



# Full wwPDB X-ray Structure Validation Report ⓘ

Feb 25, 2024 – 03:10 PM EST

PDB ID : 5IJ7  
Title : Structure of Hs/AcPRC2 in complex with a pyridone inhibitor  
Authors : Gajiwala, K.S.; Brooun, A.; Deng, Y.-L.; Liu, W.  
Deposited on : 2016-03-01  
Resolution : 2.62 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](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  
buster-report : 1.1.7 (2018)  
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

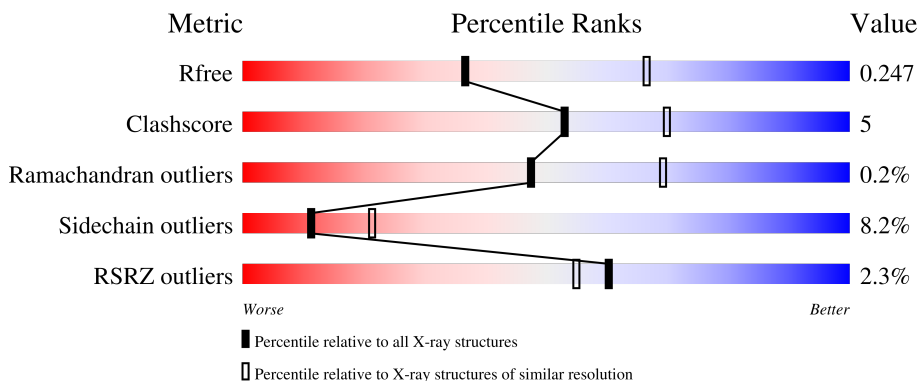
# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.62 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	3797 (2.64-2.60)
Clashscore	141614	4168 (2.64-2.60)
Ramachandran outliers	138981	4093 (2.64-2.60)
Sidechain outliers	138945	4093 (2.64-2.60)
RSRZ outliers	127900	3731 (2.64-2.60)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 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	643	<div style="display: flex; align-items: center;"> <div style="width: 2%; height: 10px; background-color: red; margin-right: 2px;"></div> <div style="width: 58%; height: 10px; background-color: green; margin-right: 2px;"></div> <div style="width: 11%; height: 10px; background-color: yellow; margin-right: 2px;"></div> <div style="width: 1%; height: 10px; background-color: orange; margin-right: 2px;"></div> <div style="width: 28%; height: 10px; background-color: grey; margin-right: 2px;"></div> </div> <p style="text-align: center;">60%      11%      •      28%</p>
1	B	643	<div style="display: flex; align-items: center;"> <div style="width: 3%; height: 10px; background-color: red; margin-right: 2px;"></div> <div style="width: 57%; height: 10px; background-color: green; margin-right: 2px;"></div> <div style="width: 12%; height: 10px; background-color: yellow; margin-right: 2px;"></div> <div style="width: 1%; height: 10px; background-color: orange; margin-right: 2px;"></div> <div style="width: 27%; height: 10px; background-color: grey; margin-right: 2px;"></div> </div> <p style="text-align: center;">3%      60%      12%      •      27%</p>
2	E	362	<div style="display: flex; align-items: center;"> <div style="width: 2%; height: 10px; background-color: red; margin-right: 2px;"></div> <div style="width: 79%; height: 10px; background-color: green; margin-right: 2px;"></div> <div style="width: 15%; height: 10px; background-color: yellow; margin-right: 2px;"></div> <div style="width: 2%; height: 10px; background-color: orange; margin-right: 2px;"></div> <div style="width: 2%; height: 10px; background-color: grey; margin-right: 2px;"></div> </div> <p style="text-align: center;">•      81%      15%      • •</p>
2	F	362	<div style="display: flex; align-items: center;"> <div style="width: 2%; height: 10px; background-color: red; margin-right: 2px;"></div> <div style="width: 78%; height: 10px; background-color: green; margin-right: 2px;"></div> <div style="width: 17%; height: 10px; background-color: yellow; margin-right: 2px;"></div> <div style="width: 1%; height: 10px; background-color: orange; margin-right: 2px;"></div> <div style="width: 2%; height: 10px; background-color: grey; margin-right: 2px;"></div> </div> <p style="text-align: center;">2%      80%      17%      • •</p>
3	S	191	<div style="display: flex; align-items: center;"> <div style="width: 2%; height: 10px; background-color: red; margin-right: 2px;"></div> <div style="width: 50%; height: 10px; background-color: green; margin-right: 2px;"></div> <div style="width: 13%; height: 10px; background-color: yellow; margin-right: 2px;"></div> <div style="width: 1%; height: 10px; background-color: orange; margin-right: 2px;"></div> <div style="width: 34%; height: 10px; background-color: grey; margin-right: 2px;"></div> </div> <p style="text-align: center;">2%      52%      13%      •      34%</p>

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Mol	Chain	Length	Quality of chain
3	T	191	 <p>A horizontal bar chart representing the quality of chain. The bar is divided into four segments: a small red segment at the beginning labeled '4%', followed by a large green segment labeled '52%', a yellow segment labeled '14%', and a grey segment at the end labeled '33%'. A small black dot is located on the grey segment.</p>

## 2 Entry composition i

There are 6 unique types of molecules in this entry. The entry contains 15642 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 Enhancer of Zeste Homolog 2 (EZH2), Histone-lysine N-methyltransferase EZH2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	465	3782	2372	680	691	39	0	0	0
1	B	469	3823	2398	687	699	39	0	1	0

There are 48 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	?	-	PRO	linker	UNP Q15910
A	?	-	PRO	linker	UNP Q15910
A	?	-	ARG	linker	UNP Q15910
A	?	-	LYS	linker	UNP Q15910
A	492	LEU	LYS	linker	UNP Q15910
A	493	GLY	LYS	linker	UNP Q15910
A	494	GLY	ARG	linker	UNP Q15910
A	495	GLY	LYS	linker	UNP Q15910
A	496	GLY	HIS	linker	UNP Q15910
A	497	SER	ARG	linker	UNP Q15910
A	498	GLY	LEU	linker	UNP Q15910
A	499	GLY	TRP	linker	UNP Q15910
A	500	GLY	ALA	linker	UNP Q15910
A	501	GLY	ALA	linker	UNP Q15910
A	502	SER	HIS	linker	UNP Q15910
A	503	GLY	CYS	linker	UNP Q15910
A	504	GLY	ARG	linker	UNP Q15910
A	505	GLY	LYS	linker	UNP Q15910
A	506	GLY	ILE	linker	UNP Q15910
A	507	SER	GLN	linker	UNP Q15910
A	508	ALA	LEU	linker	UNP Q15910
A	509	ALA	LYS	linker	UNP Q15910
A	510	ALA	LYS	linker	UNP Q15910
A	532	ASN	SER	engineered mutation	UNP Q15910

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Chain	Residue	Modelled	Actual	Comment	Reference
B	?	-	PRO	linker	UNP Q15910
B	?	-	PRO	linker	UNP Q15910
B	?	-	ARG	linker	UNP Q15910
B	?	-	LYS	linker	UNP Q15910
B	492	LEU	LYS	linker	UNP Q15910
B	493	GLY	LYS	linker	UNP Q15910
B	494	GLY	ARG	linker	UNP Q15910
B	495	GLY	LYS	linker	UNP Q15910
B	496	GLY	HIS	linker	UNP Q15910
B	497	SER	ARG	linker	UNP Q15910
B	498	GLY	LEU	linker	UNP Q15910
B	499	GLY	TRP	linker	UNP Q15910
B	500	GLY	ALA	linker	UNP Q15910
B	501	GLY	ALA	linker	UNP Q15910
B	502	SER	HIS	linker	UNP Q15910
B	503	GLY	CYS	linker	UNP Q15910
B	504	GLY	ARG	linker	UNP Q15910
B	505	GLY	LYS	linker	UNP Q15910
B	506	GLY	ILE	linker	UNP Q15910
B	507	SER	GLN	linker	UNP Q15910
B	508	ALA	LEU	linker	UNP Q15910
B	509	ALA	LYS	linker	UNP Q15910
B	510	ALA	LYS	linker	UNP Q15910
B	532	ASN	SER	engineered mutation	UNP Q15910

- Molecule 2 is a protein called Polycomb protein EED.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	E	355	2873	1819	503	530	21	0	0	0
2	F	360	2912	1843	511	537	21	0	0	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
E	66	MET	-	initiating methionine	UNP O75530
F	66	MET	-	initiating methionine	UNP O75530

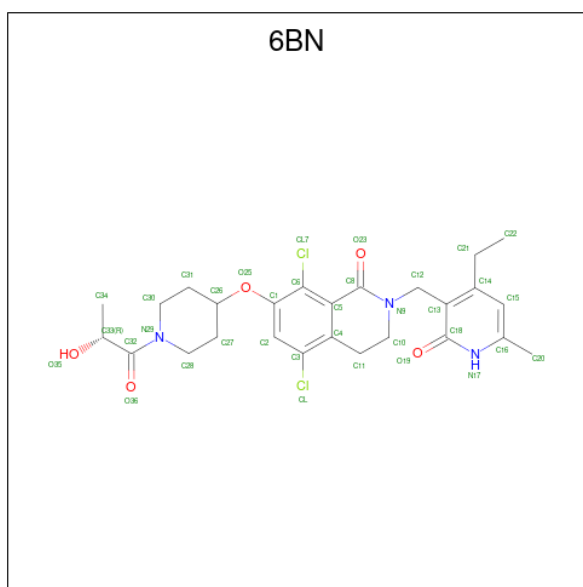
- Molecule 3 is a protein called Polycomb protein SUZ12.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	S	127	Total	C	N	O	S	0	0	0
			1060	669	182	197	12			
3	T	128	Total	C	N	O	S	0	0	0
			1070	675	185	198	12			

There are 22 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
S	535	MET	-	initiating methionine	UNP Q15022
S	536	ASP	-	expression tag	UNP Q15022
S	537	TYR	-	expression tag	UNP Q15022
S	538	LYS	-	expression tag	UNP Q15022
S	539	ASP	-	expression tag	UNP Q15022
S	540	ASP	-	expression tag	UNP Q15022
S	541	ASP	-	expression tag	UNP Q15022
S	542	ASP	-	expression tag	UNP Q15022
S	543	LYS	-	expression tag	UNP Q15022
S	544	GLY	-	expression tag	UNP Q15022
S	583	ASP	SER	engineered mutation	UNP Q15022
T	535	MET	-	initiating methionine	UNP Q15022
T	536	ASP	-	expression tag	UNP Q15022
T	537	TYR	-	expression tag	UNP Q15022
T	538	LYS	-	expression tag	UNP Q15022
T	539	ASP	-	expression tag	UNP Q15022
T	540	ASP	-	expression tag	UNP Q15022
T	541	ASP	-	expression tag	UNP Q15022
T	542	ASP	-	expression tag	UNP Q15022
T	543	LYS	-	expression tag	UNP Q15022
T	544	GLY	-	expression tag	UNP Q15022
T	583	ASP	SER	engineered mutation	UNP Q15022

- Molecule 4 is 5,8-dichloro-2-[(4-ethyl-6-methyl-2-oxo-1,2-dihydropyridin-3-yl)methyl]-7-({1-[(2R)-2-hydroxypropanoyl]piperidin-4-yl}oxy)-3,4-dihydroisoquinolin-1(2H)-one (three-letter code: 6BN) (formula: C<sub>26</sub>H<sub>31</sub>Cl<sub>2</sub>N<sub>3</sub>O<sub>5</sub>).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	
4	A	1	Total	C	Cl	N	O	0	0
			36	26	2	3	5		
4	B	1	Total	C	Cl	N	O	0	0
			36	26	2	3	5		

- Molecule 5 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	7	Total	Zn	0	0
			7	7		
5	B	7	Total	Zn	0	0
			7	7		

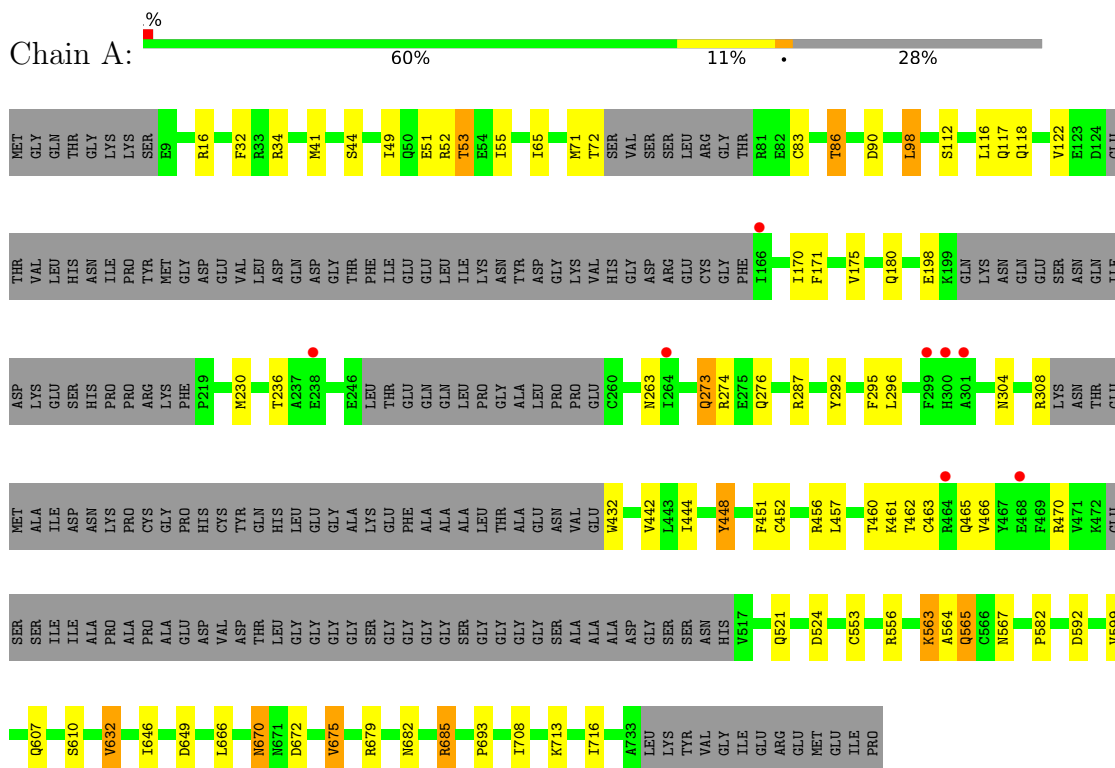
- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	14	Total	O	0	0
			14	14		
6	B	8	Total	O	0	0
			8	8		
6	E	8	Total	O	0	0
			8	8		
6	F	6	Total	O	0	0
			6	6		

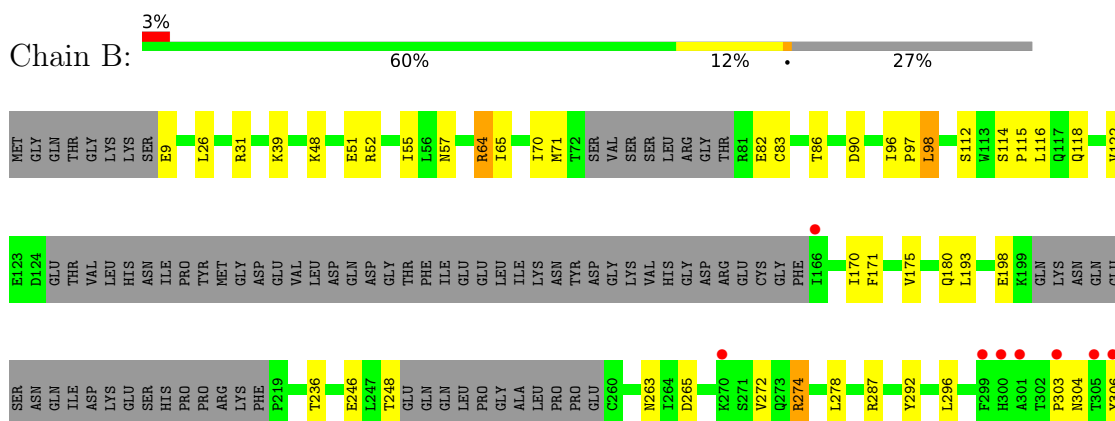
### 3 Residue-property plots [i](#)

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.

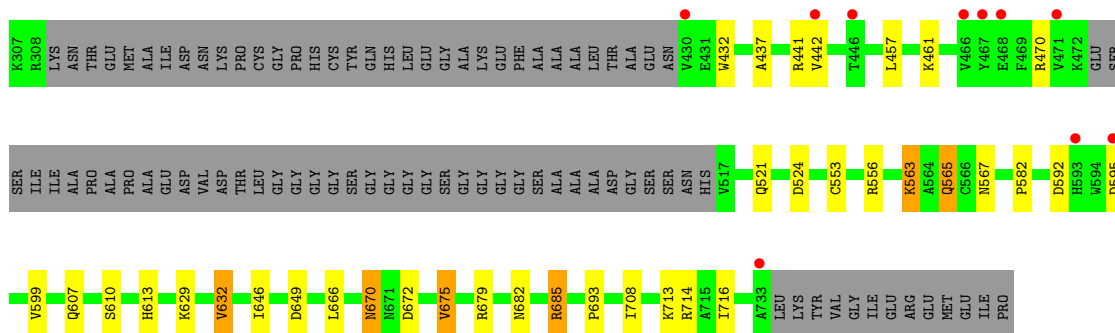
- Molecule 1: Enhancer of Zeste Homolog 2 (EZH2), Histone-lysine N-methyltransferase EZH2



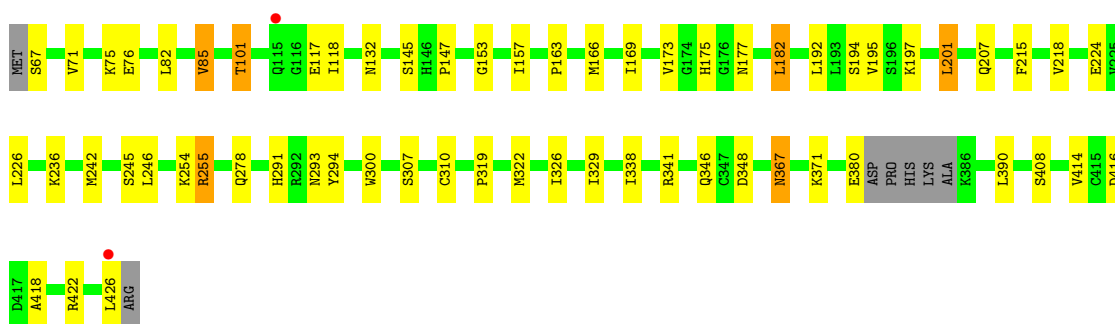
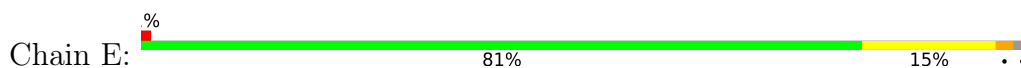
- Molecule 1: Enhancer of Zeste Homolog 2 (EZH2), Histone-lysine N-methyltransferase EZH2



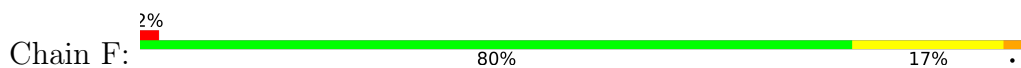




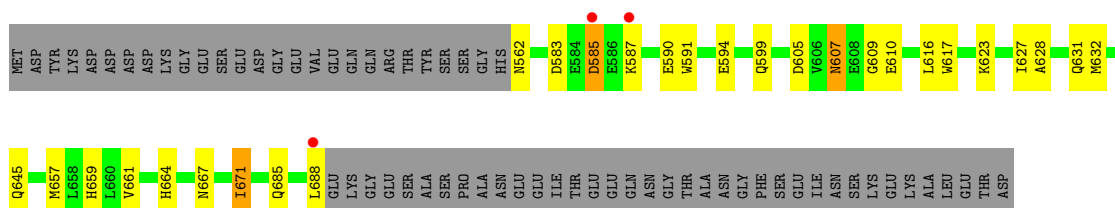
• Molecule 2: Polycomb protein EED



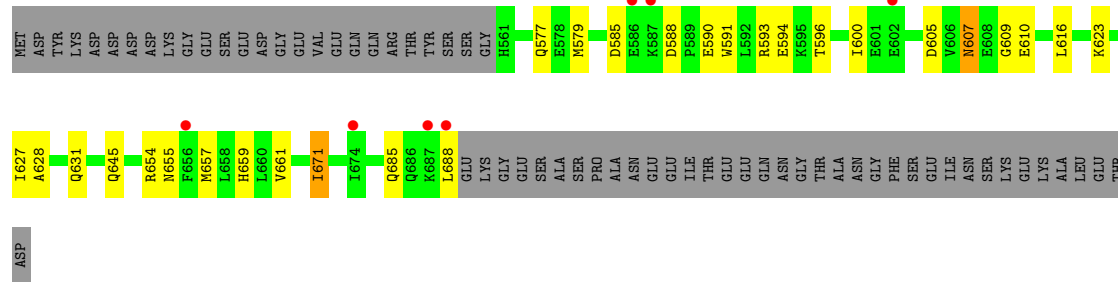
• Molecule 2: Polycomb protein EED



• Molecule 3: Polycomb protein SUZ12



• Molecule 3: Polycomb protein SUZ12



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	69.58Å 115.04Å 153.03Å 90.00° 102.53° 90.00°	Depositor
Resolution (Å)	91.15 – 2.62 91.15 – 2.62	Depositor EDS
% Data completeness (in resolution range)	99.6 (91.15-2.62) 99.6 (91.15-2.62)	Depositor EDS
$R_{merge}$	0.06	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.26 (at 2.62Å)	Xtrriage
Refinement program	BUSTER 2.11.4	Depositor
R, $R_{free}$	0.191 , 0.238 0.200 , 0.247	Depositor DCC
$R_{free}$ test set	3606 reflections (5.09%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	58.0	Xtrriage
Anisotropy	0.489	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.35 , 58.0	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	0.022 for h,-k,-h-l	Xtrriage
$F_o, F_c$ correlation	0.95	EDS
Total number of atoms	15642	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	68.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 15.50% 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

### 5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: 6BN, ZN

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	0.53	0/3863	0.70	0/5194
1	B	0.51	0/3905	0.70	0/5252
2	E	0.50	0/2944	0.75	0/3986
2	F	0.50	0/2986	0.75	0/4045
3	S	0.49	0/1080	0.67	0/1449
3	T	0.51	0/1091	0.68	0/1464
All	All	0.51	0/15869	0.71	0/21390

There are no bond length outliers.

There are no bond angle outliers.

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	3782	0	3669	43	0
1	B	3823	0	3708	41	0
2	E	2873	0	2791	30	0
2	F	2912	0	2828	36	0
3	S	1060	0	1045	21	0
3	T	1070	0	1052	21	0
4	A	36	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	B	36	0	0	0	0
5	A	7	0	0	0	0
5	B	7	0	0	0	0
6	A	14	0	0	0	0
6	B	8	0	0	0	0
6	E	8	0	0	0	0
6	F	6	0	0	0	0
All	All	15642	0	15093	164	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 5.

All (164) 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)
2:F:195:VAL:HG22	2:F:201:LEU:HD13	1.67	0.77
2:E:195:VAL:HG22	2:E:201:LEU:HD13	1.66	0.75
3:S:628:ALA:H	3:S:631:GLN:HE21	1.35	0.73
3:T:628:ALA:H	3:T:631:GLN:HE21	1.38	0.72
1:A:16:ARG:HD2	1:A:230:MET:CE	2.20	0.72
2:F:379:VAL:HG21	2:F:385:ALA:HA	1.73	0.71
3:S:627:ILE:H	3:S:631:GLN:NE2	1.89	0.70
1:B:457:LEU:HB3	3:T:657:MET:HE1	1.75	0.68
1:B:675:VAL:HG11	1:B:708:ILE:CD1	2.23	0.67
2:F:175:HIS:HE1	2:F:194:SER:OG	1.78	0.67
3:T:627:ILE:H	3:T:631:GLN:NE2	1.91	0.67
1:A:675:VAL:HG11	1:A:708:ILE:CD1	2.26	0.66
1:B:263:ASN:HB3	3:T:607:ASN:ND2	2.11	0.66
1:A:49:ILE:O	1:A:53:THR:HB	1.95	0.66
1:B:675:VAL:HG11	1:B:708:ILE:HD12	1.77	0.66
1:A:675:VAL:HG11	1:A:708:ILE:HD12	1.78	0.66
1:A:16:ARG:HD2	1:A:230:MET:HE1	1.77	0.66
2:E:175:HIS:HE1	2:E:194:SER:OG	1.80	0.65
1:B:64:ARG:HG3	2:F:92:LYS:HD3	1.79	0.64
1:A:670:ASN:HD22	1:A:672:ASP:H	1.43	0.64
1:B:670:ASN:HD22	1:B:672:ASP:H	1.43	0.64
3:S:607:ASN:HD22	3:S:609:GLY:H	1.45	0.64
3:S:627:ILE:H	3:S:631:GLN:HE22	1.45	0.63
2:F:218:VAL:HG11	3:T:591:TRP:CE3	2.33	0.63
1:B:39:LYS:HG2	2:F:380:GLU:HB3	1.80	0.62
3:T:607:ASN:HD22	3:T:609:GLY:H	1.46	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:F:319:PRO:HB2	2:F:329:ILE:HD13	1.82	0.61
2:F:201:LEU:HB2	2:F:215:PHE:HB2	1.83	0.61
1:A:263:ASN:HB3	3:S:607:ASN:ND2	2.16	0.61
2:E:319:PRO:HB2	2:E:329:ILE:HD13	1.82	0.60
2:F:82:LEU:HD22	2:F:101:THR:HG23	1.83	0.60
2:E:201:LEU:HB2	2:E:215:PHE:HB2	1.83	0.60
2:E:367:ASN:ND2	2:E:371:LYS:H	1.99	0.60
2:F:367:ASN:ND2	2:F:371:LYS:H	1.99	0.60
1:B:553:CYS:HB3	1:B:556:ARG:HG3	1.83	0.60
1:A:432:TRP:CZ2	1:A:461:LYS:HG2	2.37	0.59
1:B:613[A]:HIS:HD2	1:B:629:LYS:HD2	1.67	0.59
1:B:292:TYR:OH	3:T:659:HIS:HD2	1.85	0.59
1:A:553:CYS:HB3	1:A:556:ARG:HG3	1.85	0.59
1:A:292:TYR:OH	3:S:659:HIS:HD2	1.86	0.58
1:A:632:VAL:HG12	1:A:716:ILE:HB	1.85	0.58
1:B:682:ASN:O	1:B:685:ARG:HG2	2.03	0.58
3:T:627:ILE:H	3:T:631:GLN:HE22	1.50	0.58
1:B:57:ASN:HD22	2:F:406:ARG:HH21	1.52	0.57
1:B:632:VAL:HG12	1:B:716:ILE:HB	1.84	0.57
2:F:85:VAL:HG22	2:F:414:VAL:HG22	1.87	0.57
2:E:367:ASN:HD21	2:E:371:LYS:H	1.51	0.57
1:A:122:VAL:HG22	1:A:646:ILE:HG22	1.87	0.57
2:E:218:VAL:HG11	3:S:591:TRP:CE3	2.40	0.56
1:A:682:ASN:O	1:A:685:ARG:HG2	2.05	0.56
2:E:76:GLU:OE2	2:E:101:THR:HG21	2.05	0.56
1:A:582:PRO:HD3	1:A:607:GLN:HE22	1.71	0.55
2:F:367:ASN:HD21	2:F:371:LYS:H	1.53	0.55
1:B:122:VAL:HG22	1:B:646:ILE:HG22	1.87	0.55
2:F:182:LEU:HG	2:F:192:LEU:HD11	1.88	0.55
1:A:71:MET:O	1:A:72:THR:HB	2.07	0.55
2:E:182:LEU:HG	2:E:192:LEU:HD11	1.89	0.55
2:F:346:GLN:O	2:F:367:ASN:HB2	2.07	0.55
2:E:85:VAL:HG22	2:E:414:VAL:HG22	1.89	0.55
2:E:346:GLN:O	2:E:367:ASN:HB2	2.07	0.55
2:F:226:LEU:HD11	2:F:242:MET:HG3	1.89	0.54
1:A:16:ARG:HD2	1:A:230:MET:HE3	1.90	0.54
1:B:582:PRO:HD3	1:B:607:GLN:HE22	1.72	0.54
1:B:437:ALA:HB1	1:B:441:ARG:NH2	2.22	0.54
1:A:308:ARG:HH21	3:S:667:ASN:HA	1.73	0.54
2:F:291:HIS:HE1	2:F:307:SER:OG	1.91	0.53
1:A:273:GLN:HB2	1:A:276:GLN:HE21	1.72	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:96:ILE:HG12	2:F:120:LEU:HG	1.90	0.53
1:B:274:ARG:HB2	1:B:442:VAL:HA	1.90	0.53
2:F:218:VAL:HG11	3:T:591:TRP:CZ3	2.44	0.53
2:E:291:HIS:HE1	2:E:307:SER:OG	1.92	0.52
1:B:71:MET:HE1	2:F:123:SER:O	2.09	0.52
1:A:86:THR:HG22	2:E:75:LYS:HB3	1.91	0.52
2:F:240:CYS:HB2	2:F:295:VAL:HB	1.92	0.52
2:E:226:LEU:HD11	2:E:242:MET:HG3	1.91	0.51
3:T:588:ASP:OD1	3:T:593:ARG:HD2	2.11	0.51
1:A:457:LEU:HB3	3:S:657:MET:HE1	1.93	0.51
3:S:671:ILE:HD12	3:S:671:ILE:H	1.76	0.50
2:F:236:LYS:HE2	2:F:300:TRP:CH2	2.46	0.50
3:S:607:ASN:HD22	3:S:609:GLY:N	2.10	0.50
1:A:171:PHE:O	1:A:175:VAL:HG23	2.12	0.50
2:E:218:VAL:HG11	3:S:591:TRP:CZ3	2.46	0.50
3:T:607:ASN:HD22	3:T:609:GLY:N	2.10	0.49
2:E:236:LYS:HE2	2:E:300:TRP:CH2	2.48	0.49
3:T:607:ASN:ND2	3:T:610:GLU:H	2.10	0.49
1:B:82:GLU:HB3	1:B:97:PRO:HA	1.94	0.49
1:B:83:CYS:HB3	1:B:98:LEU:HG	1.94	0.49
3:T:671:ILE:H	3:T:671:ILE:HD12	1.76	0.49
1:A:83:CYS:HB3	1:A:98:LEU:HG	1.94	0.49
3:S:607:ASN:ND2	3:S:610:GLU:H	2.11	0.49
2:E:294:TYR:OH	2:E:310:CYS:HB3	2.13	0.48
2:E:326:ILE:HA	2:E:329:ILE:HD12	1.96	0.48
2:F:118:ILE:HD11	2:F:422:ARG:HB2	1.95	0.48
2:F:294:TYR:OH	2:F:310:CYS:HB3	2.14	0.48
2:F:326:ILE:HA	2:F:329:ILE:HD12	1.95	0.47
1:A:304:ASN:HB2	1:A:524:ASP:OD2	2.15	0.47
1:B:171:PHE:O	1:B:175:VAL:HG23	2.14	0.47
3:S:628:ALA:HB3	3:S:631:GLN:HG3	1.95	0.47
1:B:274:ARG:HD3	1:B:278:LEU:HD12	1.97	0.47
1:B:613[A]:HIS:CD2	1:B:629:LYS:HD2	2.50	0.47
2:E:118:ILE:HD11	2:E:422:ARG:HB2	1.96	0.47
3:T:596:THR:O	3:T:600:ILE:HG12	2.15	0.47
1:A:41:MET:CE	2:E:322:MET:SD	3.03	0.46
3:T:628:ALA:HB3	3:T:631:GLN:HG3	1.97	0.46
1:B:64:ARG:CG	2:F:92:LYS:HD3	2.44	0.46
1:A:52:ARG:HA	1:A:55:ILE:HD12	1.98	0.46
1:A:117:GLN:HG3	3:S:587:LYS:HA	1.98	0.46
1:A:693:PRO:HG2	1:A:713:LYS:HE2	1.99	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:E:132:ASN:O	2:E:153:GLY:HA3	2.16	0.45
1:B:432:TRP:CZ2	1:B:461:LYS:HG2	2.51	0.45
1:B:675:VAL:HG11	1:B:708:ILE:HD11	1.97	0.45
1:A:308:ARG:HD2	3:S:664:HIS:NE2	2.32	0.45
1:B:304:ASN:HB2	1:B:524:ASP:OD2	2.16	0.45
2:F:363:LEU:HD23	2:F:375:TRP:CE3	2.51	0.45
1:B:263:ASN:HB3	3:T:607:ASN:HD21	1.78	0.45
1:B:675:VAL:CG1	1:B:708:ILE:HD11	2.47	0.45
1:A:460:THR:O	1:A:461:LYS:HD2	2.17	0.45
1:A:34:ARG:NH2	2:E:338:ILE:O	2.50	0.44
2:E:236:LYS:HG3	2:E:300:TRP:CZ2	2.52	0.44
1:B:693:PRO:HG2	1:B:713:LYS:HE2	1.99	0.44
2:F:197:LYS:HA	2:F:224:GLU:HG3	1.99	0.44
1:A:563:LYS:HD3	1:A:563:LYS:H	1.83	0.44
2:E:157:ILE:HG12	2:E:173:VAL:HG22	1.99	0.44
1:B:563:LYS:CD	1:B:563:LYS:H	2.31	0.44
1:A:116:LEU:HG	1:A:118:GLN:O	2.18	0.44
1:A:462:THR:H	1:A:465:GLN:HB2	1.83	0.44
1:B:116:LEU:HG	1:B:118:GLN:O	2.17	0.43
2:F:132:ASN:O	2:F:153:GLY:HA3	2.17	0.43
2:E:82:LEU:HG	2:E:418:ALA:HA	2.01	0.43
1:A:675:VAL:CG1	1:A:708:ILE:HD11	2.48	0.43
1:B:457:LEU:HB3	3:T:657:MET:CE	2.47	0.43
1:A:451:PHE:HD1	1:A:466:VAL:HG12	1.83	0.43
1:A:675:VAL:HG11	1:A:708:ILE:HD11	2.00	0.43
2:F:157:ILE:HG12	2:F:173:VAL:HG22	2.01	0.43
2:E:255:ARG:HD3	2:E:278:GLN:OE1	2.19	0.43
1:A:563:LYS:HE2	1:A:564:ALA:H	1.84	0.42
2:F:147:PRO:O	2:F:163:PRO:HD2	2.20	0.42
2:F:236:LYS:HG3	2:F:300:TRP:CZ2	2.54	0.42
3:S:583:ASP:C	3:S:585:ASP:H	2.23	0.42
1:A:41:MET:HE1	2:E:322:MET:SD	2.58	0.42
1:A:295:PHE:HE1	3:S:599:GLN:OE1	2.02	0.42
3:S:685:GLN:HA	3:S:688:LEU:HD12	2.02	0.42
2:E:147:PRO:O	2:E:163:PRO:HD2	2.20	0.42
1:B:675:VAL:CG1	1:B:708:ILE:CD1	2.95	0.42
1:B:52:ARG:HA	1:B:55:ILE:HD12	2.02	0.42
2:F:85:VAL:HG22	2:F:414:VAL:CG2	2.50	0.41
3:S:657:MET:O	3:S:661:VAL:HG13	2.20	0.41
2:F:195:VAL:HG13	2:F:225:VAL:CG1	2.50	0.41
1:B:263:ASN:HB2	3:T:655:ASN:HD21	1.85	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:S:617:TRP:HZ2	3:S:632:MET:HE1	1.86	0.41
1:A:452:CYS:SG	1:A:463:CYS:SG	3.12	0.41
1:A:675:VAL:CG1	1:A:708:ILE:CD1	2.96	0.41
1:B:114:SER:HA	1:B:115:PRO:HD3	1.95	0.41
2:E:197:LYS:HA	2:E:224:GLU:HG3	2.02	0.41
3:T:685:GLN:HA	3:T:688:LEU:HD12	2.01	0.41
2:E:85:VAL:HG22	2:E:414:VAL:CG2	2.51	0.40
1:B:303:PRO:HA	1:B:306:TYR:CZ	2.57	0.40
3:T:657:MET:O	3:T:661:VAL:HG13	2.22	0.40
2:F:185:HIS:HB2	2:F:191:LEU:HB2	2.03	0.40
1:A:444:ILE:O	1:A:448:TYR:HA	2.21	0.40
1:B:265:ASP:HA	3:T:654:ARG:HE	1.86	0.40
2:F:255:ARG:HD3	2:F:278:GLN:OE1	2.22	0.40
1:A:274:ARG:HD2	1:A:442:VAL:HA	2.02	0.40
1:B:272:VAL:O	1:B:441:ARG:HD2	2.21	0.40

There are no symmetry-related clashes.

## 5.3 Torsion angles [i](#)

### 5.3.1 Protein backbone [i](#)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	451/643 (70%)	428 (95%)	21 (5%)	2 (0%)	34	55
1	B	456/643 (71%)	437 (96%)	18 (4%)	1 (0%)	47	69
2	E	351/362 (97%)	338 (96%)	13 (4%)	0	100	100
2	F	358/362 (99%)	344 (96%)	14 (4%)	0	100	100
3	S	125/191 (65%)	120 (96%)	5 (4%)	0	100	100
3	T	126/191 (66%)	116 (92%)	9 (7%)	1 (1%)	19	36
All	All	1867/2392 (78%)	1783 (96%)	80 (4%)	4 (0%)	47	69

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	448	TYR
3	T	579	MET
1	A	565	GLN
1	B	565	GLN

### 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	420/560 (75%)	388 (92%)	32 (8%)	13	25
1	B	425/560 (76%)	386 (91%)	39 (9%)	9	16
2	E	319/325 (98%)	294 (92%)	25 (8%)	12	24
2	F	323/325 (99%)	298 (92%)	25 (8%)	13	24
3	S	121/175 (69%)	111 (92%)	10 (8%)	11	21
3	T	122/175 (70%)	112 (92%)	10 (8%)	11	21
All	All	1730/2120 (82%)	1589 (92%)	141 (8%)	11	21

All (141) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	32	PHE
1	A	44	SER
1	A	51	GLU
1	A	53	THR
1	A	65	ILE
1	A	86	THR
1	A	90	ASP
1	A	98	LEU
1	A	112	SER
1	A	170	ILE
1	A	180	GLN
1	A	198	GLU
1	A	236	THR
1	A	273	GLN
1	A	287	ARG

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	A	296	LEU
1	A	456	ARG
1	A	470	ARG
1	A	521	GLN
1	A	563	LYS
1	A	565	GLN
1	A	567	ASN
1	A	592	ASP
1	A	599	VAL
1	A	610	SER
1	A	632	VAL
1	A	649	ASP
1	A	666	LEU
1	A	670	ASN
1	A	675	VAL
1	A	679	ARG
1	A	685	ARG
1	B	9	GLU
1	B	26	LEU
1	B	31	ARG
1	B	48	LYS
1	B	51	GLU
1	B	64	ARG
1	B	65	ILE
1	B	70	ILE
1	B	86	THR
1	B	90	ASP
1	B	98	LEU
1	B	112	SER
1	B	170	ILE
1	B	180	GLN
1	B	193	LEU
1	B	198	GLU
1	B	236	THR
1	B	246	GLU
1	B	248	THR
1	B	274	ARG
1	B	287	ARG
1	B	296	LEU
1	B	470	ARG
1	B	521	GLN
1	B	563	LYS

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	B	565	GLN
1	B	567	ASN
1	B	592	ASP
1	B	595	ASP
1	B	599	VAL
1	B	610	SER
1	B	632	VAL
1	B	649	ASP
1	B	666	LEU
1	B	670	ASN
1	B	675	VAL
1	B	679	ARG
1	B	685	ARG
1	B	714	ARG
2	E	67	SER
2	E	71	VAL
2	E	85	VAL
2	E	101	THR
2	E	117	GLU
2	E	145	SER
2	E	166	MET
2	E	169	ILE
2	E	177	ASN
2	E	182	LEU
2	E	201	LEU
2	E	207	GLN
2	E	245	SER
2	E	246	LEU
2	E	254	LYS
2	E	255	ARG
2	E	293	ASN
2	E	341	ARG
2	E	348	ASP
2	E	367	ASN
2	E	380	GLU
2	E	390	LEU
2	E	408	SER
2	E	416	ASP
2	E	426	LEU
2	F	67	SER
2	F	71	VAL
2	F	85	VAL

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
2	F	91	SER
2	F	101	THR
2	F	117	GLU
2	F	145	SER
2	F	166	MET
2	F	169	ILE
2	F	177	ASN
2	F	182	LEU
2	F	201	LEU
2	F	207	GLN
2	F	245	SER
2	F	246	LEU
2	F	254	LYS
2	F	255	ARG
2	F	293	ASN
2	F	341	ARG
2	F	348	ASP
2	F	367	ASN
2	F	380	GLU
2	F	390	LEU
2	F	408	SER
2	F	426	LEU
3	S	562	ASN
3	S	585	ASP
3	S	590	GLU
3	S	594	GLU
3	S	605	ASP
3	S	607	ASN
3	S	616	LEU
3	S	623	LYS
3	S	645	GLN
3	S	671	ILE
3	T	577	GLN
3	T	585	ASP
3	T	590	GLU
3	T	594	GLU
3	T	605	ASP
3	T	607	ASN
3	T	616	LEU
3	T	623	LYS
3	T	645	GLN
3	T	671	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (33) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	268	ASN
1	A	276	GLN
1	A	548	GLN
1	A	567	ASN
1	A	607	GLN
1	A	648	GLN
1	A	670	ASN
1	A	706	HIS
1	B	43	ASN
1	B	57	ASN
1	B	268	ASN
1	B	567	ASN
1	B	607	GLN
1	B	648	GLN
1	B	670	ASN
1	B	706	HIS
2	E	175	HIS
2	E	291	HIS
2	E	293	ASN
2	E	367	ASN
2	F	175	HIS
2	F	291	HIS
2	F	293	ASN
2	F	367	ASN
3	S	607	ASN
3	S	631	GLN
3	S	642	ASN
3	S	655	ASN
3	S	659	HIS
3	T	607	ASN
3	T	631	GLN
3	T	655	ASN
3	T	659	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](#)

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

## 5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

Of 16 ligands modelled in this entry, 14 are monoatomic - leaving 2 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	6BN	B	9001	-	37,39,39	0.34	0	43,57,57	0.66	0
4	6BN	A	9001	-	37,39,39	0.39	0	43,57,57	0.69	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	6BN	B	9001	-	-	4/18/41/41	0/4/4/4
4	6BN	A	9001	-	-	5/18/41/41	0/4/4/4

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (9) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	9001	6BN	C13-C14-C21-C22
4	A	9001	6BN	C13-C12-N9-C8

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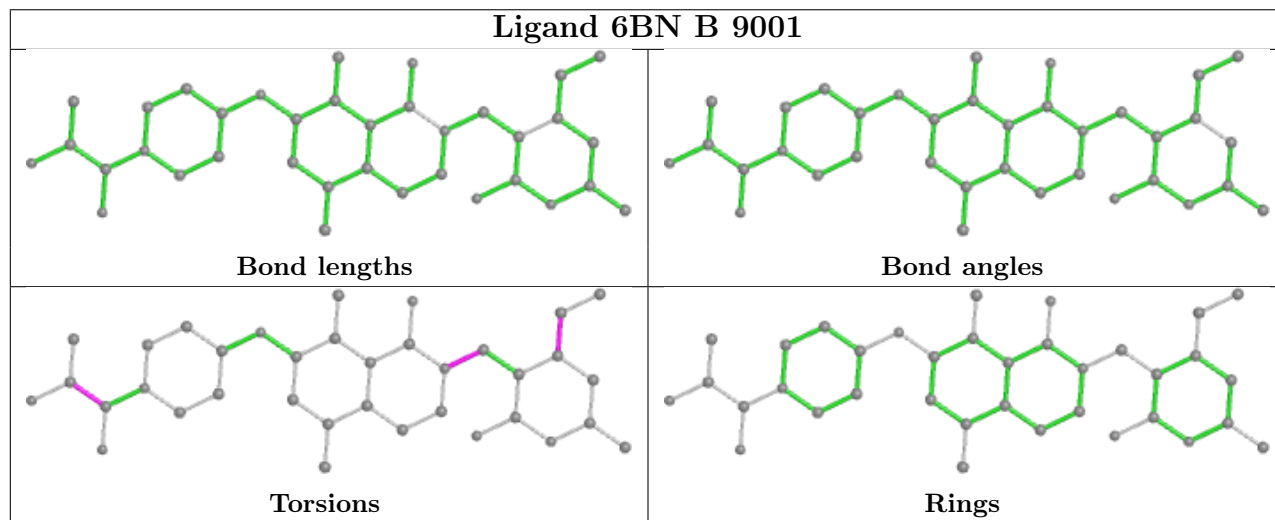
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Mol	Chain	Res	Type	Atoms
4	B	9001	6BN	C13-C14-C21-C22
4	B	9001	6BN	C13-C12-N9-C8
4	A	9001	6BN	O36-C32-C33-C34
4	B	9001	6BN	O36-C32-C33-C34
4	A	9001	6BN	C15-C14-C21-C22
4	B	9001	6BN	C15-C14-C21-C22
4	A	9001	6BN	N29-C32-C33-C34

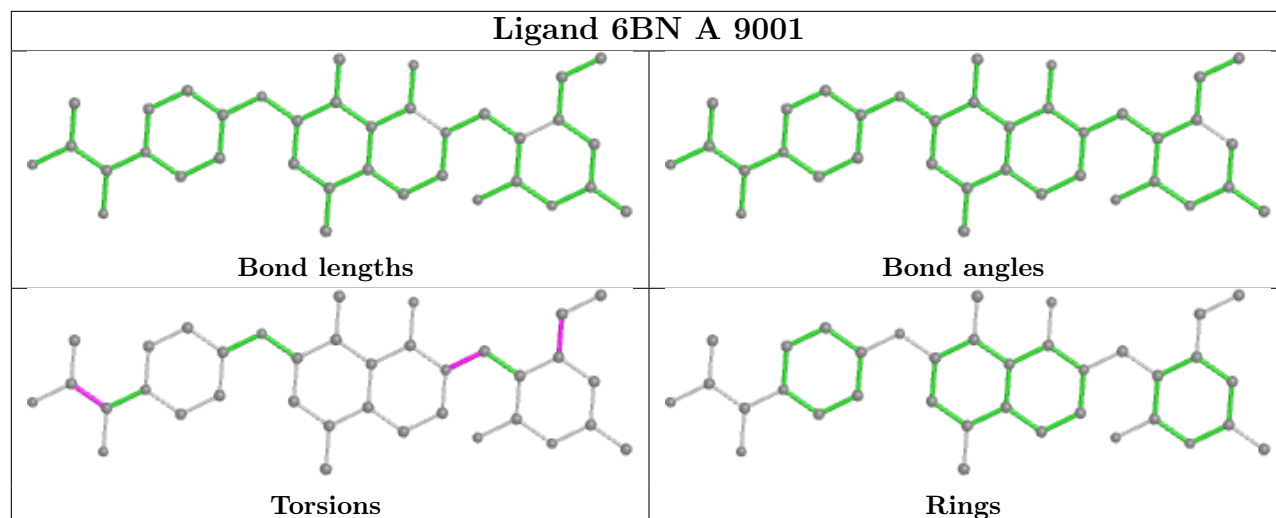
There are no ring outliers.

No monomer is involved in short contacts.

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.







## 5.7 Other polymers [\(i\)](#)

There are no such residues in this entry.

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

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	465/643 (72%)	0.21	8 (1%) 70 66	38, 63, 103, 133	0
1	B	469/643 (72%)	0.34	18 (3%) 40 34	40, 73, 110, 148	0
2	E	355/362 (98%)	0.06	2 (0%) 89 88	39, 55, 82, 102	0
2	F	360/362 (99%)	0.16	6 (1%) 70 66	39, 61, 90, 120	0
3	S	127/191 (66%)	0.24	3 (2%) 59 53	45, 67, 111, 122	0
3	T	128/191 (67%)	0.39	7 (5%) 25 20	50, 77, 116, 127	0
All	All	1904/2392 (79%)	0.22	44 (2%) 60 55	38, 64, 104, 148	0

All (44) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	F	383	HIS	7.9
1	B	300	HIS	5.9
1	B	303	PRO	5.4
2	F	382	PRO	5.3
1	B	467	TYR	5.1
3	T	587	LYS	5.1
1	B	166	ILE	4.9
1	B	306	TYR	4.7
3	S	587	LYS	4.4
1	A	301	ALA	4.2
1	B	595	ASP	4.0
1	A	468	GLU	3.9
2	F	426	LEU	3.8
1	B	466	VAL	3.5
1	B	430	VAL	3.5
1	A	166	ILE	3.4
1	B	299	PHE	3.3
3	T	688	LEU	3.2
3	S	585	ASP	3.2

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Mol	Chain	Res	Type	RSRZ
1	B	468	GLU	3.1
2	E	115	GLN	3.0
2	F	385	ALA	2.9
1	B	305	THR	2.9
1	A	264	ILE	2.7
1	B	301	ALA	2.7
1	A	299	PHE	2.7
1	B	733	ALA	2.7
1	B	270	LYS	2.6
2	E	426	LEU	2.5
3	T	602	GLU	2.5
1	A	238	GLU	2.5
1	B	593	HIS	2.4
2	F	350	TRP	2.4
1	A	300	HIS	2.4
1	B	446	THR	2.3
3	T	586	GLU	2.3
1	B	471	VAL	2.2
2	F	384	LYS	2.2
1	A	464	ARG	2.2
3	T	687	LYS	2.1
3	T	674	ILE	2.1
3	S	688	LEU	2.1
3	T	656	PHE	2.1
1	B	442	VAL	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](#)

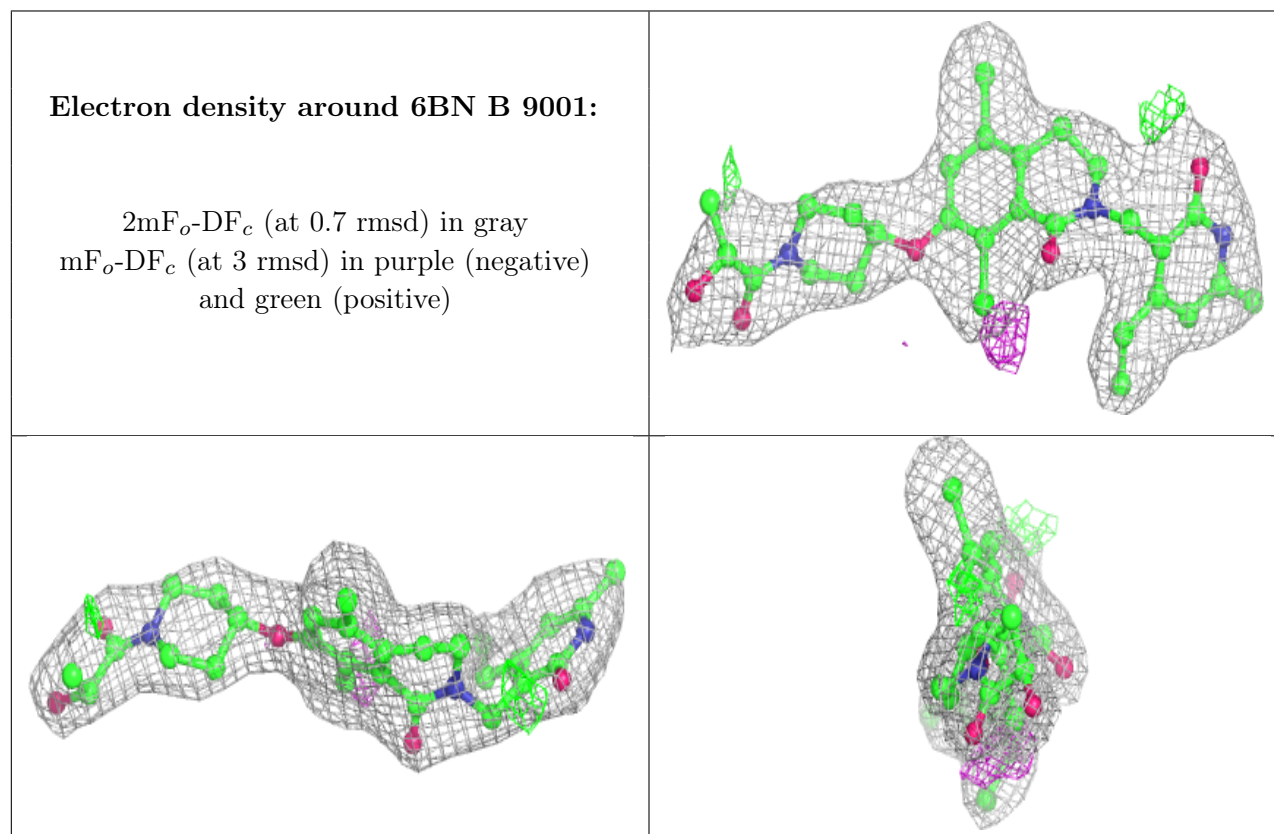
There are no monosaccharides in this entry.

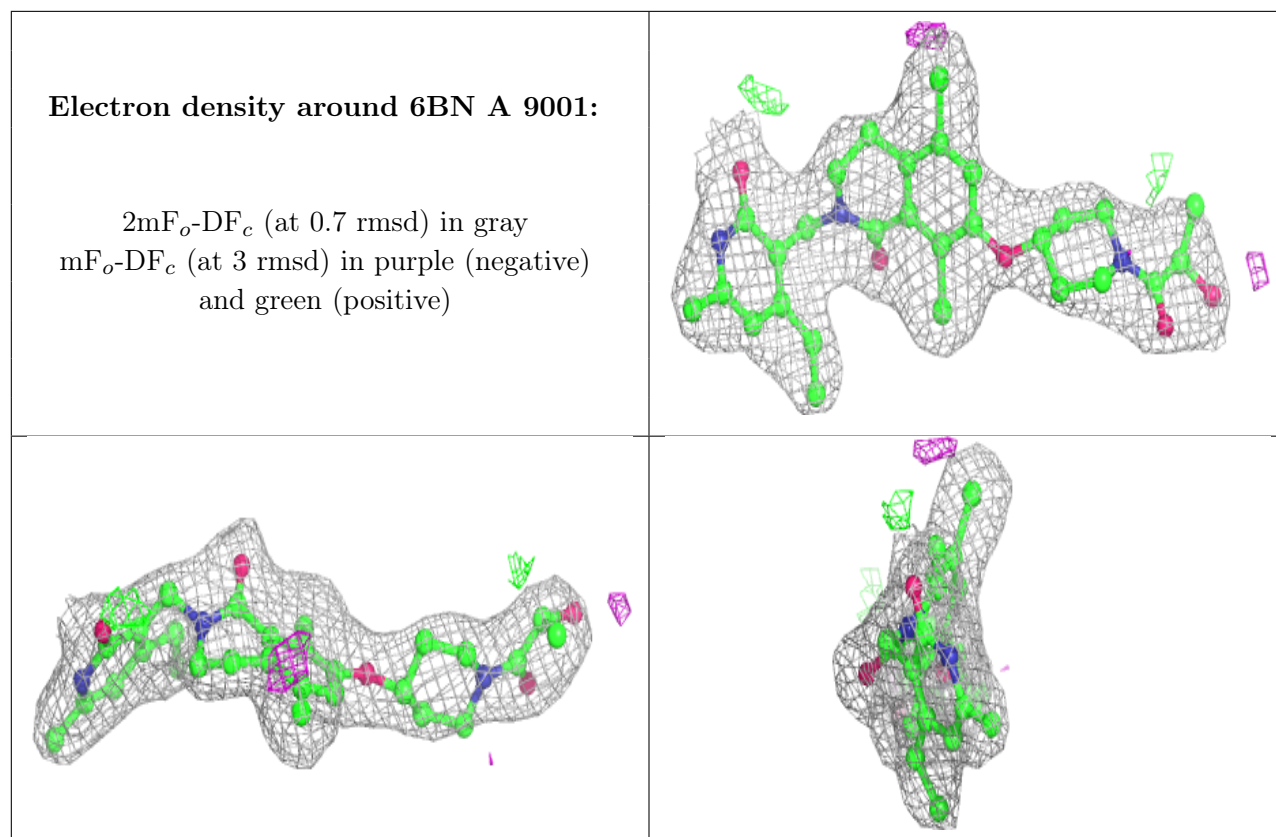
## 6.4 Ligands [i](#)

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( $\text{\AA}^2$ )	Q<0.9
4	6BN	B	9001	36/36	0.96	0.18	31,56,69,70	0
4	6BN	A	9001	36/36	0.97	0.17	32,51,64,66	0
5	ZN	B	9002	1/1	0.97	0.18	63,63,63,63	1
5	ZN	B	9005	1/1	0.97	0.23	61,61,61,61	1
5	ZN	B	9004	1/1	0.98	0.21	66,66,66,66	1
5	ZN	B	9006	1/1	0.98	0.21	56,56,56,56	1
5	ZN	A	9006	1/1	0.99	0.22	52,52,52,52	1
5	ZN	A	9005	1/1	0.99	0.24	36,36,36,36	1
5	ZN	B	9003	1/1	0.99	0.20	53,53,53,53	1
5	ZN	B	9007	1/1	0.99	0.19	45,45,45,45	1
5	ZN	B	9008	1/1	0.99	0.18	49,49,49,49	1
5	ZN	A	9003	1/1	1.00	0.19	46,46,46,46	1
5	ZN	A	9007	1/1	1.00	0.20	50,50,50,50	1
5	ZN	A	9008	1/1	1.00	0.20	35,35,35,35	1
5	ZN	A	9004	1/1	1.00	0.22	38,38,38,38	1
5	ZN	A	9002	1/1	1.00	0.22	35,35,35,35	1

The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.





## 6.5 Other polymers [i](#)

There are no such residues in this entry.