B	202	-	-	-	X
5	MG	B	207	-	-	-	X
5	MG	B	208	-	-	-	X
5	MG	B	209	-	-	-	X
5	MG	B	210	-	-	-	X
5	MG	B	211	-	-	-	X

2 Entry composition (i)

There are 6 unique types of molecules in this entry. The entry contains 11276 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 DNA chain called DNA (28-MER).

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	P			
1	E	28	566	271	101	166	28	0	0	0

- Molecule 2 is a DNA chain called DNA (5'-D(P*GP*TP*GP*TP*GP*GP*AP*TP*TP*CP *CP*G)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	P			
2	H	11	227	108	39	69	11	0	0	0

- Molecule 3 is a protein called CRISPR-associated protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	Z	982	7888	5044	1384	1440	20	0	0	0

- Molecule 4 is a RNA chain called RNA (123-MER).

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	P			
4	B	115	2462	1098	442	807	115	0	0	0

- Molecule 5 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	Mg		
5	E	1	1	1	0	0
5	H	1	1	1	0	0
5	Z	5	5	5	0	0

Continued on next page...

Continued from previous page...

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	B	19	Total Mg 19 19	0	0

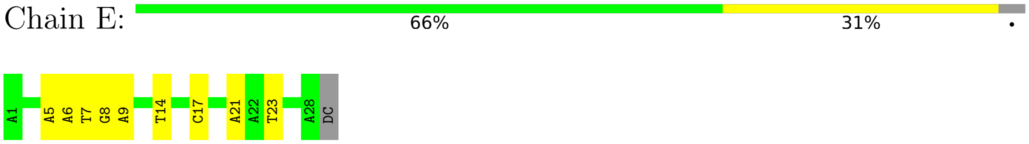
- Molecule 6 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	E	10	Total O 10 10	0	0
6	H	2	Total O 2 2	0	0
6	Z	69	Total O 69 69	0	0
6	B	26	Total O 26 26	0	0

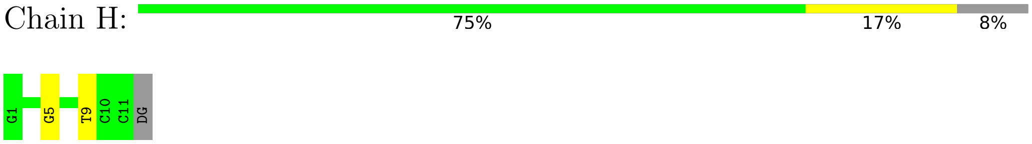
3 Residue-property plots ⓘ

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.

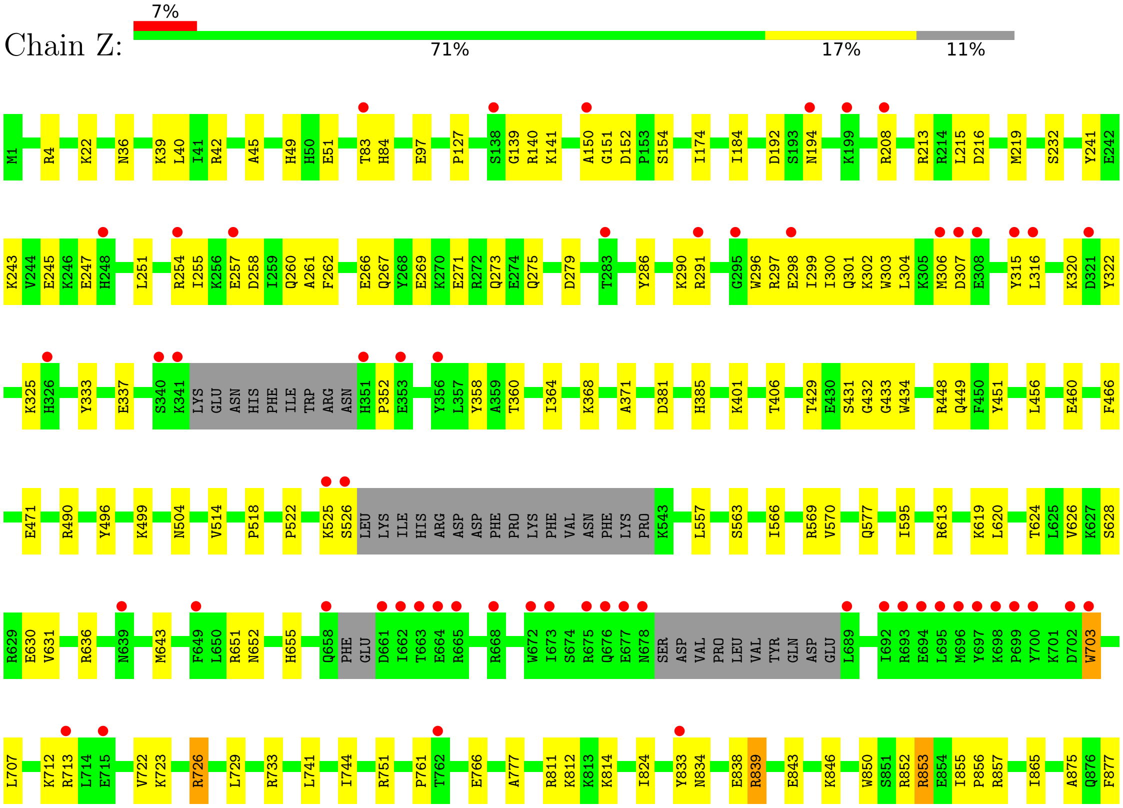
- Molecule 1: DNA (28-MER)

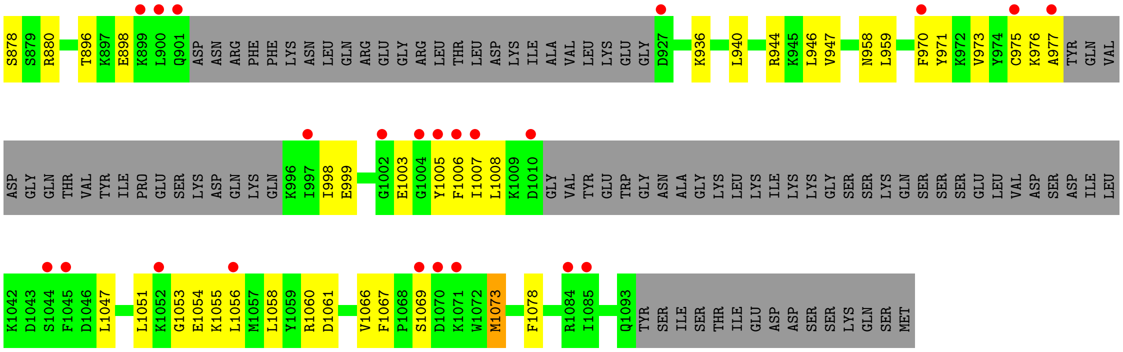


- Molecule 2: DNA (5’-D(P*GP*TP*GP*TP*GP*GP*AP*TP*TP*CP*CP*G)-3’)



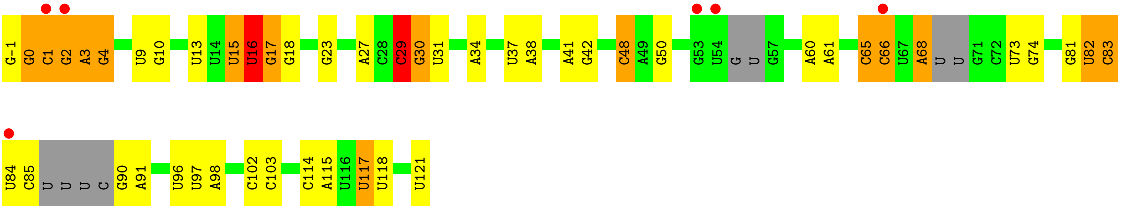
- Molecule 3: CRISPR-associated protein





- Molecule 4: RNA (123-MER)

Chain B:



4 Data and refinement statistics ⓘ

Property	**Value**	**Source**
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α, β, γ	172.06Å 138.74Å 95.61Å 90.00° 117.45° 90.00°	Depositor
Resolution (Å)	19.91 – 2.68 19.91 – 2.68	Depositor EDS
% Data completeness (in resolution range)	76.1 (19.91-2.68) 89.2 (19.91-2.68)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.89 (at 2.67Å)	Xtriage
Refinement program	PHENIX (1.10.1_2155: ???)	Depositor
R, R_{free}	0.217 , 0.264 0.216 , 0.264	Depositor DCC
R_{free} test set	2000 reflections (3.88%)	wwPDB-VP
Wilson B-factor (Å^2)	38.0	Xtriage
Anisotropy	0.034	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.31 , 51.1	EDS
L-test for twinning[2]	$< \|L\| > = 0.49$, $< L^2 > = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.90	EDS
Total number of atoms	11276	wwPDB-VP
Average B, all atoms (Å^2)	41.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.56% 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 ⓘ

5.1 Standard geometry ⓘ

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

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	E	0.59	0/633	0.92	0/972
2	H	0.61	0/253	1.02	0/389
3	Z	0.30	0/8058	0.47	1/10857 (0.0%)
4	B	0.28	0/2751	0.84	5/4281 (0.1%)
All	All	0.33	0/11695	0.63	6/16499 (0.0%)

There are no bond length outliers.

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	B	29	C	N3-C2-O2	-7.14	116.90	121.90
3	Z	194	ASN	C-N-CA	7.07	139.36	121.70
4	B	29	C	C2-N1-C1'	5.68	125.05	118.80
4	B	29	C	N1-C2-O2	5.57	122.24	118.90
4	B	16	U	N3-C2-O2	-5.32	118.47	122.20
4	B	16	U	C2-N1-C1'	5.14	123.86	117.70

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	E	566	0	316	7	0

Continued on next page...

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	H	227	0	126	2	0
3	Z	7888	0	7706	121	0
4	B	2462	0	1240	37	0
5	B	19	0	0	0	0
5	E	1	0	0	0	0
5	H	1	0	0	0	0
5	Z	5	0	0	0	0
6	B	26	0	0	1	0
6	E	10	0	0	0	0
6	H	2	0	0	0	0
6	Z	69	0	0	0	1
All	All	11276	0	9388	150	1

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 7.

All (150) 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)
3:Z:651:ARG:NH1	4:B:117:U:OP1	2.10	0.84
4:B:-1:G:H1	4:B:29:C:H5	1.30	0.78
4:B:85:C:H5	4:B:90:G:H1	1.30	0.77
1:E:23:DT:H5”	3:Z:141:LYS:HG2	1.66	0.76
3:Z:254:ARG:CZ	3:Z:257:GLU:HG3	2.19	0.73
3:Z:216:ASP:HA	3:Z:219:MET:HE2	1.69	0.73
3:Z:557:LEU:HD13	3:Z:566:ILE:HD11	1.74	0.68
3:Z:940:LEU:HD12	3:Z:1066:VAL:HG12	1.75	0.68
3:Z:834:ASN:O	3:Z:839:ARG:NH1	2.27	0.68
2:H:5:DG:OP2	3:Z:401:LYS:NZ	2.26	0.68
3:Z:456:LEU:HD23	3:Z:466:PHE:HB3	1.79	0.64
3:Z:299:ILE:O	3:Z:302:LYS:HB2	1.98	0.64
4:B:0:G:H2’	4:B:1:C:O4’	1.97	0.64
3:Z:245:GLU:OE1	3:Z:368:LYS:NZ	2.28	0.62
3:Z:258:ASP:OD1	3:Z:260:GLN:HG2	2.00	0.62
3:Z:298:GLU:OE1	3:Z:322:TYR:OH	2.15	0.62
3:Z:431:SER:N	3:Z:432:GLY:HA2	2.16	0.61
3:Z:613:ARG:NH1	4:B:17:G:N7	2.49	0.61
3:Z:761:PRO:HB3	3:Z:766:GLU:HB3	1.82	0.60
3:Z:300:ILE:HG13	3:Z:304:LEU:HD12	1.83	0.60
4:B:73:U:H2’	4:B:74:G:C8	2.36	0.60
4:B:15:U:H4’	4:B:16:U:O5’	2.02	0.59

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:Z:499:LYS:HB3	3:Z:504:ASN:HB3	1.84	0.59
4:B:73:U:H2'	4:B:74:G:H8	1.67	0.59
3:Z:275:GLN:NE2	3:Z:279:ASP:OD2	2.33	0.59
3:Z:152:ASP:OD1	3:Z:154:SER:OG	2.19	0.59
3:Z:976:LYS:HA	3:Z:1055:LYS:HD3	1.83	0.59
3:Z:269:GLU:O	3:Z:273:GLN:HG3	2.03	0.57
3:Z:518:PRO:HB3	3:Z:865:ILE:HA	1.87	0.57
3:Z:255:ILE:HD11	3:Z:358:TYR:HD1	1.70	0.57
3:Z:258:ASP:OD1	3:Z:261:ALA:N	2.18	0.57
3:Z:703:TRP:NE1	3:Z:707:LEU:HD11	2.20	0.56
1:E:7:DT:H2'	1:E:8:DG:C8	2.40	0.56
3:Z:875:ALA:HB2	3:Z:959:LEU:HD21	1.86	0.55
3:Z:570:VAL:HG22	3:Z:824:ILE:HB	1.88	0.55
3:Z:855:ILE:HB	3:Z:856:PRO:HD3	1.88	0.55
3:Z:577:GLN:N	3:Z:577:GLN:OE1	2.38	0.54
3:Z:51:GLU:OE1	3:Z:385:HIS:NE2	2.28	0.54
3:Z:1060:ARG:HH21	3:Z:1069:SER:HB3	1.72	0.54
1:E:14:DT:OP2	3:Z:857:ARG:NH2	2.41	0.54
3:Z:733:ARG:NH1	4:B:48:C:OP2	2.39	0.54
4:B:34:A:H62	4:B:73:U:H3	1.55	0.54
3:Z:49:HIS:NE2	3:Z:51:GLU:OE1	2.29	0.53
3:Z:36:ASN:HD22	3:Z:39:LYS:HE3	1.73	0.53
2:H:9:DT:O4'	3:Z:139:GLY:HA3	2.08	0.53
3:Z:406:THR:HG21	3:Z:460:GLU:HG3	1.90	0.52
3:Z:448:ARG:NH2	3:Z:471:GLU:OE1	2.34	0.52
3:Z:273:GLN:HG2	3:Z:286:TYR:HB3	1.92	0.52
3:Z:306:MET:O	3:Z:315:TYR:OH	2.18	0.52
3:Z:297:ARG:O	3:Z:301:GLN:NE2	2.41	0.50
3:Z:22:LYS:HE3	3:Z:434:TRP:CE2	2.47	0.50
3:Z:83:THR:HG22	3:Z:84:HIS:H	1.76	0.50
3:Z:970:PHE:CE2	3:Z:1006:PHE:HB2	2.47	0.50
3:Z:254:ARG:NH1	3:Z:257:GLU:HG3	2.26	0.50
3:Z:975:CYS:HB3	3:Z:998:ILE:HG22	1.93	0.49
3:Z:97:GLU:HG2	3:Z:174:ILE:HD11	1.94	0.49
3:Z:251:LEU:HD12	3:Z:364:ILE:HD12	1.93	0.49
3:Z:255:ILE:HD11	3:Z:358:TYR:CD1	2.47	0.49
3:Z:192:ASP:OD1	3:Z:213:ARG:NH2	2.36	0.48
3:Z:636:ARG:NH2	3:Z:729:LEU:O	2.38	0.48
4:B:9:U:H2'	4:B:10:G:C8	2.48	0.48
3:Z:852:ARG:HG2	3:Z:853:ARG:HG2	1.94	0.48
3:Z:150:ALA:N	3:Z:151:GLY:HA2	2.28	0.48

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:Z:296:TRP:CH2	3:Z:300:ILE:HD13	2.49	0.47
3:Z:1073:MET:HG3	3:Z:1078:PHE:HB2	1.96	0.47
4:B:82:U:H2'	4:B:83:C:C6	2.49	0.47
3:Z:241:TYR:CE1	3:Z:371:ALA:HB1	2.49	0.47
3:Z:290:LYS:HD3	3:Z:360:THR:HG22	1.96	0.47
3:Z:267:GLN:O	3:Z:271:GLU:HG3	2.14	0.47
3:Z:352:PRO:HB2	3:Z:1051:LEU:HD13	1.96	0.47
3:Z:843:GLU:HG3	3:Z:846:LYS:HE3	1.95	0.47
3:Z:4:ARG:O	3:Z:514:VAL:HG12	2.15	0.47
1:E:17:DC:OP1	3:Z:232:SER:OG	2.27	0.47
3:Z:297:ARG:HD3	3:Z:1047:LEU:CD1	2.45	0.47
3:Z:619:LYS:HD3	3:Z:624:THR:HG22	1.96	0.47
4:B:82:U:O2'	4:B:83:C:OP1	2.33	0.47
3:Z:563:SER:O	3:Z:569:ARG:NH2	2.48	0.47
3:Z:262:PHE:O	3:Z:266:GLU:HG3	2.15	0.46
3:Z:652:ASN:HA	3:Z:655:HIS:HB3	1.96	0.46
3:Z:316:LEU:HD21	3:Z:333:TYR:HE1	1.79	0.46
3:Z:878:SER:O	3:Z:958:ASN:ND2	2.40	0.46
3:Z:999:GLU:OE2	3:Z:1005:TYR:OH	2.25	0.46
4:B:82:U:H2'	4:B:83:C:H6	1.80	0.46
3:Z:643:MET:SD	3:Z:722:VAL:HG12	2.55	0.46
3:Z:303:TRP:O	3:Z:307:ASP:HB3	2.16	0.46
3:Z:522:PRO:O	3:Z:525:LYS:HD2	2.16	0.46
4:B:16:U:O2'	4:B:17:G:OP1	2.25	0.46
1:E:8:DG:H2'	1:E:9:DA:C8	2.52	0.45
3:Z:297:ARG:HD3	3:Z:1047:LEU:HD11	1.98	0.45
3:Z:846:LYS:O	3:Z:850:TRP:HB2	2.16	0.45
3:Z:42:ARG:NH2	3:Z:45:ALA:O	2.49	0.45
3:Z:628:SER:O	3:Z:631:VAL:HG22	2.16	0.45
3:Z:243:LYS:O	3:Z:247:GLU:HG3	2.16	0.45
3:Z:1054:GLU:O	3:Z:1055:LYS:HG2	2.17	0.45
4:B:65:C:HO2'	4:B:66:C:P	2.39	0.45
3:Z:877:PHE:HD1	3:Z:880:ARG:HG3	1.82	0.45
4:B:3:A:H2'	4:B:4:G:O4'	2.16	0.45
3:Z:215:LEU:O	3:Z:219:MET:HG3	2.17	0.44
3:Z:741:LEU:HD23	3:Z:744:ILE:HD12	1.99	0.44
3:Z:316:LEU:HD13	3:Z:337:GLU:HA	1.98	0.44
3:Z:944:ARG:HB3	3:Z:944:ARG:NH2	2.32	0.44
3:Z:620:LEU:O	4:B:3:A:H5"	2.17	0.44
3:Z:973:VAL:HG23	3:Z:1058:LEU:HB2	2.00	0.44
3:Z:1061:ASP:HB3	3:Z:1067:PHE:HB2	1.99	0.44

Continued on next page...

Continued from previous page...

Atom-1	**Atom-2**	**Interatomic distance (Å)**	**Clash overlap (Å)**
3:Z:325:LYS:HE3	3:Z:325:LYS:HB3	1.82	0.44
3:Z:297:ARG:HG3	3:Z:301:GLN:NE2	2.32	0.44
3:Z:429:THR:OG1	3:Z:433:GLY:N	2.50	0.44
3:Z:971:TYR:HA	3:Z:1060:ARG:HG2	1.98	0.44
3:Z:36:ASN:O	3:Z:40:LEU:HG	2.19	0.43
3:Z:1007:ILE:HG13	3:Z:1008:LEU:HD22	1.98	0.43
1:E:21:DA:H1'	3:Z:140:ARG:HH11	1.84	0.43
3:Z:977:ALA:HA	3:Z:998:ILE:HA	2.00	0.43
4:B:-1:G:N1	4:B:29:C:H5	2.06	0.43
4:B:65:C:O2'	4:B:66:C:OP1	2.34	0.43
3:Z:940:LEU:HD23	3:Z:946:LEU:HA	2.01	0.43
3:Z:1053:GLY:HA2	3:Z:1056:LEU:CD2	2.49	0.43
4:B:50:G:O2'	6:B:301:HOH:O	2.21	0.43
3:Z:300:ILE:HG13	3:Z:304:LEU:CD1	2.49	0.43
3:Z:812:LYS:O	3:Z:814:LYS:HG3	2.19	0.43
4:B:9:U:H2'	4:B:10:G:H8	1.84	0.43
4:B:84:U:H3	4:B:91:A:H61	1.66	0.42
3:Z:208:ARG:H	3:Z:208:ARG:HG3	1.53	0.42
1:E:5:DA:H2'	1:E:6:DA:C8	2.54	0.42
3:Z:496:TYR:HB3	3:Z:499:LYS:HB2	2.02	0.42
3:Z:127:PRO:HB3	3:Z:184:ILE:HG22	2.01	0.42
3:Z:811:ARG:HA	4:B:27:A:H1'	2.02	0.42
3:Z:83:THR:HG22	3:Z:84:HIS:N	2.34	0.41
3:Z:947:VAL:HG23	4:B:13:U:H5'	2.02	0.41
3:Z:320:LYS:HZ2	4:B:121:U:HO3'	1.57	0.41
4:B:29:C:O2'	4:B:30:G:OP2	2.34	0.41
3:Z:626:VAL:O	3:Z:630:GLU:HG2	2.21	0.41
4:B:114:C:H2'	4:B:115:A:C8	2.56	0.41
3:Z:451:TYR:OH	4:B:96:U:OP1	2.30	0.41
3:Z:723:LYS:HD2	4:B:60:A:OP1	2.20	0.41
3:Z:291:ARG:HG2	3:Z:838:GLU:HA	2.03	0.41
4:B:2:G:H4'	4:B:3:A:OP1	2.21	0.41
3:Z:251:LEU:HD23	3:Z:251:LEU:HA	1.88	0.41
3:Z:449:GLN:HG3	4:B:102:C:C4	2.55	0.41
3:Z:726:ARG:NE	4:B:61:A:OP1	2.54	0.41
3:Z:1053:GLY:HA2	3:Z:1056:LEU:HD23	2.03	0.41
3:Z:944:ARG:HB3	3:Z:944:ARG:HH21	1.85	0.41
4:B:37:U:H5	4:B:68:A:N7	2.18	0.41
3:Z:525:LYS:O	3:Z:526:SER:HB2	2.20	0.41
3:Z:595:ILE:H	3:Z:595:ILE:HD12	1.86	0.41
4:B:34:A:C8	4:B:74:G:C2	3.09	0.40

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:B:81:G:C6	4:B:82:U:C4	3.10	0.40
3:Z:300:ILE:HD12	3:Z:303:TRP:HB2	2.02	0.40
3:Z:751:ARG:NH1	3:Z:777:ALA:HB3	2.36	0.40
3:Z:896:THR:C	3:Z:898:GLU:H	2.25	0.40
4:B:16:U:H3'	4:B:16:U:O2	2.22	0.40

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:Z:1332:HOH:O	6:Z:1332:HOH:O[2_859]	2.19	0.01

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
3	Z	966/1108 (87%)	931 (96%)	35 (4%)	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
3	Z	815/1005 (81%)	803 (98%)	12 (2%)	60 82

All (12) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
3	Z	381	ASP
3	Z	490	ARG
3	Z	703	TRP
3	Z	712	LYS
3	Z	713	ARG
3	Z	726	ARG
3	Z	833	TYR
3	Z	839	ARG
3	Z	853	ARG
3	Z	936	LYS
3	Z	1003	GLU
3	Z	1073	MET

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
3	Z	24	HIS
3	Z	36	ASN
3	Z	267	GLN
3	Z	273	GLN

5.3.3 RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
4	B	111/123 (90%)	22 (19%)	10 (9%)

All (22) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
4	B	1	C
4	B	2	G
4	B	3	A
4	B	4	G
4	B	15	U
4	B	16	U
4	B	17	G
4	B	18	G
4	B	23	G
4	B	30	G

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
4	B	31	U
4	B	38	A
4	B	41	A
4	B	42	G
4	B	48	C
4	B	66	C
4	B	68	A
4	B	83	C
4	B	98	A
4	B	103	C
4	B	117	U
4	B	118	U

All (10) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
4	B	0	G
4	B	2	G
4	B	3	A
4	B	15	U
4	B	16	U
4	B	29	C
4	B	30	G
4	B	65	C
4	B	82	U
4	B	97	U

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 oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 26 ligands modelled in this entry, 26 are 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 ⓘ

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, 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	E	28/29 (96%)	-0.57	0	100	100	10, 25, 63, 76	0
2	H	11/12 (91%)	0.00	0	100	100	21, 26, 78, 82	0
3	Z	982/1108 (88%)	0.22	81 (8%)	19	18	9, 39, 87, 140	0
4	B	115/123 (93%)	0.14	6 (5%)	34	32	13, 40, 71, 90	0
All	All	1136/1272 (89%)	0.19	87 (7%)	21	19	9, 39, 85, 140	0

All (87) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
3	Z	658	GLN	5.1
3	Z	672	TRP	4.1
4	B	54	U	4.0
3	Z	308	GLU	4.0
3	Z	977	ALA	3.9
3	Z	661	ASP	3.8
3	Z	138	SER	3.5
3	Z	678	ASN	3.5
3	Z	1004	GLY	3.5
3	Z	901	GLN	3.5
3	Z	673	ILE	3.4
3	Z	208	ARG	3.4
3	Z	697	TYR	3.4
3	Z	649	PHE	3.3
3	Z	194	ASN	3.3
3	Z	696	MET	3.2
3	Z	1045	PHE	3.1
3	Z	150	ALA	3.1
3	Z	1044	SER	3.1
3	Z	975	CYS	3.0
3	Z	291	ARG	3.0

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
3	Z	703	TRP	3.0
3	Z	715	GLU	3.0
3	Z	351	HIS	3.0
3	Z	676	GLN	3.0
3	Z	677	GLU	2.9
4	B	2	G	2.9
3	Z	199	LYS	2.9
3	Z	1005	TYR	2.9
3	Z	662	ILE	2.8
3	Z	254	ARG	2.8
3	Z	341	LYS	2.8
3	Z	665	ARG	2.8
3	Z	257	GLU	2.8
3	Z	1085	ILE	2.8
3	Z	762	THR	2.8
3	Z	675	ARG	2.7
3	Z	997	ILE	2.7
3	Z	1006	PHE	2.7
3	Z	248	HIS	2.7
3	Z	321	ASP	2.6
3	Z	83	THR	2.6
3	Z	307	ASP	2.6
3	Z	1056	LEU	2.6
3	Z	664	GLU	2.6
3	Z	1070	ASP	2.6
4	B	53	G	2.6
3	Z	899	LYS	2.6
3	Z	900	LEU	2.6
3	Z	833	TYR	2.5
3	Z	1007	ILE	2.5
4	B	66	C	2.5
3	Z	694	GLU	2.5
3	Z	699	PRO	2.5
3	Z	326	HIS	2.5
3	Z	526	SER	2.5
3	Z	1052	LYS	2.5
3	Z	315	TYR	2.4
3	Z	1071	LYS	2.4
4	B	1	C	2.4
3	Z	695	LEU	2.4
3	Z	693	ARG	2.4
3	Z	689	LEU	2.3

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
3	Z	295	GLY	2.3
3	Z	306	MET	2.3
3	Z	663	THR	2.3
3	Z	713	ARG	2.2
3	Z	353	GLU	2.2
3	Z	698	LYS	2.2
3	Z	692	ILE	2.2
3	Z	700	TYR	2.2
3	Z	356	TYR	2.2
3	Z	316	LEU	2.2
3	Z	298	GLU	2.1
3	Z	1069	SER	2.1
3	Z	525	LYS	2.1
3	Z	668	ARG	2.1
3	Z	340	SER	2.1
3	Z	702	ASP	2.1
3	Z	1010	ASP	2.1
3	Z	1002	GLY	2.1
3	Z	927	ASP	2.1
4	B	84	U	2.1
3	Z	639	ASN	2.0
3	Z	1084	ARG	2.0
3	Z	283	THR	2.0
3	Z	970	PHE	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)

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, 95^{th} 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($Å^2$)	Q<0.9
5	MG	Z	1201	1/1	0.51	0.29	44,44,44,44	0
5	MG	Z	1205	1/1	0.53	0.35	54,54,54,54	0
5	MG	B	202	1/1	0.53	0.45	46,46,46,46	0
5	MG	B	212	1/1	0.57	0.12	20,20,20,20	0
5	MG	B	216	1/1	0.57	0.26	40,40,40,40	0
5	MG	B	214	1/1	0.59	0.17	25,25,25,25	0
5	MG	B	207	1/1	0.61	0.43	55,55,55,55	0
5	MG	H	101	1/1	0.61	0.30	32,32,32,32	0
5	MG	B	209	1/1	0.62	0.56	44,44,44,44	0
5	MG	B	203	1/1	0.64	0.30	36,36,36,36	0
5	MG	B	211	1/1	0.65	0.48	49,49,49,49	0
5	MG	E	101	1/1	0.65	0.12	23,23,23,23	0
5	MG	Z	1202	1/1	0.66	0.33	40,40,40,40	0
5	MG	B	218	1/1	0.66	0.29	41,41,41,41	0
5	MG	B	213	1/1	0.69	0.17	28,28,28,28	0
5	MG	B	215	1/1	0.69	0.28	27,27,27,27	0
5	MG	B	208	1/1	0.70	0.42	58,58,58,58	0
5	MG	Z	1204	1/1	0.72	0.21	46,46,46,46	0
5	MG	B	201	1/1	0.72	0.45	41,41,41,41	0
5	MG	Z	1203	1/1	0.75	0.38	30,30,30,30	0
5	MG	B	210	1/1	0.76	0.42	41,41,41,41	0
5	MG	B	205	1/1	0.76	0.23	32,32,32,32	0
5	MG	B	206	1/1	0.79	0.14	28,28,28,28	0
5	MG	B	204	1/1	0.81	0.36	36,36,36,36	0
5	MG	B	217	1/1	0.89	0.47	43,43,43,43	0
5	MG	B	219	1/1	0.90	0.06	28,28,28,28	0

6.5 Other polymers ⓘ

There are no such residues in this entry.