



# Full wwPDB X-ray Structure Validation Report ⓘ

Jun 20, 2016 – 01:28 PM EDT

PDB ID : 5BXO  
Title : Human Tankyrase-2 in Complex with Macrocyclised Extended Peptide  
cp4n2m3  
Authors : Xu, W.; Fischer, G.; Hyvonen, M.; Itzhaki, L.  
Deposited on : 2015-06-09  
Resolution : 1.33 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 : 1.7.1 (RC1), CSD as537be (2016)  
Xtriage (Phenix) : 1.9-1692  
EDS : rb-20027790  
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) : rb-20027790

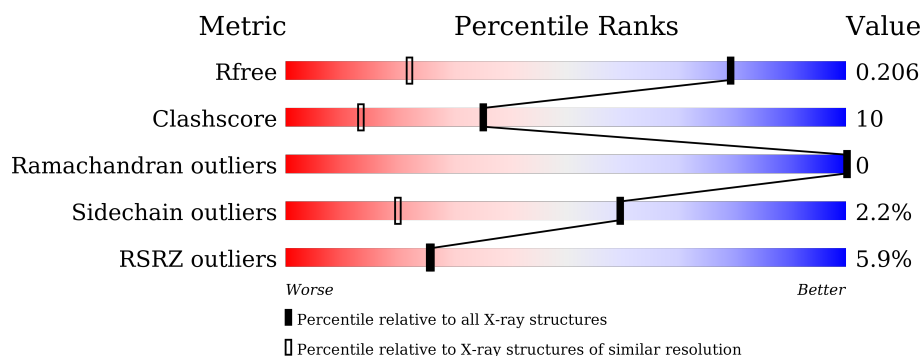
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*



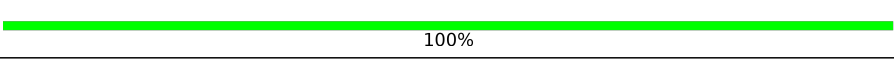
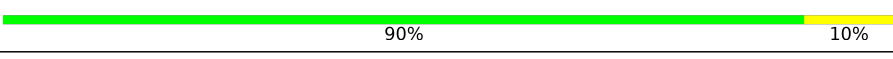
The reported resolution of this entry is 1.33 Å.

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	1723 (1.38-1.30)
Clashscore	102246	1806 (1.38-1.30)
Ramachandran outliers	100387	1749 (1.38-1.30)
Sidechain outliers	100360	1749 (1.38-1.30)
RSRZ outliers	91569	1721 (1.38-1.30)

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	164	 5% 76% 21% ..
1	B	164	 7% 79% 18% ..
2	C	10	 100%
2	D	10	 90% 10%

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 crite-

ria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
3	SO4	A	703	-	-	-	X
3	SO4	B	703	-	-	-	X
4	DMS	B	704	-	-	-	X
4	DMS	B	705	-	-	-	X

## 2 Entry composition

There are 6 unique types of molecules in this entry. The entry contains 3203 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 Tankyrase-2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	160	Total	C	N	O	S	13	13	0
			1331	831	245	251	4			
1	B	163	Total	C	N	O	S	9	17	0
			1384	858	255	266	5			

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	486	GLY	-	expression tag	UNP Q9H2K2
A	487	SER	-	expression tag	UNP Q9H2K2
B	486	GLY	-	expression tag	UNP Q9H2K2
B	487	SER	-	expression tag	UNP Q9H2K2

- Molecule 2 is a protein called Tankyrase-2.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
2	C	10	Total	C	N	O	3	1	1
			68	37	13	18			
2	D	10	Total	C	N	O	3	1	1
			68	37	13	18			

There are 10 discrepancies between the modelled and reference sequences:

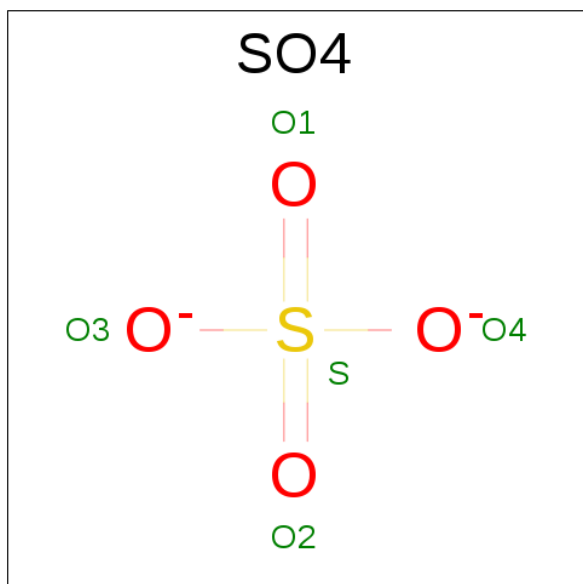
Chain	Residue	Modelled	Actual	Comment	Reference
C	0	ACE	-	expression tag	UNP Q9H2K2
C	2	GLU	CYS	conflict	UNP Q9H2K2
C	5	ASP	GLY	conflict	UNP Q9H2K2
C	8	GLU	ALA	conflict	UNP Q9H2K2
C	9	NH2	-	expression tag	UNP Q9H2K2
D	0	ACE	-	expression tag	UNP Q9H2K2
D	2	GLU	CYS	conflict	UNP Q9H2K2
D	5	ASP	GLY	conflict	UNP Q9H2K2

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Chain	Residue	Modelled	Actual	Comment	Reference
D	8	GLU	ALA	conflict	UNP Q9H2K2
D	9	NH2	-	expression tag	UNP Q9H2K2

- Molecule 3 is SULFATE ION (three-letter code: SO4) (formula: O<sub>4</sub>S).



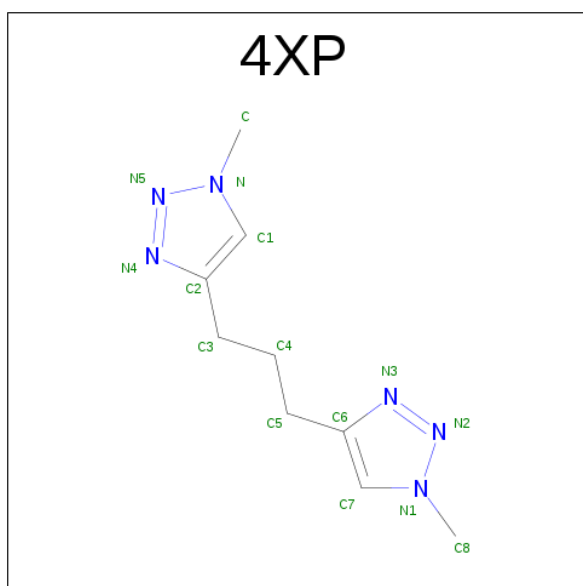
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	O	S	0	0
			5	4	1		
3	A	1	Total	O	S	0	0
			5	4	1		
3	A	1	Total	O	S	0	0
			5	4	1		
3	B	1	Total	O	S	0	0
			5	4	1		
3	B	1	Total	O	S	0	0
			5	4	1		
3	B	1	Total	O	S	0	0
			5	4	1		

- Molecule 4 is DIMETHYL SULFOXIDE (three-letter code: DMS) (formula: C<sub>2</sub>H<sub>6</sub>OS).



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

- Molecule 5 is 4,4'-propane-1,3-diylbis(1-methyl-1H-1,2,3-triazole) (three-letter code: 4XP) (formula: C<sub>9</sub>H<sub>14</sub>N<sub>6</sub>).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	C	1	Total C N 15 9 6	0	0
5	D	1	Total C N 15 9 6	0	0

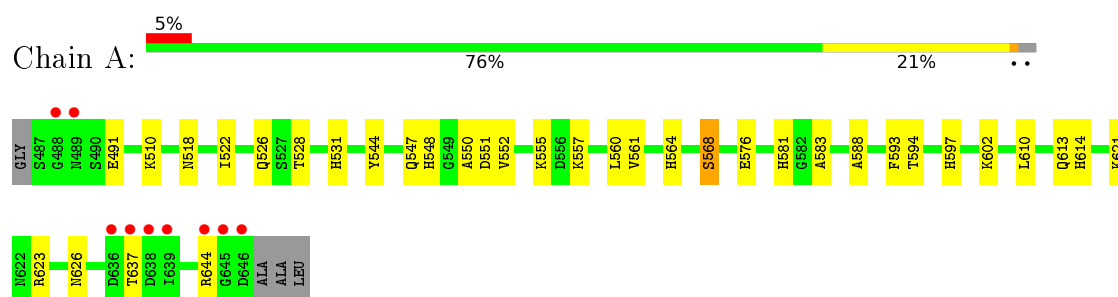
- Molecule 6 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	123	Total O 123 123	0	0
6	B	127	Total O 129 129	0	1
6	C	11	Total O 11 11	0	0
6	D	16	Total O 17 17	0	1

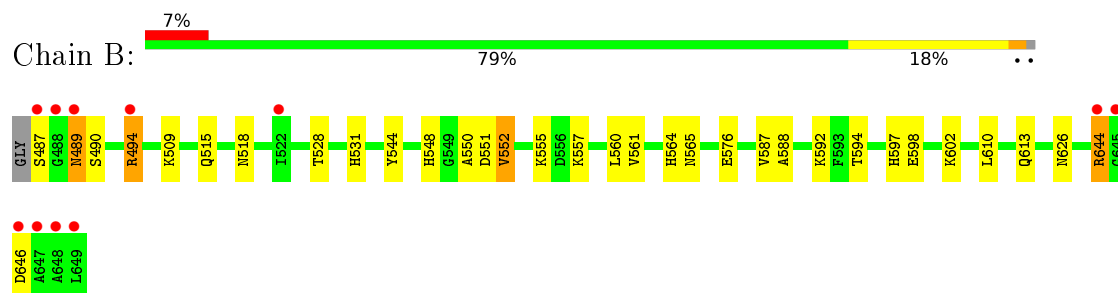
### 3 Residue-property plots [i](#)

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 ( $\text{RSRZ} > 2$ ). 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: Tankyrase-2



#### • Molecule 1: Tankyrase-2



#### • Molecule 2: Tankyrase-2



There are no outlier residues recorded for this chain.

#### • Molecule 2: Tankyrase-2





## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	29.82Å 46.01Å 54.47Å 78.45° 88.99° 72.35°	Depositor
Resolution (Å)	53.31 – 1.33 42.92 – 1.33	Depositor EDS
% Data completeness (in resolution range)	95.8 (53.31-1.33) 89.5 (42.92-1.33)	Depositor EDS
$R_{merge}$	0.08	Depositor
$R_{sym}$	0.10	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	50.00 (at 1.33Å)	Xtriage
Refinement program	REFMAC 5.8.0049	Depositor
R, $R_{free}$	0.175 , 0.203 0.177 , 0.206	Depositor DCC
$R_{free}$ test set	2933 reflections (5.24%)	DCC
Wilson B-factor (Å <sup>2</sup> )	12.0	Xtriage
Anisotropy	0.081	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.39 , 60.0	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.46$ , $\langle L^2 \rangle = 0.28$	Xtriage
Estimated twinning fraction	0.059 for h,h-k,-l	Xtriage
$F_o, F_c$ correlation	0.96	EDS
Total number of atoms	3203	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	17.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 10.16% of the height of the origin peak. No significant pseudotranslation is detected.*

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

<sup>2</sup>Theoretical values of  $\langle |L| \rangle$ ,  $\langle L^2 \rangle$  for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

## 5 Model quality [i](#)

### 5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: 4XP, DMS, SO4, ACE, NH2

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 5$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\# Z  > 5$	RMSZ	$\# Z  > 5$
1	A	1.13	6/1359 (0.4%)	0.86	3/1833 (0.2%)
1	B	0.67	1/1409 (0.1%)	0.82	1/1900 (0.1%)
2	C	0.66	0/63	0.71	0/81
2	D	0.62	0/63	0.65	0/81
All	All	0.91	7/2894 (0.2%)	0.83	4/3895 (0.1%)

All (7) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	491	GLU	CD-OE2	-27.20	0.95	1.25
1	A	491	GLU	CD-OE1	14.22	1.41	1.25
1	A	547	GLN	CD-OE1	10.27	1.46	1.24
1	B	489	ASN	CB-CG	-9.05	1.30	1.51
1	A	547	GLN	CD-NE2	-8.78	1.10	1.32
1	A	510	LYS	CD-CE	-6.58	1.34	1.51
1	A	568	SER	CB-OG	-5.05	1.35	1.42

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	509	LYS	CD-CE-NZ	6.16	125.87	111.70
1	A	621[A]	LYS	CD-CE-NZ	5.20	123.67	111.70
1	A	621[B]	LYS	CD-CE-NZ	5.20	123.67	111.70
1	A	491	GLU	CG-CD-OE1	-5.17	107.96	118.30

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	1331	0	1335	27	1
1	B	1384	0	1368	29	0
2	C	68	0	54	0	0
2	D	68	0	54	1	0
3	A	15	0	0	1	0
3	B	15	0	0	0	0
4	A	4	0	6	0	0
4	B	8	0	12	0	0
5	C	15	0	0	0	0
5	D	15	0	0	0	0
6	A	123	0	0	3	0
6	B	129	0	0	3	0
6	C	11	0	0	0	0
6	D	17	0	0	0	0
All	All	3203	0	2829	56	1

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 10.

All (56) 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:613[B]:GLN:HG3	6:B:866:HOH:O	1.80	0.81
1:B:644[A]:ARG:NH2	1:B:646:ASP:OD2	2.19	0.74
1:A:594:THR:H	1:A:597:HIS:HD2	1.38	0.70
1:A:552[B]:VAL:HG13	6:A:867:HOH:O	2.00	0.59
1:B:594:THR:H	1:B:597:HIS:HD2	1.48	0.59
1:A:594:THR:H	1:A:597:HIS:CD2	2.18	0.59
1:B:598:GLU:OE2	2:D:1:ARG:NH2	2.30	0.58
1:A:518:ASN:HD21	1:A:550:ALA:HA	1.68	0.57
1:B:594:THR:H	1:B:597:HIS:CD2	2.23	0.57
1:B:528:THR:H	1:B:531:HIS:CD2	2.24	0.56
1:A:528:THR:H	1:A:531:HIS:CD2	2.25	0.54
1:B:490[A]:SER:O	1:B:494[A]:ARG:HD3	2.07	0.54
1:B:531:HIS:HE1	1:B:560[A]:LEU:O	1.91	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:531:HIS:HE1	1:A:560[A]:LEU:O	1.91	0.54
1:A:531:HIS:HE1	1:A:560[B]:LEU:O	1.91	0.53
1:B:552[A]:VAL:HG13	6:B:896:HOH:O	2.08	0.53
1:B:528:THR:H	1:B:531:HIS:HD2	1.58	0.51
1:A:568:SER:O	1:A:602[B]:LYS:HE2	2.11	0.50
1:A:528:THR:OG1	1:A:531:HIS:HD2	1.95	0.50
1:B:518:ASN:HD21	1:B:551:ASP:H	1.59	0.50
1:A:555[A]:LYS:NZ	1:A:588:ALA:O	2.42	0.49
1:B:561:VAL:HG22	1:B:564:HIS:CD2	2.47	0.49
1:A:614:HIS:HE1	3:A:702:SO4:O2	1.96	0.49
1:B:518:ASN:HD21	1:B:550:ALA:HA	1.77	0.49
1:A:576:GLU:OE2	1:A:610:LEU:HD13	2.13	0.48
1:B:487:SER:HB2	1:B:489:ASN:N	2.30	0.47
1:B:576:GLU:OE2	1:B:610:LEU:HD13	2.14	0.47
1:A:518:ASN:HD21	1:A:551:ASP:H	1.63	0.47
1:B:555[A]:LYS:NZ	1:B:588:ALA:O	2.47	0.46
1:B:515[B]:GLN:NE2	1:B:515[B]:GLN:H	2.14	0.45
1:B:518:ASN:ND2	1:B:551:ASP:H	2.14	0.45
1:B:528:THR:OG1	1:B:531:HIS:HD2	1.99	0.45
1:A:597:HIS:HE1	1:A:626:ASN:O	1.99	0.45
1:B:602[B]:LYS:HG2	6:B:807:HOH:O	2.16	0.45
1:B:552[B]:VAL:HG12	1:B:552[B]:VAL:O	2.17	0.45
1:B:597:HIS:HE1	1:B:626:ASN:O	2.01	0.44
1:B:544:TYR:O	1:B:548:HIS:HD2	2.01	0.44
1:A:560[B]:LEU:HD11	6:A:843:HOH:O	2.17	0.44
1:A:561:VAL:HG22	1:A:564:HIS:CD2	2.53	0.43
1:A:544:TYR:O	1:A:548:HIS:HD2	2.02	0.43
1:A:560[B]:LEU:N	1:A:560[B]:LEU:HD12	2.34	0.43
1:B:557[B]:LYS:C	1:B:557[B]:LYS:HD2	2.39	0.43
1:A:552[A]:VAL:HG11	1:A:583:ALA:HB2	2.01	0.43
1:A:522:ILE:HA	1:A:526[B]:GLN:HE21	1.83	0.43
1:A:518:ASN:ND2	1:A:551:ASP:H	2.17	0.42
1:B:592[B]:LYS:HB3	1:B:592[B]:LYS:HE3	1.75	0.42
1:B:561:VAL:HG21	1:B:587:VAL:HG11	2.01	0.42
1:A:581[B]:HIS:CD2	6:A:847:HOH:O	2.73	0.41
1:A:564:HIS:HE1	1:A:593:PHE:O	2.04	0.40
1:B:531:HIS:HE1	1:B:560[B]:LEU:O	2.05	0.40
1:A:528:THR:H	1:A:531:HIS:HD2	1.66	0.40
1:A:557[B]:LYS:C	1:A:557[B]:LYS:HD2	2.42	0.40

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:613:GLN:OE1	1:A:623[B]:ARG:NH2[1_455]	2.16	0.04

## 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	171/164 (104%)	171 (100%)	0	0	100	100
1	B	178/164 (108%)	178 (100%)	0	0	100	100
2	C	9/10 (90%)	9 (100%)	0	0	100	100
2	D	9/10 (90%)	9 (100%)	0	0	100	100
All	All	367/348 (106%)	367 (100%)	0	0	100	100

There are no Ramachandran outliers to report.

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

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	143/131 (109%)	140 (98%)	3 (2%)	61	21
1	B	148/131 (113%)	140 (95%)	8 (5%)	27	2
2	C	5/4 (125%)	5 (100%)	0	100	100
2	D	5/4 (125%)	5 (100%)	0	100	100
All	All	301/270 (112%)	290 (96%)	11 (4%)	60	6

All (11) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	637[A]	THR
1	A	637[B]	THR
1	A	644	ARG
1	B	494[A]	ARG
1	B	494[B]	ARG
1	B	552[A]	VAL
1	B	552[B]	VAL
1	B	565[A]	ASN
1	B	565[B]	ASN
1	B	644[A]	ARG
1	B	644[B]	ARG

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (12) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	515	GLN
1	A	518	ASN
1	A	531	HIS
1	A	548	HIS
1	A	564	HIS
1	A	597	HIS
1	A	614	HIS
1	B	518	ASN
1	B	531	HIS
1	B	548	HIS
1	B	564	HIS
1	B	597	HIS

### 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

11 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$
3	SO4	A	701	-	4,4,4	0.47	0	6,6,6	0.15	0
3	SO4	A	702	-	4,4,4	0.58	0	6,6,6	0.40	0
3	SO4	A	703	-	4,4,4	0.44	0	6,6,6	0.98	1 (16%)
4	DMS	A	704	-	3,3,3	0.49	0	3,3,3	0.48	0
3	SO4	B	701	-	4,4,4	0.60	0	6,6,6	0.59	0
3	SO4	B	702	-	4,4,4	0.37	0	6,6,6	0.65	0
3	SO4	B	703	-	4,4,4	0.51	0	6,6,6	0.23	0
4	DMS	B	704	-	3,3,3	0.45	0	3,3,3	0.51	0
4	DMS	B	705	-	3,3,3	0.49	0	3,3,3	0.44	0
5	4XP	C	100	2	14,16,16	1.61	2 (14%)	13,21,21	2.56	3 (23%)
5	4XP	D	100	2	14,16,16	2.83	7 (50%)	13,21,21	2.77	3 (23%)

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
3	SO4	A	701	-	-	0/0/0/0	0/0/0/0
3	SO4	A	702	-	-	0/0/0/0	0/0/0/0
3	SO4	A	703	-	-	0/0/0/0	0/0/0/0
4	DMS	A	704	-	-	0/0/0/0	0/0/0/0
3	SO4	B	701	-	-	0/0/0/0	0/0/0/0
3	SO4	B	702	-	-	0/0/0/0	0/0/0/0
3	SO4	B	703	-	-	0/0/0/0	0/0/0/0
4	DMS	B	704	-	-	0/0/0/0	0/0/0/0
4	DMS	B	705	-	-	0/0/0/0	0/0/0/0
5	4XP	C	100	2	-	0/6/6/6	0/2/2/2
5	4XP	D	100	2	-	0/6/6/6	0/2/2/2

All (9) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	D	100	4XP	N4-N5	-4.05	1.28	1.34
5	D	100	4XP	N3-N2	-3.09	1.29	1.34
5	D	100	4XP	C5-C6	-2.88	1.44	1.51
5	D	100	4XP	C8-N1	-2.29	1.43	1.47
5	D	100	4XP	N5-N	2.16	1.38	1.34
5	C	100	4XP	C1-N	2.25	1.38	1.35
5	C	100	4XP	C6-N3	4.31	1.39	1.34
5	D	100	4XP	C6-N3	5.14	1.40	1.34
5	D	100	4XP	C2-N4	5.90	1.41	1.34

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	C	100	4XP	C-N-N5	-7.81	104.84	117.97
5	D	100	4XP	C-N-N5	-6.53	106.99	117.97
5	D	100	4XP	C1-C2-N4	-3.61	105.62	111.42
5	C	100	4XP	C1-C2-N4	-2.66	107.14	111.42
5	C	100	4XP	C7-C6-N3	-2.45	107.48	111.42
3	A	703	SO4	O2-S-O1	-2.24	102.12	109.59
5	D	100	4XP	C8-N1-N2	5.67	127.49	117.97

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	702	SO4	1	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	160/164 (97%)	0.40	9 (5%) 28 28	7, 13, 33, 72	5 (3%)
1	B	163/164 (99%)	0.38	11 (6%) 21 21	8, 14, 28, 58	4 (2%)
2	C	8/10 (80%)	0.06	0 100 100	10, 11, 16, 29	1 (12%)
2	D	8/10 (80%)	0.45	0 100 100	10, 13, 26, 35	1 (12%)
All	All	339/348 (97%)	0.38	20 (5%) 26 26	7, 13, 33, 72	11 (3%)

All (20) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	646	ASP	8.7
1	B	646	ASP	4.9
1	B	649	LEU	4.9
1	A	489	ASN	4.8
1	B	488	GLY	4.7
1	B	645	GLY	4.0
1	A	637[A]	THR	3.5
1	B	648	ALA	3.5
1	A	645	GLY	3.5
1	B	487	SER	3.4
1	A	638	ASP	3.0
1	A	644	ARG	2.9
1	A	639	ILE	2.7
1	B	522	ILE	2.7
1	A	488	GLY	2.7
1	B	647	ALA	2.5
1	A	636	ASP	2.5
1	B	489	ASN	2.4
1	B	644[A]	ARG	2.3
1	B	494[A]	ARG	2.3

## 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
4	DMS	B	704	4/4	0.90	0.23	10.06	33,41,43,43	0
3	SO4	A	703	5/5	0.88	0.19	2.97	28,29,31,32	0
3	SO4	B	703	5/5	0.94	0.20	2.47	33,34,36,37	0
4	DMS	B	705	4/4	0.87	0.16	2.19	60,61,62,63	0
3	SO4	A	701	5/5	0.88	0.17	1.88	51,57,58,58	0
4	DMS	A	704	4/4	0.83	0.16	1.25	63,65,66,67	0
3	SO4	A	702	5/5	0.95	0.14	1.12	30,34,35,35	0
3	SO4	B	702	5/5	0.95	0.14	1.08	30,32,32,35	0
3	SO4	B	701	5/5	0.98	0.13	0.74	18,19,20,25	0
5	4XP	C	100	15/15	0.92	0.12	0.30	13,17,21,21	0
5	4XP	D	100	15/15	0.88	0.12	-0.09	15,19,25,26	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.