



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 1, 2026 – 08:59 PM UTC

PDB ID : 5F2W / pdb_00005f2w
Title : Crystal structure of human KDM4A in complex with compound 16
Authors : Le Bihan, Y.-V.; Dempster, S.; Westwood, I.M.; van Montfort, R.L.M.
Deposited on : 2015-12-02
Resolution : 2.60 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

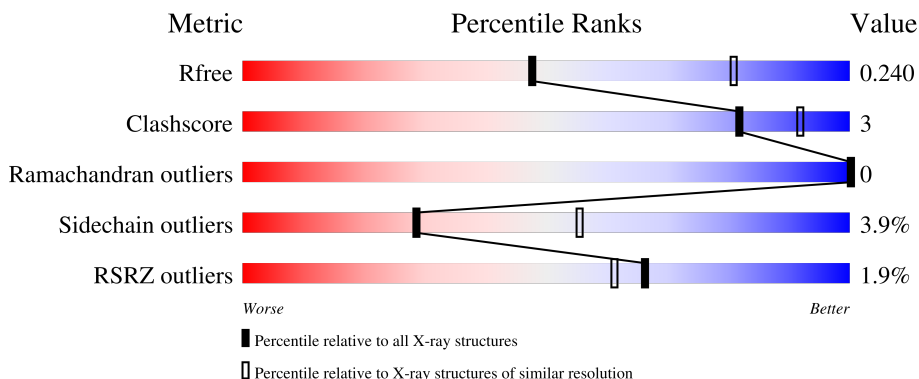
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.60 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	4008 (2.60-2.60)
Clashscore	190562	4347 (2.60-2.60)
Ramachandran outliers	187476	4277 (2.60-2.60)
Sidechain outliers	187428	4277 (2.60-2.60)
RSRZ outliers	180081	4008 (2.60-2.60)

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	360	3% 84% 10% 5%
1	B	360	2% 88% 9%
1	C	360	% 86% 11%
1	D	360	% 89% 8%

2 Entry composition

There are 6 unique types of molecules in this entry. The entry contains 11386 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 Lysine-specific demethylase 4A.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	341	Total	C	N	O	S	0	0	0
			2675	1736	436	490	13			
1	B	350	Total	C	N	O	S	0	1	0
			2769	1789	454	511	15			
1	C	350	Total	C	N	O	S	0	0	0
			2757	1792	447	504	14			
1	D	350	Total	C	N	O	S	0	0	0
			2782	1805	461	501	15			

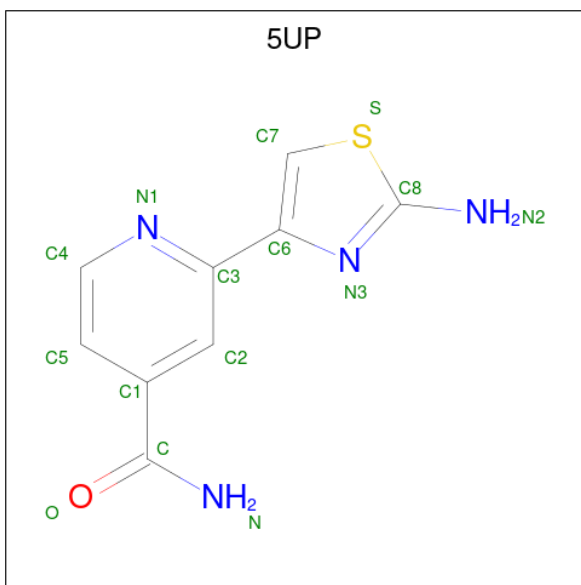
There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	0	SER	-	expression tag	UNP O75164
B	0	SER	-	expression tag	UNP O75164
C	0	SER	-	expression tag	UNP O75164
D	0	SER	-	expression tag	UNP O75164

- Molecule 2 is ZINC ION (CCD ID: ZN) (formula: Zn).

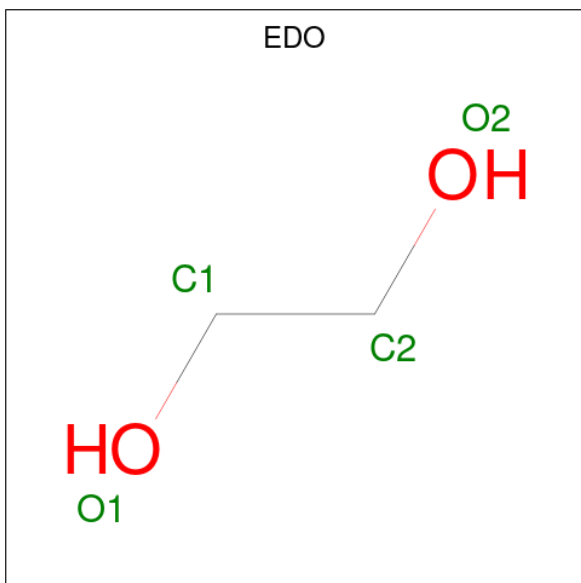
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	2	Total	Zn	0	0
			2	2		
2	B	2	Total	Zn	0	0
			2	2		
2	C	2	Total	Zn	0	0
			2	2		
2	D	2	Total	Zn	0	0
			2	2		

- Molecule 3 is 2-(2-azanyl-1,3-thiazol-4-yl)pyridine-4-carboxamide (CCD ID: 5UP) (formula: C₉H₈N₄OS).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total	C	N	O	S	0	0
			15	9	4	1	1		
3	B	1	Total	C	N	O	S	0	0
			15	9	4	1	1		
3	C	1	Total	C	N	O	S	0	0
			15	9	4	1	1		
3	D	1	Total	C	N	O	S	0	0
			15	9	4	1	1		

- Molecule 4 is 1,2-ETHANEDIOL (CCD ID: EDO) (formula: C₂H₆O₂).



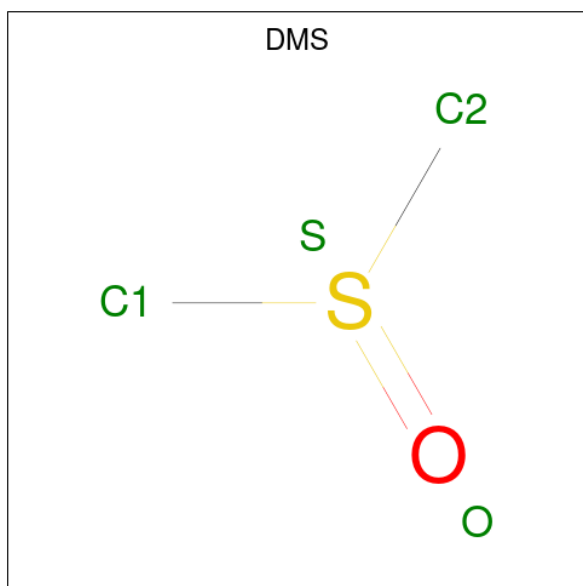
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total C O 4 2 2	0	0
4	A	1	Total C O 4 2 2	0	0
4	A	1	Total C O 4 2 2	0	0
4	B	1	Total C O 4 2 2	0	0
4	B	1	Total C O 4 2 2	0	0
4	B	1	Total C O 4 2 2	0	0
4	B	1	Total C O 4 2 2	0	0
4	B	1	Total C O 4 2 2	0	0
4	B	1	Total C O 4 2 2	0	0
4	B	1	Total C O 4 2 2	0	0
4	B	1	Total C O 4 2 2	0	0
4	B	1	Total C O 4 2 2	0	0
4	B	1	Total C O 4 2 2	0	0
4	B	1	Total C O 4 2 2	0	0
4	C	1	Total C O 4 2 2	0	0
4	C	1	Total C O 4 2 2	0	0
4	C	1	Total C O 4 2 2	0	0
4	C	1	Total C O 4 2 2	0	0
4	C	1	Total C O 4 2 2	0	0
4	C	1	Total C O 4 2 2	0	0
4	C	1	Total C O 4 2 2	0	0
4	C	1	Total C O 4 2 2	0	0
4	D	1	Total C O 4 2 2	0	0

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	D	1	Total	C	O	0	0
			4	2	2		
4	D	1	Total	C	O	0	0
			4	2	2		
4	D	1	Total	C	O	0	0
			4	2	2		
4	D	1	Total	C	O	0	0
			4	2	2		
4	D	1	Total	C	O	0	0
			4	2	2		
4	D	1	Total	C	O	0	0
			4	2	2		

- Molecule 5 is DIMETHYL SULFOXIDE (CCD ID: DMS) (formula: C₂H₆OS).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
5	A	1	Total	C	O	S	0	0
			4	2	1	1		

- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	45	Total	O	0	0
			45	45		

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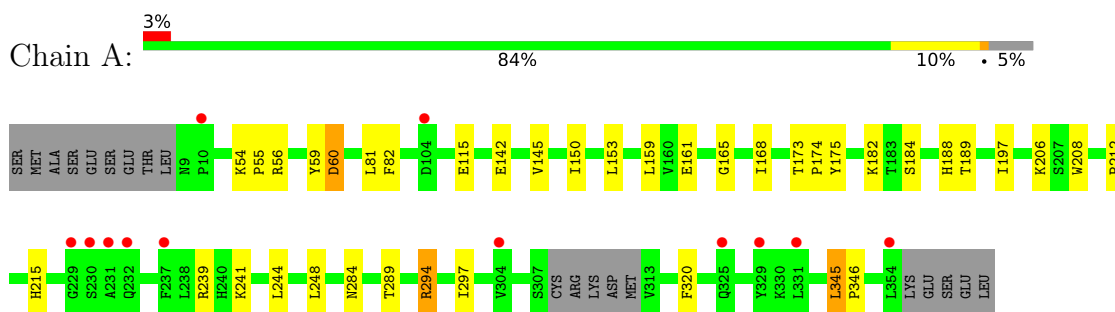
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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	B	57	Total 57	O 57	0	0
6	C	51	Total 51	O 51	0	0
6	D	62	Total 62	O 62	0	0

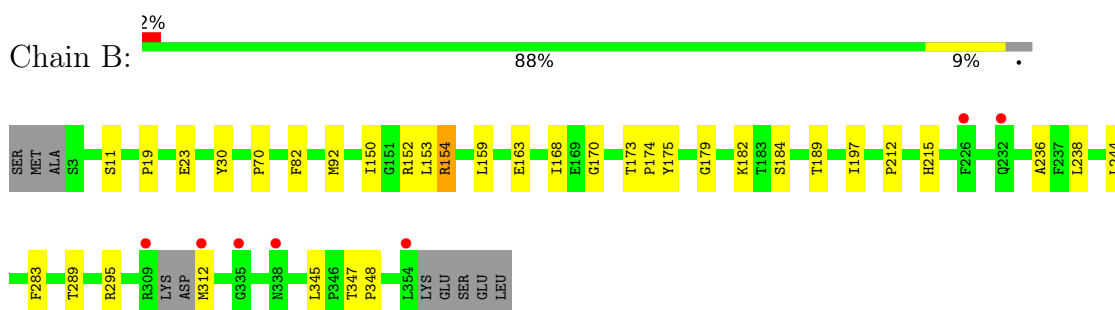
3 Residue-property plots [i](#)

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.

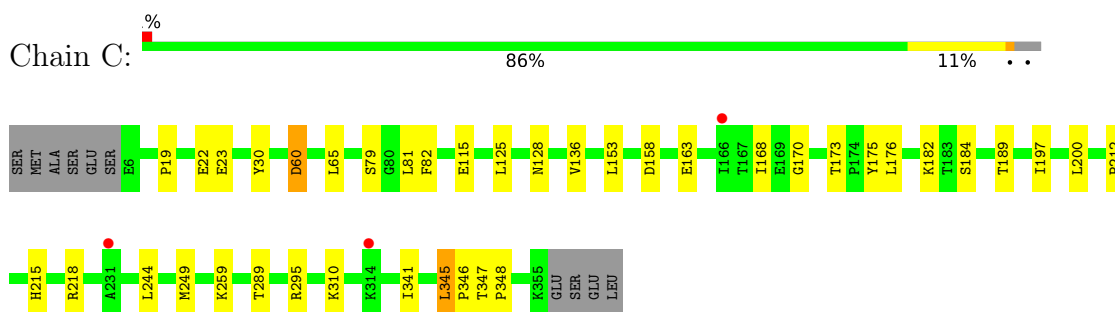
- Molecule 1: Lysine-specific demethylase 4A



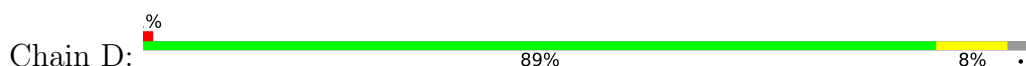
- Molecule 1: Lysine-specific demethylase 4A

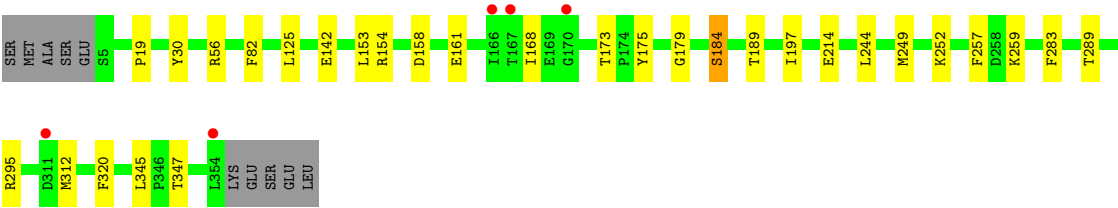


- Molecule 1: Lysine-specific demethylase 4A



- Molecule 1: Lysine-specific demethylase 4A





4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	57.39Å 102.04Å 142.15Å 90.00° 99.70° 90.00°	Depositor
Resolution (Å)	49.48 – 2.60 49.48 – 2.60	Depositor EDS
% Data completeness (in resolution range)	95.7 (49.48-2.60) 95.7 (49.48-2.60)	Depositor EDS
R_{merge}	0.11	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.76 (at 2.61Å)	Xtriage
Refinement program	BUSTER 2.10.2	Depositor
R, R_{free}	0.179 , 0.226 0.193 , 0.240	Depositor DCC
R_{free} test set	2424 reflections (5.09%)	wwPDB-VP
Wilson B-factor (Å ²)	45.7	Xtriage
Anisotropy	0.219	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.32 , 66.7	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtriage
Estimated twinning fraction	0.027 for h,-k,-h-l	Xtriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	11386	wwPDB-VP
Average B, all atoms (Å ²)	54.0	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 24.57 % 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 3.7421e-03. 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: ZN, DMS, EDO, 5UP

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	0.86	0/2760	1.28	8/3763 (0.2%)
1	B	0.88	0/2854	1.27	4/3887 (0.1%)
1	C	0.91	1/2844 (0.0%)	1.30	11/3876 (0.3%)
1	D	0.91	0/2869	1.31	4/3901 (0.1%)
All	All	0.89	1/11327 (0.0%)	1.29	27/15427 (0.2%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	128	ASN	C-O	-5.03	1.21	1.23

All (27) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	184	SER	N-CA-C	7.11	119.74	109.14
1	C	184	SER	N-CA-C	6.71	118.95	108.96
1	A	60	ASP	CA-CB-CG	6.41	119.01	112.60
1	C	158	ASP	CA-C-N	5.87	128.74	120.28
1	C	158	ASP	C-N-CA	5.87	128.74	120.28
1	A	165	GLY	CA-C-N	5.85	128.41	120.63
1	A	165	GLY	C-N-CA	5.85	128.41	120.63
1	C	60	ASP	CA-CB-CG	5.78	118.38	112.60
1	D	184	SER	N-CA-C	5.63	118.25	109.52
1	D	189	THR	N-CA-C	-5.56	101.96	110.14
1	C	189	THR	N-CA-C	-5.55	101.98	110.14
1	B	184	SER	N-CA-C	5.49	117.53	109.24
1	A	189	THR	N-CA-C	-5.46	102.12	110.14
1	D	320	PHE	CA-C-N	5.28	128.96	120.30
1	D	320	PHE	C-N-CA	5.28	128.96	120.30
1	A	294	ARG	CA-C-N	5.27	127.35	120.28

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	294	ARG	C-N-CA	5.27	127.35	120.28
1	B	189	THR	N-CA-C	-5.24	102.44	110.14
1	C	23	GLU	CA-C-N	5.15	127.69	120.28
1	C	23	GLU	C-N-CA	5.15	127.69	120.28
1	C	115	GLU	CB-CG-CD	5.09	121.26	112.60
1	C	348	PRO	CA-C-N	5.06	128.70	120.60
1	C	348	PRO	C-N-CA	5.06	128.70	120.60
1	A	284	ASN	CA-CB-CG	5.04	117.64	112.60
1	B	348	PRO	CA-C-N	5.02	128.64	120.60
1	B	348	PRO	C-N-CA	5.02	128.64	120.60
1	C	310	LYS	N-CA-C	-5.01	102.35	110.32

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

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	2675	0	2448	14	0
1	B	2769	0	2536	15	0
1	C	2757	0	2537	13	0
1	D	2782	0	2596	12	0
2	A	2	0	0	0	0
2	B	2	0	0	0	0
2	C	2	0	0	0	0
2	D	2	0	0	0	0
3	A	15	0	8	0	0
3	B	15	0	8	0	0
3	C	15	0	8	0	0
3	D	15	0	8	0	0
4	A	12	0	18	1	0
4	B	40	0	60	6	0
4	C	32	0	48	3	0
4	D	32	0	48	1	0
5	A	4	0	6	1	0
6	A	45	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
6	B	57	0	0	0	0
6	C	51	0	0	0	0
6	D	62	0	0	2	0
All	All	11386	0	10329	54	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 (54) 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:B:238:LEU:HB2	4:B:413:EDO:H12	1.67	0.76
1:A:239:ARG:O	1:A:241:LYS:NZ	2.26	0.69
1:A:294:ARG:O	1:A:297:ILE:HG12	1.96	0.65
1:A:59:TYR:O	5:A:407:DMS:H11	2.00	0.61
1:B:150:ILE:HG22	1:B:174:PRO:HB3	1.82	0.60
1:C:153:LEU:HD11	1:C:197:ILE:HG21	1.87	0.57
1:B:212:PRO:HG2	1:B:215:HIS:HD2	1.69	0.57
1:B:11:SER:HB2	4:B:404:EDO:O1	2.05	0.56
1:C:212:PRO:HG2	1:C:215:HIS:HD2	1.70	0.56
1:A:212:PRO:HG2	1:A:215:HIS:HD2	1.72	0.54
1:D:153:LEU:HD11	1:D:197:ILE:HG21	1.88	0.54
1:A:153:LEU:HD11	1:A:197:ILE:HG21	1.89	0.54
1:B:153:LEU:HD11	1:B:197:ILE:HG21	1.89	0.53
1:C:79:SER:O	1:C:249:MET:HE3	2.09	0.52
1:D:249:MET:HE1	1:D:252:LYS:HE2	1.91	0.52
1:C:82:PHE:HB2	1:C:244:LEU:HB2	1.92	0.52
1:D:82:PHE:HB2	1:D:244:LEU:HB2	1.92	0.52
1:D:295:ARG:HB2	1:D:347:THR:HA	1.92	0.51
1:B:82:PHE:HB2	1:B:244:LEU:HB2	1.92	0.51
1:B:152:ARG:HH21	1:B:154:ARG:NH2	2.09	0.51
1:B:236:ALA:HB1	4:B:413:EDO:H11	1.91	0.50
1:A:206:LYS:HD2	1:A:208:TRP:NE1	2.27	0.49
1:A:82:PHE:HB2	1:A:244:LEU:HB2	1.94	0.49
1:D:214:GLU:HG2	6:D:504:HOH:O	2.13	0.49
1:B:170:GLY:O	4:B:411:EDO:H11	2.13	0.48
1:C:341:ILE:HG23	4:C:408:EDO:H12	1.94	0.47
1:C:170:GLY:O	4:C:409:EDO:H21	2.15	0.47
1:D:154:ARG:HA	1:D:158:ASP:OD2	2.15	0.47
1:C:136:VAL:HB	1:C:176:LEU:HB2	1.95	0.47
1:D:257:PHE:H	4:D:409:EDO:H12	1.80	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:295:ARG:HB2	1:C:347:THR:HA	1.97	0.46
1:D:82:PHE:CZ	1:D:125:LEU:HD21	2.51	0.46
1:B:179:GLY:O	1:B:283:PHE:HA	2.16	0.45
1:A:55:PRO:HA	1:A:145:VAL:HG21	1.98	0.44
1:A:248:LEU:HG	4:A:405:EDO:O2	2.18	0.44
1:D:259:LYS:CD	6:D:558:HOH:O	2.66	0.44
1:A:150:ILE:HG22	1:A:174:PRO:HB3	2.00	0.44
1:B:295:ARG:HB2	1:B:347:THR:HA	1.99	0.43
1:A:345:LEU:HA	1:A:346:PRO:HD3	1.93	0.43
1:C:65:LEU:HD13	4:C:405:EDO:H21	2.01	0.43
1:B:70:PRO:HG3	1:B:92:MET:HG2	2.01	0.43
1:A:56:ARG:HA	1:A:142:GLU:HG3	2.00	0.42
1:A:188:HIS:HB3	1:A:241:LYS:HG2	2.02	0.41
1:A:297:ILE:HD12	1:A:320:PHE:HB3	2.03	0.41
1:B:19:PRO:HB3	1:B:30:TYR:CZ	2.55	0.41
1:C:19:PRO:HB3	1:C:30:TYR:CZ	2.55	0.41
1:D:179:GLY:O	1:D:283:PHE:HA	2.21	0.41
1:D:19:PRO:HB3	1:D:30:TYR:CZ	2.56	0.41
1:B:23:GLU:OE2	4:B:410:EDO:H11	2.20	0.41
1:C:82:PHE:CZ	1:C:125:LEU:HD21	2.56	0.40
1:B:238:LEU:HB2	4:B:413:EDO:C1	2.45	0.40
1:C:200:LEU:HD12	1:C:200:LEU:HA	1.96	0.40
1:C:345:LEU:HD23	1:C:346:PRO:HD2	2.04	0.40
1:D:56:ARG:HA	1:D:142:GLU:HG3	2.02	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	337/360 (94%)	330 (98%)	7 (2%)	0	100 100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	B	347/360 (96%)	339 (98%)	8 (2%)	0	100	100
1	C	348/360 (97%)	342 (98%)	6 (2%)	0	100	100
1	D	348/360 (97%)	340 (98%)	8 (2%)	0	100	100
All	All	1380/1440 (96%)	1351 (98%)	29 (2%)	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	263/316 (83%)	251 (95%)	12 (5%)	24	49
1	B	275/316 (87%)	265 (96%)	10 (4%)	31	58
1	C	272/316 (86%)	260 (96%)	12 (4%)	25	50
1	D	277/316 (88%)	269 (97%)	8 (3%)	37	65
All	All	1087/1264 (86%)	1045 (96%)	42 (4%)	28	55

All (42) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	54	LYS
1	A	60	ASP
1	A	81	LEU
1	A	115	GLU
1	A	159	LEU
1	A	161	GLU
1	A	168	ILE
1	A	173	THR
1	A	175	TYR
1	A	182	LYS
1	A	289	THR
1	A	345	LEU
1	B	154	ARG

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Mol	Chain	Res	Type
1	B	159	LEU
1	B	163	GLU
1	B	168	ILE
1	B	173	THR
1	B	175	TYR
1	B	182	LYS
1	B	289	THR
1	B	312	MET
1	B	345	LEU
1	C	22	GLU
1	C	60	ASP
1	C	81	LEU
1	C	163	GLU
1	C	168	ILE
1	C	173	THR
1	C	175	TYR
1	C	182	LYS
1	C	218	ARG
1	C	259	LYS
1	C	289	THR
1	C	345	LEU
1	D	161	GLU
1	D	168	ILE
1	D	173	THR
1	D	175	TYR
1	D	184	SER
1	D	289	THR
1	D	312	MET
1	D	345	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (11) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	215	HIS
1	B	84	GLN
1	B	124	ASN
1	B	137	ASN
1	C	37	GLN
1	C	137	ASN
1	C	215	HIS
1	D	78	GLN
1	D	84	GLN

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Mol	Chain	Res	Type
1	D	137	ASN
1	D	284	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 42 ligands modelled in this entry, 8 are monoatomic - leaving 34 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	EDO	B	404	-	3,3,3	0.23	0	2,2,2	0.54	0
4	EDO	C	411	-	3,3,3	0.47	0	2,2,2	0.53	0
4	EDO	D	406	-	3,3,3	0.77	0	2,2,2	0.21	0
4	EDO	D	408	-	3,3,3	0.58	0	2,2,2	0.21	0
4	EDO	B	413	-	3,3,3	0.85	0	2,2,2	0.35	0
3	5UP	C	403	2	16,16,16	0.42	0	20,22,22	0.35	0
4	EDO	B	411	-	3,3,3	0.38	0	2,2,2	0.44	0
4	EDO	C	406	-	3,3,3	0.58	0	2,2,2	0.28	0
4	EDO	B	408	-	3,3,3	0.41	0	2,2,2	0.43	0
3	5UP	A	403	2	16,16,16	0.28	0	20,22,22	0.35	0
4	EDO	B	412	-	3,3,3	0.53	0	2,2,2	0.40	0
4	EDO	D	410	-	3,3,3	0.39	0	2,2,2	0.61	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
4	EDO	B	406	-	3,3,3	0.50	0	2,2,2	0.29	0
4	EDO	B	407	-	3,3,3	0.56	0	2,2,2	0.31	0
4	EDO	D	407	-	3,3,3	0.70	0	2,2,2	0.26	0
3	5UP	B	403	2	16,16,16	0.39	0	20,22,22	0.36	0
3	5UP	D	403	2	16,16,16	0.47	0	20,22,22	0.43	0
4	EDO	D	409	-	3,3,3	0.55	0	2,2,2	0.34	0
5	DMS	A	407	-	3,3,3	0.23	0	3,3,3	0.55	0
4	EDO	D	404	-	3,3,3	0.38	0	2,2,2	0.54	0
4	EDO	C	410	-	3,3,3	0.64	0	2,2,2	0.31	0
4	EDO	B	409	-	3,3,3	0.68	0	2,2,2	0.27	0
4	EDO	A	406	-	3,3,3	0.53	0	2,2,2	0.26	0
4	EDO	C	404	-	3,3,3	0.65	0	2,2,2	0.34	0
4	EDO	A	405	-	3,3,3	0.44	0	2,2,2	0.60	0
4	EDO	C	407	-	3,3,3	0.50	0	2,2,2	0.38	0
4	EDO	D	411	-	3,3,3	0.50	0	2,2,2	0.36	0
4	EDO	C	405	-	3,3,3	0.60	0	2,2,2	0.28	0
4	EDO	A	404	-	3,3,3	0.37	0	2,2,2	0.40	0
4	EDO	D	405	-	3,3,3	0.61	0	2,2,2	0.18	0
4	EDO	B	410	-	3,3,3	0.47	0	2,2,2	0.49	0
4	EDO	C	409	-	3,3,3	0.45	0	2,2,2	0.70	0
4	EDO	C	408	-	3,3,3	0.63	0	2,2,2	0.11	0
4	EDO	B	405	-	3,3,3	0.60	0	2,2,2	0.15	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
4	EDO	B	404	-	-	0/1/1/1	-
4	EDO	C	411	-	-	1/1/1/1	-
4	EDO	D	406	-	-	1/1/1/1	-
4	EDO	D	408	-	-	1/1/1/1	-
4	EDO	B	413	-	-	1/1/1/1	-
3	5UP	C	403	2	-	4/8/8/8	0/2/2/2
4	EDO	B	411	-	-	1/1/1/1	-
4	EDO	C	406	-	-	0/1/1/1	-
4	EDO	B	408	-	-	1/1/1/1	-
3	5UP	A	403	2	-	4/8/8/8	0/2/2/2
4	EDO	B	412	-	-	0/1/1/1	-
4	EDO	D	410	-	-	1/1/1/1	-
4	EDO	B	406	-	-	1/1/1/1	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	EDO	B	407	-	-	0/1/1/1	-
4	EDO	D	407	-	-	1/1/1/1	-
3	5UP	B	403	2	-	5/8/8/8	0/2/2/2
3	5UP	D	403	2	-	4/8/8/8	0/2/2/2
4	EDO	D	409	-	-	0/1/1/1	-
4	EDO	D	404	-	-	1/1/1/1	-
4	EDO	C	410	-	-	1/1/1/1	-
4	EDO	B	409	-	-	1/1/1/1	-
4	EDO	A	406	-	-	0/1/1/1	-
4	EDO	C	404	-	-	0/1/1/1	-
4	EDO	A	405	-	-	1/1/1/1	-
4	EDO	C	407	-	-	0/1/1/1	-
4	EDO	D	411	-	-	0/1/1/1	-
4	EDO	C	405	-	-	1/1/1/1	-
4	EDO	A	404	-	-	0/1/1/1	-
4	EDO	D	405	-	-	1/1/1/1	-
4	EDO	B	410	-	-	0/1/1/1	-
4	EDO	C	409	-	-	0/1/1/1	-
4	EDO	C	408	-	-	0/1/1/1	-
4	EDO	B	405	-	-	1/1/1/1	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (33) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	403	5UP	C2-C3-C6-C7
3	A	403	5UP	C2-C3-C6-N3
3	B	403	5UP	C2-C3-C6-C7
3	B	403	5UP	C2-C3-C6-N3
3	C	403	5UP	C2-C3-C6-C7
3	C	403	5UP	C2-C3-C6-N3
3	D	403	5UP	C2-C3-C6-C7
3	D	403	5UP	C2-C3-C6-N3
3	A	403	5UP	N1-C3-C6-C7
3	A	403	5UP	N1-C3-C6-N3
3	B	403	5UP	N1-C3-C6-C7
3	B	403	5UP	N1-C3-C6-N3
3	C	403	5UP	N1-C3-C6-C7

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Mol	Chain	Res	Type	Atoms
3	C	403	5UP	N1-C3-C6-N3
3	D	403	5UP	N1-C3-C6-C7
3	D	403	5UP	N1-C3-C6-N3
4	C	411	EDO	O1-C1-C2-O2
4	D	405	EDO	O1-C1-C2-O2
4	D	406	EDO	O1-C1-C2-O2
4	B	409	EDO	O1-C1-C2-O2
4	D	404	EDO	O1-C1-C2-O2
4	B	408	EDO	O1-C1-C2-O2
4	B	405	EDO	O1-C1-C2-O2
4	C	405	EDO	O1-C1-C2-O2
4	D	408	EDO	O1-C1-C2-O2
4	D	410	EDO	O1-C1-C2-O2
4	C	410	EDO	O1-C1-C2-O2
4	D	407	EDO	O1-C1-C2-O2
4	B	406	EDO	O1-C1-C2-O2
4	B	411	EDO	O1-C1-C2-O2
4	B	413	EDO	O1-C1-C2-O2
3	B	403	5UP	N-C-C1-C5
4	A	405	EDO	O1-C1-C2-O2

There are no ring outliers.

10 monomers are involved in 12 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	B	404	EDO	1	0
4	B	413	EDO	3	0
4	B	411	EDO	1	0
4	D	409	EDO	1	0
5	A	407	DMS	1	0
4	A	405	EDO	1	0
4	C	405	EDO	1	0
4	B	410	EDO	1	0
4	C	409	EDO	1	0
4	C	408	EDO	1	0

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	341/360 (94%)	0.20	12 (3%) 47 41	32, 56, 93, 122	0
1	B	350/360 (97%)	-0.04	7 (2%) 65 60	23, 52, 90, 111	1 (0%)
1	C	350/360 (97%)	-0.01	3 (0%) 81 78	29, 51, 94, 113	0
1	D	350/360 (97%)	-0.13	5 (1%) 73 69	26, 46, 76, 98	0
All	All	1391/1440 (96%)	0.00	27 (1%) 66 61	23, 51, 90, 122	1 (0%)

All (27) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	311	ASP	3.5
1	D	167	THR	3.5
1	A	231	ALA	3.4
1	B	338	ASN	3.4
1	D	166	ILE	3.3
1	A	230	SER	3.1
1	A	304	VAL	3.0
1	A	104	ASP	2.7
1	B	309	ARG	2.6
1	C	231	ALA	2.6
1	A	354	LEU	2.5
1	D	170	GLY	2.5
1	B	226	PHE	2.5
1	B	354	LEU	2.4
1	B	335	GLY	2.4
1	B	312	MET	2.3
1	A	329	TYR	2.2
1	A	10	PRO	2.2
1	A	232	GLN	2.2
1	A	325	GLN	2.2
1	A	237	PHE	2.1

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Mol	Chain	Res	Type	RSRZ
1	A	229	GLY	2.1
1	C	166	ILE	2.1
1	C	314	LYS	2.1
1	A	331	LEU	2.1
1	D	354	LEU	2.1
1	B	232	GLN	2.1

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(Å ²)	Q<0.9
4	EDO	B	407	4/4	0.77	0.17	78,79,80,80	0
4	EDO	B	412	4/4	0.78	0.18	56,57,57,58	0
4	EDO	D	409	4/4	0.79	0.14	73,73,73,74	0
4	EDO	D	404	4/4	0.80	0.18	65,67,72,74	0
4	EDO	C	411	4/4	0.82	0.13	60,61,61,61	0
4	EDO	C	405	4/4	0.82	0.15	74,74,75,75	0
4	EDO	C	406	4/4	0.82	0.12	59,60,63,64	0
4	EDO	C	407	4/4	0.83	0.15	66,67,69,72	0
4	EDO	C	408	4/4	0.85	0.17	55,59,61,63	0
2	ZN	A	402	1/1	0.85	0.11	114,114,114,114	1
4	EDO	A	404	4/4	0.85	0.18	59,60,60,61	0
4	EDO	C	404	4/4	0.85	0.15	62,63,64,64	0
4	EDO	D	406	4/4	0.86	0.14	51,53,55,55	0
4	EDO	B	409	4/4	0.86	0.17	58,59,63,65	0
4	EDO	D	411	4/4	0.87	0.11	68,68,68,69	0
4	EDO	A	406	4/4	0.88	0.09	48,52,57,61	0
4	EDO	B	410	4/4	0.89	0.11	60,61,61,63	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
5	DMS	A	407	4/4	0.89	0.18	77,78,79,79	0
4	EDO	B	406	4/4	0.90	0.14	50,50,52,52	0
4	EDO	B	413	4/4	0.91	0.19	51,55,55,55	0
4	EDO	B	405	4/4	0.91	0.11	61,62,65,67	0
4	EDO	A	405	4/4	0.91	0.10	41,41,45,48	0
4	EDO	D	410	4/4	0.92	0.09	42,43,47,53	0
4	EDO	B	408	4/4	0.92	0.13	64,64,66,69	0
3	5UP	D	403	15/15	0.92	0.10	26,32,46,47	15
4	EDO	C	409	4/4	0.93	0.10	46,47,48,48	0
4	EDO	D	408	4/4	0.93	0.08	58,60,63,64	0
4	EDO	C	410	4/4	0.93	0.09	49,49,52,52	0
4	EDO	D	405	4/4	0.94	0.10	43,43,44,46	0
4	EDO	B	411	4/4	0.94	0.10	47,48,49,50	0
4	EDO	D	407	4/4	0.94	0.17	44,46,46,47	0
3	5UP	C	403	15/15	0.94	0.08	30,38,46,46	15
4	EDO	B	404	4/4	0.95	0.10	26,30,35,39	0
3	5UP	B	403	15/15	0.95	0.09	39,43,52,53	15
3	5UP	A	403	15/15	0.95	0.11	44,49,55,55	15
2	ZN	B	402	1/1	0.98	0.04	42,42,42,42	1
2	ZN	C	401	1/1	0.99	0.04	50,50,50,50	1
2	ZN	D	401	1/1	0.99	0.04	46,46,46,46	1
2	ZN	A	401	1/1	0.99	0.03	50,50,50,50	1
2	ZN	B	401	1/1	1.00	0.02	28,28,28,28	1
2	ZN	D	402	1/1	1.00	0.01	37,37,37,37	1
2	ZN	C	402	1/1	1.00	0.06	44,44,44,44	1

6.5 Other polymers [i](#)

There are no such residues in this entry.