



# Full wwPDB X-ray Structure Validation Report ⓘ

Nov 12, 2024 – 01:02 PM EST

PDB ID : 3OMI  
Title : Catalytic core subunits (I and II) of cytochrome C oxidase from *Rhodobacter sphaeroides* with D132A mutation  
Authors : Liu, J.; Qin, L.; Ferguson-Miller, S.  
Deposited on : 2010-08-27  
Resolution : 2.15 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 : 2022.3.0, CSD as543be (2022)  
Xtrriage (Phenix) : 1.20.1  
EDS : 3.0  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)  
CCP4 : 9.0.003 (Gargrove)  
Density-Fitness : 1.0.11  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.39

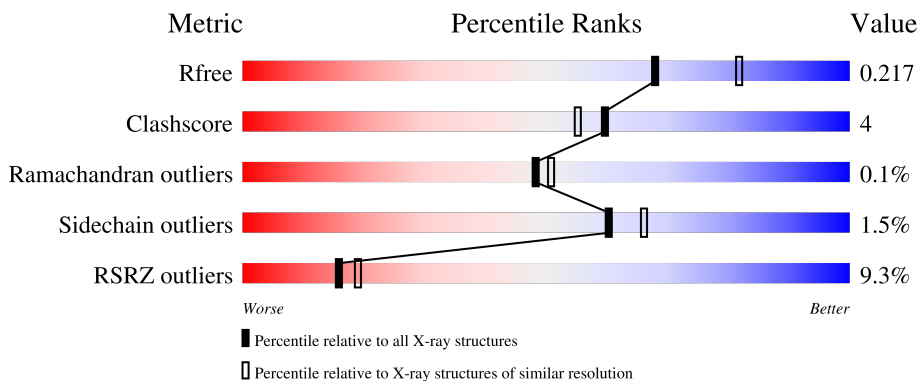
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

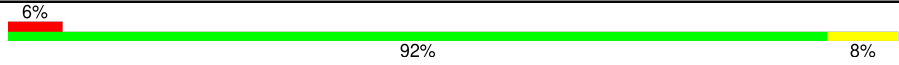

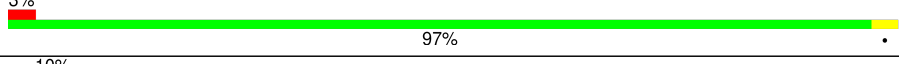
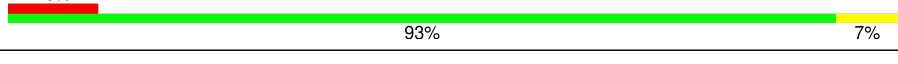
The reported resolution of this entry is 2.15 Å.

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))
$R_{free}$	164625	1881 (2.16-2.16)
Clashscore	180529	2047 (2.16-2.16)
Ramachandran outliers	177936	2027 (2.16-2.16)
Sidechain outliers	177891	2026 (2.16-2.16)
RSRZ outliers	164620	1882 (2.16-2.16)

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	535	 6% 92% 8%
1	C	535	 15% 86% 13% .
2	B	256	 3% 97% .
2	D	256	 10% 93% 7%

## 2 Entry composition

There are 14 unique types of molecules in this entry. The entry contains 13416 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 Cytochrome c oxidase, aa3 type, subunit I.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	535	Total	C	N	O	S	0	0	0
			4167	2793	654	689	31			
1	C	530	Total	C	N	O	S	0	0	0
			4102	2749	641	681	31			

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	132	ALA	ASP	engineered mutation	UNP Q3J5A7
C	132	ALA	ASP	engineered mutation	UNP Q3J5A7

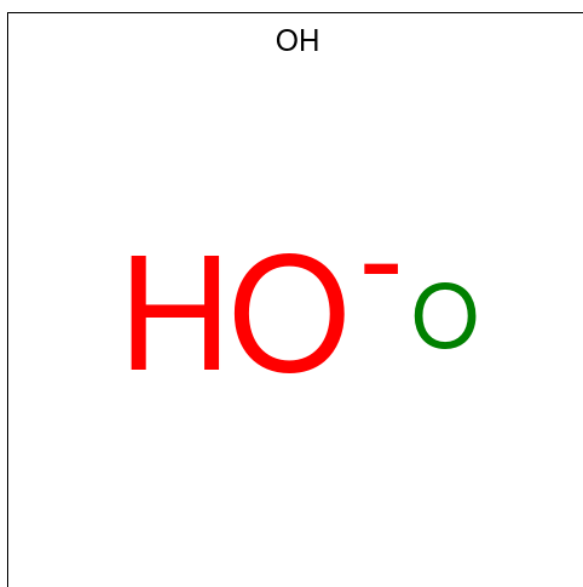
- Molecule 2 is a protein called Cytochrome c oxidase subunit 2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	256	Total	C	N	O	S	0	0	0
			2008	1312	329	361	6			
2	D	256	Total	C	N	O	S	0	0	0
			2002	1307	326	363	6			

There are 8 discrepancies between the modelled and reference sequences:

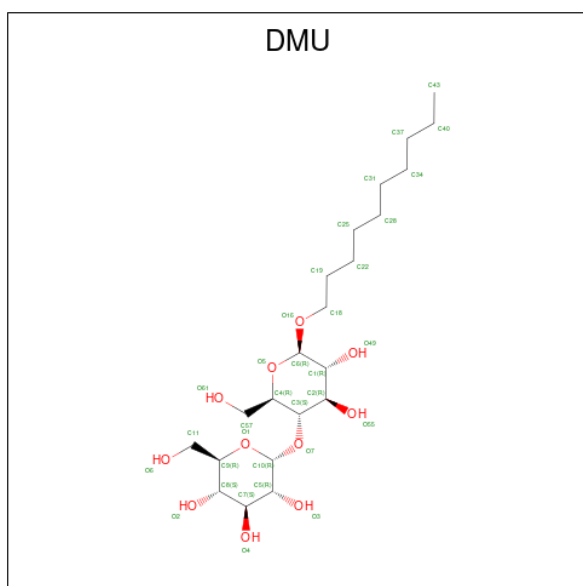
Chain	Residue	Modelled	Actual	Comment	Reference
B	282	HIS	-	expression tag	UNP Q3J5G0
B	283	HIS	-	expression tag	UNP Q3J5G0
B	284	HIS	-	expression tag	UNP Q3J5G0
B	285	HIS	-	expression tag	UNP Q3J5G0
D	282	HIS	-	expression tag	UNP Q3J5G0
D	283	HIS	-	expression tag	UNP Q3J5G0
D	284	HIS	-	expression tag	UNP Q3J5G0
D	285	HIS	-	expression tag	UNP Q3J5G0

- Molecule 3 is HYDROXIDE ION (three-letter code: OH) (formula: HO).



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

- Molecule 4 is DECYL-BETA-D-MALTOPYRANOSIDE (three-letter code: DMU) (formula:  $C_{22}H_{42}O_{11}$ ).



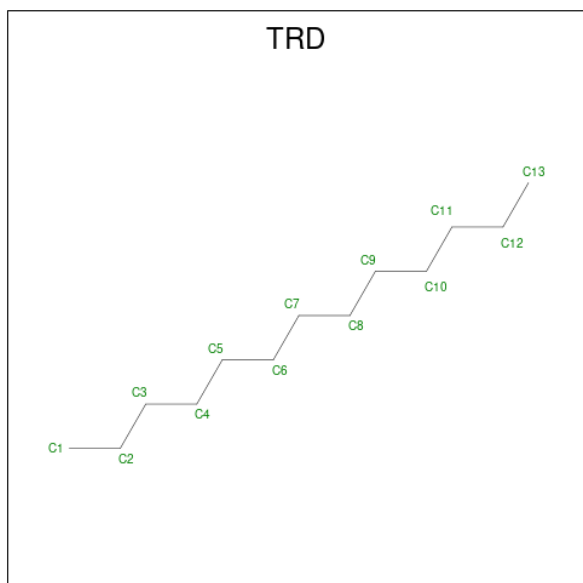
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total C O 22 16 6	0	0

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total	C	O	0	0
			22	16	6		
4	B	1	Total	C	O	0	0
			33	22	11		
4	B	1	Total	C	O	0	0
			33	22	11		
4	B	1	Total	C	O	0	0
			33	22	11		
4	B	1	Total	C	O	0	0
			23	12	11		
4	C	1	Total	C	O	0	0
			33	22	11		
4	C	1	Total	C	O	0	0
			23	12	11		
4	C	1	Total	C	O	0	0
			23	12	11		
4	D	1	Total	C	O	0	0
			23	12	11		
4	D	1	Total	C	O	0	0
			23	12	11		

- Molecule 5 is TRIDECANE (three-letter code: TRD) (formula: C<sub>13</sub>H<sub>28</sub>).



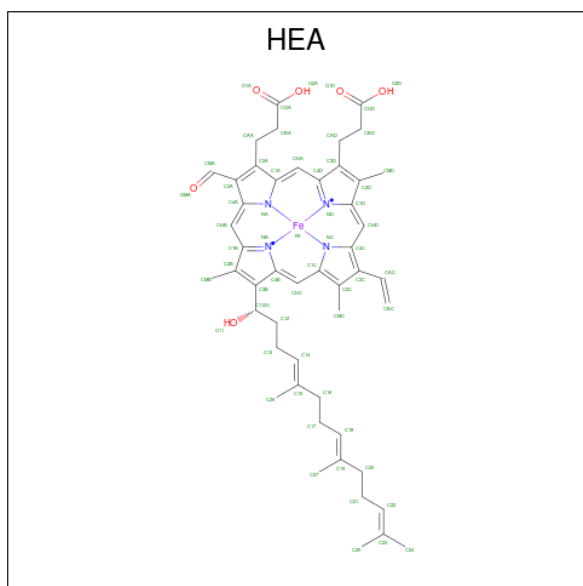
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	1	Total	C	0	0
			7	7		

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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	1	Total C 7 7	0	0
5	A	1	Total C 7 7	0	0
5	A	1	Total C 13 13	0	0
5	A	1	Total C 13 13	0	0
5	B	1	Total C 9 9	0	0
5	C	1	Total C 11 11	0	0
5	D	1	Total C 13 13	0	0
5	D	1	Total C 7 7	0	0

- Molecule 6 is HEME-A (three-letter code: HEA) (formula:  $C_{49}H_{56}FeN_4O_6$ ).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	1	Total C Fe N O 60 49 1 4 6	0	0
6	A	1	Total C Fe N O 60 49 1 4 6	0	0
6	C	1	Total C Fe N O 60 49 1 4 6	0	0

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Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	
6	C	1	Total	C	Fe	N	O	0	0
			60	49	1	4	6		

- Molecule 7 is COPPER (II) ION (three-letter code: CU) (formula: Cu).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	1	Total	Cu	0	0
			1	1		
7	B	1	Total	Cu	0	0
			1	1		
7	C	1	Total	Cu	0	0
			1	1		
7	D	1	Total	Cu	0	0
			1	1		

- Molecule 8 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
8	A	1	Total	Mg	0	0
			1	1		
8	C	1	Total	Mg	0	0
			1	1		

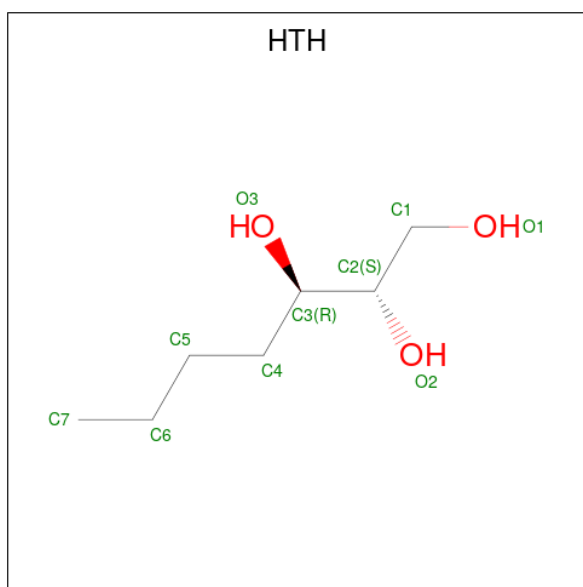
- Molecule 9 is CALCIUM ION (three-letter code: CA) (formula: Ca).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
9	A	1	Total	Ca	0	0
			1	1		
9	C	1	Total	Ca	0	0
			1	1		

- Molecule 10 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
10	A	1	Total	Cl	0	0
			1	1		
10	C	1	Total	Cl	0	0
			1	1		

- Molecule 11 is (2S,3R)-heptane-1,2,3-triol (three-letter code: HTH) (formula: C<sub>7</sub>H<sub>16</sub>O<sub>3</sub>).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
11	B	1	Total C O 10 7 3	0	0

- Molecule 12 is COPPER (I) ION (three-letter code: CU1) (formula: Cu).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
12	B	1	Total Cu 1 1	0	0
12	D	1	Total Cu 1 1	0	0

- Molecule 13 is CADMIUM ION (three-letter code: CD) (formula: Cd).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
13	B	2	Total Cd 2 2	0	0
13	D	2	Total Cd 2 2	0	0

- Molecule 14 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
14	A	142	Total O 142 142	0	0
14	B	134	Total O 134 134	0	0

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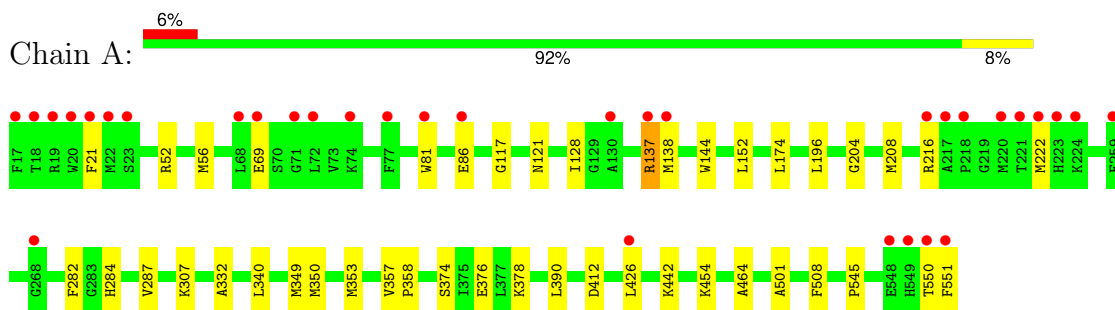
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<b>Mol</b>	<b>Chain</b>	<b>Residues</b>	<b>Atoms</b>		<b>ZeroOcc</b>	<b>AltConf</b>
14	C	95	Total 95	O 95	0	0
14	D	120	Total 120	O 120	0	0

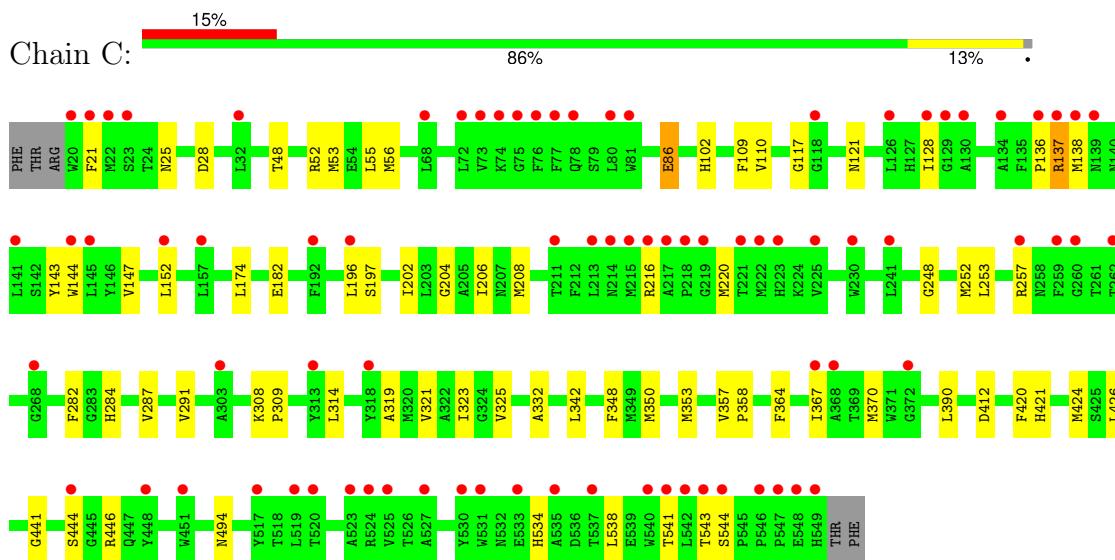
### 3 Residue-property plots [i](#)

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.

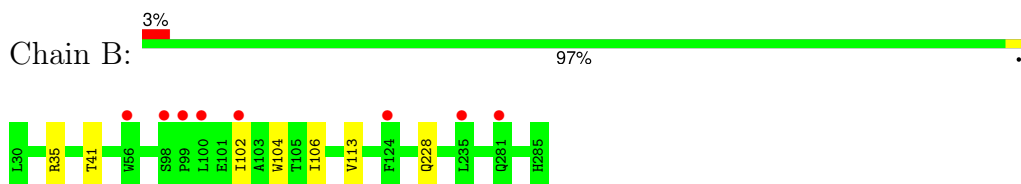
- Molecule 1: Cytochrome c oxidase, aa3 type, subunit I



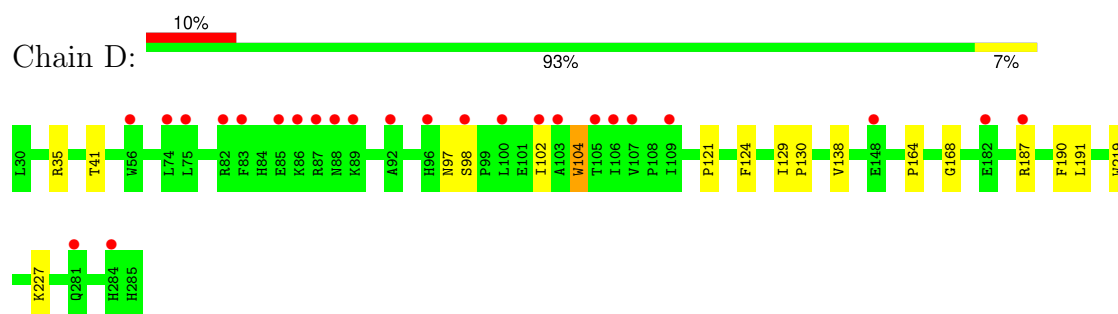
- Molecule 1: Cytochrome c oxidase, aa3 type, subunit I



- Molecule 2: Cytochrome c oxidase subunit 2



- Molecule 2: Cytochrome c oxidase subunit 2



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	125.06Å 131.52Å 175.67Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	35.84 – 2.15 35.84 – 2.15	Depositor EDS
% Data completeness (in resolution range)	96.5 (35.84-2.15) 96.5 (35.84-2.15)	Depositor EDS
$R_{merge}$	0.09	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.29 (at 2.16Å)	Xtrriage
Refinement program	REFMAC	Depositor
R, $R_{free}$	0.192 , 0.215 0.195 , 0.217	Depositor DCC
$R_{free}$ test set	4574 reflections (3.02%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	34.2	Xtrriage
Anisotropy	0.010	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.34 , 52.0	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.50$ , $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	0.008 for k,h,-l	Xtrriage
$F_o, F_c$ correlation	0.95	EDS
Total number of atoms	13416	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	38.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.26% 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: TRD, DMU, MG, HEA, CD, HTH, CU, CA, CL, OH, CU1

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	0.57	1/4320 (0.0%)	0.55	0/5900
1	C	0.48	0/4251	0.53	0/5808
2	B	0.51	0/2069	0.56	0/2835
2	D	0.49	0/2063	0.54	0/2829
All	All	0.52	1/12703 (0.0%)	0.54	0/17372

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	69	GLU	CD-OE2	7.42	1.33	1.25

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	4167	0	4063	38	0
1	C	4102	0	4001	50	0
2	B	2008	0	1955	4	0
2	D	2002	0	1940	9	0
3	A	1	0	0	1	0
3	C	1	0	0	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	A	44	0	62	1	0
4	B	122	0	147	0	0
4	C	79	0	84	3	0
4	D	46	0	42	2	0
5	A	47	0	92	2	0
5	B	9	0	17	3	0
5	C	11	0	21	0	0
5	D	20	0	41	1	0
6	A	120	0	108	6	0
6	C	120	0	108	5	0
7	A	1	0	0	0	0
7	B	1	0	0	0	0
7	C	1	0	0	0	0
7	D	1	0	0	0	0
8	A	1	0	0	0	0
8	C	1	0	0	0	0
9	A	1	0	0	0	0
9	C	1	0	0	0	0
10	A	1	0	0	0	0
10	C	1	0	0	0	0
11	B	10	0	16	0	0
12	B	1	0	0	0	0
12	D	1	0	0	0	0
13	B	2	0	0	0	0
13	D	2	0	0	0	0
14	A	142	0	0	2	0
14	B	134	0	0	1	0
14	C	95	0	0	4	0
14	D	120	0	0	0	0
All	All	13416	0	12697	107	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 4.

All (107) 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:137:ARG:HG3	1:A:137:ARG:HH11	1.07	1.16
1:C:534:HIS:HE1	14:C:794:HOH:O	1.44	1.00
1:C:534:HIS:HD2	14:C:791:HOH:O	1.47	0.98
1:A:426:LEU:HD21	1:A:464:ALA:CB	1.95	0.96

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:137:ARG:HH11	1:A:137:ARG:CG	1.87	0.88
1:A:137:ARG:HG3	1:A:137:ARG:NH1	1.87	0.87
1:A:21:PHE:HB3	1:A:144:TRP:HZ2	1.42	0.85
1:A:426:LEU:HD21	1:A:464:ALA:HB3	1.56	0.84
3:C:601:OH:O	14:C:795:HOH:O	1.93	0.84
3:A:601:OH:O	14:A:744:HOH:O	1.94	0.84
1:A:350:MET:HA	1:A:353:MET:CE	2.12	0.80
1:A:426:LEU:HD21	1:A:464:ALA:HB1	1.65	0.77
6:A:607:HEA:HMC1	6:A:607:HEA:HBC1	1.70	0.74
1:A:350:MET:HA	1:A:353:MET:HE3	1.72	0.71
1:C:182:GLU:O	1:C:257:ARG:NH1	2.24	0.71
1:A:137:ARG:HD2	1:A:138:MET:H	1.55	0.69
1:A:376:GLU:HG2	1:A:378:LYS:HG2	1.75	0.66
1:A:21:PHE:HB3	1:A:144:TRP:CZ2	2.28	0.65
1:A:287:VAL:HB	6:A:608:HEA:CAC	2.27	0.64
1:A:307:LYS:HE2	1:A:374:SER:HB3	1.79	0.64
1:C:137:ARG:HD2	1:C:137:ARG:H	1.62	0.64
6:A:608:HEA:HMC1	6:A:608:HEA:HBC1	1.79	0.63
6:C:605:HEA:HMC1	6:C:605:HEA:HBC1	1.82	0.61
1:C:308:LYS:HG3	1:C:309:PRO:HD2	1.82	0.61
2:D:121:PRO:HB3	4:D:301:DMU:H40	1.83	0.61
1:A:350:MET:HA	1:A:353:MET:HE2	1.82	0.60
1:C:319:ALA:O	1:C:323:ILE:HG12	2.02	0.60
1:C:350:MET:HA	1:C:353:MET:CE	2.33	0.59
1:C:253:LEU:O	1:C:257:ARG:HG3	2.03	0.58
1:C:56:MET:HE1	4:C:602:DMU:H6	1.85	0.58
1:C:350:MET:HA	1:C:353:MET:HE2	1.84	0.58
2:B:228:GLN:NE2	14:B:491:HOH:O	2.23	0.58
4:D:302:DMU:H35	4:D:302:DMU:H29	1.85	0.57
1:C:137:ARG:HD2	1:C:137:ARG:N	2.19	0.56
1:C:128:ILE:HB	1:C:216:ARG:HG2	1.87	0.55
1:C:444:SER:HA	4:C:604:DMU:H5	1.87	0.55
1:C:284:HIS:O	1:C:287:VAL:HG22	2.06	0.55
1:C:357:VAL:HB	1:C:358:PRO:HD3	1.88	0.55
1:C:86:GLU:H	1:C:86:GLU:CD	2.10	0.54
1:C:202:ILE:O	1:C:206:ILE:HG12	2.08	0.54
1:A:284:HIS:C	1:A:284:HIS:CD2	2.82	0.53
1:C:543:THR:HG22	1:C:544:SER:N	2.24	0.53
5:A:610:TRD:H22	2:B:41:THR:OG1	2.09	0.53
1:A:137:ARG:HD2	1:A:138:MET:N	2.24	0.53
1:C:538:LEU:O	1:C:541:THR:HB	2.08	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:86:GLU:H	1:A:86:GLU:CD	2.12	0.52
1:A:454:LYS:HE3	14:A:768:HOH:O	2.09	0.51
1:C:534:HIS:CE1	14:C:794:HOH:O	2.32	0.51
1:A:508:PHE:HB2	6:A:607:HEA:H261	1.93	0.51
1:C:284:HIS:CD2	1:C:284:HIS:C	2.83	0.51
1:A:56:MET:HE1	4:A:603:DMU:H6	1.93	0.50
1:C:321:VAL:O	1:C:325:VAL:HG23	2.12	0.50
1:A:81:TRP:CZ2	5:A:609:TRD:H61	2.47	0.49
1:C:342:LEU:HD21	2:D:124:PHE:CD2	2.47	0.49
1:C:287:VAL:HB	6:C:606:HEA:CAC	2.43	0.49
1:A:52:ARG:HG3	1:A:501:ALA:CB	2.42	0.49
1:C:143:TYR:O	1:C:147:VAL:HG23	2.13	0.48
2:B:113:VAL:HA	5:B:305:TRD:H41	1.96	0.48
1:C:109:PHE:CE1	1:C:197:SER:HB2	2.48	0.48
1:A:349:MET:O	1:A:353:MET:HE2	2.14	0.48
2:B:102:ILE:O	2:B:106:ILE:HG12	2.14	0.47
1:C:48:THR:CG2	1:C:102:HIS:CE1	2.97	0.47
1:C:367:ILE:HA	1:C:370:MET:HE2	1.96	0.47
1:C:308:LYS:HG3	1:C:309:PRO:CD	2.45	0.47
1:C:390:LEU:HD13	1:C:426:LEU:HB3	1.96	0.46
6:C:605:HEA:HMC1	6:C:605:HEA:CBC	2.45	0.46
2:D:138:VAL:HG11	2:D:219:TRP:CD1	2.50	0.46
1:C:441:GLY:HA2	1:C:446:ARG:O	2.14	0.46
1:A:137:ARG:CG	1:A:137:ARG:NH1	2.57	0.46
1:A:152:LEU:HD12	1:A:196:LEU:HD12	1.98	0.46
1:A:390:LEU:HD13	1:A:426:LEU:HD22	1.97	0.45
1:A:117:GLY:O	1:A:121:ASN:HB2	2.16	0.45
1:C:117:GLY:O	1:C:121:ASN:HB2	2.16	0.45
1:A:204:GLY:O	1:A:208:MET:HG2	2.17	0.44
1:C:136:PRO:HD2	1:C:137:ARG:NH1	2.32	0.44
1:A:390:LEU:HD13	1:A:426:LEU:HB3	2.00	0.44
1:C:21:PHE:HB3	1:C:144:TRP:HZ2	1.82	0.44
1:C:53:MET:HG2	4:C:602:DMU:H10	2.00	0.44
1:A:287:VAL:HB	6:A:608:HEA:C3C	2.48	0.43
1:C:424:MET:HG2	6:C:606:HEA:CBC	2.48	0.43
1:C:55:LEU:O	1:C:494:ASN:HB3	2.19	0.43
1:A:350:MET:HG2	5:B:305:TRD:H51	2.01	0.43
1:C:364:PHE:HB3	2:D:104:TRP:CE3	2.54	0.43
2:D:164:PRO:HA	2:D:168:GLY:O	2.19	0.43
1:C:204:GLY:O	1:C:208:MET:HG2	2.18	0.42
1:C:152:LEU:HD22	1:C:196:LEU:HD12	2.00	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:128:ILE:HB	1:A:216:ARG:HG2	2.00	0.42
2:D:98:SER:O	2:D:102:ILE:HG12	2.19	0.42
1:C:420:PHE:CE1	1:C:421:HIS:CE1	3.08	0.42
2:D:129:ILE:HA	2:D:130:PRO:HD3	1.89	0.42
1:A:550:THR:HG22	1:A:551:PHE:CD2	2.55	0.42
1:C:25:ASN:HB3	1:C:28:ASP:OD2	2.20	0.42
6:A:608:HEA:HMC1	6:A:608:HEA:CBC	2.47	0.41
1:A:332:ALA:HB1	1:A:340:LEU:HD11	2.02	0.41
1:A:357:VAL:HB	1:A:358:PRO:HD3	2.02	0.41
1:C:110:VAL:HG11	6:C:605:HEA:H271	2.03	0.41
1:C:323:ILE:HD11	1:C:358:PRO:HB2	2.03	0.41
2:D:190:PHE:O	2:D:191:LEU:HB2	2.20	0.41
1:C:248:GLY:C	1:C:252:MET:HE2	2.41	0.41
1:C:137:ARG:HH11	1:C:137:ARG:HG3	1.85	0.41
1:C:137:ARG:HD3	1:C:138:MET:H	1.86	0.41
2:D:41:THR:OG1	5:D:303:TRD:H12	2.20	0.41
1:C:323:ILE:CD1	1:C:358:PRO:HB2	2.52	0.40
1:C:543:THR:CG2	1:C:544:SER:N	2.85	0.40
1:A:353:MET:HE3	5:B:305:TRD:H62	2.02	0.40
1:C:332:ALA:HB3	1:C:348:PHE:CD2	2.57	0.40
1:A:442:LYS:O	1:A:545:PRO:HA	2.22	0.40

There are no symmetry-related clashes.

## 5.3 Torsion angles [\(i\)](#)

### 5.3.1 Protein backbone [\(i\)](#)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	A	533/535 (100%)	524 (98%)	9 (2%)	0	100 100
1	C	528/535 (99%)	517 (98%)	10 (2%)	1 (0%)	44 44
2	B	254/256 (99%)	248 (98%)	6 (2%)	0	100 100
2	D	254/256 (99%)	247 (97%)	6 (2%)	1 (0%)	30 27

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
All	All	1569/1582 (99%)	1536 (98%)	31 (2%)	2 (0%)	48	51

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	220	MET
2	D	97	ASN

### 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	423/434 (98%)	418 (99%)	5 (1%)	67	73
1	C	417/434 (96%)	409 (98%)	8 (2%)	52	57
2	B	210/215 (98%)	208 (99%)	2 (1%)	73	78
2	D	210/215 (98%)	206 (98%)	4 (2%)	52	57
All	All	1260/1298 (97%)	1241 (98%)	19 (2%)	60	66

All (19) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	137	ARG
1	A	174	LEU
1	A	222	MET
1	A	282	PHE
1	A	412	ASP
2	B	35	ARG
2	B	104	TRP
1	C	52	ARG
1	C	86	GLU
1	C	137	ARG
1	C	174	LEU
1	C	282	PHE
1	C	291	VAL

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Mol	Chain	Res	Type
1	C	314	LEU
1	C	412	ASP
2	D	35	ARG
2	D	104	TRP
2	D	187	ARG
2	D	227	LYS

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 oligosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

Of 43 ligands modelled in this entry, 2 are modelled with single atom and 16 are monoatomic - leaving 25 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	TRD	B	305	-	8,8,12	0.23	0	7,7,11	0.50	0
5	TRD	D	304	-	6,6,12	0.25	0	5,5,11	0.39	0
4	DMU	A	602	-	22,22,34	0.51	0	27,27,45	0.83	1 (3%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
6	HEA	A	608	1,14	58,67,67	1.37	6 (10%)	63,103,103	1.68	15 (23%)
6	HEA	A	607	1	58,67,67	1.34	6 (10%)	63,103,103	1.65	15 (23%)
4	DMU	D	302	-	24,24,34	0.56	0	35,35,45	0.60	0
5	TRD	A	604	-	6,6,12	0.29	0	5,5,11	0.38	0
4	DMU	D	301	-	24,24,34	0.54	0	35,35,45	0.61	0
11	HTH	B	306	-	9,9,9	0.42	0	10,10,10	0.67	0
4	DMU	B	302	-	34,34,34	0.52	0	45,45,45	0.82	2 (4%)
4	DMU	B	301	-	34,34,34	0.44	0	45,45,45	0.90	2 (4%)
4	DMU	C	603	-	24,24,34	0.54	0	35,35,45	0.74	0
5	TRD	A	609	-	12,12,12	0.26	0	11,11,11	0.56	0
4	DMU	B	304	-	24,24,34	0.55	0	35,35,45	0.68	0
4	DMU	A	603	-	22,22,34	0.55	0	27,27,45	0.84	1 (3%)
6	HEA	C	605	1	58,67,67	1.31	5 (8%)	63,103,103	1.46	13 (20%)
5	TRD	A	605	-	6,6,12	0.27	0	5,5,11	0.46	0
4	DMU	B	303	-	34,34,34	0.48	0	45,45,45	0.61	0
4	DMU	C	604	-	24,24,34	0.63	0	35,35,45	0.81	1 (2%)
4	DMU	C	602	-	34,34,34	0.57	0	45,45,45	0.80	0
5	TRD	A	610	-	12,12,12	0.36	0	11,11,11	0.43	0
5	TRD	C	607	-	10,10,12	0.33	0	9,9,11	0.44	0
5	TRD	A	606	-	6,6,12	0.31	0	5,5,11	0.40	0
5	TRD	D	303	-	12,12,12	0.21	0	11,11,11	0.63	0
6	HEA	C	606	1,14	58,67,67	1.41	5 (8%)	63,103,103	1.63	17 (26%)

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	TRD	B	305	-	-	1/6/6/10	-
5	TRD	D	304	-	-	1/4/4/10	-
4	DMU	A	602	-	-	6/13/33/59	0/1/1/2
6	HEA	A	608	1,14	-	7/32/76/76	-
6	HEA	A	607	1	-	4/32/76/76	-
4	DMU	D	302	-	-	2/8/48/59	0/2/2/2
5	TRD	A	604	-	-	2/4/4/10	-
4	DMU	D	301	-	-	4/8/48/59	0/2/2/2
11	HTH	B	306	-	-	4/10/10/10	-
4	DMU	B	302	-	-	9/19/59/59	0/2/2/2

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	DMU	B	301	-	-	5/19/59/59	0/2/2/2
4	DMU	C	603	-	-	2/8/48/59	0/2/2/2
5	TRD	A	609	-	-	7/10/10/10	-
4	DMU	B	304	-	-	3/8/48/59	0/2/2/2
4	DMU	A	603	-	-	3/13/33/59	0/1/1/2
6	HEA	C	605	1	-	6/32/76/76	-
5	TRD	A	605	-	-	0/4/4/10	-
4	DMU	B	303	-	-	5/19/59/59	0/2/2/2
4	DMU	C	604	-	-	4/8/48/59	0/2/2/2
4	DMU	C	602	-	-	9/19/59/59	0/2/2/2
5	TRD	A	610	-	-	3/10/10/10	-
5	TRD	C	607	-	-	2/8/8/10	-
5	TRD	A	606	-	-	0/4/4/10	-
5	TRD	D	303	-	-	5/10/10/10	-
6	HEA	C	606	1,14	-	4/32/76/76	-

All (22) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	A	607	HEA	C3A-C2A	-4.72	1.34	1.40
6	C	605	HEA	C3A-C2A	-4.51	1.34	1.40
6	A	608	HEA	C3A-C2A	-4.35	1.34	1.40
6	C	605	HEA	C3C-C2C	-4.30	1.34	1.40
6	C	606	HEA	C3A-C2A	-4.26	1.34	1.40
6	C	606	HEA	C11-C3B	4.26	1.56	1.51
6	A	608	HEA	C11-C3B	3.97	1.56	1.51
6	A	608	HEA	C3C-C2C	-3.86	1.35	1.40
6	C	606	HEA	C3C-C2C	-3.68	1.35	1.40
6	A	607	HEA	C3C-C2C	-3.50	1.35	1.40
6	C	606	HEA	C3A-C4A	3.15	1.46	1.41
6	A	608	HEA	C3A-C4A	2.74	1.45	1.41
6	C	605	HEA	C11-C3B	2.72	1.54	1.51
6	A	607	HEA	C3A-C4A	2.61	1.45	1.41
6	C	605	HEA	C3A-C4A	2.51	1.45	1.41
6	A	607	HEA	C11-C3B	2.36	1.54	1.51
6	C	606	HEA	CHD-C1D	2.30	1.40	1.34
6	A	607	HEA	C3A-CMA	2.13	1.51	1.46
6	A	607	HEA	CMB-C2B	2.09	1.55	1.50
6	A	608	HEA	C3A-CMA	2.07	1.51	1.46

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	C	605	HEA	CMB-C2B	2.06	1.55	1.50
6	A	608	HEA	FE-NB	2.04	2.09	1.98

All (67) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	A	608	HEA	C4B-NB-C1B	3.73	109.62	105.21
6	A	608	HEA	C4A-CHB-C1B	3.65	127.38	122.56
6	A	607	HEA	C17-C18-C19	-3.59	119.40	127.62
6	A	607	HEA	C1D-ND-C4D	3.58	109.44	105.21
6	C	606	HEA	C4D-CHA-C1A	3.56	127.25	122.56
6	A	608	HEA	CAD-CBD-CGD	-3.53	104.31	113.67
6	C	606	HEA	CAD-CBD-CGD	-3.49	104.41	113.67
6	C	605	HEA	C4D-CHA-C1A	3.45	127.11	122.56
6	A	607	HEA	C13-C12-C11	-3.32	109.09	114.39
6	A	607	HEA	C3D-C4D-ND	-3.20	107.26	110.35
6	C	605	HEA	CMC-C2C-C1C	-3.18	123.80	128.46
6	A	607	HEA	CMC-C2C-C1C	-3.14	123.85	128.46
6	C	605	HEA	C13-C14-C15	-3.12	120.47	127.62
6	A	607	HEA	C4A-CHB-C1B	3.12	126.67	122.56
6	C	606	HEA	C4B-NB-C1B	2.99	108.75	105.21
6	A	607	HEA	C12-C11-C3B	-2.98	107.47	112.12
6	A	608	HEA	C2B-C1B-NB	-2.97	106.47	109.90
6	C	606	HEA	CBA-CAA-C2A	-2.97	107.66	112.55
6	A	607	HEA	C13-C14-C15	-2.93	120.92	127.62
6	C	606	HEA	C1D-ND-C4D	2.90	108.64	105.21
6	A	608	HEA	C4D-CHA-C1A	2.85	126.31	122.56
6	A	608	HEA	C27-C19-C20	2.81	120.11	115.23
6	C	606	HEA	C4A-CHB-C1B	2.79	126.24	122.56
4	B	302	DMU	O16-C6-C1	2.78	112.49	108.27
6	A	608	HEA	CMC-C2C-C1C	-2.77	124.39	128.46
6	A	608	HEA	CMB-C2B-C3B	-2.75	124.96	130.28
6	A	607	HEA	C27-C19-C20	2.68	119.88	115.23
6	A	607	HEA	C2D-C1D-ND	-2.68	106.76	109.84
6	C	605	HEA	C3D-C4D-ND	-2.67	107.77	110.35
6	A	607	HEA	C4B-NB-C1B	2.65	108.35	105.21
4	A	602	DMU	O16-C6-C1	2.64	112.29	108.27
6	C	606	HEA	CMC-C2C-C1C	-2.59	124.66	128.46
6	C	605	HEA	C27-C19-C20	2.57	119.69	115.23
6	A	608	HEA	C3D-C4D-ND	-2.55	107.89	110.35
4	B	302	DMU	C10-O7-C3	-2.53	111.97	117.98
6	C	606	HEA	C27-C19-C20	2.51	119.58	115.23

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	A	607	HEA	C4D-CHA-C1A	2.44	125.78	122.56
4	B	301	DMU	C10-O7-C3	-2.43	112.23	117.98
6	A	608	HEA	C1D-ND-C4D	2.42	108.07	105.21
6	C	606	HEA	C3D-C4D-ND	-2.40	108.04	110.35
6	A	608	HEA	C3B-C4B-NB	-2.38	107.10	109.84
6	C	605	HEA	C17-C18-C19	-2.37	122.21	127.62
6	A	608	HEA	C3A-C4A-NA	-2.33	106.55	110.94
4	C	604	DMU	C10-O7-C3	-2.31	112.50	117.98
6	C	606	HEA	C2D-C1D-ND	-2.31	107.18	109.84
6	C	606	HEA	C13-C14-C15	-2.30	122.35	127.62
6	C	606	HEA	CMB-C2B-C3B	-2.30	125.83	130.28
4	B	301	DMU	O2-C8-C9	2.29	114.95	109.32
4	A	603	DMU	O16-C6-C1	2.25	111.69	108.27
6	C	606	HEA	CHA-C4D-ND	2.23	126.83	124.44
6	C	606	HEA	C3B-C4B-NB	-2.23	107.28	109.84
6	A	608	HEA	CHA-C4D-ND	2.20	126.80	124.44
6	C	605	HEA	C12-C11-C3B	-2.20	108.69	112.12
6	A	608	HEA	C13-C14-C15	-2.20	122.59	127.62
6	C	606	HEA	C26-C15-C16	2.17	119.00	115.23
6	C	606	HEA	C2B-C1B-NB	-2.16	107.41	109.90
6	A	608	HEA	CBA-CAA-C2A	-2.12	109.05	112.55
6	C	605	HEA	CHA-C4D-ND	2.10	126.70	124.44
6	A	607	HEA	C3B-C4B-NB	-2.10	107.43	109.84
6	A	607	HEA	CAD-CBD-CGD	-2.06	108.19	113.67
6	C	606	HEA	C3A-C4A-NA	-2.06	107.05	110.94
6	C	605	HEA	C25-C23-C24	2.04	119.28	114.59
6	C	605	HEA	C3A-C4A-NA	-2.04	107.09	110.94
6	C	605	HEA	CAD-CBD-CGD	-2.02	108.30	113.67
6	A	607	HEA	CHC-C4B-NB	2.00	126.86	124.37
6	C	605	HEA	C1D-ND-C4D	2.00	107.58	105.21
6	C	605	HEA	CHC-C4B-NB	2.00	126.85	124.37

There are no chirality outliers.

All (98) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	B	302	DMU	C19-C18-O16-C6
11	B	306	HTH	O1-C1-C2-O2
4	C	604	DMU	O5-C4-C57-O61
4	C	604	DMU	O6-C11-C9-O1
4	D	301	DMU	O5-C4-C57-O61
11	B	306	HTH	O1-C1-C2-C3

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>Atoms</b>
4	B	303	DMU	O6-C11-C9-C8
4	D	301	DMU	O6-C11-C9-C8
4	C	604	DMU	C3-C4-C57-O61
4	C	603	DMU	O5-C4-C57-O61
4	B	303	DMU	O6-C11-C9-O1
4	C	604	DMU	O6-C11-C9-C8
4	D	301	DMU	C3-C4-C57-O61
4	B	302	DMU	O5-C6-O16-C18
4	D	301	DMU	O6-C11-C9-O1
4	B	302	DMU	C1-C6-O16-C18
4	C	602	DMU	O1-C10-O7-C3
4	A	602	DMU	O5-C6-O16-C18
4	A	602	DMU	C1-C6-O16-C18
4	A	603	DMU	C1-C6-O16-C18
4	B	304	DMU	O6-C11-C9-C8
4	B	301	DMU	C25-C28-C31-C34
4	C	603	DMU	C3-C4-C57-O61
4	B	303	DMU	C28-C31-C34-C37
4	B	301	DMU	C28-C31-C34-C37
4	B	302	DMU	C18-C19-C22-C25
4	A	602	DMU	C25-C28-C31-C34
5	C	607	TRD	C9-C10-C11-C12
4	C	602	DMU	C18-C19-C22-C25
4	B	303	DMU	C25-C28-C31-C34
5	A	610	TRD	C2-C3-C4-C5
4	B	302	DMU	C25-C28-C31-C34
4	C	602	DMU	C25-C28-C31-C34
4	A	603	DMU	O5-C6-O16-C18
5	D	303	TRD	C11-C10-C9-C8
4	B	304	DMU	O6-C11-C9-O1
11	B	306	HTH	O3-C3-C4-C5
5	D	303	TRD	C6-C7-C8-C9
5	D	303	TRD	C2-C3-C4-C5
4	B	301	DMU	C31-C34-C37-C40
5	D	303	TRD	C5-C6-C7-C8
4	C	602	DMU	C31-C34-C37-C40
4	D	302	DMU	O6-C11-C9-C8
5	B	305	TRD	C4-C5-C6-C7
6	C	605	HEA	C26-C15-C16-C17
6	C	605	HEA	C14-C15-C16-C17
4	A	603	DMU	C28-C31-C34-C37
4	B	303	DMU	C22-C25-C28-C31

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Mol	Chain	Res	Type	Atoms
6	A	608	HEA	C3B-C11-C12-C13
4	B	301	DMU	C34-C37-C40-C43
5	A	609	TRD	C1-C2-C3-C4
4	A	602	DMU	C34-C37-C40-C43
5	A	604	TRD	C4-C5-C6-C7
5	A	609	TRD	C2-C3-C4-C5
6	A	607	HEA	C26-C15-C16-C17
4	B	302	DMU	C34-C37-C40-C43
5	D	303	TRD	C4-C5-C6-C7
5	A	609	TRD	C10-C11-C12-C13
4	D	302	DMU	O6-C11-C9-O1
5	D	304	TRD	C3-C4-C5-C6
11	B	306	HTH	C2-C3-C4-C5
4	C	602	DMU	C34-C37-C40-C43
4	A	602	DMU	O16-C18-C19-C22
5	A	609	TRD	C6-C7-C8-C9
4	B	302	DMU	C19-C22-C25-C28
4	C	602	DMU	C2-C3-O7-C10
5	A	610	TRD	C4-C5-C6-C7
4	C	602	DMU	C4-C3-O7-C10
6	A	607	HEA	C14-C15-C16-C17
6	C	606	HEA	CAD-CBD-CGD-O1D
5	A	609	TRD	C3-C4-C5-C6
6	A	608	HEA	CAD-CBD-CGD-O1D
5	A	610	TRD	C11-C10-C9-C8
4	A	602	DMU	C19-C22-C25-C28
6	A	608	HEA	O11-C11-C12-C13
6	C	606	HEA	CAD-CBD-CGD-O2D
6	C	606	HEA	CAA-CBA-CGA-O1A
6	A	608	HEA	CAD-CBD-CGD-O2D
6	C	605	HEA	CAD-CBD-CGD-O2D
4	C	602	DMU	C28-C31-C34-C37
6	C	606	HEA	CAA-CBA-CGA-O2A
6	A	607	HEA	CAD-CBD-CGD-O2D
4	B	302	DMU	O16-C18-C19-C22
4	B	304	DMU	C3-C4-C57-O61
4	B	302	DMU	O6-C11-C9-C8
6	A	608	HEA	CAA-CBA-CGA-O1A
6	A	607	HEA	CAD-CBD-CGD-O1D
6	C	605	HEA	CAD-CBD-CGD-O1D
6	A	608	HEA	C4D-C3D-CAD-CBD
5	A	609	TRD	C9-C10-C11-C12

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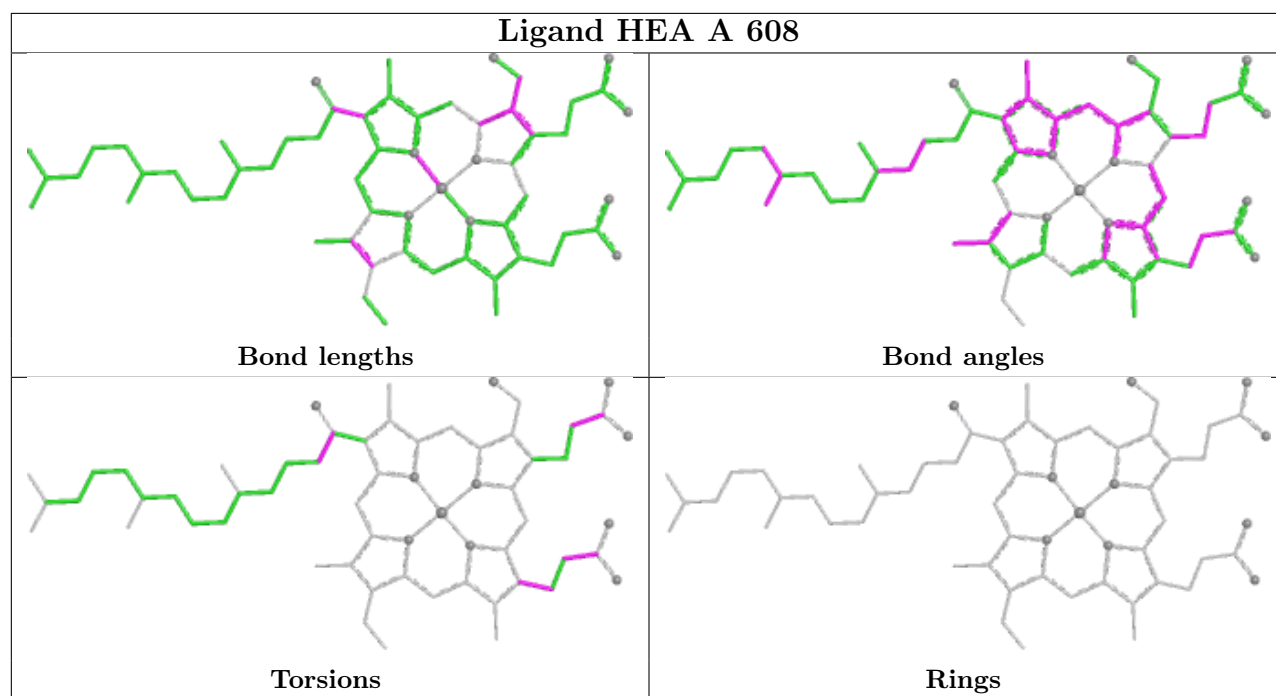
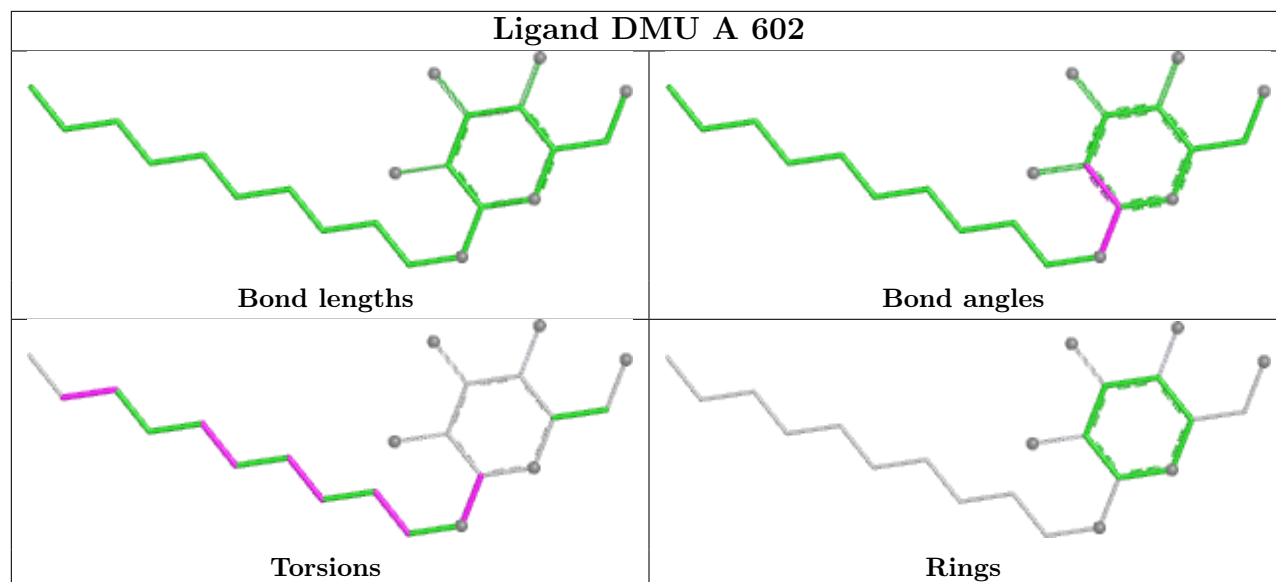
Mol	Chain	Res	Type	Atoms
5	A	604	TRD	C1-C2-C3-C4
6	C	605	HEA	CAA-CBA-CGA-O1A
6	A	608	HEA	CAA-CBA-CGA-O2A
5	C	607	TRD	C10-C11-C12-C13
6	C	605	HEA	CAA-CBA-CGA-O2A
5	A	609	TRD	C7-C8-C9-C10
4	C	602	DMU	C5-C10-O7-C3
4	B	301	DMU	C19-C22-C25-C28

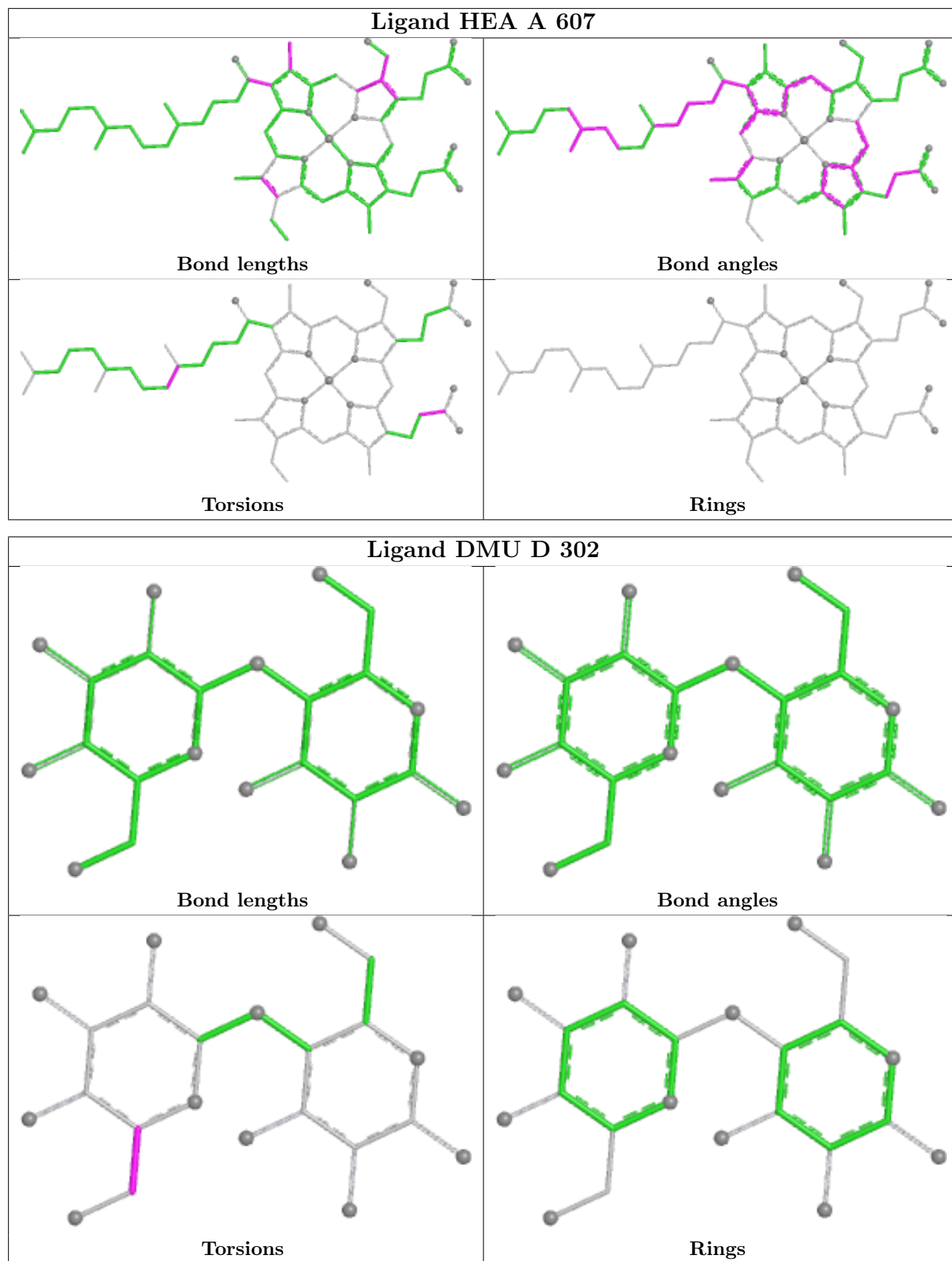
There are no ring outliers.

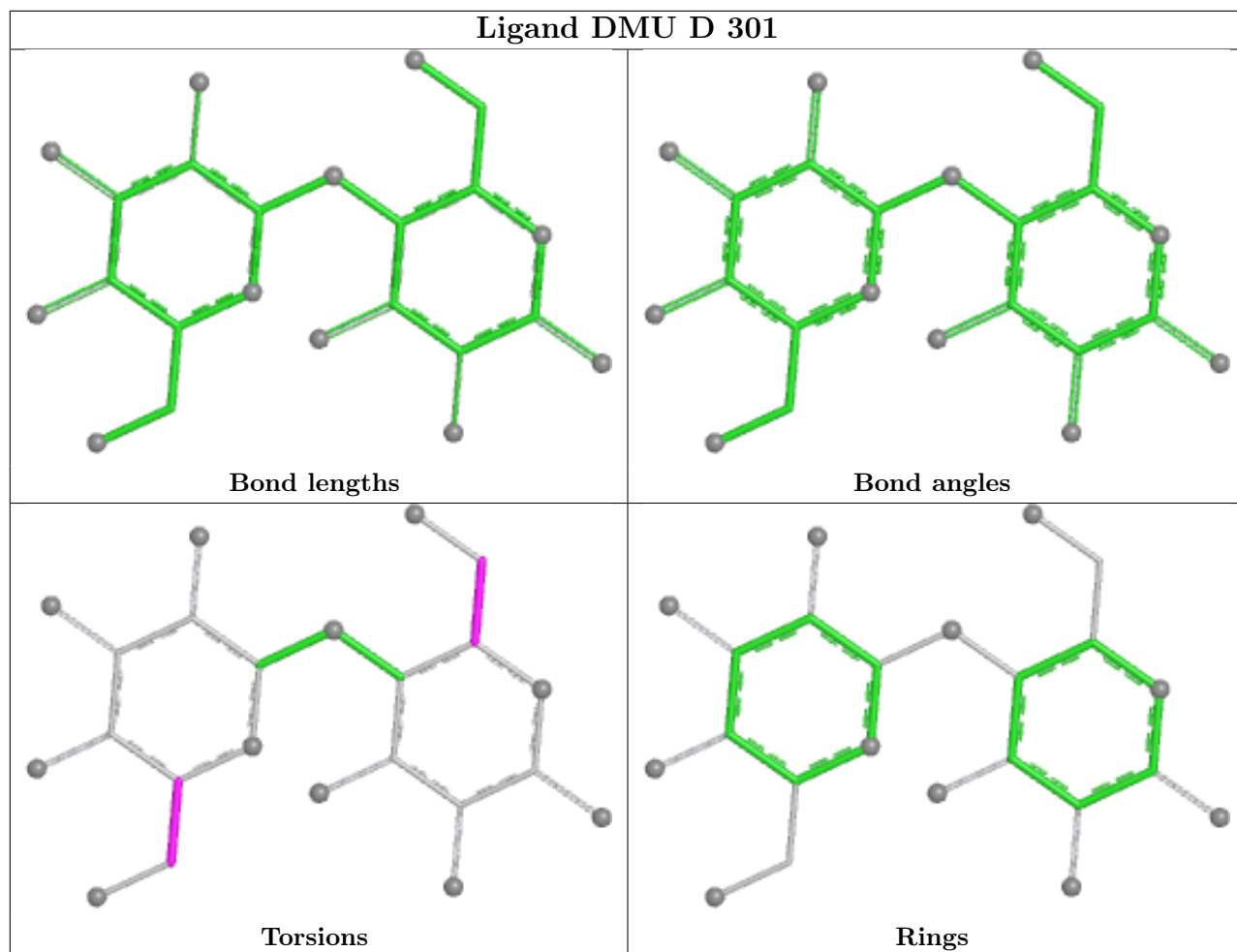
13 monomers are involved in 23 short contacts:

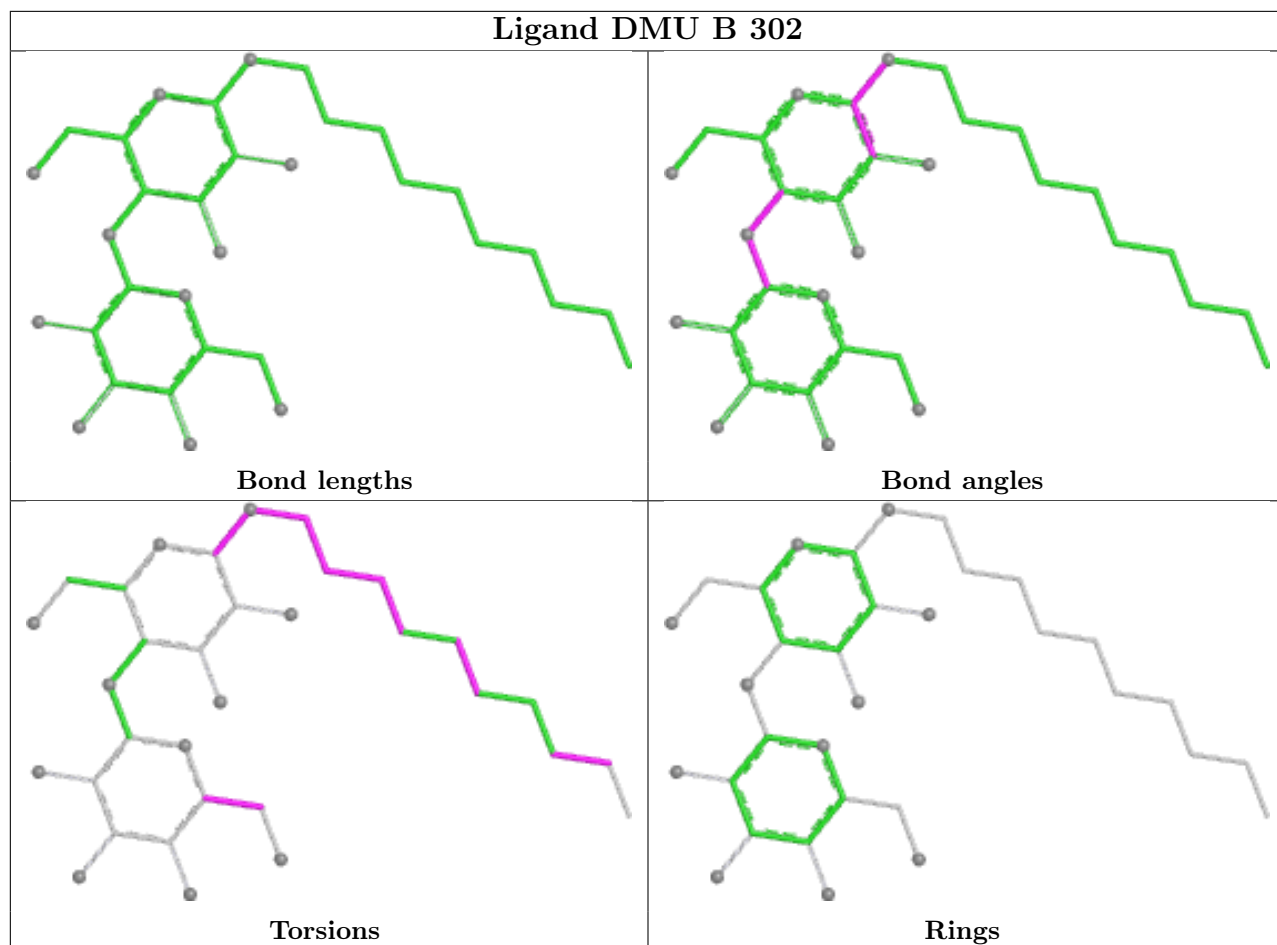
Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	B	305	TRD	3	0
6	A	608	HEA	4	0
6	A	607	HEA	2	0
4	D	302	DMU	1	0
4	D	301	DMU	1	0
5	A	609	TRD	1	0
4	A	603	DMU	1	0
6	C	605	HEA	3	0
4	C	604	DMU	1	0
4	C	602	DMU	2	0
5	A	610	TRD	1	0
5	D	303	TRD	1	0
6	C	606	HEA	2	0

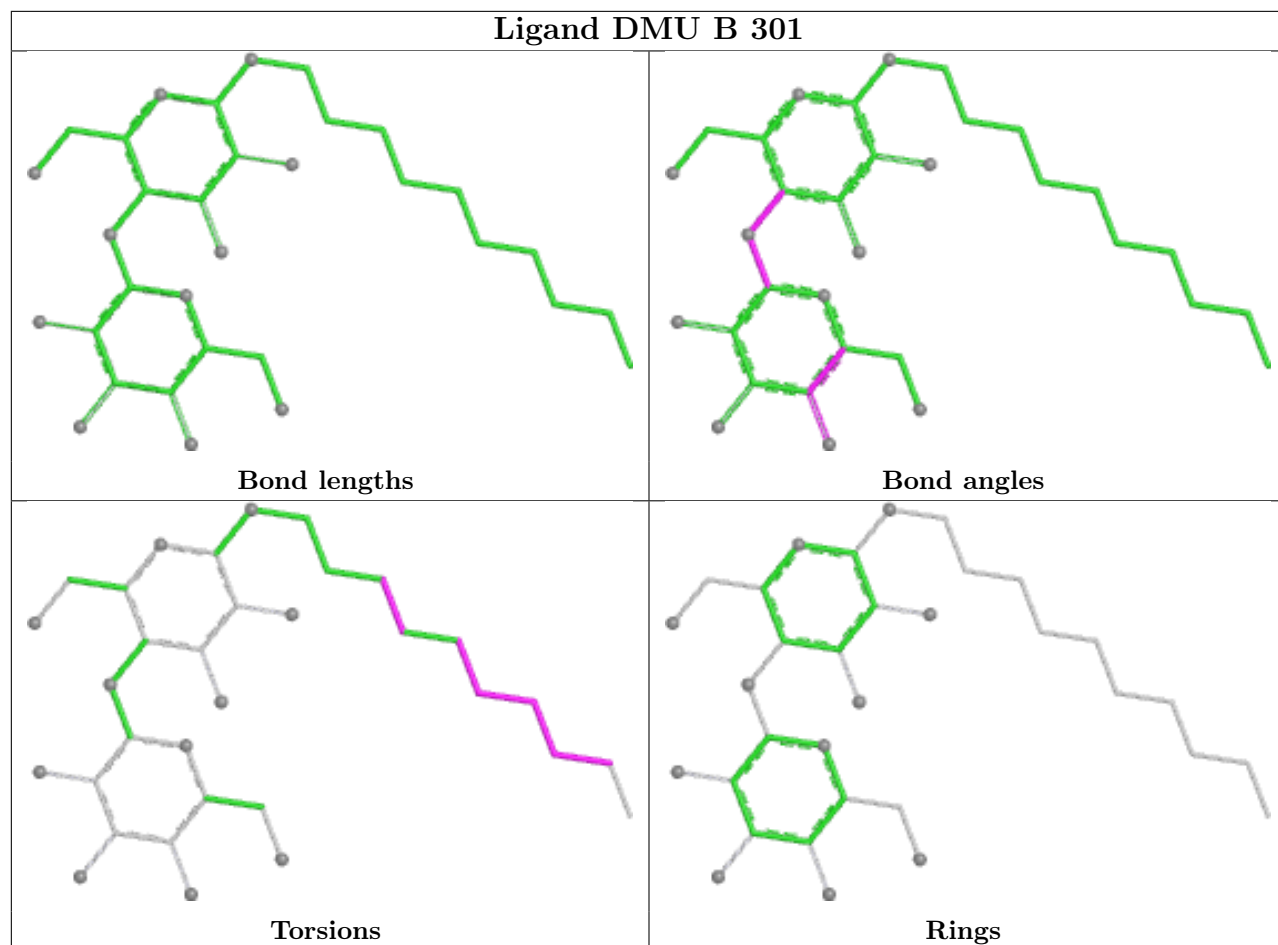
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. 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.

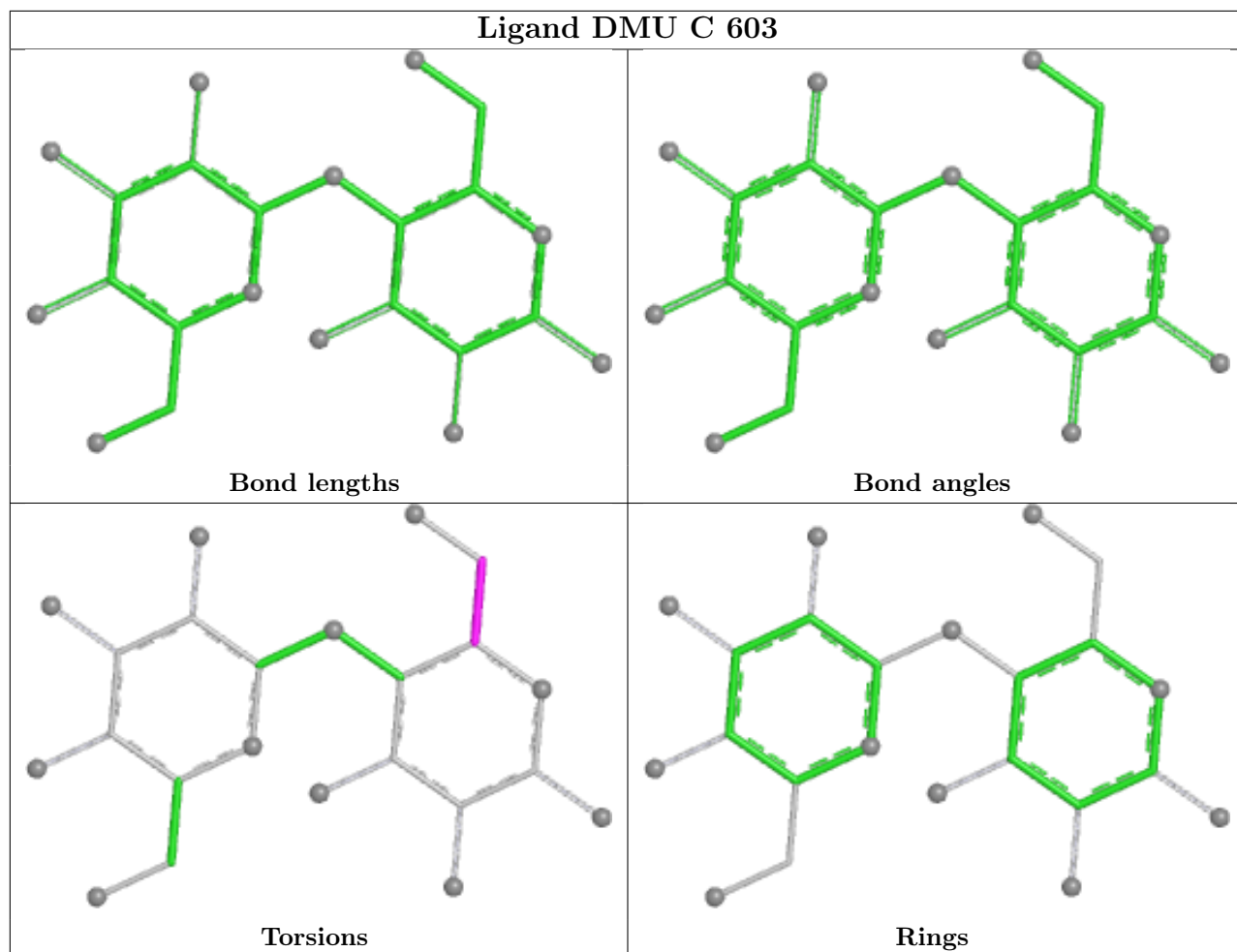




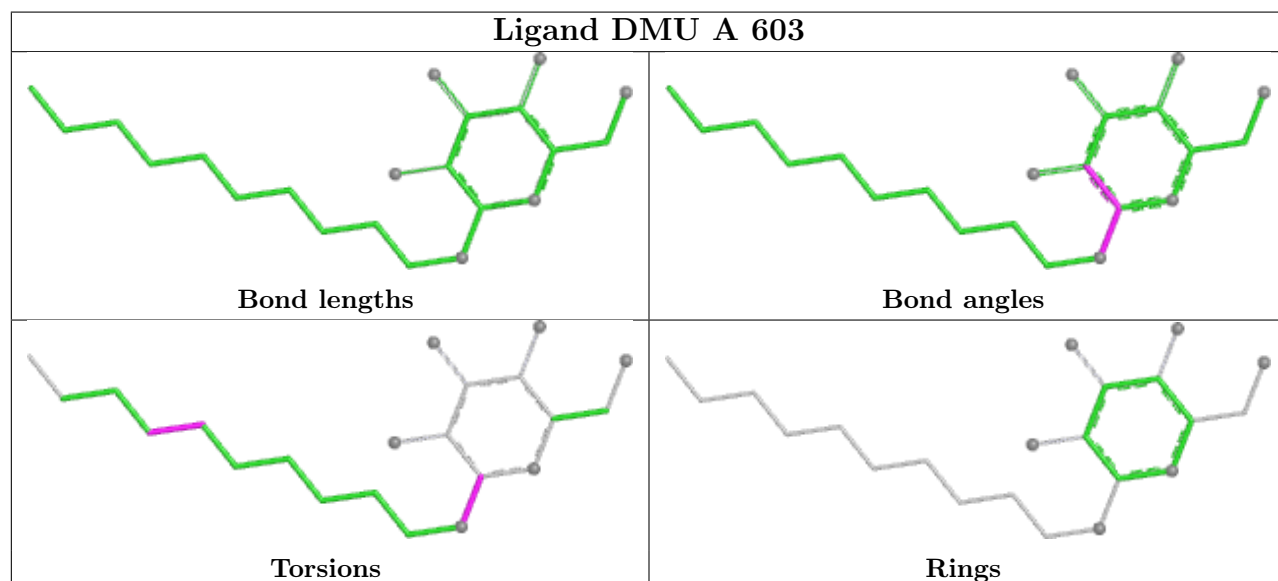
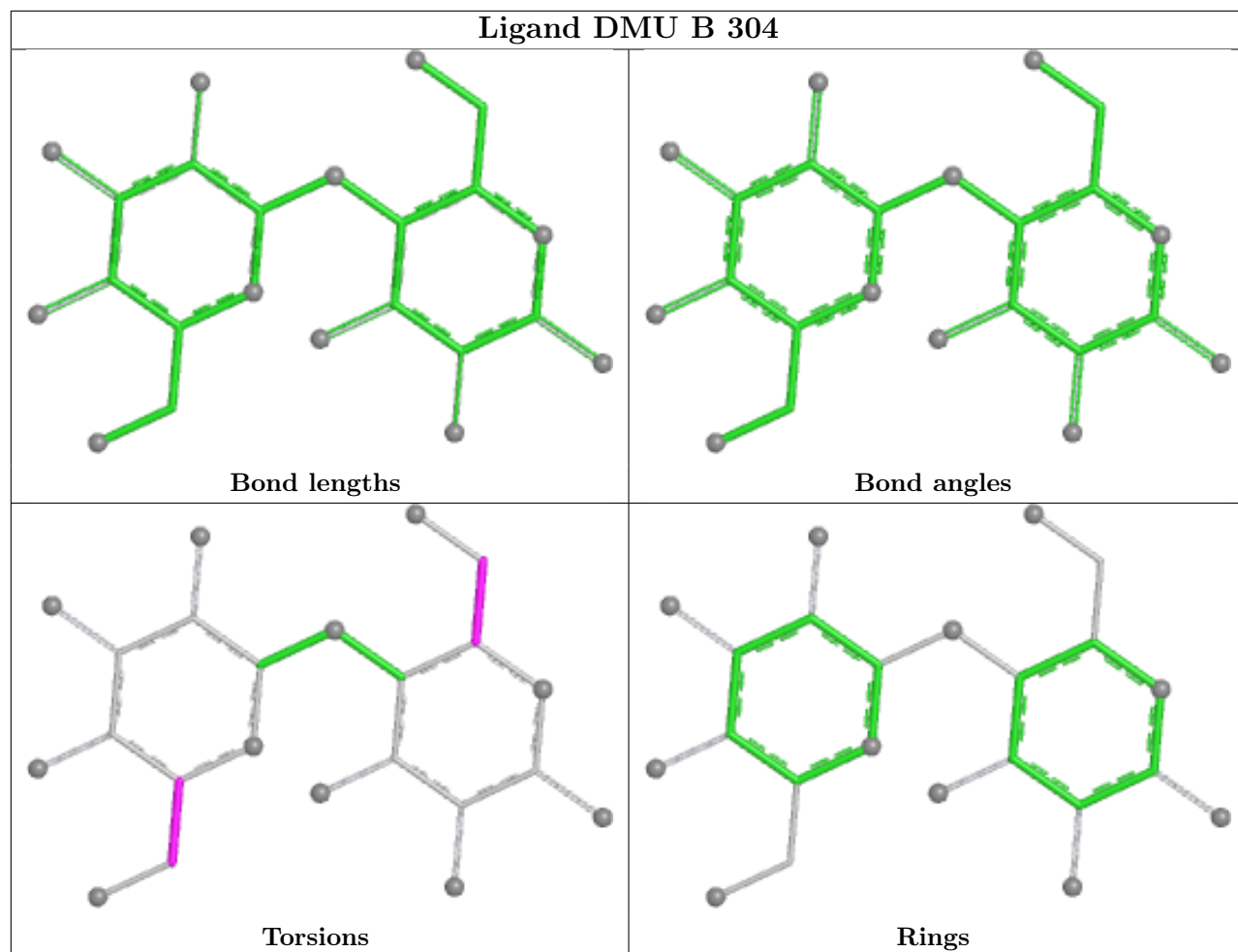


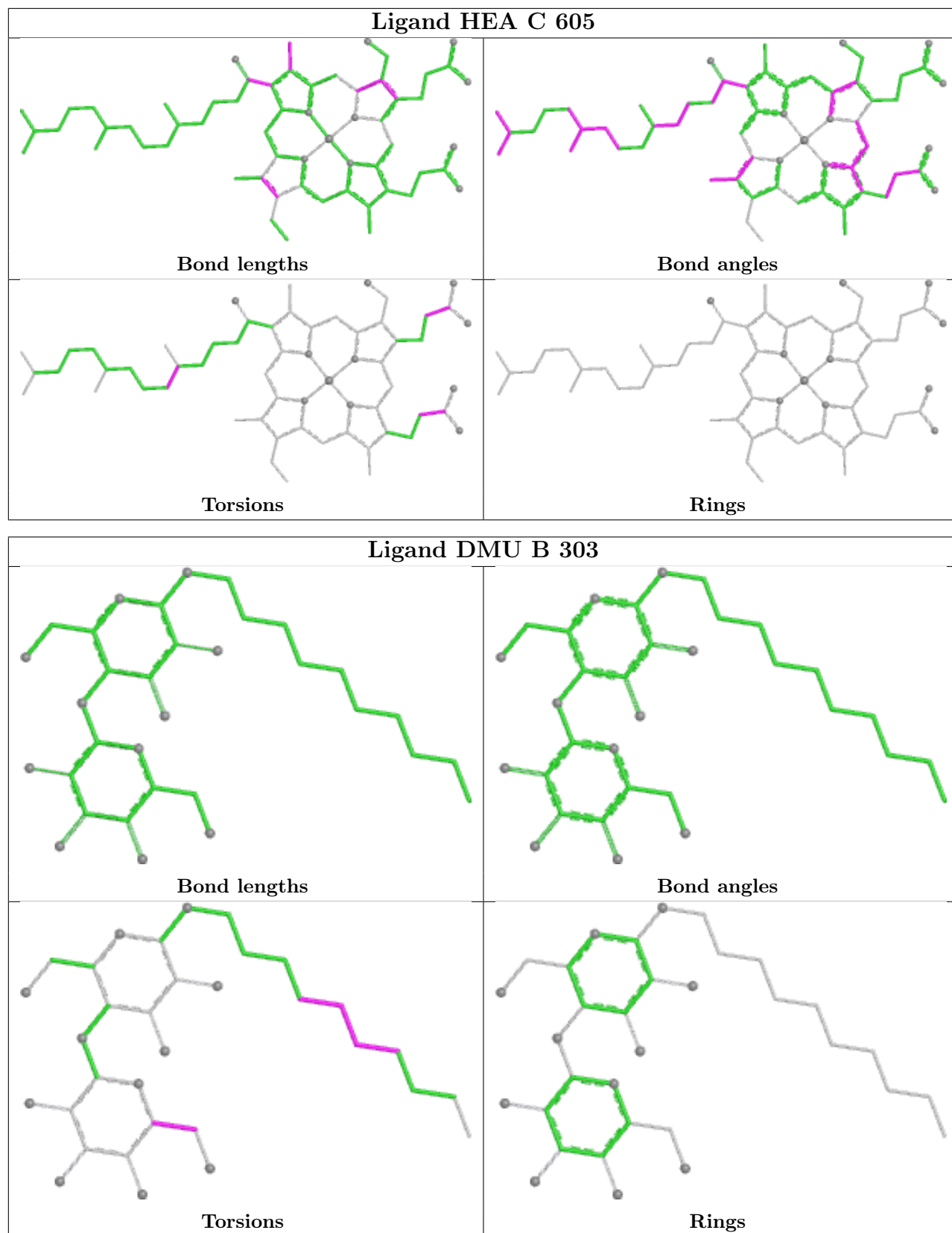


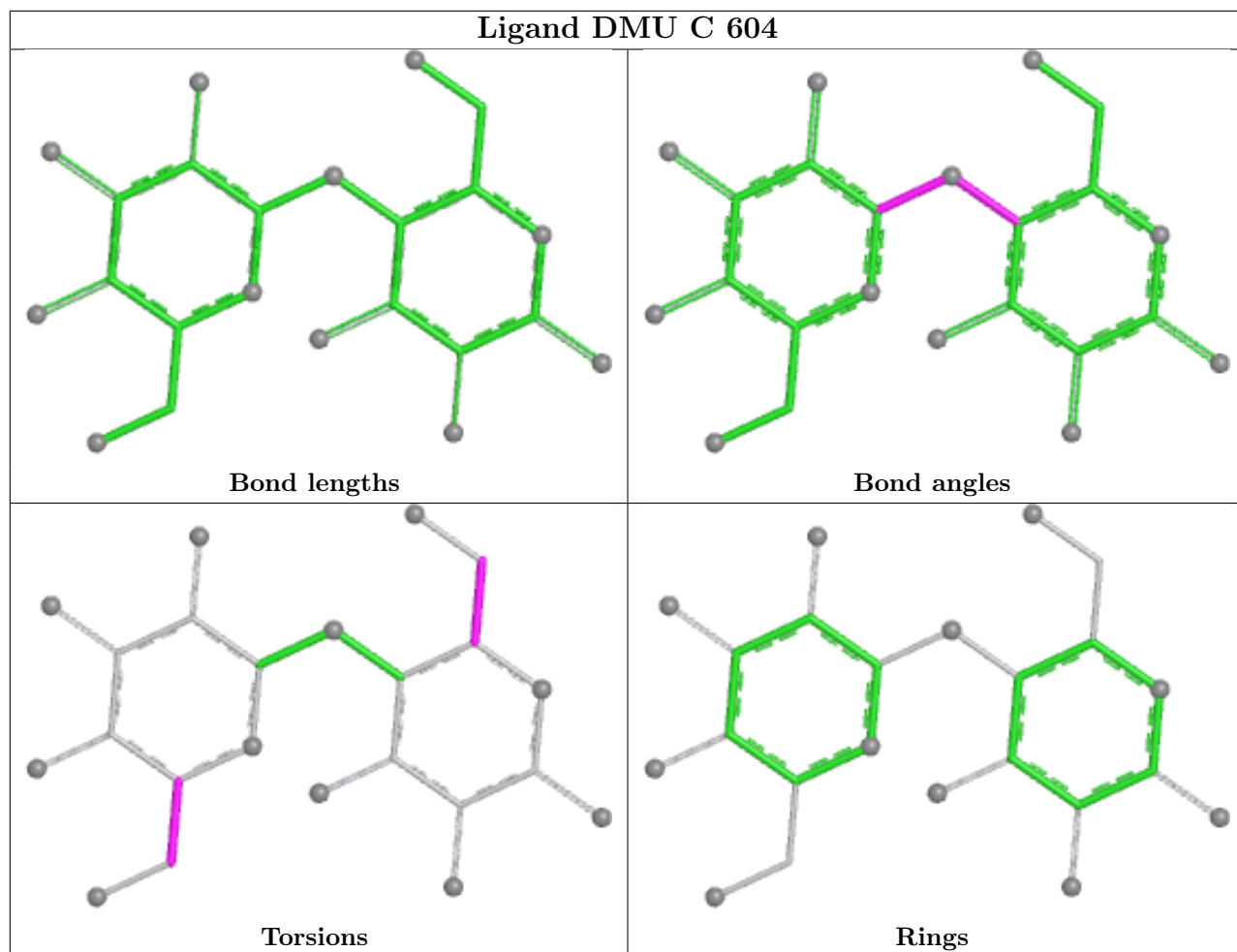


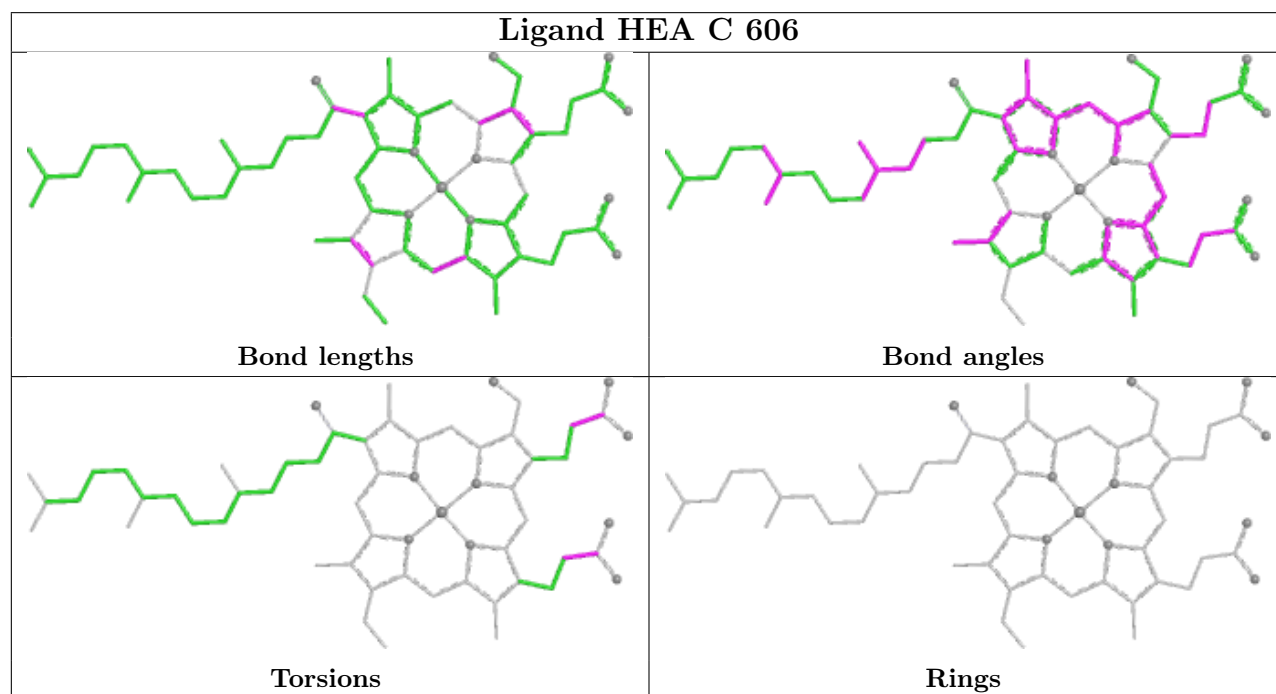
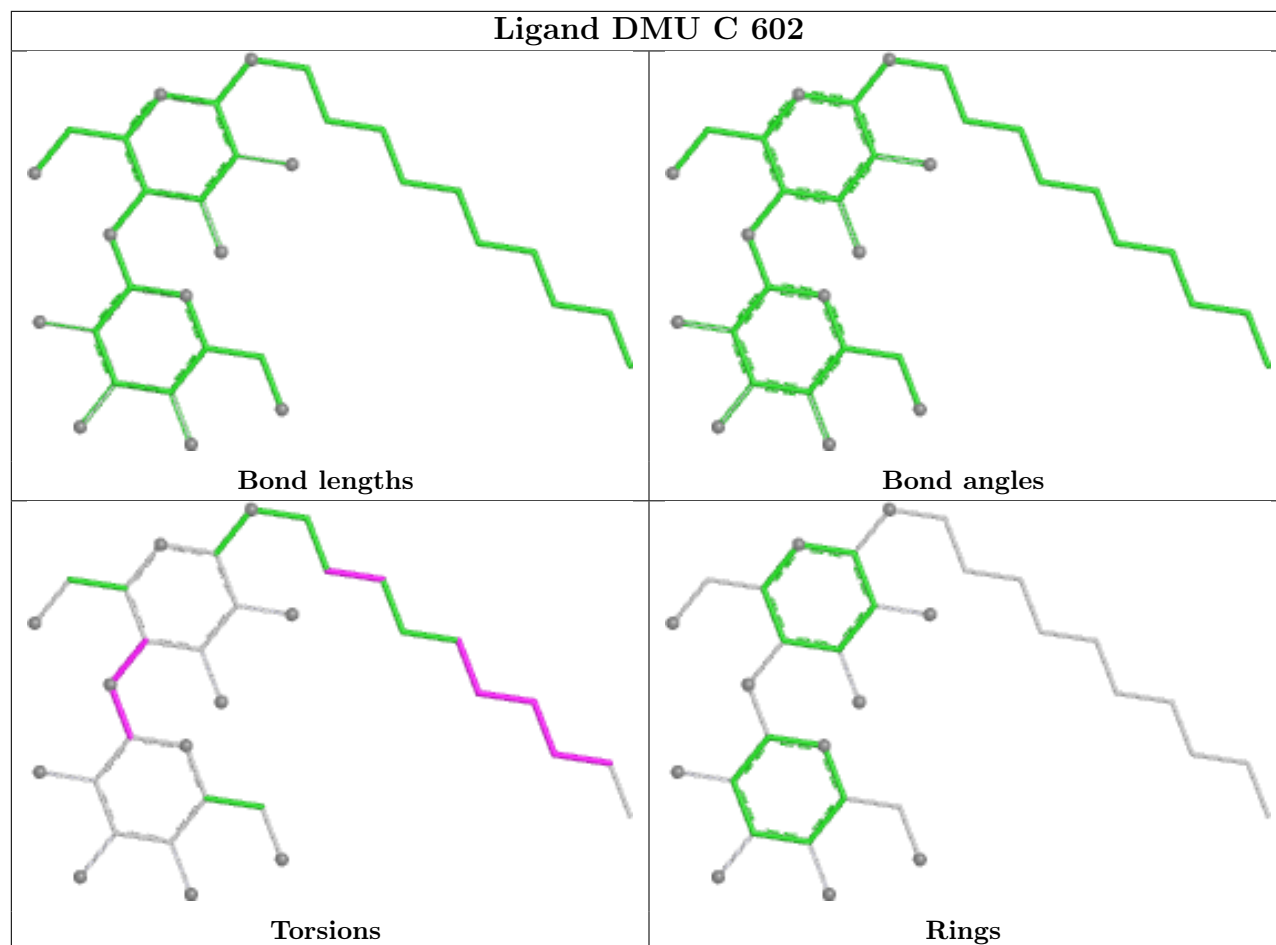












## 5.7 Other polymers [i](#)

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	535/535 (100%)	0.09	33 (6%) 28 33	18, 30, 53, 75	0
1	C	530/535 (99%)	0.99	81 (15%) 6 8	25, 45, 68, 81	0
2	B	256/256 (100%)	0.18	8 (3%) 51 57	18, 34, 47, 54	0
2	D	256/256 (100%)	0.50	25 (9%) 14 17	24, 38, 58, 67	0
All	All	1577/1582 (99%)	0.47	147 (9%) 16 19	18, 36, 61, 81	0

All (147) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	20	TRP	6.8
1	C	549	HIS	6.4
1	A	20	TRP	5.4
1	C	72	LEU	5.3
1	A	217	ALA	4.9
1	C	138	MET	4.4
1	A	81	TRP	4.2
1	C	74	LYS	4.1
1	A	551	PHE	4.1
1	C	223	HIS	3.9
1	A	69	GLU	3.9
1	A	19	ARG	3.9
1	A	18	THR	3.9
1	A	22	MET	3.8
1	A	17	PHE	3.8
1	C	548	GLU	3.7
1	C	76	PHE	3.7
1	C	22	MET	3.6
1	C	23	SER	3.6
1	C	530	TYR	3.5
2	D	56	TRP	3.5

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
1	A	220	MET	3.5
1	C	77	PHE	3.4
2	D	74	LEU	3.4
1	C	73	VAL	3.4
1	C	215	MET	3.4
1	A	550	THR	3.4
1	C	451	TRP	3.4
2	B	98	SER	3.3
2	D	86	LYS	3.3
2	D	284	HIS	3.3
1	C	268	GLY	3.2
2	B	56	TRP	3.2
1	C	222	MET	3.2
2	D	109	ILE	3.1
1	C	75	GLY	3.1
1	C	137	ARG	3.1
1	C	543	THR	3.0
1	C	139	ASN	3.0
1	C	141	LEU	3.0
1	C	517	TYR	3.0
1	A	21	PHE	3.0
1	C	81	TRP	2.9
1	C	524	ARG	2.9
1	C	145	LEU	2.9
2	D	83	PHE	2.9
1	C	535	ALA	2.9
1	A	223	HIS	2.8
1	C	130	ALA	2.8
1	C	134	ALA	2.8
1	C	221	THR	2.8
1	C	533	GLU	2.8
1	C	260	GLY	2.8
1	C	217	ALA	2.8
1	C	68	LEU	2.8
1	C	126	LEU	2.8
1	C	544	SER	2.8
1	C	542	LEU	2.7
1	C	541	THR	2.7
1	C	218	PRO	2.6
1	A	72	LEU	2.6
1	C	219	GLY	2.6
1	C	318	TYR	2.6

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
1	C	21	PHE	2.6
1	C	525	VAL	2.6
1	C	211	THR	2.6
1	C	80	LEU	2.6
1	C	128	ILE	2.5
2	B	281	GLN	2.5
2	D	88	ASN	2.5
1	A	549	HIS	2.5
1	A	130	ALA	2.5
1	C	216	ARG	2.5
1	C	367	ILE	2.5
1	C	136	PRO	2.4
1	C	213	LEU	2.4
2	B	100	LEU	2.4
2	B	235	LEU	2.4
2	D	96	HIS	2.4
1	C	546	PRO	2.4
1	C	547	PRO	2.4
1	A	138	MET	2.4
2	D	89	LYS	2.4
2	D	82	ARG	2.4
2	D	92	ALA	2.3
2	D	103	ALA	2.3
1	C	262	THR	2.3
2	D	98	SER	2.3
1	A	137	ARG	2.3
1	A	218	PRO	2.3
1	A	71	GLY	2.3
1	A	548	GLU	2.3
1	C	129	GLY	2.3
2	B	102	ILE	2.3
2	D	75	LEU	2.3
2	D	187	ARG	2.3
1	C	520	THR	2.3
1	C	78	GLN	2.3
1	A	86	GLU	2.3
1	A	259	PHE	2.3
2	B	124	PHE	2.3
1	C	257	ARG	2.3
1	C	241	LEU	2.3
1	C	537	THR	2.3
2	D	105	THR	2.3

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
2	D	148	GLU	2.2
1	A	268	GLY	2.2
1	C	531	TRP	2.2
1	C	157	LEU	2.2
1	C	523	ALA	2.2
1	A	224	LYS	2.2
1	C	214	ASN	2.2
1	C	230	TRP	2.2
2	D	102	ILE	2.2
1	A	23	SER	2.2
1	C	444	SER	2.2
1	C	372	GLY	2.2
1	A	222	MET	2.2
2	D	85	GLU	2.2
2	D	182	GLU	2.2
1	A	68	LEU	2.1
1	C	527	ALA	2.1
2	B	99	PRO	2.1
1	A	77	PHE	2.1
1	A	426	LEU	2.1
1	C	152	LEU	2.1
1	C	144	TRP	2.1
2	D	87	ARG	2.1
1	C	259	PHE	2.1
1	C	519	LEU	2.1
2	D	281	GLN	2.1
1	C	313	TYR	2.1
1	C	448	TYR	2.1
1	C	540	TRP	2.1
1	A	216	ARG	2.1
1	C	196	LEU	2.1
1	C	368	ALA	2.0
1	A	221	THR	2.0
1	C	32	LEU	2.0
2	D	100	LEU	2.0
1	C	192	PHE	2.0
2	D	106	ILE	2.0
1	C	118	GLY	2.0
1	C	303	ALA	2.0
1	A	74	LYS	2.0
1	C	225	VAL	2.0
2	D	107	VAL	2.0

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

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

## 6.3 Carbohydrates [i](#)

There are no monosaccharides in this entry.

## 6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 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.

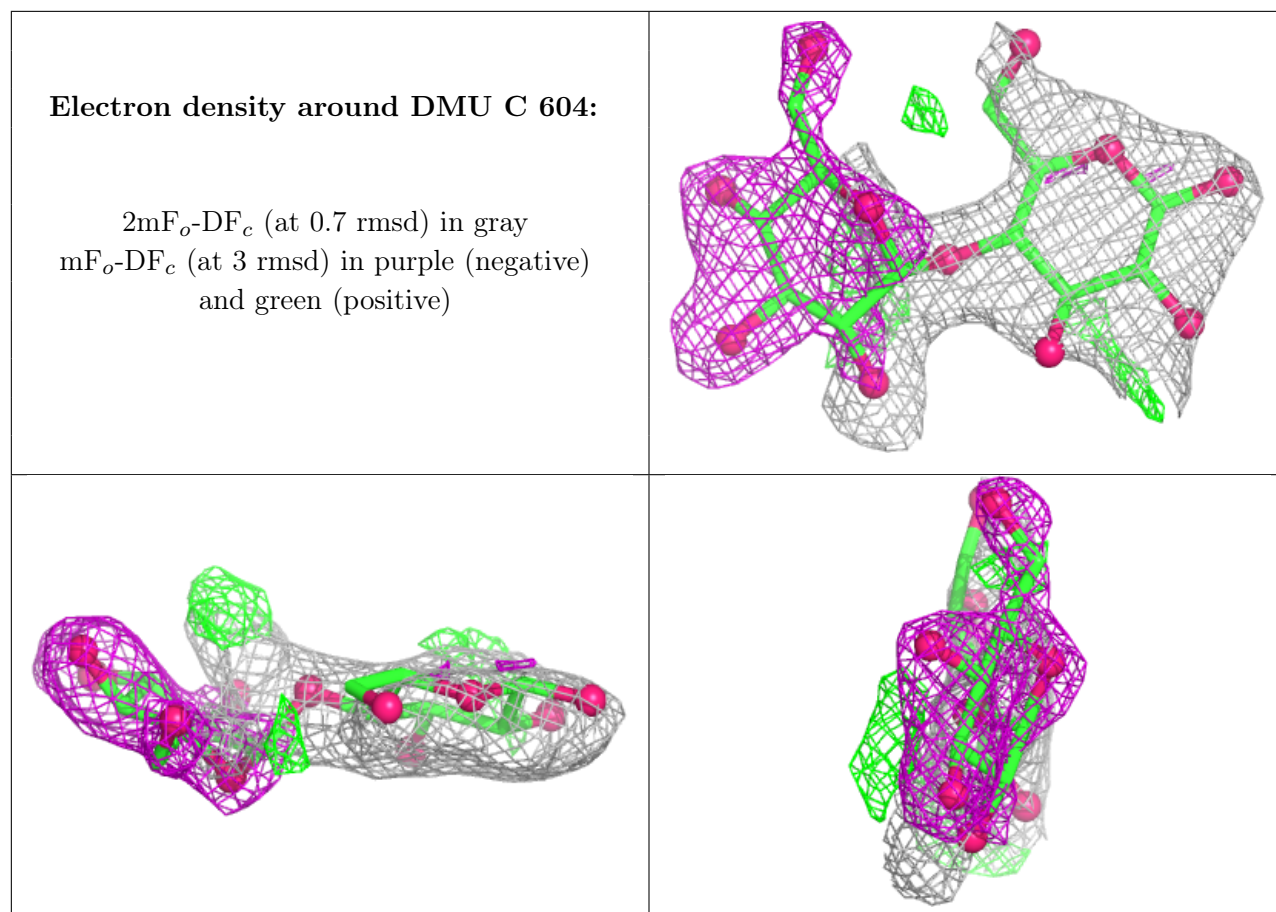
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
4	DMU	C	604	23/33	0.31	0.24	39,43,51,51	23
4	DMU	C	602	33/33	0.72	0.17	40,44,46,47	0
4	DMU	D	302	23/33	0.72	0.20	70,72,76,76	23
4	DMU	C	603	23/33	0.73	0.21	85,85,86,86	23
5	TRD	A	605	7/13	0.74	0.24	50,52,52,52	0
4	DMU	D	301	23/33	0.78	0.39	64,64,65,65	23
5	TRD	C	607	11/13	0.78	0.31	70,71,72,72	0
5	TRD	A	609	13/13	0.80	0.25	64,65,68,68	0
5	TRD	A	606	7/13	0.81	0.22	60,61,62,62	0
5	TRD	A	610	13/13	0.82	0.17	37,41,46,46	0
4	DMU	B	302	33/33	0.82	0.22	43,49,51,54	33
5	TRD	A	604	7/13	0.83	0.20	52,55,57,57	0
4	DMU	B	304	23/33	0.84	0.20	69,69,70,70	23
4	DMU	A	602	22/33	0.84	0.16	38,59,66,66	0
5	TRD	D	304	7/13	0.84	0.19	54,54,55,55	0
5	TRD	D	303	13/13	0.85	0.19	48,49,55,55	0
4	DMU	A	603	22/33	0.85	0.16	35,44,50,51	22
5	TRD	B	305	9/13	0.86	0.22	39,40,41,43	9
10	CL	C	611	1/1	0.87	0.15	66,66,66,66	0
4	DMU	B	303	33/33	0.88	0.17	46,51,57,59	33
11	HTH	B	306	10/10	0.89	0.20	51,57,60,60	0
4	DMU	B	301	33/33	0.94	0.09	20,31,51,53	0
6	HEA	C	606	60/60	0.97	0.08	25,31,41,42	0
3	OH	C	601	1/1	0.98	0.09	27,27,27,27	0
10	CL	A	614	1/1	0.98	0.07	39,39,39,39	0
6	HEA	A	608	60/60	0.98	0.07	19,24,36,39	0
6	HEA	C	605	60/60	0.98	0.07	25,29,42,43	0

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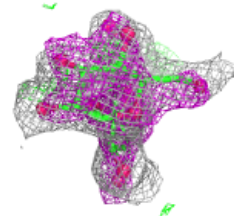
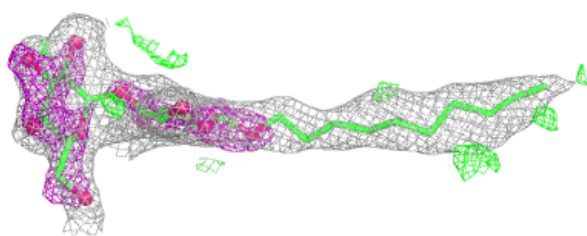
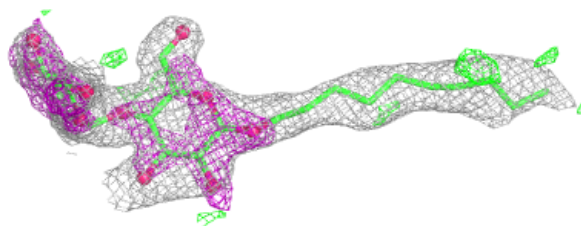
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
7	CU	C	608	1/1	0.99	0.02	35,35,35,35	0
9	CA	C	610	1/1	0.99	0.03	34,34,34,34	0
6	HEA	A	607	60/60	0.99	0.05	16,19,27,28	0
3	OH	A	601	1/1	0.99	0.04	17,17,17,17	0
7	CU	A	611	1/1	0.99	0.03	28,28,28,28	0
13	CD	B	309	1/1	0.99	0.02	37,37,37,37	0
13	CD	B	310	1/1	0.99	0.08	35,35,35,35	1
13	CD	D	307	1/1	0.99	0.02	36,36,36,36	0
13	CD	D	308	1/1	0.99	0.08	47,47,47,47	1
8	MG	C	609	1/1	1.00	0.06	20,20,20,20	0
12	CU1	B	308	1/1	1.00	0.02	21,21,21,21	0
12	CU1	D	306	1/1	1.00	0.01	26,26,26,26	0
9	CA	A	613	1/1	1.00	0.03	23,23,23,23	0
7	CU	B	307	1/1	1.00	0.01	21,21,21,21	0
7	CU	D	305	1/1	1.00	0.01	27,27,27,27	0
8	MG	A	612	1/1	1.00	0.09	16,16,16,16	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.

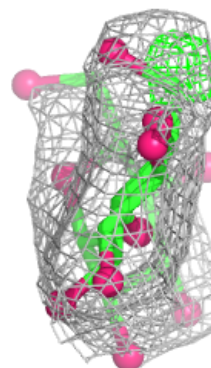
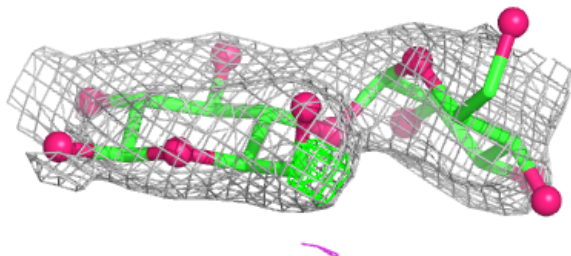
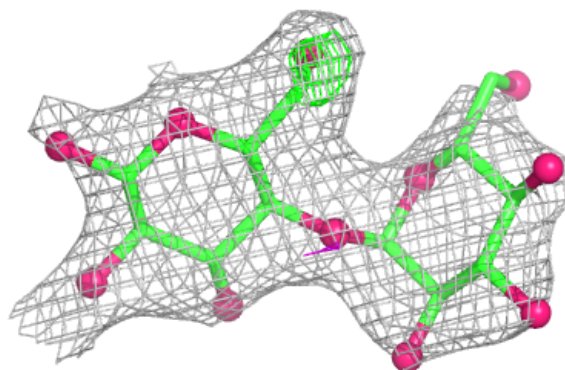


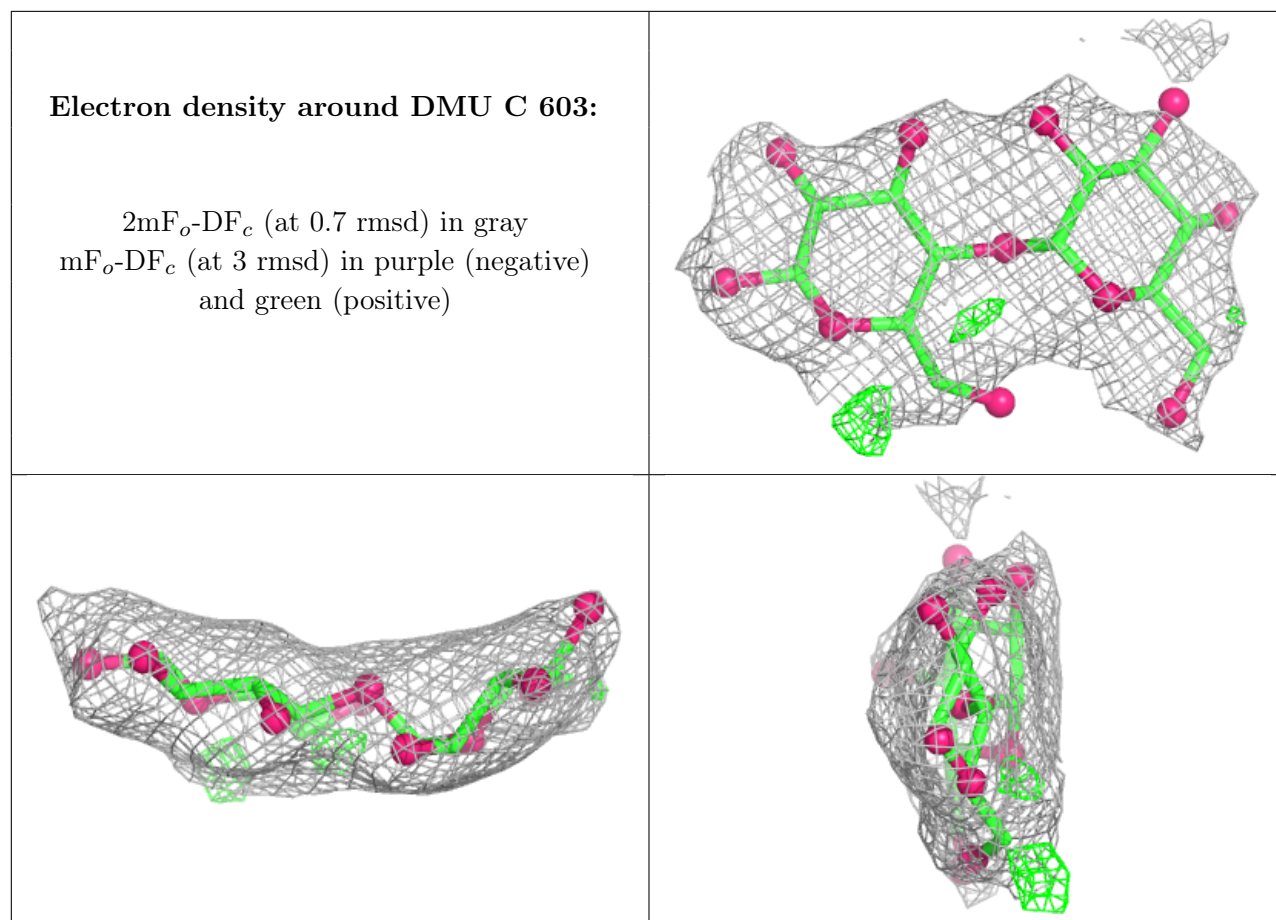
**Electron density around DMU C 602:**

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

**Electron density around DMU D 302:**

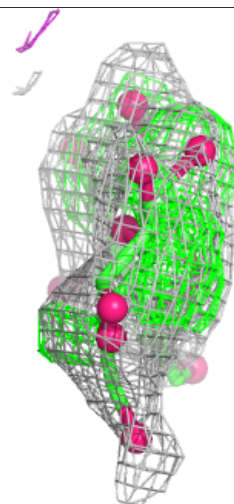
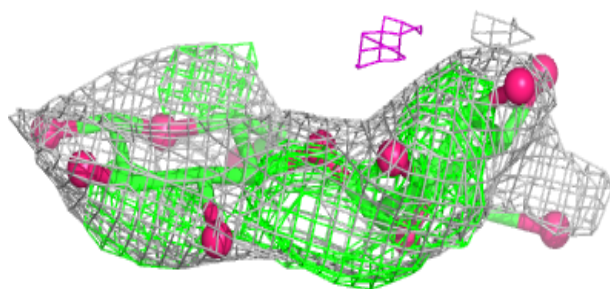
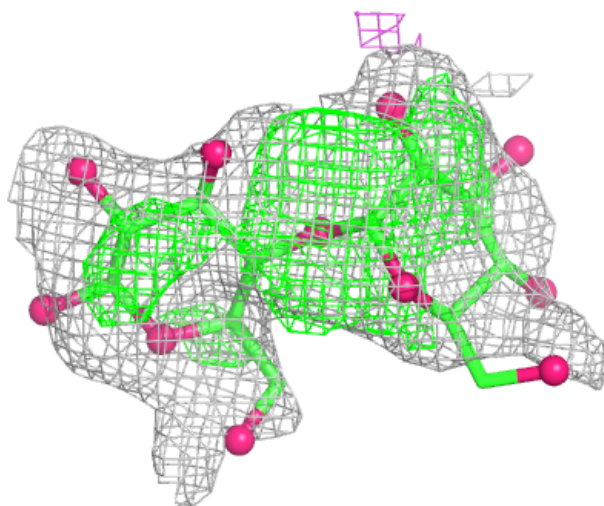
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)





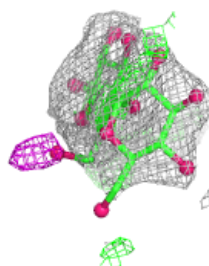
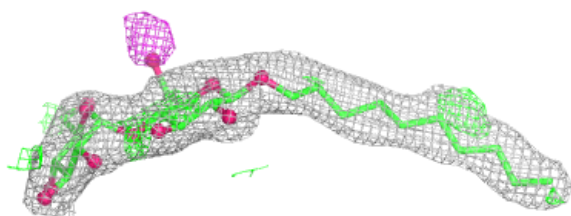
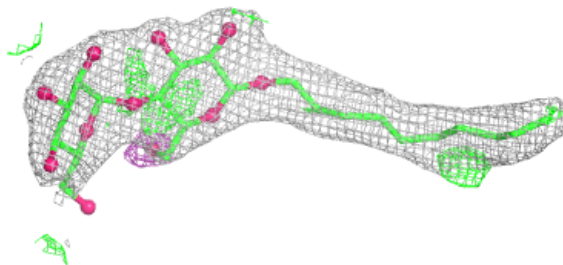
**Electron density around DMU D 301:**

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

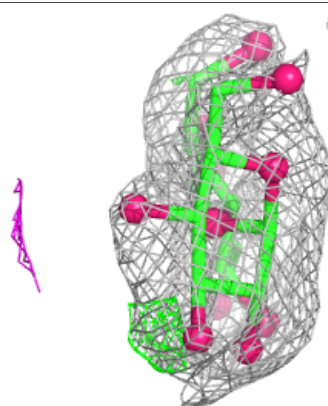
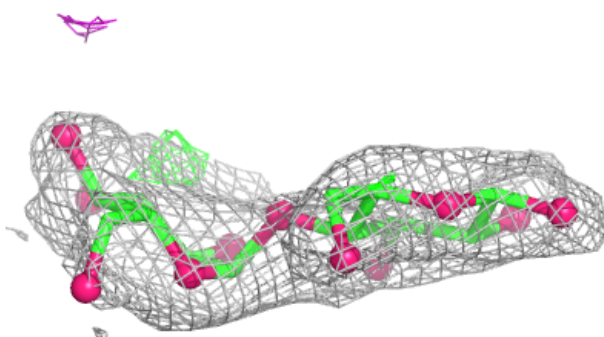
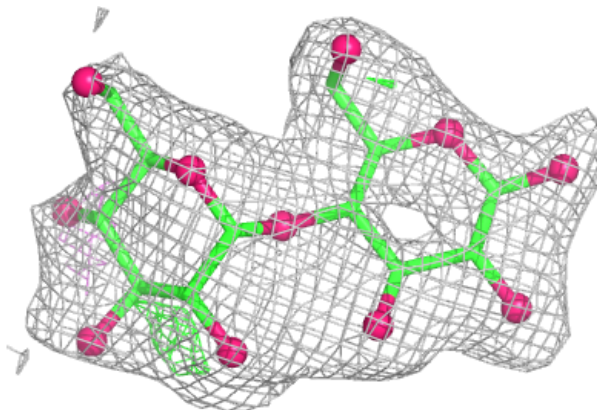


**Electron density around DMU B 302:**

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

**Electron density around DMU B 304:**

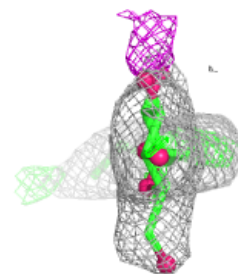
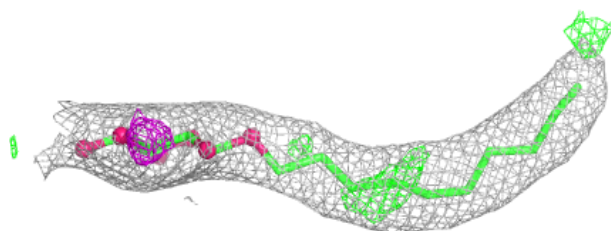
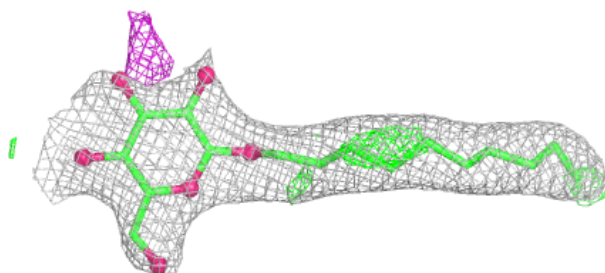
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)



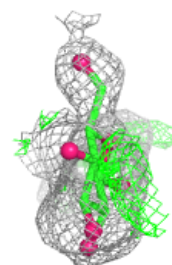
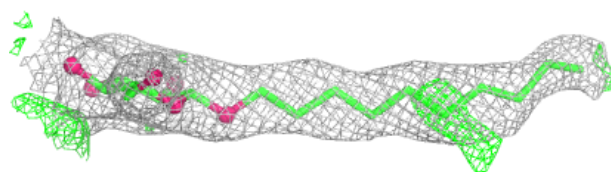
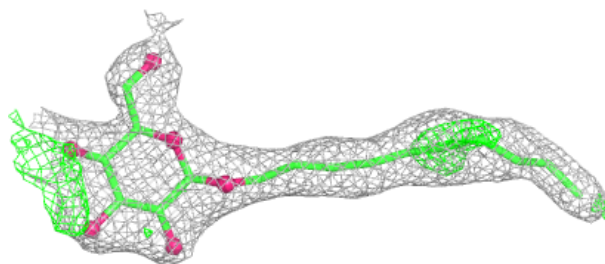


**Electron density around DMU A 602:**

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

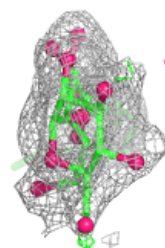
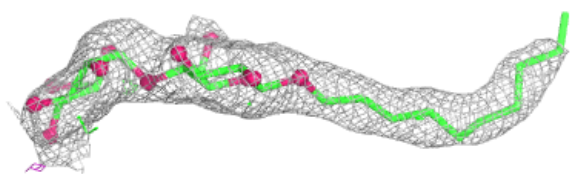
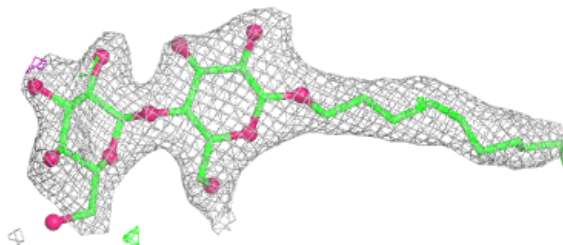
**Electron density around DMU A 603:**

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

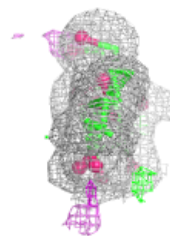
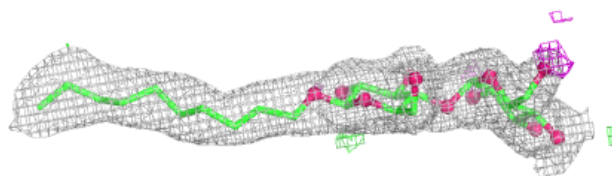
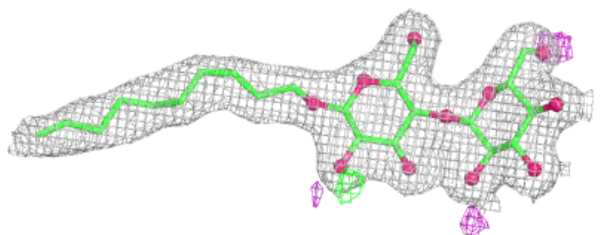


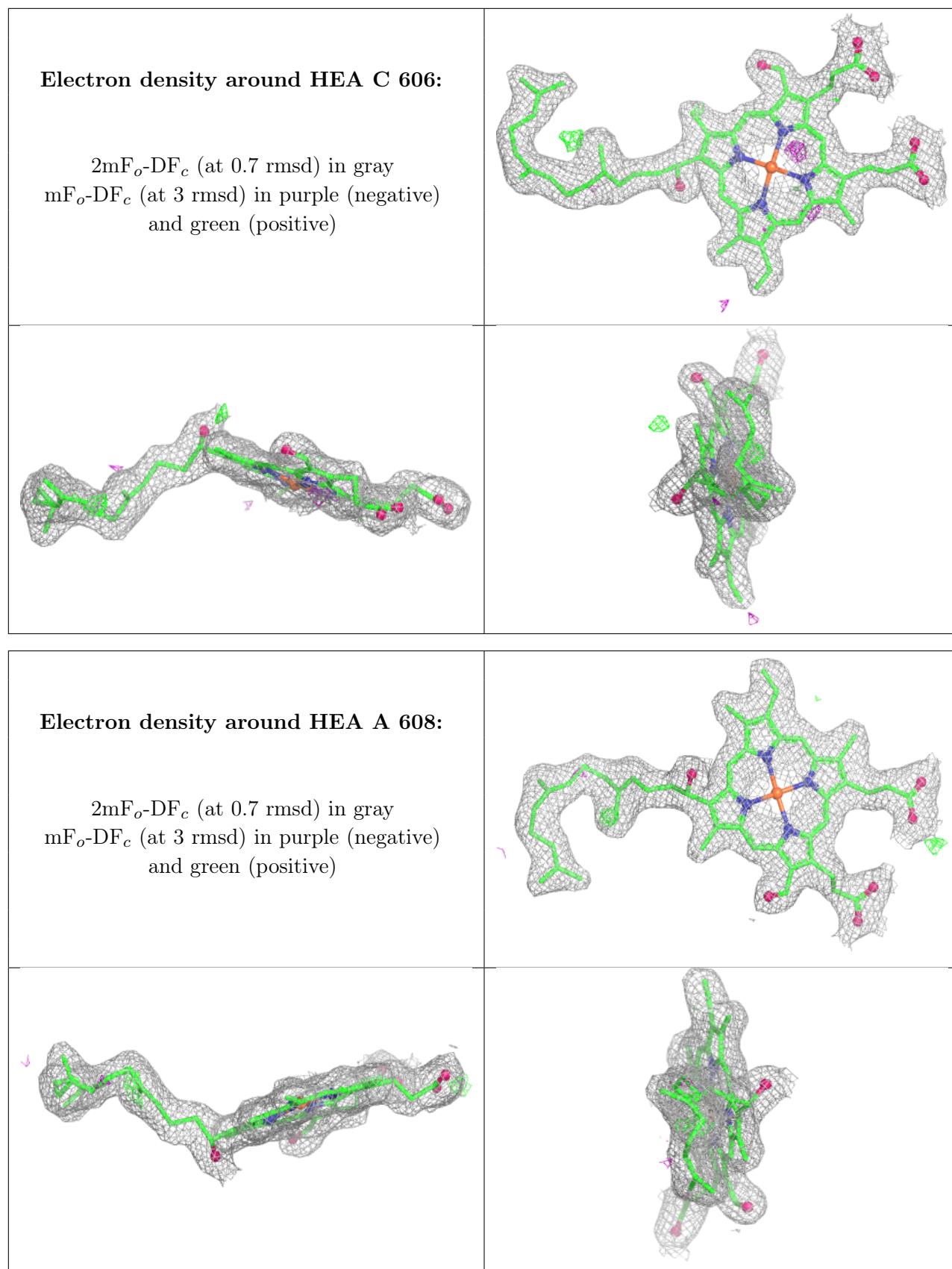
**Electron density around DMU B 303:**

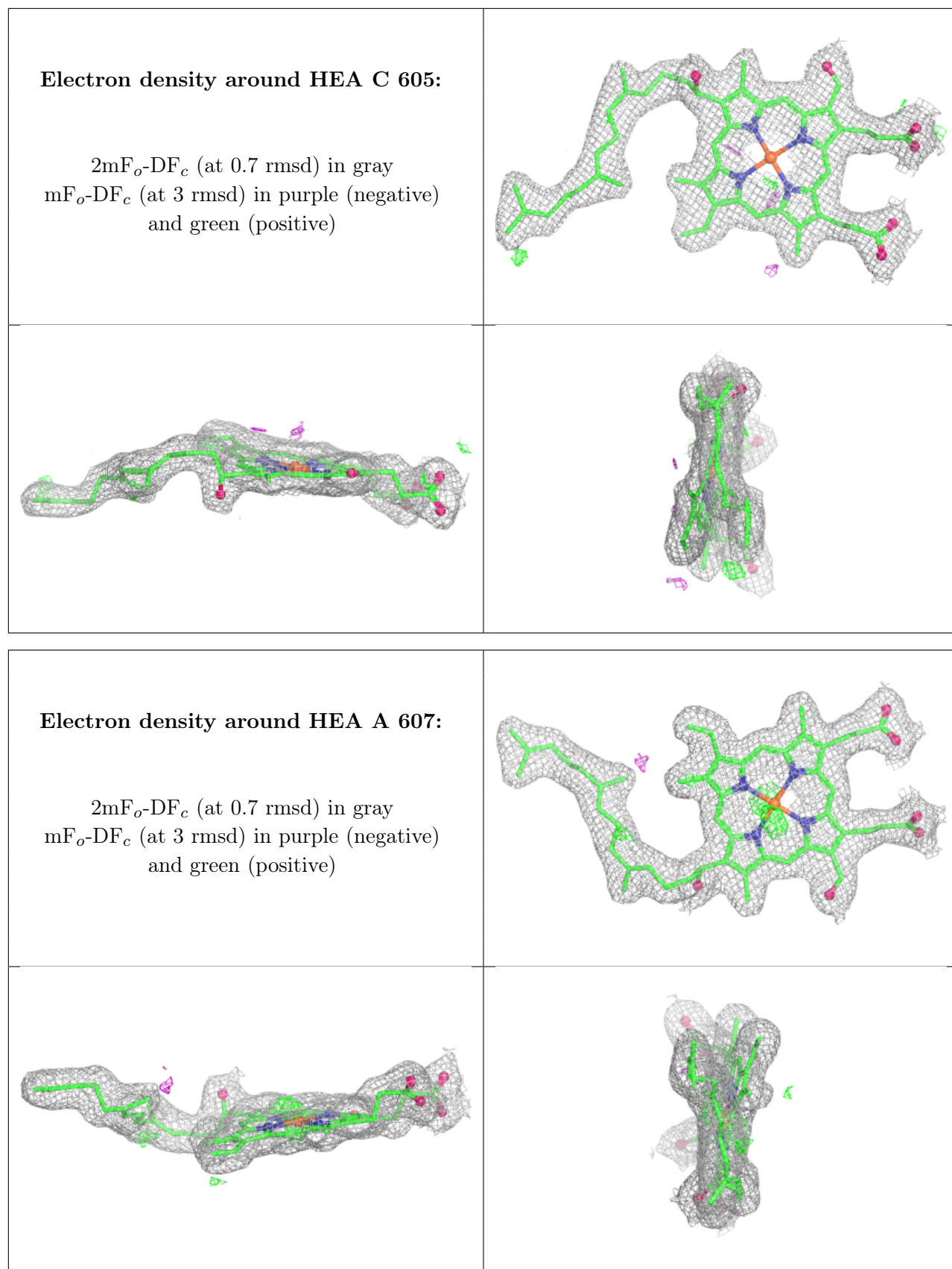
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)

**Electron density around DMU B 301:**

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







## 6.5 Other polymers [i](#)

There are no such residues in this entry.