



# wwPDB X-ray Structure Validation Summary Report ⓘ

Feb 1, 2016 – 02:15 PM GMT

PDB ID : 3WIP  
Title : Crystal structure of acetylcholine bound to Ls-AChBP  
Authors : Olsen, J.A.; Balle, T.; Gajhede, M.; Ahring, P.K.; Kastrup, J.S.  
Deposited on : 2013-09-24  
Resolution : 2.60 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  
<http://wwpdb.org/validation/2016/XrayValidationReportHelp>  
with specific help available everywhere you see the ⓘ symbol.

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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 : 1.7 (RC4), CSD as536be (2015)  
Xtriage (Phenix) : 1.9-1692  
EDS : rb-20026688  
Percentile statistics : 20151230.v01 (using entries in the PDB archive December 30th 2015)  
Refmac : 5.8.0135  
CCP4 : 6.5.0  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : trunk26865

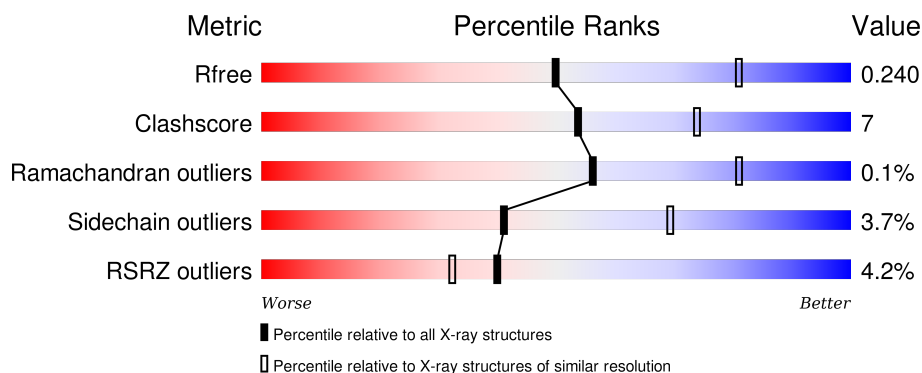
# 1 Overall quality at a glance ⓘ

The following experimental techniques were used to determine the structure:

## *X-RAY DIFFRACTION*

The reported resolution of this entry is 2.60 Å.

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








Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	91344	2328 (2.60-2.60)
Clashscore	102246	2679 (2.60-2.60)
Ramachandran outliers	100387	2635 (2.60-2.60)
Sidechain outliers	100360	2635 (2.60-2.60)
RSRZ outliers	91569	2334 (2.60-2.60)

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 on the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions  $\leq 5\%$ . The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	229	<div> <div>2%</div> <div> <div></div> <div>74%</div> <div>14%</div> <div>12%</div> </div> </div>
1	B	229	<div> <div>3%</div> <div> <div></div> <div>78%</div> <div>12%</div> <div>9%</div> </div> </div>
1	C	229	<div> <div>3%</div> <div> <div></div> <div>75%</div> <div>13%</div> <div>12%</div> </div> </div>
1	D	229	<div> <div>3%</div> <div> <div></div> <div>75%</div> <div>13%</div> <div>12%</div> </div> </div>
1	E	229	<div> <div>3%</div> <div> <div></div> <div>73%</div> <div>14%</div> <div>•</div> <div>12%</div> </div> </div>

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Mol	Chain	Length	Quality of chain
1	F	229	
1	G	229	
1	H	229	
1	I	229	
1	J	229	

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
2	ACH	A	301	-	-	-	X
2	ACH	B	301	-	-	-	X
2	ACH	C	301	-	-	-	X
2	ACH	F	301	-	-	-	X
2	ACH	H	301	-	-	-	X
2	ACH	I	301	-	-	-	X
2	ACH	J	301	-	-	-	X
3	1PE	A	302	-	-	-	X
3	1PE	A	303	-	-	X	X
3	1PE	A	304	-	-	X	-
3	1PE	B	304	-	-	X	-
3	1PE	D	303	-	-	-	X
3	1PE	D	304	-	-	-	X
3	1PE	E	303	-	-	X	X
3	1PE	G	303	-	-	X	X
3	1PE	H	302	-	-	X	X
3	1PE	I	302	-	-	-	X
4	SO4	B	302	-	-	-	X
4	SO4	C	302	-	-	-	X
4	SO4	D	302	-	-	-	X
4	SO4	E	302	-	-	-	X
4	SO4	F	302	-	-	-	X
4	SO4	G	302	-	-	-	X
4	SO4	J	302	-	-	-	X

## 2 Entry composition

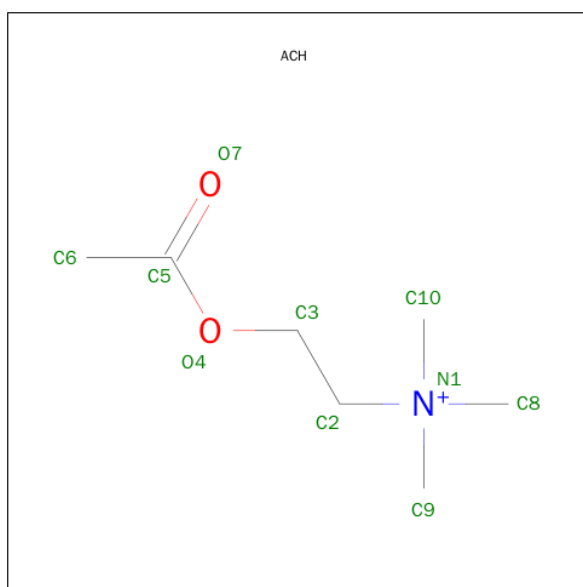
There are 7 unique types of molecules in this entry. The entry contains 17146 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 Acetylcholine-binding protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	202	Total	C	N	O	S	0	3	0
			1631	1022	282	321	6			
1	B	208	Total	C	N	O	S	0	3	0
			1683	1052	291	335	5			
1	C	202	Total	C	N	O	S	0	8	0
			1678	1048	294	331	5			
1	D	202	Total	C	N	O	S	0	5	0
			1653	1035	286	327	5			
1	E	202	Total	C	N	O	S	0	5	0
			1644	1036	280	321	7			
1	F	206	Total	C	N	O	S	0	0	0
			1648	1032	283	328	5			
1	G	202	Total	C	N	O	S	0	0	0
			1615	1012	276	322	5			
1	H	198	Total	C	N	O	S	0	1	0
			1587	998	272	312	5			
1	I	200	Total	C	N	O	S	0	1	0
			1611	1013	274	319	5			
1	J	201	Total	C	N	O	S	0	5	0
			1649	1039	283	321	6			

- Molecule 2 is ACETYLCHOLINE (three-letter code: ACH) (formula: C<sub>7</sub>H<sub>16</sub>NO<sub>2</sub>).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total	C	N	O	0	0
			10	7	1	2		
2	B	1	Total	C	N	O	0	0
			10	7	1	2		
2	C	1	Total	C	N	O	0	0
			10	7	1	2		
2	D	1	Total	C	N	O	0	0
			10	7	1	2		
2	E	1	Total	C	N	O	0	0
			10	7	1	2		
2	F	1	Total	C	N	O	0	0
			10	7	1	2		
2	G	1	Total	C	N	O	0	0
			10	7	1	2		
2	H	1	Total	C	N	O	0	0
			10	7	1	2		
2	I	1	Total	C	N	O	0	0
			10	7	1	2		
2	J	1	Total	C	N	O	0	0
			10	7	1	2		

- Molecule 3 is PENTAETHYLENE GLYCOL (three-letter code: 1PE) (formula: C<sub>10</sub>H<sub>22</sub>O<sub>6</sub>).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	C	O	0	0
			16	10	6		
3	A	1	Total	C	O	0	0
			16	10	6		
3	A	1	Total	C	O	0	0
			16	10	6		
3	B	1	Total	C	O	0	0
			16	10	6		
3	B	1	Total	C	O	0	0
			16	10	6		
3	D	1	Total	C	O	0	0
			16	10	6		
3	D	1	Total	C	O	0	0
			16	10	6		
3	E	1	Total	C	O	0	0
			16	10	6		
3	G	1	Total	C	O	0	0
			16	10	6		
3	H	1	Total	C	O	0	0
			11	7	4		
3	I	1	Total	C	O	0	0
			16	10	6		
3	J	1	Total	C	O	0	0
			16	10	6		

- Molecule 4 is SULFATE ION (three-letter code: SO4) (formula: O<sub>4</sub>S).



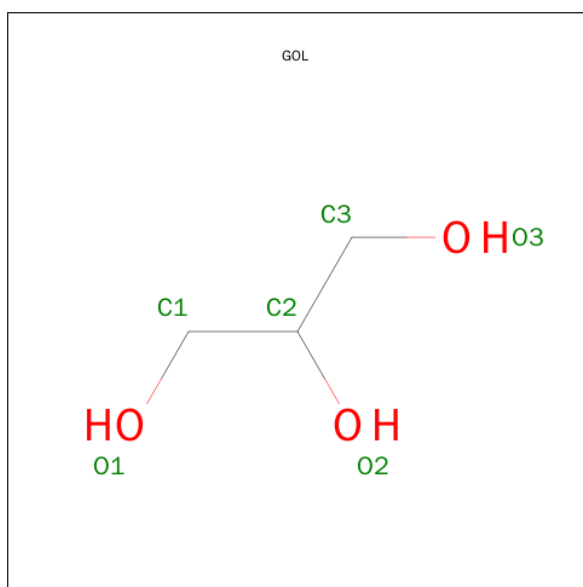
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	B	1	Total	O	S	0	0
			5	4	1		
4	C	1	Total	O	S	0	0
			5	4	1		
4	D	1	Total	O	S	0	0
			5	4	1		
4	E	1	Total	O	S	0	0
			5	4	1		
4	F	1	Total	O	S	0	0
			5	4	1		
4	G	1	Total	O	S	0	0
			5	4	1		
4	J	1	Total	O	S	0	0
			5	4	1		

- Molecule 5 is ACETATE ION (three-letter code: ACT) (formula: C<sub>2</sub>H<sub>3</sub>O<sub>2</sub>).



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

- Molecule 6 is GLYCEROL (three-letter code: GOL) (formula:  $C_3H_8O_3$ ).



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



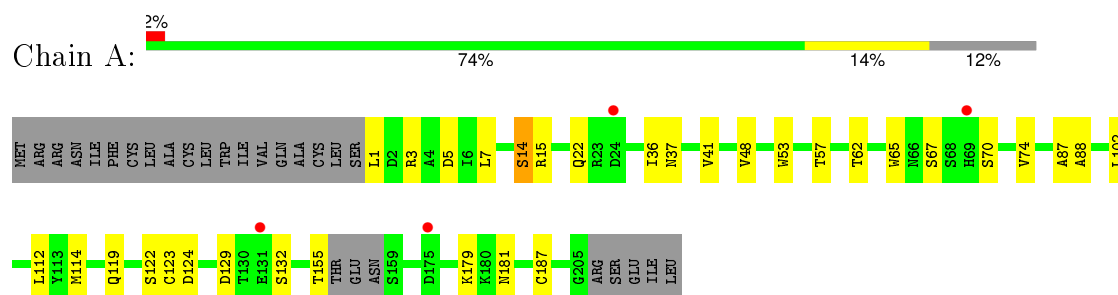
- Molecule 7 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	A	46	Total O 46 46	0	0
7	B	57	Total O 57 57	0	0
7	C	61	Total O 61 61	0	0
7	D	44	Total O 44 44	0	0
7	E	41	Total O 41 41	0	0
7	F	27	Total O 27 27	0	0
7	G	36	Total O 36 36	0	0
7	H	28	Total O 28 28	0	0
7	I	37	Total O 37 37	0	0
7	J	30	Total O 30 30	0	0

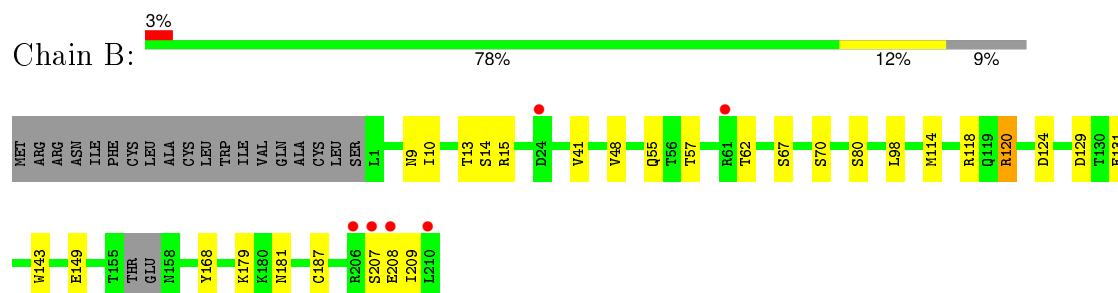
### 3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of errors displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density ( $RSRZ > 2$ ). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

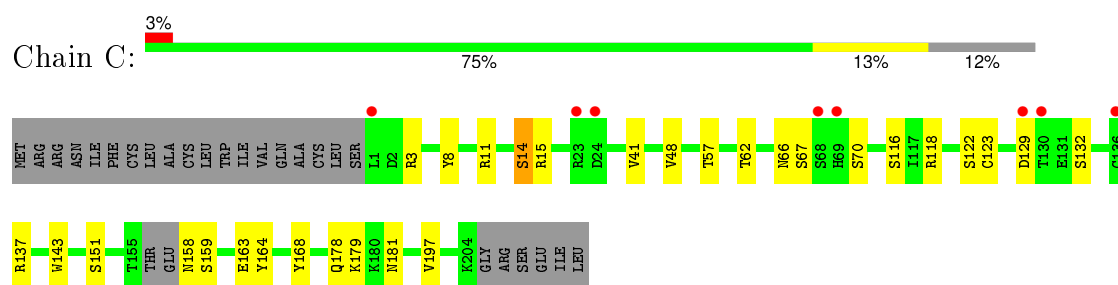
- Molecule 1: Acetylcholine-binding protein



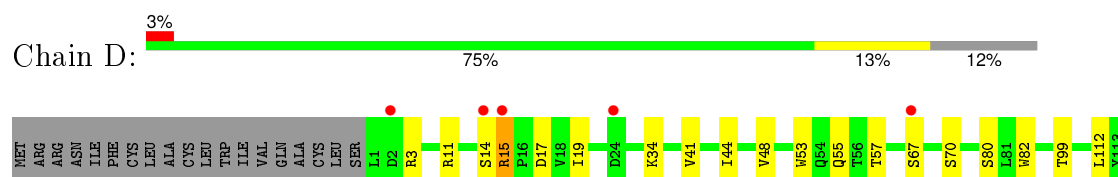
- Molecule 1: Acetylcholine-binding protein

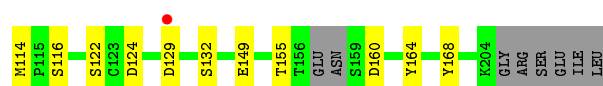


- Molecule 1: Acetylcholine-binding protein

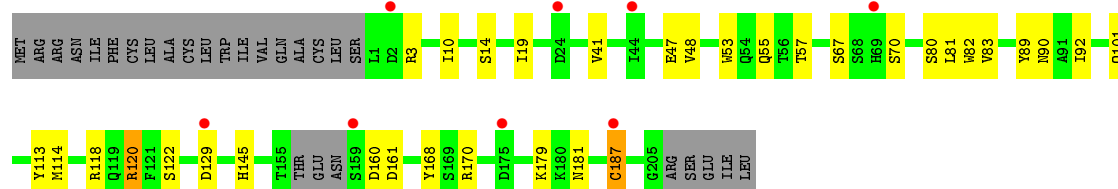
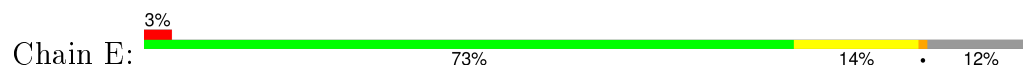


- Molecule 1: Acetylcholine-binding protein

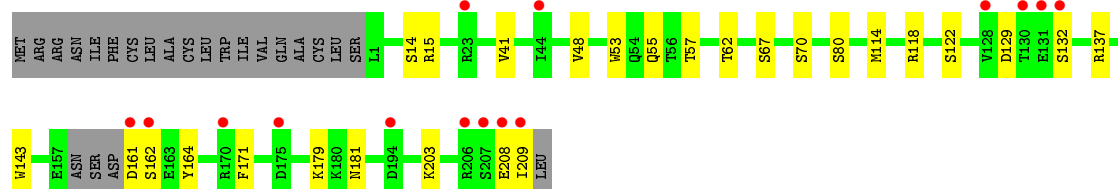
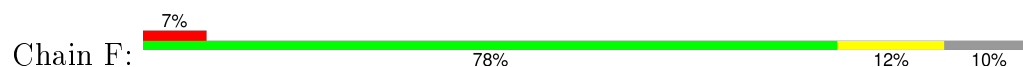




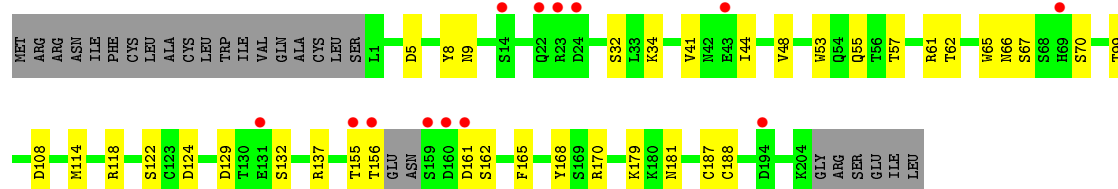
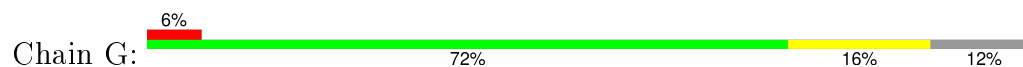
• Molecule 1: Acetylcholine-binding protein



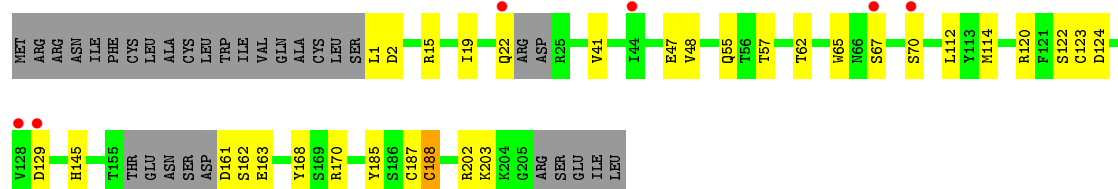
• Molecule 1: Acetylcholine-binding protein



• Molecule 1: Acetylcholine-binding protein

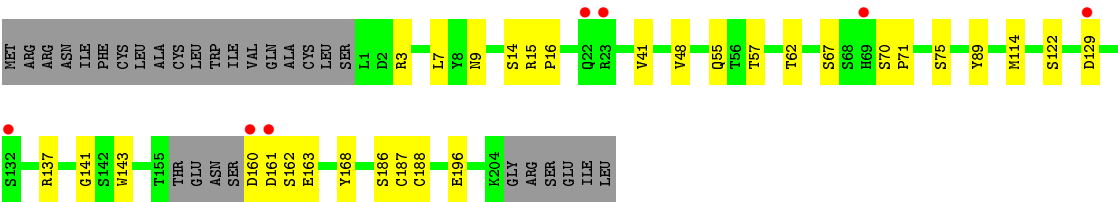


• Molecule 1: Acetylcholine-binding protein

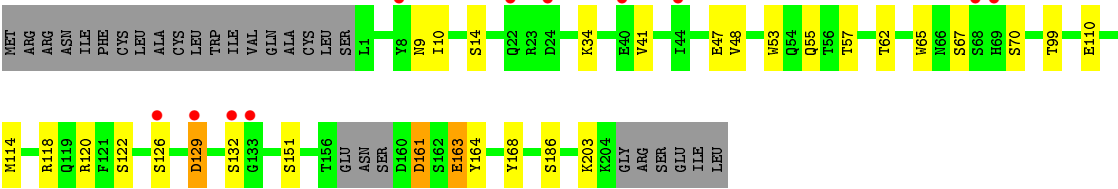


• Molecule 1: Acetylcholine-binding protein





● Molecule 1: Acetylcholine-binding protein



## 4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	236.85Å 73.15Å 132.47Å 90.00° 101.45° 90.00°	Depositor
Resolution (Å)	46.17 – 2.60 47.00 – 2.60	Depositor EDS
% Data completeness (in resolution range)	99.1 (46.17-2.60) 98.9 (47.00-2.60)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	0.10	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	3.33 (at 2.61Å)	Xtriage
Refinement program	PHENIX (phenix.refine: 1.8.2_1309)	Depositor
R, $R_{free}$	0.179 , 0.239 0.191 , 0.240	Depositor DCC
$R_{free}$ test set	3446 reflections (5.33%)	DCC
Wilson B-factor (Å <sup>2</sup> )	35.0	Xtriage
Anisotropy	0.232	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.37 , 55.4	EDS
Estimated twinning fraction	No twinning to report.	Xtriage
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.32$	Xtriage
Outliers	1 of 68167 reflections (0.001%)	Xtriage
$F_o, F_c$ correlation	0.94	EDS
Total number of atoms	17146	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	32.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.30% 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, 0.375 respectively for untwinned datasets, and 0.333, 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: ACT, GOL, ACH, SO4, 1PE

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	0.47	0/1675	0.61	0/2283
1	B	0.49	0/1721	0.62	2/2345 (0.1%)
1	C	0.49	0/1723	0.61	1/2348 (0.0%)
1	D	0.48	0/1694	0.63	0/2309
1	E	0.49	0/1696	0.60	2/2314 (0.1%)
1	F	0.45	0/1683	0.61	1/2294 (0.0%)
1	G	0.44	0/1650	0.56	0/2251
1	H	0.44	0/1624	0.60	0/2214
1	I	0.46	0/1650	0.59	0/2251
1	J	0.45	0/1698	0.57	0/2317
All	All	0.47	0/16814	0.60	6/22926 (0.0%)

There are no bond length outliers.

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

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	E	118	ARG	NE-CZ-NH1	5.67	123.13	120.30
1	E	118	ARG	NE-CZ-NH2	-5.57	117.52	120.30
1	B	118	ARG	NE-CZ-NH1	5.48	123.04	120.30
1	F	118	ARG	NE-CZ-NH2	-5.43	117.58	120.30
1	C	118	ARG	NE-CZ-NH2	-5.29	117.66	120.30

There are no chirality outliers.

There are no planarity outliers.

### 5.2 Too-close contacts [i](#)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen

atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1631	0	1592	34	0
1	B	1683	0	1637	19	0
1	C	1678	0	1634	19	0
1	D	1653	0	1618	22	0
1	E	1644	0	1609	28	0
1	F	1648	0	1600	16	0
1	G	1615	0	1565	24	0
1	H	1587	0	1547	25	0
1	I	1611	0	1562	24	0
1	J	1649	0	1615	20	0
2	A	10	0	16	0	0
2	B	10	0	16	0	0
2	C	10	0	16	0	0
2	D	10	0	16	1	0
2	E	10	0	16	0	0
2	F	10	0	16	0	0
2	G	10	0	16	1	0
2	H	10	0	16	1	0
2	I	10	0	16	0	0
2	J	10	0	16	0	0
3	A	48	0	66	19	0
3	B	32	0	44	10	0
3	D	32	0	44	8	0
3	E	16	0	22	15	0
3	G	16	0	22	9	0
3	H	11	0	13	10	0
3	I	16	0	22	4	0
3	J	16	0	22	6	0
4	B	5	0	0	0	0
4	C	5	0	0	0	0
4	D	5	0	0	1	0
4	E	5	0	0	0	0
4	F	5	0	0	0	0
4	G	5	0	0	0	0
4	J	5	0	0	0	0
5	B	4	0	3	0	0
5	G	8	0	6	1	0
6	G	6	0	8	2	0
7	A	46	0	0	3	0
7	B	57	0	0	1	0
7	C	61	0	0	4	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
7	D	44	0	0	1	0
7	E	41	0	0	0	0
7	F	27	0	0	0	0
7	G	36	0	0	2	0
7	H	28	0	0	2	0
7	I	37	0	0	2	0
7	J	30	0	0	2	0
All	All	17146	0	16411	217	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 217 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)
3:H:302:1PE:H161	1:I:75:SER:H	1.20	1.02
1:H:19:ILE:HG22	3:H:302:1PE:H261	1.50	0.93
1:H:145:HIS:HE1	3:H:302:1PE:H162	1.36	0.90
1:E:47:GLU:HB3	1:E:120:ARG:HH12	1.39	0.86
1:F:15:ARG:HH11	3:G:303:1PE:H232	1.42	0.85

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	201/229 (88%)	200 (100%)	1 (0%)	0	100	100
1	B	207/229 (90%)	205 (99%)	2 (1%)	0	100	100
1	C	206/229 (90%)	201 (98%)	5 (2%)	0	100	100
1	D	203/229 (89%)	201 (99%)	0	2 (1%)	19	39

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	E	203/229 (89%)	201 (99%)	2 (1%)	0	100	100
1	F	202/229 (88%)	198 (98%)	4 (2%)	0	100	100
1	G	198/229 (86%)	197 (100%)	1 (0%)	0	100	100
1	H	193/229 (84%)	190 (98%)	2 (1%)	1 (0%)	34	60
1	I	197/229 (86%)	195 (99%)	2 (1%)	0	100	100
1	J	202/229 (88%)	199 (98%)	3 (2%)	0	100	100
All	All	2012/2290 (88%)	1987 (99%)	22 (1%)	3 (0%)	56	81

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	H	162	SER
1	D	15[A]	ARG
1	D	15[B]	ARG

### 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	191/213 (90%)	183 (96%)	8 (4%)	36	65
1	B	197/213 (92%)	189 (96%)	8 (4%)	37	66
1	C	197/213 (92%)	190 (96%)	7 (4%)	42	71
1	D	194/213 (91%)	189 (97%)	5 (3%)	54	80
1	E	193/213 (91%)	188 (97%)	5 (3%)	54	80
1	F	192/213 (90%)	185 (96%)	7 (4%)	42	71
1	G	189/213 (89%)	179 (95%)	10 (5%)	28	53
1	H	185/213 (87%)	178 (96%)	7 (4%)	40	68
1	I	188/213 (88%)	182 (97%)	6 (3%)	46	74
1	J	193/213 (91%)	185 (96%)	8 (4%)	37	66
All	All	1919/2130 (90%)	1848 (96%)	71 (4%)	41	69

5 of 71 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	E	187	CYS
1	F	162	SER
1	J	118	ARG
1	F	57	THR
1	F	129	ASP

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (3) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	9	ASN
1	G	9	ASN
1	I	9	ASN

### 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 carbohydrates in this entry.

## 5.6 Ligand geometry [i](#)

33 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	ACH	A	301	-	9,9,9	1.15	0	12,12,12	1.63	4 (33%)
3	1PE	A	302	-	15,15,15	0.86	0	14,14,14	1.73	3 (21%)
3	1PE	A	303	-	15,15,15	0.94	1 (6%)	14,14,14	1.14	2 (14%)
3	1PE	A	304	-	15,15,15	1.31	0	14,14,14	2.16	6 (42%)
2	ACH	B	301	-	9,9,9	1.16	0	12,12,12	1.63	3 (25%)
4	SO4	B	302	-	4,4,4	0.07	0	6,6,6	0.29	0
3	1PE	B	303	-	15,15,15	0.88	0	14,14,14	0.95	0
3	1PE	B	304	-	15,15,15	0.75	0	14,14,14	1.19	1 (7%)
5	ACT	B	305	-	1,3,3	1.55	0	0,3,3	0.00	-
2	ACH	C	301	-	9,9,9	1.26	0	12,12,12	1.47	2 (16%)
4	SO4	C	302	-	4,4,4	0.23	0	6,6,6	0.38	0
2	ACH	D	301	-	9,9,9	1.12	0	12,12,12	1.48	1 (8%)
4	SO4	D	302	-	4,4,4	1.40	0	6,6,6	0.65	0
3	1PE	D	303	-	15,15,15	0.93	0	14,14,14	1.55	1 (7%)
3	1PE	D	304	-	15,15,15	0.77	0	14,14,14	1.97	4 (28%)
2	ACH	E	301	-	9,9,9	1.22	0	12,12,12	1.46	1 (8%)
4	SO4	E	302	-	4,4,4	0.16	0	6,6,6	0.26	0
3	1PE	E	303	-	15,15,15	0.94	0	14,14,14	1.25	3 (21%)
2	ACH	F	301	-	9,9,9	1.11	0	12,12,12	1.55	2 (16%)
4	SO4	F	302	-	4,4,4	0.06	0	6,6,6	0.17	0
2	ACH	G	301	-	9,9,9	1.17	0	12,12,12	1.42	1 (8%)
4	SO4	G	302	-	4,4,4	0.06	0	6,6,6	0.20	0
3	1PE	G	303	-	15,15,15	0.71	0	14,14,14	1.56	2 (14%)
6	GOL	G	304	-	5,5,5	0.26	0	5,5,5	0.18	0
5	ACT	G	305	-	1,3,3	1.74	0	0,3,3	0.00	-
5	ACT	G	306	-	1,3,3	1.69	0	0,3,3	0.00	-
2	ACH	H	301	-	9,9,9	1.14	0	12,12,12	1.50	2 (16%)
3	1PE	H	302	-	10,10,15	0.77	0	9,9,14	0.80	0
2	ACH	I	301	-	9,9,9	1.31	0	12,12,12	1.50	2 (16%)
3	1PE	I	302	-	15,15,15	0.87	0	14,14,14	1.95	6 (42%)
2	ACH	J	301	-	9,9,9	1.17	0	12,12,12	1.38	2 (16%)
4	SO4	J	302	-	4,4,4	0.14	0	6,6,6	0.24	0
3	1PE	J	303	-	15,15,15	0.77	0	14,14,14	2.07	4 (28%)

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	ACH	A	301	-	-	0/7/7/7	0/0/0/0
3	1PE	A	302	-	-	0/13/13/13	0/0/0/0
3	1PE	A	303	-	-	0/13/13/13	0/0/0/0
3	1PE	A	304	-	-	0/13/13/13	0/0/0/0
2	ACH	B	301	-	-	0/7/7/7	0/0/0/0
4	SO4	B	302	-	-	0/0/0/0	0/0/0/0
3	1PE	B	303	-	-	0/13/13/13	0/0/0/0
3	1PE	B	304	-	-	0/13/13/13	0/0/0/0
5	ACT	B	305	-	-	0/0/0/0	0/0/0/0
2	ACH	C	301	-	-	0/7/7/7	0/0/0/0
4	SO4	C	302	-	-	0/0/0/0	0/0/0/0
2	ACH	D	301	-	-	0/7/7/7	0/0/0/0
4	SO4	D	302	-	-	0/0/0/0	0/0/0/0
3	1PE	D	303	-	-	0/13/13/13	0/0/0/0
3	1PE	D	304	-	-	0/13/13/13	0/0/0/0
2	ACH	E	301	-	-	0/7/7/7	0/0/0/0
4	SO4	E	302	-	-	0/0/0/0	0/0/0/0
3	1PE	E	303	-	-	0/13/13/13	0/0/0/0
2	ACH	F	301	-	-	0/7/7/7	0/0/0/0
4	SO4	F	302	-	-	0/0/0/0	0/0/0/0
2	ACH	G	301	-	-	0/7/7/7	0/0/0/0
4	SO4	G	302	-	-	0/0/0/0	0/0/0/0
3	1PE	G	303	-	-	0/13/13/13	0/0/0/0
6	GOL	G	304	-	-	0/4/4/4	0/0/0/0
5	ACT	G	305	-	-	0/0/0/0	0/0/0/0
5	ACT	G	306	-	-	0/0/0/0	0/0/0/0
2	ACH	H	301	-	-	0/7/7/7	0/0/0/0
3	1PE	H	302	-	-	0/8/8/13	0/0/0/0
2	ACH	I	301	-	-	0/7/7/7	0/0/0/0
3	1PE	I	302	-	-	0/13/13/13	0/0/0/0
2	ACH	J	301	-	-	0/7/7/7	0/0/0/0
4	SO4	J	302	-	-	0/0/0/0	0/0/0/0
3	1PE	J	303	-	-	0/13/13/13	0/0/0/0

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	303	1PE	OH4-C24	2.00	1.50	1.42

The worst 5 of 52 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	D	304	1PE	C25-OH5-C14	-4.01	96.05	113.31

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	I	302	1PE	OH3-C22-C12	-3.41	94.75	110.43
3	G	303	1PE	C24-OH4-C13	-3.27	99.23	113.31
3	J	303	1PE	OH4-C13-C23	-2.77	98.04	110.36
3	E	303	1PE	C23-OH3-C22	-2.69	101.74	113.31

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

18 monomers are involved in 88 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	302	1PE	4	0
3	A	303	1PE	7	0
3	A	304	1PE	8	0
3	B	303	1PE	2	0
3	B	304	1PE	8	0
2	D	301	ACH	1	0
4	D	302	SO4	1	0
3	D	303	1PE	3	0
3	D	304	1PE	5	0
3	E	303	1PE	15	0
2	G	301	ACH	1	0
3	G	303	1PE	9	0
6	G	304	GOL	2	0
5	G	305	ACT	1	0
2	H	301	ACH	1	0
3	H	302	1PE	10	0
3	I	302	1PE	4	0
3	J	303	1PE	6	0

## 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	202/229 (88%)	0.04	4 (1%) 68 63	14, 28, 50, 80	0
1	B	208/229 (90%)	0.13	6 (2%) 55 48	14, 28, 59, 78	0
1	C	202/229 (88%)	0.02	8 (3%) 42 34	12, 25, 49, 82	0
1	D	202/229 (88%)	0.04	6 (2%) 54 47	12, 26, 53, 73	0
1	E	202/229 (88%)	0.08	8 (3%) 42 34	13, 26, 52, 67	0
1	F	206/229 (89%)	0.28	15 (7%) 18 12	16, 35, 62, 85	0
1	G	202/229 (88%)	0.22	13 (6%) 23 17	17, 34, 62, 89	0
1	H	198/229 (86%)	0.22	6 (3%) 54 47	18, 34, 59, 74	0
1	I	200/229 (87%)	0.16	7 (3%) 48 40	14, 30, 59, 86	0
1	J	201/229 (87%)	0.23	11 (5%) 29 21	13, 32, 60, 76	0
All	All	2023/2290 (88%)	0.14	84 (4%) 40 32	12, 30, 59, 89	0

The worst 5 of 84 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	G	161	ASP	5.2
1	D	24	ASP	4.9
1	G	23	ARG	4.3
1	C	24	ASP	4.2
1	B	207	SER	4.2

### 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	RSCC	RSR	LLDF	B-factors(Å <sup>2</sup> )	Q<0.9
3	1PE	E	303	16/16	0.83	0.39	8.91	19,39,58,64	0
3	1PE	D	304	16/16	0.88	0.30	7.44	17,42,51,54	0
3	1PE	H	302	11/16	0.85	0.33	7.00	18,35,41,42	0
2	ACH	F	301	10/10	0.88	0.27	6.38	18,26,38,47	0
3	1PE	A	303	16/16	0.84	0.32	6.00	25,40,50,54	0
2	ACH	B	301	10/10	0.87	0.28	5.32	9,25,33,35	0
2	ACH	H	301	10/10	0.89	0.24	4.72	15,25,33,39	0
4	SO4	J	302	5/5	0.68	0.53	4.04	56,88,107,109	0
2	ACH	A	301	10/10	0.89	0.25	4.00	12,25,33,36	0
3	1PE	D	303	16/16	0.82	0.31	3.81	18,40,55,69	0
4	SO4	E	302	5/5	0.82	0.27	3.21	38,64,72,92	0
4	SO4	B	302	5/5	0.82	0.55	3.19	42,69,85,100	0
2	ACH	J	301	10/10	0.85	0.24	3.15	15,25,43,44	0
3	1PE	G	303	16/16	0.88	0.36	3.06	42,52,59,61	0
4	SO4	D	302	5/5	0.85	0.48	2.46	48,55,84,100	0
2	ACH	C	301	10/10	0.94	0.22	2.38	9,24,31,40	0
3	1PE	I	302	16/16	0.84	0.26	2.26	32,44,58,59	0
4	SO4	F	302	5/5	0.89	0.43	2.18	64,67,71,75	0
3	1PE	A	302	16/16	0.85	0.28	2.10	33,45,61,68	0
4	SO4	C	302	5/5	0.94	0.31	2.09	53,55,63,90	0
2	ACH	I	301	10/10	0.91	0.22	2.07	8,20,30,32	0
4	SO4	G	302	5/5	0.83	0.40	1.74	65,67,96,96	0
3	1PE	J	303	16/16	0.87	0.27	1.74	27,44,53,60	0
3	1PE	A	304	16/16	0.91	0.22	1.73	27,40,50,56	0
3	1PE	B	304	16/16	0.90	0.28	1.72	27,38,49,51	0
3	1PE	B	303	16/16	0.89	0.19	1.71	24,42,53,53	0
2	ACH	D	301	10/10	0.91	0.23	1.69	7,18,29,30	0
2	ACH	G	301	10/10	0.91	0.21	0.75	11,29,34,41	0
2	ACH	E	301	10/10	0.91	0.23	0.67	11,23,36,38	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	LLDF	B-factors( $\text{\AA}^2$ )	Q<0.9
5	ACT	G	306	4/4	0.83	0.19	-0.21	25,43,57,61	0
5	ACT	B	305	4/4	0.89	0.15	-0.67	33,34,35,38	0
5	ACT	G	305	4/4	0.87	0.19	-1.05	30,57,58,65	0
6	GOL	G	304	6/6	0.69	0.24	-	49,66,72,72	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.