



# Full wwPDB X-ray Structure Validation Report

Feb 27, 2014 – 08:38 PM GMT

PDB ID : 4ENW  
Title : Structure of the S234N variant of E. coli KatE  
Authors : Loewen, P.C.; Jha, V.  
Deposited on : 2012-04-13  
Resolution : 1.90 Å(reported)

This is a full wwPDB validation 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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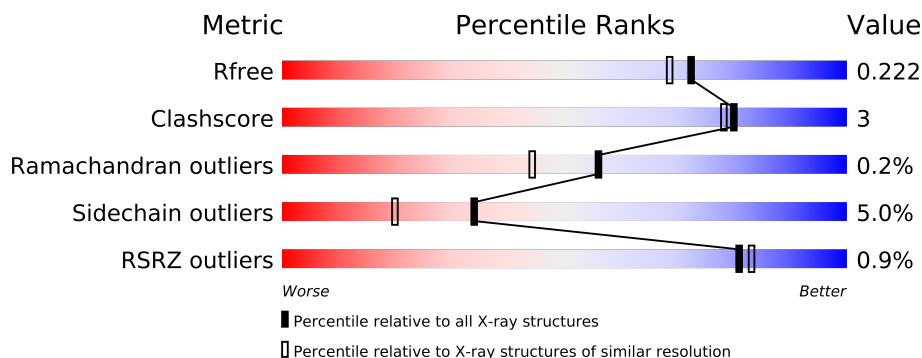
The following versions of software and data (see [references](#)) were used in the production of this report:

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 1.90 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))
$R_{free}$	66092	3684 (1.90-1.90)
Clashscore	79885	4465 (1.90-1.90)
Ramachandran outliers	78287	4413 (1.90-1.90)
Sidechain outliers	78261	4414 (1.90-1.90)
RSRZ outliers	66119	3686 (1.90-1.90)

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	753	
1	B	753	
1	C	753	
1	D	753	

## 2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 25927 atoms, of which 0 are hydrogen 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.

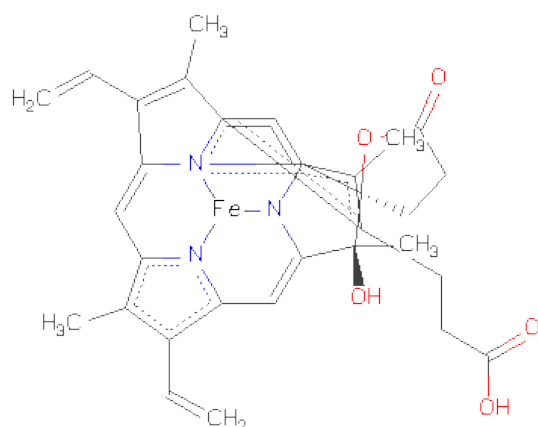
- Molecule 1 is a protein called Catalase HP11.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	726	Total	C	N	O	S	0	1	0
			5747	3649	1007	1079	12			
1	B	726	Total	C	N	O	S	0	1	0
			5747	3649	1007	1079	12			
1	C	726	Total	C	N	O	S	0	2	0
			5752	3654	1007	1079	12			
1	D	726	Total	C	N	O	S	0	2	0
			5753	3653	1008	1080	12			

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	234	ASN	SER	ENGINEERED MUTATION	UNP P21179
B	234	ASN	SER	ENGINEERED MUTATION	UNP P21179
C	234	ASN	SER	ENGINEERED MUTATION	UNP P21179
D	234	ASN	SER	ENGINEERED MUTATION	UNP P21179

- Molecule 2 is CIS-HEME D HYDROXYCHLORIN GAMMA-SPIROLACTONE (three-letter code: HDD) (formula: C<sub>34</sub>H<sub>32</sub>FeN<sub>4</sub>O<sub>5</sub>).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	Fe	N	O	0	0
			44	34	1	4	5		
2	B	1	Total	C	Fe	N	O	0	0
			44	34	1	4	5		
2	C	1	Total	C	Fe	N	O	0	0
			44	34	1	4	5		
2	D	1	Total	C	Fe	N	O	0	0
			44	34	1	4	5		

- Molecule 3 is water.

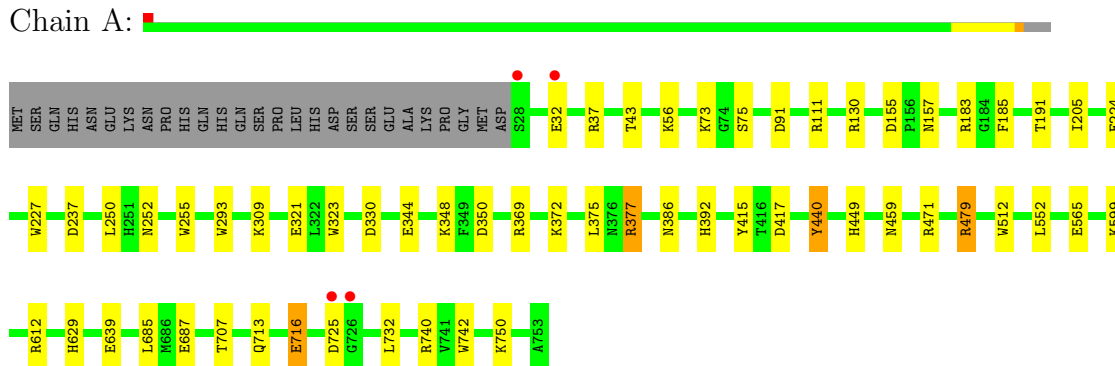
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	730	Total	O	0	0
			730	730		
3	B	629	Total	O	0	0
			629	629		
3	C	649	Total	O	0	0
			649	649		
3	D	744	Total	O	0	0
			744	744		

### 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.

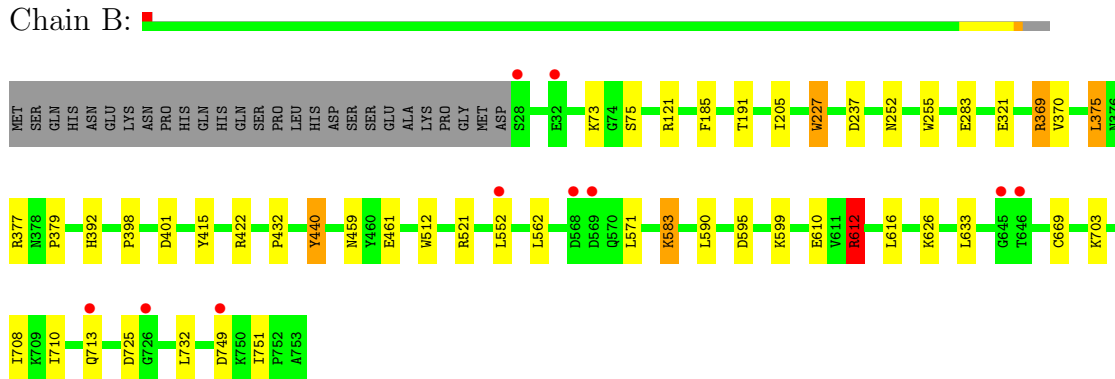
#### • Molecule 1: Catalase HP1I

Chain A:



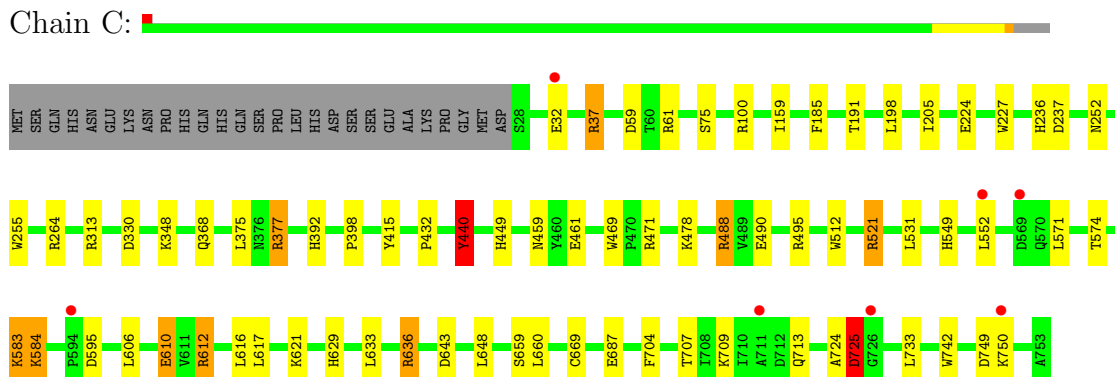
#### • Molecule 1: Catalase HP1I

Chain B:



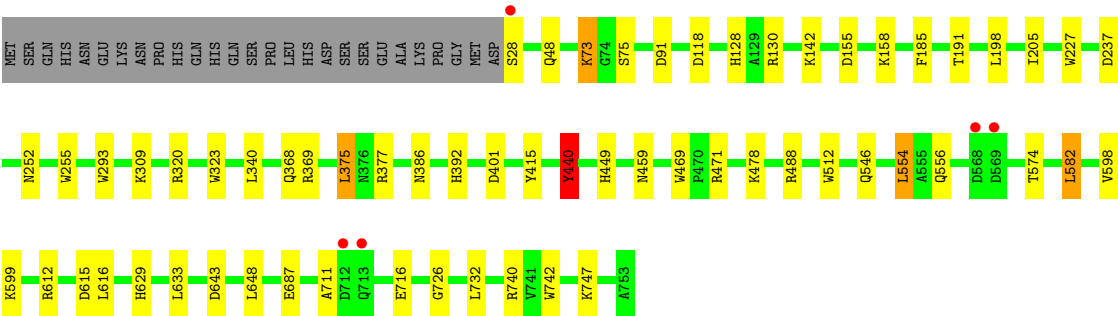
#### • Molecule 1: Catalase HP1I

Chain C:



● Molecule 1: Catalase HP1I

Chain D: 



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	93.39Å 132.57Å 122.57Å 90.00° 109.23° 90.00°	Depositor
Resolution (Å)	35.13 – 1.90 35.13 – 1.90	Depositor EDS
% Data completeness (in resolution range)	93.4 (35.13-1.90) 93.4 (35.13-1.90)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	0.09	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	6.66 (at 1.89Å)	Xtriage
Refinement program	REFMAC 5.6.0117	Depositor
R, $R_{free}$	0.175 , 0.221 0.176 , 0.222	Depositor DCC
$R_{free}$ test set	10355 reflections (5.28%)	DCC
Wilson B-factor (Å <sup>2</sup> )	11.0	Xtriage
Anisotropy	0.187	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.37 , 31.6	EDS
Estimated twinning fraction	No twinning to report.	Xtriage
L-test for twinning	$\langle  L  \rangle = 0.48$ , $\langle L^2 \rangle = 0.31$	Xtriage
Outliers	0 of 206534 reflections	Xtriage
$F_o, F_c$ correlation	0.94	EDS
Total number of atoms	25927	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	15.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.95% of the height of the origin peak. No significant pseudotranslation is detected.*

<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: HDD

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# $ Z  > 5$	RMSZ	# $ Z  > 5$
1	A	1.00	8/5907 (0.1%)	0.97	12/8031 (0.1%)
1	B	0.97	4/5907 (0.1%)	0.96	7/8031 (0.1%)
1	C	0.97	5/5915 (0.1%)	0.96	15/8042 (0.2%)
1	D	1.02	8/5916 (0.1%)	0.98	14/8043 (0.2%)
All	All	0.99	25/23645 (0.1%)	0.97	48/32147 (0.1%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
1	C	0	2

All (25) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	440	TYR	CE1-CZ	7.87	1.48	1.38
1	B	255	TRP	CD2-CE2	7.45	1.50	1.41
1	A	440	TYR	CE1-CZ	7.22	1.48	1.38
1	D	293	TRP	CD2-CE2	7.02	1.49	1.41
1	A	321	GLU	CD-OE1	6.69	1.33	1.25
1	D	323	TRP	CD2-CE2	6.51	1.49	1.41
1	C	469	TRP	CD2-CE2	6.44	1.49	1.41
1	A	742	TRP	CD2-CE2	6.32	1.49	1.41
1	A	323	TRP	CD2-CE2	6.18	1.48	1.41
1	A	344	GLU	CD-OE2	5.91	1.32	1.25
1	A	255	TRP	CD2-CE2	5.89	1.48	1.41
1	D	440	TYR	CE1-CZ	5.80	1.46	1.38
1	C	742	TRP	CD2-CE2	5.79	1.48	1.41
1	B	512	TRP	CD2-CE2	5.79	1.48	1.41

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	227	TRP	CD2-CE2	5.64	1.48	1.41
1	D	742	TRP	CD2-CE2	5.44	1.47	1.41
1	C	512	TRP	CD2-CE2	5.40	1.47	1.41
1	C	255	TRP	CD2-CE2	5.39	1.47	1.41
1	D	469	TRP	CD2-CE2	5.33	1.47	1.41
1	D	512	TRP	CD2-CE2	5.28	1.47	1.41
1	D	128	HIS	CB-CG	5.28	1.59	1.50
1	A	512	TRP	CD2-CE2	5.25	1.47	1.41
1	D	255	TRP	CD2-CE2	5.22	1.47	1.41
1	C	440	TYR	CE1-CZ	5.22	1.45	1.38
1	A	293	TRP	CD2-CE2	5.15	1.47	1.41

All (48) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	478	LYS	CD-CE-NZ	10.06	134.84	111.70
1	C	471	ARG	NE-CZ-NH2	-9.57	115.51	120.30
1	B	121	ARG	NE-CZ-NH1	8.62	124.61	120.30
1	B	422	ARG	NE-CZ-NH1	8.05	124.33	120.30
1	B	401	ASP	CB-CG-OD2	8.00	125.50	118.30
1	C	636	ARG	NE-CZ-NH1	7.39	124.00	120.30
1	B	401	ASP	CB-CG-OD1	-7.27	111.76	118.30
1	B	375	LEU	CB-CG-CD1	7.06	123.00	111.00
1	A	740	ARG	NE-CZ-NH1	6.68	123.64	120.30
1	A	377	ARG	NE-CZ-NH2	-6.66	116.97	120.30
1	A	130	ARG	NE-CZ-NH2	-6.61	117.00	120.30
1	B	590	LEU	CB-CG-CD2	-6.57	99.83	111.00
1	C	636	ARG	NE-CZ-NH2	-6.52	117.04	120.30
1	A	479	ARG	NE-CZ-NH1	6.43	123.52	120.30
1	A	350	ASP	CB-CG-OD1	-6.42	112.52	118.30
1	D	582	LEU	CB-CG-CD1	6.31	121.73	111.00
1	A	471	ARG	NE-CZ-NH1	-6.29	117.15	120.30
1	D	740	ARG	NE-CZ-NH1	6.17	123.38	120.30
1	D	401	ASP	CB-CG-OD2	6.07	123.76	118.30
1	C	377	ARG	NE-CZ-NH1	-5.99	117.30	120.30
1	D	375	LEU	CB-CG-CD2	5.97	121.14	111.00
1	A	372	LYS	CD-CE-NZ	-5.95	98.02	111.70
1	A	155	ASP	CB-CG-OD2	5.88	123.60	118.30
1	D	155	ASP	CB-CG-OD2	5.87	123.58	118.30
1	A	250	LEU	CB-CG-CD1	-5.80	101.14	111.00
1	C	313	ARG	NE-CZ-NH1	5.77	123.19	120.30
1	B	121	ARG	NE-CZ-NH2	-5.73	117.43	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	478	LYS	CB-CG-CD	5.72	126.47	111.60
1	C	348	LYS	CD-CE-NZ	-5.72	98.55	111.70
1	C	495	ARG	NE-CZ-NH1	-5.63	117.48	120.30
1	D	554	LEU	CB-CG-CD2	5.60	120.53	111.00
1	A	183	ARG	NE-CZ-NH1	5.56	123.08	120.30
1	A	685	LEU	CB-CG-CD1	-5.54	101.58	111.00
1	C	264	ARG	NE-CZ-NH1	5.48	123.04	120.30
1	C	313	ARG	NE-CZ-NH2	-5.47	117.56	120.30
1	C	595	ASP	CB-CG-OD2	5.47	123.22	118.30
1	D	471	ARG	NE-CZ-NH2	-5.47	117.57	120.30
1	A	111	ARG	NE-CZ-NH2	-5.37	117.61	120.30
1	C	100	ARG	NE-CZ-NH1	5.37	122.99	120.30
1	C	725	ASP	N-CA-C	5.37	125.51	111.00
1	D	401	ASP	CB-CG-OD1	-5.26	113.57	118.30
1	D	130	ARG	NE-CZ-NH2	-5.19	117.70	120.30
1	D	740	ARG	NE-CZ-NH2	-5.18	117.71	120.30
1	C	552[A]	LEU	CB-CG-CD2	5.15	119.75	111.00
1	C	552[B]	LEU	CB-CG-CD2	5.15	119.75	111.00
1	D	615	ASP	CB-CG-OD2	5.14	122.93	118.30
1	D	643	ASP	CB-CG-OD1	5.11	122.90	118.30
1	C	471	ARG	NE-CZ-NH1	5.01	122.81	120.30

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	C	724	ALA	Peptide
1	C	725	ASP	Peptide

## 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	5747	0	0	20	0
1	B	5747	0	0	12	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	C	5752	0	0	29	1
1	D	5753	0	0	24	0
2	A	44	0	0	0	0
2	B	44	0	0	0	0
2	C	44	0	0	0	0
2	D	44	0	0	0	0
3	A	730	0	0	7	0
3	B	629	0	0	4	1
3	C	649	0	0	10	0
3	D	744	0	0	13	0
All	All	25927	0	0	78	1

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 3.

All (78) close contacts within the same asymmetric unit are listed below.

Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:A:392:HIS:ND1	1:A:415:TYR:CB	1.71	1.54
1:D:392:HIS:ND1	1:D:415:TYR:CB	1.69	1.53
1:B:392:HIS:ND1	1:B:415:TYR:CB	1.72	1.49
1:C:392:HIS:ND1	1:C:415:TYR:CB	1.71	1.49
1:D:449[B]:HIS:CE1	3:D:1637:HOH:O	1.76	1.37
1:D:449[B]:HIS:NE2	3:D:1637:HOH:O	1.66	1.21
1:C:521:ARG:NH1	1:C:521:ARG:CG	2.20	1.00
1:A:449[B]:HIS:CG	1:C:449[B]:HIS:CG	2.34	0.95
3:B:1463:HOH:O	1:D:73:LYS:CD	2.16	0.92
1:A:716:GLU:CG	3:A:1302:HOH:O	2.18	0.90
1:A:449[B]:HIS:CG	1:C:449[B]:HIS:ND1	2.04	0.86
1:C:440:TYR:CD1	3:C:1353:HOH:O	2.31	0.81
1:A:449[B]:HIS:ND1	1:C:449[B]:HIS:CG	2.09	0.78
1:D:392:HIS:CE1	1:D:415:TYR:CB	2.68	0.77
1:C:392:HIS:CE1	1:C:415:TYR:CB	2.68	0.76
1:A:392:HIS:CE1	1:A:415:TYR:CB	2.69	0.76
1:B:392:HIS:CE1	1:B:415:TYR:CB	2.71	0.72
1:D:368:GLN:OE1	3:D:1555:HOH:O	2.07	0.71
1:A:392:HIS:ND1	1:A:415:TYR:CG	2.58	0.70
1:C:549:HIS:NE2	3:C:1506:HOH:O	2.23	0.70
1:A:157:ASN:ND2	3:A:1388:HOH:O	2.25	0.69
1:C:584:LYS:NZ	3:C:1286:HOH:O	2.25	0.69
1:B:612:ARG:NH1	1:B:669:CYS:SG	2.68	0.67
1:A:392:HIS:CG	1:A:415:TYR:CB	2.74	0.64
1:D:711:ALA:N	3:D:1513:HOH:O	2.32	0.62

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Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:B:369:ARG:CG	3:B:1296:HOH:O	2.48	0.62
1:C:37:ARG:NH1	3:C:1345:HOH:O	2.33	0.61
1:C:392:HIS:ND1	1:C:415:TYR:CG	2.64	0.61
1:C:488:ARG:NH1	3:C:1429:HOH:O	2.36	0.58
1:C:612:ARG:NH1	1:C:612:ARG:CG	2.67	0.56
1:D:392:HIS:ND1	1:D:415:TYR:CG	2.66	0.56
1:A:639:GLU:CG	3:A:1479:HOH:O	2.53	0.56
1:A:479:ARG:NH2	3:A:1523:HOH:O	2.39	0.56
1:D:392:HIS:CG	1:D:415:TYR:CB	2.75	0.54
1:D:556:GLN:NE2	3:D:1572:HOH:O	2.39	0.54
1:D:599:LYS:NZ	3:D:1407:HOH:O	2.40	0.53
1:B:392:HIS:CG	1:B:415:TYR:CB	2.79	0.53
1:D:629:HIS:CD2	3:D:1259:HOH:O	2.62	0.53
1:D:377:ARG:NH1	3:D:1240:HOH:O	2.42	0.53
1:C:392:HIS:CG	1:C:415:TYR:CB	2.78	0.53
1:D:158:LYS:NZ	3:D:1607:HOH:O	2.42	0.52
1:B:708:ILE:CD1	1:B:710:ILE:CD1	2.87	0.52
1:B:583:LYS:NZ	1:B:583:LYS:N	2.59	0.51
1:C:368:GLN:NE2	3:C:1326:HOH:O	2.43	0.51
1:A:377:ARG:NH1	3:A:1096:HOH:O	2.44	0.50
1:C:490:GLU:OE1	1:D:488:ARG:NH2	2.45	0.50
1:B:392:HIS:ND1	1:B:415:TYR:CA	2.68	0.49
1:D:309:LYS:NZ	3:D:1225:HOH:O	2.45	0.49
1:A:91:ASP:OD1	1:C:461:GLU:OE1	2.30	0.49
1:C:330:ASP:OD1	1:C:629:HIS:CE1	2.66	0.49
1:C:749:ASP:N	3:C:1437:HOH:O	2.48	0.47
1:D:320:ARG:NH2	3:D:1470:HOH:O	2.47	0.47
1:C:612:ARG:NH2	1:C:669:CYS:SG	2.88	0.47
1:C:704:PHE:O	1:C:707:THR:CG2	2.63	0.46
1:B:392:HIS:ND1	1:B:415:TYR:CG	2.69	0.46
1:C:612:ARG:CB	1:C:612:ARG:NH1	2.79	0.46
1:C:629:HIS:CD2	3:C:1201:HOH:O	2.68	0.45
1:A:599:LYS:NZ	3:A:1386:HOH:O	2.50	0.45
1:C:574:THR:N	3:C:1247:HOH:O	2.50	0.44
1:C:440:TYR:OH	3:C:1135:HOH:O	2.20	0.43
1:B:73:LYS:NZ	3:B:1232:HOH:O	2.51	0.43
1:D:386:ASN:C	1:D:386:ASN:OD1	2.57	0.43
1:D:440:TYR:CD2	1:D:440:TYR:C	2.92	0.43
1:A:386:ASN:OD1	1:A:386:ASN:C	2.57	0.42
1:C:659:SER:OG	1:C:687:GLU:OE1	2.38	0.42
1:A:224:GLU:OE1	3:A:1024:HOH:O	2.22	0.42
1:D:28:SER:N	3:D:1638:HOH:O	2.53	0.42

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Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:A:330:ASP:OD1	1:A:629:HIS:NE2	2.53	0.42
1:C:583:LYS:O	1:C:584:LYS:CB	2.68	0.41
1:B:461:GLU:OE1	1:D:91:ASP:OD1	2.38	0.41
1:C:610:GLU:OE1	1:C:643:ASP:CA	2.69	0.41
1:A:43:THR:OG1	1:A:56:LYS:NZ	2.54	0.41
1:B:599:LYS:NZ	3:B:1502:HOH:O	2.54	0.41
1:A:417:ASP:OD2	1:D:118:ASP:OD1	2.38	0.41
1:C:224:GLU:OE2	1:C:236:HIS:ND1	2.53	0.41
1:D:726:GLY:O	3:D:1500:HOH:O	2.22	0.41
1:D:309:LYS:CE	1:D:687:GLU:OE2	2.69	0.41
1:A:309:LYS:NZ	1:A:687:GLU:OE2	2.54	0.40

All (1) 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	Distance(Å)	Clash(Å)
1:C:59:ASP:CB	3:B:1526:HOH:O[2.545]	2.00	0.20

## 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	725/753 (96%)	706 (97%)	18 (2%)	1 (0%)	59 48
1	B	725/753 (96%)	702 (97%)	20 (3%)	3 (0%)	43 29
1	C	726/753 (96%)	710 (98%)	15 (2%)	1 (0%)	59 48
1	D	726/753 (96%)	704 (97%)	21 (3%)	1 (0%)	59 48
All	All	2902/3012 (96%)	2822 (97%)	74 (2%)	6 (0%)	56 44

All (6) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	725	ASP
1	B	612	ARG
1	D	75	SER

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Mol	Chain	Res	Type
1	A	75	SER
1	B	75	SER
1	C	75	SER

### 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	612/636 (96%)	589 (96%)	23 (4%)	44	31
1	B	612/636 (96%)	579 (95%)	33 (5%)	31	17
1	C	613/636 (96%)	574 (94%)	39 (6%)	25	12
1	D	613/636 (96%)	585 (95%)	28 (5%)	37	23
All	All	2450/2544 (96%)	2327 (95%)	123 (5%)	34	20

All (123) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	32	GLU
1	A	37	ARG
1	A	73	LYS
1	A	185	PHE
1	A	191	THR
1	A	205	ILE
1	A	227	TRP
1	A	237	ASP
1	A	252	ASN
1	A	348	LYS
1	A	369	ARG
1	A	375	LEU
1	A	440	TYR
1	A	459	ASN
1	A	552	LEU
1	A	565	GLU
1	A	612	ARG
1	A	707	THR
1	A	713	GLN

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Mol	Chain	Res	Type
1	A	716	GLU
1	A	725	ASP
1	A	732	LEU
1	A	750	LYS
1	B	185	PHE
1	B	191	THR
1	B	205	ILE
1	B	227	TRP
1	B	237	ASP
1	B	252	ASN
1	B	283	GLU
1	B	321	GLU
1	B	369	ARG
1	B	370	VAL
1	B	375	LEU
1	B	377	ARG
1	B	379	PRO
1	B	398	PRO
1	B	432	PRO
1	B	440	TYR
1	B	459	ASN
1	B	521	ARG
1	B	552	LEU
1	B	562	LEU
1	B	571	LEU
1	B	583	LYS
1	B	595	ASP
1	B	610	GLU
1	B	612	ARG
1	B	616	LEU
1	B	626	LYS
1	B	633	LEU
1	B	703	LYS
1	B	713	GLN
1	B	732	LEU
1	B	749	ASP
1	B	751	ILE
1	C	32	GLU
1	C	37	ARG
1	C	61	ARG
1	C	159	ILE
1	C	185	PHE

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Mol	Chain	Res	Type
1	C	191	THR
1	C	198	LEU
1	C	205	ILE
1	C	227	TRP
1	C	237	ASP
1	C	252	ASN
1	C	375	LEU
1	C	377	ARG
1	C	398	PRO
1	C	432	PRO
1	C	440	TYR
1	C	459	ASN
1	C	478	LYS
1	C	488	ARG
1	C	521	ARG
1	C	531	LEU
1	C	571	LEU
1	C	583	LYS
1	C	584	LYS
1	C	606	LEU
1	C	610	GLU
1	C	612	ARG
1	C	616	LEU
1	C	617	LEU
1	C	621	LYS
1	C	633	LEU
1	C	636	ARG
1	C	648	LEU
1	C	660	LEU
1	C	709	LYS
1	C	713	GLN
1	C	725	ASP
1	C	733	LEU
1	C	750	LYS
1	D	48	GLN
1	D	73	LYS
1	D	142	LYS
1	D	185	PHE
1	D	191	THR
1	D	198	LEU
1	D	205	ILE
1	D	227	TRP

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Mol	Chain	Res	Type
1	D	237	ASP
1	D	252	ASN
1	D	340	LEU
1	D	369	ARG
1	D	375	LEU
1	D	440	TYR
1	D	459	ASN
1	D	546[A]	GLN
1	D	546[B]	GLN
1	D	554	LEU
1	D	574	THR
1	D	582	LEU
1	D	598	VAL
1	D	612	ARG
1	D	616	LEU
1	D	633	LEU
1	D	648	LEU
1	D	716	GLU
1	D	732	LEU
1	D	747	LYS

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 ⓘ

4 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	HDD	A	801	1,3	52,52,52	2.09	16 (30%)	70,89,89	3.55	28 (40%)
2	HDD	B	801	1,3	52,52,52	2.50	20 (38%)	70,89,89	3.74	34 (48%)
2	HDD	C	801	1	52,52,52	2.31	17 (32%)	70,89,89	3.85	32 (45%)
2	HDD	D	801	1,3	52,52,52	2.27	18 (34%)	70,89,89	3.29	27 (38%)

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	HDD	A	801	1,3	-	0/5/89/89	0/1/9/9
2	HDD	B	801	1,3	-	0/5/89/89	0/1/9/9
2	HDD	C	801	1	-	0/5/89/89	0/1/9/9
2	HDD	D	801	1,3	-	0/5/89/89	0/1/9/9

All (71) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	801	HDD	C4A-C3A	7.63	1.49	1.40
2	A	801	HDD	C4A-C3A	6.80	1.48	1.40
2	D	801	HDD	C4B-C3B	6.49	1.49	1.41
2	C	801	HDD	C4A-C3A	6.09	1.47	1.40
2	C	801	HDD	C1C-C2C	5.88	1.47	1.40
2	D	801	HDD	C1C-C2C	5.36	1.46	1.40
2	B	801	HDD	C1C-C2C	5.30	1.46	1.40
2	D	801	HDD	C4A-C3A	5.15	1.46	1.40
2	A	801	HDD	O1D-CGD	4.99	1.44	1.35
2	C	801	HDD	C3C-C4C	4.73	1.47	1.40
2	B	801	HDD	C3C-C4C	4.71	1.47	1.40
2	C	801	HDD	C3C-C2C	4.43	1.49	1.41
2	B	801	HDD	FE-NB	4.38	2.11	1.92
2	B	801	HDD	O1D-C3D	4.29	1.54	1.46
2	D	801	HDD	FE-NB	4.27	2.10	1.92

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	801	HDD	C4B-CHC	4.09	1.51	1.38
2	A	801	HDD	FE-NB	3.98	2.09	1.92
2	C	801	HDD	C4A-CHB	3.98	1.50	1.39
2	A	801	HDD	C1C-C2C	3.96	1.45	1.40
2	C	801	HDD	FE-NB	3.94	2.09	1.92
2	D	801	HDD	FE-NC	3.73	2.08	1.92
2	B	801	HDD	FE-NC	3.67	2.08	1.92
2	C	801	HDD	C3C-CAC	-3.66	1.45	1.49
2	C	801	HDD	C1A-C2A	3.59	1.49	1.43
2	D	801	HDD	C4C-CHD	3.54	1.49	1.39
2	A	801	HDD	C3C-C4C	3.50	1.45	1.40
2	B	801	HDD	FE-NA	3.50	2.07	1.92
2	D	801	HDD	FE-NA	3.49	2.07	1.92
2	B	801	HDD	C2A-C3A	3.49	1.48	1.37
2	C	801	HDD	C4B-C3B	3.45	1.45	1.41
2	A	801	HDD	FE-NC	3.43	2.07	1.92
2	D	801	HDD	O1D-CGD	3.42	1.41	1.35
2	B	801	HDD	O1D-CGD	3.42	1.41	1.35
2	B	801	HDD	C4B-C3B	3.39	1.45	1.41
2	B	801	HDD	C1B-NB	-3.32	1.32	1.37
2	B	801	HDD	C3C-CAC	-3.28	1.46	1.49
2	C	801	HDD	FE-NC	3.26	2.06	1.92
2	C	801	HDD	FE-NA	3.18	2.06	1.92
2	B	801	HDD	C4A-CHB	3.16	1.48	1.39
2	C	801	HDD	C4B-CHC	3.04	1.47	1.38
2	D	801	HDD	C2A-C3A	3.03	1.46	1.37
2	A	801	HDD	FE-NA	3.01	2.05	1.92
2	D	801	HDD	C1C-CHC	2.99	1.48	1.39
2	D	801	HDD	C3C-C4C	2.93	1.44	1.40
2	D	801	HDD	C1A-CHA	2.88	1.47	1.39
2	A	801	HDD	C1B-CHB	2.84	1.47	1.38
2	D	801	HDD	C1B-CHB	2.84	1.47	1.38
2	D	801	HDD	C4B-NB	-2.83	1.33	1.37
2	A	801	HDD	C4C-CHD	2.81	1.47	1.39
2	C	801	HDD	C1B-CHB	2.80	1.47	1.38
2	C	801	HDD	O1D-CGD	2.74	1.40	1.35
2	D	801	HDD	OND-C2D	2.70	1.48	1.42
2	D	801	HDD	C4B-CHC	2.66	1.46	1.38
2	A	801	HDD	C1A-C2A	2.64	1.48	1.43
2	B	801	HDD	C4B-NB	-2.63	1.33	1.37
2	C	801	HDD	C2A-C3A	2.62	1.45	1.37
2	B	801	HDD	C1A-C2A	2.61	1.48	1.43

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	801	HDD	C4C-CHD	2.59	1.47	1.39
2	B	801	HDD	C1C-CHC	2.57	1.46	1.39
2	A	801	HDD	C1C-CHC	2.56	1.46	1.39
2	A	801	HDD	C1A-CHA	2.54	1.46	1.39
2	D	801	HDD	C4A-CHB	2.54	1.46	1.39
2	C	801	HDD	C1C-CHC	2.53	1.46	1.39
2	D	801	HDD	C3B-C2B	2.44	1.45	1.41
2	A	801	HDD	C4B-CHC	2.42	1.45	1.38
2	A	801	HDD	OND-C2D	2.42	1.47	1.42
2	A	801	HDD	C2A-C3A	2.28	1.44	1.37
2	A	801	HDD	C4B-C3B	2.25	1.44	1.41
2	C	801	HDD	C1A-CHA	2.13	1.45	1.39
2	B	801	HDD	C3C-C2C	2.09	1.45	1.41
2	B	801	HDD	C1A-CHA	2.02	1.45	1.39

All (121) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	801	HDD	C3C-C2C-C1C	-15.43	97.97	107.00
2	A	801	HDD	C1B-C2B-C3B	-11.35	99.52	107.07
2	D	801	HDD	C1B-C2B-C3B	-11.26	99.58	107.07
2	B	801	HDD	C3C-C2C-C1C	-11.22	100.43	107.00
2	B	801	HDD	C1B-C2B-C3B	-11.07	99.71	107.07
2	D	801	HDD	C2B-C1B-NB	11.00	117.72	109.41
2	C	801	HDD	C1B-C2B-C3B	-10.98	99.76	107.07
2	A	801	HDD	C3C-C2C-C1C	-10.55	100.82	107.00
2	C	801	HDD	C2C-C1C-NC	10.04	116.99	109.41
2	D	801	HDD	C3C-C2C-C1C	-9.95	101.17	107.00
2	A	801	HDD	C2B-C1B-NB	9.77	116.79	109.41
2	B	801	HDD	C2B-C1B-NB	9.42	116.53	109.41
2	A	801	HDD	O1D-C3D-CAD	-9.08	99.15	105.29
2	B	801	HDD	C2C-C1C-NC	8.90	116.13	109.41
2	C	801	HDD	C4D-ND-C1D	-8.79	101.99	107.94
2	C	801	HDD	C2B-C1B-NB	7.94	115.41	109.41
2	B	801	HDD	O1D-CGD-O2D	7.85	128.55	120.81
2	B	801	HDD	C4D-ND-C1D	-7.45	102.90	107.94
2	A	801	HDD	O1D-CGD-O2D	7.24	127.95	120.81
2	C	801	HDD	C3D-C4D-ND	6.89	117.46	105.75
2	A	801	HDD	C2C-C1C-NC	6.41	114.25	109.41
2	A	801	HDD	OND-C2D-CMD	-6.30	98.63	109.57
2	D	801	HDD	C2C-C1C-NC	6.25	114.13	109.41
2	B	801	HDD	O1D-C3D-CAD	-6.20	101.10	105.29

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	801	HDD	C3D-C4D-ND	6.12	116.16	105.75
2	D	801	HDD	C4D-ND-C1D	-6.06	103.83	107.94
2	C	801	HDD	C2D-C1D-ND	6.05	116.31	105.53
2	B	801	HDD	C3D-C4D-ND	6.04	116.02	105.75
2	A	801	HDD	C4D-ND-C1D	-6.01	103.87	107.94
2	B	801	HDD	CAD-C3D-C2D	-5.93	110.42	116.32
2	D	801	HDD	C4A-C3A-C2A	-5.86	102.92	107.00
2	D	801	HDD	C3D-C4D-ND	5.77	115.56	105.75
2	B	801	HDD	C2D-C1D-ND	5.72	115.72	105.53
2	C	801	HDD	C3C-CAC-CBC	-5.69	114.16	125.95
2	B	801	HDD	C3A-C4A-NA	5.67	113.69	109.41
2	C	801	HDD	C3B-CAB-CBB	-5.63	114.29	125.95
2	D	801	HDD	C2D-C1D-ND	5.39	115.13	105.53
2	D	801	HDD	CAD-C3D-C2D	-5.38	110.97	116.32
2	B	801	HDD	O1D-CGD-CBD	-5.36	103.86	110.21
2	B	801	HDD	C4A-C3A-C2A	-5.33	103.29	107.00
2	C	801	HDD	C3A-C4A-NA	5.17	113.32	109.41
2	A	801	HDD	O1D-CGD-CBD	-5.05	104.23	110.21
2	C	801	HDD	OND-C2D-CMD	-4.92	101.02	109.57
2	A	801	HDD	C2D-C1D-ND	4.87	114.21	105.53
2	D	801	HDD	CMB-C2B-C3B	4.75	132.46	124.97
2	A	801	HDD	C3C-CAC-CBC	-4.73	116.16	125.95
2	B	801	HDD	OND-C2D-CMD	-4.70	101.41	109.57
2	D	801	HDD	C3A-C4A-NA	4.65	112.92	109.41
2	C	801	HDD	O1D-C3D-CAD	-4.59	102.18	105.29
2	A	801	HDD	CMB-C2B-C3B	4.50	132.05	124.97
2	C	801	HDD	O1D-CGD-O2D	4.49	125.23	120.81
2	C	801	HDD	C4A-C3A-C2A	-4.28	104.02	107.00
2	A	801	HDD	C3A-C4A-NA	4.02	112.45	109.41
2	B	801	HDD	CMC-C2C-C3C	3.94	131.17	124.97
2	D	801	HDD	O1D-CGD-O2D	3.88	124.64	120.81
2	D	801	HDD	OND-C2D-CMD	-3.80	102.98	109.57
2	B	801	HDD	C1A-C2A-C3A	-3.78	103.00	106.92
2	A	801	HDD	C3B-CAB-CBB	-3.78	118.13	125.95
2	C	801	HDD	CMC-C2C-C3C	3.67	130.75	124.97
2	B	801	HDD	CAA-CBA-CGA	-3.47	102.33	113.47
2	A	801	HDD	C4C-CHD-C1D	-3.46	122.85	130.06
2	D	801	HDD	CAA-CBA-CGA	-3.40	102.53	113.47
2	A	801	HDD	C4A-C3A-C2A	-3.37	104.65	107.00
2	C	801	HDD	CMA-C3A-C2A	3.32	131.19	124.94
2	A	801	HDD	CMC-C2C-C1C	3.31	133.72	128.62
2	A	801	HDD	C1A-C2A-C3A	-3.30	103.50	106.92

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	801	HDD	CBA-CAA-C2A	-3.27	106.93	112.69
2	C	801	HDD	CAA-CBA-CGA	-3.26	103.00	113.47
2	D	801	HDD	C4C-CHD-C1D	-3.20	123.39	130.06
2	D	801	HDD	O1D-C3D-C2D	3.20	115.49	109.46
2	C	801	HDD	C3A-C4A-CHB	-3.14	120.05	126.00
2	B	801	HDD	C2A-C1A-NA	3.07	113.99	109.73
2	B	801	HDD	CMB-C2B-C3B	3.05	129.77	124.97
2	C	801	HDD	C1A-C2A-C3A	-3.03	103.78	106.92
2	B	801	HDD	C2C-C1C-CHC	-3.01	120.30	126.00
2	B	801	HDD	C1A-CHA-C4D	-2.99	123.85	130.06
2	A	801	HDD	C2A-C1A-NA	2.97	113.86	109.73
2	A	801	HDD	CAA-CBA-CGA	-2.95	103.99	113.47
2	B	801	HDD	O1D-C3D-C2D	2.93	114.98	109.46
2	C	801	HDD	CMD-C2D-C3D	2.91	123.07	115.61
2	B	801	HDD	CAD-CBD-CGD	2.89	109.57	104.56
2	C	801	HDD	C2C-C1C-CHC	-2.84	120.62	126.00
2	D	801	HDD	C3C-CAC-CBC	-2.81	120.12	125.95
2	C	801	HDD	CBD-CAD-C3D	2.80	109.38	105.00
2	D	801	HDD	C3C-C4C-NC	2.77	111.33	108.64
2	C	801	HDD	C4C-C3C-CAC	-2.70	121.72	127.18
2	D	801	HDD	C3B-CAB-CBB	-2.69	120.39	125.95
2	C	801	HDD	CMB-C2B-C1B	2.67	131.44	126.16
2	B	801	HDD	C3C-C4C-NC	2.66	111.23	108.64
2	C	801	HDD	CBA-CAA-C2A	-2.66	108.00	112.69
2	B	801	HDD	CBD-CAD-C3D	2.58	109.04	105.00
2	C	801	HDD	CMA-C3A-C4A	-2.55	124.70	128.62
2	D	801	HDD	C1A-CHA-C4D	-2.53	124.80	130.06
2	B	801	HDD	C3C-CAC-CBC	-2.51	120.75	125.95
2	C	801	HDD	C4C-CHD-C1D	-2.47	124.91	130.06
2	C	801	HDD	CMB-C2B-C3B	2.42	128.79	124.97
2	B	801	HDD	C3A-C4A-CHB	-2.42	121.40	126.00
2	D	801	HDD	C3A-C4A-CHB	-2.42	121.42	126.00
2	B	801	HDD	C4C-CHD-C1D	-2.39	125.10	130.06
2	C	801	HDD	C3C-C4C-NC	2.34	110.92	108.64
2	D	801	HDD	O1D-C3D-CAD	-2.34	103.70	105.29
2	D	801	HDD	CMC-C2C-C1C	2.33	132.21	128.62
2	D	801	HDD	C2A-C1A-NA	2.30	112.93	109.73
2	B	801	HDD	C2D-C1D-CHD	-2.29	117.36	123.22
2	C	801	HDD	C4B-C3B-C2B	2.27	108.45	106.87
2	A	801	HDD	C1B-CHB-C4A	-2.20	124.57	127.47
2	A	801	HDD	C3A-C4A-CHB	-2.19	121.84	126.00
2	A	801	HDD	C2C-C1C-CHC	-2.18	121.87	126.00

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	801	HDD	CMB-C2B-C1B	2.16	130.44	126.16
2	D	801	HDD	CMA-C3A-C2A	2.12	128.95	124.94
2	A	801	HDD	CBD-CAD-C3D	2.11	108.30	105.00
2	C	801	HDD	C2A-C1A-NA	2.10	112.65	109.73
2	D	801	HDD	C2C-C1C-CHC	-2.10	122.03	126.00
2	B	801	HDD	CMA-C3A-C2A	2.09	128.89	124.94
2	D	801	HDD	CBA-CAA-C2A	-2.08	109.02	112.69
2	B	801	HDD	O1D-C3D-C4D	2.07	114.83	109.60
2	B	801	HDD	C3D-O1D-CGD	2.06	116.39	109.33
2	A	801	HDD	C1A-CHA-C4D	-2.04	125.81	130.06
2	A	801	HDD	C3C-C4C-NC	2.04	110.62	108.64
2	A	801	HDD	C3D-O1D-CGD	2.03	116.27	109.33
2	C	801	HDD	OND-C2D-C1D	-2.02	108.01	111.72

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	726/753 (96%)	-0.43	4 (0%) 86 88	5, 12, 26, 51	1 (0%)
1	B	726/753 (96%)	-0.32	10 (1%) 72 74	6, 13, 35, 56	1 (0%)
1	C	726/753 (96%)	-0.33	7 (0%) 79 81	6, 13, 33, 52	1 (0%)
1	D	726/753 (96%)	-0.38	5 (0%) 84 87	5, 12, 29, 54	1 (0%)
All	All	2904/3012 (96%)	-0.36	26 (0%) 81 83	5, 12, 32, 56	4 (0%)

All (26) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	726	GLY	3.2
1	B	32	GLU	3.1
1	D	28	SER	3.1
1	C	750	LYS	3.1
1	B	713	GLN	3.1
1	D	712	ASP	2.9
1	A	726	GLY	2.9
1	D	713	GLN	2.8
1	B	28	SER	2.7
1	A	28	SER	2.6
1	C	711	ALA	2.6
1	C	594	PRO	2.6
1	A	32	GLU	2.5
1	C	726	GLY	2.5
1	B	552	LEU	2.5
1	B	569	ASP	2.4
1	B	568	ASP	2.3
1	A	725	ASP	2.3
1	B	645	GLY	2.2
1	B	646	THR	2.2
1	D	569	ASP	2.1

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Mol	Chain	Res	Type	RSRZ
1	C	552[A]	LEU	2.1
1	C	569	ASP	2.1
1	C	32	GLU	2.1
1	B	749	ASP	2.0
1	D	568	ASP	2.0

## 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(Å <sup>2</sup> )	Q<0.9
2	HDD	A	801	44/44	0.12	1.04	5,8,11,12	0
2	HDD	D	801	44/44	0.09	0.69	6,7,12,14	0
2	HDD	C	801	44/44	0.10	0.37	7,8,13,17	0
2	HDD	B	801	44/44	0.09	0.24	6,9,11,12	0

## 6.5 Other polymers ⓘ

There are no such residues in this entry.