WORLDWIDE wwPDB PROTEIN DATA BANK

Full wwPDB X-ray Structure Validation Report ⓘ

Feb 12, 2024 – 01:00 pm GMT

PDB ID	:	8CDM
Title	:	Plasmodium falciparum Myosin A full-length, post-rigor state complexed to the inhibitor KNX-002
Authors	:	Moussaoui, D.; Robblee, J.P.; Robert-Paganin, J.; Auguin, D.; Fisher, F.; Fagnant, P.M.; MacFarlane, J.E.; Mueller-Dieckmann, C.; Baum, J.; Trybus, K.M.; Houdusse, A.
Deposited on	:	2023-01-31
Resolution	:	2.35 Å(reported)

The following versions of software and data (see references ①) 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 ⓘ

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

The reported resolution of this entry is 2.35 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	Percentile Ranks	Value
Rfree		0.246
Clashscore		5
Ramachandran outliers		0
Sidechain outliers		3.7%
RSRZ outliers		5.5%

Worse ← → *Better*

▮ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution
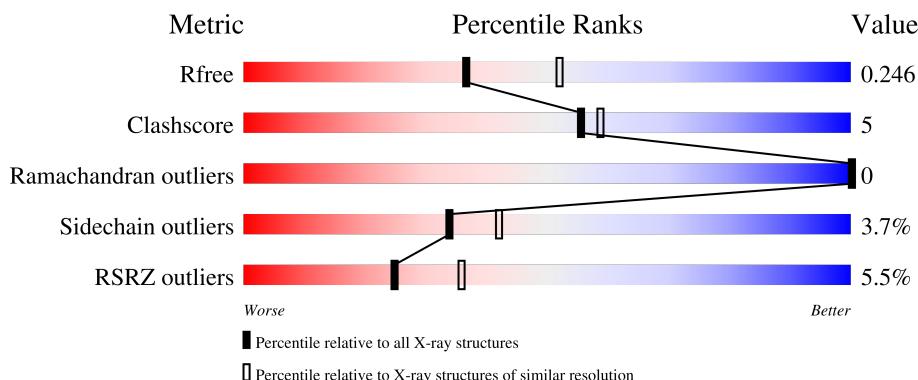
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	1164 (2.36-2.36)
Clashscore	141614	1232 (2.36-2.36)
Ramachandran outliers	138981	1211 (2.36-2.36)
Sidechain outliers	138945	1212 (2.36-2.36)
RSRZ outliers	127900	1150 (2.36-2.36)

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	818	4% ▮ 86% ... 12% ...
2	B	204	6% ▮ 54% ... 10% ... 36%
3	E	134	10% ▮ 81% ... 14% ...
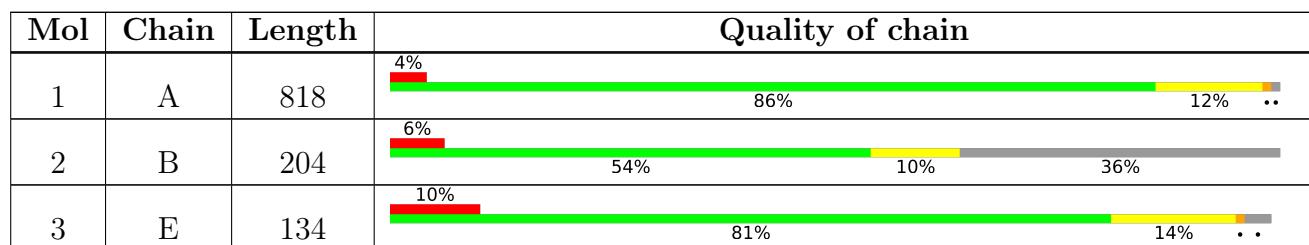
2 Entry composition ⓘ

There are 7 unique types of molecules in this entry. The entry contains 8946 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 Myosin-A.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	808	Total 6426	C 4092	N 1090	O 1210	P 1	S 33	0	1	0

- Molecule 2 is a protein called Myosin A tail domain interacting protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	131	Total 1051	C 661	N 167	O 218	S 5	0	0	0

- Molecule 3 is a protein called Myosin essential light chain ELC.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	E	130	Total 1069	C 683	N 173	O 207	S 6	0	0	0

- Molecule 4 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: $C_2H_6O_2$).
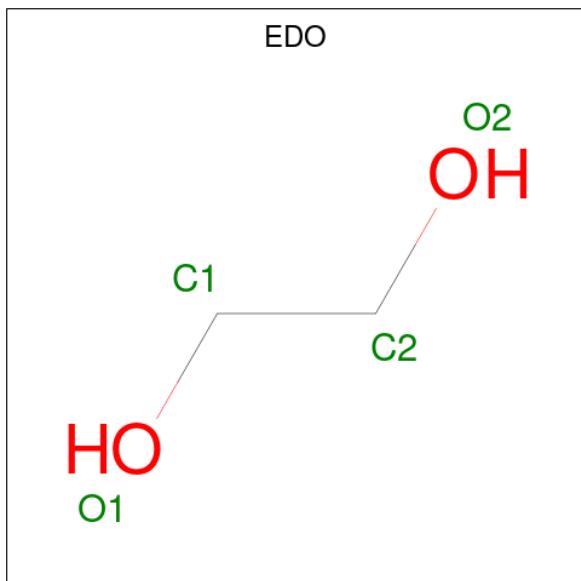
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total 4	C 2	O 2	0	0
4	E	1	Total 4	C 2	O 2	0	0

- Molecule 5 is 1-(4-methoxyphenyl)- {N}-[(3-thiophen-2-yl-1 {H}-pyrazol-4-yl)methyl]cyclopropan-1-amine (three-letter code: KQ0) (formula: $C_{18}H_{19}N_3OS$) (labeled as "Ligand of Interest" by depositor).
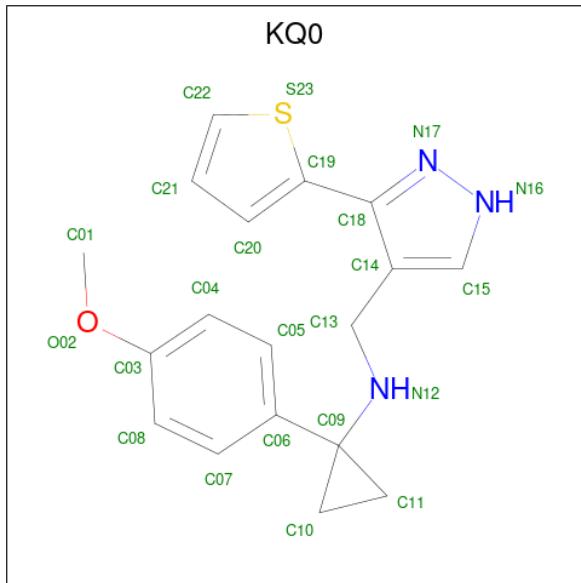
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
5	A	1	Total 23	C 18	N 3	O 1	S 1	0	0

- Molecule 6 is TETRAETHYLENE GLYCOL (three-letter code: PG4) (formula: $C_8H_{18}O_5$).

PG4
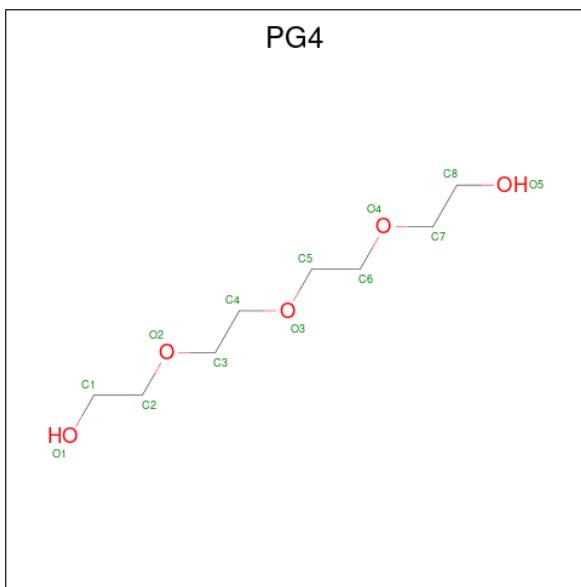
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	A	1	Total 13	C 8	O 5	0	0

- Molecule 7 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	287	Total 287	O 287	0	0
7	B	30	Total 30	O 30	0	0
7	E	39	Total 39	O 39	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: Myosin-A
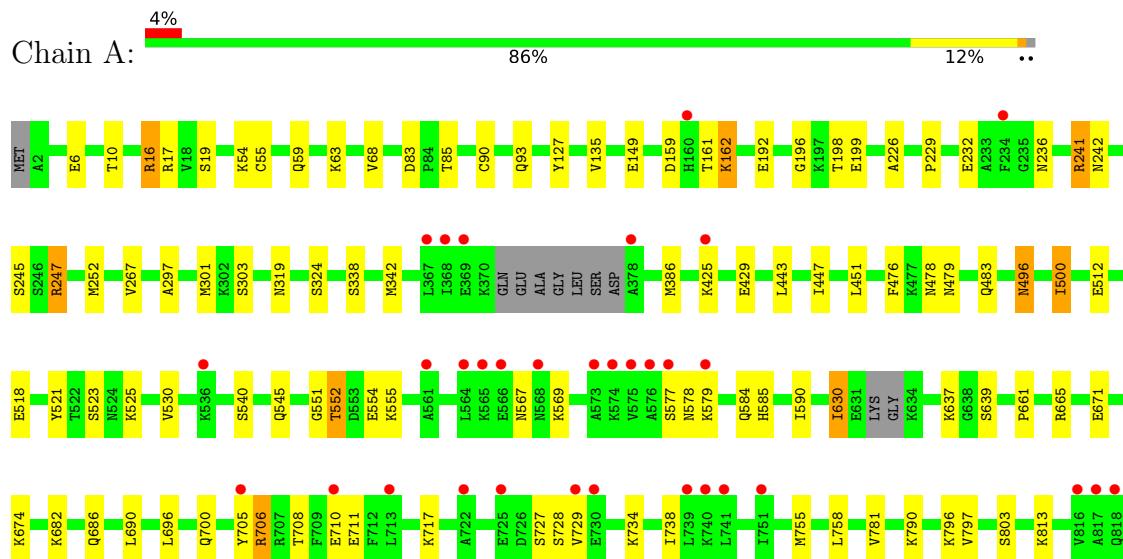
• Molecule 2: Myosin A tail domain interacting protein
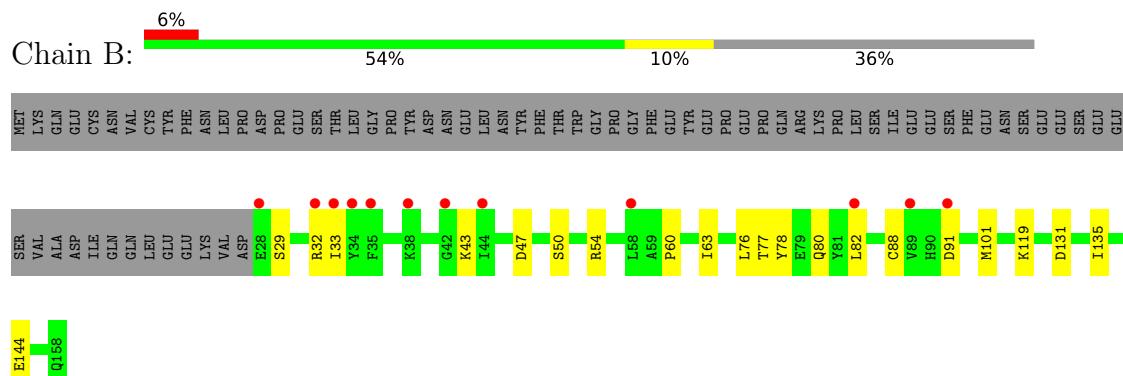
• Molecule 3: Myosin essential light chain ELC
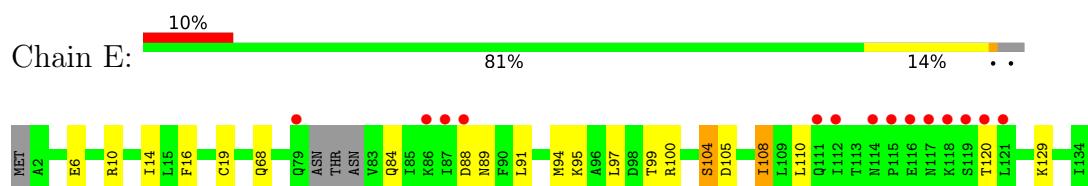
4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	89.93Å 114.41Å 170.33Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	46.44 – 2.35 46.44 – 2.35	Depositor EDS
% Data completeness (in resolution range)	75.4 (46.44-2.35) 75.4 (46.44-2.35)	Depositor EDS
R_{merge}	0.14	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.71 (at 2.37Å)	Xtriage
Refinement program	PHENIX 1.19.2_4158, PHENIX 1.19.2_4158	Depositor
R, R_{free}	0.196 , 0.248 0.194 , 0.246	Depositor DCC
R_{free} test set	2810 reflections (5.08%)	wwPDB-VP
Wilson B-factor (Å^2)	55.2	Xtriage
Anisotropy	0.043	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.35 , 49.8	EDS
L-test for twinning[2]	$< |L| > = 0.50, < L^2 > = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	8946	wwPDB-VP
Average B, all atoms (Å^2)	58.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.31% 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: PG4, EDO, KQ0, SEP

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	0.42	0/6526	0.59	0/8797
2	B	0.37	0/1068	0.51	0/1440
3	E	0.38	0/1088	0.53	0/1465
All	All	0.41	0/8682	0.57	0/11702

There are no bond length outliers.

There are no bond angle outliers.

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	6426	0	6535	65	0
2	B	1051	0	1005	10	0
3	E	1069	0	1051	17	0
4	A	4	0	6	1	0
4	E	4	0	6	0	0
5	A	23	0	0	0	0
6	A	13	0	18	1	0
7	A	287	0	0	5	0
7	B	30	0	0	2	0
7	E	39	0	0	0	0
All	All	8946	0	8621	87	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 5.

All (87) 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:241:ARG:NH1	7:A:1001:HOH:O	1.85	0.92
1:A:247:ARG:NH2	7:A:1001:HOH:O	2.05	0.87
1:A:241:ARG:NH2	7:A:1001:HOH:O	2.07	0.83
1:A:545:GLN:HE21	1:A:551:GLY:HA2	1.44	0.80
1:A:93:GLN:HB3	3:E:100:ARG:HD2	1.72	0.72
3:E:84:GLN:HE21	3:E:120:THR:HG23	1.59	0.67
3:E:6:GLU:OE2	3:E:10:ARG:NH2	2.26	0.67
1:A:159:ASP:H	1:A:162:LYS:HZ3	1.44	0.66
1:A:6:GLU:O	1:A:10:THR:HG22	1.96	0.66
1:A:717:LYS:NZ	3:E:89:ASN:OD1	2.33	0.62
1:A:159:ASP:HB3	1:A:162:LYS:NZ	2.15	0.60
1:A:552:THR:HG23	1:A:555:LYS:HB2	1.87	0.55
3:E:84:GLN:HG2	3:E:120:THR:OG1	2.06	0.54
1:A:198:THR:H	4:A:901:EDO:H11	1.72	0.54
1:A:545:GLN:HE21	1:A:551:GLY:CA	2.18	0.54
1:A:496:ASN:HD21	1:A:661:PRO:HG3	1.73	0.53
3:E:91:LEU:O	3:E:95:LYS:HD2	2.08	0.53
2:B:60:PRO:HB3	2:B:88:CYS:SG	2.49	0.53
1:A:790:LYS:HG3	3:E:16:PHE:HE1	1.74	0.51
1:A:729:VAL:HG23	1:A:734:LYS:HG3	1.92	0.51
1:A:708:THR:OG1	1:A:711:GLU:HG3	2.10	0.51
2:B:29:SER:O	2:B:33:ILE:HD12	2.11	0.51
1:A:192:GLU:HB2	7:A:1034:HOH:O	2.09	0.51
1:A:797:VAL:HG22	2:B:101:MET:HE2	1.93	0.51
1:A:159:ASP:H	1:A:162:LYS:NZ	2.09	0.49
1:A:554:GLU:HB2	1:A:579:LYS:NZ	2.28	0.48
1:A:232:GLU:O	1:A:236:ASN:HB2	2.13	0.48
1:A:696:LEU:O	1:A:700:GLN:HG3	2.14	0.48
1:A:159:ASP:HB3	1:A:162:LYS:HZ3	1.77	0.47
1:A:226:ALA:O	1:A:229:PRO:HD2	2.14	0.47
1:A:523:SER:OG	1:A:525:LYS:HG2	2.13	0.47
1:A:297:ALA:HB1	1:A:301:MET:HB3	1.95	0.47
1:A:54:LYS:HD3	1:A:90:CYS:SG	2.55	0.47
1:A:665:ARG:HD2	1:A:690:LEU:HB3	1.96	0.47
3:E:14:ILE:HB	3:E:19:CYS:HA	1.97	0.46
1:A:521:TYR:CE2	1:A:523:SER:HB2	2.50	0.46
1:A:578:ASN:OD1	1:A:578:ASN:N	2.45	0.46

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:521:TYR:HE2	1:A:523:SER:HB2	1.81	0.46
2:B:78:TYR:CE2	2:B:82:LEU:HD11	2.51	0.46
1:A:159:ASP:O	1:A:162:LYS:HD3	2.17	0.45
2:B:76:LEU:HB3	2:B:80:GLN:HB2	1.97	0.45
1:A:706:ARG:HE	1:A:706:ARG:HB2	1.64	0.45
1:A:781:VAL:HG21	3:E:97:LEU:HD12	1.97	0.45
3:E:105:ASP:N	3:E:105:ASP:OD1	2.49	0.45
1:A:476:PHE:O	1:A:479:ASN:ND2	2.49	0.45
1:A:55:CYS:HB3	1:A:68:VAL:HB	1.98	0.44
1:A:512:GLU:CD	1:A:755:MET:HE2	2.38	0.44
1:A:682:LYS:O	1:A:686:GLN:HG3	2.17	0.44
1:A:425:LYS:HE2	1:A:429:GLU:OE2	2.18	0.44
2:B:50:SER:O	2:B:54:ARG:HG3	2.18	0.44
2:B:119:LYS:HD2	2:B:135:ILE:HG13	2.00	0.44
3:E:129:LYS:HD3	3:E:129:LYS:HA	1.70	0.44
1:A:226:ALA:HB1	1:A:338:SER:HB3	2.00	0.43
1:A:569:LYS:HA	1:A:584:GLN:HB2	2.00	0.43
1:A:734:LYS:O	1:A:738:ILE:HG12	2.18	0.43
3:E:94:MET:HB3	3:E:94:MET:HE2	1.86	0.43
1:A:710:GLU:H	1:A:710:GLU:HG2	1.51	0.43
3:E:100:ARG:HE	3:E:100:ARG:HB3	1.44	0.43
3:E:110:LEU:HD23	3:E:110:LEU:HA	1.85	0.43
1:A:196:GLY:O	1:A:199[B]:GLU:HG2	2.19	0.43
1:A:813:LYS:HE2	1:A:813:LYS:HB3	1.85	0.43
1:A:127:TYR:HA	1:A:135:VAL:O	2.19	0.43
1:A:554:GLU:HG3	1:A:578:ASN:HB2	2.00	0.43
1:A:545:GLN:NE2	1:A:551:GLY:HA2	2.25	0.42
1:A:671:GLU:HG3	1:A:682:LYS:NZ	2.33	0.42
1:A:54:LYS:HB2	1:A:54:LYS:HE2	1.75	0.42
1:A:630:ILE:HD12	1:A:630:ILE:H	1.84	0.42
1:A:483:GLN:HE22	6:A:903:PG4:H51	1.83	0.42
3:E:105:ASP:O	3:E:108:ILE:HG12	2.19	0.42
1:A:443:LEU:O	1:A:447:ILE:HG13	2.20	0.42
1:A:705:TYR:HB3	1:A:758:LEU:HB2	2.02	0.42
1:A:342:MET:HG2	1:A:451:LEU:HD13	2.01	0.42
1:A:17:ARG:HG3	1:A:85:THR:O	2.19	0.42
2:B:54:ARG:NH1	7:B:201:HOH:O	2.32	0.41
1:A:242:ASN:HB3	1:A:245:SER:HB2	2.01	0.41
1:A:159:ASP:OD1	1:A:161:THR:OG1	2.36	0.41
2:B:63:ILE:HD13	7:B:217:HOH:O	2.20	0.41
1:A:252:MET:HG2	1:A:267:VAL:HG22	2.03	0.41

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:585:HIS:CD2	1:A:590:ILE:HD12	2.57	0.40
1:A:16:ARG:CZ	1:A:17:ARG:H	2.34	0.40
1:A:500:ILE:HG12	1:A:661:PRO:HD2	2.03	0.40
1:A:674:LYS:HD3	1:A:674:LYS:HA	1.82	0.40
1:A:530:VAL:HB	1:A:567:ASN:HD21	1.86	0.40
3:E:94:MET:CE	3:E:99:THR:HG21	2.51	0.40
1:A:59:GLN:NE2	7:A:1007:HOH:O	2.54	0.40
2:B:43:LYS:HE3	2:B:77:THR:HG22	2.04	0.40
3:E:104:SER:O	3:E:108:ILE:HG23	2.21	0.40

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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	802/818 (98%)	781 (97%)	21 (3%)	0	100	100
2	B	129/204 (63%)	126 (98%)	3 (2%)	0	100	100
3	E	126/134 (94%)	115 (91%)	11 (9%)	0	100	100
All	All	1057/1156 (91%)	1022 (97%)	35 (3%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains ⓘ

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	719/725 (99%)	693 (96%)	26 (4%)	35	43
2	B	117/186 (63%)	112 (96%)	5 (4%)	29	35
3	E	122/126 (97%)	118 (97%)	4 (3%)	38	46
All	All	958/1037 (92%)	923 (96%)	35 (4%)	34	42

All (35) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	16	ARG
1	A	63	LYS
1	A	83	ASP
1	A	149	GLU
1	A	162	LYS
1	A	241	ARG
1	A	247	ARG
1	A	303	SER
1	A	319	ASN
1	A	324	SER
1	A	386	MET
1	A	478	ASN
1	A	496	ASN
1	A	500	ILE
1	A	518	GLU
1	A	540	SER
1	A	552	THR
1	A	577	SER
1	A	630	ILE
1	A	637	LYS
1	A	639	SER
1	A	706	ARG
1	A	727	SER
1	A	728	SER
1	A	796	LYS
1	A	803	SER
2	B	32	ARG
2	B	47	ASP
2	B	91	ASP
2	B	131	ASP
2	B	144	GLU
3	E	68	GLN
3	E	88	ASP
3	E	104	SER

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
3	E	108	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	59	GLN
1	A	496	ASN
1	A	545	GLN
3	E	41	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

1 non-standard protein/DNA/RNA residue is 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	$\#|Z| > 2$
1	SEP	A	19	1	8,9,10	1.51	1 (12%)	8,12,14	1.29	1 (12%)

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
1	SEP	A	19	1	-	1/5/8/10	-

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	19	SEP	P-O1P	3.32	1.61	1.50

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	19	SEP	P-OG-CB	-3.17	109.55	118.30

There are no chirality outliers.

All (1) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	A	19	SEP	N-CA-CB-OG

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

4 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	#$\|Z\|>2$
4	EDO	A	901	-	3,3,3	0.43	0	2,2,2	1.13	0
5	KQ0	A	902	-	21,26,26	1.50	3 (14%)	21,37,37	5.89	9 (42%)
6	PG4	A	903	-	12,12,12	0.53	0	11,11,11	0.43	0
4	EDO	E	201	-	3,3,3	0.33	0	2,2,2	1.63	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
4	EDO	A	901	-	-	0/1/1/1	-
5	KQ0	A	902	-	-	2/9/22/22	0/4/4/4
6	PG4	A	903	-	-	5/10/10/10	-
4	EDO	E	201	-	-	1/1/1/1	-

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	A	902	KQ0	C19-S23	-4.35	1.68	1.72
5	A	902	KQ0	C21-C22	2.28	1.41	1.34
5	A	902	KQ0	C18-C19	2.03	1.53	1.49

All (9) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
5	A	902	KQ0	C11-C09-C06	19.00	143.96	118.78
5	A	902	KQ0	C10-C09-C06	-10.90	104.34	118.78
5	A	902	KQ0	C10-C09-N12	-9.62	107.93	117.30
5	A	902	KQ0	C21-C22-S23	-7.73	106.71	112.98
5	A	902	KQ0	C11-C09-N12	-7.46	110.04	117.30
5	A	902	KQ0	C14-C13-N12	-3.81	102.93	112.36
5	A	902	KQ0	C01-O02-C03	-2.78	111.47	117.51
5	A	902	KQ0	C07-C06-C09	-2.32	117.46	121.08
5	A	902	KQ0	C13-C14-C15	-2.30	124.44	127.67

There are no chirality outliers.

All (8) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	A	902	KQ0	C08-C03-O02-C01
5	A	902	KQ0	C04-C03-O02-C01
6	A	903	PG4	O3-C5-C6-O4
6	A	903	PG4	O4-C7-C8-O5
6	A	903	PG4	C5-C6-O4-C7
4	E	201	EDO	O1-C1-C2-O2
6	A	903	PG4	C3-C4-O3-C5
6	A	903	PG4	C4-C3-O2-C2

There are no ring outliers.

2 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	A	901	EDO	1	0
6	A	903	PG4	1	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 KQ0 A 902

Bond lengths

Bond angles

Torsions

Rings
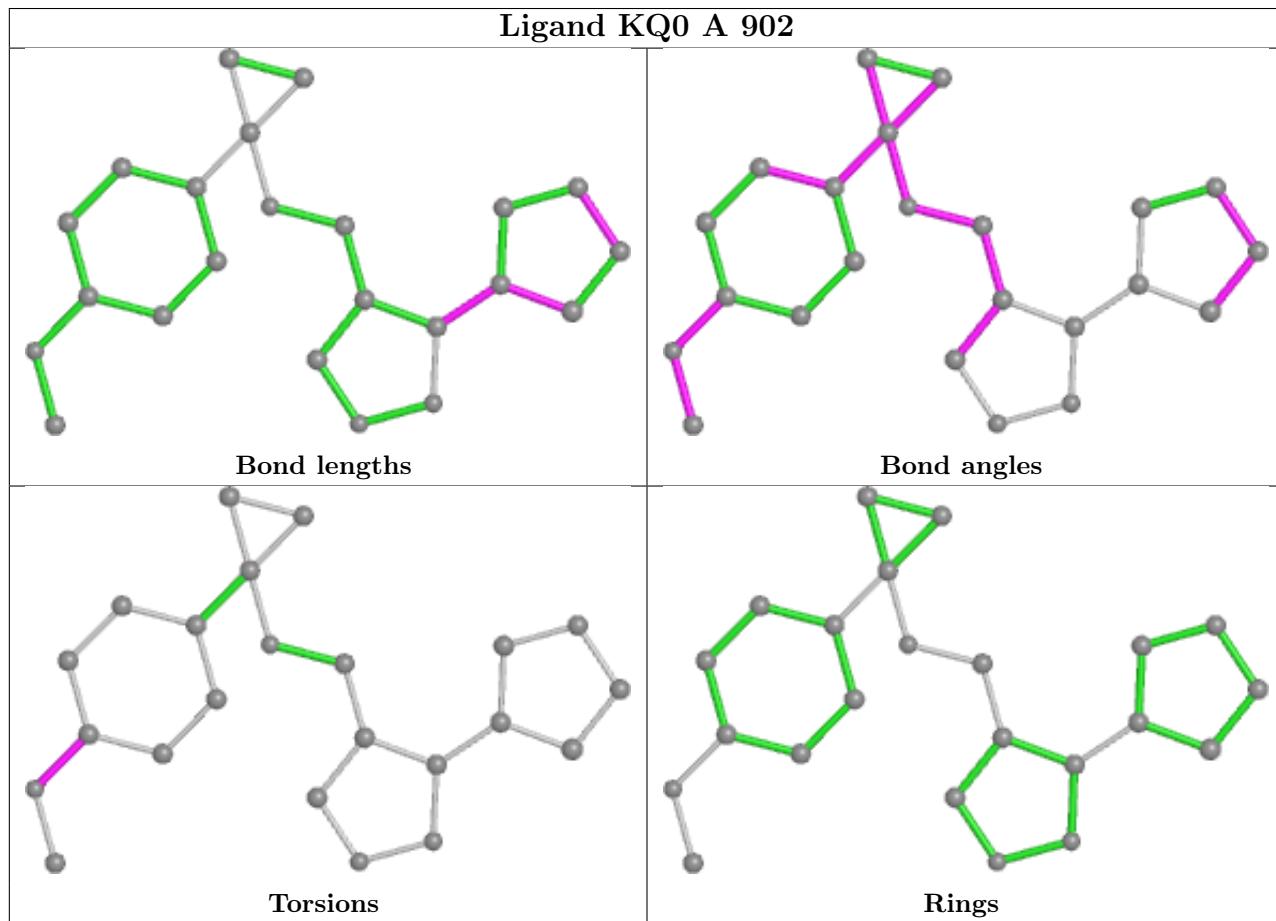
5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

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, 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	807/818 (98%)	0.40	33 (4%)	37	49	34, 52, 81, 104	0
2	B	131/204 (64%)	0.41	12 (9%)	9	14	46, 72, 103, 112	0
3	E	130/134 (97%)	0.67	14 (10%)	5	9	44, 66, 110, 124	0
All	All	1068/1156 (92%)	0.43	59 (5%)	25	36	34, 55, 92, 124	0

All (59) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	575	VAL	7.7
3	E	119	SER	7.5
3	E	117	ASN	6.1
3	E	120	THR	5.7
1	A	568	ASN	5.4
3	E	79	GLN	4.9
1	A	577	SER	4.8
1	A	574	LYS	4.7
1	A	729	VAL	4.5
1	A	725	GLU	4.4
1	A	573	ALA	4.4
2	B	91	ASP	4.4
1	A	576	ALA	4.3
1	A	741	LEU	4.2
3	E	121	LEU	4.2
1	A	817	ALA	4.1
3	E	115	PRO	4.0
1	A	378	ALA	4.0
2	B	89	VAL	4.0
1	A	566	GLU	3.9
2	B	35	PHE	3.7
1	A	368	ILE	3.7
1	A	160	HIS	3.6

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
3	E	118	LYS	3.5
2	B	58	LEU	3.4
1	A	818	GLN	3.3
1	A	722	ALA	3.2
2	B	42	GLY	3.2
1	A	536	LYS	3.2
1	A	739	LEU	2.9
2	B	33	ILE	2.9
1	A	816	VAL	2.8
1	A	713	LEU	2.8
1	A	710	GLU	2.8
1	A	367	LEU	2.7
2	B	28	GLU	2.7
3	E	112	ILE	2.7
1	A	425	LYS	2.7
1	A	369	GLU	2.6
3	E	88	ASP	2.6
3	E	111	GLN	2.5
3	E	116	GLU	2.5
1	A	740	LYS	2.5
2	B	34	TYR	2.5
1	A	751	ILE	2.5
1	A	561	ALA	2.4
2	B	44	ILE	2.4
2	B	32	ARG	2.4
3	E	87	ILE	2.4
1	A	564	LEU	2.4
1	A	565	LYS	2.4
2	B	82	LEU	2.4
1	A	234	PHE	2.4
3	E	86	LYS	2.3
1	A	579	LYS	2.2
1	A	705	TYR	2.1
2	B	38	LYS	2.1
3	E	114	ASN	2.1
1	A	730	GLU	2.0

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

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, 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	B-factors(Å^2)	Q<0.9
1	SEP	A	19	10/11	0.84	0.36	66,73,77,78	10

6.3 Carbohydrates ⓘ

There are no monosaccharides in this entry.

6.4 Ligands ⓘ

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, 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	B-factors(Å^2)	Q<0.9
4	EDO	A	901	4/4	0.93	0.41	51,54,55,59	0
6	PG4	A	903	13/13	0.94	0.14	45,50,56,59	0
4	EDO	E	201	4/4	0.95	0.37	48,53,62,69	0
5	KQ0	A	902	23/23	0.97	0.21	40,42,47,50	0

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 KQ0 A 902:

$2mF_o$-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.