



# Full wwPDB X-ray Structure Validation Report ⓘ

Feb 13, 2017 – 09:39 am GMT

PDB ID : 1K0O  
Title : Crystal structure of a soluble form of CLIC1. An intracellular chloride ion channel  
Authors : Harrop, S.J.; DeMaere, M.Z.; Fairlie, W.D.; Reztsova, T.; Valenzuela, S.M.; Mazzanti, M.; Tonini, R.; Qiu, M.R.; Jankova, L.; Warton, K.; Bauskin, A.R.; Wu, W.M.; Pankhurst, S.; Campbell, T.J.; Breit, S.N.; Curmi, P.M.G.  
Deposited on : 2001-09-19  
Resolution : 1.75 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  
Xtrriage (Phenix) : **NOT EXECUTED**  
EDS : **NOT EXECUTED**  
Percentile statistics : 20161228.v01 (using entries in the PDB archive December 28th 2016)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : recalc28949

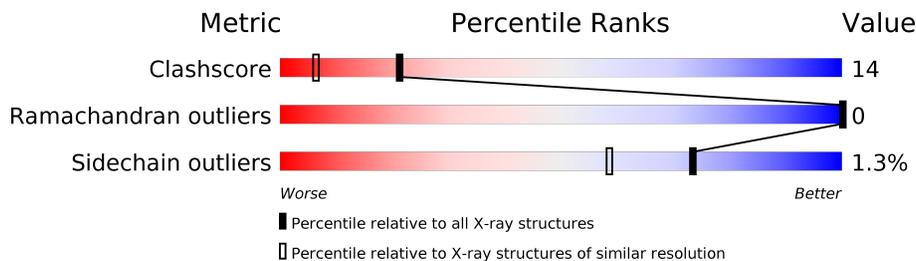
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 1.75 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))
Clashscore	112137	1889 (1.76-1.76)
Ramachandran outliers	110173	1868 (1.76-1.76)
Sidechain outliers	110143	1868 (1.76-1.76)

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.

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	A	241	 81% 11% • 7%
1	B	241	 65% 22% • 12%

## 2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 3572 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 CHLORIDE INTRACELLULAR CHANNEL PROTEIN 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	225	Total	C	N	O	S	0	0	0
			1771	1136	296	332	7			
1	B	213	Total	C	N	O	S	0	0	0
			1679	1080	279	313	7			

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	63	GLU	GLN	CONFLICT	UNP O00299
A	151	GLY	GLU	ENGINEERED	UNP O00299
B	63	GLU	GLN	CONFLICT	UNP O00299
B	151	GLY	GLU	ENGINEERED	UNP O00299

- Molecule 2 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	100	Total	O	0	0
			100	100		
2	B	22	Total	O	0	0
			22	22		



## 4 Data and refinement statistics

Xtrriage (Phenix) and EDS were not executed - this section is therefore incomplete.

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	46.41Å 60.31Å 89.43Å 90.00° 92.41° 90.00°	Depositor
Resolution (Å)	87.71 – 1.75	Depositor
% Data completeness (in resolution range)	98.0 (87.71-1.75)	Depositor
$R_{merge}$	0.04	Depositor
$R_{sym}$	0.04	Depositor
Refinement program	REFMAC 5	Depositor
R, $R_{free}$	0.240 , 0.268	Depositor
Estimated twinning fraction	No twinning to report.	Xtrriage
Total number of atoms	3572	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	16.0	wwPDB-VP

## 5 Model quality [i](#)

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

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	0.76	0/1808	0.85	4/2448 (0.2%)
1	B	0.54	0/1710	0.80	4/2309 (0.2%)
All	All	0.66	0/3518	0.83	8/4757 (0.2%)

There are no bond length outliers.

All (8) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	169	ASP	CB-CG-OD2	7.95	125.45	118.30
1	A	225	ASP	CB-CG-OD2	6.21	123.89	118.30
1	A	76	ASP	CB-CG-OD2	5.93	123.64	118.30
1	B	225	ASP	CB-CG-OD2	5.72	123.45	118.30
1	A	127	ASP	CB-CG-OD2	5.31	123.08	118.30
1	B	17	ASP	CB-CG-OD2	5.29	123.06	118.30
1	B	177	ASP	CB-CG-OD2	5.16	122.94	118.30
1	A	226	ASP	CB-CG-OD1	5.03	122.82	118.30

There are no chirality outliers.

There are no planarity outliers.

### 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	1771	0	1786	23	0
1	B	1679	0	1698	71	0
2	A	100	0	0	4	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	B	22	0	0	2	0
All	All	3572	0	3484	94	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 14.

All (94) 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:98:ALA:HB1	1:B:169:ASP:OD2	1.47	1.11
1:B:231:LEU:HD12	1:B:234:GLU:OE2	1.53	1.08
1:B:185:HIS:HD2	1:B:214:TYR:OH	1.42	1.01
1:B:46:VAL:HG21	1:B:64:LEU:CD1	1.96	0.95
1:A:76:ASP:OD1	1:A:79:LYS:HG3	1.71	0.91
1:B:231:LEU:HD12	1:B:234:GLU:CD	1.94	0.88
1:B:46:VAL:CG2	1:B:64:LEU:CD1	2.51	0.88
1:B:46:VAL:CG2	1:B:64:LEU:HD13	2.07	0.85
1:B:185:HIS:CD2	1:B:214:TYR:OH	2.32	0.83
1:B:34:LEU:HD21	1:B:84:LEU:HD13	1.62	0.82
1:B:46:VAL:HG21	1:B:64:LEU:HD11	1.62	0.81
1:A:210:LEU:O	1:A:214:TYR:HD2	1.63	0.80
1:A:210:LEU:O	1:A:214:TYR:CD2	2.35	0.79
1:B:168:LEU:HD21	1:B:209:TYR:CE2	2.18	0.78
1:B:218:GLU:HG3	2:B:257:HOH:O	1.83	0.77
1:B:46:VAL:CG2	1:B:64:LEU:HD11	2.14	0.77
1:B:58:LEU:HD21	1:B:68:LEU:HD22	1.68	0.75
1:A:16:SER:HB3	1:A:231:LEU:HD23	1.69	0.73
1:B:104:ASN:O	1:B:108:LEU:HD11	1.89	0.73
1:B:16:SER:HB3	1:B:231:LEU:CD2	2.22	0.70
1:B:168:LEU:HG	1:B:177:ASP:OD1	1.92	0.69
1:B:12:VAL:O	1:B:46:VAL:HG22	1.92	0.69
1:B:231:LEU:CD1	1:B:234:GLU:OE2	2.37	0.68
1:B:131:LYS:HE2	1:B:135:LYS:CE	2.23	0.68
1:B:168:LEU:HD21	1:B:209:TYR:CZ	2.28	0.68
1:B:144:LEU:HD21	1:B:168:LEU:CD2	2.24	0.68
1:B:131:LYS:HE2	1:B:135:LYS:HE3	1.74	0.67
1:A:214:TYR:CE1	1:A:219:PHE:HE2	2.13	0.67
1:A:16:SER:N	1:A:228:GLU:OE2	2.28	0.67
1:B:131:LYS:HG2	1:B:135:LYS:HE3	1.77	0.67
1:B:36:LEU:CD2	1:B:96:LEU:HD22	2.26	0.66
1:B:231:LEU:HA	1:B:234:GLU:HG3	1.78	0.66

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:214:TYR:CD1	1:A:219:PHE:HE2	2.15	0.65
1:B:98:ALA:CB	1:B:169:ASP:OD2	2.36	0.63
1:B:46:VAL:HG23	1:B:64:LEU:CD1	2.28	0.63
1:B:36:LEU:HD23	1:B:96:LEU:HD13	1.81	0.62
1:B:37:LYS:HE2	1:B:96:LEU:HD12	1.79	0.62
1:B:36:LEU:HD21	1:B:96:LEU:HD22	1.81	0.61
1:A:225:ASP:OD1	1:A:227:GLU:HG2	2.01	0.60
1:A:185:HIS:HD2	1:A:214:TYR:OH	1.83	0.60
1:A:214:TYR:CE1	1:A:219:PHE:CE2	2.90	0.60
1:B:144:LEU:HD21	1:B:168:LEU:HD22	1.84	0.59
1:B:29:ARG:NE	1:B:81:GLU:OE1	2.35	0.58
1:B:35:TRP:CG	1:B:218:GLU:HG2	2.39	0.57
1:B:235:GLN:HG2	1:B:235:GLN:O	2.05	0.57
1:B:85:GLU:OE2	1:B:96:LEU:N	2.21	0.57
1:B:144:LEU:HD13	1:B:209:TYR:HB2	1.88	0.56
1:A:75:THR:O	1:A:76:ASP:HB3	2.05	0.56
1:B:46:VAL:HG21	1:B:64:LEU:HD13	1.72	0.55
1:B:88:LEU:HD22	1:B:93:TYR:CE2	2.42	0.54
1:A:63:GLU:HG3	2:A:242:HOH:O	2.08	0.53
1:A:31:PHE:CE1	1:A:43:VAL:HG21	2.44	0.53
1:B:34:LEU:CD2	1:B:84:LEU:HD13	2.35	0.53
1:B:20:LYS:HE3	1:B:228:GLU:OE1	2.09	0.53
1:A:26:PHE:HE1	2:A:318:HOH:O	1.92	0.52
1:B:76:ASP:HB3	1:B:79:LYS:HB2	1.90	0.52
1:B:16:SER:HB3	1:B:231:LEU:HD23	1.90	0.52
1:B:46:VAL:HG23	1:B:64:LEU:HD13	1.90	0.52
1:B:144:LEU:HD21	1:B:168:LEU:HD23	1.89	0.52
1:A:185:HIS:HE1	2:A:248:HOH:O	1.94	0.51
1:B:37:LYS:NZ	1:B:85:GLU:OE1	2.42	0.49
1:B:54:THR:O	1:B:58:LEU:HB2	2.13	0.48
1:B:34:LEU:HD21	1:B:84:LEU:CD1	2.36	0.48
1:B:122:ASN:HD22	1:B:122:ASN:C	2.18	0.47
1:B:210:LEU:O	1:B:214:TYR:HD2	1.97	0.47
1:A:123:PRO:HG3	1:A:241:LYS:OXT	2.14	0.47
1:A:138:LYS:HD3	1:A:203:PHE:CE1	2.49	0.47
1:B:36:LEU:HD13	1:B:173:LEU:HD23	1.97	0.47
1:B:130:GLU:O	1:B:134:LEU:HG	2.14	0.47
1:B:231:LEU:O	1:B:234:GLU:HG3	2.15	0.47
1:B:35:TRP:CD1	1:B:218:GLU:HG2	2.50	0.47
1:B:20:LYS:CE	1:B:228:GLU:OE1	2.63	0.46
1:B:119:LYS:O	1:B:238:LYS:HD2	2.14	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:231:LEU:HA	1:B:234:GLU:CG	2.44	0.46
1:B:39:VAL:HG12	1:B:40:THR:N	2.31	0.46
1:B:46:VAL:HG21	1:B:64:LEU:CD2	2.46	0.46
1:B:227:GLU:OE1	1:B:230:GLU:OE1	2.34	0.46
1:B:37:LYS:HZ1	1:B:85:GLU:CD	2.20	0.45
1:A:214:TYR:CD1	1:A:219:PHE:CE2	3.01	0.45
1:B:218:GLU:N	2:B:257:HOH:O	2.26	0.44
1:A:83:PHE:O	1:A:87:VAL:HG22	2.18	0.44
1:A:185:HIS:CE1	2:A:248:HOH:O	2.71	0.43
1:B:122:ASN:HD22	1:B:124:ALA:N	2.16	0.43
1:A:119:LYS:HE2	1:A:236:VAL:HG13	1.99	0.43
1:B:168:LEU:CD2	1:B:209:TYR:CZ	2.99	0.43
1:B:87:VAL:HG12	1:B:87:VAL:O	2.19	0.43
1:B:58:LEU:HD21	1:B:68:LEU:HD13	2.01	0.42
1:B:15:GLY:N	1:B:20:LYS:O	2.53	0.42
1:B:16:SER:CB	1:B:231:LEU:CD2	2.95	0.42
1:B:29:ARG:CZ	1:B:179:ASN:HD22	2.34	0.41
1:B:36:LEU:HD21	1:B:173:LEU:O	2.21	0.41
1:B:36:LEU:HD23	1:B:96:LEU:HD22	1.99	0.41
1:A:15:GLY:HA3	1:A:228:GLU:OE2	2.20	0.41
1:A:197:PHE:C	1:A:197:PHE:CD2	2.95	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	221/241 (92%)	216 (98%)	5 (2%)	0	100	100
1	B	205/241 (85%)	200 (98%)	5 (2%)	0	100	100
All	All	426/482 (88%)	416 (98%)	10 (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	194/207 (94%)	192 (99%)	2 (1%)	80	67
1	B	183/207 (88%)	180 (98%)	3 (2%)	68	50
All	All	377/414 (91%)	372 (99%)	5 (1%)	73	58

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

Mol	Chain	Res	Type
1	A	31	PHE
1	A	217	GLU
1	B	99	LEU
1	B	122	ASN
1	B	146	SER

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (7) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	23	ASN
1	A	185	HIS
1	B	23	ASN
1	B	74	HIS
1	B	122	ASN
1	B	126	ASN
1	B	185	HIS

### 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](#)

There are no ligands in this entry.

## 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](#)

EDS was not executed - this section is therefore empty.

### 6.2 Non-standard residues in protein, DNA, RNA chains [i](#)

EDS was not executed - this section is therefore empty.

### 6.3 Carbohydrates [i](#)

EDS was not executed - this section is therefore empty.

### 6.4 Ligands [i](#)

EDS was not executed - this section is therefore empty.

### 6.5 Other polymers [i](#)

EDS was not executed - this section is therefore empty.