



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 8, 2026 – 07:24 AM UTC

PDB ID : 3WVK / pdb_00003wvk
Title : Time-Resolved Crystal Structure of HindIII with 230sec soaking
Authors : Kawamura, T.; Kobayashi, T.; Watanabe, N.
Deposited on : 2014-05-22
Resolution : 2.00 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

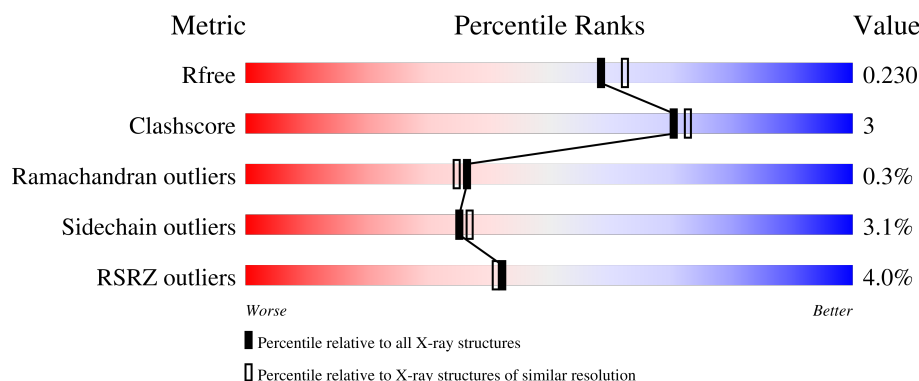
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.00 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	10052 (2.00-2.00)
Clashscore	190562	11152 (2.00-2.00)
Ramachandran outliers	187476	11031 (2.00-2.00)
Sidechain outliers	187428	11029 (2.00-2.00)
RSRZ outliers	180081	10067 (2.00-2.00)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. 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	300	5% 86% 13% .
1	B	300	4% 86% 13% ..
1	C	300	4% 88% 11% .
1	D	300	4% 86% 11% ..
2	M	12	8% 50% 25% 25%

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Mol	Chain	Length	Quality of chain
2	N	12	
2	O	12	
2	P	12	
3	E	4	
3	G	4	
3	I	4	
3	K	4	
4	F	8	
4	H	8	
4	J	8	
4	L	8	

2 Entry composition

There are 7 unique types of molecules in this entry. The entry contains 12239 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 Type-2 restriction enzyme HindIII.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	298	Total	C	N	O	S	0	0	0
			2452	1580	405	464	3			
1	B	298	Total	C	N	O	S	0	0	0
			2452	1580	405	464	3			
1	C	298	Total	C	N	O	S	0	0	0
			2452	1580	405	464	3			
1	D	298	Total	C	N	O	S	0	0	0
			2452	1580	405	464	3			

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	M	12	Total	C	N	O	P	0	0	0
			243	116	46	70	11			
2	N	12	Total	C	N	O	P	0	0	0
			243	116	46	70	11			
2	O	12	Total	C	N	O	P	0	0	0
			243	116	46	70	11			
2	P	12	Total	C	N	O	P	0	0	0
			243	116	46	70	11			

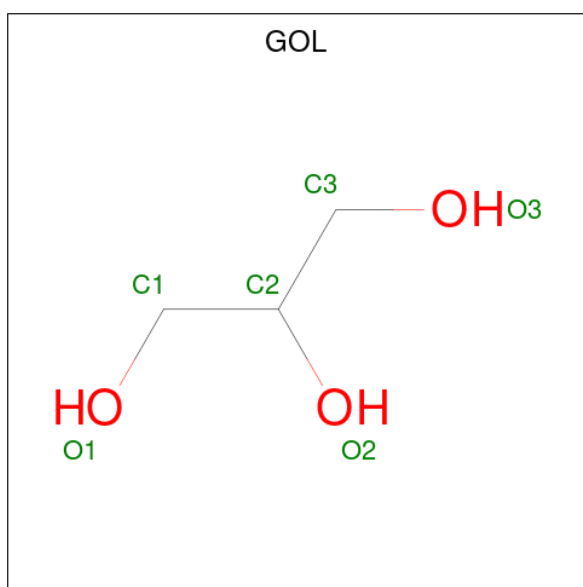
- Molecule 3 is a DNA chain called DNA (5'-D(*GP*CP*CP*A)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	E	4	Total	C	N	O	P	0	0	0
			78	38	16	21	3			
3	G	4	Total	C	N	O	P	0	0	0
			78	38	16	21	3			
3	I	4	Total	C	N	O	P	0	0	0
			78	38	16	21	3			
3	K	4	Total	C	N	O	P	0	0	0
			78	38	16	21	3			

- Molecule 4 is a DNA chain called DNA (5'-D(P*AP*GP*CP*TP*TP*GP*GP*C)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
4	F	8	Total 166	C 78	N 30	O 50	P 8	0	0	0
4	H	8	Total 166	C 78	N 30	O 50	P 8	0	0	0
4	J	8	Total 166	C 78	N 30	O 50	P 8	0	0	0
4	L	8	Total 166	C 78	N 30	O 50	P 8	0	0	0

- Molecule 5 is GLYCEROL (CCD ID: GOL) (formula: C₃H₈O₃).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	A	1	Total	C	O	0	0
			6	3	3		
5	A	1	Total	C	O	0	0
			6	3	3		
5	C	1	Total	C	O	0	0
			6	3	3		
5	D	1	Total	C	O	0	0
			6	3	3		

- Molecule 6 is MANGANESE (II) ION (CCD ID: MN) (formula: Mn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	2	Total	Mn	0	0
			2	2		

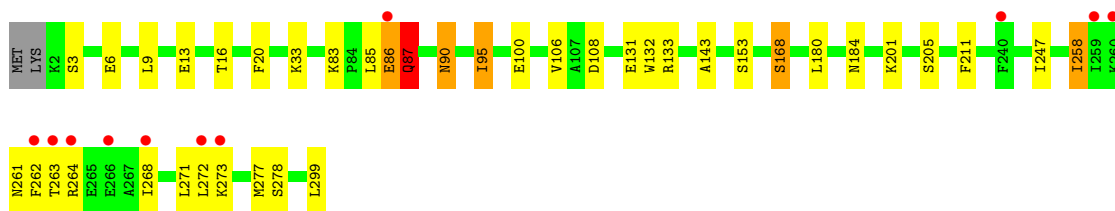
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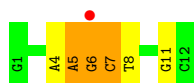
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	B	2	Total 2	Mn 2	0	0
6	C	2	Total 2	Mn 2	0	0
6	D	2	Total 2	Mn 2	0	0

- Molecule 7 is water.

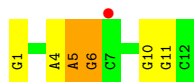
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	88	Total 88	O 88	0	0
7	B	99	Total 99	O 99	0	0
7	C	77	Total 77	O 77	0	0
7	D	93	Total 93	O 93	0	0
7	N	2	Total 2	O 2	0	0
7	O	1	Total 1	O 1	0	0
7	P	1	Total 1	O 1	0	0
7	E	8	Total 8	O 8	0	0
7	F	14	Total 14	O 14	0	0
7	G	15	Total 15	O 15	0	0
7	H	14	Total 14	O 14	0	0
7	I	8	Total 8	O 8	0	0
7	J	11	Total 11	O 11	0	0
7	K	9	Total 9	O 9	0	0
7	L	11	Total 11	O 11	0	0



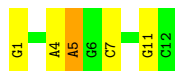
- Molecule 2: DNA (5'-D(*GP*CP*CP*AP*AP*GP*CP*TP*TP*GP*GP*C)-3')



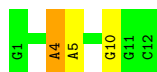
- Molecule 2: DNA (5'-D(*GP*CP*CP*AP*AP*GP*CP*TP*TP*GP*GP*C)-3')



- Molecule 2: DNA (5'-D(*GP*CP*CP*AP*AP*GP*CP*TP*TP*GP*GP*C)-3')



- Molecule 2: DNA (5'-D(*GP*CP*CP*AP*AP*GP*CP*TP*TP*GP*GP*C)-3')



- Molecule 3: DNA (5'-D(*GP*CP*CP*A)-3')



- Molecule 3: DNA (5'-D(*GP*CP*CP*A)-3')



There are no outlier residues recorded for this chain.

- Molecule 3: DNA (5'-D(*GP*CP*CP*A)-3')

Chain I:  75% 25%



- Molecule 3: DNA (5'-D(*GP*CP*CP*A)-3')

Chain K:  100%

There are no outlier residues recorded for this chain.

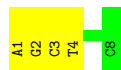
- Molecule 4: DNA (5'-D(P*AP*GP*CP*TP*TP*GP*GP*C)-3')

Chain F:  75% 25%

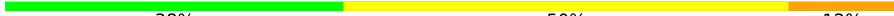


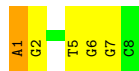
- Molecule 4: DNA (5'-D(P*AP*GP*CP*TP*TP*GP*GP*C)-3')

Chain H:  50% 50%



- Molecule 4: DNA (5'-D(P*AP*GP*CP*TP*TP*GP*GP*C)-3')

Chain J:  38% 50% 12%



- Molecule 4: DNA (5'-D(P*AP*GP*CP*TP*TP*GP*GP*C)-3')

Chain L:  75% 25%



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	80.25Å 141.16Å 96.58Å 90.00° 111.96° 90.00°	Depositor
Resolution (Å)	39.77 – 2.00 39.77 – 2.00	Depositor EDS
% Data completeness (in resolution range)	99.7 (39.77-2.00) 99.6 (39.77-2.00)	Depositor EDS
R_{merge}	0.10	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.09 (at 2.00Å)	Xtriage
Refinement program	REFMAC 5.8.0069	Depositor
R, R_{free}	0.179 , 0.226 0.187 , 0.230	Depositor DCC
R_{free} test set	6688 reflections (5.01%)	wwPDB-VP
Wilson B-factor (Å ²)	29.2	Xtriage
Anisotropy	0.063	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.38 , 39.5	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	0.046 for h,-k,-h-l	Xtriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	12239	wwPDB-VP
Average B, all atoms (Å ²)	36.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.76% 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: GOL, MN

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	1.32	6/2494 (0.2%)	1.17	5/3351 (0.1%)
1	B	1.32	5/2494 (0.2%)	1.20	7/3351 (0.2%)
1	C	1.29	4/2494 (0.2%)	1.14	4/3351 (0.1%)
1	D	1.24	5/2494 (0.2%)	1.15	4/3351 (0.1%)
2	M	0.51	0/272	1.17	5/418 (1.2%)
2	N	0.64	1/272 (0.4%)	1.26	6/418 (1.4%)
2	O	0.60	0/272	1.22	4/418 (1.0%)
2	P	0.51	0/272	1.22	3/418 (0.7%)
3	E	0.79	0/87	1.07	0/132
3	G	0.53	0/87	1.12	0/132
3	I	0.82	0/87	1.08	1/132 (0.8%)
3	K	0.75	0/87	1.06	0/132
4	F	0.62	0/185	1.03	0/282
4	H	0.58	0/185	0.99	0/282
4	J	0.63	0/185	1.15	3/282 (1.1%)
4	L	0.67	0/185	1.03	0/282
All	All	1.20	21/12152 (0.2%)	1.16	42/16732 (0.3%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
3	E	0	1

All (21) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	86	GLU	CA-C	6.66	1.61	1.52
1	A	191	LEU	C-O	-6.30	1.16	1.24

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	143	ALA	CA-C	6.14	1.58	1.52
1	A	36	ARG	N-CA	-6.14	1.39	1.46
1	A	57	SER	CA-C	-5.73	1.45	1.53
1	C	217	LYS	N-CA	5.63	1.53	1.46
1	D	153	SER	CA-C	-5.56	1.45	1.52
1	D	87	GLN	CA-C	-5.55	1.45	1.52
1	D	168	SER	N-CA	-5.48	1.39	1.45
1	B	176	LEU	CA-C	5.47	1.59	1.52
1	D	90	ASN	CA-C	-5.47	1.45	1.52
1	C	161	ASP	N-CA	-5.41	1.39	1.46
1	A	10	SER	CA-C	-5.41	1.46	1.52
1	C	161	ASP	C-O	-5.37	1.17	1.24
1	D	108	ASP	CG-OD2	5.25	1.35	1.25
1	C	45	SER	C-O	-5.19	1.17	1.24
1	A	87	GLN	CA-C	-5.13	1.45	1.52
1	B	152	LYS	C-O	-5.08	1.17	1.23
2	N	1	DG	O3'-P	-5.06	1.53	1.61
1	A	33	LYS	C-O	-5.02	1.17	1.24
1	B	110	LYS	N-CA	-5.02	1.40	1.46

All (42) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	P	5	DA	C2'-C3'-O3'	8.46	124.20	111.50
2	P	10	DG	C4'-C3'-O3'	-8.07	97.89	110.00
2	N	1	DG	C5'-C4'-O4'	7.88	121.22	109.40
1	A	288	ILE	N-CA-C	7.60	117.72	110.42
1	C	294	ASN	N-CA-C	7.50	119.46	111.28
2	N	4	DA	C4'-C3'-O3'	-7.06	99.41	110.00
2	O	5	DA	C4'-C3'-O3'	-6.83	99.75	110.00
1	D	16	THR	N-CA-C	6.63	119.35	111.33
1	B	294	ASN	N-CA-C	6.60	118.47	111.28
4	J	1	DA	C2'-C3'-O3'	6.50	121.24	111.50
2	N	11	DG	C4'-C3'-O3'	-6.29	100.56	110.00
1	B	16	THR	N-CA-C	6.23	118.58	111.11
2	M	5	DA	C4'-C3'-O3'	-6.19	100.72	110.00
2	M	11	DG	C2'-C3'-O3'	6.15	120.72	111.50
1	B	174	ILE	N-CA-C	5.81	116.00	110.42
2	O	1	DG	C4'-C3'-O3'	-5.76	101.36	110.00
2	M	6	DG	C2'-C3'-O3'	-5.70	102.95	111.50
2	M	11	DG	C4'-C3'-O3'	-5.67	101.50	110.00
1	D	205	SER	N-CA-C	5.59	118.14	111.71

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	N	5	DA	C4'-C3'-O3'	-5.45	101.83	110.00
2	N	10	DG	C4'-C3'-O3'	-5.44	101.84	110.00
1	A	25	ASN	N-CA-C	5.42	117.89	111.33
2	P	4	DA	C2'-C3'-O3'	-5.38	103.44	111.50
1	D	258	ILE	N-CA-C	-5.30	104.58	110.62
1	C	276	ASN	N-CA-C	5.29	118.54	111.24
1	B	83	LYS	CA-C-N	5.29	125.19	119.85
1	B	83	LYS	C-N-CA	5.29	125.19	119.85
2	M	7	DC	C4'-C3'-O3'	-5.26	102.11	110.00
1	B	184	ASN	N-CA-C	5.25	118.79	112.38
2	O	7	DC	C4'-C3'-O3'	-5.21	102.19	110.00
2	O	11	DG	C4'-C3'-O3'	-5.21	102.19	110.00
3	I	3	DC	C2'-C3'-O3'	-5.19	103.72	111.50
4	J	5	DT	C4'-C3'-O3'	-5.16	102.26	110.00
1	A	99	LYS	N-CA-C	-5.13	105.32	112.45
1	C	5	LEU	N-CA-C	5.11	116.84	111.28
1	D	278	SER	CB-CA-C	-5.11	102.86	110.88
1	A	273	LYS	CA-C-N	5.10	127.37	120.44
1	A	273	LYS	C-N-CA	5.10	127.37	120.44
1	B	269	GLU	N-CA-C	-5.07	105.84	111.36
4	J	6	DG	C4'-C3'-O3'	-5.06	102.42	110.00
2	N	6	DG	C4'-C3'-O3'	-5.01	102.49	110.00
1	C	260	LYS	N-CA-C	5.00	116.73	111.28

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
3	E	4	DA	Sidechain

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	2452	0	2502	25	0
1	B	2452	0	2502	21	0
1	C	2452	0	2502	17	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	D	2452	0	2502	17	0
2	M	243	0	136	6	0
2	N	243	0	136	1	0
2	O	243	0	136	1	0
2	P	243	0	136	1	0
3	E	78	0	45	0	0
3	G	78	0	45	0	0
3	I	78	0	45	0	0
3	K	78	0	45	0	0
4	F	166	0	91	1	0
4	H	166	0	91	2	0
4	J	166	0	91	2	0
4	L	166	0	91	1	0
5	A	12	0	16	0	0
5	C	6	0	8	0	0
5	D	6	0	8	0	0
6	A	2	0	0	0	0
6	B	2	0	0	0	0
6	C	2	0	0	0	0
6	D	2	0	0	0	0
7	A	88	0	0	0	0
7	B	99	0	0	2	0
7	C	77	0	0	0	0
7	D	93	0	0	0	0
7	E	8	0	0	0	0
7	F	14	0	0	0	0
7	G	15	0	0	0	0
7	H	14	0	0	0	0
7	I	8	0	0	0	0
7	J	11	0	0	0	0
7	K	9	0	0	0	0
7	L	11	0	0	0	0
7	N	2	0	0	0	0
7	O	1	0	0	0	0
7	P	1	0	0	0	0
All	All	12239	0	11128	78	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 3.

All (78) 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:264:ARG:NH1	1:B:262:PHE:O	1.77	1.17
1:A:213:ARG:NH1	1:B:299:LEU:OXT	2.01	0.93
2:M:5:DA:H2''	2:M:6:DG:OP2	1.76	0.83
1:A:285:ASP:OD1	1:B:249:LYS:HE3	1.87	0.74
1:C:271:LEU:HG	1:D:271:LEU:HD13	1.73	0.69
1:B:263:THR:OG1	1:B:266:GLU:HG3	1.92	0.69
1:C:262:PHE:O	1:D:264:ARG:NH1	2.30	0.64
1:A:277:MET:HE1	1:B:259:ILE:CD1	2.31	0.61
1:D:9:LEU:O	1:D:13:GLU:HG2	2.03	0.59
2:N:5:DA:H2''	2:N:6:DG:OP2	2.03	0.59
1:A:285:ASP:OD1	1:B:249:LYS:CE	2.51	0.58
1:B:95:ILE:HD12	1:B:136:LYS:HE3	1.85	0.57
1:D:85:LEU:HD11	1:D:95:ILE:HG23	1.87	0.57
1:A:18:GLN:NE2	1:A:22:GLN:OE1	2.38	0.56
1:C:256:ILE:HG22	1:D:277:MET:HE3	1.86	0.56
1:A:252:TRP:HB2	1:B:281:ILE:HD11	1.88	0.55
1:A:17:ASN:ND2	1:A:18:GLN:OE1	2.40	0.55
1:C:264:ARG:HB3	1:C:264:ARG:NH2	2.23	0.54
1:A:288:ILE:HD11	1:B:245:SER:CB	2.39	0.53
2:M:5:DA:C2'	2:M:6:DG:OP2	2.51	0.51
1:B:200:LYS:HE2	7:B:495:HOH:O	2.11	0.50
2:M:7:DC:H1'	2:M:8:DT:H5'	1.94	0.50
1:C:230:LEU:HD23	1:D:299:LEU:HD21	1.94	0.50
2:O:4:DA:H2''	2:O:5:DA:OP2	2.12	0.49
2:P:4:DA:H2'	2:P:4:DA:OP2	2.13	0.49
1:C:264:ARG:HG3	1:D:264:ARG:HG2	1.94	0.49
1:A:141:LEU:C	1:A:141:LEU:HD23	2.37	0.48
1:A:252:TRP:CB	1:B:281:ILE:HD11	2.44	0.48
2:M:5:DA:OP2	2:M:5:DA:H2'	2.13	0.48
1:A:90:ASN:HB3	1:A:132:TRP:CD1	2.48	0.48
1:C:16:THR:OG1	1:C:59:GLN:HG3	2.14	0.47
1:C:37:ASN:O	1:C:41:GLU:HG3	2.14	0.47
1:C:90:ASN:HB3	1:C:132:TRP:CD1	2.49	0.47
2:M:4:DA:H1'	2:M:5:DA:C8	2.50	0.47
1:C:106:VAL:HG11	1:C:133:ARG:HA	1.98	0.46
1:A:252:TRP:O	1:A:256:ILE:HG23	2.16	0.46
1:B:293:SER:OG	1:B:295:ASP:OD1	2.33	0.46
1:C:263:THR:HG23	1:C:266:GLU:HG3	1.98	0.46
1:A:264:ARG:HA	1:B:264:ARG:HG3	1.99	0.45
1:B:271:LEU:HA	1:B:271:LEU:HD23	1.79	0.45
1:D:247:ILE:H	1:D:247:ILE:HD12	1.81	0.45
4:J:1:DA:H2'	4:J:2:DG:O4'	2.17	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:90:ASN:HB3	1:D:132:TRP:CD1	2.52	0.45
1:B:59:GLN:HG3	7:B:464:HOH:O	2.16	0.45
1:D:86:GLU:O	1:D:87:GLN:HB2	2.17	0.44
1:A:3:SER:HB2	1:A:41:GLU:OE2	2.17	0.44
1:A:42:LEU:HD23	1:A:42:LEU:HA	1.84	0.44
1:A:285:ASP:OD1	1:B:249:LYS:NZ	2.50	0.44
4:H:1:DA:H2'	4:H:2:DG:O4'	2.18	0.44
1:A:275:ILE:HG21	1:A:277:MET:HE3	2.00	0.43
1:A:275:ILE:O	1:A:276:ASN:C	2.61	0.43
1:B:163:ASN:HA	1:B:195:PRO:HB2	1.99	0.43
1:C:141:LEU:C	1:C:141:LEU:HD23	2.43	0.43
1:A:107:ALA:HA	1:A:140:VAL:O	2.17	0.43
1:B:107:ALA:HA	1:B:140:VAL:O	2.19	0.43
1:D:106:VAL:HG11	1:D:133:ARG:HA	2.00	0.43
1:D:20:PHE:CD1	4:J:7:DG:H5''	2.54	0.43
1:C:194:PHE:N	1:C:195:PRO:CD	2.81	0.43
4:H:3:DC:H2''	4:H:4:DT:H5'	2.01	0.43
4:F:1:DA:H2'	4:F:2:DG:O4'	2.19	0.43
1:B:40:ILE:O	1:B:44:ARG:HG2	2.18	0.42
1:C:264:ARG:HB3	1:C:264:ARG:CZ	2.49	0.42
2:M:6:DG:OP2	2:M:6:DG:H2'	2.18	0.42
1:C:264:ARG:CZ	1:C:264:ARG:CB	2.97	0.42
1:D:143:ALA:O	1:D:168:SER:HA	2.20	0.42
1:A:284:ILE:O	1:A:288:ILE:HD12	2.20	0.42
1:A:277:MET:HE1	1:B:259:ILE:HD13	2.02	0.41
1:D:180:LEU:HA	1:D:180:LEU:HD23	1.86	0.41
1:B:106:VAL:HG11	1:B:133:ARG:HA	2.03	0.41
1:C:236:LYS:HB2	1:C:236:LYS:HE3	1.67	0.41
1:D:100:GLU:OE1	1:D:184:ASN:HB3	2.19	0.41
1:A:163:ASN:HA	1:A:195:PRO:HB2	2.03	0.41
1:D:3:SER:N	1:D:6:GLU:OE2	2.44	0.41
4:L:1:DA:H2'	4:L:2:DG:O4'	2.21	0.41
1:A:17:ASN:OD1	1:A:17:ASN:N	2.52	0.40
1:A:106:VAL:HG11	1:A:133:ARG:HA	2.02	0.40
1:C:263:THR:OG1	1:C:264:ARG:N	2.53	0.40
1:D:272:LEU:HD22	1:D:277:MET:HE1	2.03	0.40

There are no symmetry-related clashes.

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	296/300 (99%)	289 (98%)	7 (2%)	0	100	100
1	B	296/300 (99%)	287 (97%)	7 (2%)	2 (1%)	18	14
1	C	296/300 (99%)	284 (96%)	12 (4%)	0	100	100
1	D	296/300 (99%)	285 (96%)	9 (3%)	2 (1%)	18	14
All	All	1184/1200 (99%)	1145 (97%)	35 (3%)	4 (0%)	36	35

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	D	263	THR
1	B	87	GLN
1	D	87	GLN
1	B	117	THR

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	274/276 (99%)	267 (97%)	7 (3%)	40	44
1	B	274/276 (99%)	269 (98%)	5 (2%)	51	58
1	C	274/276 (99%)	264 (96%)	10 (4%)	31	31
1	D	274/276 (99%)	262 (96%)	12 (4%)	25	24
All	All	1096/1104 (99%)	1062 (97%)	34 (3%)	35	37

All (34) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	19	GLU
1	A	26	SER
1	A	196	LYS
1	A	211	PHE
1	A	232	GLN
1	A	278	SER
1	A	289	LYS
1	B	201	LYS
1	B	211	PHE
1	B	259	ILE
1	B	277	MET
1	B	281	ILE
1	C	22	GLN
1	C	205	SER
1	C	211	PHE
1	C	226	ASP
1	C	263	THR
1	C	265	GLU
1	C	269	GLU
1	C	272	LEU
1	C	277	MET
1	C	293	SER
1	D	33	LYS
1	D	83	LYS
1	D	86	GLU
1	D	95	ILE
1	D	131	GLU
1	D	201	LYS
1	D	211	PHE
1	D	258	ILE
1	D	261	ASN
1	D	262	PHE
1	D	268	ILE
1	D	273	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (7) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	177	GLN
1	A	261	ASN
1	C	177	GLN

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Mol	Chain	Res	Type
1	C	231	ASN
1	C	255	GLN
1	D	177	GLN
1	D	294	ASN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 12 ligands modelled in this entry, 8 are monoatomic - leaving 4 for Mogul analysis.

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	$\# Z > 2$
5	GOL	A	302	-	5,5,5	0.65	0	5,5,5	0.50	0
5	GOL	A	301	-	5,5,5	0.86	0	5,5,5	0.64	0
5	GOL	C	301	-	5,5,5	0.55	0	5,5,5	0.65	0
5	GOL	D	301	-	5,5,5	0.63	0	5,5,5	0.83	0

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
5	GOL	A	302	-	-	0/4/4/4	-
5	GOL	A	301	-	-	0/4/4/4	-
5	GOL	C	301	-	-	2/4/4/4	-
5	GOL	D	301	-	-	2/4/4/4	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (4) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	C	301	GOL	C1-C2-C3-O3
5	D	301	GOL	O1-C1-C2-C3
5	D	301	GOL	O1-C1-C2-O2
5	C	301	GOL	O2-C2-C3-O3

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 [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	298/300 (99%)	0.12	14 (4%) 36 35	17, 33, 62, 89	0
1	B	298/300 (99%)	0.08	13 (4%) 39 38	18, 32, 56, 75	0
1	C	298/300 (99%)	0.01	11 (3%) 45 44	19, 33, 66, 91	0
1	D	298/300 (99%)	0.09	11 (3%) 45 44	20, 33, 67, 97	0
2	M	12/12 (100%)	0.91	1 (8%) 17 16	33, 53, 68, 69	0
2	N	12/12 (100%)	0.91	1 (8%) 17 16	29, 52, 63, 69	0
2	O	12/12 (100%)	0.56	0 100 100	31, 50, 58, 60	0
2	P	12/12 (100%)	0.51	0 100 100	29, 45, 62, 65	0
3	E	4/4 (100%)	-0.80	0 100 100	23, 23, 23, 34	0
3	G	4/4 (100%)	-1.27	0 100 100	19, 19, 21, 26	0
3	I	4/4 (100%)	-1.09	0 100 100	21, 22, 23, 28	0
3	K	4/4 (100%)	-1.19	0 100 100	19, 22, 23, 27	0
4	F	8/8 (100%)	-1.19	0 100 100	22, 23, 26, 29	0
4	H	8/8 (100%)	-1.00	0 100 100	20, 26, 30, 36	0
4	J	8/8 (100%)	-1.18	0 100 100	22, 24, 26, 30	0
4	L	8/8 (100%)	-1.11	0 100 100	23, 24, 26, 30	0
All	All	1288/1296 (99%)	0.05	51 (3%) 42 41	17, 33, 63, 97	0

All (51) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	256	ILE	5.4
1	A	256	ILE	3.7
1	D	262	PHE	3.6
1	C	263	THR	3.5
1	D	263	THR	3.5

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Mol	Chain	Res	Type	RSRZ
1	A	272	LEU	3.2
1	B	259	ILE	3.1
1	C	259	ILE	3.1
1	C	267	ALA	2.9
1	A	259	ILE	2.9
1	D	259	ILE	2.9
1	D	86	GLU	2.9
1	A	16	THR	2.9
1	D	264	ARG	2.7
1	A	294	ASN	2.7
1	B	267	ALA	2.7
1	B	227	LYS	2.7
1	A	275	ILE	2.6
1	D	272	LEU	2.6
1	B	240	PHE	2.5
1	C	272	LEU	2.5
1	D	240	PHE	2.5
1	B	258	ILE	2.5
1	A	269	GLU	2.4
1	A	293	SER	2.4
1	B	263	THR	2.4
1	A	258	ILE	2.4
1	D	268	ILE	2.4
1	C	264	ARG	2.3
1	A	17	ASN	2.3
1	A	253	LYS	2.3
1	B	262	PHE	2.3
1	B	86	GLU	2.3
1	C	2	LYS	2.3
1	B	257	ASN	2.3
1	C	275	ILE	2.2
1	A	240	PHE	2.2
1	B	264	ARG	2.2
1	A	267	ALA	2.2
1	B	228	ASP	2.2
1	A	262	PHE	2.1
2	M	6	DG	2.1
1	B	221	ASP	2.1
1	D	266	GLU	2.1
1	D	273	LYS	2.1
1	C	3	SER	2.1
1	D	260	LYS	2.0

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Mol	Chain	Res	Type	RSRZ
1	C	258	ILE	2.0
1	B	17	ASN	2.0
1	C	257	ASN	2.0
2	N	7	DC	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
5	GOL	C	301	6/6	0.93	0.11	35,43,45,53	0
5	GOL	D	301	6/6	0.93	0.11	42,45,48,48	0
5	GOL	A	302	6/6	0.95	0.12	32,39,43,48	0
5	GOL	A	301	6/6	0.96	0.13	30,38,40,40	0
6	MN	A	303	1/1	1.00	0.02	26,26,26,26	0
6	MN	A	304	1/1	1.00	0.01	28,28,28,28	0
6	MN	B	301	1/1	1.00	0.01	24,24,24,24	0
6	MN	B	302	1/1	1.00	0.03	24,24,24,24	0
6	MN	C	302	1/1	1.00	0.01	26,26,26,26	0
6	MN	C	303	1/1	1.00	0.03	28,28,28,28	0
6	MN	D	302	1/1	1.00	0.01	25,25,25,25	0
6	MN	D	303	1/1	1.00	0.02	29,29,29,29	0

6.5 Other polymers [i](#)

There are no such residues in this entry.