



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 18, 2026 – 06:25 AM UTC

PDB ID : 3CVS / pdb_00003cvs
Title : Crystal Structure of an AlkA Host/Guest Complex 8oxoGuanine:Adenine Base Pair
Authors : Bowman, B.R.; Lee, S.; Wang, S.; Verdine, G.L.
Deposited on : 2008-04-19
Resolution : 2.40 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
Mogul	:	2022.3.0, CSD as543be (2022)
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

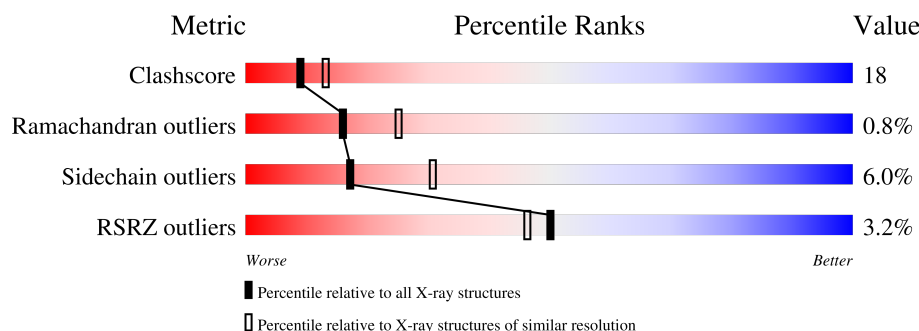
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.40 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.



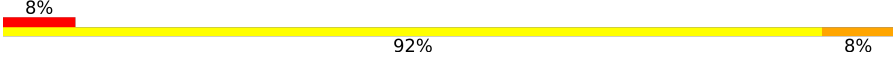
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
Clashscore	190562	5391 (2.40-2.40)
Ramachandran outliers	187476	5320 (2.40-2.40)
Sidechain outliers	187428	5321 (2.40-2.40)
RSRZ outliers	180081	4916 (2.40-2.40)

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	282	2% 70% 28% .
1	B	282	4% 65% 30% .
1	C	282	3% 68% 29% .
1	D	282	2% 66% 29% .
2	E	12	25% 42% 50% 8%
2	G	12	50% 42% 8%

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Mol	Chain	Length	Quality of chain
3	F	12	
3	H	12	

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
2	8OG	E	8	-	-	X	-

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 10005 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-3-methyladenine glycosylase 2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	282	Total	C	N	O	S	0	0	0
			2215	1427	387	389	12			
1	B	282	Total	C	N	O	S	0	0	0
			2215	1427	387	389	12			
1	C	282	Total	C	N	O	S	0	0	0
			2215	1427	387	389	12			
1	D	282	Total	C	N	O	S	0	0	0
			2215	1427	387	389	12			

- Molecule 2 is a DNA chain called DNA (5'-D(*DGP*DAP*DCP*DAP*DTP*DGP*DAP*(8OG)P*DTP*DGP*DCP*DC)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	E	12	Total	C	N	O	P	0	0	0
			246	117	48	70	11			
2	G	12	Total	C	N	O	P	0	0	0
			246	117	48	70	11			

- Molecule 3 is a DNA chain called DNA (5'-D(*DGP*DGP*DCP*DAP*DAP*DTP*DCP*DAP*DTP*DGP*DTP*DC)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	F	12	Total	C	N	O	P	0	0	0
			243	117	45	70	11			
3	H	12	Total	C	N	O	P	0	0	0
			243	117	45	70	11			

- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	39	Total	O	0	0
			39	39		

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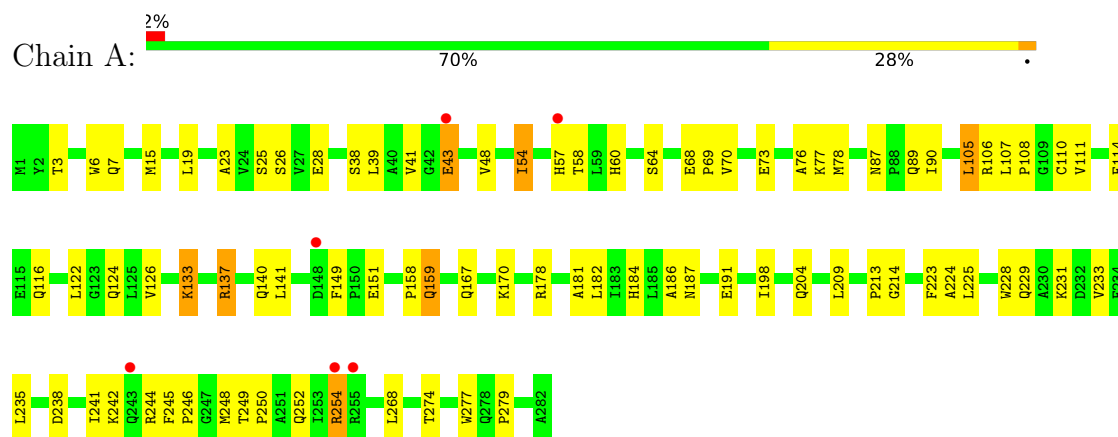
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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	B	37	Total 37	O 37	0	0
4	C	40	Total 40	O 40	0	0
4	D	45	Total 45	O 45	0	0
4	E	1	Total 1	O 1	0	0
4	G	2	Total 2	O 2	0	0
4	H	3	Total 3	O 3	0	0

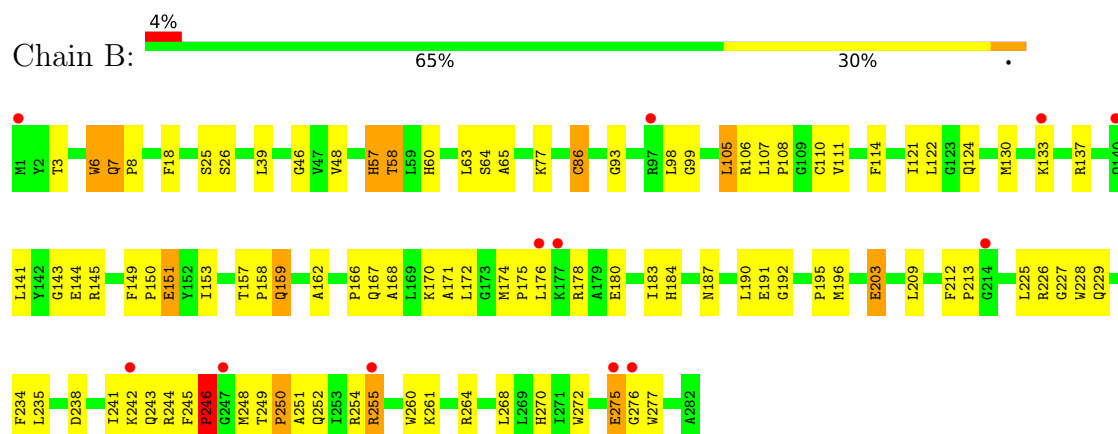
3 Residue-property plots [i](#)

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.

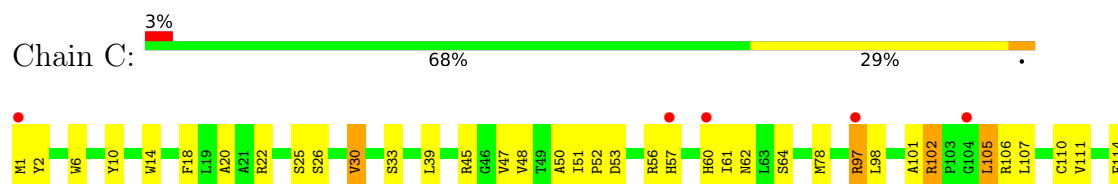
• Molecule 1: DNA-3-methyladenine glycosylase 2

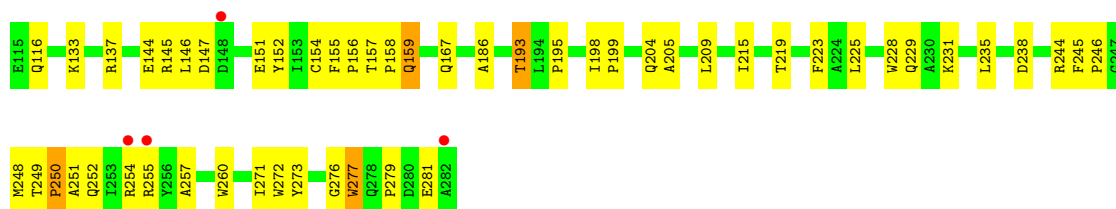


• Molecule 1: DNA-3-methyladenine glycosylase 2

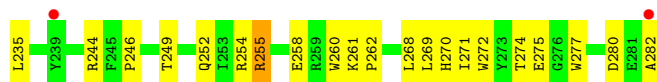
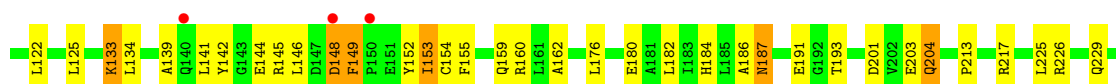
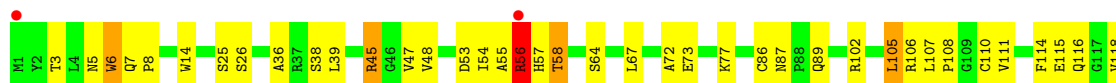


• Molecule 1: DNA-3-methyladenine glycosylase 2

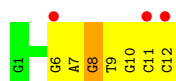
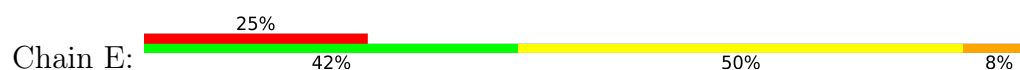




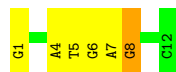
● Molecule 1: DNA-3-methyladenine glycosylase 2



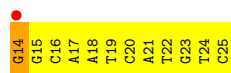
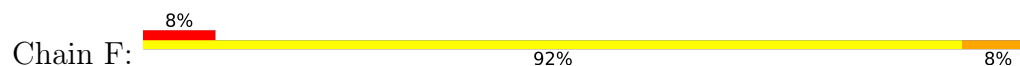
● Molecule 2: DNA (5'-D(*DGP*DAP*DCP*DAP*DTP*DGP*DAP*(8OG)P*DTP*DGP*DCP*DC)-3')



● Molecule 2: DNA (5'-D(*DGP*DAP*DCP*DAP*DTP*DGP*DAP*(8OG)P*DTP*DGP*DCP*DC)-3')



● Molecule 3: DNA (5'-D(*DGP*DGP*DCP*DAP*DAP*DTP*DCP*DAP*DTP*DGP*DTP*D C)-3')



● Molecule 3: DNA (5'-D(*DGP*DGP*DCP*DAP*DAP*DTP*DCP*DAP*DTP*DGP*DTP*D C)-3')

Chain H:  83% 17%



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	75.17Å 101.25Å 102.92Å 90.00° 94.19° 90.00°	Depositor
Resolution (Å)	50.00 – 2.40 50.00 – 2.40	Depositor EDS
% Data completeness (in resolution range)	93.3 (50.00-2.40) 93.3 (50.00-2.40)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.09 (at 2.39Å)	Xtriage
Refinement program	CNS	Depositor
R, R_{free}	0.219 , 0.270 0.238 , (Not available)	Depositor DCC
R_{free} test set	No test flags present.	wwPDB-VP
Wilson B-factor (Å ²)	36.9	Xtriage
Anisotropy	0.190	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.33 , 38.9	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	10005	wwPDB-VP
Average B, all atoms (Å ²)	49.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.09% 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: 8OG

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	0.45	0/2277	0.93	6/3104 (0.2%)
1	B	0.43	0/2277	0.92	6/3104 (0.2%)
1	C	0.44	0/2277	0.86	2/3104 (0.1%)
1	D	0.46	0/2277	0.93	7/3104 (0.2%)
2	E	0.36	0/249	0.82	0/380
2	G	0.33	0/249	0.71	0/380
3	F	0.36	0/272	0.79	1/418 (0.2%)
3	H	0.30	0/272	0.66	0/418
All	All	0.44	0/10150	0.89	22/14012 (0.2%)

There are no bond length outliers.

All (22) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	149	PHE	CA-C-N	7.05	127.36	119.32
1	A	149	PHE	C-N-CA	7.05	127.36	119.32
1	D	56	ARG	N-CA-C	6.87	118.95	109.54
1	B	57	HIS	N-CA-C	-5.99	103.14	111.52
1	B	86	CYS	N-CA-C	5.83	118.81	110.24
1	D	261	LYS	N-CA-C	-5.65	101.98	109.84
1	D	86	CYS	N-CA-C	5.60	118.45	110.10
1	D	149	PHE	CA-C-N	5.51	125.60	119.32
1	D	149	PHE	C-N-CA	5.51	125.60	119.32
1	A	198	ILE	N-CA-C	5.40	114.85	108.96
1	D	38	SER	N-CA-C	-5.40	102.88	110.50
1	A	54	ILE	N-CA-C	5.34	115.55	110.42
3	F	14	DG	N9-C1'-C2'	5.31	121.46	113.50
1	B	149	PHE	CA-C-N	5.26	126.41	119.84
1	B	149	PHE	C-N-CA	5.26	126.41	119.84
1	D	64	SER	N-CA-C	-5.25	103.95	110.41

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	38	SER	N-CA-C	-5.19	103.55	110.55
1	A	64	SER	N-CA-C	-5.19	103.68	110.53
1	C	97	ARG	N-CA-C	5.18	116.92	111.28
1	C	231	LYS	N-CA-C	5.17	119.44	113.18
1	B	93	GLY	N-CA-C	-5.09	108.00	114.16
1	B	162	ALA	N-CA-C	-5.00	105.91	111.36

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	2215	0	2209	69	0
1	B	2215	0	2209	92	0
1	C	2215	0	2209	70	0
1	D	2215	0	2209	77	0
2	E	246	0	136	16	0
2	G	246	0	136	16	0
3	F	243	0	137	19	0
3	H	243	0	137	3	0
4	A	39	0	0	7	0
4	B	37	0	0	2	0
4	C	40	0	0	1	0
4	D	45	0	0	5	0
4	E	1	0	0	0	0
4	G	2	0	0	0	0
4	H	3	0	0	1	0
All	All	10005	0	9382	353	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 18.

All (353) 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:H:21:DA:H2''	3:H:22:DT:H5'	1.19	1.16
2:G:5:DT:H2''	2:G:6:DG:H5''	1.09	1.07
2:G:5:DT:C2'	2:G:6:DG:H5''	1.85	1.05
2:G:4:DA:H2''	2:G:5:DT:H5''	1.47	0.96
1:A:124:GLN:NE2	1:A:178:ARG:HH11	1.65	0.92
1:A:124:GLN:HE21	1:A:178:ARG:HH11	0.99	0.92
1:D:56:ARG:HH21	1:D:57:HIS:CE1	1.89	0.90
1:C:97:ARG:HD2	1:C:98:LEU:N	1.86	0.90
2:G:5:DT:H2''	2:G:6:DG:C5'	2.00	0.88
2:G:4:DA:C2'	2:G:5:DT:H5''	2.04	0.87
1:B:174:MET:HB2	1:B:178:ARG:HG2	1.55	0.87
1:B:124:GLN:HB3	3:F:14:DG:H5'	1.55	0.87
1:A:124:GLN:HE21	1:A:178:ARG:NH1	1.74	0.86
1:A:15:MET:HE1	1:A:108:PRO:HB3	1.58	0.86
1:A:15:MET:HE2	1:A:19:LEU:HG	1.56	0.85
1:A:3:THR:HG22	1:A:60:HIS:HD2	1.41	0.84
1:C:248:MET:HE1	1:C:279:PRO:HG3	1.61	0.81
1:A:77:LYS:HB3	1:A:111:VAL:HG23	1.63	0.80
1:C:97:ARG:HD2	1:C:98:LEU:H	1.41	0.80
2:E:8:8OG:C2'	2:E:9:DT:H5''	2.12	0.80
1:B:124:GLN:NE2	1:B:178:ARG:HH12	1.81	0.78
1:B:143:GLY:HA3	1:B:153:ILE:HD11	1.65	0.78
2:E:8:8OG:H2'	2:E:9:DT:H5''	1.64	0.78
3:H:21:DA:C2'	3:H:22:DT:H5'	2.11	0.77
1:B:145:ARG:HG2	1:B:145:ARG:HH11	1.49	0.77
3:F:14:DG:H4'	3:F:15:DG:H5'	1.67	0.77
1:B:124:GLN:HE21	1:B:178:ARG:HH12	1.33	0.77
1:B:39:LEU:HD22	1:B:48:VAL:HG21	1.67	0.76
1:A:48:VAL:HG11	1:A:78:MET:HE3	1.67	0.75
1:C:158:PRO:HD2	1:C:159:GLN:NE2	2.02	0.75
1:D:39:LEU:HD22	1:D:48:VAL:HG21	1.65	0.75
1:A:235:LEU:HD22	1:A:268:LEU:HD21	1.69	0.74
3:F:18:DA:H2''	3:F:19:DT:O5'	1.88	0.74
2:G:7:DA:H2''	2:G:8:8OG:H5'	1.68	0.74
1:B:77:LYS:HB3	1:B:111:VAL:HG23	1.71	0.73
1:D:254:ARG:HD2	4:H:98:HOH:O	1.88	0.73
1:B:130:MET:HG2	1:B:133:LYS:HE3	1.71	0.72
1:D:110:CYS:HB3	1:D:116:GLN:HE21	1.53	0.72
1:B:203:GLU:HG3	4:B:303:HOH:O	1.89	0.71
1:D:134:LEU:C	1:D:134:LEU:HD23	2.15	0.71
3:H:21:DA:H2''	3:H:22:DT:C5'	2.10	0.71
2:E:8:8OG:C3'	2:E:9:DT:H5''	2.21	0.71

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:G:4:DA:C3'	2:G:5:DT:H5''	2.19	0.71
1:D:8:PRO:HG2	1:D:57:HIS:CE1	2.25	0.71
1:D:108:PRO:O	1:D:226:ARG:HD2	1.91	0.71
2:E:8:8OG:H4'	2:E:8:8OG:OP1	1.91	0.71
1:C:133:LYS:HE3	1:C:137:ARG:NH2	2.06	0.70
1:D:77:LYS:HB3	1:D:111:VAL:HG23	1.74	0.70
1:B:184:HIS:CD2	1:B:213:PRO:HD2	2.27	0.70
1:C:158:PRO:HD2	1:C:159:GLN:HE21	1.55	0.70
2:G:7:DA:H2''	2:G:8:8OG:C5'	2.22	0.69
1:B:3:THR:HG22	1:B:60:HIS:HD2	1.59	0.68
1:B:261:LYS:HG2	1:B:264:ARG:CZ	2.24	0.68
1:C:235:LEU:HB3	1:C:238:ASP:HB2	1.76	0.68
3:F:21:DA:H1'	3:F:22:DT:H5''	1.76	0.67
1:A:249:THR:OG1	1:A:252:GLN:HG3	1.95	0.67
1:B:26:SER:HB3	1:B:153:ILE:HG22	1.75	0.67
1:B:77:LYS:HB3	1:B:111:VAL:CG2	2.25	0.67
1:C:251:ALA:HB3	2:G:7:DA:OP1	1.95	0.67
1:C:33:SER:O	1:C:52:PRO:HD2	1.95	0.66
1:D:45:ARG:HA	1:D:67:LEU:HD21	1.76	0.66
1:D:255:ARG:O	1:D:258:GLU:HG3	1.95	0.66
1:D:26:SER:HB3	1:D:153:ILE:CG2	2.25	0.66
1:A:140:GLN:HE21	1:A:140:GLN:HA	1.61	0.65
1:A:6:TRP:CZ2	1:A:57:HIS:HA	2.30	0.65
1:B:238:ASP:HB3	1:B:241:ILE:HB	1.77	0.65
2:G:7:DA:H2'	2:G:8:8OG:N2	2.11	0.65
1:B:261:LYS:HE2	1:B:264:ARG:NH1	2.12	0.65
1:B:6:TRP:C	1:B:6:TRP:CD1	2.75	0.65
1:D:139:ALA:O	1:D:153:ILE:HD11	1.96	0.65
1:A:133:LYS:HD2	1:A:137:ARG:NH1	2.11	0.64
1:B:124:GLN:NE2	1:B:178:ARG:NH1	2.44	0.64
1:C:1:MET:HE2	1:C:2:TYR:CE2	2.33	0.64
1:C:102:ARG:NH1	1:C:273:TYR:HB3	2.11	0.64
1:C:260:TRP:CH2	1:C:271:ILE:HD11	2.32	0.64
4:A:319:HOH:O	1:D:191:GLU:HB2	1.97	0.64
3:F:14:DG:H4'	3:F:15:DG:C5'	2.28	0.64
1:C:1:MET:H1	1:C:60:HIS:CE1	2.17	0.63
1:D:203:GLU:H	1:D:203:GLU:CD	2.06	0.63
1:A:15:MET:HE2	1:A:19:LEU:CG	2.28	0.63
1:A:244:ARG:C	1:A:246:PRO:HD3	2.24	0.62
1:B:234:PHE:C	1:B:235:LEU:HD12	2.24	0.62
1:A:133:LYS:HD2	1:A:137:ARG:HH11	1.65	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:8:PRO:HG2	1:B:57:HIS:CE1	2.35	0.62
3:F:21:DA:C2'	3:F:22:DT:H5''	2.30	0.62
1:B:124:GLN:HB3	3:F:14:DG:C5'	2.28	0.61
2:E:8:SOG:H2'	2:E:9:DT:O4'	1.99	0.61
1:C:248:MET:CE	1:C:279:PRO:HG3	2.31	0.61
2:G:5:DT:C3'	2:G:6:DG:H5''	2.30	0.61
3:F:23:DG:H2''	3:F:24:DT:OP2	2.00	0.61
1:D:25:SER:O	1:D:26:SER:HB2	2.01	0.61
1:D:39:LEU:CD2	1:D:48:VAL:HG21	2.31	0.61
1:A:248:MET:HE1	1:A:279:PRO:HG3	1.83	0.61
1:D:107:LEU:CD1	1:D:269:LEU:HD11	2.32	0.60
1:A:231:LYS:NZ	4:A:301:HOH:O	2.34	0.60
1:B:251:ALA:HB2	2:E:6:DG:H3'	1.83	0.60
1:C:107:LEU:HD11	1:C:225:LEU:HD21	1.82	0.60
1:A:105:LEU:HD13	1:A:106:ARG:N	2.17	0.60
1:D:225:LEU:HD23	1:D:226:ARG:HG2	1.83	0.60
1:B:157:THR:HB	1:B:159:GLN:HE21	1.65	0.59
1:B:166:PRO:HG3	1:B:183:ILE:CD1	2.32	0.59
1:C:1:MET:H1	1:C:60:HIS:HE1	1.50	0.59
1:C:1:MET:N	1:C:60:HIS:CE1	2.70	0.59
1:D:77:LYS:HE3	1:D:111:VAL:O	2.02	0.59
1:D:6:TRP:CD1	1:D:6:TRP:C	2.80	0.59
1:B:107:LEU:C	1:B:107:LEU:HD23	2.28	0.58
2:E:11:DC:C2	2:E:12:DC:C5	2.91	0.58
1:B:261:LYS:HE2	1:B:264:ARG:CZ	2.33	0.58
1:D:77:LYS:HB3	1:D:111:VAL:CG2	2.33	0.58
1:C:245:PHE:HB3	1:C:248:MET:HE3	1.85	0.58
1:B:145:ARG:HG2	1:B:145:ARG:NH1	2.18	0.58
1:C:107:LEU:HD11	1:C:225:LEU:CD2	2.34	0.58
1:D:56:ARG:NH2	1:D:57:HIS:CE1	2.66	0.58
1:D:146:LEU:HB3	1:D:148:ASP:OD1	2.04	0.58
1:B:130:MET:HA	1:B:133:LYS:HG2	1.86	0.58
1:B:3:THR:HG22	1:B:60:HIS:CD2	2.39	0.58
3:F:21:DA:H2''	3:F:22:DT:H5''	1.84	0.58
1:C:254:ARG:HG3	1:C:254:ARG:HH11	1.69	0.57
1:A:110:CYS:HB3	1:A:116:GLN:HE21	1.69	0.57
1:A:3:THR:CG2	1:A:60:HIS:HD2	2.13	0.57
1:A:184:HIS:CD2	1:A:213:PRO:HD2	2.39	0.57
1:B:143:GLY:CA	1:B:153:ILE:HD11	2.34	0.57
1:D:107:LEU:HD11	1:D:225:LEU:HD21	1.86	0.57
1:D:145:ARG:HD2	4:D:297:HOH:O	2.04	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:141:LEU:HD23	1:B:172:LEU:HD11	1.87	0.57
1:D:47:VAL:HG21	1:D:152:TYR:CD2	2.39	0.57
3:F:24:DT:H2''	3:F:25:DC:C5'	2.35	0.57
1:A:41:VAL:HB	1:A:70:VAL:HG21	1.87	0.57
1:A:15:MET:HE1	1:A:108:PRO:CB	2.33	0.56
1:D:105:LEU:HD13	1:D:106:ARG:N	2.21	0.56
1:D:162:ALA:HB1	1:D:187:ASN:ND2	2.21	0.56
1:B:167:GLN:NE2	1:B:170:LYS:HD3	2.20	0.56
1:B:241:ILE:HD11	1:B:268:LEU:HD12	1.87	0.56
2:E:11:DC:H2''	2:E:12:DC:C5	2.41	0.56
1:D:36:ALA:HA	1:D:48:VAL:O	2.07	0.55
1:D:148:ASP:HB2	1:D:149:PHE:CD2	2.42	0.54
1:D:235:LEU:HD13	1:D:268:LEU:HD22	1.90	0.54
1:B:141:LEU:HD22	1:B:172:LEU:HD21	1.89	0.54
1:C:254:ARG:HG3	1:C:254:ARG:NH1	2.21	0.54
1:B:176:LEU:O	1:B:180:GLU:HG3	2.08	0.54
1:A:187:ASN:O	1:A:191:GLU:HG3	2.07	0.54
1:C:110:CYS:CB	1:C:116:GLN:HE21	2.21	0.54
1:D:54:ILE:O	1:D:55:ALA:C	2.50	0.54
1:C:10:TYR:HB2	4:C:317:HOH:O	2.07	0.54
1:A:68:GLU:HG3	4:D:307:HOH:O	2.08	0.54
1:B:251:ALA:HB3	2:E:7:DA:OP1	2.07	0.54
1:C:159:GLN:NE2	1:C:159:GLN:H	2.06	0.54
1:B:6:TRP:HZ3	1:B:58:THR:O	1.91	0.54
3:F:19:DT:H4'	3:F:19:DT:OP1	2.08	0.54
1:B:108:PRO:O	1:B:226:ARG:HD2	2.09	0.53
1:C:225:LEU:O	1:C:229:GLN:HA	2.08	0.53
1:D:235:LEU:HD13	1:D:268:LEU:CD2	2.38	0.53
1:C:6:TRP:CZ2	1:C:57:HIS:HA	2.43	0.53
3:F:24:DT:H2''	3:F:25:DC:O5'	2.08	0.53
1:D:107:LEU:HD13	1:D:269:LEU:HD11	1.90	0.53
1:A:39:LEU:HD23	1:A:48:VAL:HG21	1.90	0.53
1:B:159:GLN:H	1:B:159:GLN:NE2	2.06	0.53
1:D:141:LEU:HD23	1:D:142:TYR:CE2	2.44	0.53
1:B:124:GLN:HB2	1:B:178:ARG:NH1	2.24	0.53
1:B:145:ARG:HD2	1:B:150:PRO:HA	1.90	0.53
1:C:249:THR:HB	2:G:7:DA:H5'	1.91	0.53
1:C:102:ARG:HH11	1:C:273:TYR:HB3	1.75	0.52
1:D:201:ASP:CG	1:D:204:GLN:HB2	2.34	0.52
1:D:225:LEU:O	1:D:229:GLN:HA	2.09	0.52
1:A:7:GLN:NE2	1:A:89:GLN:HE21	2.07	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:F:21:DA:H2''	3:F:22:DT:C5'	2.38	0.52
1:C:53:ASP:OD2	1:C:56:ARG:HB2	2.10	0.52
1:A:167:GLN:NE2	1:A:170:LYS:HD3	2.25	0.52
1:D:146:LEU:HD21	1:D:154:CYS:SG	2.50	0.52
3:F:21:DA:C1'	3:F:22:DT:H5''	2.40	0.52
1:A:235:LEU:HB3	1:A:238:ASP:HB2	1.92	0.51
1:A:248:MET:CE	1:A:279:PRO:HG3	2.39	0.51
2:E:11:DC:N1	2:E:12:DC:H5	2.09	0.51
1:D:107:LEU:HD11	1:D:225:LEU:CD2	2.41	0.51
1:A:6:TRP:CD1	1:A:6:TRP:C	2.89	0.51
1:A:158:PRO:HD2	1:A:159:GLN:HE21	1.75	0.51
1:D:260:TRP:CH2	1:D:271:ILE:HD11	2.45	0.51
1:B:25:SER:O	1:B:26:SER:HB2	2.11	0.51
1:B:159:GLN:HA	1:B:190:LEU:HD11	1.93	0.51
1:C:157:THR:OG1	1:C:159:GLN:HG2	2.11	0.50
1:C:1:MET:HG2	1:C:62:ASN:HA	1.92	0.50
1:C:97:ARG:NH1	1:C:98:LEU:HB2	2.26	0.50
1:C:249:THR:OG1	1:C:252:GLN:HG3	2.10	0.50
1:D:122:LEU:HD13	1:D:134:LEU:CD2	2.41	0.50
1:D:148:ASP:HB2	1:D:149:PHE:HD2	1.76	0.50
3:F:15:DG:H2''	3:F:16:DC:O5'	2.12	0.50
1:B:159:GLN:H	1:B:159:GLN:CD	2.18	0.50
1:B:187:ASN:O	1:B:191:GLU:HG2	2.12	0.50
1:A:25:SER:O	1:A:26:SER:HB2	2.12	0.50
1:C:1:MET:HG3	1:C:2:TYR:H	1.77	0.50
1:C:193:THR:O	1:C:193:THR:CG2	2.60	0.50
1:D:274:THR:HG22	1:D:277:TRP:HB2	1.94	0.49
3:F:24:DT:H2''	3:F:25:DC:H5''	1.93	0.49
1:B:121:ILE:O	1:B:124:GLN:HG3	2.12	0.49
1:B:261:LYS:HE2	1:B:264:ARG:NH2	2.27	0.49
1:D:110:CYS:CB	1:D:116:GLN:HE21	2.21	0.49
1:D:7:GLN:NE2	1:D:87:ASN:HA	2.27	0.49
1:D:57:HIS:N	1:D:57:HIS:CD2	2.80	0.49
1:A:248:MET:HE2	4:A:318:HOH:O	2.13	0.49
1:B:166:PRO:HG3	1:B:183:ILE:HD12	1.95	0.49
1:B:77:LYS:HD3	1:B:111:VAL:HG22	1.94	0.49
1:D:14:TRP:CD1	1:D:102:ARG:HH21	2.31	0.49
1:C:6:TRP:CD1	1:C:6:TRP:C	2.90	0.48
1:B:167:GLN:HE21	1:B:170:LYS:HD3	1.78	0.48
1:B:175:PRO:HD2	1:B:178:ARG:HB2	1.95	0.48
1:D:122:LEU:HD22	1:D:134:LEU:HD21	1.95	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:E:9:DT:H2'	2:E:10:DG:C8	2.48	0.48
1:C:105:LEU:HD13	1:C:106:ARG:N	2.28	0.48
1:C:110:CYS:HB2	1:C:116:GLN:HE21	1.78	0.48
1:A:6:TRP:CZ3	1:A:58:THR:O	2.67	0.48
1:C:215:ILE:HG23	1:C:219:THR:HB	1.96	0.48
1:A:229:GLN:O	1:A:231:LYS:HE2	2.14	0.48
1:A:231:LYS:HE3	4:A:290:HOH:O	2.12	0.48
1:C:45:ARG:HB3	1:C:146:LEU:CD2	2.44	0.48
1:A:245:PHE:CA	1:A:248:MET:HE3	2.44	0.48
1:B:6:TRP:CZ3	1:B:58:THR:O	2.66	0.48
1:D:107:LEU:HD12	1:D:269:LEU:HD11	1.96	0.48
1:B:158:PRO:HD2	1:B:159:GLN:NE2	2.28	0.47
1:D:6:TRP:CZ3	1:D:58:THR:O	2.67	0.47
1:C:198:ILE:O	1:C:198:ILE:HG23	2.14	0.47
2:E:7:DA:H2''	2:E:8:8OG:H5''	1.96	0.47
2:G:7:DA:H2'	2:G:8:8OG:C2	2.44	0.47
1:A:54:ILE:HD12	4:A:313:HOH:O	2.13	0.47
1:C:25:SER:O	1:C:26:SER:HB2	2.14	0.47
2:E:8:8OG:H2'	2:E:9:DT:C5'	2.42	0.47
1:C:145:ARG:HH11	1:C:145:ARG:HG3	1.79	0.47
1:A:77:LYS:HD3	1:A:111:VAL:HG22	1.96	0.47
1:A:224:ALA:O	1:A:228:TRP:HB2	2.15	0.47
1:B:238:ASP:O	1:B:242:LYS:HG3	2.14	0.47
1:C:209:LEU:HD11	1:C:223:PHE:CD2	2.50	0.47
1:D:53:ASP:HB3	1:D:58:THR:HG22	1.97	0.47
1:D:134:LEU:C	1:D:134:LEU:CD2	2.87	0.47
1:C:195:PRO:HB2	1:C:228:TRP:CZ2	2.50	0.47
2:E:11:DC:C2'	2:E:12:DC:H5	2.28	0.46
1:B:18:PHE:CD1	1:B:18:PHE:C	2.94	0.46
1:B:249:THR:O	1:B:252:GLN:N	2.49	0.46
1:D:5:ASN:HB2	4:D:307:HOH:O	2.15	0.46
1:A:274:THR:CG2	1:A:277:TRP:HB2	2.45	0.46
1:A:114:PHE:CD2	1:A:158:PRO:HG3	2.50	0.46
1:B:168:ALA:O	1:B:171:ALA:HB3	2.16	0.46
1:B:243:GLN:O	1:B:246:PRO:HD3	2.15	0.45
1:D:118:VAL:HG13	1:D:182:LEU:HD22	1.96	0.45
1:B:48:VAL:HG22	1:B:63:LEU:CD2	2.46	0.45
1:D:176:LEU:O	1:D:180:GLU:HG3	2.15	0.45
1:B:275:GLU:C	1:B:277:TRP:H	2.24	0.45
2:G:6:DG:H2''	2:G:7:DA:C8	2.51	0.45
2:G:7:DA:H2''	2:G:8:8OG:H5''	1.98	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:242:LYS:HG2	4:A:288:HOH:O	2.16	0.45
1:B:145:ARG:CD	1:B:150:PRO:O	2.64	0.45
1:C:257:ALA:HA	1:C:260:TRP:CE3	2.51	0.45
1:D:244:ARG:C	1:D:246:PRO:HD3	2.42	0.45
2:E:11:DC:H2''	2:E:12:DC:C6	2.52	0.45
1:B:261:LYS:HE2	1:B:264:ARG:HH12	1.82	0.45
1:B:225:LEU:O	1:B:229:GLN:HA	2.17	0.45
1:B:133:LYS:O	1:B:137:ARG:HG3	2.17	0.44
1:C:39:LEU:HD22	1:C:48:VAL:HG21	1.99	0.44
1:C:47:VAL:H	1:C:64:SER:HB3	1.82	0.44
1:A:87:ASN:HB3	1:A:90:ILE:HD12	1.99	0.44
1:B:250:PRO:O	1:B:254:ARG:HB2	2.16	0.44
1:C:14:TRP:HZ3	1:C:106:ARG:O	2.00	0.44
1:D:270:HIS:HE1	4:D:283:HOH:O	2.01	0.44
1:A:15:MET:CE	1:A:19:LEU:HG	2.37	0.44
1:C:276:GLY:O	1:C:277:TRP:O	2.36	0.44
1:A:23:ALA:HA	1:A:28:GLU:OE2	2.18	0.44
1:A:114:PHE:CE1	1:A:186:ALA:HA	2.52	0.44
1:B:114:PHE:CD2	1:B:158:PRO:HG3	2.53	0.44
1:B:107:LEU:C	1:B:107:LEU:CD2	2.90	0.44
1:C:249:THR:HB	1:C:250:PRO:HD2	1.99	0.44
1:A:249:THR:HB	3:F:20:DC:H5'	2.00	0.44
1:D:249:THR:OG1	1:D:252:GLN:HG3	2.18	0.44
1:A:3:THR:HG22	1:A:60:HIS:CD2	2.33	0.43
1:A:209:LEU:HD11	1:A:223:PHE:CD2	2.53	0.43
1:B:245:PHE:O	1:B:246:PRO:C	2.60	0.43
1:B:254:ARG:HG3	1:B:254:ARG:HH11	1.83	0.43
1:B:255:ARG:HG2	1:B:255:ARG:HH11	1.82	0.43
1:C:114:PHE:CE1	1:C:186:ALA:HA	2.53	0.43
1:D:134:LEU:HD23	1:D:134:LEU:O	2.17	0.43
1:D:114:PHE:CE1	1:D:186:ALA:HA	2.53	0.43
1:A:76:ALA:HA	1:D:72:ALA:HB1	1.99	0.43
1:B:7:GLN:HG3	1:B:86:CYS:O	2.18	0.43
1:D:55:ALA:O	1:D:56:ARG:HD2	2.17	0.43
1:D:122:LEU:HD13	1:D:134:LEU:HD22	2.00	0.43
1:B:7:GLN:HA	1:B:8:PRO:HD3	1.91	0.43
1:B:151:GLU:CD	1:B:151:GLU:H	2.26	0.43
1:A:140:GLN:HA	1:A:140:GLN:NE2	2.29	0.43
3:F:17:DA:H1'	3:F:18:DA:H5'	2.01	0.43
1:B:195:PRO:HB2	1:B:228:TRP:CZ2	2.54	0.43
1:C:244:ARG:C	1:C:246:PRO:HD3	2.44	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:209:LEU:O	1:B:212:PHE:HB2	2.18	0.42
1:D:203:GLU:CD	1:D:203:GLU:N	2.77	0.42
1:C:151:GLU:HG2	1:C:152:TYR:N	2.34	0.42
1:B:98:LEU:HD22	1:B:260:TRP:CE2	2.54	0.42
1:C:61:ILE:HD12	1:C:78:MET:HG3	2.01	0.42
3:F:14:DG:N3	3:F:14:DG:O4'	2.53	0.42
1:B:244:ARG:C	1:B:246:PRO:HD3	2.45	0.42
1:C:110:CYS:HB3	1:C:116:GLN:HE21	1.84	0.42
1:B:143:GLY:HA3	1:B:153:ILE:CD1	2.41	0.42
1:C:51:ILE:HB	1:C:60:HIS:HB3	2.02	0.42
1:D:280:ASP:C	1:D:282:ALA:H	2.28	0.42
1:A:7:GLN:NE2	1:A:89:GLN:NE2	2.68	0.42
1:A:181:ALA:HB2	1:A:214:GLY:HA3	2.01	0.42
1:B:46:GLY:HA3	1:B:64:SER:OG	2.19	0.42
1:C:155:PHE:CD2	1:C:156:PRO:HD2	2.54	0.42
1:D:176:LEU:N	4:D:305:HOH:O	2.52	0.42
1:A:43:GLU:H	1:A:43:GLU:HG3	1.48	0.42
1:B:174:MET:HB2	1:B:178:ARG:CG	2.39	0.42
1:C:20:ALA:HA	1:C:30:VAL:HG21	2.00	0.42
1:C:51:ILE:HD12	1:C:60:HIS:CD2	2.54	0.42
1:C:51:ILE:HD12	1:C:60:HIS:HD2	1.84	0.42
1:A:151:GLU:OE1	1:A:151:GLU:N	2.42	0.41
1:B:105:LEU:HD13	1:B:106:ARG:N	2.34	0.41
1:B:261:LYS:HG2	1:B:264:ARG:NE	2.35	0.41
1:A:68:GLU:HB3	1:A:69:PRO:HD3	2.02	0.41
1:A:158:PRO:HD2	1:A:159:GLN:NE2	2.35	0.41
1:B:114:PHE:H	1:B:196:MET:HE1	1.85	0.41
1:C:101:ALA:C	1:C:102:ARG:HG2	2.46	0.41
1:B:122:LEU:HD23	1:B:122:LEU:HA	1.86	0.41
1:D:149:PHE:CD2	1:D:149:PHE:N	2.88	0.41
1:D:184:HIS:CD2	1:D:213:PRO:HD2	2.55	0.41
1:A:105:LEU:O	1:A:106:ARG:HD3	2.20	0.41
1:C:39:LEU:CD2	1:C:48:VAL:HG21	2.51	0.41
1:A:254:ARG:HA	1:A:254:ARG:HD3	1.81	0.41
1:C:159:GLN:H	1:C:159:GLN:CD	2.29	0.41
1:C:145:ARG:HG3	1:C:145:ARG:NH1	2.36	0.41
1:D:56:ARG:NH2	1:D:57:HIS:NE2	2.68	0.41
1:D:115:GLU:HG3	1:D:155:PHE:CE1	2.55	0.41
1:D:125:LEU:HD13	2:G:1:DG:C8	2.55	0.41
1:D:201:ASP:OD2	1:D:204:GLN:HB2	2.21	0.41
1:B:110:CYS:SG	1:B:227:GLY:HA2	2.60	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:18:PHE:CE1	1:C:22:ARG:HD2	2.56	0.41
1:D:274:THR:CG2	1:D:277:TRP:HB2	2.51	0.41
1:A:6:TRP:HZ3	1:A:58:THR:O	2.02	0.41
1:A:245:PHE:N	1:A:246:PRO:HD3	2.36	0.41
1:B:99:GLY:HA2	1:B:270:HIS:CD2	2.56	0.41
1:B:192:GLY:HA2	4:B:301:HOH:O	2.19	0.41
1:A:122:LEU:HD21	1:A:182:LEU:HD11	2.02	0.41
1:B:235:LEU:HD13	1:B:268:LEU:HD22	2.03	0.41
1:A:107:LEU:HD11	1:A:225:LEU:HD21	2.03	0.40
1:A:254:ARG:HD2	4:A:320:HOH:O	2.21	0.40
1:B:209:LEU:HD23	1:B:209:LEU:HA	1.88	0.40
1:A:141:LEU:HD12	1:A:141:LEU:O	2.22	0.40
1:C:199:PRO:HG3	1:C:205:ALA:CB	2.52	0.40
1:D:148:ASP:C	1:D:149:PHE:CD2	2.99	0.40
1:A:241:ILE:HD11	1:A:268:LEU:CD1	2.51	0.40
1:B:106:ARG:O	1:B:108:PRO:HD3	2.21	0.40
1:C:144:GLU:HB3	1:C:154:CYS:HB2	2.04	0.40
1:D:217:ARG:NH1	1:D:254:ARG:HH22	2.18	0.40
2:E:11:DC:C2'	2:E:12:DC:C5	3.02	0.40
1:D:133:LYS:HE2	1:D:133:LYS:HA	2.02	0.40
1:D:193:THR:O	1:D:193:THR:HG22	2.21	0.40
1:B:106:ARG:HA	1:B:106:ARG:HD3	1.80	0.40
1:C:10:TYR:CE2	1:C:106:ARG:HG3	2.55	0.40
1:C:50:ALA:HA	1:C:60:HIS:O	2.21	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	280/282 (99%)	272 (97%)	7 (2%)	1 (0%)	30 43

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	B	280/282 (99%)	264 (94%)	10 (4%)	6 (2%)	5	7
1	C	280/282 (99%)	264 (94%)	14 (5%)	2 (1%)	18	28
1	D	280/282 (99%)	264 (94%)	16 (6%)	0	100	100
All	All	1120/1128 (99%)	1064 (95%)	47 (4%)	9 (1%)	16	25

All (9) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	248	MET
1	C	277	TRP
1	B	65	ALA
1	C	281	GLU
1	B	246	PRO
1	B	275	GLU
1	B	250	PRO
1	B	276	GLY
1	A	126	VAL

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	222/222 (100%)	212 (96%)	10 (4%)	24	42
1	B	222/222 (100%)	211 (95%)	11 (5%)	22	38
1	C	222/222 (100%)	210 (95%)	12 (5%)	20	35
1	D	222/222 (100%)	202 (91%)	20 (9%)	9	15
All	All	888/888 (100%)	835 (94%)	53 (6%)	17	31

All (53) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	43	GLU
1	A	73	GLU

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Mol	Chain	Res	Type
1	A	105	LEU
1	A	133	LYS
1	A	137	ARG
1	A	159	GLN
1	A	204	GLN
1	A	233	VAL
1	A	250	PRO
1	A	254	ARG
1	B	6	TRP
1	B	7	GLN
1	B	58	THR
1	B	105	LEU
1	B	144	GLU
1	B	151	GLU
1	B	159	GLN
1	B	203	GLU
1	B	246	PRO
1	B	255	ARG
1	B	272	TRP
1	C	30	VAL
1	C	102	ARG
1	C	105	LEU
1	C	111	VAL
1	C	147	ASP
1	C	159	GLN
1	C	167	GLN
1	C	193	THR
1	C	204	GLN
1	C	250	PRO
1	C	255	ARG
1	C	272	TRP
1	D	3	THR
1	D	6	TRP
1	D	45	ARG
1	D	56	ARG
1	D	58	THR
1	D	73	GLU
1	D	89	GLN
1	D	105	LEU
1	D	133	LYS
1	D	144	GLU
1	D	148	ASP

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Mol	Chain	Res	Type
1	D	153	ILE
1	D	159	GLN
1	D	160	ARG
1	D	187	ASN
1	D	204	GLN
1	D	255	ARG
1	D	262	PRO
1	D	272	TRP
1	D	275	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (38) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	60	HIS
1	A	89	GLN
1	A	116	GLN
1	A	124	GLN
1	A	140	GLN
1	A	159	GLN
1	A	167	GLN
1	A	204	GLN
1	A	221	ASN
1	A	243	GLN
1	B	116	GLN
1	B	124	GLN
1	B	159	GLN
1	B	167	GLN
1	B	184	HIS
1	B	187	ASN
1	B	204	GLN
1	B	221	ASN
1	B	270	HIS
1	C	60	HIS
1	C	89	GLN
1	C	116	GLN
1	C	124	GLN
1	C	140	GLN
1	C	159	GLN
1	C	167	GLN
1	C	187	ASN
1	C	221	ASN
1	D	5	ASN

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Mol	Chain	Res	Type
1	D	7	GLN
1	D	57	HIS
1	D	60	HIS
1	D	116	GLN
1	D	124	GLN
1	D	187	ASN
1	D	210	GLN
1	D	221	ASN
1	D	270	HIS

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

2 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$
2	8OG	E	8	2,3	22,25,26	1.08	1 (4%)	26,37,40	1.75	4 (15%)
2	8OG	G	8	2,3	22,25,26	1.08	2 (9%)	26,37,40	1.78	4 (15%)

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
2	8OG	E	8	2,3	-	4/7/21/22	0/3/3/3
2	8OG	G	8	2,3	-	0/7/21/22	0/3/3/3

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	E	8	8OG	C8-N7	-4.30	1.30	1.38
2	G	8	8OG	C8-N7	-4.09	1.30	1.38
2	G	8	8OG	C8-N9	-2.09	1.37	1.40

All (8) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	G	8	8OG	N7-C8-N9	6.80	114.17	106.61
2	E	8	8OG	N7-C8-N9	6.70	114.07	106.61
2	G	8	8OG	C5-N7-C8	-4.12	103.79	109.47
2	E	8	8OG	C5-N7-C8	-4.11	103.80	109.47
2	E	8	8OG	C4-C5-N7	2.63	110.87	106.06
2	G	8	8OG	C4-C5-N7	2.62	110.86	106.06
2	G	8	8OG	O8-C8-N9	-2.14	123.08	126.00
2	E	8	8OG	O8-C8-N7	-2.11	122.52	126.47

There are no chirality outliers.

All (4) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	E	8	8OG	C4'-C5'-O5'-P
2	E	8	8OG	C3'-C4'-C5'-O5'
2	E	8	8OG	O4'-C4'-C5'-O5'
2	E	8	8OG	O4'-C1'-N9-C4

There are no ring outliers.

2 monomers are involved in 12 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	E	8	8OG	7	0
2	G	8	8OG	5	0

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, 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	282/282 (100%)	-0.10	6 (2%) 63 59	20, 40, 70, 99	0
1	B	282/282 (100%)	0.17	12 (4%) 40 36	22, 42, 78, 128	0
1	C	282/282 (100%)	0.12	9 (3%) 50 46	19, 42, 79, 132	0
1	D	282/282 (100%)	0.06	7 (2%) 58 54	24, 40, 69, 141	0
2	E	11/12 (91%)	1.31	3 (27%) 1 1	55, 107, 123, 132	0
2	G	11/12 (91%)	0.40	0 100 100	42, 65, 80, 84	0
3	F	12/12 (100%)	1.60	1 (8%) 17 14	71, 105, 120, 124	0
3	H	12/12 (100%)	0.03	0 100 100	37, 60, 75, 79	0
All	All	1174/1176 (99%)	0.09	38 (3%) 50 46	19, 42, 81, 141	0

All (38) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	60	HIS	6.5
1	D	56	ARG	4.3
1	D	282	ALA	4.3
3	F	14	DG	3.9
1	A	254	ARG	3.7
1	B	275	GLU	3.6
1	B	177	LYS	3.4
1	C	282	ALA	3.4
1	D	1	MET	3.2
1	C	1	MET	3.0
1	A	43	GLU	2.8
1	B	133	LYS	2.7
1	C	148	ASP	2.6
1	C	104	GLY	2.6
1	D	150	PRO	2.6
1	C	254	ARG	2.6

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Mol	Chain	Res	Type	RSRZ
1	A	243	GLN	2.6
1	B	97	ARG	2.5
1	A	57	HIS	2.5
1	B	276	GLY	2.4
1	A	148	ASP	2.4
1	C	57	HIS	2.4
1	B	247	GLY	2.3
1	C	97	ARG	2.3
2	E	12	DC	2.3
1	A	255	ARG	2.3
1	B	176	LEU	2.2
1	B	140	GLN	2.2
1	D	140	GLN	2.1
1	C	255	ARG	2.1
2	E	6	DG	2.1
2	E	11	DC	2.1
1	B	1	MET	2.1
1	B	255	ARG	2.1
1	D	148	ASP	2.0
1	D	239	TYR	2.0
1	B	214	GLY	2.0
1	B	242	LYS	2.0

6.2 Non-standard residues in protein, DNA, RNA chains [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
2	8OG	E	8	23/24	0.70	0.15	101,103,106,112	0
2	8OG	G	8	23/24	0.90	0.10	62,64,70,73	0

6.3 Carbohydrates [i](#)

There are no oligosaccharides 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.