



# Full wwPDB X-ray Structure Validation Report ⓘ

Mar 29, 2017 – 07:57 PM EDT

PDB ID : 1Q84  
Title : Crystal structure of the mouse acetylcholinesterase-TZ2PA6 anti complex  
Authors : Bourne, Y.; Kolb, H.C.; Radic, Z.; Sharpless, K.B.; Taylor, P.; Marchot, P.  
Deposited on : 2003-08-20  
Resolution : 2.45 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 : 1.7.2 (RC1), CSD as538be (2017)  
Xtriage (Phenix) : 1.9-1692  
EDS : rb-20029077  
Percentile statistics : 20161228.v01 (using entries in the PDB archive December 28th 2016)  
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) : rb-20029077

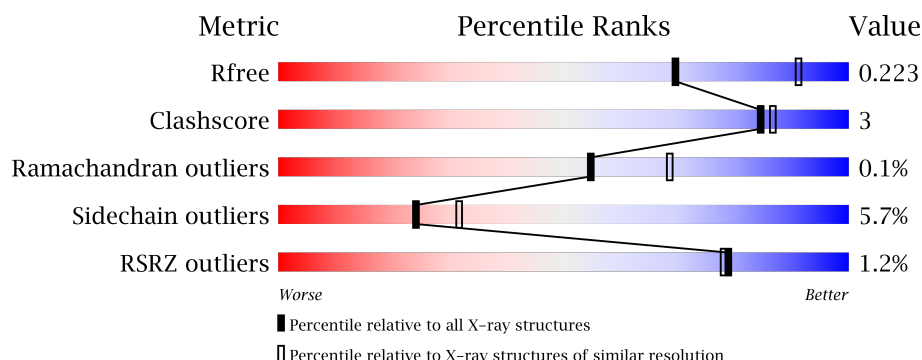
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

## *X-RAY DIFFRACTION*

The reported resolution of this entry is 2.45 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))
$R_{free}$	100719	1119 (2.48-2.44)
Clashscore	112137	1193 (2.48-2.44)
Ramachandran outliers	110173	1185 (2.48-2.44)
Sidechain outliers	110143	1185 (2.48-2.44)
RSRZ outliers	101464	1126 (2.48-2.44)

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	580	<div> <div>2%</div> <div>81%</div> <div>10%</div> <div>8%</div> </div>
1	B	580	<div> <div>%</div> <div>81%</div> <div>9%</div> <div>8%</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
2	NAG	A	1501	-	-	-	X
3	P6G	A	901	-	-	-	X

## 2 Entry composition [i](#)

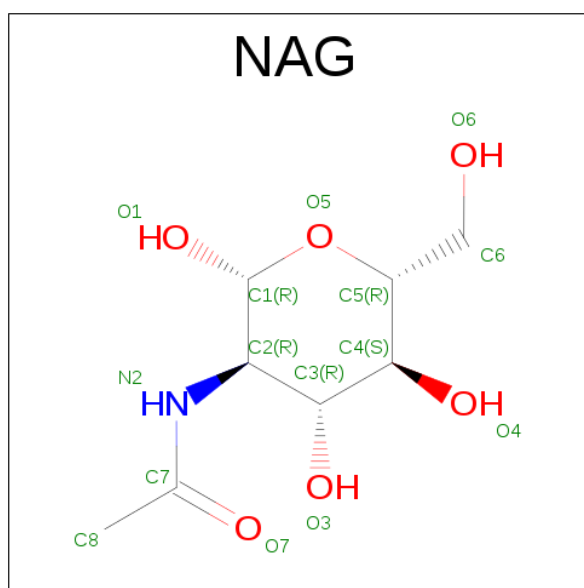
There are 5 unique types of molecules in this entry. The entry contains 8799 atoms, of which 0 are hydrogens and 0 are deuteriums.

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.

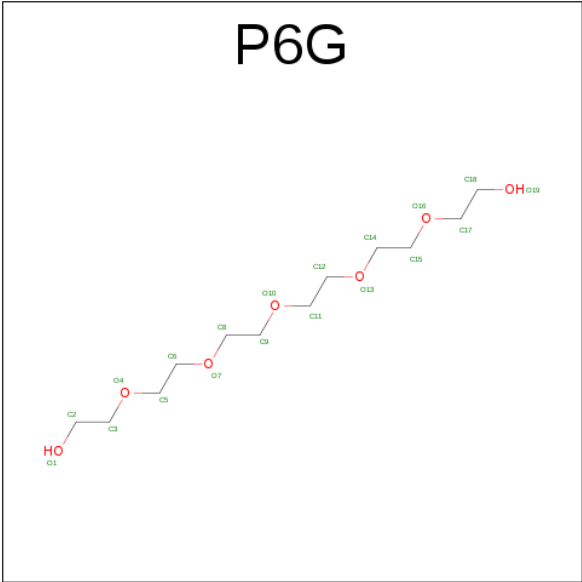
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	536	Total	C	N	O	S	0	0	0
			4172	2678	723	757	14			
1	B	531	Total	C	N	O	S	0	0	0
			4142	2662	715	751	14			

- Molecule 2 is SUGAR (N-ACETYL-D-GLUCOSAMINE) (three-letter code: NAG) (formula:  $C_8H_{15}NO_6$ ).



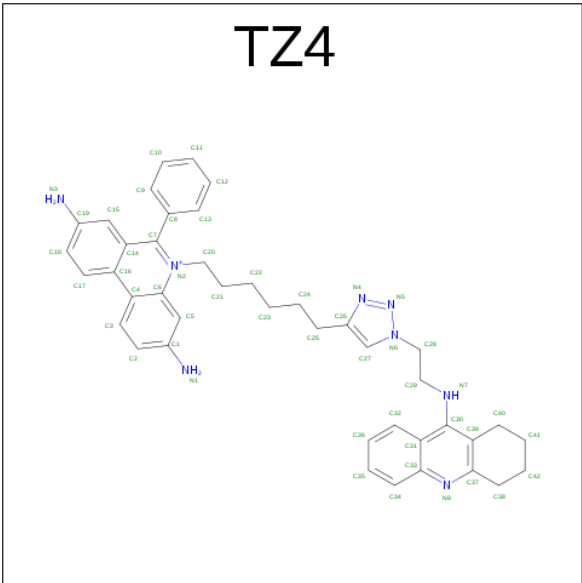
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total	C	N	O	0	0
			14	8	1	5		
2	A	1	Total	C	N	O	0	0
			14	8	1	5		

- Molecule 3 is HEXAETHYLENE GLYCOL (three-letter code: P6G) (formula:  $C_{12}H_{26}O_7$ ).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	C	O	0	0
			19	12	7		

- Molecule 4 is 3,8-DIAMINO-6-PHENYL-5-[6-[1-[2-[(1,2,3,4-TETRAHYDRO-9-ACRIDINYL)AMINO]ETHYL]-1H-1,2,3-TRIAZOL-4-YL]HEXYL]-PHENANTHRIDINIUM (three-letter code: TZ4) (formula: C<sub>42</sub>H<sub>45</sub>N<sub>8</sub>).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total	C	N	0	0
			50	42	8		
4	B	1	Total	C	N	0	0
			50	42	8		

- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	214	Total 214	O 214	0	0
5	B	124	Total 124	O 124	0	0

These plots are drawn for all protein, RNA and DNA 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.

Chain A:

81% 10% 2% 8%

Amino Acid	Category
ARG	Orange
PRO	Green
TRP	Green
TYR	Green
PRO	Green
LEU	Green
HIS	Green
THR	Green
PRO	Green
SER	Green
LEU	Green
ALA	Green
PHE	Green
PRO	Green
LEU	Green
LEU	Green
PHE	Green
ALA	Green
LEU	Green
LEU	Green
LEU	Green
SER	Green
LEU	Green
GLY	Green
GLY	Green
GLY	Green
GLY	Green
ALA	Green
ALA	Green
ARG	Orange
ALA	Grey
E1	Green
G2	Yellow
R3	Orange
E4	Orange
R13	Orange
R18	Orange
K23	Yellow
R45	Yellow
Y70	Yellow
T112	Yellow
P113	Yellow
G143	Yellow
L161	Yellow
I187	Yellow
M195	Yellow
G196	Yellow
V197	Yellow
F200	Orange
L216	Yellow
H223	Yellow
R224	Yellow
A225	Green
V226	Green
R245	Yellow
R246	Yellow
T249	Orange
L250	Green
L251	Yellow
P258	Green
PRO	Green
GLY	Green
GLY	Green
ALA	Green
ALA	Green
G264	Green
I270	Yellow
R274	Yellow
Q281	Orange
F295	Yellow
V300	Yellow
P301	Yellow
E313	Yellow
Q322	Yellow
R323	Orange
L324	Yellow
Q325	Yellow
V326	Green
L327	Yellow
V328	Yellow
Y337	Yellow
D349	Yellow
L353	Yellow
R356	Yellow
Q369	Yellow
H381	Yellow
E389	Yellow
D390	Yellow
P391	Yellow
T393	Yellow
H393	Yellow
D396	Yellow
Q413	Yellow
R424	Yellow
A427	Yellow
R433	Orange
L437	Yellow
Y449	Yellow
P458	Yellow
Y465	Yellow
R475	Yellow
K478	Yellow
R485	Yellow
T486	Green
G487	Yellow
D491	Yellow
F492	Orange
R493	Orange
D494	Orange
S495	Orange
K496	Orange
S497	Orange
W500	Yellow
L524	Yellow
R525	Yellow
A526	Green
Q527	Yellow
F531	Yellow
L536	Yellow
L540	Orange
S541	Green
ALA	Grey
THR	Grey
ASP	Grey
THR	Grey
LEU	Grey
ASP	Grey
GLU	Grey
ALA	Grey

Chain B:

Amino Acid	Percentage
MET	
ARG	
PRO	
PRO	
TRP	
TTR	
PRO	
LEU	
LEU	
HIS	
THR	
PRO	
SER	
LEU	
SER	
PHE	
PRO	
LEU	
LEU	
PHE	
LEU	
LEU	
LEU	
LEU	
GLY	
GLY	
GLY	
ARG	
P4	
D5	
R11	
R21	
S30	
P41	
V42	
D61	
D74	
T103	
L109	
T112	
L115	
L130	

## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	79.27Å 111.77Å 227.17Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	20.00 – 2.45 28.86 – 2.45	Depositor EDS
% Data completeness (in resolution range)	99.7 (20.00-2.45) 99.7 (28.86-2.45)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	0.06	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	4.17 (at 2.45Å)	Xtriage
Refinement program	REFMAC 5.1.24	Depositor
R, $R_{free}$	0.184 , 0.214 0.198 , 0.223	Depositor DCC
$R_{free}$ test set	1507 reflections (2.06%)	DCC
Wilson B-factor (Å <sup>2</sup> )	47.0	Xtriage
Anisotropy	0.695	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.30 , 36.8	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.51$ , $\langle L^2 \rangle = 0.35$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
$F_o, F_c$ correlation	0.96	EDS
Total number of atoms	8799	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	54.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.72% 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: NAG, P6G, TZ4

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	0.72	0/4296	0.88	8/5872 (0.1%)
1	B	0.67	0/4266	0.83	13/5833 (0.2%)
All	All	0.70	0/8562	0.86	21/11705 (0.2%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
1	B	0	1

There are no bond length outliers.

All (21) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	404	ASP	CB-CG-OD2	6.96	124.56	118.30
1	A	396	ASP	CB-CG-OD2	6.89	124.50	118.30
1	B	74	ASP	CB-CG-OD2	6.87	124.48	118.30
1	A	491	ASP	CB-CG-OD2	6.61	124.25	118.30
1	A	390	ASP	CB-CG-OD2	6.49	124.14	118.30
1	B	5	ASP	CB-CG-OD2	6.13	123.82	118.30
1	B	349	ASP	CB-CG-OD2	6.05	123.75	118.30
1	B	396	ASP	CB-CG-OD2	6.04	123.73	118.30
1	B	320	ASP	CB-CG-OD2	5.97	123.68	118.30
1	A	433	ARG	NE-CZ-NH2	-5.90	117.35	120.30
1	B	498	PRO	N-CA-C	-5.74	97.17	112.10
1	A	433	ARG	NE-CZ-NH1	5.55	123.07	120.30
1	B	488	ASP	CB-CG-OD2	5.51	123.26	118.30
1	A	349	ASP	CB-CG-OD2	5.41	123.17	118.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	193	ASP	CB-CG-OD2	5.39	123.15	118.30
1	B	491	ASP	CB-CG-OD2	5.39	123.15	118.30
1	B	390	ASP	CB-CG-OD2	5.37	123.13	118.30
1	A	18	ARG	NE-CZ-NH2	-5.31	117.64	120.30
1	A	475	ARG	NE-CZ-NH2	-5.25	117.67	120.30
1	B	306	ASP	CB-CG-OD2	5.17	122.95	118.30
1	B	494	ASP	CB-CG-OD2	5.10	122.89	118.30

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	B	497	SER	Peptide

## 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	4172	0	4050	27	0
1	B	4142	0	4023	17	0
2	A	28	0	26	0	0
3	A	19	0	26	3	0
4	A	50	0	45	1	0
4	B	50	0	45	1	0
5	A	214	0	0	6	0
5	B	124	0	0	2	0
All	All	8799	0	8215	45	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 3.

All (45) 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:197:VAL:H	1:B:223:HIS:HD2	1.36	0.72

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:30:SER:HB2	1:B:103:THR:HG22	1.71	0.71
1:B:245:ARG:O	1:B:249:THR:HG23	1.94	0.67
1:B:112:THR:HG21	1:B:143:GLY:O	1.96	0.65
4:A:951:TZ4:H291	5:A:1755:HOH:O	1.96	0.65
1:A:4:GLU:OE2	1:A:18:ARG:HD3	1.99	0.61
1:A:197:VAL:H	1:A:223:HIS:HD2	1.48	0.61
1:A:527:GLN:HG3	3:A:901:P6G:H22	1.83	0.59
1:B:534:ARG:HD3	5:B:1075:HOH:O	2.02	0.58
1:A:325:GLN:HE21	1:A:487:GLY:HA3	1.68	0.58
1:A:113:PRO:HG2	1:A:485:ARG:HG2	1.86	0.57
1:A:112:THR:HG21	1:A:143:GLY:O	2.05	0.56
1:B:211:MET:HG2	1:B:308:LEU:HD21	1.90	0.54
1:A:369:GLN:HB2	5:A:1726:HOH:O	2.09	0.52
1:A:13:ARG:NH2	5:A:1722:HOH:O	2.43	0.51
1:A:245:ARG:O	1:A:249:THR:HG23	2.11	0.50
1:A:328:VAL:O	1:A:427:ALA:HA	2.12	0.49
1:A:274:ARG:HD3	5:A:1794:HOH:O	2.12	0.48
1:A:433:ARG:HD3	5:A:1810:HOH:O	2.13	0.48
1:A:300:VAL:HB	1:A:301:PRO:HD2	1.95	0.48
1:A:161:LEU:HD12	1:A:270:ILE:HD11	1.96	0.48
1:A:458:PRO:HA	1:A:465:TYR:CD2	2.50	0.47
1:A:381:HIS:HA	3:A:901:P6G:H172	1.96	0.46
1:B:328:VAL:O	1:B:427:ALA:HA	2.15	0.46
1:A:393:HIS:HB2	5:A:1780:HOH:O	2.14	0.46
1:A:437:LEU:HD11	1:A:449:TYR:CD2	2.50	0.46
1:B:458:PRO:HA	1:B:465:TYR:CD2	2.51	0.46
1:B:369:GLN:HB3	5:B:1024:HOH:O	2.16	0.46
1:A:224:ARG:HD3	1:A:325:GLN:NE2	2.31	0.45
1:A:353:LEU:HB3	1:A:391:PRO:HB2	1.98	0.44
1:B:497:SER:HB2	1:B:498:PRO:HA	2.00	0.43
1:B:528:THR:O	1:B:531:PHE:HB3	2.18	0.43
1:B:497:SER:CB	1:B:498:PRO:HA	2.49	0.43
1:A:200:PHE:CB	1:A:226:VAL:HB	2.48	0.43
1:A:245:ARG:O	1:A:249:THR:CG2	2.67	0.42
1:A:224:ARG:HG2	1:A:325:GLN:HB2	2.01	0.42
1:B:294:ILE:HD11	1:B:402:VAL:HG21	2.02	0.42
1:B:130:LEU:HD12	1:B:133:TYR:CE2	2.55	0.42
1:B:439:TRP:CZ2	4:B:952:TZ4:H36	2.55	0.41
1:B:161:LEU:HD11	1:B:269:LEU:HD22	2.03	0.41
1:A:531:PHE:HB2	3:A:901:P6G:H62	2.02	0.41
1:A:327:LEU:HD11	1:A:500:TRP:CH2	2.56	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:187:ILE:HD12	1:A:187:ILE:HA	1.94	0.41
1:A:291:GLN:HE22	1:A:369:GLN:NE2	2.19	0.40
1:B:295:PHE:CE2	1:B:338:PHE:CE1	3.09	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	532/580 (92%)	517 (97%)	15 (3%)	0	100	100
1	B	527/580 (91%)	511 (97%)	15 (3%)	1 (0%)	51	62
All	All	1059/1160 (91%)	1028 (97%)	30 (3%)	1 (0%)	55	68

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	497	SER

### 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	437/473 (92%)	408 (93%)	29 (7%)	19	25
1	B	435/473 (92%)	414 (95%)	21 (5%)	30	40

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
All	All	872/946 (92%)	822 (94%)	50 (6%)	24	32

All (50) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	3	ARG
1	A	4	GLU
1	A	13	ARG
1	A	23	LYS
1	A	45	ARG
1	A	70	TYR
1	A	195	MET
1	A	200	PHE
1	A	216	LEU
1	A	246	ARG
1	A	249	THR
1	A	251	LEU
1	A	291	GLN
1	A	295	PHE
1	A	313	GLU
1	A	322	GLN
1	A	325	GLN
1	A	337	TYR
1	A	356	ARG
1	A	389	GLU
1	A	413	GLN
1	A	424	ARG
1	A	433	ARG
1	A	478	LYS
1	A	497	SER
1	A	524	LEU
1	A	525	ARG
1	A	536	LEU
1	A	540	LEU
1	B	11	ARG
1	B	21	ARG
1	B	61	ASP
1	B	115	LEU
1	B	136	ARG
1	B	165	ARG
1	B	195	MET
1	B	200	PHE

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Mol	Chain	Res	Type
1	B	246	ARG
1	B	249	THR
1	B	281	LEU
1	B	291	GLN
1	B	295	PHE
1	B	337	TYR
1	B	369	GLN
1	B	389	GLU
1	B	413	GLN
1	B	424	ARG
1	B	461	PRO
1	B	525	ARG
1	B	536	LEU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (6) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	223	HIS
1	A	291	GLN
1	A	325	GLN
1	B	223	HIS
1	B	291	GLN
1	B	369	GLN

### 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](#)

5 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	NAG	A	1501	1	14,14,15	1.18	1 (7%)	15,19,21	1.77	2 (13%)
2	NAG	A	1701	1	14,14,15	0.75	0	15,19,21	1.49	3 (20%)
3	P6G	A	901	-	18,18,18	2.12	6 (33%)	17,17,17	1.29	1 (5%)
4	TZ4	A	951	-	54,57,57	1.58	9 (16%)	68,80,80	2.23	21 (30%)
4	TZ4	B	952	-	54,57,57	1.72	11 (20%)	68,80,80	2.43	22 (32%)

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	NAG	A	1501	1	-	0/6/23/26	0/1/1/1
2	NAG	A	1701	1	-	0/6/23/26	0/1/1/1
3	P6G	A	901	-	-	0/16/16/16	0/0/0/0
4	TZ4	A	951	-	-	0/19/26/26	0/8/8/8
4	TZ4	B	952	-	-	1/19/26/26	0/8/8/8

All (27) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	B	952	TZ4	C40-C39	-5.37	1.43	1.51
4	A	951	TZ4	C40-C39	-4.59	1.44	1.51
4	B	952	TZ4	C38-C37	-3.83	1.45	1.50
4	B	952	TZ4	C41-C40	-3.82	1.37	1.51
4	B	952	TZ4	C42-C38	-3.78	1.37	1.51
4	A	951	TZ4	C41-C40	-3.76	1.37	1.51
4	A	951	TZ4	C42-C38	-3.58	1.38	1.51
4	A	951	TZ4	C38-C37	-3.49	1.45	1.50
4	B	952	TZ4	C42-C41	-2.24	1.42	1.51
4	A	951	TZ4	C42-C41	-2.17	1.42	1.51
4	A	951	TZ4	C27-N6	-2.17	1.33	1.35
4	B	952	TZ4	C6-N2	2.17	1.43	1.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	B	952	TZ4	C14-C16	2.18	1.45	1.42
4	A	951	TZ4	C3-C4	2.21	1.45	1.41
4	A	951	TZ4	C4-C6	2.23	1.45	1.41
4	B	952	TZ4	C37-N8	2.27	1.35	1.32
4	B	952	TZ4	C15-C14	2.38	1.46	1.42
4	B	952	TZ4	C30-C39	2.64	1.43	1.39
3	A	901	P6G	O7-C6	2.84	1.54	1.42
4	B	952	TZ4	C39-C37	3.08	1.44	1.40
4	A	951	TZ4	C39-C37	3.14	1.44	1.40
3	A	901	P6G	O19-C18	3.20	1.59	1.42
3	A	901	P6G	O4-C3	3.37	1.56	1.42
2	A	1501	NAG	C1-C2	3.51	1.57	1.52
3	A	901	P6G	O16-C15	3.54	1.57	1.42
3	A	901	P6G	O13-C12	3.81	1.58	1.42
3	A	901	P6G	O10-C9	4.06	1.59	1.42

All (49) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	B	952	TZ4	C40-C39-C37	-10.90	112.36	121.14
4	A	951	TZ4	C40-C39-C37	-8.45	114.34	121.14
4	B	952	TZ4	C28-C29-N7	-3.87	103.97	112.52
4	A	951	TZ4	C28-N6-C27	-3.81	120.61	129.76
4	A	951	TZ4	C9-C8-C7	-3.57	114.82	120.20
4	B	952	TZ4	C9-C8-C7	-3.36	115.14	120.20
4	A	951	TZ4	C24-C25-C26	-2.98	102.67	113.12
4	B	952	TZ4	C28-N6-C27	-2.97	122.62	129.76
2	A	1701	NAG	C3-C4-C5	-2.96	105.01	110.22
4	B	952	TZ4	C17-C16-C14	-2.80	114.10	117.75
4	A	951	TZ4	C17-C16-C14	-2.79	114.12	117.75
4	A	951	TZ4	C28-C29-N7	-2.58	106.82	112.52
4	A	951	TZ4	C29-C28-N6	-2.37	106.95	110.95
4	B	952	TZ4	C24-C25-C26	-2.34	104.92	113.12
4	A	951	TZ4	C38-C37-C39	-2.28	119.32	121.61
4	A	951	TZ4	C18-C19-C15	-2.27	114.66	119.72
4	B	952	TZ4	C39-C37-N8	-2.14	121.66	123.47
4	B	952	TZ4	C18-C19-C15	-2.09	115.06	119.72
4	B	952	TZ4	C2-C1-C5	-2.07	115.11	119.72
2	A	1501	NAG	O7-C7-C8	-2.07	118.29	122.06
4	B	952	TZ4	C3-C4-C6	-2.06	114.87	117.76
4	A	951	TZ4	C3-C4-C6	-2.03	114.91	117.76
4	B	952	TZ4	C8-C7-C14	-2.03	116.94	121.34

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	A	951	TZ4	C2-C1-C5	-2.02	115.23	119.72
2	A	1701	NAG	C6-C5-C4	2.05	117.80	113.00
4	A	951	TZ4	C35-C34-C33	2.09	123.21	120.07
4	B	952	TZ4	C42-C41-C40	2.12	121.87	112.54
4	B	952	TZ4	C8-C7-N2	2.24	123.14	120.46
4	B	952	TZ4	C2-C3-C4	2.42	124.99	121.60
4	A	951	TZ4	C37-N8-C33	2.48	120.50	117.72
2	A	1701	NAG	O4-C4-C5	2.55	115.70	109.28
4	B	952	TZ4	C1-C5-C6	2.67	125.40	119.02
4	A	951	TZ4	C1-C5-C6	2.75	125.59	119.02
4	B	952	TZ4	C40-C39-C30	3.17	127.43	120.63
3	A	901	P6G	O1-C2-C3	3.20	130.28	111.89
4	A	951	TZ4	C40-C39-C30	3.20	127.49	120.63
4	B	952	TZ4	C19-C15-C14	3.53	124.18	120.78
4	B	952	TZ4	C13-C8-C7	3.56	125.56	120.20
4	A	951	TZ4	C42-C38-C37	3.66	119.84	113.56
4	A	951	TZ4	N4-N5-N6	3.95	110.29	107.31
4	A	951	TZ4	C19-C15-C14	4.30	124.91	120.78
4	A	951	TZ4	C41-C40-C39	4.35	121.90	112.89
4	A	951	TZ4	C39-C30-N7	4.63	128.62	119.55
4	A	951	TZ4	C13-C8-C7	4.84	127.49	120.20
2	A	1501	NAG	C1-O5-C5	4.84	118.84	112.17
4	B	952	TZ4	N4-N5-N6	4.87	110.99	107.31
4	B	952	TZ4	C42-C38-C37	5.20	122.47	113.56
4	B	952	TZ4	C41-C40-C39	5.28	123.82	112.89
4	B	952	TZ4	C39-C30-N7	5.55	130.41	119.55

There are no chirality outliers.

All (1) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	B	952	TZ4	C29-C28-N6-N5

There are no ring outliers.

3 monomers are involved in 5 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	901	P6G	3	0
4	A	951	TZ4	1	0
4	B	952	TZ4	1	0

## 5.7 Other polymers

There are no such residues in this entry.

## 5.8 Polymer linkage issues

There are no chain breaks in this entry.

## 6 Fit of model and data [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	536/580 (92%)	-0.34	9 (1%) 70 67	36, 50, 72, 99	0
1	B	531/580 (91%)	-0.16	4 (0%) 86 87	39, 55, 77, 97	0
All	All	1067/1160 (91%)	-0.25	13 (1%) 79 78	36, 52, 75, 99	0

All (13) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	540	LEU	6.9
1	A	495	SER	3.6
1	A	497	SER	3.6
1	A	264	GLY	3.4
1	A	541	SER	3.1
1	B	41	PRO	3.0
1	A	494	ASP	3.0
1	B	42	VAL	2.6
1	A	493	ARG	2.6
1	B	109	ALA	2.5
1	A	496	LYS	2.3
1	A	323	ASP	2.2
1	B	540	LEU	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(Å <sup>2</sup> )	Q<0.9
2	NAG	A	1501	14/15	0.86	0.39	8.61	79,87,94,94	0
3	P6G	A	901	19/19	0.90	0.19	2.30	61,72,83,86	0
4	TZ4	B	952	50/50	0.86	0.19	1.73	53,71,77,78	0
4	TZ4	A	951	50/50	0.90	0.16	0.60	44,62,66,67	0
2	NAG	A	1701	14/15	0.81	0.42	-	86,95,98,99	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.