



# Full wwPDB X-ray Structure Validation Report ⓘ

Feb 1, 2016 – 03:00 PM GMT

PDB ID : 4B80  
Title : Mus musculus Acetylcholinesterase in complex with N-(2-Diethylamino-ethyl)-1-(4-fluoro-phenyl)-methanesulfonamide  
Authors : Andersson, C.D.; Forsgren, N.; Akfur, C.; Allgardsson, A.; Berg, L.; Qian, W.; Ekstrom, F.; Linusson, A.  
Deposited on : 2012-08-24  
Resolution : 2.50 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  
<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

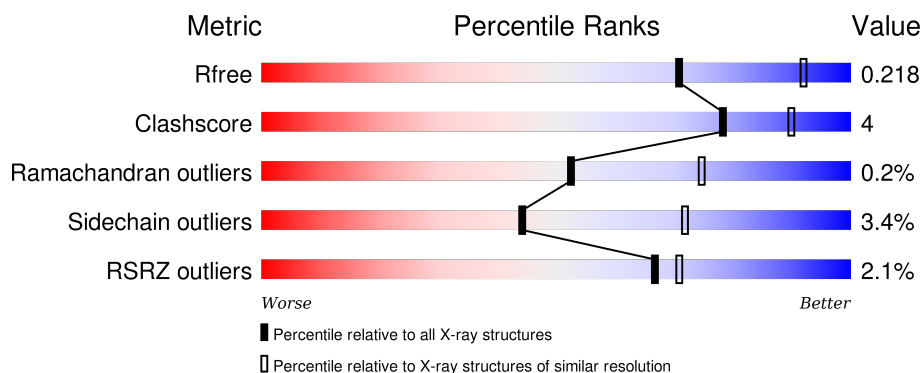
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

## *X-RAY DIFFRACTION*

The reported resolution of this entry is 2.50 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	3553 (2.50-2.50)
Clashscore	102246	4242 (2.50-2.50)
Ramachandran outliers	100387	4156 (2.50-2.50)
Sidechain outliers	100360	4158 (2.50-2.50)
RSRZ outliers	91569	3562 (2.50-2.50)

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	548	<div> <div>3%</div> <div>86%</div> <div>11%</div> <div>..</div> </div>
1	B	548	<div> <div>%</div> <div>86%</div> <div>10%</div> <div>..</div> </div>

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	SO4	A	1545	-	-	-	X
4	SO4	B	1545	-	-	-	X
5	NAG	A	1546	-	-	-	X
5	NAG	B	1548	X	-	-	-
6	PEG	A	1547	-	-	-	X
8	PGE	A	1551	-	-	-	X
8	PGE	B	1547	-	-	-	X
9	P4C	B	1554	-	-	-	X

## 2 Entry composition [i](#)

There are 10 unique types of molecules in this entry. The entry contains 8861 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.

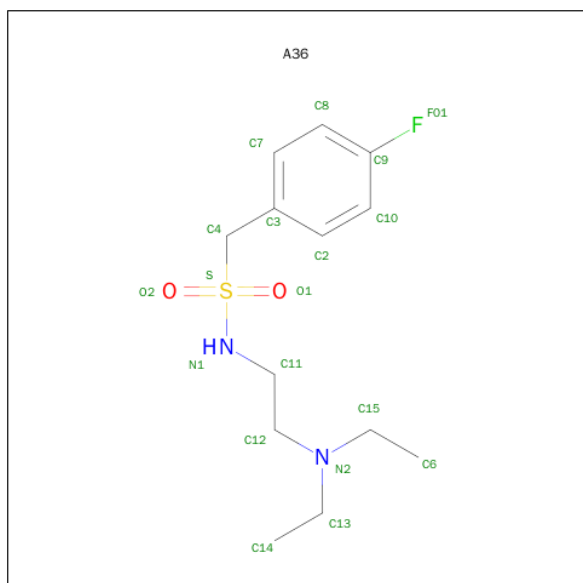
- Molecule 1 is a protein called ACETYLCHOLINESTERASE.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	538	Total	C	N	O	S	0	2	0
			4205	2697	731	763	14			
1	B	533	Total	C	N	O	S	0	3	0
			4185	2688	727	756	14			

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	546	GLU	-	EXPRESSION TAG	UNP P21836
A	547	ALA	-	EXPRESSION TAG	UNP P21836
A	548	PRO	-	EXPRESSION TAG	UNP P21836
B	546	GLU	-	EXPRESSION TAG	UNP P21836
B	547	ALA	-	EXPRESSION TAG	UNP P21836
B	548	PRO	-	EXPRESSION TAG	UNP P21836

- Molecule 2 is N-[2-(DIETHYLAMINO)ETHYL]-1-(4-FLUOROPHENYL)METHANESULFONAMIDE (three-letter code: A36) (formula: C<sub>13</sub>H<sub>21</sub>FN<sub>2</sub>O<sub>2</sub>S).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	F	N	O	S	
			19	13	1	2	2	1	
2	B	1	Total	C	F	N	O	S	
			19	13	1	2	2	1	

- Molecule 3 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula:  $C_2H_6O_2$ ).



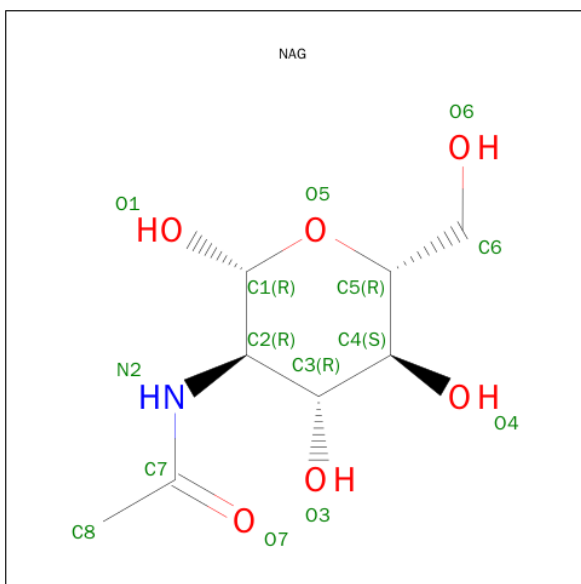
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	C	O		
			4	2	2	0	0
3	A	1	Total	C	O		
			4	2	2	0	0
3	B	1	Total	C	O		
			4	2	2	0	0
3	B	1	Total	C	O		
			4	2	2	0	0
3	B	1	Total	C	O		
			4	2	2	0	0

- Molecule 4 is SULFATE ION (three-letter code: SO4) (formula:  $O_4S$ ).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total	O	S	0	0
			5	4	1		
4	B	1	Total	O	S	0	0
			5	4	1		

- Molecule 5 is SUGAR (N-ACETYL-D-GLUCOSAMINE) (three-letter code: NAG) (formula: C<sub>8</sub>H<sub>15</sub>NO<sub>6</sub>).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
5	A	1	Total	C	N	O	0	0
			14	8	1	5		

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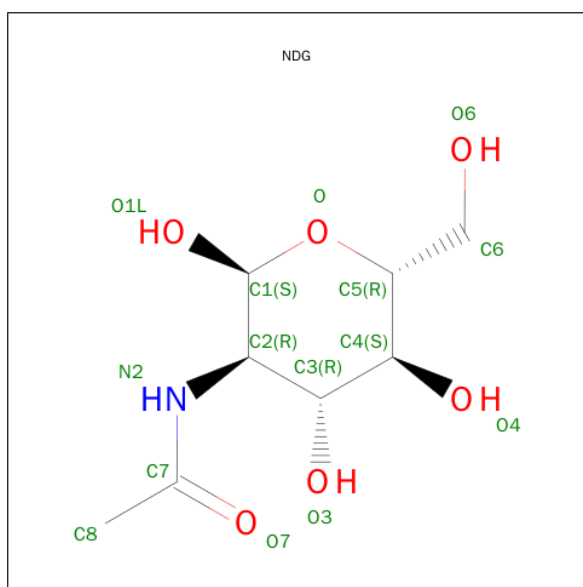
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
5	B	1	Total	C	N	O	0	0
			14	8	1	5		

- Molecule 6 is DI(HYDROXYETHYL)ETHER (three-letter code: PEG) (formula:  $C_4H_{10}O_3$ ).



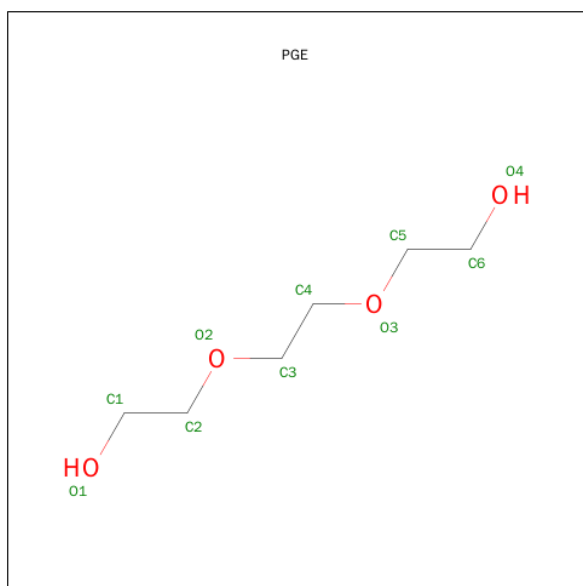
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	A	1	Total	C	O	0	0
			7	4	3		
6	A	1	Total	C	O	0	0
			7	4	3		
6	A	1	Total	C	O	0	0
			7	4	3		
6	B	1	Total	C	O	0	0
			7	4	3		
6	B	1	Total	C	O	0	0
			7	4	3		
6	B	1	Total	C	O	0	0
			7	4	3		

- Molecule 7 is SUGAR (2-(ACETYLAMINO)-2-DEOXY-A-D-GLUCOPYRANOSE) (three-letter code: NDG) (formula:  $C_8H_{15}NO_6$ ).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
7	A	1	Total	C	N	O	0	0
			14	8	1	5		

- Molecule 8 is TRIETHYLENE GLYCOL (three-letter code: PGE) (formula:  $C_6H_{14}O_4$ ).

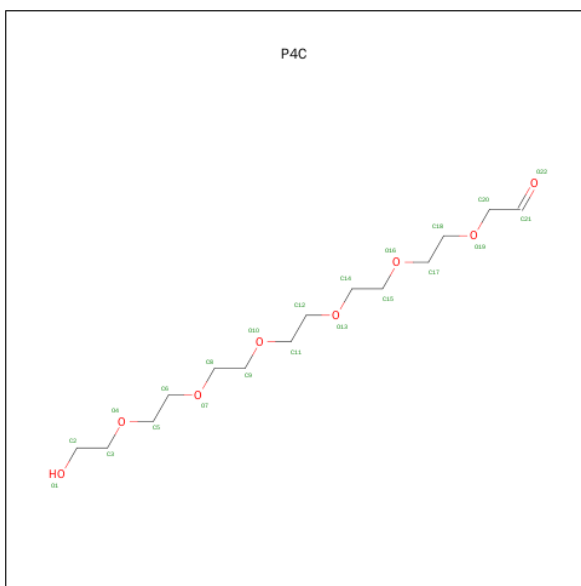


Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
8	A	1	Total	C	O	0	0
			10	6	4		
8	B	1	Total	C	O	0	0
			10	6	4		

- Molecule 9 is O-ACETALDEHYDYL-HEXAETHYLENE GLYCOL (three-letter code:



P4C) (formula:  $\text{C}_{14}\text{H}_{28}\text{O}_8$ ).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
9	B	1	Total	C	O	0	0
			22	14	8		

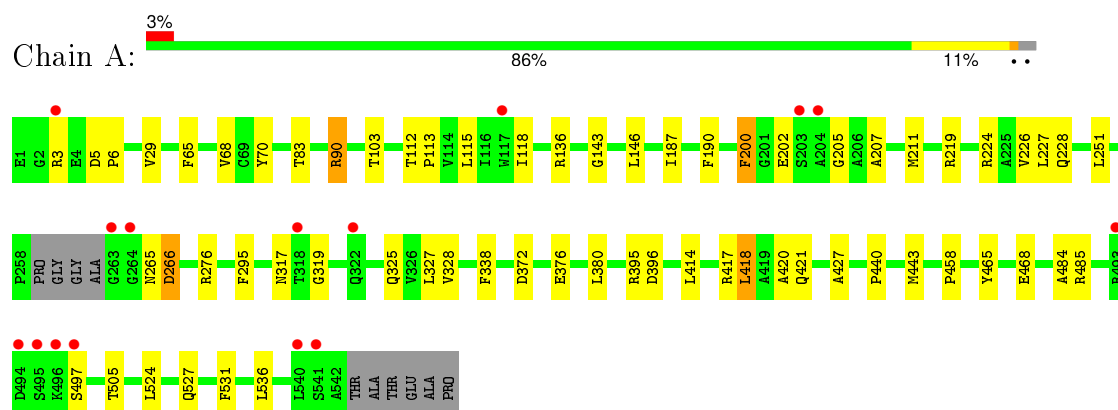
- Molecule 10 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
10	A	161	Total O 161 161	0	0
10	B	112	Total O 112 112	0	0

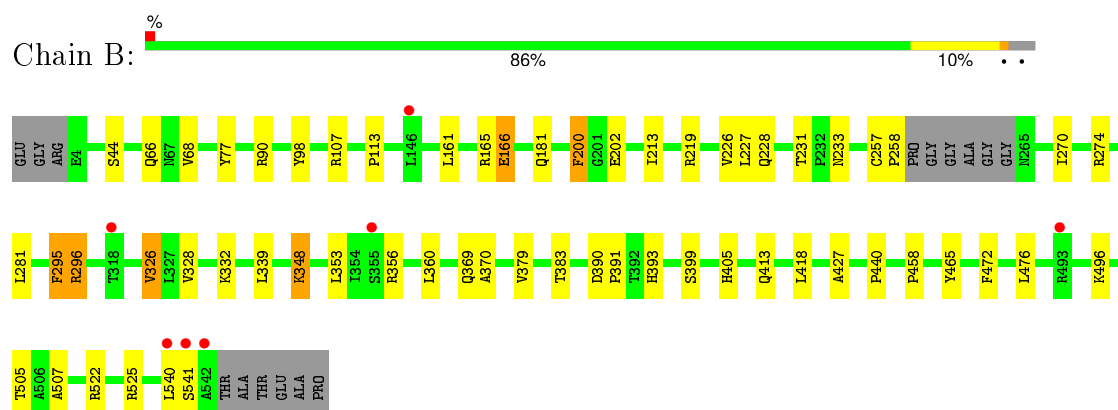
### 3 Residue-property plots [i](#)

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: ACETYLCHOLINESTERASE



#### • Molecule 1: ACETYLCHOLINESTERASE



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	78.87Å 111.54Å 227.59Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	28.95 – 2.50 28.95 – 2.50	Depositor EDS
% Data completeness (in resolution range)	99.8 (28.95-2.50) 100.0 (28.95-2.50)	Depositor EDS
$R_{merge}$	0.09	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.87 (at 2.51Å)	Xtriage
Refinement program	PHENIX (PHENIX.REFINE)	Depositor
R, $R_{free}$	0.186 , 0.223 0.185 , 0.218	Depositor DCC
$R_{free}$ test set	1411 reflections (2.05%)	DCC
Wilson B-factor (Å <sup>2</sup> )	42.0	Xtriage
Anisotropy	0.803	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.31 , 40.4	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	0 of 70265 reflections	Xtriage
$F_o, F_c$ correlation	0.96	EDS
Total number of atoms	8861	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	50.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.61% 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

### 5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: PGE, NAG, P4C, EDO, NDG, SO4, PEG, A36

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	0.39	0/4336	0.54	0/5924
1	B	0.37	0/4319	0.53	0/5901
All	All	0.38	0/8655	0.53	0/11825

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	4205	0	4090	32	0
1	B	4185	0	4085	28	0
2	A	19	0	21	2	0
2	B	19	0	21	0	0
3	A	8	0	12	0	0
3	B	16	0	24	1	0
4	A	5	0	0	0	0
4	B	5	0	0	0	0
5	A	14	0	13	0	0
5	B	14	0	13	0	0
6	A	21	0	30	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
6	B	21	0	30	1	0
7	A	14	0	13	0	0
8	A	10	0	14	0	0
8	B	10	0	14	0	0
9	B	22	0	28	3	0
10	A	161	0	0	1	0
10	B	112	0	0	1	0
All	All	8861	0	8408	61	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 4.

All (61) 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)
1:B:390:ASP:OD2	1:B:393[A]:HIS:ND1	2.17	0.75
1:B:360:LEU:HD13	1:B:379:VAL:HG21	1.75	0.68
1:A:531:PHE:HB2	9:B:1554:P4C:H142	1.76	0.67
1:A:113:PRO:HG2	1:A:485:ARG:HG2	1.79	0.64
1:B:356:ARG:NH2	1:B:383:THR:OG1	2.31	0.63
1:B:326:VAL:HG11	1:B:418:LEU:HD13	1.84	0.60
1:B:353:LEU:HB3	1:B:391:PRO:HB2	1.84	0.59
1:A:265:ASN:O	1:A:266:ASP:HB2	2.03	0.59
1:A:527:GLN:HE21	9:B:1554:P4C:H181	1.71	0.56
1:B:369:GLN:HE22	1:B:405:HIS:CE1	2.26	0.53
1:A:338:PHE:CE2	2:A:1543:A36:H42C	2.44	0.53
1:A:395:ARG:HD2	1:A:396:ASP:OD1	2.09	0.53
1:A:468:GLU:N	1:A:468:GLU:OE1	2.41	0.52
2:A:1543:A36:H111	10:A:2062:HOH:O	2.10	0.51
1:B:227:LEU:HB2	1:B:328:VAL:HG12	1.92	0.51
1:B:458:PRO:HA	1:B:465:TYR:CD2	2.45	0.51
1:A:65:PHE:HB2	1:A:90:ARG:HD2	1.93	0.51
1:A:458:PRO:HA	1:A:465:TYR:CD1	2.46	0.51
1:A:224:ARG:HG2	1:A:325:GLN:HB2	1.93	0.50
1:B:166:GLU:HB2	1:B:274:ARG:HH22	1.76	0.50
1:B:507:ALA:O	1:B:522:ARG:HD3	2.11	0.50
1:A:68:VAL:HG23	1:A:90:ARG:HB2	1.94	0.50
1:A:328:VAL:O	1:A:427:ALA:HA	2.12	0.50
1:A:207:ALA:O	1:A:211:MET:HG3	2.14	0.48
1:B:68:VAL:HG23	1:B:90:ARG:HB2	1.96	0.47
1:B:66:GLN:HG3	1:B:98:TYR:CD2	2.50	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:77:TYR:CZ	1:B:348:LYS:HG2	2.49	0.47
1:A:219:ARG:HA	1:A:219:ARG:HD2	1.75	0.47
1:B:370:ALA:HA	1:B:540:LEU:HD21	1.97	0.47
1:A:29:VAL:HG21	1:A:136:ARG:HB2	1.97	0.47
1:A:319:GLY:O	1:A:421:GLN:HG2	2.15	0.46
1:A:115:LEU:HD21	1:A:484:ALA:HB2	1.97	0.46
1:A:227:LEU:HB2	1:A:328:VAL:HG12	1.97	0.46
1:B:231:THR:HB	1:B:233:ASN:OD1	2.15	0.46
1:B:328:VAL:O	1:B:427:ALA:HA	2.16	0.45
1:A:376:GLU:O	1:A:380:LEU:HG	2.16	0.45
1:B:200:PHE:CB	1:B:226:VAL:HB	2.46	0.45
1:B:202:GLU:HA	1:B:228:GLN:O	2.16	0.45
1:B:472:PHE:CZ	1:B:476:LEU:HD11	2.52	0.45
1:B:161:LEU:HD12	1:B:270:ILE:HD11	1.98	0.44
1:B:213:ILE:O	1:B:219:ARG:HD3	2.18	0.44
1:B:257:CYS:HA	1:B:258:PRO:HA	1.79	0.44
1:A:118:ILE:O	1:A:205:GLY:HA3	2.19	0.43
1:B:369:GLN:HB3	10:B:2076:HOH:O	2.18	0.43
1:B:348:LYS:HA	1:B:440:PRO:HG3	2.01	0.42
1:A:5:ASP:HA	1:A:6:PRO:HD2	1.94	0.42
1:A:200:PHE:CB	1:A:226:VAL:HB	2.49	0.42
1:A:202:GLU:HA	1:A:228:GLN:O	2.20	0.42
1:B:339:LEU:HD11	1:B:399:SER:HA	2.02	0.42
1:A:420:ALA:HB2	1:A:505:THR:HG21	2.01	0.42
1:A:103:THR:HG21	1:A:190:PHE:HB3	2.01	0.42
1:A:317:ASN:O	1:A:421:GLN:NE2	2.53	0.41
1:B:113:PRO:HD2	3:B:1550:EDO:H12	2.01	0.41
1:A:112:THR:HG21	1:A:143:GLY:O	2.21	0.41
1:A:440:PRO:HG2	1:A:443:MET:HG3	2.02	0.41
1:A:276:ARG:HD3	1:A:276:ARG:HA	1.87	0.41
1:B:295:PHE:O	1:B:296:ARG:HD3	2.21	0.41
1:A:187:ILE:HA	1:A:187:ILE:HD12	1.98	0.41
1:A:531:PHE:HE1	9:B:1554:P4C:H81	1.86	0.40
1:A:414:LEU:HG	1:A:418:LEU:HD22	2.04	0.40
1:B:332:LYS:NZ	6:B:1551:PEG:H12	2.36	0.40

There are no symmetry-related clashes.

## 5.3 Torsion angles

### 5.3.1 Protein backbone

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	536/548 (98%)	517 (96%)	18 (3%)	1 (0%)	52	75
1	B	532/548 (97%)	511 (96%)	20 (4%)	1 (0%)	52	75
All	All	1068/1096 (97%)	1028 (96%)	38 (4%)	2 (0%)	52	75

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	266	ASP
1	B	541	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	442/446 (99%)	427 (97%)	15 (3%)	44	72
1	B	442/446 (99%)	426 (96%)	16 (4%)	42	69
All	All	884/892 (99%)	853 (96%)	31 (4%)	44	70

All (31) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	3	ARG
1	A	70	TYR
1	A	83	THR
1	A	90	ARG

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Mol	Chain	Res	Type
1	A	146	LEU
1	A	200	PHE
1	A	251	LEU
1	A	295	PHE
1	A	327	LEU
1	A	372	ASP
1	A	417	ARG
1	A	418	LEU
1	A	497	SER
1	A	524	LEU
1	A	536	LEU
1	B	44	SER
1	B	107	ARG
1	B	165	ARG
1	B	166	GLU
1	B	181[A]	GLN
1	B	181[B]	GLN
1	B	200	PHE
1	B	281	LEU
1	B	295	PHE
1	B	296	ARG
1	B	326	VAL
1	B	348	LYS
1	B	413	GLN
1	B	496	LYS
1	B	505	THR
1	B	525	ARG

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

Mol	Chain	Res	Type
1	A	474	GLN

### 5.3.3 RNA ⓘ

There are no RNA molecules 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 ⓘ

22 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	A36	A	1543	-	19,19,19	1.37	2 (10%)	21,25,25	1.07	2 (9%)
3	EDO	A	1544	-	3,3,3	0.59	0	2,2,2	1.05	0
4	SO4	A	1545	-	4,4,4	0.27	0	6,6,6	0.23	0
5	NAG	A	1546	1	14,14,15	0.53	0	15,19,21	1.49	1 (6%)
6	PEG	A	1547	-	6,6,6	0.49	0	5,5,5	1.34	0
6	PEG	A	1548	-	6,6,6	0.39	0	5,5,5	1.42	0
7	NDG	A	1549	1	14,14,15	0.47	0	15,19,21	0.88	1 (6%)
6	PEG	A	1550	-	6,6,6	0.58	0	5,5,5	1.31	0
8	PGE	A	1551	-	9,9,9	0.83	0	8,8,8	1.08	0
3	EDO	A	1552	-	3,3,3	0.65	0	2,2,2	0.96	0
2	A36	B	1543	-	19,19,19	1.15	1 (5%)	21,25,25	0.91	1 (4%)
3	EDO	B	1544	-	3,3,3	0.67	0	2,2,2	0.99	0
4	SO4	B	1545	-	4,4,4	0.21	0	6,6,6	0.16	0
6	PEG	B	1546	-	6,6,6	0.46	0	5,5,5	1.42	0
8	PGE	B	1547	-	9,9,9	0.64	0	8,8,8	1.17	0
5	NAG	B	1548	1	14,14,15	0.73	0	15,19,21	1.60	2 (13%)
3	EDO	B	1549	-	3,3,3	0.68	0	2,2,2	0.92	0
3	EDO	B	1550	-	3,3,3	0.69	0	2,2,2	0.86	0
6	PEG	B	1551	-	6,6,6	0.47	0	5,5,5	1.40	0
3	EDO	B	1552	-	3,3,3	0.62	0	2,2,2	0.96	0
6	PEG	B	1553	-	6,6,6	0.45	0	5,5,5	1.40	0
9	P4C	B	1554	-	21,21,21	1.07	1 (4%)	19,20,20	1.08	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
2	A36	A	1543	-	-	0/16/16/16	0/1/1/1
3	EDO	A	1544	-	-	0/1/1/1	0/0/0/0
4	SO4	A	1545	-	-	0/0/0/0	0/0/0/0
5	NAG	A	1546	1	-	0/6/23/26	0/1/1/1
6	PEG	A	1547	-	-	0/4/4/4	0/0/0/0
6	PEG	A	1548	-	-	0/4/4/4	0/0/0/0
7	NDG	A	1549	1	-	0/6/23/26	0/1/1/1
6	PEG	A	1550	-	-	0/4/4/4	0/0/0/0
8	PGE	A	1551	-	-	0/7/7/7	0/0/0/0
3	EDO	A	1552	-	-	0/1/1/1	0/0/0/0
2	A36	B	1543	-	-	0/16/16/16	0/1/1/1
3	EDO	B	1544	-	-	0/1/1/1	0/0/0/0
4	SO4	B	1545	-	-	0/0/0/0	0/0/0/0
6	PEG	B	1546	-	-	0/4/4/4	0/0/0/0
8	PGE	B	1547	-	-	0/7/7/7	0/0/0/0
5	NAG	B	1548	1	1/1/5/7	0/6/23/26	0/1/1/1
3	EDO	B	1549	-	-	0/1/1/1	0/0/0/0
3	EDO	B	1550	-	-	0/1/1/1	0/0/0/0
6	PEG	B	1551	-	-	0/4/4/4	0/0/0/0
3	EDO	B	1552	-	-	0/1/1/1	0/0/0/0
6	PEG	B	1553	-	-	0/4/4/4	0/0/0/0
9	P4C	B	1554	-	-	0/18/19/19	0/0/0/0

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	1543	A36	S-N1	2.71	1.68	1.60
2	A	1543	A36	C12-N2	2.93	1.54	1.47
2	A	1543	A36	S-N1	3.10	1.69	1.60
9	B	1554	P4C	O22-C21	3.34	1.41	1.19

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	1543	A36	C11-C12-N2	-2.04	108.16	112.90
5	B	1548	NAG	C1-O5-C5	2.11	114.93	112.25
7	A	1549	NDG	C1-O-C5	2.21	115.05	112.25
2	B	1543	A36	C12-C11-N1	2.74	115.11	110.14
2	A	1543	A36	C12-C11-N1	3.91	117.23	110.14
5	A	1546	NAG	C1-O5-C5	4.85	118.41	112.25
5	B	1548	NAG	C2-N2-C7	4.88	129.31	123.04

All (1) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
5	B	1548	NAG	C1

There are no torsion outliers.

There are no ring outliers.

4 monomers are involved in 7 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	1543	A36	2	0
3	B	1550	EDO	1	0
6	B	1551	PEG	1	0
9	B	1554	P4C	3	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	538/548 (98%)	-0.29	15 (2%) 56 61	27, 43, 76, 121	0
1	B	533/548 (97%)	-0.24	7 (1%) 79 82	31, 49, 78, 119	0
All	All	1071/1096 (97%)	-0.27	22 (2%) 67 71	27, 46, 77, 121	0

All (22) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	495	SER	5.0
1	A	493	ARG	4.6
1	A	263	GLY	4.3
1	B	493	ARG	3.3
1	A	497	SER	3.1
1	A	494	ASP	3.1
1	A	496	LYS	2.7
1	A	541	SER	2.7
1	A	264	GLY	2.6
1	A	540	LEU	2.6
1	B	355	SER	2.5
1	B	542	ALA	2.4
1	B	146	LEU	2.4
1	B	540	LEU	2.3
1	A	203	SER	2.3
1	A	204	ALA	2.2
1	A	322	GLN	2.1
1	A	117	TRP	2.1
1	B	541	SER	2.0
1	B	318	THR	2.0
1	A	3	ARG	2.0
1	A	318	THR	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 carbohydrates 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. 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( $\text{\AA}^2$ )	Q<0.9
5	NAG	A	1546	14/15	0.80	0.33	10.55	79,91,99,104	0
9	P4C	B	1554	22/22	0.92	0.23	7.99	40,66,95,98	0
8	PGE	A	1551	10/10	0.84	0.20	4.88	58,67,80,83	0
4	SO4	B	1545	5/5	0.86	0.35	2.59	103,107,111,118	0
4	SO4	A	1545	5/5	0.88	0.29	2.32	100,111,113,115	0
8	PGE	B	1547	10/10	0.87	0.17	2.29	66,74,87,89	0
6	PEG	A	1547	7/7	0.89	0.17	2.22	64,68,73,75	0
6	PEG	B	1546	7/7	0.79	0.20	1.69	70,77,85,86	0
6	PEG	B	1551	7/7	0.88	0.16	1.65	68,75,80,82	0
6	PEG	B	1553	7/7	0.89	0.12	1.36	68,77,88,90	0
3	EDO	B	1550	4/4	0.88	0.14	1.18	53,55,66,66	0
2	A36	A	1543	19/19	0.95	0.19	0.99	36,51,62,68	0
2	A36	B	1543	19/19	0.96	0.16	0.63	45,56,74,74	0
3	EDO	A	1552	4/4	0.90	0.17	0.45	72,73,77,79	0
3	EDO	A	1544	4/4	0.84	0.19	-	75,75,76,78	0
3	EDO	B	1549	4/4	0.91	0.27	-	66,67,72,76	0
7	NDG	A	1549	14/15	0.83	0.28	-	85,98,104,105	0
5	NAG	B	1548	14/15	0.60	0.35	-	70,90,100,100	0
3	EDO	B	1552	4/4	0.90	0.23	-	59,63,67,69	0
6	PEG	A	1548	7/7	0.94	0.23	-	53,60,70,71	0
3	EDO	B	1544	4/4	0.93	0.15	-	67,67,71,72	0
6	PEG	A	1550	7/7	0.96	0.10	-	65,67,72,74	0

## 6.5 Other polymers

There are no such residues in this entry.