Full wwPDB X-ray Structure Validation Report (i)

Dec 9, 2023 – 04:29 pm GMT

PDB ID	:	2JK5
Title	:	Potassium Channel KcsA in complex with Tetrabutylammonium in high K
Authors	:	Lenaeus, M.J.; Focia, P.J.; Wagner, T.; Gross, A.
Deposited on	:	2008-08-15
Resolution	:	2.40 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*
A user guide is available at
https://www.wwpdb.org/validation/2017/XrayValidationReportHelp
with specific help available everywhere you see the (i) symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

The following versions of software and data (see references (i)) were used in the production of this report:

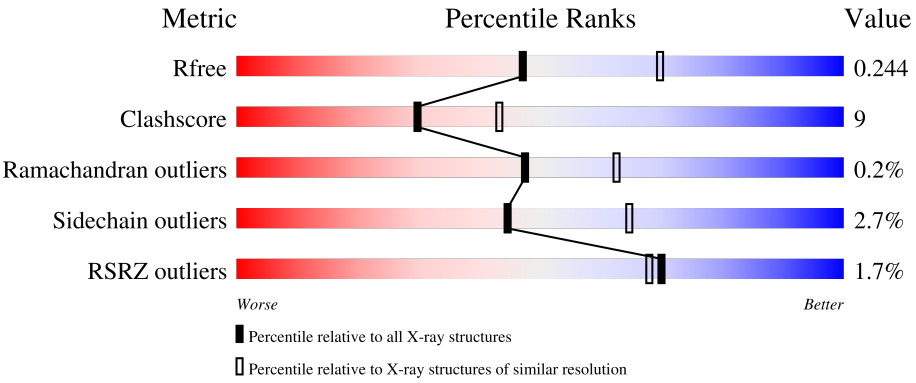
MolProbity	:	4.02b-467
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.36
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 2.40 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}	130704	3907 (2.40-2.40)
Clashscore	141614	4398 (2.40-2.40)
Ramachandran outliers	138981	4318 (2.40-2.40)
Sidechain outliers	138945	4319 (2.40-2.40)
RSRZ outliers	127900	3811 (2.40-2.40)

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 of the lower bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. 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 <=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	219	3% 85% 13%
2	B	212	% 83% 15%
3	C	124	78% 5% 17%

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
5	K	C	1130	-	-	-	X

2 Entry composition (i)

There are 10 unique types of molecules in this entry. The entry contains 4420 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 ANTIBODY FAB FRAGMENT LIGHT CHAIN.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	219	Total	C	N	O	S	0	7	0
			1687	1061	283	337	6			

- Molecule 2 is a protein called ANTIBODY FAB FRAGMENT HEAVY CHAIN.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	212	Total	C	N	O	S	0	2	0
			1664	1033	286	340	5			

- Molecule 3 is a protein called VOLTAGE-GATED POTASSIUM CHANNEL.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	C	103	Total	C	N	O	S	0	1	0
			778	510	133	133	2			

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	90	CYS	LEU	conflict	UNP P0A334

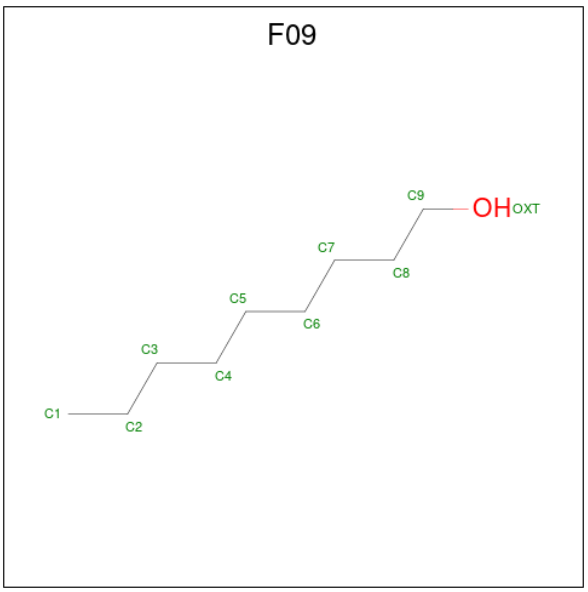
- Molecule 4 is COBALT (II) ION (three-letter code: CO) (formula: Co).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	C	1	Total	Co	0	0
			1	1		

- Molecule 5 is POTASSIUM ION (three-letter code: K) (formula: K).

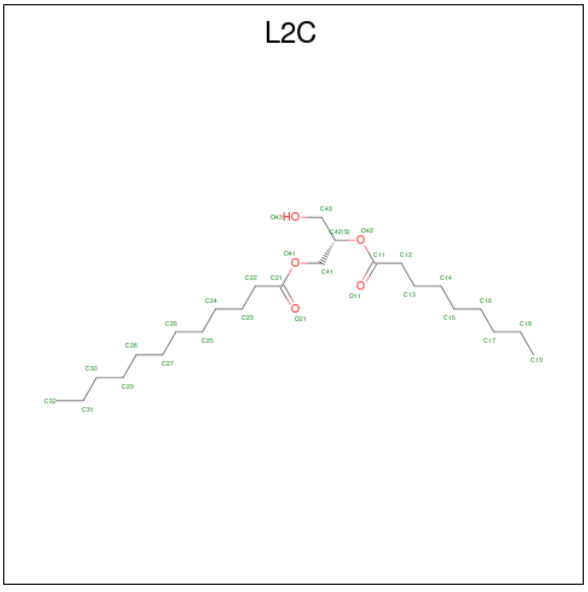
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	C	6	Total	K	0	0
			6	6		

- Molecule 6 is NONAN-1-OL (three-letter code: F09) (formula: $C_9H_{20}O$).



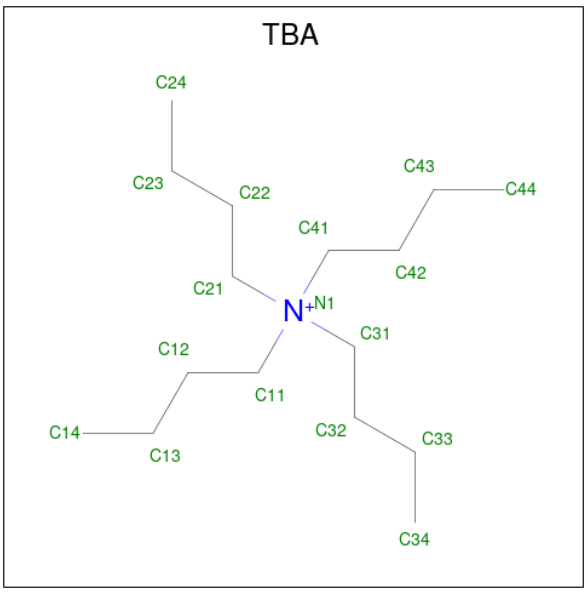
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	C	1	Total C O 10 9 1	0	0

- Molecule 7 is (2S)-3-HYDROXY-2-(NONANOYLOXY)PROPYL LAURATE (three-letter code: L2C) (formula: $C_{24}H_{46}O_5$).



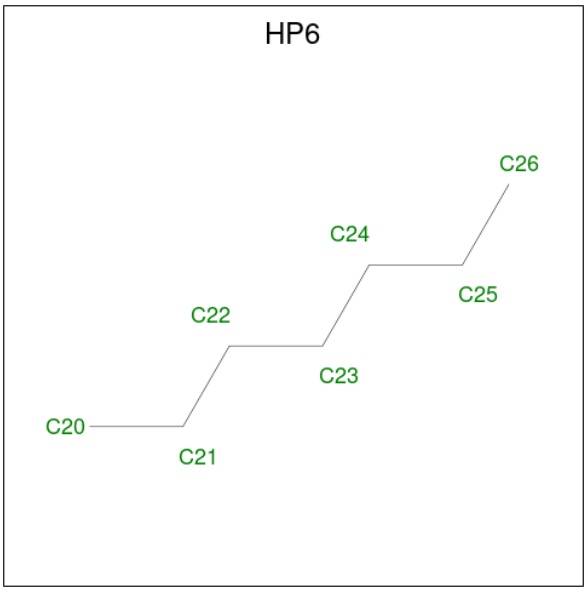
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	C	1	Total C O 29 24 5	0	0

- Molecule 8 is TETRABUTYLAMMONIUM ION (three-letter code: TBA) (formula: $C_{16}H_{36}N$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
8	C	1	Total C N 34 32 2	0	1

- Molecule 9 is HEPTANE (three-letter code: HP6) (formula: C_7H_{16}).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
9	C	1	Total C 7 7	0	0

- Molecule 10 is water.

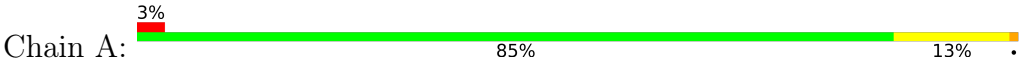
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
10	A	72	Total O 72 72	0	0
10	B	81	Total O 81 81	0	0
10	C	51	Total O 51 51	0	0

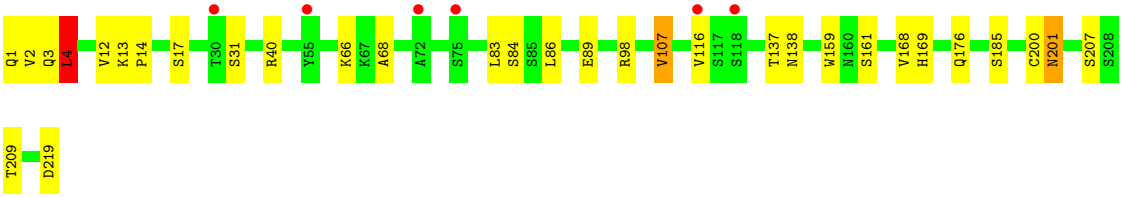
3 Residue-property plots

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

• Molecule 1: ANTIBODY FAB FRAGMENT LIGHT CHAIN

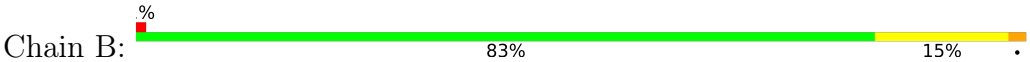
Chain A:

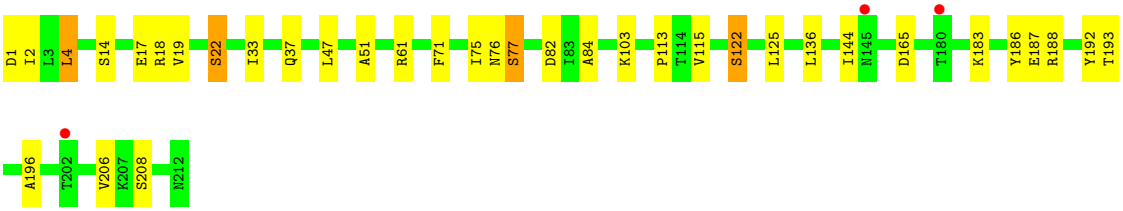




• Molecule 2: ANTIBODY FAB FRAGMENT HEAVY CHAIN

Chain B:





• Molecule 3: VOLTAGE-GATED POTASSIUM CHANNEL

Chain C:

4 Data and refinement statistics (i)

Property	Value	Source
Space group	I 4	Depositor
Cell constants a, b, c, α, β, γ	156.15Å 156.15Å 76.33Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	30.00 – 2.40 49.38 – 2.40	Depositor EDS
% Data completeness (in resolution range)	99.5 (30.00-2.40) 99.4 (49.38-2.40)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.95 (at 2.39Å)	Xtriage
Refinement program	REFMAC 5.5.0051	Depositor
R, R_{free}	0.202 , 0.249 0.202 , 0.244	Depositor DCC
R_{free} test set	1790 reflections (5.01%)	wwPDB-VP
Wilson B-factor (Å^2)	37.1	Xtriage
Anisotropy	0.381	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.33 , 52.0	EDS
L-test for twinning[2]	$< \|L\| > = 0.48$, $< L^2 > = 0.31$	Xtriage
Estimated twinning fraction	0.029 for -k,-h,-l	Xtriage
F_o,F_c correlation	0.94	EDS
Total number of atoms	4420	wwPDB-VP
Average B, all atoms (Å^2)	44.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.28% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ 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: K, L2C, HP6, CO, F09, TBA

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	0.51	0/1730	0.60	1/2368 (0.0%)
2	B	0.53	0/1701	0.62	0/2309
3	C	0.65	0/798	0.63	0/1097
All	All	0.55	0/4229	0.62	1/5774 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	4	LEU	CA-CB-CG	5.46	127.86	115.30

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	1687	0	1616	25	0
2	B	1664	0	1591	35	0
3	C	778	0	789	5	0
4	C	1	0	0	0	0
5	C	6	0	0	0	0
6	C	10	0	19	1	0
7	C	29	0	46	6	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
8	C	34	0	72	9	0
9	C	7	0	16	1	0
10	A	72	0	0	3	0
10	B	81	0	0	5	0
10	C	51	0	0	2	0
All	All	4420	0	4149	79	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 9.

All (79) 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)
7:C:1132:L2C:H121	7:C:1132:L2C:H412	1.32	1.10
2:B:193:THR:HG22	2:B:208:SER:HB3	1.44	0.95
2:B:193:THR:HG22	2:B:208:SER:CB	1.97	0.95
2:B:18:ARG:HH11	2:B:76[A]:ASN:HD21	1.04	0.93
2:B:1:ASP:OD1	10:B:2002:HOH:O	1.85	0.93
2:B:18:ARG:HH11	2:B:76[A]:ASN:ND2	1.76	0.83
7:C:1132:L2C:H121	7:C:1132:L2C:C41	2.13	0.77
2:B:193:THR:CG2	2:B:208:SER:HB3	2.15	0.76
7:C:1132:L2C:H412	7:C:1132:L2C:C12	2.06	0.75
1:A:40[B]:ARG:HD3	10:A:2017:HOH:O	1.89	0.73
6:C:1131:F09:H32	9:C:1134:HP6:H241	1.72	0.71
7:C:1132:L2C:O43	10:C:2051:HOH:O	2.01	0.69
1:A:66:LYS:HE2	1:A:68:ALA:O	1.94	0.68
1:A:161:SER:H	1:A:201:ASN:HD21	1.43	0.65
2:B:193:THR:HG22	2:B:208:SER:HB2	1.79	0.64
8:C:1133[B]:TBA:C22	8:C:1133[B]:TBA:H122	2.28	0.63
1:A:83:LEU:HB3	1:A:86:LEU:HD21	1.78	0.63
3:C:22:SER:HA	10:C:2007:HOH:O	2.00	0.61
1:A:40[B]:ARG:HH12	1:A:89:GLU:HA	1.64	0.60
1:A:1:GLN:N	10:A:2001:HOH:O	2.33	0.60
8:C:1133[B]:TBA:H122	8:C:1133[B]:TBA:H221	1.82	0.60
8:C:1133[B]:TBA:H221	8:C:1133[B]:TBA:C12	2.30	0.60
1:A:40[A]:ARG:HD3	10:A:2016:HOH:O	2.01	0.59
2:B:19:VAL:HG12	2:B:75:ILE:HB	1.87	0.57
7:C:1132:L2C:C41	7:C:1132:L2C:C12	2.74	0.56
2:B:113:PRO:HG3	2:B:144:ILE:HD11	1.88	0.55
2:B:61:ARG:HG3	2:B:76[A]:ASN:O	2.06	0.55
2:B:61:ARG:HG3	2:B:76[B]:ASN:O	2.07	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:137:THR:HG22	1:A:138:ASN:N	2.25	0.52
1:A:17[B]:SER:OG	1:A:84[B]:SER:HA	2.09	0.51
1:A:3[A]:GLN:HE21	1:A:98:ARG:NH1	2.08	0.51
2:B:22:SER:HB2	10:B:2041:HOH:O	2.11	0.51
2:B:193:THR:CB	2:B:208:SER:HB3	2.41	0.51
2:B:61:ARG:HG2	2:B:75:ILE:HG23	1.92	0.51
2:B:37:GLN:HB2	2:B:47:LEU:HD11	1.93	0.50
3:C:44:SER:OG	3:C:66:LEU:HA	2.11	0.50
2:B:206:VAL:HB	10:B:2078:HOH:O	2.12	0.50
1:A:1:GLN:N	1:A:1:GLN:OE1	2.34	0.49
1:A:12:VAL:HG11	1:A:86:LEU:HD12	1.94	0.49
2:B:76[B]:ASN:O	2:B:76[B]:ASN:ND2	2.46	0.49
1:A:12:VAL:O	1:A:116:VAL:HA	2.13	0.48
2:B:115:VAL:HG13	2:B:136:LEU:HD13	1.95	0.48
2:B:18:ARG:HD2	2:B:76[A]:ASN:ND2	2.28	0.47
2:B:76[B]:ASN:ND2	2:B:76[B]:ASN:C	2.67	0.47
1:A:40[B]:ARG:NH1	1:A:89:GLU:HA	2.27	0.47
2:B:18:ARG:NH1	2:B:76[A]:ASN:HD21	1.89	0.47
1:A:168:VAL:HA	1:A:185:SER:O	2.15	0.46
2:B:61:ARG:NH1	2:B:82:ASP:OD1	2.36	0.46
3:C:25:HIS:H	3:C:25:HIS:CD2	2.33	0.46
1:A:161:SER:N	1:A:201:ASN:HD21	2.12	0.46
8:C:1133[B]:TBA:H122	8:C:1133[B]:TBA:H212	1.61	0.45
2:B:14:SER:O	2:B:17:GLU:HB2	2.17	0.45
2:B:186:TYR:HA	2:B:192:TYR:OH	2.16	0.45
3:C:89:ARG:HH11	7:C:1132:L2C:H131	1.82	0.45
8:C:1133[A]:TBA:H122	8:C:1133[A]:TBA:H212	1.27	0.45
2:B:33:ILE:HG21	2:B:71:PHE:CD2	2.52	0.44
2:B:61:ARG:HD2	2:B:77:SER:O	2.18	0.44
8:C:1133[B]:TBA:H322	8:C:1133[B]:TBA:H412	1.61	0.44
2:B:1:ASP:HB2	10:B:2003:HOH:O	2.17	0.44
2:B:193:THR:HB	10:B:2078:HOH:O	2.18	0.44
1:A:159:TRP:CZ3	1:A:200:CYS:HB3	2.53	0.43
8:C:1133[A]:TBA:H322	8:C:1133[A]:TBA:H412	1.27	0.43
2:B:183:LYS:O	2:B:187:GLU:HG2	2.17	0.43
8:C:1133[B]:TBA:H422	8:C:1133[B]:TBA:H111	1.73	0.43
1:A:137:THR:CG2	1:A:138:ASN:N	2.83	0.42
2:B:122:SER:HA	2:B:125:LEU:HD12	2.01	0.42
2:B:2:ILE:HG22	2:B:4:LEU:HD13	2.01	0.42
1:A:13:LYS:O	1:A:14:PRO:C	2.58	0.42
1:A:4:LEU:HD22	1:A:107:VAL:HG13	2.02	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:31:SER:HB2	3:C:62:TYR:CE1	2.54	0.42
1:A:207:SER:O	1:A:209:THR:HG23	2.20	0.41
1:A:40[B]:ARG:HD3	1:A:40[B]:ARG:HH11	1.73	0.41
8:C:1133[B]:TBA:H222	8:C:1133[B]:TBA:H311	1.81	0.41
2:B:77:SER:O	2:B:77:SER:OG	2.38	0.41
2:B:33:ILE:HG22	2:B:51:ALA:HB2	2.03	0.41
2:B:136:LEU:CD1	2:B:196:ALA:HB2	2.51	0.40
1:A:3[A]:GLN:HE21	1:A:98:ARG:HH12	1.69	0.40
1:A:159:TRP:CH2	1:A:200:CYS:HB3	2.56	0.40
2:B:84:ALA:O	2:B:103:LYS:HD2	2.22	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	223/219 (102%)	213 (96%)	9 (4%)	1 (0%)	34 48
2	B	212/212 (100%)	203 (96%)	9 (4%)	0	100 100
3	C	102/124 (82%)	99 (97%)	3 (3%)	0	100 100
All	All	537/555 (97%)	515 (96%)	21 (4%)	1 (0%)	47 62

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	2	VAL

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	187/185 (101%)	180 (96%)	7 (4%)	34 53
2	B	192/190 (101%)	186 (97%)	6 (3%)	40 60
3	C	75/92 (82%)	75 (100%)	0	100 100
All	All	454/467 (97%)	441 (97%)	13 (3%)	44 62

All (13) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	4	LEU
1	A	107	VAL
1	A	169	HIS
1	A	176	GLN
1	A	201	ASN
1	A	219[A]	ASP
1	A	219[B]	ASP
2	B	4	LEU
2	B	22	SER
2	B	77	SER
2	B	122	SER
2	B	165	ASP
2	B	188	ARG

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

Mol	Chain	Res	Type
1	A	65	GLN
1	A	201	ASN
2	B	41	ASN
2	B	137	ASN
2	B	190	ASN
3	C	25	HIS

5.3.3 RNA

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 monosaccharides in this entry.

5.6 Ligand geometry (i)

Of 12 ligands modelled in this entry, 7 are monoatomic - leaving 5 for Mogul analysis.

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	$\#\|Z\| > 2$
7	L2C	C	1132	-	28,28,28	1.42	3 (10%)	30,30,30	1.58	3 (10%)
8	TBA	C	1133[B]	-	16,16,16	0.77	0	18,18,18	0.67	0
9	HP6	C	1134	-	6,6,6	0.33	0	5,5,5	0.34	0
6	F09	C	1131	-	9,9,9	1.29	1 (11%)	8,8,8	0.52	0
8	TBA	C	1133[A]	-	16,16,16	1.35	4 (25%)	18,18,18	0.98	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
7	L2C	C	1132	-	-	17/30/30/30	-
8	TBA	C	1133[B]	-	-	9/20/20/20	-
9	HP6	C	1134	-	-	4/4/4/4	-
6	F09	C	1131	-	-	6/7/7/7	-
8	TBA	C	1133[A]	-	-	14/20/20/20	-

All (8) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
7	C	1132	L2C	O41-C21	4.54	1.46	1.33
7	C	1132	L2C	O42-C11	4.46	1.46	1.34
6	C	1131	F09	OXT-C9	-3.79	1.22	1.42
7	C	1132	L2C	C25-C24	-3.11	1.34	1.51
8	C	1133[A]	TBA	C41-N1	-2.73	1.43	1.52
8	C	1133[A]	TBA	C21-N1	-2.72	1.43	1.52
8	C	1133[A]	TBA	C11-N1	-2.64	1.43	1.52
8	C	1133[A]	TBA	C31-N1	-2.64	1.43	1.52

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
7	C	1132	L2C	O42-C11-C12	5.82	124.05	111.50
7	C	1132	L2C	O41-C21-C22	3.16	121.83	111.91
7	C	1132	L2C	O42-C11-O11	-2.82	116.89	123.70

There are no chirality outliers.

All (50) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
7	C	1132	L2C	O11-C11-O42-C42
7	C	1132	L2C	C12-C11-O42-C42
7	C	1132	L2C	O42-C42-C43-O43
7	C	1132	L2C	C23-C24-C25-C26
7	C	1132	L2C	C22-C21-O41-C41
7	C	1132	L2C	O21-C21-O41-C41
6	C	1131	F09	C4-C5-C6-C7
7	C	1132	L2C	C21-C22-C23-C24
8	C	1133[A]	TBA	N1-C31-C32-C33
8	C	1133[A]	TBA	N1-C11-C12-C13
8	C	1133[B]	TBA	C12-C11-N1-C31
8	C	1133[B]	TBA	C12-C11-N1-C21
8	C	1133[B]	TBA	N1-C31-C32-C33
8	C	1133[B]	TBA	N1-C11-C12-C13
8	C	1133[B]	TBA	C12-C11-N1-C41
7	C	1132	L2C	C24-C25-C26-C27
6	C	1131	F09	C5-C6-C7-C8
8	C	1133[A]	TBA	C12-C11-N1-C31
8	C	1133[A]	TBA	C32-C31-N1-C11
6	C	1131	F09	C2-C3-C4-C5
7	C	1132	L2C	C22-C23-C24-C25
9	C	1134	HP6	C21-C22-C23-C24

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Mol	Chain	Res	Type	Atoms
8	C	1133[A]	TBA	C12-C11-N1-C21
8	C	1133[A]	TBA	C32-C31-N1-C41
8	C	1133[A]	TBA	C12-C11-N1-C41
8	C	1133[A]	TBA	C32-C31-N1-C21
8	C	1133[A]	TBA	C21-C22-C23-C24
8	C	1133[A]	TBA	C41-C42-C43-C44
6	C	1131	F09	C3-C4-C5-C6
6	C	1131	F09	C1-C2-C3-C4
9	C	1134	HP6	C23-C24-C25-C26
7	C	1132	L2C	C12-C13-C14-C15
7	C	1132	L2C	O41-C41-C42-C43
7	C	1132	L2C	C41-C42-C43-O43
7	C	1132	L2C	C27-C28-C29-C30
7	C	1132	L2C	C41-C42-O42-C11
9	C	1134	HP6	C20-C21-C22-C23
7	C	1132	L2C	O41-C41-C42-O42
9	C	1134	HP6	C22-C23-C24-C25
8	C	1133[A]	TBA	C11-C12-C13-C14
8	C	1133[A]	TBA	C31-C32-C33-C34
8	C	1133[B]	TBA	C31-C32-C33-C34
8	C	1133[B]	TBA	C32-C31-N1-C21
8	C	1133[B]	TBA	C32-C31-N1-C11
6	C	1131	F09	C6-C7-C8-C9
8	C	1133[B]	TBA	C32-C31-N1-C41
8	C	1133[A]	TBA	N1-C41-C42-C43
8	C	1133[A]	TBA	N1-C21-C22-C23
7	C	1132	L2C	C16-C17-C18-C19
7	C	1132	L2C	C25-C26-C27-C28

There are no ring outliers.

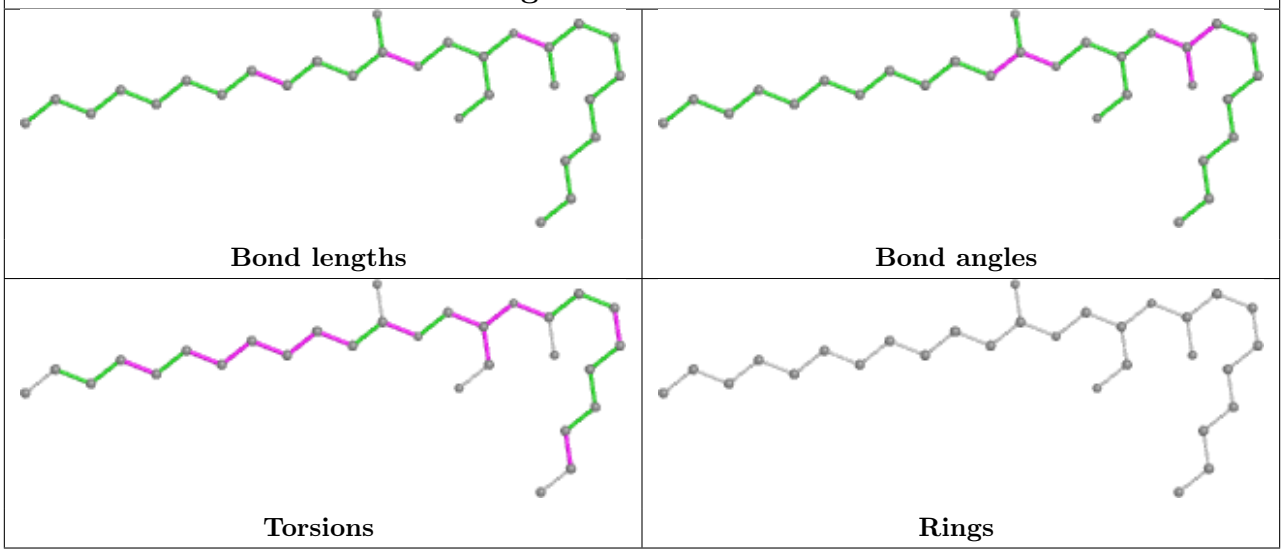
5 monomers are involved in 16 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
7	C	1132	L2C	6	0
8	C	1133[B]	TBA	7	0
9	C	1134	HP6	1	0
6	C	1131	F09	1	0
8	C	1133[A]	TBA	2	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will

also be included. For torsion angles, if less then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

Ligand L2C C 1132



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^{th} 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	219/219 (100%)	-0.16	6 (2%) 54 52	30, 51, 62, 70	3 (1%)
2	B	212/212 (100%)	-0.09	3 (1%) 75 73	22, 47, 69, 75	5 (2%)
3	C	103/124 (83%)	-0.22	0 100 100	19, 26, 50, 56	2 (1%)
All	All	534/555 (96%)	-0.15	9 (1%) 70 68	19, 46, 65, 75	10 (1%)

All (9) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	B	202	THR	3.0
1	A	75	SER	3.0
1	A	72	ALA	2.4
1	A	116	VAL	2.4
2	B	145	ASN	2.4
2	B	180	THR	2.3
1	A	30	THR	2.2
1	A	55	TYR	2.2
1	A	118[A]	SER	2.1

6.2 Non-standard residues in protein, DNA, RNA chains

There are no non-standard protein/DNA/RNA residues in this entry.

6.3 Carbohydrates

There are no monosaccharides in this entry.

6.4 Ligands (i)

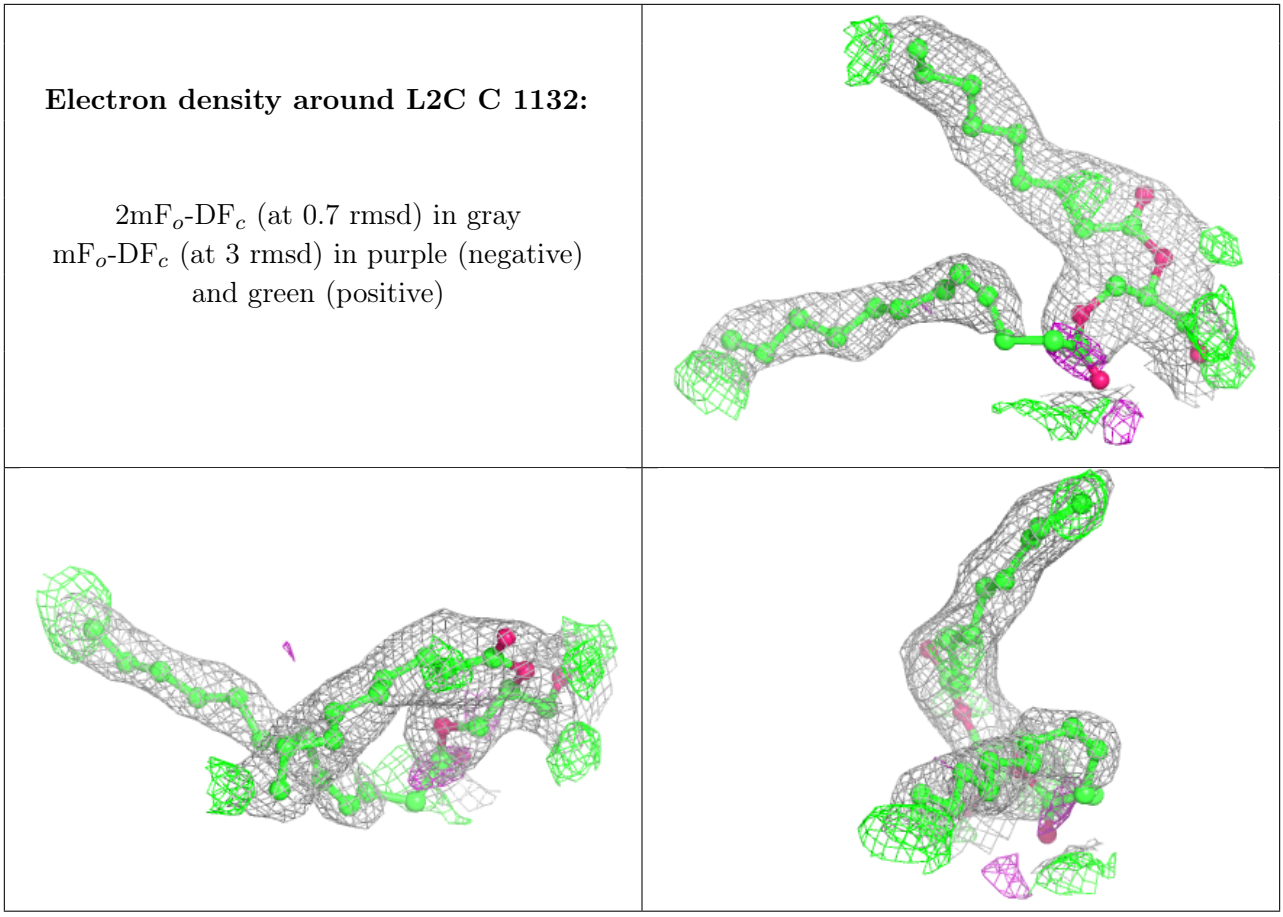
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
5	K	C	1130	1/1	0.56	0.87	63,63,63,63	1
7	L2C	C	1132	29/29	0.76	0.25	47,59,69,72	0
9	HP6	C	1134	7/7	0.80	0.35	48,51,54,54	0
6	F09	C	1131	10/10	0.93	0.17	56,59,60,61	0
8	TBA	C	1133[B]	17/17	0.95	0.17	20,21,21,21	17
8	TBA	C	1133[A]	17/17	0.95	0.17	23,23,24,24	17
5	K	C	1129	1/1	0.97	0.20	26,26,26,26	1
5	K	C	1126	1/1	0.99	0.21	22,22,22,22	1
5	K	C	1127	1/1	0.99	0.22	27,27,27,27	1
5	K	C	1128	1/1	0.99	0.16	18,18,18,18	1
4	CO	C	1124	1/1	0.99	0.05	42,42,42,42	1
5	K	C	1125	1/1	0.99	0.14	16,16,16,16	1

The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.

Electron density around L2C C 1132:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



6.5 Other polymers

There are no such residues in this entry.