



# Full wwPDB X-ray Structure Validation Report ⓘ

Aug 22, 2020 – 07:00 PM BST

PDB ID : 6DFN  
Title : Crystal structure of estrogen receptor alpha in complex with receptor degrader 16aa  
Authors : Kiefer, J.R.; Vinogradova, M.; Liang, J.; Zhang, B.; Ortwine, D.F.; Nettles, K.W.; Nwachukwu, J.C.  
Deposited on : 2018-05-15  
Resolution : 2.10 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.

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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 : 2.13.1  
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) : 2.13.1

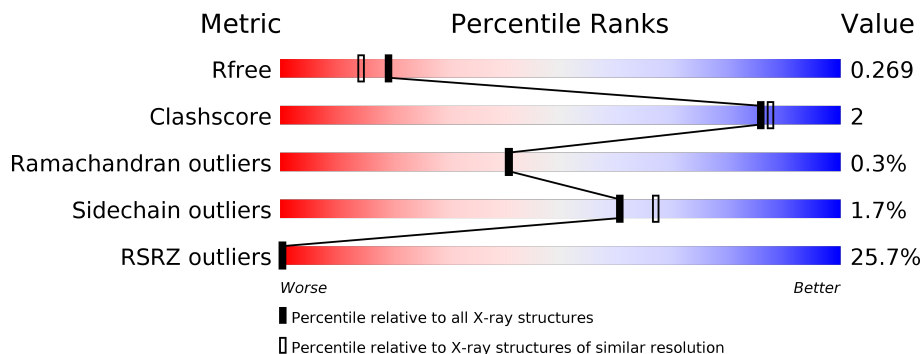
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.10 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	5197 (2.10-2.10)
Clashscore	141614	5710 (2.10-2.10)
Ramachandran outliers	138981	5647 (2.10-2.10)
Sidechain outliers	138945	5648 (2.10-2.10)
RSRZ outliers	127900	5083 (2.10-2.10)

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 on 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	280	
1	B	280	
1	C	280	
1	D	280	

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 crite-

ria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
3	NI	A	602	-	-	-	X
5	GOL	B	603	-	-	-	X
5	GOL	B	604	-	-	X	-

## 2 Entry composition [i](#)

There are 6 unique types of molecules in this entry. The entry contains 7249 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 Estrogen receptor.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	234	1833	1176	308	330	19	0	1	0
1	B	218	1690	1076	295	303	16	0	2	0
1	C	228	1761	1130	301	313	17	0	0	0
1	D	221	1724	1103	295	307	19	0	2	0

There are 104 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	274	MET	-	initiating methionine	UNP P03372
A	275	HIS	-	expression tag	UNP P03372
A	276	HIS	-	expression tag	UNP P03372
A	277	HIS	-	expression tag	UNP P03372
A	278	HIS	-	expression tag	UNP P03372
A	279	HIS	-	expression tag	UNP P03372
A	280	HIS	-	expression tag	UNP P03372
A	281	SER	-	expression tag	UNP P03372
A	282	SER	-	expression tag	UNP P03372
A	283	GLY	-	expression tag	UNP P03372
A	284	VAL	-	expression tag	UNP P03372
A	285	ASP	-	expression tag	UNP P03372
A	286	LEU	-	expression tag	UNP P03372
A	287	GLY	-	expression tag	UNP P03372
A	288	THR	-	expression tag	UNP P03372
A	289	GLU	-	expression tag	UNP P03372
A	290	ASN	-	expression tag	UNP P03372
A	291	LEU	-	expression tag	UNP P03372
A	292	TYR	-	expression tag	UNP P03372
A	293	PHE	-	expression tag	UNP P03372
A	294	GLN	-	expression tag	UNP P03372

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Chain	Residue	Modelled	Actual	Comment	Reference
A	295	SER	-	expression tag	UNP P03372
A	296	ASN	-	expression tag	UNP P03372
A	297	ALA	-	expression tag	UNP P03372
A	372	SER	LEU	conflict	UNP P03372
A	536	SER	LEU	conflict	UNP P03372
B	274	MET	-	initiating methionine	UNP P03372
B	275	HIS	-	expression tag	UNP P03372
B	276	HIS	-	expression tag	UNP P03372
B	277	HIS	-	expression tag	UNP P03372
B	278	HIS	-	expression tag	UNP P03372
B	279	HIS	-	expression tag	UNP P03372
B	280	HIS	-	expression tag	UNP P03372
B	281	SER	-	expression tag	UNP P03372
B	282	SER	-	expression tag	UNP P03372
B	283	GLY	-	expression tag	UNP P03372
B	284	VAL	-	expression tag	UNP P03372
B	285	ASP	-	expression tag	UNP P03372
B	286	LEU	-	expression tag	UNP P03372
B	287	GLY	-	expression tag	UNP P03372
B	288	THR	-	expression tag	UNP P03372
B	289	GLU	-	expression tag	UNP P03372
B	290	ASN	-	expression tag	UNP P03372
B	291	LEU	-	expression tag	UNP P03372
B	292	TYR	-	expression tag	UNP P03372
B	293	PHE	-	expression tag	UNP P03372
B	294	GLN	-	expression tag	UNP P03372
B	295	SER	-	expression tag	UNP P03372
B	296	ASN	-	expression tag	UNP P03372
B	297	ALA	-	expression tag	UNP P03372
B	372	SER	LEU	conflict	UNP P03372
B	536	SER	LEU	conflict	UNP P03372
C	274	MET	-	initiating methionine	UNP P03372
C	275	HIS	-	expression tag	UNP P03372
C	276	HIS	-	expression tag	UNP P03372
C	277	HIS	-	expression tag	UNP P03372
C	278	HIS	-	expression tag	UNP P03372
C	279	HIS	-	expression tag	UNP P03372
C	280	HIS	-	expression tag	UNP P03372
C	281	SER	-	expression tag	UNP P03372
C	282	SER	-	expression tag	UNP P03372
C	283	GLY	-	expression tag	UNP P03372
C	284	VAL	-	expression tag	UNP P03372

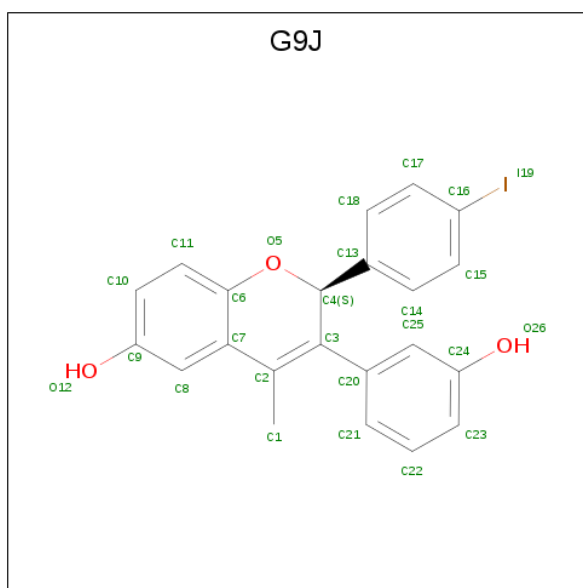
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Chain	Residue	Modelled	Actual	Comment	Reference
C	285	ASP	-	expression tag	UNP P03372
C	286	LEU	-	expression tag	UNP P03372
C	287	GLY	-	expression tag	UNP P03372
C	288	THR	-	expression tag	UNP P03372
C	289	GLU	-	expression tag	UNP P03372
C	290	ASN	-	expression tag	UNP P03372
C	291	LEU	-	expression tag	UNP P03372
C	292	TYR	-	expression tag	UNP P03372
C	293	PHE	-	expression tag	UNP P03372
C	294	GLN	-	expression tag	UNP P03372
C	295	SER	-	expression tag	UNP P03372
C	296	ASN	-	expression tag	UNP P03372
C	297	ALA	-	expression tag	UNP P03372
C	372	SER	LEU	conflict	UNP P03372
C	536	SER	LEU	conflict	UNP P03372
D	274	MET	-	initiating methionine	UNP P03372
D	275	HIS	-	expression tag	UNP P03372
D	276	HIS	-	expression tag	UNP P03372
D	277	HIS	-	expression tag	UNP P03372
D	278	HIS	-	expression tag	UNP P03372
D	279	HIS	-	expression tag	UNP P03372
D	280	HIS	-	expression tag	UNP P03372
D	281	SER	-	expression tag	UNP P03372
D	282	SER	-	expression tag	UNP P03372
D	283	GLY	-	expression tag	UNP P03372
D	284	VAL	-	expression tag	UNP P03372
D	285	ASP	-	expression tag	UNP P03372
D	286	LEU	-	expression tag	UNP P03372
D	287	GLY	-	expression tag	UNP P03372
D	288	THR	-	expression tag	UNP P03372
D	289	GLU	-	expression tag	UNP P03372
D	290	ASN	-	expression tag	UNP P03372
D	291	LEU	-	expression tag	UNP P03372
D	292	TYR	-	expression tag	UNP P03372
D	293	PHE	-	expression tag	UNP P03372
D	294	GLN	-	expression tag	UNP P03372
D	295	SER	-	expression tag	UNP P03372
D	296	ASN	-	expression tag	UNP P03372
D	297	ALA	-	expression tag	UNP P03372
D	372	SER	LEU	conflict	UNP P03372
D	536	SER	LEU	conflict	UNP P03372

- Molecule 2 is (2S)-3-(3-hydroxyphenyl)-2-(4-iodophenyl)-4-methyl-2H-1-benzopyran-6-ol

(three-letter code: G9J) (formula: C<sub>22</sub>H<sub>17</sub>IO<sub>3</sub>).

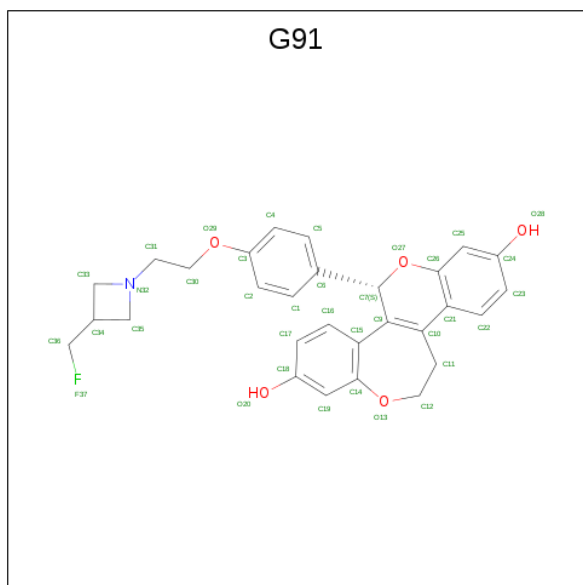


Mol	Chain	Residues	Atoms			ZeroOcc	AltConf	
2	A	1	Total	C	I	O	0	0
			26	22	1	3		
2	B	1	Total	C	I	O	0	1
			26	22	1	3		
2	C	1	Total	C	I	O	0	0
			26	22	1	3		
2	D	1	Total	C	I	O	0	1
			26	22	1	3		

- Molecule 3 is NICKEL (II) ION (three-letter code: NI) (formula: Ni).

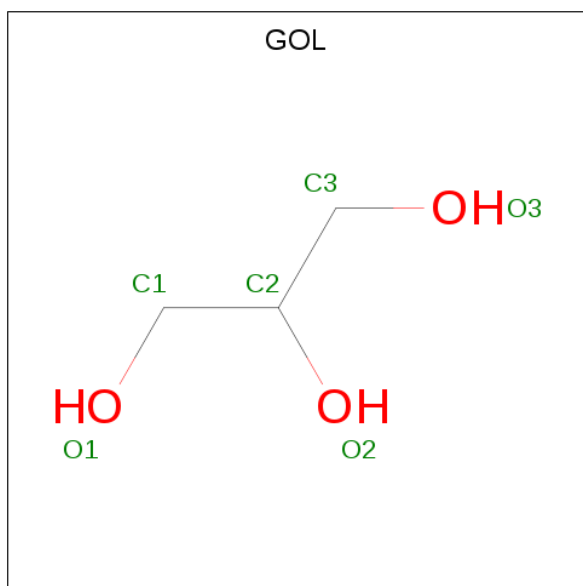
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	1	Total	Ni		
			1	1	0	0

- Molecule 4 is (8S)-8-(4-{2-[3-(fluoromethyl)azetidin-1-yl]ethoxy}phenyl)-1,8-dihydro-2H-[1]benzopyrano[4,3-d][1]benzoxepine-5,11-diol (three-letter code: G91) (formula: C<sub>29</sub>H<sub>28</sub>FN<sub>2</sub>O<sub>5</sub>).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	F	N	O		
4	B	1	36	29	1	1	5	0	1
4	D	1	36	29	1	1	5	0	1

- Molecule 5 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
			Total	C	O		
5	B	1	6	3	3	0	0
5	B	1	6	3	3	0	0

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

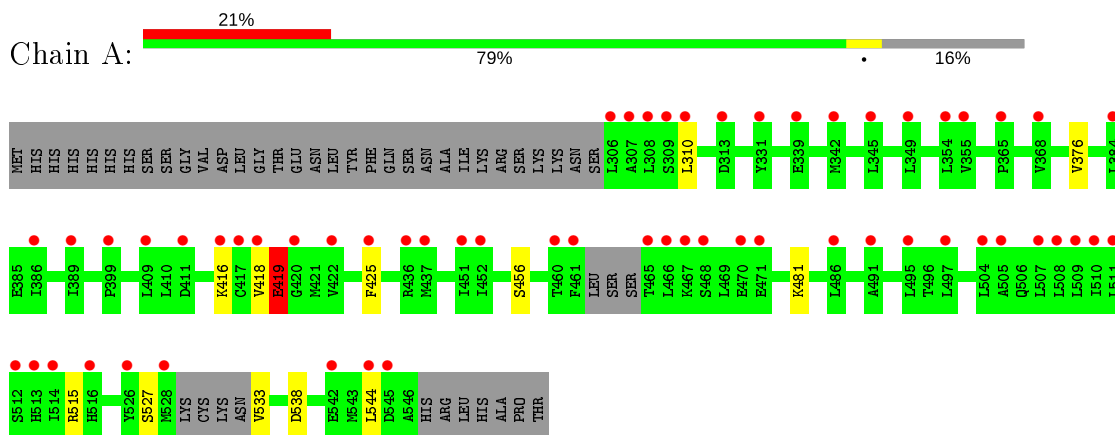
- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	16	Total 17	O 17	0	1
6	B	9	Total 9	O 9	0	0
6	C	10	Total 10	O 10	0	0
6	D	10	Total 10	O 10	0	0

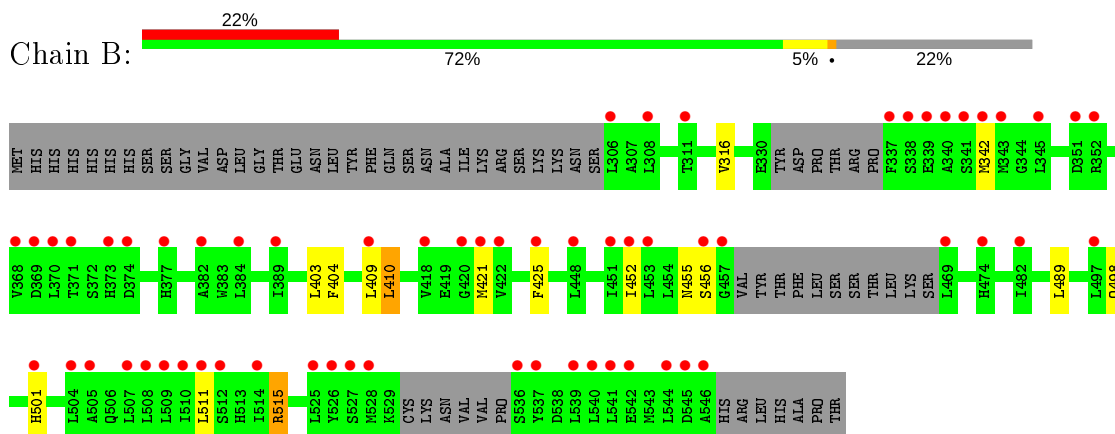
### 3 Residue-property plots [i](#)

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.

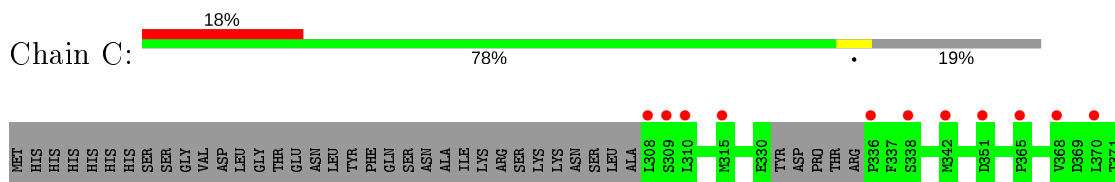
- Molecule 1: Estrogen receptor

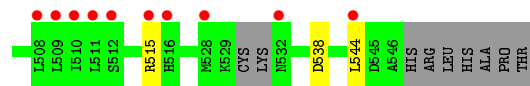
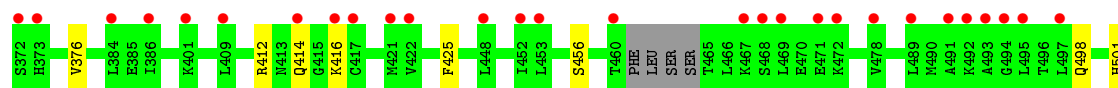


- Molecule 1: Estrogen receptor

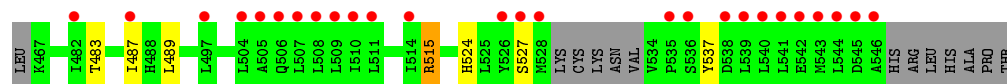
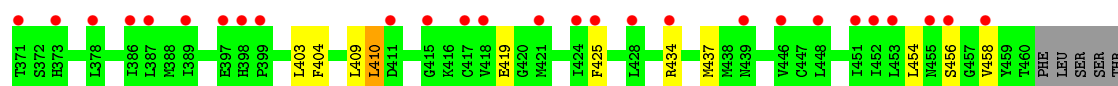
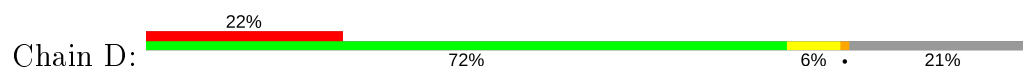


- Molecule 1: Estrogen receptor





● Molecule 1: Estrogen receptor



## 4 Data and refinement statistics i

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	53.09Å 59.13Å 94.18Å 86.05° 74.92° 63.34°	Depositor
Resolution (Å)	29.47 – 2.10 29.47 – 2.10	Depositor EDS
% Data completeness (in resolution range)	89.2 (29.47-2.10) 94.1 (29.47-2.10)	Depositor EDS
$R_{merge}$	0.05	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.35 (at 2.10Å)	Xtriage
Refinement program	REFMAC 5.8.0155	Depositor
R, $R_{free}$	0.247 , 0.265 0.257 , 0.269	Depositor DCC
$R_{free}$ test set	2737 reflections (5.06%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	49.4	Xtriage
Anisotropy	0.320	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.36 , 57.4	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.55$ , $\langle L^2 \rangle = 0.40$	Xtriage
Estimated twinning fraction	0.148 for h,h-k,h-l	Xtriage
Reported twinning fraction	0.839 for H, K, L 0.161 for H, H-K, H-L	Depositor
Outliers	0 of 54118 reflections	Xtriage
$F_o, F_c$ correlation	0.93	EDS
Total number of atoms	7249	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	64.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.80% 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, G9J, G9I, NI

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	0.38	0/1866	0.62	0/2524
1	B	0.38	0/1715	0.61	1/2317 (0.0%)
1	C	0.38	0/1791	0.61	1/2422 (0.0%)
1	D	0.39	0/1751	0.63	1/2366 (0.0%)
All	All	0.38	0/7123	0.62	3/9629 (0.0%)

There are no bond length outliers.

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	515	ARG	NE-CZ-NH1	5.92	123.26	120.30
1	D	515	ARG	NE-CZ-NH1	5.71	123.15	120.30
1	C	412	ARG	NE-CZ-NH1	5.58	123.09	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	1833	0	1839	6	0
1	B	1690	0	1686	12	0
1	C	1761	0	1772	3	0
1	D	1724	0	1733	9	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	A	26	0	0	1	0
2	B	26	0	0	0	0
2	C	26	0	0	0	0
2	D	26	0	0	1	0
3	A	1	0	0	0	0
4	B	36	0	0	0	0
4	D	36	0	0	0	0
5	B	12	0	16	6	0
5	D	6	0	8	0	0
6	A	17	0	0	0	0
6	B	9	0	0	0	0
6	C	10	0	0	0	0
6	D	10	0	0	0	0
All	All	7249	0	7054	31	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 2.

All (31) 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:D:483:THR:O	1:D:487:ILE:HD12	1.81	0.80
1:A:310:LEU:O	1:A:481:LYS:HE3	1.96	0.65
1:A:310:LEU:O	1:A:481:LYS:CE	2.47	0.62
1:B:452:ILE:HG12	5:B:604:GOL:C3	2.34	0.57
1:D:404:PHE:CD2	1:D:410:LEU:HD22	2.45	0.52
1:B:452:ILE:HG12	5:B:604:GOL:H31	1.91	0.52
1:B:404:PHE:CD2	1:B:410:LEU:HD22	2.45	0.52
1:B:455:ASN:HD22	5:B:604:GOL:C1	2.24	0.50
1:D:483:THR:O	1:D:487:ILE:CD1	2.56	0.50
1:B:455:ASN:HD22	5:B:604:GOL:H12	1.76	0.49
1:B:403:LEU:HD12	1:B:409:LEU:HD13	1.94	0.48
1:B:511:LEU:HB3	5:B:604:GOL:O2	2.13	0.48
1:D:403:LEU:HD12	1:D:409:LEU:HD13	1.95	0.47
2:D:601[B]:G9J:C21	2:D:601[B]:G9J:C1	2.94	0.46
1:B:342:MET:CE	1:B:421:MET:CE	2.95	0.44
1:B:452:ILE:HG12	5:B:604:GOL:H32	1.99	0.44
1:D:454:LEU:O	1:D:458:VAL:CG2	2.66	0.43
1:B:498:GLN:HA	1:B:501:HIS:CE1	2.53	0.43
1:C:498:GLN:HA	1:C:501:HIS:CE1	2.53	0.43
1:B:456:SER:HA	1:B:515:ARG:NH2	2.34	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:456:SER:HA	1:D:515:ARG:NH2	2.35	0.42
1:A:376:VAL:HG22	1:A:544:LEU:HD12	2.02	0.41
1:D:524:HIS:O	1:D:527:SER:OG	2.33	0.41
1:A:418:VAL:O	1:A:419:GLU:CB	2.68	0.41
1:B:316:VAL:HG21	1:B:489:LEU:HD21	2.03	0.41
1:A:533:VAL:O	2:A:601:G9J:I19	3.09	0.41
1:A:456:SER:HA	1:A:515:ARG:NH2	2.36	0.41
1:C:376:VAL:HG22	1:C:544:LEU:HD12	2.04	0.40
1:D:434:ARG:HA	1:D:437[B]:MET:HG2	2.03	0.40
1:C:456:SER:HA	1:C:515:ARG:NH2	2.36	0.40
1:D:316:VAL:HG21	1:D:489:LEU:HD21	2.04	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	228/280 (81%)	225 (99%)	2 (1%)	1 (0%)	34	32
1	B	212/280 (76%)	211 (100%)	1 (0%)	0	100	100
1	C	220/280 (79%)	218 (99%)	2 (1%)	0	100	100
1	D	215/280 (77%)	210 (98%)	3 (1%)	2 (1%)	17	12
All	All	875/1120 (78%)	864 (99%)	8 (1%)	3 (0%)	41	41

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	419	GLU
1	D	419	GLU
1	D	537	TYR

### 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	201/252 (80%)	196 (98%)	5 (2%)	47	52
1	B	180/252 (71%)	178 (99%)	2 (1%)	73	79
1	C	191/252 (76%)	187 (98%)	4 (2%)	53	59
1	D	187/252 (74%)	185 (99%)	2 (1%)	73	79
All	All	759/1008 (75%)	746 (98%)	13 (2%)	60	67

All (13) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	416	LYS
1	A	419	GLU
1	A	425	PHE
1	A	527	SER
1	A	538	ASP
1	B	410	LEU
1	B	425	PHE
1	C	414	GLN
1	C	416	LYS
1	C	425	PHE
1	C	538	ASP
1	D	410	LEU
1	D	425	PHE

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (8) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	375	GLN
1	B	455	ASN
1	B	501	HIS
1	B	519	ASN
1	C	441	GLN
1	C	519	ASN

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Mol	Chain	Res	Type
1	D	413	ASN
1	D	524	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 [i](#)

Of 10 ligands modelled in this entry, 1 is monoatomic - leaving 9 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	$\# Z  > 2$
2	G9J	D	601[B]	-	29,29,29	0.47	0	38,42,42	1.15	4 (10%)
2	G9J	A	601	-	29,29,29	0.81	1 (3%)	38,42,42	0.99	0
4	G91	D	602[A]	-	39,41,41	0.27	0	43,59,59	0.81	1 (2%)
4	G91	B	601[A]	-	39,41,41	0.28	0	43,59,59	0.50	0
2	G9J	C	601	-	29,29,29	0.88	1 (3%)	38,42,42	1.14	3 (7%)
5	GOL	B	603	-	5,5,5	0.35	0	5,5,5	0.25	0
5	GOL	D	603	-	5,5,5	0.33	0	5,5,5	0.16	0
2	G9J	B	602[B]	-	29,29,29	0.48	0	38,42,42	1.17	4 (10%)
5	GOL	B	604	-	5,5,5	0.22	0	5,5,5	0.48	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	G9J	D	601[B]	-	-	0/8/24/24	0/4/4/4
2	G9J	A	601	-	-	0/8/24/24	0/4/4/4
4	G91	D	602[A]	-	-	1/8/46/46	0/6/6/6
4	G91	B	601[A]	-	-	0/8/46/46	0/6/6/6
2	G9J	C	601	-	-	0/8/24/24	0/4/4/4
5	GOL	B	603	-	-	2/4/4/4	-
5	GOL	D	603	-	-	2/4/4/4	-
2	G9J	B	602[B]	-	-	2/8/24/24	0/4/4/4
5	GOL	B	604	-	-	2/4/4/4	-

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	601	G9J	C7-C2	2.75	1.50	1.45
2	A	601	G9J	C7-C2	2.14	1.49	1.45

All (12) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	D	602[A]	G91	C6-C7-C9	-4.72	105.96	114.48
2	B	602[B]	G9J	C13-C4-C3	-3.66	107.88	114.48
2	D	601[B]	G9J	C13-C4-C3	-3.08	108.93	114.48
2	D	601[B]	G9J	C1-C2-C3	-2.96	120.57	124.49
2	B	602[B]	G9J	C1-C2-C3	-2.59	121.07	124.49
2	C	601	G9J	O5-C6-C7	-2.55	119.16	122.09
2	B	602[B]	G9J	O5-C6-C11	2.42	120.62	116.29
2	C	601	G9J	C13-C4-C3	-2.40	110.15	114.48
2	C	601	G9J	C21-C20-C3	-2.28	117.95	120.91
2	D	601[B]	G9J	O5-C6-C11	2.21	120.24	116.29
2	B	602[B]	G9J	O5-C6-C7	-2.13	119.65	122.09
2	D	601[B]	G9J	C1-C2-C7	2.01	120.81	118.57

There are no chirality outliers.

All (9) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	D	603	GOL	C1-C2-C3-O3

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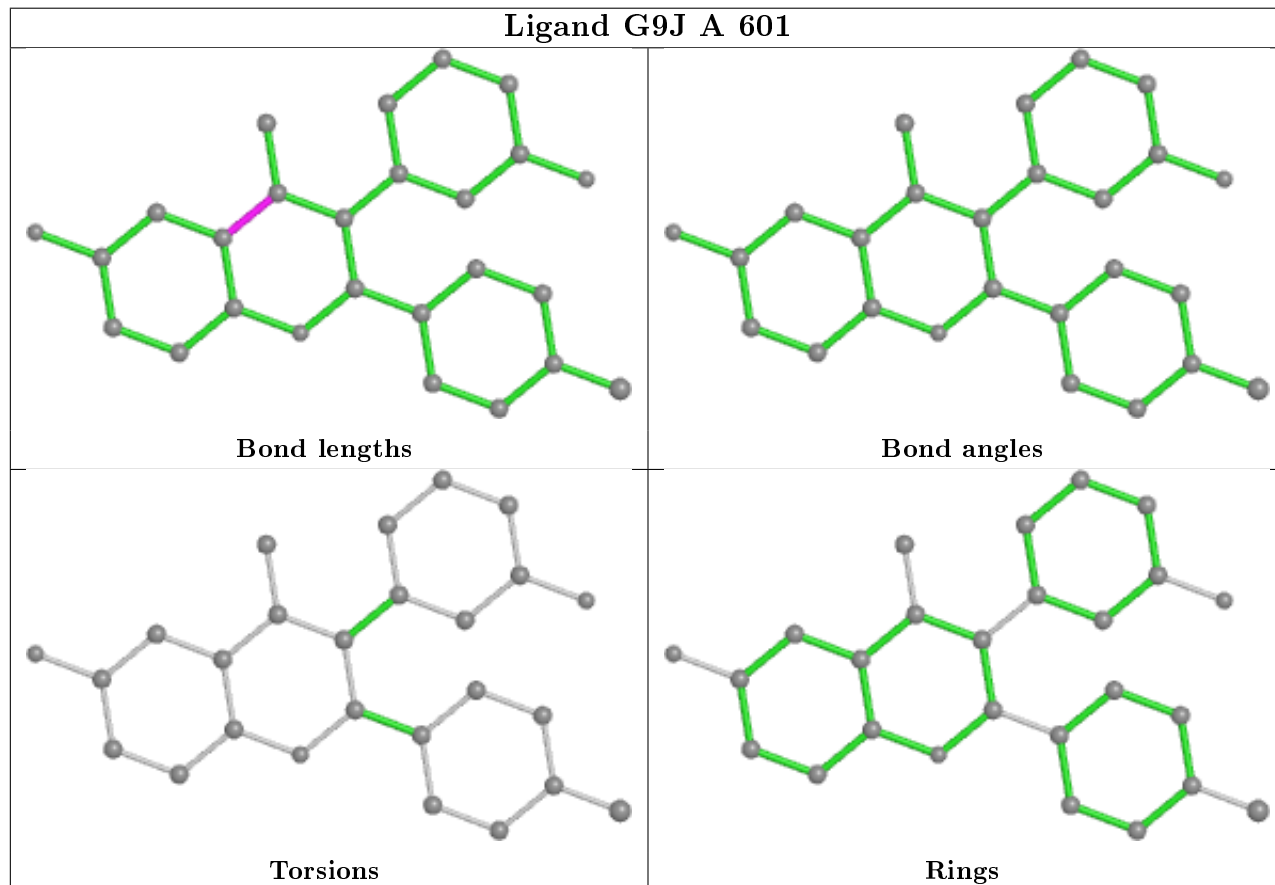
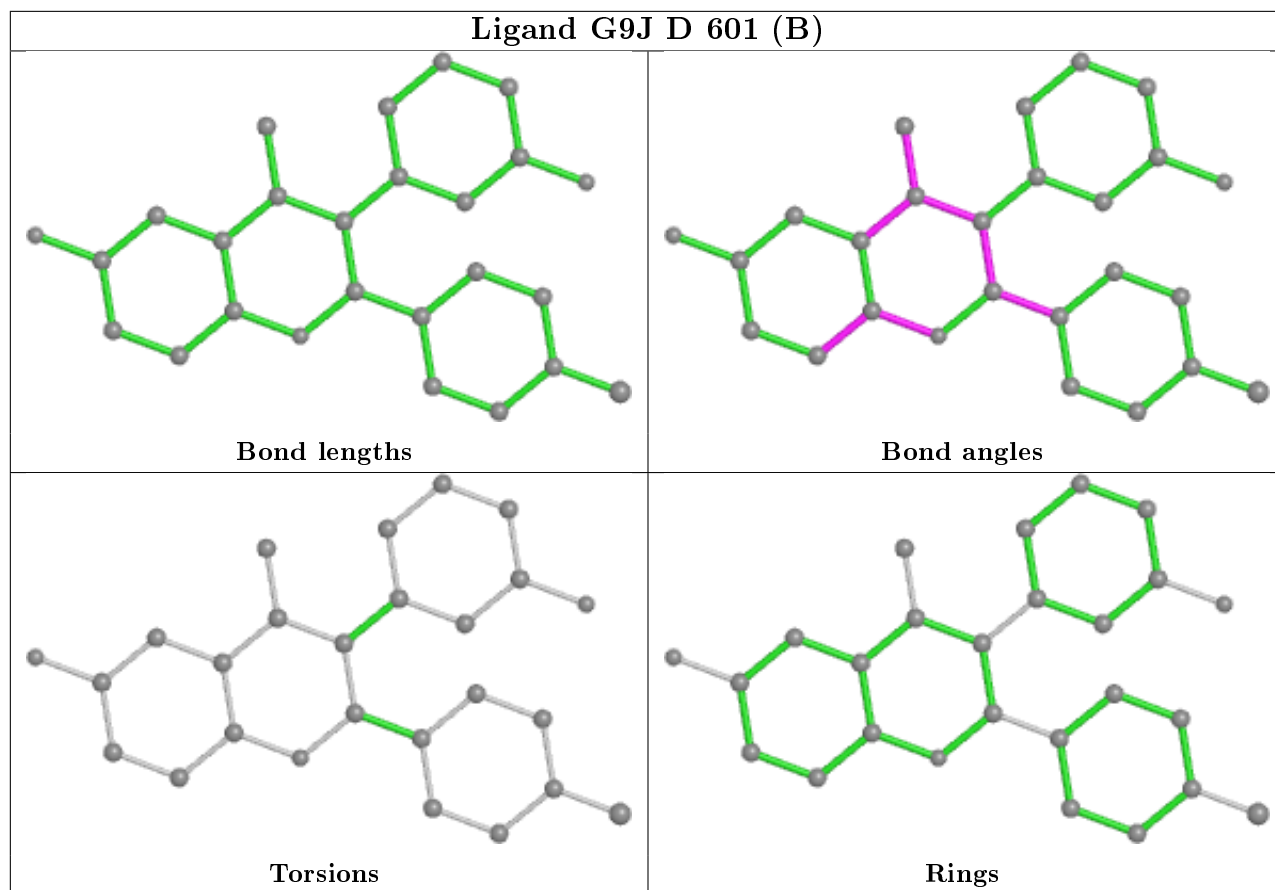
Mol	Chain	Res	Type	Atoms
5	D	603	GOL	O2-C2-C3-O3
5	B	604	GOL	O1-C1-C2-C3
5	B	603	GOL	C1-C2-C3-O3
5	B	603	GOL	O2-C2-C3-O3
5	B	604	GOL	O1-C1-C2-O2
2	B	602[B]	G9J	C25-C20-C3-C2
4	D	602[A]	G91	O29-C30-C31-N32
2	B	602[B]	G9J	C21-C20-C3-C2

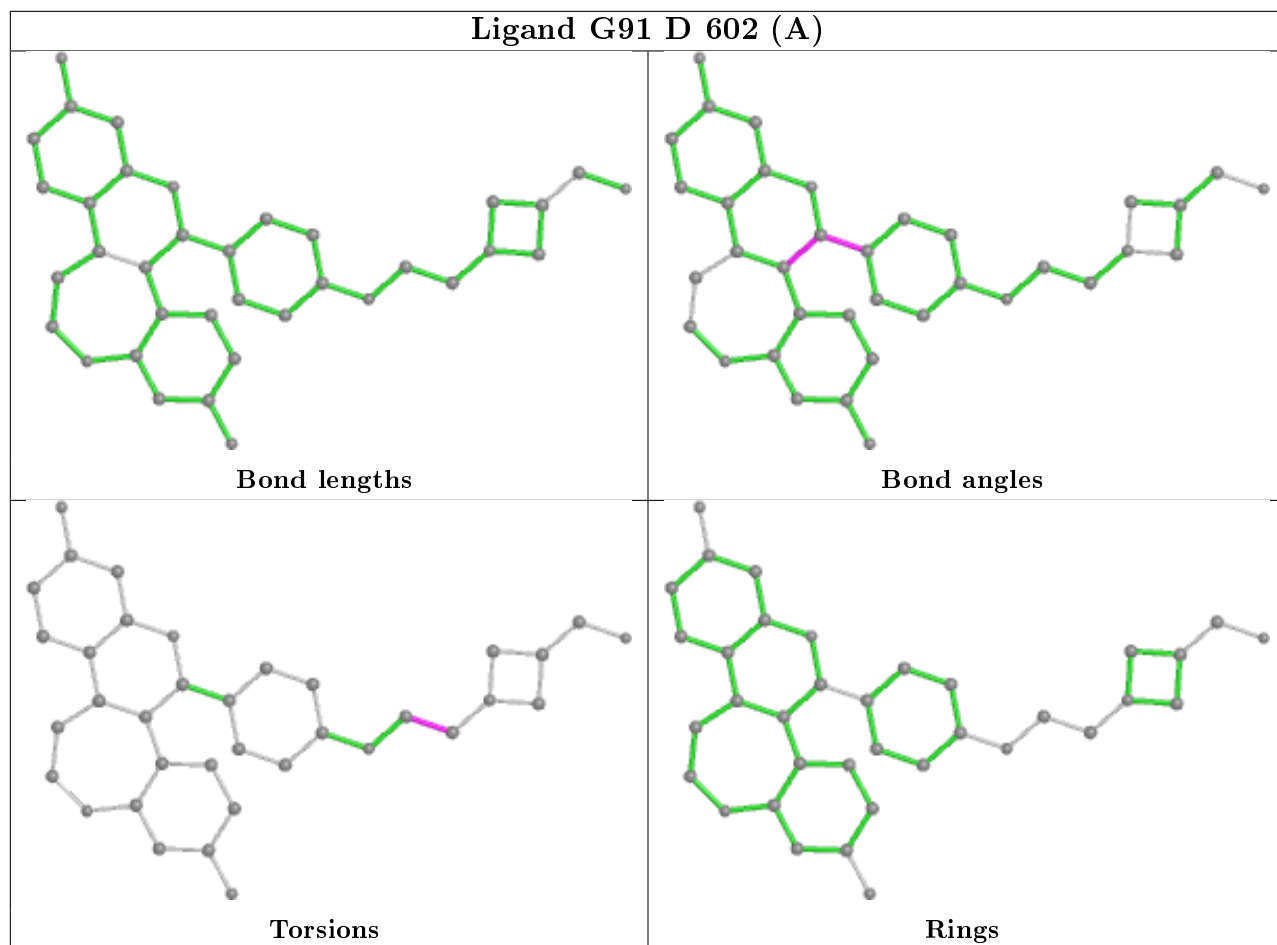
There are no ring outliers.

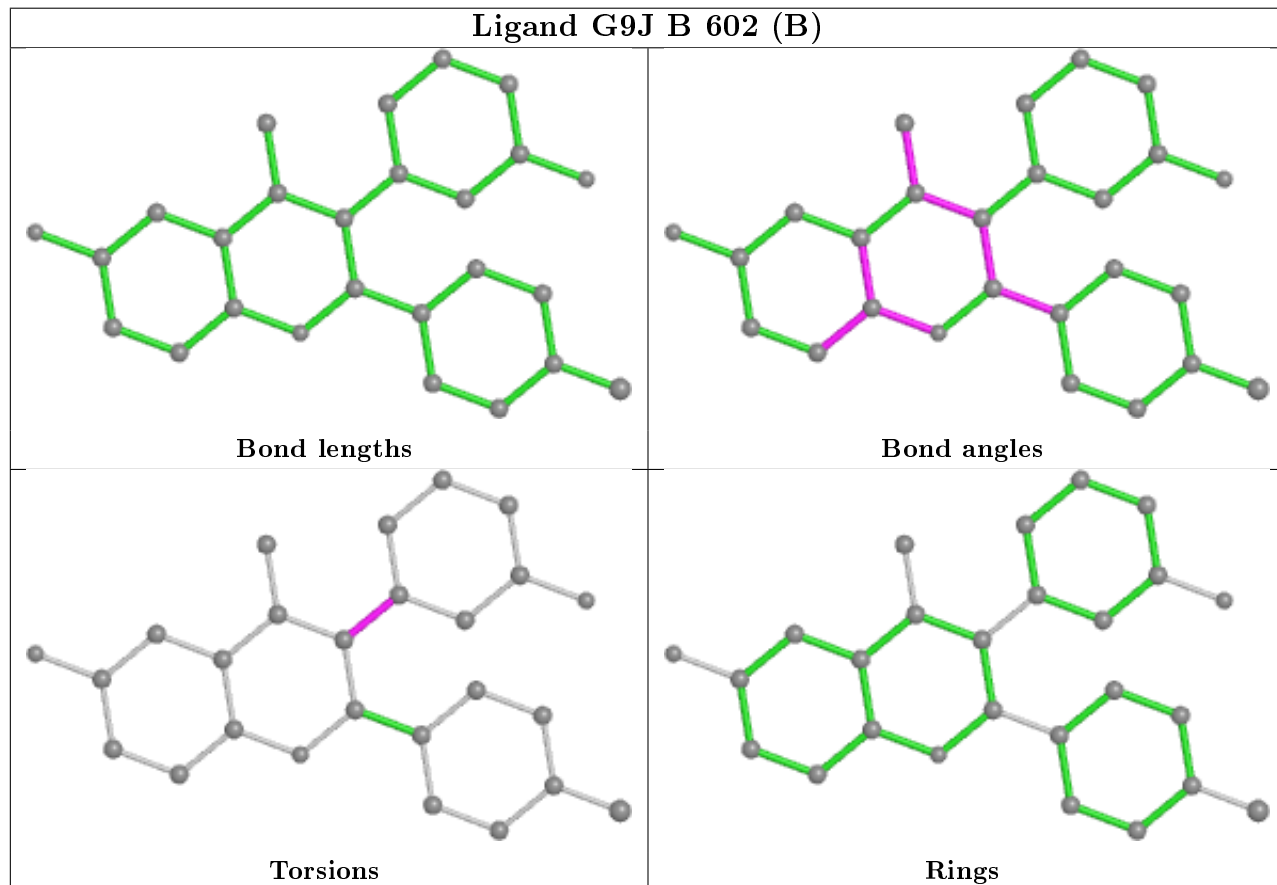
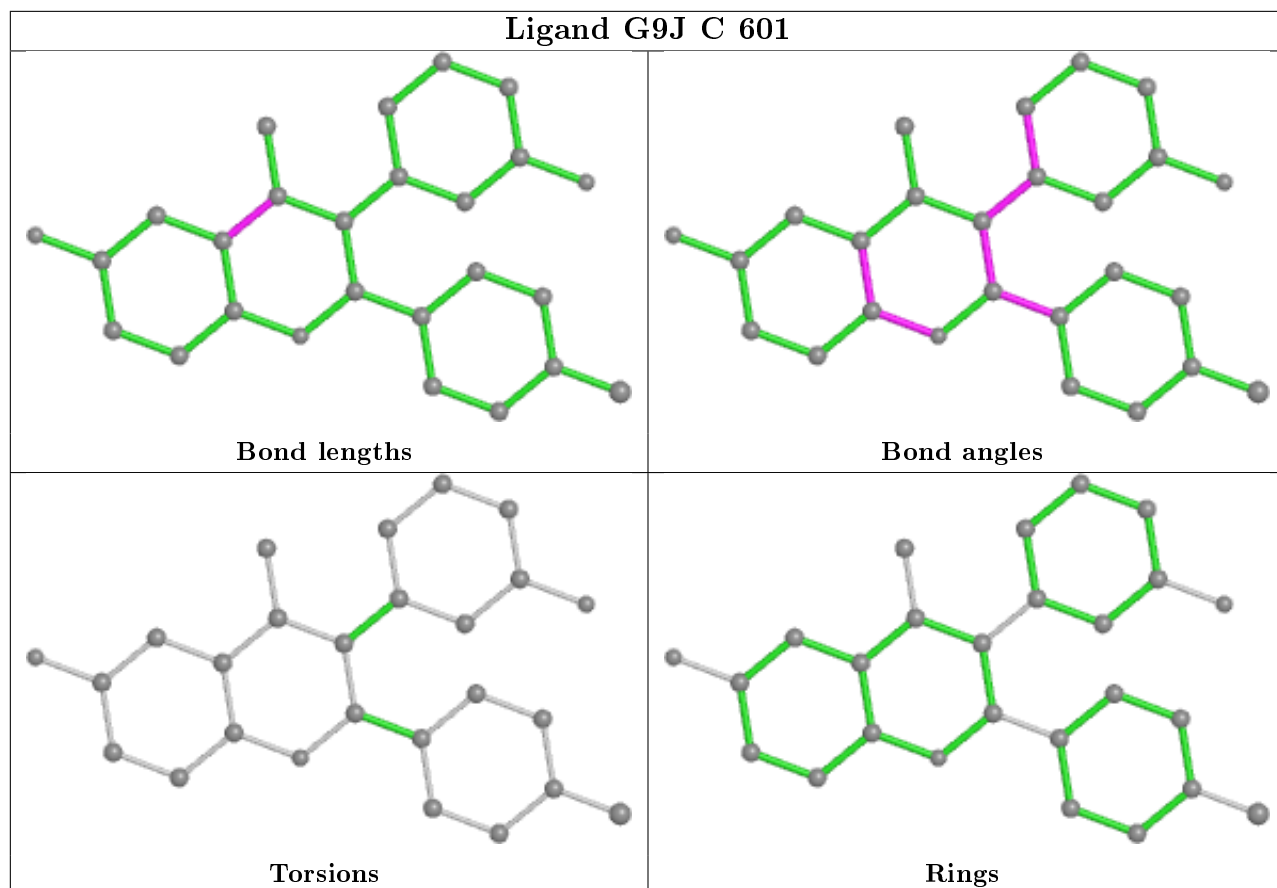
3 monomers are involved in 8 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	D	601[B]	G9J	1	0
2	A	601	G9J	1	0
5	B	604	GOL	6	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	234/280 (83%)	1.43	59 (25%) 0 0	41, 63, 96, 119	0
1	B	218/280 (77%)	1.59	62 (28%) 0 0	40, 61, 106, 131	0
1	C	228/280 (81%)	1.34	49 (21%) 0 0	42, 66, 90, 114	0
1	D	221/280 (78%)	1.54	62 (28%) 0 0	36, 61, 100, 122	0
All	All	901/1120 (80%)	1.47	232 (25%) 0 0	36, 62, 97, 131	0

All (232) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	536	SER	12.7
1	B	306	LEU	9.9
1	B	540	LEU	9.4
1	D	306	LEU	9.1
1	D	368	VAL	7.0
1	A	306	LEU	6.9
1	D	536	SER	6.8
1	B	544	LEU	6.4
1	B	545	ASP	6.3
1	D	546	ALA	6.3
1	C	494	GLY	6.2
1	C	509	LEU	5.9
1	B	537	TYR	5.9
1	C	308	LEU	5.6
1	D	526	TYR	5.6
1	A	307	ALA	5.6
1	B	508	LEU	5.6
1	B	337	PHE	5.6
1	C	508	LEU	5.6
1	D	511	LEU	5.5
1	A	310	LEU	5.4

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
1	A	511	LEU	5.3
1	C	544	LEU	5.2
1	D	545	ASP	5.2
1	A	508	LEU	5.2
1	D	539	LEU	5.2
1	D	538	ASP	5.2
1	B	539	LEU	5.2
1	D	544	LEU	5.2
1	B	511	LEU	5.1
1	B	452	ILE	5.0
1	D	509	LEU	5.0
1	D	418	VAL	4.9
1	C	491	ALA	4.9
1	B	418	VAL	4.8
1	D	507	LEU	4.7
1	C	511	LEU	4.6
1	B	451	ILE	4.5
1	A	542	GLU	4.5
1	D	508	LEU	4.5
1	B	340	ALA	4.4
1	D	451	ILE	4.4
1	A	545	ASP	4.4
1	A	417	CYS	4.3
1	A	509	LEU	4.2
1	B	425	PHE	4.2
1	D	543	MET	4.2
1	A	497	LEU	4.2
1	A	418	VAL	4.2
1	C	422	VAL	4.2
1	B	509	LEU	4.1
1	A	308	LEU	4.1
1	B	338	SER	4.1
1	A	471	GLU	4.1
1	A	409	LEU	4.1
1	C	452	ILE	4.1
1	D	510	ILE	4.0
1	B	373	HIS	4.0
1	B	541	LEU	4.0
1	D	448	LEU	3.9
1	C	401	LYS	3.9
1	B	368	VAL	3.9
1	A	452	ILE	3.9

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
1	B	453	LEU	3.9
1	A	309	SER	3.8
1	D	527	SER	3.8
1	A	470	GLU	3.8
1	B	497	LEU	3.8
1	C	469	LEU	3.8
1	A	528[A]	MET	3.7
1	C	467	LYS	3.7
1	D	425	PHE	3.7
1	C	310	LEU	3.7
1	D	497	LEU	3.7
1	C	421	MET	3.7
1	B	469	LEU	3.6
1	B	421	MET	3.6
1	C	336	PRO	3.6
1	A	331	TYR	3.6
1	B	526	TYR	3.6
1	C	468	SER	3.5
1	D	528	MET	3.5
1	C	497	LEU	3.5
1	B	374	ASP	3.5
1	C	492	LYS	3.4
1	B	377	HIS	3.4
1	B	542	GLU	3.4
1	C	370	LEU	3.4
1	A	386	ILE	3.3
1	C	309	SER	3.3
1	B	507	LEU	3.3
1	D	331	TYR	3.3
1	C	414	GLN	3.2
1	B	527	SER	3.2
1	D	397	GLU	3.2
1	A	466	LEU	3.2
1	A	512	SER	3.2
1	A	514	ILE	3.2
1	B	371	THR	3.2
1	D	452	ILE	3.2
1	B	512	SER	3.1
1	D	345	LEU	3.1
1	A	422	VAL	3.1
1	A	420	GLY	3.1
1	B	341	SER	3.1

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
1	C	384	LEU	3.1
1	C	495	LEU	3.1
1	A	437	MET	3.1
1	D	506	GLN	3.0
1	C	351	ASP	3.0
1	C	460	THR	3.0
1	D	541	LEU	3.0
1	D	411	ASP	3.0
1	A	465	THR	3.0
1	A	544	LEU	3.0
1	A	510	ILE	3.0
1	C	510	ILE	3.0
1	D	505	ALA	3.0
1	C	471	GLU	2.9
1	D	398	HIS	2.9
1	D	415	GLY	2.9
1	A	384	LEU	2.9
1	A	504	LEU	2.9
1	A	339	GLU	2.9
1	D	456	SER	2.9
1	A	468	SER	2.9
1	A	526	TYR	2.9
1	B	352[A]	ARG	2.9
1	A	411	ASP	2.9
1	D	373	HIS	2.8
1	D	389	ILE	2.8
1	A	491	ALA	2.8
1	C	368	VAL	2.8
1	B	505	ALA	2.8
1	D	387	LEU	2.8
1	B	389	ILE	2.8
1	A	461	PHE	2.8
1	C	315	MET	2.8
1	C	338	SER	2.8
1	D	378	LEU	2.8
1	D	321	ASP	2.7
1	A	507	LEU	2.7
1	B	311	THR	2.7
1	D	455	ASN	2.6
1	B	308	LEU	2.6
1	C	365	PRO	2.6
1	D	417	CYS	2.6

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
1	B	525	LEU	2.6
1	D	535	PRO	2.6
1	B	510	ILE	2.6
1	C	386	ILE	2.6
1	C	493	ALA	2.6
1	A	516	HIS	2.6
1	B	514	ILE	2.6
1	B	501	HIS	2.6
1	A	425	PHE	2.6
1	D	514	ILE	2.6
1	D	330	GLU	2.6
1	D	453	LEU	2.5
1	B	448	LEU	2.5
1	A	467	LYS	2.5
1	D	504	LEU	2.5
1	C	478	VAL	2.5
1	D	371	THR	2.5
1	D	542	GLU	2.5
1	A	389	ILE	2.5
1	A	436	ARG	2.5
1	D	540	LEU	2.5
1	C	528	MET	2.5
1	B	546	ALA	2.4
1	B	409	LEU	2.4
1	C	489	LEU	2.4
1	D	327	LEU	2.4
1	C	472	LYS	2.4
1	B	420	GLY	2.4
1	C	512	SER	2.4
1	D	458	VAL	2.4
1	D	439	ASN	2.4
1	A	354	LEU	2.4
1	C	448	LEU	2.4
1	C	417	CYS	2.3
1	D	386	ILE	2.3
1	B	384	LEU	2.3
1	C	453	LEU	2.3
1	A	399	PRO	2.3
1	A	355	VAL	2.3
1	B	422	VAL	2.3
1	D	421	MET	2.3
1	A	513	HIS	2.3

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
1	A	345	LEU	2.3
1	B	528	MET	2.3
1	A	460	THR	2.3
1	B	456	SER	2.3
1	A	505	ALA	2.2
1	B	345	LEU	2.2
1	A	365	PRO	2.2
1	D	360	TRP	2.2
1	A	451	ILE	2.2
1	B	382	ALA	2.2
1	D	434	ARG	2.2
1	B	351	ASP	2.2
1	B	482	ILE	2.2
1	D	399	PRO	2.2
1	C	373	HIS	2.2
1	B	343	MET	2.2
1	A	313	ASP	2.2
1	D	446	VAL	2.2
1	C	516	HIS	2.2
1	C	372	SER	2.1
1	D	482	ILE	2.1
1	A	349	LEU	2.1
1	A	486	LEU	2.1
1	D	428	LEU	2.1
1	A	416	LYS	2.1
1	D	424	ILE	2.1
1	B	504	LEU	2.1
1	B	339	GLU	2.1
1	B	457	GLY	2.1
1	A	342	MET	2.1
1	B	342	MET	2.1
1	C	532	ASN	2.1
1	D	369	ASP	2.1
1	A	368	VAL	2.1
1	C	342	MET	2.1
1	A	495	LEU	2.1
1	C	409	LEU	2.0
1	C	416	LYS	2.0
1	B	370	LEU	2.0
1	B	474	HIS	2.0
1	B	369	ASP	2.0
1	D	487	ILE	2.0

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Mol	Chain	Res	Type	RSRZ
1	C	515	ARG	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](#)

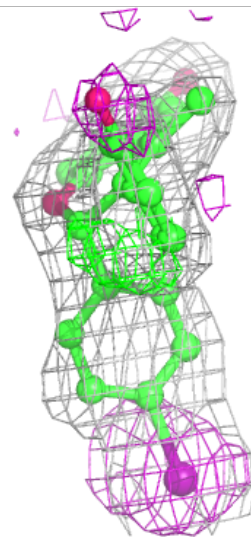
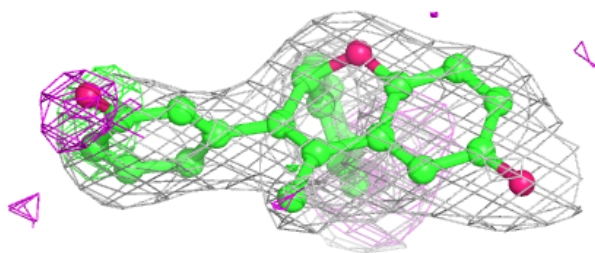
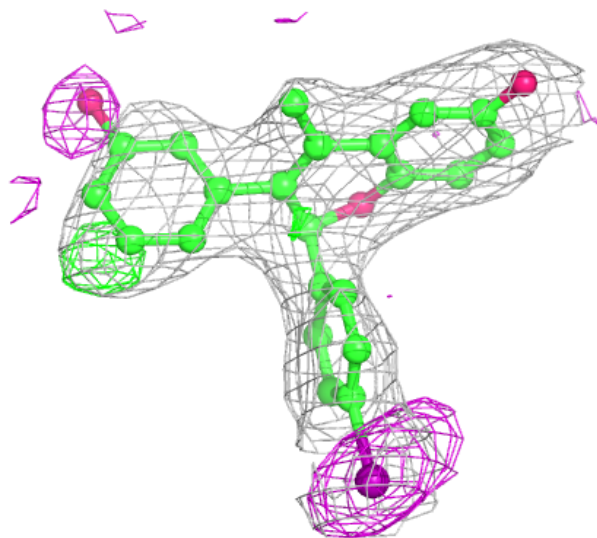
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 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	NI	A	602	1/1	-0.32	0.53	159,159,159,159	0
5	GOL	B	603	6/6	0.30	0.41	85,86,87,87	0
5	GOL	B	604	6/6	0.77	0.38	73,74,76,77	0
5	GOL	D	603	6/6	0.85	0.13	64,66,68,69	0
4	G9I	B	601[A]	36/36	0.90	0.18	42,50,61,61	36
2	G9J	A	601	26/26	0.90	0.18	48,53,64,68	0
2	G9J	B	602[B]	26/26	0.91	0.16	60,64,71,82	26
4	G9I	D	602[A]	36/36	0.92	0.18	57,60,69,70	36
2	G9J	D	601[B]	26/26	0.92	0.15	53,55,61,71	26
2	G9J	C	601	26/26	0.93	0.16	49,56,68,73	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.

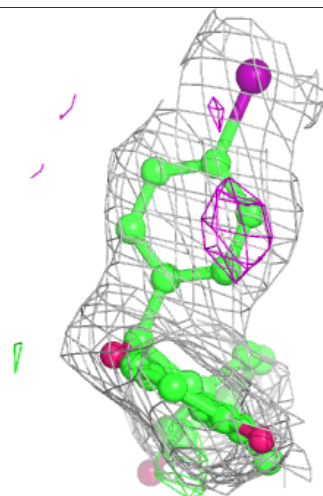
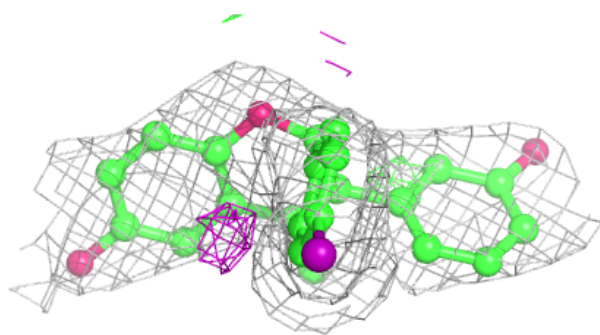
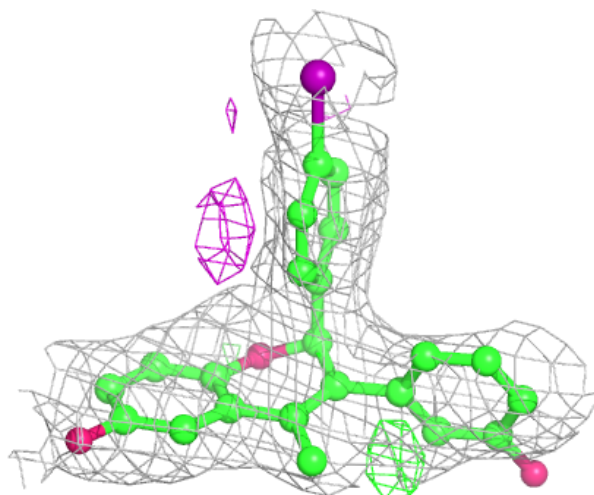
**Electron density around G9J A 601:**

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



**Electron density around G9J B 602 (B):**

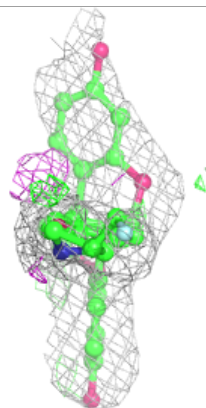
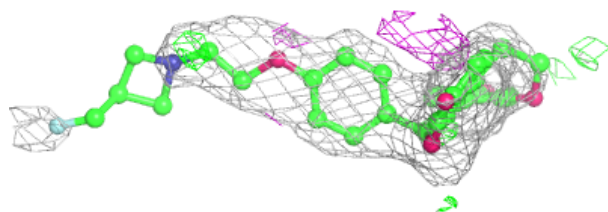
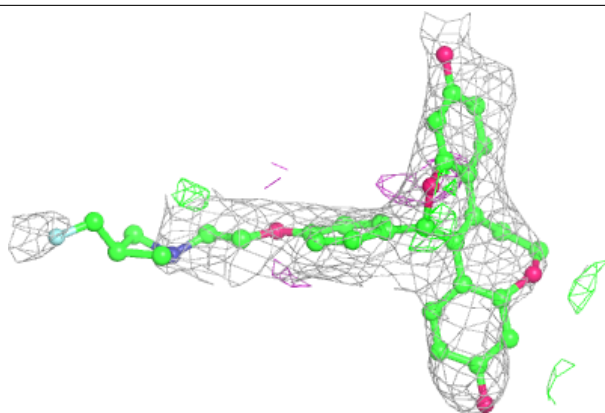
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)





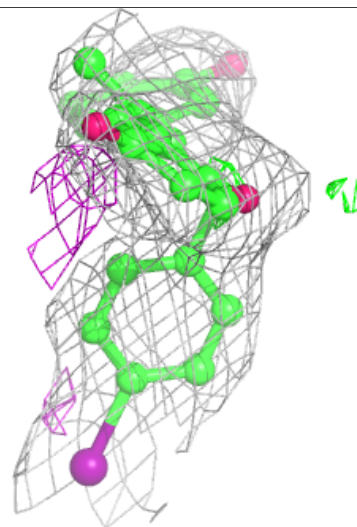
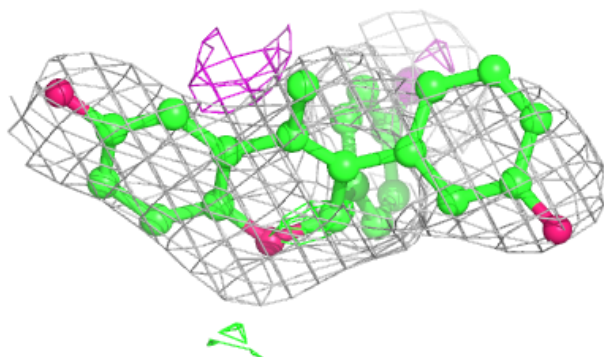
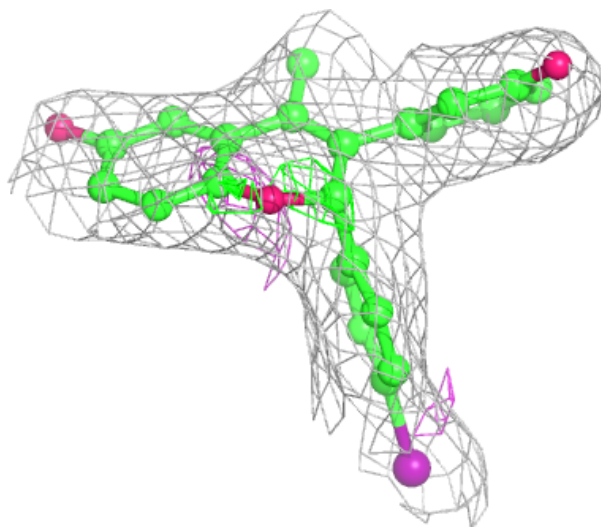
**Electron density around G91 D 602 (A):**

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



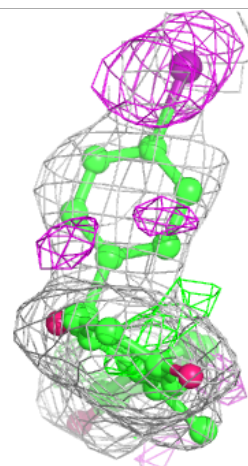
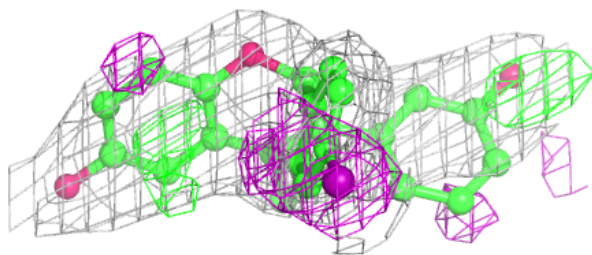
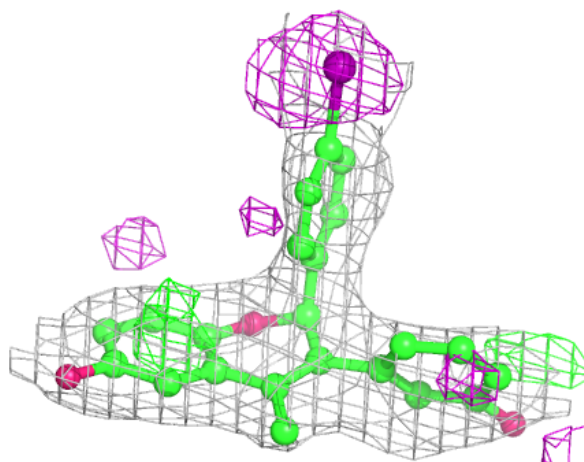
**Electron density around G9J D 601 (B):**

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



**Electron density around G9J C 601:**

$2mF_o-DF_c$  (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.