



wwPDB X-ray Structure Validation Summary Report ⓘ

Dec 7, 2021 – 12:03 PM EST

PDB ID : 7LKY
Title : Crystal Structure of PHF1 Tudor domain in complex with a peptidomimetic ligand UNC6641
Authors : Liu, J.; Kutateladze, T.G.
Deposited on : 2021-02-03
Resolution : 1.85 Å(reported)

This is a wwPDB X-ray Structure Validation Summary 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 following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.24
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.24

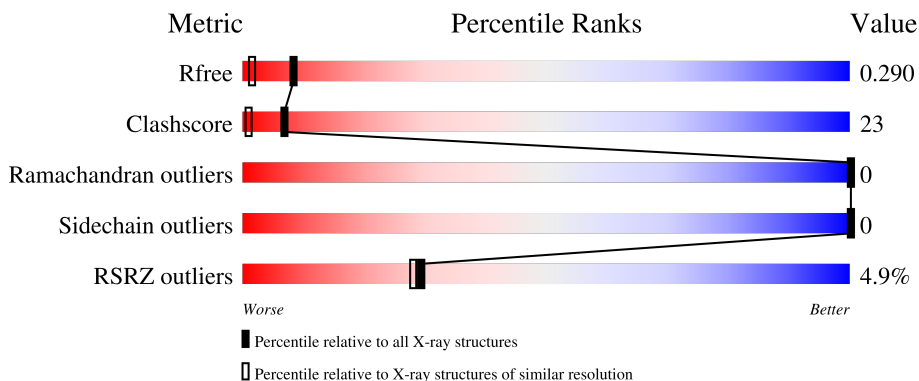
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.85 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}	130704	2469 (1.86-1.86)
Clashscore	141614	2625 (1.86-1.86)
Ramachandran outliers	138981	2592 (1.86-1.86)
Sidechain outliers	138945	2592 (1.86-1.86)
RSRZ outliers	127900	2436 (1.86-1.86)

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	64	<div> <div>3%</div> <div>45%</div> <div>42%</div> <div>12%</div> </div>
1	B	64	<div> <div>3%</div> <div>64%</div> <div>22%</div> <div>14%</div> </div>
1	C	64	<div> <div>3%</div> <div>52%</div> <div>34%</div> <div>14%</div> </div>
1	D	64	<div> <div>6%</div> <div>45%</div> <div>42%</div> <div>12%</div> </div>
1	E	64	<div> <div>3%</div> <div>53%</div> <div>34%</div> <div>12%</div> </div>

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Mol	Chain	Length	Quality of chain
1	F	64	
1	G	64	
1	H	64	
2	I	8	
2	J	8	
2	K	8	
2	L	8	
2	M	8	
2	N	8	
2	O	8	
2	P	8	

2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 4365 atoms, of which 18 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 Isoform 1 of PHD finger protein 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	56	Total	C	N	O	S	0	0	0
			452	294	74	83	1			
1	B	55	Total	C	N	O	S	0	0	0
			445	289	73	82	1			
1	C	55	Total	C	N	O	S	0	0	0
			445	289	73	82	1			
1	D	56	Total	C	N	O	S	0	0	0
			452	294	74	83	1			
1	E	56	Total	C	N	O	S	0	0	0
			452	294	74	83	1			
1	F	55	Total	C	N	O	S	0	0	0
			445	289	73	82	1			
1	G	55	Total	C	N	O	S	0	0	0
			445	289	73	82	1			
1	H	56	Total	C	N	O	S	0	0	0
			452	294	74	83	1			

There are 32 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	24	GLY	-	expression tag	UNP O43189
A	25	PRO	-	expression tag	UNP O43189
A	26	LEU	-	expression tag	UNP O43189
A	27	GLY	-	expression tag	UNP O43189
B	24	GLY	-	expression tag	UNP O43189
B	25	PRO	-	expression tag	UNP O43189
B	26	LEU	-	expression tag	UNP O43189
B	27	GLY	-	expression tag	UNP O43189
C	24	GLY	-	expression tag	UNP O43189
C	25	PRO	-	expression tag	UNP O43189
C	26	LEU	-	expression tag	UNP O43189
C	27	GLY	-	expression tag	UNP O43189
D	24	GLY	-	expression tag	UNP O43189

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Chain	Residue	Modelled	Actual	Comment	Reference
D	25	PRO	-	expression tag	UNP O43189
D	26	LEU	-	expression tag	UNP O43189
D	27	GLY	-	expression tag	UNP O43189
E	24	GLY	-	expression tag	UNP O43189
E	25	PRO	-	expression tag	UNP O43189
E	26	LEU	-	expression tag	UNP O43189
E	27	GLY	-	expression tag	UNP O43189
F	24	GLY	-	expression tag	UNP O43189
F	25	PRO	-	expression tag	UNP O43189
F	26	LEU	-	expression tag	UNP O43189
F	27	GLY	-	expression tag	UNP O43189
G	24	GLY	-	expression tag	UNP O43189
G	25	PRO	-	expression tag	UNP O43189
G	26	LEU	-	expression tag	UNP O43189
G	27	GLY	-	expression tag	UNP O43189
H	24	GLY	-	expression tag	UNP O43189
H	25	PRO	-	expression tag	UNP O43189
H	26	LEU	-	expression tag	UNP O43189
H	27	GLY	-	expression tag	UNP O43189

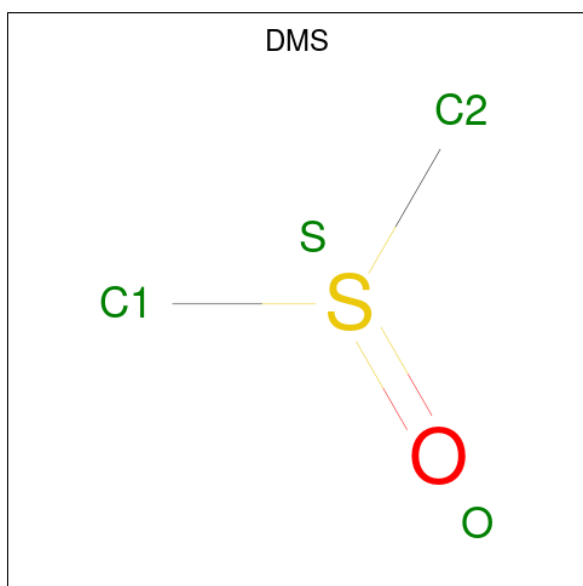
- Molecule 2 is a protein called Peptidomimetic inhibitor UNC6641.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
2	J	7	Total	C	N	O	0	0	0
			59	43	9	7			
2	I	7	Total	C	N	O	0	0	0
			59	43	9	7			
2	K	7	Total	C	N	O	0	0	0
			59	43	9	7			
2	L	7	Total	C	N	O	0	0	0
			59	43	9	7			
2	M	7	Total	C	N	O	0	0	0
			59	43	9	7			
2	N	7	Total	C	N	O	0	0	0
			59	43	9	7			
2	O	7	Total	C	N	O	0	0	0
			59	43	9	7			
2	P	8	Total	C	N	O	0	0	0
			70	49	13	8			

- Molecule 3 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	2	Total Zn 2 2	0	0
3	C	1	Total Zn 1 1	0	0
3	D	1	Total Zn 1 1	0	0
3	E	1	Total Zn 1 1	0	0
3	H	1	Total Zn 1 1	0	0

- Molecule 4 is DIMETHYL SULFOXIDE (three-letter code: DMS) (formula: C₂H₆OS).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	D	1	Total C H O S 10 2 6 1 1	0	0
4	E	1	Total C H O S 10 2 6 1 1	0	0
4	G	1	Total C H O S 10 2 6 1 1	0	0

- Molecule 5 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	26	Total O 26 26	0	0
5	B	30	Total O 30 30	0	0

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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	C	31	Total 31	O 31	0	0
5	D	41	Total 41	O 41	0	0
5	E	23	Total 23	O 23	0	0
5	F	32	Total 32	O 32	0	0
5	G	25	Total 25	O 25	0	0
5	H	26	Total 26	O 26	0	0
5	J	3	Total 3	O 3	0	0
5	K	2	Total 2	O 2	0	0
5	L	1	Total 1	O 1	0	0
5	M	6	Total 6	O 6	0	0
5	N	2	Total 2	O 2	0	0
5	O	7	Total 7	O 7	0	0
5	P	3	Total 3	O 3	0	0

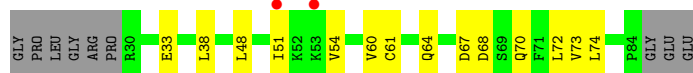
3 Residue-property plots [i](#)

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.

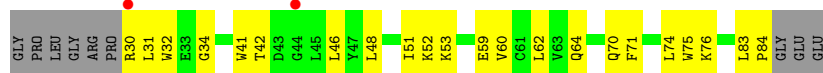
- Molecule 1: Isoform 1 of PHD finger protein 1



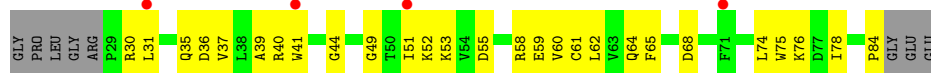
- Molecule 1: Isoform 1 of PHD finger protein 1



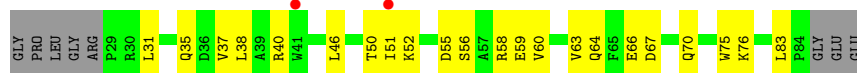
- Molecule 1: Isoform 1 of PHD finger protein 1



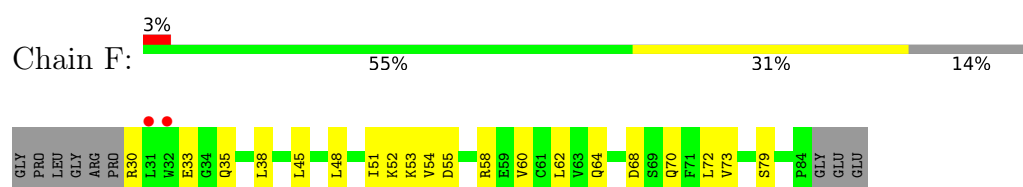
- Molecule 1: Isoform 1 of PHD finger protein 1



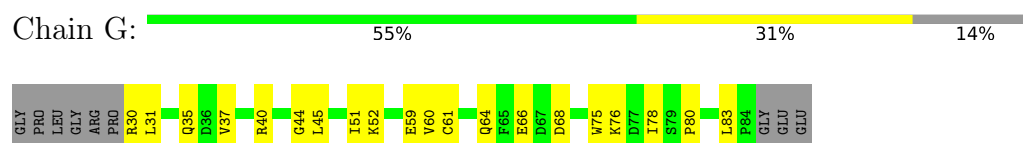
- Molecule 1: Isoform 1 of PHD finger protein 1



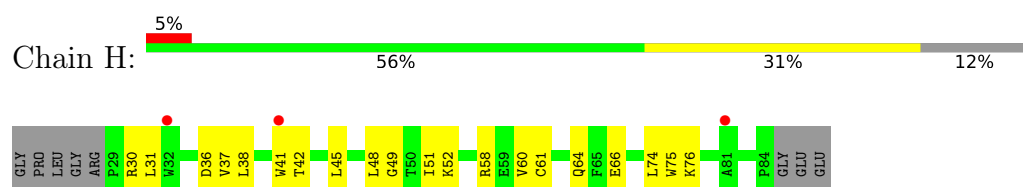
- Molecule 1: Isoform 1 of PHD finger protein 1



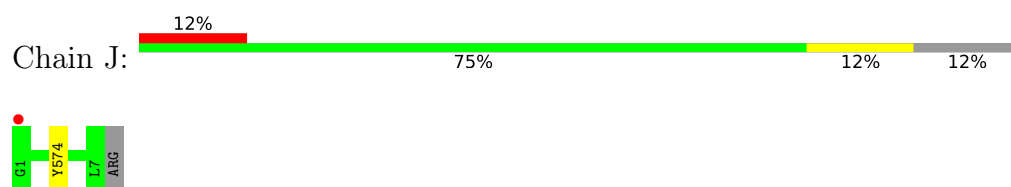
- Molecule 1: Isoform 1 of PHD finger protein 1



- Molecule 1: Isoform 1 of PHD finger protein 1



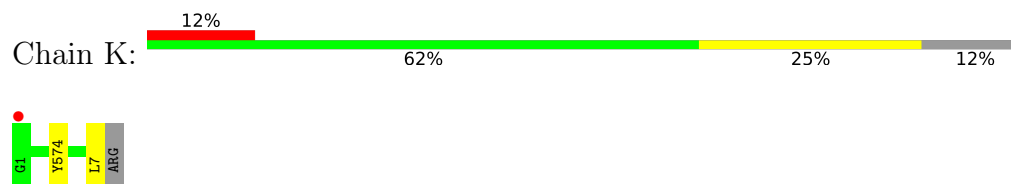
- Molecule 2: Peptidomimetic inhibitor UNC6641



- Molecule 2: Peptidomimetic inhibitor UNC6641



- Molecule 2: Peptidomimetic inhibitor UNC6641



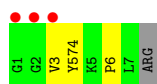
- Molecule 2: Peptidomimetic inhibitor UNC6641



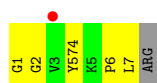
- Molecule 2: Peptidomimetic inhibitor UNC6641



- Molecule 2: Peptidomimetic inhibitor UNC6641



- Molecule 2: Peptidomimetic inhibitor UNC6641



- Molecule 2: Peptidomimetic inhibitor UNC6641



4 Data and refinement statistics

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α , β , γ	43.39Å 45.34Å 64.44Å 90.02° 95.19° 90.07°	Depositor
Resolution (Å)	43.22 – 1.85 43.22 – 1.85	Depositor EDS
% Data completeness (in resolution range)	90.8 (43.22-1.85) 90.7 (43.22-1.85)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.85 (at 1.86Å)	Xtriage
Refinement program	PHENIX 1.18.2_3874	Depositor
R, R_{free}	0.233 , 0.281 0.239 , 0.290	Depositor DCC
R_{free} test set	1935 reflections (5.10%)	wwPDB-VP
Wilson B-factor (Å ²)	16.1	Xtriage
Anisotropy	0.536	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.38 , 41.6	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	0.438 for -h,k,-l	Xtriage
Reported twinning fraction	0.480 for -h,k,-l	Depositor
Outliers	0 of 37956 reflections	Xtriage
F_o, F_c correlation	0.92	EDS
Total number of atoms	4365	wwPDB-VP
Average B, all atoms (Å ²)	19.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 41.89 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 2.2090e-04. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

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: DMS, Y57, ZN

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# $ Z > 5$	RMSZ	# $ Z > 5$
1	A	0.26	0/463	0.45	0/630
1	B	0.25	0/455	0.46	0/619
1	C	0.26	0/455	0.49	0/619
1	D	0.26	0/463	0.47	0/630
1	E	0.26	0/463	0.47	0/630
1	F	0.26	0/455	0.56	0/619
1	G	0.25	0/455	0.48	0/619
1	H	0.30	0/463	0.52	0/630
2	I	0.24	0/38	0.33	0/48
2	J	0.25	0/38	0.45	0/48
2	K	0.21	0/38	0.44	0/48
2	L	0.29	0/38	0.47	0/48
2	M	0.27	0/38	0.46	0/48
2	N	0.35	0/38	0.47	0/48
2	O	0.23	0/38	0.35	0/48
2	P	0.28	0/49	0.49	0/62
All	All	0.26	0/3987	0.49	0/5394

There are no bond length outliers.

There are no bond angle outliers.

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	452	0	451	36	0
1	B	445	0	443	14	0
1	C	445	0	443	23	0
1	D	452	0	451	33	1
1	E	452	0	451	19	1
1	F	445	0	443	25	0
1	G	445	0	443	20	0
1	H	452	0	451	19	0
2	I	59	0	48	2	0
2	J	59	0	48	0	0
2	K	59	0	48	1	0
2	L	59	0	48	6	0
2	M	59	0	48	4	0
2	N	59	0	48	3	0
2	O	59	0	48	6	0
2	P	70	0	61	7	0
3	A	2	0	0	0	0
3	C	1	0	0	0	0
3	D	1	0	0	0	0
3	E	1	0	0	0	0
3	H	1	0	0	0	0
4	D	4	6	6	0	0
4	E	4	6	6	2	0
4	G	4	6	6	0	0
5	A	26	0	0	5	0
5	B	30	0	0	4	3
5	C	31	0	0	2	2
5	D	41	0	0	6	1
5	E	23	0	0	1	5
5	F	32	0	0	5	1
5	G	25	0	0	6	0
5	H	26	0	0	1	0
5	J	3	0	0	0	0
5	K	2	0	0	0	0
5	L	1	0	0	1	0
5	M	6	0	0	3	0
5	N	2	0	0	1	0
5	O	7	0	0	3	0
5	P	3	0	0	1	0
All	All	4347	18	3991	187	7

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.

The worst 5 of 187 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:52:LYS:HB2	1:A:62:LEU:HD22	1.47	0.96
1:F:52:LYS:NZ	1:F:64:GLN:OE1	2.00	0.94
1:F:30:ARG:HH12	2:L:3:VAL:HG23	1.32	0.92
1:F:45:LEU:HD13	2:N:6:PRO:HB2	1.51	0.92
1:B:64:GLN:HE21	1:B:68:ASP:HA	1.33	0.91

The worst 5 of 7 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)
5:B:115:HOH:O	5:E:223:HOH:O[1_554]	1.89	0.31
5:B:115:HOH:O	5:E:214:HOH:O[1_554]	1.96	0.24
5:B:104:HOH:O	5:E:214:HOH:O[1_554]	2.00	0.20
5:D:240:HOH:O	5:E:220:HOH:O[1_655]	2.02	0.18
1:D:59:GLU:OE2	5:F:102:HOH:O[1_556]	2.05	0.15

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	54/64 (84%)	52 (96%)	2 (4%)	0	100	100
1	B	53/64 (83%)	49 (92%)	4 (8%)	0	100	100
1	C	53/64 (83%)	52 (98%)	1 (2%)	0	100	100
1	D	54/64 (84%)	53 (98%)	1 (2%)	0	100	100
1	E	54/64 (84%)	53 (98%)	1 (2%)	0	100	100
1	F	53/64 (83%)	51 (96%)	2 (4%)	0	100	100
1	G	53/64 (83%)	50 (94%)	3 (6%)	0	100	100
1	H	54/64 (84%)	52 (96%)	2 (4%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
2	I	4/8 (50%)	4 (100%)	0	0	100	100
2	J	4/8 (50%)	4 (100%)	0	0	100	100
2	K	4/8 (50%)	4 (100%)	0	0	100	100
2	L	4/8 (50%)	4 (100%)	0	0	100	100
2	M	4/8 (50%)	2 (50%)	2 (50%)	0	100	100
2	N	4/8 (50%)	3 (75%)	1 (25%)	0	100	100
2	O	4/8 (50%)	4 (100%)	0	0	100	100
2	P	5/8 (62%)	5 (100%)	0	0	100	100
All	All	461/576 (80%)	442 (96%)	19 (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	49/54 (91%)	49 (100%)	0	100	100
1	B	48/54 (89%)	48 (100%)	0	100	100
1	C	48/54 (89%)	48 (100%)	0	100	100
1	D	49/54 (91%)	49 (100%)	0	100	100
1	E	49/54 (91%)	49 (100%)	0	100	100
1	F	48/54 (89%)	48 (100%)	0	100	100
1	G	48/54 (89%)	48 (100%)	0	100	100
1	H	49/54 (91%)	49 (100%)	0	100	100
2	I	4/5 (80%)	4 (100%)	0	100	100
2	J	4/5 (80%)	4 (100%)	0	100	100
2	K	4/5 (80%)	4 (100%)	0	100	100
2	L	4/5 (80%)	4 (100%)	0	100	100
2	M	4/5 (80%)	4 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	N	4/5 (80%)	4 (100%)	0	100	100
2	O	4/5 (80%)	4 (100%)	0	100	100
2	P	5/5 (100%)	5 (100%)	0	100	100
All	All	421/472 (89%)	421 (100%)	0	100	100

There are no protein residues with a non-rotameric sidechain to report.

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

Mol	Chain	Res	Type
1	B	64	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	$\# Z > 2$
2	Y57	M	4	2	19,20,21	0.71	1 (5%)	19,24,26	6.36	4 (21%)
2	Y57	N	4	2	19,20,21	0.68	1 (5%)	19,24,26	4.34	3 (15%)
2	Y57	K	4	2	19,20,21	0.66	1 (5%)	19,24,26	6.01	5 (26%)
2	Y57	P	4	2	19,20,21	0.67	1 (5%)	19,24,26	2.58	4 (21%)
2	Y57	O	4	2	19,20,21	0.66	1 (5%)	19,24,26	1.66	3 (15%)
2	Y57	L	4	2	19,20,21	0.65	0	19,24,26	1.84	3 (15%)
2	Y57	J	4	2	19,20,21	0.64	0	19,24,26	4.08	2 (10%)
2	Y57	I	4	2	19,20,21	0.66	1 (5%)	19,24,26	0.86	1 (5%)

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	Y57	M	4	2	-	5/17/18/20	0/1/1/1
2	Y57	N	4	2	-	4/17/18/20	0/1/1/1
2	Y57	K	4	2	-	2/17/18/20	0/1/1/1
2	Y57	P	4	2	-	3/17/18/20	0/1/1/1
2	Y57	O	4	2	-	3/17/18/20	0/1/1/1
2	Y57	L	4	2	-	1/17/18/20	0/1/1/1
2	Y57	J	4	2	-	6/17/18/20	0/1/1/1
2	Y57	I	4	2	-	0/17/18/20	0/1/1/1

The worst 5 of 6 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	M	4	Y57	CE-NZ	-2.12	1.43	1.47
2	K	4	Y57	CE-NZ	-2.08	1.43	1.47
2	P	4	Y57	CE-NZ	-2.06	1.43	1.47
2	O	4	Y57	CE-NZ	-2.03	1.43	1.47
2	N	4	Y57	CE-NZ	-2.02	1.43	1.47

The worst 5 of 25 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	K	4	Y57	C08-NZ-CE	22.19	148.68	112.20
2	M	4	Y57	C08-NZ-CE	19.10	143.60	112.20
2	M	4	Y57	CE-NZ-C10	-18.69	87.47	113.33
2	J	4	Y57	CE-NZ-C10	17.36	137.34	113.33
2	N	4	Y57	C08-NZ-CE	-17.03	84.19	112.20

There are no chirality outliers.

5 of 24 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	J	4	Y57	C11-C10-NZ-CE
2	J	4	Y57	C12-C10-NZ-CE
2	M	4	Y57	CD-CE-NZ-C08
2	M	4	Y57	C07-C08-NZ-CE
2	N	4	Y57	N-CA-CB-CG

There are no ring outliers.

2 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	P	4	Y57	2	0
2	L	4	Y57	2	0

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 9 ligands modelled in this entry, 6 are monoatomic - leaving 3 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	$\# Z > 2$
4	DMS	G	101	-	3,3,3	0.63	0	3,3,3	0.60	0
4	DMS	E	101	-	3,3,3	0.62	0	3,3,3	0.57	0
4	DMS	D	101	-	3,3,3	0.63	0	3,3,3	0.56	0

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.

1 monomer is involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	E	101	DMS	2	0

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	56/64 (87%)	0.53	2 (3%) 42 40	13, 18, 25, 30	0
1	B	55/64 (85%)	0.76	2 (3%) 42 40	11, 19, 37, 51	0
1	C	55/64 (85%)	0.64	2 (3%) 42 40	11, 18, 28, 39	0
1	D	56/64 (87%)	0.73	4 (7%) 16 15	13, 20, 30, 36	0
1	E	56/64 (87%)	0.66	2 (3%) 42 40	10, 19, 29, 51	0
1	F	55/64 (85%)	0.40	2 (3%) 42 40	11, 17, 24, 39	0
1	G	55/64 (85%)	0.36	0 100 100	12, 17, 23, 34	0
1	H	56/64 (87%)	0.40	3 (5%) 25 24	9, 17, 33, 44	0
2	I	6/8 (75%)	0.67	0 100 100	17, 19, 25, 26	0
2	J	6/8 (75%)	0.59	1 (16%) 1 1	14, 18, 21, 29	0
2	K	6/8 (75%)	1.09	1 (16%) 1 1	24, 27, 33, 36	0
2	L	6/8 (75%)	1.11	0 100 100	24, 31, 32, 32	0
2	M	6/8 (75%)	0.97	1 (16%) 1 1	20, 29, 36, 38	0
2	N	6/8 (75%)	1.74	3 (50%) 0 0	27, 30, 45, 47	0
2	O	6/8 (75%)	1.07	1 (16%) 1 1	16, 20, 50, 50	0
2	P	7/8 (87%)	1.14	0 100 100	19, 23, 37, 40	0
All	All	493/576 (85%)	0.61	24 (4%) 29 28	9, 19, 33, 51	0

The worst 5 of 24 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	N	2	GLY	4.0
1	B	53	LYS	3.9
1	C	30	ARG	3.7
1	D	41	TRP	3.6
2	N	3	VAL	3.6

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	Y57	M	4	20/21	0.78	0.19	12,20,33,42	0
2	Y57	N	4	20/21	0.80	0.18	14,17,36,38	0
2	Y57	P	4	20/21	0.80	0.18	12,18,26,27	0
2	Y57	L	4	20/21	0.83	0.14	17,23,32,33	0
2	Y57	O	4	20/21	0.85	0.15	10,15,25,30	0
2	Y57	K	4	20/21	0.86	0.13	9,18,32,34	0
2	Y57	I	4	20/21	0.86	0.14	13,18,23,24	0
2	Y57	J	4	20/21	0.92	0.11	7,14,19,20	0

6.3 Carbohydrates ⓘ

There are no monosaccharides in this entry.

6.4 Ligands ⓘ

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
3	ZN	C	101	1/1	0.09	0.21	79,79,79,79	0
4	DMS	D	101	4/4	0.67	0.22	13,16,20,31	0
3	ZN	A	102	1/1	0.84	0.10	37,37,37,37	0
3	ZN	H	101	1/1	0.91	0.06	45,45,45,45	0
4	DMS	E	101	4/4	0.91	0.14	9,21,38,38	0
3	ZN	A	101	1/1	0.92	0.08	36,36,36,36	0
3	ZN	D	102	1/1	0.94	0.10	36,36,36,36	0
4	DMS	G	101	4/4	0.97	0.09	13,20,24,29	0
3	ZN	E	102	1/1	0.99	0.04	27,27,27,27	0

6.5 Other polymers ⓘ

There are no such residues in this entry.