



# wwPDB X-ray Structure Validation Summary Report

Aug 16, 2023 – 12:02 AM EDT

PDB ID : 1SO2  
Title : CATALYTIC DOMAIN OF HUMAN PHOSPHODIESTERASE 3B In COMPLEX WITH A DIHYDROPYRIDAZINE INHIBITOR  
Authors : Scapin, G.; Patel, S.B.; Chung, C.; Varnerin, J.P.; Edmondson, S.D.; Mastracchio, A.; Parmee, E.R.; Becker, J.W.; Singh, S.B.; Van Der Ploeg, L.H.; Tota, M.R.  
Deposited on : 2004-03-12  
Resolution : 2.40 Å(reported)

This is a wwPDB X-ray Structure Validation Summary 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](#) ①) were used in the production of this report:

MolProbity : 4.02b-467  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
Xtrriage (Phenix) : 1.13  
EDS : 2.35  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Refmac : 5.8.0158  
CCP4 : 7.0.044 (Gargrove)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.35

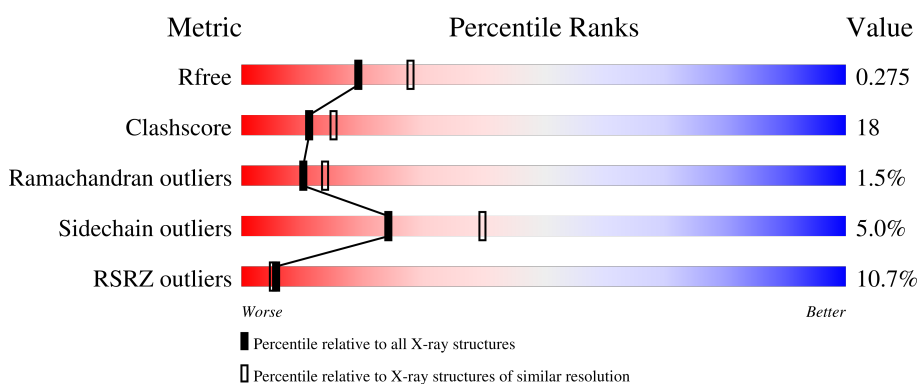
# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.40 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 <sub>free</sub>	130704	3907 (2.40-2.40)
Clashscore	141614	4398 (2.40-2.40)
Ramachandran outliers	138981	4318 (2.40-2.40)
Sidechain outliers	138945	4319 (2.40-2.40)
RSRZ outliers	127900	3811 (2.40-2.40)

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	420	9% (Poor fit) 61% (0 outliers), 23% (1 outlier), 14% (2+ outliers)
1	B	420	8% (Poor fit) 60% (0 outliers), 24% (1 outlier), 14% (2+ outliers)
1	C	420	9% (Poor fit) 63% (0 outliers), 24% (1 outlier), 11% (2+ outliers)
1	D	420	12% (Poor fit) 50% (0 outliers), 33% (1 outlier), 5% (2 outliers), 13% (2+ outliers)

## 2 Entry composition [i](#)

There are 5 unique types of molecules in this entry. The entry contains 12292 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.

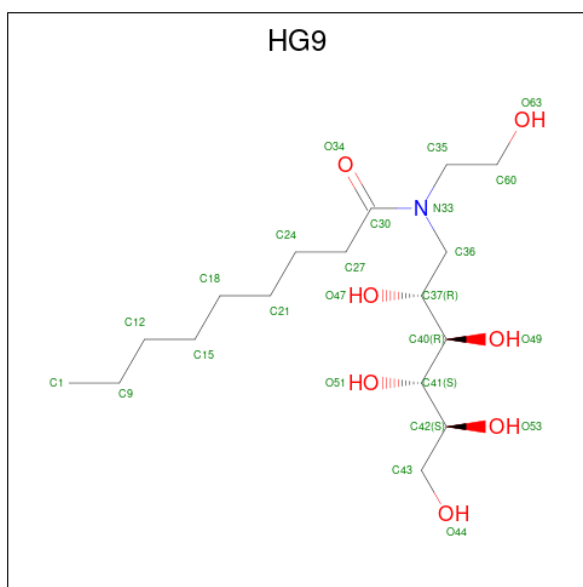
- Molecule 1 is a protein called cGMP-inhibited 3',5'-cyclic phosphodiesterase B.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	363	2916	1868	501	533	14	0	0	0
1	B	363	2909	1863	500	532	14	0	0	0
1	C	372	2964	1897	508	545	14	0	0	0
1	D	365	2916	1867	500	535	14	0	0	0

- Molecule 2 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

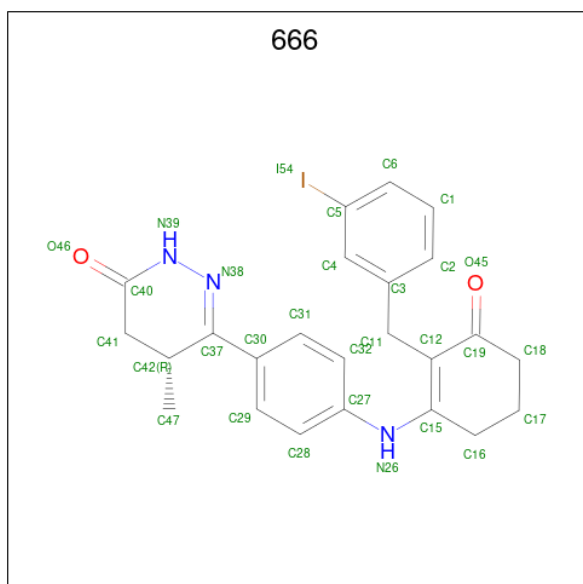
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	3	Total 3	Mg 3	0	0
2	B	2	Total 2	Mg 2	0	0
2	C	2	Total 2	Mg 2	0	0
2	D	2	Total 2	Mg 2	0	0

- Molecule 3 is 1-DEOXY-1-[(2-HYDROXYETHYL)(NONANOYL)AMINO]HEXITOL (three-letter code: HG9) (formula: C<sub>17</sub>H<sub>35</sub>NO<sub>7</sub>).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf	
			Total	C	N			O
3	A	1	24	16	1	7	0	0
3	A	1	24	16	1	7	0	0
3	B	1	24	16	1	7	0	0
3	B	1	24	16	1	7	0	0

- Molecule 4 is 6-(4-{[2-(3-iodobenzyl)-3-oxocyclohex-1-en-1-yl]amino}phenyl)-5-methyl-4,5-dihydropyridazin-3(2H)-one (three-letter code: 666) (formula:  $C_{24}H_{24}IN_3O_2$ ).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	
4	A	1	Total	C	I	N	O	0	0
			30	24	1	3	2		
4	B	1	Total	C	I	N	O	0	0
			30	24	1	3	2		
4	C	1	Total	C	I	N	O	0	0
			30	24	1	3	2		
4	D	1	Total	C	I	N	O	0	0
			30	24	1	3	2		

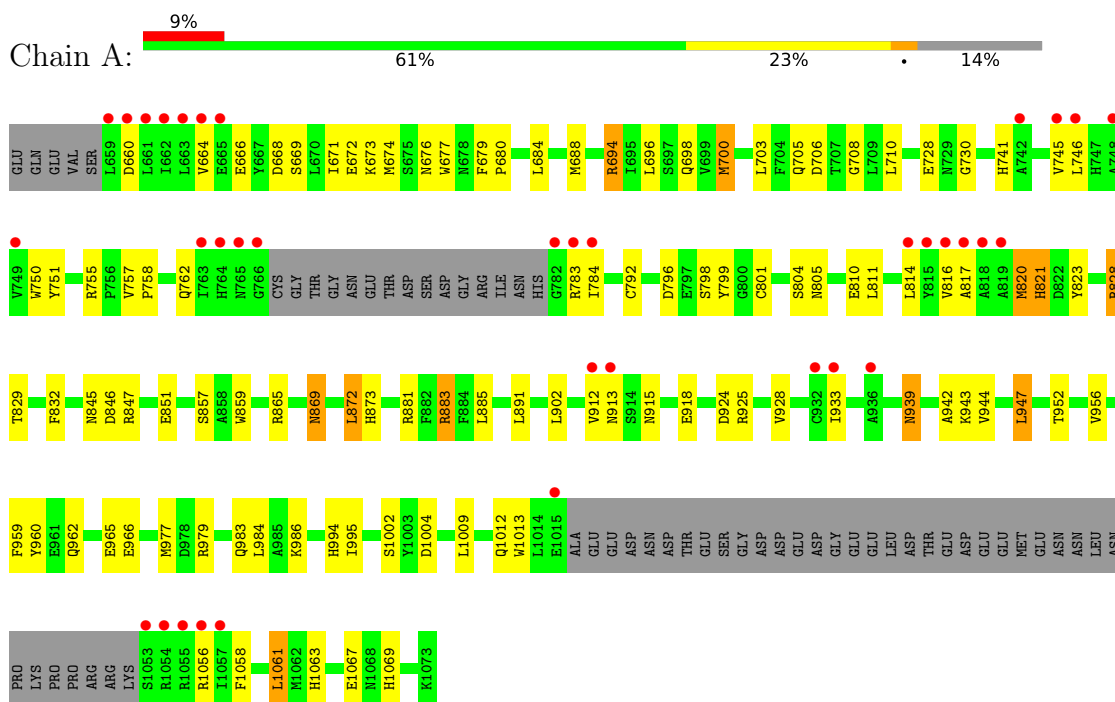
- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	119	Total	O	0	0
			119	119		
5	B	115	Total	O	0	0
			115	115		
5	C	70	Total	O	0	0
			70	70		
5	D	58	Total	O	0	0
			58	58		

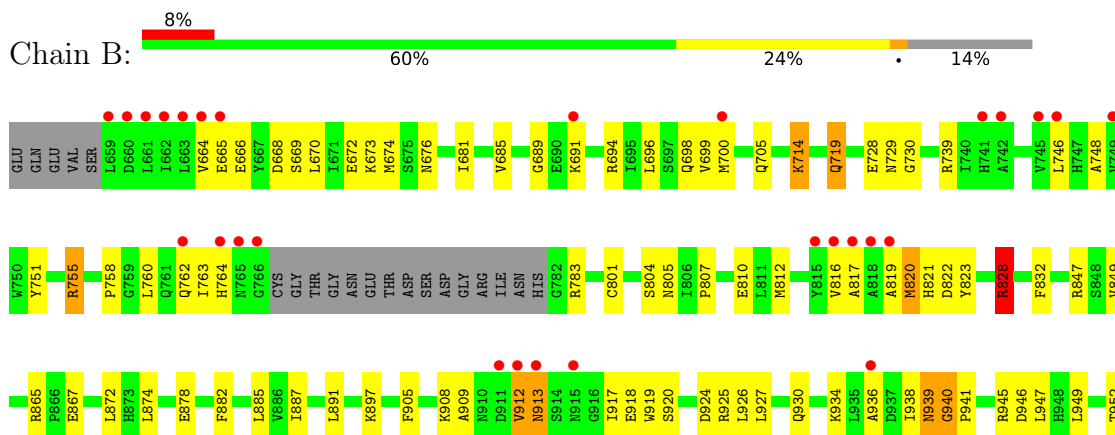
### 3 Residue-property plots [i](#)

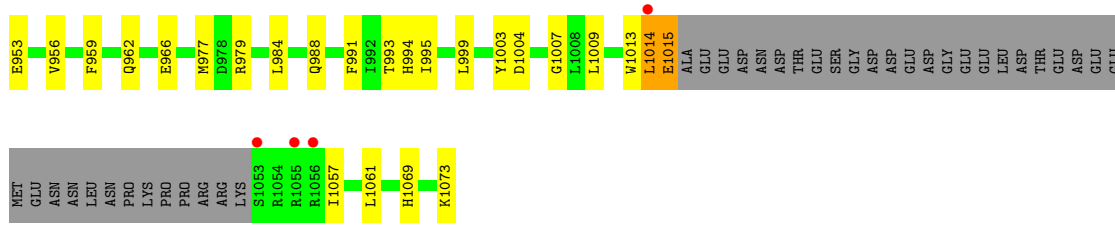
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. 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: cGMP-inhibited 3',5'-cyclic phosphodiesterase B

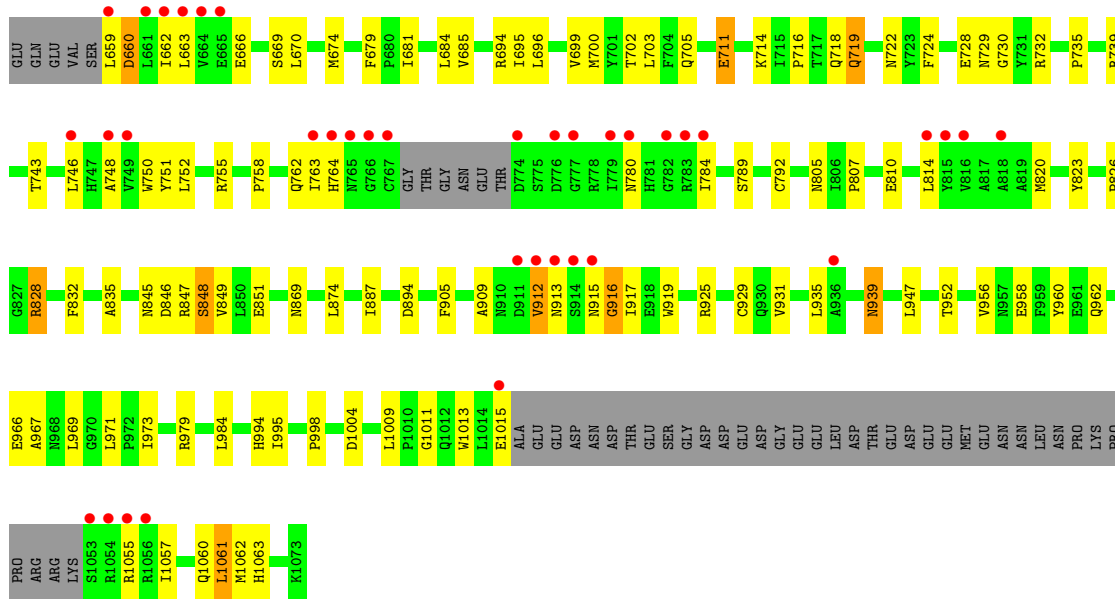


- Molecule 1: cGMP-inhibited 3',5'-cyclic phosphodiesterase B

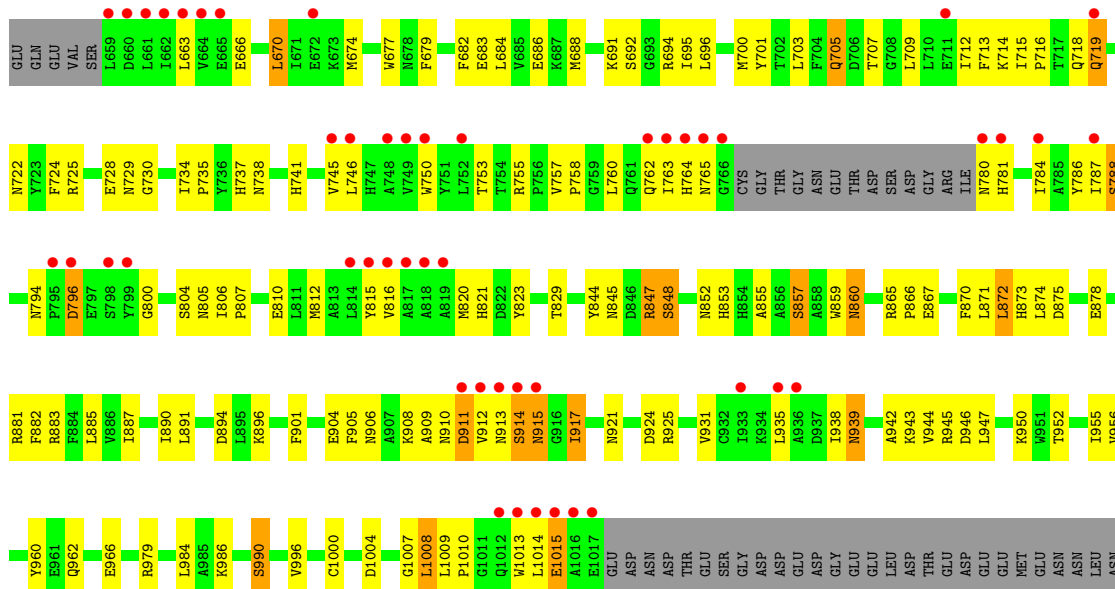




● Molecule 1: cGMP-inhibited 3',5'-cyclic phosphodiesterase B



● Molecule 1: cGMP-inhibited 3',5'-cyclic phosphodiesterase B







## 4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	147.48Å 121.77Å 126.67Å 90.00° 100.74° 90.00°	Depositor
Resolution (Å)	30.00 – 2.40 29.82 – 2.40	Depositor EDS
% Data completeness (in resolution range)	99.8 (30.00-2.40) 99.8 (29.82-2.40)	Depositor EDS
$R_{merge}$	0.06	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	4.10 (at 2.39Å)	Xtrriage
Refinement program	CNX	Depositor
R, $R_{free}$	0.232 , 0.277 0.228 , 0.275	Depositor DCC
$R_{free}$ test set	4345 reflections (5.07%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	39.8	Xtrriage
Anisotropy	0.881	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.33 , 46.6	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.51$ , $\langle L^2 \rangle = 0.34$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.94	EDS
Total number of atoms	12292	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	48.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.49% 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: MG, 666, HG9

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	0.59	0/2992	0.67	1/4063 (0.0%)
1	B	0.58	0/2985	0.70	1/4054 (0.0%)
1	C	0.55	0/3040	0.66	0/4129
1	D	0.58	0/2992	0.64	0/4065
All	All	0.57	0/12009	0.67	2/16311 (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	828	ARG	NE-CZ-NH2	-5.26	117.67	120.30
1	A	821	HIS	N-CA-C	5.22	125.09	111.00

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	2916	0	2803	83	0
1	B	2909	0	2788	107	0
1	C	2964	0	2834	87	0
1	D	2916	0	2788	148	0
2	A	3	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	B	2	0	0	0	0
2	C	2	0	0	0	0
2	D	2	0	0	0	0
3	A	48	0	60	2	0
3	B	48	0	60	2	0
4	A	30	0	24	2	0
4	B	30	0	24	2	0
4	C	30	0	24	1	0
4	D	30	0	24	3	0
5	A	119	0	0	2	0
5	B	115	0	0	6	0
5	C	70	0	0	3	0
5	D	58	0	0	4	0
All	All	12292	0	11429	419	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 18.

The worst 5 of 419 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:A:700:MET:HE3	1:A:746:LEU:HD21	1.38	1.00
1:C:828:ARG:HG2	1:C:832:PHE:CD2	1.96	0.99
1:C:967:ALA:HB2	1:C:973:ILE:HD11	1.45	0.96
1:B:828:ARG:HG2	1:B:832:PHE:CD2	2.04	0.93
1:B:719:GLN:H	1:B:719:GLN:HE21	0.99	0.92

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	357/420 (85%)	337 (94%)	18 (5%)	2 (1%)	25	36
1	B	357/420 (85%)	325 (91%)	26 (7%)	6 (2%)	9	11
1	C	366/420 (87%)	336 (92%)	25 (7%)	5 (1%)	11	15
1	D	359/420 (86%)	319 (89%)	31 (9%)	9 (2%)	5	6
All	All	1439/1680 (86%)	1317 (92%)	100 (7%)	22 (2%)	10	14

5 of 22 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	912	VAL
1	B	913	ASN
1	C	660	ASP
1	D	914	SER
1	D	1015	GLU

### 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	310/370 (84%)	293 (94%)	17 (6%)	21	35
1	B	308/370 (83%)	295 (96%)	13 (4%)	30	47
1	C	313/370 (85%)	301 (96%)	12 (4%)	33	51
1	D	308/370 (83%)	288 (94%)	20 (6%)	17	27
All	All	1239/1480 (84%)	1177 (95%)	62 (5%)	24	40

5 of 62 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	1014	LEU
1	D	911	ASP
1	C	792	CYS
1	D	910	ASN
1	D	990	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 36 such sidechains are listed below:

Mol	Chain	Res	Type
1	D	729	ASN
1	D	939	ASN
1	D	805	ASN
1	D	898	HIS
1	B	869	ASN

### 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 17 ligands modelled in this entry, 9 are monoatomic - leaving 8 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	HG9	A	454	-	23,23,24	1.71	6 (26%)	27,28,29	1.48	4 (14%)
4	666	D	464	-	33,33,33	3.88	25 (75%)	43,46,46	2.74	13 (30%)
3	HG9	B	451	-	23,23,24	1.86	5 (21%)	27,28,29	1.15	2 (7%)
3	HG9	A	453	-	23,23,24	1.51	3 (13%)	27,28,29	1.27	3 (11%)
3	HG9	B	452	-	23,23,24	1.47	3 (13%)	27,28,29	1.29	5 (18%)
4	666	B	462	-	33,33,33	3.81	22 (66%)	43,46,46	2.66	9 (20%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
4	666	A	461	-	33,33,33	3.89	25 (75%)	43,46,46	2.66	12 (27%)
4	666	C	463	-	33,33,33	3.83	24 (72%)	43,46,46	2.73	9 (20%)

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	HG9	A	454	-	-	6/32/32/33	-
4	666	D	464	-	-	1/12/39/39	0/4/4/4
3	HG9	B	451	-	-	4/32/32/33	-
3	HG9	A	453	-	-	4/32/32/33	-
3	HG9	B	452	-	-	5/32/32/33	-
4	666	B	462	-	-	1/12/39/39	0/4/4/4
4	666	A	461	-	-	1/12/39/39	0/4/4/4
4	666	C	463	-	-	1/12/39/39	0/4/4/4

The worst 5 of 113 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	D	464	666	C15-N26	10.29	1.49	1.35
4	A	461	666	C15-N26	10.13	1.49	1.35
4	B	462	666	C37-N38	9.81	1.39	1.29
4	B	462	666	C15-N26	9.80	1.49	1.35
4	A	461	666	C37-N38	9.52	1.38	1.29

The worst 5 of 57 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	B	462	666	C11-C12-C19	-9.79	102.99	118.50
4	D	464	666	C11-C12-C19	-9.57	103.33	118.50
4	A	461	666	C11-C12-C19	-8.99	104.26	118.50
4	C	463	666	C11-C12-C19	-8.21	105.49	118.50
4	C	463	666	C19-C12-C15	-8.16	113.59	120.37

There are no chirality outliers.

5 of 23 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	453	HG9	N33-C36-C37-C40
3	A	453	HG9	N33-C36-C37-O47
3	A	454	HG9	N33-C36-C37-O47
3	B	451	HG9	N33-C36-C37-C40
3	B	451	HG9	N33-C36-C37-O47

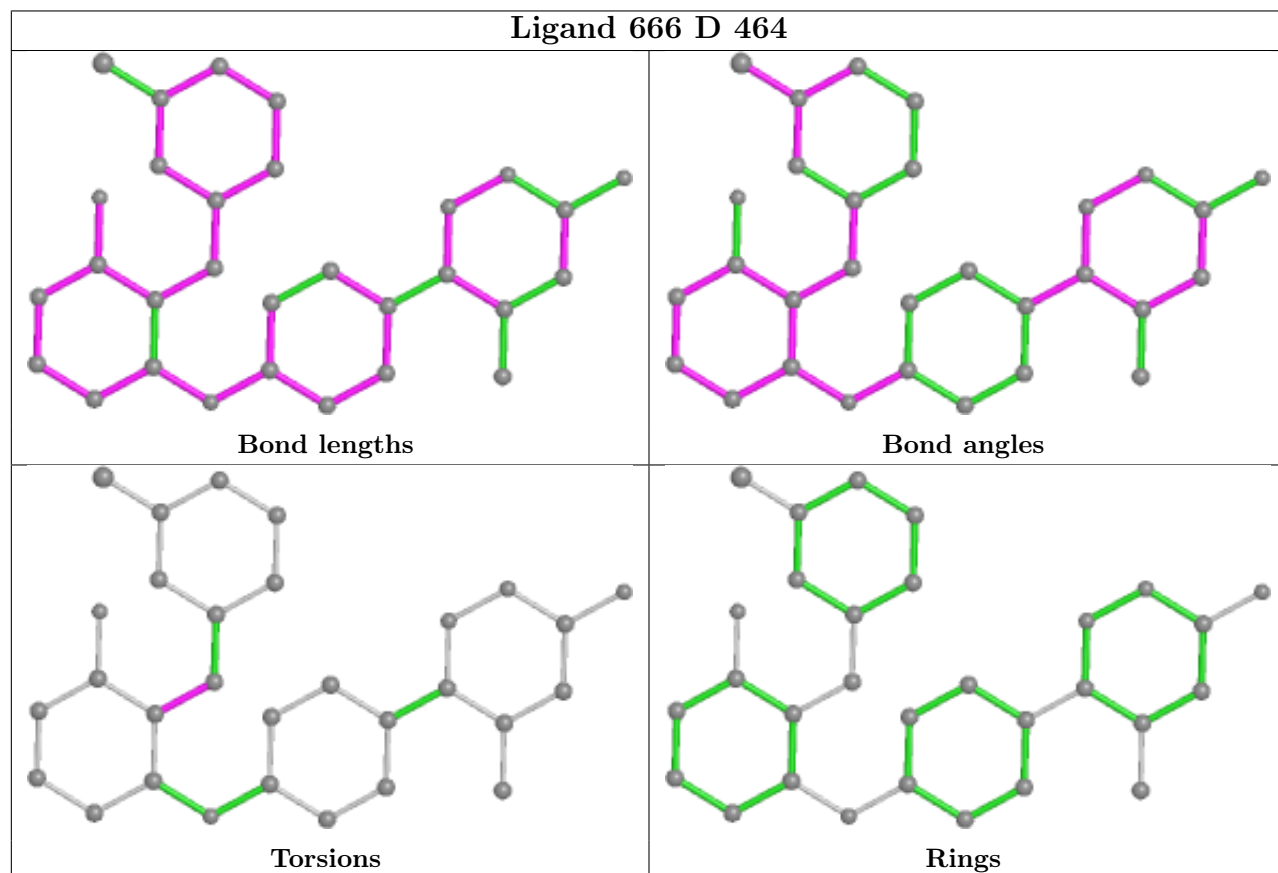
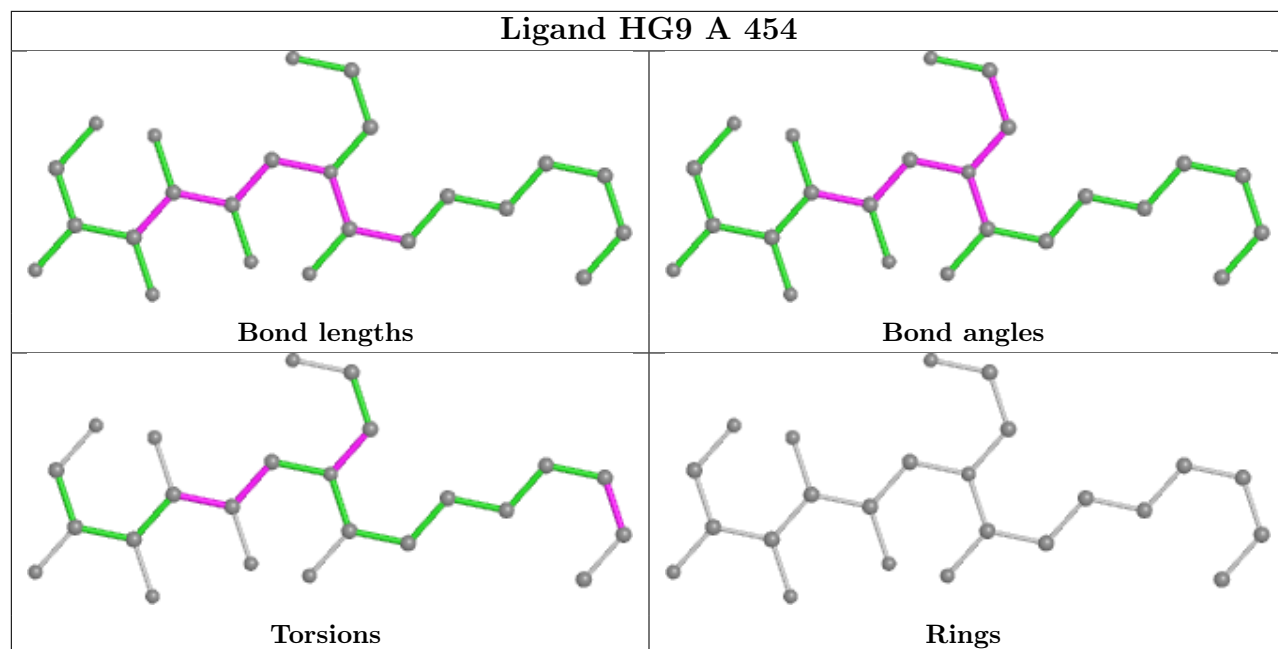
There are no ring outliers.

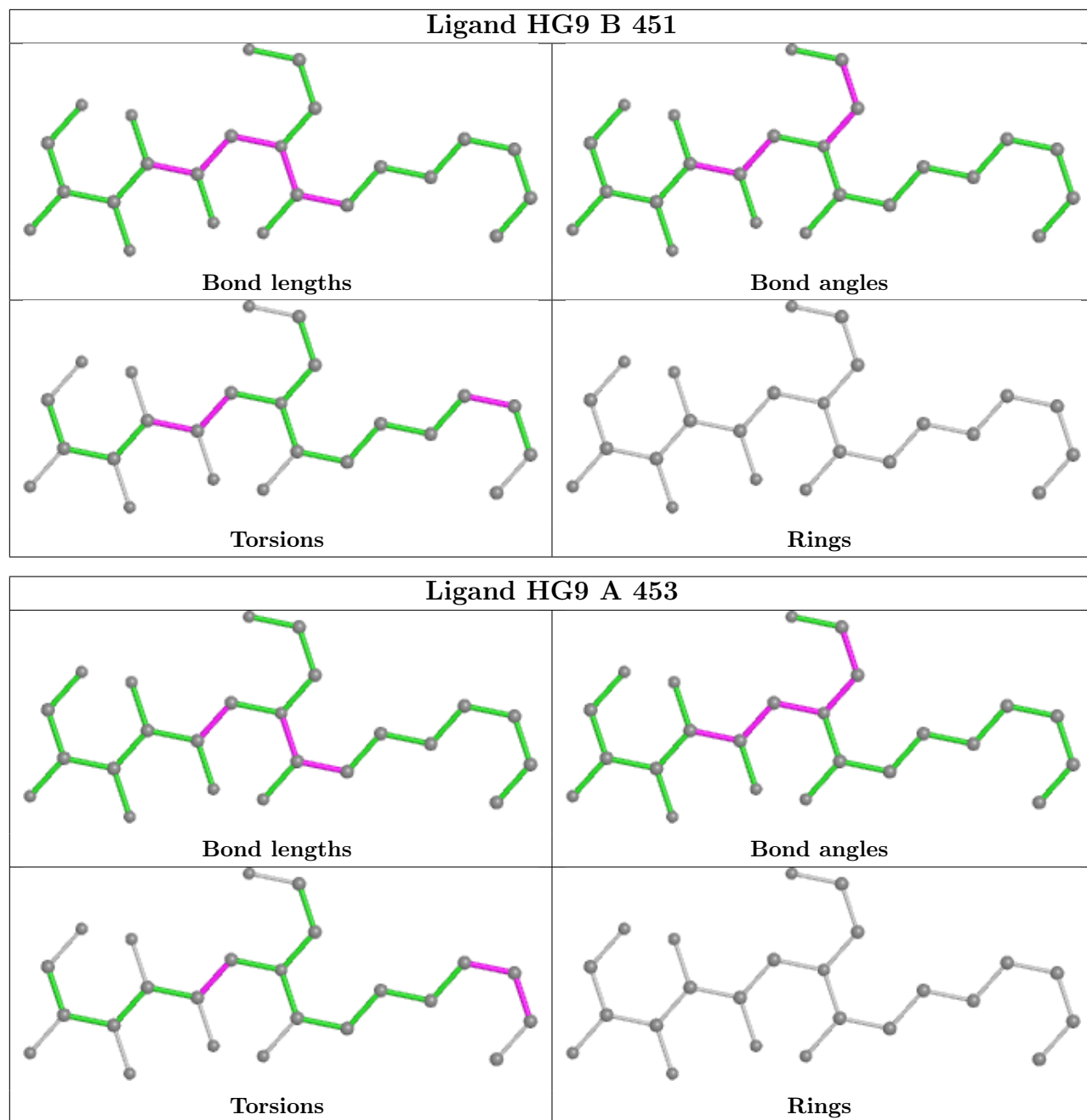
6 monomers are involved in 12 short contacts:

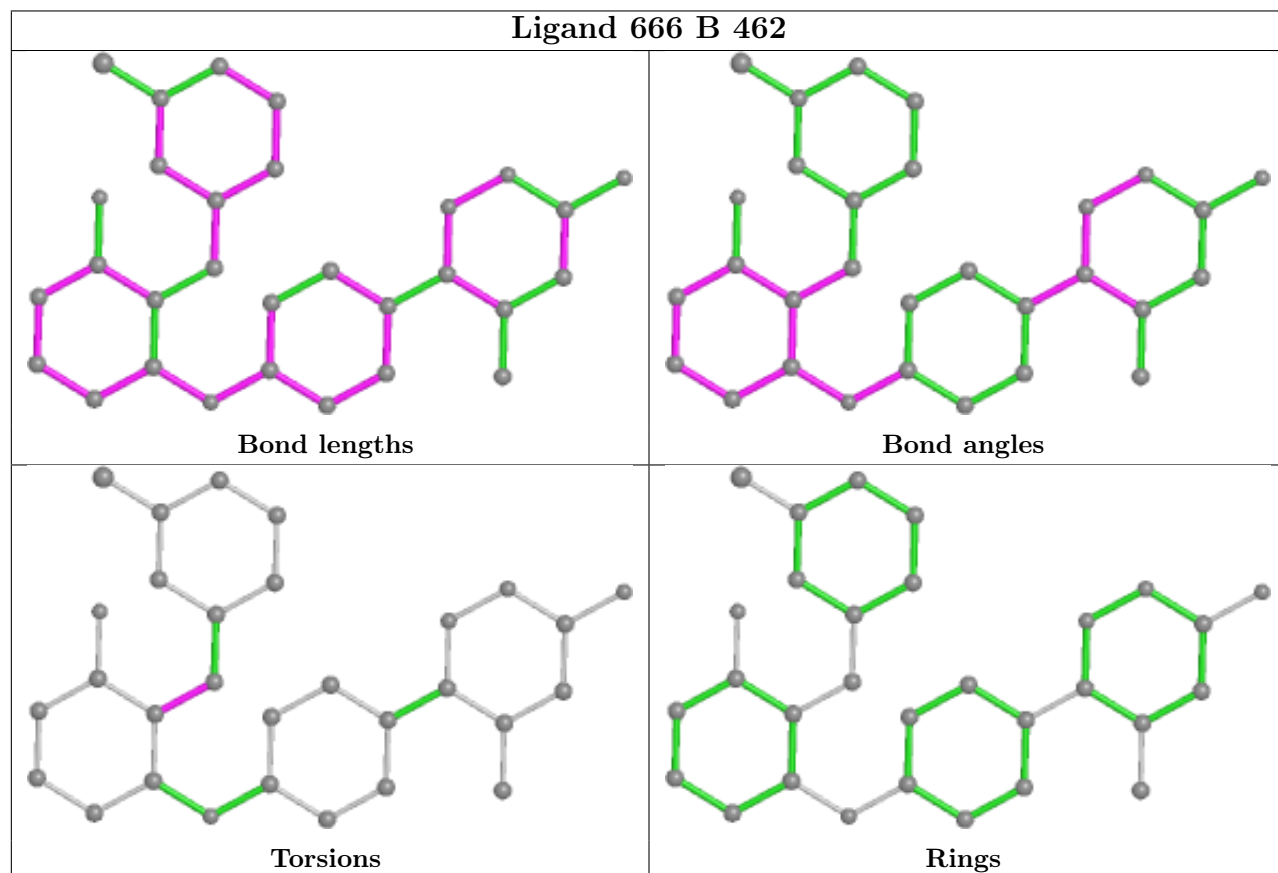
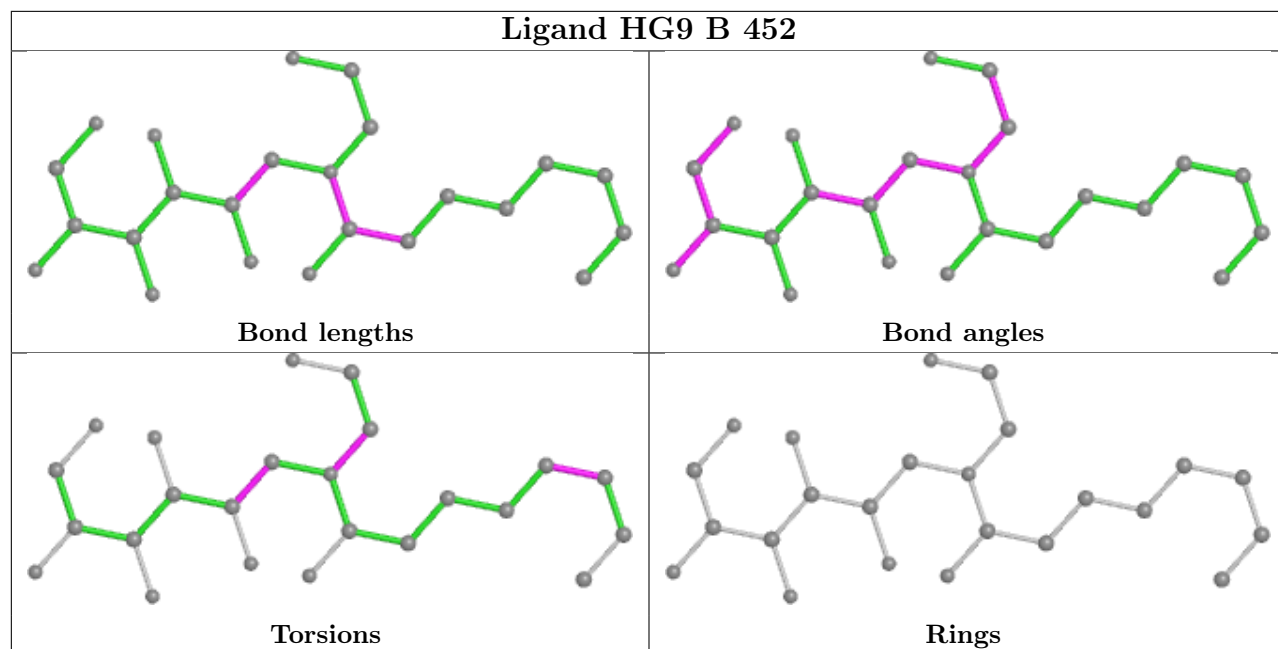
Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	D	464	666	3	0
3	B	451	HG9	2	0
3	A	453	HG9	2	0
4	B	462	666	2	0
4	A	461	666	2	0
4	C	463	666	1	0

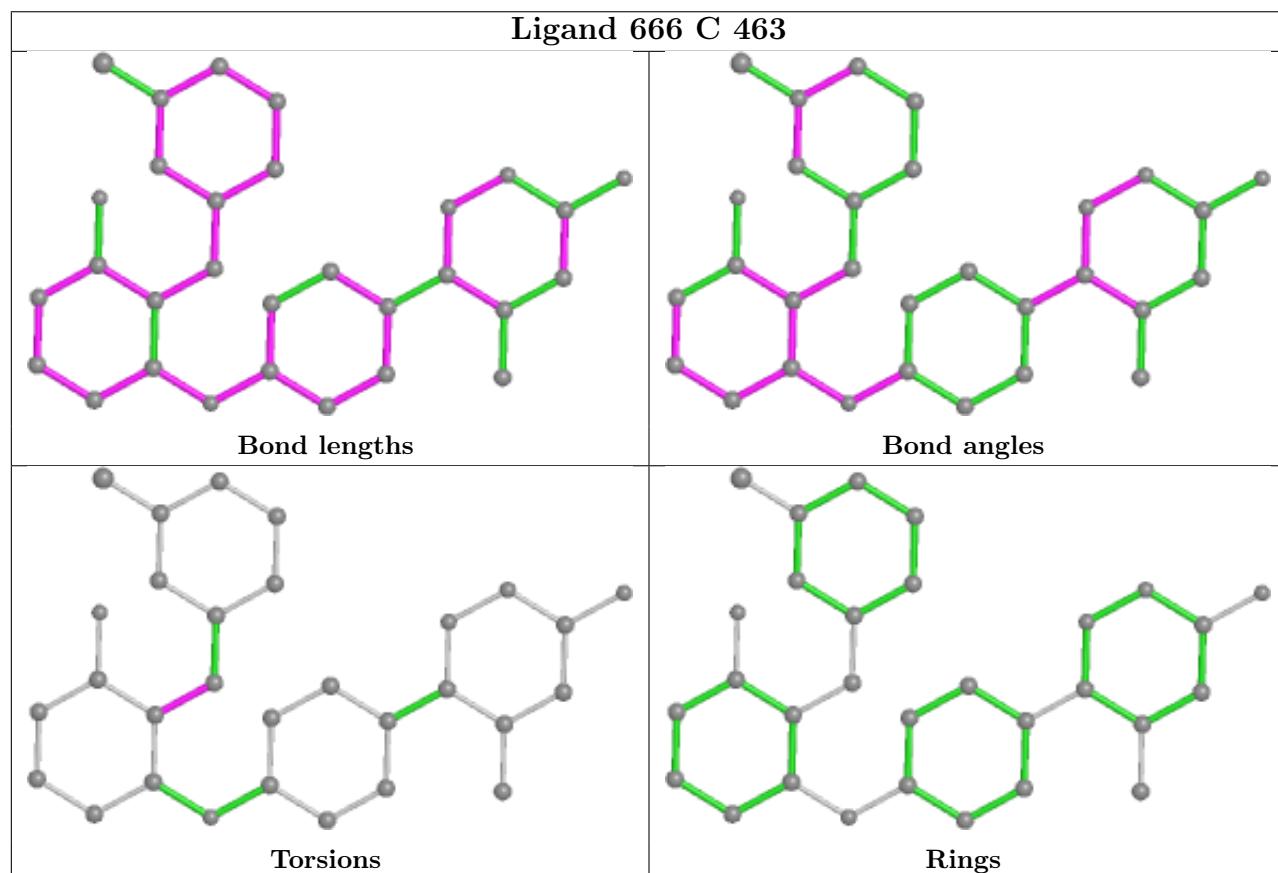
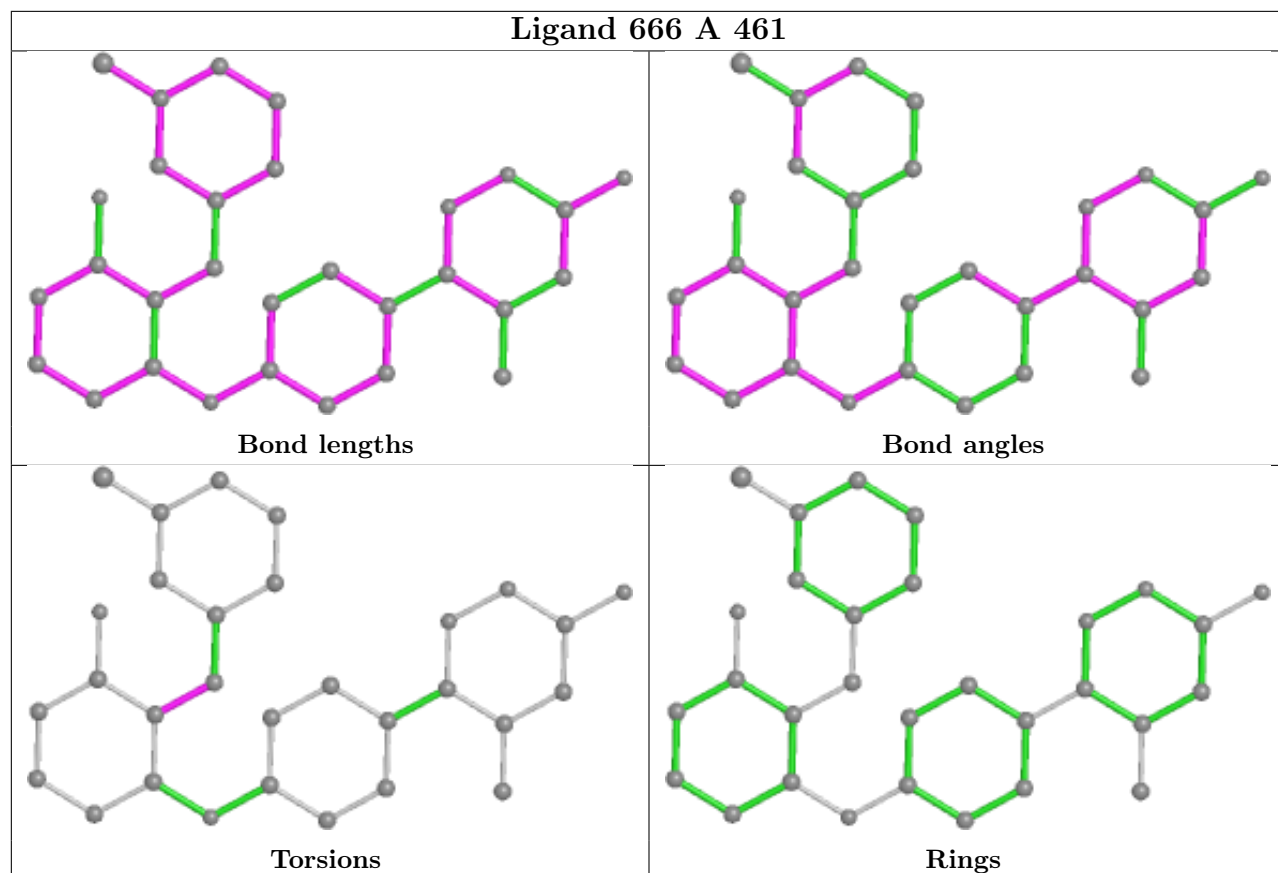
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. 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	363/420 (86%)	0.28	36 (9%) 7 6	26, 42, 69, 77	0
1	B	363/420 (86%)	0.29	32 (8%) 10 9	23, 43, 70, 79	0
1	C	372/420 (88%)	0.39	37 (9%) 7 6	34, 49, 72, 78	0
1	D	365/420 (86%)	0.73	52 (14%) 2 2	33, 55, 74, 79	0
All	All	1463/1680 (87%)	0.42	157 (10%) 6 5	23, 48, 72, 79	0

The worst 5 of 157 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	1016	ALA	9.5
1	A	662	ILE	8.1
1	C	661	LEU	8.0
1	A	1053	SER	7.4
1	A	659	LEU	7.1

### 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](#)

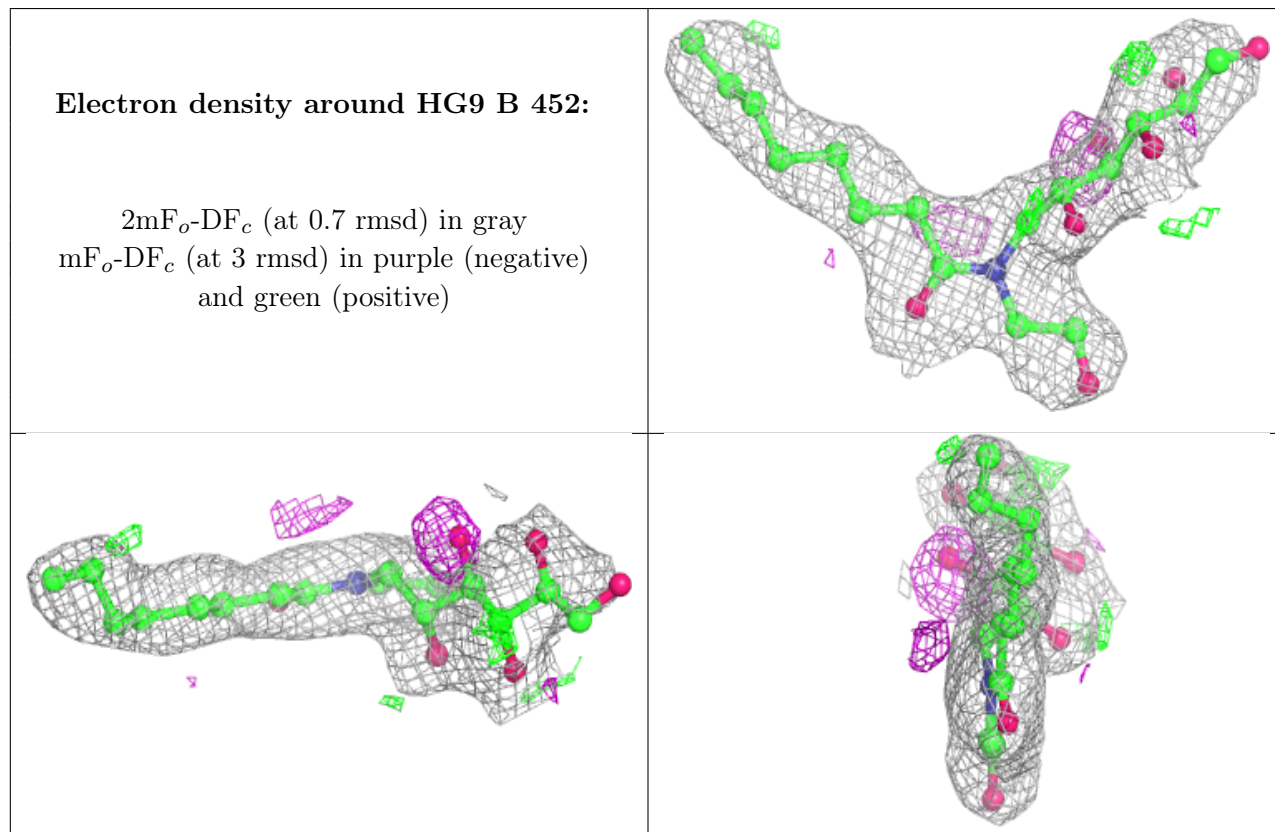
There are no monosaccharides in this entry.

### 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.

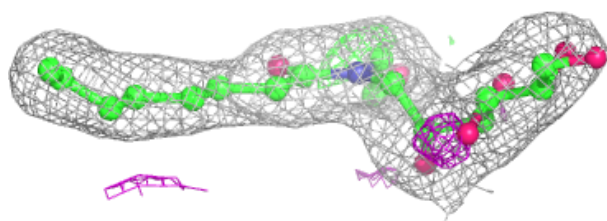
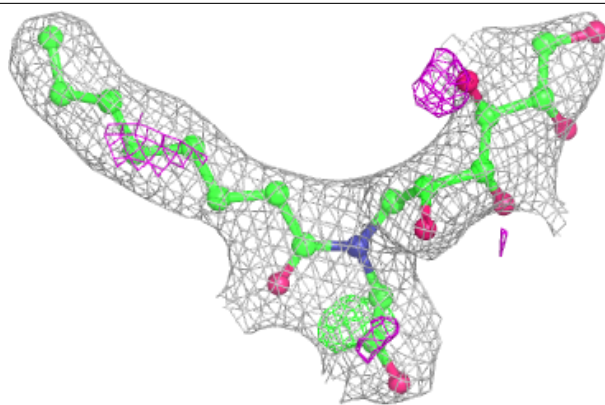
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
3	HG9	B	452	24/25	0.76	0.26	48,54,68,70	0
3	HG9	B	451	24/25	0.78	0.28	37,49,69,70	0
3	HG9	A	453	24/25	0.80	0.27	42,53,65,67	0
3	HG9	A	454	24/25	0.83	0.22	46,61,71,74	0
4	666	C	463	30/30	0.93	0.20	39,53,72,85	0
4	666	A	461	30/30	0.94	0.17	32,43,59,73	0
4	666	B	462	30/30	0.95	0.20	36,43,60,68	0
4	666	D	464	30/30	0.95	0.18	46,50,65,82	0
2	MG	A	472	1/1	0.97	0.19	32,32,32,32	0
2	MG	A	479	1/1	0.97	0.06	39,39,39,39	0
2	MG	B	474	1/1	0.97	0.14	33,33,33,33	0
2	MG	C	476	1/1	0.97	0.18	37,37,37,37	0
2	MG	D	477	1/1	0.99	0.18	34,34,34,34	0
2	MG	D	478	1/1	0.99	0.13	31,31,31,31	0
2	MG	A	471	1/1	0.99	0.27	34,34,34,34	0
2	MG	C	475	1/1	0.99	0.16	28,28,28,28	0
2	MG	B	473	1/1	0.99	0.29	23,23,23,23	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.

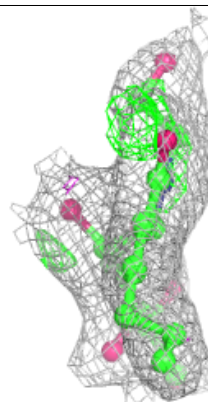
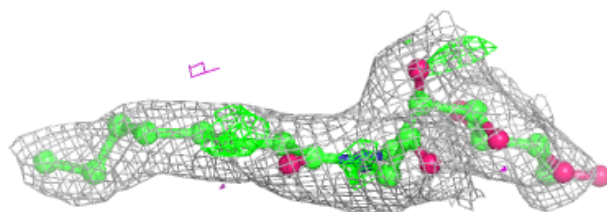
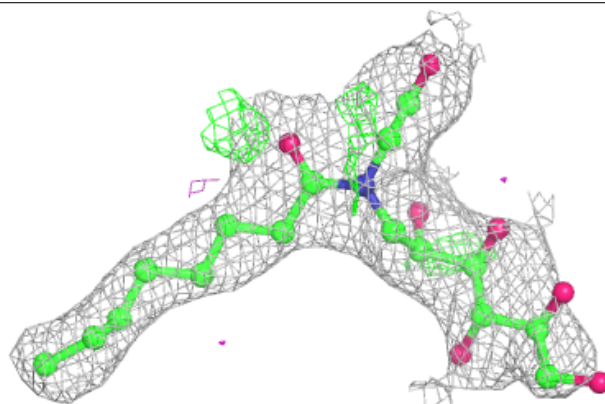


**Electron density around HG9 B 451:**

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

**Electron density around HG9 A 453:**

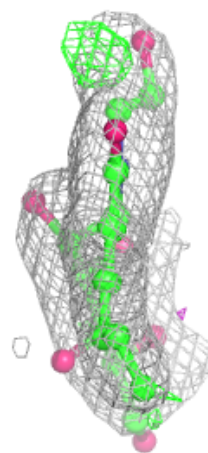
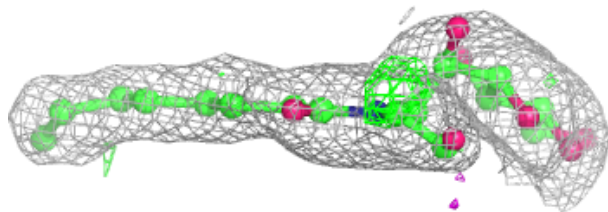
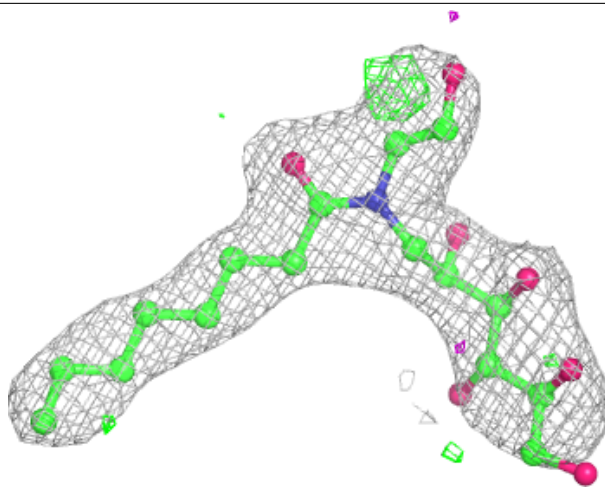
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)





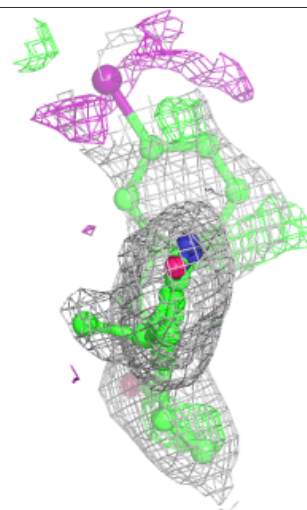
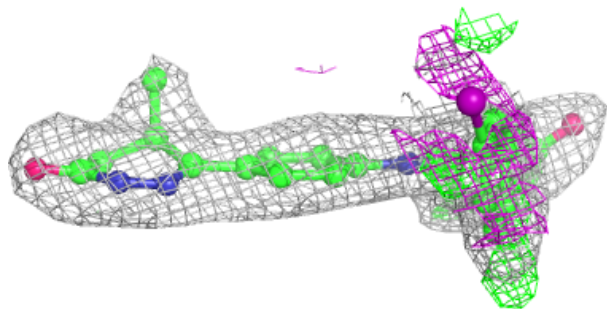
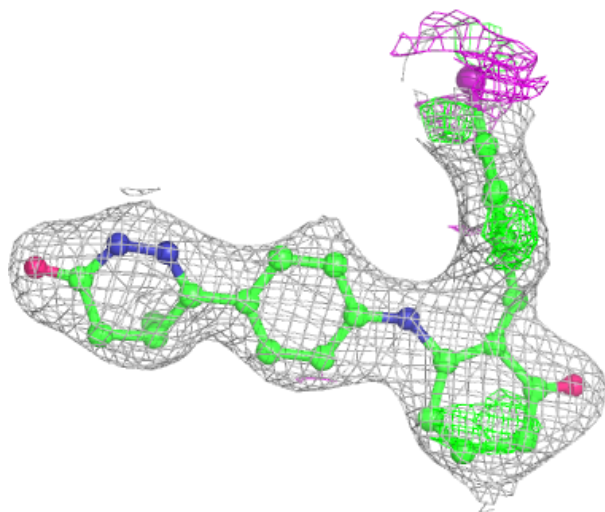
**Electron density around HG9 A 454:**

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



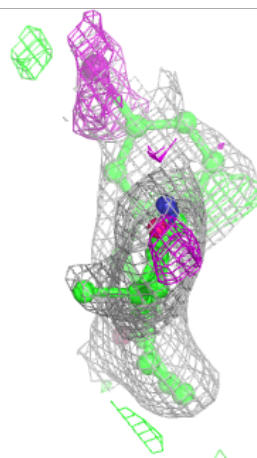
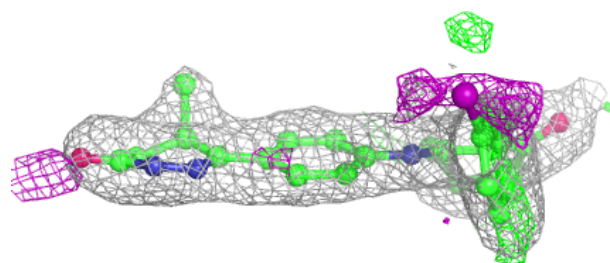
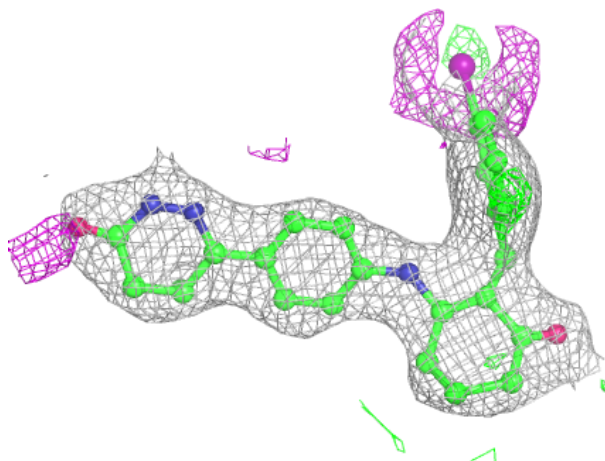
**Electron density around 666 C 463:**

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



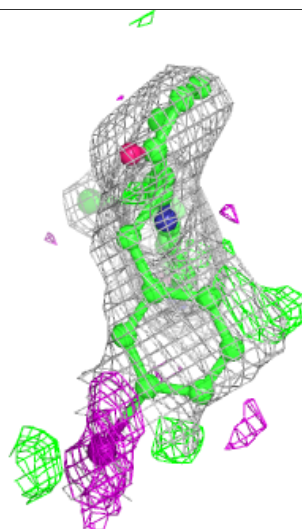
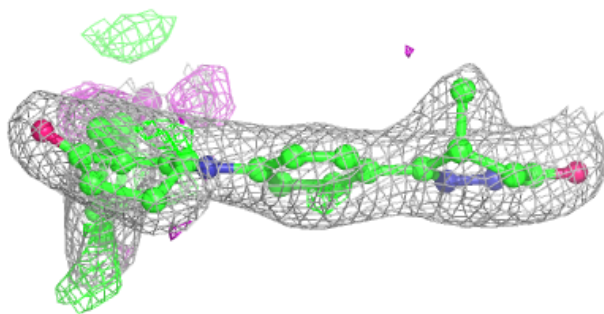
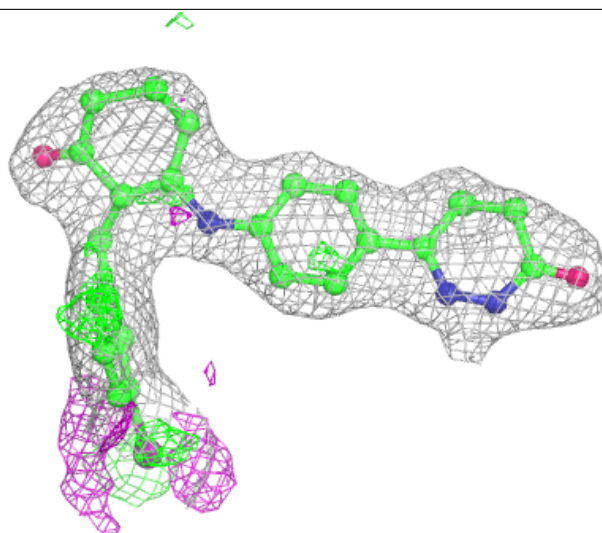
**Electron density around 666 A 461:**

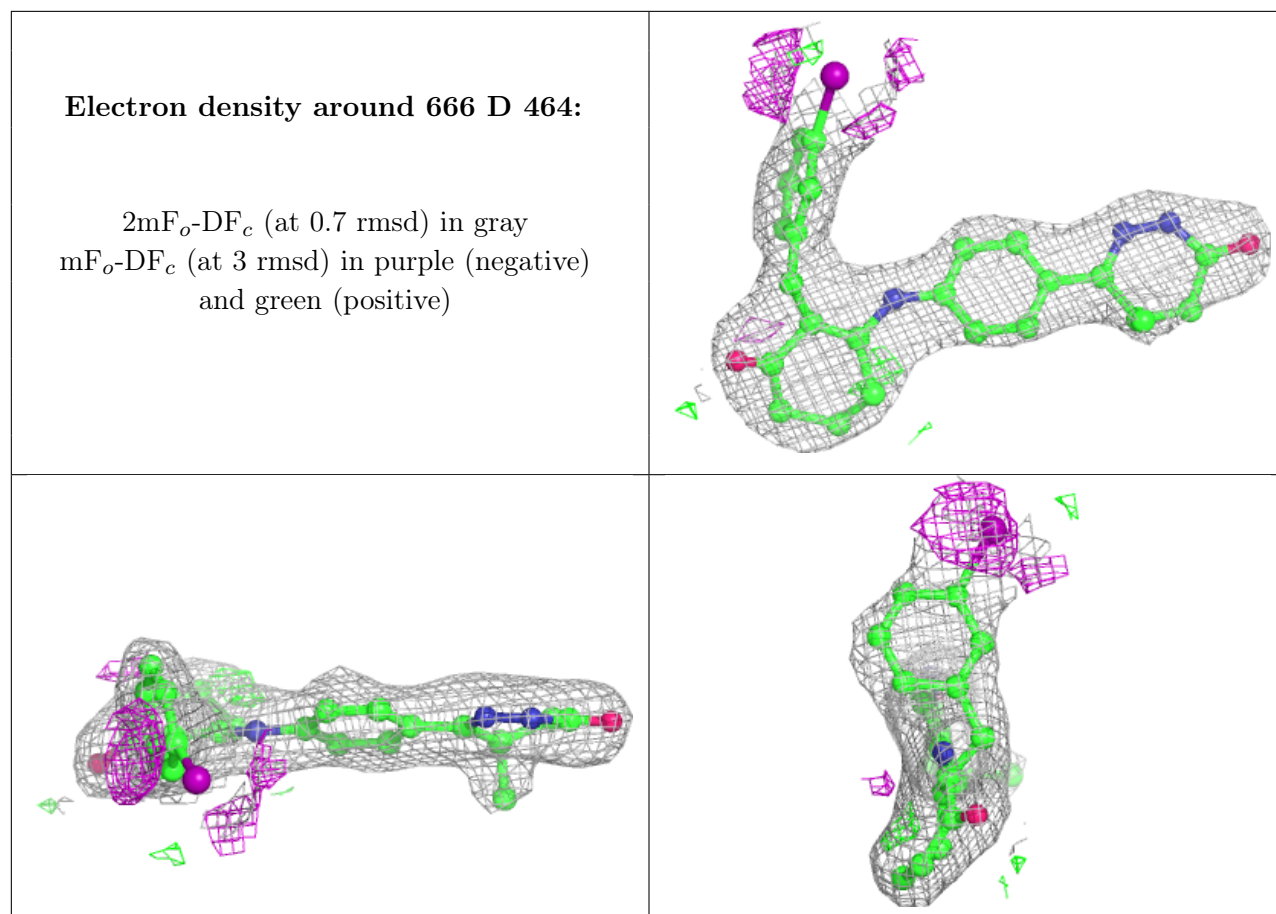
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)



**Electron density around 666 B 462:**

$2mF_o-DF_c$  (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.