



# wwPDB X-ray Structure Validation Summary Report ⓘ

Aug 27, 2023 – 12:25 PM EDT

PDB ID : 3H1L  
Title : Chicken cytochrome BC1 complex with ascochlorin bound at QO and QI sites  
Authors : Berry, E.A.; Huang, L.S.; Minagawa, N.  
Deposited on : 2009-04-12  
Resolution : 3.21 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 ⓘ](#)) were used in the production of this report:

MolProbity : 4.02b-467  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
Xtriage (Phenix) : 1.13  
EDS : 2.35  
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

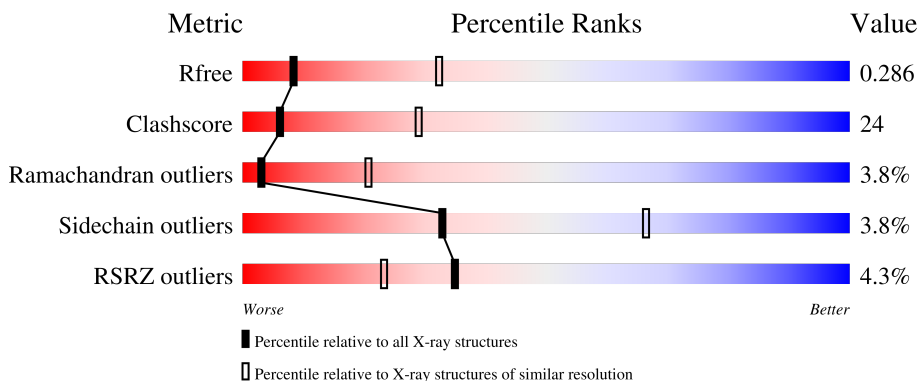
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 3.21 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	1335 (3.24-3.20)
Clashscore	141614	1460 (3.24-3.20)
Ramachandran outliers	138981	1437 (3.24-3.20)
Sidechain outliers	138945	1436 (3.24-3.20)
RSRZ outliers	127900	1291 (3.24-3.20)

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	446	 3% 57% 39%
1	N	446	 3% 57% 38% 5%
2	B	441	 4% 47% 43% 5% 5%
2	O	441	 4% 49% 41% 5%
3	C	380	 2% 58% 39%

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Mol	Chain	Length	Quality of chain
3	P	380	
4	D	241	
4	Q	241	
5	E	196	
5	R	196	
6	F	110	
6	S	110	
7	G	81	
7	T	81	
8	H	77	
8	U	77	
9	I	47	
9	V	47	
10	J	61	
10	W	61	

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
11	PEE	P	3008	-	X	-	-
11	PEE	R	3005	-	-	-	X
12	UNL	C	2104	-	-	-	X
12	UNL	C	3015	-	-	-	X
12	UNL	C	3106	-	-	-	X
12	UNL	E	2105	-	-	-	X
12	UNL	P	2106	-	-	-	X
12	UNL	P	3010	-	-	-	X
12	UNL	P	3103	-	-	-	X
12	UNL	P	3104	-	-	-	X
12	UNL	R	2103	-	-	-	X
15	CDL	P	3003	-	-	-	X

## 2 Entry composition [i](#)

There are 20 unique types of molecules in this entry. The entry contains 32657 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 MITOCHONDRIAL UBIQUINOL-CYTOCHROME-C REDUCTASE COMPLEX CORE PROTEIN I.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	443	Total 3440	C 2155	N 606	O 658	S 21	0	0	1
1	N	442	Total 3437	C 2154	N 605	O 657	S 21	0	0	0

- Molecule 2 is a protein called MITOCHONDRIAL UBIQUINOL-CYTOCHROME-C REDUCTASE COMPLEX CORE PROTEIN 2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	421	Total 3141	C 1974	N 545	O 613	S 9	0	0	0
2	O	422	Total 3147	C 1977	N 546	O 614	S 10	0	0	0

- Molecule 3 is a protein called Cytochrome b.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	C	380	Total 3020	C 2024	N 478	O 505	S 13	0	0	0
3	P	379	Total 3012	C 2019	N 477	O 504	S 12	0	0	0

- Molecule 4 is a protein called MITOCHONDRIAL CYTOCHROME C1, HEME PROTEIN.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
4	D	241	Total 1898	C 1212	N 327	O 347	S 12	0	0	0
4	Q	241	Total 1898	C 1212	N 327	O 347	S 12	0	0	0

- Molecule 5 is a protein called Cytochrome b-c1 complex subunit Rieske, mitochondrial.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
5	E	196	Total	C	N	O	S	0	0	0
			1513	952	263	292	6			
5	R	196	Total	C	N	O	S	0	0	0
			1513	952	263	292	6			

- Molecule 6 is a protein called MITOCHONDRIAL UBIQUINOL-CYTOCHROME C REDUCTASE 14 KDA PROTEIN.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
6	F	101	Total	C	N	O	S	0	0	0
			891	571	160	157	3			
6	S	101	Total	C	N	O	S	0	0	0
			891	571	160	157	3			

- Molecule 7 is a protein called MITOCHONDRIAL UBIQUINOL-CYTOCHROME C REDUCTASE UBIQUINONE-BINDING PROTEIN QP-C.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
7	G	81	Total	C	N	O	0	0	0
			676	439	120	117			
7	T	79	Total	C	N	O	0	0	0
			658	430	117	111			

- Molecule 8 is a protein called MITOCHONDRIAL UBIQUINOL-CYTOCHROME C REDUCTASE 11 KDA PROTEIN, COMPLEX III SUBUNIT VIII.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
8	H	70	Total	C	N	O	S	0	0	0
			574	350	105	114	5			
8	U	67	Total	C	N	O	S	0	0	0
			553	338	103	107	5			

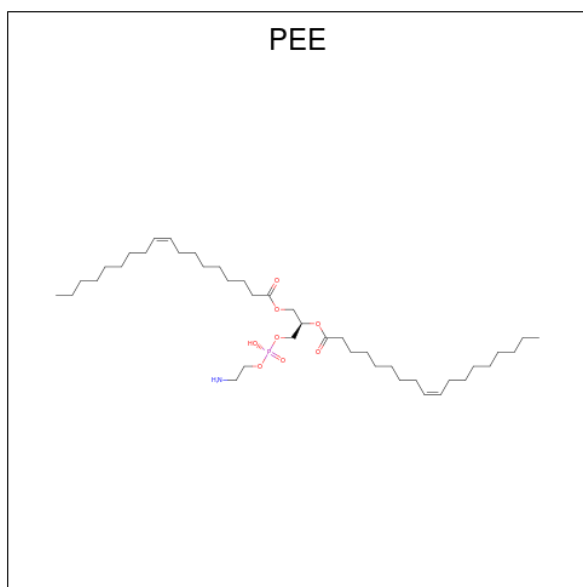
- Molecule 9 is a protein called Cytochrome b-c1 complex subunit Rieske, mitochondrial.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
9	I	46	Total	C	N	O	S	0	0	0
			285	169	58	56	2			
9	V	44	Total	C	N	O	S	0	0	1
			275	164	56	53	2			

- Molecule 10 is a protein called MITOCHONDRIAL UBIQUINOL-CYTOCHROME C REDUCTASE 7.2 KDA PROTEIN.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
10	J	61	497	321	87	89	0	0	0
10	W	59	478	311	85	82	0	0	0

- Molecule 11 is 1,2-dioleoyl-sn-glycero-3-phosphoethanolamine (three-letter code: PEE) (formula: C<sub>41</sub>H<sub>78</sub>NO<sub>8</sub>P).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	N	O	P		
11	A	1	21	12	8	1	0	0	
11	C	1	49	39	1	8	1	0	0
11	E	1	50	40	1	8	1	0	0
11	P	1	49	39	1	8	1	0	0
11	P	1	5	4	1		0	0	
11	R	1	50	40	1	8	1	0	0

- Molecule 12 is UNKNOWN LIGAND (three-letter code: UNL) (formula: ).

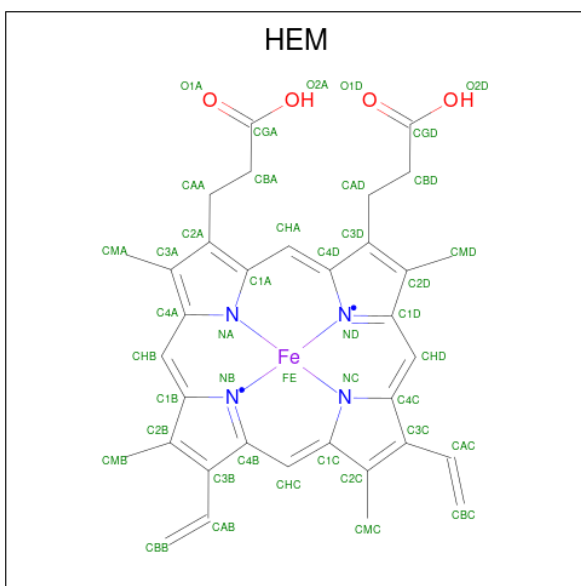
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
12	A	1	Total 1 O 1	0	0

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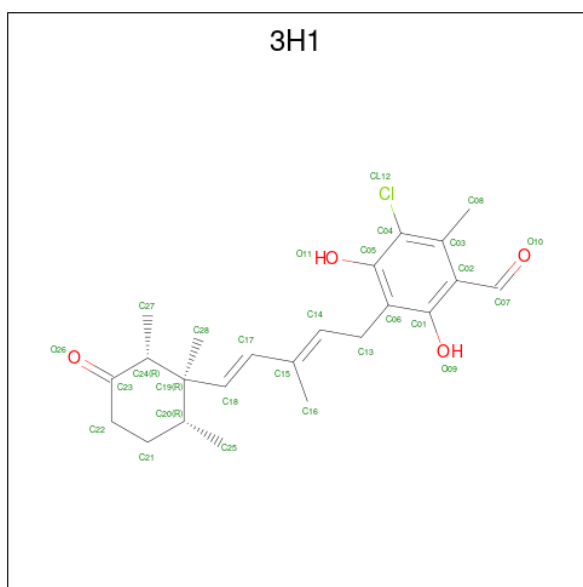
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
12	C	4	Total O 4 4	0	0
12	E	1	Total O 1 1	0	0
12	P	5	Total O 5 5	0	0
12	R	1	Total O 1 1	0	0

- Molecule 13 is PROTOPORPHYRIN IX CONTAINING FE (three-letter code: HEM) (formula:  $C_{34}H_{32}FeN_4O_4$ ).



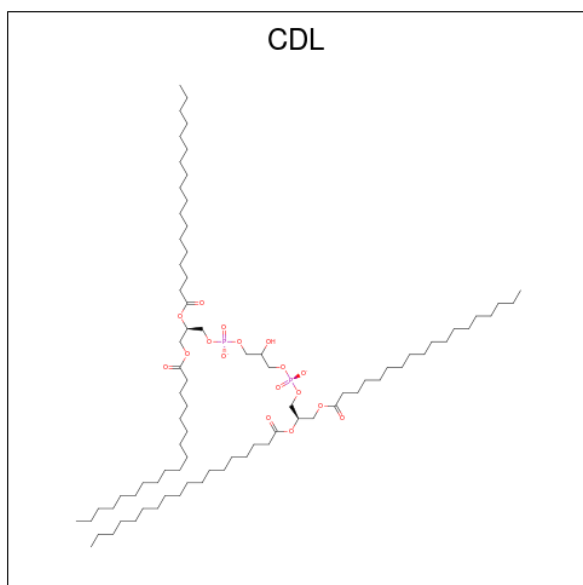
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
13	C	1	Total C Fe N O 43 34 1 4 4	0	0
13	C	1	Total C Fe N O 43 34 1 4 4	0	0
13	P	1	Total C Fe N O 43 34 1 4 4	0	0
13	P	1	Total C Fe N O 43 34 1 4 4	0	0

- Molecule 14 is 3-chloro-4,6-dihydroxy-2-methyl-5-[(2E,4E)-3-methyl-5-[(1R,2R,6R)-1,2,6-trimethyl-3-oxocyclohexyl]penta-2,4-dien-1-yl]benzaldehyde (three-letter code: 3H1) (formula:  $C_{23}H_{29}ClO_4$ ).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	
			Total	C	Cl	O			
14	C	1	Total	28	23	1	4	0	0
14	C	1	Total	28	23	1	4	0	0
14	P	1	Total	28	23	1	4	0	0
14	P	1	Total	28	23	1	4	0	0

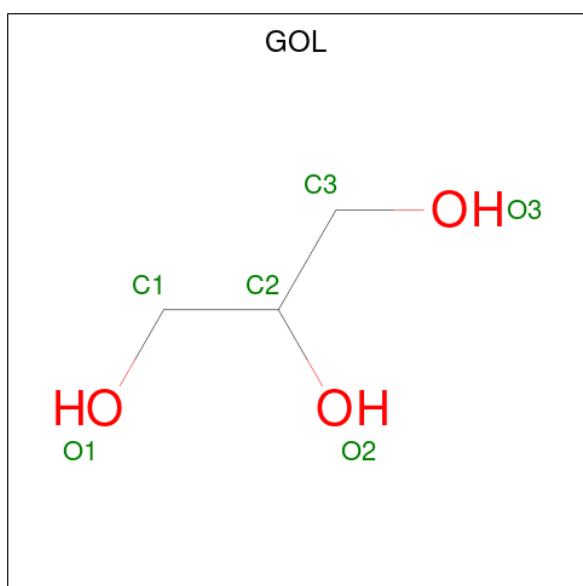
- Molecule 15 is CARDIOLIPIN (three-letter code: CDL) (formula:  $C_{81}H_{156}O_{17}P_2$ ).





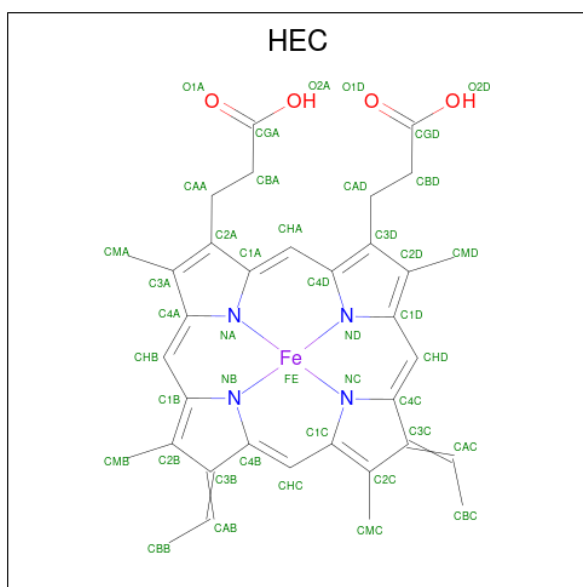
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf	
15	C	1	Total	C	O	P	0	0
			50	31	17	2		
15	G	1	Total	C	O	P	0	0
			40	21	17	2		
15	P	1	Total	C	O	P	0	0
			50	31	17	2		
15	T	1	Total	C	O	P	0	0
			40	21	17	2		

- Molecule 16 is GLYCEROL (three-letter code: GOL) (formula: C<sub>3</sub>H<sub>8</sub>O<sub>3</sub>).



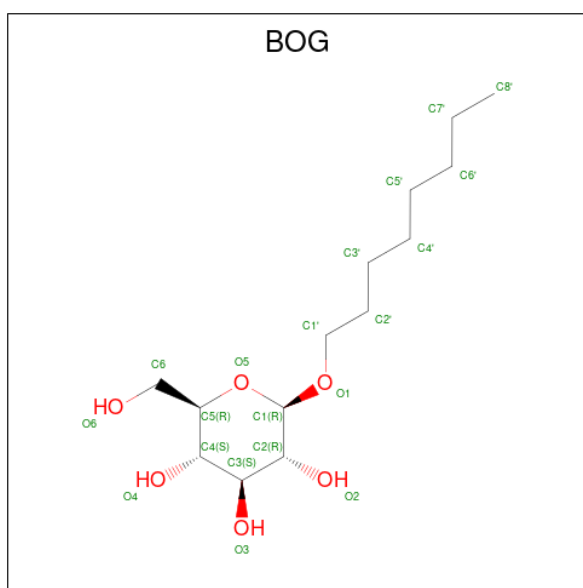
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
16	C	1	Total	C O	0	0
			6	3 3		
16	P	1	Total	C O	0	0
			6	3 3		

- Molecule 17 is HEME C (three-letter code: HEC) (formula: C<sub>34</sub>H<sub>34</sub>FeN<sub>4</sub>O<sub>4</sub>).



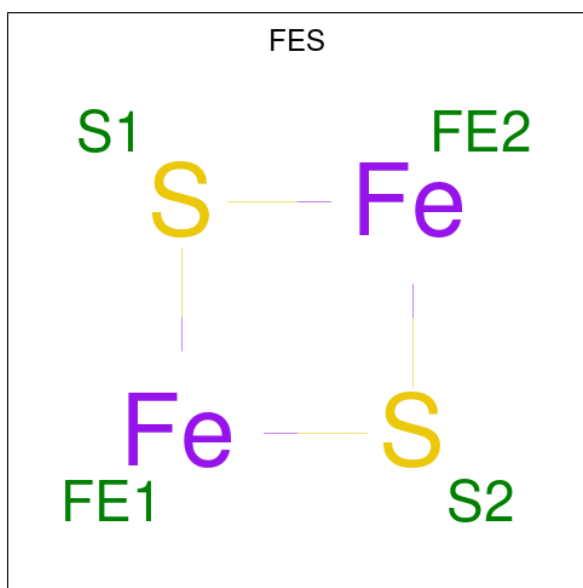
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	
17	D	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
17	Q	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		

- Molecule 18 is octyl beta-D-glucopyranoside (three-letter code: BOG) (formula:  $C_{14}H_{28}O_6$ ).



Mol	Chain	Residues	Atoms		ZeroOcc	AltConf	
18	D	1	Total	C	O	0	0
			20	14	6		
18	R	1	Total	C	O	0	0
			20	14	6		

- Molecule 19 is FE2/S2 (INORGANIC) CLUSTER (three-letter code: FES) (formula: Fe<sub>2</sub>S<sub>2</sub>).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
19	E	1	Total	Fe	S	0	0
			4	2	2		
19	R	1	Total	Fe	S	0	0
			4	2	2		

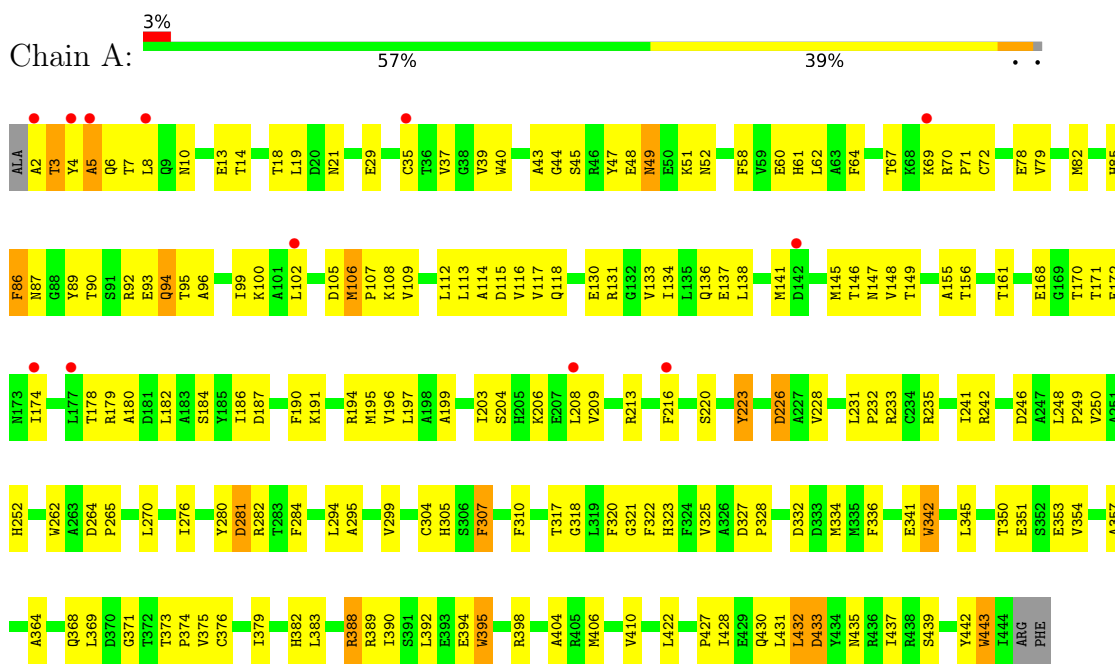
- Molecule 20 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
20	B	1	Total	O	0	0
			1	1		
20	C	6	Total	O	0	0
			6	6		
20	P	6	Total	O	0	0
			6	6		
20	U	1	Total	O	0	0
			1	1		

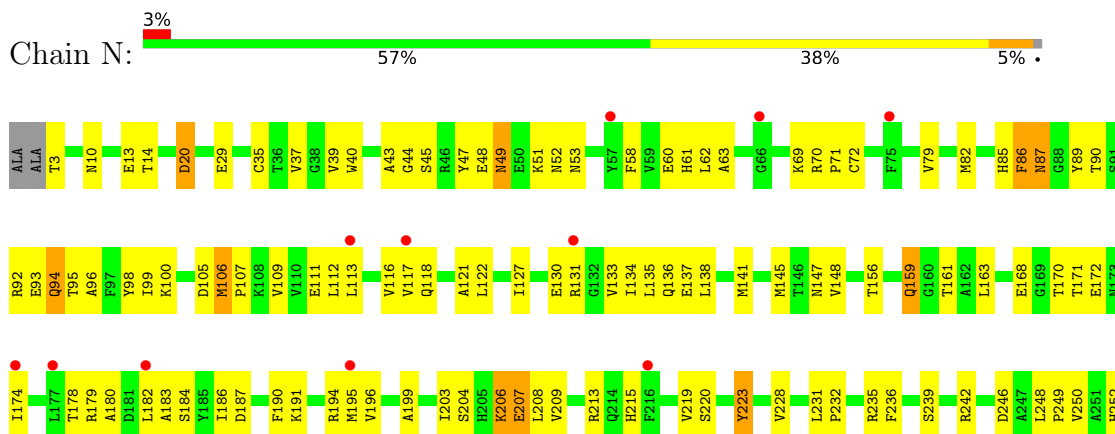
### 3 Residue-property plots [i](#)

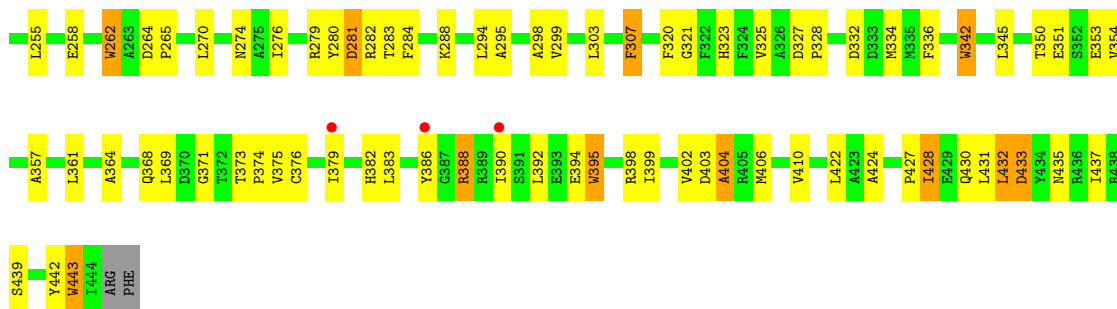
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. 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: MITOCHONDRIAL UBIQUINOL-CYTOCHROME-C REDUCTASE COMPLEX CORE PROTEIN I

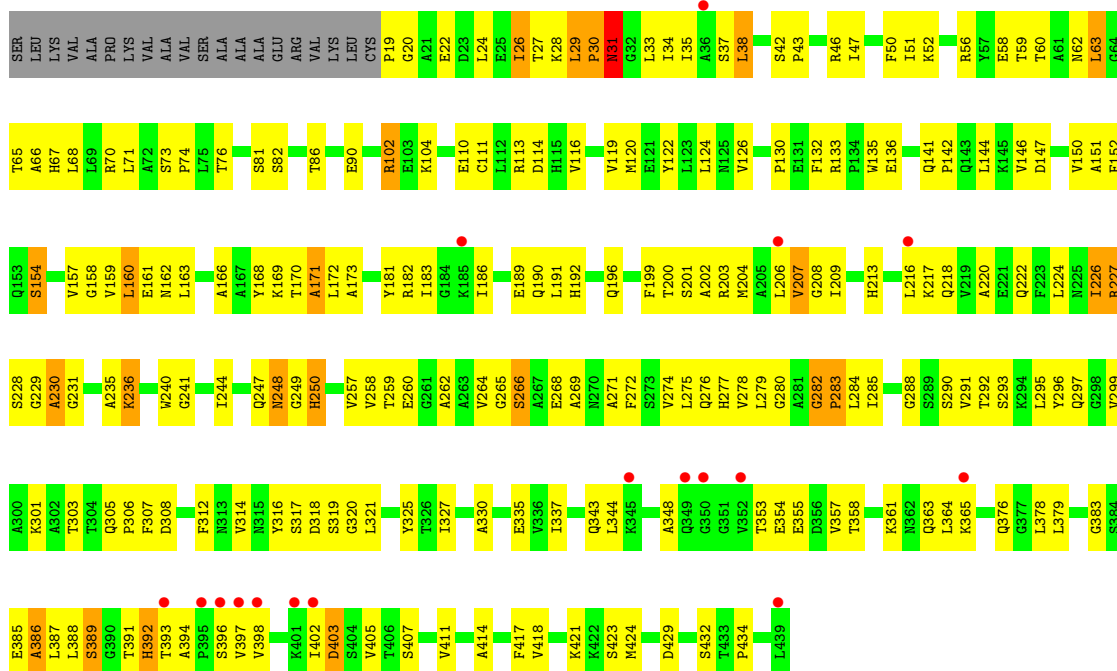


#### • Molecule 1: MITOCHONDRIAL UBIQUINOL-CYTOCHROME-C REDUCTASE COMPLEX CORE PROTEIN I

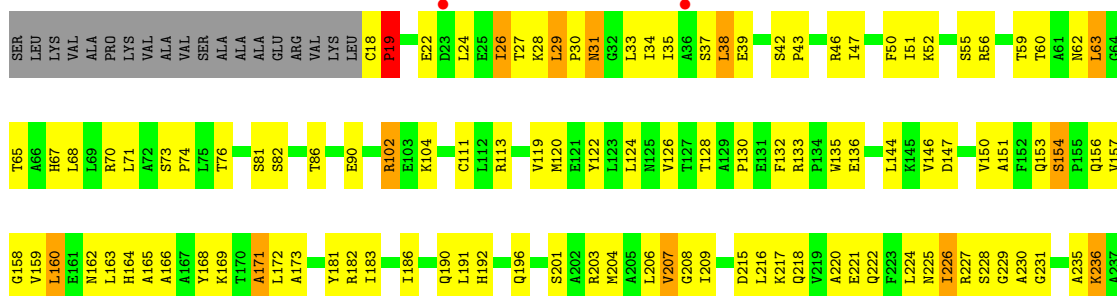


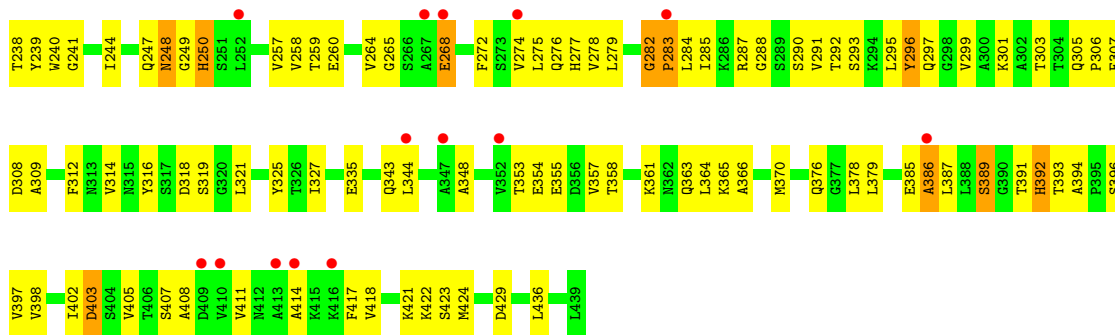


• Molecule 2: MITOCHONDRIAL UBIQUINOL-CYTOCHROME-C REDUCTASE COMPLEX CORE PROTEIN 2

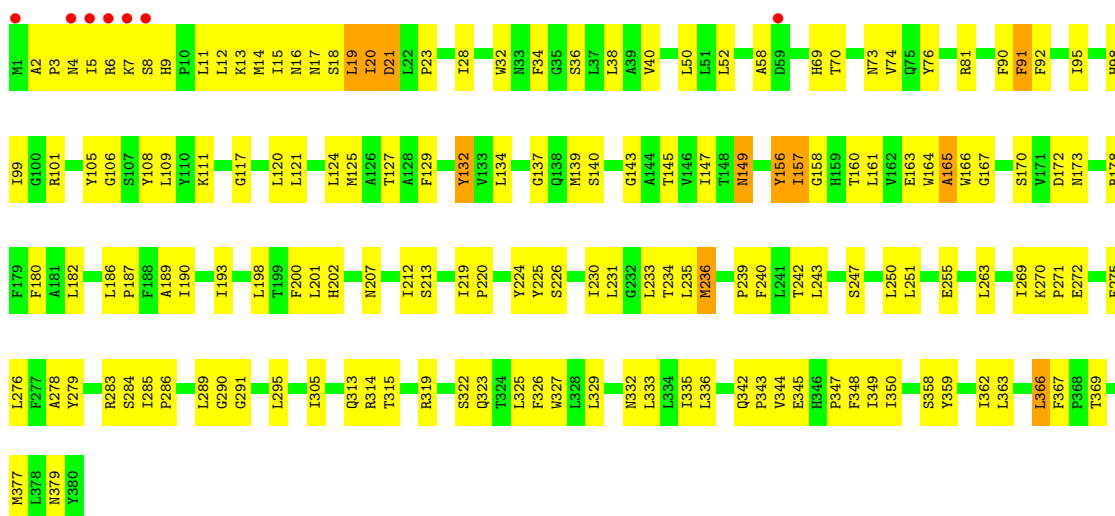


• Molecule 2: MITOCHONDRIAL UBIQUINOL-CYTOCHROME-C REDUCTASE COMPLEX CORE PROTEIN 2

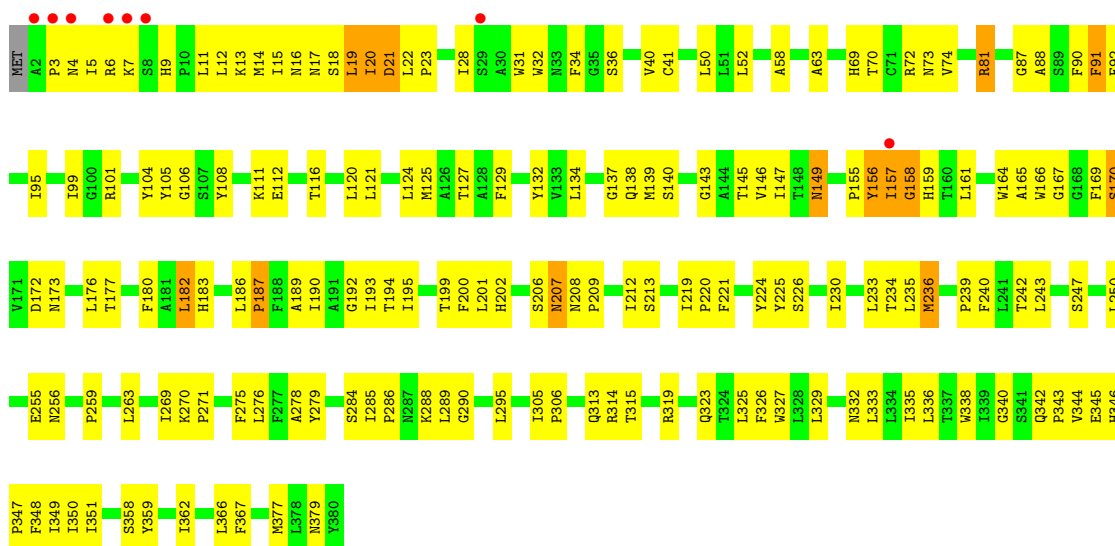




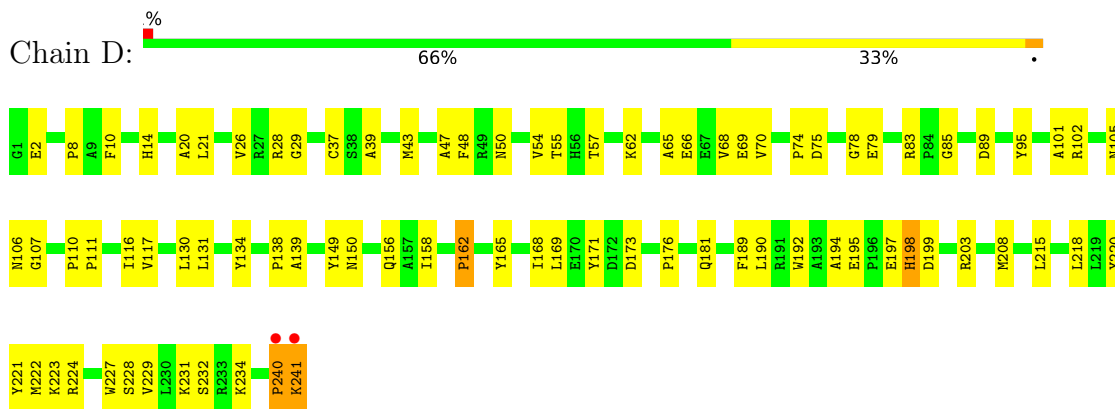
• Molecule 3: Cytochrome b



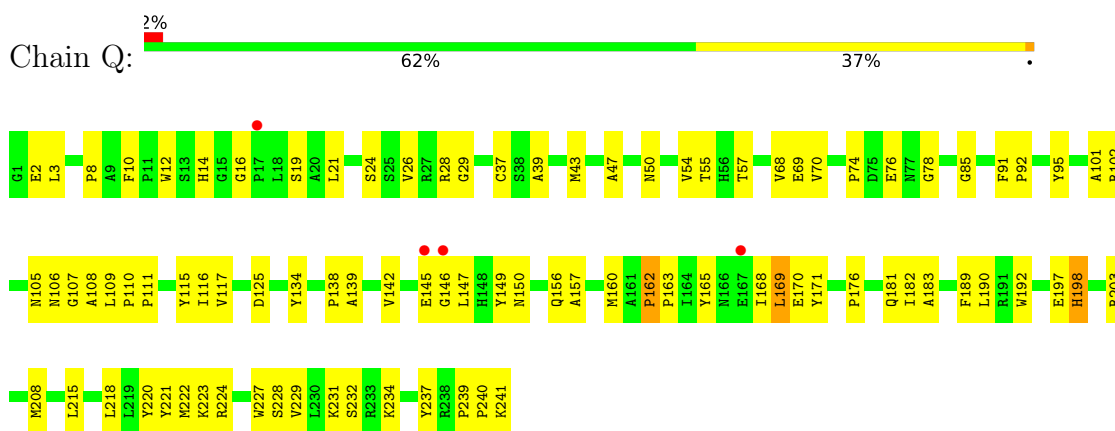
• Molecule 3: Cytochrome b



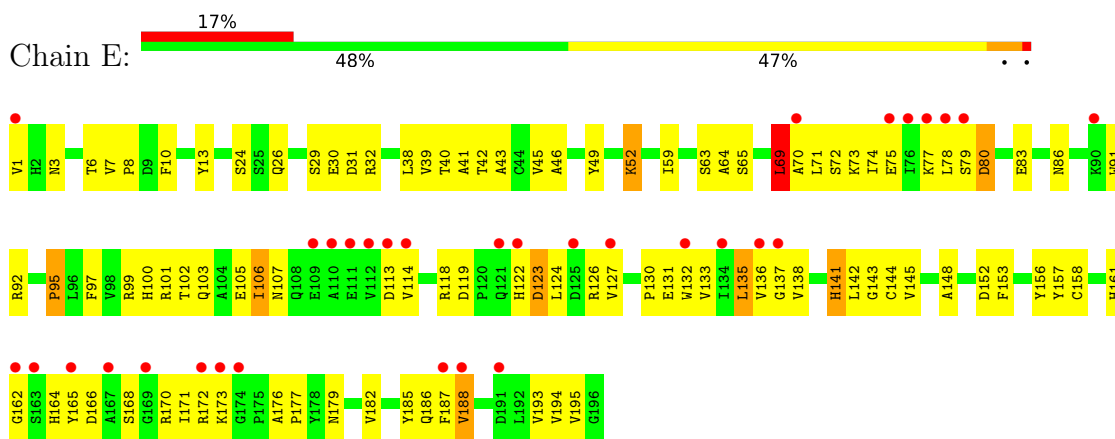
- Molecule 4: MITOCHONDRIAL CYTOCHROME C1, HEME PROTEIN



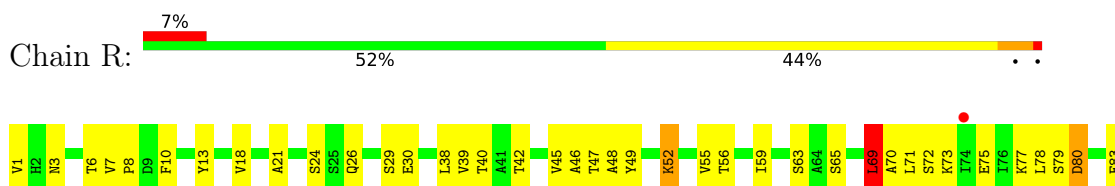
- Molecule 4: MITOCHONDRIAL CYTOCHROME C1, HEME PROTEIN

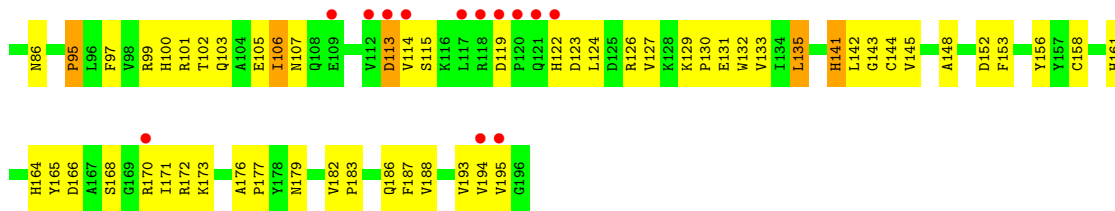


- Molecule 5: Cytochrome b-c1 complex subunit Rieske, mitochondrial



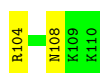
- Molecule 5: Cytochrome b-c1 complex subunit Rieske, mitochondrial





● Molecule 6: MITOCHONDRIAL UBIQUINOL-CYTOCHROME C REDUCTASE 14 KDA PROTEIN

Chain F: 63% 26% 8%



● Molecule 6: MITOCHONDRIAL UBIQUINOL-CYTOCHROME C REDUCTASE 14 KDA PROTEIN

Chain S: 4% 53% 35% 8%



● Molecule 7: MITOCHONDRIAL UBIQUINOL-CYTOCHROME C REDUCTASE UBIQUINONE-BINDING PROTEIN QP-C

Chain G: 46% 46% 9%



● Molecule 7: MITOCHONDRIAL UBIQUINOL-CYTOCHROME C REDUCTASE UBIQUINONE-BINDING PROTEIN QP-C

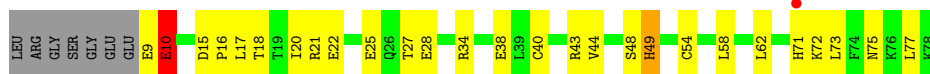
Chain T: 15% 43% 44% 10%







- Molecule 8: MITOCHONDRIAL UBIQUINOL-CYTOCHROME C REDUCTASE 11 KDA PROTEIN, COMPLEX III SUBUNIT VIII



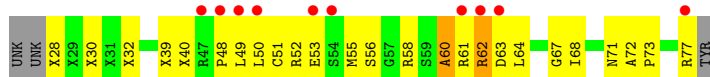
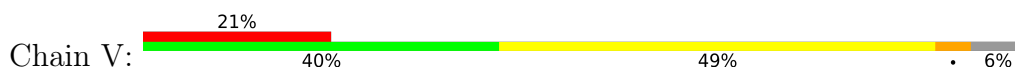
- Molecule 8: MITOCHONDRIAL UBIQUINOL-CYTOCHROME C REDUCTASE 11 KDA PROTEIN, COMPLEX III SUBUNIT VIII



- Molecule 9: Cytochrome b-c1 complex subunit Rieske, mitochondrial



- Molecule 9: Cytochrome b-c1 complex subunit Rieske, mitochondrial

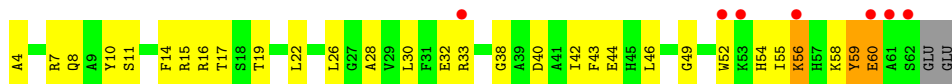


- Molecule 10: MITOCHONDRIAL UBIQUINOL-CYTOCHROME C REDUCTASE 7.2 KDA PROTEIN



- Molecule 10: MITOCHONDRIAL UBIQUINOL-CYTOCHROME C REDUCTASE 7.2 KDA PROTEIN





## 4 Data and refinement statistics i

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	174.14Å 182.36Å 241.63Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	29.99 – 3.21 39.96 – 3.21	Depositor EDS
% Data completeness (in resolution range)	99.1 (29.99-3.21) 99.2 (39.96-3.21)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	0.16	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.98 (at 3.18Å)	Xtrriage
Refinement program	CNS	Depositor
R, $R_{free}$	0.267 , 0.295 0.250 , 0.286	Depositor DCC
$R_{free}$ test set	2492 reflections (1.99%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	92.9	Xtrriage
Anisotropy	0.613	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.27 , 56.5	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.50$ , $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	0.006 for k,h,-l	Xtrriage
$F_o, F_c$ correlation	0.91	EDS
Total number of atoms	32657	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	105.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 1.76% 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: HEM, UNL, PEE, BOG, 3H1, CDL, GOL, FES, HEC

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	0.44	0/3511	0.65	0/4757
1	N	0.45	0/3508	0.67	0/4753
2	B	0.39	0/3196	0.65	0/4334
2	O	0.43	0/3202	0.65	0/4343
3	C	0.59	2/3122 (0.1%)	0.73	0/4273
3	P	0.50	0/3114	0.69	0/4263
4	D	0.50	0/1956	0.68	0/2658
4	Q	0.40	0/1956	0.62	0/2658
5	E	0.39	0/1547	0.66	1/2103 (0.0%)
5	R	0.41	0/1547	0.68	1/2103 (0.0%)
6	F	0.56	0/911	0.73	0/1218
6	S	0.43	0/911	0.65	0/1218
7	G	0.57	0/698	0.72	1/946 (0.1%)
7	T	0.43	0/680	0.68	1/923 (0.1%)
8	H	0.49	0/582	0.61	0/779
8	U	0.37	0/561	0.56	0/751
9	I	0.40	0/218	0.63	0/293
9	V	0.41	0/218	0.66	0/293
10	J	0.43	0/508	0.63	0/682
10	W	0.41	0/489	0.62	0/658
All	All	0.46	2/32435 (0.0%)	0.67	4/44006 (0.0%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
3	C	0	1

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	C	132	TYR	CD1-CE1	5.29	1.47	1.39
3	C	132	TYR	CD2-CE2	5.08	1.47	1.39

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	E	143	GLY	N-CA-C	6.38	129.05	113.10
5	R	143	GLY	N-CA-C	6.27	128.77	113.10
7	T	18	LEU	CA-CB-CG	5.87	128.80	115.30
7	G	18	LEU	CA-CB-CG	5.68	128.37	115.30

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
3	C	76	TYR	Sidechain

## 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	3440	0	3353	173	0
1	N	3437	0	3349	166	0
2	B	3141	0	3142	212	0
2	O	3147	0	3146	205	0
3	C	3020	0	3070	158	0
3	P	3012	0	3058	174	0
4	D	1898	0	1846	69	0
4	Q	1898	0	1846	86	0
5	E	1513	0	1478	81	0
5	R	1513	0	1478	79	0
6	F	891	0	900	36	0
6	S	891	0	900	37	0
7	G	676	0	659	48	0
7	T	658	0	647	54	0
8	H	574	0	548	23	0
8	U	553	0	535	37	0
9	I	285	0	239	30	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
9	V	275	0	238	33	0
10	J	497	0	490	21	0
10	W	478	0	478	30	0
11	A	21	0	13	0	0
11	C	49	0	72	0	0
11	E	50	0	77	0	0
11	P	54	0	72	3	0
11	R	50	0	77	3	0
12	A	1	0	0	0	0
12	C	4	0	0	1	0
12	E	1	0	0	0	0
12	P	5	0	0	0	0
12	R	1	0	0	0	0
13	C	86	0	60	12	0
13	P	86	0	60	7	0
14	C	56	0	56	3	0
14	P	56	0	58	9	0
15	C	50	0	44	2	0
15	G	40	0	24	1	0
15	P	50	0	44	1	0
15	T	40	0	24	1	0
16	C	6	0	8	0	0
16	P	6	0	8	0	0
17	D	43	0	30	3	0
17	Q	43	0	30	3	0
18	D	20	0	28	1	0
18	R	20	0	28	1	0
19	E	4	0	0	1	0
19	R	4	0	0	1	0
20	B	1	0	0	0	0
20	C	6	0	0	1	0
20	P	6	0	0	1	0
20	U	1	0	0	0	0
All	All	32657	0	32213	1589	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 24.

The worst 5 of 1589 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)
2:O:157:VAL:HG23	9:V:64:LEU:HD21	1.15	1.13
2:O:206:LEU:HD23	2:O:220:ALA:HB2	1.40	0.99
3:P:139:MET:HE1	3:P:269:ILE:HA	1.39	0.99
6:F:52:LYS:HZ1	7:G:11:ARG:HH11	0.95	0.95
3:C:13:LYS:O	3:C:17:ASN:HB2	1.66	0.95

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	441/446 (99%)	383 (87%)	47 (11%)	11 (2%)	5	31
1	N	440/446 (99%)	382 (87%)	45 (10%)	13 (3%)	4	27
2	B	419/441 (95%)	323 (77%)	73 (17%)	23 (6%)	2	13
2	O	420/441 (95%)	331 (79%)	67 (16%)	22 (5%)	2	14
3	C	378/380 (100%)	333 (88%)	33 (9%)	12 (3%)	4	25
3	P	377/380 (99%)	329 (87%)	36 (10%)	12 (3%)	4	25
4	D	239/241 (99%)	204 (85%)	32 (13%)	3 (1%)	12	46
4	Q	239/241 (99%)	201 (84%)	35 (15%)	3 (1%)	12	46
5	E	194/196 (99%)	153 (79%)	26 (13%)	15 (8%)	1	6
5	R	194/196 (99%)	153 (79%)	27 (14%)	14 (7%)	1	7
6	F	99/110 (90%)	90 (91%)	8 (8%)	1 (1%)	15	52
6	S	99/110 (90%)	88 (89%)	8 (8%)	3 (3%)	4	27
7	G	79/81 (98%)	64 (81%)	10 (13%)	5 (6%)	1	10
7	T	77/81 (95%)	63 (82%)	10 (13%)	4 (5%)	2	14
8	H	68/77 (88%)	59 (87%)	7 (10%)	2 (3%)	4	27
8	U	65/77 (84%)	53 (82%)	12 (18%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
9	I	29/47 (62%)	23 (79%)	4 (14%)	2 (7%)	1	8
9	V	29/47 (62%)	21 (72%)	5 (17%)	3 (10%)	0	3
10	J	59/61 (97%)	51 (86%)	5 (8%)	3 (5%)	2	15
10	W	57/61 (93%)	45 (79%)	10 (18%)	2 (4%)	3	23
All	All	4002/4160 (96%)	3349 (84%)	500 (12%)	153 (4%)	3	21

5 of 153 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	94	GLN
1	A	282	ARG
2	B	20	GLY
2	B	26	ILE
2	B	29	LEU

### 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	365/368 (99%)	348 (95%)	17 (5%)	26	61
1	N	365/368 (99%)	347 (95%)	18 (5%)	25	60
2	B	332/347 (96%)	323 (97%)	9 (3%)	44	74
2	O	333/347 (96%)	324 (97%)	9 (3%)	44	74
3	C	329/329 (100%)	321 (98%)	8 (2%)	49	76
3	P	328/329 (100%)	315 (96%)	13 (4%)	31	65
4	D	200/200 (100%)	194 (97%)	6 (3%)	41	72
4	Q	200/200 (100%)	196 (98%)	4 (2%)	55	79
5	E	166/166 (100%)	159 (96%)	7 (4%)	30	64
5	R	166/166 (100%)	159 (96%)	7 (4%)	30	64
6	F	93/96 (97%)	89 (96%)	4 (4%)	29	63
6	S	93/96 (97%)	90 (97%)	3 (3%)	39	70

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
7	G	71/71 (100%)	65 (92%)	6 (8%)	10	38
7	T	69/71 (97%)	63 (91%)	6 (9%)	10	36
8	H	65/71 (92%)	62 (95%)	3 (5%)	27	62
8	U	63/71 (89%)	61 (97%)	2 (3%)	39	70
9	I	23/26 (88%)	22 (96%)	1 (4%)	29	63
9	V	23/26 (88%)	23 (100%)	0	100	100
10	J	49/49 (100%)	46 (94%)	3 (6%)	18	53
10	W	47/49 (96%)	44 (94%)	3 (6%)	17	51
All	All	3380/3446 (98%)	3251 (96%)	129 (4%)	33	66

5 of 129 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
6	S	13	MET
7	T	16	TYR
6	F	70	LEU
6	F	63	LYS
7	T	41	PHE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 95 such sidechains are listed below:

Mol	Chain	Res	Type
1	N	308	GLN
2	O	376	GLN
2	O	31	ASN
2	O	248	ASN
3	P	82	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 38 ligands modelled in this entry, 12 are unknown - leaving 26 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
18	BOG	R	3009	-	20,20,20	1.09	2 (10%)	25,25,25	0.98	1 (4%)
11	PEE	A	2008	-	20,20,50	1.72	5 (25%)	23,25,55	0.64	0
14	3H1	C	2001	-	28,29,29	2.63	12 (42%)	34,43,43	1.82	7 (20%)
11	PEE	E	2005	-	49,49,50	1.46	9 (18%)	52,54,55	0.90	3 (5%)
17	HEC	D	501	4	32,50,50	2.65	6 (18%)	24,82,82	1.29	3 (12%)
15	CDL	G	2004	-	39,39,99	1.34	5 (12%)	45,51,111	1.08	4 (8%)
19	FES	E	501	5	0,4,4	-	-	-	-	-
19	FES	R	501	5	0,4,4	-	-	-	-	-
11	PEE	P	3008	-	4,4,50	3.63	4 (100%)	6,6,55	0.53	0
13	HEM	P	502	3	41,50,50	1.54	6 (14%)	45,82,82	1.60	8 (17%)
16	GOL	C	2011	-	5,5,5	1.44	0	5,5,5	0.67	0
11	PEE	R	3005	-	49,49,50	1.48	8 (16%)	52,54,55	0.89	3 (5%)
16	GOL	P	3011	-	5,5,5	1.29	0	5,5,5	0.62	0
15	CDL	C	2003	-	49,49,99	1.22	5 (10%)	55,61,111	0.88	1 (1%)
11	PEE	C	2007	-	48,48,50	1.38	6 (12%)	51,53,55	0.80	2 (3%)
15	CDL	T	3004	-	39,39,99	1.27	5 (12%)	45,51,111	1.12	4 (8%)
11	PEE	P	3007	-	48,48,50	1.37	5 (10%)	51,53,55	0.78	2 (3%)
14	3H1	P	3001	-	28,29,29	2.77	14 (50%)	34,43,43	1.68	7 (20%)
13	HEM	C	502	3	41,50,50	1.78	10 (24%)	45,82,82	1.65	9 (20%)
13	HEM	C	501	3	41,50,50	1.80	11 (26%)	45,82,82	2.12	16 (35%)
14	3H1	P	3002	-	28,29,29	2.36	11 (39%)	34,43,43	1.73	10 (29%)
18	BOG	D	2009	-	20,20,20	0.77	0	25,25,25	0.84	1 (4%)
14	3H1	C	2002	-	28,29,29	2.30	14 (50%)	34,43,43	1.67	9 (26%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
13	HEM	P	501	3	41,50,50	1.69	8 (19%)	45,82,82	1.61	8 (17%)
17	HEC	Q	501	4	32,50,50	2.19	5 (15%)	24,82,82	1.17	1 (4%)
15	CDL	P	3003	-	49,49,99	1.17	5 (10%)	55,61,111	0.92	2 (3%)

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
18	BOG	R	3009	-	-	7/11/31/31	0/1/1/1
11	PEE	A	2008	-	-	13/24/24/54	-
14	3H1	C	2001	-	-	2/13/34/34	0/2/2/2
11	PEE	E	2005	-	-	28/53/53/54	-
17	HEC	D	501	4	-	6/10/54/54	-
15	CDL	G	2004	-	-	18/49/49/110	-
19	FES	E	501	5	-	-	0/1/1/1
19	FES	R	501	5	-	-	0/1/1/1
13	HEM	P	502	3	-	4/12/54/54	-
16	GOL	C	2011	-	-	0/4/4/4	-
11	PEE	R	3005	-	-	28/53/53/54	-
16	GOL	P	3011	-	-	2/4/4/4	-
15	CDL	C	2003	-	-	18/59/59/110	-
11	PEE	C	2007	-	-	27/52/52/54	-
15	CDL	T	3004	-	-	21/49/49/110	-
11	PEE	P	3007	-	-	26/52/52/54	-
14	3H1	P	3001	-	-	2/13/34/34	0/2/2/2
13	HEM	C	502	3	-	4/12/54/54	-
13	HEM	C	501	3	-	6/12/54/54	-
14	3H1	P	3002	-	-	4/13/34/34	0/2/2/2
18	BOG	D	2009	-	-	7/11/31/31	0/1/1/1
14	3H1	C	2002	-	-	4/13/34/34	0/2/2/2
13	HEM	P	501	3	-	6/12/54/54	-
17	HEC	Q	501	4	-	6/10/54/54	-
15	CDL	P	3003	-	-	18/59/59/110	-

The worst 5 of 156 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
17	D	501	HEC	C2B-C3B	-9.47	1.30	1.40
17	Q	501	HEC	C2B-C3B	-9.08	1.31	1.40
17	D	501	HEC	C3C-C2C	-8.92	1.31	1.40
14	P	3001	3H1	C13-C06	6.38	1.58	1.51
14	C	2001	3H1	C13-C06	5.44	1.57	1.51

The worst 5 of 101 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
14	C	2001	3H1	C05-C04-C03	-5.94	119.02	122.79
13	C	501	HEM	C3B-C2B-C1B	-5.74	102.23	106.49
13	C	501	HEM	CBA-CAA-C2A	-5.28	103.61	112.62
13	C	502	HEM	C3B-C2B-C1B	-5.19	102.64	106.49
13	P	502	HEM	C3B-C2B-C1B	-4.91	102.84	106.49

There are no chirality outliers.

5 of 257 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
11	A	2008	PEE	C1-O3P-P-O2P
11	A	2008	PEE	C1-O3P-P-O4P
11	E	2005	PEE	C11-C10-O2-C2
11	E	2005	PEE	C1-O3P-P-O1P
11	E	2005	PEE	C1-O3P-P-O4P

There are no ring outliers.

20 monomers are involved in 52 short contacts:

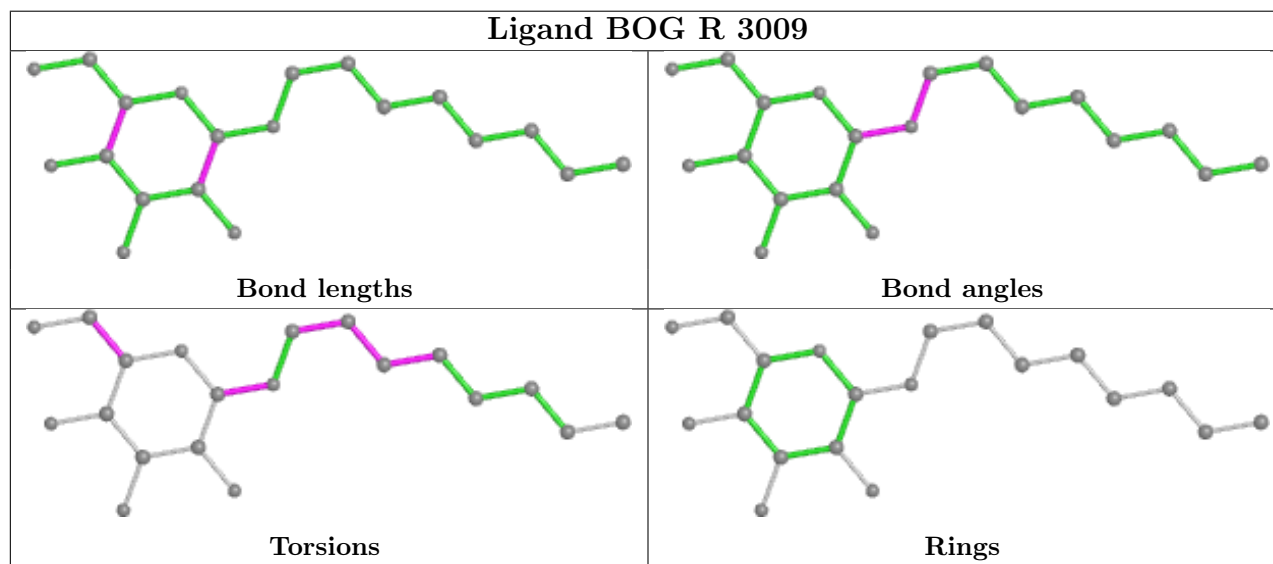
Mol	Chain	Res	Type	Clashes	Symm-Clashes
18	R	3009	BOG	1	0
14	C	2001	3H1	2	0
17	D	501	HEC	3	0
15	G	2004	CDL	1	0
19	E	501	FES	1	0
19	R	501	FES	1	0
13	P	502	HEM	2	0
11	R	3005	PEE	3	0
15	C	2003	CDL	2	0
15	T	3004	CDL	1	0
11	P	3007	PEE	3	0
14	P	3001	3H1	4	0
13	C	502	HEM	5	0

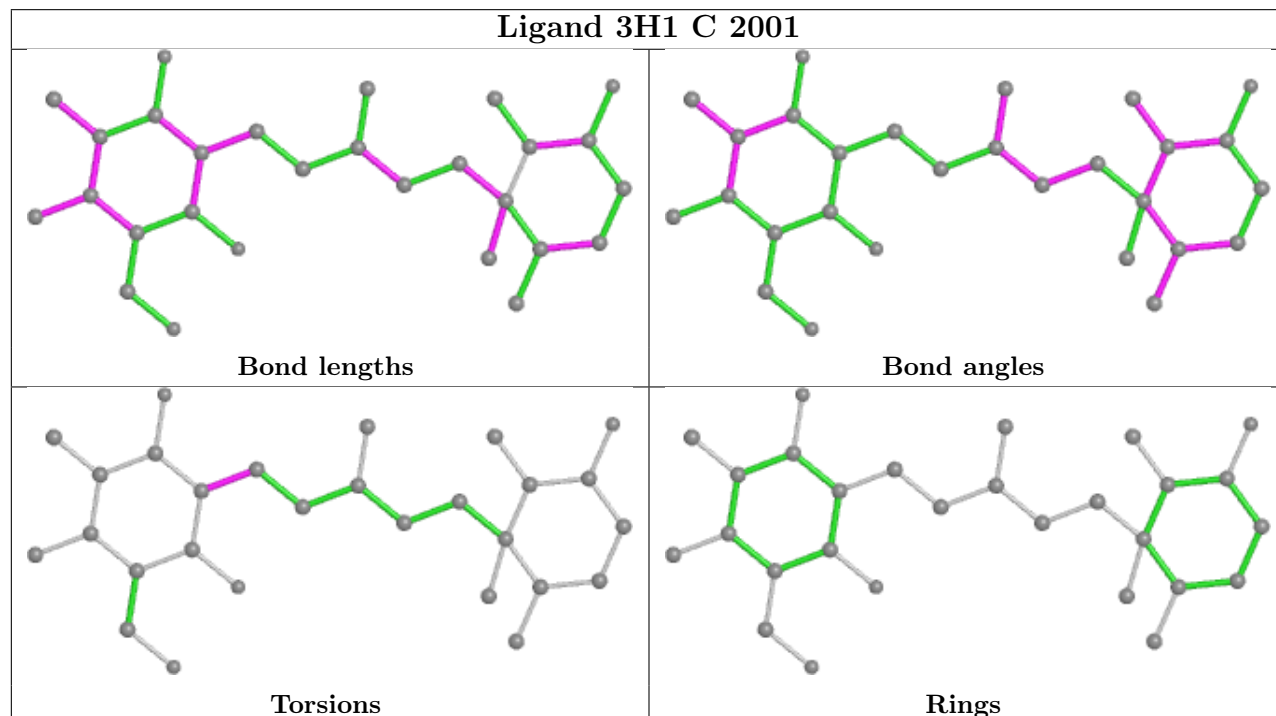
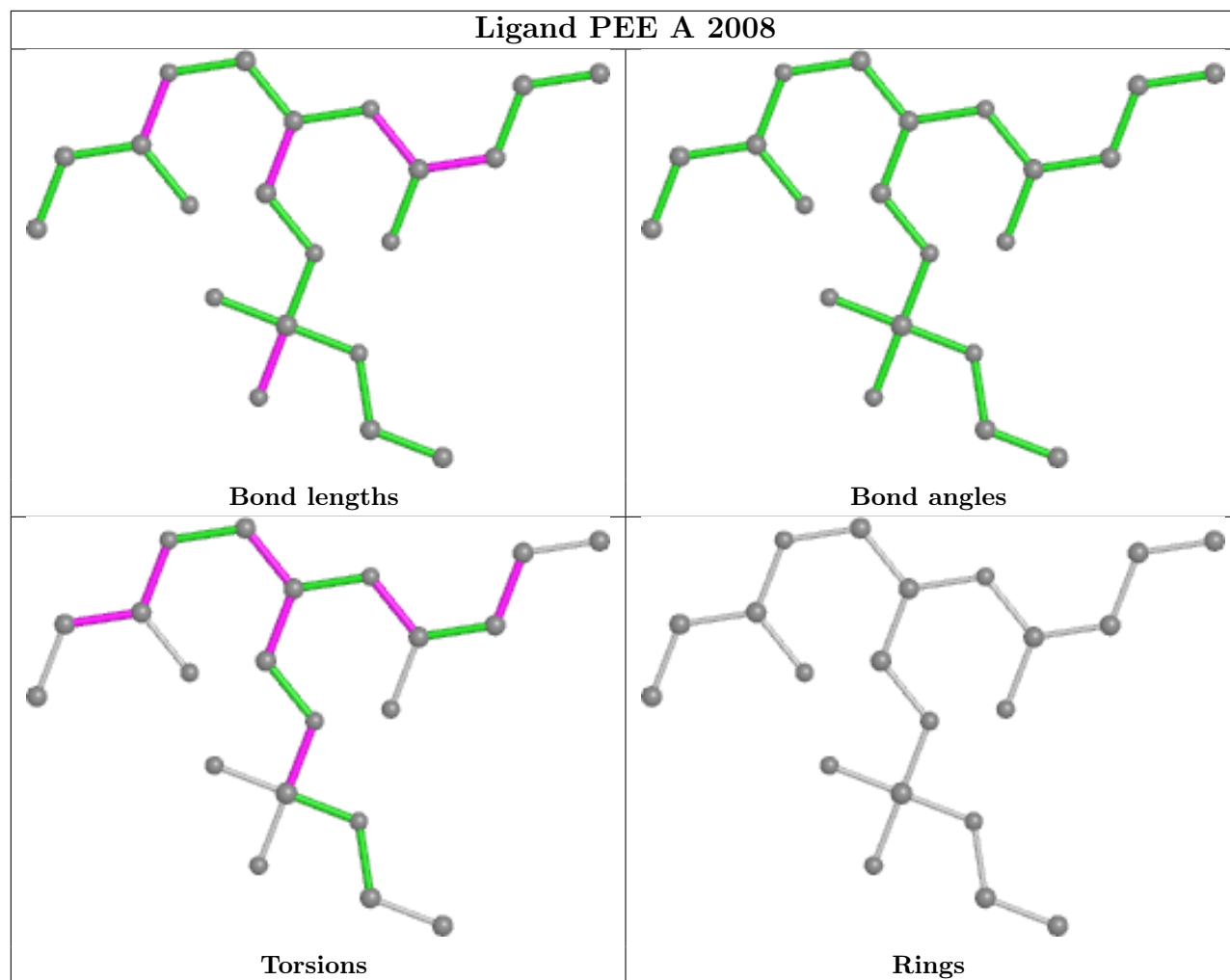
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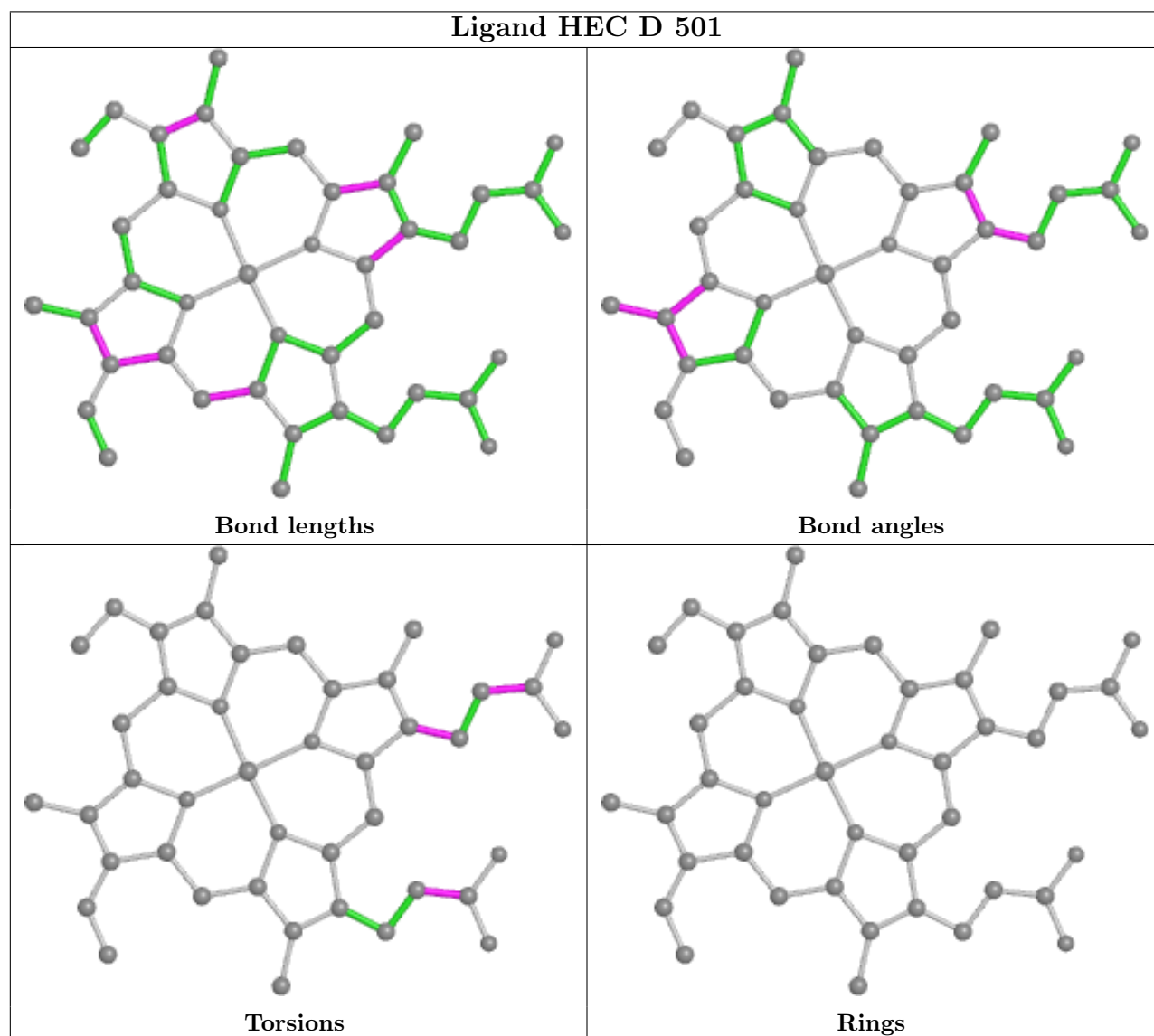
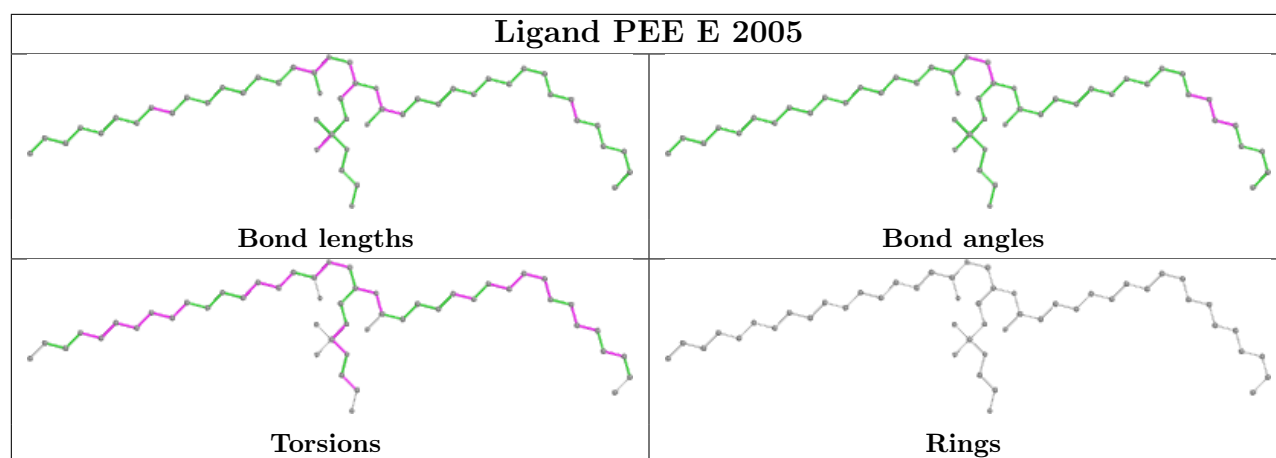
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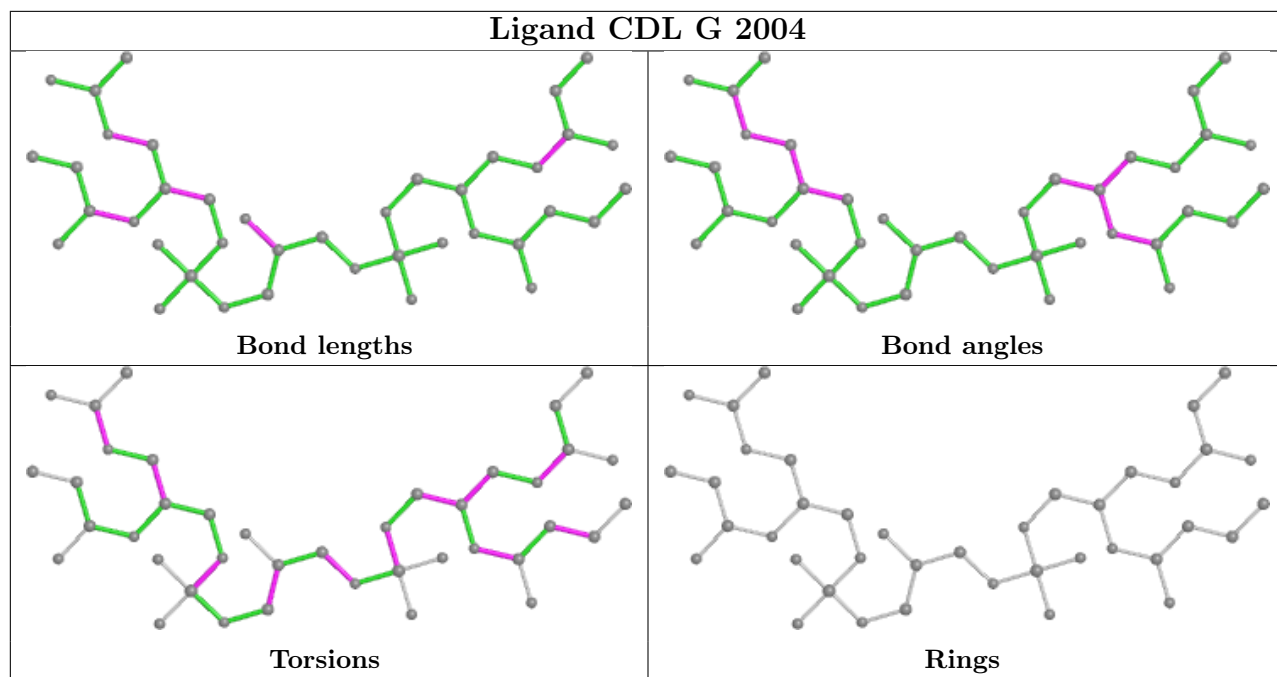
Mol	Chain	Res	Type	Clashes	Symm-Clashes
13	C	501	HEM	7	0
14	P	3002	3H1	5	0
18	D	2009	BOG	1	0
14	C	2002	3H1	1	0
13	P	501	HEM	5	0
17	Q	501	HEC	3	0
15	P	3003	CDL	1	0

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.

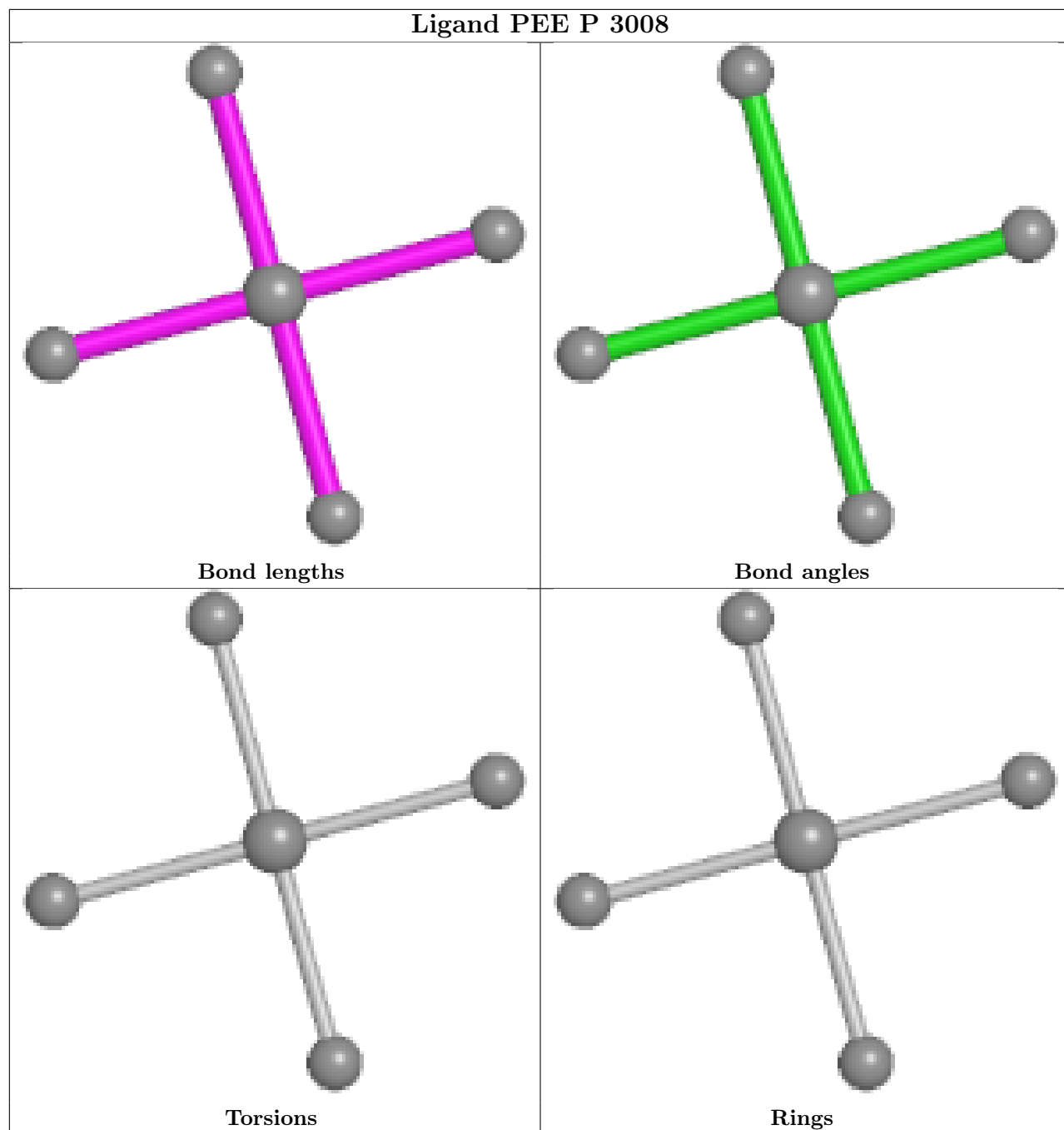


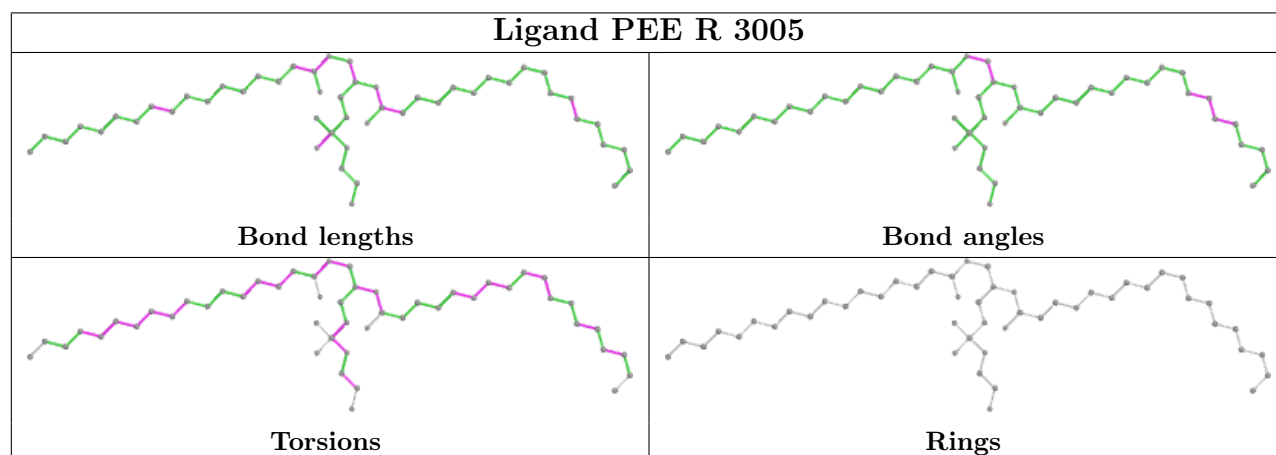
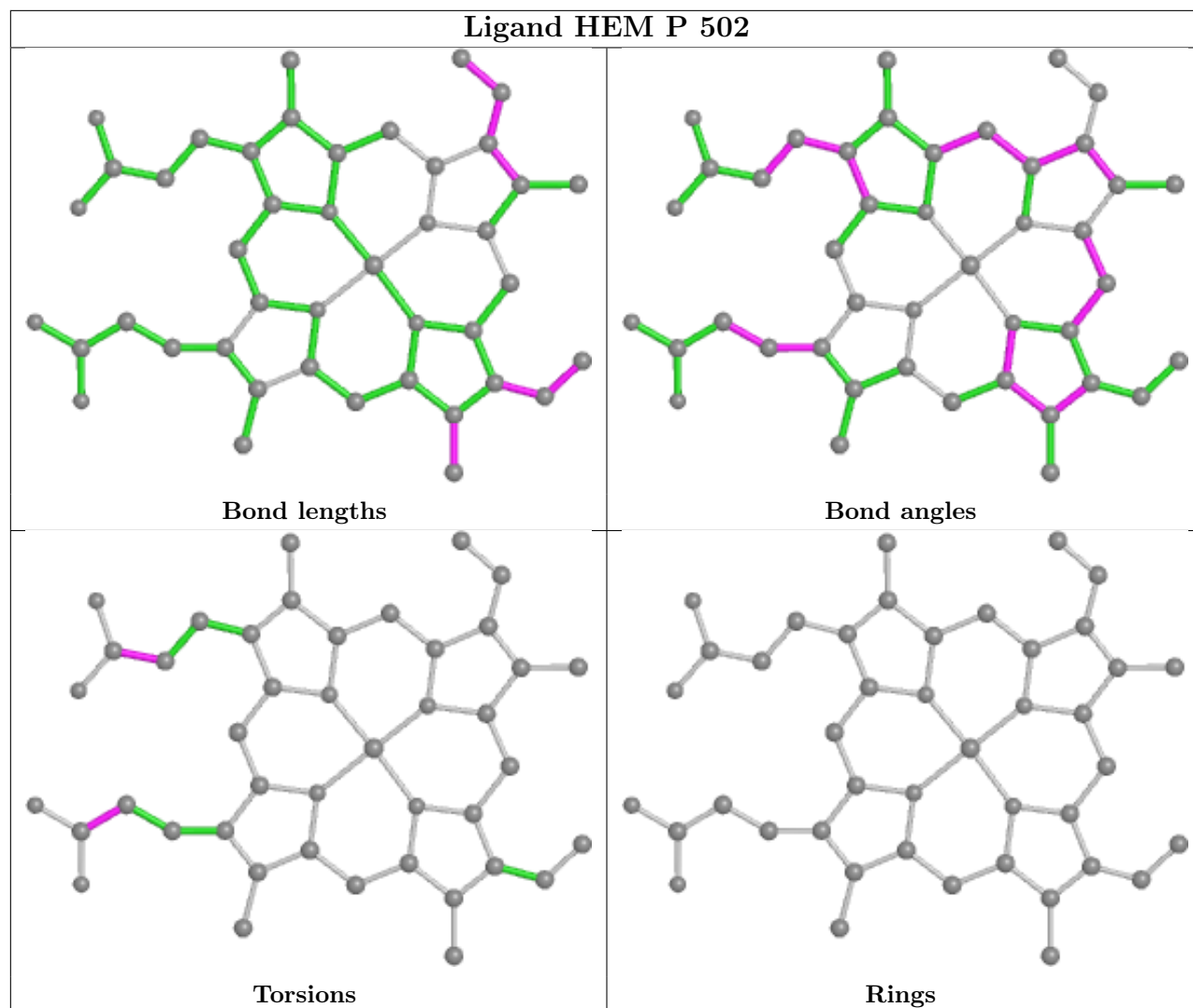


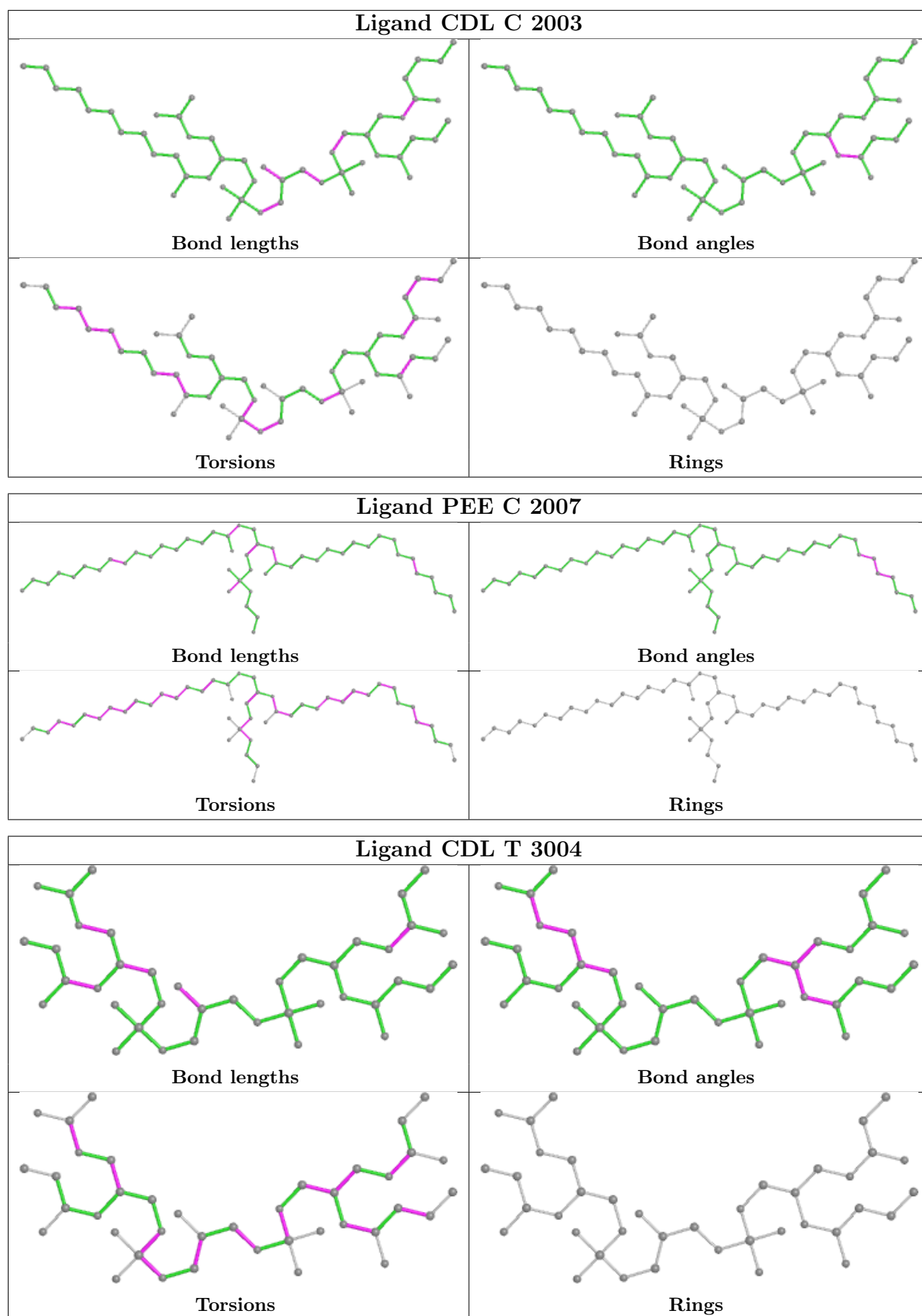


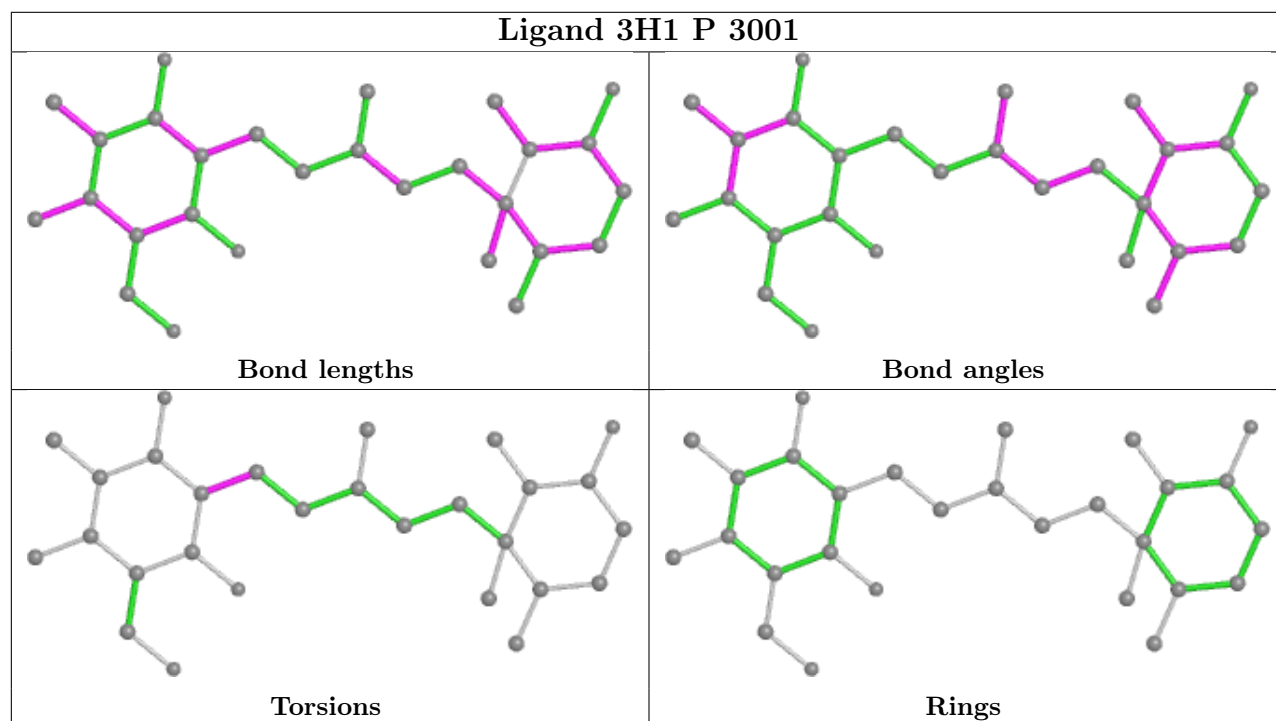
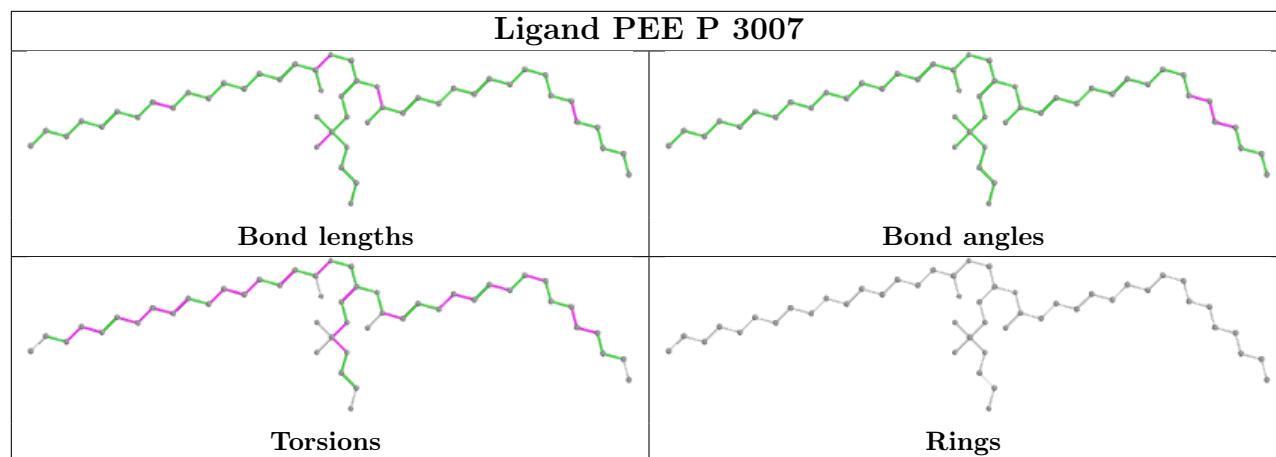


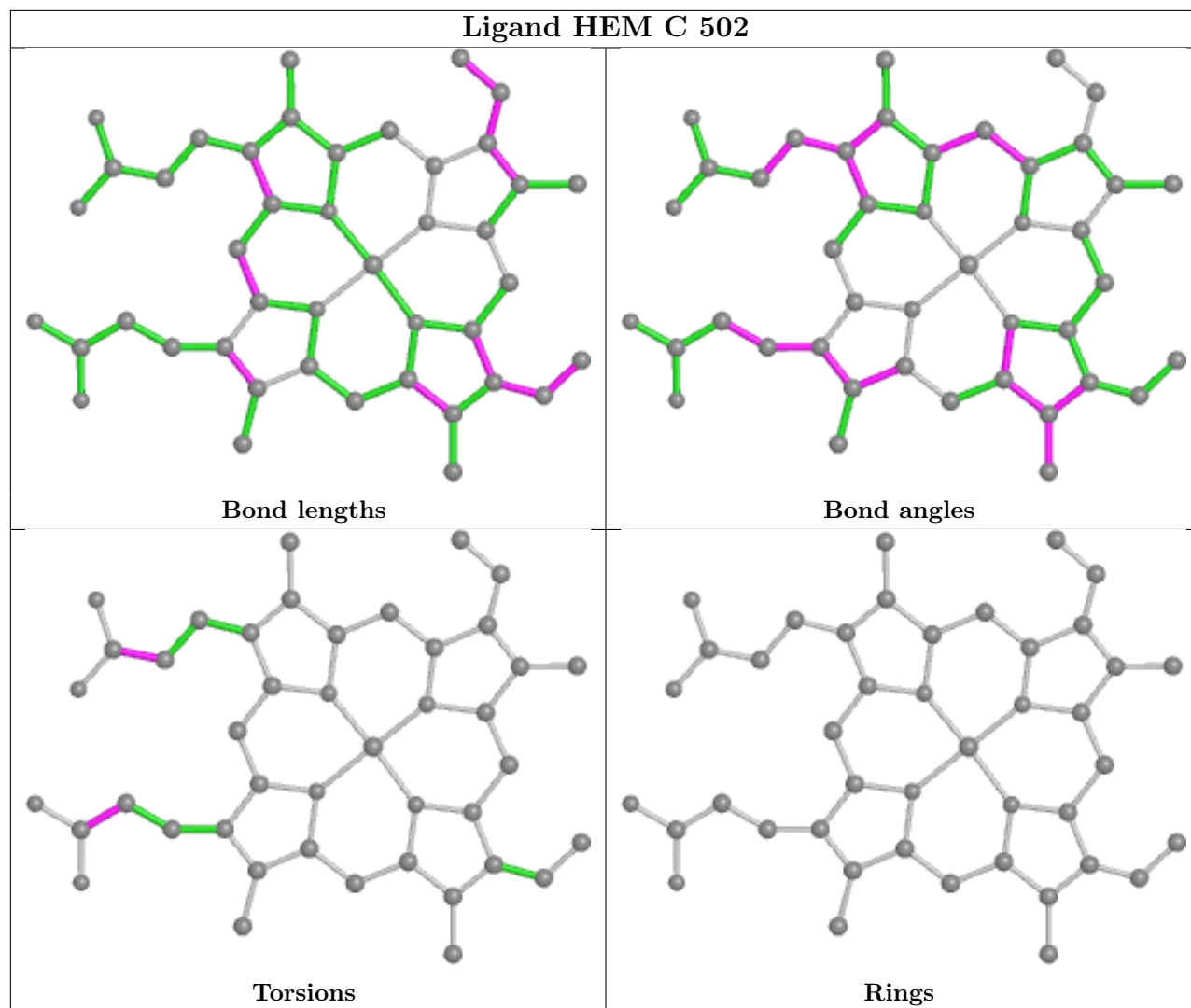


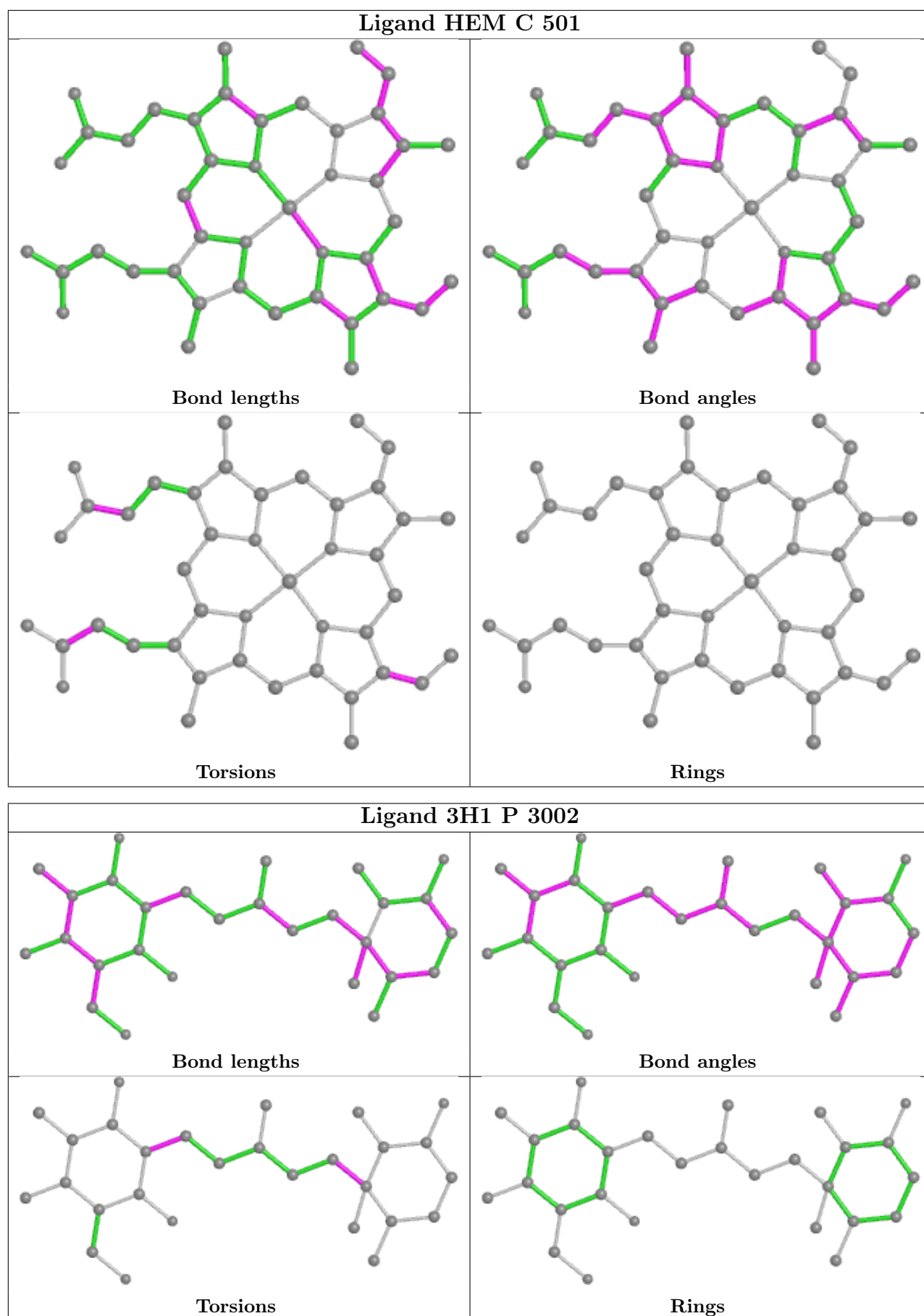


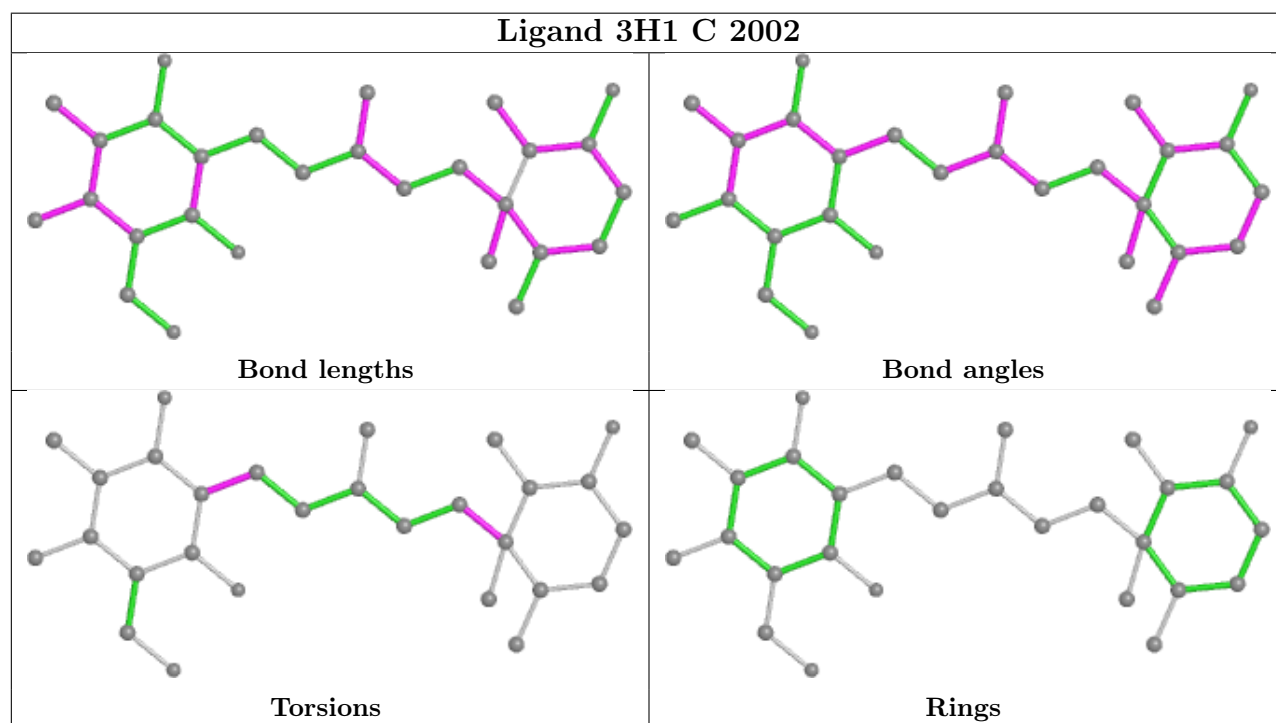
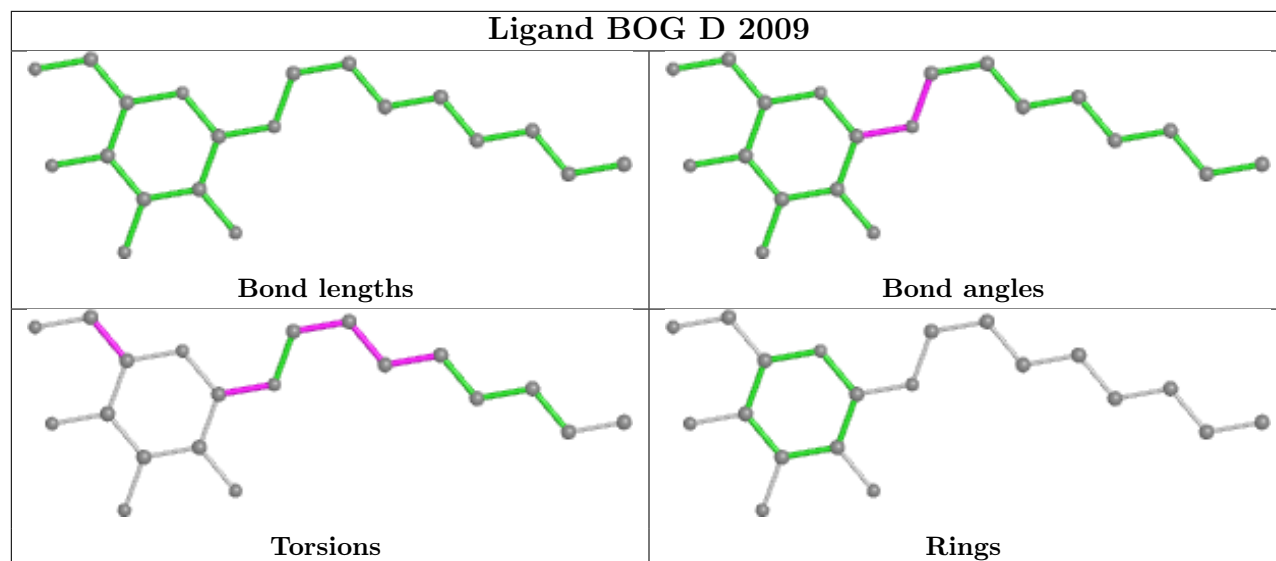


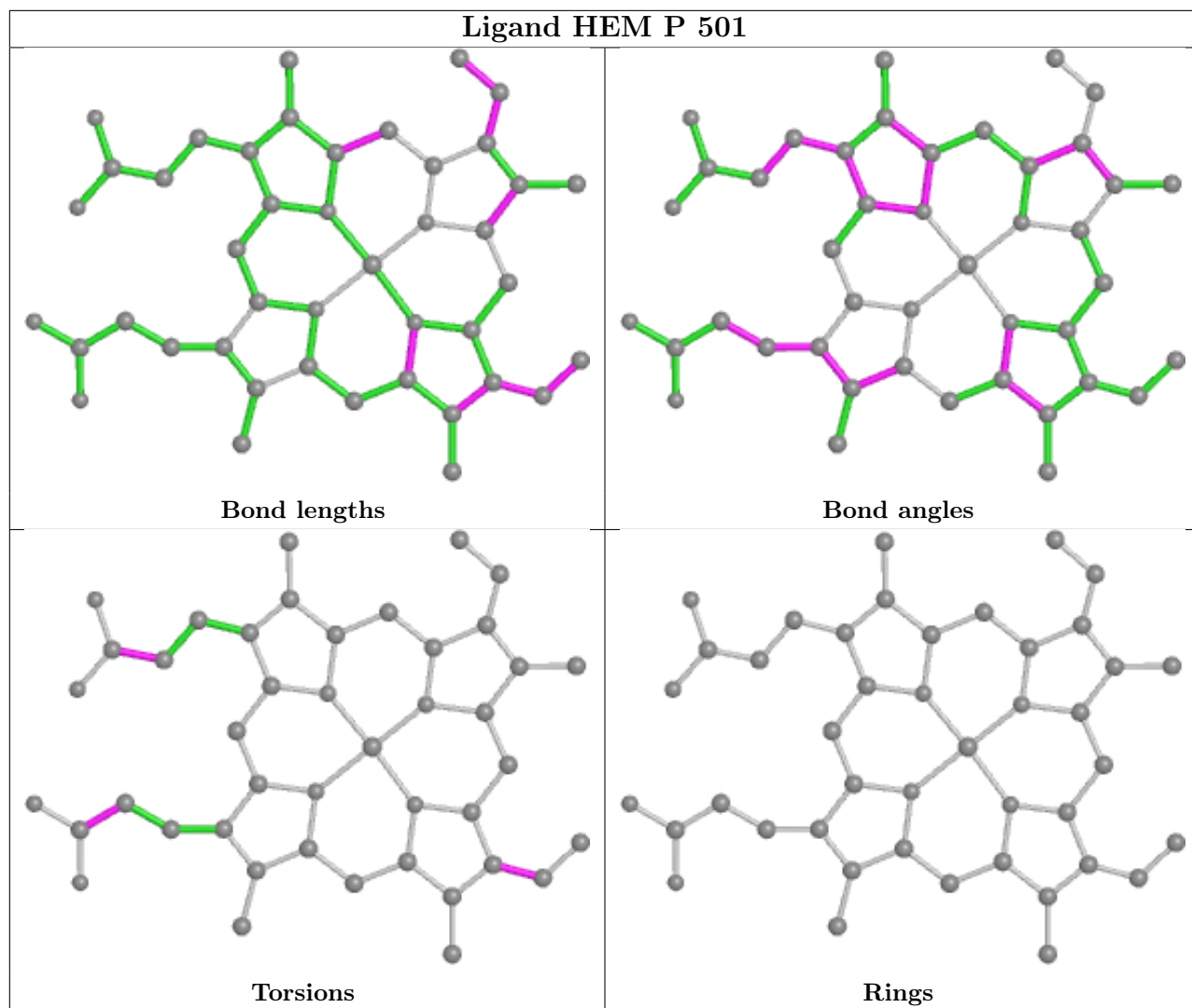




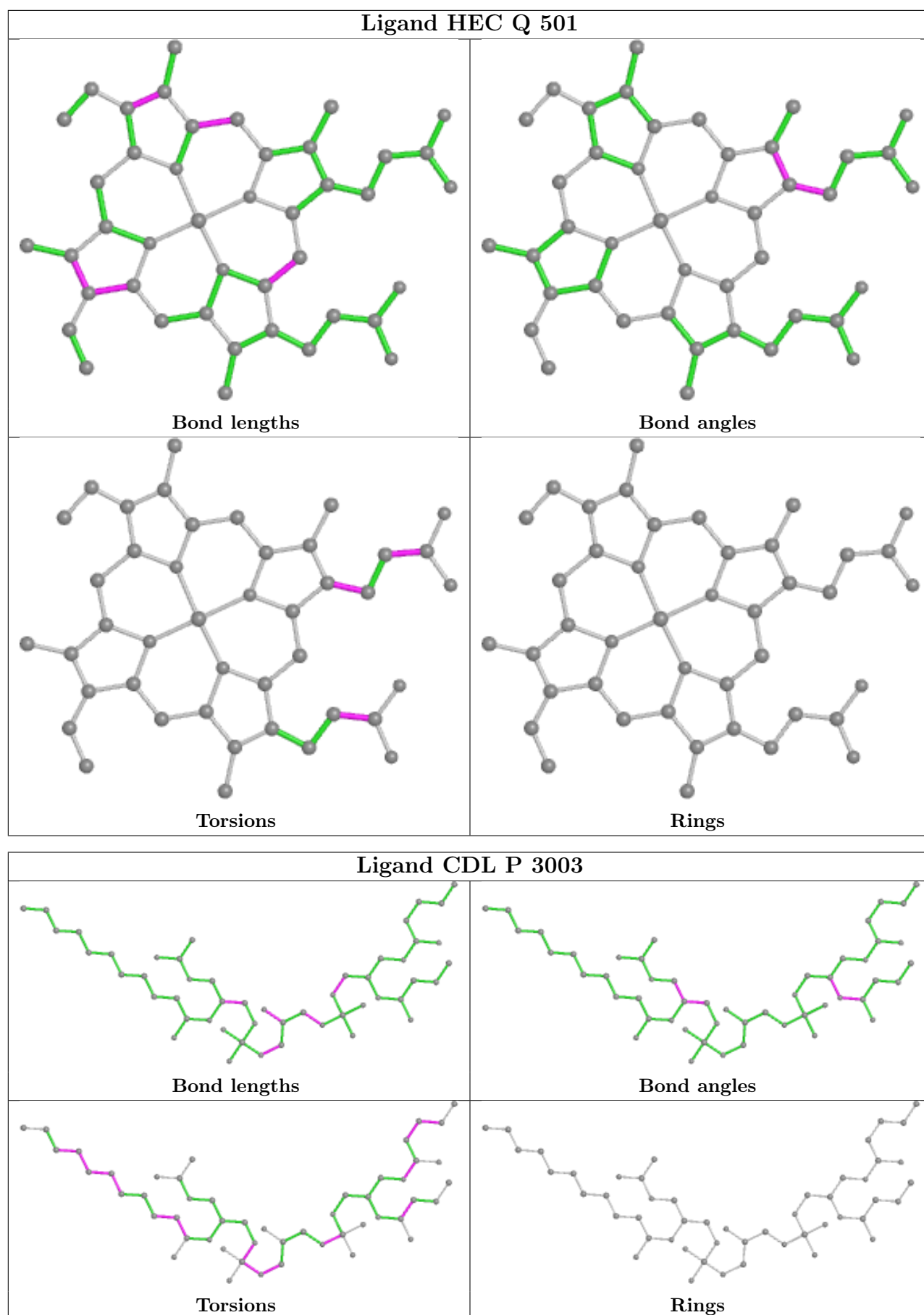












## 5.7 Other polymers [i](#)

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	443/446 (99%)	0.03	12 (2%) 54 40	56, 105, 138, 156	0
1	N	442/446 (99%)	0.06	14 (3%) 47 33	66, 108, 138, 151	0
2	B	421/441 (95%)	0.09	17 (4%) 38 26	85, 124, 160, 177	0
2	O	422/441 (95%)	0.14	16 (3%) 40 27	68, 111, 142, 166	0
3	C	380/380 (100%)	-0.27	7 (1%) 68 56	39, 61, 113, 164	0
3	P	379/380 (99%)	-0.04	8 (2%) 63 50	59, 104, 140, 164	0
4	D	241/241 (100%)	-0.33	2 (0%) 86 79	53, 68, 111, 136	0
4	Q	241/241 (100%)	-0.07	4 (1%) 70 58	84, 117, 150, 163	0
5	E	196/196 (100%)	0.78	33 (16%) 1 1	63, 142, 190, 194	0
5	R	196/196 (100%)	0.26	14 (7%) 16 10	64, 107, 152, 165	0
6	F	101/110 (91%)	-0.43	0 100 100	52, 68, 86, 121	0
6	S	101/110 (91%)	0.33	4 (3%) 38 26	96, 122, 162, 177	0
7	G	81/81 (100%)	-0.06	0 100 100	53, 74, 134, 148	0
7	T	79/81 (97%)	0.67	12 (15%) 2 1	89, 132, 184, 194	0
8	H	70/77 (90%)	-0.32	1 (1%) 75 64	56, 95, 116, 154	0
8	U	67/77 (87%)	0.59	6 (8%) 9 5	143, 165, 185, 187	0
9	I	31/47 (65%)	1.27	7 (22%) 0 0	128, 157, 170, 174	0
9	V	31/47 (65%)	1.53	10 (32%) 0 0	109, 147, 196, 198	0
10	J	61/61 (100%)	-0.18	1 (1%) 72 60	73, 93, 137, 168	0
10	W	59/61 (96%)	0.49	7 (11%) 4 3	91, 109, 133, 159	0
All	All	4042/4160 (97%)	0.07	175 (4%) 35 23	39, 106, 160, 198	0

The worst 5 of 175 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
7	T	1	GLY	9.7
5	E	111	GLU	7.9
5	E	109	GLU	7.7
9	I	48	PRO	7.3
5	E	110	ALA	6.9

## 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.

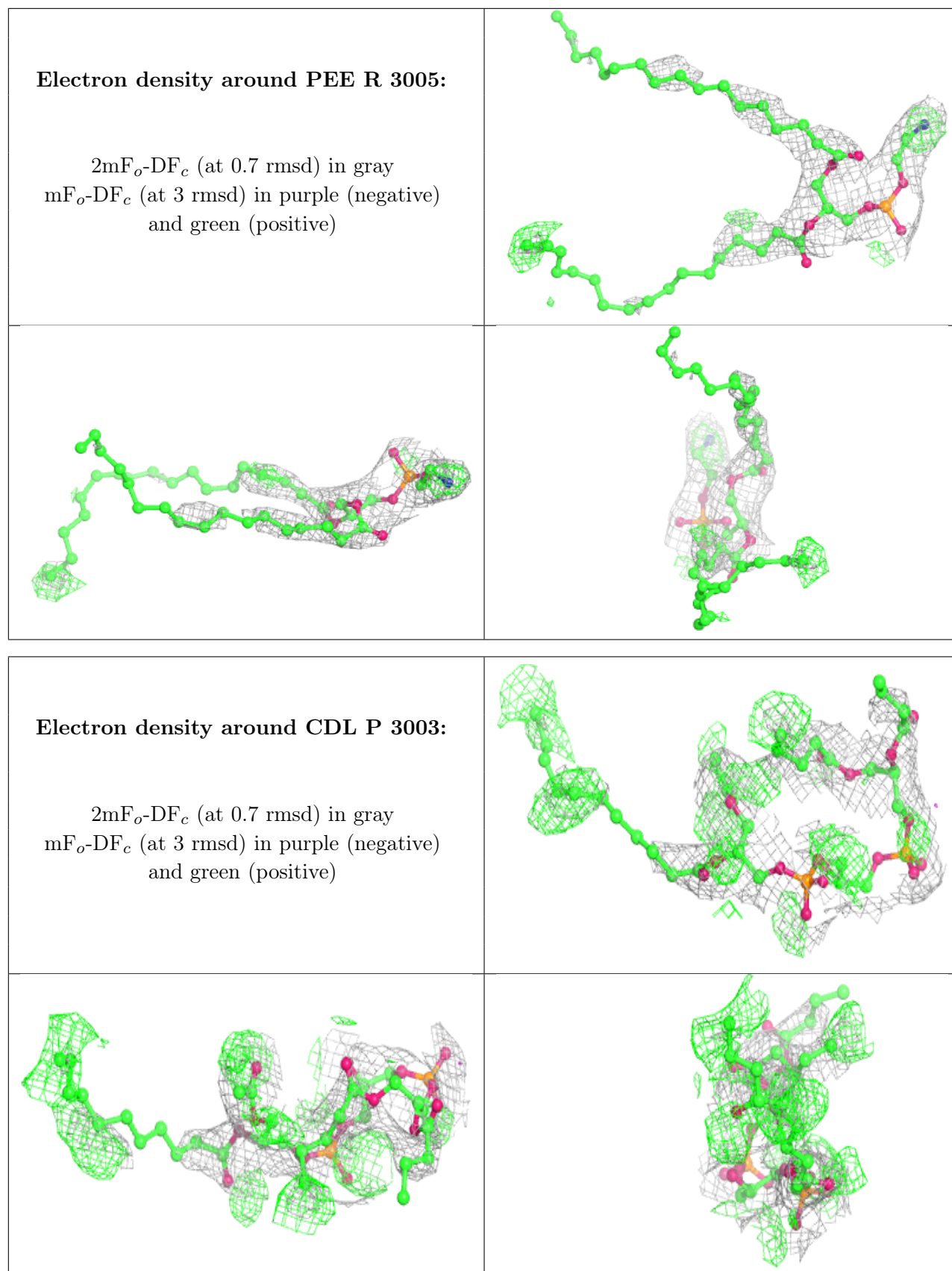
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
12	UNL	C	2104	1/-	0.39	0.74	85,85,85,85	0
12	UNL	P	2106	1/-	0.49	1.32	63,63,63,63	0
12	UNL	P	3104	1/-	0.49	0.92	83,83,83,83	0
12	UNL	E	2105	1/-	0.52	0.45	82,82,82,82	0
12	UNL	P	3103	1/-	0.64	0.55	76,76,76,76	0
11	PEE	R	3005	50/51	0.67	0.54	102,123,129,130	0
12	UNL	P	3010	1/-	0.68	0.90	60,60,60,60	0
15	CDL	P	3003	50/100	0.71	0.43	150,158,162,162	0
11	PEE	A	2008	21/51	0.72	0.37	149,161,164,166	0
12	UNL	C	3015	1/-	0.72	0.45	53,53,53,53	0
12	UNL	C	3106	1/-	0.78	0.71	44,44,44,44	0
14	3H1	P	3002	28/28	0.79	0.34	101,108,114,114	0
12	UNL	R	2103	1/-	0.79	0.79	53,53,53,53	0
11	PEE	E	2005	50/51	0.81	0.42	95,113,124,126	0
12	UNL	P	2015	1/-	0.82	0.23	48,48,48,48	0
11	PEE	P	3008	5/51	0.84	0.54	149,149,150,151	0
15	CDL	T	3004	40/100	0.84	0.33	117,124,129,131	0
16	GOL	C	2011	6/6	0.85	0.47	84,87,88,88	0
12	UNL	A	3016	1/-	0.86	0.53	69,69,69,69	0

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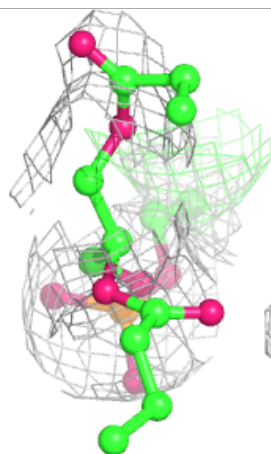
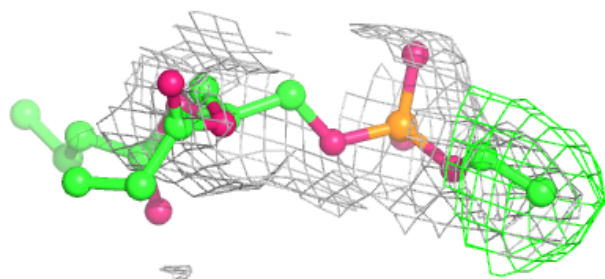
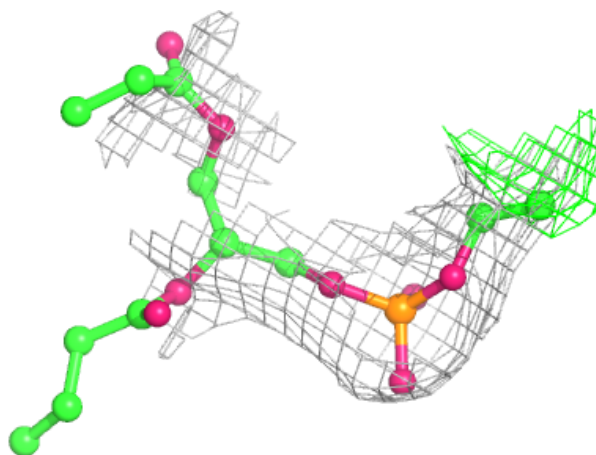
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
15	CDL	C	2003	50/100	0.88	0.28	82,93,106,107	0
11	PEE	P	3007	49/51	0.88	0.36	107,121,139,140	0
16	GOL	P	3011	6/6	0.88	0.46	108,110,111,113	0
18	BOG	R	3009	20/20	0.88	0.23	101,121,124,124	0
14	3H1	P	3001	28/28	0.89	0.29	101,106,112,112	0
14	3H1	C	2002	28/28	0.90	0.26	66,76,89,89	0
14	3H1	C	2001	28/28	0.93	0.21	47,56,60,61	0
11	PEE	C	2007	49/51	0.93	0.26	55,72,95,97	0
15	CDL	G	2004	40/100	0.93	0.24	65,79,101,103	0
18	BOG	D	2009	20/20	0.93	0.23	75,88,91,92	0
12	UNL	C	2010	1/-	0.93	0.49	30,30,30,30	0
17	HEC	Q	501	43/43	0.95	0.22	95,99,103,105	0
13	HEM	P	501	43/43	0.97	0.23	72,78,85,88	0
19	FES	E	501	4/4	0.97	0.12	118,119,120,120	0
13	HEM	C	501	43/43	0.98	0.22	47,53,58,62	0
13	HEM	P	502	43/43	0.98	0.20	79,81,93,100	0
13	HEM	C	502	43/43	0.98	0.21	37,42,47,56	0
17	HEC	D	501	43/43	0.98	0.17	38,48,57,60	0
19	FES	R	501	4/4	0.99	0.14	69,69,69,69	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.



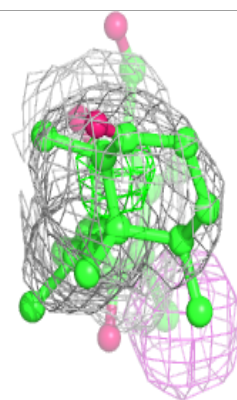
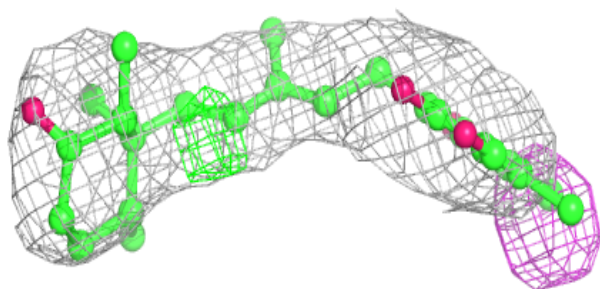
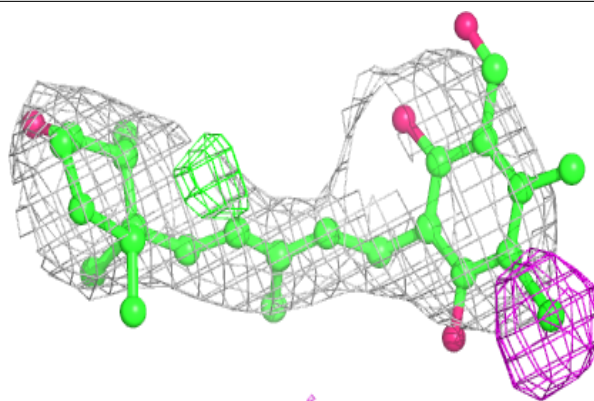
**Electron density around PEE A 2008:**

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

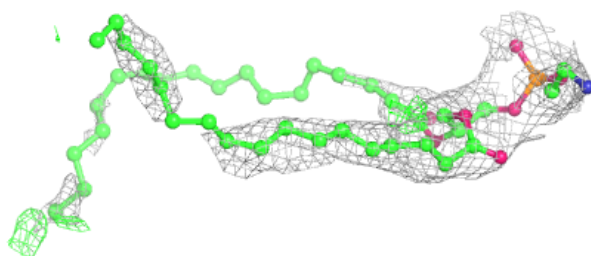
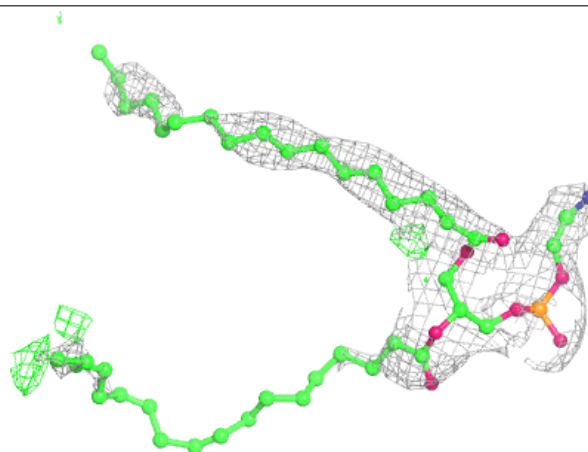


**Electron density around 3H1 P 3002:**

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

**Electron density around PEE E 2005:**

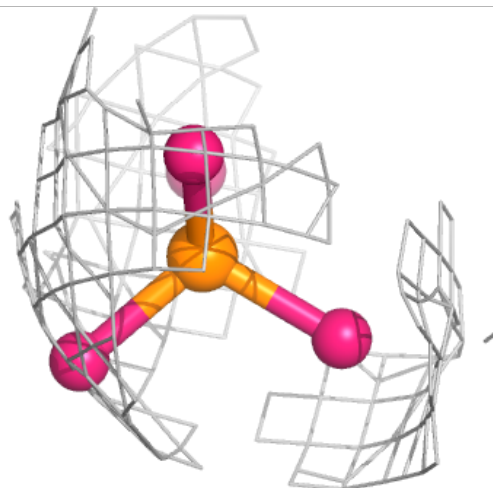
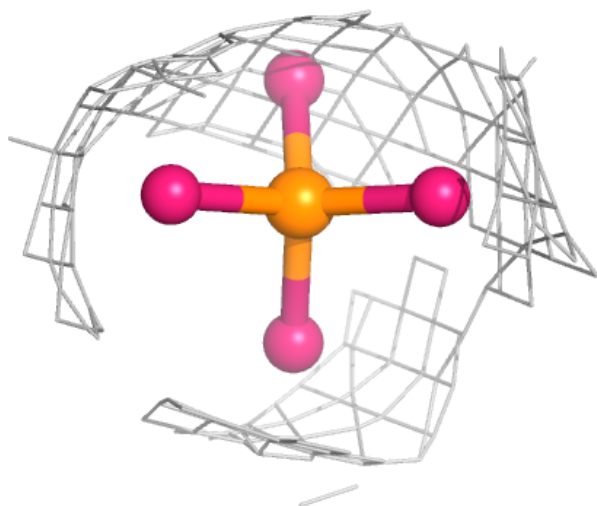
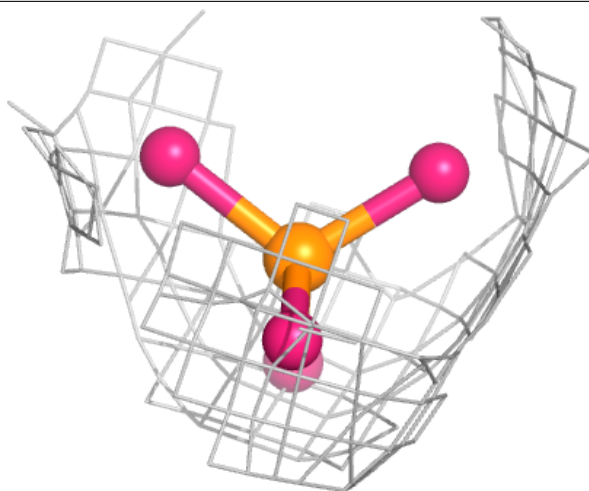
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)





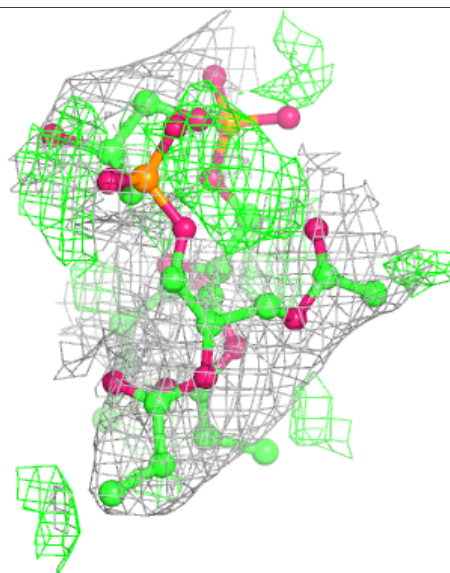
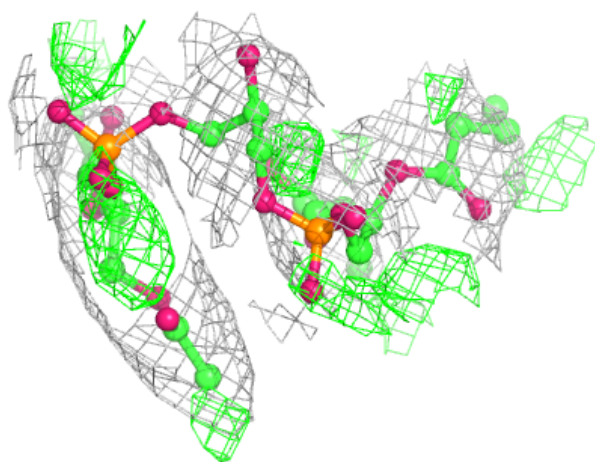
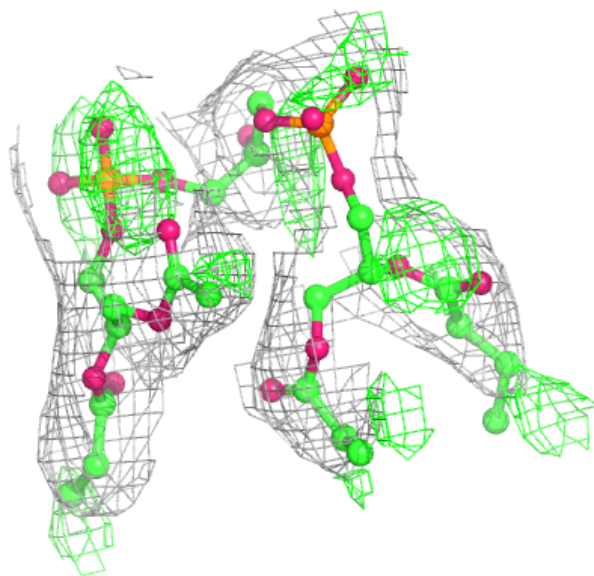
**Electron density around PEE P 3008:**

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and green (positive)



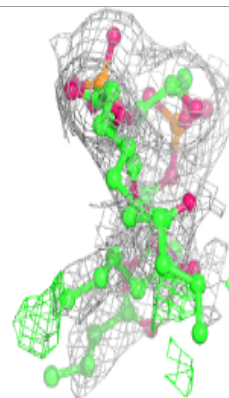
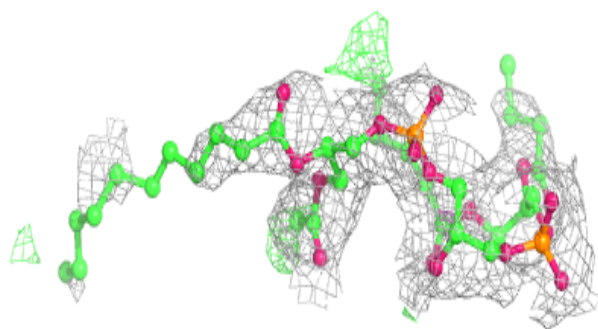
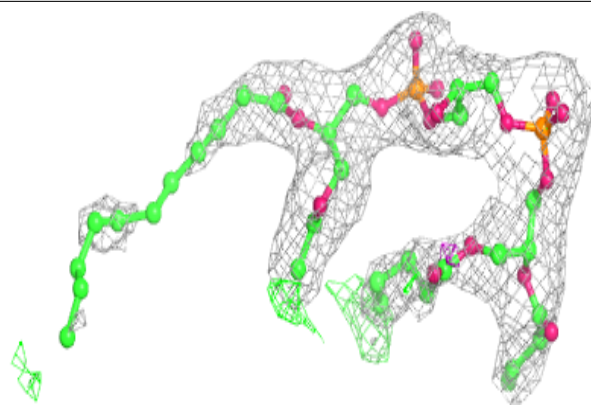
**Electron density around CDL T 3004:**

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and green (positive)

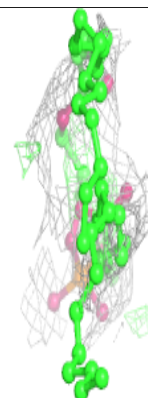
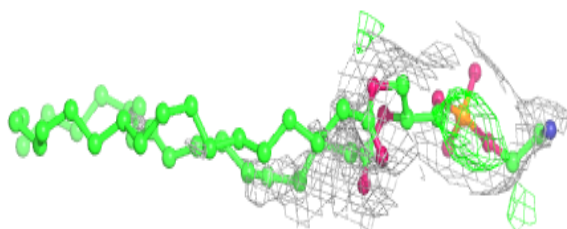
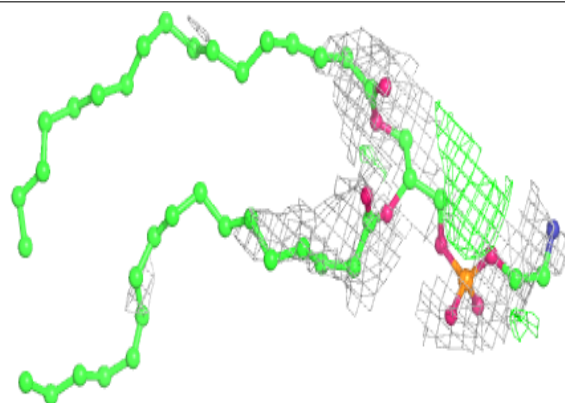


**Electron density around CDL C 2003:**

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and green (positive)

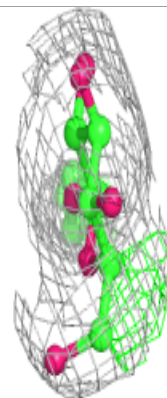
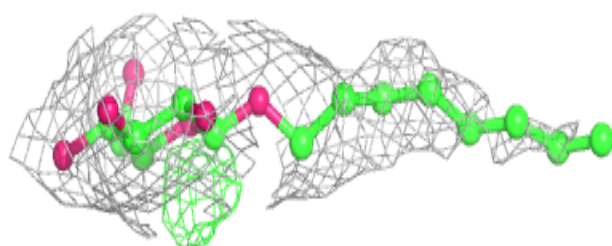
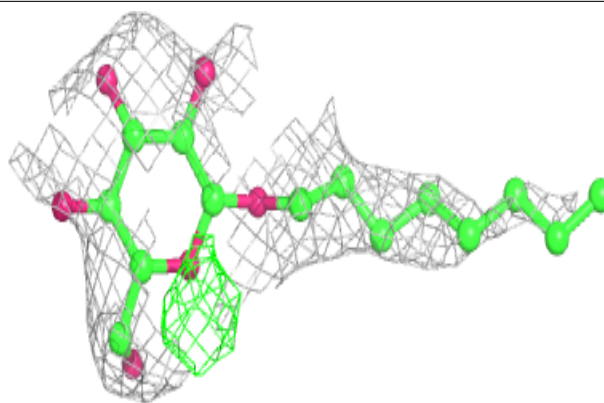
**Electron density around PEE P 3007:**

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

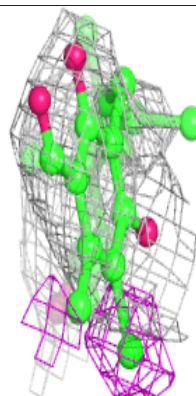
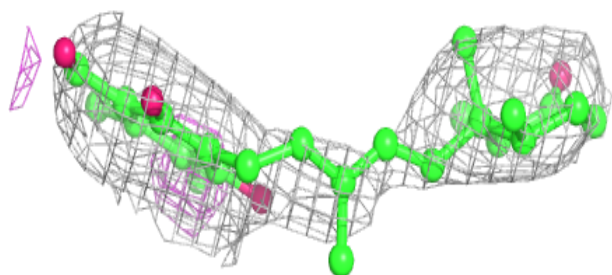
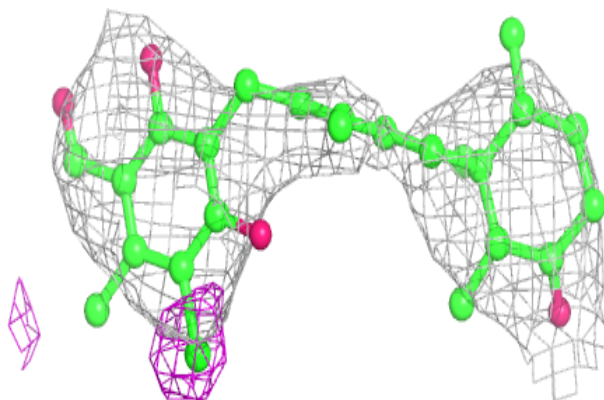


**Electron density around BOG R 3009:**

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

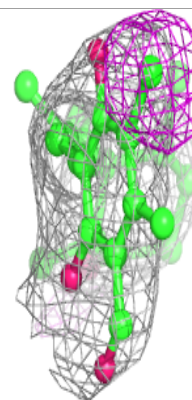
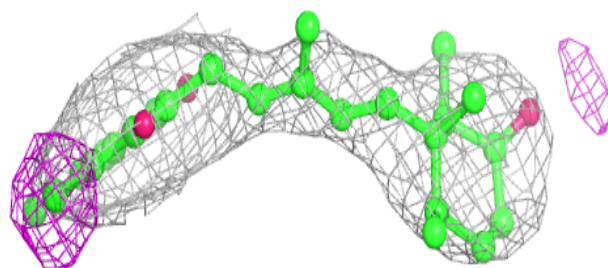
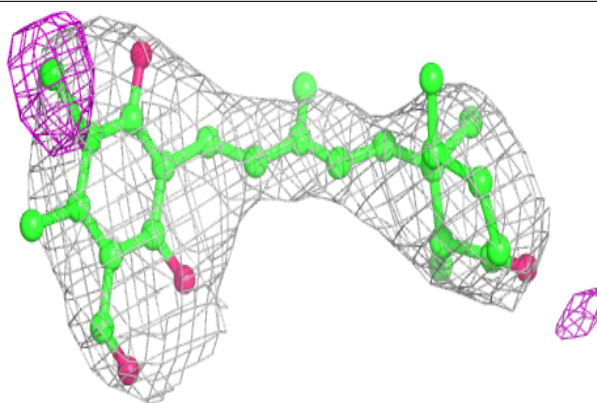
**Electron density around 3H1 P 3001:**

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and green (positive)

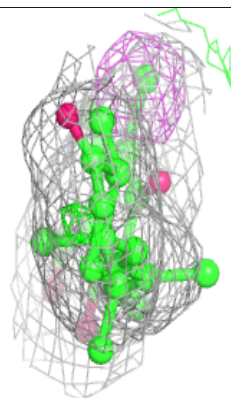
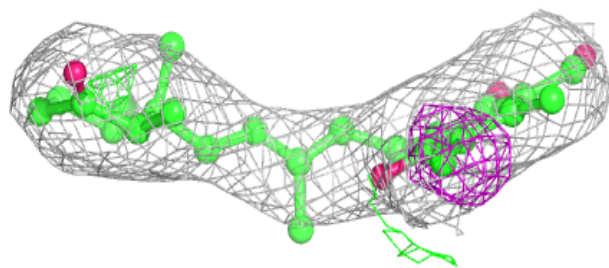
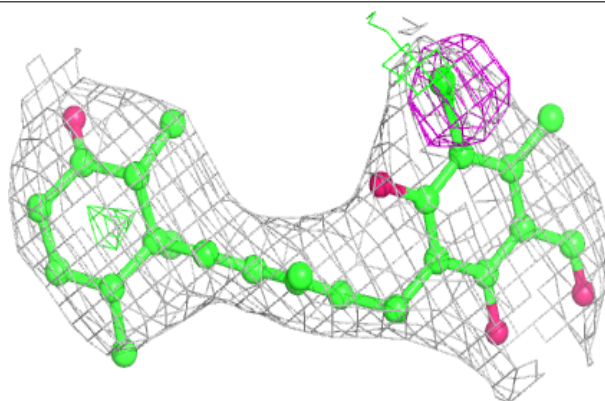


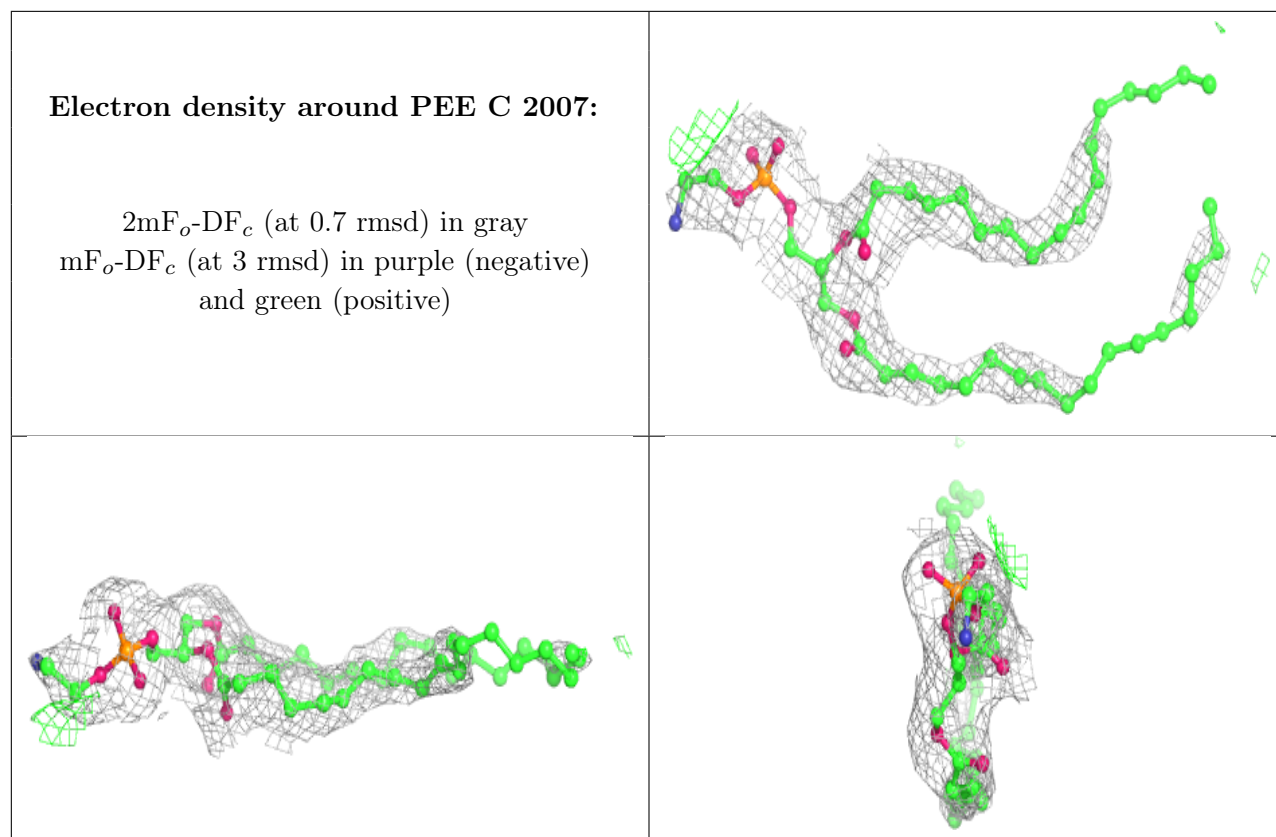
**Electron density around 3H1 C 2002:**

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and green (positive)

**Electron density around 3H1 C 2001:**

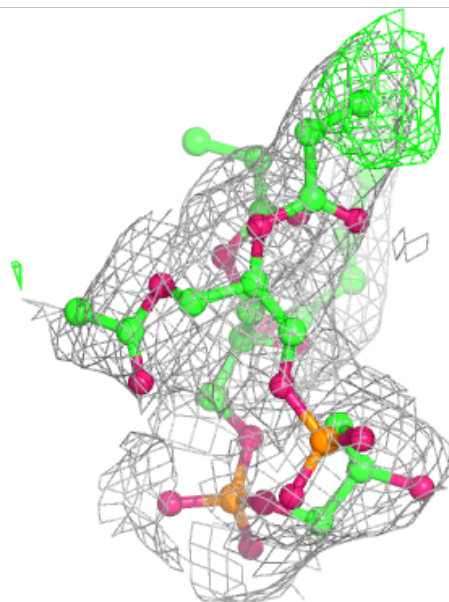
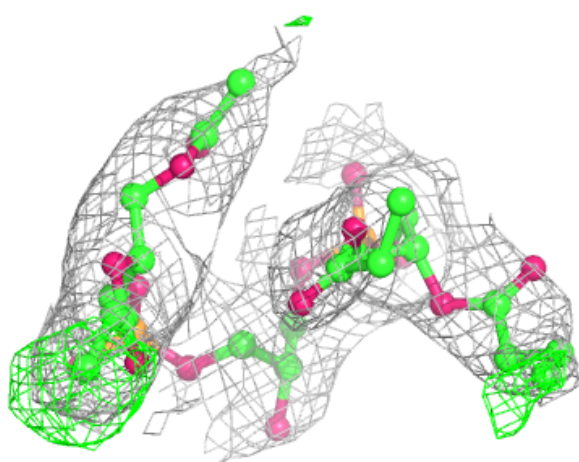
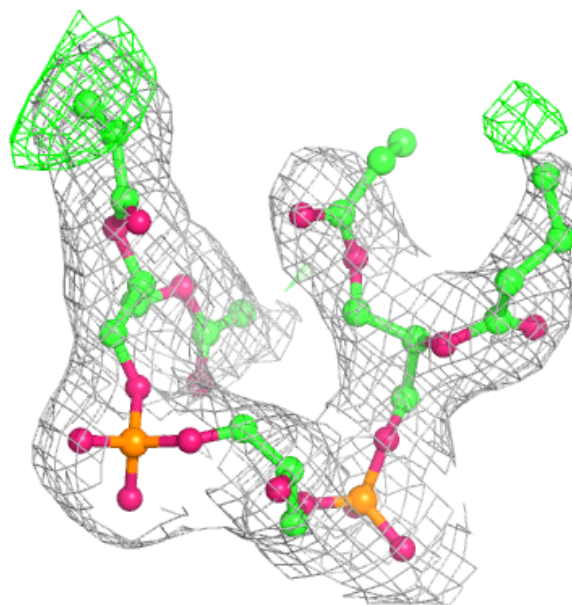
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 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)

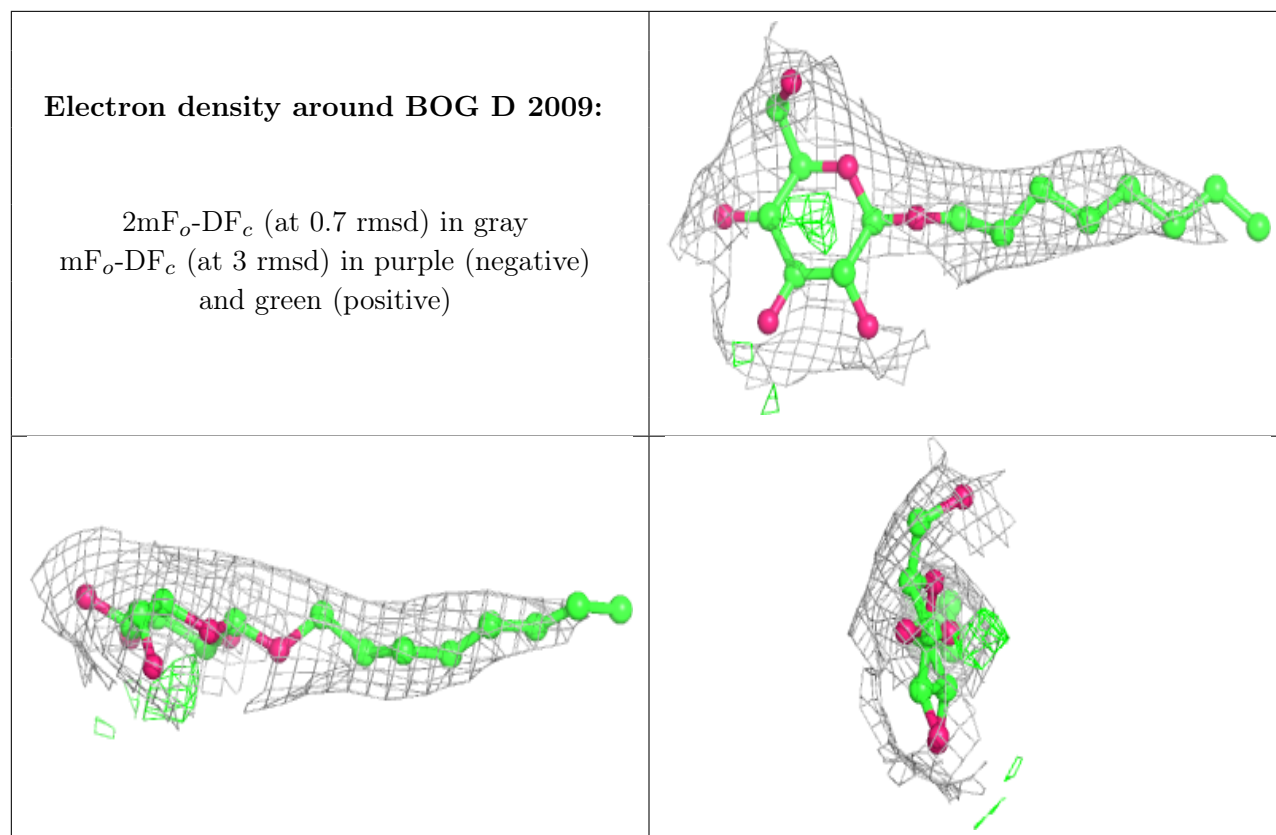




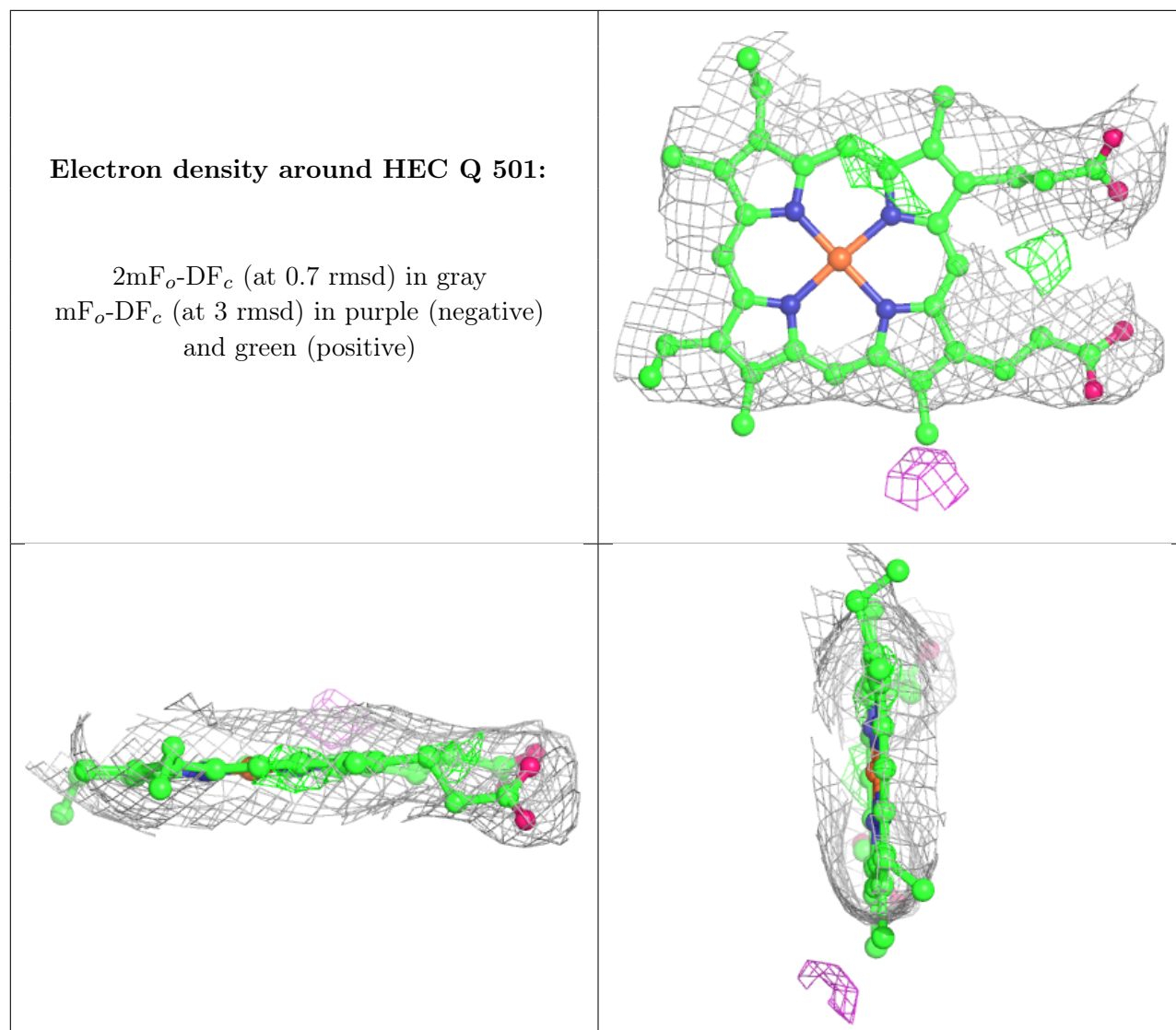
**Electron density around CDL G 2004:**

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and green (positive)



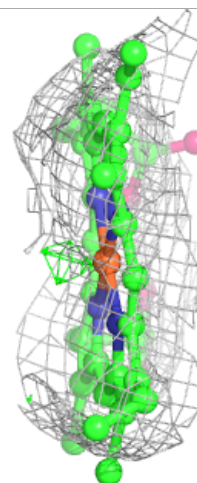
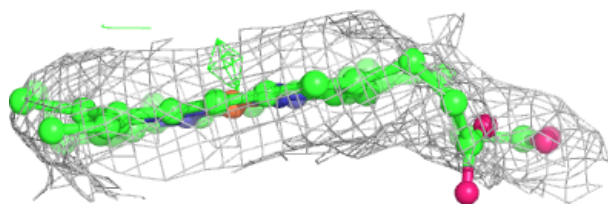
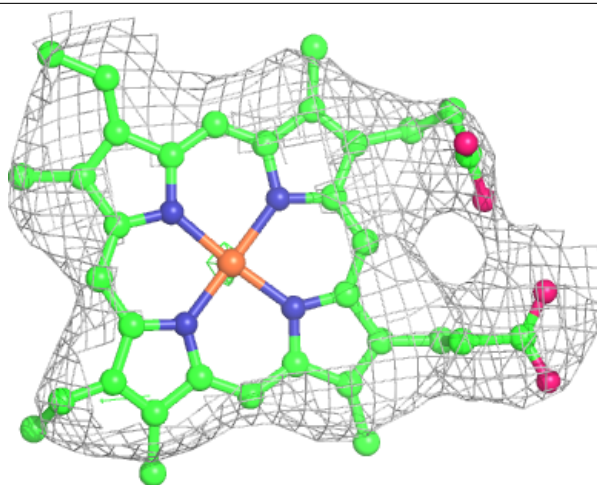


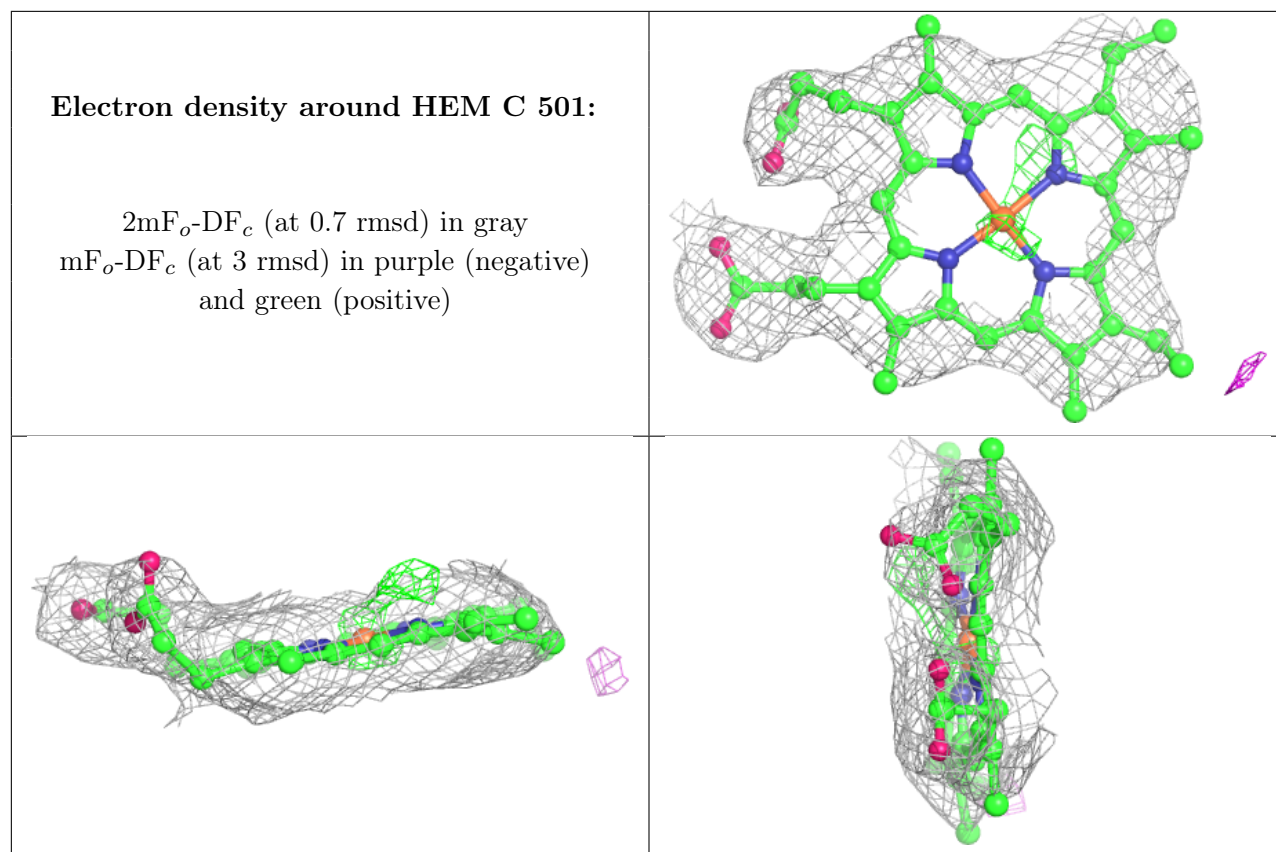




**Electron density around HEM P 501:**

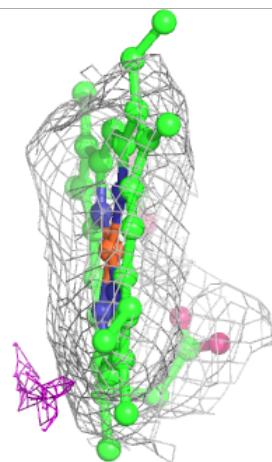
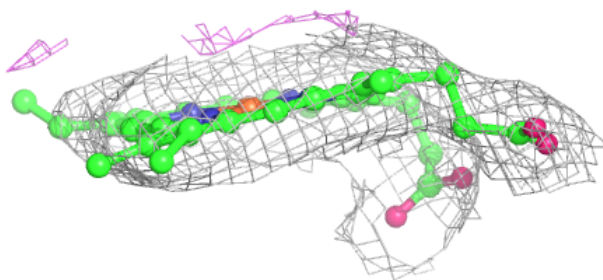
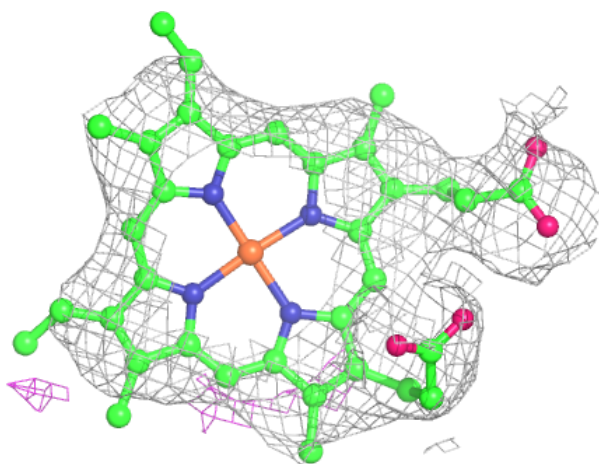
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)

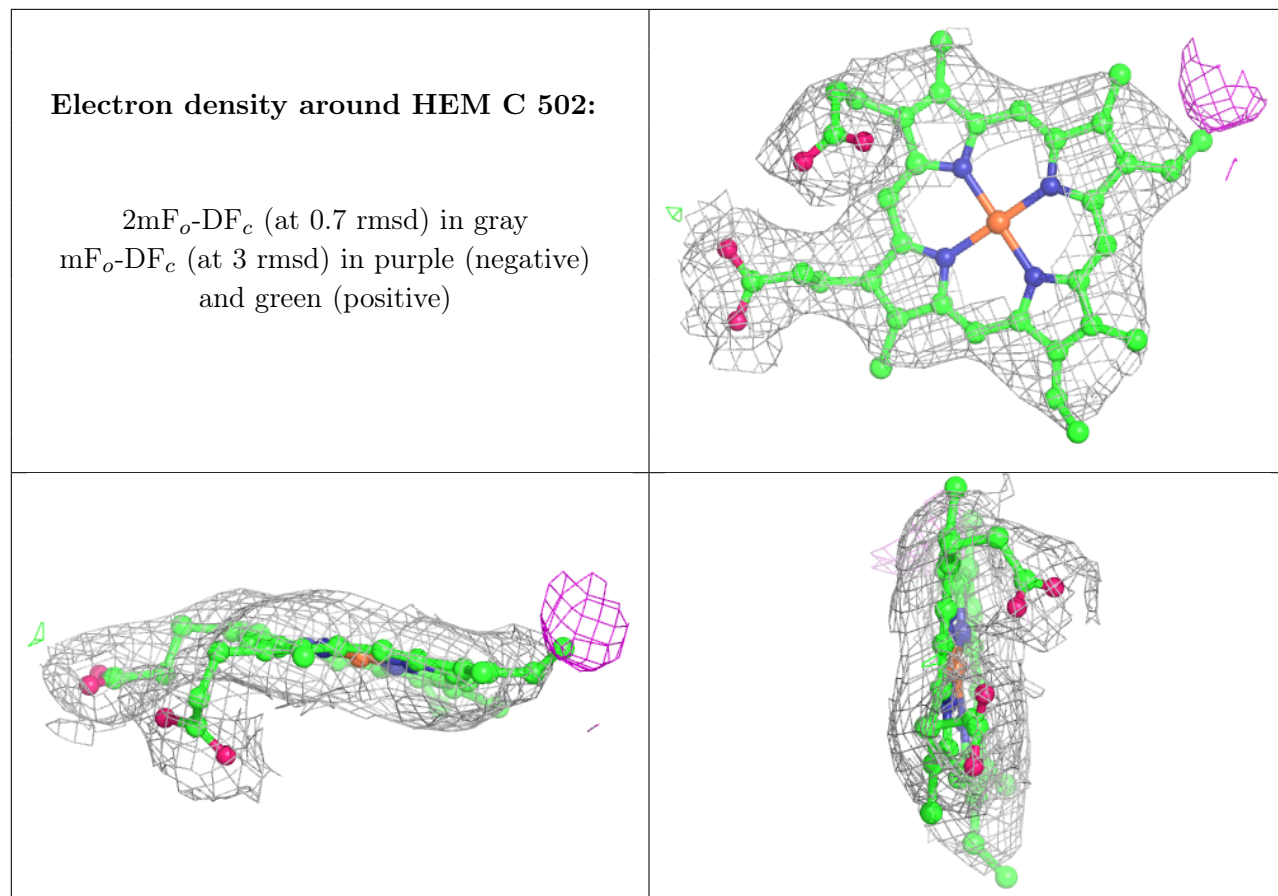


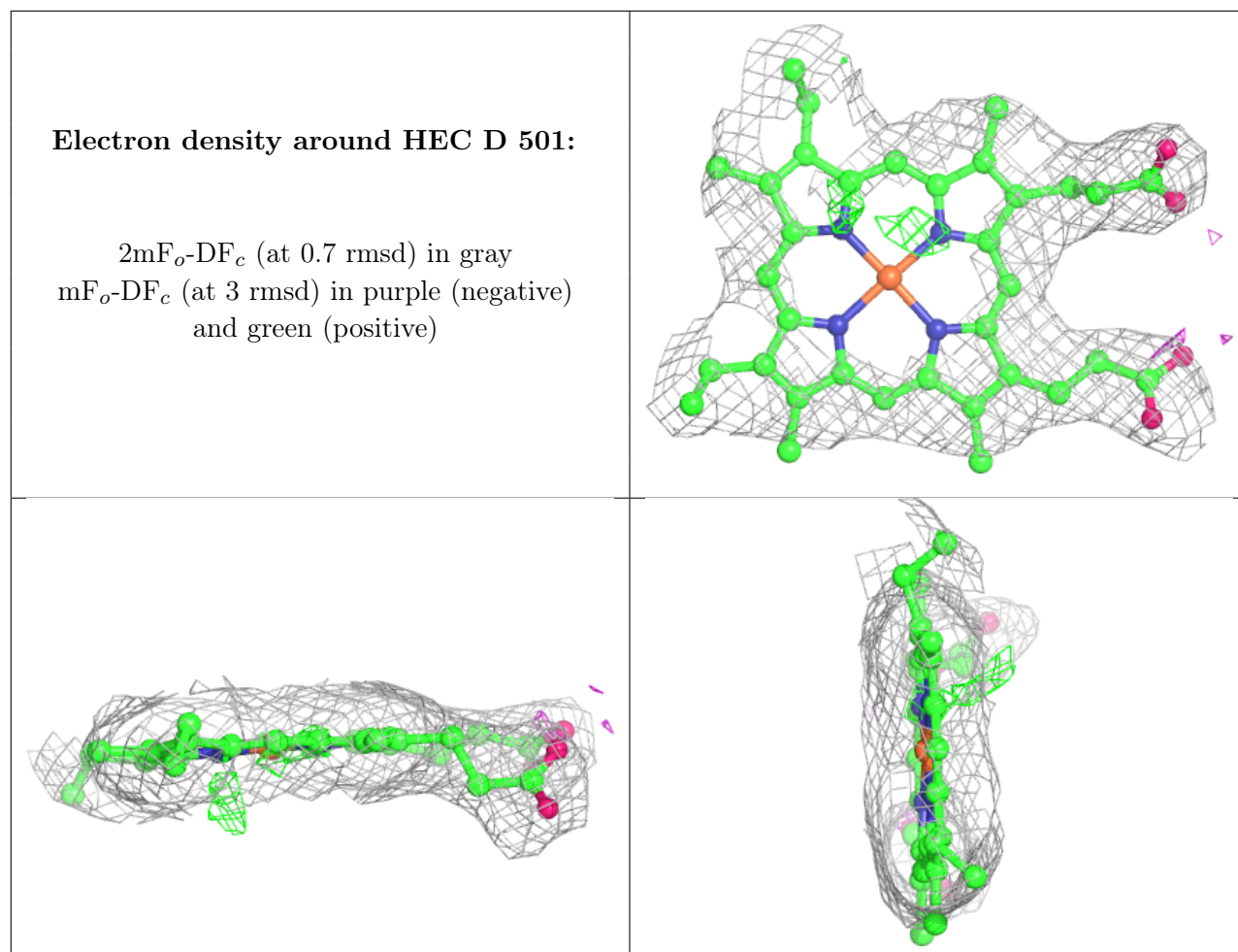


**Electron density around HEM P 502:**

$2mF_o-DF_c$  (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.