



# wwPDB X-ray Structure Validation Summary Report i

Feb 28, 2014 – 06:08 PM GMT

PDB ID : 2X9G  
Title : High resolution structure of TbPTR1 in complex with Pemetrexed  
Authors : Dawson, A.; Barrack, K.L.; Tulloch, L.B.; Hunter, W.N.  
Deposited on : 2010-03-18  
Resolution : 1.10 Å(reported)

This is a wwPDB validation summary report for a publicly released PDB entry.

We welcome your comments at [validation@mail.wwpdb.org](mailto:validation@mail.wwpdb.org)

A user guide is available at <http://wwpdb.org/ValidationPDFNotes.html>

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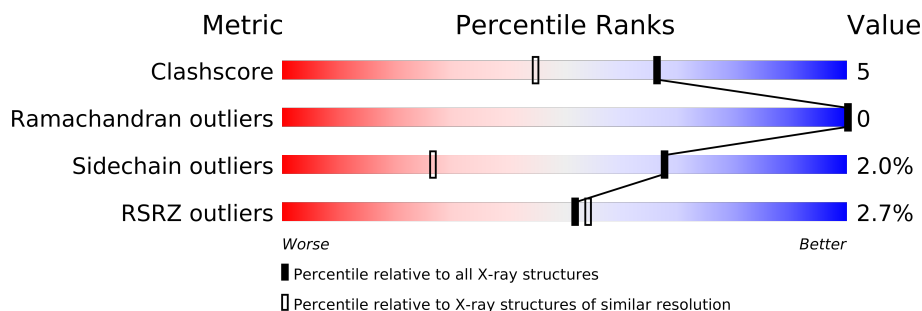
The following versions of software and data (see [references](#)) were used in the production of this report:

MolProbity	:	4.02b-467
Mogul	:	1.15 2013
Xtriage (Phenix)	:	dev-1323
EDS	:	stable22639
Percentile statistics	:	21963
Refmac	:	5.8.0049
CCP4	:	6.3.0 (Settle)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et. al. (1996)
Validation Pipeline (wwPDB-VP)	:	stable22683

# 1 Overall quality at a glance

The reported resolution of this entry is 1.10 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
Clashscore	79885	1559 (1.20-1.00)
Ramachandran outliers	78287	1474 (1.20-1.00)
Sidechain outliers	78261	1472 (1.20-1.00)
RSRZ outliers	66119	1400 (1.20-1.00)

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 on the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density.

Mol	Chain	Length	Quality of chain
1	A	288	
1	B	288	
1	C	288	
1	D	288	

The following table lists non-polymeric compounds that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Geometry	Electron density
3	LYA	A	1270[A]	-	X
3	LYA	A	1270[B]	-	X
3	LYA	B	1270[A]	-	X
3	LYA	B	1270[B]	-	X
3	LYA	C	1270[A]	-	X
3	LYA	C	1270[B]	-	X
3	LYA	D	1270[A]	-	X

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Mol	Type	Chain	Res	Geometry	Electron density
3	LYA	D	1270[B]	-	X

## 2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 16553 atoms, of which 7199 are hydrogens and 0 are deuterium.

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 PTERIDINE REDUCTASE.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	251	Total	C	H	N	O	S	0	9	0
			3670	1202	1766	333	357	12			
1	B	250	Total	C	H	N	O	S	0	8	0
			3654	1193	1761	331	357	12			
1	C	252	Total	C	H	N	O	S	0	8	0
			3656	1195	1751	337	362	11			
1	D	249	Total	C	H	N	O	S	0	12	0
			3685	1206	1773	332	362	12			

There are 80 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-19	MET	-	EXPRESSION TAG	UNP O76290
A	-18	GLY	-	EXPRESSION TAG	UNP O76290
A	-17	SER	-	EXPRESSION TAG	UNP O76290
A	-16	SER	-	EXPRESSION TAG	UNP O76290
A	-15	HIS	-	EXPRESSION TAG	UNP O76290
A	-14	HIS	-	EXPRESSION TAG	UNP O76290
A	-13	HIS	-	EXPRESSION TAG	UNP O76290
A	-12	HIS	-	EXPRESSION TAG	UNP O76290
A	-11	HIS	-	EXPRESSION TAG	UNP O76290
A	-10	HIS	-	EXPRESSION TAG	UNP O76290
A	-9	SER	-	EXPRESSION TAG	UNP O76290
A	-8	SER	-	EXPRESSION TAG	UNP O76290
A	-7	GLY	-	EXPRESSION TAG	UNP O76290
A	-6	LEU	-	EXPRESSION TAG	UNP O76290
A	-5	VAL	-	EXPRESSION TAG	UNP O76290
A	-4	PRO	-	EXPRESSION TAG	UNP O76290
A	-3	ARG	-	EXPRESSION TAG	UNP O76290
A	-2	GLY	-	EXPRESSION TAG	UNP O76290
A	-1	SER	-	EXPRESSION TAG	UNP O76290
A	0	HIS	-	EXPRESSION TAG	UNP O76290
B	-19	MET	-	EXPRESSION TAG	UNP O76290

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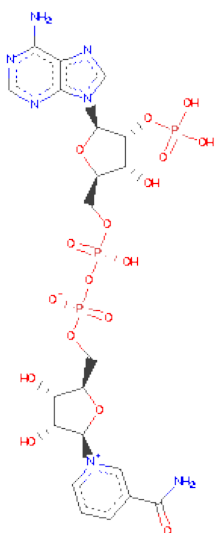
Chain	Residue	Modelled	Actual	Comment	Reference
B	-18	GLY	-	EXPRESSION TAG	UNP O76290
B	-17	SER	-	EXPRESSION TAG	UNP O76290
B	-16	SER	-	EXPRESSION TAG	UNP O76290
B	-15	HIS	-	EXPRESSION TAG	UNP O76290
B	-14	HIS	-	EXPRESSION TAG	UNP O76290
B	-13	HIS	-	EXPRESSION TAG	UNP O76290
B	-12	HIS	-	EXPRESSION TAG	UNP O76290
B	-11	HIS	-	EXPRESSION TAG	UNP O76290
B	-10	HIS	-	EXPRESSION TAG	UNP O76290
B	-9	SER	-	EXPRESSION TAG	UNP O76290
B	-8	SER	-	EXPRESSION TAG	UNP O76290
B	-7	GLY	-	EXPRESSION TAG	UNP O76290
B	-6	LEU	-	EXPRESSION TAG	UNP O76290
B	-5	VAL	-	EXPRESSION TAG	UNP O76290
B	-4	PRO	-	EXPRESSION TAG	UNP O76290
B	-3	ARG	-	EXPRESSION TAG	UNP O76290
B	-2	GLY	-	EXPRESSION TAG	UNP O76290
B	-1	SER	-	EXPRESSION TAG	UNP O76290
B	0	HIS	-	EXPRESSION TAG	UNP O76290
C	-19	MET	-	EXPRESSION TAG	UNP O76290
C	-18	GLY	-	EXPRESSION TAG	UNP O76290
C	-17	SER	-	EXPRESSION TAG	UNP O76290
C	-16	SER	-	EXPRESSION TAG	UNP O76290
C	-15	HIS	-	EXPRESSION TAG	UNP O76290
C	-14	HIS	-	EXPRESSION TAG	UNP O76290
C	-13	HIS	-	EXPRESSION TAG	UNP O76290
C	-12	HIS	-	EXPRESSION TAG	UNP O76290
C	-11	HIS	-	EXPRESSION TAG	UNP O76290
C	-10	HIS	-	EXPRESSION TAG	UNP O76290
C	-9	SER	-	EXPRESSION TAG	UNP O76290
C	-8	SER	-	EXPRESSION TAG	UNP O76290
C	-7	GLY	-	EXPRESSION TAG	UNP O76290
C	-6	LEU	-	EXPRESSION TAG	UNP O76290
C	-5	VAL	-	EXPRESSION TAG	UNP O76290
C	-4	PRO	-	EXPRESSION TAG	UNP O76290
C	-3	ARG	-	EXPRESSION TAG	UNP O76290
C	-2	GLY	-	EXPRESSION TAG	UNP O76290
C	-1	SER	-	EXPRESSION TAG	UNP O76290
C	0	HIS	-	EXPRESSION TAG	UNP O76290
D	-19	MET	-	EXPRESSION TAG	UNP O76290
D	-18	GLY	-	EXPRESSION TAG	UNP O76290
D	-17	SER	-	EXPRESSION TAG	UNP O76290

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Chain	Residue	Modelled	Actual	Comment	Reference
D	-16	SER	-	EXPRESSION TAG	UNP O76290
D	-15	HIS	-	EXPRESSION TAG	UNP O76290
D	-14	HIS	-	EXPRESSION TAG	UNP O76290
D	-13	HIS	-	EXPRESSION TAG	UNP O76290
D	-12	HIS	-	EXPRESSION TAG	UNP O76290
D	-11	HIS	-	EXPRESSION TAG	UNP O76290
D	-10	HIS	-	EXPRESSION TAG	UNP O76290
D	-9	SER	-	EXPRESSION TAG	UNP O76290
D	-8	SER	-	EXPRESSION TAG	UNP O76290
D	-7	GLY	-	EXPRESSION TAG	UNP O76290
D	-6	LEU	-	EXPRESSION TAG	UNP O76290
D	-5	VAL	-	EXPRESSION TAG	UNP O76290
D	-4	PRO	-	EXPRESSION TAG	UNP O76290
D	-3	ARG	-	EXPRESSION TAG	UNP O76290
D	-2	GLY	-	EXPRESSION TAG	UNP O76290
D	-1	SER	-	EXPRESSION TAG	UNP O76290
D	0	HIS	-	EXPRESSION TAG	UNP O76290

- Molecule 2 is NADP NICOTINAMIDE-ADENINE-DINUCLEOTIDEPHOSPHATE (three-letter code: NAP) (formula:  $C_{21}H_{28}N_7O_{17}P_3$ ).



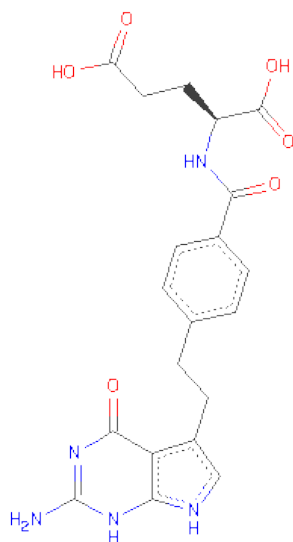
Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
2	A	1	Total	C	H	N	O	P	0	0
			66	21	18	7	17	3		
2	B	1	Total	C	H	N	O	P	0	0
			66	21	18	7	17	3		

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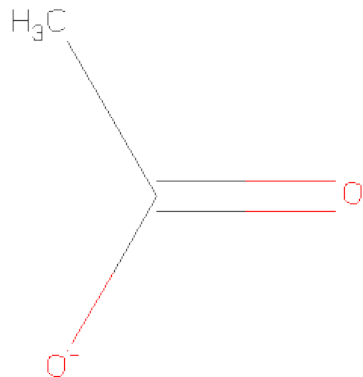
Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
2	C	1	Total	C	H	N	O	P	0	0
			66	21	18	7	17	3		
2	D	1	Total	C	H	N	O	P	0	0
			66	21	18	7	17	3		

- Molecule 3 is 2-{4-[2-(2-AMINO-4-OXO-4,7-DIHYDRO-3H-PYRROLO[2,3-D]PYRIMIDIN-5-YL)-ETHYL]-BENZOYLAMINO}-PENTANEDIOICACID (three-letter code: LYA) (formula: C<sub>20</sub>H<sub>21</sub>N<sub>5</sub>O<sub>6</sub>).



Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
3	A	1	Total	C	H	N	O		0	1
			62	26	19	6	11			
3	B	1	Total	C	H	N	O		0	1
			62	26	19	6	11			
3	C	1	Total	C	H	N	O		0	1
			62	26	19	6	11			
3	D	1	Total	C	H	N	O		0	1
			62	26	19	6	11			

- Molecule 4 is ACETATE ION (three-letter code: ACT) (formula: C<sub>2</sub>H<sub>3</sub>O<sub>2</sub>).



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

- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	344	Total	O	0	0
			344	344		
5	B	380	Total	O	0	0
			380	380		
5	C	333	Total	O	0	0
			333	333		
5	D	315	Total	O	0	0
			315	315		

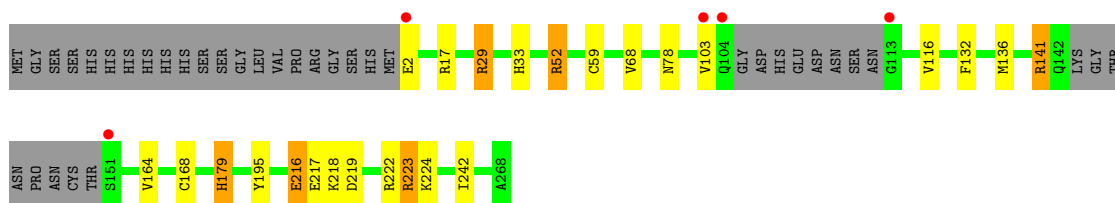


### 3 Residue-property plots

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.

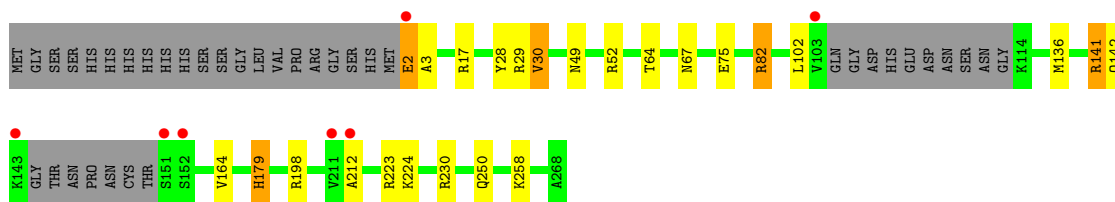
#### • Molecule 1: PTERIDINE REDUCTASE

Chain A:



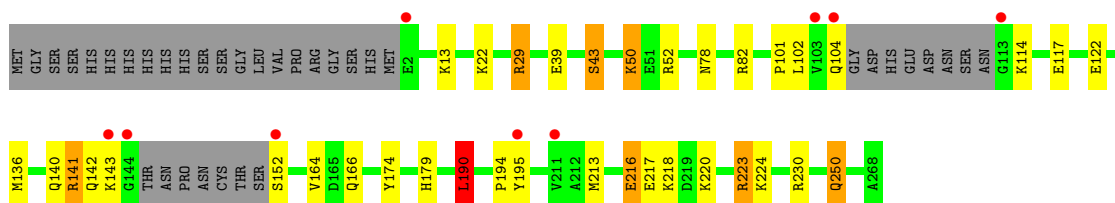
#### • Molecule 1: PTERIDINE REDUCTASE

Chain B:



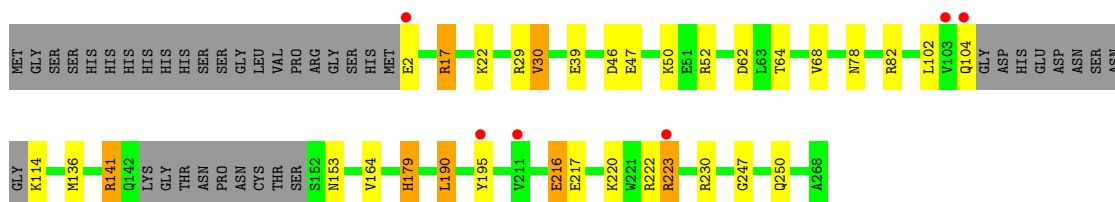
#### • Molecule 1: PTERIDINE REDUCTASE

Chain C:



#### • Molecule 1: PTERIDINE REDUCTASE

Chain D:



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	74.72Å 90.57Å 82.58Å 90.00° 115.61° 90.00°	Depositor
Resolution (Å)	20.00 – 1.10 19.99 – 1.10	Depositor EDS
% Data completeness (in resolution range)	94.7 (20.00-1.10) 93.1 (19.99-1.10)	Depositor EDS
$R_{merge}$	0.05	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	3.56 (at 1.10Å)	Xtriage
Refinement program	SHELX-97	Depositor
R, $R_{free}$	0.121 , 0.147 0.131 , (Not available)	Depositor DCC
$R_{free}$ test set	No test flags present.	DCC
Wilson B-factor (Å <sup>2</sup> )	8.2	Xtriage
Anisotropy	0.635	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.42 , 62.3	EDS
Estimated twinning fraction	0.017 for h,-k,-h-l	Xtriage
L-test for twinning	$\langle  L  \rangle = 0.48$ , $\langle L^2 \rangle = 0.31$	Xtriage
Outliers	2 of 378868 reflections (0.001%)	Xtriage
$F_o, F_c$ correlation	0.98	EDS
Total number of atoms	16553	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	15.0	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 20.67 % 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 8.2688e-03.*

<sup>1</sup>Intensities estimated from amplitudes.

## 5 Model quality ⓘ

### 5.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: NAP, LYA, ACT

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	0.67	0/1971	1.18	16/2675 (0.6%)
1	B	0.73	3/1958 (0.2%)	1.25	18/2656 (0.7%)
1	C	0.83	2/1966 (0.1%)	1.26	23/2664 (0.9%)
1	D	0.78	3/2002 (0.1%)	1.32	26/2718 (1.0%)
All	All	0.76	8/7897 (0.1%)	1.25	83/10713 (0.8%)

The worst 5 of 8 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	43[B]	SER	CA-CB	15.06	1.75	1.52
1	C	43[A]	SER	CA-CB	15.06	1.75	1.52
1	D	30[B]	VAL	CA-CB	8.51	1.72	1.54
1	D	30[A]	VAL	CA-CB	8.51	1.72	1.54
1	D	30[C]	VAL	CA-CB	8.51	1.72	1.54

The worst 5 of 83 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	230	ARG	CD-NE-CZ	19.22	150.51	123.60
1	C	141	ARG	NE-CZ-NH1	16.09	128.34	120.30
1	B	141	ARG	NE-CZ-NH2	-13.62	113.49	120.30
1	B	82	ARG	NE-CZ-NH1	12.88	126.74	120.30
1	C	141	ARG	CD-NE-CZ	12.74	141.43	123.60

There are no chirality outliers.

There are no planarity outliers.

## 5.2 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 hydrogens added by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, and the number in parentheses is this value normalized per 1000 atoms of the molecule in the chain. The Symm-Clashes column gives symmetry related clashes, in the same way as for the Clashes column.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1904	1766	0	15	0
1	B	1893	1761	0	18	0
1	C	1905	1751	0	22	0
1	D	1912	1773	0	25	0
2	A	48	18	0	0	0
2	B	48	18	0	0	0
2	C	48	18	0	0	0
2	D	48	18	0	0	0
3	A	43	19	0	1	0
3	B	43	19	0	0	0
3	C	43	19	0	0	0
3	D	43	19	0	1	0
4	B	4	0	0	0	0
5	A	344	0	0	6	0
5	B	380	0	0	11	0
5	C	333	0	0	11	0
5	D	315	0	0	16	0
All	All	9354	7199	0	77	0

Clashscore is defined as the number of clashes calculated for the entry per 1000 atoms (including hydrogens) of the entry. The overall clashscore for this entry is 5.

The worst 5 of 77 close contacts within the same asymmetric unit are listed below.

Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:B:212:ALA:HB2	5:B:2287:HOH:O	1.86	0.76
1:A:136[B]:MET:HG3	1:C:102:LEU:O	1.86	0.75
1:C:13:LYS:HE3	5:C:2005:HOH:O	1.91	0.70
1:D:220:LYS:O	1:D:223:ARG:HG3	1.92	0.69
1:D:216[B]:GLU:HG2	1:D:217:GLU:OE2	1.95	0.67

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	255/288 (88%)	246 (96%)	9 (4%)	0	100	100
1	B	253/288 (88%)	244 (96%)	9 (4%)	0	100	100
1	C	254/288 (88%)	245 (96%)	9 (4%)	0	100	100
1	D	258/288 (90%)	250 (97%)	8 (3%)	0	100	100
All	All	1020/1152 (88%)	985 (97%)	35 (3%)	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	207/231 (90%)	204 (99%)	3 (1%)	78	44
1	B	208/231 (90%)	205 (99%)	3 (1%)	78	44
1	C	207/231 (90%)	198 (96%)	9 (4%)	40	6
1	D	213/231 (92%)	208 (98%)	5 (2%)	63	21
All	All	835/924 (90%)	815 (98%)	20 (2%)	68	19

5 of 20 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	C	152	SER
1	C	166	GLN
1	D	22	LYS
1	C	104	GLN
1	C	142	GLN

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

### 5.3.3 RNA ⓘ

There are no RNA chains 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 carbohydrates in this entry.

## 5.6 Ligand geometry ⓘ

13 ligands 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	NAP	A	1269	-	52,52,52	0.90	2 (3%)	80,80,80	1.12	5 (6%)
3	LYA	A	1270[A]	-	9,11,33	0.91	0	11,13,46	1.59	3 (27%)
3	LYA	A	1270[B]	-	9,11,33	0.91	0	11,13,46	1.39	2 (18%)
2	NAP	B	1269	-	52,52,52	0.88	0	80,80,80	1.17	6 (7%)
3	LYA	B	1270[A]	-	9,11,33	0.88	0	11,13,46	1.13	1 (9%)
3	LYA	B	1270[B]	-	9,11,33	0.88	0	11,13,46	1.30	2 (18%)
4	ACT	B	1271	-	1,3,3	4.47	1 (100%)	0,3,3	0.00	-
2	NAP	C	1269	-	52,52,52	0.83	1 (1%)	80,80,80	1.06	3 (3%)
3	LYA	C	1270[A]	-	9,11,33	1.04	0	11,13,46	1.48	1 (9%)
3	LYA	C	1270[B]	-	9,11,33	0.97	0	11,13,46	2.42	7 (63%)
2	NAP	D	1269	-	52,52,52	0.84	0	80,80,80	1.09	7 (8%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
3	LYA	D	1270[A]	-	9,11,33	1.23	0	11,13,46	2.71	6 (54%)
3	LYA	D	1270[B]	-	9,11,33	0.97	0	11,13,46	2.26	5 (45%)

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	NAP	A	1269	-	-	0/35/67/67	0/3/5/5
3	LYA	A	1270[A]	-	-	0/11/12/22	0/0/0/3
3	LYA	A	1270[B]	-	-	0/11/12/22	0/0/0/3
2	NAP	B	1269	-	-	0/35/67/67	0/3/5/5
3	LYA	B	1270[A]	-	-	0/11/12/22	0/0/0/3
3	LYA	B	1270[B]	-	-	0/11/12/22	0/0/0/3
4	ACT	B	1271	-	-	0/0/0/0	0/0/0/0
2	NAP	C	1269	-	-	0/35/67/67	0/3/5/5
3	LYA	C	1270[A]	-	-	0/11/12/22	0/0/0/3
3	LYA	C	1270[B]	-	-	0/11/12/22	0/0/0/3
2	NAP	D	1269	-	-	0/35/67/67	0/3/5/5
3	LYA	D	1270[A]	-	-	0/11/12/22	0/0/0/3
3	LYA	D	1270[B]	-	-	0/11/12/22	0/0/0/3

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	B	1271	ACT	CH3-C	4.47	1.55	1.48
2	C	1269	NAP	C2N-N1N	3.20	1.39	1.35
2	A	1269	NAP	C2N-C3N	-2.13	1.35	1.38
2	A	1269	NAP	C2N-N1N	2.11	1.38	1.35

The worst 5 of 48 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	1269	NAP	C4B-O4B-C1B	-5.40	103.89	109.75
2	B	1269	NAP	C4B-O4B-C1B	-5.30	103.99	109.75
3	D	1270[A]	LYA	C29-C23-N22	5.30	124.22	110.51
2	A	1269	NAP	C4B-O4B-C1B	-4.80	104.54	109.75
3	D	1270[A]	LYA	C24-C23-N22	4.70	117.44	110.50

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

## 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, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	251/288 (87%)	-0.36	5 (1%) 62 65	6, 11, 27, 56	0
1	B	250/288 (86%)	-0.44	7 (2%) 50 53	6, 10, 24, 56	0
1	C	252/288 (87%)	-0.26	9 (3%) 41 44	6, 11, 28, 67	0
1	D	249/288 (86%)	-0.38	6 (2%) 56 58	6, 11, 26, 53	0
All	All	1002/1152 (86%)	-0.36	27 (2%) 52 54	6, 11, 27, 67	0

The worst 5 of 27 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	113	GLY	7.8
1	C	144	GLY	7.6
1	A	151	SER	7.0
1	C	143	LYS	6.8
1	A	113	GLY	6.6

### 6.2 Non-standard residues in protein, DNA, RNA chains ⓘ

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

### 6.3 Carbohydrates ⓘ

There are no carbohydrates 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. 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, 95<sup>th</sup> 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	RSR	LLDF	B-factors( $\text{\AA}^2$ )	Q<0.9
3	LYA	D	1270[A]	12/31	0.12	9.70	17,27,33,37	17
3	LYA	D	1270[B]	12/31	0.12	9.70	16,21,29,32	17
3	LYA	A	1270[A]	12/31	0.12	8.92	16,21,33,34	17
3	LYA	A	1270[B]	12/31	0.12	8.92	16,19,23,31	17
3	LYA	B	1270[B]	12/31	0.08	5.35	13,15,19,23	17
3	LYA	B	1270[A]	12/31	0.08	5.35	14,15,19,20	17
3	LYA	C	1270[B]	12/31	0.10	1.38	15,18,30,31	17
3	LYA	C	1270[A]	12/31	0.10	1.34	17,26,32,35	17
2	NAP	A	1269	48/48	0.04	-0.33	6,8,11,14	0
4	ACT	B	1271	4/4	0.04	-0.56	12,13,13,14	0
2	NAP	C	1269	48/48	0.04	-0.61	5,7,9,10	0
2	NAP	B	1269	48/48	0.03	-0.84	5,7,9,10	0
2	NAP	D	1269	48/48	0.03	-0.90	6,8,10,12	0

## 6.5 Other polymers ⓘ

There are no such residues in this entry.