



# wwPDB X-ray Structure Validation Summary Report ⓘ

May 23, 2024 – 09:50 AM EDT

PDB ID : 3FDE  
Title : Mouse UHRF1 SRA domain bound with hemi-methylated CpG DNA, crystal structure in space group C222(1) at 1.4 Å resolution  
Authors : Hashimoto, H.; Horton, J.R.; Zhang, X.; Cheng, X.  
Deposited on : 2008-11-25  
Resolution : 1.41 Å (reported)

This is a wwPDB X-ray Structure Validation Summary Report for a publicly released PDB entry.

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

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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 : 1.8.5 (274361), CSD as541be (2020)  
Xtriage (Phenix) : 1.13  
EDS : 2.36.2  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Refmac : 5.8.0158  
CCP4 : 7.0.044 (Gargrove)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.36.2

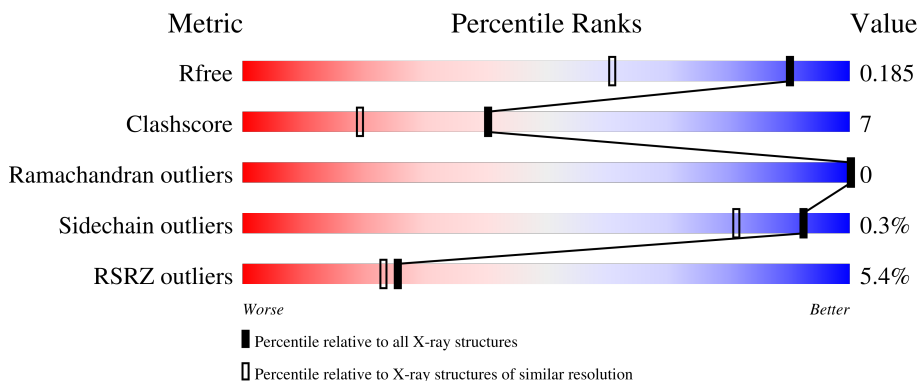
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 1.41 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	130704	2579 (1.44-1.40)
Clashscore	141614	2696 (1.44-1.40)
Ramachandran outliers	138981	2632 (1.44-1.40)
Sidechain outliers	138945	2631 (1.44-1.40)
RSRZ outliers	127900	2528 (1.44-1.40)

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  $\geq 3$ , 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	212	
1	B	212	
2	C	12	
2	D	12	
3	E	12	

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Mol	Chain	Length	Quality of chain
3	F	12	

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 criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
4	EDO	A	636	-	X	X	-
4	EDO	B	633	-	-	X	-
6	UNL	A	638	-	-	X	-
6	UNL	A	654	-	-	X	-
6	UNL	B	636	-	-	X	-
6	UNL	C	456	-	-	X	-
6	UNL	C	637	-	-	X	-

## 2 Entry composition [i](#)

There are 7 unique types of molecules in this entry. The entry contains 5159 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 E3 ubiquitin-protein ligase UHRF1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	210	Total 1698	C 1051	N 326	O 315	S 6	0	7	1
1	B	206	Total 1651	C 1024	N 318	O 304	S 5	0	4	0

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	417	HIS	-	expression tag	UNP Q8VDF2
A	418	MET	-	expression tag	UNP Q8VDF2
B	417	HIS	-	expression tag	UNP Q8VDF2
B	418	MET	-	expression tag	UNP Q8VDF2

- Molecule 2 is a DNA chain called 5'-D(\*CP\*CP\*AP\*TP\*GP\*(5CM)P\*GP\*CP\*TP\*GP\*A P\*C)-3'.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	P			
2	D	12	Total 241	C 116	N 44	O 70	P 11	0	0	0
2	C	12	Total 283	C 136	N 52	O 82	P 13	0	2	0

- Molecule 3 is a DNA chain called 5'-D(\*GP\*TP\*CP\*AP\*GP\*CP\*GP\*CP\*AP\*TP\*GP\*G)-3'.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	P			
3	E	12	Total 246	C 117	N 48	O 70	P 11	0	0	0
3	F	12	Total 246	C 117	N 48	O 70	P 11	0	0	0

- Molecule 4 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: C<sub>2</sub>H<sub>6</sub>O<sub>2</sub>).



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	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	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	D	1	Total C O 4 2 2	0	0

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

- Molecule 5 is SODIUM ION (three-letter code: NA) (formula: Na).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	1	Total Na 1 1	0	0
5	B	1	Total Na 1 1	0	0
5	E	1	Total Na 1 1	0	0
5	F	1	Total Na 1 1	0	0

- Molecule 6 is UNKNOWN LIGAND (three-letter code: UNL) (formula: ).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	2	Total O 4 4	0	0
6	B	4	Total C O 12 2 10	0	0
6	C	3	Total O 6 6	0	0

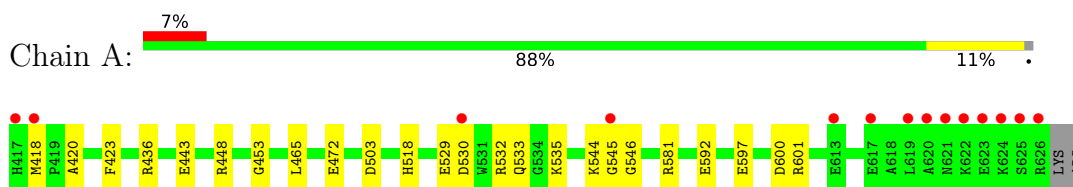
- Molecule 7 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	257	Total 257	O 257	0	0
7	B	269	Total 269	O 269	0	0
7	D	40	Total 40	O 40	0	0
7	E	37	Total 37	O 37	0	0
7	C	43	Total 43	O 43	0	0
7	F	34	Total 34	O 34	0	0

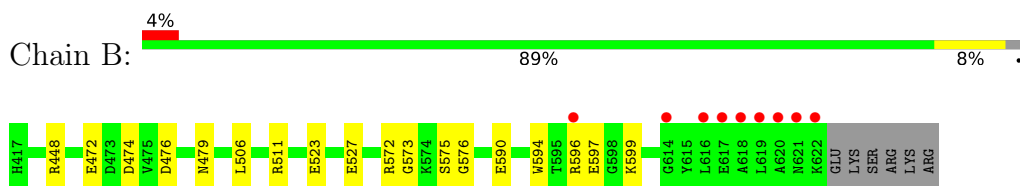
### 3 Residue-property plots [i](#)

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.

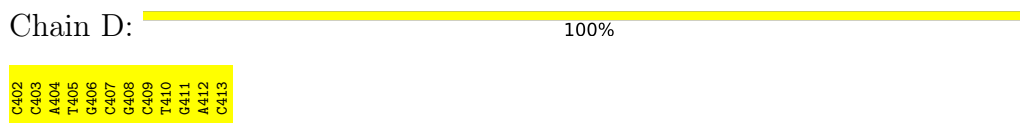
- Molecule 1: E3 ubiquitin-protein ligase UHRF1



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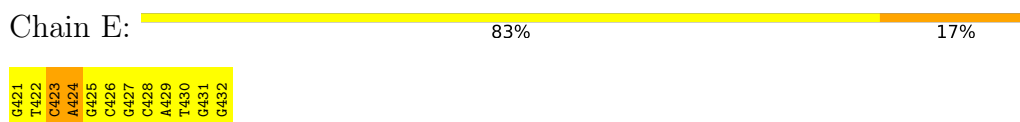
- Molecule 2: 5'-D(\*CP\*CP\*AP\*TP\*GP\*(5CM)P\*GP\*CP\*TP\*GP\*AP\*C)-3'



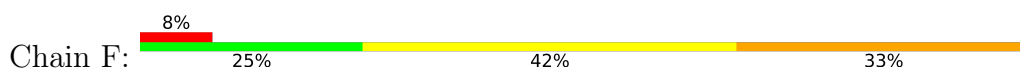
- Molecule 2: 5'-D(\*CP\*CP\*AP\*TP\*GP\*(5CM)P\*GP\*CP\*TP\*GP\*AP\*C)-3'



- Molecule 3: 5'-D(\*GP\*TP\*CP\*AP\*GP\*CP\*GP\*CP\*AP\*TP\*GP\*G)-3'



- Molecule 3: 5'-D(\*GP\*TP\*CP\*AP\*GP\*CP\*GP\*CP\*AP\*TP\*GP\*G)-3'







## 4 Data and refinement statistics

Property	Value	Source
Space group	C 2 2 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	84.68Å 103.69Å 149.84Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	32.79 – 1.41 32.79 – 1.41	Depositor EDS
% Data completeness (in resolution range)	96.1 (32.79-1.41) 96.0 (32.79-1.41)	Depositor EDS
$R_{merge}$	0.10	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.09 (at 1.41Å)	Xtrriage
Refinement program	REFMAC 5.5.0044	Depositor
R, $R_{free}$	0.149 , 0.186 0.148 , 0.185	Depositor DCC
$R_{free}$ test set	6067 reflections (5.01%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	14.3	Xtrriage
Anisotropy	0.101	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.37 , 51.9	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.50$ , $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.98	EDS
Total number of atoms	5159	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	19.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.99% of the height of the origin peak. No significant pseudotranslation is detected.*

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

<sup>2</sup>Theoretical 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: 5CM, NA, UNL, EDO

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	1.09	3/1740 (0.2%)	1.00	4/2350 (0.2%)
1	B	1.13	4/1694 (0.2%)	0.99	5/2291 (0.2%)
2	C	1.68	1/271 (0.4%)	2.30	17/414 (4.1%)
2	D	2.10	6/246 (2.4%)	2.63	26/375 (6.9%)
3	E	1.86	4/276 (1.4%)	3.24	53/425 (12.5%)
3	F	1.76	1/276 (0.4%)	2.42	26/425 (6.1%)
All	All	1.32	19/4503 (0.4%)	1.61	131/6280 (2.1%)

The worst 5 of 19 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	D	405	DT	C5-C7	8.24	1.54	1.50
3	F	430	DT	C5-C7	7.75	1.54	1.50
1	A	592	GLU	CG-CD	7.53	1.63	1.51
1	A	529	GLU	CD-OE2	7.08	1.33	1.25
1	B	590	GLU	CG-CD	6.79	1.62	1.51

The worst 5 of 131 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	418	MET	CG-SD-CE	16.90	127.25	100.20
3	E	423	DC	O4'-C4'-C3'	-15.98	96.41	106.00
3	E	426	DC	C5-C6-N1	14.21	128.10	121.00
2	C	402	DC	O4'-C1'-N1	-11.35	100.06	108.00
2	D	406	DG	C5-C6-N1	11.16	117.08	111.50

There are no chirality outliers.

There are no planarity outliers.

## 5.2 Too-close contacts

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1698	0	1618	22	0
1	B	1651	0	1566	17	0
2	C	283	0	162	1	0
2	D	241	0	138	0	0
3	E	246	0	134	2	0
3	F	246	0	136	3	0
4	A	32	0	48	7	0
4	B	20	0	30	8	0
4	C	4	0	4	0	0
4	D	4	0	4	0	0
4	E	8	0	11	0	0
4	F	20	0	29	3	0
5	A	1	0	0	0	0
5	B	1	0	0	0	0
5	E	1	0	0	0	0
5	F	1	0	0	0	0
6	A	4	0	0	4	0
6	B	12	0	0	5	0
6	C	6	0	0	5	0
7	A	257	0	0	11	0
7	B	269	0	0	8	0
7	C	43	0	0	1	0
7	D	40	0	0	0	0
7	E	37	0	0	0	0
7	F	34	0	0	1	0
All	All	5159	0	3880	60	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 7.

The worst 5 of 60 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)
6:B:215:UNL:O1	6:B:215:UNL:O2	1.71	1.08
6:C:456:UNL:O1	6:C:456:UNL:O2	1.71	1.07

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:546:GLY:HA2	7:B:853:HOH:O	1.52	1.06
1:B:479:ASN:ND2	6:B:655:UNL:O1	1.94	1.00
6:A:638:UNL:O1	6:A:638:UNL:O2	1.86	0.94

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	215/212 (101%)	211 (98%)	4 (2%)	0	100	100
1	B	208/212 (98%)	205 (99%)	3 (1%)	0	100	100
All	All	423/424 (100%)	416 (98%)	7 (2%)	0	100	100

There are no Ramachandran outliers to report.

### 5.3.2 Protein sidechains [i](#)

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	172/173 (99%)	172 (100%)	0	100	100
1	B	166/173 (96%)	165 (99%)	1 (1%)	86	69
All	All	338/346 (98%)	337 (100%)	1 (0%)	92	81

All (1) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	596	ARG

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

Mol	Chain	Res	Type
1	B	518	HIS

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

## 5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

3 non-standard protein/DNA/RNA residues are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 2$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
2	5CM	C	407[B]	2	17,21,22	1.23	1 (5%)	24,30,33	1.47	3 (12%)
2	5CM	D	407	2	17,21,22	1.38	3 (17%)	24,30,33	1.50	4 (16%)
2	5CM	C	407[A]	2	17,21,22	1.45	2 (11%)	24,30,33	1.41	3 (12%)

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	5CM	C	407[B]	2	-	0/7/21/22	0/2/2/2
2	5CM	D	407	2	-	0/7/21/22	0/2/2/2
2	5CM	C	407[A]	2	-	2/7/21/22	0/2/2/2

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

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	407[A]	5CM	C6-C5	4.49	1.42	1.34
2	C	407[B]	5CM	C6-C5	3.73	1.40	1.34
2	D	407	5CM	C6-C5	2.78	1.39	1.34
2	C	407[A]	5CM	O4'-C1'	2.30	1.47	1.42
2	D	407	5CM	C2-N1	-2.06	1.35	1.40

The worst 5 of 10 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	407[B]	5CM	C5-C6-N1	-3.61	119.62	123.34
2	C	407[A]	5CM	C5-C6-N1	-3.48	119.76	123.34
2	C	407[B]	5CM	C5A-C5-C6	-3.45	118.25	122.85
2	C	407[A]	5CM	O4'-C1'-N1	-3.12	102.29	107.86
2	C	407[B]	5CM	O4'-C1'-N1	-3.11	102.31	107.86

There are no chirality outliers.

All (2) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	C	407[A]	5CM	O4'-C4'-C5'-O5'
2	C	407[A]	5CM	C3'-C4'-C5'-O5'

There are no ring outliers.

No monomer is involved in short contacts.

## 5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

Of 35 ligands modelled in this entry, 4 are monoatomic and 9 are unknown - leaving 22 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	A	629	-	3,3,3	0.21	0	2,2,2	1.96	1 (50%)
4	EDO	B	629	-	3,3,3	1.53	1 (33%)	2,2,2	0.57	0
4	EDO	E	503	-	3,3,3	0.55	0	2,2,2	0.73	0
4	EDO	B	632	-	3,3,3	0.56	0	2,2,2	0.90	0
4	EDO	A	634	-	3,3,3	0.69	0	2,2,2	0.33	0
4	EDO	F	506	5	3,3,3	0.50	0	2,2,2	0.89	0
4	EDO	F	513	-	3,3,3	0.57	0	2,2,2	0.61	0
4	EDO	E	501	5	3,3,3	0.50	0	2,2,2	0.43	0
4	EDO	A	630	-	3,3,3	0.57	0	2,2,2	0.43	0
4	EDO	F	511	-	3,3,3	0.91	0	2,2,2	0.06	0
4	EDO	B	633	-	3,3,3	0.85	0	2,2,2	0.98	0
4	EDO	F	509	-	3,3,3	0.53	0	2,2,2	0.99	0
4	EDO	A	636	-	3,3,3	0.24	0	2,2,2	4.10	2 (100%)
4	EDO	A	633	-	3,3,3	0.34	0	2,2,2	0.64	0
4	EDO	B	630	-	3,3,3	0.93	0	2,2,2	0.70	0
4	EDO	C	505	5	3,3,3	0.78	0	2,2,2	0.21	0
4	EDO	A	631	-	3,3,3	0.85	0	2,2,2	0.98	0
4	EDO	B	631	-	3,3,3	0.39	0	2,2,2	0.96	0
4	EDO	D	502	5	3,3,3	1.06	0	2,2,2	0.09	0
4	EDO	A	635	-	3,3,3	0.49	0	2,2,2	0.31	0
4	EDO	F	510	-	3,3,3	1.18	0	2,2,2	0.93	0
4	EDO	A	632	-	3,3,3	0.45	0	2,2,2	0.58	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	A	629	-	-	0/1/1/1	-
4	EDO	B	629	-	-	0/1/1/1	-
4	EDO	E	503	-	-	0/1/1/1	-
4	EDO	B	632	-	-	1/1/1/1	-
4	EDO	A	634	-	-	1/1/1/1	-
4	EDO	F	506	5	-	0/1/1/1	-
4	EDO	F	513	-	-	0/1/1/1	-
4	EDO	E	501	5	-	0/1/1/1	-
4	EDO	A	630	-	-	1/1/1/1	-
4	EDO	F	511	-	-	1/1/1/1	-
4	EDO	B	633	-	-	0/1/1/1	-
4	EDO	F	509	-	-	1/1/1/1	-
4	EDO	A	636	-	-	1/1/1/1	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	EDO	A	633	-	-	0/1/1/1	-
4	EDO	B	630	-	-	1/1/1/1	-
4	EDO	C	505	5	-	0/1/1/1	-
4	EDO	A	631	-	-	1/1/1/1	-
4	EDO	B	631	-	-	0/1/1/1	-
4	EDO	D	502	5	-	0/1/1/1	-
4	EDO	A	635	-	-	0/1/1/1	-
4	EDO	F	510	-	-	1/1/1/1	-
4	EDO	A	632	-	-	0/1/1/1	-

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	B	629	EDO	O2-C2	2.26	1.53	1.42

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	A	636	EDO	O2-C2-C1	5.09	148.55	111.91
4	A	636	EDO	O1-C1-C2	-2.77	92.00	111.91
4	A	629	EDO	O1-C1-C2	-2.76	92.02	111.91

There are no chirality outliers.

5 of 9 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	B	632	EDO	O1-C1-C2-O2
4	F	511	EDO	O1-C1-C2-O2
4	A	631	EDO	O1-C1-C2-O2
4	B	630	EDO	O1-C1-C2-O2
4	A	630	EDO	O1-C1-C2-O2

There are no ring outliers.

6 monomers are involved in 18 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	B	632	EDO	1	0
4	F	513	EDO	3	0
4	A	630	EDO	3	0
4	B	633	EDO	6	0
4	A	636	EDO	4	0

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Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	B	630	EDO	1	0

## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [i](#)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
2	C	2

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	C	406:DG	O3'	407[A]:5CM	P	1.76
1	C	406:DG	O3'	407[B]:5CM	P	1.75

## 6 Fit of model and data [i](#)

### 6.1 Protein, DNA and RNA chains [i](#)

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	210/212 (99%)	0.17	14 (6%) 17 15	8, 15, 33, 64	0
1	B	206/212 (97%)	0.07	9 (4%) 34 34	7, 13, 30, 62	0
2	C	11/12 (91%)	0.20	1 (9%) 9 8	12, 17, 48, 56	0
2	D	11/12 (91%)	-0.24	0 100 100	12, 21, 29, 30	0
3	E	12/12 (100%)	0.00	0 100 100	15, 23, 33, 35	0
3	F	12/12 (100%)	0.10	1 (8%) 11 9	13, 21, 42, 42	0
All	All	462/472 (97%)	0.11	25 (5%) 25 23	7, 14, 35, 64	0

The worst 5 of 25 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	619	LEU	8.4
1	B	620	ALA	7.9
1	A	626	ARG	6.7
1	B	621	ASN	6.7
1	A	417	HIS	5.5

### 6.2 Non-standard residues in protein, DNA, RNA chains [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, 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	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
2	5CM	C	407[A]	20/21	0.98	0.10	4,7,9,9	20
2	5CM	C	407[B]	20/21	0.98	0.10	5,8,11,11	20
2	5CM	D	407	20/21	0.99	0.09	7,9,11,12	0

### 6.3 Carbohydrates [i](#)

There are no monosaccharides 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, 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	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
4	EDO	B	633	4/4	0.51	0.36	30,34,34,39	0
6	UNL	B	655	5/-	0.68	0.27	33,33,33,33	0
4	EDO	B	631	4/4	0.74	0.28	45,45,49,51	0
6	UNL	A	654	2/-	0.75	0.14	31,31,31,40	0
6	UNL	B	215	2/-	0.75	0.28	29,29,29,29	0
4	EDO	F	513	4/4	0.77	0.22	34,41,44,46	0
4	EDO	B	632	4/4	0.80	0.14	25,31,40,50	0
4	EDO	B	629	4/4	0.82	0.14	22,27,28,29	0
4	EDO	A	635	4/4	0.84	0.15	47,49,50,52	0
4	EDO	A	636	4/4	0.85	0.23	23,27,36,38	0
4	EDO	F	510	4/4	0.86	0.12	22,23,24,29	0
4	EDO	A	632	4/4	0.89	0.15	30,32,40,41	0
4	EDO	B	630	4/4	0.89	0.15	20,35,35,38	0
4	EDO	A	634	4/4	0.91	0.18	25,27,30,32	0
6	UNL	B	322	3/-	0.92	0.12	30,30,35,42	0
4	EDO	F	509	4/4	0.92	0.08	23,25,32,34	0
6	UNL	A	638	2/-	0.93	0.12	31,31,31,34	0
6	UNL	C	456	2/-	0.93	0.19	34,34,34,34	0
4	EDO	D	502	4/4	0.94	0.09	18,19,21,21	0
4	EDO	A	630	4/4	0.94	0.16	20,33,37,42	0
4	EDO	E	503	4/4	0.95	0.07	31,34,37,37	0
6	UNL	C	637	2/-	0.95	0.24	29,29,29,32	0
4	EDO	A	633	4/4	0.96	0.14	31,36,38,38	0
6	UNL	C	359	2/-	0.96	0.08	27,27,27,38	0
4	EDO	A	631	4/4	0.96	0.10	17,18,31,39	0
4	EDO	A	629	4/4	0.96	0.11	19,24,27,36	0
6	UNL	B	636	2/-	0.97	0.06	26,26,26,32	0
4	EDO	F	511	4/4	0.97	0.05	23,26,30,32	0
4	EDO	F	506	4/4	0.98	0.08	12,14,15,17	0
4	EDO	C	505	4/4	0.98	0.07	13,13,14,16	0
4	EDO	E	501	4/4	0.99	0.05	15,18,19,21	0
5	NA	B	634	1/1	1.00	0.21	9,9,9,9	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
5	NA	E	504	1/1	1.00	0.04	16,16,16,16	0
5	NA	F	503	1/1	1.00	0.06	12,12,12,12	0
5	NA	A	637	1/1	1.00	0.19	11,11,11,11	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.