



# Full wwPDB X-ray Structure Validation Report ⓘ

Aug 23, 2023 – 12:41 AM EDT

PDB ID : 3CJR  
Title : Ribosomal protein L11 methyltransferase (PrmA) in complex with ribosomal protein L11 (K39A) and inhibitor Sinefungin.  
Authors : Demirci, H.; Gregory, S.T.; Dahlberg, A.E.; Jogl, G.  
Deposited on : 2008-03-13  
Resolution : 2.05 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)  
Xtriage (Phenix) : 1.13  
EDS : 2.35  
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

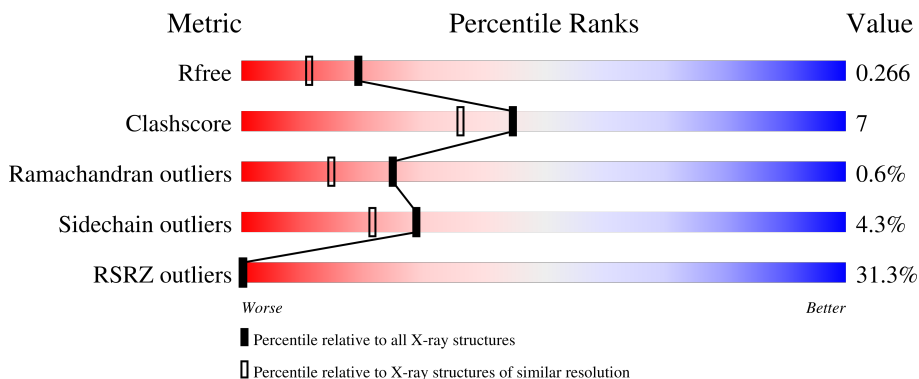
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.05 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	1692 (2.04-2.04)
Clashscore	141614	1773 (2.04-2.04)
Ramachandran outliers	138981	1752 (2.04-2.04)
Sidechain outliers	138945	1752 (2.04-2.04)
RSRZ outliers	127900	1672 (2.04-2.04)

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	254	 26% (Poor fit), 85% (0-3 outliers), 12% (4-5 outliers), 2% (Not modelled)
2	B	147	 34% (Poor fit), 65% (0-3 outliers), 14% (4-5 outliers), 20% (Not modelled)



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	N	O		
3	A	1	27	15	7	5	0	0

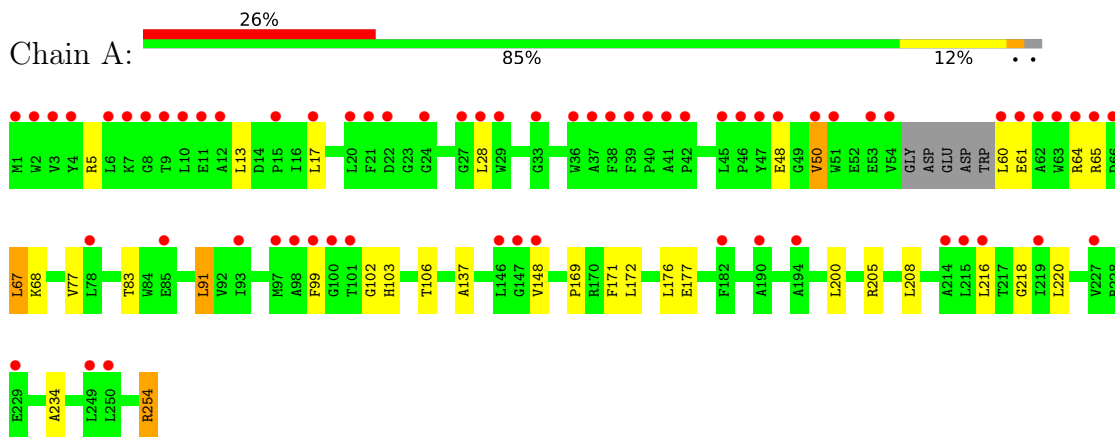
- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	271	Total 271	O 271	0	0
4	B	57	Total 57	O 57	0	0

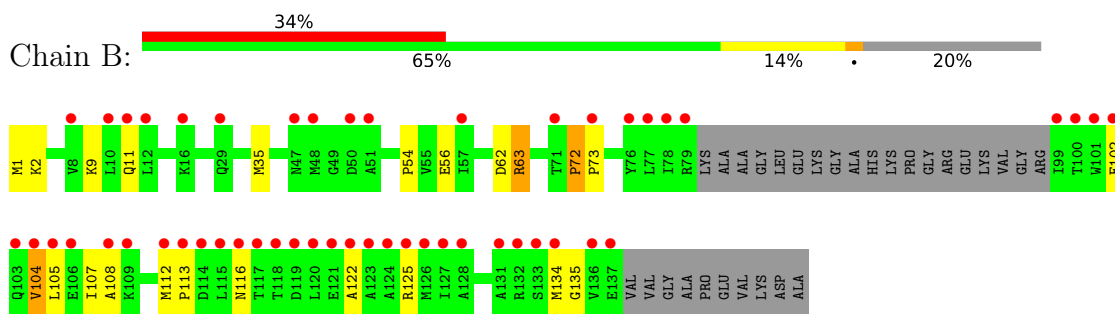
### 3 Residue-property plots [i](#)

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: Ribosomal protein L11 methyltransferase



- Molecule 2: 50S ribosomal protein L11



## 4 Data and refinement statistics i

Property	Value	Source
Space group	P 65	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	132.74Å 132.74Å 46.06Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	20.00 – 2.05 19.94 – 2.05	Depositor EDS
% Data completeness (in resolution range)	100.0 (20.00-2.05) 100.0 (19.94-2.05)	Depositor EDS
$R_{merge}$	0.07	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.27 (at 2.06Å)	Xtrriage
Refinement program	REFMAC 5.2.0019	Depositor
R, $R_{free}$	0.213 , 0.277 0.209 , 0.266	Depositor DCC
$R_{free}$ test set	1491 reflections (5.08%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	35.4	Xtrriage
Anisotropy	0.008	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.32 , 57.1	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	0.033 for h,-h-k,-l	Xtrriage
$F_o, F_c$ correlation	0.94	EDS
Total number of atoms	3146	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	51.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.34% 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: SFG

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	0.35	0/1969	0.54	0/2682
2	B	0.49	1/892 (0.1%)	0.90	3/1213 (0.2%)
All	All	0.40	1/2861 (0.0%)	0.68	3/3895 (0.1%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	63	ARG	CZ-NH2	-10.48	1.19	1.33

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	63	ARG	NE-CZ-NH2	23.16	131.88	120.30
2	B	63	ARG	NH1-CZ-NH2	-10.59	107.76	119.40
2	B	35	MET	CG-SD-CE	5.46	108.93	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	1915	0	1927	18	0
2	B	876	0	908	20	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	A	27	0	22	1	0
4	A	271	0	0	0	0
4	B	57	0	0	0	0
All	All	3146	0	2857	37	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 7.

All (37) 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)
2:B:72:PRO:HB2	2:B:73:PRO:CD	1.74	1.15
2:B:72:PRO:HB2	2:B:73:PRO:HD2	1.34	1.09
1:A:254:ARG:HH11	1:A:254:ARG:HG3	1.16	1.08
2:B:134:MET:H	2:B:135:GLY:HA2	1.20	1.06
2:B:134:MET:N	2:B:135:GLY:HA2	1.90	0.83
1:A:254:ARG:HG3	1:A:254:ARG:NH1	1.95	0.77
1:A:254:ARG:HH11	1:A:254:ARG:CG	2.02	0.69
2:B:72:PRO:HB2	2:B:73:PRO:HD3	1.70	0.68
2:B:134:MET:H	2:B:135:GLY:CA	2.03	0.67
2:B:1:MET:HA	2:B:2:LYS:HB2	1.82	0.61
1:A:208:LEU:HB2	1:A:254:ARG:HD3	1.84	0.58
1:A:28:LEU:HB2	2:B:11:GLN:HB2	1.87	0.56
1:A:77:VAL:HG11	1:A:102:GLY:HA3	1.86	0.56
2:B:1:MET:CA	2:B:2:LYS:HB2	2.36	0.55
2:B:72:PRO:CB	2:B:73:PRO:CD	2.62	0.54
2:B:122:ALA:HA	2:B:125:ARG:HE	1.73	0.51
2:B:9:LYS:HG2	2:B:56:GLU:HG2	1.93	0.49
2:B:72:PRO:CB	2:B:73:PRO:HD2	2.24	0.49
1:A:5:ARG:HB2	1:A:50:VAL:HG23	1.95	0.48
1:A:148:VAL:HG12	1:A:172:LEU:HB3	1.94	0.48
1:A:68:LYS:O	1:A:103:HIS:HE1	1.99	0.45
2:B:54:PRO:HD3	2:B:72:PRO:HB3	1.98	0.45
1:A:13:LEU:O	1:A:17:LEU:HG	2.17	0.45
1:A:60:LEU:HD12	1:A:61:GLU:HG2	1.98	0.44
2:B:112:MET:HB2	2:B:113:PRO:HD3	1.99	0.43
1:A:205:ARG:HD2	1:A:234:ALA:O	2.18	0.43
1:A:91:LEU:HD21	1:A:137:ALA:HB2	2.00	0.43
2:B:104:VAL:HA	2:B:107:ILE:HB	2.02	0.42
2:B:54:PRO:CD	2:B:72:PRO:HB3	2.49	0.42
1:A:106:THR:HG21	1:A:218:GLY:HA2	2.02	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:102:GLU:HB3	2:B:105:LEU:HD12	2.03	0.41
1:A:64:ARG:O	1:A:67:LEU:HB2	2.21	0.41
1:A:65:ARG:HD3	1:A:65:ARG:HA	1.84	0.41
2:B:62:ASP:O	2:B:63:ARG:HB2	2.19	0.41
1:A:99:PHE:HD1	3:A:255:SFG:HB2	1.85	0.41
2:B:104:VAL:HG12	2:B:108:ALA:HB2	2.02	0.41
1:A:169:PRO:HG2	1:A:171:PHE:CZ	2.56	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	245/254 (96%)	236 (96%)	8 (3%)	1 (0%)	34	24
2	B	114/147 (78%)	102 (90%)	11 (10%)	1 (1%)	17	8
All	All	359/401 (90%)	338 (94%)	19 (5%)	2 (1%)	25	15

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	48	GLU
2	B	72	PRO

#### 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	185/189 (98%)	175 (95%)	10 (5%)	22	13
2	B	91/110 (83%)	89 (98%)	2 (2%)	52	46
All	All	276/299 (92%)	264 (96%)	12 (4%)	29	22

All (12) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	50	VAL
1	A	67	LEU
1	A	83	THR
1	A	91	LEU
1	A	176	LEU
1	A	177	GLU
1	A	200	LEU
1	A	216	LEU
1	A	220	LEU
1	A	254	ARG
2	B	104	VAL
2	B	116	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	103	HIS

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

There are no non-standard protein/DNA/RNA residues in this entry.

## 5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

## 5.6 Ligand geometry

1 ligand 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
3	SFG	A	255	-	25,29,29	1.01	2 (8%)	23,42,42	1.53	4 (17%)

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	SFG	A	255	-	-	4/13/33/33	0/3/3/3

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	255	SFG	C5-C4	2.55	1.47	1.40
3	A	255	SFG	OXT-C	-2.11	1.23	1.30

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	255	SFG	N3-C2-N1	-3.56	123.11	128.68
3	A	255	SFG	OXT-C-O	-2.98	117.33	124.09
3	A	255	SFG	C4-C5-N7	-2.66	106.63	109.40
3	A	255	SFG	OXT-C-CA	2.31	121.24	113.38

There are no chirality outliers.

All (4) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	255	SFG	NE-CD-CG-CB
3	A	255	SFG	C5'-CD-CG-CB

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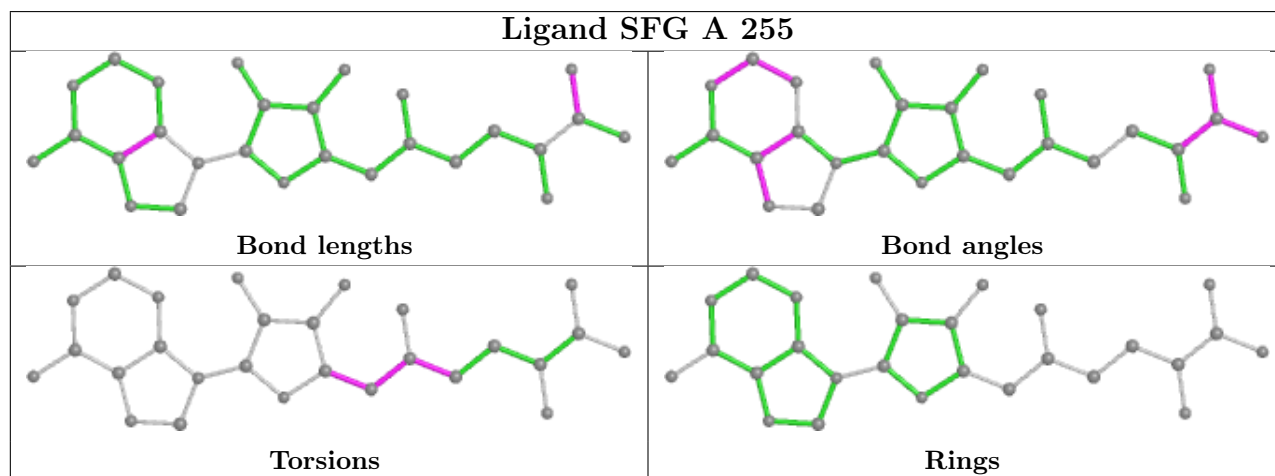
Mol	Chain	Res	Type	Atoms
3	A	255	SFG	O4'-C4'-C5'-CD
3	A	255	SFG	C4'-C5'-CD-NE

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	255	SFG	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

### 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, 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	249/254 (98%)	1.27	65 (26%) 0 0	23, 30, 94, 98	2 (0%)
2	B	118/147 (80%)	2.34	50 (42%) 0 0	43, 54, 100, 100	1 (0%)
All	All	367/401 (91%)	1.62	115 (31%) 0 0	23, 43, 100, 100	3 (0%)

All (115) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	B	123	ALA	14.8
2	B	118	THR	12.4
2	B	105	LEU	11.9
2	B	116	ASN	9.6
2	B	122	ALA	9.5
2	B	100	THR	8.3
1	A	97	MET	7.6
1	A	2	TRP	7.3
2	B	112	MET	7.2
2	B	115	LEU	7.1
2	B	106	GLU	7.0
2	B	104	VAL	7.0
2	B	117	THR	6.9
1	A	53	GLU	6.5
2	B	113	PRO	6.1
1	A	63	TRP	6.0
1	A	51	TRP	5.9
1	A	38	PHE	5.8
1	A	41	ALA	5.8
1	A	12	ALA	5.8
1	A	99	PHE	5.7
1	A	98	ALA	5.5
2	B	132	ARG	5.4
1	A	4	TYR	5.3

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
1	A	7	LYS	5.2
1	A	62	ALA	5.0
2	B	136	VAL	4.9
1	A	28	LEU	4.9
2	B	10	LEU	4.9
2	B	108	ALA	4.9
1	A	33	GLY	4.9
1	A	61	GLU	4.9
1	A	54	VAL	4.8
2	B	120	LEU	4.8
2	B	101	TRP	4.6
2	B	121	GLU	4.4
2	B	71	THR	4.3
2	B	114	ASP	4.3
2	B	119	ASP	4.2
1	A	48	GLU	4.2
1	A	40	PRO	4.1
2	B	126	MET	4.1
2	B	103	GLN	4.0
2	B	127	ILE	3.9
2	B	128	ALA	3.8
1	A	24	GLY	3.7
2	B	124	ALA	3.7
1	A	46	PRO	3.7
1	A	66	ASP	3.7
1	A	216	LEU	3.6
1	A	6	LEU	3.6
2	B	109	LYS	3.5
1	A	42	PRO	3.5
1	A	1	MET	3.5
1	A	65	ARG	3.4
1	A	39	PHE	3.4
1	A	45	LEU	3.4
2	B	50	ASP	3.4
2	B	48	MET	3.3
2	B	125	ARG	3.3
1	A	29	TRP	3.3
1	A	37	ALA	3.3
1	A	9	THR	3.3
1	A	15	PRO	3.1
1	A	60	LEU	3.1
2	B	134	MET	3.1

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
1	A	194	ALA	3.1
2	B	131	ALA	3.1
2	B	137	GLU	3.0
1	A	93	ILE	3.0
1	A	8	GLY	3.0
2	B	102	GLU	2.9
1	A	21	PHE	2.9
1	A	148	VAL	2.9
1	A	47	TYR	2.9
1	A	227	VAL	2.9
1	A	219	ILE	2.8
1	A	50	VAL	2.8
2	B	77	LEU	2.8
1	A	27	GLY	2.7
1	A	10	LEU	2.7
1	A	146	LEU	2.6
2	B	57	ILE	2.6
1	A	3	VAL	2.6
2	B	73	PRO	2.6
1	A	22	ASP	2.5
1	A	64	ARG	2.5
2	B	47	ASN	2.5
1	A	78	LEU	2.4
1	A	229	GLU	2.4
2	B	99	ILE	2.4
1	A	85	GLU	2.4
2	B	8	VAL	2.4
2	B	51	ALA	2.4
1	A	147	GLY	2.3
1	A	214	ALA	2.3
2	B	16	LYS	2.3
1	A	100	GLY	2.3
1	A	215	LEU	2.3
1	A	250	LEU	2.3
1	A	11	GLU	2.3
2	B	78	ILE	2.3
1	A	20	LEU	2.2
2	B	11	GLN	2.2
2	B	79	ARG	2.2
1	A	182	PHE	2.1
1	A	190	ALA	2.1
2	B	29	GLN	2.1

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Mol	Chain	Res	Type	RSRZ
2	B	76	TYR	2.1
2	B	133	SER	2.0
1	A	17	LEU	2.0
1	A	249	LEU	2.0
1	A	36	TRP	2.0
1	A	101	THR	2.0
2	B	12	LEU	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.

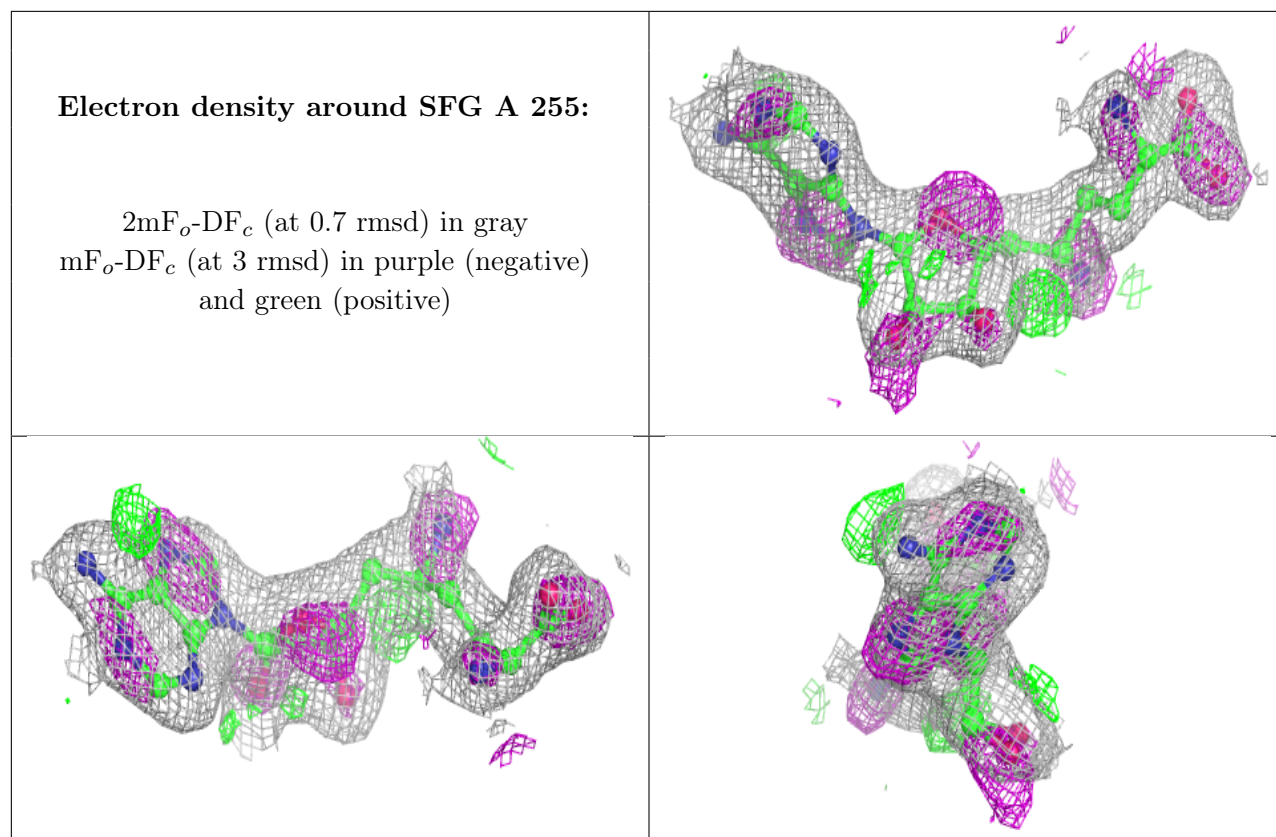
## 6.4 Ligands [i](#)

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(Å <sup>2</sup> )	Q<0.9
3	SFG	A	255	27/27	0.92	0.14	28,32,34,36	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.





## 6.5 Other polymers [i](#)

There are no such residues in this entry.