



# Full wwPDB X-ray Structure Validation Report ⓘ

Sep 18, 2023 – 06:56 PM EDT

PDB ID : 5B8I  
Title : Crystal structure of Calcineurin A and Calcineurin B in complex with FKBP12 and FK506 from *Coccidioides immitis* RS  
Authors : Seattle Structural Genomics Center for Infectious Disease (SSGCID); Fox III, D.; Dranow, D.M.; Lorimer, D.D.; Edwards, T.E.  
Deposited on : 2015-05-03  
Resolution : 1.85 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

<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>.

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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  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
Xtrriage (Phenix) : 1.13  
EDS : 2.35.1  
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) : 2.35.1

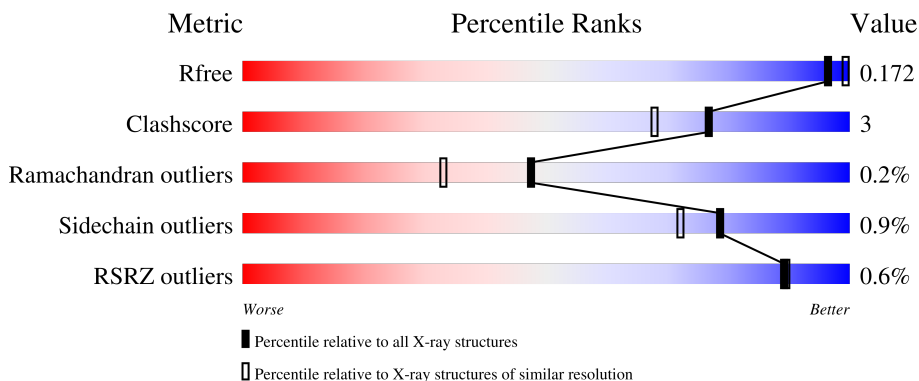
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 1.85 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	2469 (1.86-1.86)
Clashscore	141614	2625 (1.86-1.86)
Ramachandran outliers	138981	2592 (1.86-1.86)
Sidechain outliers	138945	2592 (1.86-1.86)
RSRZ outliers	127900	2436 (1.86-1.86)

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  $\geq 3$ , 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	390	
2	B	171	
3	C	130	

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:

<b>Mol</b>	<b>Type</b>	<b>Chain</b>	<b>Res</b>	<b>Chirality</b>	<b>Geometry</b>	<b>Clashes</b>	<b>Electron density</b>
6	MES	A	403	-	-	X	-

## 2 Entry composition [i](#)

There are 10 unique types of molecules in this entry. The entry contains 6073 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 Serine/threonine-protein phosphatase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	359	2974	1933	487	532	22	0	12	0

There are 21 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	1	MET	-	initiating methionine	UNP J3K9C5
A	2	GLY	-	expression tag	UNP J3K9C5
A	3	SER	-	expression tag	UNP J3K9C5
A	4	SER	-	expression tag	UNP J3K9C5
A	5	HIS	-	expression tag	UNP J3K9C5
A	6	HIS	-	expression tag	UNP J3K9C5
A	7	HIS	-	expression tag	UNP J3K9C5
A	8	HIS	-	expression tag	UNP J3K9C5
A	9	HIS	-	expression tag	UNP J3K9C5
A	10	HIS	-	expression tag	UNP J3K9C5
A	11	SER	-	expression tag	UNP J3K9C5
A	12	SER	-	expression tag	UNP J3K9C5
A	13	GLY	-	expression tag	UNP J3K9C5
A	14	GLU	-	expression tag	UNP J3K9C5
A	15	ASN	-	expression tag	UNP J3K9C5
A	16	LEU	-	expression tag	UNP J3K9C5
A	17	TYR	-	expression tag	UNP J3K9C5
A	18	PHE	-	expression tag	UNP J3K9C5
A	19	GLN	-	expression tag	UNP J3K9C5
A	20	GLY	-	expression tag	UNP J3K9C5
A	21	SER	-	expression tag	UNP J3K9C5

- Molecule 2 is a protein called Calcineurin subunit B, variant.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	171	1374	863	226	275	10	0	5	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	1	MET	-	initiating methionine	UNP A0A0D8JSK0

- Molecule 3 is a protein called Peptidylprolyl isomerase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	C	119	912	579	155	174	4	0	1	0

There are 11 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	0	MET	-	initiating methionine	UNP J3K5Z5
C	1	TRP	-	expression tag	UNP J3K5Z5
C	2	SER	-	expression tag	UNP J3K5Z5
C	3	HIS	-	expression tag	UNP J3K5Z5
C	4	PRO	-	expression tag	UNP J3K5Z5
C	5	GLN	-	expression tag	UNP J3K5Z5
C	6	PHE	-	expression tag	UNP J3K5Z5
C	7	GLU	-	expression tag	UNP J3K5Z5
C	8	LYS	-	expression tag	UNP J3K5Z5
C	9	GLY	-	expression tag	UNP J3K5Z5
C	10	SER	-	expression tag	UNP J3K5Z5

- Molecule 4 is ZINC ION (three-letter code: ZN) (formula: Zn).

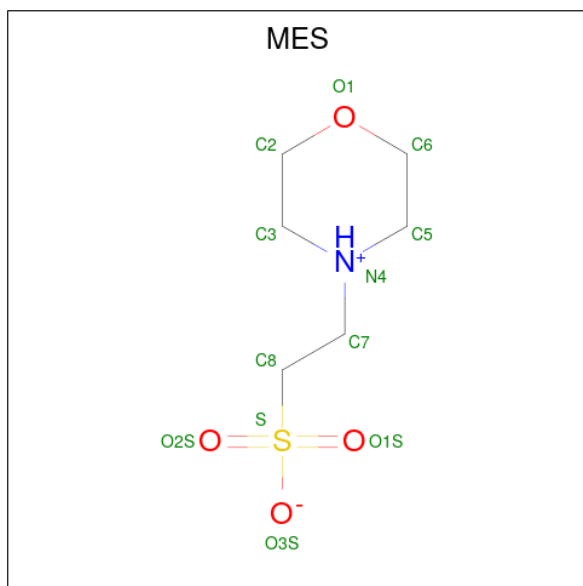
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	1	Total	Zn	0	0
			1	1		

- Molecule 5 is FE (III) ION (three-letter code: FE) (formula: Fe).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	1	Total	Fe	0	0
			1	1		

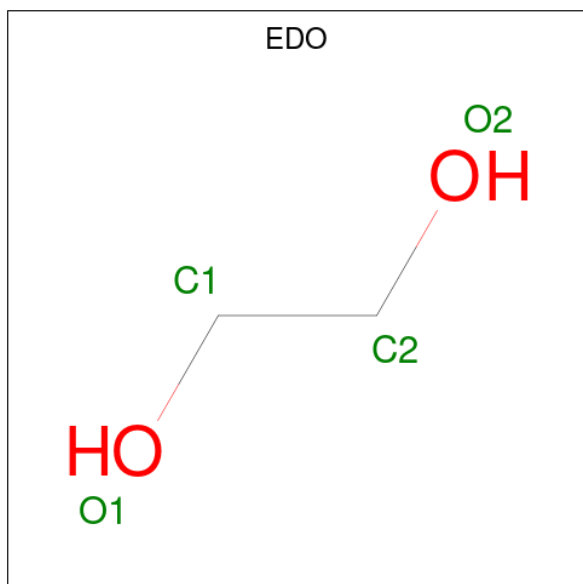
- Molecule 6 is 2-(N-MORPHOLINO)-ETHANESULFONIC ACID (three-letter code: MES)

(formula: C<sub>6</sub>H<sub>13</sub>NO<sub>4</sub>S).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	N	O	S		
6	A	1	7	2	1	3	1	0	0
6	A	1	12	6	1	4	1	0	0

- Molecule 7 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: C<sub>2</sub>H<sub>6</sub>O<sub>2</sub>).



Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	C O		
7	A	1	4	2 2	0	0

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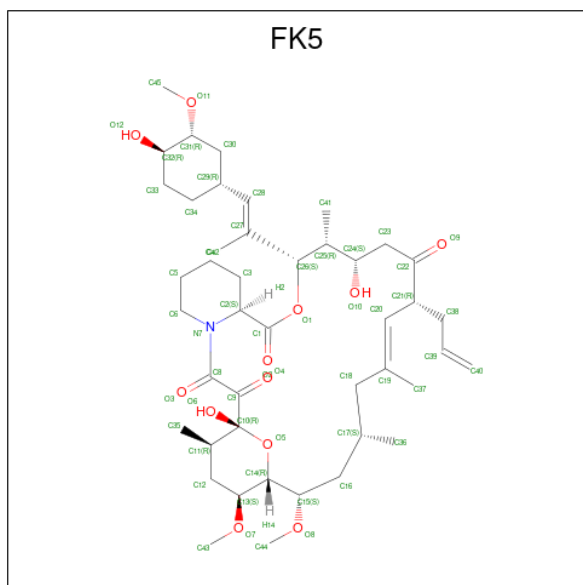
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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	A	1	Total C O 4 2 2	0	0
7	A	1	Total C O 4 2 2	0	0
7	A	1	Total C O 4 2 2	0	0
7	A	1	Total C O 4 2 2	0	0
7	A	1	Total C O 4 2 2	0	0
7	B	1	Total C O 4 2 2	0	0
7	B	1	Total C O 4 2 2	0	0
7	C	1	Total C O 4 2 2	0	0
7	C	1	Total C O 4 2 2	0	0
7	C	1	Total C O 4 2 2	0	0

- Molecule 8 is CALCIUM ION (three-letter code: CA) (formula: Ca).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
8	B	4	Total Ca 4 4	0	0

- Molecule 9 is 8-DEETHYL-8-[BUT-3-ENYL]-ASCOMYCIN (three-letter code: FK5) (formula: C<sub>44</sub>H<sub>69</sub>NO<sub>12</sub>).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	N	O		
9	C	1	57	44	1	12	0	0

- Molecule 10 is water.

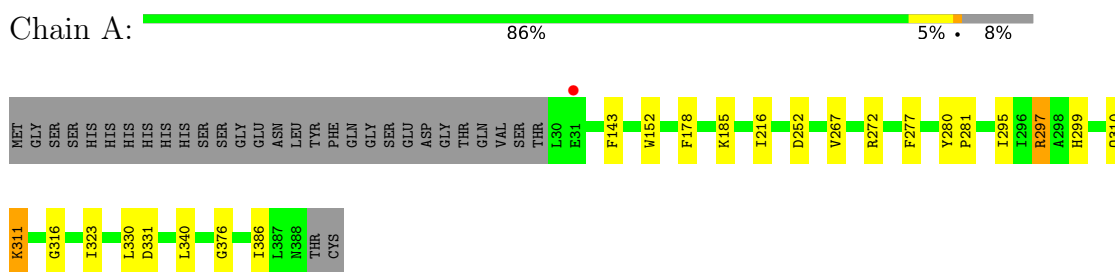
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
10	A	424	Total	O	0	0
			424	424		
10	B	174	Total	O	0	0
			174	174		
10	C	89	Total	O	0	0
			89	89		



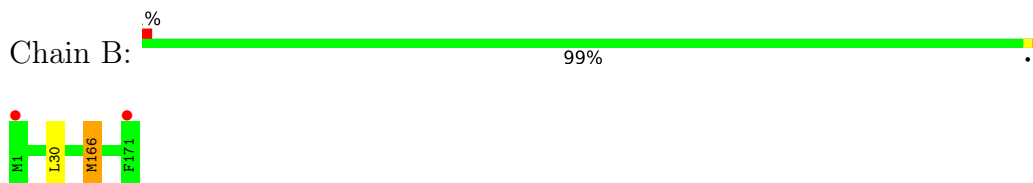
### 3 Residue-property plots [i](#)

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.

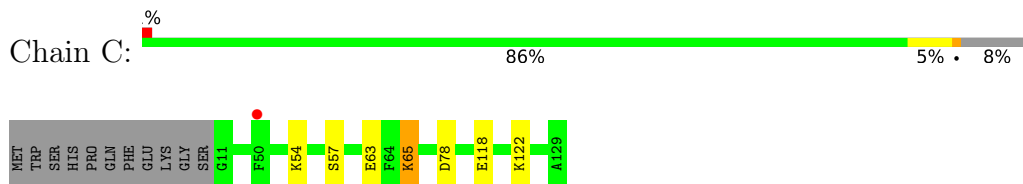
- Molecule 1: Serine/threonine-protein phosphatase



- Molecule 2: Calcineurin subunit B, variant



- Molecule 3: Peptidylprolyl isomerase



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 2	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	94.67Å 154.63Å 64.75Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	45.27 – 1.85 47.33 – 1.85	Depositor EDS
% Data completeness (in resolution range)	100.0 (45.27-1.85) 100.0 (47.33-1.85)	Depositor EDS
$R_{merge}$	0.09	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	3.99 (at 1.86Å)	Xtrriage
Refinement program	PHENIX (PHENIX.REFINE: DEV_1932)	Depositor
R, $R_{free}$	0.145 , 0.172 0.145 , 0.172	Depositor DCC
$R_{free}$ test set	4019 reflections (4.91%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	19.5	Xtrriage
Anisotropy	0.366	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.35 , 56.8	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.97	EDS
Total number of atoms	6073	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	27.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.61% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical 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: FK5, ZN, FE, MES, EDO, CA

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	1.02	2/3101 (0.1%)	0.83	0/4219
2	B	0.77	0/1408	0.75	1/1886 (0.1%)
3	C	0.73	0/932	0.72	0/1254
All	All	0.91	2/5441 (0.0%)	0.80	1/7359 (0.0%)

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	267	VAL	CB-CG1	-5.91	1.40	1.52
1	A	143	PHE	CE1-CZ	5.26	1.47	1.37

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	166	MET	CG-SD-CE	6.32	110.32	100.20

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	2974	0	2874	21	0
2	B	1374	0	1336	6	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	C	912	0	898	4	0
4	A	1	0	0	0	0
5	A	1	0	0	0	0
6	A	19	0	16	9	0
7	A	24	0	36	2	0
7	B	8	0	12	0	0
7	C	12	0	18	1	0
8	B	4	0	0	0	0
9	C	57	0	69	0	0
10	A	424	0	0	7	0
10	B	174	0	0	0	0
10	C	89	0	0	0	0
All	All	6073	0	5259	32	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 3.

All (32) 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:272:ARG:HH12	6:A:403:MES:H82	1.20	1.06
1:A:272:ARG:NH1	6:A:403:MES:H82	1.85	0.91
3:C:63[B]:GLU:HG3	3:C:65:LYS:HE2	1.66	0.77
1:A:272:ARG:HH12	6:A:403:MES:C8	1.99	0.74
2:B:166:MET:HA	2:B:166:MET:HE2	1.73	0.71
6:A:403:MES:N4	10:A:852:HOH:O	2.23	0.70
1:A:216[B]:ILE:HD12	1:A:297:ARG:HB3	1.73	0.70
1:A:386:ILE:HG23	2:B:30:LEU:HD11	1.79	0.64
1:A:376:GLY:HA2	2:B:166:MET:CE	2.31	0.60
1:A:376:GLY:HA2	2:B:166:MET:HE1	1.84	0.59
1:A:299:HIS:O	6:A:403:MES:H72	2.06	0.55
1:A:310[A]:GLN:OE1	10:A:501:HOH:O	2.17	0.55
6:A:403:MES:H72	10:A:851:HOH:O	2.09	0.52
1:A:185:LYS:NZ	10:A:899:HOH:O	2.42	0.52
3:C:118:GLU:HG2	7:C:203:EDO:H12	1.92	0.52
3:C:54:LYS:HD2	3:C:57:SER:HB3	1.96	0.47
1:A:323:ILE:HD13	1:A:340:LEU:HG	1.96	0.47
7:A:410:EDO:H21	10:A:863:HOH:O	2.15	0.47
1:A:216[B]:ILE:CD1	1:A:297:ARG:HB3	2.43	0.45
1:A:216[B]:ILE:HD11	1:A:295:ILE:CG2	2.46	0.45
1:A:272:ARG:HH12	6:A:403:MES:C7	2.29	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:166:MET:HA	2:B:166:MET:CE	2.45	0.44
1:A:252:ASP:O	1:A:277:PHE:HA	2.17	0.44
1:A:330:LEU:O	1:A:331:ASP:HB2	2.18	0.44
1:A:376:GLY:HA2	2:B:166:MET:HE3	2.01	0.43
6:A:403:MES:H81	10:A:744:HOH:O	2.18	0.43
1:A:311:LYS:HD2	1:A:316:GLY:O	2.19	0.42
7:A:405:EDO:H22	10:A:504:HOH:O	2.20	0.42
3:C:122:LYS:HE2	3:C:122:LYS:HA	2.03	0.41
1:A:280:TYR:HB3	1:A:281:PRO:HD3	2.02	0.40
1:A:299:HIS:O	6:A:403:MES:C7	2.70	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	369/390 (95%)	357 (97%)	11 (3%)	1 (0%)	41	26
2	B	174/171 (102%)	172 (99%)	2 (1%)	0	100	100
3	C	118/130 (91%)	112 (95%)	6 (5%)	0	100	100
All	All	661/691 (96%)	641 (97%)	19 (3%)	1 (0%)	47	33

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	178	PHE

### 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	321/344 (93%)	318 (99%)	3 (1%)	78	72
2	B	155/155 (100%)	155 (100%)	0	100	100
3	C	95/109 (87%)	93 (98%)	2 (2%)	53	38
All	All	571/608 (94%)	566 (99%)	5 (1%)	78	72

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

Mol	Chain	Res	Type
1	A	152	TRP
1	A	297	ARG
1	A	311	LYS
3	C	65	LYS
3	C	78	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

### 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 monosaccharides in this entry.

### 5.6 Ligand geometry [i](#)

Of 20 ligands modelled in this entry, 6 are monoatomic - leaving 14 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	EDO	A	408	-	3,3,3	0.73	0	2,2,2	0.43	0
6	MES	A	403	5,4	6,6,12	3.88	2 (33%)	6,8,16	2.22	1 (16%)
7	EDO	C	203	-	3,3,3	0.45	0	2,2,2	0.42	0
7	EDO	C	202	-	3,3,3	0.53	0	2,2,2	0.23	0
7	EDO	A	406	-	3,3,3	0.73	0	2,2,2	0.13	0
7	EDO	A	410	-	3,3,3	0.29	0	2,2,2	2.27	1 (50%)
7	EDO	A	409	-	3,3,3	0.65	0	2,2,2	0.68	0
7	EDO	C	204	-	3,3,3	0.56	0	2,2,2	0.24	0
6	MES	A	404	-	12,12,12	1.54	1 (8%)	14,16,16	2.45	6 (42%)
7	EDO	A	405	-	3,3,3	0.73	0	2,2,2	0.55	0
9	FK5	C	201	-	54,60,60	3.23	13 (24%)	64,86,86	1.96	15 (23%)
7	EDO	B	206	-	3,3,3	0.44	0	2,2,2	0.67	0
7	EDO	A	407	-	3,3,3	0.58	0	2,2,2	0.88	0
7	EDO	B	205	-	3,3,3	0.80	0	2,2,2	0.27	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	EDO	A	408	-	-	0/1/1/1	-
6	MES	A	403	5,4	-	2/4/4/14	-
7	EDO	C	203	-	-	0/1/1/1	-
7	EDO	C	202	-	-	0/1/1/1	-
7	EDO	A	406	-	-	0/1/1/1	-
7	EDO	A	410	-	-	0/1/1/1	-
7	EDO	A	409	-	-	0/1/1/1	-
7	EDO	C	204	-	-	1/1/1/1	-
6	MES	A	404	-	-	2/6/14/14	0/1/1/1
7	EDO	A	405	-	-	0/1/1/1	-
9	FK5	C	201	-	-	6/68/114/114	0/3/4/4
7	EDO	B	206	-	-	0/1/1/1	-
7	EDO	A	407	-	-	0/1/1/1	-
7	EDO	B	205	-	-	0/1/1/1	-

All (16) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
9	C	201	FK5	C8-C9	-10.45	1.40	1.53
9	C	201	FK5	C20-C19	9.77	1.48	1.33
9	C	201	FK5	O4-C9	9.25	1.38	1.22
6	A	403	MES	C8-S	-9.07	1.64	1.77
9	C	201	FK5	O9-C22	9.07	1.37	1.21
9	C	201	FK5	O2-C1	6.13	1.36	1.21
9	C	201	FK5	O3-C8	5.31	1.34	1.23
9	C	201	FK5	C28-C27	5.23	1.44	1.33
9	C	201	FK5	O6-C10	5.16	1.48	1.39
6	A	404	MES	C8-S	-4.90	1.70	1.77
9	C	201	FK5	C16-C15	3.54	1.59	1.52
9	C	201	FK5	O1-C1	-3.17	1.26	1.34
9	C	201	FK5	C40-C39	2.87	1.48	1.28
9	C	201	FK5	C30-C31	2.28	1.56	1.52
9	C	201	FK5	C41-C25	2.28	1.58	1.53
6	A	403	MES	O2S-S	2.04	1.51	1.45

All (23) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
9	C	201	FK5	O1-C1-C2	6.38	124.84	110.78
6	A	404	MES	C5-N4-C3	5.58	121.38	108.83
9	C	201	FK5	C21-C20-C19	-5.12	122.39	127.64
6	A	403	MES	O3S-S-C8	4.33	112.76	105.77
9	C	201	FK5	C9-C8-N7	4.21	124.06	119.25
9	C	201	FK5	O2-C1-C2	-4.04	115.39	124.49
9	C	201	FK5	O1-C26-C25	3.87	110.34	105.91
9	C	201	FK5	C30-C29-C34	3.68	112.87	108.66
9	C	201	FK5	C30-C31-C32	-3.55	107.23	111.00
6	A	404	MES	C2-C3-N4	3.53	115.45	110.10
9	C	201	FK5	O12-C32-C31	-3.28	103.06	110.01
6	A	404	MES	C7-N4-C5	3.24	119.52	111.23
7	A	410	EDO	O1-C1-C2	-3.20	88.86	111.91
6	A	404	MES	O1-C2-C3	2.79	117.94	111.80
6	A	404	MES	O2S-S-C8	2.77	110.25	106.92
9	C	201	FK5	O9-C22-C23	-2.57	117.95	121.41
9	C	201	FK5	O5-C14-C13	-2.56	105.66	109.42
9	C	201	FK5	C21-C38-C39	-2.50	106.49	113.67
6	A	404	MES	C7-N4-C3	2.48	117.59	111.23
9	C	201	FK5	O1-C1-O2	-2.30	119.65	123.94
9	C	201	FK5	C33-C34-C29	-2.22	107.15	110.76
9	C	201	FK5	C42-C27-C26	2.06	119.23	115.68

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
9	C	201	FK5	C12-C13-C14	-2.02	106.73	110.61

There are no chirality outliers.

All (11) torsion outliers are listed below:

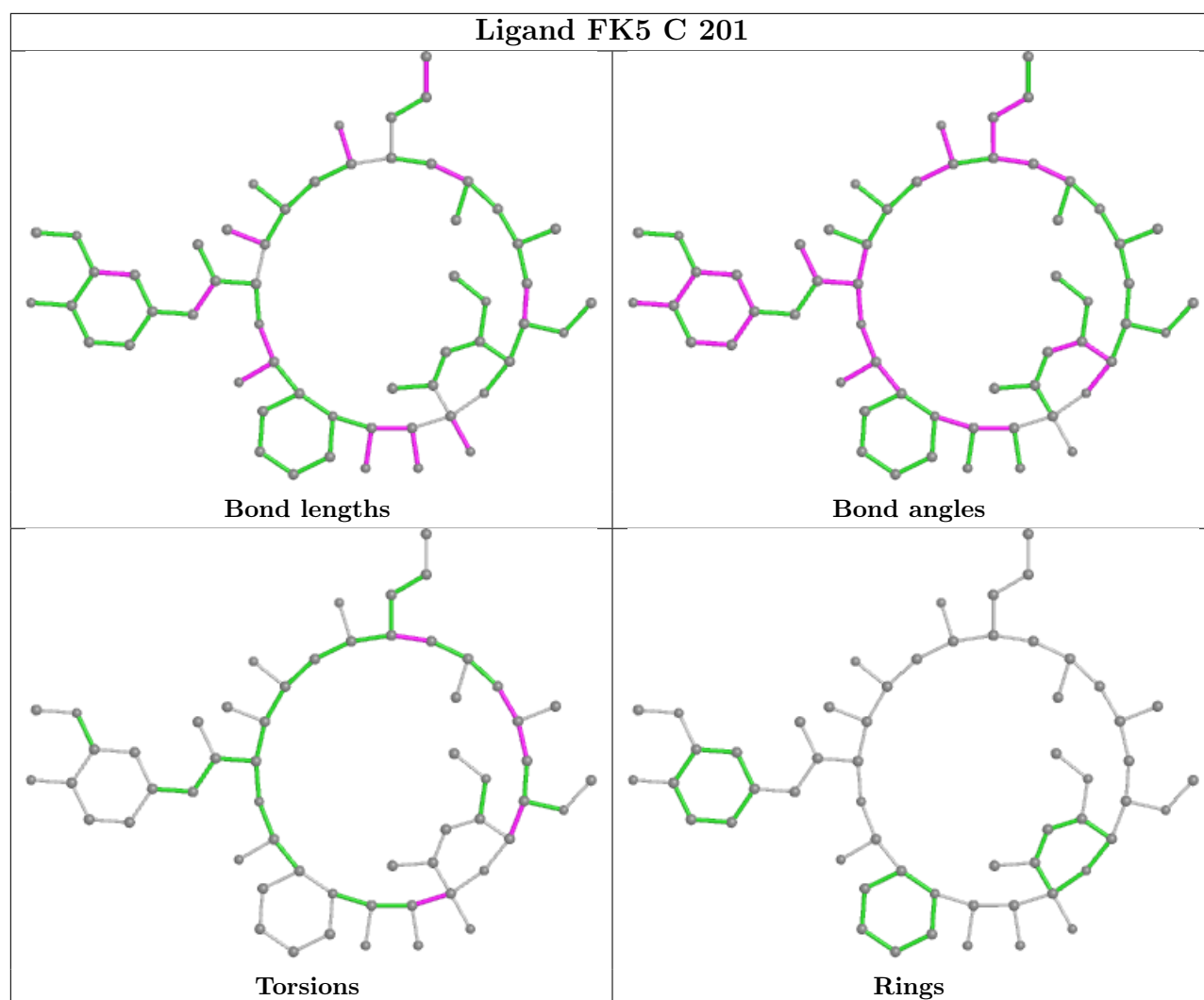
Mol	Chain	Res	Type	Atoms
6	A	403	MES	N4-C7-C8-S
6	A	403	MES	C7-C8-S-O2S
9	C	201	FK5	C15-C16-C17-C36
6	A	404	MES	C8-C7-N4-C5
9	C	201	FK5	C13-C14-C15-O8
9	C	201	FK5	C13-C14-C15-C16
9	C	201	FK5	C36-C17-C18-C19
9	C	201	FK5	C19-C20-C21-C22
9	C	201	FK5	O5-C10-C9-O4
6	A	404	MES	C8-C7-N4-C3
7	C	204	EDO	O1-C1-C2-O2

There are no ring outliers.

4 monomers are involved in 12 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	A	403	MES	9	0
7	C	203	EDO	1	0
7	A	410	EDO	1	0
7	A	405	EDO	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 than 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.



## 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, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	359/390 (92%)	-0.41	1 (0%) 94   93	10, 17, 42, 61	0
2	B	171/171 (100%)	-0.41	2 (1%) 79   79	16, 28, 44, 80	0
3	C	119/130 (91%)	-0.18	1 (0%) 86   86	21, 37, 54, 70	0
All	All	649/691 (93%)	-0.37	4 (0%) 89   89	10, 23, 48, 80	0

All (4) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	B	171	PHE	4.9
2	B	1	MET	4.8
3	C	50	PHE	2.4
1	A	31	GLU	2.0

### 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](#)

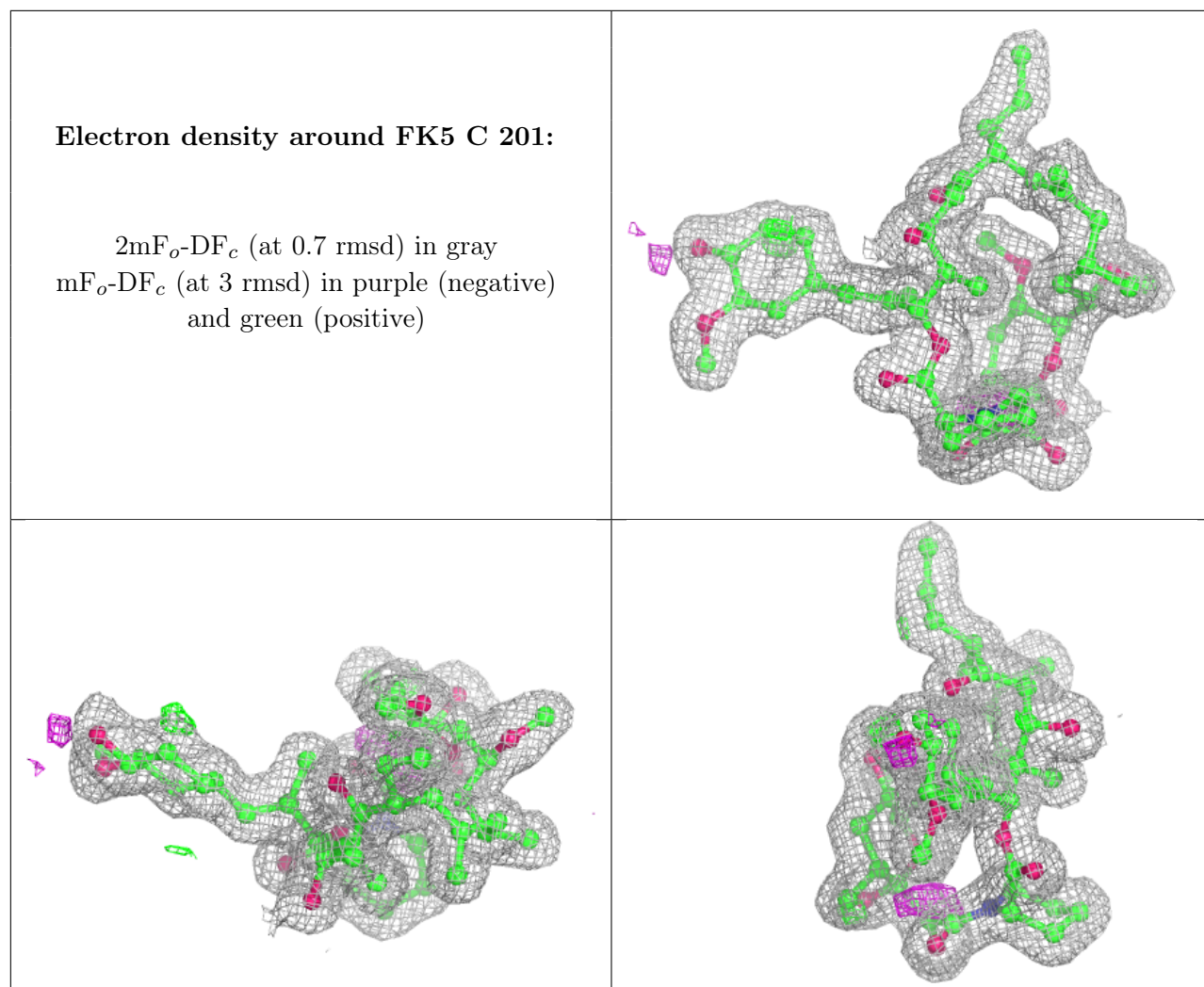
There are no monosaccharides in this entry.

### 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<sup>th</sup> 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
7	EDO	C	204	4/4	0.74	0.21	56,57,59,59	0
7	EDO	B	205	4/4	0.77	0.25	42,48,49,51	0
7	EDO	A	408	4/4	0.83	0.19	43,44,44,48	0
7	EDO	A	405	4/4	0.84	0.17	34,38,38,40	0
7	EDO	A	410	4/4	0.89	0.20	18,23,25,37	0
7	EDO	C	203	4/4	0.91	0.13	54,55,56,58	0
7	EDO	B	206	4/4	0.93	0.15	38,39,43,49	0
7	EDO	C	202	4/4	0.94	0.18	48,48,49,49	0
7	EDO	A	409	4/4	0.94	0.18	22,32,36,37	0
6	MES	A	404	12/12	0.94	0.15	20,25,29,31	12
6	MES	A	403	7/12	0.96	0.16	20,21,25,29	7
7	EDO	A	406	4/4	0.96	0.14	18,27,30,33	0
9	FK5	C	201	57/57	0.96	0.07	13,19,25,26	0
7	EDO	A	407	4/4	0.97	0.08	21,22,22,24	0
8	CA	B	204	1/1	0.98	0.04	26,26,26,26	0
8	CA	B	203	1/1	0.98	0.05	26,26,26,26	0
8	CA	B	201	1/1	0.99	0.06	20,20,20,20	0
4	ZN	A	401	1/1	0.99	0.07	19,19,19,19	1
8	CA	B	202	1/1	1.00	0.05	21,21,21,21	0
5	FE	A	402	1/1	1.00	0.07	15,15,15,15	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.



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

There are no such residues in this entry.