



# Full wwPDB X-ray Structure Validation Report ⓘ

Jul 19, 2016 – 04:56 PM EDT

PDB ID : 5CU3  
Title : Crystal Structure of CK2alpha with compound 10 bound  
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Deposited on : 2015-07-24  
Resolution : 1.79 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

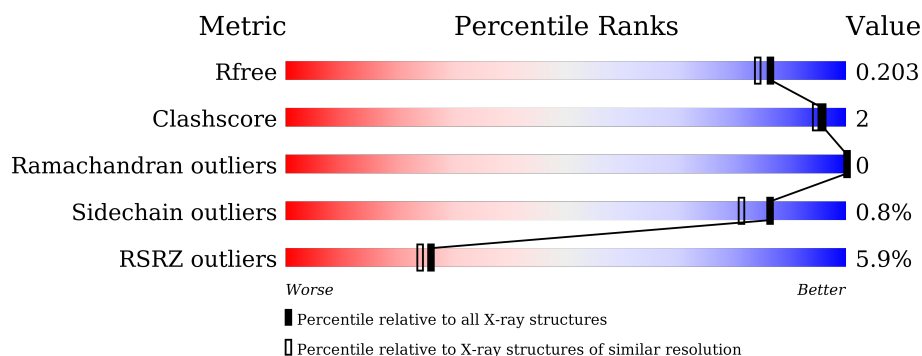
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 1.79 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	6655 (1.80-1.76)
Clashscore	102246	7658 (1.80-1.76)
Ramachandran outliers	100387	7570 (1.80-1.76)
Sidechain outliers	100360	7569 (1.80-1.76)
RSRZ outliers	91569	6671 (1.80-1.76)

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	352	<div> <div>3%</div> <div>89%</div> <div>8%</div> </div>
1	B	352	<div> <div>7%</div> <div>88%</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
4	DMS	A	405	-	-	-	X
4	DMS	B	404	-	-	X	X

## 2 Entry composition

There are 6 unique types of molecules in this entry. The entry contains 5970 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 Casein kinase II subunit alpha.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	325	Total	C	N	O	S	0	3	0
			2762	1769	483	499	11			
1	B	324	Total	C	N	O	S	0	2	0
			2754	1766	482	495	11			

There are 50 discrepancies between the modelled and reference sequences:

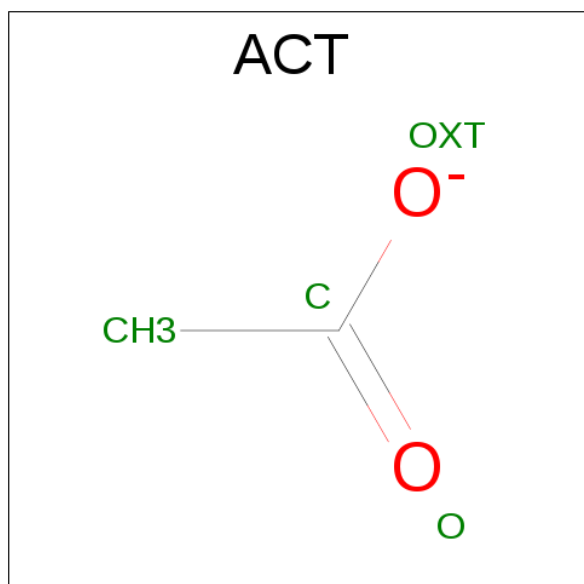
Chain	Residue	Modelled	Actual	Comment	Reference
A	-22	GLY	-	expression tag	UNP P68400
A	-21	SER	-	expression tag	UNP P68400
A	-20	MET	-	expression tag	UNP P68400
A	-19	ASP	-	expression tag	UNP P68400
A	-18	ILE	-	expression tag	UNP P68400
A	-17	GLU	-	expression tag	UNP P68400
A	-16	PHE	-	expression tag	UNP P68400
A	-15	ASP	-	expression tag	UNP P68400
A	-14	ASP	-	expression tag	UNP P68400
A	-13	ASP	-	expression tag	UNP P68400
A	-12	ALA	-	expression tag	UNP P68400
A	-11	ASP	-	expression tag	UNP P68400
A	-10	ASP	-	expression tag	UNP P68400
A	-9	ASP	-	expression tag	UNP P68400
A	-8	GLY	-	expression tag	UNP P68400
A	-7	SER	-	expression tag	UNP P68400
A	-6	GLY	-	expression tag	UNP P68400
A	-5	SER	-	expression tag	UNP P68400
A	-4	GLY	-	expression tag	UNP P68400
A	-3	SER	-	expression tag	UNP P68400
A	-2	GLY	-	expression tag	UNP P68400
A	-1	SER	-	expression tag	UNP P68400
A	0	GLY	-	expression tag	UNP P68400
A	1	SER	-	expression tag	UNP P68400
A	21	SER	ARG	engineered mutation	UNP P68400

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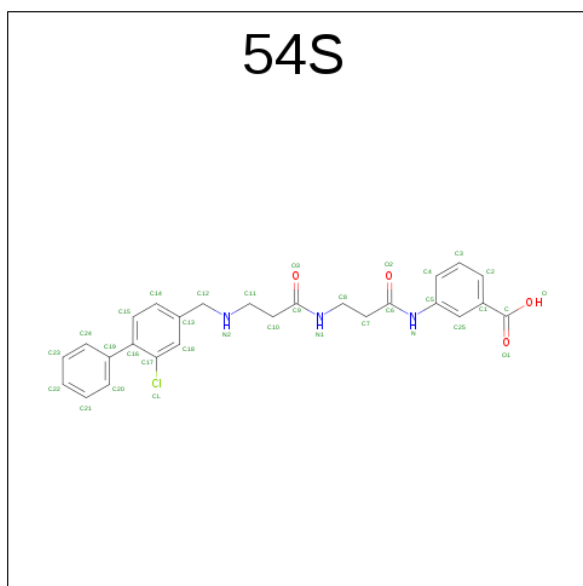
Chain	Residue	Modelled	Actual	Comment	Reference
B	-22	GLY	-	expression tag	UNP P68400
B	-21	SER	-	expression tag	UNP P68400
B	-20	MET	-	expression tag	UNP P68400
B	-19	ASP	-	expression tag	UNP P68400
B	-18	ILE	-	expression tag	UNP P68400
B	-17	GLU	-	expression tag	UNP P68400
B	-16	PHE	-	expression tag	UNP P68400
B	-15	ASP	-	expression tag	UNP P68400
B	-14	ASP	-	expression tag	UNP P68400
B	-13	ASP	-	expression tag	UNP P68400
B	-12	ALA	-	expression tag	UNP P68400
B	-11	ASP	-	expression tag	UNP P68400
B	-10	ASP	-	expression tag	UNP P68400
B	-9	ASP	-	expression tag	UNP P68400
B	-8	GLY	-	expression tag	UNP P68400
B	-7	SER	-	expression tag	UNP P68400
B	-6	GLY	-	expression tag	UNP P68400
B	-5	SER	-	expression tag	UNP P68400
B	-4	GLY	-	expression tag	UNP P68400
B	-3	SER	-	expression tag	UNP P68400
B	-2	GLY	-	expression tag	UNP P68400
B	-1	SER	-	expression tag	UNP P68400
B	0	GLY	-	expression tag	UNP P68400
B	1	SER	-	expression tag	UNP P68400
B	21	SER	ARG	engineered mutation	UNP P68400

- Molecule 2 is ACETATE ION (three-letter code: ACT) (formula:  $C_2H_3O_2$ ).



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

- Molecule 3 is N-[(2-chlorobiphenyl-4-yl)methyl]-beta-alanyl-N-(3-carboxyphenyl)-beta-alaninamide (three-letter code: 54S) (formula: C<sub>26</sub>H<sub>26</sub>ClN<sub>3</sub>O<sub>4</sub>).



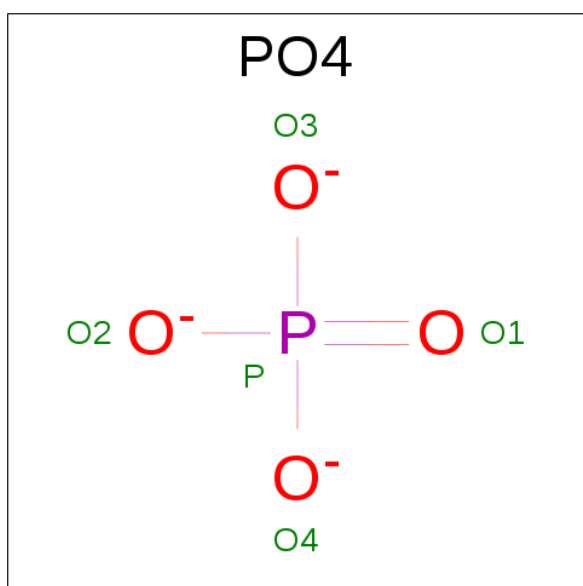
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	1	Total	C	Cl	N	O	0
			34	26	1	3	4	0
3	B	1	Total	C	Cl	N	O	0
			34	26	1	3	4	0

- 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		

- Molecule 5 is PHOSPHATE ION (three-letter code: PO4) (formula:  $O_4P$ ).



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

- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	211	Total 211	O 211	0	0
6	B	142	Total 142	O 142	0	0





## 4 Data and refinement statistics

Property	Value	Source
Space group	C 2 2 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	65.28Å 66.33Å 333.62Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	55.60 – 1.79 55.60 – 1.79	Depositor EDS
% Data completeness (in resolution range)	99.6 (55.60-1.79) 95.2 (55.60-1.79)	Depositor EDS
$R_{merge}$	0.04	Depositor
$R_{sym}$	0.04	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.11 (at 1.78Å)	Xtriage
Refinement program	BUSTER-TNT	Depositor
R, $R_{free}$	0.183 , 0.202 0.186 , 0.203	Depositor DCC
$R_{free}$ test set	3495 reflections (5.33%)	DCC
Wilson B-factor (Å <sup>2</sup> )	28.7	Xtriage
Anisotropy	0.481	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.33 , 37.1	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	0.280 for -k,-h,-l	Xtriage
$F_o, F_c$ correlation	0.96	EDS
Total number of atoms	5970	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	41.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.68% 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: 54S, PO4, DMS, ACT

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	0.59	0/2837	0.62	0/3838
1	B	0.53	0/2829	0.61	0/3826
All	All	0.56	0/5666	0.61	0/7664

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.

There are no bond angle outliers.

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	B	123[B]	GLN	Mainchain

### 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	2762	0	2695	6	1
1	B	2754	0	2692	9	0
2	A	12	0	9	0	0
2	B	8	0	6	0	0
3	A	34	0	0	2	0
3	B	34	0	0	1	0
4	A	4	0	6	0	0
4	B	4	0	6	4	0
5	A	5	0	0	0	0
6	A	211	0	0	1	0
6	B	142	0	0	2	0
All	All	5970	0	5414	17	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 2.

All (17) 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:A:259:ASP:OD2	6:A:501:HOH:O	1.94	0.85
4:B:404:DMS:H22	6:B:637:HOH:O	1.81	0.81
1:B:35:ASN:H	4:B:404:DMS:C2	2.01	0.73
1:B:35:ASN:H	4:B:404:DMS:H23	1.61	0.64
1:B:17:THR:HG22	6:B:550:HOH:O	2.00	0.62
1:A:116:VAL:HG21	1:A:163:MET:HG3	1.87	0.57
3:A:404:54S:CL	3:A:404:54S:C24	2.91	0.55
1:B:35:ASN:H	4:B:404:DMS:H21	1.72	0.55
3:B:403:54S:CL	3:B:403:54S:C24	2.97	0.49
1:B:120:ASP:OD2	1:B:123[B]:GLN:OE1	2.30	0.49
1:A:20:PRO:HD2	1:B:105:VAL:HG21	1.97	0.46
1:B:47:ARG:HG3	1:B:52:GLU:HG3	1.98	0.46
1:A:174:ILE:HD12	3:A:404:54S:C5	2.46	0.45
1:A:47:ARG:HG3	1:A:52:GLU:HG3	1.98	0.45
1:B:20:PRO:HB2	1:B:22:GLU:OE1	2.16	0.44
1:A:116:VAL:CG2	1:A:163:MET:HG3	2.46	0.44
1:B:165:ASP:HB3	1:B:170:LYS:HB3	2.01	0.42

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:264:GLU:CD	1:A:280:ARG:NH1[8_597]	2.18	0.02

## 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	326/352 (93%)	318 (98%)	8 (2%)	0	100	100
1	B	324/352 (92%)	316 (98%)	8 (2%)	0	100	100
All	All	650/704 (92%)	634 (98%)	16 (2%)	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	302/319 (95%)	300 (99%)	2 (1%)	88	84
1	B	301/319 (94%)	298 (99%)	3 (1%)	82	75
All	All	603/638 (94%)	598 (99%)	5 (1%)	86	81

All (5) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	33	TRP
1	A	180	GLU
1	B	33	TRP

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Mol	Chain	Res	Type
1	B	57	ILE
1	B	127	THR

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	186	GLN
1	A	238	ASN
1	A	262	ASN
1	A	270	ASN
1	B	186	GLN
1	B	270	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](#)

10 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	ACT	A	401	-	0,3,3	0.00	-	0,3,3	0.00	-

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
2	ACT	A	402	-	0,3,3	0.00	-	0,3,3	0.00	-
2	ACT	A	403	-	0,3,3	0.00	-	0,3,3	0.00	-
3	54S	A	404	-	33,36,36	0.10	0	42,47,47	0.25	0
4	DMS	A	405	-	3,3,3	0.24	0	3,3,3	0.21	0
5	PO4	A	406	-	4,4,4	1.90	3 (75%)	6,6,6	0.27	0
2	ACT	B	401	-	0,3,3	0.00	-	0,3,3	0.00	-
2	ACT	B	402	-	0,3,3	0.00	-	0,3,3	0.00	-
3	54S	B	403	-	33,36,36	0.10	0	42,47,47	0.21	0
4	DMS	B	404	-	3,3,3	0.58	0	3,3,3	0.50	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	ACT	A	401	-	-	0/0/0/0	0/0/0/0
2	ACT	A	402	-	-	0/0/0/0	0/0/0/0
2	ACT	A	403	-	-	0/0/0/0	0/0/0/0
3	54S	A	404	-	-	0/21/25/25	0/3/3/3
4	DMS	A	405	-	-	0/0/0/0	0/0/0/0
5	PO4	A	406	-	-	0/0/0/0	0/0/0/0
2	ACT	B	401	-	-	0/0/0/0	0/0/0/0
2	ACT	B	402	-	-	0/0/0/0	0/0/0/0
3	54S	B	403	-	-	0/21/25/25	0/3/3/3
4	DMS	B	404	-	-	0/0/0/0	0/0/0/0

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	A	406	PO4	P-O2	2.02	1.60	1.53
5	A	406	PO4	P-O3	2.18	1.60	1.53
5	A	406	PO4	P-O4	2.35	1.61	1.53

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

3 monomers are involved in 7 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	404	54S	2	0
3	B	403	54S	1	0
4	B	404	DMS	4	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	325/352 (92%)	0.08	12 (3%) 45 43	17, 31, 61, 94	0
1	B	324/352 (92%)	0.45	26 (8%) 15 14	25, 44, 76, 107	0
All	All	649/704 (92%)	0.27	38 (5%) 26 24	17, 38, 72, 107	0

All (38) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	125	TYR	16.7
1	B	122	LYS	11.1
1	B	124	LEU	9.4
1	B	126	GLN	8.5
1	B	50	TYR	8.5
1	B	121	PHE	7.9
1	A	125	TYR	7.5
1	A	124	LEU	7.0
1	A	49	LYS	6.8
1	A	50	TYR	6.5
1	A	121	PHE	6.3
1	B	120	ASP	6.0
1	A	122	LYS	5.5
1	A	126	GLN	5.2
1	B	123[A]	GLN	4.9
1	B	72	PRO	4.9
1	B	49	LYS	3.7
1	B	63	GLU	3.5
1	B	325	TYR	3.3
1	B	128	LEU	3.2
1	B	41	LEU	3.0
1	B	116	VAL	3.0
1	B	73	VAL	2.9
1	A	47	ARG	2.7

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Mol	Chain	Res	Type	RSRZ
1	A	105	VAL	2.7
1	A	123	GLN	2.6
1	B	127	THR	2.4
1	B	258	ILE	2.4
1	B	74	LYS	2.4
1	B	160	HIS	2.4
1	B	45	LEU	2.3
1	A	72	PRO	2.3
1	B	47	ARG	2.3
1	B	21	SER	2.3
1	B	327	VAL	2.2
1	B	40	GLN	2.1
1	A	160	HIS	2.1
1	B	167	GLU	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
4	DMS	B	404	4/4	0.93	0.11	3.07	34,41,43,45	0
4	DMS	A	405	4/4	0.96	0.11	2.14	38,41,43,43	0
2	ACT	A	403	4/4	0.96	0.17	2.00	49,49,50,51	0
3	54S	B	403	34/34	0.82	0.17	0.15	30,42,53,71	0
3	54S	A	404	34/34	0.86	0.14	0.15	25,32,46,62	0
2	ACT	B	401	4/4	0.98	0.11	0.14	42,47,48,48	0
5	PO4	A	406	5/5	0.97	0.07	-1.08	34,35,40,41	0

*Continued on next page...*

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	LLDF	B-factors( $\text{\AA}^2$ )	Q<0.9
2	ACT	A	401	4/4	0.97	0.07	-1.16	36,38,39,40	0
2	ACT	B	402	4/4	0.73	0.21	-	61,62,62,62	0
2	ACT	A	402	4/4	0.93	0.18	-	42,42,42,46	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.