Full wwPDB X-ray Structure Validation Report ⓘ

Jun 24, 2025 – 02:18 pm BST

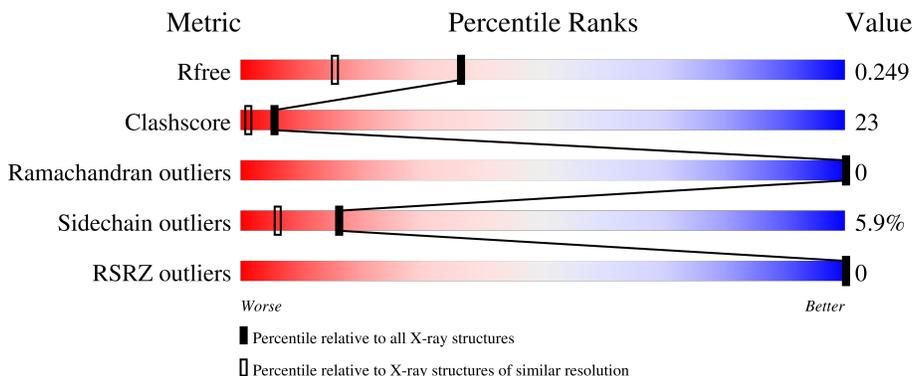|		
PDB ID	:	5A3D / pdb_00005a3d
Title	:	Structural insights into the recognition of cisplatin and AAF-dG lesions by Rad14 (XPA)
Authors	:	Kuper, J.; Koch, S.C.; Gasteiger, K.L.; Wichlein, N.; Schneider, S.; Kisker, C.; Carell, T.
Deposited on	:	2015-05-28
Resolution	:	1.80 Å(reported)

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 1.80 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	Percentile Ranks	Value
Rfree		0.249
Clashscore		23
Ramachandran outliers		0
Sidechain outliers		5.9%
RSRZ outliers		0

Worse   *Better*

▮ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	164625	7108 (1.80-1.80)
Clashscore	180529	8162 (1.80-1.80)
Ramachandran outliers	177936	8077 (1.80-1.80)
Sidechain outliers	177891	8076 (1.80-1.80)
RSRZ outliers	164620	7108 (1.80-1.80)

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 >=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	115	78% 19% ··
1	B	115	83% 14% ·
2	C	15	7% 73% 20%
3	D	15	13% 67% 20%

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
3	5IU	D	10[B]	-	-	X	-

2 Entry composition ⓘ

There are 5 unique types of molecules in this entry. The entry contains 3156 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 DNA REPAIR PROTEIN RAD14.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	114	Total	C	N	O	S	0	0	0
			935	591	159	177	8			
1	B	115	Total	C	N	O	S	0	0	0
			940	594	160	178	8			

- Molecule 2 is a DNA chain called 5'-D(*DTP*CP*TP*CP*TP*AP*C 8FGP*TP*CP*AP* TP*CP*DAP*CP)-3'.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	C	15	Total	C	N	O	P	0	15	0
			626	318	98	182	28			

- Molecule 3 is a DNA chain called 5'-D(*DG 5IUP*GP*A 5IUP*GP*AP*CP*G 5IUP*AP* GP*AP*DGP*AP)-3'.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
3	D	15	Total	C	I	N	O	P	0	15	0
			610	284	6	122	170	28			

- Molecule 4 is ZINC ION (CCD ID: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	1	Total	Zn	0	0
			1	1		
4	B	1	Total	Zn	0	0
			1	1		

- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	19	Total	O	0	0
			19	19		

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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	B	18	Total 18	O 18	0	0
5	C	2	Total 2	O 2	0	0
5	D	4	Total 4	O 4	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 REPAIR PROTEIN RAD14
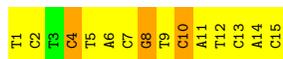
Chain A:

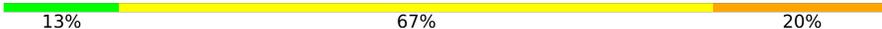• Molecule 1: DNA REPAIR PROTEIN RAD14

Chain B:

• Molecule 2: 5'-D(*DTP*CP*TP*CP*TP*AP*C 8FGP*TP*CP*AP*TP*CP*DAP*CP)-3'

Chain C:

• Molecule 3: 5'-D(*DG 5IUP*GP*A 5IUP*GP*AP*CP*G 5IUP*AP*GP*AP*DGP*AP)-3'

Chain D:

4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 41	Depositor
Cell constants a, b, c, α, β, γ	53.73Å 53.73Å 130.55Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	53.73 – 1.80 53.73 – 1.80	Depositor EDS
% Data completeness (in resolution range)	99.8 (53.73-1.80) 99.8 (53.73-1.80)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.63 (at 1.79Å)	Xtriage
Refinement program	REFMAC 5.7.0032	Depositor
R, R_{free}	0.210 , 0.241 0.222 , 0.249	Depositor DCC
R_{free} test set	1705 reflections (5.07%)	wwPDB-VP
Wilson B-factor (Å^2)	32.0	Xtriage
Anisotropy	0.019	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.33 , 23.6	EDS
L-test for twinning[2]	$< |L| > = 0.50, < L^2 > = 0.33$	Xtriage
Estimated twinning fraction	0.487 for h,-k,-l	Xtriage
F_o,F_c correlation	0.96	EDS
Total number of atoms	3156	wwPDB-VP
Average B, all atoms (Å^2)	48.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.55% of the height of the origin peak. No significant pseudotranslation is detected.*

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[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)

Bond lengths and bond angles in the following residue types are not validated in this section: 5IU, 8FG, 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	1.36	8/958 (0.8%)	1.20	0/1289
1	B	1.32	0/963	1.26	2/1296 (0.2%)
2	C	0.40	0/606	0.85	4/922 (0.4%)
3	D	0.35	0/550	0.59	0/834
All	All	1.08	8/3077 (0.3%)	1.06	6/4341 (0.1%)

All (8) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	217	SER	CA-C	6.75	1.61	1.52
1	A	246	GLU	N-CA	6.15	1.54	1.46
1	A	214	LYS	N-CA	-5.31	1.39	1.46
1	A	212	VAL	C-O	-5.26	1.18	1.24
1	A	271	CYS	CA-C	5.17	1.59	1.52
1	A	269	VAL	C-O	5.11	1.30	1.24
1	A	263	ALA	CA-CB	-5.07	1.44	1.53
1	A	266	GLN	C-O	-5.00	1.18	1.24

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	198	ILE	N-CA-CB	-6.79	102.98	112.35
2	C	4[A]	DC	C2'-C3'-O3'	6.21	120.81	111.50
2	C	4[B]	DC	C2'-C3'-O3'	6.21	120.81	111.50
1	B	269	VAL	N-CA-CB	5.16	116.34	110.72
2	C	10[A]	DC	C2'-C3'-O3'	-5.05	103.92	111.50
2	C	10[B]	DC	C2'-C3'-O3'	-5.05	103.92	111.50

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	935	0	884	11	0
1	B	940	0	886	16	0
2	C	626	0	344	70	1
3	D	610	0	273	56	0
4	A	1	0	0	0	0
4	B	1	0	0	0	0
5	A	19	0	0	0	1
5	B	18	0	0	1	0
5	C	2	0	0	0	0
5	D	4	0	0	5	0
All	All	3156	0	2387	124	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 23.

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)
3:D:9[B]:DG:H2"	3:D:10[B]:5IU:C5'	1.33	1.55
2:C:8[B]:8FG:C43	3:D:8[B]:DC:H2'	1.70	1.20
3:D:9[B]:DG:C2'	3:D:10[B]:5IU:C5'	2.25	1.14
3:D:9[B]:DG:H5"	3:D:9[B]:DG:H8	1.15	1.12
2:C:8[B]:8FG:H372	3:D:9[B]:DG:O6	1.51	1.11
2:C:8[B]:8FG:H43	3:D:8[B]:DC:H2'	1.31	1.10
3:D:9[B]:DG:H2"	3:D:10[B]:5IU:H5'	1.21	1.09
3:D:9[B]:DG:H5"	3:D:9[B]:DG:C8	1.88	1.08
2:C:8[A]:8FG:N7	2:C:8[A]:8FG:H33	1.68	1.07
2:C:8[B]:8FG:N7	2:C:8[B]:8FG:H33	1.68	1.07
2:C:5[B]:DT:H2"	2:C:6[B]:DA:C8	1.93	1.04
3:D:9[B]:DG:C2'	3:D:10[B]:5IU:H5'	1.88	1.00
2:C:8[B]:8FG:N7	2:C:8[B]:8FG:C33	2.22	0.99
2:C:8[B]:8FG:H43	3:D:8[B]:DC:C2'	1.97	0.93
2:C:8[A]:8FG:N7	2:C:8[A]:8FG:C33	2.28	0.92
2:C:5[A]:DT:OP1	3:D:15[A]:DA:N6	2.06	0.87
2:C:6[B]:DA:C5	2:C:7[B]:DC:N4	2.42	0.86

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:D:8[B]:DC:H2"	3:D:9[B]:DG:O5'	1.77	0.84
1:B:261:THR:O	3:D:15[B]:DA:C2'	2.25	0.84
3:D:1[A]:DG:H3'	3:D:2[A]:5IU:H5"	1.60	0.83
2:C:8[B]:8FG:H372	3:D:9[B]:DG:C6	2.13	0.82
2:C:7[B]:DC:C2'	2:C:8[B]:8FG:H5'	2.09	0.82
2:C:6[B]:DA:H2"	2:C:7[B]:DC:H5'	1.63	0.80
2:C:6[B]:DA:N7	2:C:7[B]:DC:N4	2.30	0.79
1:B:261:THR:O	3:D:15[B]:DA:H2'	1.84	0.78
2:C:1[A]:DT:H3'	2:C:2[A]:DC:H5'	1.64	0.78
2:C:6[B]:DA:C5	2:C:7[B]:DC:C4	2.72	0.78
2:C:7[B]:DC:H2"	2:C:8[B]:8FG:H5'	1.65	0.77
3:D:9[B]:DG:H1'	3:D:10[B]:5IU:H5'	1.67	0.77
3:D:9[B]:DG:C1'	3:D:10[B]:5IU:H5'	2.15	0.77
2:C:5[B]:DT:C2'	2:C:6[B]:DA:C8	2.69	0.76
2:C:14[A]:DA:OP2	2:C:15[A]:DC:N3	2.19	0.76
3:D:9[B]:DG:H8	3:D:9[B]:DG:C5'	1.97	0.74
1:A:239:THR:HG21	2:C:7[B]:DC:OP1	1.85	0.74
2:C:6[B]:DA:H2'	2:C:7[B]:DC:C6	2.23	0.74
1:B:251:ARG:HH11	1:B:251:ARG:HG2	1.53	0.73
2:C:1[B]:DT:H3'	2:C:1[B]:DT:O2	1.90	0.72
1:A:263:ALA:HB2	3:D:15[A]:DA:H2"	1.72	0.72
1:B:294:ARG:NH1	3:D:9[B]:DG:OP2	2.23	0.70
2:C:4[B]:DC:H2'	2:C:5[B]:DT:H71	1.71	0.70
2:C:4[B]:DC:C2'	2:C:5[B]:DT:H71	2.21	0.69
3:D:7[A]:DA:C5'	5:D:2003:HOH:O	2.39	0.69
1:B:240:ASP:OD2	3:D:5[A]:5IU:I5	2.82	0.68
2:C:8[B]:8FG:C37	3:D:9[B]:DG:O6	2.34	0.68
1:A:258:HIS:NE2	2:C:2[A]:DC:OP2	2.20	0.68
1:B:239:THR:HG21	3:D:7[B]:DA:OP1	1.94	0.67
3:D:11[B]:DA:H2"	3:D:12[B]:DG:H5'	1.75	0.67
3:D:1[A]:DG:H3'	3:D:2[A]:5IU:C5'	2.24	0.67
2:C:4[B]:DC:H2"	2:C:5[B]:DT:C6	2.30	0.65
3:D:7[A]:DA:H5'	5:D:2003:HOH:O	1.95	0.65
2:C:9[B]:DT:O4	3:D:7[B]:DA:N6	2.17	0.64
3:D:9[B]:DG:C8	3:D:9[B]:DG:C5'	2.75	0.64
3:D:9[B]:DG:H2'	3:D:10[B]:5IU:H6	1.81	0.63
2:C:8[A]:8FG:H43	3:D:8[A]:DC:H2'	1.81	0.62
2:C:8[B]:8FG:H43	3:D:8[B]:DC:C1'	2.29	0.61
2:C:1[B]:DT:O2	2:C:1[B]:DT:C3'	2.48	0.61
3:D:14[B]:DG:H3'	3:D:15[B]:DA:H5"	1.82	0.61
3:D:12[B]:DG:H1'	3:D:13[B]:DA:H5"	1.82	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:8[B]:8FG:H36	3:D:8[B]:DC:C1'	2.31	0.60
1:A:294:ARG:NH1	3:D:9[A]:DG:OP1	2.34	0.60
3:D:8[B]:DC:C2'	3:D:9[B]:DG:O5'	2.49	0.59
2:C:8[A]:8FG:H372	3:D:9[A]:DG:O6	2.02	0.59
3:D:9[B]:DG:H2'	3:D:10[B]:5IU:C6	2.35	0.57
2:C:8[B]:8FG:H1'	2:C:8[B]:8FG:O44	2.06	0.56
2:C:8[B]:8FG:C2	2:C:9[B]:DT:H73	2.36	0.56
1:B:194:CYS:HB3	1:B:216:CYS:SG	2.46	0.56
1:B:248:LEU:HD21	1:B:276:PHE:CE1	2.42	0.54
2:C:1[A]:DT:H3'	2:C:2[A]:DC:C5'	2.35	0.54
3:D:7[A]:DA:H5"	5:D:2003:HOH:O	2.05	0.54
1:A:194:CYS:HB3	1:A:216:CYS:SG	2.48	0.53
2:C:6[B]:DA:C2'	2:C:7[B]:DC:H5'	2.36	0.53
1:B:253:GLU:C	1:B:254:LYS:HG2	2.34	0.53
2:C:1[A]:DT:C2'	2:C:2[A]:DC:H5"	2.38	0.52
2:C:4[B]:DC:H2"	2:C:5[B]:DT:H71	1.91	0.51
2:C:6[B]:DA:C4	2:C:7[B]:DC:C4	2.98	0.51
3:D:10[B]:5IU:H1'	3:D:11[B]:DA:C8	2.46	0.51
3:D:5[B]:5IU:H2"	3:D:6[B]:DG:H5'	1.92	0.51
1:A:240:ASP:OD2	3:D:5[B]:5IU:I5	2.98	0.51
1:B:276:PHE:CE1	1:B:279:LYS:HE2	2.45	0.51
2:C:1[A]:DT:C3'	2:C:2[A]:DC:C5'	2.90	0.50
2:C:14[B]:DA:H3'	2:C:15[B]:DC:H5"	1.92	0.50
3:D:1[A]:DG:C3'	3:D:2[A]:5IU:C5'	2.89	0.49
3:D:8[A]:DC:O4'	3:D:8[A]:DC:OP1	2.29	0.49
2:C:5[A]:DT:H2"	2:C:6[A]:DA:C8	2.47	0.49
2:C:7[B]:DC:C5'	5:D:2003:HOH:O	2.60	0.49
3:D:15[B]:DA:OP1	3:D:15[B]:DA:C4	2.66	0.49
1:B:261:THR:O	3:D:15[B]:DA:C3'	2.62	0.48
2:C:1[A]:DT:C3'	2:C:2[A]:DC:H5'	2.40	0.48
2:C:9[B]:DT:H2"	2:C:10[B]:DC:O5'	2.13	0.48
2:C:11[B]:DA:C5	2:C:12[B]:DT:C4	3.01	0.48
2:C:7[B]:DC:H5"	5:D:2003:HOH:O	2.14	0.48
2:C:8[B]:8FG:C43	3:D:8[B]:DC:C2'	2.60	0.47
1:B:258:HIS:NE2	3:D:2[A]:5IU:OP2	2.44	0.47
2:C:8[A]:8FG:N3	2:C:9[A]:DT:H72	2.29	0.47
2:C:4[B]:DC:H2'	2:C:5[B]:DT:C7	2.41	0.47
1:B:248:LEU:HD23	1:B:249:PHE:CE2	2.50	0.47
5:B:2010:HOH:O	2:C:1[B]:DT:H5'	2.15	0.47
2:C:6[B]:DA:C6	2:C:7[B]:DC:N4	2.83	0.47
2:C:11[B]:DA:C8	2:C:12[B]:DT:C5	3.04	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:11[B]:DA:C8	2:C:12[B]:DT:C7	2.99	0.46
2:C:5[B]:DT:C2'	2:C:6[B]:DA:N7	2.78	0.46
3:D:12[B]:DG:C2'	3:D:13[B]:DA:H5"	2.46	0.46
1:A:281:TRP:CE3	1:A:290:GLU:HG3	2.50	0.46
2:C:12[B]:DT:H2"	2:C:13[B]:DC:C6	2.51	0.46
2:C:8[B]:8FG:H372	3:D:9[B]:DG:C5	2.51	0.46
1:B:188:ALA:HB1	1:B:189:PRO:HD2	1.98	0.45
2:C:1[A]:DT:C2'	2:C:2[A]:DC:C5'	2.94	0.45
2:C:8[A]:8FG:H453	3:D:9[A]:DG:C2	2.52	0.45
3:D:12[B]:DG:C1'	3:D:13[B]:DA:H5"	2.46	0.45
1:B:258:HIS:NE2	2:C:2[B]:DC:OP2	2.38	0.45
2:C:8[B]:8FG:C37	3:D:9[B]:DG:C6	2.93	0.44
1:A:233:LYS:NZ	1:A:240:ASP:OD2	2.41	0.43
1:A:248:LEU:HD12	1:A:248:LEU:O	2.18	0.43
2:C:8[A]:8FG:N3	2:C:8[A]:8FG:H5"	2.33	0.43
3:D:14[B]:DG:C3'	3:D:15[B]:DA:H5"	2.49	0.43
1:A:248:LEU:HD21	1:A:276:PHE:CE2	2.54	0.42
2:C:1[A]:DT:H2'	2:C:2[A]:DC:H5"	2.00	0.42
2:C:6[B]:DA:N7	2:C:7[B]:DC:C4	2.85	0.42
2:C:1[B]:DT:O2	2:C:1[B]:DT:C5'	2.67	0.42
2:C:8[A]:8FG:C2	2:C:9[A]:DT:H72	2.50	0.42
2:C:5[B]:DT:H2'	2:C:6[B]:DA:N7	2.35	0.41
1:B:251:ARG:HG2	1:B:251:ARG:NH1	2.29	0.41
1:A:281:TRP:CZ3	1:A:290:GLU:HG3	2.56	0.41
2:C:6[B]:DA:C4	2:C:7[B]:DC:N3	2.88	0.41

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)
2:C:1[B]:DT:C7	5:A:2011:HOH:O[4_554]	1.64	0.56

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	112/115 (97%)	108 (96%)	4 (4%)	0	100	100
1	B	113/115 (98%)	109 (96%)	4 (4%)	0	100	100
All	All	225/230 (98%)	217 (96%)	8 (4%)	0	100	100

There are no Ramachandran outliers to report.

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	101/104 (97%)	95 (94%)	6 (6%)	16	6
1	B	101/104 (97%)	95 (94%)	6 (6%)	16	6
All	All	202/208 (97%)	190 (94%)	12 (6%)	16	6

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

Mol	Chain	Res	Type
1	A	238	LEU
1	A	243	LEU
1	A	246	GLU
1	A	252	LEU
1	A	254	LYS
1	A	292	GLN
1	B	198	ILE
1	B	243	LEU
1	B	251	ARG
1	B	252	LEU
1	B	254	LYS
1	B	279	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	266	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

8 non-standard protein/DNA/RNA residues are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. 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 $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#|Z| > 2	Counts	RMSZ	#|Z| > 2
3	5IU	D	10[A]	3,2	18,21,22	1.49	3 (16%)	26,30,33	2.56	12 (46%)
3	5IU	D	2[A]	3,2	18,21,22	1.51	3 (16%)	26,30,33	1.86	6 (23%)
2	8FG	C	8[B]	2	36,44,45	2.07	3 (8%)	43,66,69	2.17	19 (44%)
3	5IU	D	5[B]	3,2	18,21,22	1.96	6 (33%)	26,30,33	2.37	10 (38%)
3	5IU	D	2[B]	3,2	18,21,22	1.39	3 (16%)	26,30,33	1.66	5 (19%)
3	5IU	D	10[B]	3,2	18,21,22	1.71	4 (22%)	26,30,33	2.55	10 (38%)
2	8FG	C	8[A]	2	36,44,45	2.07	6 (16%)	43,66,69	1.79	10 (23%)
3	5IU	D	5[A]	3,2	18,21,22	2.25	6 (33%)	26,30,33	2.12	9 (34%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	5IU	D	10[A]	3,2	-	4/7/21/22	0/2/2/2
3	5IU	D	2[A]	3,2	-	0/7/21/22	0/2/2/2
2	8FG	C	8[B]	2	-	4/11/41/42	0/6/6/6
3	5IU	D	5[B]	3,2	-	2/7/21/22	0/2/2/2
3	5IU	D	2[B]	3,2	-	2/7/21/22	0/2/2/2

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	5IU	D	10[B]	3,2	-	6/7/21/22	0/2/2/2
2	8FG	C	8[A]	2	-	7/11/41/42	0/6/6/6
3	5IU	D	5[A]	3,2	-	0/7/21/22	0/2/2/2

All (34) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	8[B]	8FG	C37-C38	-6.68	1.45	1.54
2	C	8[B]	8FG	C37-C34	-6.64	1.45	1.54
2	C	8[A]	8FG	C37-C34	-6.61	1.45	1.54
2	C	8[A]	8FG	C37-C38	-6.48	1.45	1.54
3	D	5[A]	5IU	C5-I5	5.62	2.24	2.08
2	C	8[A]	8FG	C8-N29	5.48	1.49	1.35
2	C	8[B]	8FG	C8-N29	5.37	1.48	1.35
3	D	5[A]	5IU	C6-N1	4.53	1.45	1.38
3	D	5[B]	5IU	C5-I5	3.96	2.19	2.08
3	D	10[B]	5IU	C6-N1	3.92	1.44	1.38
3	D	2[A]	5IU	C2-N3	3.84	1.44	1.38
3	D	5[B]	5IU	O3'-C3'	3.81	1.51	1.43
3	D	10[A]	5IU	C6-N1	3.22	1.43	1.38
3	D	10[A]	5IU	C4-C5	-3.21	1.38	1.45
3	D	2[B]	5IU	C4-C5	-2.97	1.39	1.45
3	D	5[B]	5IU	C2'-C3'	2.93	1.60	1.52
3	D	10[B]	5IU	C5-I5	2.89	2.16	2.08
3	D	10[B]	5IU	C4-C5	-2.88	1.39	1.45
3	D	5[A]	5IU	C6-C5	2.88	1.43	1.35
3	D	2[A]	5IU	C3'-C4'	2.70	1.60	1.53
3	D	5[B]	5IU	C6-N1	2.66	1.42	1.38
3	D	5[A]	5IU	C4-C5	-2.54	1.39	1.45
3	D	10[A]	5IU	O4'-C4'	2.38	1.50	1.45
3	D	2[A]	5IU	C4-C5	-2.37	1.40	1.45
3	D	5[B]	5IU	C6-C5	2.32	1.41	1.35
3	D	2[B]	5IU	C2-N3	2.28	1.42	1.38
3	D	5[B]	5IU	C4-C5	-2.27	1.40	1.45
3	D	5[A]	5IU	C2'-C3'	2.24	1.58	1.52
3	D	2[B]	5IU	C2-N1	-2.19	1.34	1.38
2	C	8[A]	8FG	C6-N1	-2.14	1.34	1.37
3	D	5[A]	5IU	C2-N3	2.08	1.41	1.38
2	C	8[A]	8FG	C42-C43	2.03	1.41	1.36
2	C	8[A]	8FG	C32-N29	2.01	1.47	1.44
3	D	10[B]	5IU	C6-C5	2.00	1.41	1.35

All (81) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	D	10[B]	5IU	C4-N3-C2	-6.20	119.32	127.35
3	D	10[A]	5IU	C4-N3-C2	-5.86	119.77	127.35
3	D	5[B]	5IU	C4'-O4'-C1'	-5.85	95.31	109.45
3	D	2[A]	5IU	C4-N3-C2	-5.21	120.60	127.35
3	D	10[A]	5IU	N3-C2-N1	5.01	121.54	114.89
3	D	10[B]	5IU	N3-C2-N1	4.99	121.51	114.89
3	D	5[B]	5IU	C4-N3-C2	-4.87	121.05	127.35
3	D	5[A]	5IU	C5-C4-N3	4.71	121.72	113.86
3	D	2[B]	5IU	C4-N3-C2	-4.70	121.27	127.35
3	D	10[B]	5IU	C5-C4-N3	4.46	121.30	113.86
3	D	5[A]	5IU	C4-N3-C2	-4.40	121.66	127.35
3	D	2[A]	5IU	N3-C2-N1	4.23	120.50	114.89
2	C	8[B]	8FG	C32-N29-C8	-4.22	111.12	120.94
3	D	10[A]	5IU	O4-C4-C5	-4.19	118.23	125.69
2	C	8[B]	8FG	C37-C34-C35	4.15	111.44	107.24
2	C	8[A]	8FG	C37-C38-C39	4.14	111.43	107.24
2	C	8[A]	8FG	C37-C38-C40	-4.09	129.22	134.47
3	D	10[B]	5IU	O4-C4-C5	-4.06	118.46	125.69
2	C	8[B]	8FG	C37-C38-C39	4.05	111.33	107.24
3	D	10[A]	5IU	C5-C4-N3	3.98	120.49	113.86
3	D	5[B]	5IU	C5-C4-N3	3.95	120.44	113.86
3	D	10[A]	5IU	O4'-C1'-N1	3.90	114.83	107.86
2	C	8[B]	8FG	C37-C38-C40	-3.88	129.49	134.47
3	D	10[B]	5IU	C6-C5-I5	3.74	127.39	120.97
3	D	2[B]	5IU	N3-C2-N1	3.67	119.76	114.89
3	D	5[A]	5IU	C6-C5-I5	3.63	127.19	120.97
2	C	8[B]	8FG	O3'-C3'-C4'	-3.57	96.43	110.10
2	C	8[A]	8FG	C32-N29-C30	-3.55	114.49	121.52
3	D	5[B]	5IU	N3-C2-N1	3.50	119.53	114.89
2	C	8[B]	8FG	C3'-C2'-C1'	3.46	111.21	102.54
2	C	8[A]	8FG	C3'-C2'-C1'	3.42	111.11	102.54
2	C	8[A]	8FG	C37-C34-C35	3.41	110.69	107.24
2	C	8[B]	8FG	O3'-C3'-C2'	3.25	122.53	110.90
3	D	5[B]	5IU	C2'-C1'-N1	3.22	121.18	113.77
3	D	5[A]	5IU	N3-C2-N1	3.20	119.14	114.89
3	D	10[A]	5IU	O2-C2-N3	-3.15	115.63	121.50
3	D	5[A]	5IU	O4-C4-C5	-3.15	120.08	125.69
3	D	5[B]	5IU	O4'-C4'-C3'	-3.15	98.33	105.67
3	D	10[B]	5IU	C4-C5-I5	-3.04	113.51	118.54
2	C	8[B]	8FG	C2'-C3'-C4'	-2.98	96.55	102.76
2	C	8[A]	8FG	C2-N1-C6	-2.93	119.69	125.10
3	D	5[A]	5IU	O2-C2-N3	-2.86	116.18	121.50

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	D	10[A]	5IU	C6-C5-I5	2.83	125.83	120.97
2	C	8[A]	8FG	C32-N29-C8	-2.83	114.36	120.94
3	D	10[B]	5IU	C1'-N1-C6	2.82	125.64	120.77
3	D	10[A]	5IU	C6-N1-C2	-2.81	118.45	121.30
2	C	8[A]	8FG	C34-C35-C39	2.80	108.65	107.01
2	C	8[B]	8FG	C5-C6-N1	2.80	118.90	113.95
2	C	8[B]	8FG	O4'-C4'-C5'	2.77	118.47	109.37
3	D	2[B]	5IU	C5-C4-N3	2.76	118.47	113.86
3	D	10[A]	5IU	O4'-C1'-C2'	-2.76	101.04	106.25
3	D	10[A]	5IU	C4-C5-I5	-2.71	114.06	118.54
3	D	10[B]	5IU	O2-C2-N1	-2.70	119.20	122.79
2	C	8[B]	8FG	O4'-C4'-C3'	2.70	111.97	105.67
3	D	5[B]	5IU	O4-C4-C5	-2.69	120.89	125.69
2	C	8[B]	8FG	C42-C43-C39	-2.60	117.28	120.89
2	C	8[A]	8FG	C5-C6-N1	2.59	118.53	113.95
2	C	8[B]	8FG	C2-N1-C6	-2.55	120.40	125.10
3	D	5[B]	5IU	O4'-C1'-C2'	-2.54	101.46	106.25
3	D	10[A]	5IU	O4'-C4'-C5'	2.49	117.57	109.37
3	D	10[A]	5IU	C3'-C2'-C1'	-2.49	96.31	102.54
3	D	2[B]	5IU	C1'-N1-C2	2.44	122.45	117.64
3	D	2[B]	5IU	O4-C4-C5	-2.43	121.36	125.69
3	D	5[A]	5IU	C6-N1-C2	-2.42	118.85	121.30
2	C	8[B]	8FG	C38-C37-C34	-2.41	100.84	102.85
3	D	2[A]	5IU	O4-C4-C5	-2.38	121.45	125.69
2	C	8[B]	8FG	C45-C30-N29	2.38	121.22	117.78
2	C	8[B]	8FG	C31-C36-C35	-2.32	117.91	121.13
3	D	2[A]	5IU	C4'-O4'-C1'	-2.30	103.89	109.45
3	D	5[A]	5IU	C1'-N1-C6	2.23	124.62	120.77
2	C	8[B]	8FG	C38-C39-C35	2.23	108.32	107.01
3	D	10[B]	5IU	O4'-C4'-C5'	-2.23	102.05	109.37
2	C	8[B]	8FG	C43-C39-C35	-2.19	128.33	133.15
3	D	5[A]	5IU	C2'-C3'-C4'	2.18	107.31	102.76
3	D	5[B]	5IU	O2-C2-N3	-2.18	117.45	121.50
3	D	5[B]	5IU	O5'-C5'-C4'	-2.16	101.65	108.99
2	C	8[A]	8FG	C4'-O4'-C1'	2.16	114.66	109.45
3	D	10[B]	5IU	C2'-C3'-C4'	-2.15	98.29	102.76
2	C	8[B]	8FG	C36-C35-C39	-2.10	128.54	133.15
3	D	2[A]	5IU	C5-C4-N3	2.05	117.28	113.86
3	D	2[A]	5IU	O4'-C1'-N1	-2.00	104.28	107.86

There are no chirality outliers.

All (25) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	C	8[A]	8FG	O44-C30-N29-C8
2	C	8[A]	8FG	C45-C30-N29-C8
2	C	8[A]	8FG	O44-C30-N29-C32
2	C	8[A]	8FG	C45-C30-N29-C32
2	C	8[A]	8FG	C3'-C4'-C5'-O5'
2	C	8[B]	8FG	O44-C30-N29-C8
2	C	8[B]	8FG	C45-C30-N29-C8
3	D	2[B]	5IU	C3'-C4'-C5'-O5'
3	D	2[B]	5IU	O4'-C4'-C5'-O5'
3	D	5[B]	5IU	O4'-C4'-C5'-O5'
2	C	8[A]	8FG	O4'-C4'-C5'-O5'
3	D	5[B]	5IU	C3'-C4'-C5'-O5'
3	D	10[B]	5IU	C3'-C4'-C5'-O5'
2	C	8[B]	8FG	O4'-C4'-C5'-O5'
3	D	10[B]	5IU	C2'-C1'-N1-C6
3	D	10[B]	5IU	O4'-C4'-C5'-O5'
2	C	8[A]	8FG	C31-C32-N29-C8
3	D	10[B]	5IU	O4'-C1'-N1-C6
3	D	10[B]	5IU	C2'-C1'-N1-C2
2	C	8[B]	8FG	C3'-C4'-C5'-O5'
3	D	10[A]	5IU	C2'-C1'-N1-C6
3	D	10[B]	5IU	O4'-C1'-N1-C2
3	D	10[A]	5IU	O4'-C1'-N1-C6
3	D	10[A]	5IU	C2'-C1'-N1-C2
3	D	10[A]	5IU	O4'-C1'-N1-C2

There are no ring outliers.

6 monomers are involved in 41 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	D	2[A]	5IU	4	0
2	C	8[B]	8FG	17	0
3	D	5[B]	5IU	2	0
3	D	10[B]	5IU	9	0
2	C	8[A]	8FG	8	0
3	D	5[A]	5IU	1	0

5.5 Carbohydrates (i)

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 2 ligands modelled in this entry, 2 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	A	114/115 (99%)	-0.92	0	100	100	26, 39, 97, 135	0
1	B	115/115 (100%)	-0.94	0	100	100	26, 38, 91, 110	0
2	C	14/15 (93%)	-0.84	0	100	100	17, 24, 28, 37	14 (100%)
3	D	12/15 (80%)	-0.81	0	100	100	20, 27, 33, 35	12 (100%)
All	All	255/260 (98%)	-0.92	0	100	100	17, 37, 92, 135	26 (10%)

There are no RSRZ outliers to report.

6.2 Non-standard residues in protein, DNA, RNA chains ⓘ

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(Å^2)	Q<0.9
2	8FG	C	8[A]	39/40	0.95	0.10	62,66,69,71	39
2	8FG	C	8[B]	39/40	0.95	0.10	50,54,58,59	39
3	5IU	D	10[A]	20/21	0.98	0.07	65,70,82,86	20
3	5IU	D	10[B]	20/21	0.98	0.07	65,66,67,71	20
3	5IU	D	5[A]	20/21	0.99	0.05	36,45,48,52	20
3	5IU	D	5[B]	20/21	0.99	0.05	45,47,49,49	20
3	5IU	D	2[A]	20/21	0.99	0.07	35,41,46,55	20
3	5IU	D	2[B]	20/21	0.99	0.07	47,49,52,53	20

6.3 Carbohydrates ⓘ

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(Å^2)	Q<0.9
4	ZN	A	500	1/1	1.00	0.03	32,32,32,32	0
4	ZN	B	500	1/1	1.00	0.03	32,32,32,32	0

6.5 Other polymers (i)

There are no such residues in this entry.