



Full wwPDB X-ray Structure Validation Report ⓘ

Sep 23, 2023 – 09:27 PM EDT

PDB ID : 5TIN
Title : Crystal Structure of Human Glycine Receptor alpha-3 Mutant N38Q Bound to AM-3607
Authors : Shaffer, P.L.; Huang, X.; Chen, H.
Deposited on : 2016-10-03
Resolution : 2.61 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

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

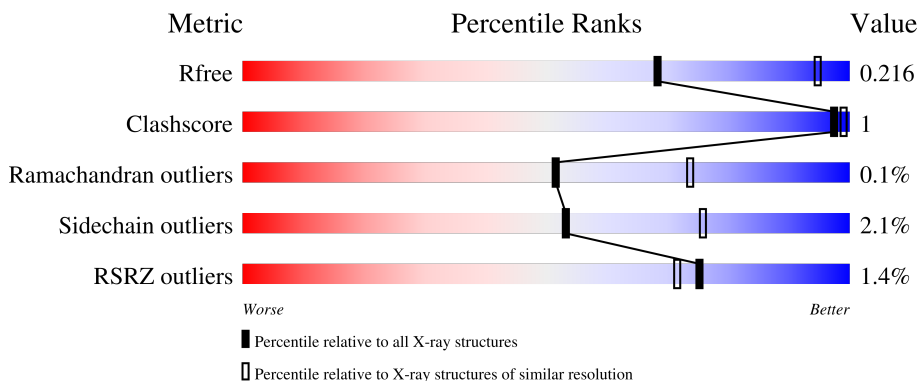
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.61 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	3797 (2.64-2.60)
Clashscore	141614	4168 (2.64-2.60)
Ramachandran outliers	138981	4093 (2.64-2.60)
Sidechain outliers	138945	4093 (2.64-2.60)
RSRZ outliers	127900	3731 (2.64-2.60)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	362	89% 7%
1	B	362	91% 5%
1	C	362	89% 7%
1	D	362	90% 5% 5%
1	E	362	90% 7%

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
3	GLY	C	402	-	X	-	-
5	CL	E	403	-	-	-	X

2 Entry composition [i](#)

There are 6 unique types of molecules in this entry. The entry contains 14133 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 Glycine receptor subunit alpha-3.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	338	2701	1762	434	485	20	0	0	0
1	B	343	2726	1778	436	492	20	0	0	0
1	C	338	2699	1761	431	487	20	0	0	0
1	D	343	2737	1784	440	493	20	0	0	0
1	E	338	2699	1761	431	487	20	0	0	0

There are 60 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	38	GLN	ASN	engineered mutation	UNP O75311
A	310	ALA	-	linker	UNP O75311
A	311	GLY	-	linker	UNP O75311
A	312	THR	-	linker	UNP O75311
A	355	TRP	-	expression tag	UNP O75311
A	356	SER	-	expression tag	UNP O75311
A	357	HIS	-	expression tag	UNP O75311
A	358	PRO	-	expression tag	UNP O75311
A	359	GLN	-	expression tag	UNP O75311
A	360	PHE	-	expression tag	UNP O75311
A	361	GLU	-	expression tag	UNP O75311
A	362	LYS	-	expression tag	UNP O75311
B	38	GLN	ASN	engineered mutation	UNP O75311
B	310	ALA	-	linker	UNP O75311
B	311	GLY	-	linker	UNP O75311
B	312	THR	-	linker	UNP O75311
B	355	TRP	-	expression tag	UNP O75311
B	356	SER	-	expression tag	UNP O75311
B	357	HIS	-	expression tag	UNP O75311

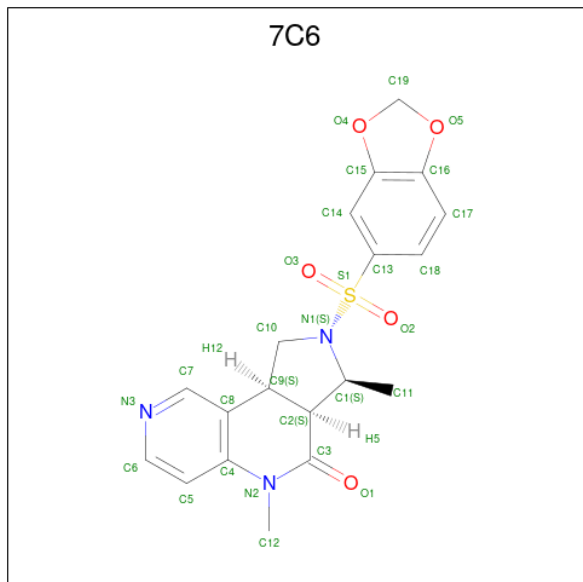
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Chain	Residue	Modelled	Actual	Comment	Reference
B	358	PRO	-	expression tag	UNP O75311
B	359	GLN	-	expression tag	UNP O75311
B	360	PHE	-	expression tag	UNP O75311
B	361	GLU	-	expression tag	UNP O75311
B	362	LYS	-	expression tag	UNP O75311
C	38	GLN	ASN	engineered mutation	UNP O75311
C	310	ALA	-	linker	UNP O75311
C	311	GLY	-	linker	UNP O75311
C	312	THR	-	linker	UNP O75311
C	355	TRP	-	expression tag	UNP O75311
C	356	SER	-	expression tag	UNP O75311
C	357	HIS	-	expression tag	UNP O75311
C	358	PRO	-	expression tag	UNP O75311
C	359	GLN	-	expression tag	UNP O75311
C	360	PHE	-	expression tag	UNP O75311
C	361	GLU	-	expression tag	UNP O75311
C	362	LYS	-	expression tag	UNP O75311
D	38	GLN	ASN	engineered mutation	UNP O75311
D	310	ALA	-	linker	UNP O75311
D	311	GLY	-	linker	UNP O75311
D	312	THR	-	linker	UNP O75311
D	355	TRP	-	expression tag	UNP O75311
D	356	SER	-	expression tag	UNP O75311
D	357	HIS	-	expression tag	UNP O75311
D	358	PRO	-	expression tag	UNP O75311
D	359	GLN	-	expression tag	UNP O75311
D	360	PHE	-	expression tag	UNP O75311
D	361	GLU	-	expression tag	UNP O75311
D	362	LYS	-	expression tag	UNP O75311
E	38	GLN	ASN	engineered mutation	UNP O75311
E	310	ALA	-	linker	UNP O75311
E	311	GLY	-	linker	UNP O75311
E	312	THR	-	linker	UNP O75311
E	355	TRP	-	expression tag	UNP O75311
E	356	SER	-	expression tag	UNP O75311
E	357	HIS	-	expression tag	UNP O75311
E	358	PRO	-	expression tag	UNP O75311
E	359	GLN	-	expression tag	UNP O75311
E	360	PHE	-	expression tag	UNP O75311
E	361	GLU	-	expression tag	UNP O75311
E	362	LYS	-	expression tag	UNP O75311

- Molecule 2 is (3S,3aS,9bS)-2-[(2H-1,3-benzodioxol-5-yl)sulfonyl]-3,5-dimethyl-1,2,3,3a,5,

9b-hexahydro-4H-pyrrolo[3,4-c][1,6]naphthyridin-4-one (three-letter code: 7C6) (formula: $C_{19}H_{19}N_3O_5S$).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	N	O	S	0	0
			28	19	3	5	1		
2	B	1	Total	C	N	O	S	0	0
			28	19	3	5	1		
2	C	1	Total	C	N	O	S	0	0
			28	19	3	5	1		
2	D	1	Total	C	N	O	S	0	0
			28	19	3	5	1		
2	E	1	Total	C	N	O	S	0	0
			28	19	3	5	1		

- Molecule 3 is GLYCINE (three-letter code: GLY) (formula: $C_2H_5NO_2$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	1	Total	C	N	O	0	0
			5	2	1	2		
3	B	1	Total	C	N	O	0	0
			5	2	1	2		
3	C	1	Total	C	N	O	0	0
			5	2	1	2		
3	D	1	Total	C	N	O	0	0
			5	2	1	2		
3	E	1	Total	C	N	O	0	0
			5	2	1	2		

- 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		
4	B	1	Total	Zn	0	0
			1	1		
4	C	1	Total	Zn	0	0
			1	1		
4	D	1	Total	Zn	0	0
			1	1		
4	E	1	Total	Zn	0	0
			1	1		

- Molecule 5 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	E	1	Total Cl 1 1	0	0

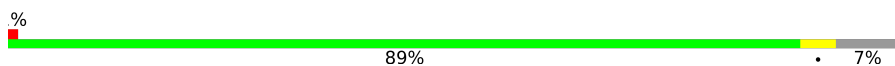
- Molecule 6 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	78	Total O 78 78	0	0
6	B	97	Total O 97 97	0	0
6	C	98	Total O 98 98	0	0
6	D	72	Total O 72 72	0	0
6	E	55	Total O 55 55	0	0

3 Residue-property plots [i](#)

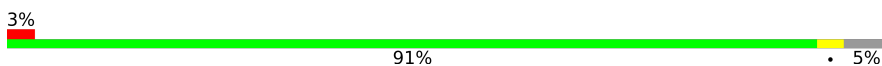
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. 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.

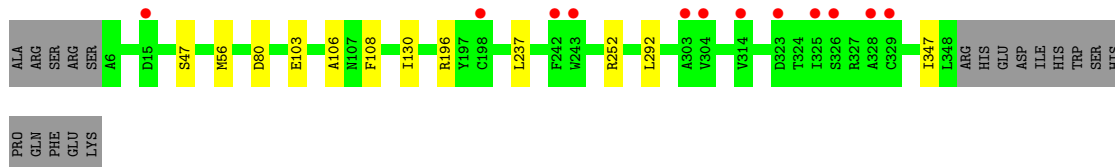
- Molecule 1: Glycine receptor subunit alpha-3

Chain A: 

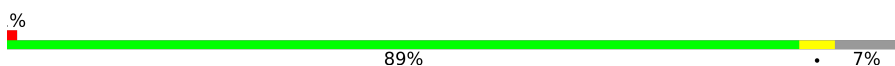


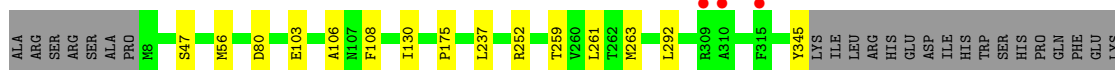
- Molecule 1: Glycine receptor subunit alpha-3

Chain B: 

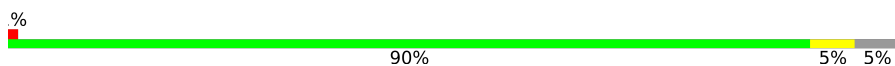


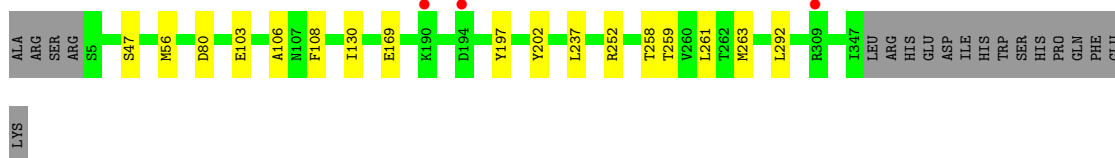
- Molecule 1: Glycine receptor subunit alpha-3

Chain C: 




- Molecule 1: Glycine receptor subunit alpha-3

Chain D: 



- Molecule 1: Glycine receptor subunit alpha-3

Chain E:  90% 7%



4 Data and refinement statistics i

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	136.30Å 136.79Å 192.50Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	50.00 – 2.61 48.28 – 2.61	Depositor EDS
% Data completeness (in resolution range)	98.4 (50.00-2.61) 98.4 (48.28-2.61)	Depositor EDS
R_{merge}	0.14	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.61 (at 2.61Å)	Xtrriage
Refinement program	REFMAC 5.8.0073	Depositor
R, R_{free}	0.204 , 0.214 0.206 , 0.216	Depositor DCC
R_{free} test set	2006 reflections (1.86%)	wwPDB-VP
Wilson B-factor (Å ²)	48.1	Xtrriage
Anisotropy	0.684	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.31 , 42.1	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	0.011 for k,h,-l	Xtrriage
F_o, F_c correlation	0.93	EDS
Total number of atoms	14133	wwPDB-VP
Average B, all atoms (Å ²)	56.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.62% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: 7C6, CL, ZN

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	0.40	0/2772	0.58	0/3774
1	B	0.40	0/2798	0.61	2/3812 (0.1%)
1	C	0.42	0/2770	0.58	0/3772
1	D	0.40	0/2809	0.57	0/3824
1	E	0.38	0/2770	0.56	0/3772
All	All	0.40	0/13919	0.58	2/18954 (0.0%)

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	196	ARG	NE-CZ-NH1	10.04	125.32	120.30
1	B	196	ARG	NE-CZ-NH2	-8.17	116.21	120.30

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	2701	0	2656	4	0
1	B	2726	0	2667	2	0
1	C	2699	0	2649	6	0
1	D	2737	0	2692	7	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	E	2699	0	2649	5	0
2	A	28	0	0	0	0
2	B	28	0	0	0	0
2	C	28	0	0	0	0
2	D	28	0	0	0	0
2	E	28	0	0	0	0
3	A	5	0	2	0	0
3	B	5	0	2	0	0
3	C	5	0	2	0	0
3	D	5	0	2	0	0
3	E	5	0	2	0	0
4	A	1	0	0	0	0
4	B	1	0	0	0	0
4	C	1	0	0	0	0
4	D	1	0	0	0	0
4	E	1	0	0	0	0
5	E	1	0	0	0	0
6	A	78	0	0	0	0
6	B	97	0	0	0	0
6	C	98	0	0	2	0
6	D	72	0	0	1	0
6	E	55	0	0	1	0
All	All	14133	0	13323	22	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 (22) 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:175:PRO:HD2	6:C:565:HOH:O	2.06	0.54
1:D:202:TYR:OH	6:D:601:HOH:O	2.19	0.50
1:D:169:GLU:OE2	1:D:197:TYR:OH	2.23	0.50
1:D:261:LEU:HD11	1:E:258:THR:HB	1.97	0.47
1:E:103:GLU:HG3	1:E:106:ALA:HB2	1.97	0.47
1:C:103:GLU:HG3	1:C:106:ALA:HB2	1.97	0.46
1:A:108:PHE:CD1	1:A:130:ILE:HD11	2.50	0.46
1:C:108:PHE:CD1	1:C:130:ILE:HD11	2.51	0.46
1:A:103:GLU:HG3	1:A:106:ALA:HB2	1.98	0.46
1:B:103:GLU:HG3	1:B:106:ALA:HB2	1.98	0.45
1:D:103:GLU:HG3	1:D:106:ALA:HB2	1.97	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:108:PHE:CD1	1:E:130:ILE:HD11	2.52	0.45
1:D:108:PHE:CD1	1:D:130:ILE:HD11	2.51	0.45
1:E:31:ASN:ND2	6:E:503:HOH:O	2.50	0.44
1:B:108:PHE:CD1	1:B:130:ILE:HD11	2.53	0.43
1:C:261:LEU:HD11	1:D:258:THR:HB	2.01	0.42
1:A:330:PHE:HB2	1:A:331:PRO:HD3	2.03	0.41
1:A:259:THR:O	1:A:263:MET:HB2	2.22	0.40
1:C:259:THR:O	1:C:263:MET:HB2	2.22	0.40
1:C:345:TYR:O	6:C:501:HOH:O	2.22	0.40
1:E:259:THR:O	1:E:263:MET:HB2	2.22	0.40
1:D:259:THR:O	1:D:263:MET:HB2	2.22	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	336/362 (93%)	331 (98%)	5 (2%)	0	100	100
1	B	341/362 (94%)	334 (98%)	6 (2%)	1 (0%)	41	62
1	C	336/362 (93%)	331 (98%)	5 (2%)	0	100	100
1	D	341/362 (94%)	336 (98%)	5 (2%)	0	100	100
1	E	336/362 (93%)	331 (98%)	5 (2%)	0	100	100
All	All	1690/1810 (93%)	1663 (98%)	26 (2%)	1 (0%)	51	74

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	347	ILE

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	295/326 (90%)	288 (98%)	7 (2%)	49 72
1	B	296/326 (91%)	290 (98%)	6 (2%)	55 77
1	C	295/326 (90%)	289 (98%)	6 (2%)	55 77
1	D	299/326 (92%)	293 (98%)	6 (2%)	55 77
1	E	295/326 (90%)	289 (98%)	6 (2%)	55 77
All	All	1480/1630 (91%)	1449 (98%)	31 (2%)	53 76

All (31) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	47	SER
1	A	56	MET
1	A	80	ASP
1	A	115	ASN
1	A	237	LEU
1	A	252	ARG
1	A	292	LEU
1	B	47	SER
1	B	56	MET
1	B	80	ASP
1	B	237	LEU
1	B	252	ARG
1	B	292	LEU
1	C	47	SER
1	C	56	MET
1	C	80	ASP
1	C	237	LEU
1	C	252	ARG
1	C	292	LEU
1	D	47	SER
1	D	56	MET
1	D	80	ASP
1	D	237	LEU

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Mol	Chain	Res	Type
1	D	252	ARG
1	D	292	LEU
1	E	47	SER
1	E	56	MET
1	E	80	ASP
1	E	237	LEU
1	E	252	ARG
1	E	292	LEU

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

Mol	Chain	Res	Type
1	B	186	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](#)

Of 16 ligands modelled in this entry, 6 are monoatomic - leaving 10 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
3	GLY	E	402	-	4,4,4	1.28	1 (25%)	3,4,4	2.54	2 (66%)
2	7C6	A	401	-	31,32,32	2.05	4 (12%)	41,50,50	1.72	8 (19%)
3	GLY	D	402	-	4,4,4	1.30	1 (25%)	3,4,4	1.94	2 (66%)
2	7C6	D	401	-	31,32,32	2.05	5 (16%)	41,50,50	1.97	9 (21%)
3	GLY	B	402	-	4,4,4	1.44	1 (25%)	3,4,4	1.95	1 (33%)
3	GLY	C	402	-	4,4,4	1.39	1 (25%)	3,4,4	1.65	1 (33%)
2	7C6	C	401	-	31,32,32	1.95	5 (16%)	41,50,50	1.86	9 (21%)
2	7C6	E	401	-	31,32,32	2.10	4 (12%)	41,50,50	1.90	7 (17%)
2	7C6	B	401	-	31,32,32	2.12	5 (16%)	41,50,50	1.93	10 (24%)
3	GLY	A	402	-	4,4,4	1.20	1 (25%)	3,4,4	1.66	1 (33%)

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	GLY	E	402	-	-	0/2/2/2	-
2	7C6	A	401	-	-	0/12/50/50	0/5/5/5
3	GLY	D	402	-	-	0/2/2/2	-
2	7C6	D	401	-	-	0/12/50/50	0/5/5/5
3	GLY	B	402	-	-	0/2/2/2	-
3	GLY	C	402	-	-	2/2/2/2	-
2	7C6	C	401	-	-	0/12/50/50	0/5/5/5
2	7C6	E	401	-	-	0/12/50/50	0/5/5/5
2	7C6	B	401	-	-	0/12/50/50	0/5/5/5
3	GLY	A	402	-	-	0/2/2/2	-

All (28) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	401	7C6	O3-S1	7.91	1.52	1.43
2	A	401	7C6	O2-S1	6.94	1.51	1.43
2	D	401	7C6	O3-S1	6.85	1.51	1.43
2	E	401	7C6	S1-N1	6.72	1.73	1.63
2	C	401	7C6	O3-S1	6.57	1.50	1.43
2	C	401	7C6	O2-S1	6.31	1.50	1.43
2	D	401	7C6	O2-S1	6.31	1.50	1.43
2	A	401	7C6	O3-S1	6.29	1.50	1.43
2	B	401	7C6	O2-S1	6.28	1.50	1.43

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	E	401	7C6	O3-S1	6.15	1.50	1.43
2	E	401	7C6	O2-S1	6.03	1.50	1.43
2	D	401	7C6	S1-N1	4.16	1.69	1.63
2	A	401	7C6	S1-N1	4.04	1.69	1.63
2	B	401	7C6	C13-S1	-2.95	1.72	1.76
3	B	402	GLY	OXT-C	-2.77	1.21	1.30
3	C	402	GLY	OXT-C	-2.68	1.21	1.30
2	D	401	7C6	C2-C3	2.62	1.54	1.51
3	E	402	GLY	OXT-C	-2.50	1.22	1.30
3	D	402	GLY	OXT-C	-2.50	1.22	1.30
2	C	401	7C6	S1-N1	2.48	1.67	1.63
3	A	402	GLY	OXT-C	-2.36	1.22	1.30
2	A	401	7C6	C3-N2	2.35	1.41	1.36
2	C	401	7C6	C13-S1	-2.23	1.73	1.76
2	E	401	7C6	C2-C3	2.22	1.54	1.51
2	D	401	7C6	C3-N2	2.20	1.40	1.36
2	C	401	7C6	C1-N1	-2.11	1.48	1.50
2	B	401	7C6	C4-N2	-2.02	1.36	1.40
2	B	401	7C6	S1-N1	2.00	1.66	1.63

All (50) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	E	401	7C6	O3-S1-O2	-5.69	110.31	119.52
2	D	401	7C6	O3-S1-O2	-5.19	111.11	119.52
2	B	401	7C6	O1-C3-N2	-5.05	117.35	122.44
2	D	401	7C6	C7-C8-C9	-4.90	120.00	125.03
2	A	401	7C6	O3-S1-O2	-4.75	111.83	119.52
2	B	401	7C6	C7-C8-C9	-4.49	120.42	125.03
2	E	401	7C6	C7-C8-C9	-4.42	120.49	125.03
2	C	401	7C6	C1-N1-S1	-4.31	112.55	120.06
2	C	401	7C6	O3-S1-O2	-4.29	112.57	119.52
2	D	401	7C6	O1-C3-N2	-4.20	118.20	122.44
2	E	401	7C6	O1-C3-N2	-4.08	118.32	122.44
2	B	401	7C6	C10-N1-S1	-4.02	110.98	118.80
2	C	401	7C6	O1-C3-N2	-3.94	118.47	122.44
2	D	401	7C6	C10-N1-S1	-3.91	111.19	118.80
2	A	401	7C6	C10-N1-S1	-3.76	111.48	118.80
2	B	401	7C6	C1-N1-S1	-3.71	113.59	120.06
2	C	401	7C6	C7-C8-C9	-3.53	121.41	125.03
2	C	401	7C6	C6-N3-C7	3.35	122.64	116.85
2	A	401	7C6	C1-N1-S1	-3.31	114.29	120.06

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	E	401	7C6	C6-N3-C7	3.19	122.36	116.85
2	A	401	7C6	C7-C8-C9	-3.19	121.76	125.03
2	B	401	7C6	O3-S1-O2	-3.15	114.41	119.52
2	E	401	7C6	C10-N1-S1	-3.15	112.67	118.80
3	E	402	GLY	OXT-C-O	-3.13	115.51	123.30
2	B	401	7C6	C6-N3-C7	3.11	122.23	116.85
2	D	401	7C6	O4-C15-C14	3.01	131.88	127.85
3	E	402	GLY	OXT-C-CA	3.00	125.37	113.45
2	B	401	7C6	O3-S1-C13	-2.93	104.33	108.05
2	D	401	7C6	C6-N3-C7	2.92	121.90	116.85
3	B	402	GLY	OXT-C-O	-2.91	116.05	123.30
2	B	401	7C6	O3-S1-N1	2.85	112.16	106.97
2	A	401	7C6	C6-N3-C7	2.77	121.64	116.85
2	C	401	7C6	O4-C15-C14	2.67	131.43	127.85
2	B	401	7C6	C8-C7-N3	-2.65	119.28	124.14
2	E	401	7C6	O4-C15-C14	2.63	131.37	127.85
2	D	401	7C6	C1-N1-S1	-2.48	115.74	120.06
3	A	402	GLY	OXT-C-O	-2.48	117.12	123.30
3	C	402	GLY	OXT-C-O	-2.42	117.26	123.30
3	D	402	GLY	OXT-C-O	-2.41	117.29	123.30
2	D	401	7C6	C12-N2-C3	2.35	120.40	117.89
2	C	401	7C6	C10-N1-S1	-2.32	114.28	118.80
2	A	401	7C6	O4-C15-C14	2.31	130.95	127.85
3	D	402	GLY	OXT-C-CA	2.29	122.56	113.45
2	E	401	7C6	O5-C19-O4	-2.27	104.45	108.08
2	D	401	7C6	O5-C19-O4	-2.27	104.45	108.08
2	C	401	7C6	C12-N2-C3	2.26	120.30	117.89
2	A	401	7C6	C13-S1-N1	2.20	111.28	107.36
2	B	401	7C6	C13-S1-N1	2.12	111.13	107.36
2	C	401	7C6	O5-C19-O4	-2.09	104.75	108.08
2	A	401	7C6	O1-C3-N2	-2.07	120.36	122.44

There are no chirality outliers.

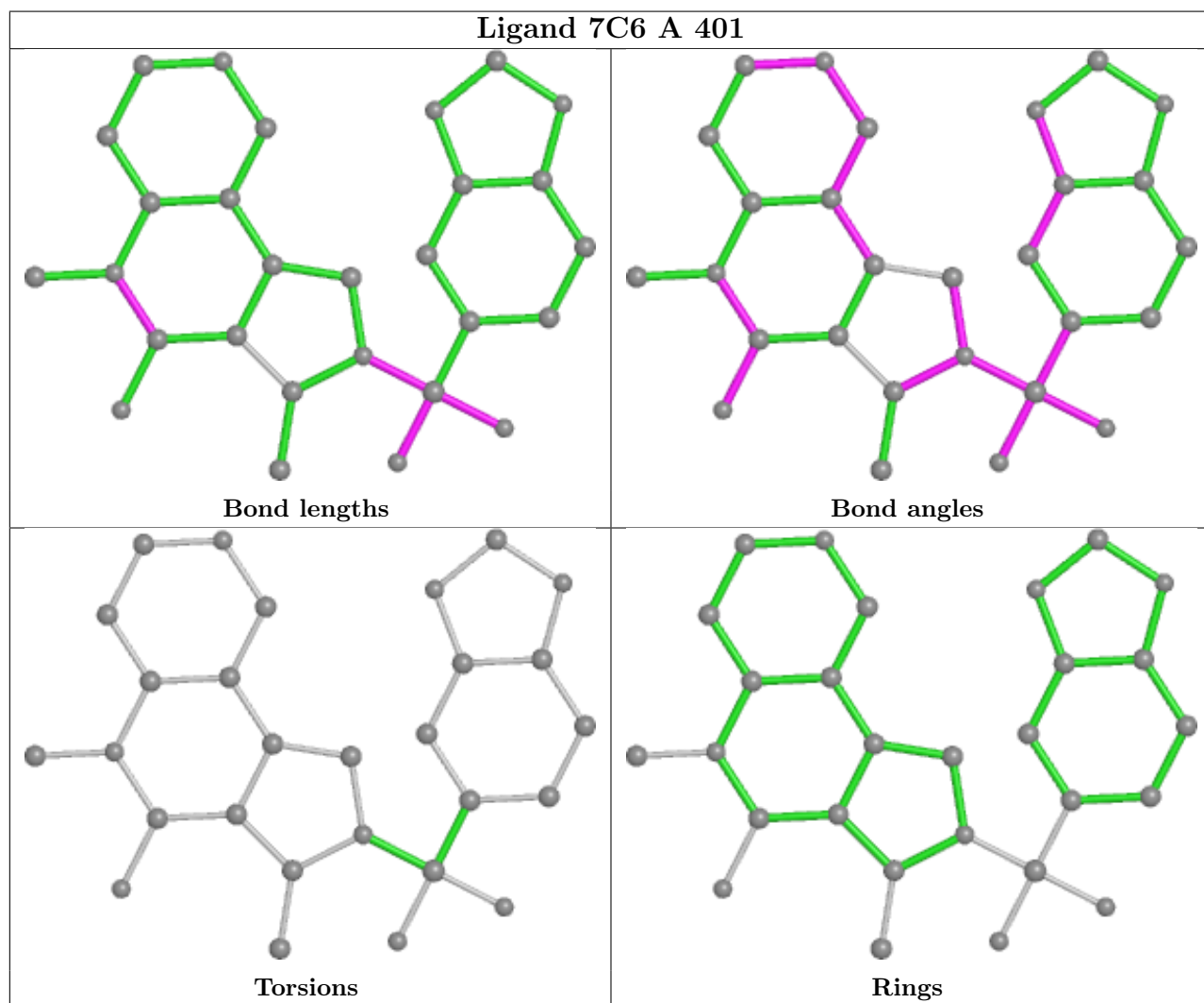
All (2) torsion outliers are listed below:

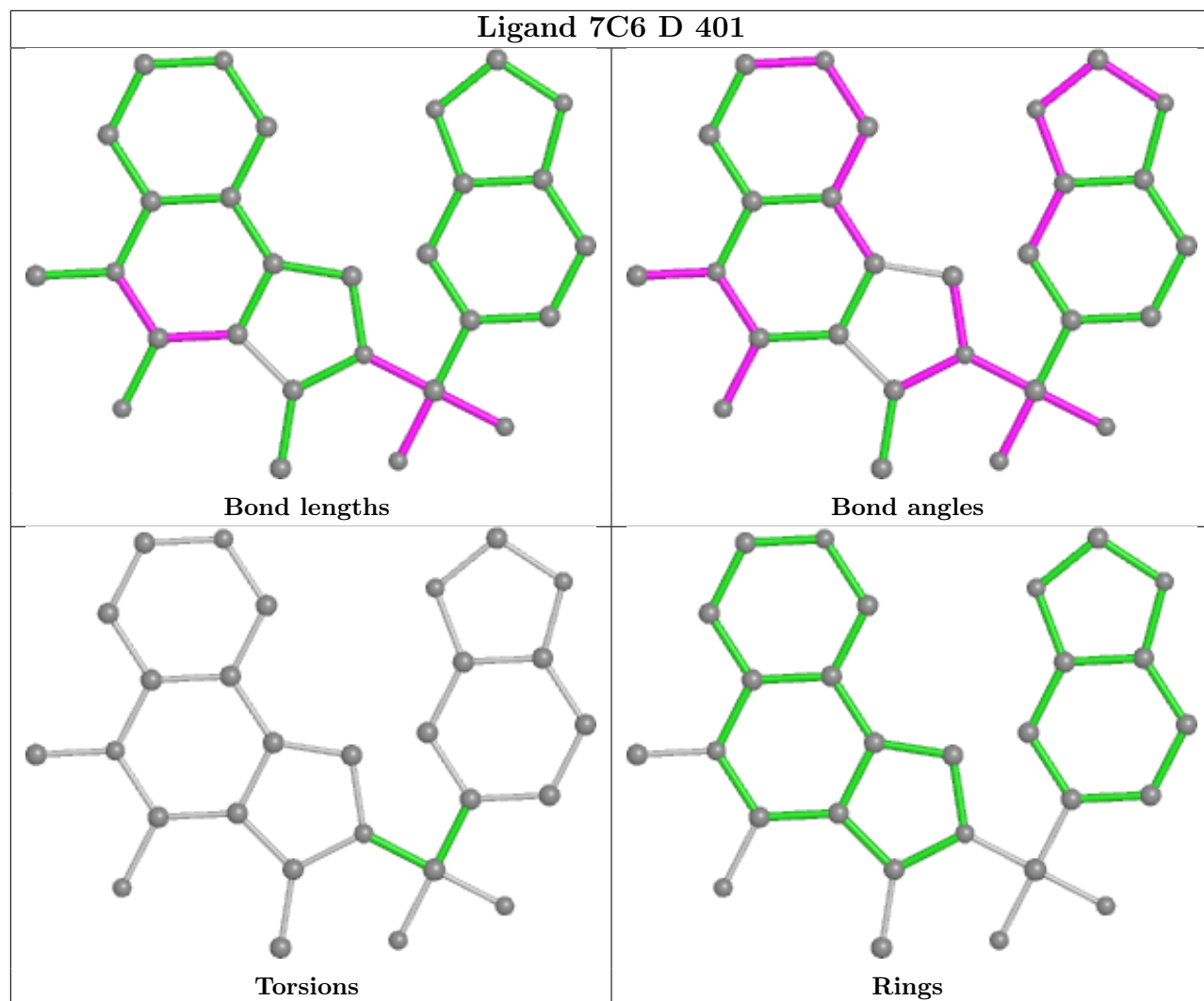
Mol	Chain	Res	Type	Atoms
3	C	402	GLY	O-C-CA-N
3	C	402	GLY	OXT-C-CA-N

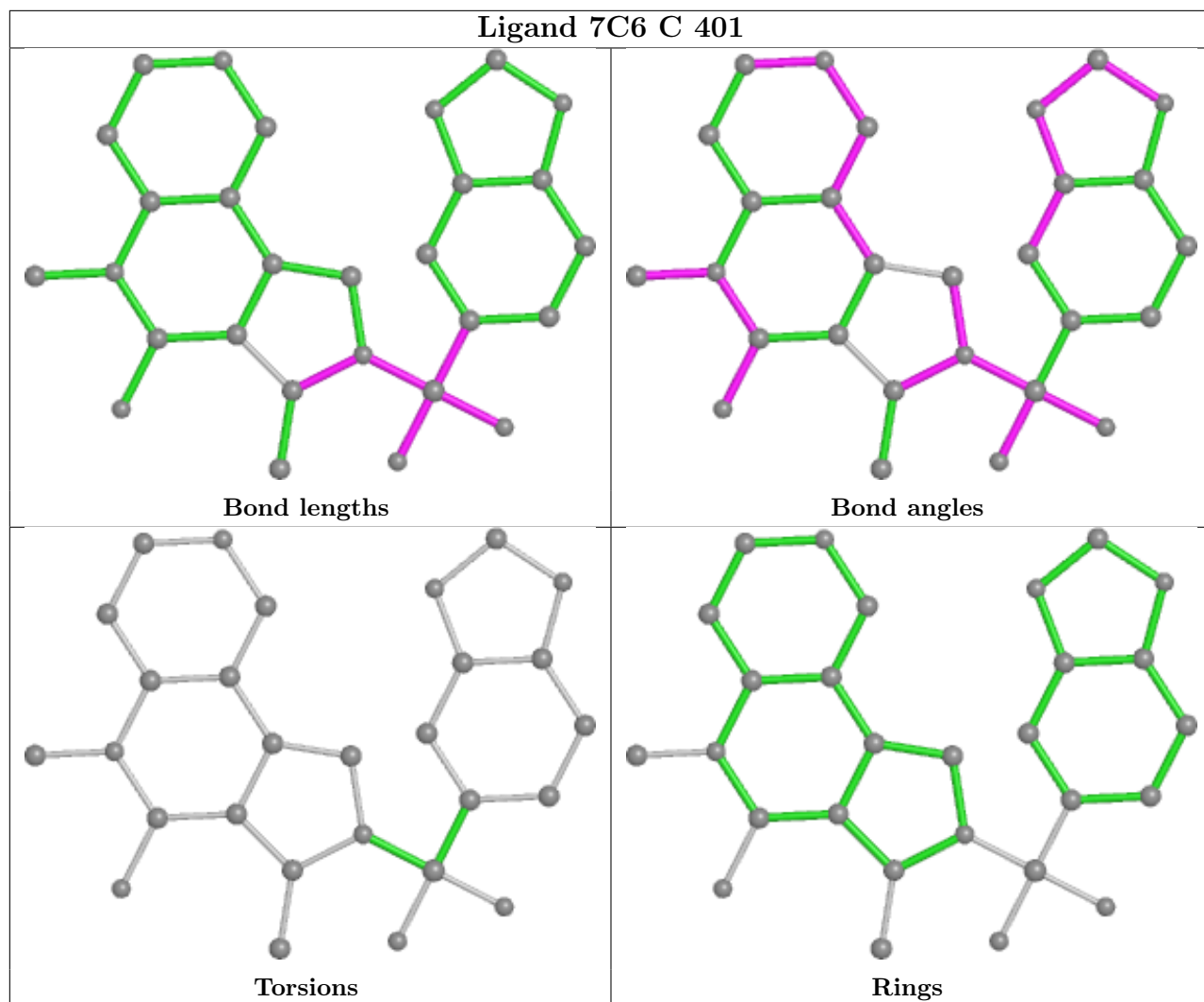
There are no ring outliers.

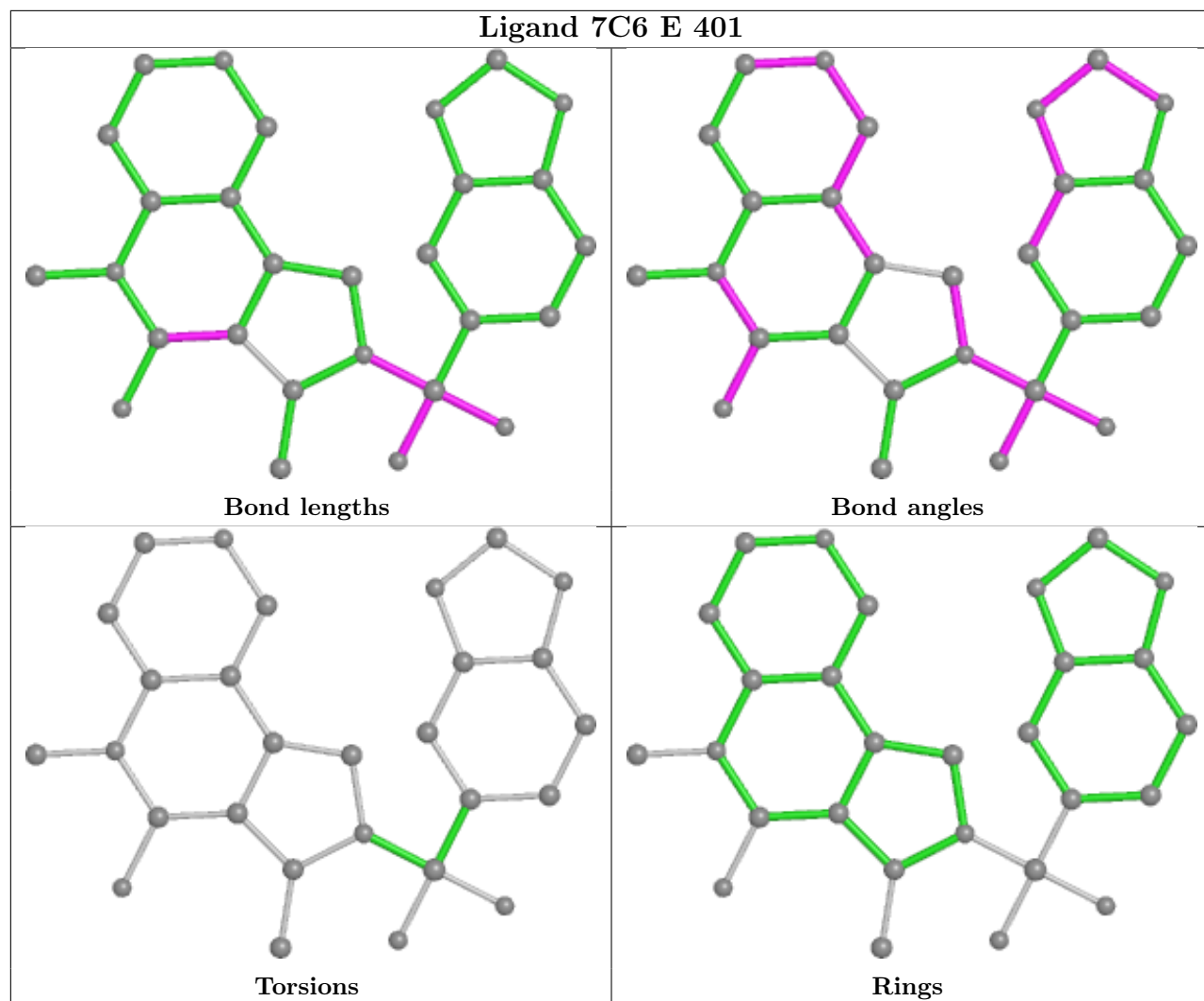
No monomer is involved in short contacts.

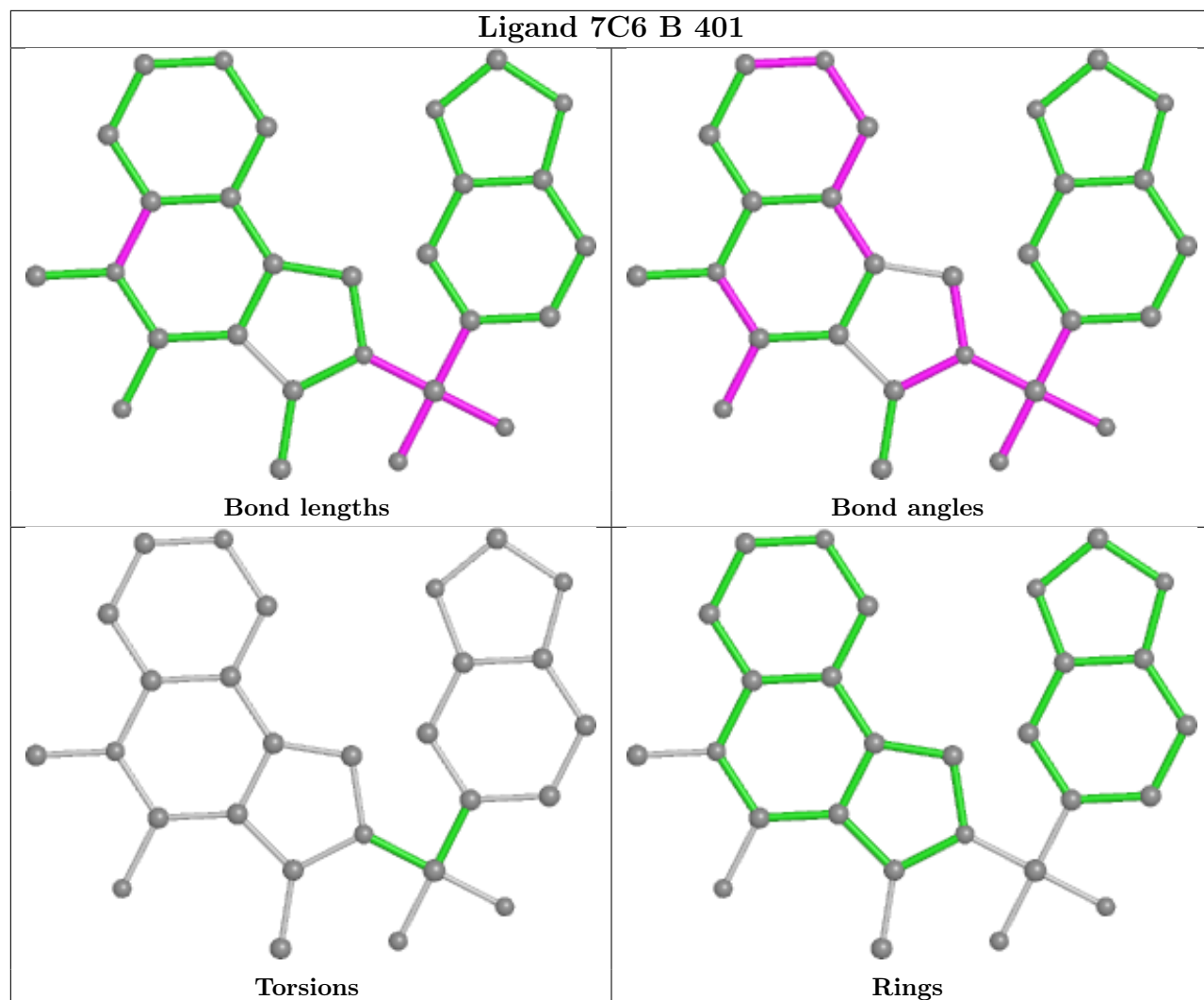
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. 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, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q < 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	338/362 (93%)	-0.24	5 (1%) 73 70	30, 56, 81, 109	0
1	B	343/362 (94%)	-0.12	12 (3%) 44 37	32, 56, 88, 112	0
1	C	338/362 (93%)	-0.27	3 (0%) 84 82	29, 52, 81, 112	0
1	D	343/362 (94%)	-0.28	3 (0%) 84 82	33, 55, 71, 104	0
1	E	338/362 (93%)	-0.23	1 (0%) 94 93	37, 61, 82, 106	0
All	All	1700/1810 (93%)	-0.23	24 (1%) 75 71	29, 56, 82, 112	0

All (24) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	328	ALA	3.9
1	B	325	ILE	3.4
1	B	329	CYS	3.1
1	B	242	PHE	2.9
1	A	81	ASP	2.9
1	A	79	PRO	2.6
1	E	33	LYS	2.6
1	B	198	CYS	2.6
1	A	310	ALA	2.5
1	B	314	VAL	2.5
1	C	310	ALA	2.4
1	C	309	ARG	2.3
1	B	243	TRP	2.3
1	A	181	GLY	2.3
1	D	194	ASP	2.3
1	A	311	GLY	2.2
1	B	15	ASP	2.2
1	B	303	ALA	2.2
1	B	323	ASP	2.2
1	D	309	ARG	2.1

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Mol	Chain	Res	Type	RSRZ
1	C	315	PHE	2.1
1	B	326	SER	2.1
1	D	190	LYS	2.0
1	B	304	VAL	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.

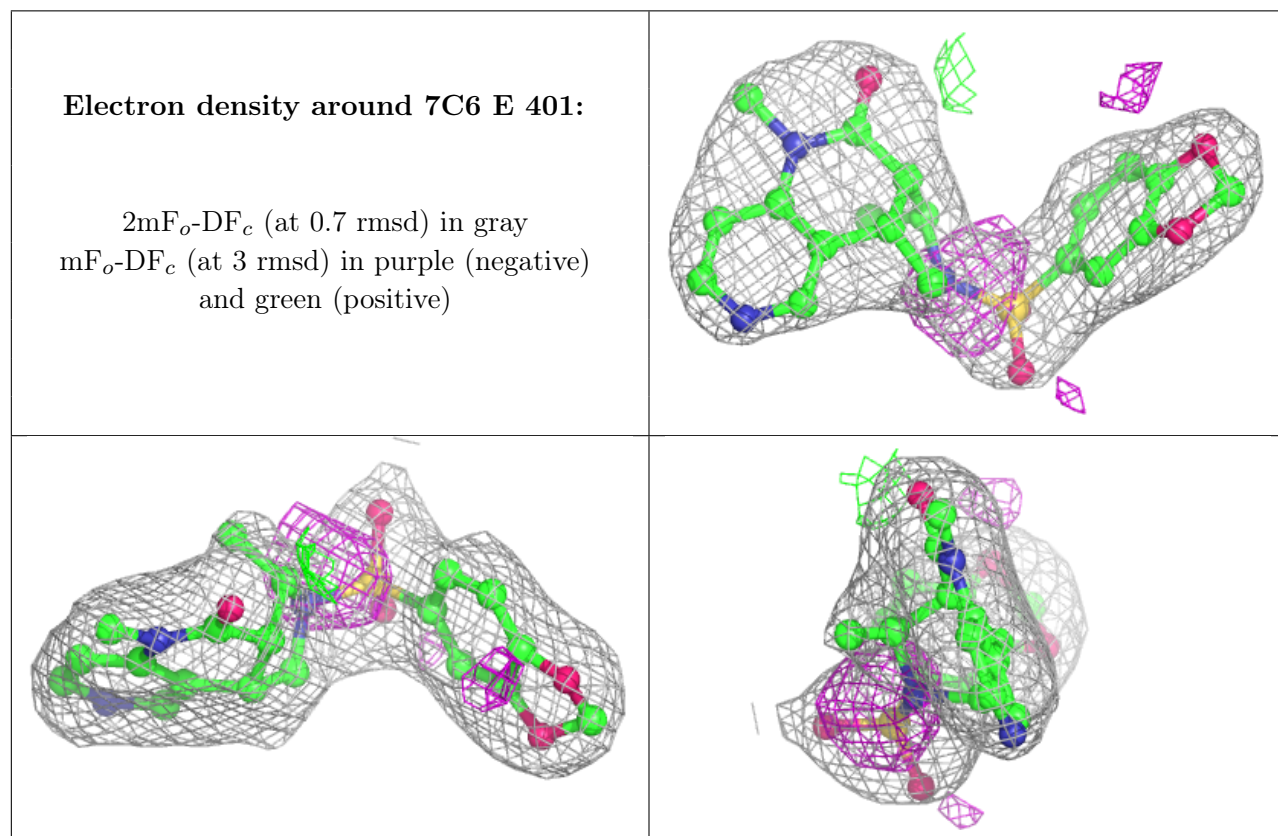
6.4 Ligands [i](#)

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, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
5	CL	E	403	1/1	0.72	0.64	90,90,90,90	0
4	ZN	A	403	1/1	0.86	0.11	71,71,71,71	1
4	ZN	C	403	1/1	0.91	0.06	76,76,76,76	1
4	ZN	D	403	1/1	0.93	0.20	73,73,73,73	1
4	ZN	B	403	1/1	0.94	0.12	72,72,72,72	1
4	ZN	E	404	1/1	0.94	0.12	89,89,89,89	1
2	7C6	E	401	28/28	0.94	0.21	53,61,66,69	0
2	7C6	D	401	28/28	0.95	0.21	57,65,72,77	0
3	GLY	C	402	5/5	0.96	0.21	44,45,46,46	0
3	GLY	E	402	5/5	0.96	0.28	50,53,55,57	0
3	GLY	D	402	5/5	0.97	0.20	54,57,60,60	0
2	7C6	B	401	28/28	0.97	0.12	42,44,48,49	0
3	GLY	B	402	5/5	0.97	0.16	47,47,49,51	0
2	7C6	A	401	28/28	0.97	0.15	41,47,49,49	0
2	7C6	C	401	28/28	0.98	0.12	43,48,51,52	0
3	GLY	A	402	5/5	0.98	0.18	38,40,41,42	0

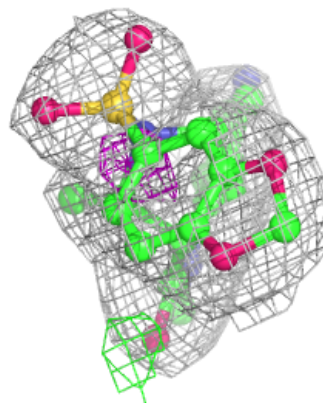
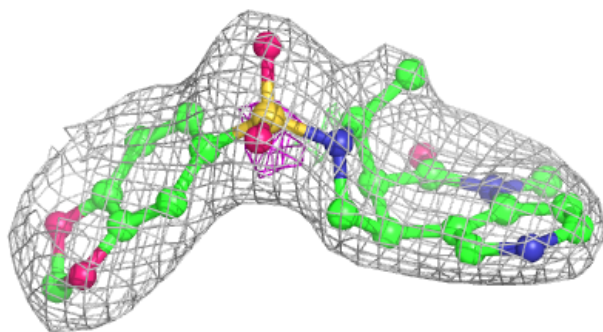
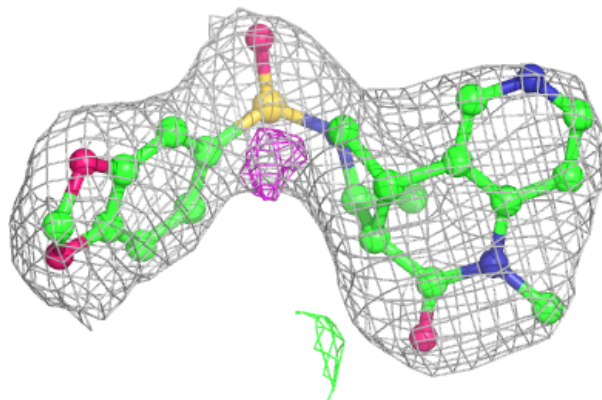
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers

as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.



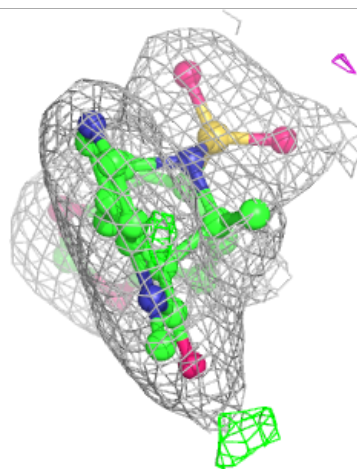
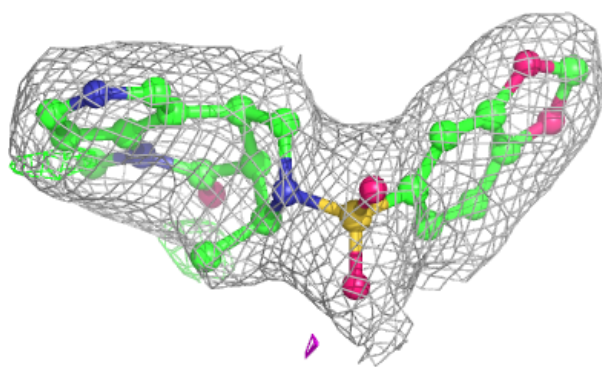
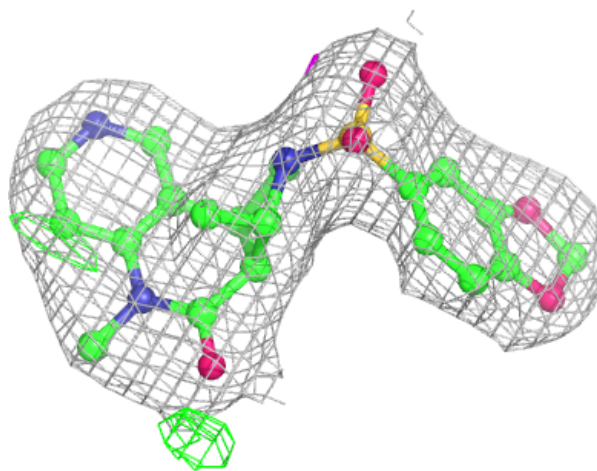
Electron density around 7C6 D 401:

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



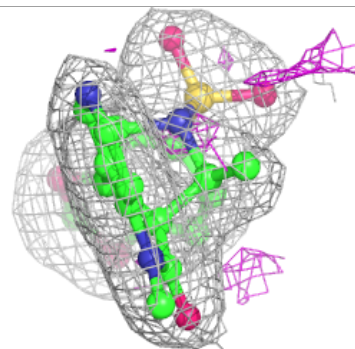
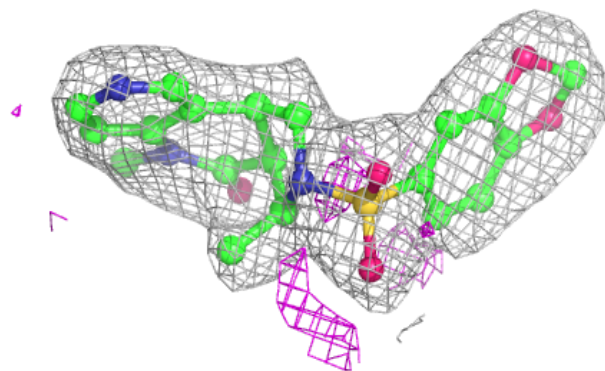
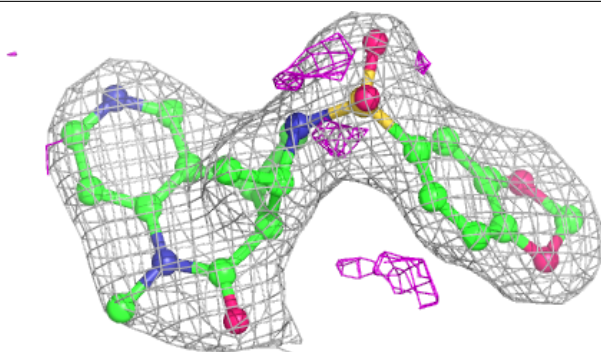
Electron density around 7C6 B 401:

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

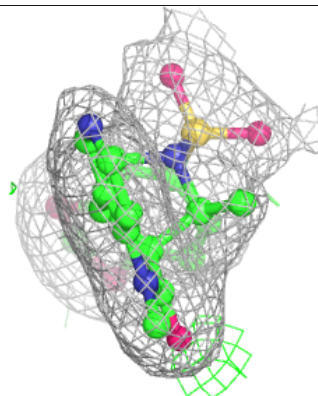
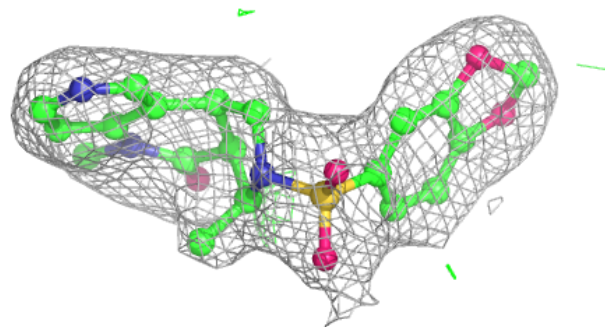
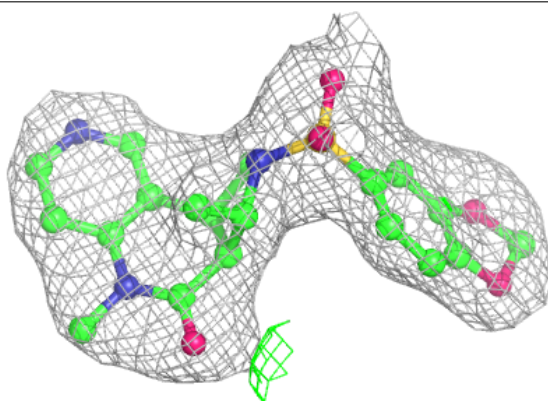


Electron density around 7C6 A 401:

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

**Electron density around 7C6 C 401:**

$2mF_o-DF_c$ (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.