



Full wwPDB X-ray Structure Validation Report ⓘ

Feb 23, 2017 – 11:18 AM EST

PDB ID : 5UUV
Title : Crystal Structure of the Catalytic Domain of the Inosine Monophosphate Dehydrogenase from Bacillus anthracis in the complex with a product IMP and the inhibitor P182
Authors : Kim, Y.; Maltseva, N.; Mulligan, R.; Makowska-Grzyska, M.; Gu, M.; Gollapalli, D.; Hedstrom, L.; Anderson, W.F.; Joachimiak, A.; Center for Structural Genomics of Infectious Diseases (CSGID)
Deposited on : 2017-02-17
Resolution : 2.75 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

<http://wwpdb.org/validation/2016/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	:	1.7.1 (RC1), CSD as537be (2016)
Xtriage (Phenix)	:	1.9-1692
EDS	:	rb-20028442
Percentile statistics	:	20151230.v01 (using entries in the PDB archive December 30th 2015)
Refmac	:	5.8.0135
CCP4	:	6.5.0
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	rb-20028442

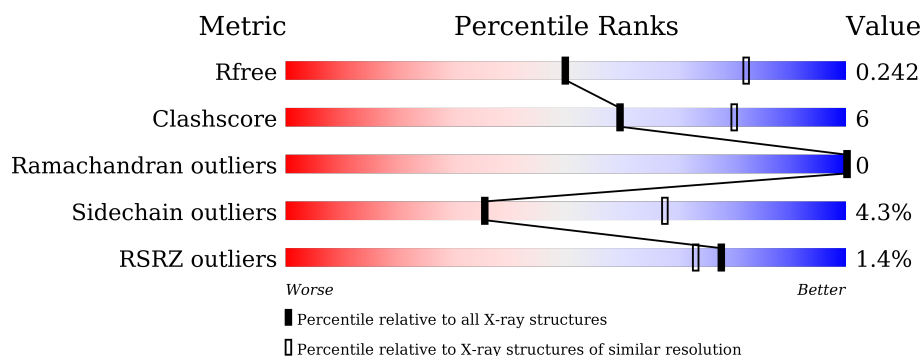
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.75 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}	91344	3340 (2.80-2.72)
Clashscore	102246	3829 (2.80-2.72)
Ramachandran outliers	100387	3767 (2.80-2.72)
Sidechain outliers	100360	3770 (2.80-2.72)
RSRZ outliers	91569	3352 (2.80-2.72)

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 on the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria. 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	384	<div> <div>%</div> <div> <div></div> <div>76%</div> <div>12%</div> <div>•</div> <div>10%</div> </div> </div>
1	B	384	<div> <div>%</div> <div> <div></div> <div>79%</div> <div>11%</div> <div>•</div> <div>10%</div> </div> </div>
1	C	384	<div> <div>2%</div> <div> <div></div> <div>74%</div> <div>15%</div> <div>•</div> <div>10%</div> </div> </div>
1	D	384	<div> <div>%</div> <div> <div></div> <div>77%</div> <div>12%</div> <div>•</div> <div>10%</div> </div> </div>

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 crite-

ria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
3	8L1	D	501	-	-	-	X
4	K	B	503	-	-	-	X

2 Entry composition

There are 6 unique types of molecules in this entry. The entry contains 10464 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 Inosine-5'-monophosphate dehydrogenase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	346	Total	C	N	O	S	0	0	0
			2535	1591	444	484	16			
1	B	347	Total	C	N	O	S	0	0	0
			2546	1600	446	484	16			
1	C	347	Total	C	N	O	S	0	0	0
			2542	1598	445	483	16			
1	D	347	Total	C	N	O	S	0	2	0
			2561	1611	448	486	16			

There are 104 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-23	MET	-	initiating methionine	UNP Q81W29
A	-22	HIS	-	expression tag	UNP Q81W29
A	-21	HIS	-	expression tag	UNP Q81W29
A	-20	HIS	-	expression tag	UNP Q81W29
A	-19	HIS	-	expression tag	UNP Q81W29
A	-18	HIS	-	expression tag	UNP Q81W29
A	-17	HIS	-	expression tag	UNP Q81W29
A	-16	SER	-	expression tag	UNP Q81W29
A	-15	SER	-	expression tag	UNP Q81W29
A	-14	GLY	-	expression tag	UNP Q81W29
A	-13	VAL	-	expression tag	UNP Q81W29
A	-12	ASP	-	expression tag	UNP Q81W29
A	-11	LEU	-	expression tag	UNP Q81W29
A	-10	GLY	-	expression tag	UNP Q81W29
A	-9	THR	-	expression tag	UNP Q81W29
A	-8	GLU	-	expression tag	UNP Q81W29
A	-7	ASN	-	expression tag	UNP Q81W29
A	-6	LEU	-	expression tag	UNP Q81W29
A	-5	TYR	-	expression tag	UNP Q81W29
A	-4	PHE	-	expression tag	UNP Q81W29
A	-3	GLN	-	expression tag	UNP Q81W29

Continued on next page...

Continued from previous page...

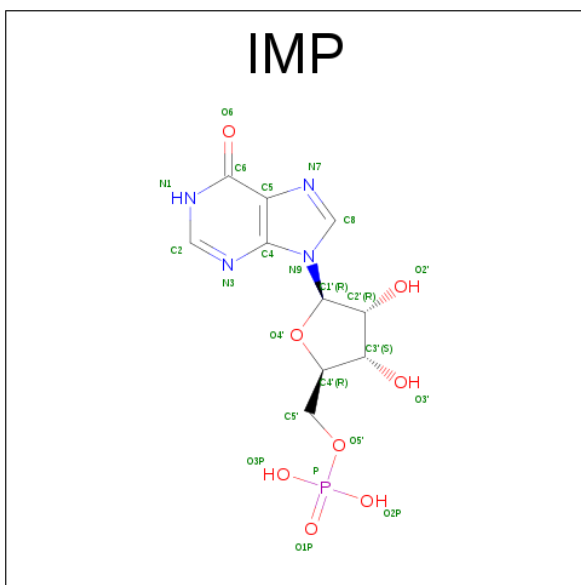
Chain	Residue	Modelled	Actual	Comment	Reference
A	-2	SER	-	expression tag	UNP Q81W29
A	-1	ASN	-	expression tag	UNP Q81W29
A	0	ALA	-	expression tag	UNP Q81W29
A	92	GLY	-	linker	UNP Q81W29
A	220	GLY	-	linker	UNP Q81W29
B	-23	MET	-	initiating methionine	UNP Q81W29
B	-22	HIS	-	expression tag	UNP Q81W29
B	-21	HIS	-	expression tag	UNP Q81W29
B	-20	HIS	-	expression tag	UNP Q81W29
B	-19	HIS	-	expression tag	UNP Q81W29
B	-18	HIS	-	expression tag	UNP Q81W29
B	-17	HIS	-	expression tag	UNP Q81W29
B	-16	SER	-	expression tag	UNP Q81W29
B	-15	SER	-	expression tag	UNP Q81W29
B	-14	GLY	-	expression tag	UNP Q81W29
B	-13	VAL	-	expression tag	UNP Q81W29
B	-12	ASP	-	expression tag	UNP Q81W29
B	-11	LEU	-	expression tag	UNP Q81W29
B	-10	GLY	-	expression tag	UNP Q81W29
B	-9	THR	-	expression tag	UNP Q81W29
B	-8	GLU	-	expression tag	UNP Q81W29
B	-7	ASN	-	expression tag	UNP Q81W29
B	-6	LEU	-	expression tag	UNP Q81W29
B	-5	TYR	-	expression tag	UNP Q81W29
B	-4	PHE	-	expression tag	UNP Q81W29
B	-3	GLN	-	expression tag	UNP Q81W29
B	-2	SER	-	expression tag	UNP Q81W29
B	-1	ASN	-	expression tag	UNP Q81W29
B	0	ALA	-	expression tag	UNP Q81W29
B	92	GLY	-	linker	UNP Q81W29
B	220	GLY	-	linker	UNP Q81W29
C	-23	MET	-	initiating methionine	UNP Q81W29
C	-22	HIS	-	expression tag	UNP Q81W29
C	-21	HIS	-	expression tag	UNP Q81W29
C	-20	HIS	-	expression tag	UNP Q81W29
C	-19	HIS	-	expression tag	UNP Q81W29
C	-18	HIS	-	expression tag	UNP Q81W29
C	-17	HIS	-	expression tag	UNP Q81W29
C	-16	SER	-	expression tag	UNP Q81W29
C	-15	SER	-	expression tag	UNP Q81W29
C	-14	GLY	-	expression tag	UNP Q81W29
C	-13	VAL	-	expression tag	UNP Q81W29

Continued on next page...

Continued from previous page...

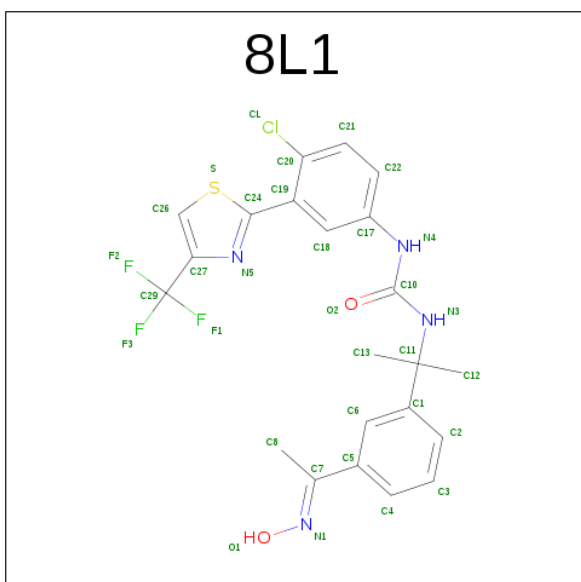
Chain	Residue	Modelled	Actual	Comment	Reference
C	-12	ASP	-	expression tag	UNP Q81W29
C	-11	LEU	-	expression tag	UNP Q81W29
C	-10	GLY	-	expression tag	UNP Q81W29
C	-9	THR	-	expression tag	UNP Q81W29
C	-8	GLU	-	expression tag	UNP Q81W29
C	-7	ASN	-	expression tag	UNP Q81W29
C	-6	LEU	-	expression tag	UNP Q81W29
C	-5	TYR	-	expression tag	UNP Q81W29
C	-4	PHE	-	expression tag	UNP Q81W29
C	-3	GLN	-	expression tag	UNP Q81W29
C	-2	SER	-	expression tag	UNP Q81W29
C	-1	ASN	-	expression tag	UNP Q81W29
C	0	ALA	-	expression tag	UNP Q81W29
C	92	GLY	-	linker	UNP Q81W29
C	220	GLY	-	linker	UNP Q81W29
D	-23	MET	-	initiating methionine	UNP Q81W29
D	-22	HIS	-	expression tag	UNP Q81W29
D	-21	HIS	-	expression tag	UNP Q81W29
D	-20	HIS	-	expression tag	UNP Q81W29
D	-19	HIS	-	expression tag	UNP Q81W29
D	-18	HIS	-	expression tag	UNP Q81W29
D	-17	HIS	-	expression tag	UNP Q81W29
D	-16	SER	-	expression tag	UNP Q81W29
D	-15	SER	-	expression tag	UNP Q81W29
D	-14	GLY	-	expression tag	UNP Q81W29
D	-13	VAL	-	expression tag	UNP Q81W29
D	-12	ASP	-	expression tag	UNP Q81W29
D	-11	LEU	-	expression tag	UNP Q81W29
D	-10	GLY	-	expression tag	UNP Q81W29
D	-9	THR	-	expression tag	UNP Q81W29
D	-8	GLU	-	expression tag	UNP Q81W29
D	-7	ASN	-	expression tag	UNP Q81W29
D	-6	LEU	-	expression tag	UNP Q81W29
D	-5	TYR	-	expression tag	UNP Q81W29
D	-4	PHE	-	expression tag	UNP Q81W29
D	-3	GLN	-	expression tag	UNP Q81W29
D	-2	SER	-	expression tag	UNP Q81W29
D	-1	ASN	-	expression tag	UNP Q81W29
D	0	ALA	-	expression tag	UNP Q81W29
D	92	GLY	-	linker	UNP Q81W29
D	220	GLY	-	linker	UNP Q81W29

- Molecule 2 is INOSINIC ACID (three-letter code: IMP) (formula: C₁₀H₁₃N₄O₈P).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	N	O	P	0	0
			23	10	4	8	1		
2	B	1	Total	C	N	O	P	0	0
			23	10	4	8	1		
2	C	1	Total	C	N	O	P	0	0
			23	10	4	8	1		
2	D	1	Total	C	N	O	P	0	0
			23	10	4	8	1		

- Molecule 3 is N-{4-chloro-3-[4-(trifluoromethyl)-1,3-thiazol-2-yl]phenyl}-N'-(2-{3-[(1E)-N-hydroxyethanimidoyl]phenyl}propan-2-yl)urea (three-letter code: 8L1) (formula: C₂₂H₂₀ClF₃N₄O₂S).

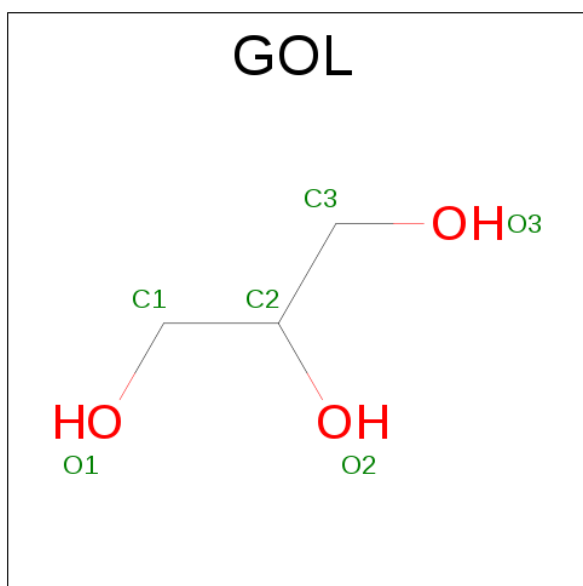


Mol	Chain	Residues	Atoms							ZeroOcc	AltConf
3	A	1	Total	C	Cl	F	N	O	S	0	0
			33	22	1	3	4	2	1		
3	B	1	Total	C	Cl	F	N	O	S	0	0
			33	22	1	3	4	2	1		
3	C	1	Total	C	Cl	F	N	O	S	0	0
			33	22	1	3	4	2	1		
3	D	1	Total	C	Cl	F	N	O	S	0	0
			33	22	1	3	4	2	1		

- Molecule 4 is POTASSIUM ION (three-letter code: K) (formula: K).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	B	2	Total K 2 2	0	0
4	A	2	Total K 2 2	0	0

- Molecule 5 is GLYCEROL (three-letter code: GOL) (formula: C₃H₈O₃).



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

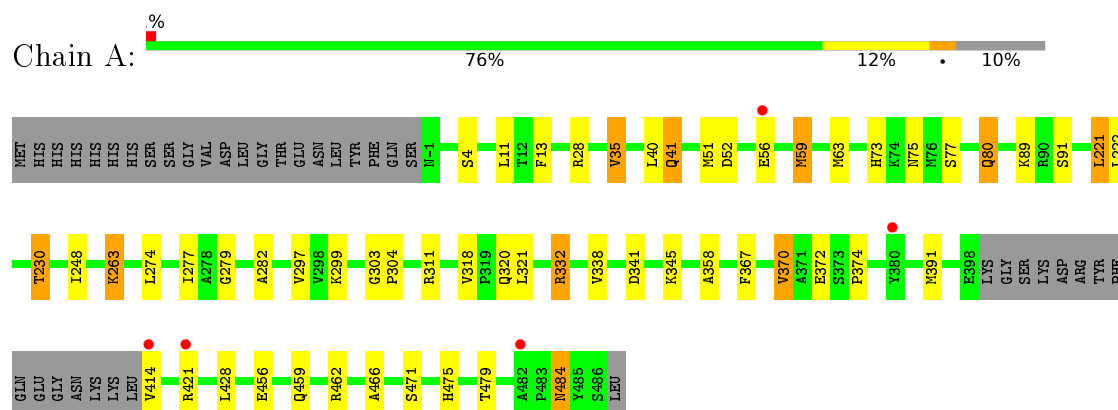
- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	7	Total 7	O 7	0	0
6	B	12	Total 12	O 12	0	0
6	C	12	Total 12	O 12	0	0
6	D	9	Total 9	O 9	0	0

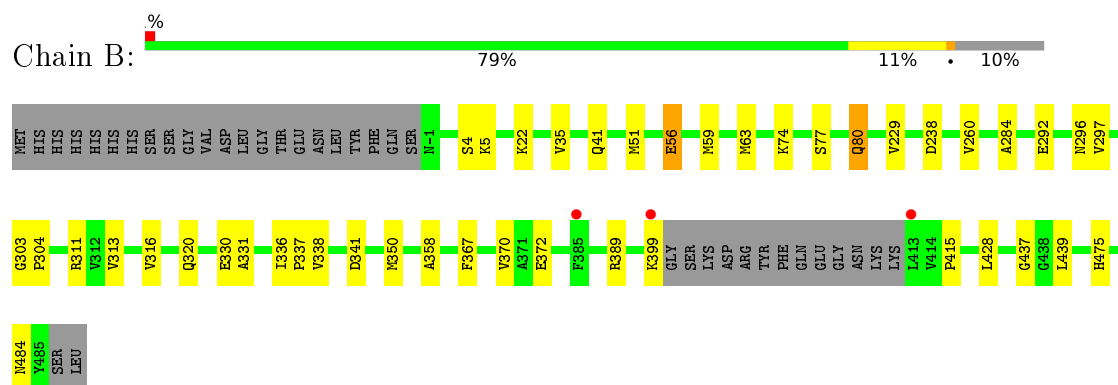
3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of errors 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.

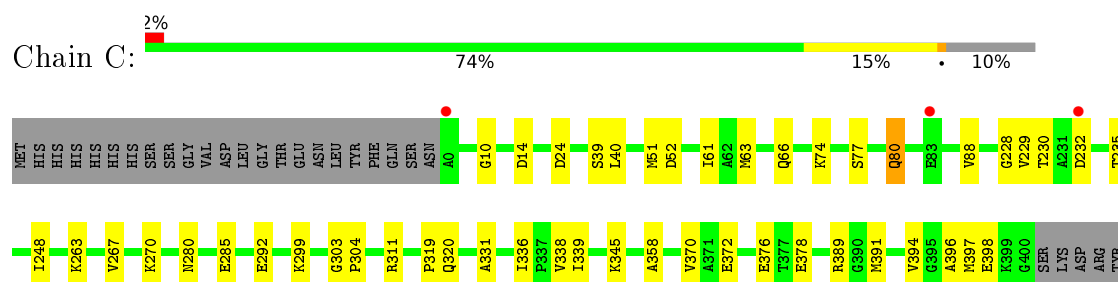
• Molecule 1: Inosine-5'-monophosphate dehydrogenase



• Molecule 1: Inosine-5'-monophosphate dehydrogenase

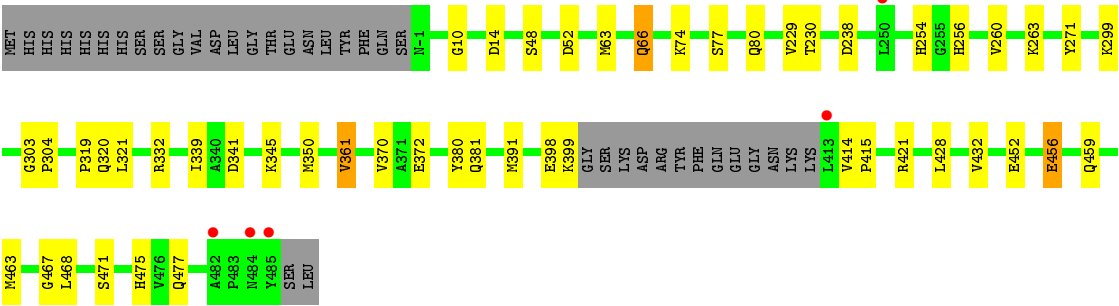
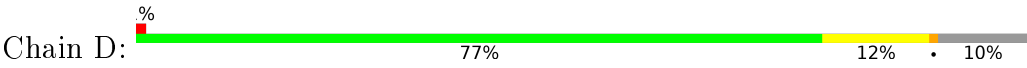


• Molecule 1: Inosine-5'-monophosphate dehydrogenase





● Molecule 1: Inosine-5'-monophosphate dehydrogenase



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	85.28Å 89.16Å 164.30Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	46.67 – 2.75 49.30 – 2.71	Depositor EDS
% Data completeness (in resolution range)	94.3 (46.67-2.75) 94.3 (49.30-2.71)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.14	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.51 (at 2.73Å)	Xtriage
Refinement program	PHENIX (1.11.1_2575: ???)	Depositor
R, R_{free}	0.194 , 0.242 0.191 , 0.242	Depositor DCC
R_{free} test set	1636 reflections (5.13%)	DCC
Wilson B-factor (Å ²)	54.1	Xtriage
Anisotropy	0.401	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.34 , 41.5	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtriage
Estimated twinning fraction	0.021 for k,h,-l	Xtriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	10464	wwPDB-VP
Average B, all atoms (Å ²)	57.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.23% 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 [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: GOL, K, 8L1, IMP

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	0.29	0/2571	0.48	1/3477 (0.0%)
1	B	0.25	0/2582	0.46	0/3491
1	C	0.26	0/2578	0.46	0/3485
1	D	0.26	0/2597	0.46	0/3513
All	All	0.27	0/10328	0.46	1/13966 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	332	ARG	NE-CZ-NH2	5.35	122.97	120.30

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	2535	0	2584	35	0
1	B	2546	0	2603	29	0
1	C	2542	0	2600	36	0
1	D	2561	0	2622	32	0
2	A	23	0	11	3	0
2	B	23	0	11	2	0

Continued on next page...

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	C	23	0	11	1	0
2	D	23	0	11	1	0
3	A	33	0	0	1	0
3	B	33	0	0	1	0
3	C	33	0	0	1	0
3	D	33	0	0	1	0
4	A	2	0	0	0	0
4	B	2	0	0	0	0
5	B	6	0	8	1	0
5	C	6	0	8	0	0
6	A	7	0	0	0	0
6	B	12	0	0	1	0
6	C	12	0	0	1	0
6	D	9	0	0	0	0
All	All	10464	0	10469	119	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 6.

All (119) 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:D:52:ASP:H	1:D:391:MET:HE3	1.47	0.76
1:C:63:MET:HE2	1:C:428:LEU:HD21	1.74	0.70
1:D:341:ASP:OD1	2:D:500:IMP:O2'	2.13	0.67
1:A:56:GLU:HG3	1:A:374:PRO:HG3	1.78	0.66
1:D:380:TYR:CE2	1:D:421:ARG:HD3	2.32	0.65
1:D:381:GLN:HA	1:D:381:GLN:OE1	1.97	0.64
1:A:421:ARG:NH2	1:D:477:GLN:OE1	2.30	0.64
1:A:332:ARG:NH2	1:A:456:GLU:OE2	2.33	0.62
1:B:484:ASN:ND2	1:D:415:PRO:O	2.32	0.62
1:C:229:VAL:HG13	1:C:263:LYS:HG3	1.82	0.61
1:C:280:ASN:ND2	1:C:299:LYS:HE3	2.15	0.61
1:C:389:ARG:HD3	1:C:396:ALA:HB2	1.81	0.61
1:C:66:GLN:HG2	1:C:432:VAL:HG11	1.82	0.60
1:D:380:TYR:CE2	1:D:421:ARG:CD	2.85	0.60
1:C:280:ASN:HD21	1:C:299:LYS:HE3	1.67	0.59
1:D:48:SER:HB3	1:D:63:MET:HE3	1.83	0.59
1:B:311:ARG:HD2	1:C:471:SER:HA	1.85	0.59
1:C:51:MET:HE1	2:C:501:IMP:H5'2	1.85	0.58
1:D:238:ASP:OD1	1:D:271:TYR:OH	2.22	0.57

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:437:GLY:HA3	1:D:414[B]:VAL:HG21	1.89	0.55
1:B:229:VAL:HG21	1:B:260:VAL:HG22	1.89	0.55
1:B:313:VAL:HG21	1:C:484:ASN:HD22	1.71	0.55
1:A:89:LYS:HD3	1:A:221:LEU:O	2.07	0.55
1:A:341:ASP:OD2	2:A:501:IMP:O3'	2.23	0.55
1:A:345:LYS:HD2	1:D:475:HIS:CE1	2.42	0.55
1:A:40:LEU:HD12	1:A:222:LEU:HD13	1.88	0.55
1:B:35:VAL:HG12	1:B:41:GLN:HG2	1.89	0.54
1:A:341:ASP:OD1	2:A:501:IMP:O2'	2.22	0.54
1:C:270:LYS:NZ	6:C:601:HOH:O	2.39	0.53
3:C:502:8L1:CL	3:C:502:8L1:S	3.04	0.53
1:A:52:ASP:H	1:A:391:MET:HE3	1.74	0.53
1:B:341:ASP:OD1	2:B:501:IMP:O2'	2.25	0.53
1:D:77:SER:H	1:D:80:GLN:HE21	1.57	0.53
1:D:229:VAL:HG21	1:D:260:VAL:HG22	1.90	0.53
3:B:502:8L1:CL	3:B:502:8L1:S	3.05	0.52
1:B:51:MET:HE1	2:B:501:IMP:H5'1	1.90	0.52
3:D:501:8L1:S	3:D:501:8L1:CL	3.04	0.52
1:A:51:MET:HE1	2:A:501:IMP:H5'2	1.93	0.50
1:B:5:LYS:NZ	1:C:455:ARG:O	2.33	0.50
3:A:502:8L1:S	3:A:502:8L1:CL	3.06	0.50
1:B:331:ALA:HB1	1:B:336:ILE:HB	1.93	0.50
1:B:475:HIS:CE1	1:D:345:LYS:HD2	2.47	0.50
1:C:484:ASN:OD1	1:C:484:ASN:N	2.30	0.50
1:D:350:MET:HG3	1:D:361:VAL:HG11	1.94	0.49
1:A:56:GLU:H	1:A:59:MET:HB3	1.77	0.49
1:A:77:SER:OG	1:A:80:GLN:HB2	2.12	0.49
1:D:230:THR:O	1:D:263:LYS:NZ	2.45	0.49
1:B:63:MET:HE2	1:B:428:LEU:HD21	1.94	0.49
1:D:77:SER:H	1:D:80:GLN:NE2	2.10	0.49
1:A:471:SER:HA	1:C:311:ARG:HD2	1.94	0.49
1:A:479:THR:HG23	1:C:420:GLY:HA2	1.95	0.49
1:D:66:GLN:HG2	1:D:432:VAL:HG11	1.94	0.48
1:B:370:VAL:HG12	1:B:372:GLU:H	1.78	0.48
1:B:296:ASN:HD22	5:B:504:GOL:H12	1.79	0.48
1:D:463:MET:HE2	1:D:467:GLY:HA3	1.95	0.47
1:B:415:PRO:O	1:C:484:ASN:ND2	2.47	0.47
1:A:277:ILE:HG12	1:A:297:VAL:HB	1.96	0.47
1:C:248:ILE:HD11	1:C:267:VAL:HG11	1.96	0.47
1:C:304:PRO:HG3	1:C:320:GLN:HG2	1.96	0.47
1:A:11:LEU:HD11	1:A:462:ARG:HD3	1.97	0.47

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:230:THR:O	1:C:263:LYS:NZ	2.46	0.47
1:C:331:ALA:HB1	1:C:336:ILE:HB	1.96	0.47
1:A:466:ALA:HB1	1:C:14:ASP:HB2	1.95	0.47
1:C:74:LYS:NZ	1:C:228:GLY:HA3	2.30	0.47
1:A:59:MET:CE	1:A:367:PHE:HB3	2.45	0.47
1:B:389:ARG:HH12	1:B:399:LYS:CD	2.28	0.47
1:A:230:THR:O	1:A:263:LYS:NZ	2.48	0.46
1:D:229:VAL:HG13	1:D:263:LYS:HG3	1.97	0.46
1:C:77:SER:OG	1:C:80:GLN:HB2	2.15	0.46
1:D:414[A]:VAL:HG13	1:D:415:PRO:HD2	1.98	0.46
1:B:297:VAL:HG22	1:B:337:PRO:HG2	1.97	0.46
1:C:378:GLU:OE2	1:C:421:ARG:HB3	2.16	0.45
1:A:40:LEU:CD1	1:A:222:LEU:HD13	2.46	0.45
1:C:299:LYS:HG3	1:C:339:ILE:HB	1.97	0.45
1:D:63:MET:HE2	1:D:428:LEU:HD21	1.98	0.45
6:B:604:HOH:O	1:C:470:GLU:HG2	2.15	0.45
1:A:370:VAL:HG13	1:A:372:GLU:H	1.82	0.45
1:B:77:SER:OG	1:B:80:GLN:HB2	2.17	0.44
1:D:10:GLY:HA3	1:D:319:PRO:HG2	1.98	0.44
1:B:56:GLU:H	1:B:59:MET:HB3	1.82	0.44
1:B:313:VAL:HG21	1:C:484:ASN:ND2	2.31	0.44
1:A:13:PHE:CE1	1:A:321:LEU:HD13	2.52	0.44
1:A:338:VAL:HG23	1:A:358:ALA:HA	1.99	0.44
1:A:263:LYS:HD3	1:A:263:LYS:HA	1.64	0.44
1:D:370:VAL:HG12	1:D:372:GLU:H	1.82	0.44
1:D:321:LEU:HA	1:D:321:LEU:HD12	1.74	0.44
1:D:299:LYS:HG3	1:D:339:ILE:HB	2.00	0.44
1:D:14:ASP:HB3	1:D:468:LEU:HD22	2.00	0.44
1:A:475:HIS:CE1	1:C:345:LYS:HD2	2.53	0.44
1:A:311:ARG:HD2	1:D:471:SER:HA	1.99	0.43
1:C:370:VAL:HG12	1:C:372:GLU:H	1.84	0.43
1:B:338:VAL:HG23	1:B:358:ALA:HA	2.00	0.43
1:B:284:ALA:HB1	1:B:330:GLU:HB2	2.00	0.43
1:B:399:LYS:HB3	1:B:399:LYS:HE2	1.75	0.43
1:B:311:ARG:HG2	1:B:316:VAL:O	2.19	0.43
1:C:10:GLY:HA3	1:C:319:PRO:HG2	2.02	0.42
1:D:452:GLU:O	1:D:456:GLU:HB2	2.19	0.42
1:A:279:GLY:HA3	1:A:299:LYS:HB3	2.01	0.42
1:A:35:VAL:HG12	1:A:41:GLN:HB3	2.00	0.42
1:A:484:ASN:OD1	1:A:484:ASN:N	2.51	0.42
1:B:303:GLY:N	1:B:304:PRO:CD	2.82	0.42

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:303:GLY:N	1:A:304:PRO:CD	2.83	0.42
1:A:52:ASP:HA	1:A:73:HIS:CD2	2.55	0.42
1:B:304:PRO:HG3	1:B:320:GLN:HG2	2.02	0.42
1:C:338:VAL:HG23	1:C:358:ALA:HA	2.02	0.42
1:C:63:MET:HE2	1:C:428:LEU:CD2	2.48	0.42
1:D:254:HIS:CE1	1:D:256:HIS:HB3	2.54	0.42
1:A:248:ILE:HG12	1:A:274:LEU:HD21	2.02	0.42
1:C:303:GLY:N	1:C:304:PRO:CD	2.83	0.42
1:C:40:LEU:HD12	1:C:40:LEU:HA	1.90	0.42
1:B:59:MET:HE2	1:B:367:PHE:HB3	2.02	0.41
1:A:282:ALA:HB1	1:A:318:VAL:HB	2.02	0.41
1:B:350:MET:HE1	1:B:439:LEU:HB2	2.03	0.41
1:D:303:GLY:N	1:D:304:PRO:CD	2.84	0.41
1:A:4:SER:OG	1:D:459:GLN:NE2	2.53	0.41
1:A:63:MET:HE2	1:A:428:LEU:HD21	2.04	0.41
1:C:52:ASP:H	1:C:391:MET:HE1	1.86	0.40
1:C:61:ILE:HG13	1:C:88:VAL:HG22	2.03	0.40
1:B:4:SER:OG	1:C:459:GLN:NE2	2.50	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	342/384 (89%)	337 (98%)	5 (2%)	0	100	100
1	B	343/384 (89%)	337 (98%)	6 (2%)	0	100	100
1	C	343/384 (89%)	336 (98%)	7 (2%)	0	100	100
1	D	344/384 (90%)	337 (98%)	7 (2%)	0	100	100
All	All	1372/1536 (89%)	1347 (98%)	25 (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	264/298 (89%)	249 (94%)	15 (6%)	25	55
1	B	265/298 (89%)	259 (98%)	6 (2%)	58	87
1	C	264/298 (89%)	248 (94%)	16 (6%)	23	52
1	D	267/298 (90%)	259 (97%)	8 (3%)	48	80
All	All	1060/1192 (89%)	1015 (96%)	45 (4%)	35	68

All (45) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	28	ARG
1	A	35	VAL
1	A	41	GLN
1	A	59	MET
1	A	75	ASN
1	A	80	GLN
1	A	91	SER
1	A	221	LEU
1	A	230	THR
1	A	263	LYS
1	A	320	GLN
1	A	370	VAL
1	A	414	VAL
1	A	459	GLN
1	A	484	ASN
1	B	22	LYS
1	B	56	GLU
1	B	74	LYS
1	B	80	GLN
1	B	238	ASP
1	B	292	GLU
1	C	24	ASP
1	C	39	SER
1	C	80	GLN

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	C	232	ASP
1	C	235	THR
1	C	285	GLU
1	C	292	GLU
1	C	376	GLU
1	C	394	VAL
1	C	397	MET
1	C	398	GLU
1	C	435	LEU
1	C	456	GLU
1	C	462	ARG
1	C	480	LYS
1	C	484	ASN
1	D	66	GLN
1	D	74	LYS
1	D	320	GLN
1	D	332	ARG
1	D	361	VAL
1	D	398	GLU
1	D	399	LYS
1	D	456	GLU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (9) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	384	GLN
1	B	80	GLN
1	B	459	GLN
1	C	280	ASN
1	C	381	GLN
1	C	459	GLN
1	D	66	GLN
1	D	80	GLN
1	D	459	GLN

5.3.3 RNA ⓘ

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 carbohydrates in this entry.

5.6 Ligand geometry [i](#)

Of 14 ligands modelled in this entry, 4 are monoatomic - leaving 10 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$
2	IMP	A	501	-	21,25,25	1.24	3 (14%)	22,38,38	2.53	3 (13%)
3	8L1	A	502	-	32,35,35	2.02	5 (15%)	44,52,52	2.28	9 (20%)
2	IMP	B	501	-	21,25,25	1.23	3 (14%)	22,38,38	2.47	2 (9%)
3	8L1	B	502	-	32,35,35	2.03	5 (15%)	44,52,52	2.15	8 (18%)
5	GOL	B	504	-	5,5,5	0.36	0	5,5,5	0.23	0
2	IMP	C	501	-	21,25,25	1.22	3 (14%)	22,38,38	2.52	3 (13%)
3	8L1	C	502	-	32,35,35	2.03	5 (15%)	44,52,52	2.25	11 (25%)
5	GOL	C	503	-	5,5,5	0.35	0	5,5,5	0.20	0
2	IMP	D	500	-	21,25,25	1.23	3 (14%)	22,38,38	2.54	4 (18%)
3	8L1	D	501	-	32,35,35	2.03	5 (15%)	44,52,52	2.21	9 (20%)

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	IMP	A	501	-	-	0/6/26/26	0/3/3/3
3	8L1	A	502	-	-	0/29/31/31	0/3/3/3
2	IMP	B	501	-	-	0/6/26/26	0/3/3/3

Continued on next page...

Continued from previous page...

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	8L1	B	502	-	-	0/29/31/31	0/3/3/3
5	GOL	B	504	-	-	0/4/4/4	0/0/0/0
2	IMP	C	501	-	-	0/6/26/26	0/3/3/3
3	8L1	C	502	-	-	0/29/31/31	0/3/3/3
5	GOL	C	503	-	-	0/4/4/4	0/0/0/0
2	IMP	D	500	-	-	0/6/26/26	0/3/3/3
3	8L1	D	501	-	-	0/29/31/31	0/3/3/3

All (32) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	D	501	8L1	C8-C7	-9.24	1.32	1.50
3	C	502	8L1	C8-C7	-9.20	1.32	1.50
3	A	502	8L1	C8-C7	-9.18	1.32	1.50
3	B	502	8L1	C8-C7	-9.17	1.32	1.50
3	C	502	8L1	C17-N4	-2.53	1.36	1.41
3	D	501	8L1	C17-N4	-2.50	1.37	1.41
3	A	502	8L1	C17-N4	-2.49	1.37	1.41
3	B	502	8L1	C17-N4	-2.46	1.37	1.41
2	B	501	IMP	C2-N1	2.34	1.38	1.33
2	C	501	IMP	C2-N1	2.35	1.38	1.33
2	D	500	IMP	C2-N1	2.35	1.38	1.33
2	A	501	IMP	C2-N1	2.39	1.38	1.33
3	B	502	8L1	C20-CL	2.48	1.80	1.73
3	D	501	8L1	C20-CL	2.53	1.80	1.73
3	C	502	8L1	C20-CL	2.55	1.80	1.73
3	A	502	8L1	C20-CL	2.56	1.80	1.73
3	C	502	8L1	C7-N1	2.90	1.33	1.28
2	D	500	IMP	C6-N1	2.92	1.38	1.33
2	C	501	IMP	C6-N1	2.94	1.38	1.33
2	B	501	IMP	C6-N1	2.96	1.38	1.33
3	D	501	8L1	C7-N1	2.96	1.33	1.28
3	B	502	8L1	C7-N1	3.03	1.34	1.28
3	A	502	8L1	C7-N1	3.04	1.34	1.28
2	A	501	IMP	C6-N1	3.05	1.38	1.33
3	A	502	8L1	C24-N5	3.09	1.35	1.31
3	D	501	8L1	C24-N5	3.22	1.36	1.31
3	C	502	8L1	C24-N5	3.27	1.36	1.31
3	B	502	8L1	C24-N5	3.27	1.36	1.31
2	A	501	IMP	C2-N3	3.53	1.38	1.32
2	C	501	IMP	C2-N3	3.53	1.38	1.32
2	D	500	IMP	C2-N3	3.57	1.38	1.32

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	501	IMP	C2-N3	3.61	1.38	1.32

All (49) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	501	IMP	N3-C2-N1	-11.03	120.20	128.87
2	D	500	IMP	N3-C2-N1	-10.91	120.30	128.87
2	C	501	IMP	N3-C2-N1	-10.91	120.30	128.87
2	B	501	IMP	N3-C2-N1	-10.87	120.33	128.87
3	A	502	8L1	C26-C27-C29	-8.41	118.24	128.14
3	C	502	8L1	C26-C27-C29	-8.23	118.46	128.14
3	D	501	8L1	C26-C27-C29	-7.73	119.05	128.14
3	B	502	8L1	C26-C27-C29	-7.71	119.07	128.14
3	C	502	8L1	C4-C5-C7	-2.85	117.61	121.21
3	A	502	8L1	C4-C5-C7	-2.71	117.78	121.21
3	B	502	8L1	C4-C5-C7	-2.65	117.86	121.21
2	D	500	IMP	C1'-N9-C4	-2.61	123.89	126.81
3	D	501	8L1	C8-C7-N1	-2.47	115.15	123.11
3	D	501	8L1	C4-C5-C7	-2.41	118.16	121.21
3	A	502	8L1	C8-C7-N1	-2.41	115.36	123.11
3	C	502	8L1	C8-C7-N1	-2.35	115.56	123.11
3	B	502	8L1	C8-C7-N1	-2.33	115.63	123.11
3	C	502	8L1	C2-C1-C11	-2.15	118.43	121.17
3	C	502	8L1	F2-C29-C27	-2.04	108.81	112.54
3	A	502	8L1	F2-C29-C27	-2.03	108.84	112.54
3	A	502	8L1	F1-C29-C27	-2.02	108.85	112.54
3	C	502	8L1	F3-C29-C27	-2.02	108.86	112.54
3	D	501	8L1	C19-C18-C17	2.05	122.11	119.32
3	A	502	8L1	C5-C7-N1	2.06	125.44	116.90
3	D	501	8L1	C5-C7-N1	2.12	125.65	116.90
2	D	500	IMP	C2-N1-C6	2.15	119.84	116.13
2	D	500	IMP	O2P-P-O1P	2.17	117.71	110.63
3	B	502	8L1	C19-C18-C17	2.20	122.31	119.32
2	C	501	IMP	C2-N1-C6	2.20	119.92	116.13
2	B	501	IMP	C2-N1-C6	2.21	119.94	116.13
2	A	501	IMP	C2-N1-C6	2.28	120.06	116.13
2	A	501	IMP	O2P-P-O1P	2.36	118.34	110.63
3	C	502	8L1	C1-C11-N3	2.42	113.11	110.49
2	C	501	IMP	O2P-P-O1P	2.54	118.90	110.63
3	B	502	8L1	C6-C5-C7	2.74	122.76	120.54
3	D	501	8L1	C6-C5-C7	2.87	122.87	120.54
3	C	502	8L1	C19-C20-CL	2.97	125.30	120.70

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	502	8L1	C19-C20-CL	2.97	125.31	120.70
3	C	502	8L1	C6-C5-C7	3.02	122.99	120.54
3	A	502	8L1	C6-C5-C7	3.07	123.03	120.54
3	D	501	8L1	C19-C20-CL	3.13	125.54	120.70
3	B	502	8L1	C19-C24-N5	3.83	130.11	123.50
3	D	501	8L1	C19-C24-N5	3.94	130.31	123.50
3	C	502	8L1	C19-C24-N5	4.14	130.65	123.50
3	A	502	8L1	C19-C24-N5	4.89	131.95	123.50
3	C	502	8L1	O1-N1-C7	7.16	123.32	112.90
3	B	502	8L1	O1-N1-C7	7.42	123.69	112.90
3	A	502	8L1	O1-N1-C7	7.81	124.27	112.90
3	D	501	8L1	O1-N1-C7	7.86	124.34	112.90

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

9 monomers are involved in 12 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	501	IMP	3	0
3	A	502	8L1	1	0
2	B	501	IMP	2	0
3	B	502	8L1	1	0
5	B	504	GOL	1	0
2	C	501	IMP	1	0
3	C	502	8L1	1	0
2	D	500	IMP	1	0
3	D	501	8L1	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	346/384 (90%)	-0.01	5 (1%) 78 73	34, 52, 86, 109	0
1	B	347/384 (90%)	-0.06	3 (0%) 85 82	34, 51, 80, 116	0
1	C	347/384 (90%)	0.00	7 (2%) 68 63	32, 56, 90, 123	0
1	D	347/384 (90%)	-0.00	5 (1%) 78 73	32, 52, 84, 107	0
All	All	1387/1536 (90%)	-0.02	20 (1%) 78 73	32, 52, 87, 123	0

All (20) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	0	ALA	4.6
1	D	413[A]	LEU	3.5
1	A	380	TYR	3.3
1	C	479	THR	3.2
1	C	482	ALA	2.9
1	A	482	ALA	2.8
1	C	232	ASP	2.7
1	B	385	PHE	2.6
1	C	485	TYR	2.5
1	D	250	LEU	2.5
1	B	399	LYS	2.4
1	D	485	TYR	2.4
1	B	413	LEU	2.4
1	D	482	ALA	2.3
1	A	414	VAL	2.3
1	C	483	PRO	2.1
1	A	56	GLU	2.1
1	A	421	ARG	2.0
1	C	83	GLU	2.0
1	D	484	ASN	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 carbohydrates 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. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. 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	LLDF	B-factors(Å ²)	Q<0.9
4	K	B	503	1/1	0.86	0.41	5.02	159,159,159,159	0
3	8L1	D	501	33/33	0.93	0.25	2.11	53,63,93,95	0
5	GOL	C	503	6/6	0.86	0.22	1.20	60,61,65,66	0
3	8L1	B	502	33/33	0.89	0.23	0.83	53,66,103,103	0
3	8L1	A	502	33/33	0.93	0.22	0.78	49,61,87,88	0
5	GOL	B	504	6/6	0.82	0.17	0.58	65,68,74,75	0
3	8L1	C	502	33/33	0.92	0.18	0.49	45,61,86,87	0
4	K	A	503	1/1	0.76	0.18	0.48	98,98,98,98	0
2	IMP	D	500	23/23	0.96	0.14	0.40	29,51,54,57	0
2	IMP	C	501	23/23	0.95	0.15	0.13	37,50,55,57	0
4	K	B	505	1/1	0.96	0.12	-0.38	77,77,77,77	0
2	IMP	A	501	23/23	0.96	0.12	-0.59	37,47,53,58	0
4	K	A	504	1/1	0.91	0.12	-0.93	87,87,87,87	0
2	IMP	B	501	23/23	0.97	0.11	-1.25	35,44,49,53	0

6.5 Other polymers [i](#)

There are no such residues in this entry.