



# Full wwPDB X-ray Structure Validation Report ⓘ

Oct 19, 2022 – 01:23 pm BST

PDB ID : 7NFB  
Title : ER-PRS\*(+) (Y537S) in complex with genistein and SRC-2 coactivator peptide  
Authors : Kriegel, M.; Muller, Y.A.  
Deposited on : 2021-02-05  
Resolution : 1.33 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 : 1.8.4, CSD as541be (2020)  
Xtriage (Phenix) : 1.13  
EDS : 2.31.2  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Refmac : 5.8.0267  
CCP4 : 7.1.010 (Gargrove)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.31.2

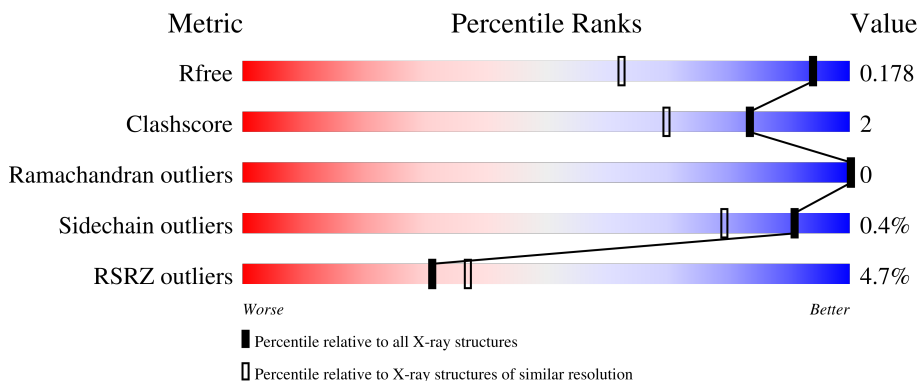
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 1.33 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	1385 (1.36-1.32)
Clashscore	141614	1417 (1.36-1.32)
Ramachandran outliers	138981	1397 (1.36-1.32)
Sidechain outliers	138945	1397 (1.36-1.32)
RSRZ outliers	127900	1369 (1.36-1.32)

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	247	 6% 91% 6%
1	B	247	 3% 95%
2	C	15	 13% 67% 33%
2	D	15	 80% 20%

## 2 Entry composition [i](#)

There are 8 unique types of molecules in this entry. The entry contains 9328 atoms, of which 4519 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 Estrogen receptor.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
			Total	C	H	N	O	S			
1	A	241	4077	1302	2062	329	367	17	0	13	0
1	B	244	4163	1323	2118	336	366	20	0	15	0

There are 60 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	302	SER	-	expression tag	UNP P03372
A	303	MET	-	expression tag	UNP P03372
A	315	ILE	MET	engineered mutation	UNP P03372
A	316	ILE	VAL	engineered mutation	UNP P03372
A	321	GLU	ASP	engineered mutation	UNP P03372
A	334	SER	THR	engineered mutation	UNP P03372
A	341	TYR	SER	engineered mutation	UNP P03372
A	363	LYS	ARG	engineered mutation	UNP P03372
A	371	SER	THR	engineered mutation	UNP P03372
A	381	SER	CYS	engineered mutation	UNP P03372
A	397	ASP	GLU	engineered mutation	UNP P03372
A	407	ASP	ASN	engineered mutation	UNP P03372
A	413	GLU	ASN	engineered mutation	UNP P03372
A	417	SER	CYS	engineered mutation	UNP P03372
A	433	GLU	SER	engineered mutation	UNP P03372
A	437	GLU	MET	engineered mutation	UNP P03372
A	439	LYS	ASN	engineered mutation	UNP P03372
A	442	ARG	GLY	engineered mutation	UNP P03372
A	450	ALA	SER	engineered mutation	UNP P03372
A	471	ASN	GLU	engineered mutation	UNP P03372
A	473	GLU	ASP	engineered mutation	UNP P03372
A	474	LYS	HIS	engineered mutation	UNP P03372
A	478	MET	VAL	engineered mutation	UNP P03372
A	485	ALA	THR	engineered mutation	UNP P03372
A	488	TRP	HIS	engineered mutation	UNP P03372

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Chain	Residue	Modelled	Actual	Comment	Reference
A	489	TYR	LEU	engineered mutation	UNP P03372
A	493	SER	ALA	engineered mutation	UNP P03372
A	496	SER	THR	engineered mutation	UNP P03372
A	530	SER	CYS	engineered mutation	UNP P03372
A	537	SER	TYR	engineered mutation	UNP P03372
B	302	SER	-	expression tag	UNP P03372
B	303	MET	-	expression tag	UNP P03372
B	315	ILE	MET	engineered mutation	UNP P03372
B	316	ILE	VAL	engineered mutation	UNP P03372
B	321	GLU	ASP	engineered mutation	UNP P03372
B	334	SER	THR	engineered mutation	UNP P03372
B	341	TYR	SER	engineered mutation	UNP P03372
B	363	LYS	ARG	engineered mutation	UNP P03372
B	371	SER	THR	engineered mutation	UNP P03372
B	381	SER	CYS	engineered mutation	UNP P03372
B	397	ASP	GLU	engineered mutation	UNP P03372
B	407	ASP	ASN	engineered mutation	UNP P03372
B	413	GLU	ASN	engineered mutation	UNP P03372
B	417	SER	CYS	engineered mutation	UNP P03372
B	433	GLU	SER	engineered mutation	UNP P03372
B	437	GLU	MET	engineered mutation	UNP P03372
B	439	LYS	ASN	engineered mutation	UNP P03372
B	442	ARG	GLY	engineered mutation	UNP P03372
B	450	ALA	SER	engineered mutation	UNP P03372
B	471	ASN	GLU	engineered mutation	UNP P03372
B	473	GLU	ASP	engineered mutation	UNP P03372
B	474	LYS	HIS	engineered mutation	UNP P03372
B	478	MET	VAL	engineered mutation	UNP P03372
B	485	ALA	THR	engineered mutation	UNP P03372
B	488	TRP	HIS	engineered mutation	UNP P03372
B	489	TYR	LEU	engineered mutation	UNP P03372
B	493	SER	ALA	engineered mutation	UNP P03372
B	496	SER	THR	engineered mutation	UNP P03372
B	530	SER	CYS	engineered mutation	UNP P03372
B	537	SER	TYR	engineered mutation	UNP P03372

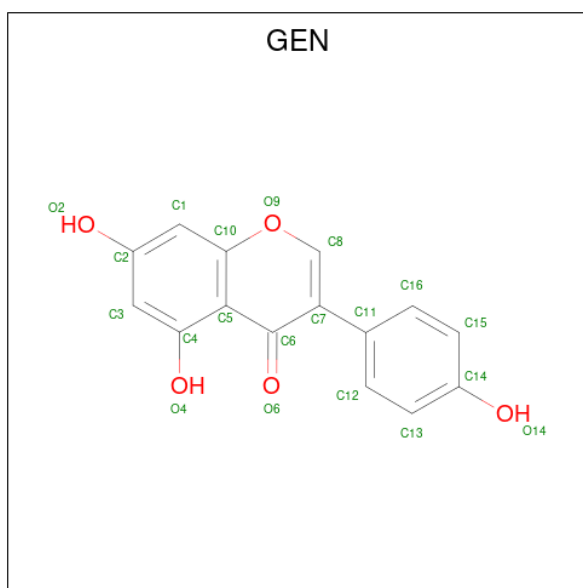
- Molecule 2 is a protein called Nuclear receptor coactivator 2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	C	10	Total	C	H	N	O	0	1	0
			203	62	106	22	13			
2	D	12	Total	C	H	N	O	0	0	0
			210	65	109	21	15			

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	685	ACE	-	acetylation	UNP Q15596
D	685	ACE	-	acetylation	UNP Q15596

- Molecule 3 is GENISTEIN (three-letter code: GEN) (formula: C<sub>15</sub>H<sub>10</sub>O<sub>5</sub>) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf	
			Total	C	H			O
3	A	1	Total	C	H	O	0	0
			30	15	10	5		
3	B	1	Total	C	H	O	0	0
			30	15	10	5		

- Molecule 4 is SODIUM ION (three-letter code: NA) (formula: Na).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	Na		
4	A	2	Total	Na	0	0
			2	2		
4	B	1	Total	Na	0	0
			1	1		

- Molecule 5 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: C<sub>2</sub>H<sub>6</sub>O<sub>2</sub>).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	H	O		
5	A	1	10	2	6	2	0	0
5	A	1	10	2	6	2	0	0
5	A	1	10	2	6	2	0	0
5	A	1	10	2	6	2	0	0
5	A	1	10	2	6	2	0	0
5	A	1	10	2	6	2	0	0
5	A	1	10	2	6	2	0	0
5	A	1	10	2	6	2	0	0
5	B	1	10	2	6	2	0	0
5	B	1	10	2	6	2	0	0
5	B	1	10	2	6	2	0	0
5	B	1	10	2	6	2	0	0
5	B	1	10	2	6	2	0	0
5	B	1	10	2	6	2	0	0
5	B	1	10	2	6	2	0	0

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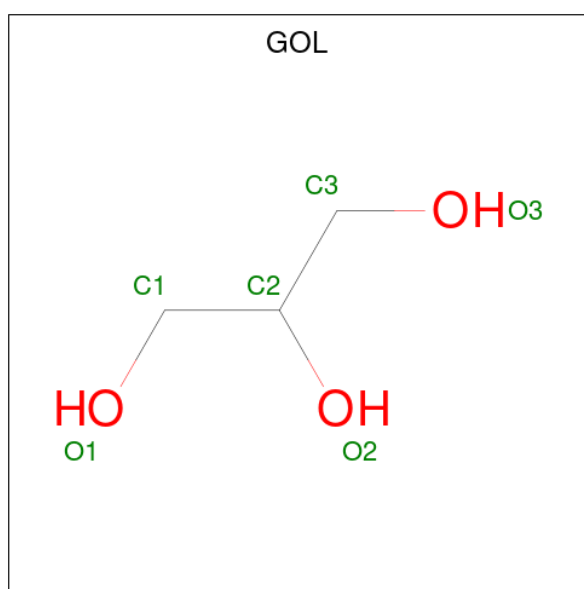
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Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
5	B	1	Total	C	H	O	0	0
			10	2	6	2		
5	B	1	Total	C	H	O	0	0
			10	2	6	2		

- Molecule 6 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	1	Total	Cl	0	0
			1	1		
6	B	2	Total	Cl	0	0
			2	2		

- Molecule 7 is GLYCEROL (three-letter code: GOL) (formula: C<sub>3</sub>H<sub>8</sub>O<sub>3</sub>).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
7	C	1	Total	C	H	O	0	0
			14	3	8	3		

- Molecule 8 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
8	A	218	Total	O	0	0
			218	218		
8	B	209	Total	O	0	0
			209	209		

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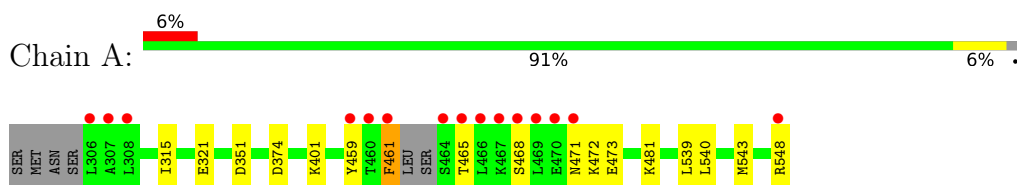
<b>Mol</b>	<b>Chain</b>	<b>Residues</b>	<b>Atoms</b>	<b>ZeroOcc</b>	<b>AltConf</b>
8	C	3	Total O 3 3	0	0
8	D	5	Total O 5 5	0	0



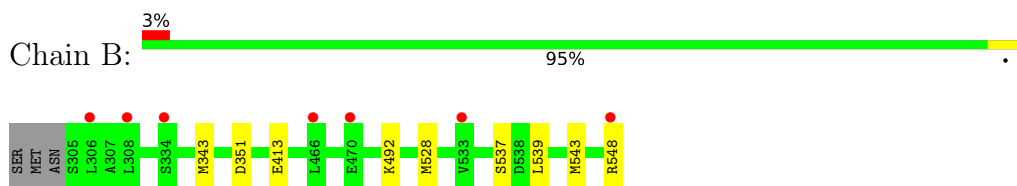
### 3 Residue-property plots [i](#)

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.

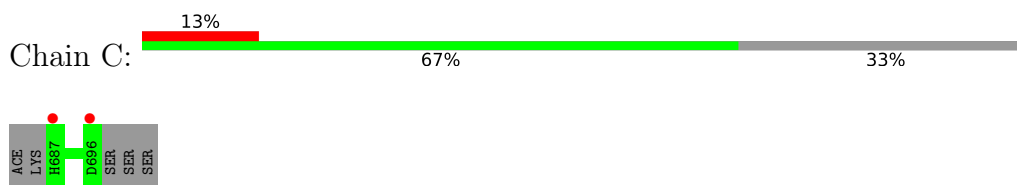
- Molecule 1: Estrogen receptor



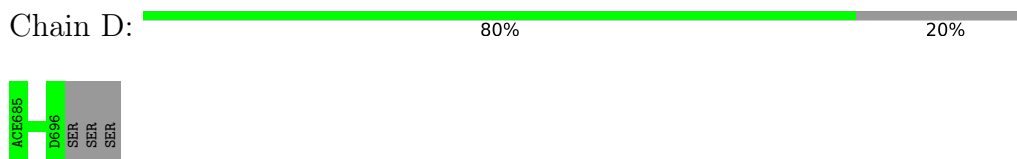
- Molecule 1: Estrogen receptor



- Molecule 2: Nuclear receptor coactivator 2



- Molecule 2: Nuclear receptor coactivator 2



## 4 Data and refinement statistics i

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	55.85Å 81.53Å 58.46Å 90.00° 108.46° 90.00°	Depositor
Resolution (Å)	27.73 – 1.33 46.33 – 1.33	Depositor EDS
% Data completeness (in resolution range)	98.9 (27.73-1.33) 98.9 (46.33-1.33)	Depositor EDS
$R_{merge}$	0.06	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.49 (at 1.33Å)	Xtrriage
Refinement program	PHENIX 1.17.1_3660	Depositor
R, $R_{free}$	0.142 , 0.178 0.144 , 0.178	Depositor DCC
$R_{free}$ test set	1472 reflections (1.31%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	18.6	Xtrriage
Anisotropy	0.251	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	(Not available) , (Not available)	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	0.020 for l,-k,h	Xtrriage
$F_o, F_c$ correlation	0.98	EDS
Total number of atoms	9328	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 6.44% 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: ACE, NA, GOL, EDO, GEN, CL

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	0.30	0/2089	0.52	0/2816
1	B	0.29	0/2122	0.51	0/2859
2	C	0.23	0/101	0.46	0/133
2	D	0.23	0/100	0.35	0/132
All	All	0.29	0/4412	0.51	0/5940

There are no bond length outliers.

There are no bond angle outliers.

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	2015	2062	2082	12	0
1	B	2045	2118	2140	8	0
2	C	97	106	108	0	0
2	D	101	109	112	0	0
3	A	20	10	8	0	0
3	B	20	10	9	0	0
4	A	2	0	0	0	0
4	B	1	0	0	0	0
5	A	28	42	42	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
5	B	36	54	54	1	0
6	A	1	0	0	0	0
6	B	2	0	0	0	0
7	C	6	8	8	0	0
8	A	218	0	0	4	1
8	B	209	0	0	6	0
8	C	3	0	0	0	1
8	D	5	0	0	0	0
All	All	4809	4519	4563	21	1

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 2.

All (21) 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:B:351[B]:ASP:OD2	8:B:701:HOH:O	1.95	0.84
5:B:611:EDO:O2	8:B:702:HOH:O	2.04	0.76
1:A:459[B]:TYR:OH	8:A:701:HOH:O	2.10	0.70
1:B:413:GLU:OE2	8:B:703:HOH:O	2.11	0.68
1:B:351[B]:ASP:OD1	1:B:537:SER:OG	2.16	0.62
1:A:401:LYS:NZ	8:A:704:HOH:O	2.34	0.60
1:A:539:LEU:O	1:A:543[B]:MET:HG2	2.01	0.59
1:B:343[B]:MET:SD	1:B:528[B]:MET:SD	3.01	0.59
1:B:343[B]:MET:HE2	1:B:343[B]:MET:HA	1.86	0.57
1:A:321[B]:GLU:OE1	8:A:702:HOH:O	2.19	0.52
1:A:473:GLU:OE2	5:A:610:EDO:O1	2.28	0.51
1:A:465:THR:HG23	1:A:468:SER:H	1.76	0.50
1:A:374[B]:ASP:OD2	1:A:471[B]:ASN:ND2	2.44	0.49
1:A:472:LYS:HE3	8:B:707:HOH:O	2.12	0.49
1:A:351[B]:ASP:OD2	8:A:703:HOH:O	2.20	0.49
1:B:492:LYS:NZ	8:B:706:HOH:O	2.40	0.46
1:B:548:ARG:NH2	8:B:708:HOH:O	2.48	0.46
1:B:539:LEU:O	1:B:543[B]:MET:HG2	2.19	0.43
1:A:374[A]:ASP:OD2	1:A:461:PHE:CE2	2.72	0.42
1:A:351[B]:ASP:OD1	1:A:540:LEU:HG	2.19	0.42
1:A:315:ILE:HD11	1:A:481:LYS:HE3	2.03	0.40

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
8:A:735:HOH:O	8:C:803:HOH:O[2_645]	2.04	0.16

### 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	250/247 (101%)	249 (100%)	1 (0%)	0	100	100
1	B	257/247 (104%)	256 (100%)	1 (0%)	0	100	100
2	C	9/15 (60%)	9 (100%)	0	0	100	100
2	D	10/15 (67%)	10 (100%)	0	0	100	100
All	All	526/524 (100%)	524 (100%)	2 (0%)	0	100	100

There are no Ramachandran outliers to report.

#### 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	230/223 (103%)	228 (99%)	2 (1%)	78	52
1	B	235/223 (105%)	235 (100%)	0	100	100
2	C	11/14 (79%)	11 (100%)	0	100	100
2	D	11/14 (79%)	11 (100%)	0	100	100
All	All	487/474 (103%)	485 (100%)	2 (0%)	91	79

All (2) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	461	PHE
1	A	548	ARG

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

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

## 5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

Of 25 ligands modelled in this entry, 6 are monoatomic - leaving 19 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	$\# Z  > 2$
5	EDO	B	606	-	3,3,3	0.51	0	2,2,2	0.15	0
5	EDO	A	608	-	3,3,3	0.47	0	2,2,2	0.38	0
5	EDO	B	605	-	3,3,3	0.48	0	2,2,2	0.25	0
5	EDO	A	609	-	3,3,3	0.45	0	2,2,2	0.22	0
3	GEN	B	601	-	18,22,22	1.20	2 (11%)	22,32,32	1.20	2 (9%)
5	EDO	A	605	-	3,3,3	0.50	0	2,2,2	0.19	0
5	EDO	B	611	-	3,3,3	0.41	0	2,2,2	0.49	0
5	EDO	A	604	-	3,3,3	0.46	0	2,2,2	0.30	0
5	EDO	B	610	-	3,3,3	0.47	0	2,2,2	0.27	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
7	GOL	C	701	-	5,5,5	0.83	0	5,5,5	0.78	0
5	EDO	A	610	-	3,3,3	0.42	0	2,2,2	0.42	0
5	EDO	A	607	-	3,3,3	0.48	0	2,2,2	0.34	0
5	EDO	B	604	-	3,3,3	0.41	0	2,2,2	0.55	0
5	EDO	B	607	-	3,3,3	0.51	0	2,2,2	0.05	0
3	GEN	A	601	-	18,22,22	1.17	2 (11%)	22,32,32	1.23	2 (9%)
5	EDO	B	609	-	3,3,3	0.42	0	2,2,2	0.41	0
5	EDO	B	603	-	3,3,3	0.50	0	2,2,2	0.03	0
5	EDO	B	608	-	3,3,3	0.48	0	2,2,2	0.32	0
5	EDO	A	606	-	3,3,3	0.49	0	2,2,2	0.28	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
5	EDO	B	606	-	-	1/1/1/1	-
5	EDO	A	608	-	-	0/1/1/1	-
5	EDO	B	605	-	-	0/1/1/1	-
5	EDO	A	609	-	-	0/1/1/1	-
3	GEN	B	601	-	-	0/0/4/4	0/3/3/3
5	EDO	A	605	-	-	0/1/1/1	-
5	EDO	B	611	-	-	1/1/1/1	-
5	EDO	A	604	-	-	0/1/1/1	-
5	EDO	B	610	-	-	0/1/1/1	-
7	GOL	C	701	-	-	3/4/4/4	-
5	EDO	A	610	-	-	1/1/1/1	-
5	EDO	A	607	-	-	0/1/1/1	-
5	EDO	B	604	-	-	0/1/1/1	-
5	EDO	B	607	-	-	0/1/1/1	-
3	GEN	A	601	-	-	0/0/4/4	0/3/3/3
5	EDO	B	609	-	-	1/1/1/1	-
5	EDO	B	603	-	-	0/1/1/1	-
5	EDO	B	608	-	-	0/1/1/1	-
5	EDO	A	606	-	-	0/1/1/1	-

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	B	601	GEN	C8-C7	-2.31	1.34	1.39
3	B	601	GEN	C5-C10	-2.28	1.38	1.41

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	601	GEN	C5-C10	-2.28	1.38	1.41
3	A	601	GEN	C8-C7	-2.18	1.34	1.39

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	601	GEN	C5-C6-C7	-3.33	114.78	120.60
3	A	601	GEN	C5-C6-C7	-3.26	114.90	120.60
3	B	601	GEN	C2-C1-C10	-2.44	117.00	120.42
3	A	601	GEN	C2-C1-C10	-2.40	117.05	120.42

There are no chirality outliers.

All (7) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
7	C	701	GOL	O1-C1-C2-C3
7	C	701	GOL	O1-C1-C2-O2
5	A	610	EDO	O1-C1-C2-O2
5	B	609	EDO	O1-C1-C2-O2
5	B	606	EDO	O1-C1-C2-O2
5	B	611	EDO	O1-C1-C2-O2
7	C	701	GOL	C1-C2-C3-O3

There are no ring outliers.

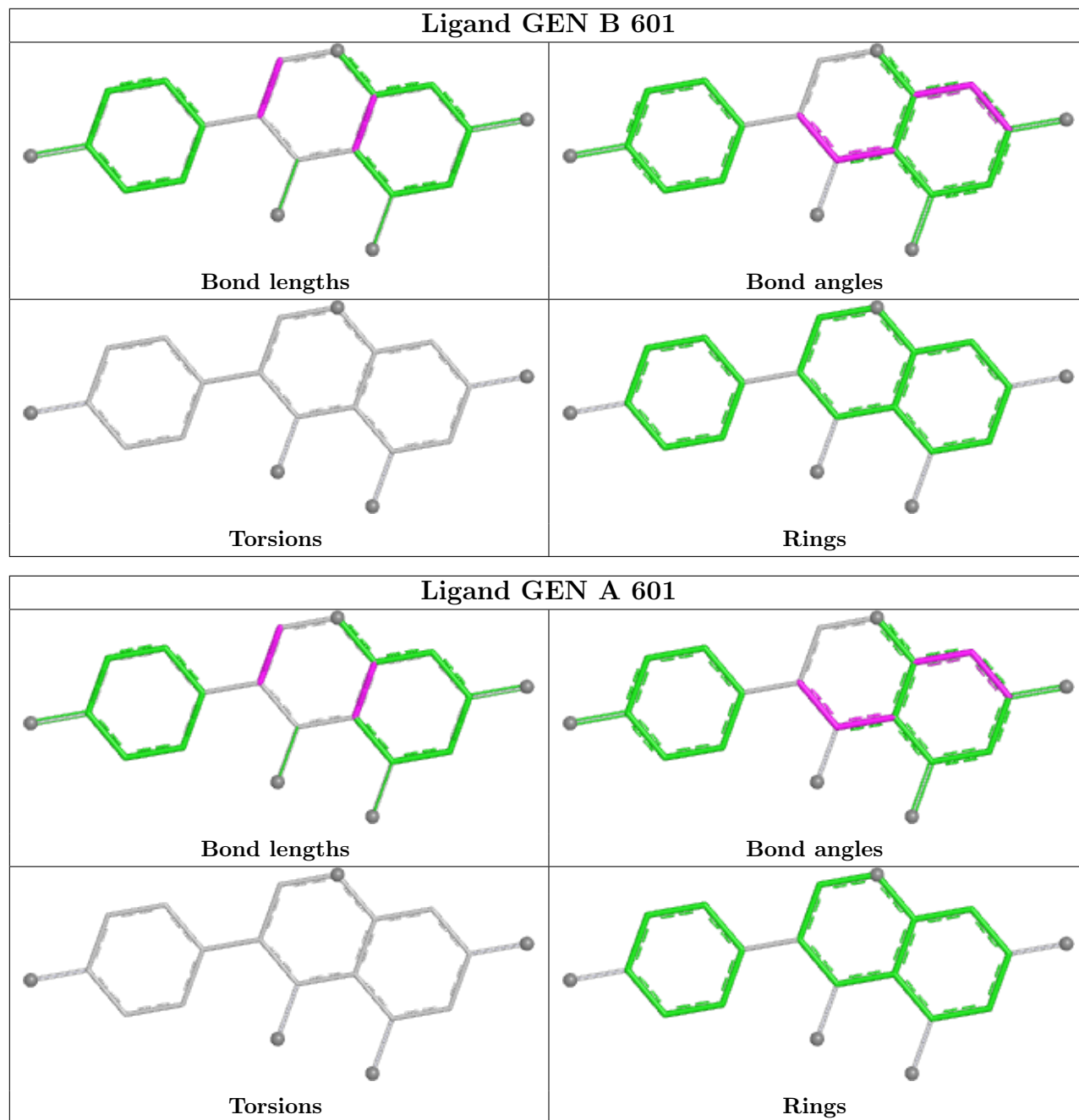
2 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	B	611	EDO	1	0
5	A	610	EDO	1	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient



equivalents in the CSD to analyse the geometry.



## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

## 6 Fit of model and data [i](#)

### 6.1 Protein, DNA and RNA chains [i](#)

In the following table, the column labelled ‘#RSRZ > 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95<sup>th</sup> percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q < 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å <sup>2</sup> )	Q<0.9
1	A	241/247 (97%)	0.16	15 (6%) 20 22	13, 21, 42, 57	0
1	B	244/247 (98%)	0.02	7 (2%) 51 58	16, 24, 39, 65	0
2	C	10/15 (66%)	0.83	2 (20%) 1 1	23, 32, 54, 61	0
2	D	11/15 (73%)	0.47	0 100 100	31, 39, 53, 64	0
All	All	506/524 (96%)	0.11	24 (4%) 31 37	13, 23, 42, 65	0

All (24) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	466	LEU	8.0
1	A	461	PHE	8.0
1	A	306	LEU	6.8
1	A	460	THR	5.7
1	A	467	LYS	5.3
1	A	469	LEU	5.1
1	B	548	ARG	4.6
1	B	308	LEU	4.1
1	A	465	THR	3.7
2	C	696	ASP	3.2
1	A	459[A]	TYR	3.2
1	A	471[A]	ASN	2.9
1	A	470	GLU	2.9
1	B	533	VAL	2.8
1	A	308	LEU	2.8
1	A	464	SER	2.6
1	A	468	SER	2.6
1	A	307	ALA	2.6
1	B	470	GLU	2.4
1	A	548	ARG	2.4
1	B	306	LEU	2.2

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Mol	Chain	Res	Type	RSRZ
1	B	466	LEU	2.2
2	C	687	HIS	2.1
1	B	334	SER	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.

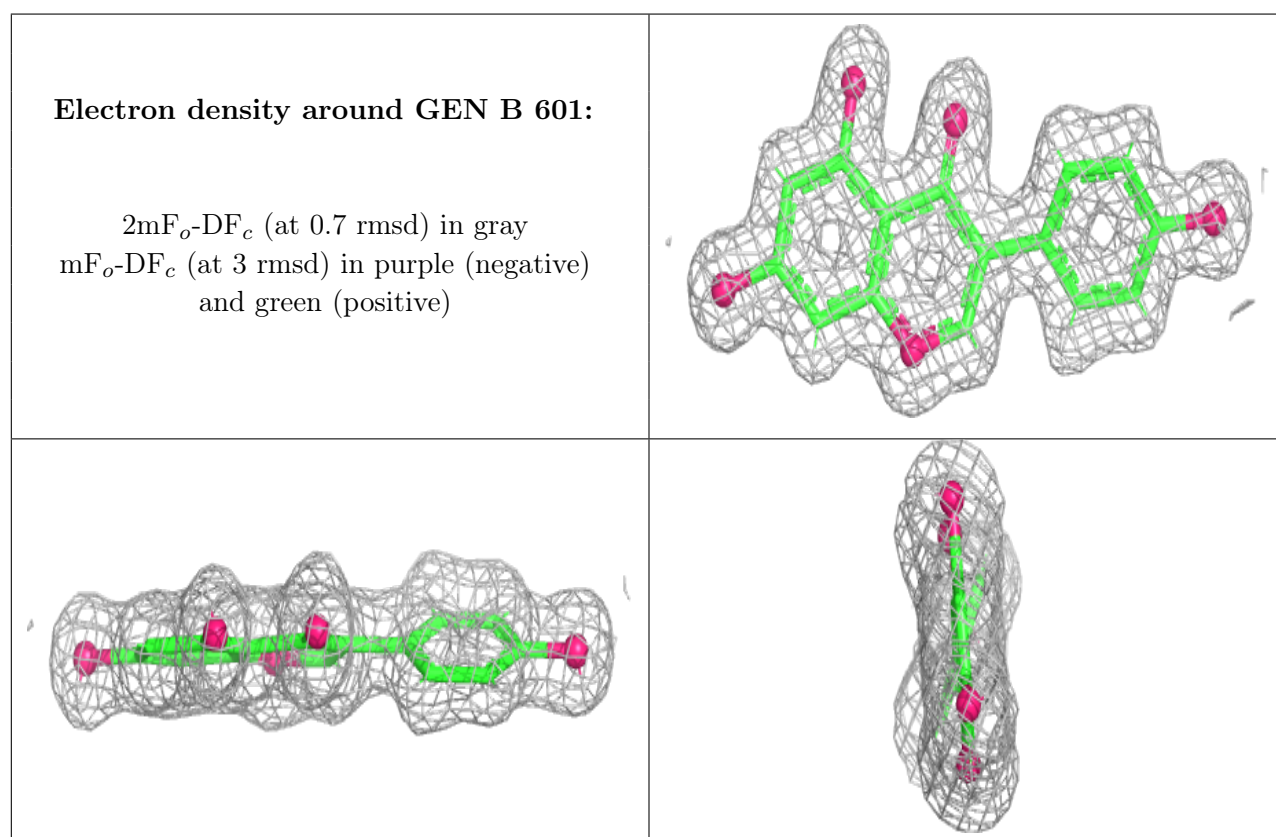
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
7	GOL	C	701	6/6	0.48	0.20	54,65,66,67	0
5	EDO	A	606	4/4	0.69	0.12	39,47,52,56	0
5	EDO	B	606	4/4	0.80	0.18	41,50,55,57	0
5	EDO	B	611	4/4	0.82	0.29	33,40,43,43	0
5	EDO	A	610	4/4	0.86	0.18	40,48,53,54	0
5	EDO	B	607	4/4	0.87	0.13	40,48,53,54	0
5	EDO	A	609	4/4	0.88	0.14	29,36,41,45	0
5	EDO	B	610	4/4	0.89	0.10	28,34,40,40	0
5	EDO	A	605	4/4	0.90	0.13	33,42,46,50	0
5	EDO	B	609	4/4	0.91	0.24	48,57,58,59	0
5	EDO	B	608	4/4	0.91	0.14	37,45,49,50	0
5	EDO	A	604	4/4	0.93	0.10	25,31,36,37	0
5	EDO	A	608	4/4	0.94	0.12	30,36,40,43	0
6	CL	B	612	1/1	0.95	0.07	51,51,51,51	0
5	EDO	B	604	4/4	0.95	0.07	29,35,36,36	0
5	EDO	B	605	4/4	0.97	0.09	27,33,37,39	0
3	GEN	B	601	20/20	0.97	0.08	18,20,25,26	0
6	CL	B	613	1/1	0.97	0.19	66,66,66,66	0
5	EDO	A	607	4/4	0.97	0.07	29,35,41,41	0
5	EDO	B	603	4/4	0.98	0.09	24,29,32,32	0

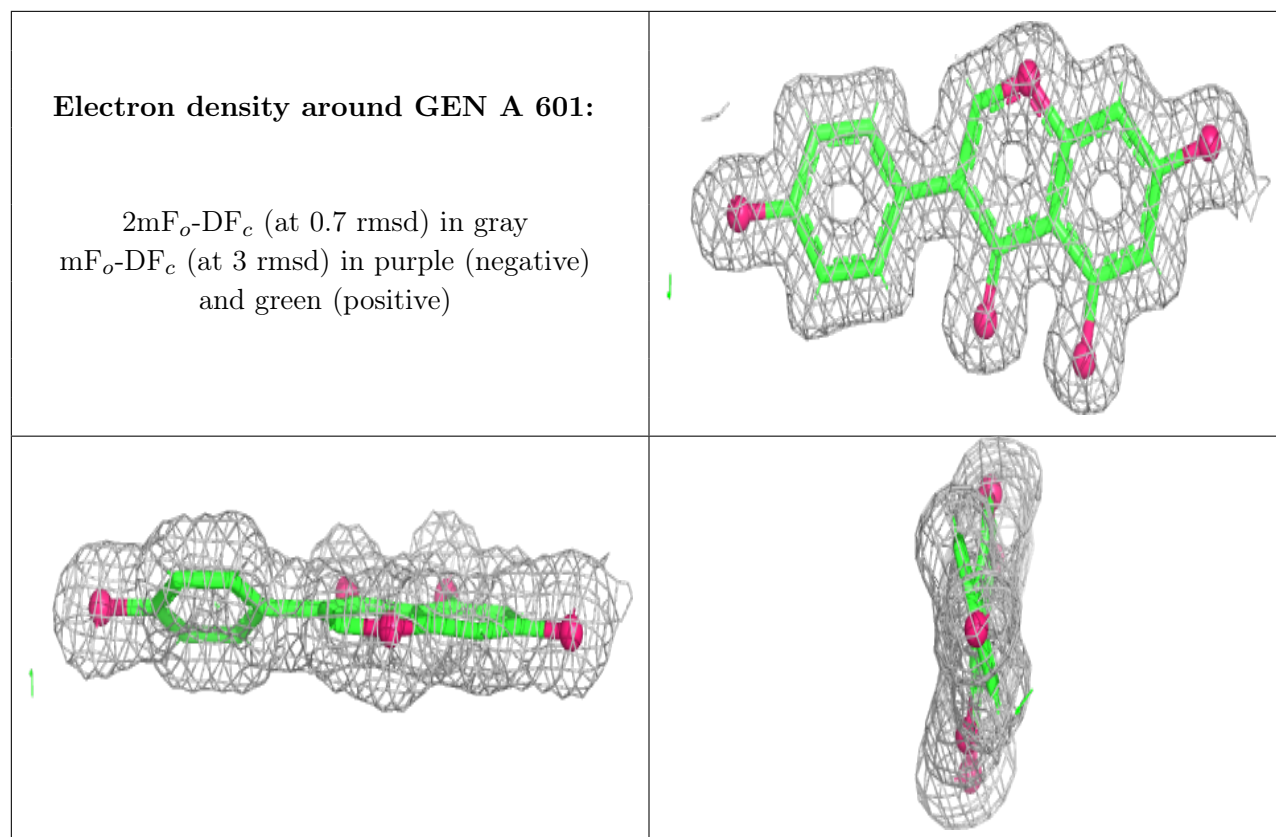
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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
4	NA	B	602	1/1	0.98	0.05	41,41,41,41	0
3	GEN	A	601	20/20	0.98	0.07	14,18,22,24	0
4	NA	A	603	1/1	1.00	0.13	23,23,23,23	0
4	NA	A	602	1/1	1.00	0.07	25,25,25,25	0
6	CL	A	611	1/1	1.00	0.07	25,25,25,25	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.