



# Full wwPDB X-ray Structure Validation Report ⓘ

Oct 10, 2023 – 03:03 AM EDT

PDB ID : 7LZ1  
Title : Structure of glutamate receptor-like channel GLR3.4 ligand-binding domain in complex with serine  
Authors : Gangwar, S.P.; Green, M.N.; Sobolevsky, A.I.  
Deposited on : 2021-03-08  
Resolution : 1.51 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>.

---

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 : 2.35.1  
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

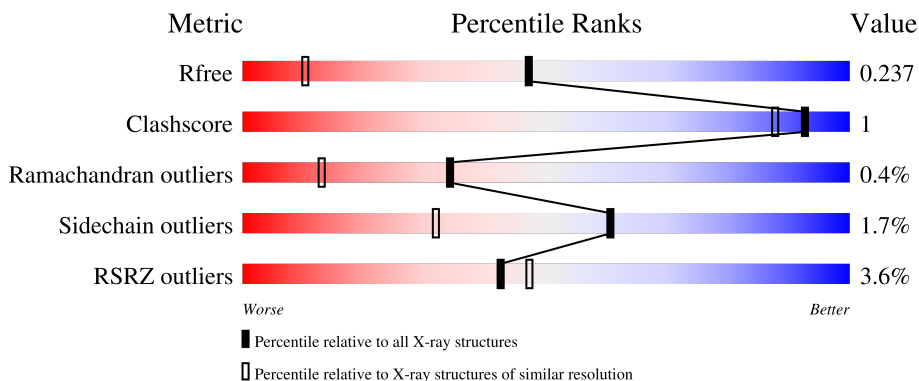
# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 1.51 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	4009 (1.54-1.50)
Clashscore	141614	4249 (1.54-1.50)
Ramachandran outliers	138981	4148 (1.54-1.50)
Sidechain outliers	138945	4146 (1.54-1.50)
RSRZ outliers	127900	3943 (1.54-1.50)

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	268	<div style="display: flex; align-items: center;"> <div style="width: 2%; height: 10px; background-color: red; margin-right: 2px;"></div> <div style="width: 88%; height: 10px; background-color: green; margin-right: 2px;"></div> <div style="width: 6%; height: 10px; background-color: yellow; margin-right: 2px;"></div> <div style="width: 6%; height: 10px; background-color: grey;"></div> </div> <p style="text-align: center;">88% 6% 6%</p>
1	B	268	<div style="display: flex; align-items: center;"> <div style="width: 3%; height: 10px; background-color: red; margin-right: 2px;"></div> <div style="width: 88%; height: 10px; background-color: green; margin-right: 2px;"></div> <div style="width: 8%; height: 10px; background-color: grey;"></div> </div> <p style="text-align: center;">88% 8%</p>
1	C	268	<div style="display: flex; align-items: center;"> <div style="width: 6%; height: 10px; background-color: red; margin-right: 2px;"></div> <div style="width: 87%; height: 10px; background-color: green; margin-right: 2px;"></div> <div style="width: 6%; height: 10px; background-color: yellow; margin-right: 2px;"></div> <div style="width: 7%; height: 10px; background-color: grey;"></div> </div> <p style="text-align: center;">87% 6% 7%</p>

## 2 Entry composition i

There are 5 unique types of molecules in this entry. The entry contains 6109 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 Glutamate receptor 3.4.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	252	Total 1968	C 1250	N 332	O 381	S 5	0	0	0
1	B	247	Total 1941	C 1235	N 327	O 375	S 4	0	0	0
1	C	250	Total 1953	C 1242	N 328	O 378	S 5	0	0	0

There are 72 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-15	MET	-	expression tag	UNP Q8GXJ4
A	-14	HIS	-	expression tag	UNP Q8GXJ4
A	-13	HIS	-	expression tag	UNP Q8GXJ4
A	-12	HIS	-	expression tag	UNP Q8GXJ4
A	-11	HIS	-	expression tag	UNP Q8GXJ4
A	-10	HIS	-	expression tag	UNP Q8GXJ4
A	-9	HIS	-	expression tag	UNP Q8GXJ4
A	-8	HIS	-	expression tag	UNP Q8GXJ4
A	-7	HIS	-	expression tag	UNP Q8GXJ4
A	-6	SER	-	expression tag	UNP Q8GXJ4
A	-5	SER	-	expression tag	UNP Q8GXJ4
A	-4	GLY	-	expression tag	UNP Q8GXJ4
A	-3	LEU	-	expression tag	UNP Q8GXJ4
A	-2	VAL	-	expression tag	UNP Q8GXJ4
A	-1	PRO	-	expression tag	UNP Q8GXJ4
A	0	ARG	-	expression tag	UNP Q8GXJ4
A	1	GLY	-	expression tag	UNP Q8GXJ4
A	2	SER	-	expression tag	UNP Q8GXJ4
A	3	ALA	-	expression tag	UNP Q8GXJ4
A	4	MET	-	expression tag	UNP Q8GXJ4
A	5	GLY	-	expression tag	UNP Q8GXJ4
A	6	SER	-	expression tag	UNP Q8GXJ4
A	117	GLY	-	linker	UNP Q8GXJ4

*Continued on next page...*

*Continued from previous page...*

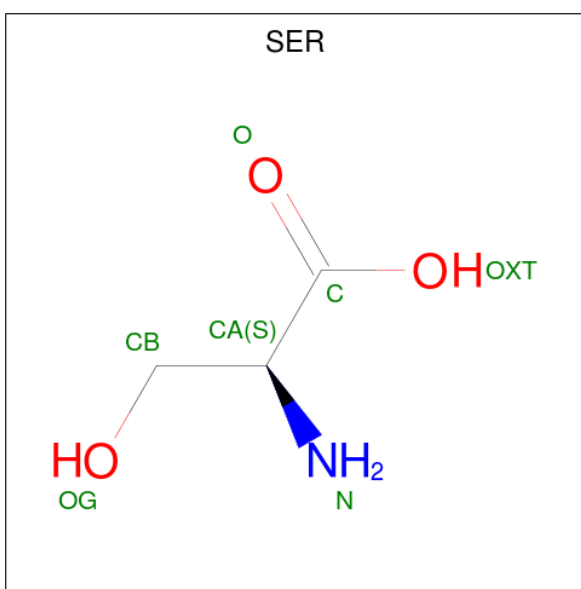
Chain	Residue	Modelled	Actual	Comment	Reference
A	118	THR	-	linker	UNP Q8GXJ4
B	-15	MET	-	expression tag	UNP Q8GXJ4
B	-14	HIS	-	expression tag	UNP Q8GXJ4
B	-13	HIS	-	expression tag	UNP Q8GXJ4
B	-12	HIS	-	expression tag	UNP Q8GXJ4
B	-11	HIS	-	expression tag	UNP Q8GXJ4
B	-10	HIS	-	expression tag	UNP Q8GXJ4
B	-9	HIS	-	expression tag	UNP Q8GXJ4
B	-8	HIS	-	expression tag	UNP Q8GXJ4
B	-7	HIS	-	expression tag	UNP Q8GXJ4
B	-6	SER	-	expression tag	UNP Q8GXJ4
B	-5	SER	-	expression tag	UNP Q8GXJ4
B	-4	GLY	-	expression tag	UNP Q8GXJ4
B	-3	LEU	-	expression tag	UNP Q8GXJ4
B	-2	VAL	-	expression tag	UNP Q8GXJ4
B	-1	PRO	-	expression tag	UNP Q8GXJ4
B	0	ARG	-	expression tag	UNP Q8GXJ4
B	1	GLY	-	expression tag	UNP Q8GXJ4
B	2	SER	-	expression tag	UNP Q8GXJ4
B	3	ALA	-	expression tag	UNP Q8GXJ4
B	4	MET	-	expression tag	UNP Q8GXJ4
B	5	GLY	-	expression tag	UNP Q8GXJ4
B	6	SER	-	expression tag	UNP Q8GXJ4
B	117	GLY	-	linker	UNP Q8GXJ4
B	118	THR	-	linker	UNP Q8GXJ4
C	-15	MET	-	expression tag	UNP Q8GXJ4
C	-14	HIS	-	expression tag	UNP Q8GXJ4
C	-13	HIS	-	expression tag	UNP Q8GXJ4
C	-12	HIS	-	expression tag	UNP Q8GXJ4
C	-11	HIS	-	expression tag	UNP Q8GXJ4
C	-10	HIS	-	expression tag	UNP Q8GXJ4
C	-9	HIS	-	expression tag	UNP Q8GXJ4
C	-8	HIS	-	expression tag	UNP Q8GXJ4
C	-7	HIS	-	expression tag	UNP Q8GXJ4
C	-6	SER	-	expression tag	UNP Q8GXJ4
C	-5	SER	-	expression tag	UNP Q8GXJ4
C	-4	GLY	-	expression tag	UNP Q8GXJ4
C	-3	LEU	-	expression tag	UNP Q8GXJ4
C	-2	VAL	-	expression tag	UNP Q8GXJ4
C	-1	PRO	-	expression tag	UNP Q8GXJ4
C	0	ARG	-	expression tag	UNP Q8GXJ4
C	1	GLY	-	expression tag	UNP Q8GXJ4

*Continued on next page...*

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
C	2	SER	-	expression tag	UNP Q8GXJ4
C	3	ALA	-	expression tag	UNP Q8GXJ4
C	4	MET	-	expression tag	UNP Q8GXJ4
C	5	GLY	-	expression tag	UNP Q8GXJ4
C	6	SER	-	expression tag	UNP Q8GXJ4
C	117	GLY	-	linker	UNP Q8GXJ4
C	118	THR	-	linker	UNP Q8GXJ4

- Molecule 2 is SERINE (three-letter code: SER) (formula:  $C_3H_7NO_3$ ) (labeled as "Ligand of Interest" by depositor).



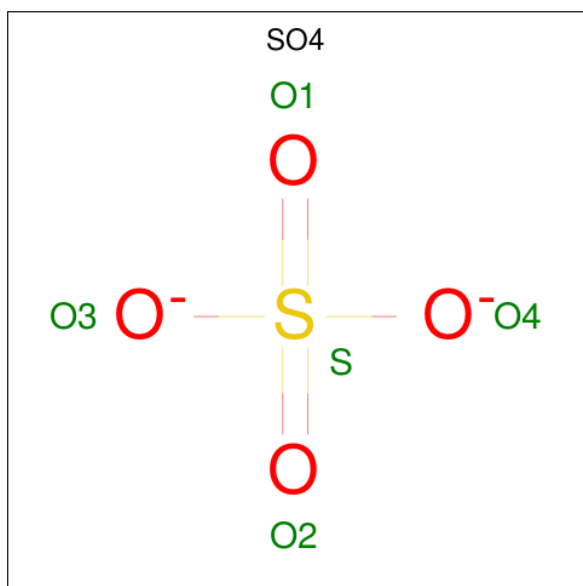
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	N	O		
2	A	1	7	3	1	3	0	0
2	B	1	7	3	1	3	0	0
2	C	1	7	3	1	3	0	0

- Molecule 3 is GLYCEROL (three-letter code: GOL) (formula:  $C_3H_8O_3$ ).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	C	O	0	0
			6	3	3		

- Molecule 4 is SULFATE ION (three-letter code: SO<sub>4</sub>) (formula: O<sub>4</sub>S).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	B	1	Total	O	S	0	0
			5	4	1		
4	C	1	Total	O	S	0	0
			5	4	1		
4	C	1	Total	O	S	0	0
			5	4	1		

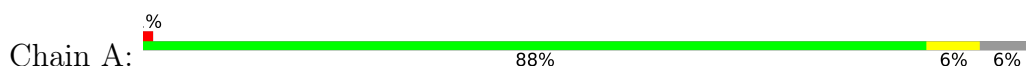
- Molecule 5 is water.

<b>Mol</b>	<b>Chain</b>	<b>Residues</b>	<b>Atoms</b>		<b>ZeroOcc</b>	<b>AltConf</b>
5	A	84	Total 84	O 84	0	0
5	B	57	Total 57	O 57	0	0
5	C	64	Total 64	O 64	0	0

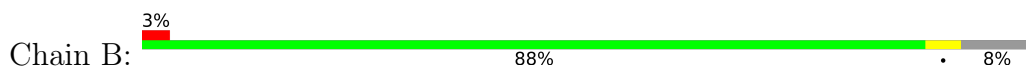
### 3 Residue-property plots [i](#)

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.

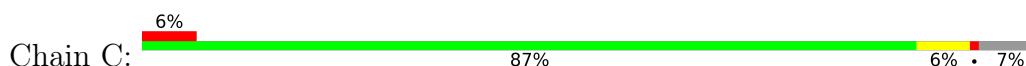
- Molecule 1: Glutamate receptor 3.4



- Molecule 1: Glutamate receptor 3.4



- Molecule 1: Glutamate receptor 3.4





## 4 Data and refinement statistics

Property	Value	Source
Space group	P 65 2 2	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	74.51Å 74.51Å 507.98Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	64.61 – 1.51 64.53 – 1.51	Depositor EDS
% Data completeness (in resolution range)	100.0 (64.61-1.51) 100.0 (64.53-1.51)	Depositor EDS
$R_{merge}$	0.09	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.48 (at 1.51Å)	Xtrriage
Refinement program	REFMAC 5.8.0267	Depositor
R, $R_{free}$	0.202 , 0.232 0.210 , 0.237	Depositor DCC
$R_{free}$ test set	6619 reflections (4.98%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	22.3	Xtrriage
Anisotropy	0.203	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.38 , 35.6	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.42$ , $\langle L^2 \rangle = 0.24$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.96	EDS
Total number of atoms	6109	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	28.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.10% 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: GOL, SO4

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	0.77	1/2010 (0.0%)	0.92	1/2738 (0.0%)
1	B	0.77	1/1983 (0.1%)	0.90	3/2703 (0.1%)
1	C	0.75	0/1994	0.89	2/2717 (0.1%)
All	All	0.76	2/5987 (0.0%)	0.90	6/8158 (0.1%)

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	B	0	1
1	C	0	1
All	All	0	2

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	161	GLU	CD-OE1	7.57	1.33	1.25
1	A	117	GLY	C-O	5.13	1.31	1.23

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	16	ARG	NE-CZ-NH2	-6.01	117.29	120.30
1	C	143	TYR	CB-CG-CD1	-5.73	117.56	121.00
1	A	143	TYR	CB-CG-CD2	-5.63	117.62	121.00
1	B	194	SER	C-N-CA	5.25	134.83	121.70
1	B	195	ASN	CB-CA-C	-5.25	99.90	110.40
1	C	63	ARG	NE-CZ-NH1	5.13	122.86	120.30

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	B	251	CYS	Peptide
1	C	114	LYS	Peptide

## 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	1968	0	1945	9	0
1	B	1941	0	1917	3	0
1	C	1953	0	1929	8	0
2	A	7	0	4	1	0
2	B	7	0	4	0	0
2	C	7	0	4	0	0
3	A	6	0	8	0	0
4	B	5	0	0	0	0
4	C	10	0	0	0	0
5	A	84	0	0	0	0
5	B	57	0	0	0	0
5	C	64	0	0	0	0
All	All	6109	0	5811	17	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 1.

All (17) 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:16:ARG:HH22	1:C:135:GLN:HE22	1.17	0.88
1:B:93:THR:HG21	1:C:229:LEU:CD1	2.25	0.66
1:B:93:THR:HG21	1:C:229:LEU:HD13	1.79	0.64
1:A:161:GLU:HA	1:A:164:TYR:CD2	2.42	0.54
1:C:248:LYS:HG2	1:C:248:LYS:O	2.06	0.54
1:A:170:ARG:HG3	1:A:170:ARG:HH11	1.75	0.51
1:A:126:VAL:HG22	1:A:150:ILE:HD11	1.94	0.50

*Continued on next page...*

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:87:THR:HG1	2:A:301:SER:N	2.14	0.46
1:C:192:THR:HG22	1:C:192:THR:O	2.17	0.45
1:A:165:LEU:HD21	1:A:194:SER:HB3	1.99	0.45
1:A:208:THR:HG23	1:A:209:GLY:H	1.83	0.43
1:A:19:TYR:CE2	1:A:186:TYR:HB3	2.54	0.41
1:A:166:SER:O	1:A:169:GLN:HG2	2.20	0.41
1:B:90:THR:HG23	1:C:233:GLU:OE1	2.20	0.41
1:C:150:ILE:HG21	1:C:155:ILE:HD11	2.02	0.41
1:A:208:THR:HG23	1:A:209:GLY:N	2.36	0.41
1:C:249:HIS:O	1:C:250:GLU:HB2	2.19	0.41

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	250/268 (93%)	245 (98%)	5 (2%)	0	100	100
1	B	245/268 (91%)	237 (97%)	8 (3%)	0	100	100
1	C	248/268 (92%)	233 (94%)	12 (5%)	3 (1%)	13	2
All	All	743/804 (92%)	715 (96%)	25 (3%)	3 (0%)	34	13

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	3	ALA
1	C	250	GLU
1	C	248	LYS

### 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	217/232 (94%)	216 (100%)	1 (0%)	88	78
1	B	215/232 (93%)	211 (98%)	4 (2%)	57	26
1	C	215/232 (93%)	209 (97%)	6 (3%)	43	14
All	All	647/696 (93%)	636 (98%)	11 (2%)	60	32

All (11) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	245	LEU
1	B	113	VAL
1	B	118	THR
1	B	246	ASN
1	B	249	HIS
1	C	4	MET
1	C	203	GLN
1	C	246	ASN
1	C	248	LYS
1	C	250	GLU
1	C	251	CYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (3) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	28	ASN
1	B	246	ASN
1	C	135	GLN

### 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](#)

7 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	SO4	B	302	-	4,4,4	0.36	0	6,6,6	0.14	0
4	SO4	C	303	-	4,4,4	0.34	0	6,6,6	0.28	0
2	SER	A	301	-	5,6,6	0.72	0	5,7,7	0.81	0
4	SO4	C	302	-	4,4,4	0.38	0	6,6,6	0.09	0
3	GOL	A	302	-	5,5,5	0.20	0	5,5,5	0.34	0
2	SER	C	301	-	5,6,6	1.36	1 (20%)	5,7,7	0.86	0
2	SER	B	301	-	5,6,6	1.22	0	5,7,7	0.97	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
2	SER	A	301	-	-	1/6/6/6	-
2	SER	C	301	-	-	1/6/6/6	-
3	GOL	A	302	-	-	2/4/4/4	-
2	SER	B	301	-	-	2/6/6/6	-

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	301	SER	OXT-C	-2.77	1.21	1.30

There are no bond angle outliers.

There are no chirality outliers.

All (6) torsion outliers are listed below:

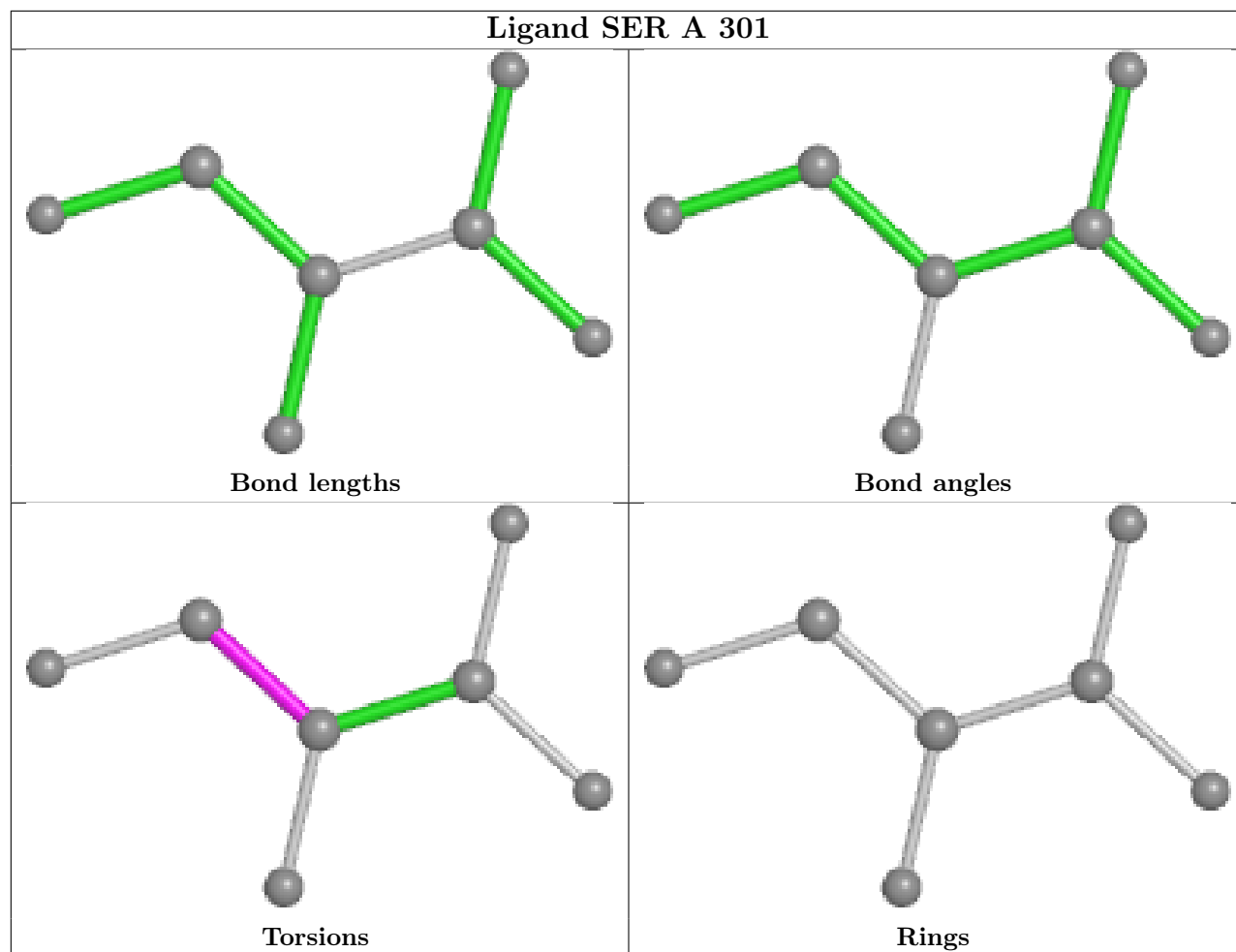
Mol	Chain	Res	Type	Atoms
2	B	301	SER	N-CA-CB-OG
2	B	301	SER	C-CA-CB-OG
3	A	302	GOL	C1-C2-C3-O3
3	A	302	GOL	O2-C2-C3-O3
2	C	301	SER	C-CA-CB-OG
2	A	301	SER	C-CA-CB-OG

There are no ring outliers.

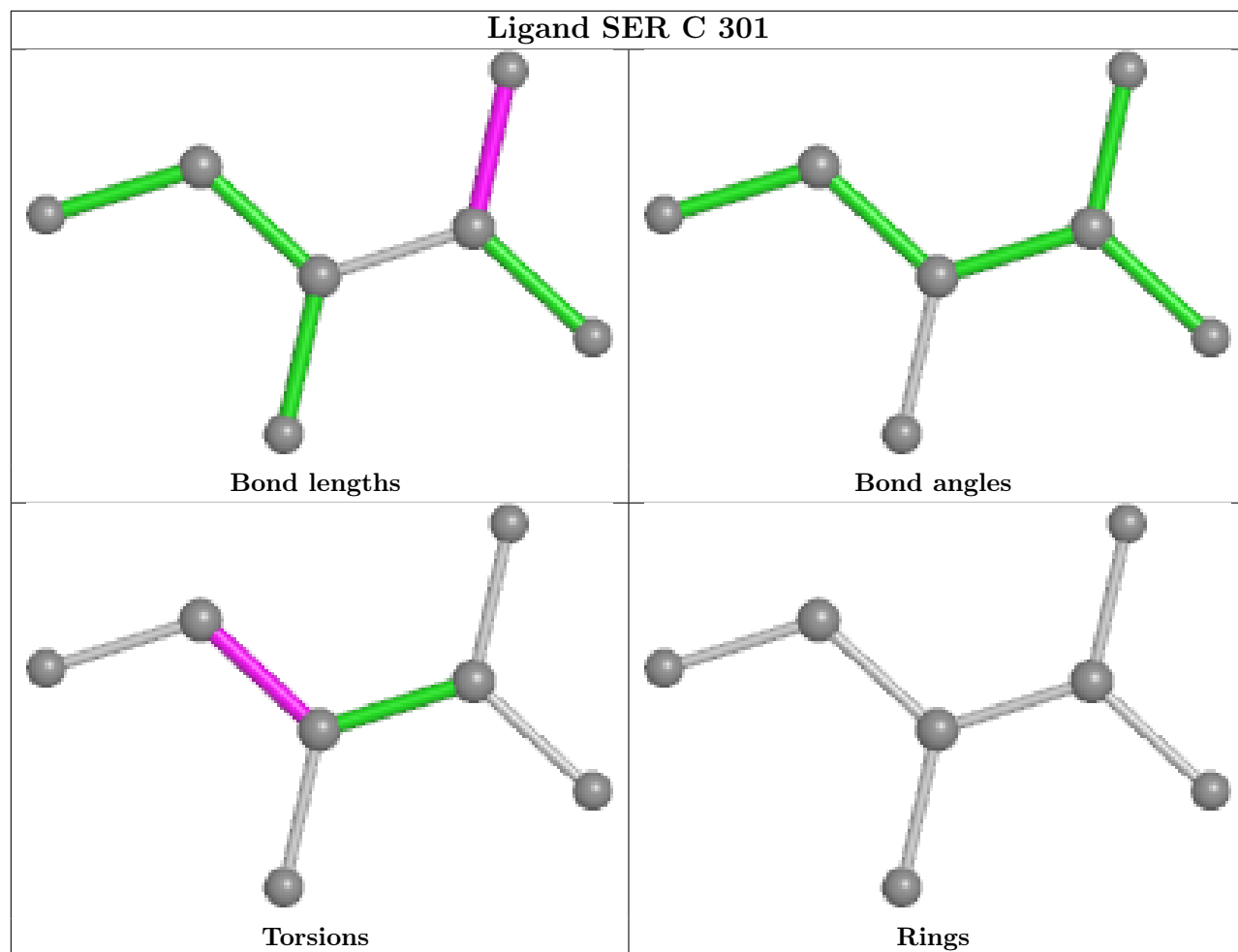
1 monomer is involved in 1 short contact:

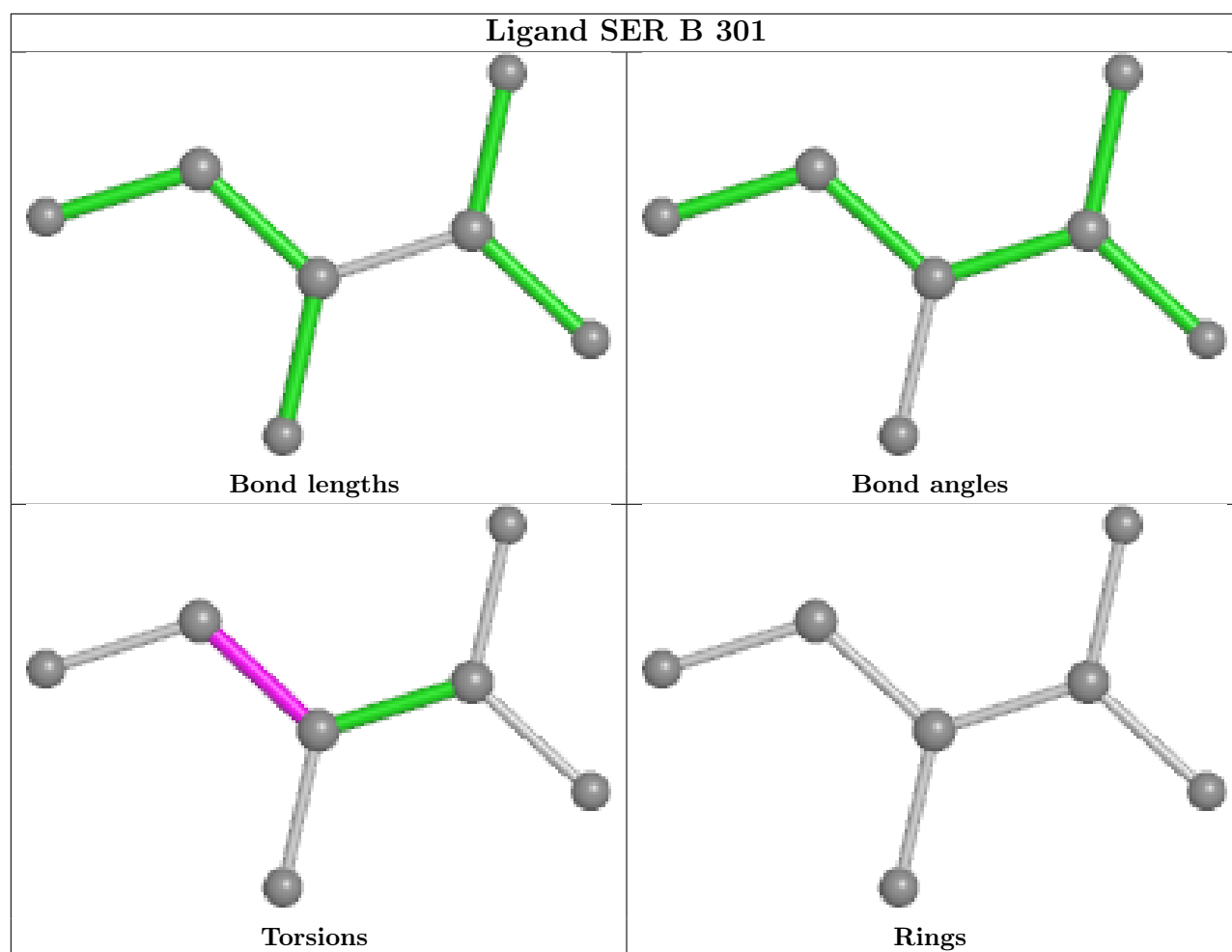
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	301	SER	1	0

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	252/268 (94%)	0.16	4 (1%) 72 76	16, 24, 42, 59	0
1	B	247/268 (92%)	0.24	8 (3%) 47 52	18, 26, 52, 87	1 (0%)
1	C	250/268 (93%)	0.36	15 (6%) 21 24	17, 25, 64, 120	0
All	All	749/804 (93%)	0.25	27 (3%) 42 47	16, 24, 47, 120	1 (0%)

All (27) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	251	CYS	16.2
1	C	116	ALA	10.4
1	C	247	TYR	10.2
1	B	117	GLY	8.7
1	B	116	ALA	7.6
1	C	2	SER	6.9
1	C	3	ALA	6.6
1	B	247	TYR	6.3
1	B	249	HIS	5.7
1	C	115	GLU	5.4
1	C	117	GLY	5.1
1	C	249	HIS	4.5
1	A	251	CYS	4.3
1	B	113	VAL	4.3
1	C	4	MET	3.9
1	B	95	TYR	3.8
1	A	252	SER	2.8
1	C	114	LYS	2.7
1	C	95	TYR	2.7
1	A	1	GLY	2.6
1	C	246	ASN	2.5
1	C	250	GLU	2.5
1	C	248	LYS	2.5

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type	RSRZ
1	B	7	LYS	2.4
1	B	118	THR	2.2
1	A	29	PRO	2.1
1	C	126	VAL	2.1

## 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](#)

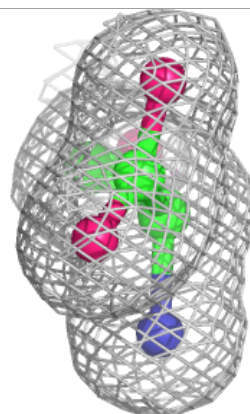
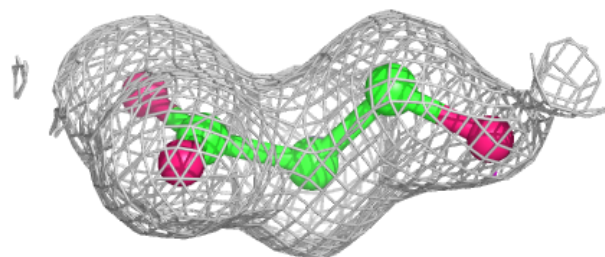
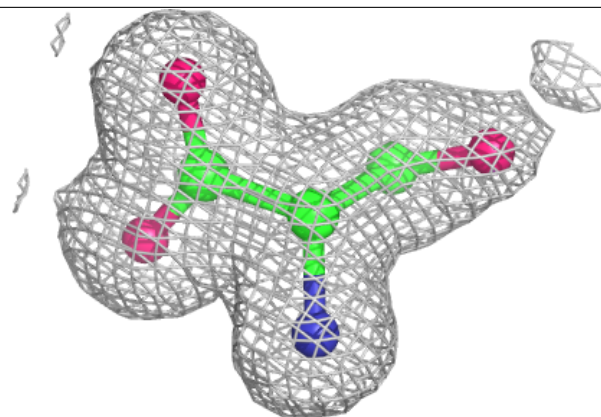
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 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	GOL	A	302	6/6	0.79	0.15	34,49,54,56	0
4	SO4	C	302	5/5	0.91	0.21	83,84,88,91	0
2	SER	B	301	7/7	0.95	0.11	18,19,22,36	0
2	SER	A	301	7/7	0.96	0.12	15,18,20,34	0
2	SER	C	301	7/7	0.96	0.10	17,18,21,39	0
4	SO4	B	302	5/5	0.97	0.09	38,38,40,45	0
4	SO4	C	303	5/5	0.99	0.07	32,33,37,39	0

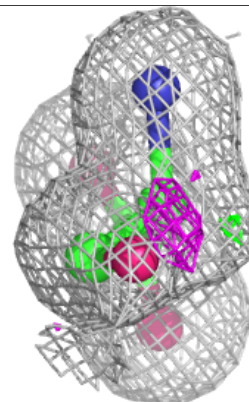
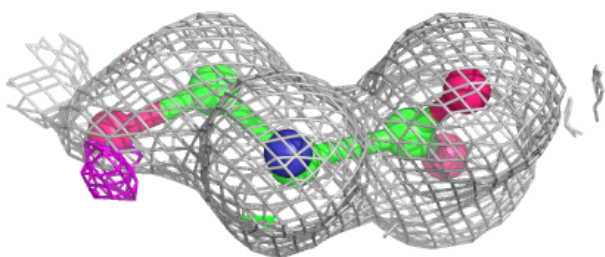
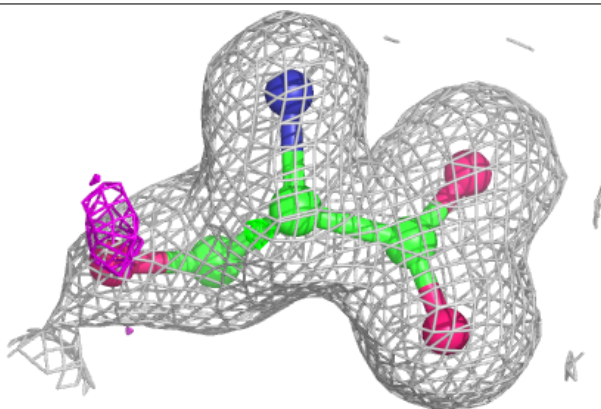
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.

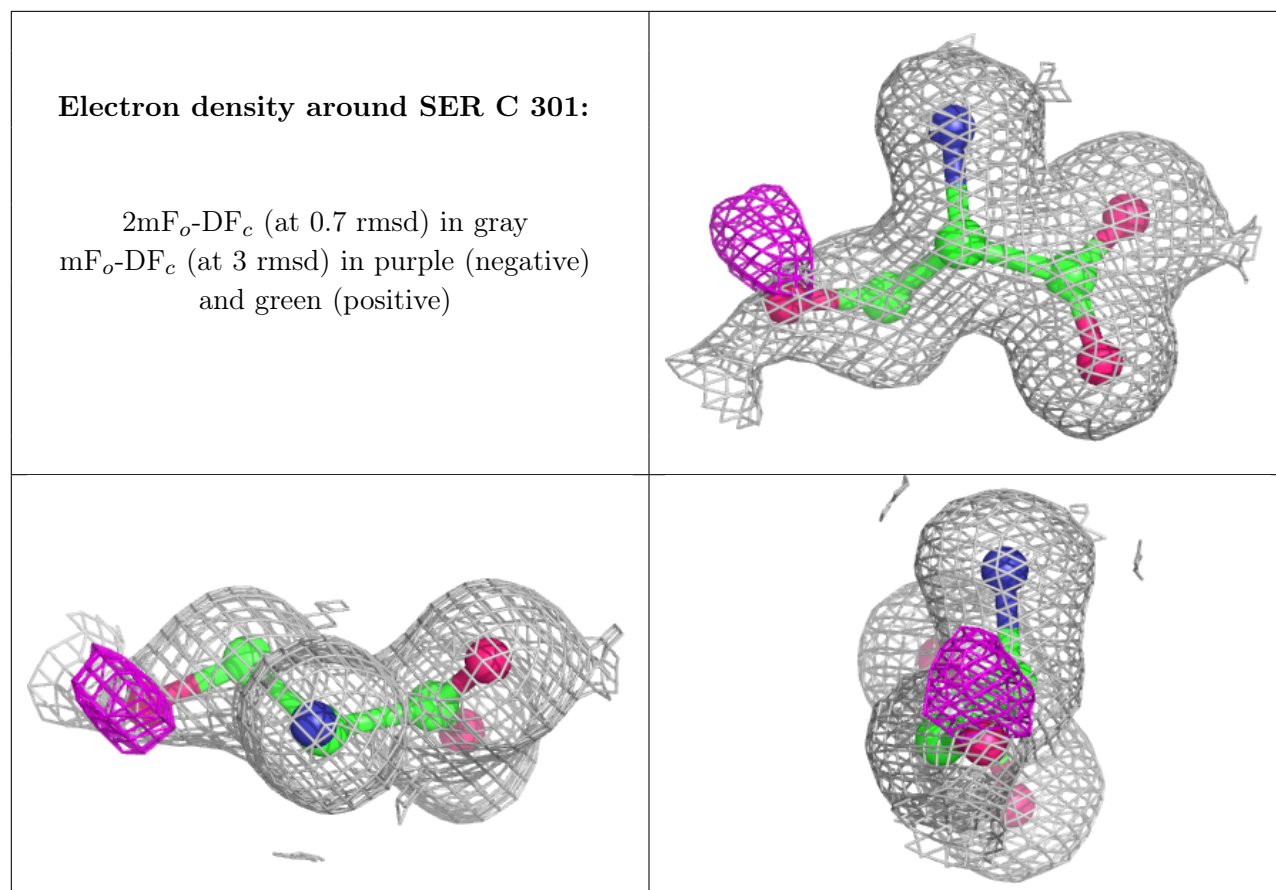
**Electron density around SER B 301:**

$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)

**Electron density around SER A 301:**

$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)





## 6.5 Other polymers [i](#)

There are no such residues in this entry.