



wwPDB X-ray Structure Validation Summary Report ⓘ

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PDB ID : 3L4C / pdb_00003l4c
Title : Structural basis of membrane-targeting by Dock180
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Deposited on : 2009-12-18
Resolution : 2.37 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

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ 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 ⓘ](#)) were used in the production of this report:

MolProbity	:	4-5-2 with Phenix2.0
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

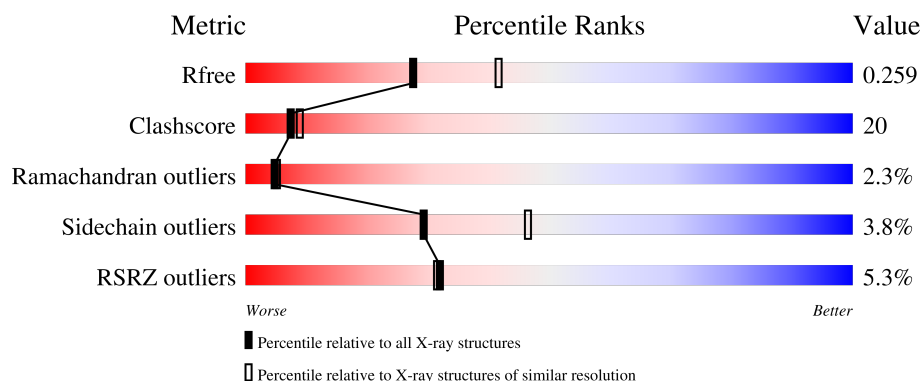
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.37 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}	180053	7164 (2.40-2.36)
Clashscore	190562	7722 (2.40-2.36)
Ramachandran outliers	187476	7626 (2.40-2.36)
Sidechain outliers	187428	7627 (2.40-2.36)
RSRZ outliers	180081	7170 (2.40-2.36)

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 $\leq 5\%$. 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	220	5% 49% 27% 5% 19%
1	B	220	4% 60% 17% •• 19%

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 2924 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 Deducator of cytokinesis protein 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	178	Total	C	N	O	S	0	0	0
			1424	900	240	280	4			
1	B	179	Total	C	N	O	S	0	0	0
			1428	901	240	283	4			

There are 44 discrepancies between the modelled and reference sequences:

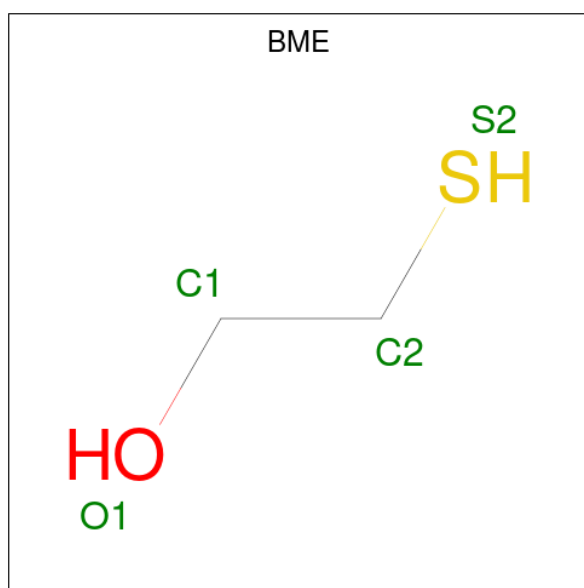
Chain	Residue	Modelled	Actual	Comment	Reference
A	400	MET	-	expression tag	UNP Q14185
A	401	GLY	-	expression tag	UNP Q14185
A	402	SER	-	expression tag	UNP Q14185
A	403	SER	-	expression tag	UNP Q14185
A	404	HIS	-	expression tag	UNP Q14185
A	405	HIS	-	expression tag	UNP Q14185
A	406	HIS	-	expression tag	UNP Q14185
A	407	HIS	-	expression tag	UNP Q14185
A	408	HIS	-	expression tag	UNP Q14185
A	409	HIS	-	expression tag	UNP Q14185
A	410	SER	-	expression tag	UNP Q14185
A	411	SER	-	expression tag	UNP Q14185
A	412	GLY	-	expression tag	UNP Q14185
A	413	LEU	-	expression tag	UNP Q14185
A	414	VAL	-	expression tag	UNP Q14185
A	415	PRO	-	expression tag	UNP Q14185
A	416	ARG	-	expression tag	UNP Q14185
A	417	GLY	-	expression tag	UNP Q14185
A	418	SER	-	expression tag	UNP Q14185
A	419	HIS	-	expression tag	UNP Q14185
A	420	MET	-	expression tag	UNP Q14185
A	421	PRO	-	expression tag	UNP Q14185
B	400	MET	-	expression tag	UNP Q14185
B	401	GLY	-	expression tag	UNP Q14185
B	402	SER	-	expression tag	UNP Q14185

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Chain	Residue	Modelled	Actual	Comment	Reference
B	403	SER	-	expression tag	UNP Q14185
B	404	HIS	-	expression tag	UNP Q14185
B	405	HIS	-	expression tag	UNP Q14185
B	406	HIS	-	expression tag	UNP Q14185
B	407	HIS	-	expression tag	UNP Q14185
B	408	HIS	-	expression tag	UNP Q14185
B	409	HIS	-	expression tag	UNP Q14185
B	410	SER	-	expression tag	UNP Q14185
B	411	SER	-	expression tag	UNP Q14185
B	412	GLY	-	expression tag	UNP Q14185
B	413	LEU	-	expression tag	UNP Q14185
B	414	VAL	-	expression tag	UNP Q14185
B	415	PRO	-	expression tag	UNP Q14185
B	416	ARG	-	expression tag	UNP Q14185
B	417	GLY	-	expression tag	UNP Q14185
B	418	SER	-	expression tag	UNP Q14185
B	419	HIS	-	expression tag	UNP Q14185
B	420	MET	-	expression tag	UNP Q14185
B	421	PRO	-	expression tag	UNP Q14185

- Molecule 2 is BETA-MERCAPTOETHANOL (CCD ID: BME) (formula: C_2H_6OS).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	1	Total S 1 1	0	0
2	B	1	Total S 1 1	0	0

- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	27	Total 27	O 27	0	0
3	B	43	Total 43	O 43	0	0

4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	46.99Å 63.53Å 63.42Å 90.00° 109.28° 90.00°	Depositor
Resolution (Å)	50.00 – 2.37 50.00 – 2.37	Depositor EDS
% Data completeness (in resolution range)	96.6 (50.00-2.37) 96.6 (50.00-2.37)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.08	Depositor
$\langle I/\sigma(I) \rangle$ ¹	0.86 (at 2.36Å)	Xtriage
Refinement program	REFMAC & CNS	Depositor
R, R_{free}	0.216 , 0.269 0.212 , 0.259	Depositor DCC
R_{free} test set	699 reflections (4.86%)	wwPDB-VP
Wilson B-factor (Å ²)	34.6	Xtriage
Anisotropy	0.681	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.35 , 44.5	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	0.035 for h,-k,-h-l	Xtriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	2924	wwPDB-VP
Average B, all atoms (Å ²)	42.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 8.84% 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, 0.333 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: BME

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	0.36	0/1448	0.90	4/1949 (0.2%)
1	B	0.44	0/1452	1.12	10/1956 (0.5%)
All	All	0.41	0/2900	1.02	14/3905 (0.4%)

There are no bond length outliers.

The worst 5 of 14 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	519	GLN	N-CA-C	14.45	131.92	109.52
1	B	518	SER	N-CA-C	-12.66	94.19	110.53
1	A	520	ASP	N-CA-C	-9.61	101.75	113.19
1	B	445	ALA	N-CA-C	-7.81	100.50	110.19
1	B	441	SER	N-CA-C	7.39	121.12	109.81

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	1424	0	1415	66	0
1	B	1428	0	1414	50	0
2	A	1	0	0	0	0
2	B	1	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	A	27	0	0	1	0
3	B	43	0	0	1	0
All	All	2924	0	2829	116	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 20.

The worst 5 of 116 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:439:LYS:HG2	1:A:442:LYS:HB2	1.10	1.04
1:A:589:MET:HE1	1:A:592:LEU:HD13	1.42	1.00
1:A:439:LYS:HD3	1:A:446:LYS:HE2	1.46	0.97
1:A:439:LYS:HG2	1:A:442:LYS:CB	1.95	0.96
1:A:439:LYS:CG	1:A:442:LYS:HB2	1.99	0.91

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	174/220 (79%)	154 (88%)	17 (10%)	3 (2%)	7	9
1	B	175/220 (80%)	156 (89%)	14 (8%)	5 (3%)	3	3
All	All	349/440 (79%)	310 (89%)	31 (9%)	8 (2%)	5	5

5 of 8 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	526	GLU
1	A	445	ALA

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Mol	Chain	Res	Type
1	B	440	GLY
1	B	520	ASP
1	B	522	LYS

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	159/194 (82%)	150 (94%)	9 (6%)	18	30
1	B	160/194 (82%)	157 (98%)	3 (2%)	50	69
All	All	319/388 (82%)	307 (96%)	12 (4%)	29	46

5 of 12 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	540	ASP
1	A	550	ASP
1	B	539	TYR
1	B	520	ASP
1	A	501	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 7 such sidechains are listed below:

Mol	Chain	Res	Type
1	A	519	GLN
1	A	549	HIS
1	B	488	GLN
1	B	485	GLN
1	A	508	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 oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 2 ligands modelled in this entry, 2 are modelled with single atom - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

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	178/220 (80%)	0.39	10 (5%) 30 29	23, 44, 82, 98	0
1	B	179/220 (81%)	0.25	9 (5%) 34 34	19, 35, 73, 96	0
All	All	357/440 (81%)	0.32	19 (5%) 32 31	19, 39, 81, 98	0

The worst 5 of 19 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	521	SER	5.2
1	A	443	THR	3.1
1	A	523	ASP	2.7
1	B	611	THR	2.7
1	A	518	SER	2.6

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 oligosaccharides 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, 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($\text{\AA}^2$)	Q<0.9
2	BME	B	1	1/4	0.87	0.14	39,39,39,39	0
2	BME	A	2	1/4	0.93	0.22	43,43,43,43	0

6.5 Other polymers [i](#)

There are no such residues in this entry.