



wwPDB X-ray Structure Validation Summary Report ⓘ

Feb 1, 2016 – 01:47 PM GMT

PDB ID : 3UYT
Title : crystal structure of ck1d with PF670462 from P1 crystal form
Authors : Huang, X.
Deposited on : 2011-12-06
Resolution : 2.00 Å(reported)

This is a wwPDB X-ray Structure Validation Summary Report for a publicly released PDB entry.
We welcome your comments at validation@mail.wwpdb.org
A user guide is available at
<http://wwpdb.org/validation/2016/XrayValidationReportHelp>
with specific help available everywhere you see the ⓘ symbol.

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

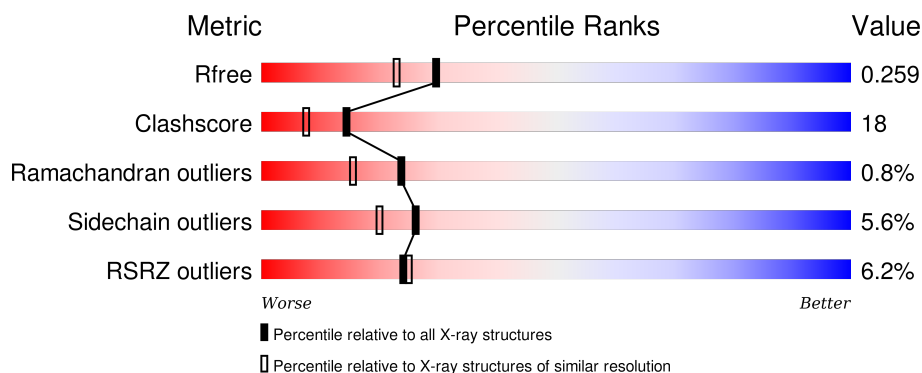
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.00 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	6249 (2.00-2.00)
Clashscore	102246	7340 (2.00-2.00)
Ramachandran outliers	100387	7248 (2.00-2.00)
Sidechain outliers	100360	7247 (2.00-2.00)
RSRZ outliers	91569	6262 (2.00-2.00)

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 ≥ 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	296	<div> <div>5%</div> <div>68%</div> <div>26%</div> <div>• •</div> </div>
1	B	296	<div> <div>8%</div> <div>61%</div> <div>30%</div> <div>5%</div> <div>•</div> </div>
1	C	296	<div> <div>7%</div> <div>64%</div> <div>30%</div> <div>• •</div> </div>
1	D	296	<div> <div>3%</div> <div>64%</div> <div>24%</div> <div>•</div> <div>9%</div> </div>

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 10156 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.

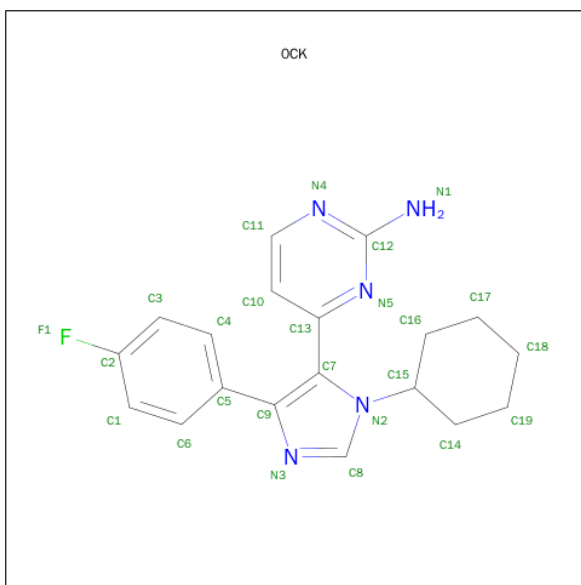
- Molecule 1 is a protein called Casein kinase I isoform delta.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	287	Total	C	N	O	S	0	0	0
			2315	1485	398	418	14			
1	B	286	Total	C	N	O	S	0	0	0
			2321	1488	403	416	14			
1	C	286	Total	C	N	O	S	0	0	0
			2284	1468	391	411	14			
1	D	268	Total	C	N	O	S	0	0	0
			2161	1393	367	387	14			

There are 8 discrepancies between the modelled and reference sequences:

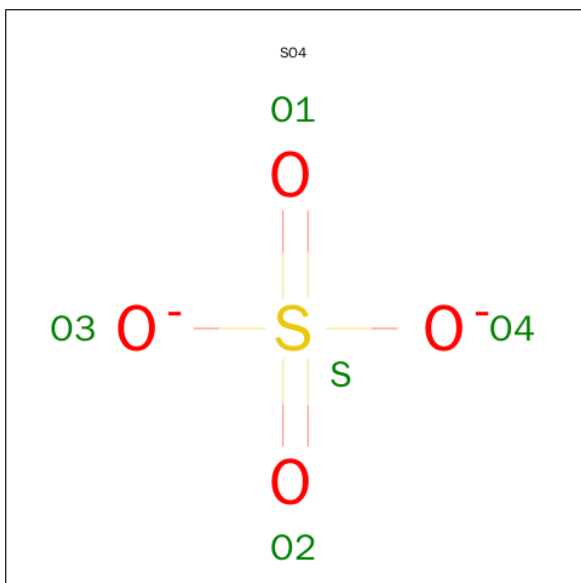
Chain	Residue	Modelled	Actual	Comment	Reference
A	-1	GLY	-	EXPRESSION TAG	UNP P48730
A	0	SER	-	EXPRESSION TAG	UNP P48730
B	-1	GLY	-	EXPRESSION TAG	UNP P48730
B	0	SER	-	EXPRESSION TAG	UNP P48730
C	-1	GLY	-	EXPRESSION TAG	UNP P48730
C	0	SER	-	EXPRESSION TAG	UNP P48730
D	-1	GLY	-	EXPRESSION TAG	UNP P48730
D	0	SER	-	EXPRESSION TAG	UNP P48730

- Molecule 2 is 4-[1-CYCLOHEXYL-4-(4-FLUOROPHENYL)-1H-IMIDAZOL-5-YL]PYRIMIDIN-2-AMINE (three-letter code: 0CK) (formula: C₁₉H₂₀FN₅).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total	C	F	N	0	0
			25	19	1	5		
2	B	1	Total	C	F	N	0	0
			25	19	1	5		
2	C	1	Total	C	F	N	0	0
			25	19	1	5		
2	D	1	Total	C	F	N	0	0
			25	19	1	5		

- Molecule 3 is SULFATE ION (three-letter code: SO4) (formula: O₄S).



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

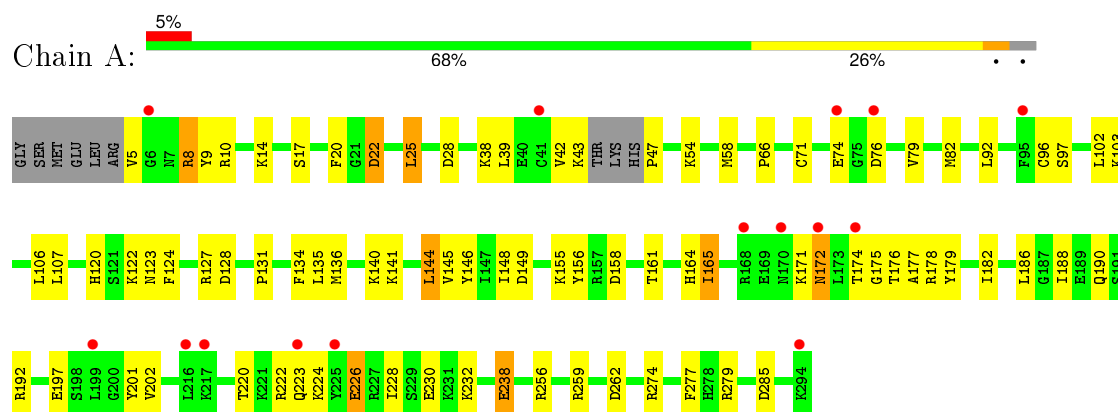
- Molecule 4 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	251	Total O 251 251	0	0
4	B	225	Total O 225 225	0	0
4	C	236	Total O 236 236	0	0
4	D	228	Total O 228 228	0	0

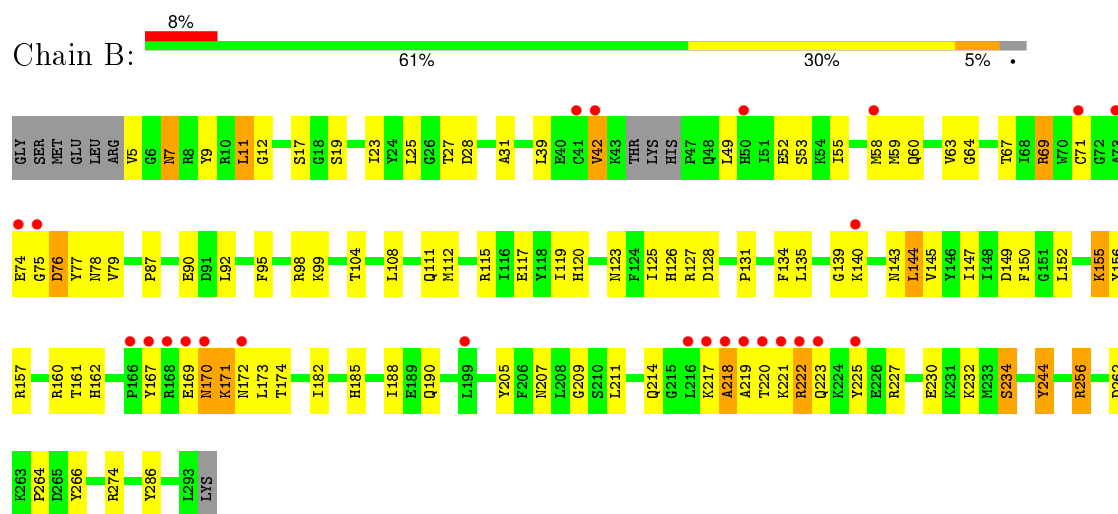
3 Residue-property plots

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.

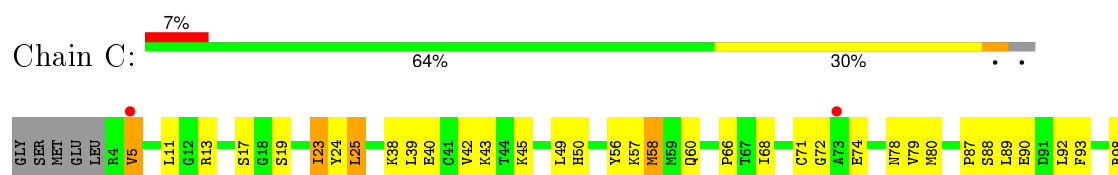
• Molecule 1: Casein kinase I isoform delta

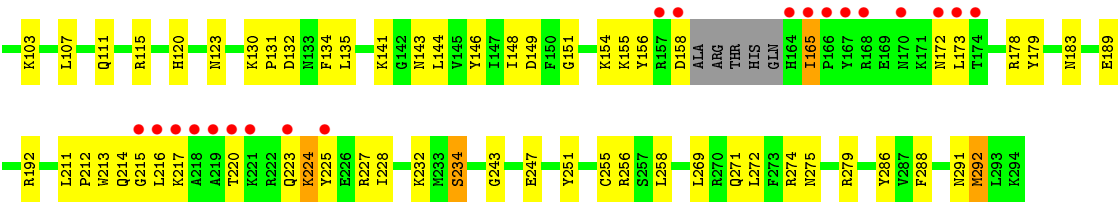


• Molecule 1: Casein kinase I isoform delta

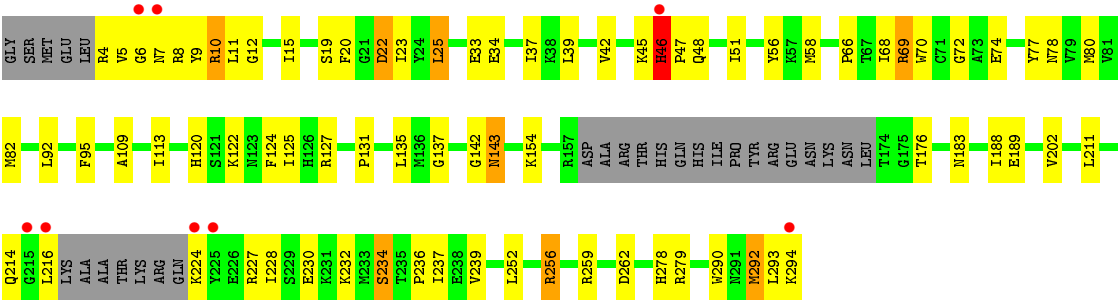


• Molecule 1: Casein kinase I isoform delta





● Molecule 1: Casein kinase I isoform delta



4 Data and refinement statistics

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α , β , γ	49.15Å 85.34Å 89.14Å 72.87° 74.36° 87.26°	Depositor
Resolution (Å)	50.00 – 2.00 32.98 – 1.84	Depositor EDS
% Data completeness (in resolution range)	(Not available) (50.00-2.00) 80.1 (32.98-1.84)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.20 (at 1.84Å)	Xtriage
Refinement program	CNS	Depositor
R, R_{free}	0.244 , 0.264 0.239 , 0.259	Depositor DCC
R_{free} test set	4389 reflections (5.27%)	DCC
Wilson B-factor (Å ²)	25.9	Xtriage
Anisotropy	0.542	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.31 , 43.7	EDS
Estimated twinning fraction	0.074 for h,-k,h-l	Xtriage
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.34$	Xtriage
Outliers	0 of 97538 reflections	Xtriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	10156	wwPDB-VP
Average B, all atoms (Å ²)	36.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 8.08% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

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

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: 0CK, SO4

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	0.48	0/2368	0.71	0/3186
1	B	0.47	0/2374	0.72	0/3193
1	C	0.46	0/2335	0.70	0/3144
1	D	0.50	1/2210 (0.0%)	0.76	3/2970 (0.1%)
All	All	0.48	1/9287 (0.0%)	0.72	3/12493 (0.0%)

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

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	D	69	ARG	NE-CZ	-5.47	1.25	1.33

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	69	ARG	NE-CZ-NH2	-7.45	116.58	120.30
1	D	78	ASN	N-CA-C	-6.24	94.16	111.00
1	D	69	ARG	NE-CZ-NH1	5.21	122.90	120.30

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	B	244	TYR	Sidechain

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	2315	0	2278	75	0
1	B	2321	0	2298	80	0
1	C	2284	0	2242	93	0
1	D	2161	0	2137	80	0
2	A	25	0	20	2	0
2	B	25	0	20	3	0
2	C	25	0	20	0	0
2	D	25	0	20	6	0
3	A	10	0	0	1	0
3	B	5	0	0	0	0
3	C	10	0	0	2	0
3	D	10	0	0	0	0
4	A	251	0	0	16	2
4	B	225	0	0	20	0
4	C	236	0	0	23	0
4	D	228	0	0	14	1
All	All	10156	0	9035	328	2

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 18.

The worst 5 of 328 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:D:46:HIS:HB3	1:D:47:PRO:CA	1.78	1.13
1:D:46:HIS:HB3	1:D:47:PRO:HA	1.39	1.04
1:A:172:ASN:OD1	1:B:170:ASN:HB3	1.56	1.04
1:C:156:TYR:HA	1:C:165:ILE:HD13	1.39	1.04
1:D:256:ARG:HD2	4:D:336:HOH:O	1.70	0.92

All (2) symmetry-related close contacts are listed below. The label for Atom-2 includes the sym-

metry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:A:805:HOH:O	4:D:327:HOH:O[1_455]	2.08	0.12
4:A:1015:HOH:O	4:A:1134:HOH:O[1_455]	2.19	0.01

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	283/296 (96%)	277 (98%)	5 (2%)	1 (0%)	39	33
1	B	282/296 (95%)	264 (94%)	12 (4%)	6 (2%)	9	3
1	C	282/296 (95%)	266 (94%)	15 (5%)	1 (0%)	39	33
1	D	262/296 (88%)	251 (96%)	10 (4%)	1 (0%)	39	33
All	All	1109/1184 (94%)	1058 (95%)	42 (4%)	9 (1%)	24	15

5 of 9 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	170	ASN
1	B	218	ALA
1	D	46	HIS
1	B	139	GLY
1	B	7	ASN

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	245/259 (95%)	235 (96%)	10 (4%)	37	32
1	B	247/259 (95%)	228 (92%)	19 (8%)	16	10
1	C	239/259 (92%)	228 (95%)	11 (5%)	33	28
1	D	230/259 (89%)	216 (94%)	14 (6%)	23	17
All	All	961/1036 (93%)	907 (94%)	54 (6%)	26	20

5 of 54 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	173	LEU
1	C	11	LEU
1	D	176	THR
1	B	174	THR
1	B	234	SER

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 19 such sidechains are listed below:

Mol	Chain	Res	Type
1	B	190	GLN
1	C	78	ASN
1	D	46	HIS
1	B	162	HIS
1	D	143	ASN

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$
2	OCK	A	295	-	24,28,28	3.08	13 (54%)	29,39,39	2.36	10 (34%)
3	SO4	A	296	-	4,4,4	1.02	0	6,6,6	0.33	0
3	SO4	A	297	-	4,4,4	1.03	0	6,6,6	0.85	0
2	OCK	B	295	-	24,28,28	3.07	15 (62%)	29,39,39	2.96	12 (41%)
3	SO4	B	296	-	4,4,4	1.17	0	6,6,6	1.03	0
2	OCK	C	295	-	24,28,28	2.72	12 (50%)	29,39,39	2.35	9 (31%)
3	SO4	C	296	-	4,4,4	0.84	0	6,6,6	0.51	0
3	SO4	C	297	-	4,4,4	1.38	1 (25%)	6,6,6	0.51	0
2	OCK	D	295	-	24,28,28	2.81	11 (45%)	29,39,39	2.38	14 (48%)
3	SO4	D	296	-	4,4,4	1.46	0	6,6,6	1.26	1 (16%)
3	SO4	D	297	-	4,4,4	0.92	0	6,6,6	0.29	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	OCK	A	295	-	-	0/5/20/20	0/4/4/4
3	SO4	A	296	-	-	0/0/0/0	0/0/0/0
3	SO4	A	297	-	-	0/0/0/0	0/0/0/0
2	OCK	B	295	-	-	0/5/20/20	0/4/4/4
3	SO4	B	296	-	-	0/0/0/0	0/0/0/0
2	OCK	C	295	-	-	0/5/20/20	0/4/4/4
3	SO4	C	296	-	-	0/0/0/0	0/0/0/0
3	SO4	C	297	-	-	0/0/0/0	0/0/0/0
2	OCK	D	295	-	-	0/5/20/20	0/4/4/4
3	SO4	D	296	-	-	0/0/0/0	0/0/0/0
3	SO4	D	297	-	-	0/0/0/0	0/0/0/0

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

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	295	0CK	C15-N2	-3.21	1.44	1.49
2	C	295	0CK	C15-N2	-2.31	1.45	1.49
3	C	297	SO4	O2-S	-2.07	1.40	1.47
2	A	295	0CK	C10-C11	2.08	1.42	1.38
2	B	295	0CK	C11-N4	2.21	1.39	1.34

The worst 5 of 46 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	295	0CK	C10-C11-N4	-4.63	118.62	123.90
2	B	295	0CK	C10-C13-N5	-4.51	115.78	122.01
2	D	295	0CK	C10-C11-N4	-4.44	118.83	123.90
2	B	295	0CK	C10-C11-N4	-3.65	119.74	123.90
2	A	295	0CK	C10-C13-N5	-3.56	117.10	122.01

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

6 monomers are involved in 14 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	295	0CK	2	0
3	A	297	SO4	1	0
2	B	295	0CK	3	0
3	C	296	SO4	1	0
3	C	297	SO4	1	0
2	D	295	0CK	6	0

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data [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, 95th 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 ²)	Q<0.9
1	A	287/296 (96%)	0.19	15 (5%) 31 33	20, 33, 52, 63	1 (0%)
1	B	286/296 (96%)	0.37	25 (8%) 13 13	21, 35, 59, 71	1 (0%)
1	C	286/296 (96%)	0.39	22 (7%) 16 17	20, 33, 67, 80	1 (0%)
1	D	268/296 (90%)	0.09	8 (2%) 54 55	19, 32, 51, 61	1 (0%)
All	All	1127/1184 (95%)	0.26	70 (6%) 24 25	19, 33, 57, 80	4 (0%)

The worst 5 of 70 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	170	ASN	9.9
1	C	166	PRO	8.7
1	C	218	ALA	7.4
1	C	165	ILE	7.4
1	B	222	ARG	6.4

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, 95th 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(\AA^2)	Q<0.9
2	OCK	C	295	25/25	0.90	0.14	0.77	25,29,33,33	0
2	OCK	D	295	25/25	0.94	0.14	0.46	26,28,32,33	0
2	OCK	B	295	25/25	0.89	0.14	0.37	29,35,39,39	0
3	SO4	C	296	5/5	0.94	0.12	0.19	53,53,54,55	0
2	OCK	A	295	25/25	0.93	0.11	-0.39	27,30,32,32	0
3	SO4	A	296	5/5	0.96	0.11	-0.54	47,48,49,50	0
3	SO4	C	297	5/5	0.97	0.14	-0.68	55,57,57,58	0
3	SO4	D	297	5/5	0.98	0.12	-0.71	47,48,48,49	0
3	SO4	B	296	5/5	0.96	0.09	-1.15	51,52,53,53	0
3	SO4	D	296	5/5	0.98	0.09	-1.42	51,52,52,52	0
3	SO4	A	297	5/5	0.94	0.10	-	54,55,56,57	0

6.5 Other polymers [i](#)

There are no such residues in this entry.