



# wwPDB X-ray Structure Validation Summary Report ⓘ

Oct 8, 2024 – 12:31 pm BST

PDB ID : 9EMK  
Title : DupA from legionella covalently bound to ubiquitin-based probe  
Authors : Kim, R.Q.; Kloet, M.S.; van der Heden van Noort, G.  
Deposited on : 2024-03-08  
Resolution : 2.17 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](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 : 1.8.4, CSD as541be (2020)  
Xtriage (Phenix) : 1.13  
EDS : 3.0  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)  
CCP4 : 9.0.003 (Gargrove)  
Density-Fitness : 1.0.11  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.39

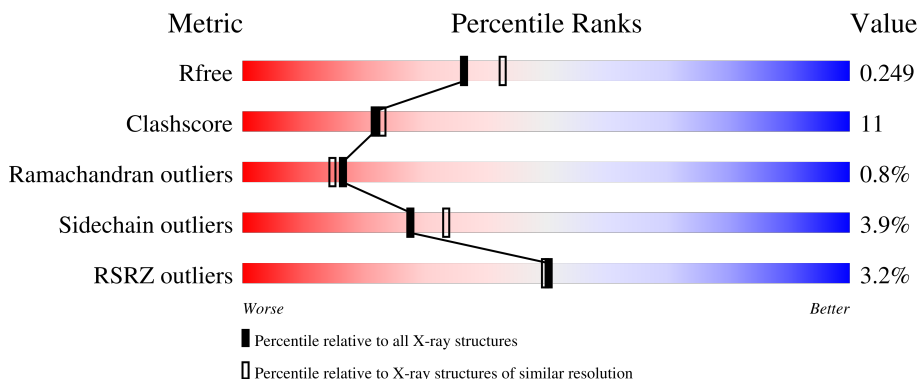
# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.17 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.



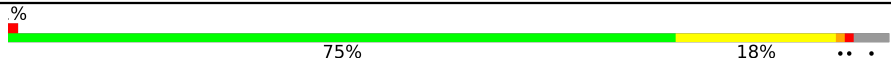
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	164625	8336 (2.20-2.16)
Clashscore	180529	9404 (2.20-2.16)
Ramachandran outliers	177936	9297 (2.20-2.16)
Sidechain outliers	177891	9297 (2.20-2.16)
RSRZ outliers	164620	8337 (2.20-2.16)

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	347	
1	C	347	
1	E	347	
2	B	76	
2	D	76	

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Length	Quality of chain
2	F	76	 <p>A horizontal bar chart representing the quality of chain. The bar is divided into segments: a small red segment at the start, followed by a large green segment labeled '75%', then a yellow segment labeled '18%', and finally a small grey segment at the end. Above the bar is a '%' symbol, and below the bar are two dots '..'. The bar is contained within a table cell.</p>

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
2	ABA	D	42	X	-	-	-

## 2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 18701 atoms, of which 9174 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 Septation initiation protein.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
			Total	C	H	N	O	S			
1	A	312	4944	1584	2446	441	463	10	89	0	0
1	C	312	4957	1588	2454	442	463	10	89	0	0
1	E	308	4901	1572	2424	437	459	9	89	0	0

There are 18 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-1	GLY	-	expression tag	UNP A0A3A6VNK6
A	0	ALA	-	expression tag	UNP A0A3A6VNK6
A	1	MET	-	expression tag	UNP A0A3A6VNK6
A	2	GLY	-	expression tag	UNP A0A3A6VNK6
A	3	SER	-	expression tag	UNP A0A3A6VNK6
A	228	ASP	ALA	conflict	UNP A0A3A6VNK6
C	-1	GLY	-	expression tag	UNP A0A3A6VNK6
C	0	ALA	-	expression tag	UNP A0A3A6VNK6
C	1	MET	-	expression tag	UNP A0A3A6VNK6
C	2	GLY	-	expression tag	UNP A0A3A6VNK6
C	3	SER	-	expression tag	UNP A0A3A6VNK6
C	228	ASP	ALA	conflict	UNP A0A3A6VNK6
E	-1	GLY	-	expression tag	UNP A0A3A6VNK6
E	0	ALA	-	expression tag	UNP A0A3A6VNK6
E	1	MET	-	expression tag	UNP A0A3A6VNK6
E	2	GLY	-	expression tag	UNP A0A3A6VNK6
E	3	SER	-	expression tag	UNP A0A3A6VNK6
E	228	ASP	ALA	conflict	UNP A0A3A6VNK6

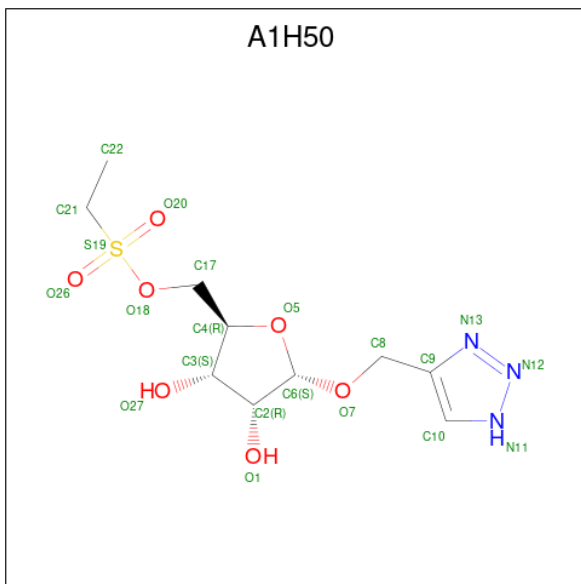
- Molecule 2 is a protein called Polyubiquitin-B.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace	
			Total	C	H	N	O				S
2	B	76	Total	C	H	N	O	S	13	0	0
			1217	376	620	102	118	1			
2	D	73	Total	C	H	N	O	S	13	0	0
			1162	360	590	98	114				
2	F	73	Total	C	H	N	O	S	13	0	0
			1178	366	601	96	114	1			

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	42	ABA	ARG	engineered mutation	UNP P0CG47
D	42	ABA	ARG	engineered mutation	UNP P0CG47
F	42	ABA	ARG	engineered mutation	UNP P0CG47

- Molecule 3 is [(2 {R},3 {S},4 {R},5 {S})-5-[(1-ethyl-1,2,3-triazol-4-yl)methoxy]-3,4-bis(oxidan-yl)oxolan-2-yl]methyl ethanesulfonate (three-letter code: A1H50) (formula: C<sub>10</sub>H<sub>17</sub>N<sub>3</sub>O<sub>7</sub>S) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	
			Total	C	H	N	O			S
3	A	1	Total	C	H	N	O	S	2	0
			34	10	13	3	7	1		
3	C	1	Total	C	H	N	O	S	2	0
			34	10	13	3	7	1		
3	E	1	Total	C	H	N	O	S	2	0
			34	10	13	3	7	1		

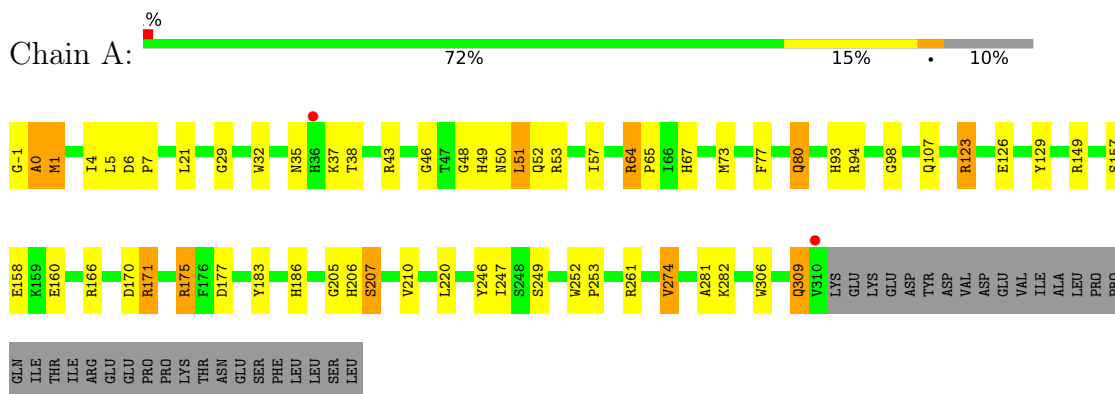
- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	121	Total 121	O 121	0	0
4	B	3	Total 3	O 3	0	0
4	C	54	Total 54	O 54	0	0
4	D	1	Total 1	O 1	0	0
4	E	59	Total 59	O 59	0	0
4	F	2	Total 2	O 2	0	0

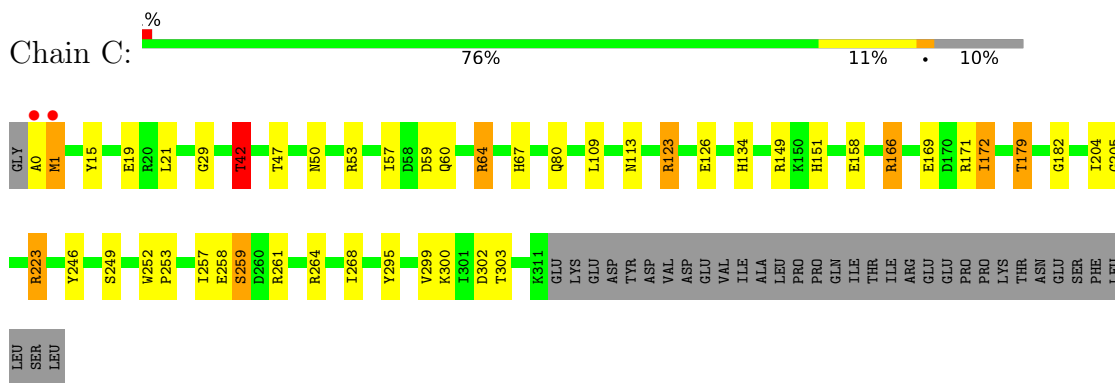
### 3 Residue-property plots

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.

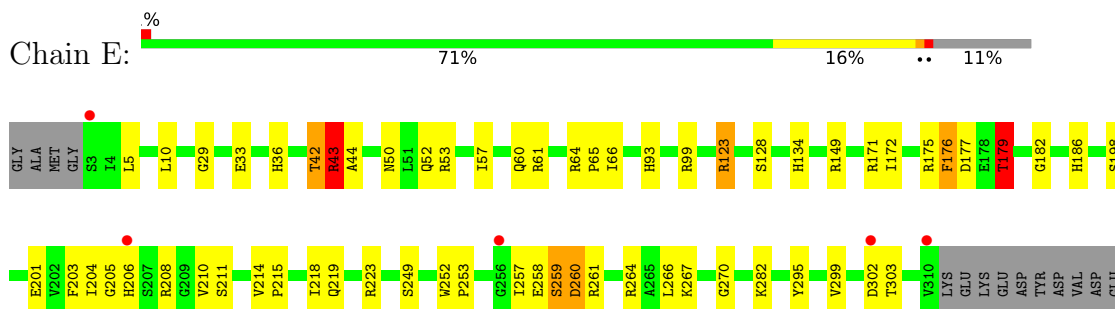
- Molecule 1: Septation initiation protein



- Molecule 1: Septation initiation protein

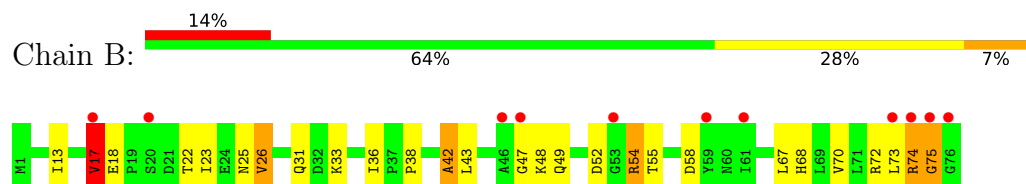


- Molecule 1: Septation initiation protein

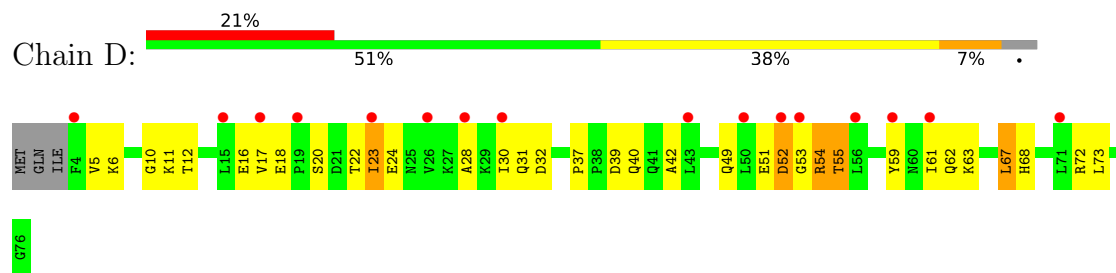


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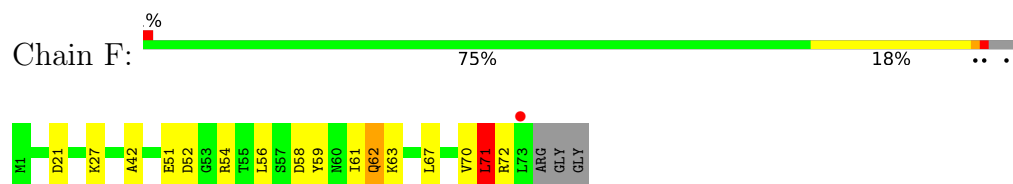
- Molecule 2: Polyubiquitin-B



- Molecule 2: Polyubiquitin-B



- Molecule 2: Polyubiquitin-B





## 4 Data and refinement statistics

Property	Value	Source
Space group	P 32	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	86.81Å 86.81Å 146.54Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	75.29 – 2.17 75.18 – 2.17	Depositor EDS
% Data completeness (in resolution range)	100.0 (75.29-2.17) 99.9 (75.18-2.17)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.39 (at 2.16Å)	Xtrriage
Refinement program	REFMAC 5.8.0419	Depositor
R, $R_{free}$	0.185 , 0.239 0.190 , 0.249	Depositor DCC
$R_{free}$ test set	3239 reflections (4.96%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	44.4	Xtrriage
Anisotropy	0.084	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.40 , 46.9	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.46$ , $\langle L^2 \rangle = 0.29$	Xtrriage
Estimated twinning fraction	0.025 for -h,-k,l 0.093 for h,-h-k,-l 0.036 for -k,-h,-l	Xtrriage
$F_o, F_c$ correlation	0.96	EDS
Total number of atoms	18701	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	66.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.72% 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: A1H50, ABA

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	0.55	0/2561	1.01	9/3465 (0.3%)
1	C	0.51	0/2566	0.98	8/3471 (0.2%)
1	E	0.49	0/2540	0.95	9/3438 (0.3%)
2	B	0.39	0/596	0.94	2/799 (0.3%)
2	D	0.38	0/571	0.88	0/766
2	F	0.40	0/576	0.88	0/775
All	All	0.50	0/9410	0.97	28/12714 (0.2%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	1	4
1	C	0	3
1	E	0	4
2	B	1	1
2	D	2	0
All	All	4	12

There are no bond length outliers.

The worst 5 of 28 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	1	MET	CG-SD-CE	11.00	117.79	100.20
1	A	64	ARG	NE-CZ-NH2	-9.71	115.44	120.30
1	E	302	ASP	CB-CA-C	8.80	128.00	110.40
1	A	64	ARG	NE-CZ-NH1	8.21	124.41	120.30
1	C	64	ARG	NE-CZ-NH2	-8.13	116.23	120.30

All (4) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
1	A	207	SER	CA
2	B	17	VAL	CA
2	D	17	VAL	CA
2	D	42	ABA	CA

5 of 12 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	123	ARG	Sidechain
1	A	171	ARG	Sidechain
1	A	175	ARG	Sidechain
1	A	43	ARG	Sidechain
2	B	54	ARG	Sidechain

## 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	2498	2446	2429	52	0
1	C	2503	2454	2439	41	0
1	E	2477	2424	2406	37	0
2	B	597	620	621	31	0
2	D	572	590	588	32	0
2	F	577	601	602	10	0
3	A	21	13	0	0	0
3	C	21	13	0	1	0
3	E	21	13	0	0	0
4	A	121	0	0	5	0
4	B	3	0	0	0	0
4	C	54	0	0	0	0
4	D	1	0	0	0	0
4	E	59	0	0	0	0
4	F	2	0	0	0	0
All	All	9527	9174	9085	194	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 11.

The worst 5 of 194 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:C:179:THR:HG22	1:C:182:GLY:H	1.30	0.95
1:E:33:GLU:O	1:E:42:THR:HG21	1.66	0.95
1:E:179:THR:HG22	1:E:182:GLY:H	1.32	0.95
2:D:23:ILE:HD11	2:D:52:ASP:HA	1.49	0.94
1:A:29:GLY:H	1:A:50:ASN:HD21	0.99	0.93

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	310/347 (89%)	302 (97%)	7 (2%)	1 (0%)	37	40
1	C	310/347 (89%)	303 (98%)	6 (2%)	1 (0%)	37	40
1	E	306/347 (88%)	298 (97%)	6 (2%)	2 (1%)	19	18
2	B	73/76 (96%)	68 (93%)	3 (4%)	2 (3%)	4	2
2	D	70/76 (92%)	61 (87%)	8 (11%)	1 (1%)	9	6
2	F	70/76 (92%)	67 (96%)	1 (1%)	2 (3%)	3	1
All	All	1139/1269 (90%)	1099 (96%)	31 (3%)	9 (1%)	16	15

5 of 9 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	0	ALA
2	B	17	VAL
1	C	259	SER
2	F	71	LEU
2	F	72	ARG

### 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	261/295 (88%)	256 (98%)	5 (2%)	52	64
1	C	262/295 (89%)	256 (98%)	6 (2%)	45	56
1	E	260/295 (88%)	247 (95%)	13 (5%)	20	23
2	B	67/67 (100%)	64 (96%)	3 (4%)	23	27
2	D	64/67 (96%)	55 (86%)	9 (14%)	3	2
2	F	66/67 (98%)	64 (97%)	2 (3%)	36	45
All	All	980/1086 (90%)	942 (96%)	38 (4%)	27	33

5 of 38 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	E	210	VAL
1	E	303	THR
1	E	211	SER
1	E	266	LEU
2	F	71	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 19 such sidechains are listed below:

Mol	Chain	Res	Type
1	E	36	HIS
1	E	134	HIS
2	F	25	ASN
1	E	93	HIS
1	C	50	ASN

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

3 non-standard protein/DNA/RNA residues 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
2	ABA	F	42	3,2	4,5,6	0.54	0	1,5,7	9.36	1 (100%)
2	ABA	D	42	3,2	4,5,6	1.25	1 (25%)	1,5,7	15.58	1 (100%)
2	ABA	B	42	3,2	4,5,6	0.74	0	1,5,7	11.17	1 (100%)

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
2	ABA	F	42	3,2	-	2/3/4/6	-
2	ABA	D	42	3,2	1/1/1/2	1/3/4/6	-
2	ABA	B	42	3,2	-	2/3/4/6	-

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	D	42	ABA	CB-CA	2.08	1.58	1.52

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	D	42	ABA	CG-CB-CA	15.58	149.06	113.42
2	B	42	ABA	CG-CB-CA	11.17	138.98	113.42
2	F	42	ABA	CG-CB-CA	9.36	134.84	113.42

All (1) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
2	D	42	ABA	CA

All (5) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	B	42	ABA	N-CA-CB-CG
2	B	42	ABA	C-CA-CB-CG
2	D	42	ABA	C-CA-CB-CG
2	F	42	ABA	N-CA-CB-CG
2	F	42	ABA	C-CA-CB-CG

There are no ring outliers.

1 monomer is involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	42	ABA	3	0

## 5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

3 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	$\# Z  > 2$
3	A1H50	A	401	2,1	20,22,22	0.73	1 (5%)	27,31,31	1.21	2 (7%)
3	A1H50	C	401	2,1	20,22,22	0.75	1 (5%)	27,31,31	1.35	4 (14%)
3	A1H50	E	401	2,1	20,22,22	0.73	1 (5%)	27,31,31	1.09	2 (7%)

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
3	A1H50	A	401	2,1	-	5/12/30/30	0/2/2/2
3	A1H50	C	401	2,1	-	5/12/30/30	0/2/2/2
3	A1H50	E	401	2,1	-	4/12/30/30	0/2/2/2

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	E	401	A1H50	N13-N12	-2.22	1.31	1.34
3	C	401	A1H50	N13-N12	-2.18	1.31	1.34
3	A	401	A1H50	N13-N12	-2.12	1.31	1.34

The worst 5 of 8 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	C	401	A1H50	N13-N12-N11	-3.50	106.88	111.24
3	A	401	A1H50	N13-N12-N11	-3.40	107.01	111.24
3	E	401	A1H50	N13-N12-N11	-3.40	107.01	111.24
3	C	401	A1H50	O18-S19-C21	-2.50	97.53	104.18
3	C	401	A1H50	O26-S19-C21	2.37	113.78	106.71

There are no chirality outliers.

5 of 14 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	401	A1H50	O18-C17-C4-C3
3	A	401	A1H50	O18-C17-C4-O5
3	C	401	A1H50	O18-C17-C4-C3
3	C	401	A1H50	C22-C21-S19-O18
3	C	401	A1H50	C22-C21-S19-O26

There are no ring outliers.

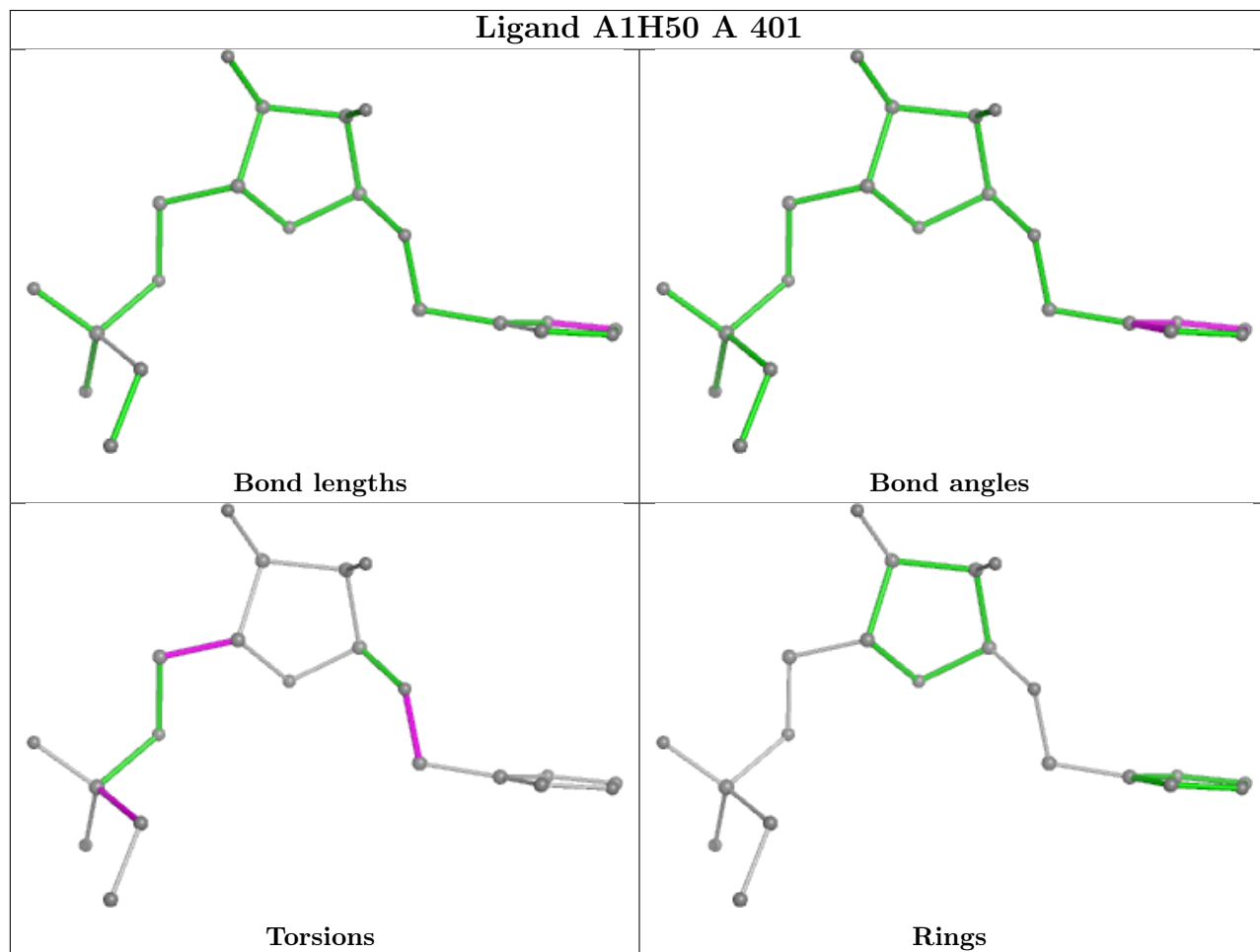
1 monomer is involved in 1 short contact:

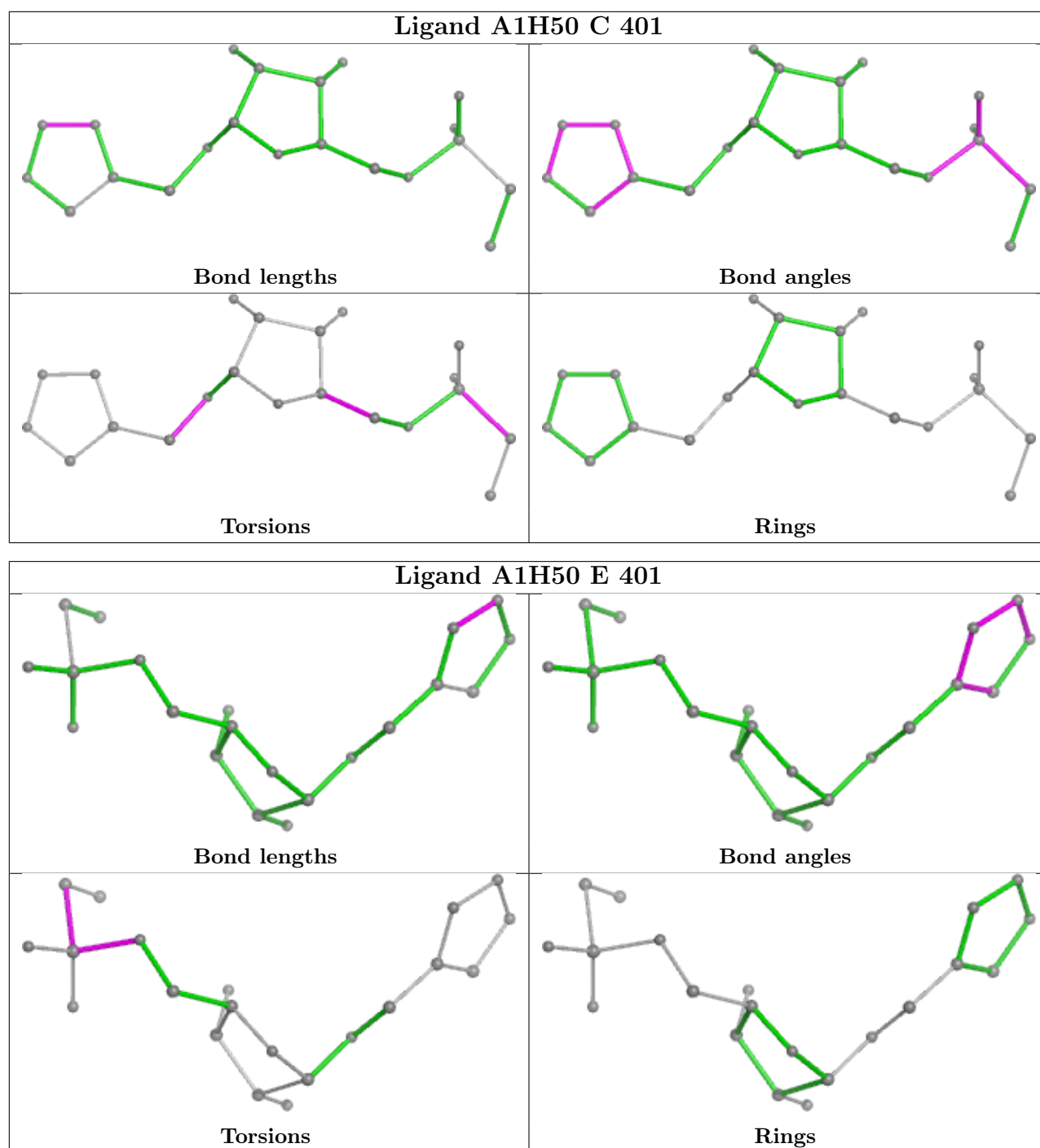
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	C	401	A1H50	1	0

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	312/347 (89%)	-0.44	2 (0%) 85 84	29, 45, 80, 100	0
1	C	312/347 (89%)	-0.32	2 (0%) 85 84	34, 52, 87, 115	0
1	E	308/347 (88%)	-0.13	5 (1%) 70 69	33, 63, 101, 116	0
2	B	75/76 (98%)	1.01	11 (14%) 7 7	50, 112, 139, 152	2 (2%)
2	D	72/76 (94%)	1.40	16 (22%) 3 3	66, 122, 147, 163	0
2	F	72/76 (94%)	0.49	1 (1%) 73 72	63, 82, 107, 119	0
All	All	1151/1269 (90%)	-0.06	37 (3%) 50 50	29, 58, 124, 163	2 (0%)

The worst 5 of 37 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	B	73	LEU	7.5
2	F	73	LEU	5.5
2	B	17	VAL	4.1
1	E	3	SER	3.4
2	D	4	PHE	3.3

### 6.2 Non-standard residues in protein, DNA, RNA chains [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(Å <sup>2</sup> )	Q<0.9
2	ABA	D	42	6/7	0.69	0.15	100,116,120,129	0
2	ABA	B	42	6/7	0.88	0.11	66,90,95,97	0
2	ABA	F	42	6/7	0.92	0.12	62,74,92,95	0

### 6.3 Carbohydrates [i](#)

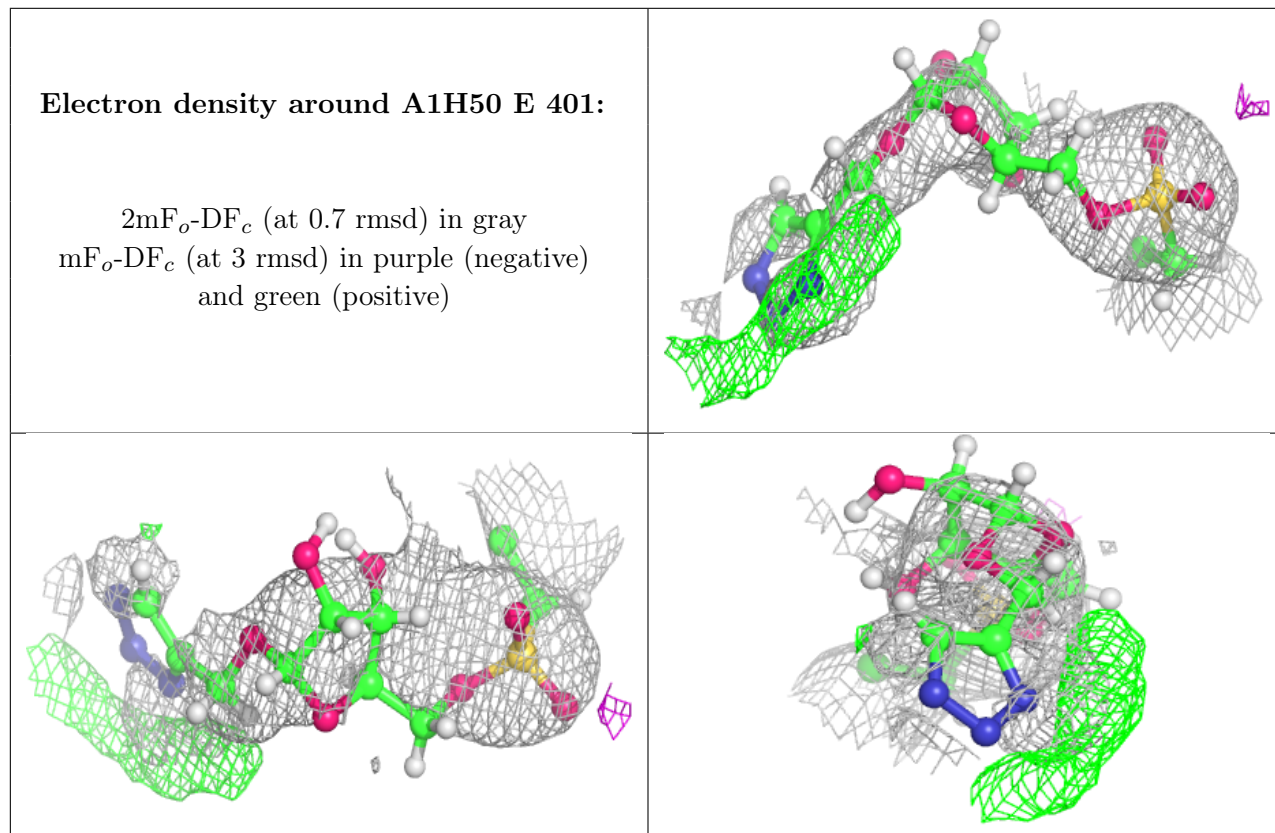
There are no monosaccharides in this entry.

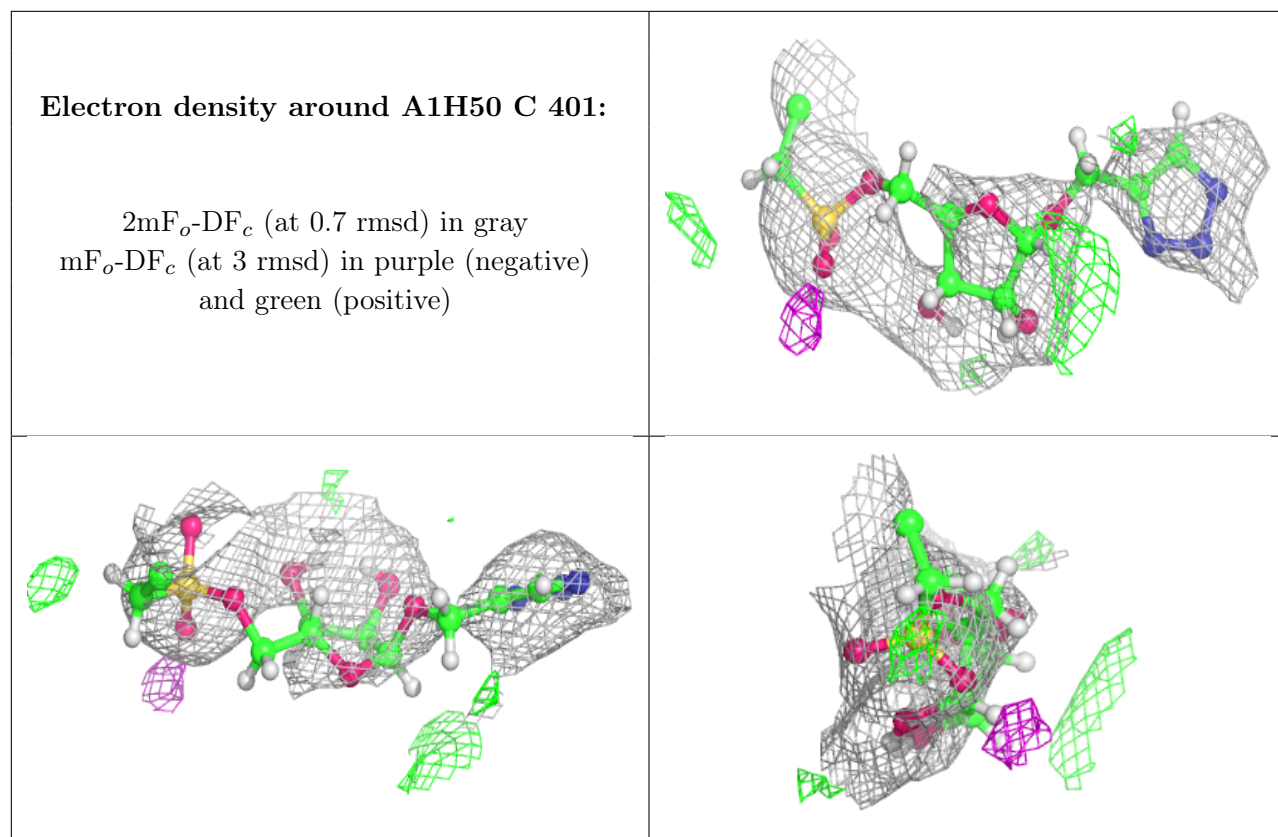
### 6.4 Ligands [i](#)

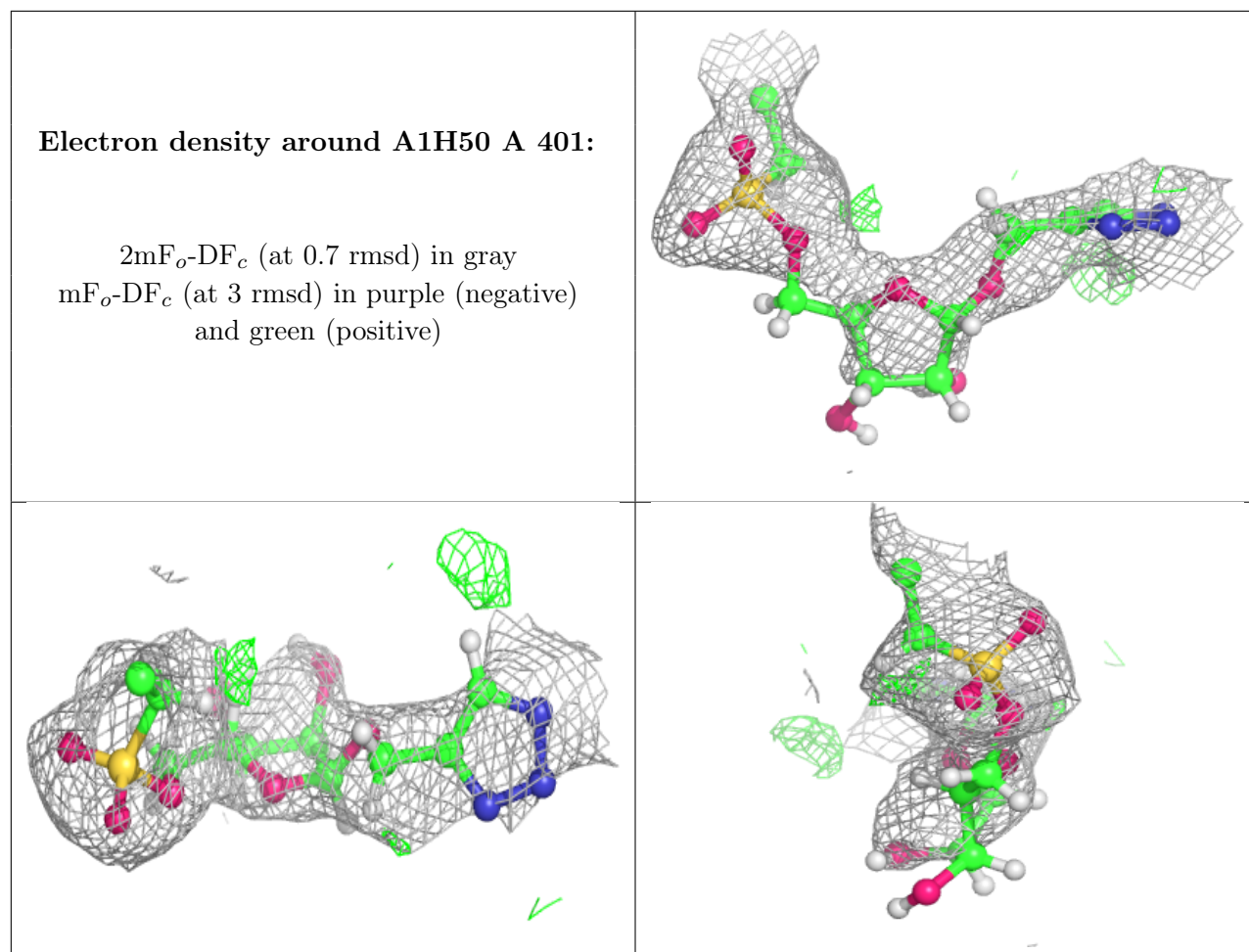
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled 'Q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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
3	A1H50	E	401	21/21	0.78	0.15	30,118,138,147	2
3	A1H50	C	401	21/21	0.84	0.14	30,111,118,125	2
3	A1H50	A	401	21/21	0.86	0.12	30,110,127,132	2

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.