



wwPDB X-ray Structure Validation Summary Report ⓘ

Mar 20, 2026 – 01:55 AM UTC

PDB ID : 7KNZ / pdb_00007knz
Title : Dihydropicolinate synthase (DHDPS) from C.jejuni, E88A mutant with pyruvate bound in the active site and R,R-bislysine at the allosteric site
Authors : Saran, S.; Sanders, D.A.R.
Deposited on : 2020-11-06
Resolution : 2.28 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

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>.

The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity	:	4-5-2 with Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

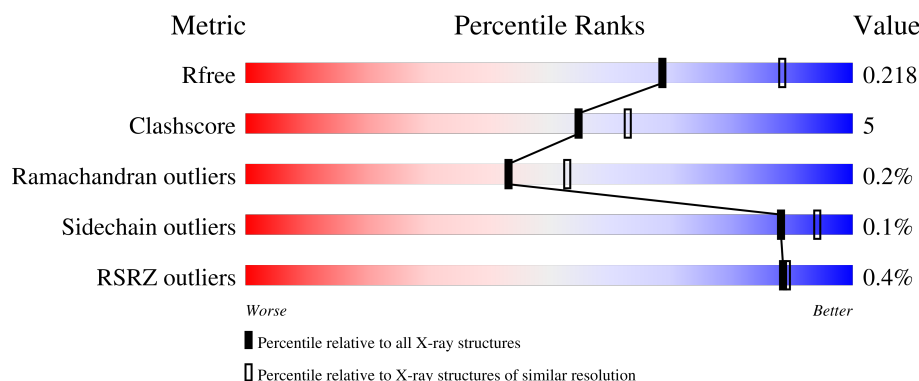
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.28 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}	180053	9078 (2.30-2.26)
Clashscore	190562	9802 (2.30-2.26)
Ramachandran outliers	187476	9690 (2.30-2.26)
Sidechain outliers	187428	9691 (2.30-2.26)
RSRZ outliers	180081	9085 (2.30-2.26)

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 ≥ 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	310	
1	B	310	
1	C	310	
1	D	310	
1	E	310	

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Mol	Chain	Length	Quality of chain
1	F	310	% 85% 10% 5%

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
4	PEG	E	305	-	-	X	-
4	PEG	F	304	-	-	X	-
6	EDO	C	306	-	-	X	-
8	GOL	F	308	-	X	X	-

2 Entry composition

There are 9 unique types of molecules in this entry. The entry contains 14744 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 4-hydroxy-tetrahydrodipicolinate synthase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	296	Total	C	N	O	S	0	0	0
			2253	1433	372	435	13			
1	B	296	Total	C	N	O	S	0	0	0
			2267	1443	376	435	13			
1	C	296	Total	C	N	O	S	0	0	0
			2267	1442	377	435	13			
1	D	296	Total	C	N	O	S	0	0	0
			2255	1435	372	435	13			
1	E	296	Total	C	N	O	S	0	0	0
			2265	1442	375	435	13			
1	F	296	Total	C	N	O	S	0	0	0
			2259	1437	374	435	13			

There are 78 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-11	MET	-	expression tag	UNP Q9PPB4
A	-10	ARG	-	expression tag	UNP Q9PPB4
A	-9	GLY	-	expression tag	UNP Q9PPB4
A	-8	SER	-	expression tag	UNP Q9PPB4
A	-7	HIS	-	expression tag	UNP Q9PPB4
A	-6	HIS	-	expression tag	UNP Q9PPB4
A	-5	HIS	-	expression tag	UNP Q9PPB4
A	-4	HIS	-	expression tag	UNP Q9PPB4
A	-3	HIS	-	expression tag	UNP Q9PPB4
A	-2	HIS	-	expression tag	UNP Q9PPB4
A	-1	GLY	-	expression tag	UNP Q9PPB4
A	0	SER	-	expression tag	UNP Q9PPB4
A	88	ALA	GLU	engineered mutation	UNP Q9PPB4
B	-11	MET	-	expression tag	UNP Q9PPB4
B	-10	ARG	-	expression tag	UNP Q9PPB4
B	-9	GLY	-	expression tag	UNP Q9PPB4
B	-8	SER	-	expression tag	UNP Q9PPB4

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Chain	Residue	Modelled	Actual	Comment	Reference
B	-7	HIS	-	expression tag	UNP Q9PPB4
B	-6	HIS	-	expression tag	UNP Q9PPB4
B	-5	HIS	-	expression tag	UNP Q9PPB4
B	-4	HIS	-	expression tag	UNP Q9PPB4
B	-3	HIS	-	expression tag	UNP Q9PPB4
B	-2	HIS	-	expression tag	UNP Q9PPB4
B	-1	GLY	-	expression tag	UNP Q9PPB4
B	0	SER	-	expression tag	UNP Q9PPB4
B	88	ALA	GLU	engineered mutation	UNP Q9PPB4
C	-11	MET	-	expression tag	UNP Q9PPB4
C	-10	ARG	-	expression tag	UNP Q9PPB4
C	-9	GLY	-	expression tag	UNP Q9PPB4
C	-8	SER	-	expression tag	UNP Q9PPB4
C	-7	HIS	-	expression tag	UNP Q9PPB4
C	-6	HIS	-	expression tag	UNP Q9PPB4
C	-5	HIS	-	expression tag	UNP Q9PPB4
C	-4	HIS	-	expression tag	UNP Q9PPB4
C	-3	HIS	-	expression tag	UNP Q9PPB4
C	-2	HIS	-	expression tag	UNP Q9PPB4
C	-1	GLY	-	expression tag	UNP Q9PPB4
C	0	SER	-	expression tag	UNP Q9PPB4
C	88	ALA	GLU	engineered mutation	UNP Q9PPB4
D	-11	MET	-	expression tag	UNP Q9PPB4
D	-10	ARG	-	expression tag	UNP Q9PPB4
D	-9	GLY	-	expression tag	UNP Q9PPB4
D	-8	SER	-	expression tag	UNP Q9PPB4
D	-7	HIS	-	expression tag	UNP Q9PPB4
D	-6	HIS	-	expression tag	UNP Q9PPB4
D	-5	HIS	-	expression tag	UNP Q9PPB4
D	-4	HIS	-	expression tag	UNP Q9PPB4
D	-3	HIS	-	expression tag	UNP Q9PPB4
D	-2	HIS	-	expression tag	UNP Q9PPB4
D	-1	GLY	-	expression tag	UNP Q9PPB4
D	0	SER	-	expression tag	UNP Q9PPB4
D	88	ALA	GLU	engineered mutation	UNP Q9PPB4
E	-11	MET	-	expression tag	UNP Q9PPB4
E	-10	ARG	-	expression tag	UNP Q9PPB4
E	-9	GLY	-	expression tag	UNP Q9PPB4
E	-8	SER	-	expression tag	UNP Q9PPB4
E	-7	HIS	-	expression tag	UNP Q9PPB4
E	-6	HIS	-	expression tag	UNP Q9PPB4
E	-5	HIS	-	expression tag	UNP Q9PPB4

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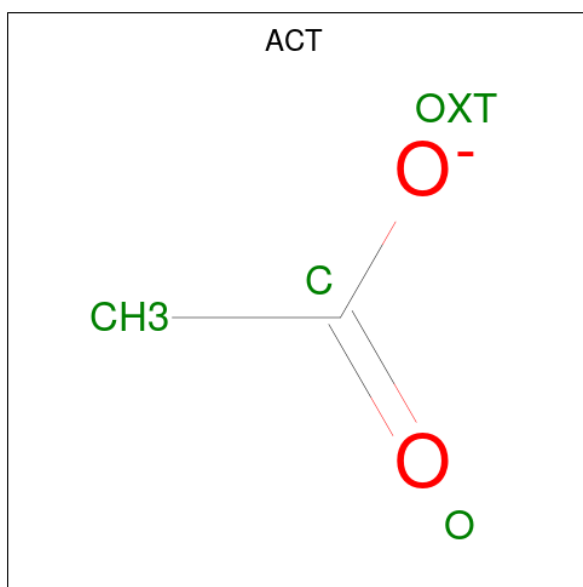
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Chain	Residue	Modelled	Actual	Comment	Reference
E	-4	HIS	-	expression tag	UNP Q9PPB4
E	-3	HIS	-	expression tag	UNP Q9PPB4
E	-2	HIS	-	expression tag	UNP Q9PPB4
E	-1	GLY	-	expression tag	UNP Q9PPB4
E	0	SER	-	expression tag	UNP Q9PPB4
E	88	ALA	GLU	engineered mutation	UNP Q9PPB4
F	-11	MET	-	expression tag	UNP Q9PPB4
F	-10	ARG	-	expression tag	UNP Q9PPB4
F	-9	GLY	-	expression tag	UNP Q9PPB4
F	-8	SER	-	expression tag	UNP Q9PPB4
F	-7	HIS	-	expression tag	UNP Q9PPB4
F	-6	HIS	-	expression tag	UNP Q9PPB4
F	-5	HIS	-	expression tag	UNP Q9PPB4
F	-4	HIS	-	expression tag	UNP Q9PPB4
F	-3	HIS	-	expression tag	UNP Q9PPB4
F	-2	HIS	-	expression tag	UNP Q9PPB4
F	-1	GLY	-	expression tag	UNP Q9PPB4
F	0	SER	-	expression tag	UNP Q9PPB4
F	88	ALA	GLU	engineered mutation	UNP Q9PPB4

- Molecule 2 is MAGNESIUM ION (CCD ID: MG) (formula: Mg) (labeled as "Ligand of Interest" by depositor).

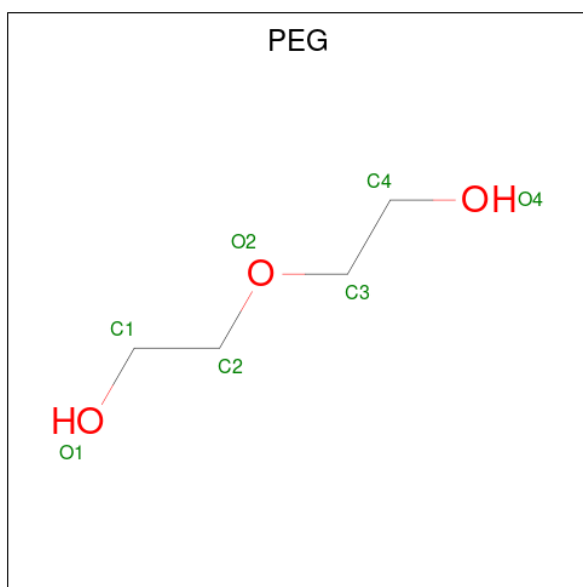
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	2	Total Mg 2 2	0	0
2	B	2	Total Mg 2 2	0	0
2	C	2	Total Mg 2 2	0	0
2	D	2	Total Mg 2 2	0	0
2	E	2	Total Mg 2 2	0	0

- Molecule 3 is ACETATE ION (CCD ID: ACT) (formula: C₂H₃O₂) (labeled as "Ligand of Interest" by depositor).



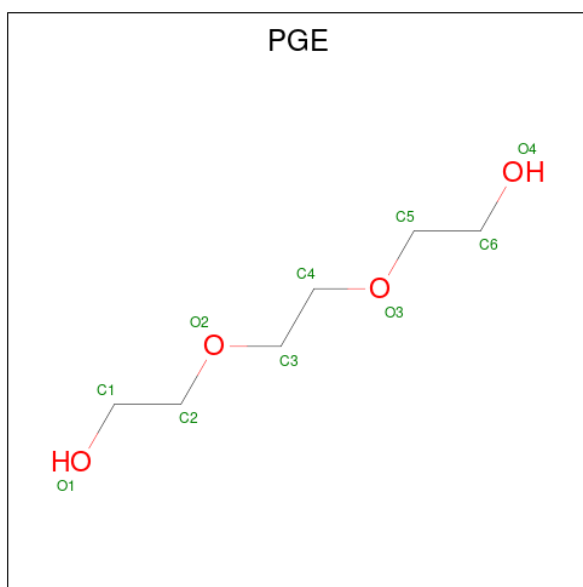
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	C	O	0	0
			4	2	2		
3	A	1	Total	C	O	0	0
			4	2	2		
3	A	1	Total	C	O	0	0
			4	2	2		
3	B	1	Total	C	O	0	0
			4	2	2		
3	C	1	Total	C	O	0	0
			4	2	2		
3	C	1	Total	C	O	0	0
			4	2	2		
3	D	1	Total	C	O	0	0
			4	2	2		
3	E	1	Total	C	O	0	0
			4	2	2		
3	E	1	Total	C	O	0	0
			4	2	2		
3	F	1	Total	C	O	0	0
			4	2	2		
3	F	1	Total	C	O	0	0
			4	2	2		

- Molecule 4 is DI(HYDROXYETHYL)ETHER (CCD ID: PEG) (formula: C₄H₁₀O₃) (labeled as "Ligand of Interest" by depositor).



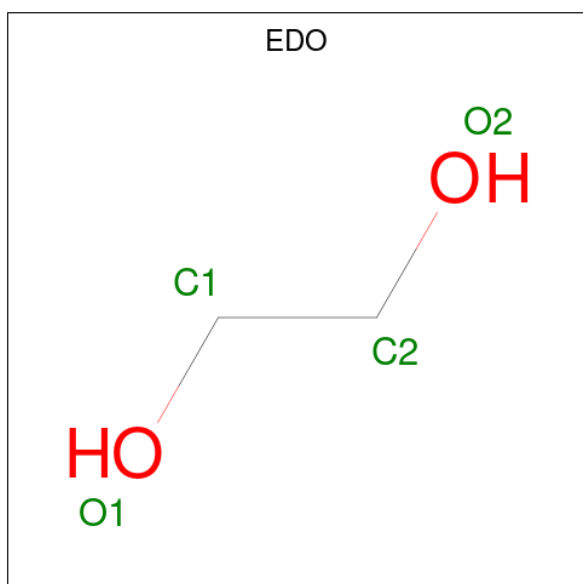
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total	C	O	0	0
			7	4	3		
4	B	1	Total	C	O	0	0
			7	4	3		
4	B	1	Total	C	O	0	0
			7	4	3		
4	E	1	Total	C	O	0	0
			7	4	3		
4	E	1	Total	C	O	0	0
			7	4	3		
4	E	1	Total	C	O	0	0
			7	4	3		
4	F	1	Total	C	O	0	0
			7	4	3		
4	F	1	Total	C	O	0	0
			7	4	3		

- Molecule 5 is TRIETHYLENE GLYCOL (CCD ID: PGE) (formula: C₆H₁₄O₄) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	A	1	Total	C	O	0	0
			10	6	4		
5	B	1	Total	C	O	0	0
			10	6	4		
5	C	1	Total	C	O	0	0
			10	6	4		
5	D	1	Total	C	O	0	0
			10	6	4		

- Molecule 6 is 1,2-ETHANEDIOL (CCD ID: EDO) (formula: $C_2H_6O_2$) (labeled as "Ligand of Interest" by depositor).



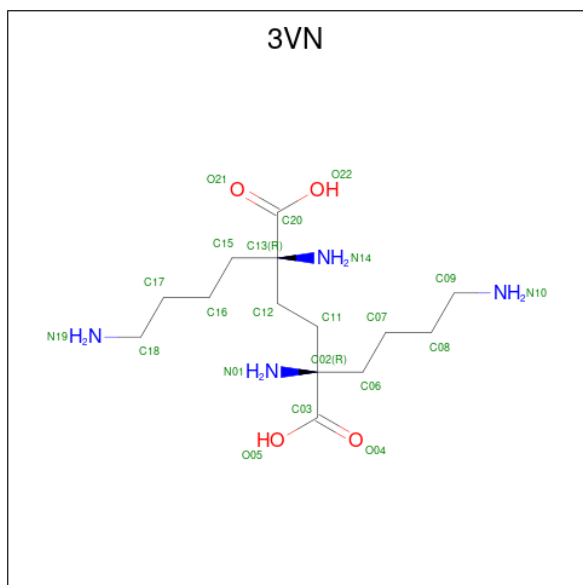
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	1	Total C O 4 2 2	0	0
6	A	1	Total C O 4 2 2	0	0
6	A	1	Total C O 4 2 2	0	0
6	A	1	Total C O 4 2 2	0	0
6	A	1	Total C O 4 2 2	0	0
6	A	1	Total C O 4 2 2	0	0
6	B	1	Total C O 4 2 2	0	0
6	B	1	Total C O 4 2 2	0	0
6	B	1	Total C O 4 2 2	0	0
6	B	1	Total C O 4 2 2	0	0
6	C	1	Total C O 4 2 2	0	0
6	C	1	Total C O 4 2 2	0	0
6	C	1	Total C O 4 2 2	0	0
6	C	1	Total C O 4 2 2	0	0
6	D	1	Total C O 4 2 2	0	0
6	D	1	Total C O 4 2 2	0	0
6	D	1	Total C O 4 2 2	0	0
6	D	1	Total C O 4 2 2	0	0
6	D	1	Total C O 4 2 2	0	0
6	D	1	Total C O 4 2 2	0	0
6	E	1	Total C O 4 2 2	0	0
6	E	1	Total C O 4 2 2	0	0

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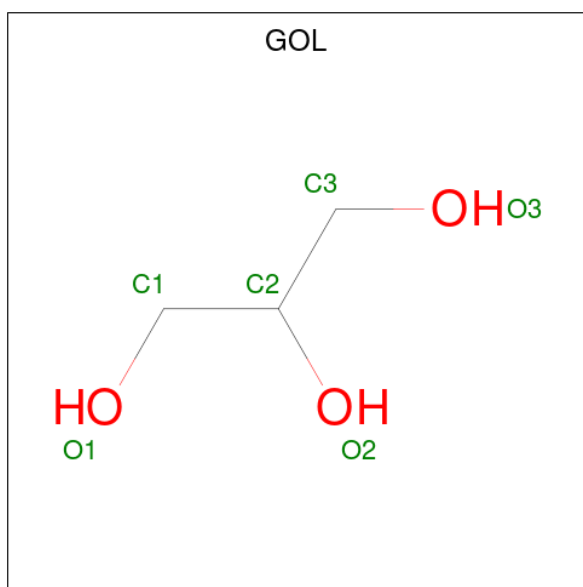
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	F	1	Total	C	O	0	0
			4	2	2		

- Molecule 7 is (2R,5R)-2,5-diamino-2,5-bis(4-aminobutyl)hexanedioic acid (CCD ID: 3VN) (formula: $C_{14}H_{30}N_4O_4$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
7	B	1	Total	C	N	O	0	0
			22	14	4	4		
7	D	1	Total	C	N	O	0	0
			22	14	4	4		
7	F	1	Total	C	N	O	0	0
			22	14	4	4		

- Molecule 8 is GLYCEROL (CCD ID: GOL) (formula: $C_3H_8O_3$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
8	C	1	Total	C	O	0	0
			6	3	3		
8	F	1	Total	C	O	0	0
			6	3	3		

- Molecule 9 is water.

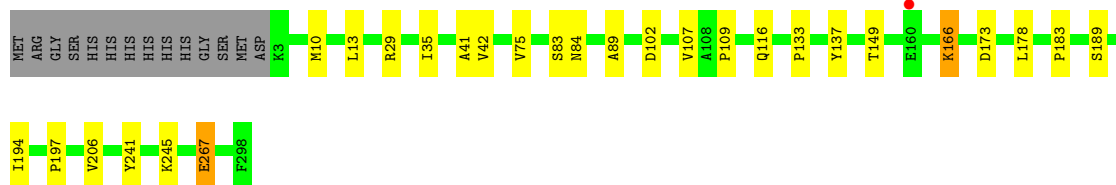
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
9	A	143	Total	O	0	0
			143	143		
9	B	142	Total	O	0	0
			142	142		
9	C	147	Total	O	0	0
			147	147		
9	D	135	Total	O	0	0
			135	135		
9	E	136	Total	O	0	0
			136	136		
9	F	148	Total	O	0	0
			148	148		

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: 4-hydroxy-tetrahydrodipicolinate synthase

Chain A: 



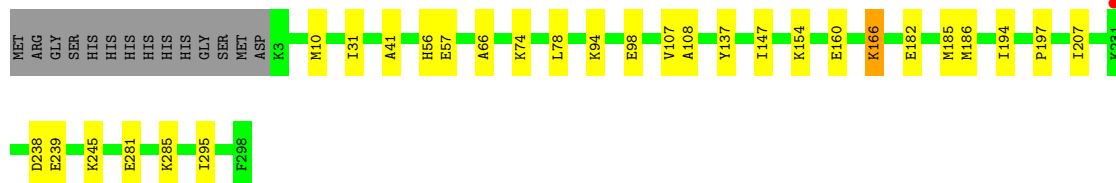
- Molecule 1: 4-hydroxy-tetrahydrodipicolinate synthase

Chain B: 



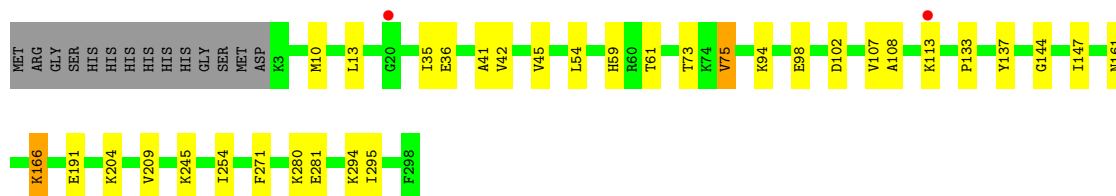
- Molecule 1: 4-hydroxy-tetrahydrodipicolinate synthase

Chain C: 

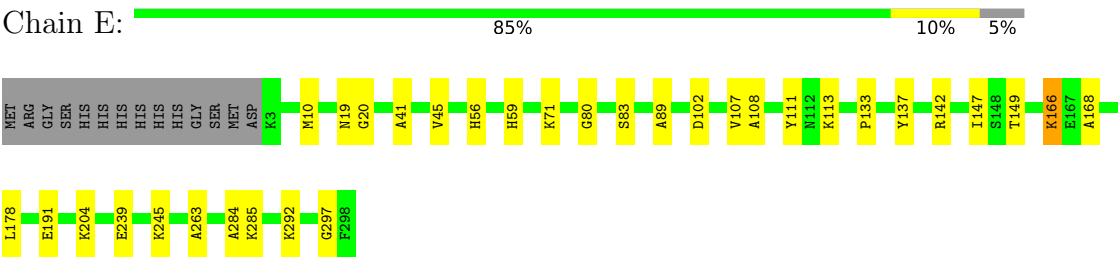


- Molecule 1: 4-hydroxy-tetrahydrodipicolinate synthase

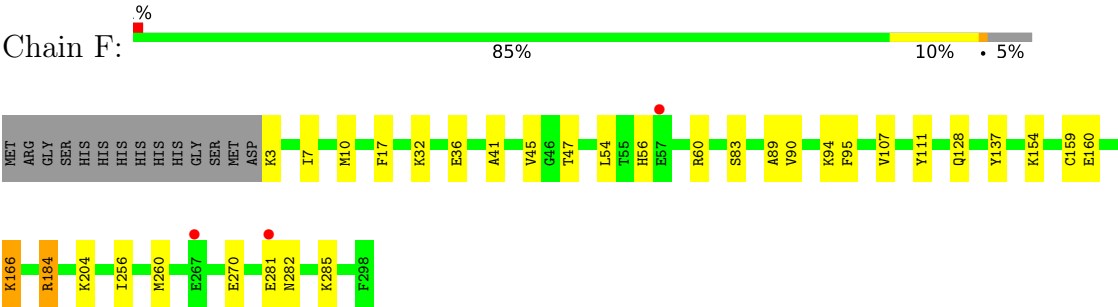
Chain D: 



● Molecule 1: 4-hydroxy-tetrahydrodipicolinate synthase



● Molecule 1: 4-hydroxy-tetrahydrodipicolinate synthase



4 Data and refinement statistics

Property	Value	Source
Space group	C 2 2 21	Depositor
Cell constants a, b, c, α , β , γ	85.12Å 231.21Å 200.12Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	45.91 – 2.28 45.91 – 2.28	Depositor EDS
% Data completeness (in resolution range)	99.8 (45.91-2.28) 92.9 (45.91-2.28)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.40 (at 2.29Å)	Xtriage
Refinement program	PHENIX 1.17.1_3660	Depositor
R, R_{free}	0.179 , 0.216 0.182 , 0.218	Depositor DCC
R_{free} test set	4499 reflections (4.99%)	wwPDB-VP
Wilson B-factor (Å ²)	26.1	Xtriage
Anisotropy	0.596	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.35 , 33.3	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	14744	wwPDB-VP
Average B, all atoms (Å ²)	31.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.56% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical 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

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: PEG, EDO, ACT, GOL, KPI, 3VN, MG, PGE

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	0.24	0/2277	0.39	1/3086 (0.0%)
1	B	0.15	0/2291	0.41	1/3100 (0.0%)
1	C	0.34	1/2291 (0.0%)	0.47	1/3100 (0.0%)
1	D	0.54	3/2279 (0.1%)	0.55	5/3087 (0.2%)
1	E	0.40	2/2289 (0.1%)	0.42	0/3098
1	F	0.36	1/2283 (0.0%)	0.52	0/3092
All	All	0.36	7/13710 (0.1%)	0.47	8/18563 (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
1	A	0	1
1	B	0	1
1	D	0	1
1	E	0	1
All	All	0	4

The worst 5 of 7 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	D	295	ILE	C-O	-6.16	1.17	1.24
1	C	238	ASP	C-O	-5.90	1.17	1.24
1	D	75	VAL	C-O	-5.69	1.18	1.24
1	D	294	LYS	C-O	-5.61	1.17	1.24
1	E	284	ALA	C-O	-5.22	1.17	1.24

The worst 5 of 8 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	267	GLU	N-CA-C	6.35	118.00	111.14
1	D	280	LYS	CA-C-N	-6.01	110.62	121.14
1	D	280	LYS	C-N-CA	-6.01	110.62	121.14
1	D	73	THR	N-CA-C	-5.83	100.89	109.81
1	C	160	GLU	CB-CA-C	-5.78	101.03	110.85

There are no chirality outliers.

All (4) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	166	KPI	Mainchain
1	B	166	KPI	Mainchain
1	D	166	KPI	Mainchain
1	E	166	KPI	Mainchain

5.2 Too-close contacts ⓘ

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	2253	0	2253	16	0
1	B	2267	0	2293	14	0
1	C	2267	0	2297	19	0
1	D	2255	0	2258	19	5
1	E	2265	0	2286	22	0
1	F	2259	0	2271	29	5
2	A	2	0	0	0	0
2	B	2	0	0	0	0
2	C	2	0	0	0	0
2	D	2	0	0	0	0
2	E	2	0	0	0	0
3	A	12	0	9	2	0
3	B	4	0	3	0	0
3	C	8	0	6	0	0
3	D	4	0	3	1	0
3	E	8	0	6	0	0
3	F	8	0	6	0	0
4	A	7	0	10	1	0
4	B	14	0	20	3	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	E	21	0	30	9	0
4	F	21	0	30	8	0
5	A	10	0	14	0	0
5	B	10	0	14	5	0
5	C	10	0	14	2	0
5	D	10	0	14	0	0
6	A	24	0	36	3	0
6	B	16	0	24	1	0
6	C	16	0	24	7	0
6	D	24	0	36	5	0
6	E	8	0	12	2	0
6	F	4	0	6	2	0
7	B	22	0	28	2	0
7	D	22	0	28	3	0
7	F	22	0	28	4	0
8	C	6	0	8	1	0
8	F	6	0	8	4	0
9	A	143	0	0	0	0
9	B	142	0	0	1	0
9	C	147	0	0	2	0
9	D	135	0	0	3	0
9	E	136	0	0	2	0
9	F	148	0	0	4	0
All	All	14744	0	14075	133	5

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 5.

The worst 5 of 133 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:F:159:CYS:HA	4:F:304:PEG:H21	1.54	0.89
4:E:305:PEG:H11	7:F:301:3VN:H14	1.67	0.76
4:E:305:PEG:H31	7:F:301:3VN:H2	1.56	0.71
1:C:154:LYS:NZ	9:C:401:HOH:O	2.23	0.70
1:F:90:VAL:HG21	6:F:307:EDO:H12	1.74	0.69

All (5) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:36:GLU:OE2	1:F:184:ARG:NH1[3_555]	1.56	0.64
1:D:36:GLU:OE2	1:F:184:ARG:NH2[3_555]	1.56	0.64
1:D:36:GLU:OE2	1:F:184:ARG:CZ[3_555]	1.72	0.48
1:D:36:GLU:CD	1:F:184:ARG:NH1[3_555]	1.98	0.22
1:D:36:GLU:OE1	1:F:184:ARG:NH1[3_555]	2.03	0.17

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	293/310 (94%)	288 (98%)	5 (2%)	0	100	100
1	B	293/310 (94%)	286 (98%)	5 (2%)	2 (1%)	18	21
1	C	293/310 (94%)	288 (98%)	5 (2%)	0	100	100
1	D	293/310 (94%)	287 (98%)	6 (2%)	0	100	100
1	E	293/310 (94%)	285 (97%)	6 (2%)	2 (1%)	18	21
1	F	293/310 (94%)	288 (98%)	5 (2%)	0	100	100
All	All	1758/1860 (94%)	1722 (98%)	32 (2%)	4 (0%)	43	53

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	20	GLY
1	E	20	GLY
1	E	19	ASN
1	B	19	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	240/259 (93%)	239 (100%)	1 (0%)	84	91
1	B	244/259 (94%)	244 (100%)	0	100	100
1	C	245/259 (95%)	244 (100%)	1 (0%)	84	91
1	D	240/259 (93%)	240 (100%)	0	100	100
1	E	243/259 (94%)	243 (100%)	0	100	100
1	F	242/259 (93%)	242 (100%)	0	100	100
All	All	1454/1554 (94%)	1452 (100%)	2 (0%)	88	94

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

Mol	Chain	Res	Type
1	A	267	GLU
1	C	239	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (5) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	229	ASN
1	B	242	ASN
1	D	19	ASN
1	E	201	ASN
1	F	201	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

6 non-standard protein/DNA/RNA residues are modelled in this entry.

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$
1	KPI	E	166	1	11,13,14	2.36	3 (27%)	9,15,17	3.85	5 (55%)
1	KPI	A	166	1	11,13,14	2.37	3 (27%)	9,15,17	3.82	5 (55%)
1	KPI	B	166	1	11,13,14	2.36	3 (27%)	9,15,17	4.03	5 (55%)
1	KPI	C	166	1	11,13,14	1.04	1 (9%)	9,15,17	2.76	4 (44%)
1	KPI	D	166	1	11,13,14	1.63	2 (18%)	9,15,17	3.48	4 (44%)
1	KPI	F	166	1	11,13,14	0.98	1 (9%)	9,15,17	3.48	4 (44%)

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
1	KPI	E	166	1	-	4/13/14/16	-
1	KPI	A	166	1	-	4/13/14/16	-
1	KPI	B	166	1	-	4/13/14/16	-
1	KPI	C	166	1	-	0/13/14/16	-
1	KPI	D	166	1	-	0/13/14/16	-
1	KPI	F	166	1	-	0/13/14/16	-

The worst 5 of 13 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	166	KPI	O2-CX2	5.81	1.36	1.22
1	E	166	KPI	O2-CX2	5.71	1.36	1.22
1	B	166	KPI	O2-CX2	5.67	1.36	1.22
1	B	166	KPI	O-C	4.43	1.36	1.20
1	D	166	KPI	O-C	4.41	1.36	1.20

The worst 5 of 27 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	F	166	KPI	C1-CX1-CX2	-7.80	110.75	118.11
1	B	166	KPI	C1-CX1-CX2	-7.61	110.94	118.11
1	E	166	KPI	C1-CX1-CX2	-7.38	111.15	118.11
1	D	166	KPI	C1-CX1-CX2	-7.36	111.17	118.11
1	A	166	KPI	C1-CX1-CX2	-6.85	111.65	118.11

There are no chirality outliers.

5 of 12 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	A	166	KPI	NZ-CX1-CX2-O1
1	A	166	KPI	NZ-CX1-CX2-O2
1	A	166	KPI	C1-CX1-CX2-O2
1	B	166	KPI	NZ-CX1-CX2-O1
1	B	166	KPI	NZ-CX1-CX2-O2

There are no ring outliers.

2 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	C	166	KPI	1	0
1	F	166	KPI	1	0

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 62 ligands modelled in this entry, 10 are monoatomic - leaving 52 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	$\# Z > 2$
6	EDO	B	310	-	3,3,3	0.44	0	2,2,2	0.32	0
3	ACT	F	303	-	3,3,3	1.46	1 (33%)	3,3,3	1.35	0
3	ACT	F	302	-	3,3,3	1.17	0	3,3,3	1.56	0
4	PEG	F	305	-	6,6,6	0.49	0	5,5,5	0.24	0
5	PGE	D	305	-	9,9,9	0.32	0	8,8,8	0.27	0
4	PEG	B	305	-	6,6,6	0.51	0	5,5,5	0.30	0
6	EDO	A	308	-	3,3,3	0.42	0	2,2,2	0.40	0
7	3VN	F	301	-	17,21,21	1.21	1 (5%)	18,28,28	1.66	4 (22%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
6	EDO	D	309	-	3,3,3	0.43	0	2,2,2	0.41	0
8	GOL	F	308	-	5,5,5	0.56	0	5,5,5	1.81	2 (40%)
6	EDO	A	310	-	3,3,3	0.41	0	2,2,2	0.38	0
3	ACT	C	304	-	3,3,3	1.44	1 (33%)	3,3,3	1.35	0
4	PEG	A	306	-	6,6,6	0.48	0	5,5,5	0.48	0
4	PEG	E	306	-	6,6,6	0.49	0	5,5,5	0.24	0
6	EDO	D	308	-	3,3,3	0.41	0	2,2,2	0.38	0
4	PEG	B	306	-	6,6,6	0.49	0	5,5,5	0.26	0
6	EDO	E	308	-	3,3,3	0.39	0	2,2,2	0.47	0
7	3VN	D	301	-	17,21,21	1.12	1 (5%)	18,28,28	1.92	6 (33%)
6	EDO	E	309	-	3,3,3	0.42	0	2,2,2	0.40	0
6	EDO	D	311	-	3,3,3	0.36	0	2,2,2	0.49	0
6	EDO	F	307	-	3,3,3	0.44	0	2,2,2	0.28	0
3	ACT	A	305	-	3,3,3	1.39	1 (33%)	3,3,3	1.36	0
7	3VN	B	301	-	17,21,21	1.30	2 (11%)	18,28,28	1.65	4 (22%)
6	EDO	C	308	-	3,3,3	0.42	0	2,2,2	0.37	0
4	PEG	E	307	-	6,6,6	0.52	0	5,5,5	0.25	0
3	ACT	A	304	-	3,3,3	1.32	0	3,3,3	1.52	0
6	EDO	D	310	-	3,3,3	0.44	0	2,2,2	0.37	0
3	ACT	C	303	-	3,3,3	1.36	0	3,3,3	1.48	0
3	ACT	B	304	-	3,3,3	1.38	0	3,3,3	1.48	0
6	EDO	C	307	-	3,3,3	0.45	0	2,2,2	0.24	0
6	EDO	C	306	-	3,3,3	0.47	0	2,2,2	0.20	0
6	EDO	B	311	-	3,3,3	0.44	0	2,2,2	0.36	0
8	GOL	C	310	-	5,5,5	0.89	0	5,5,5	1.07	1 (20%)
3	ACT	A	303	-	3,3,3	1.33	0	3,3,3	1.52	0
4	PEG	F	304	-	6,6,6	0.53	0	5,5,5	0.49	0
6	EDO	D	306	-	3,3,3	0.39	0	2,2,2	0.41	0
6	EDO	B	308	-	3,3,3	0.44	0	2,2,2	0.30	0
6	EDO	B	309	-	3,3,3	0.44	0	2,2,2	0.39	0
4	PEG	E	305	-	6,6,6	0.50	0	5,5,5	0.36	0
6	EDO	C	309	-	3,3,3	0.45	0	2,2,2	0.40	0
3	ACT	D	304	-	3,3,3	1.20	0	3,3,3	1.54	0
6	EDO	A	313	-	3,3,3	0.43	0	2,2,2	0.35	0
3	ACT	E	303	-	3,3,3	1.44	1 (33%)	3,3,3	1.36	0
6	EDO	A	312	-	3,3,3	0.43	0	2,2,2	0.40	0
3	ACT	E	304	-	3,3,3	1.41	1 (33%)	3,3,3	1.49	0
6	EDO	D	307	-	3,3,3	0.41	0	2,2,2	0.45	0
6	EDO	A	309	-	3,3,3	0.44	0	2,2,2	0.41	0
4	PEG	F	306	-	6,6,6	0.50	0	5,5,5	0.27	0
5	PGE	A	307	-	9,9,9	0.30	0	8,8,8	0.33	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
5	PGE	B	307	-	9,9,9	0.32	0	8,8,8	0.32	0
5	PGE	C	305	-	9,9,9	0.32	0	8,8,8	0.30	0
6	EDO	A	311	-	3,3,3	0.42	0	2,2,2	0.42	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
6	EDO	B	310	-	-	0/1/1/1	-
5	PGE	D	305	-	-	2/7/7/7	-
7	3VN	F	301	-	-	9/31/31/31	-
4	PEG	F	305	-	-	3/4/4/4	-
4	PEG	B	305	-	-	1/4/4/4	-
6	EDO	A	308	-	-	0/1/1/1	-
8	GOL	F	308	-	-	4/4/4/4	-
6	EDO	D	309	-	-	1/1/1/1	-
6	EDO	A	310	-	-	1/1/1/1	-
4	PEG	A	306	-	-	2/4/4/4	-
4	PEG	E	306	-	-	2/4/4/4	-
6	EDO	D	308	-	-	1/1/1/1	-
4	PEG	B	306	-	-	3/4/4/4	-
6	EDO	E	308	-	-	1/1/1/1	-
7	3VN	D	301	-	-	9/31/31/31	-
6	EDO	E	309	-	-	0/1/1/1	-
6	EDO	D	311	-	-	0/1/1/1	-
6	EDO	F	307	-	-	0/1/1/1	-
7	3VN	B	301	-	-	1/31/31/31	-
6	EDO	C	308	-	-	0/1/1/1	-
4	PEG	E	307	-	-	3/4/4/4	-
6	EDO	D	310	-	-	1/1/1/1	-
6	EDO	C	307	-	-	0/1/1/1	-
6	EDO	C	306	-	-	0/1/1/1	-
6	EDO	B	311	-	-	1/1/1/1	-
8	GOL	C	310	-	-	2/4/4/4	-
4	PEG	F	304	-	-	1/4/4/4	-
6	EDO	D	306	-	-	0/1/1/1	-
6	EDO	B	308	-	-	1/1/1/1	-
6	EDO	B	309	-	-	0/1/1/1	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	PEG	E	305	-	-	3/4/4/4	-
6	EDO	C	309	-	-	0/1/1/1	-
6	EDO	A	313	-	-	1/1/1/1	-
6	EDO	A	312	-	-	1/1/1/1	-
6	EDO	D	307	-	-	0/1/1/1	-
6	EDO	A	309	-	-	0/1/1/1	-
4	PEG	F	306	-	-	2/4/4/4	-
5	PGE	A	307	-	-	5/7/7/7	-
5	PGE	B	307	-	-	6/7/7/7	-
5	PGE	C	305	-	-	5/7/7/7	-
6	EDO	A	311	-	-	1/1/1/1	-

The worst 5 of 9 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
7	B	301	3VN	C06-C02	2.68	1.57	1.55
7	F	301	3VN	C06-C02	2.58	1.57	1.55
3	E	303	ACT	CH3-C	2.19	1.57	1.49
3	F	303	ACT	CH3-C	2.18	1.57	1.49
3	C	304	ACT	CH3-C	2.10	1.57	1.49

The worst 5 of 17 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	D	301	3VN	C07-C06-C02	-3.70	108.60	115.16
7	F	301	3VN	C11-C12-C13	-3.45	109.07	115.14
7	B	301	3VN	O05-C03-C02	3.25	122.36	113.69
7	F	301	3VN	O22-C20-C13	2.87	121.36	113.69
7	D	301	3VN	O22-C20-C13	2.85	121.28	113.69

There are no chirality outliers.

5 of 73 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
7	D	301	3VN	N14-C13-C20-O22
7	F	301	3VN	C11-C02-C03-O04
7	F	301	3VN	C11-C02-C03-O05
7	F	301	3VN	N14-C13-C20-O22
8	C	310	GOL	C1-C2-C3-O3

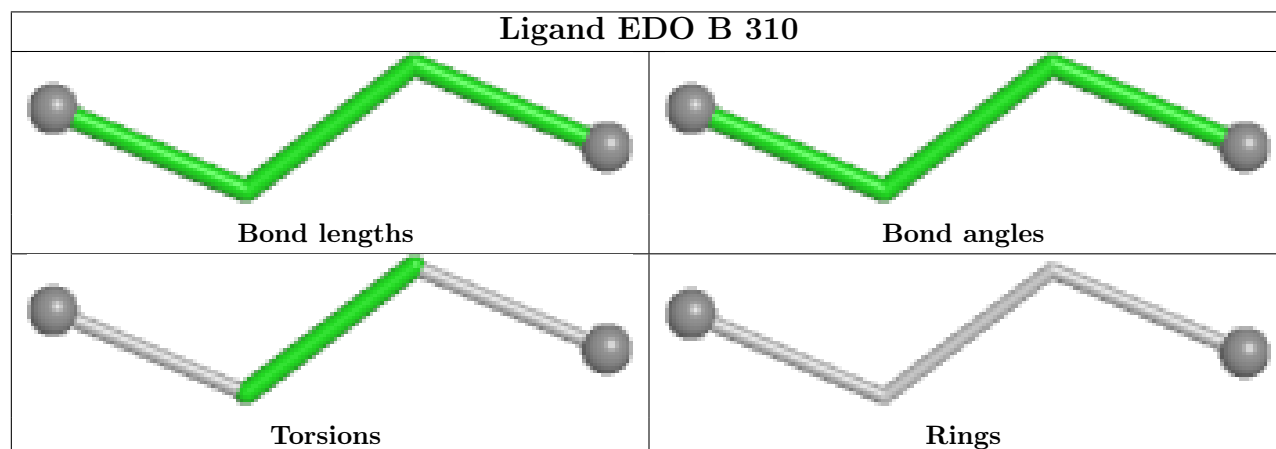
There are no ring outliers.

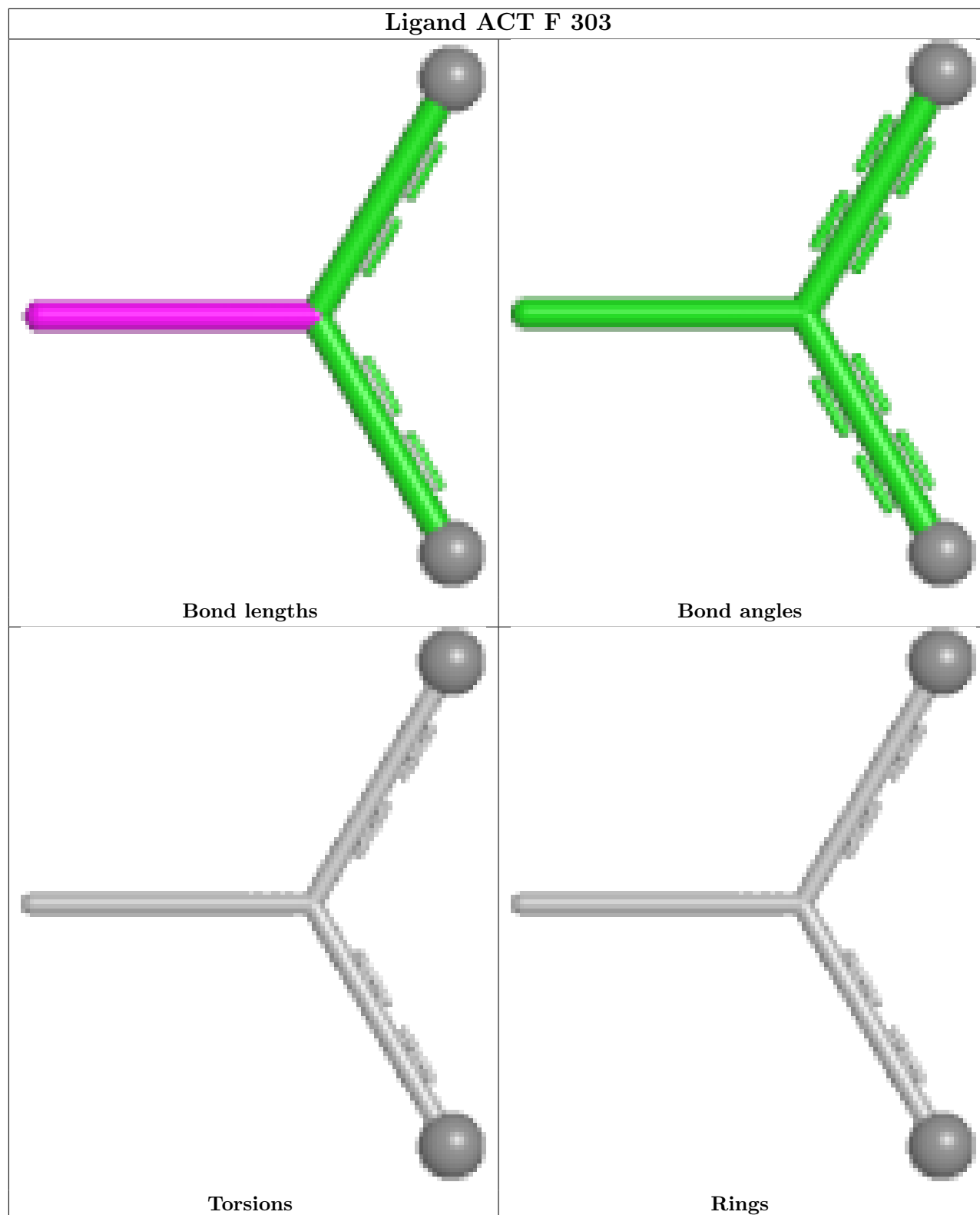
32 monomers are involved in 57 short contacts:

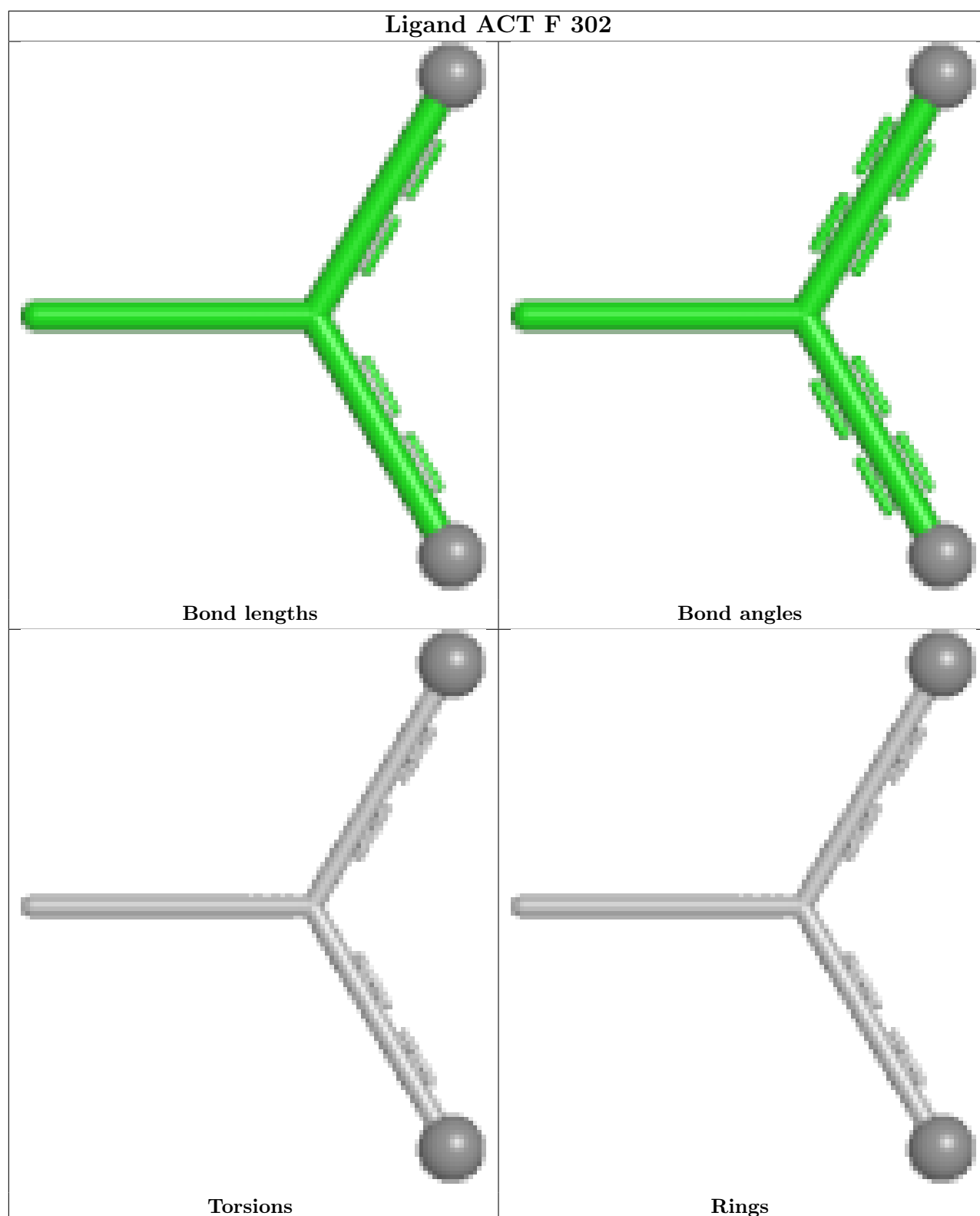
Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	B	310	EDO	1	0
4	F	305	PEG	3	0
4	B	305	PEG	2	0
7	F	301	3VN	4	0
8	F	308	GOL	4	0
4	A	306	PEG	1	0
4	E	306	PEG	1	0
6	D	308	EDO	2	0
4	B	306	PEG	1	0
6	E	308	EDO	1	0
7	D	301	3VN	3	0
6	E	309	EDO	1	0
6	F	307	EDO	2	0
7	B	301	3VN	2	0
6	C	308	EDO	1	0
4	E	307	PEG	2	0
3	A	304	ACT	1	0
6	C	307	EDO	1	0
6	C	306	EDO	4	0
8	C	310	GOL	1	0
3	A	303	ACT	1	0
4	F	304	PEG	5	0
6	D	306	EDO	2	0
4	E	305	PEG	6	0
6	C	309	EDO	1	0
3	D	304	ACT	1	0
6	A	313	EDO	1	0
6	A	312	EDO	1	0
6	D	307	EDO	1	0
6	A	309	EDO	1	0
5	B	307	PGE	5	0
5	C	305	PGE	2	0

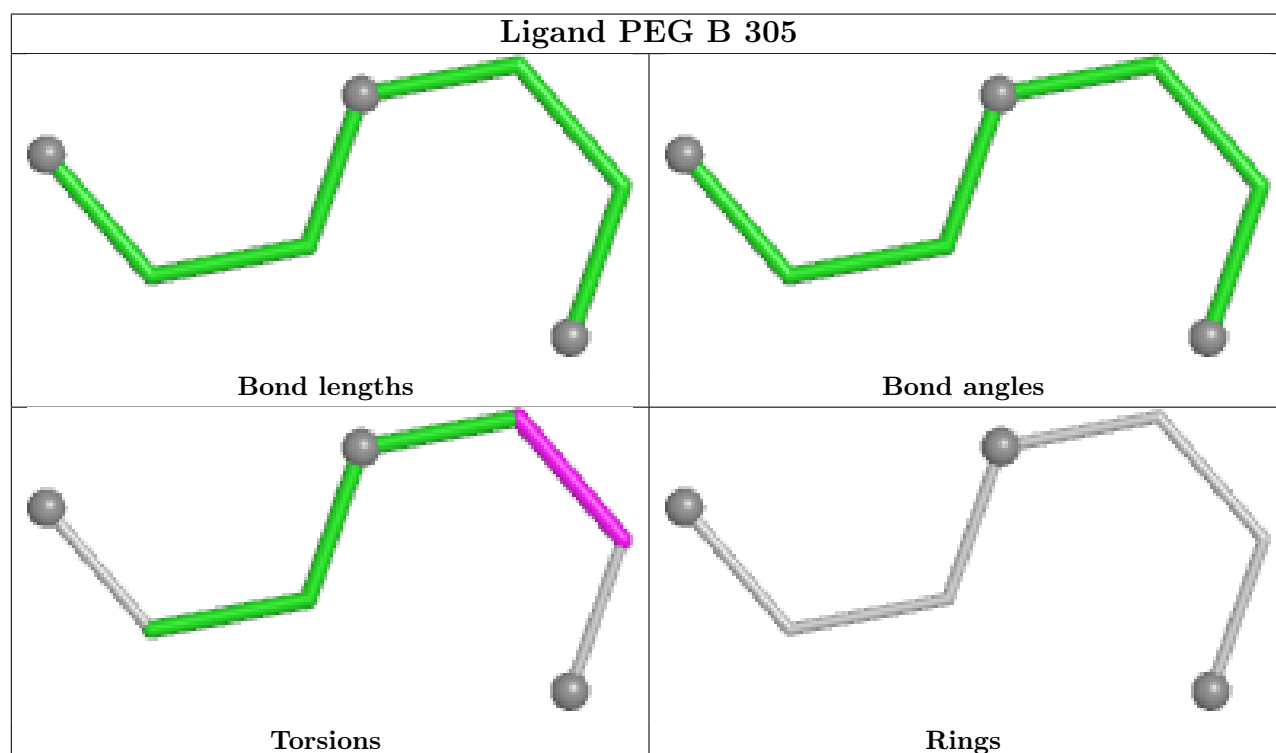
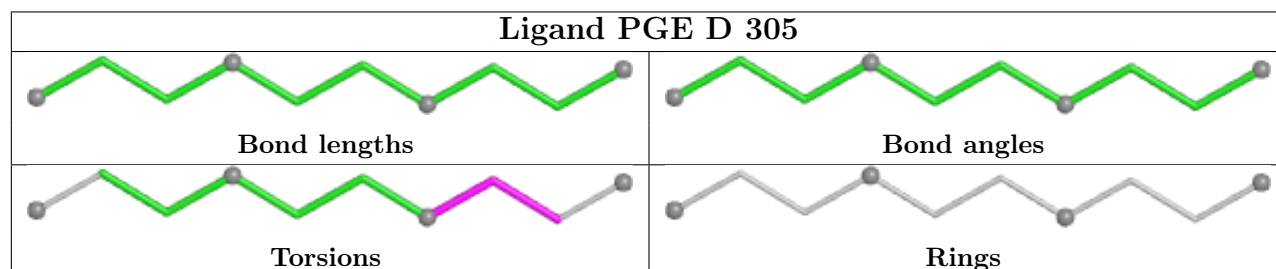
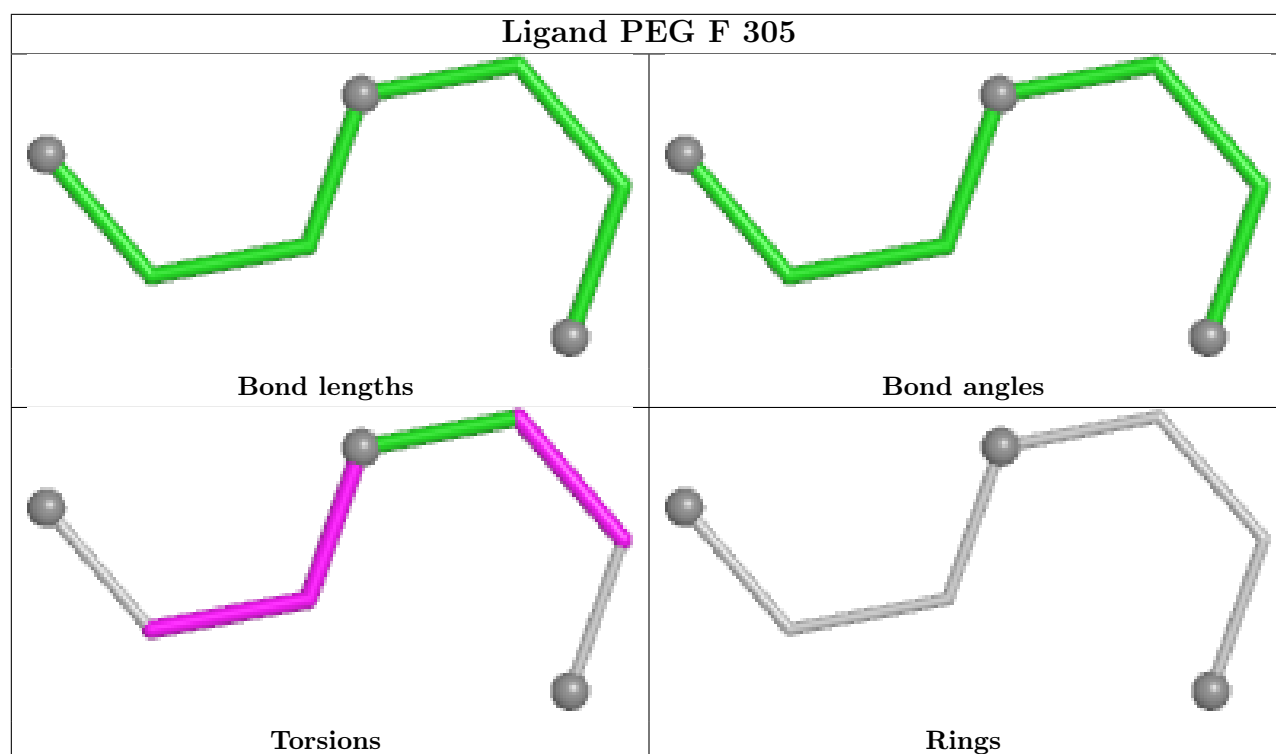
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

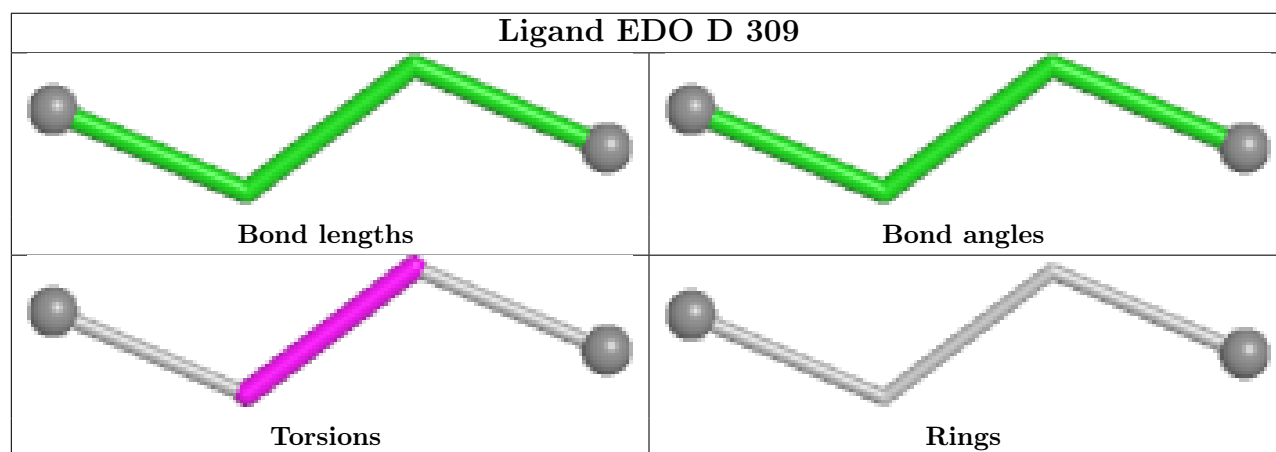
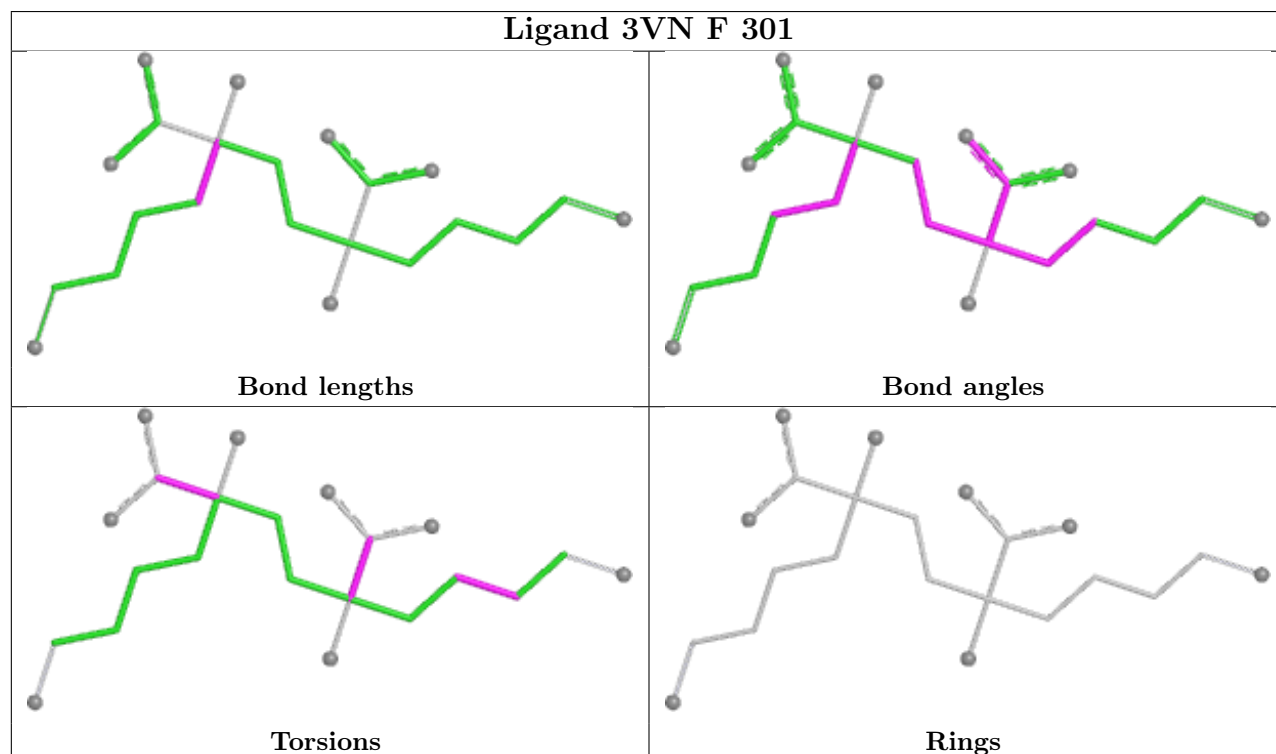
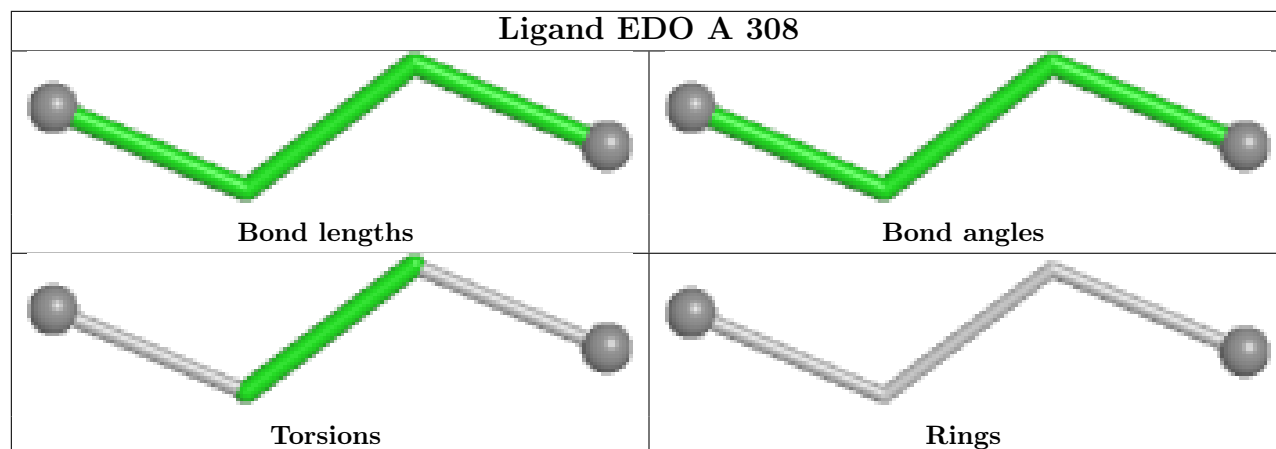
average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

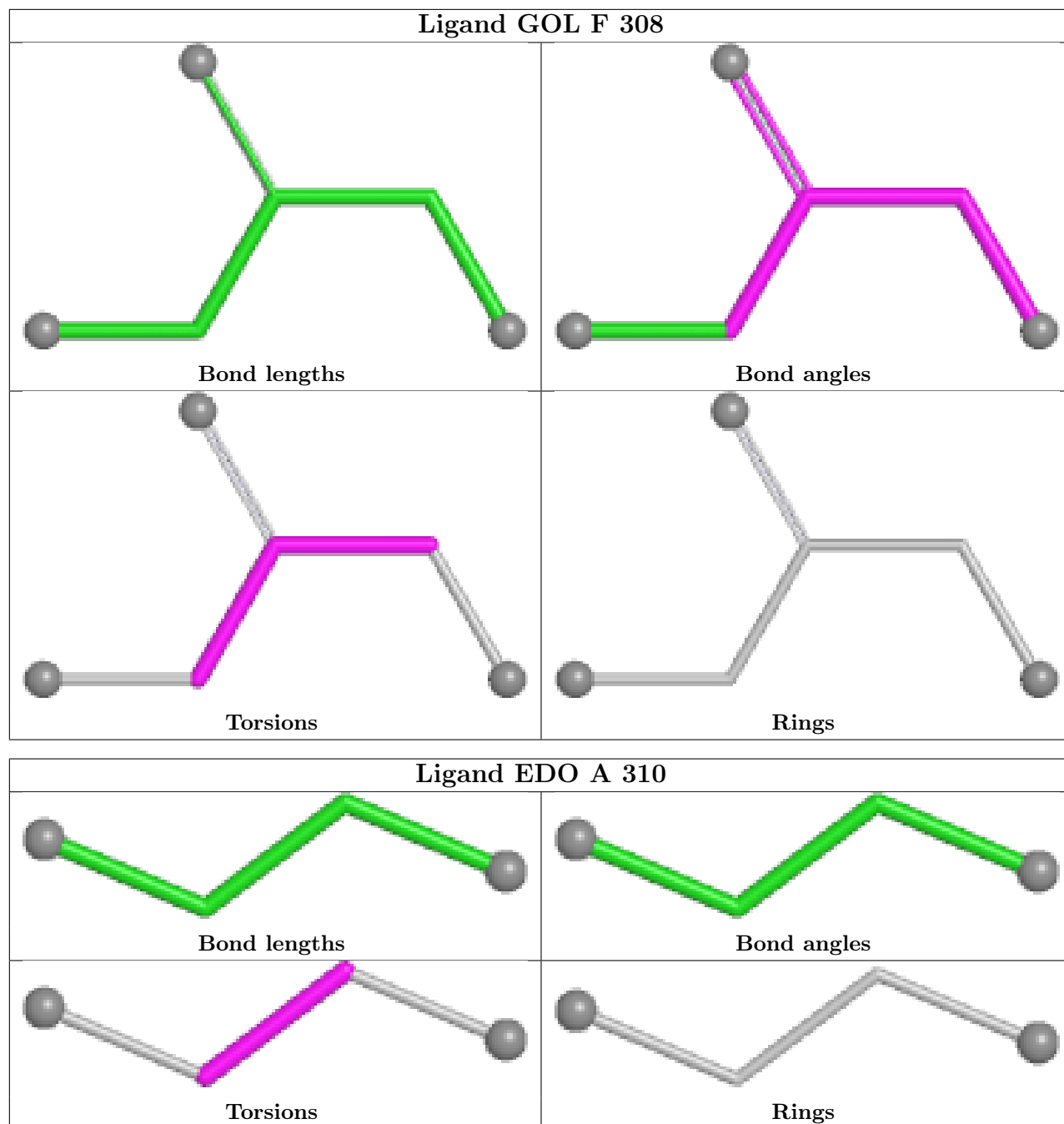


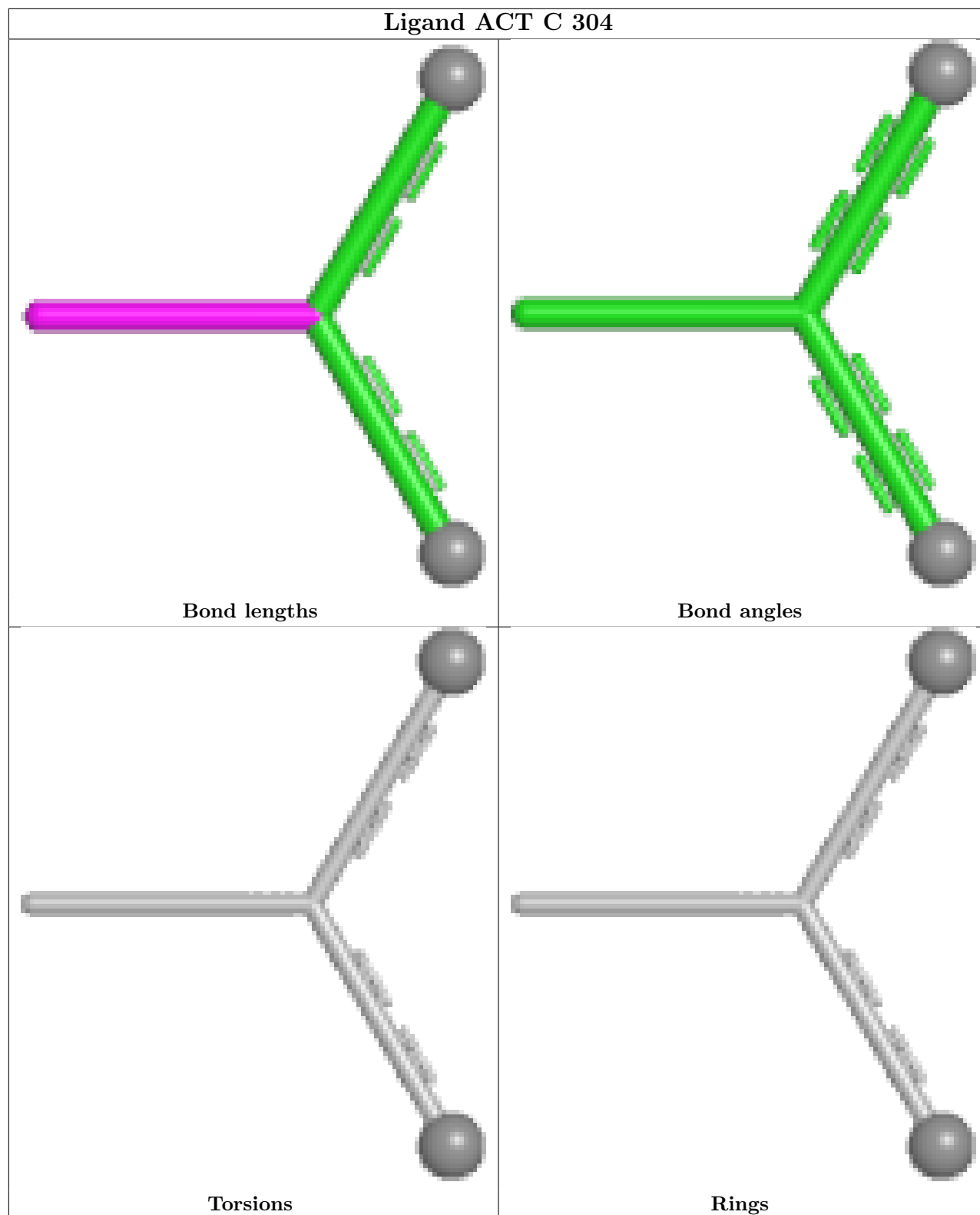


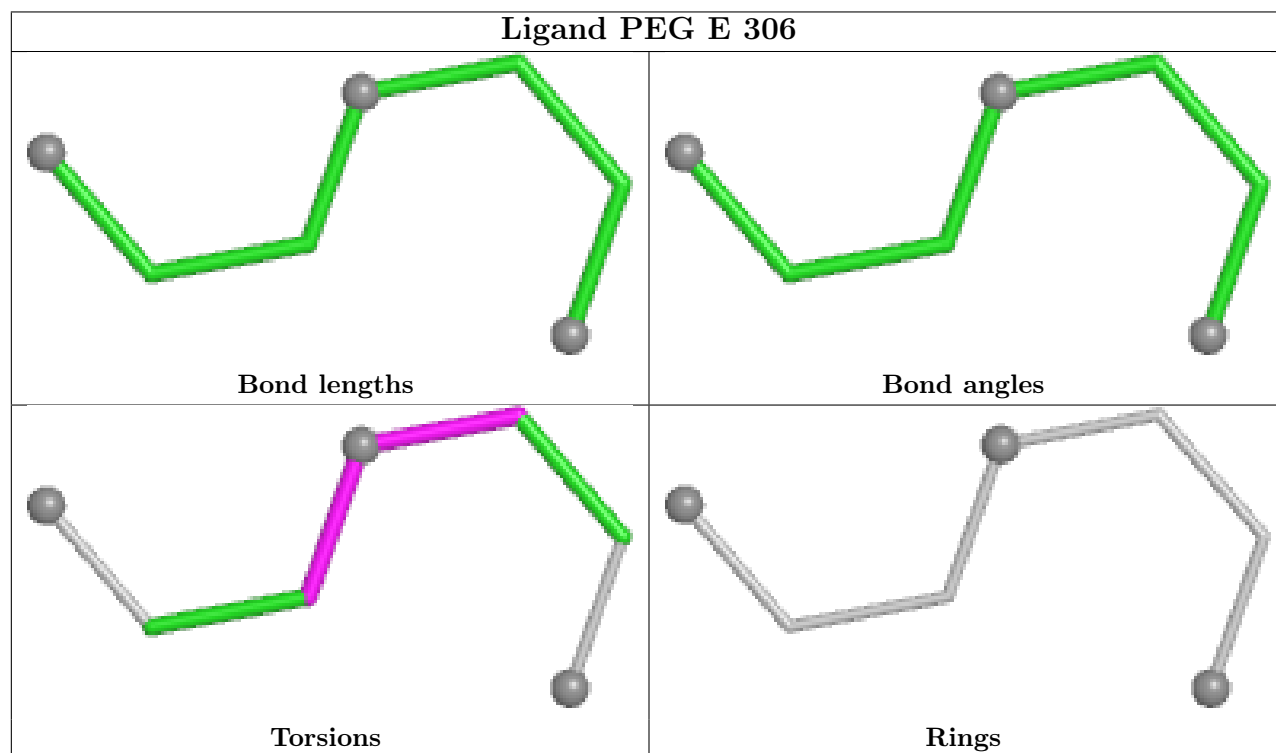
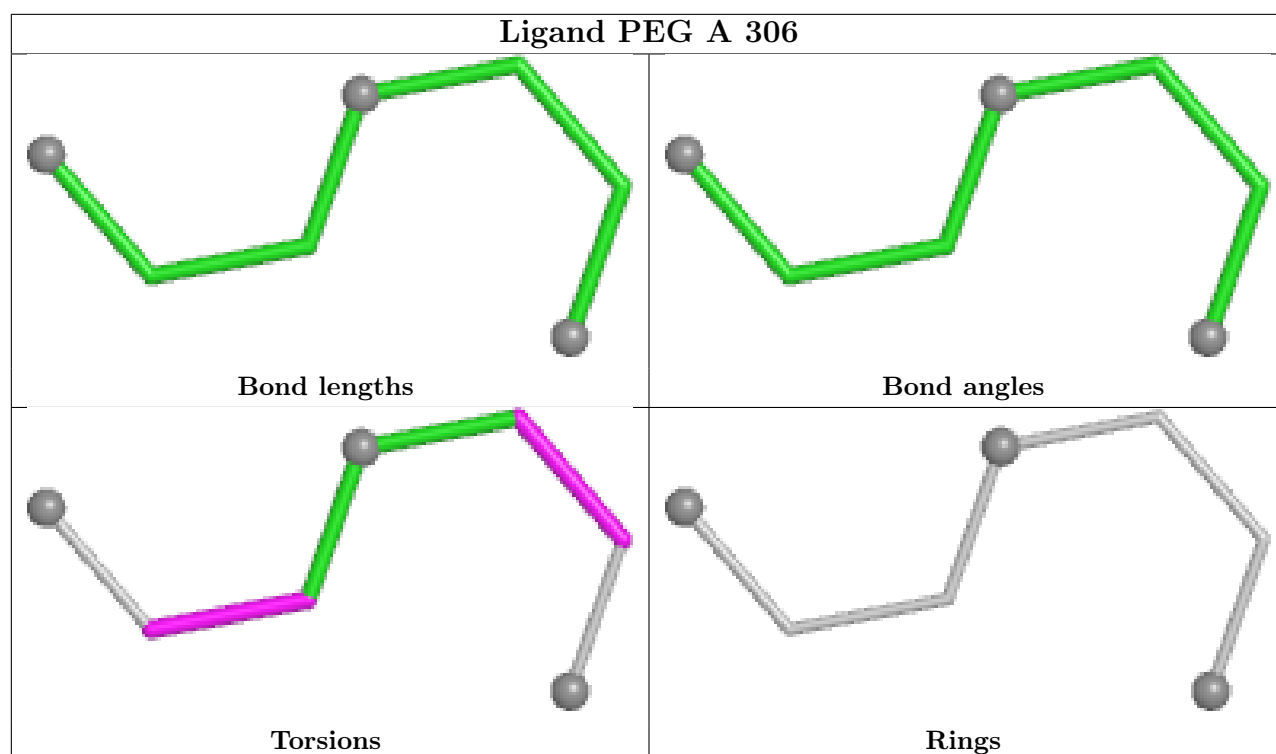


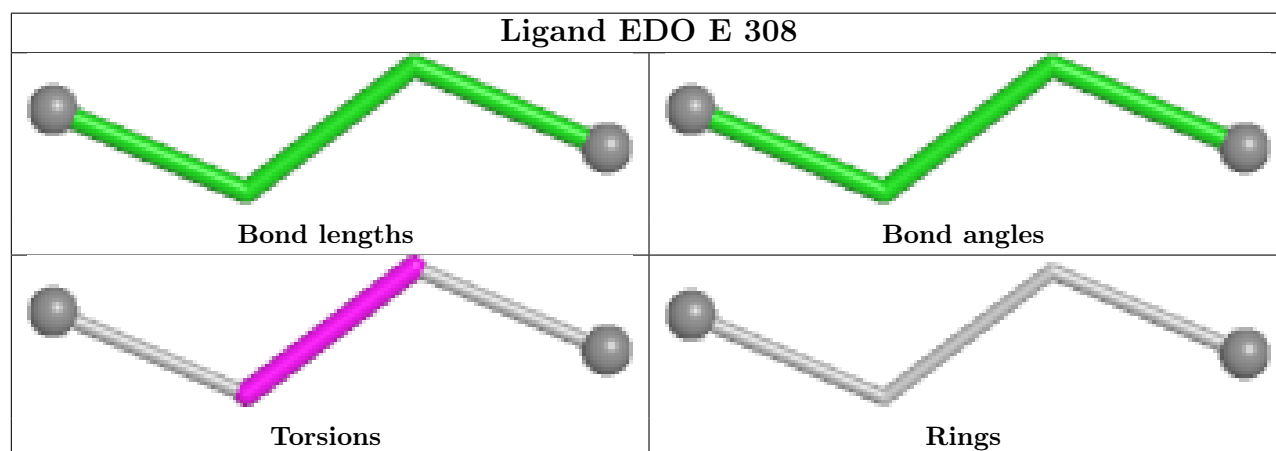
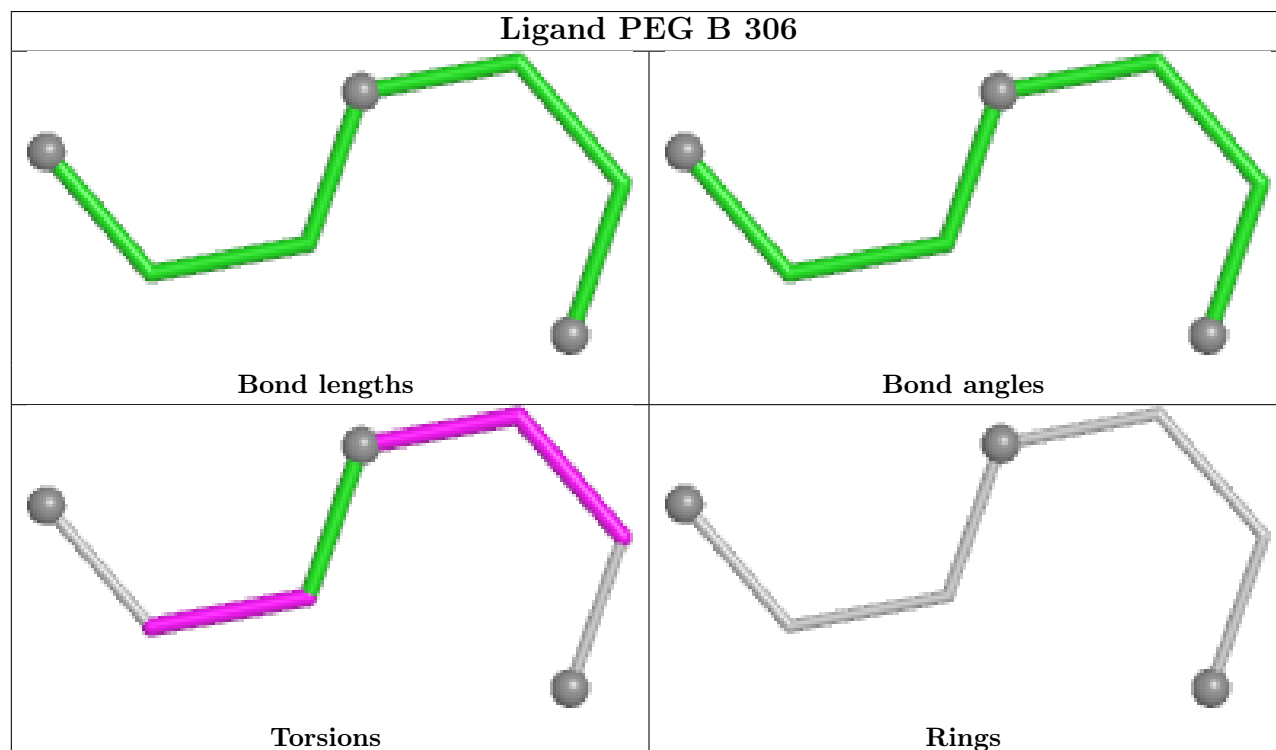
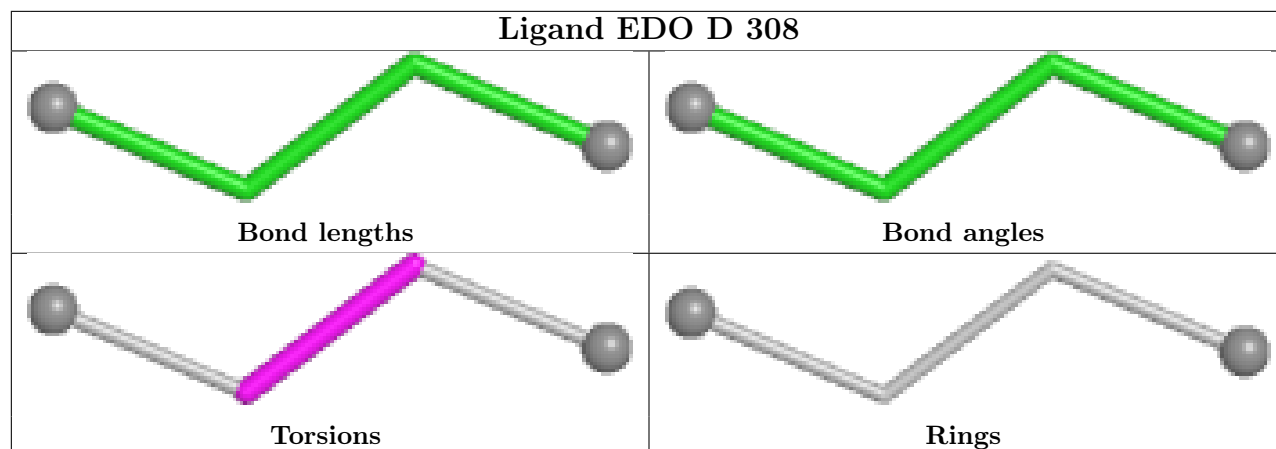


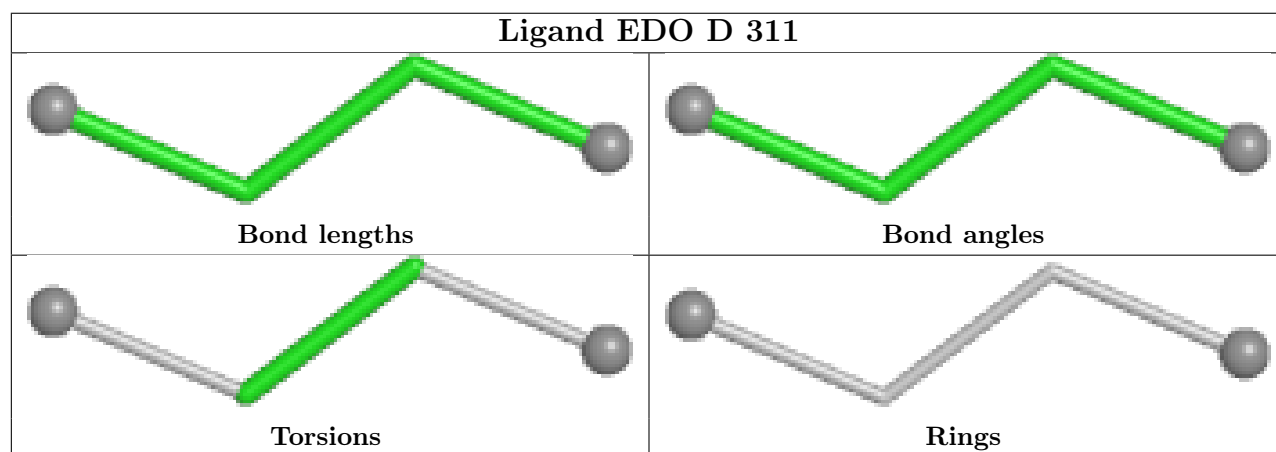
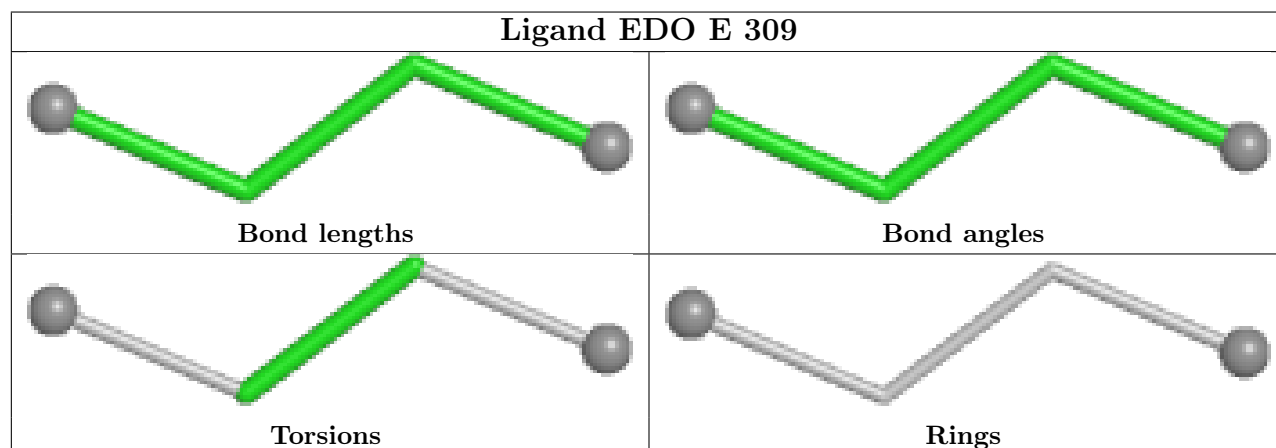
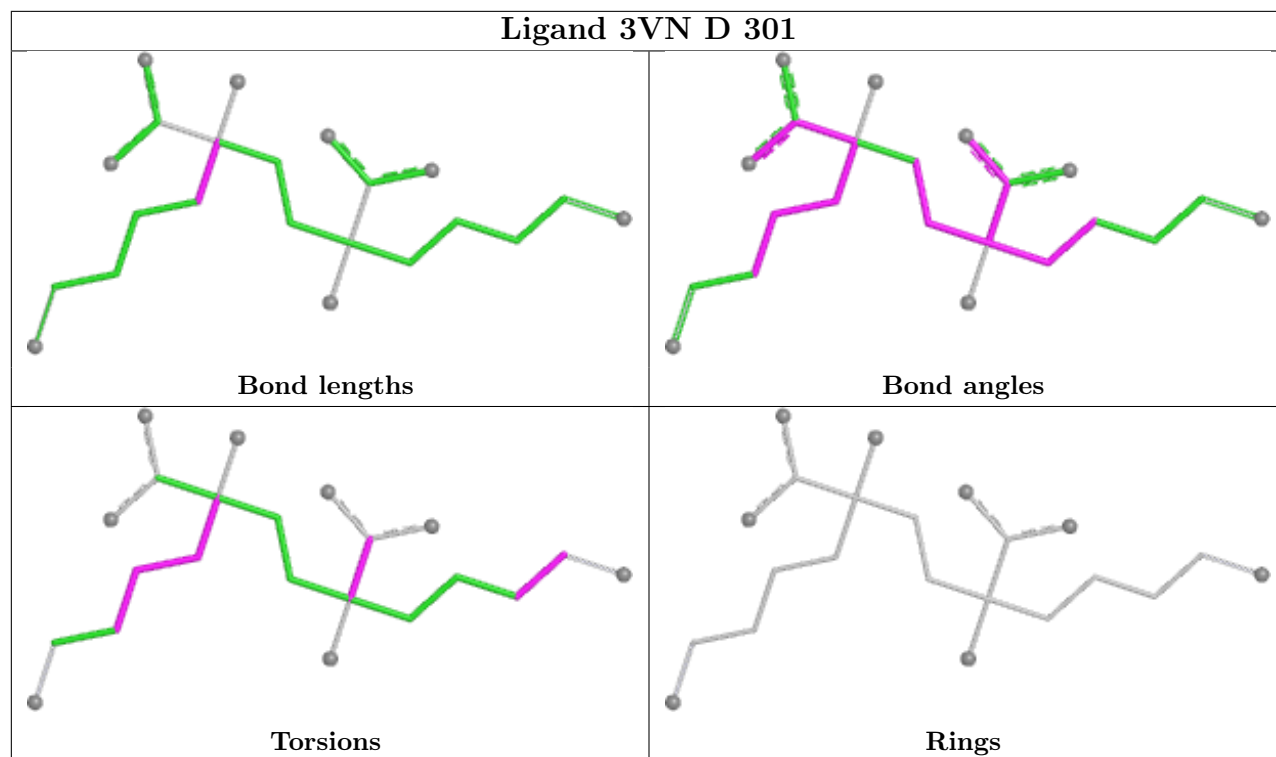


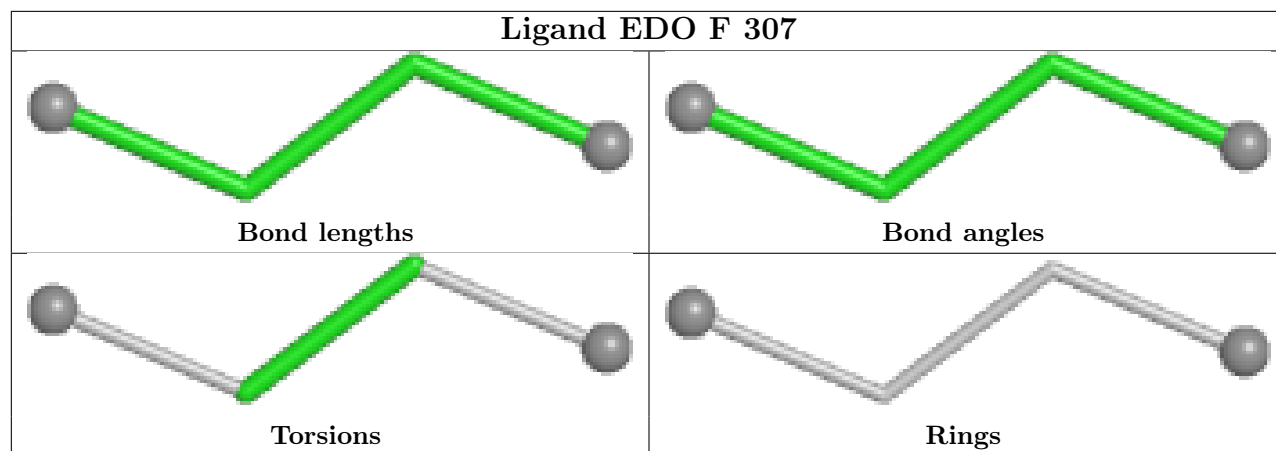


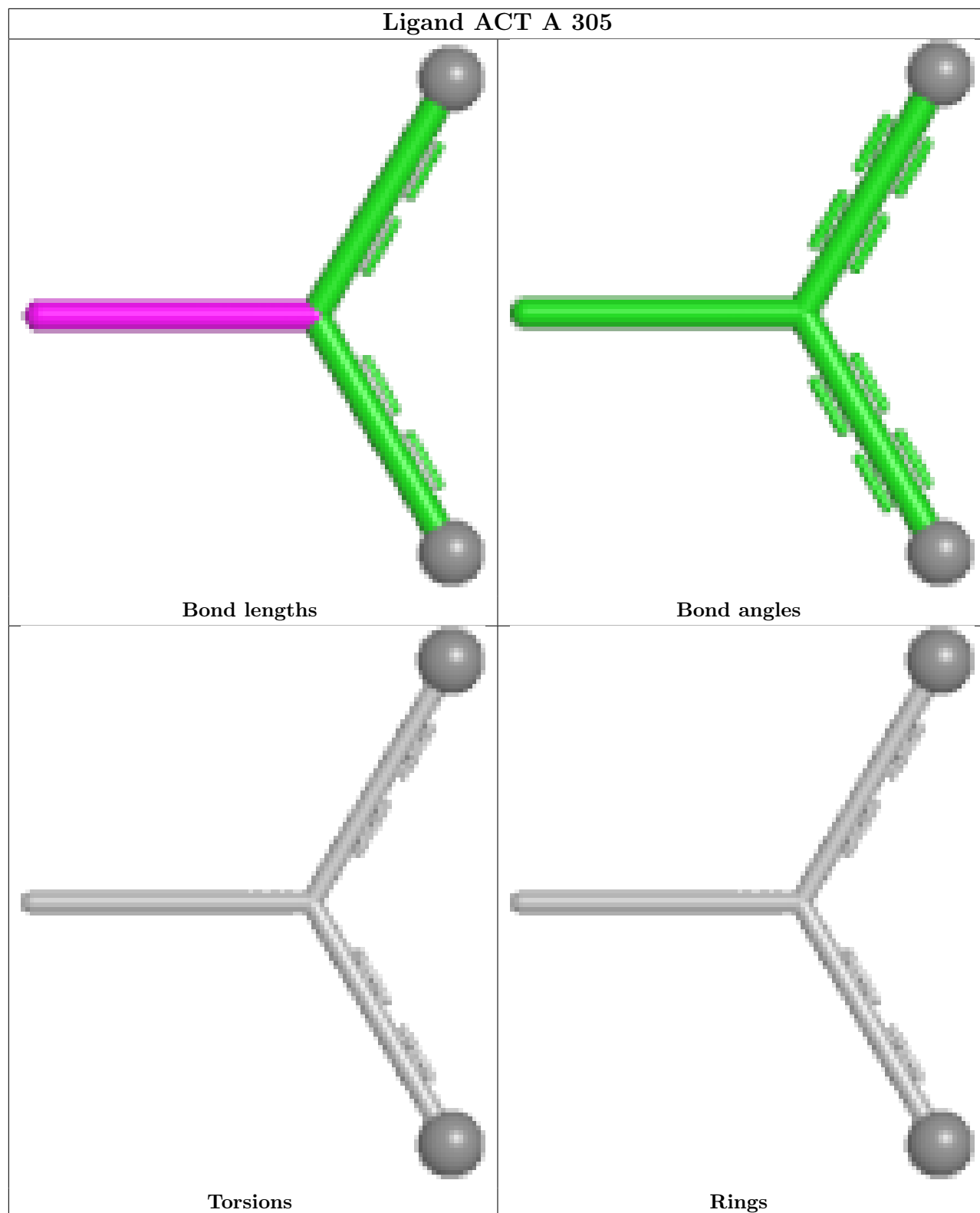




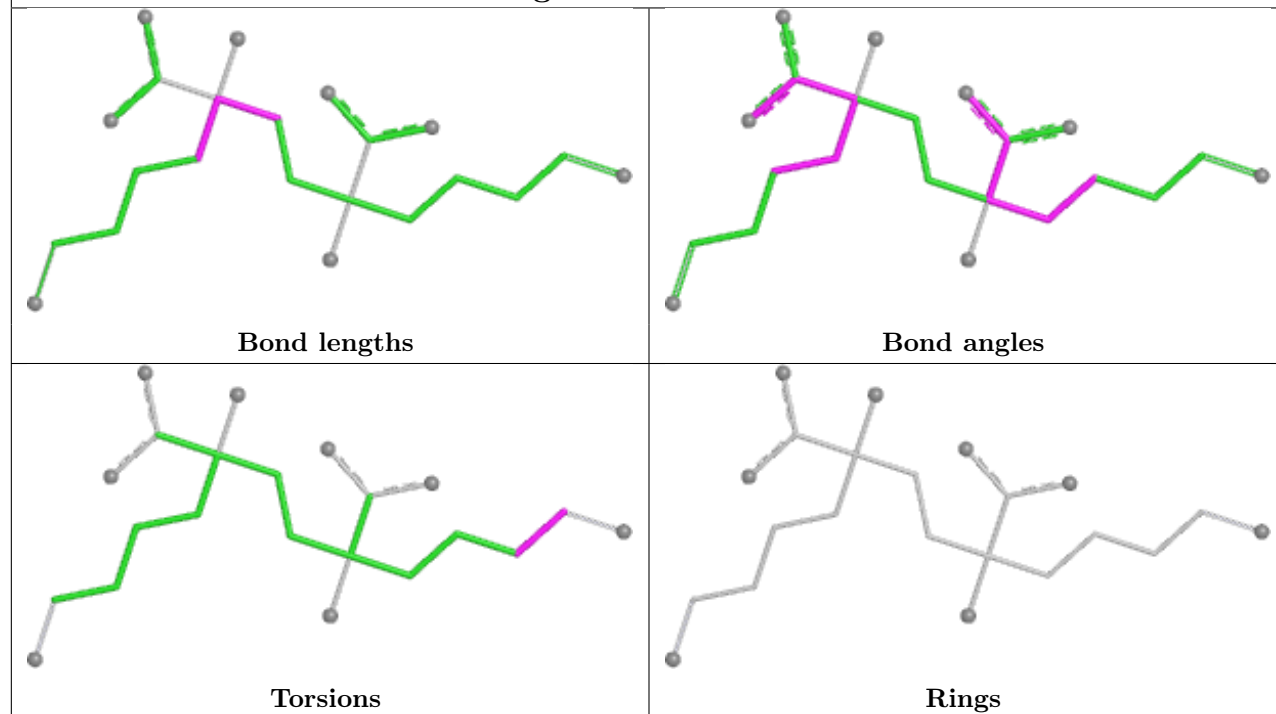




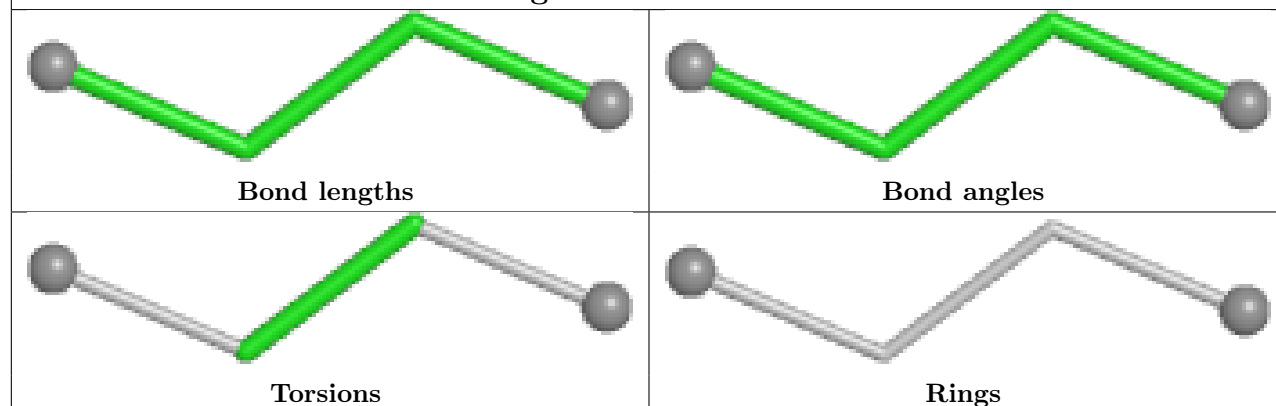


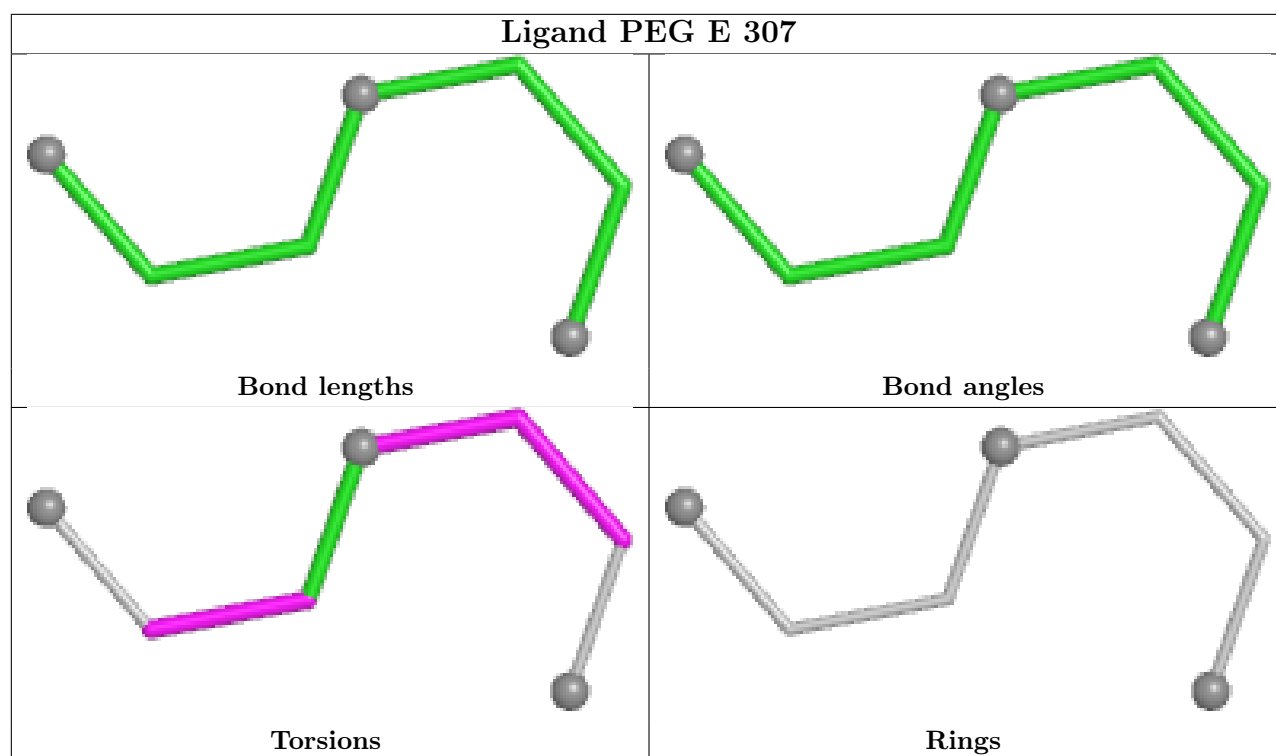


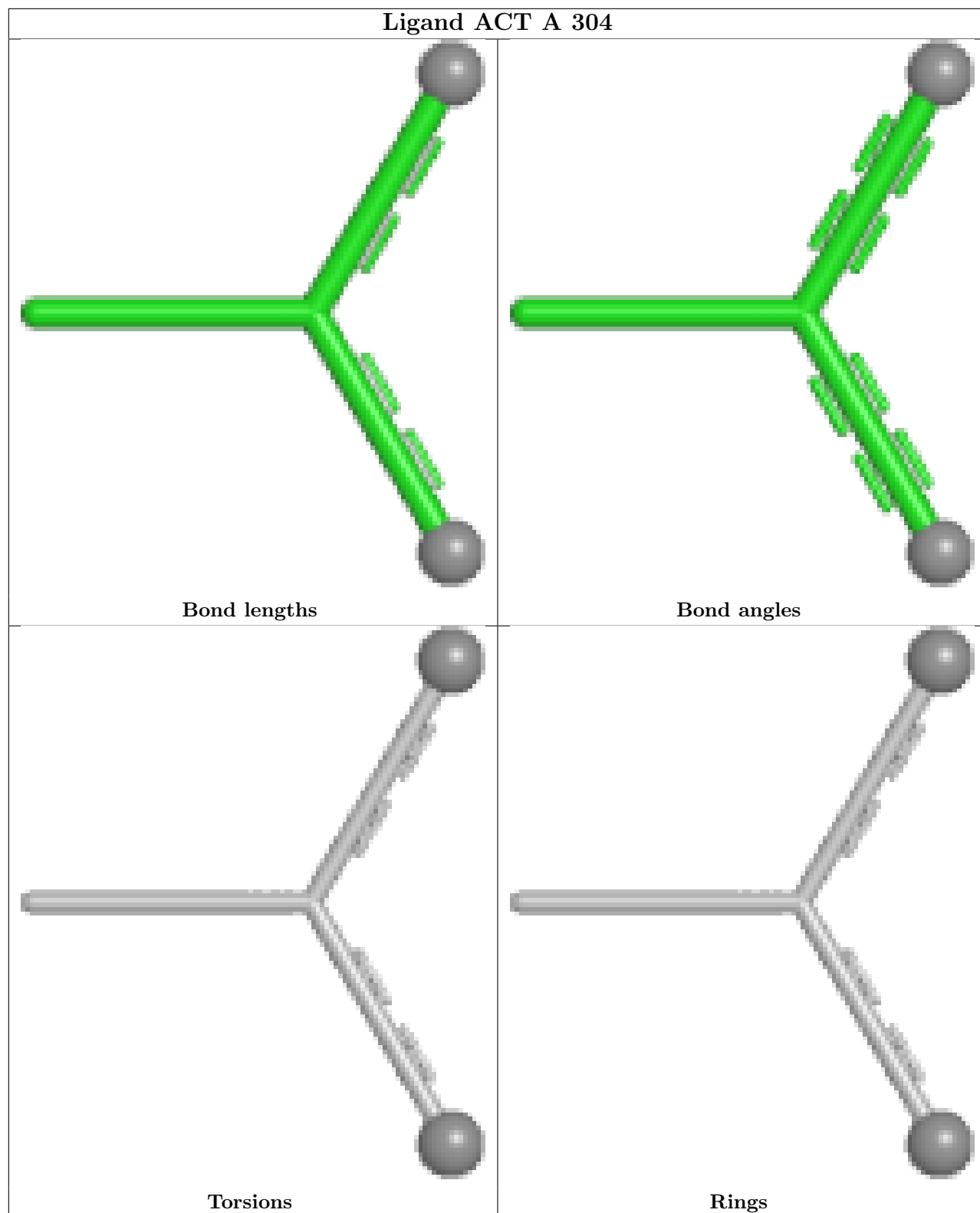
Ligand 3VN B 301

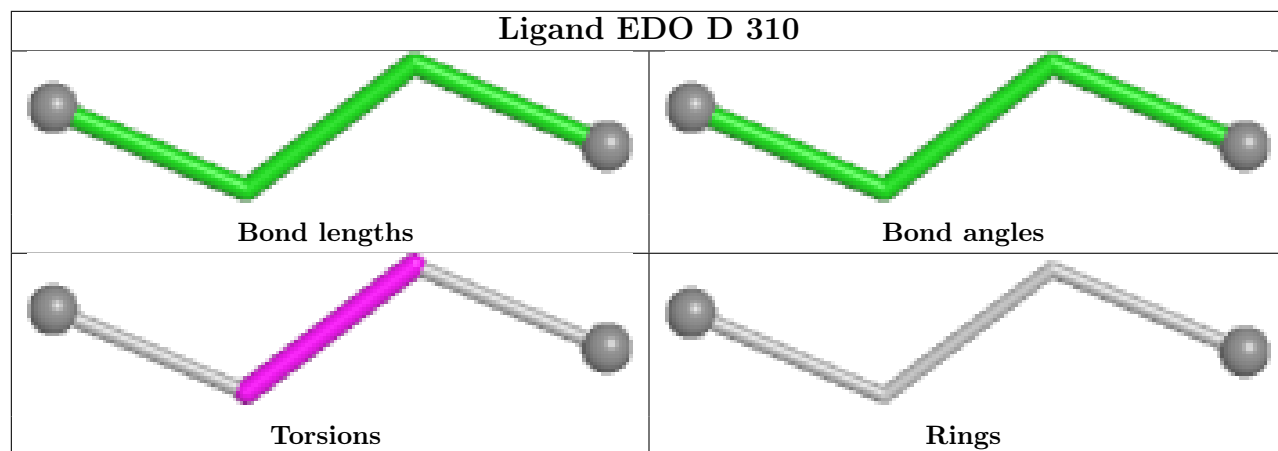


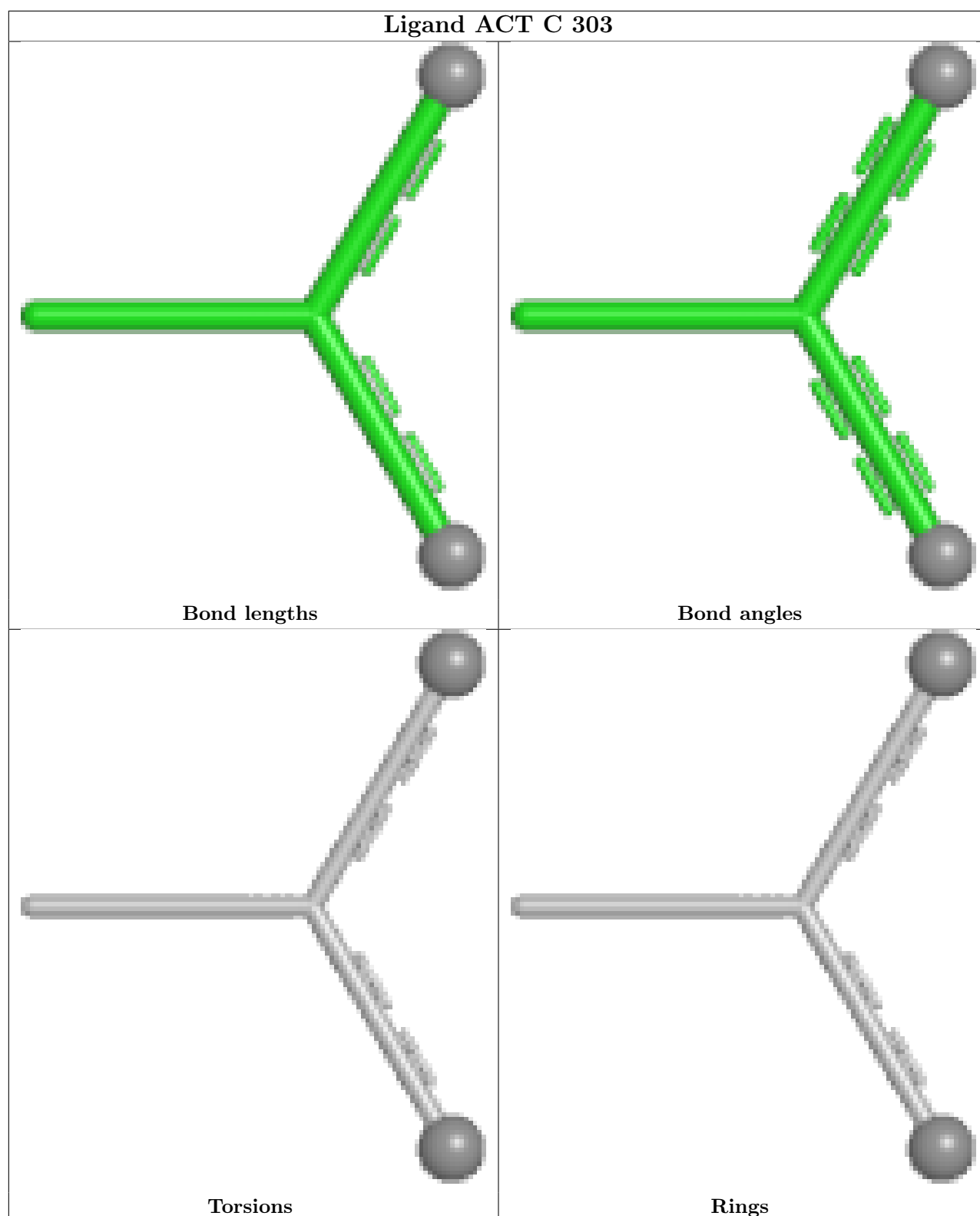
Ligand EDO C 308

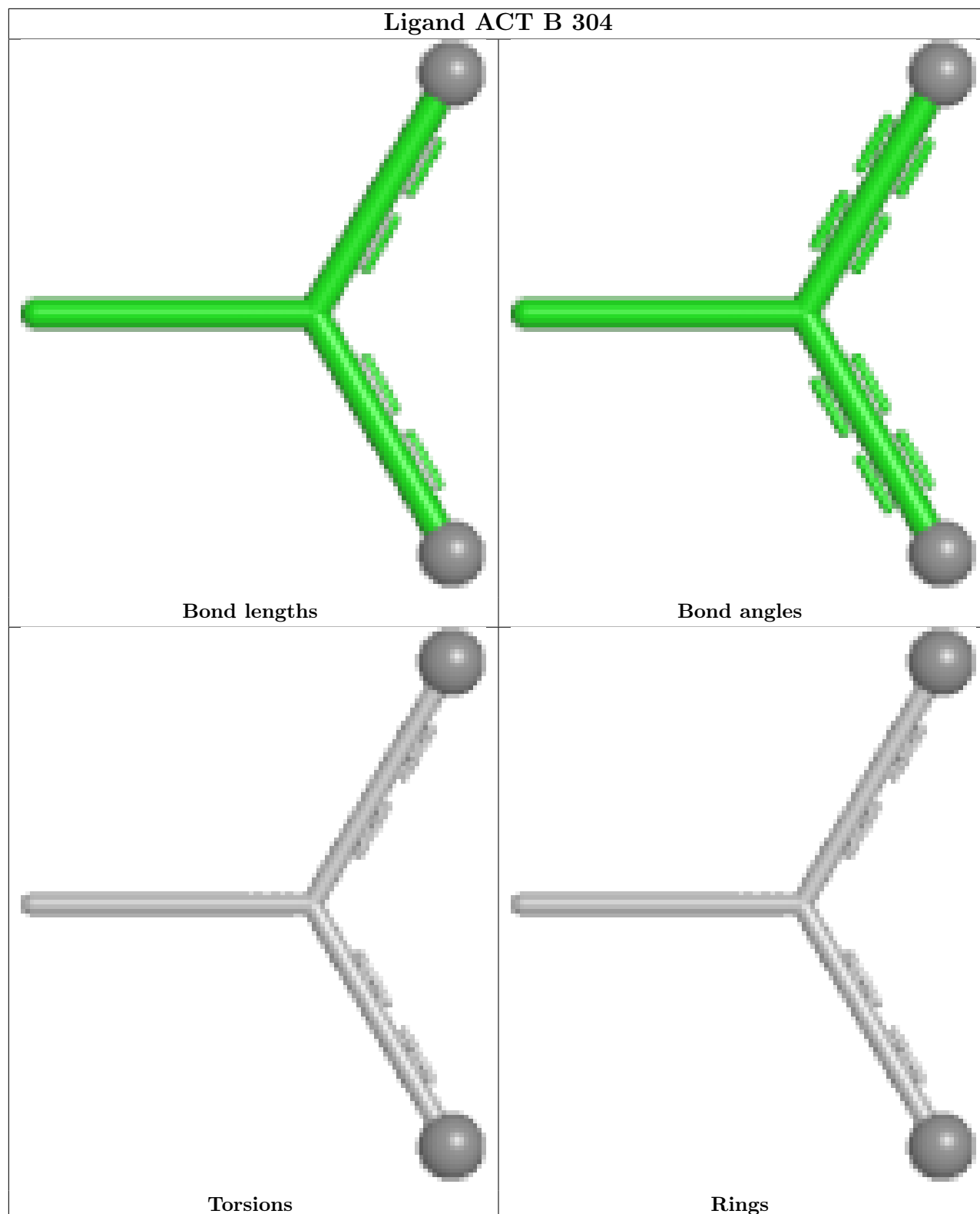


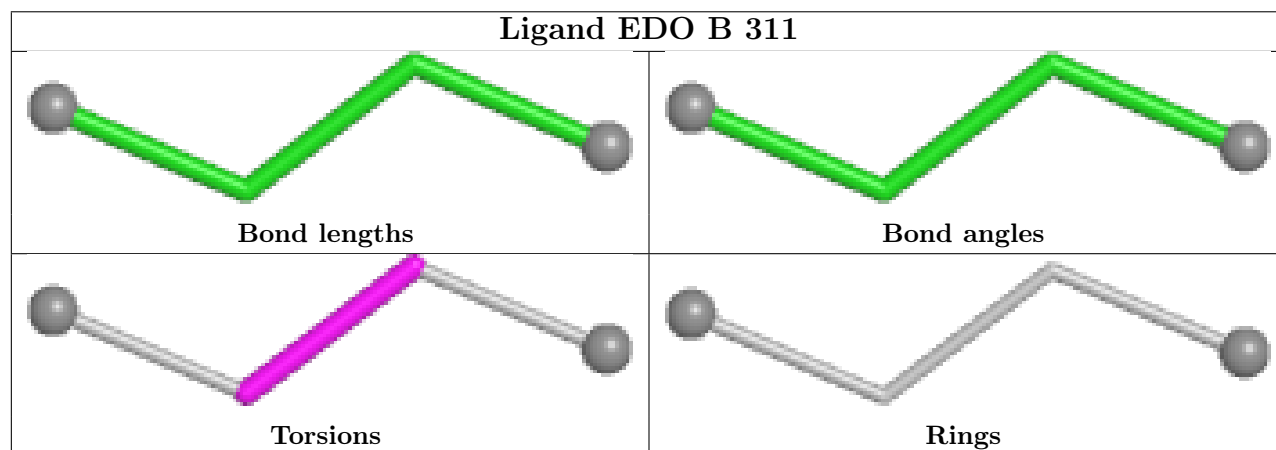
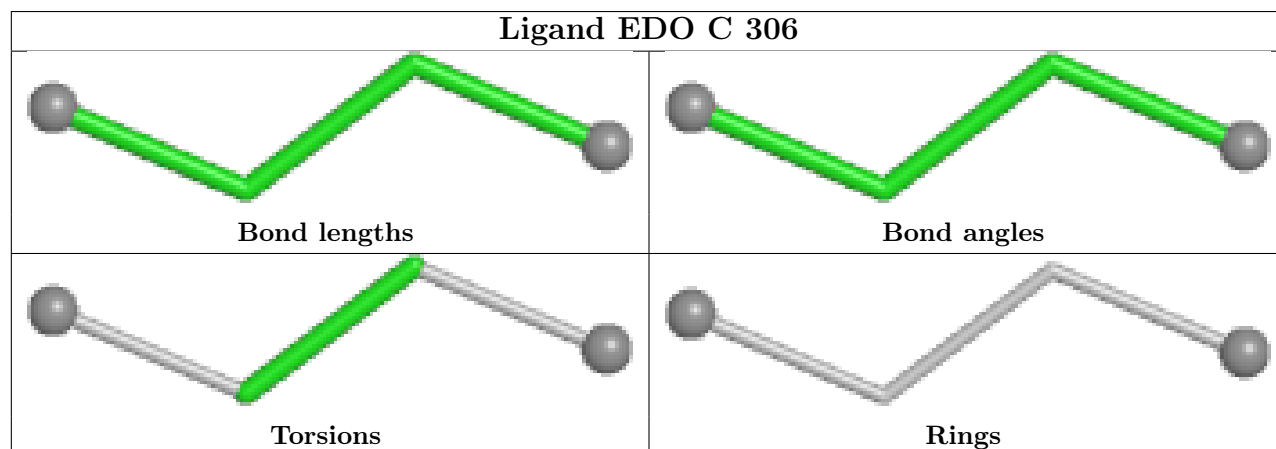
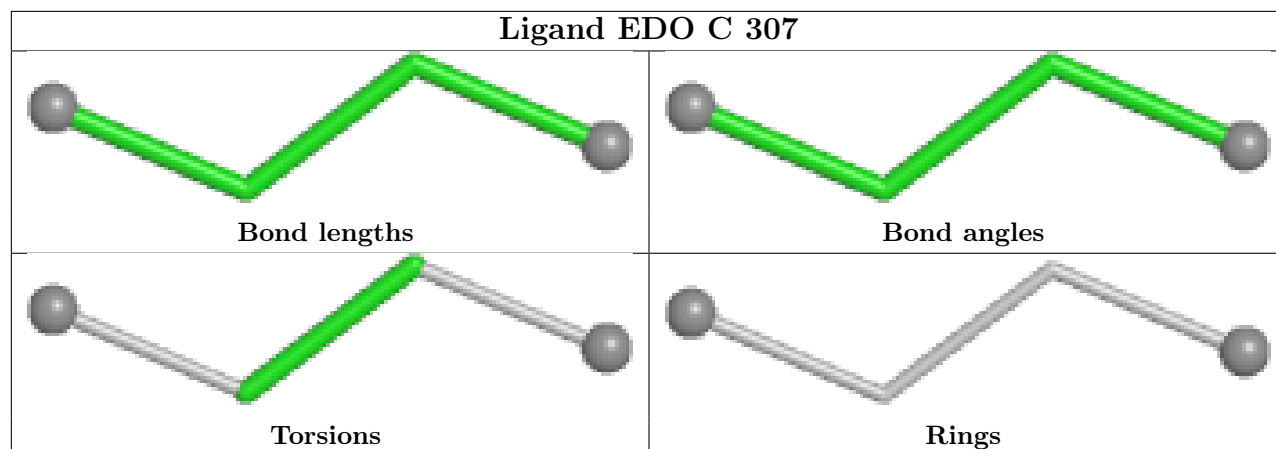


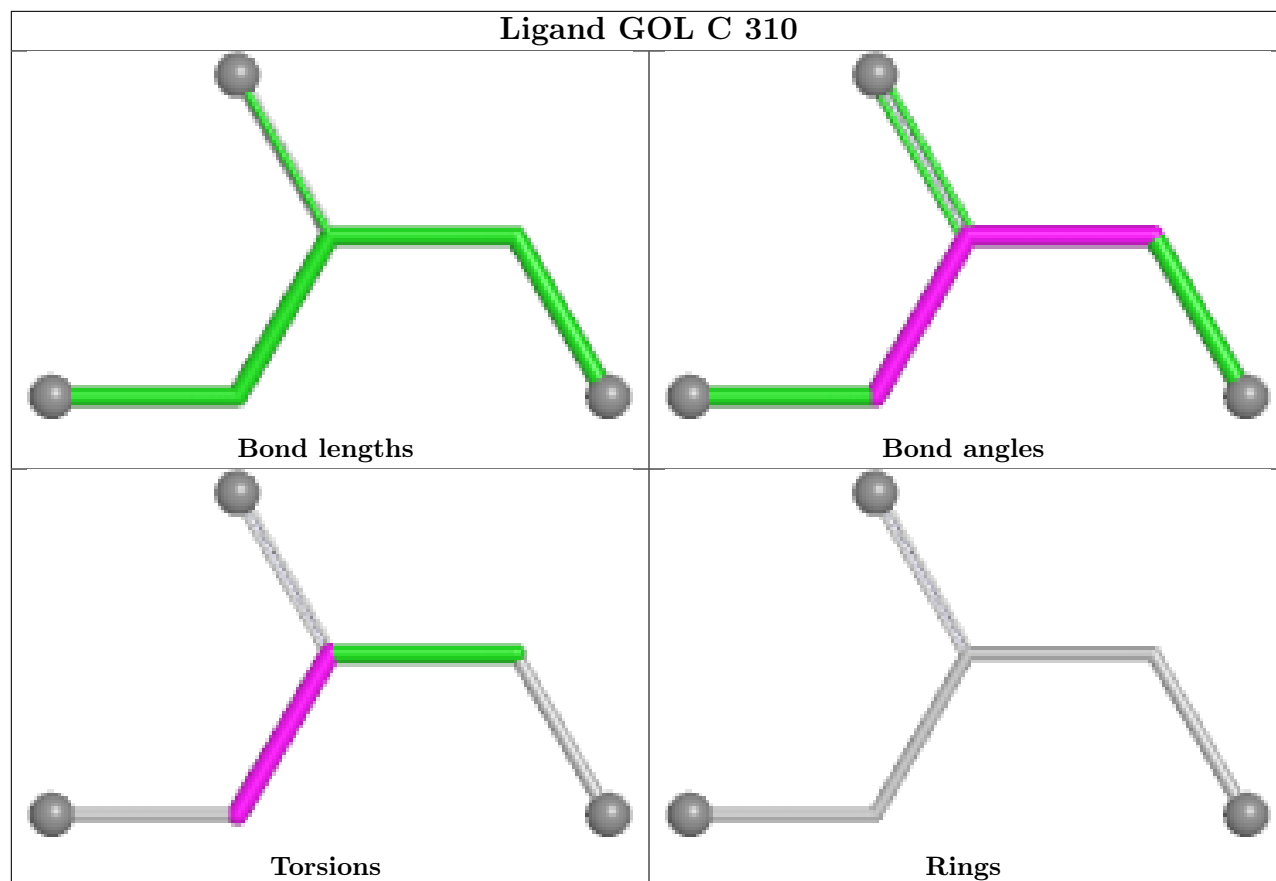


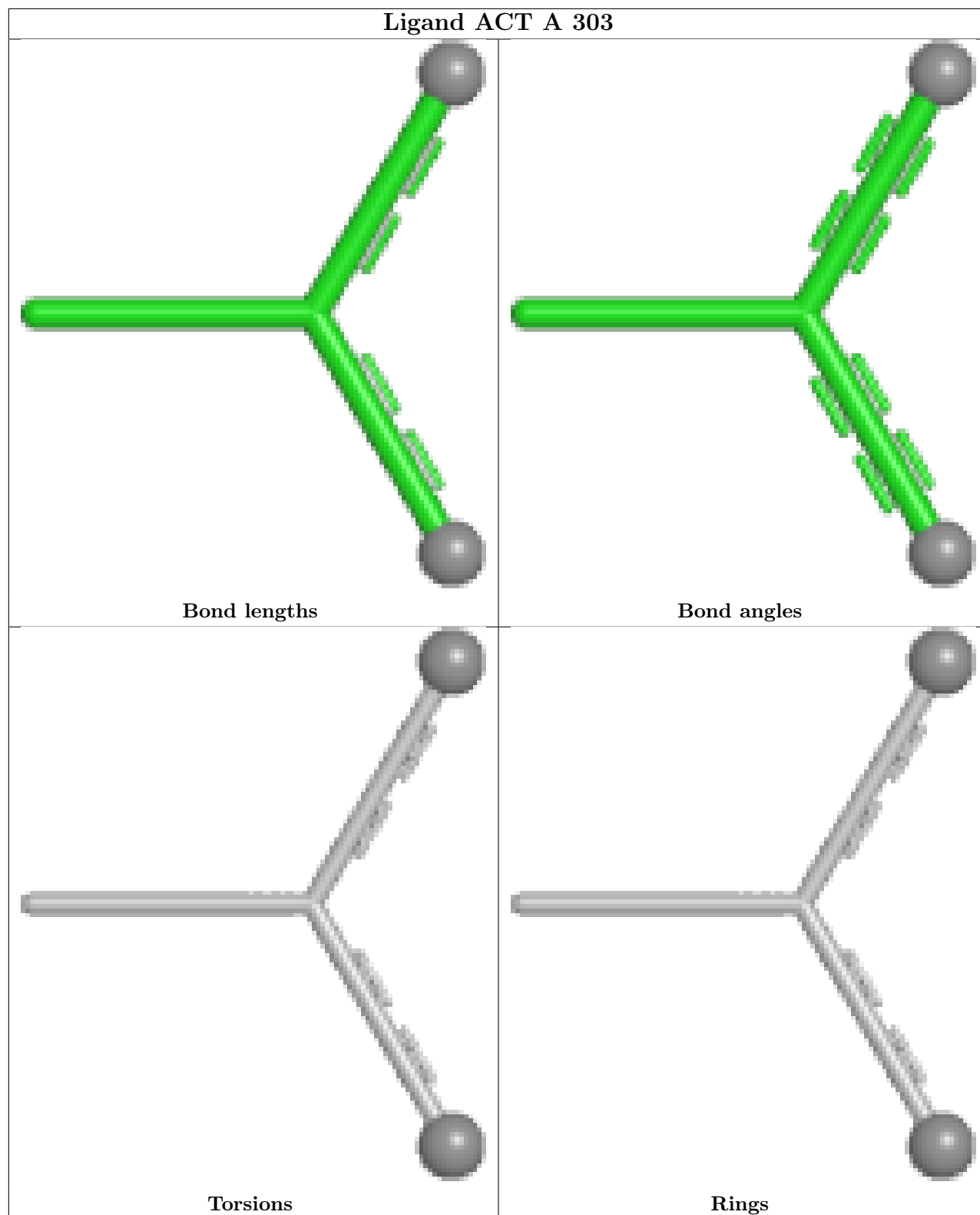


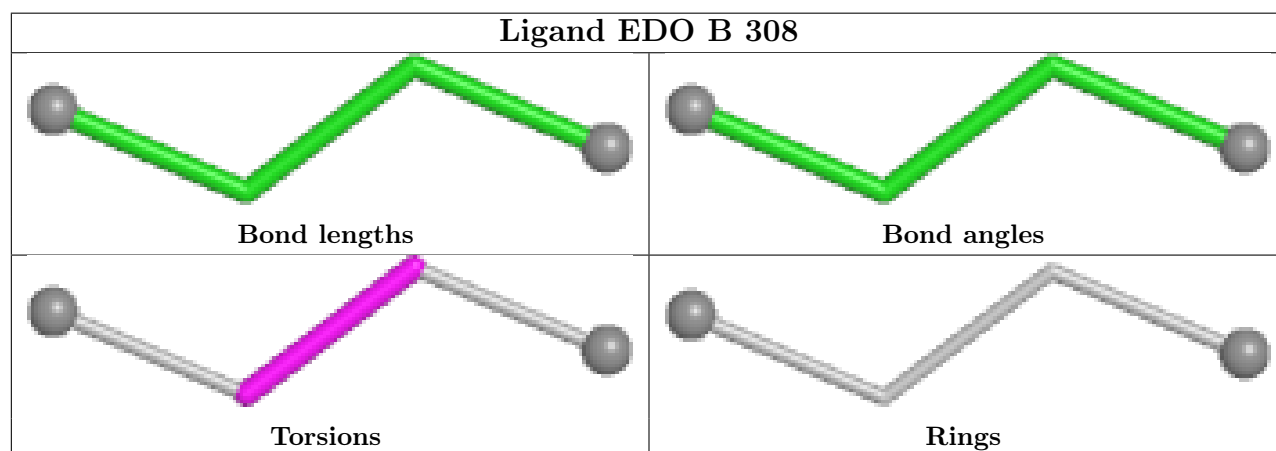
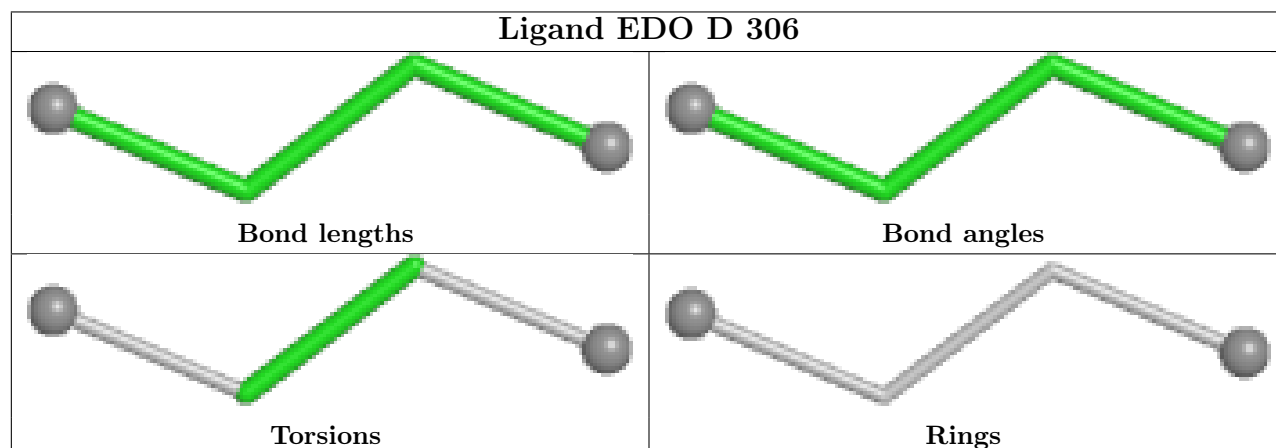
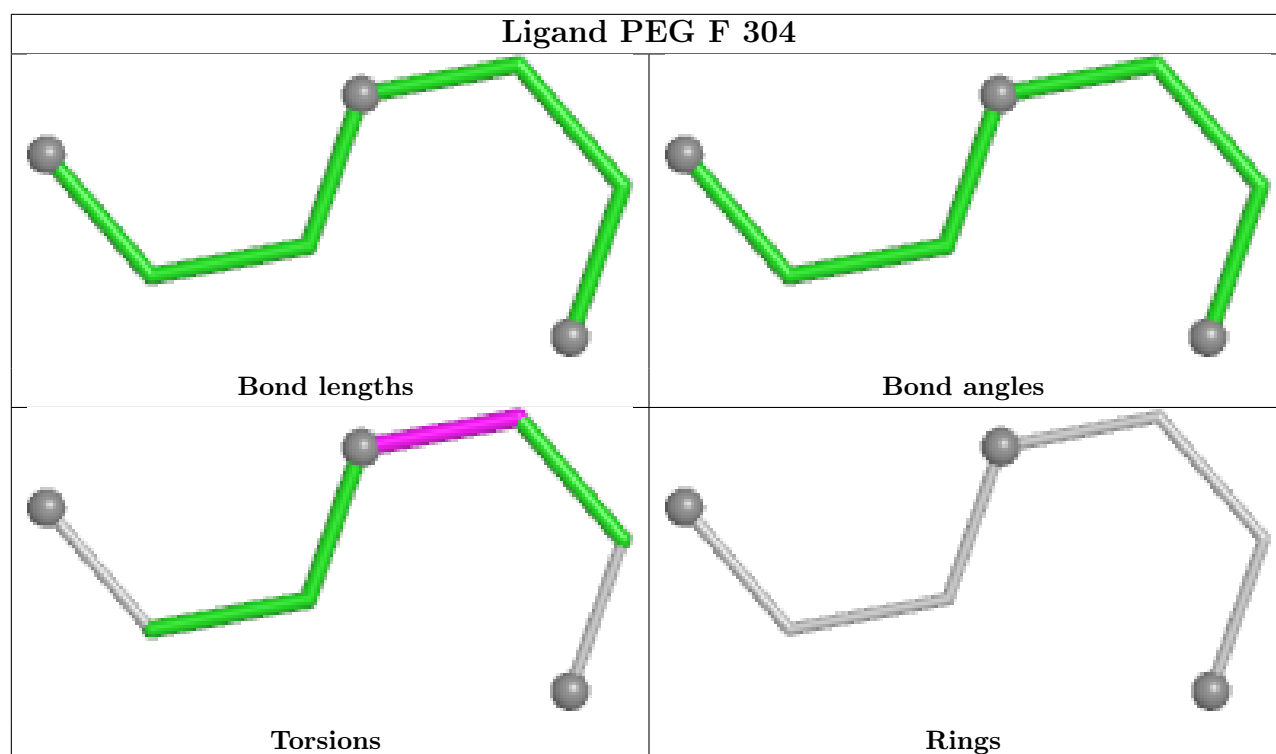


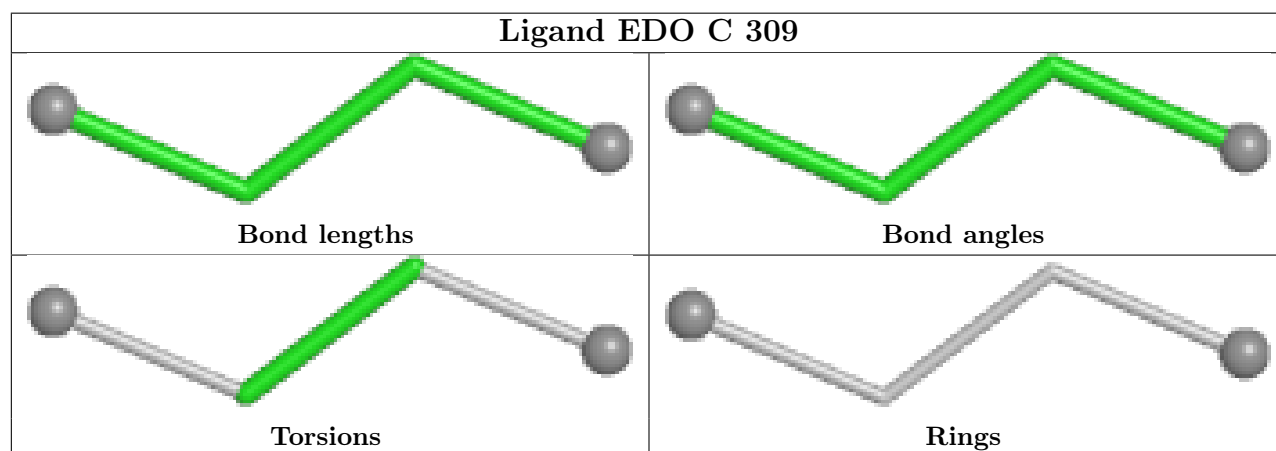
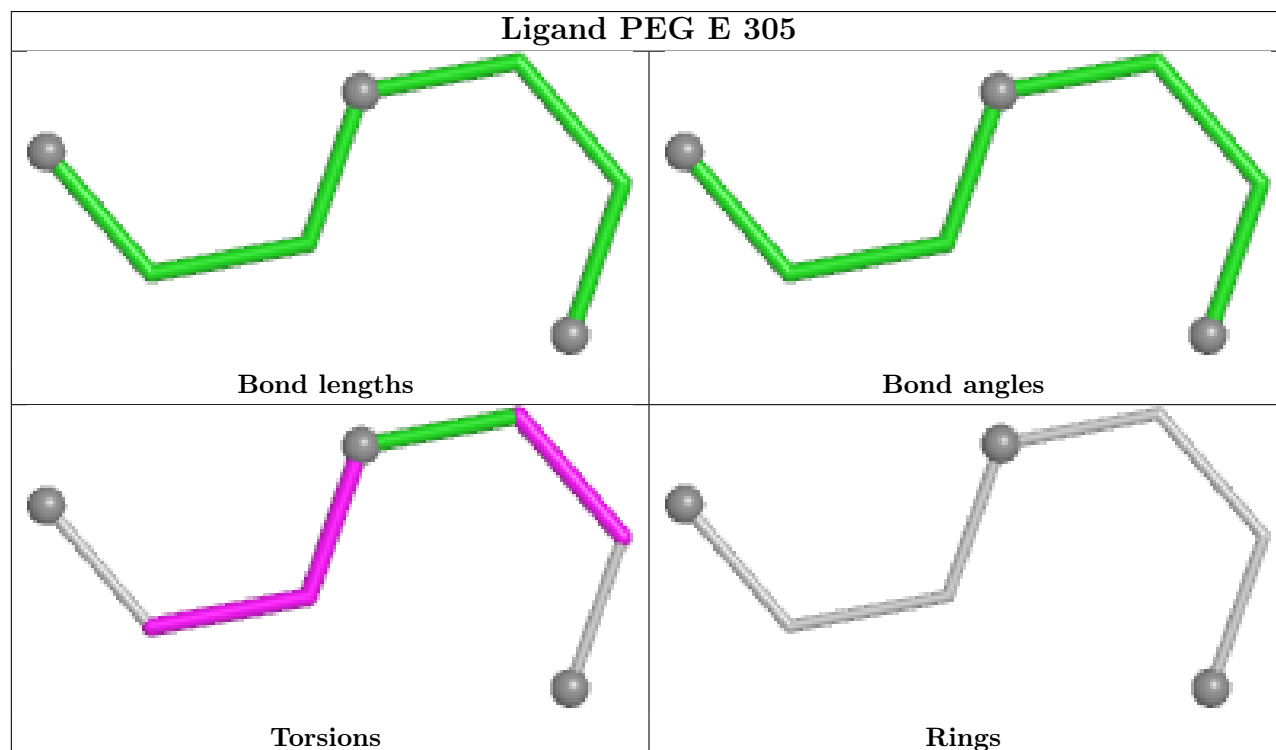
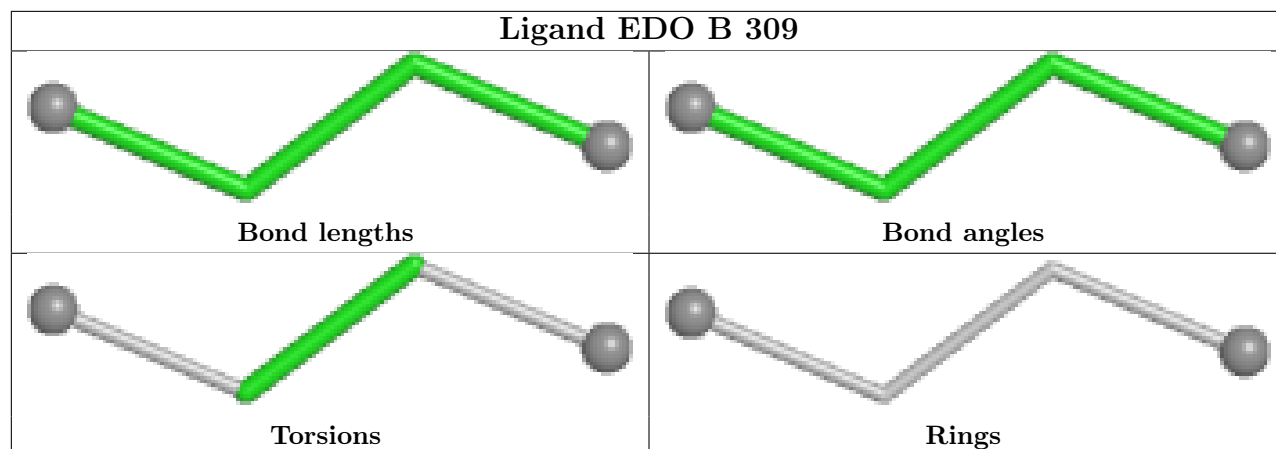


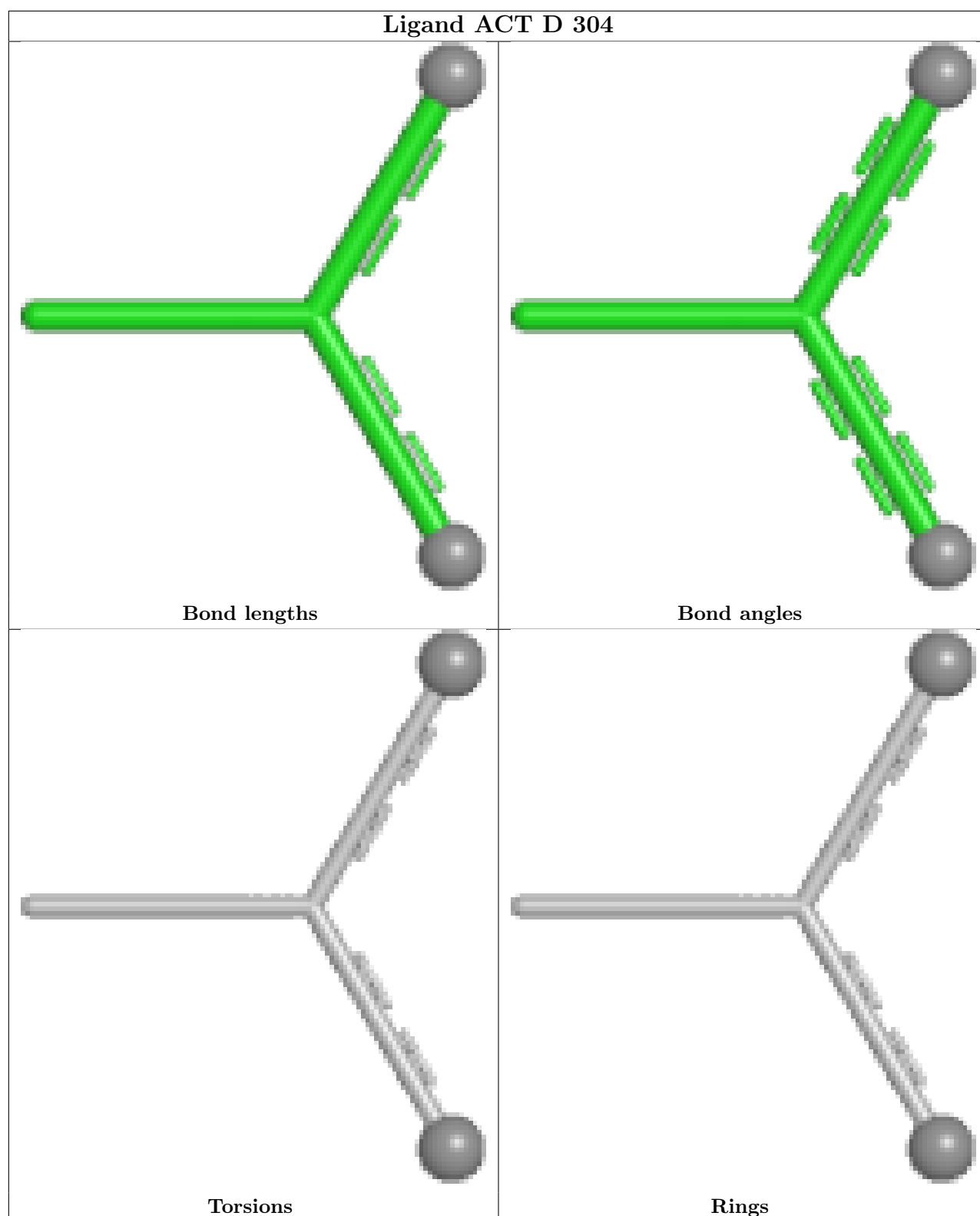


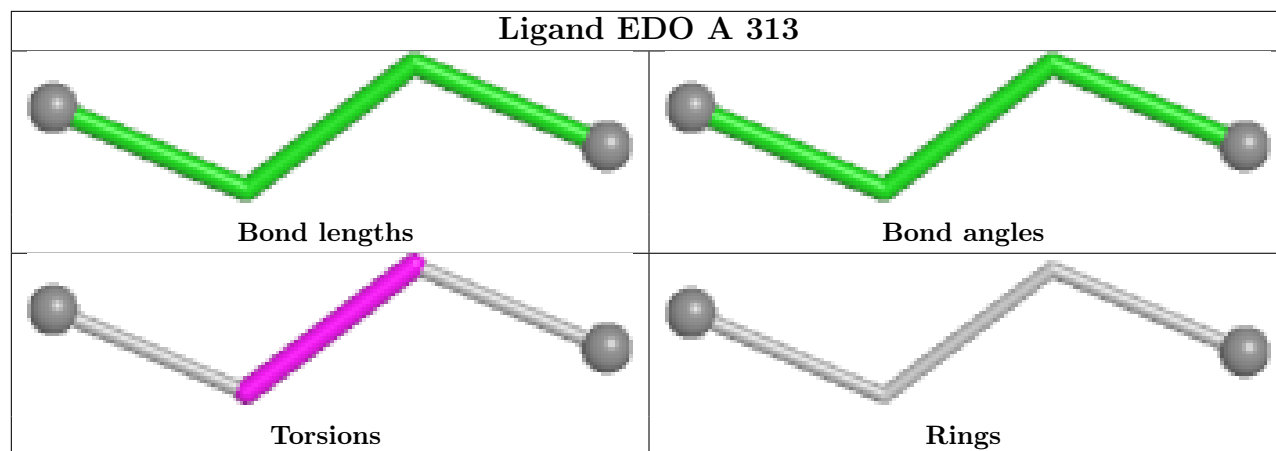




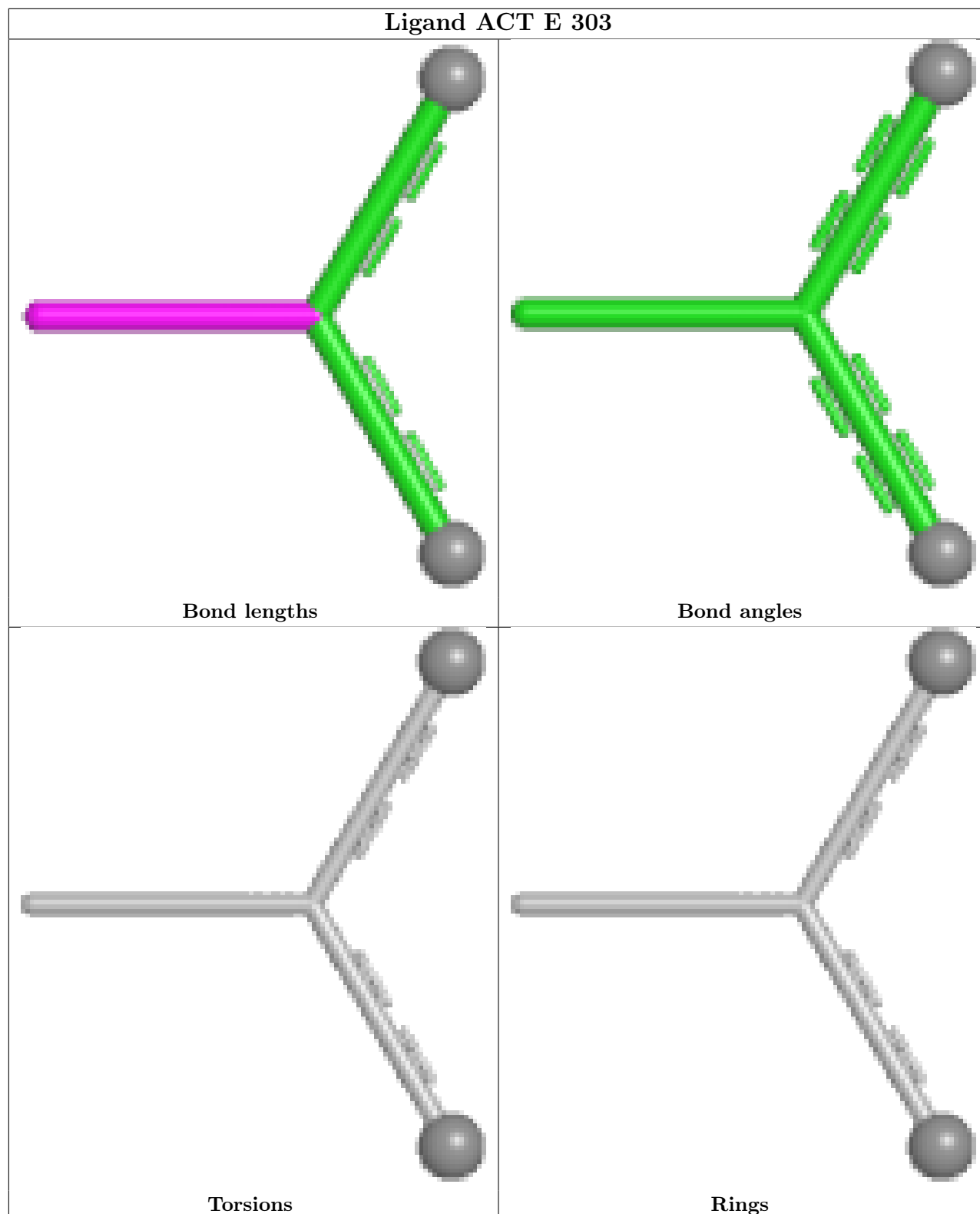


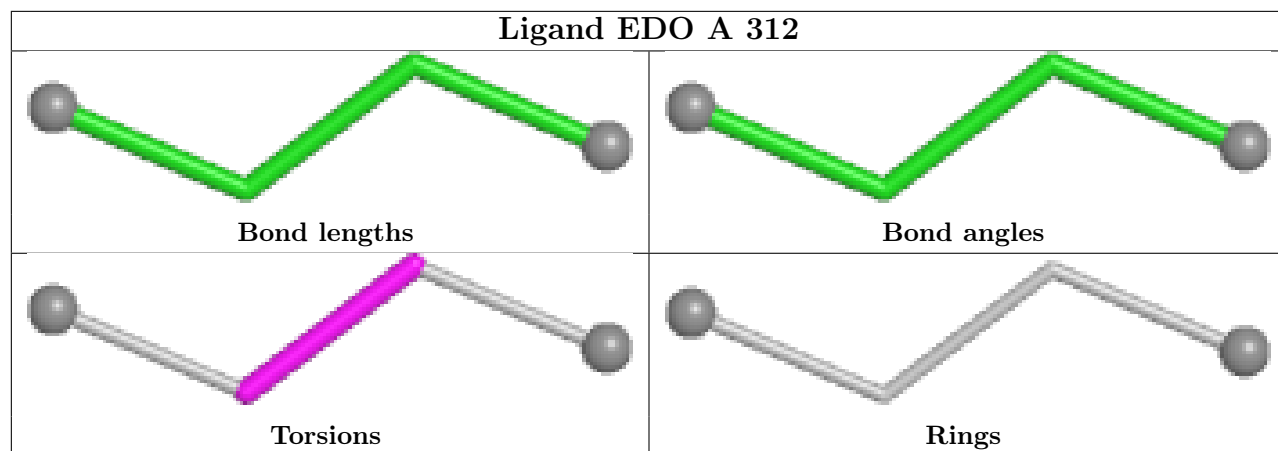


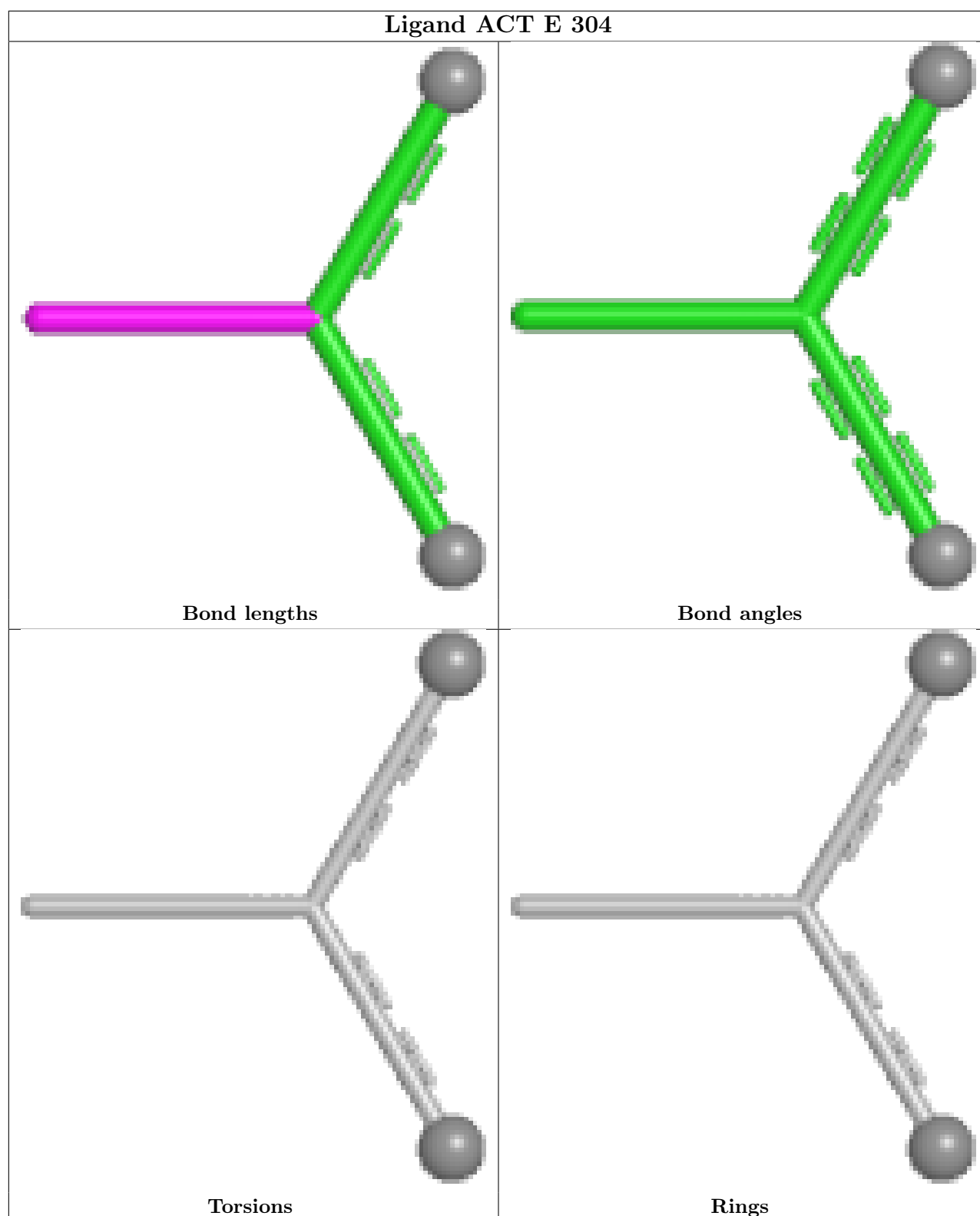


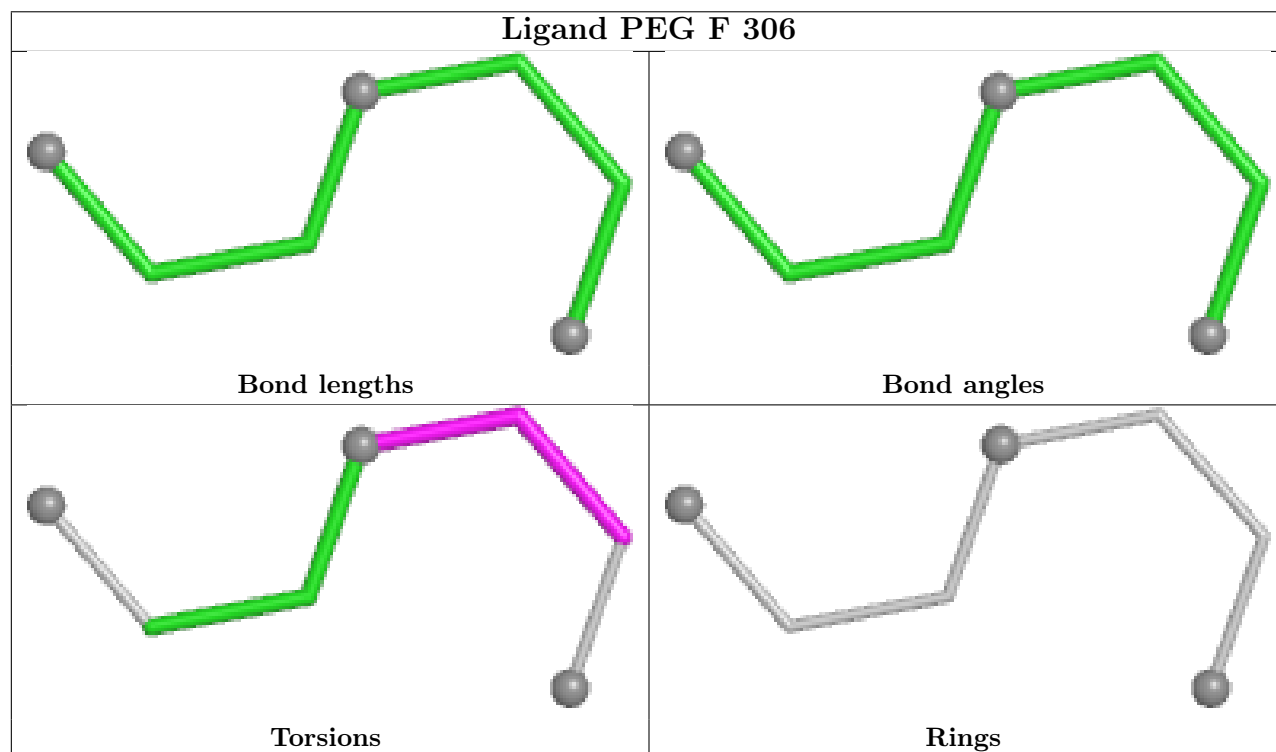
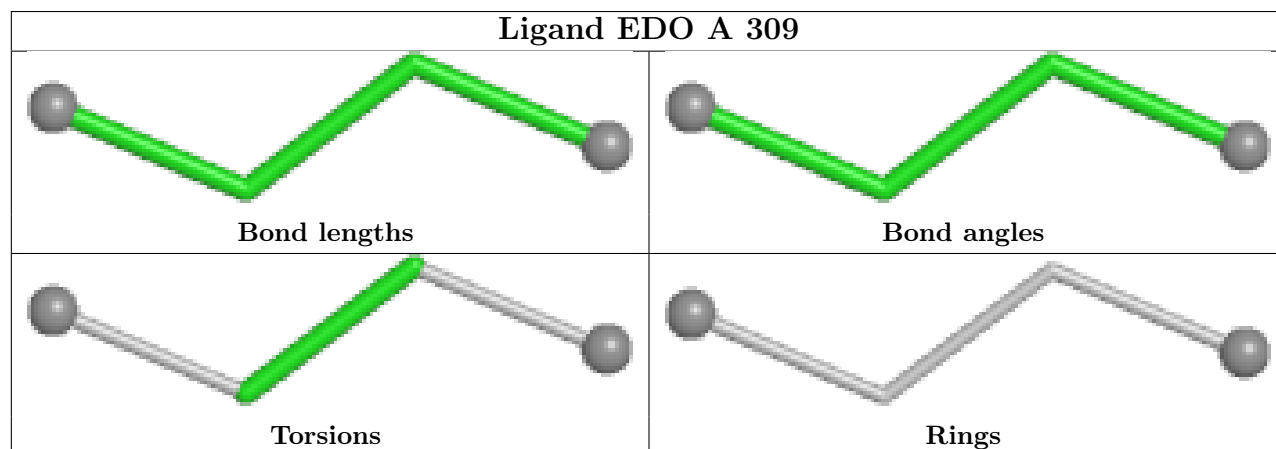
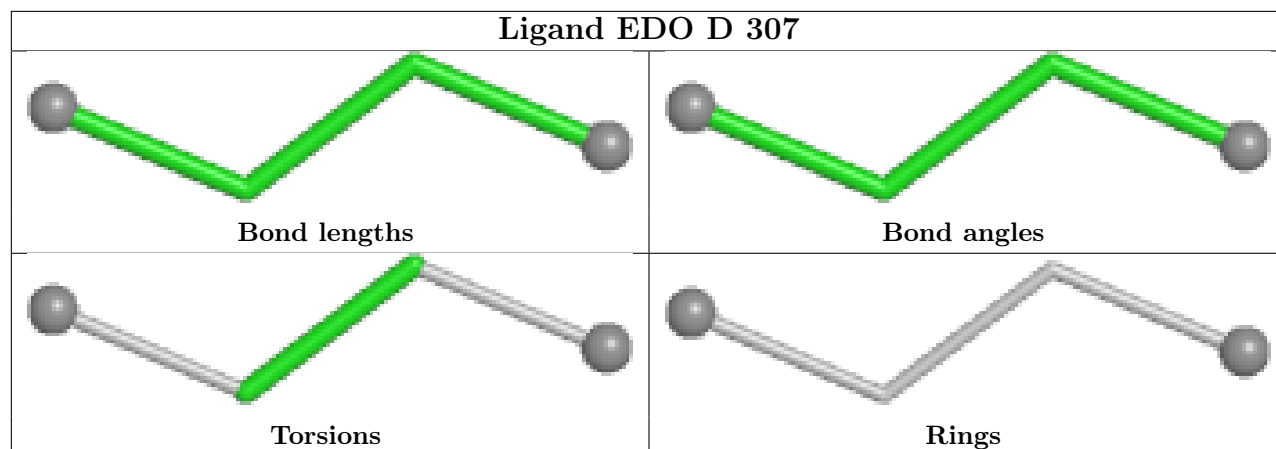


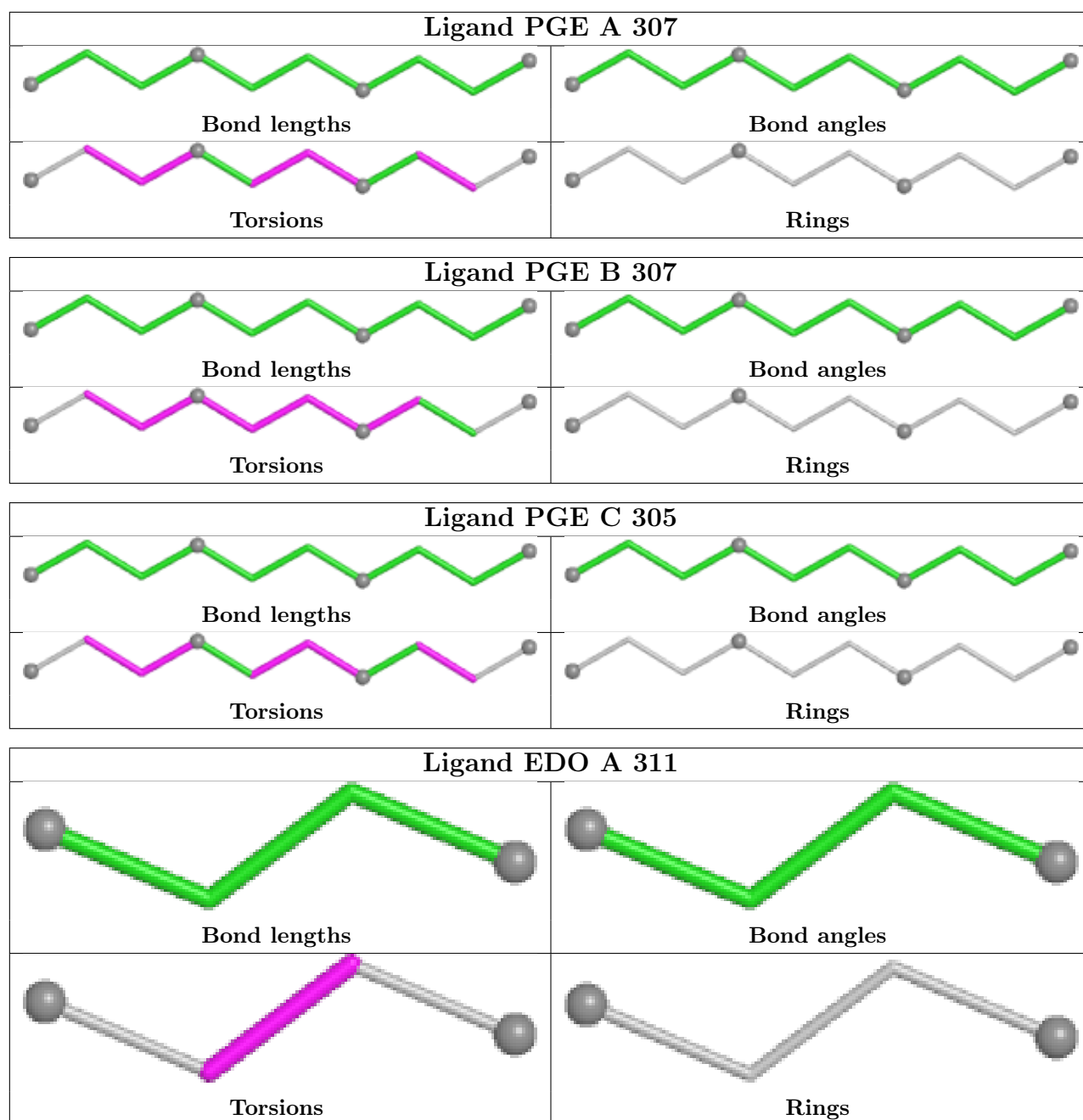
Ligand ACT E 303











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, 95th 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 ²)	Q<0.9
1	A	295/310 (95%)	-0.29	1 (0%) 90 90	22, 28, 40, 54	0
1	B	295/310 (95%)	-0.31	0 100 100	22, 28, 40, 52	0
1	C	295/310 (95%)	-0.23	1 (0%) 90 90	22, 29, 43, 52	0
1	D	295/310 (95%)	-0.15	2 (0%) 84 85	22, 29, 42, 54	0
1	E	295/310 (95%)	-0.17	0 100 100	24, 31, 44, 57	0
1	F	295/310 (95%)	-0.15	3 (1%) 79 81	23, 31, 44, 59	0
All	All	1770/1860 (95%)	-0.21	7 (0%) 88 89	22, 29, 42, 59	0

The worst 5 of 7 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	20	GLY	4.0
1	C	231	LYS	2.8
1	F	57	GLU	2.5
1	F	281	GLU	2.3
1	F	267	GLU	2.3

6.2 Non-standard residues in protein, DNA, RNA chains [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, 95th 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 ²)	Q<0.9
1	KPI	D	166	14/15	0.82	0.14	23,27,39,42	0
1	KPI	B	166	14/15	0.85	0.13	22,25,39,45	0
1	KPI	C	166	14/15	0.85	0.13	22,24,39,40	0
1	KPI	A	166	14/15	0.85	0.16	18,24,43,47	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
1	KPI	F	166	14/15	0.87	0.12	23,29,41,44	0
1	KPI	E	166	14/15	0.88	0.12	24,29,44,47	0

6.3 Carbohydrates [i](#)

There are no oligosaccharides 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, 95th 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
2	MG	D	302	1/1	0.62	0.13	41,41,41,41	0
3	ACT	E	303	4/4	0.62	0.23	42,48,55,62	0
4	PEG	F	306	7/7	0.63	0.19	51,54,55,59	0
3	ACT	A	305	4/4	0.64	0.21	42,52,58,60	0
3	ACT	C	303	4/4	0.66	0.18	39,51,55,57	0
3	ACT	E	304	4/4	0.67	0.16	30,44,46,50	0
8	GOL	C	310	6/6	0.67	0.18	42,49,52,54	0
3	ACT	A	304	4/4	0.71	0.18	43,51,53,60	0
3	ACT	F	303	4/4	0.71	0.21	40,44,44,51	0
6	EDO	A	310	4/4	0.72	0.18	39,45,46,54	0
8	GOL	F	308	6/6	0.75	0.17	20,20,20,20	0
6	EDO	A	308	4/4	0.76	0.14	46,49,50,52	0
3	ACT	F	302	4/4	0.77	0.17	26,32,36,48	0
6	EDO	C	306	4/4	0.78	0.18	29,31,35,43	0
6	EDO	C	308	4/4	0.78	0.21	45,48,49,50	0
6	EDO	C	307	4/4	0.79	0.19	42,43,43,45	0
6	EDO	B	310	4/4	0.79	0.18	39,43,44,46	0
6	EDO	D	306	4/4	0.80	0.26	31,31,33,41	0
6	EDO	E	309	4/4	0.80	0.18	41,42,44,51	0
4	PEG	B	305	7/7	0.80	0.22	40,48,54,56	0
4	PEG	A	306	7/7	0.80	0.28	38,39,47,48	0
6	EDO	D	311	4/4	0.81	0.17	36,39,40,41	0
6	EDO	B	311	4/4	0.82	0.13	50,50,56,61	0
2	MG	B	303	1/1	0.83	0.15	38,38,38,38	0
6	EDO	D	307	4/4	0.83	0.17	27,29,35,43	0
4	PEG	E	307	7/7	0.83	0.17	34,40,44,50	0

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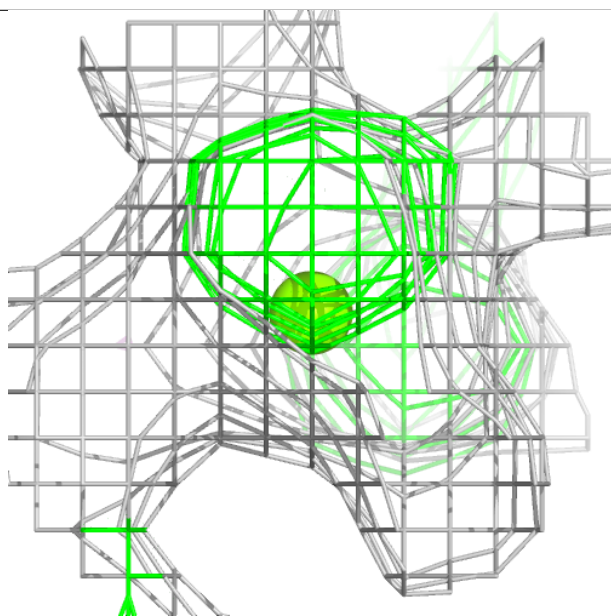
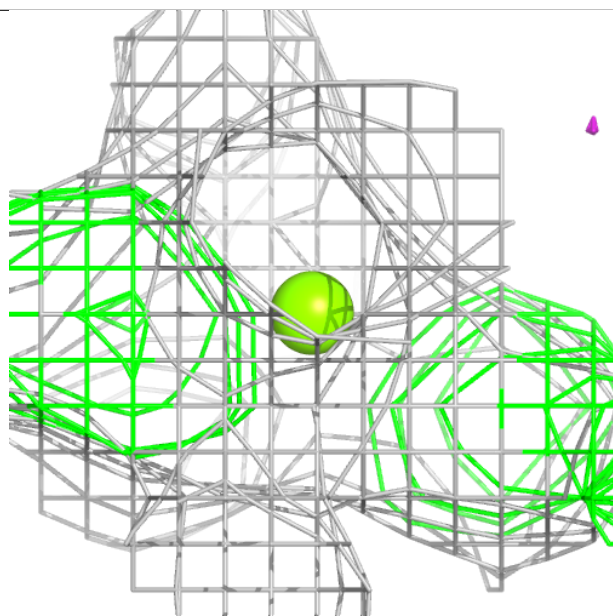
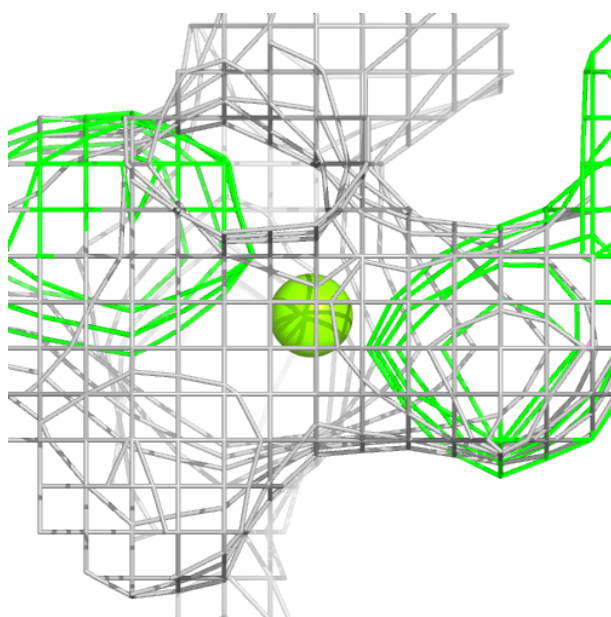
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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
6	EDO	D	309	4/4	0.84	0.17	41,42,46,53	0
6	EDO	F	307	4/4	0.84	0.21	33,36,36,44	0
3	ACT	B	304	4/4	0.84	0.15	45,45,53,54	0
6	EDO	E	308	4/4	0.84	0.20	42,44,45,48	0
6	EDO	C	309	4/4	0.85	0.15	40,43,44,53	0
4	PEG	B	306	7/7	0.85	0.12	37,43,48,49	0
6	EDO	A	313	4/4	0.85	0.16	32,35,38,41	0
6	EDO	B	309	4/4	0.85	0.12	41,42,46,52	0
2	MG	C	301	1/1	0.85	0.09	38,38,38,38	0
5	PGE	A	307	10/10	0.86	0.11	34,41,44,48	0
6	EDO	D	310	4/4	0.86	0.12	40,40,47,50	0
4	PEG	E	305	7/7	0.86	0.17	29,32,39,42	0
4	PEG	E	306	7/7	0.86	0.13	41,44,52,54	0
6	EDO	A	311	4/4	0.86	0.18	43,44,45,54	0
3	ACT	D	304	4/4	0.86	0.13	24,37,41,49	0
4	PEG	F	305	7/7	0.86	0.13	36,43,45,51	0
2	MG	A	301	1/1	0.86	0.11	35,35,35,35	0
2	MG	E	301	1/1	0.87	0.09	48,48,48,48	0
3	ACT	A	303	4/4	0.87	0.15	25,34,36,40	0
5	PGE	B	307	10/10	0.87	0.13	38,43,48,52	0
3	ACT	C	304	4/4	0.88	0.11	33,43,45,52	0
6	EDO	D	308	4/4	0.88	0.14	38,43,43,48	0
2	MG	C	302	1/1	0.89	0.12	56,56,56,56	0
2	MG	A	302	1/1	0.89	0.12	45,45,45,45	0
5	PGE	C	305	10/10	0.89	0.11	30,38,46,57	0
6	EDO	A	312	4/4	0.89	0.13	34,39,39,42	0
5	PGE	D	305	10/10	0.89	0.10	33,38,44,48	0
6	EDO	B	308	4/4	0.89	0.12	33,37,42,52	0
7	3VN	D	301	22/22	0.91	0.10	24,28,33,39	0
4	PEG	F	304	7/7	0.93	0.13	26,33,37,39	0
2	MG	D	303	1/1	0.93	0.22	51,51,51,51	0
2	MG	B	302	1/1	0.94	0.05	33,33,33,33	0
7	3VN	F	301	22/22	0.94	0.07	26,30,32,34	0
2	MG	E	302	1/1	0.94	0.15	52,52,52,52	0
7	3VN	B	301	22/22	0.94	0.07	24,28,31,34	0
6	EDO	A	309	4/4	0.96	0.08	30,33,33,36	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.

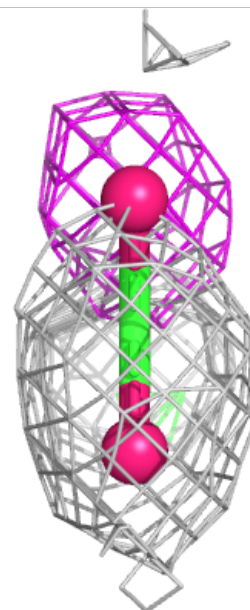
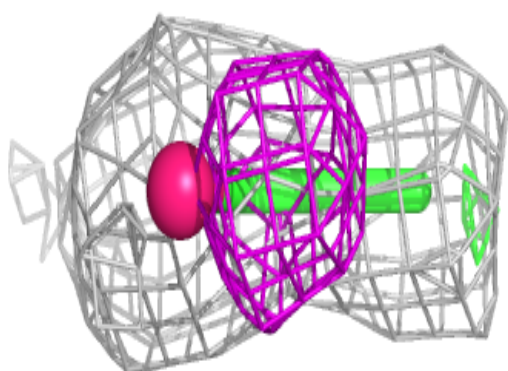
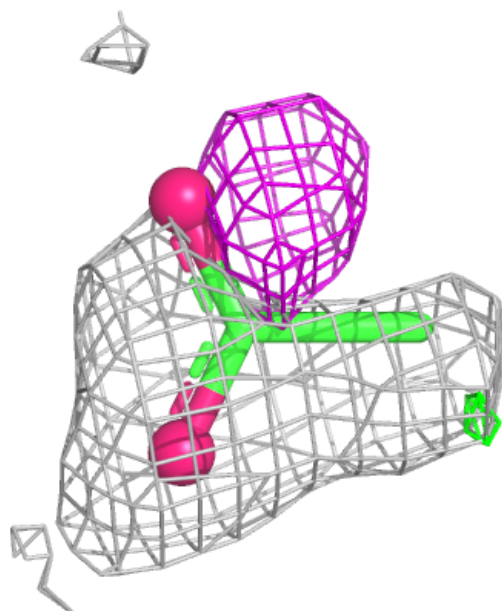
Electron density around MG D 302:

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



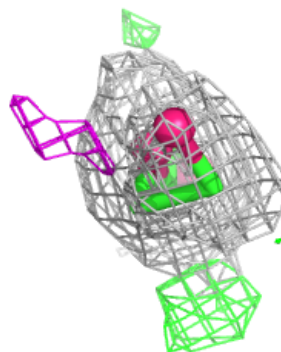
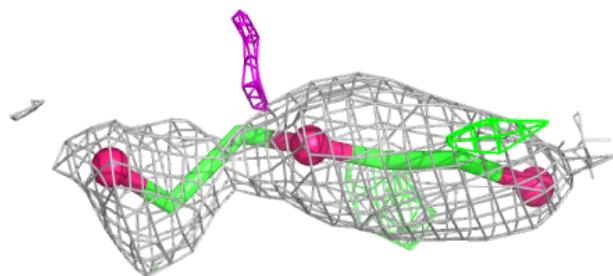
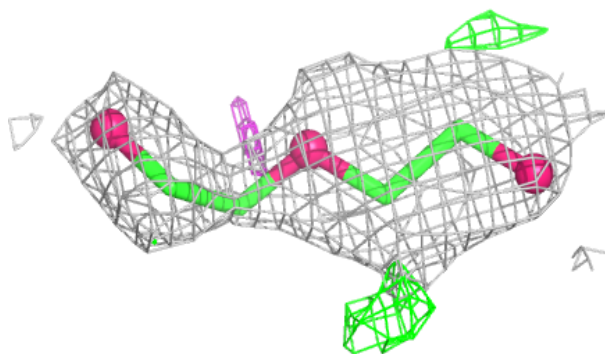
Electron density around ACT E 303:

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



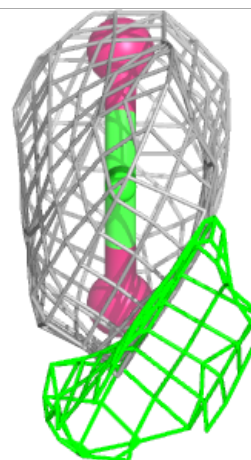
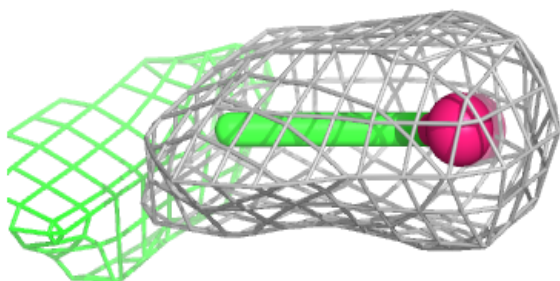
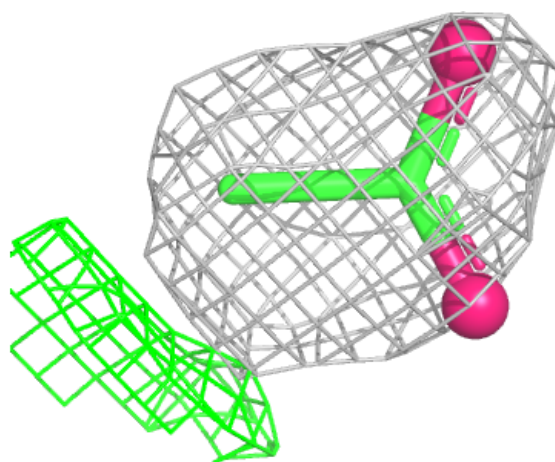
Electron density around PEG F 306:

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



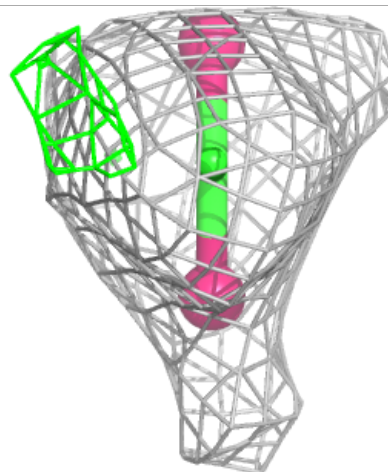
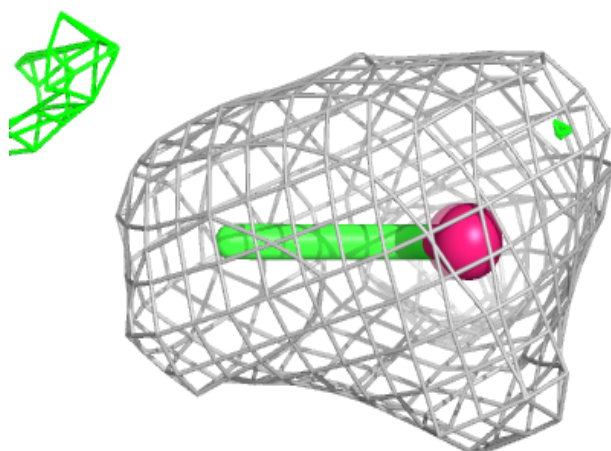
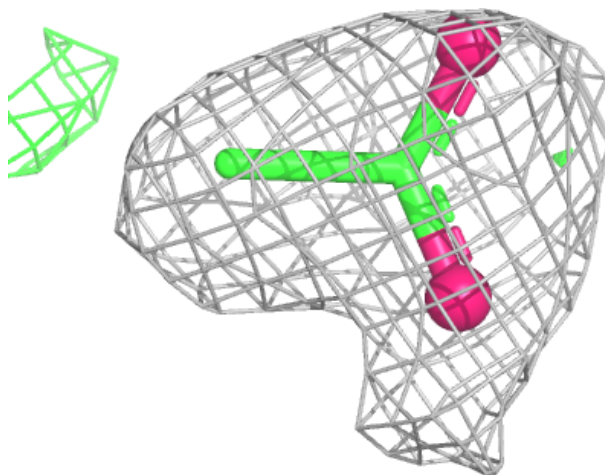
Electron density around ACT A 305:

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



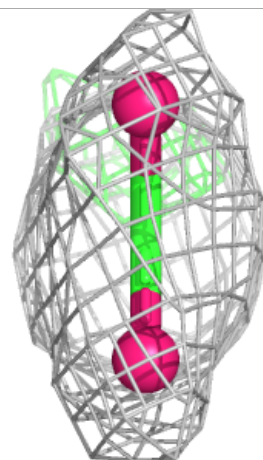
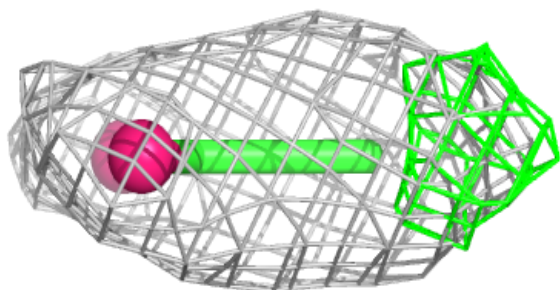
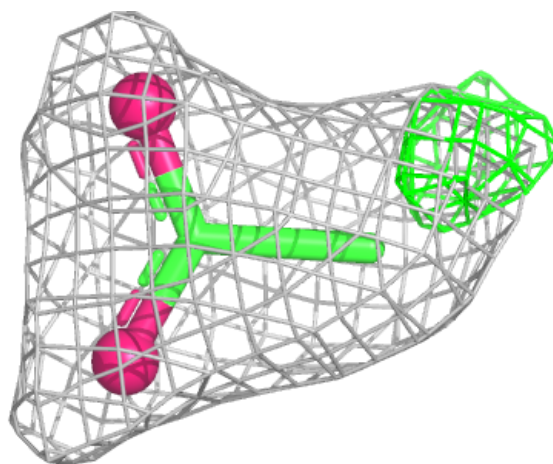
Electron density around ACT C 303:

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



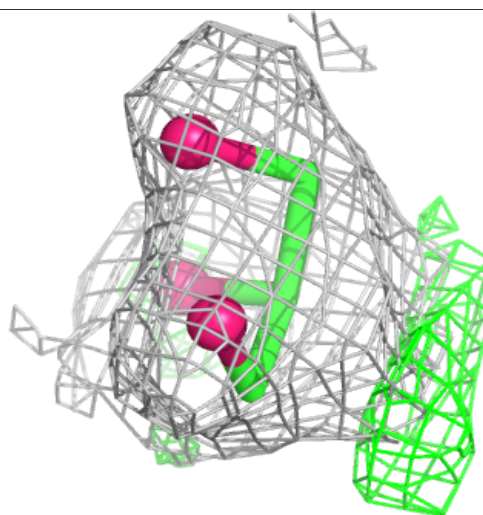
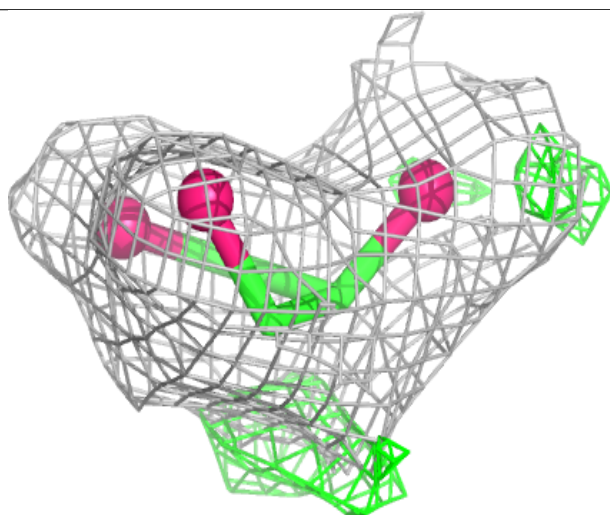
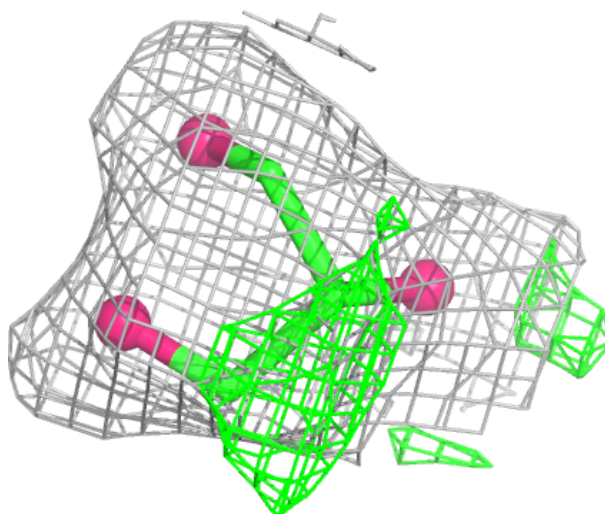
Electron density around ACT E 304:

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



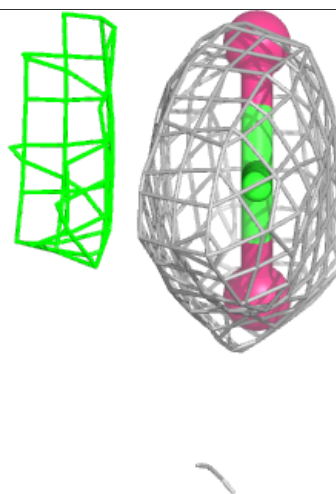
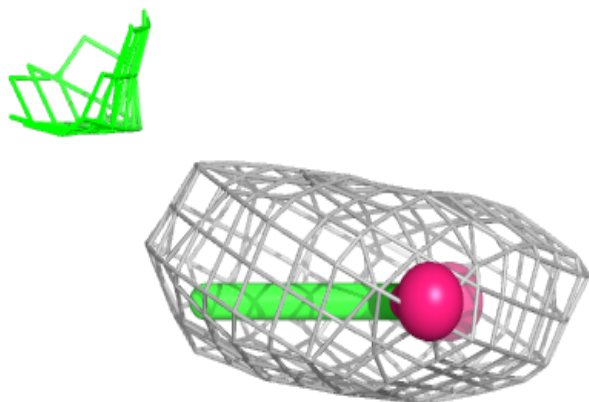
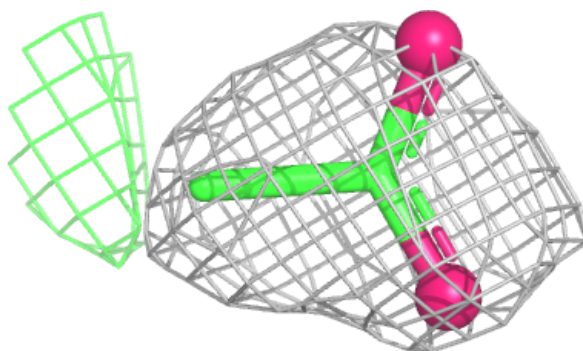
Electron density around GOL C 310:

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



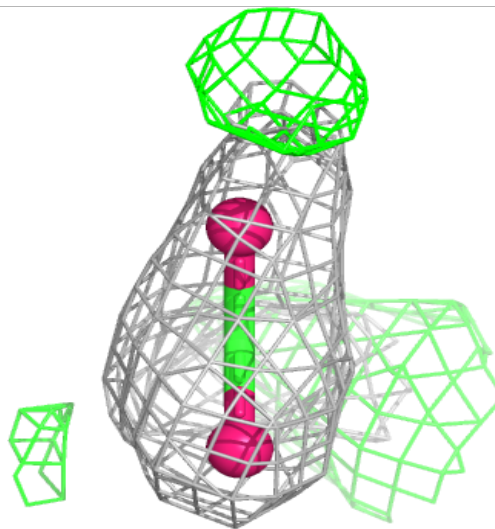
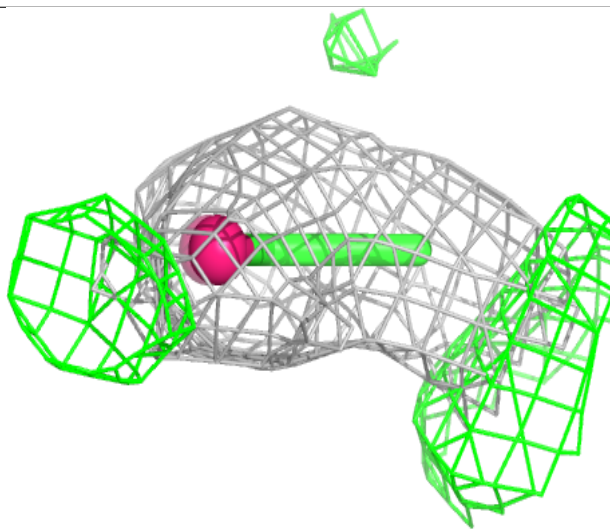
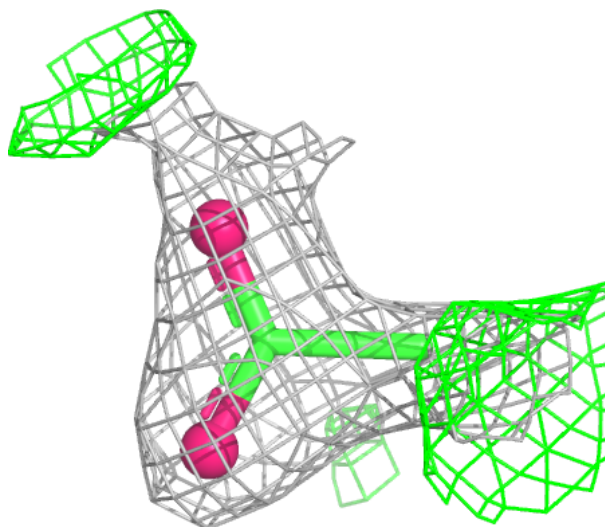
Electron density around ACT A 304:

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



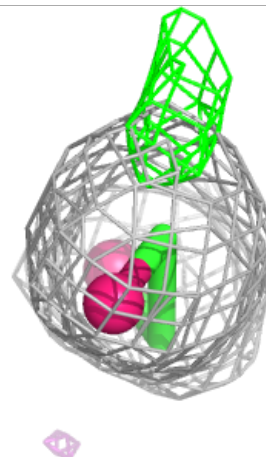
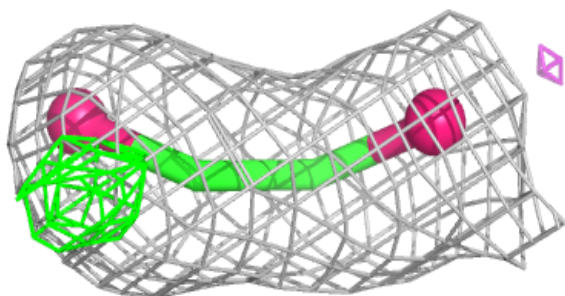
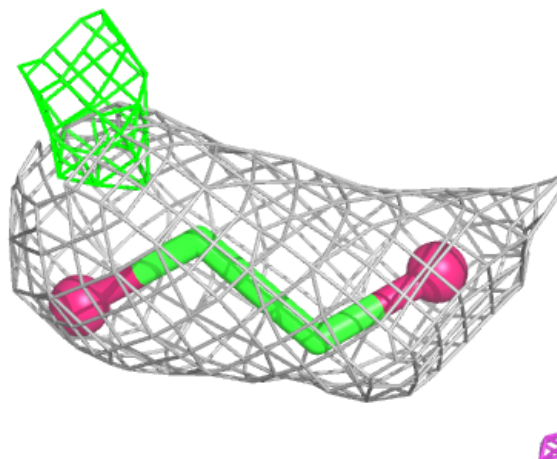
Electron density around ACT F 303:

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



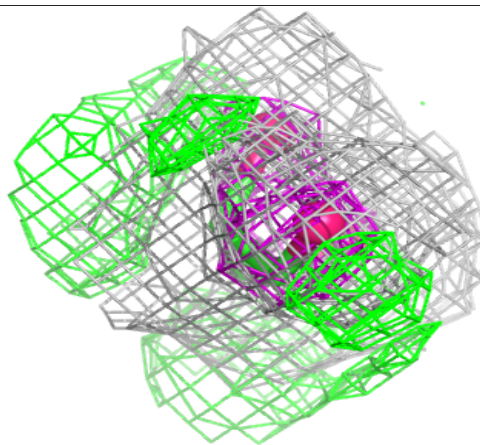
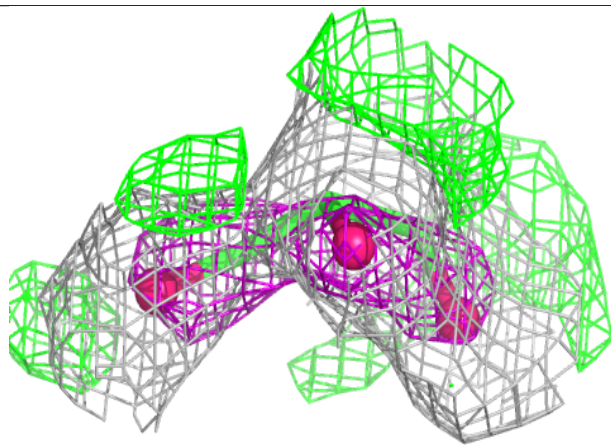
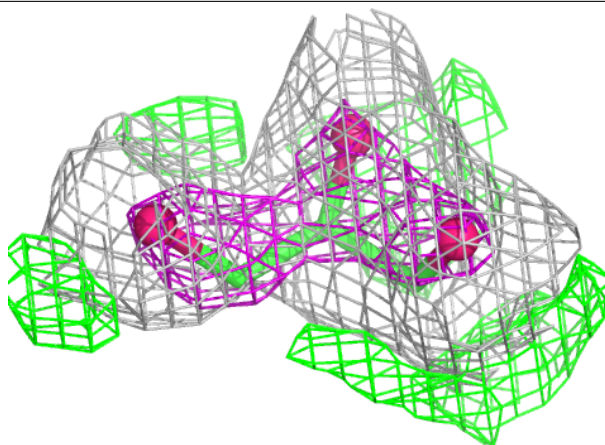
Electron density around EDO A 310:

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



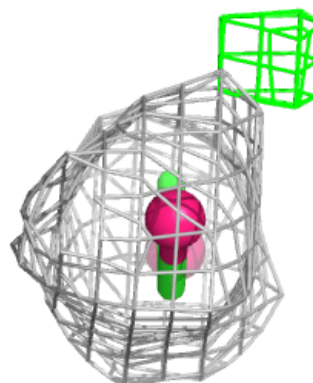
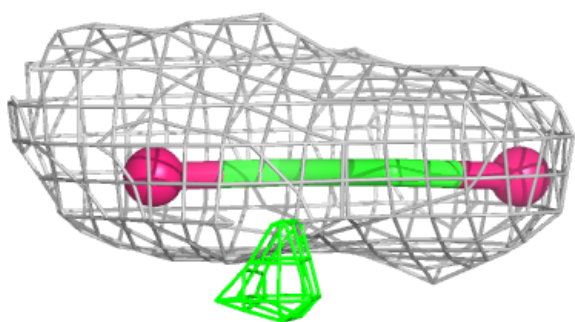
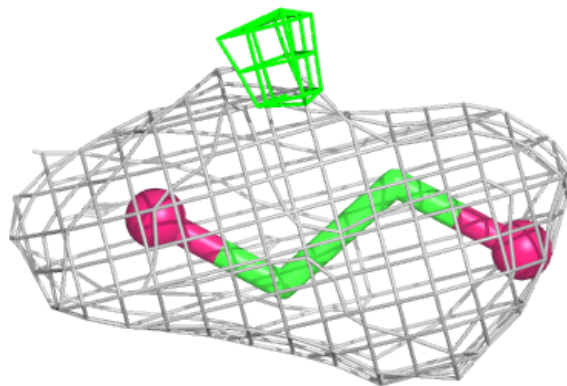
Electron density around GOL F 308:

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



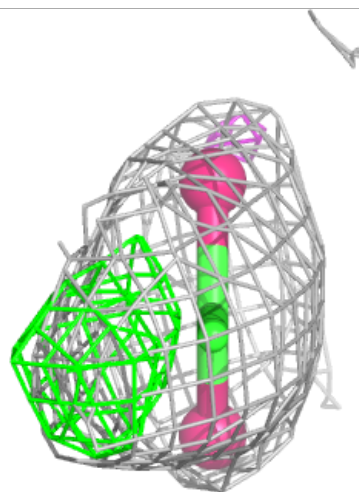
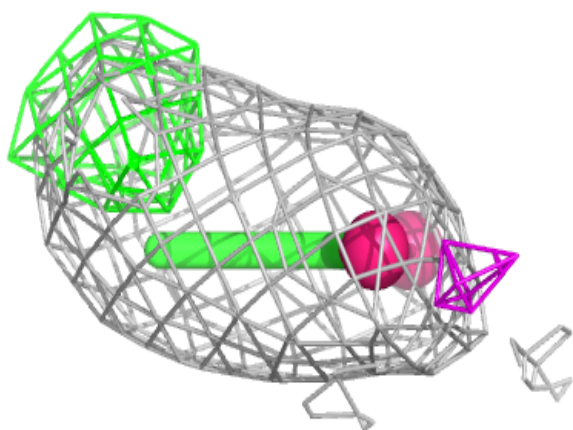
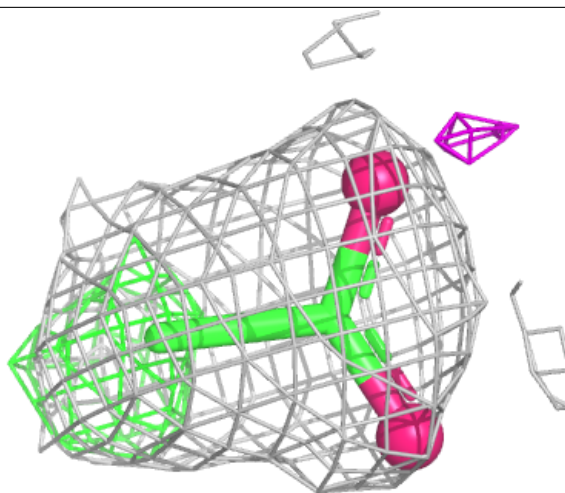
Electron density around EDO A 308:

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



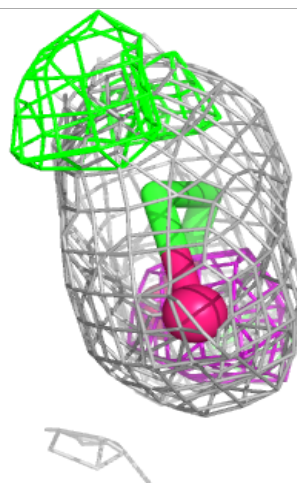
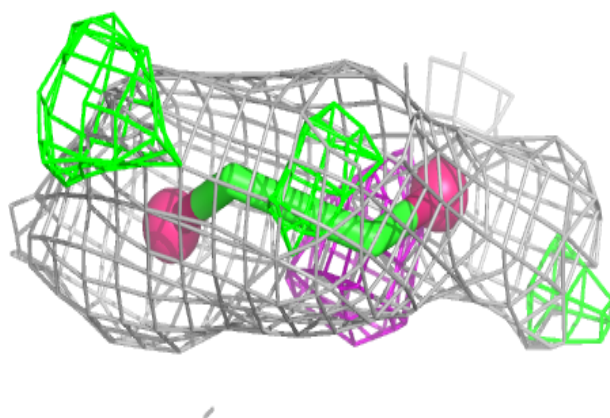
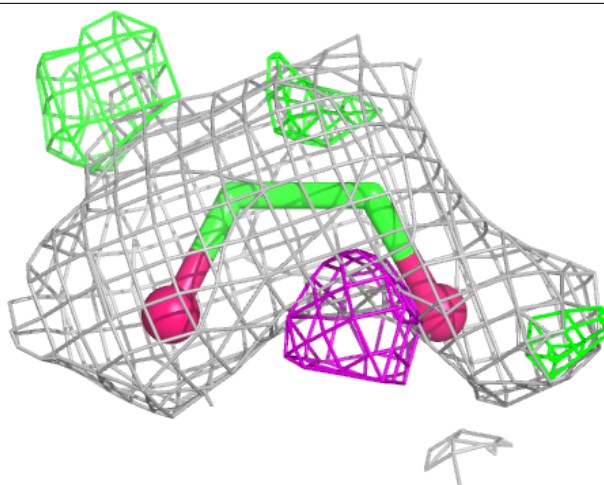
Electron density around ACT F 302:

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



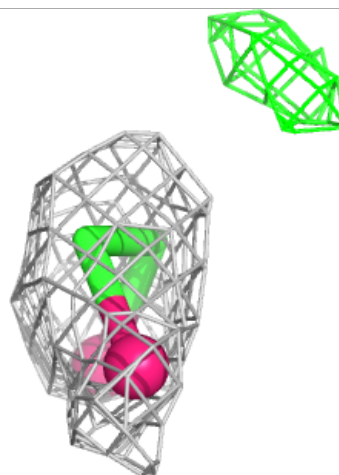
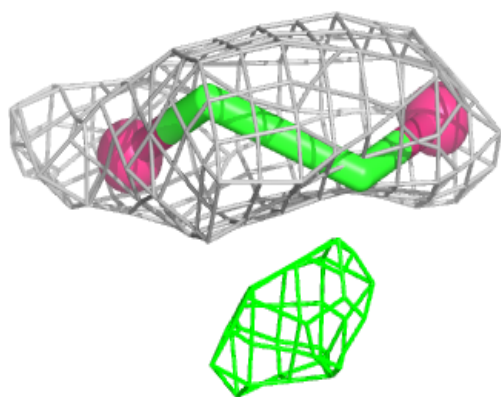
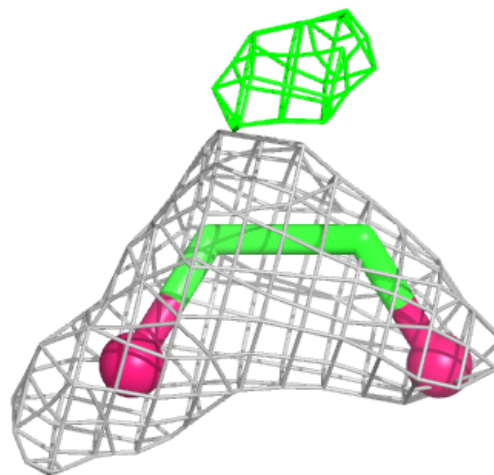
Electron density around EDO C 306:

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



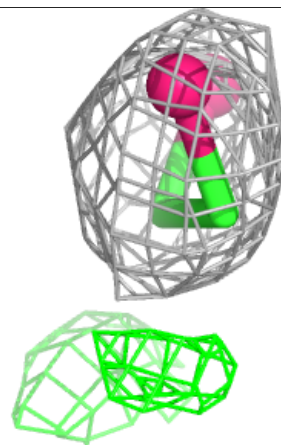
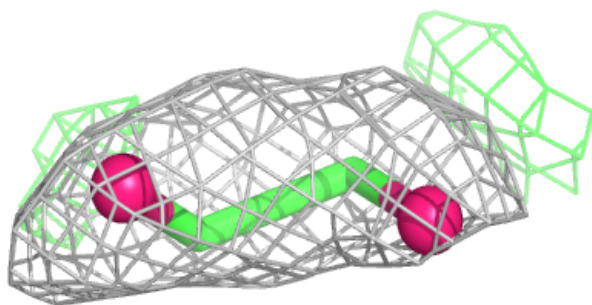
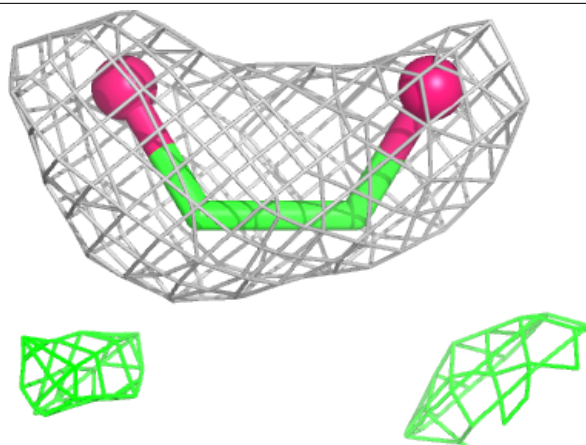
Electron density around EDO C 308:

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



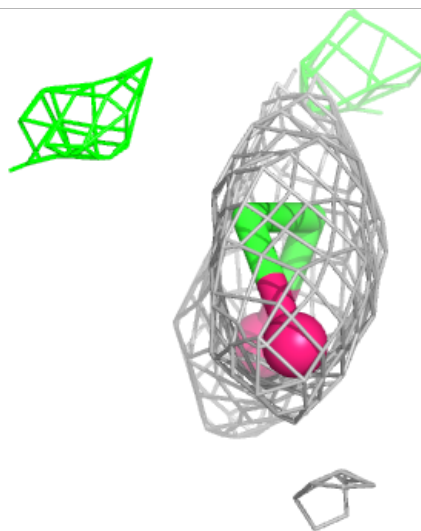
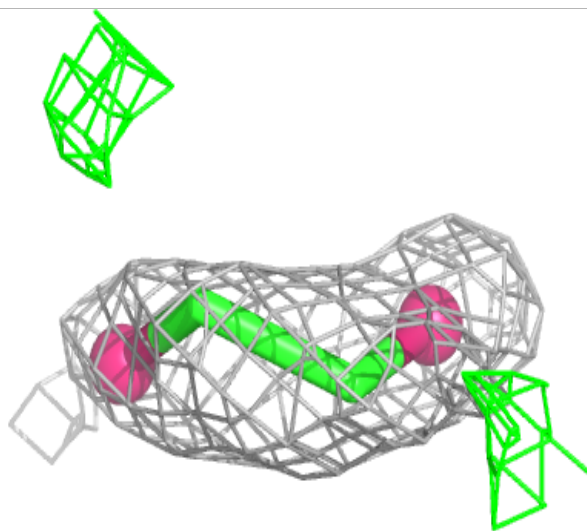
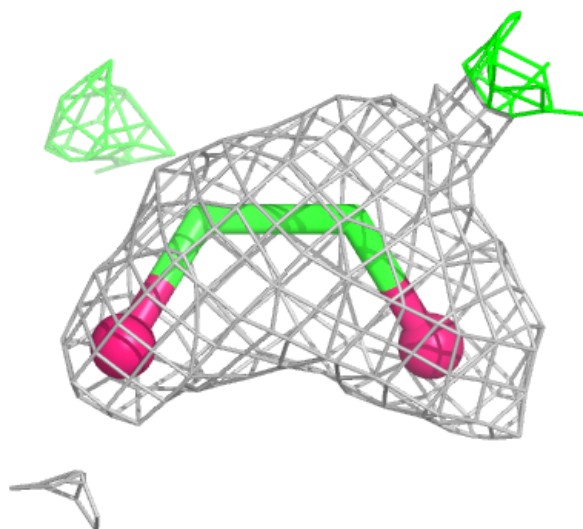
Electron density around EDO C 307:

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



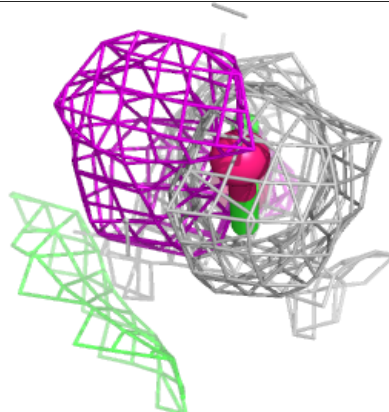
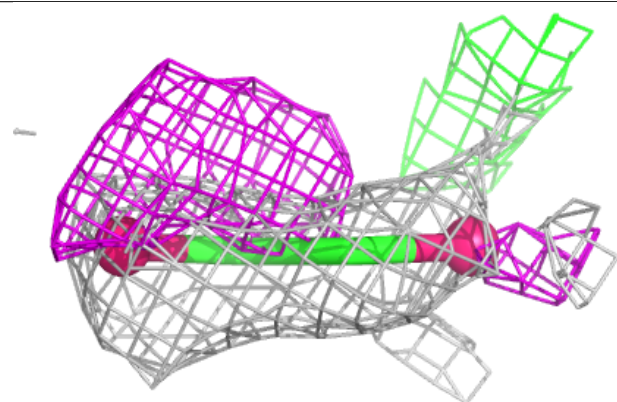
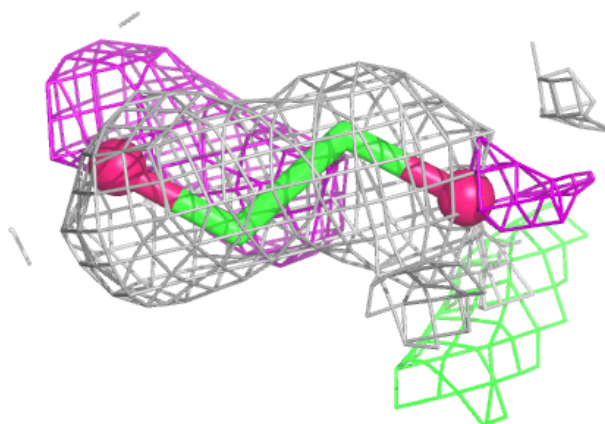
Electron density around EDO B 310:

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



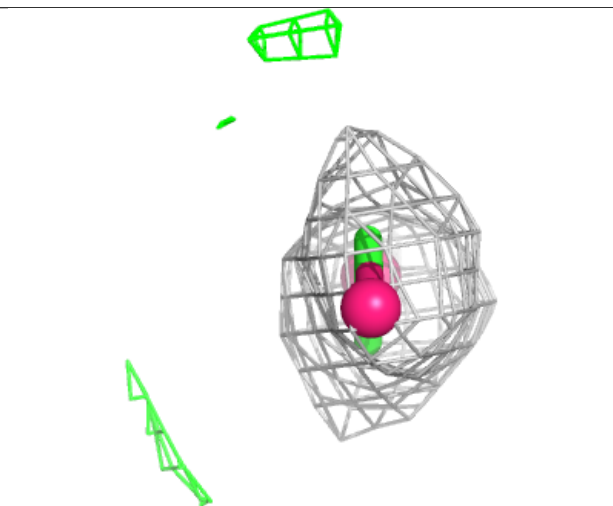
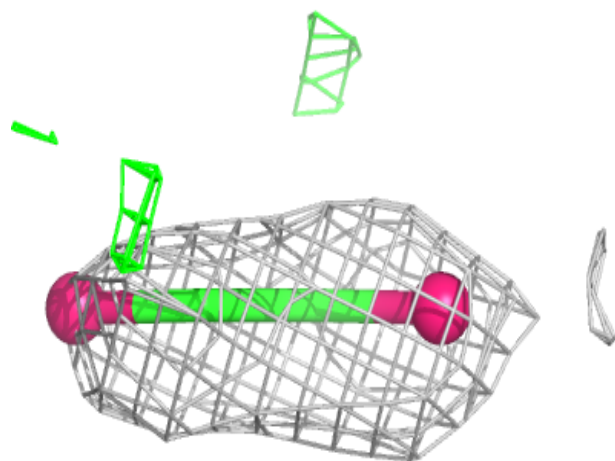
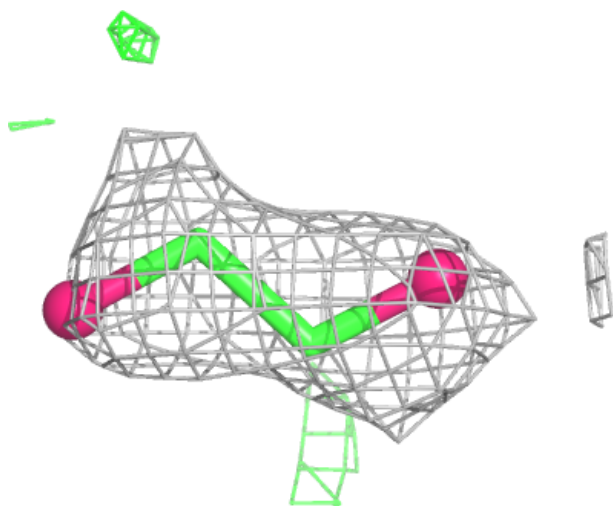
Electron density around EDO D 306:

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



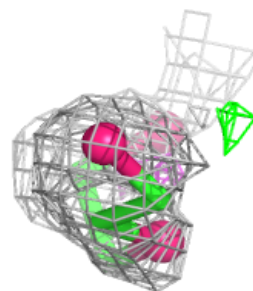
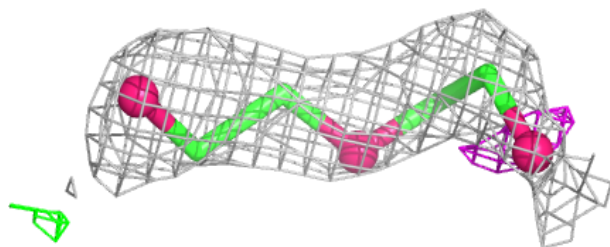
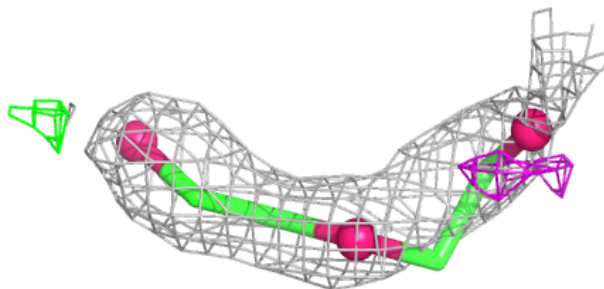
Electron density around EDO E 309:

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

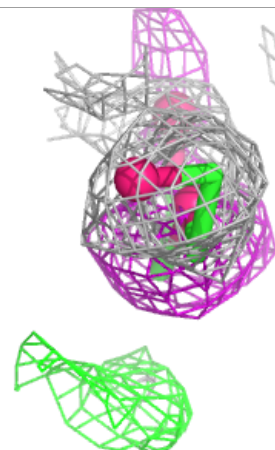
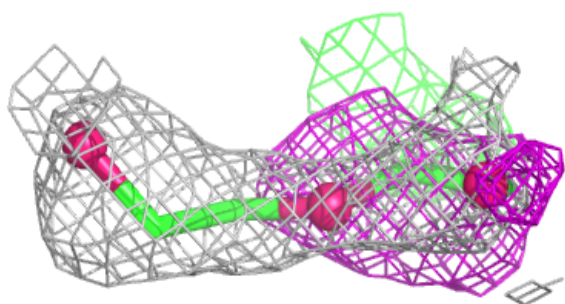
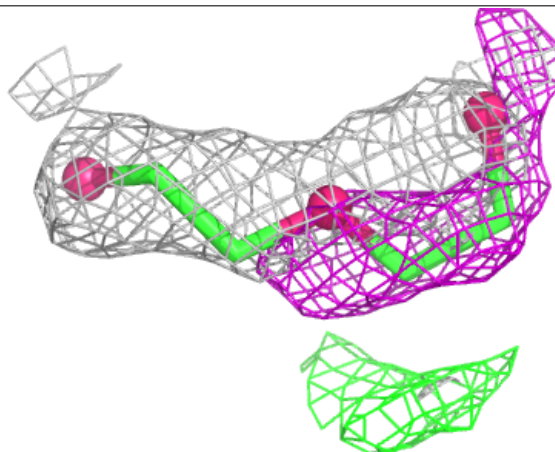


Electron density around PEG B 305:

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

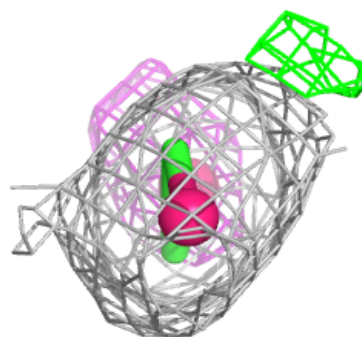
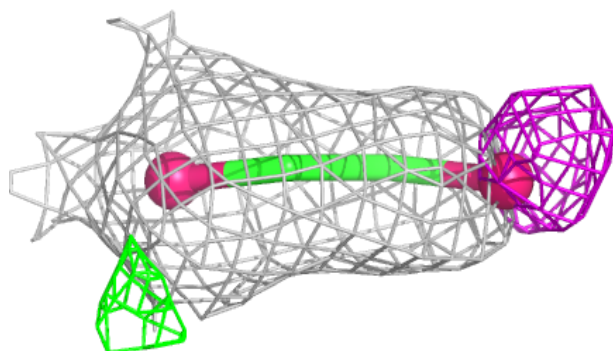
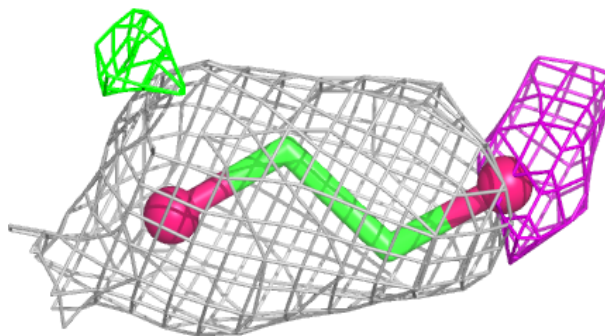
**Electron density around PEG A 306:**

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

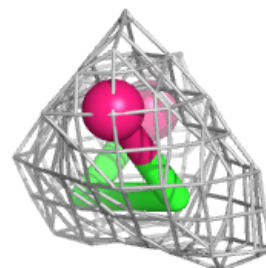
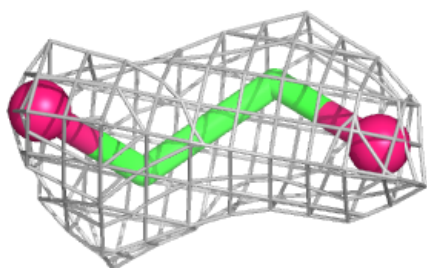
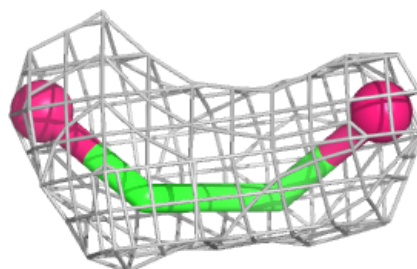


Electron density around EDO D 311:

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

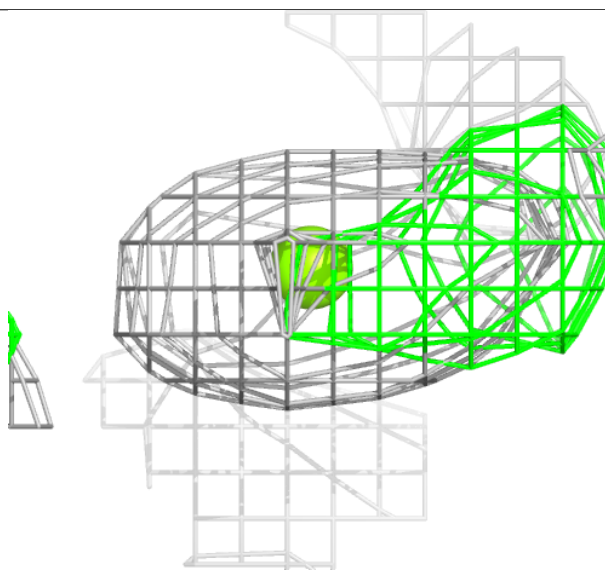
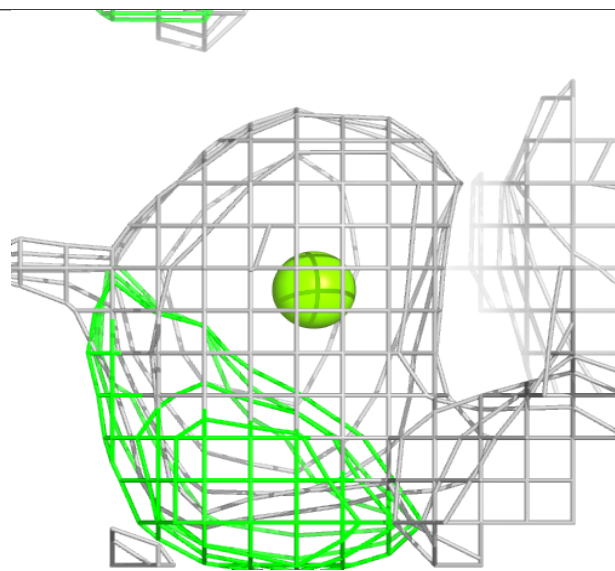
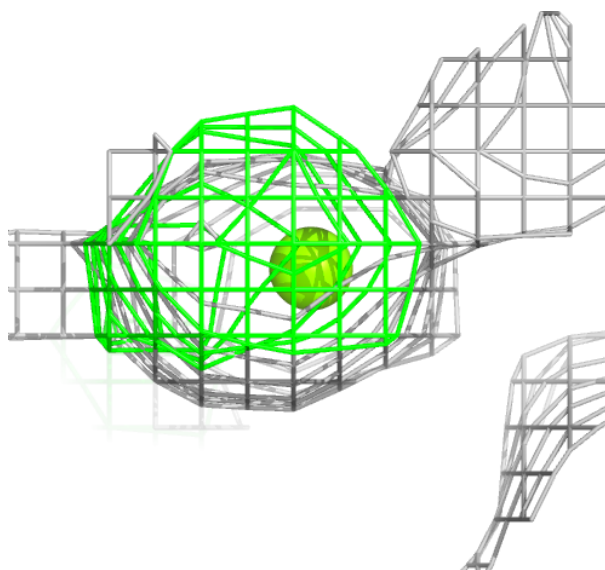
**Electron density around EDO B 311:**

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



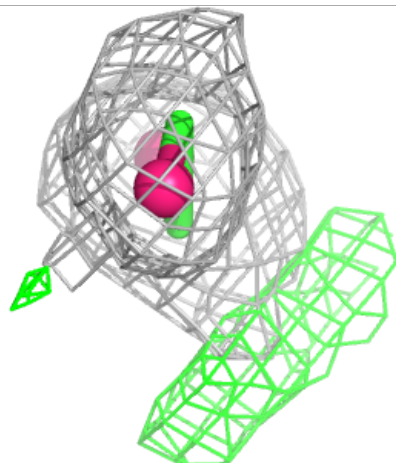
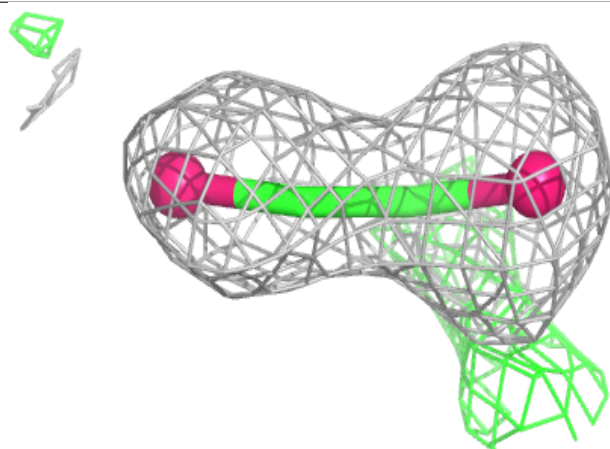
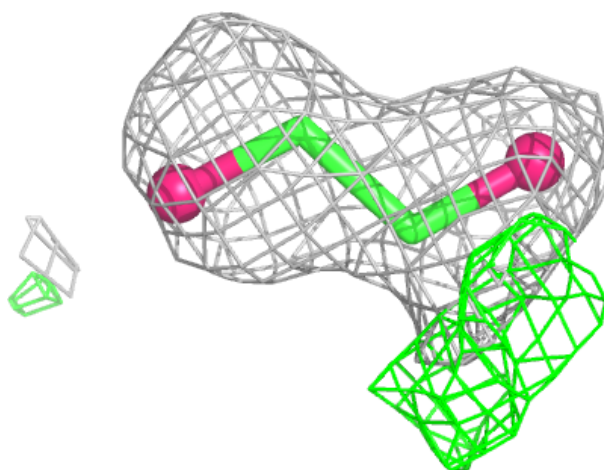
Electron density around MG B 303:

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



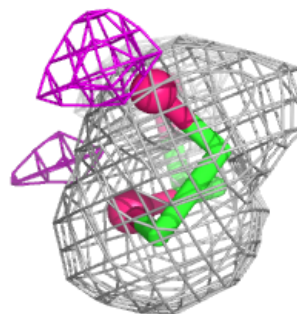
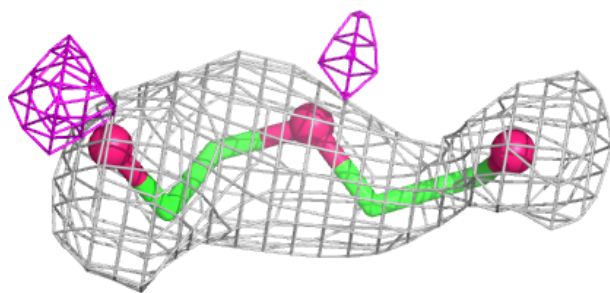
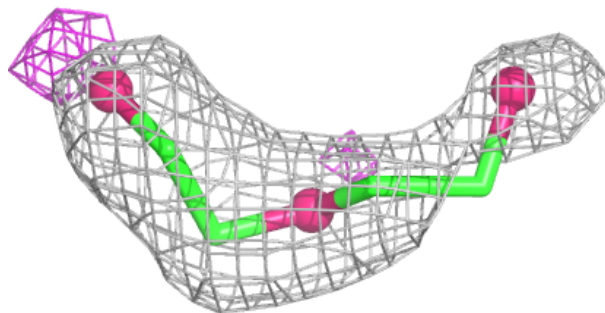
Electron density around EDO D 307:

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

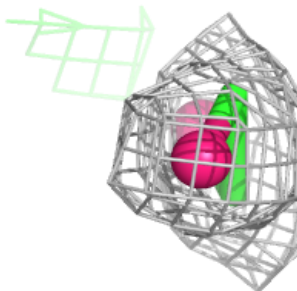
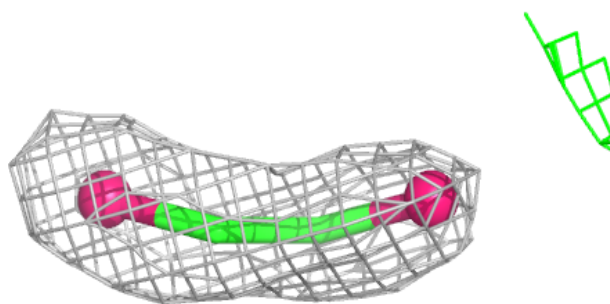
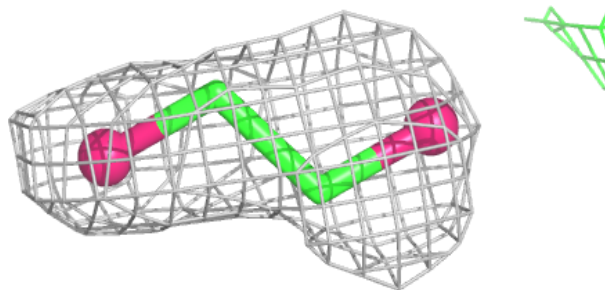


Electron density around PEG E 307:

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

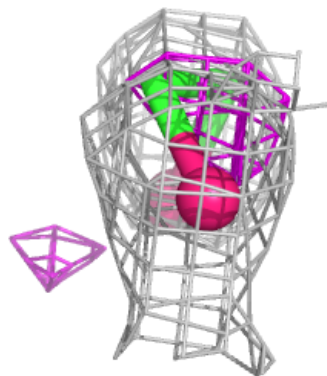
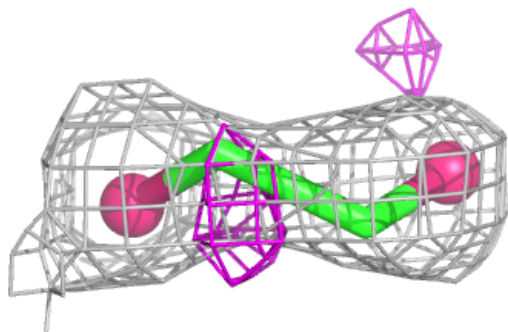
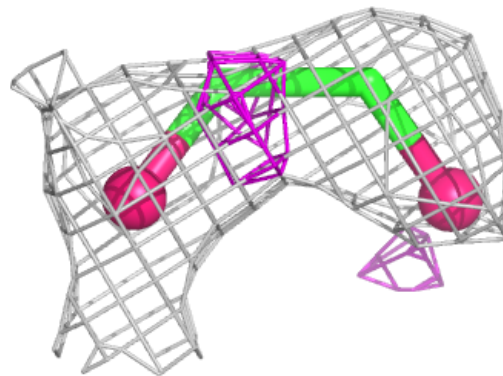
**Electron density around EDO D 309:**

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



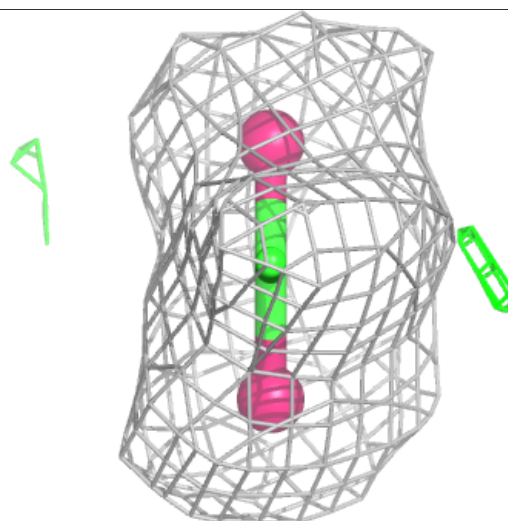
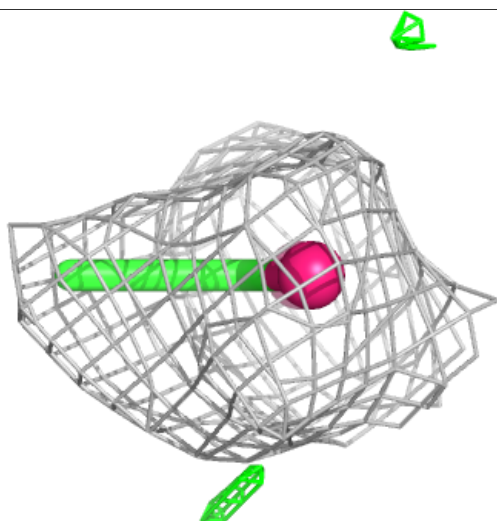
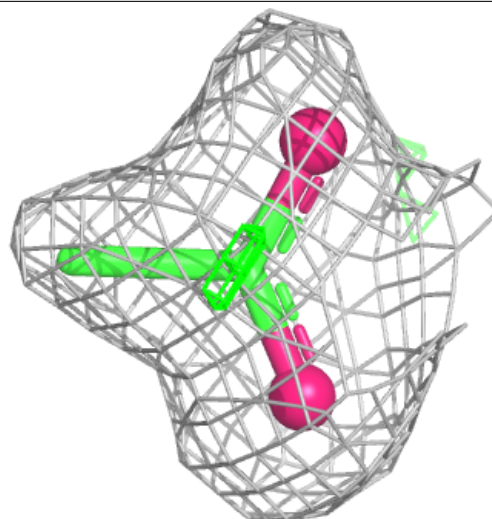
Electron density around EDO F 307:

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



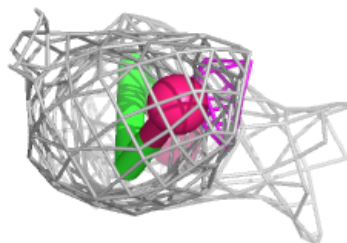
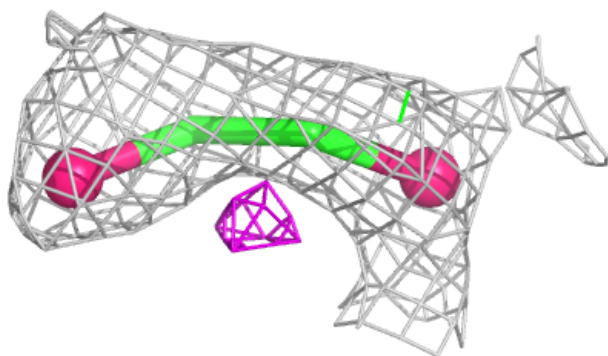
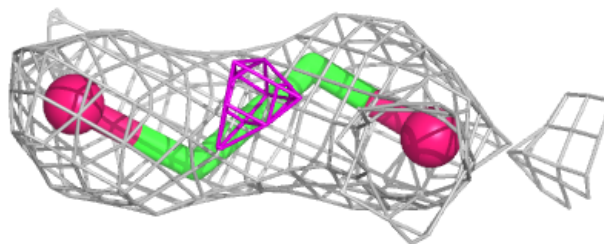
Electron density around ACT B 304:

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

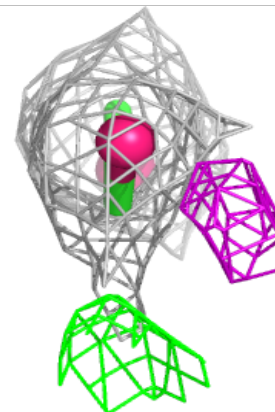
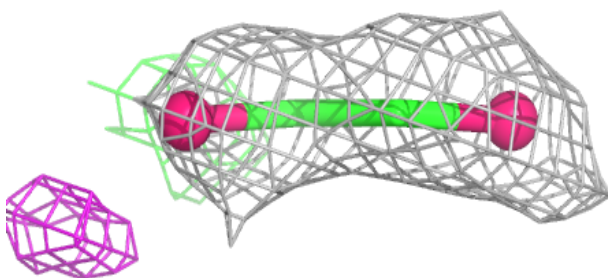
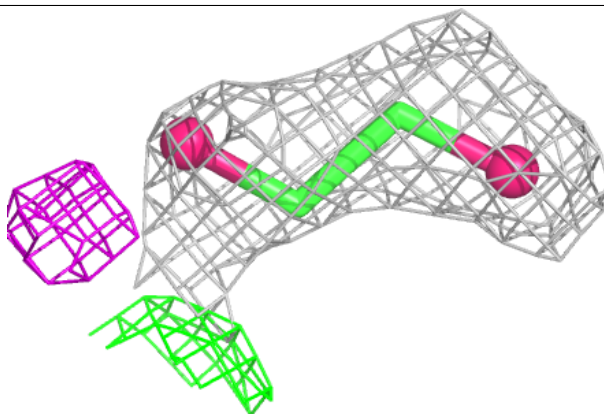


Electron density around EDO E 308:

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

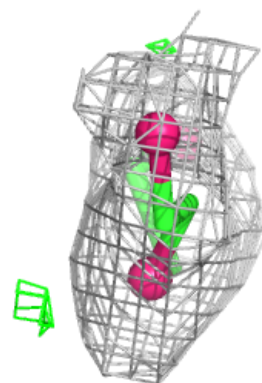
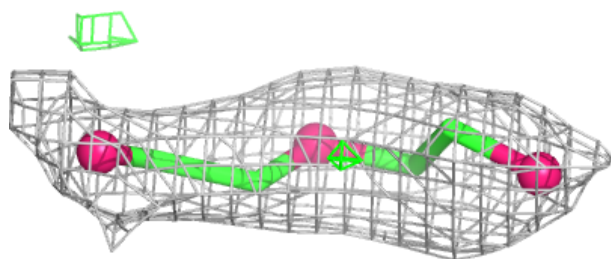
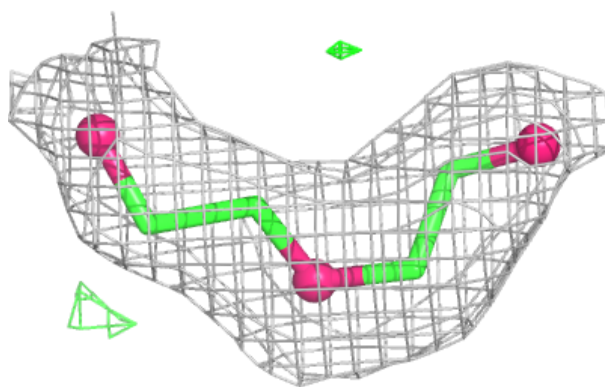
**Electron density around EDO C 309:**

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



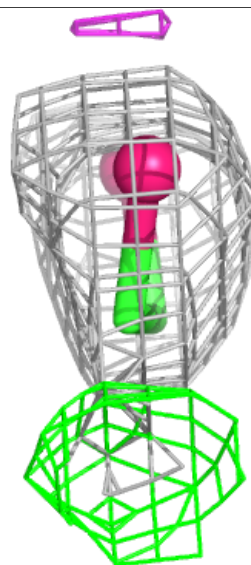
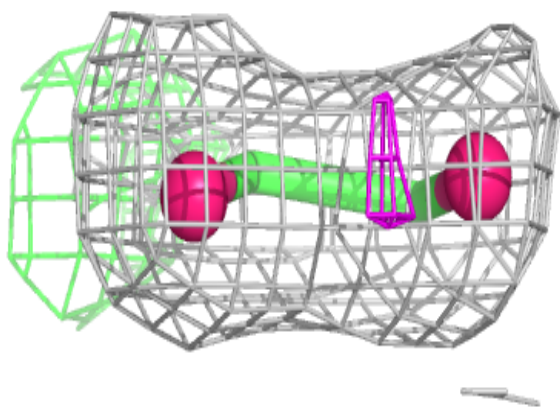
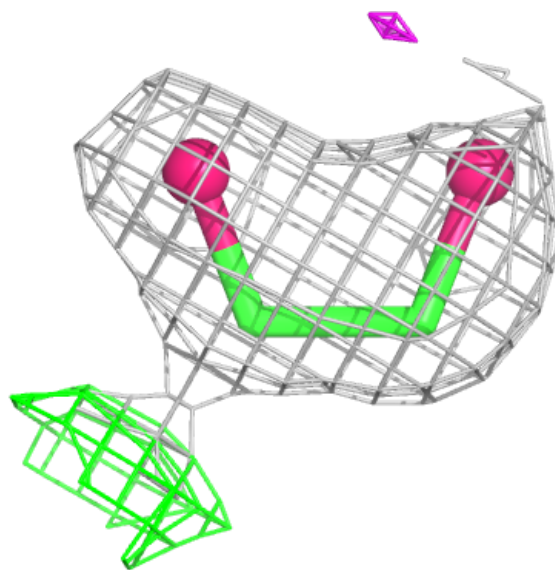
Electron density around PEG B 306:

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



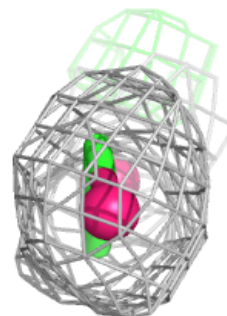
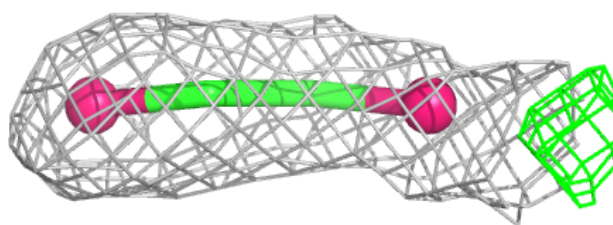
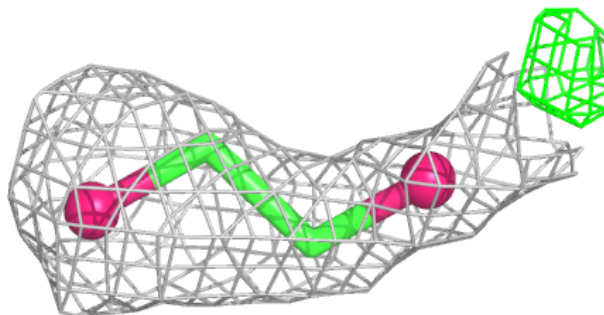
Electron density around EDO A 313:

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



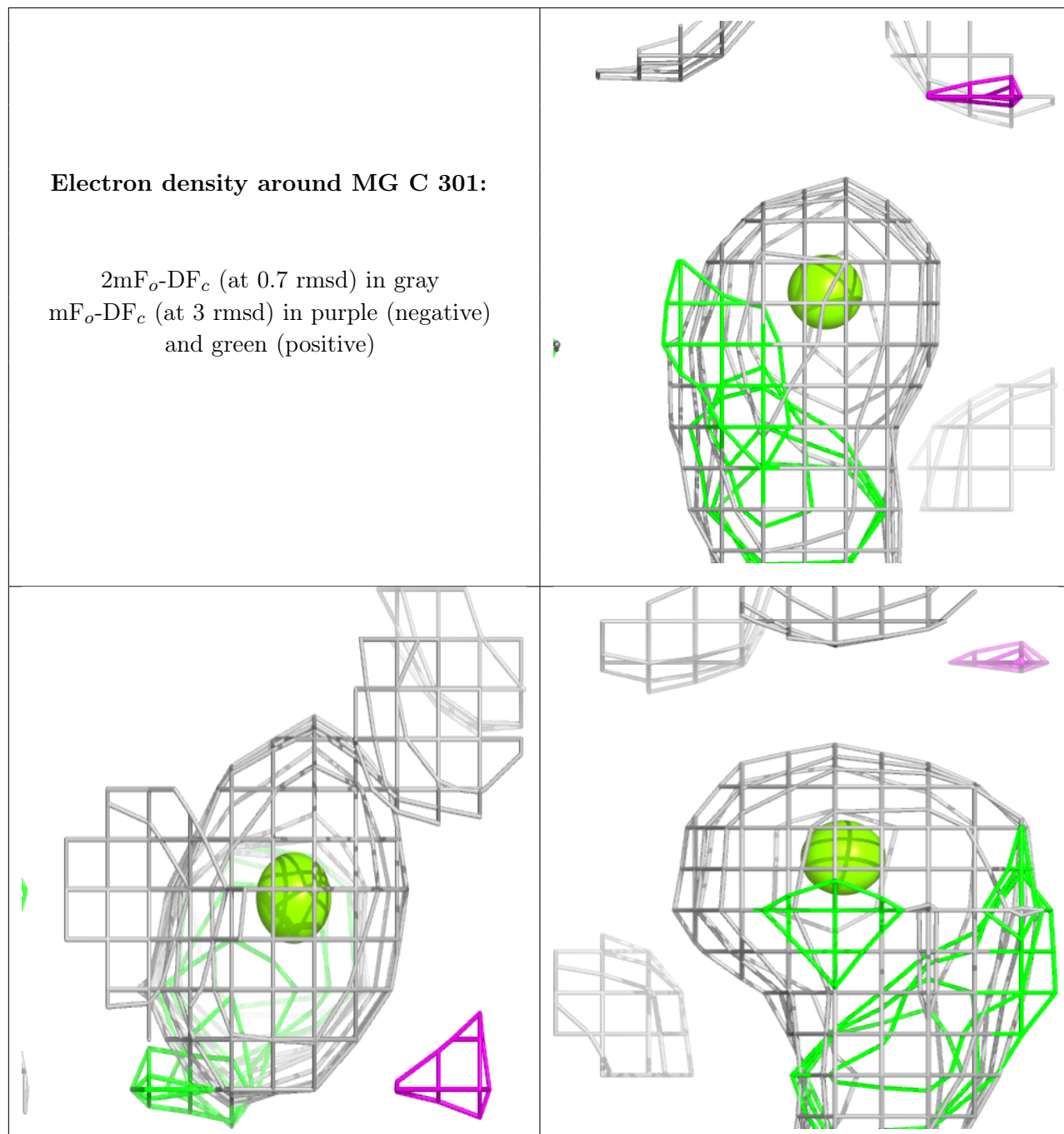
Electron density around EDO B 309:

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



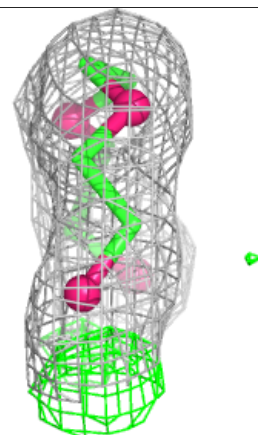
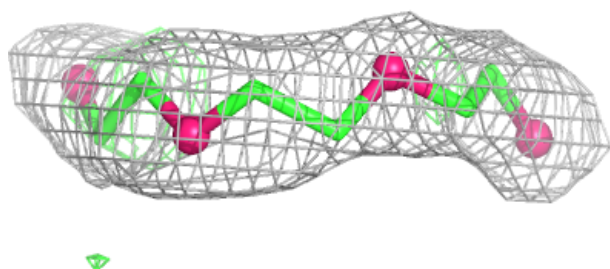
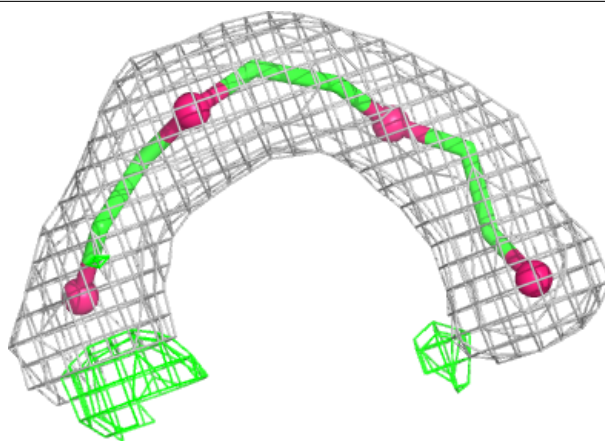
Electron density around MG C 301:

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

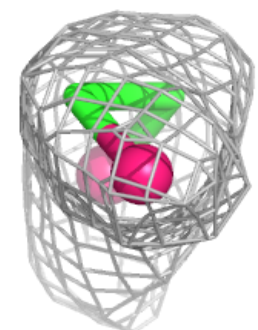
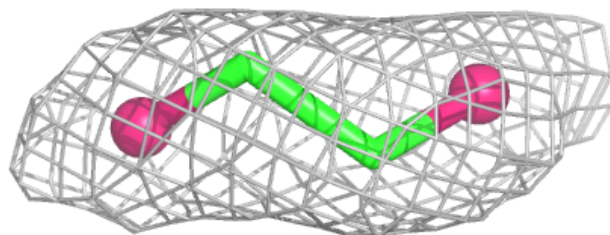
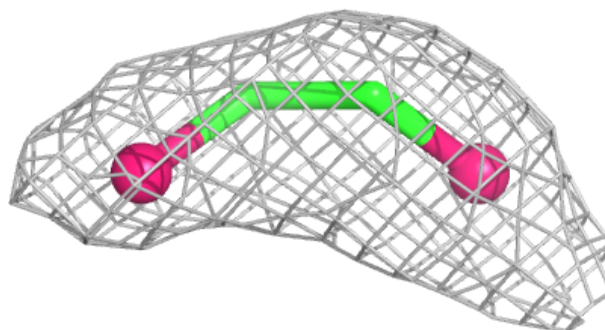


Electron density around PGE A 307:

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

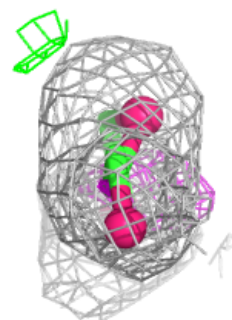
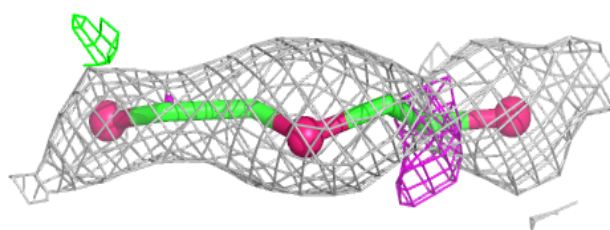
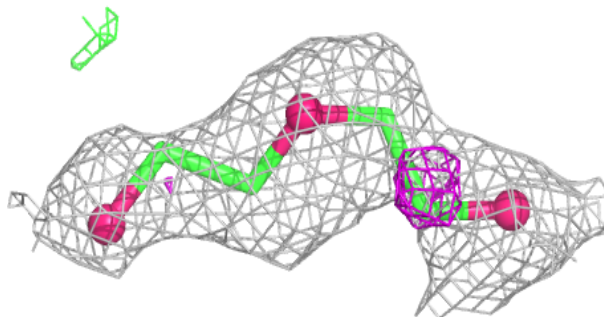
**Electron density around EDO D 310:**

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

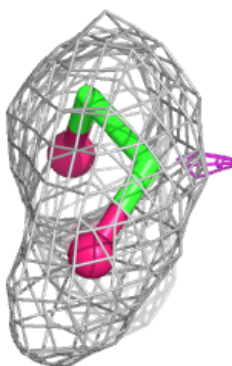
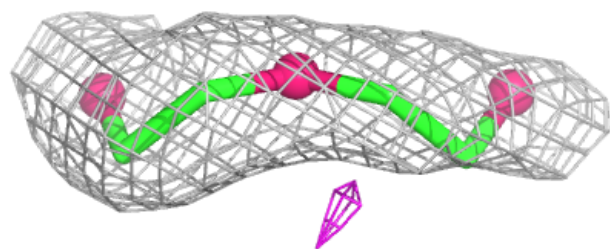
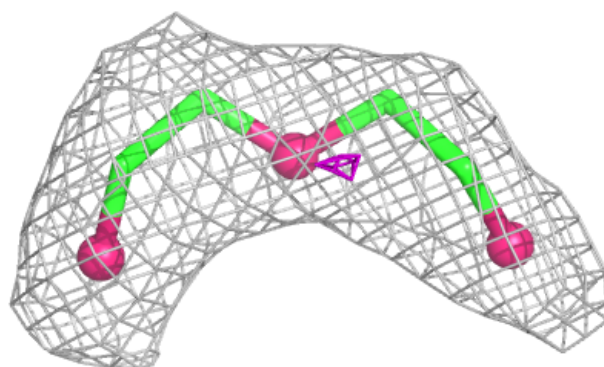


Electron density around PEG E 305:

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

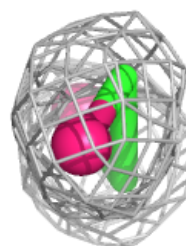
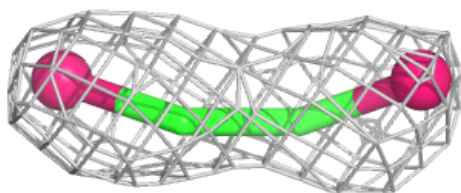
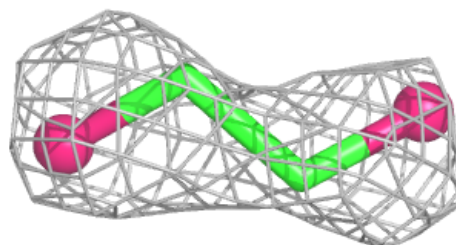
**Electron density around PEG E 306:**

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



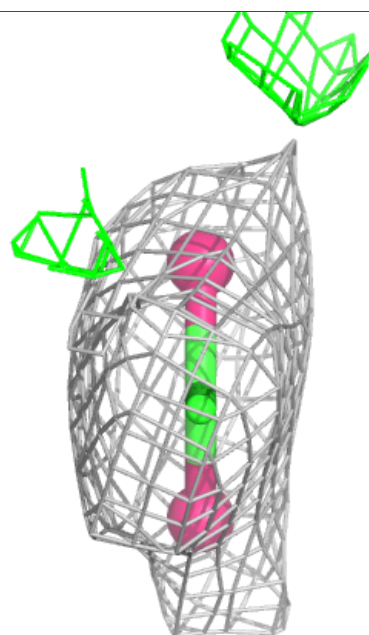
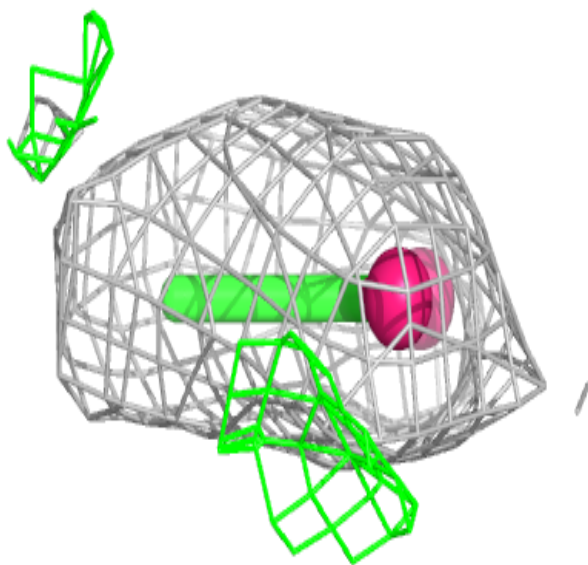
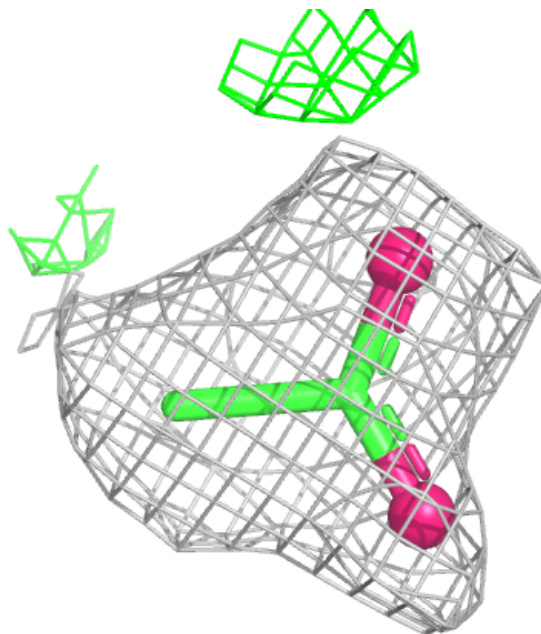
Electron density around EDO A 311:

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



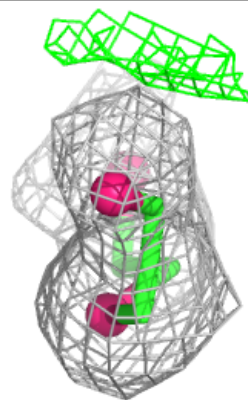
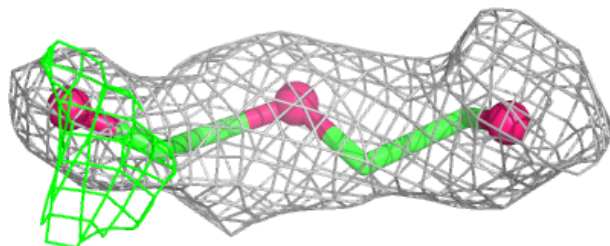
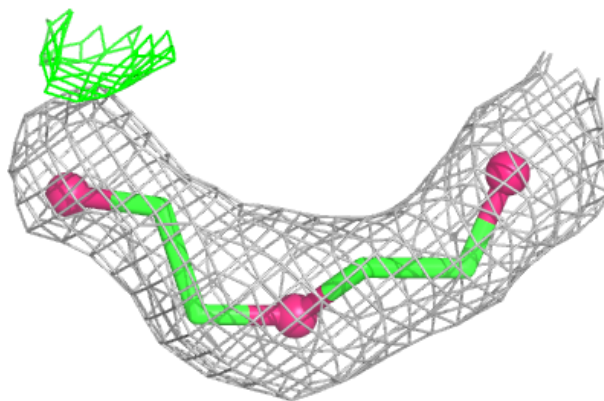
Electron density around ACT D 304:

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



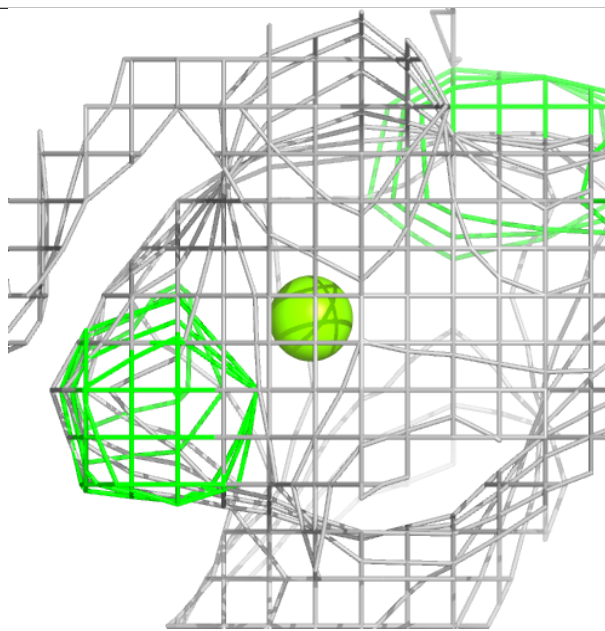
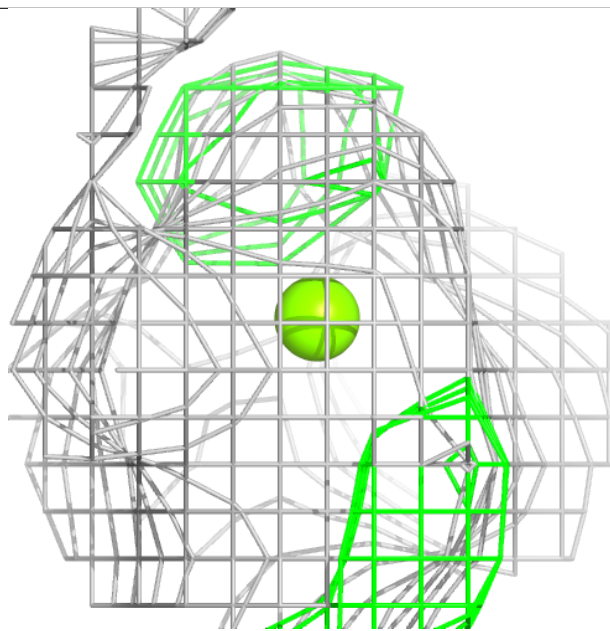
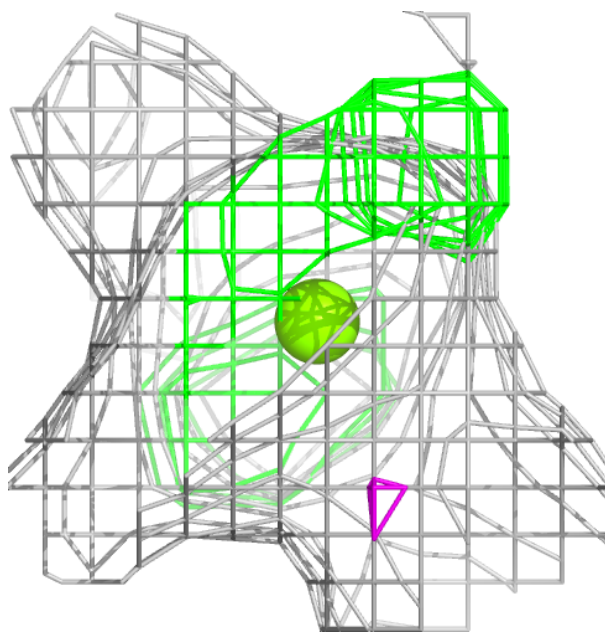
Electron density around PEG F 305:

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



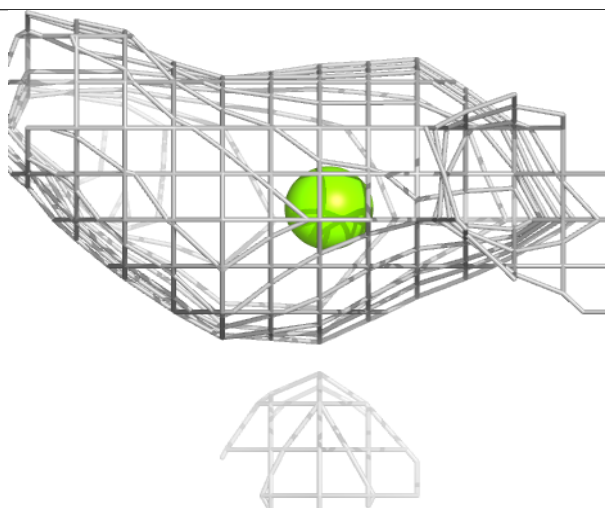
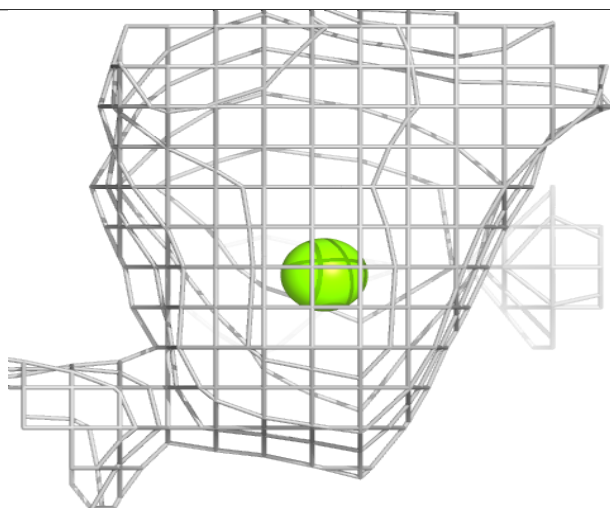
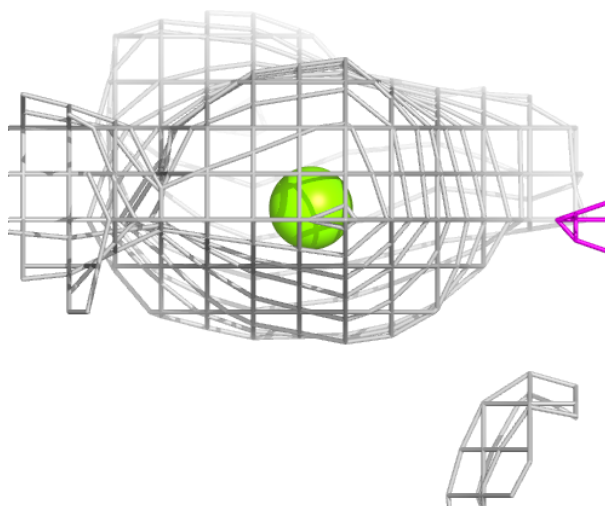
Electron density around MG A 301:

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



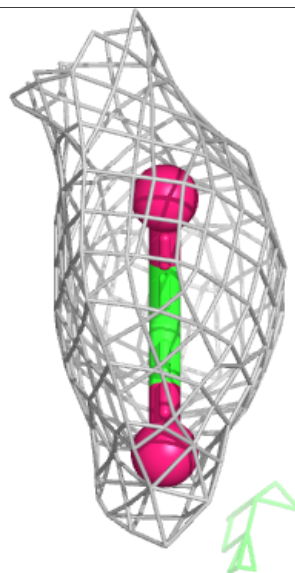
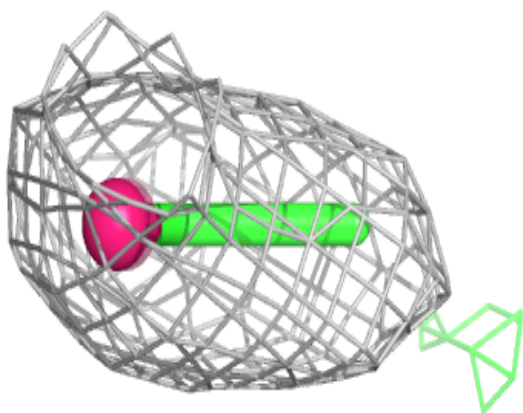
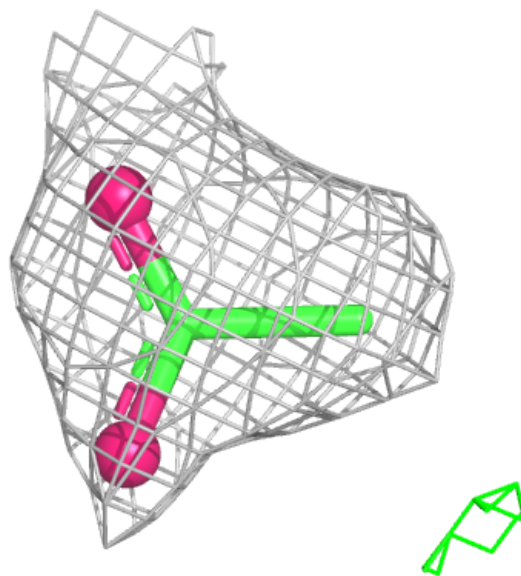
Electron density around MG E 301:

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



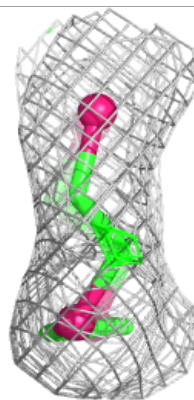
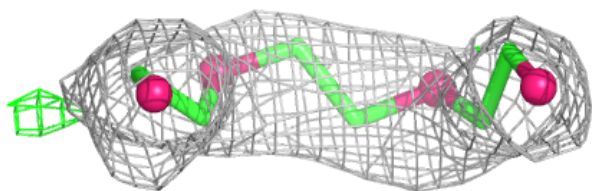
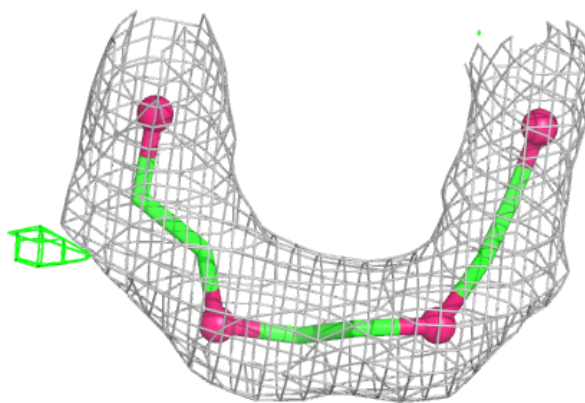
Electron density around ACT A 303:

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



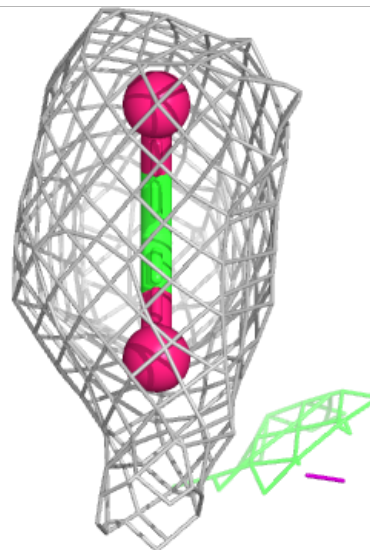
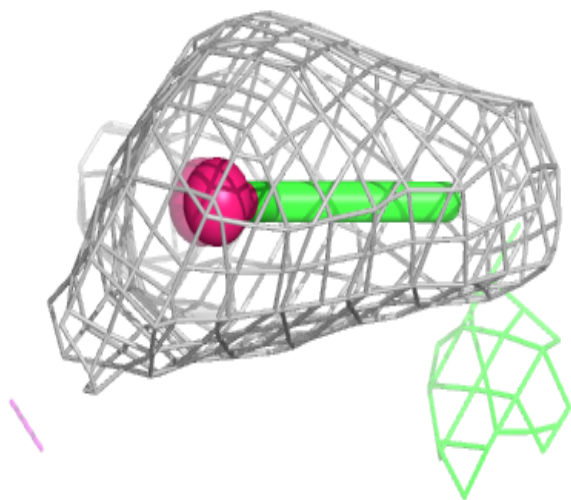
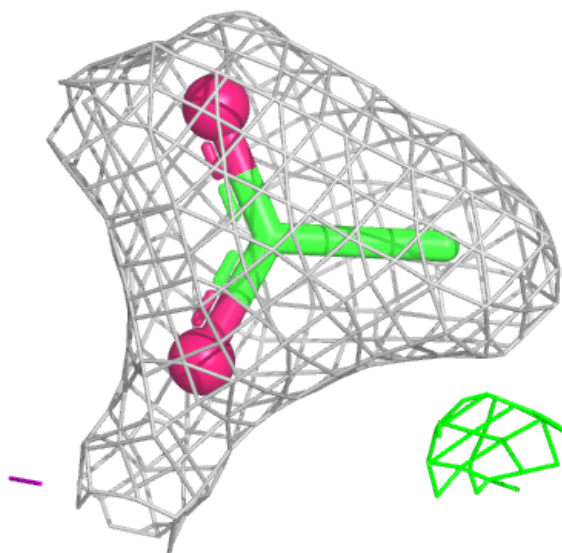
Electron density around PGE B 307:

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



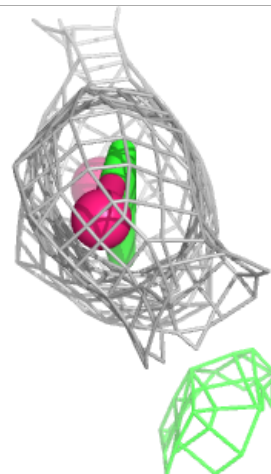
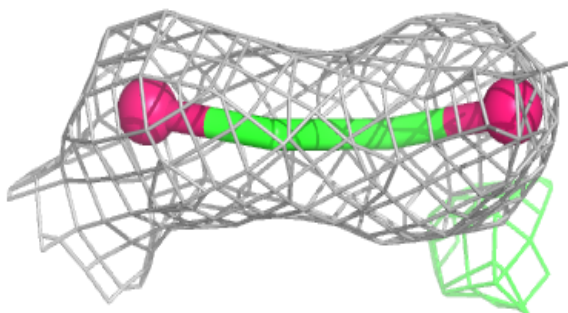
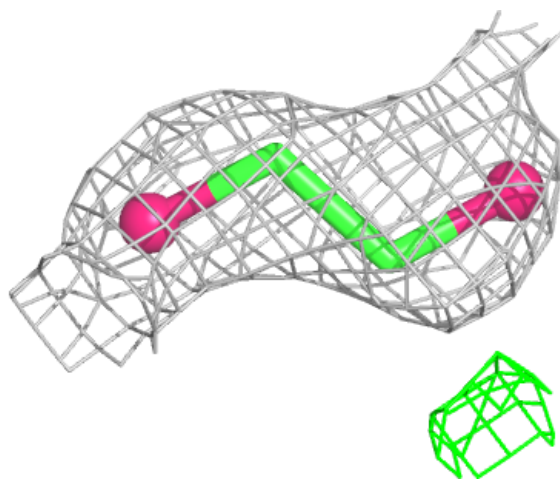
Electron density around ACT C 304:

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



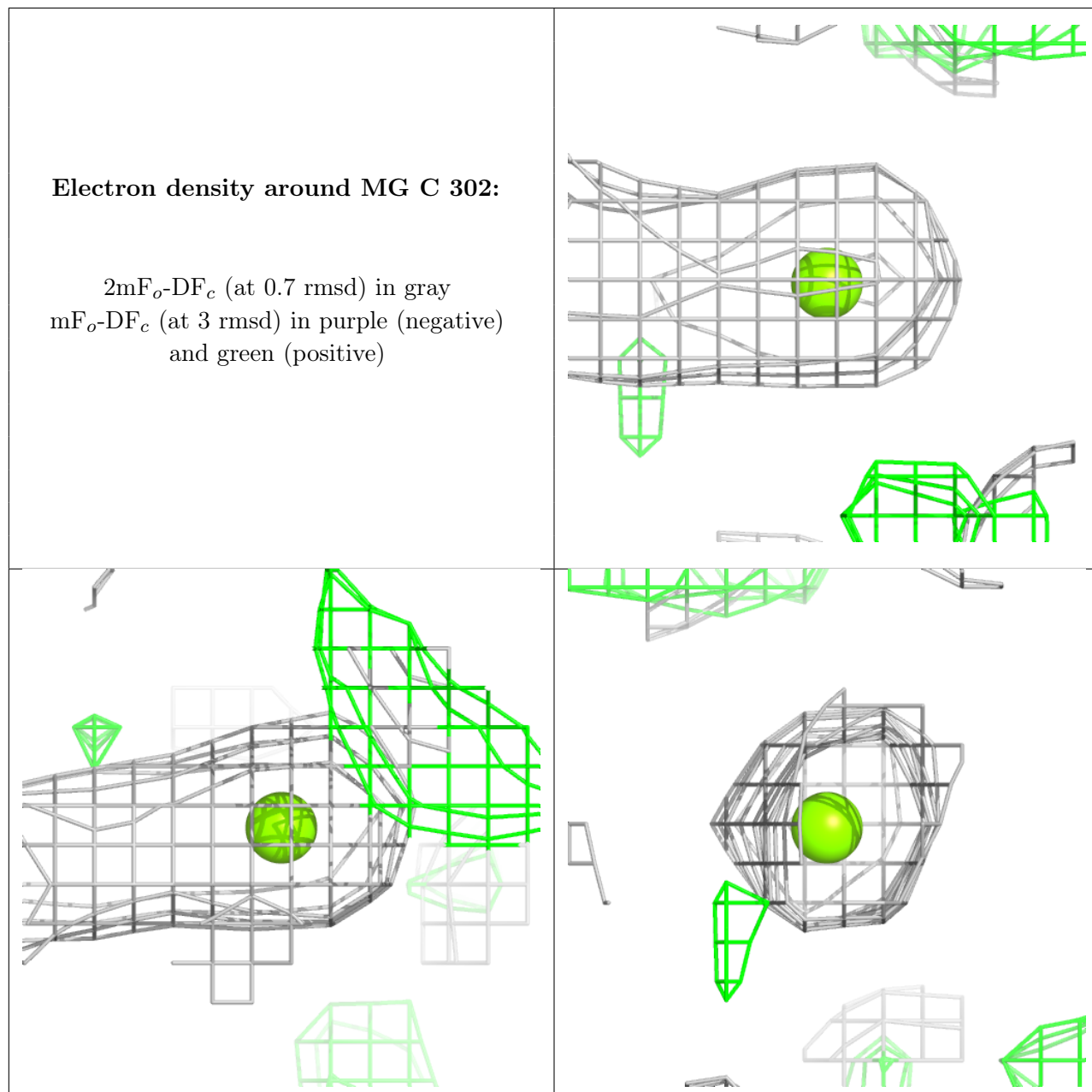
Electron density around EDO D 308:

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



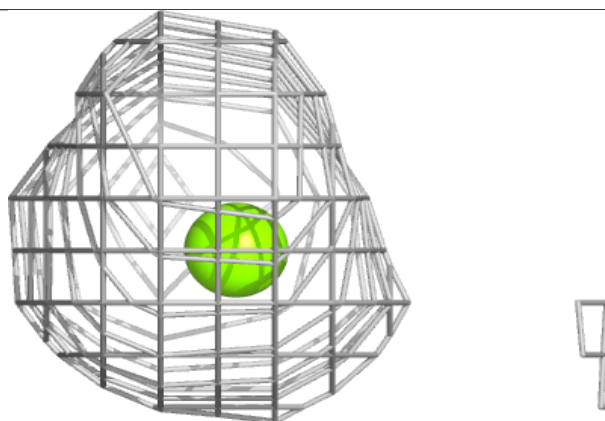
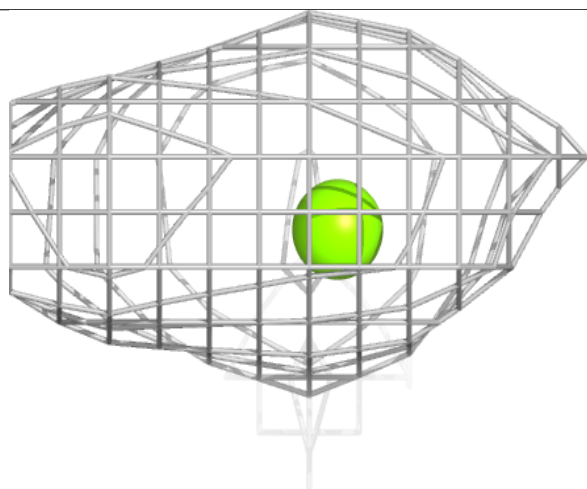
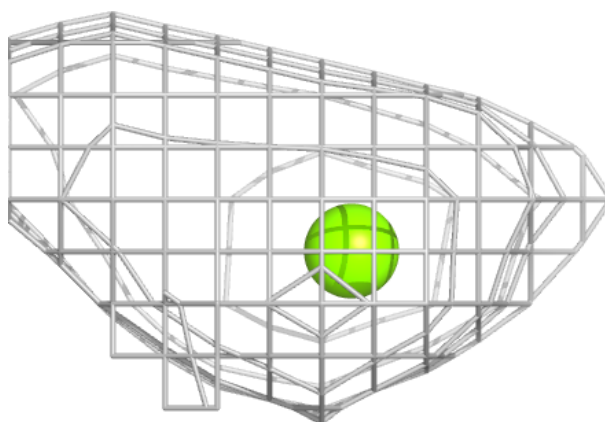
Electron density around MG C 302:

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



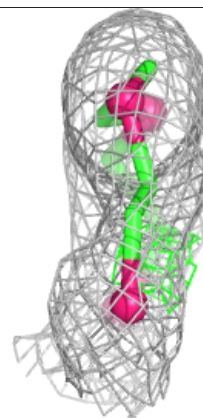
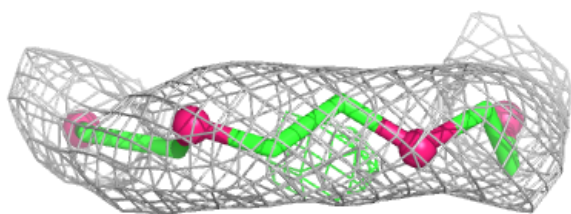
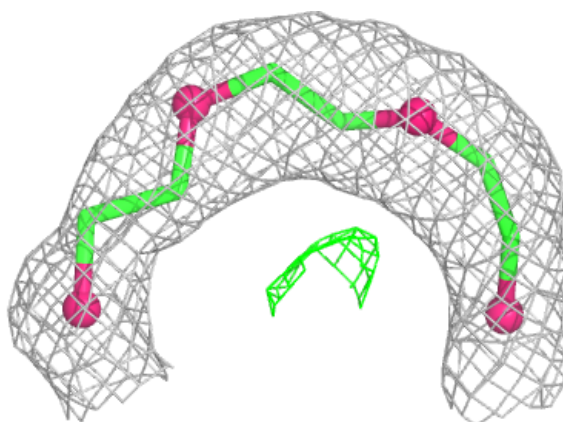
Electron density around MG A 302:

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

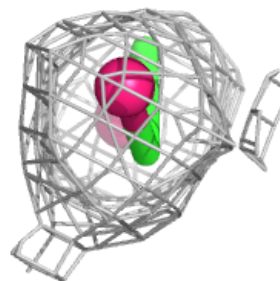
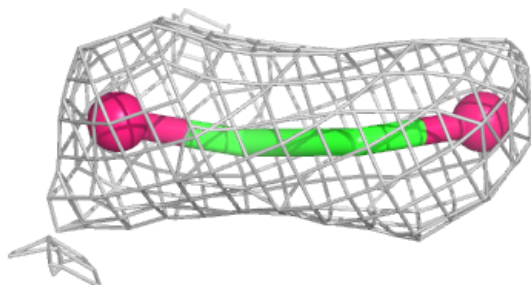
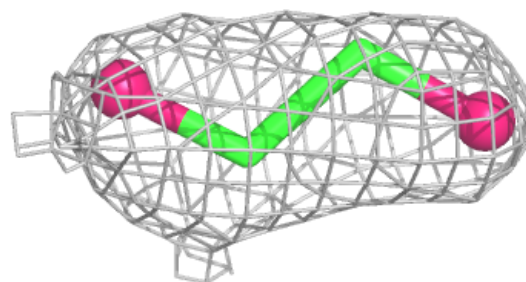


Electron density around PGE C 305:

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

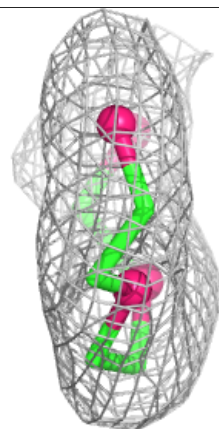
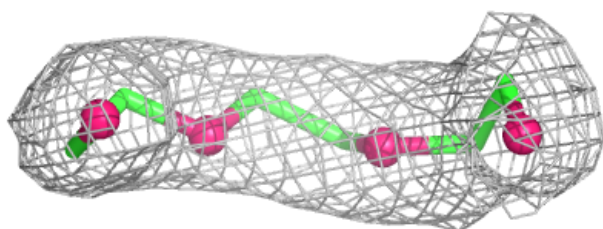
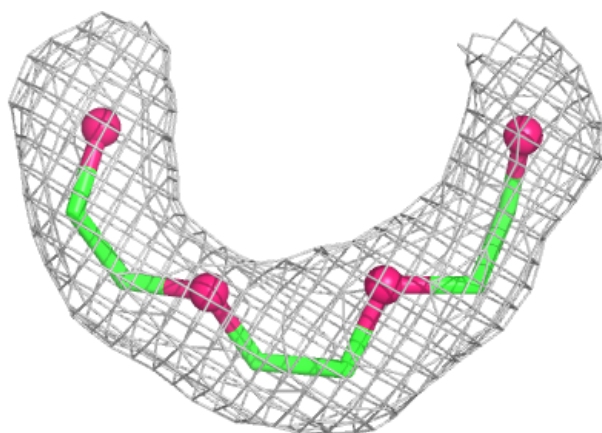
**Electron density around EDO A 312:**

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

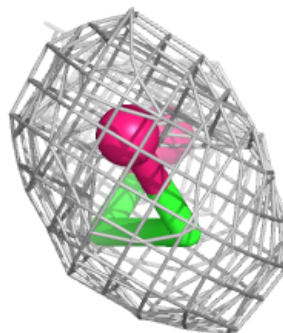
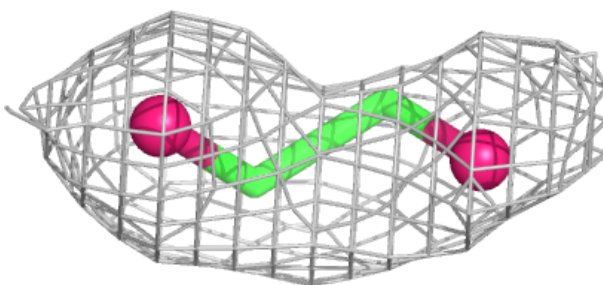
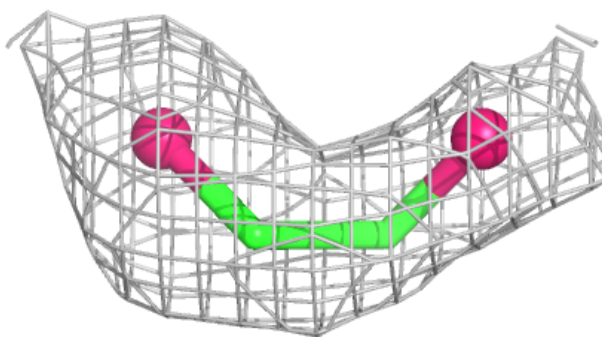


Electron density around PGE D 305:

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

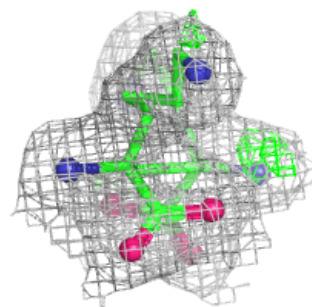
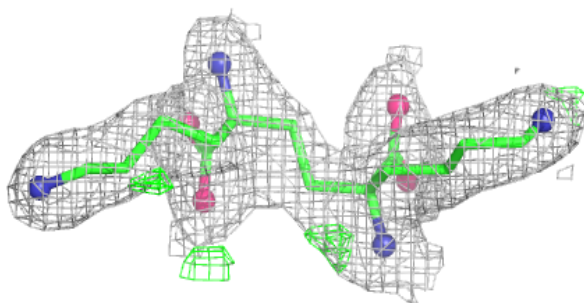
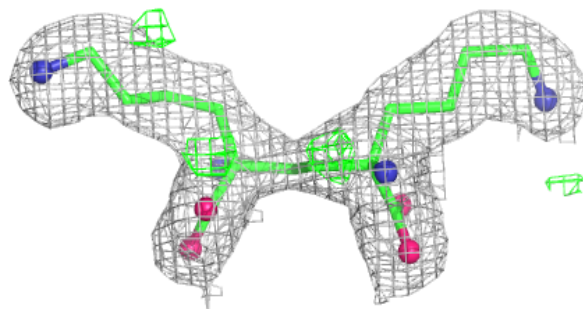
**Electron density around EDO B 308:**

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

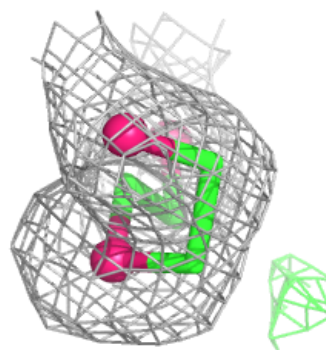
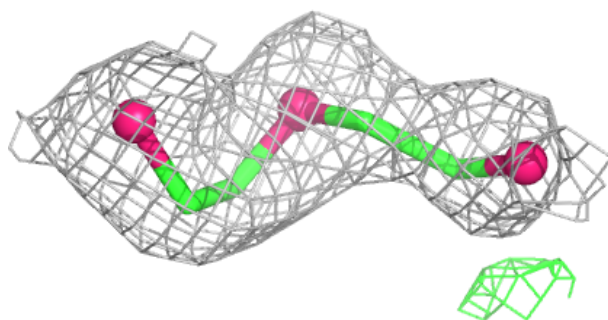
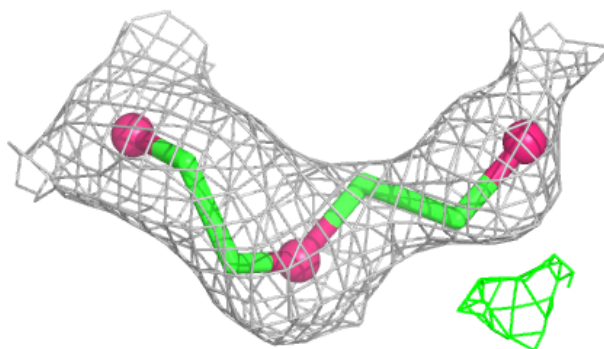


Electron density around 3VN D 301:

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

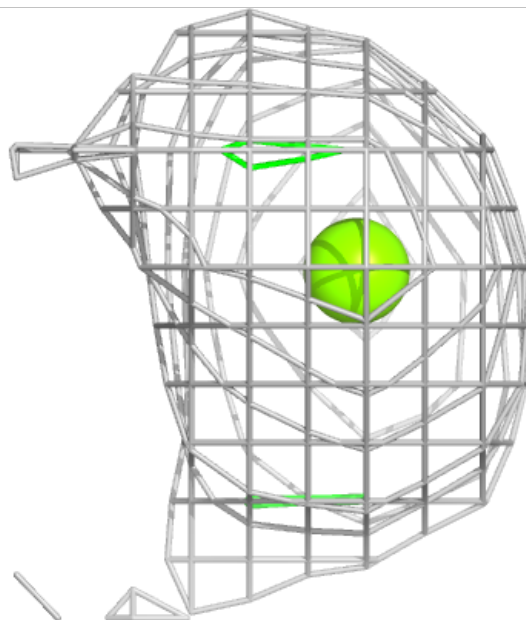
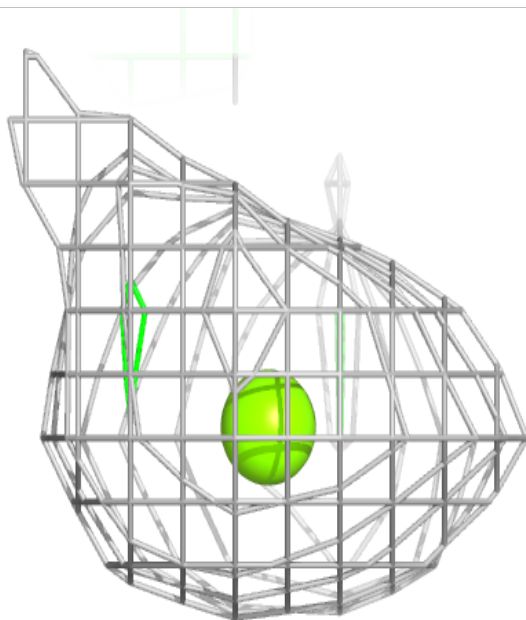
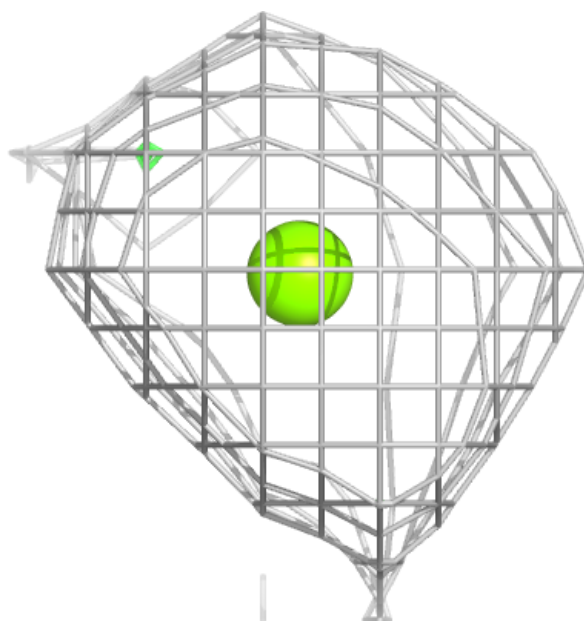
**Electron density around PEG F 304:**

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



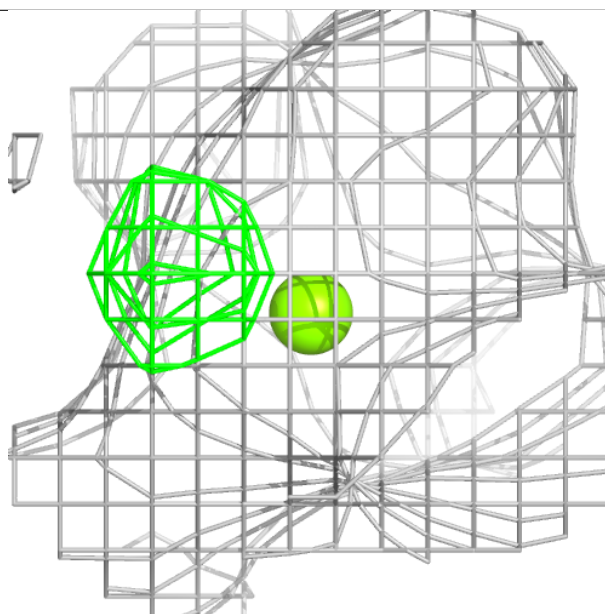
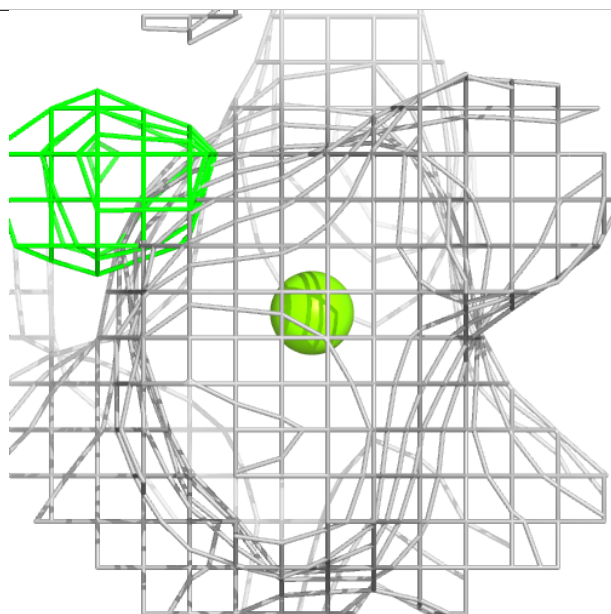
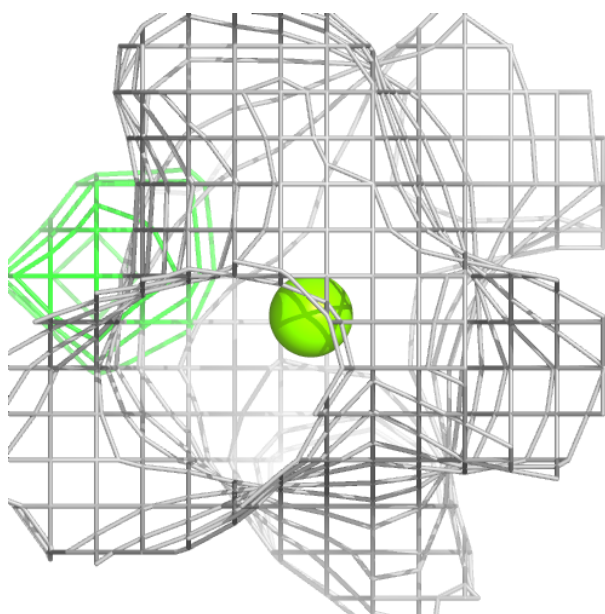
Electron density around MG D 303:

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



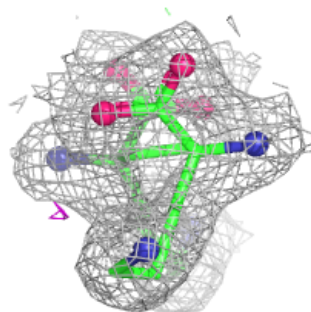
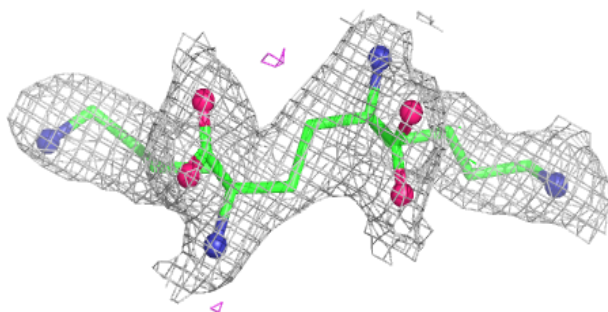
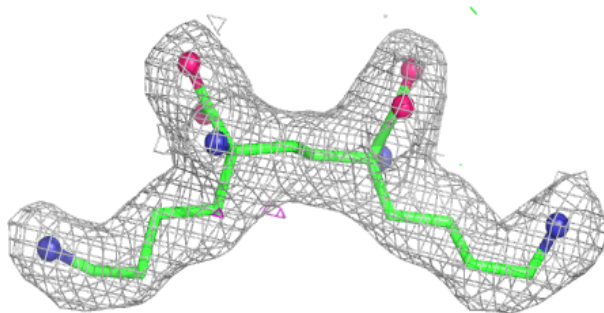
Electron density around MG B 302:

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



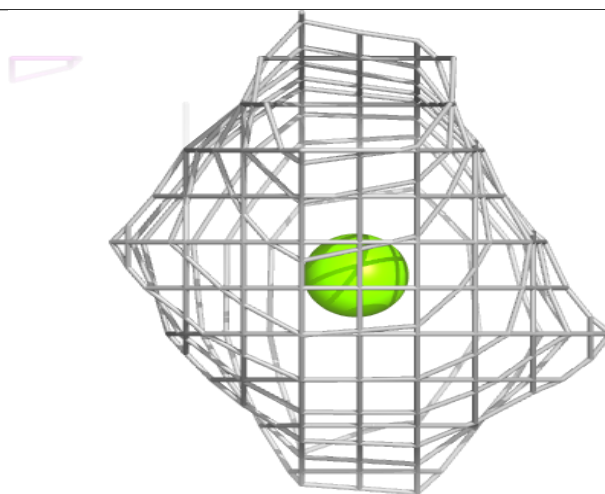
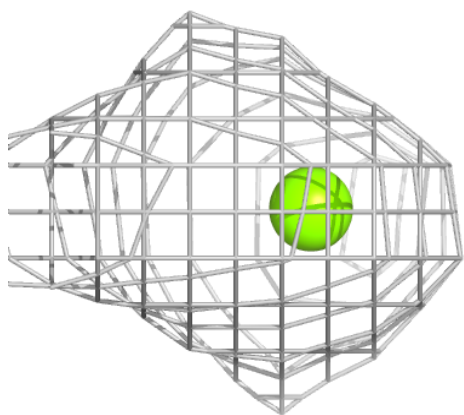
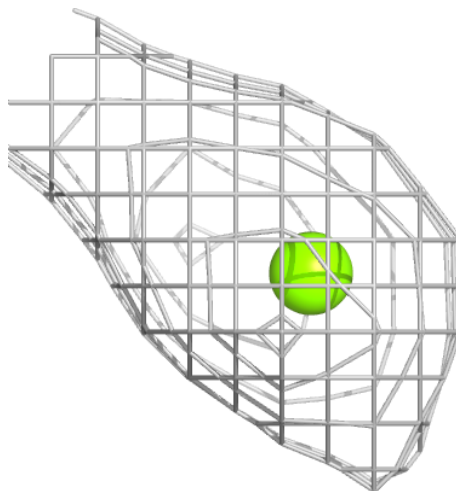
Electron density around 3VN F 301:

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



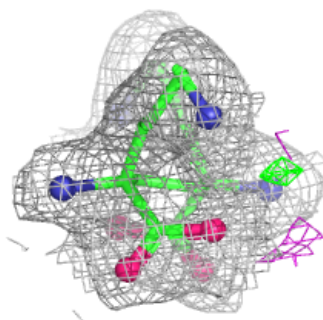
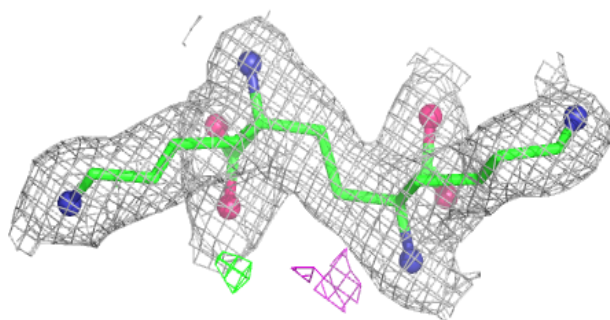
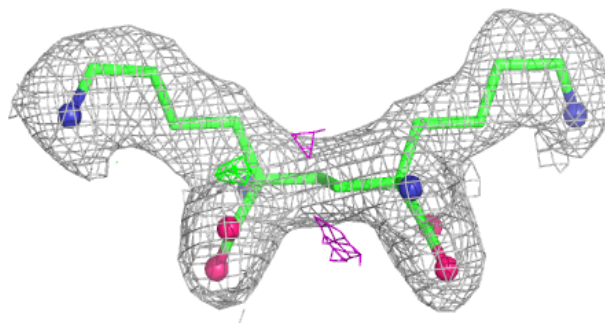
Electron density around MG E 302:

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

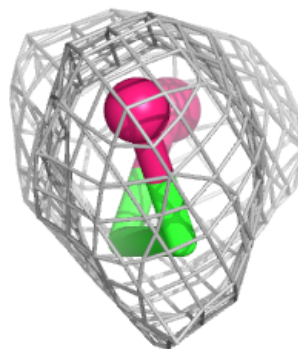
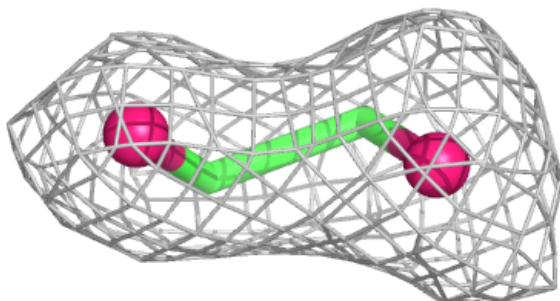
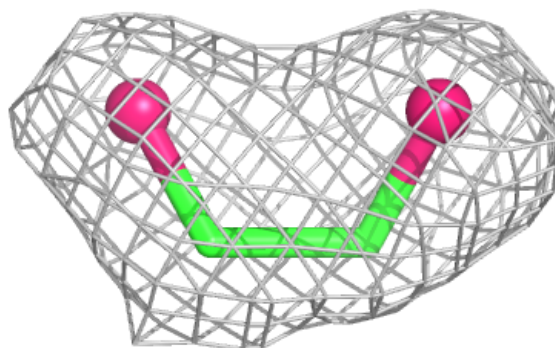


Electron density around 3VN B 301:

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

**Electron density around EDO A 309:**

$2mF_o-DF_c$ (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.