



wwPDB X-ray Structure Validation Summary Report ⓘ

Dec 17, 2023 – 09:06 am GMT

PDB ID : 3ZBY
Title : Ligand-free structure of CYP142 from Mycobacterium smegmatis
Authors : Garcia-Fernandez, E.; Frank, D.J.; Galan, B.; Kells, P.M.; Podust, L.M.; Garcia, J.L.; Ortiz de Montellano, P.R.
Deposited on : 2012-11-13
Resolution : 1.93 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 : 4.02b-467
Mogul : 1.8.4, CSD as541be (2020)
Xtriage (Phenix) : 1.13
EDS : 2.36
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) : 2.36

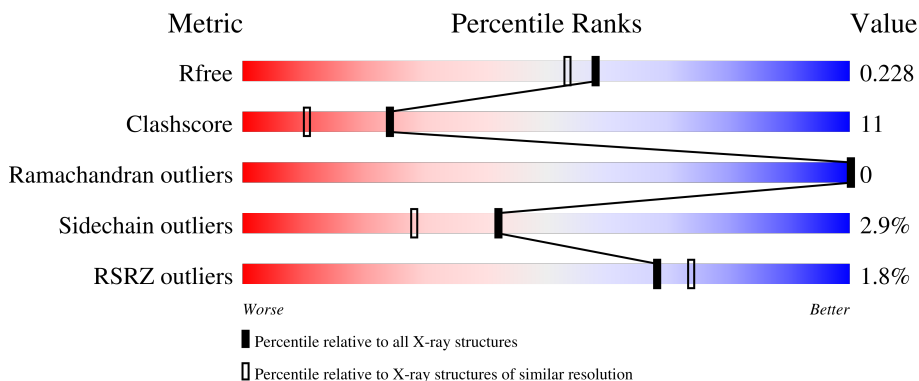
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.93 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.



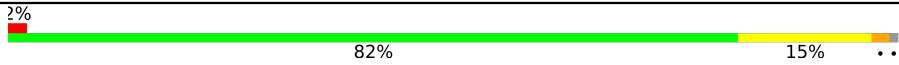


Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	4310 (1.96-1.92)
Clashscore	141614	1023 (1.94-1.94)
Ramachandran outliers	138981	1007 (1.94-1.94)
Sidechain outliers	138945	1007 (1.94-1.94)
RSRZ outliers	127900	4250 (1.96-1.92)

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	407	
1	B	407	
1	C	407	
1	D	407	
1	E	407	

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Mol	Chain	Length	Quality of chain
1	F	407	
2	G	7	
2	H	7	
2	I	7	
2	J	7	
2	K	7	
2	L	7	

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
2	GLC	G	1	X	-	-	-
2	GLC	G	2	-	-	X	-
2	GLC	G	3	-	-	X	-
2	GLC	G	7	X	-	-	-
2	GLC	H	1	X	-	X	-
2	GLC	H	2	-	-	X	-
2	GLC	H	5	-	-	X	-
2	GLC	H	7	X	-	X	-
2	GLC	I	1	X	-	X	-
2	GLC	I	2	-	-	X	-
2	GLC	I	6	-	-	X	-
2	GLC	I	7	X	-	X	-
2	GLC	J	7	X	-	-	-
2	GLC	K	1	X	-	X	-
2	GLC	K	4	X	-	-	-
2	GLC	K	6	-	-	X	-
2	GLC	K	7	X	-	X	-
2	GLC	L	4	X	-	-	-
2	GLC	L	6	X	-	-	-
4	SO4	A	1404	-	-	X	-
4	SO4	B	1408	-	-	X	-
4	SO4	C	1406	-	-	X	-
4	SO4	D	1406	-	-	X	-
4	SO4	E	1406	-	-	X	-
4	SO4	F	1406	-	-	X	-

2 Entry composition [i](#)

There are 6 unique types of molecules in this entry. The entry contains 22588 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 P450 HEME-THIOLATE PROTEIN.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	402	3171	1990	561	595	25	0	5	0
1	B	404	3181	1994	559	604	24	0	5	0
1	C	402	3180	1995	561	600	24	0	7	0
1	D	402	3205	2005	569	606	25	0	7	0
1	E	402	3199	1999	574	602	24	0	6	0
1	F	402	3186	1996	563	603	24	0	6	0

There are 36 discrepancies between the modelled and reference sequences:

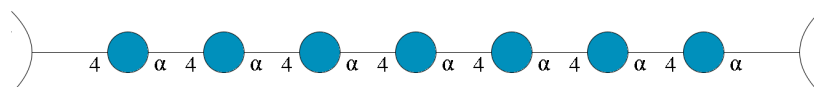
Chain	Residue	Modelled	Actual	Comment	Reference
A	402	HIS	-	expression tag	UNP A0R4Q6
A	403	HIS	-	expression tag	UNP A0R4Q6
A	404	HIS	-	expression tag	UNP A0R4Q6
A	405	HIS	-	expression tag	UNP A0R4Q6
A	406	HIS	-	expression tag	UNP A0R4Q6
A	407	HIS	-	expression tag	UNP A0R4Q6
B	402	HIS	-	expression tag	UNP A0R4Q6
B	403	HIS	-	expression tag	UNP A0R4Q6
B	404	HIS	-	expression tag	UNP A0R4Q6
B	405	HIS	-	expression tag	UNP A0R4Q6
B	406	HIS	-	expression tag	UNP A0R4Q6
B	407	HIS	-	expression tag	UNP A0R4Q6
C	402	HIS	-	expression tag	UNP A0R4Q6
C	403	HIS	-	expression tag	UNP A0R4Q6
C	404	HIS	-	expression tag	UNP A0R4Q6
C	405	HIS	-	expression tag	UNP A0R4Q6
C	406	HIS	-	expression tag	UNP A0R4Q6

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Chain	Residue	Modelled	Actual	Comment	Reference
C	407	HIS	-	expression tag	UNP A0R4Q6
D	402	HIS	-	expression tag	UNP A0R4Q6
D	403	HIS	-	expression tag	UNP A0R4Q6
D	404	HIS	-	expression tag	UNP A0R4Q6
D	405	HIS	-	expression tag	UNP A0R4Q6
D	406	HIS	-	expression tag	UNP A0R4Q6
D	407	HIS	-	expression tag	UNP A0R4Q6
E	402	HIS	-	expression tag	UNP A0R4Q6
E	403	HIS	-	expression tag	UNP A0R4Q6
E	404	HIS	-	expression tag	UNP A0R4Q6
E	405	HIS	-	expression tag	UNP A0R4Q6
E	406	HIS	-	expression tag	UNP A0R4Q6
E	407	HIS	-	expression tag	UNP A0R4Q6
F	402	HIS	-	expression tag	UNP A0R4Q6
F	403	HIS	-	expression tag	UNP A0R4Q6
F	404	HIS	-	expression tag	UNP A0R4Q6
F	405	HIS	-	expression tag	UNP A0R4Q6
F	406	HIS	-	expression tag	UNP A0R4Q6
F	407	HIS	-	expression tag	UNP A0R4Q6

- Molecule 2 is an oligosaccharide called Cycloheptakis-(1-4)-(alpha-D-glucopyranose).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf	Trace
2	G	7	Total	C	O	0	0	0
			77	42	35			
2	H	7	Total	C	O	0	0	0
			77	42	35			
2	I	7	Total	C	O	0	0	0
			77	42	35			
2	J	7	Total	C	O	0	0	0
			77	42	35			
2	K	7	Total	C	O	0	0	0
			77	42	35			
2	L	7	Total	C	O	0	0	0
			77	42	35			

- Molecule 3 is PROTOPORPHYRIN IX CONTAINING FE (three-letter code: HEM) (formula: C₃₄H₃₂FeN₄O₄).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	
3	A	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
3	B	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
3	C	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
3	D	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
3	E	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
3	F	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		

- Molecule 4 is SULFATE ION (three-letter code: SO4) (formula: O₄S).



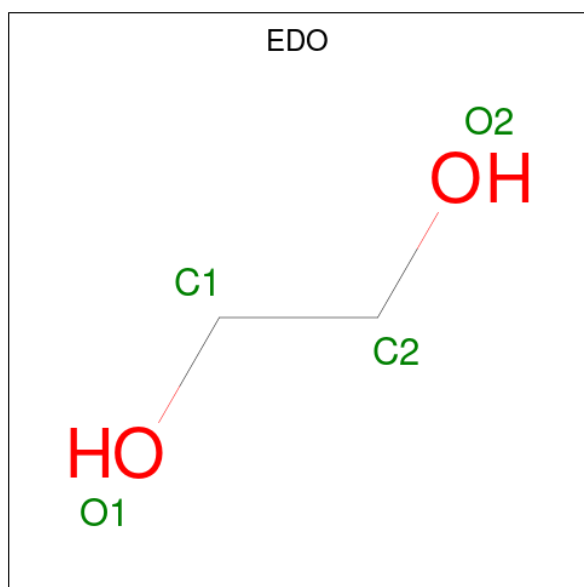
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total O S 5 4 1	0	0
4	A	1	Total O S 5 4 1	0	0
4	B	1	Total O S 5 4 1	0	0
4	B	1	Total O S 5 4 1	0	0
4	B	1	Total O S 5 4 1	0	0
4	C	1	Total O S 5 4 1	0	0
4	C	1	Total O S 5 4 1	0	0
4	C	1	Total O S 5 4 1	0	0
4	D	1	Total O S 5 4 1	0	0
4	D	1	Total O S 5 4 1	0	0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

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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	F	1	Total O S 5 4 1	0	0
4	F	1	Total O S 5 4 1	0	0
4	F	1	Total O S 5 4 1	0	0

- Molecule 5 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: C₂H₆O₂).



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

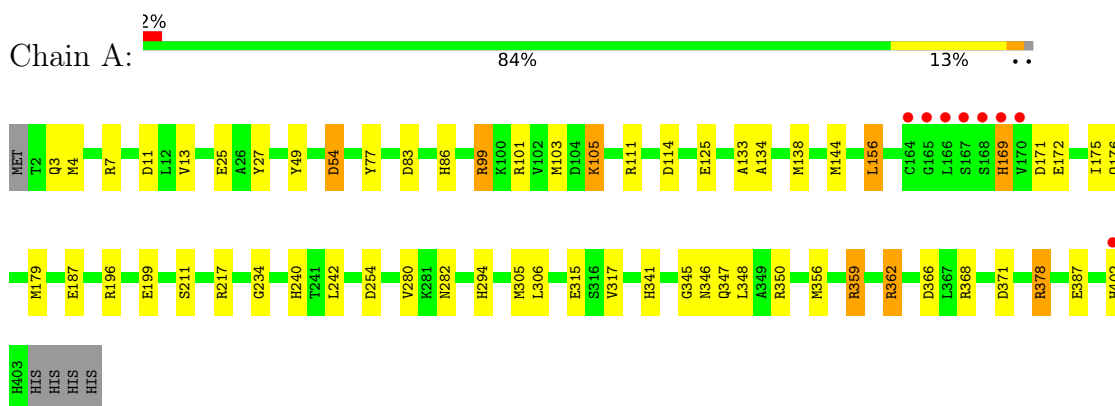
- Molecule 6 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	448	Total O 448 448	0	0
6	B	439	Total O 439 439	0	0
6	C	457	Total O 457 457	0	0
6	D	431	Total O 431 431	0	0
6	E	445	Total O 445 445	0	0
6	F	417	Total O 417 417	0	0

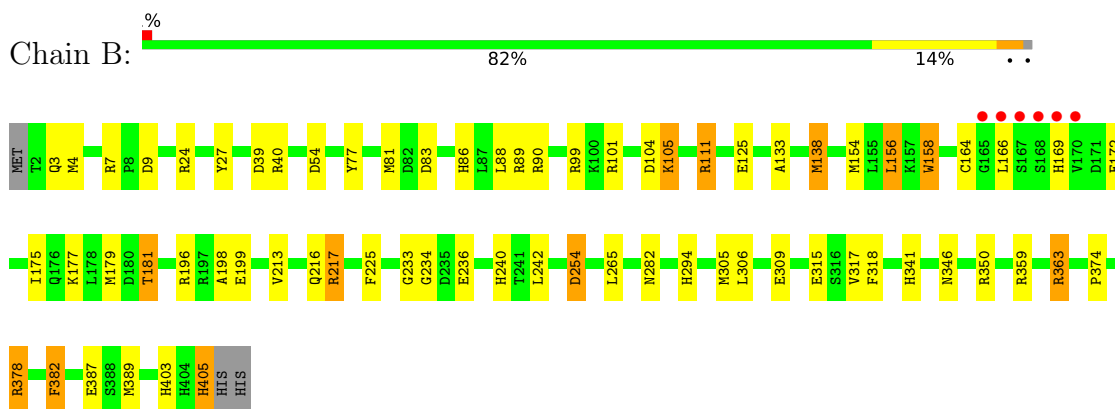
3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density ($RSRZ > 2$). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

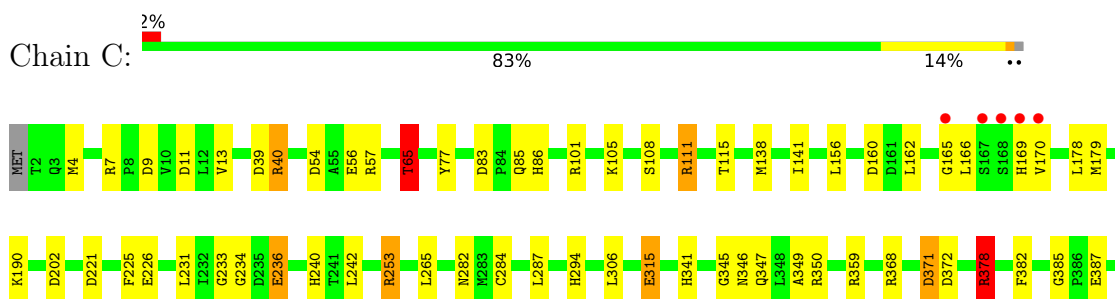
• Molecule 1: P450 HEME-THIOLATE PROTEIN



• Molecule 1: P450 HEME-THIOLATE PROTEIN

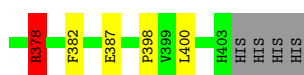
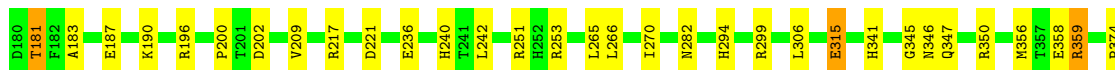
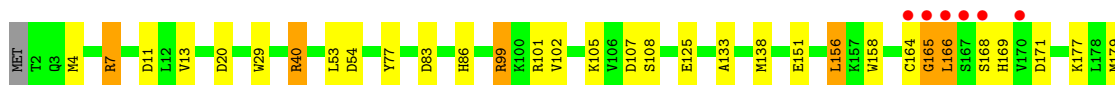
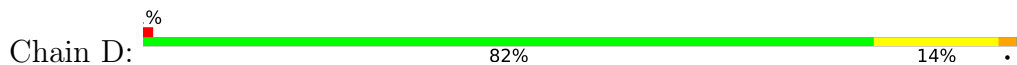


• Molecule 1: P450 HEME-THIOLATE PROTEIN

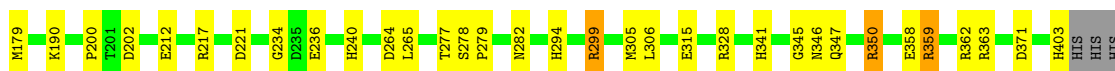
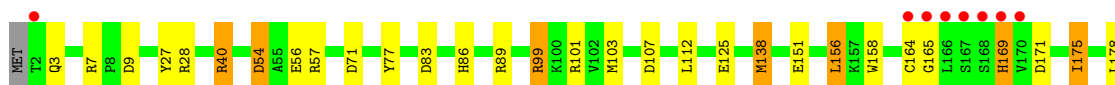
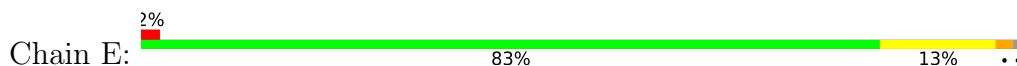




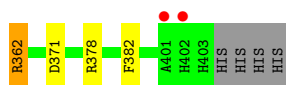
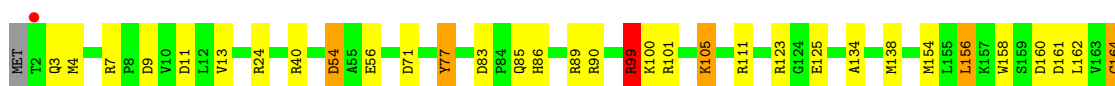
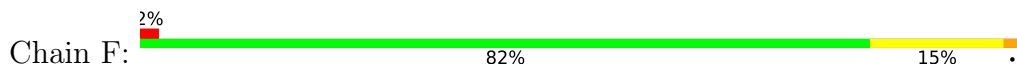
- Molecule 1: P450 HEME-THIOLATE PROTEIN



- Molecule 1: P450 HEME-THIOLATE PROTEIN



- Molecule 1: P450 HEME-THIOLATE PROTEIN



- Molecule 2: Cycloheptakis-(1-4)-(alpha-D-glucopyranose)



- Molecule 2: Cycloheptakis-(1-4)-(alpha-D-glucopyranose)

Chain H:  100%

GLC1
GLC2
GLC3
GLC4
GLC5
GLC6
GLC7

- Molecule 2: Cycloheptakis-(1-4)-(alpha-D-glucopyranose)

Chain I:  14% 86%

GLC1
GLC2
GLC3
GLC4
GLC5
GLC6
GLC7

- Molecule 2: Cycloheptakis-(1-4)-(alpha-D-glucopyranose)

Chain J:  29% 71%

GLC1
GLC2
GLC3
GLC4
GLC5
GLC6
GLC7

- Molecule 2: Cycloheptakis-(1-4)-(alpha-D-glucopyranose)

Chain K:  14% 86%

GLC1
GLC2
GLC3
GLC4
GLC5
GLC6
GLC7

- Molecule 2: Cycloheptakis-(1-4)-(alpha-D-glucopyranose)

Chain L:  71% 29%

GLC1
GLC2
GLC3
GLC4
GLC5
GLC6
GLC7

4 Data and refinement statistics i

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	94.05Å 162.85Å 266.44Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	266.44 – 1.93 69.49 – 1.93	Depositor EDS
% Data completeness (in resolution range)	94.3 (266.44-1.93) 94.3 (69.49-1.93)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.16 (at 1.92Å)	Xtriage
Refinement program	REFMAC 5.5.0109	Depositor
R, R_{free}	0.190 , 0.230 0.189 , 0.228	Depositor DCC
R_{free} test set	14356 reflections (5.06%)	wwPDB-VP
Wilson B-factor (Å ²)	22.0	Xtriage
Anisotropy	0.095	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.34 , 33.4	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.34$	Xtriage
Estimated twinning fraction	0.460 for -1/2*h+1/2*k,3/2*h+1/2*k,-l 0.467 for -1/2*h-1/2*k,-3/2*h+1/2*k,-l 0.467 for 1/2*h+1/2*k,3/2*h-1/2*k,-l 0.467 for 1/2*h-1/2*k,-3/2*h-1/2*k,-l 0.467 for -h,-k,l	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	22588	wwPDB-VP
Average B, all atoms (Å ²)	25.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.10% 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 i

5.1 Standard geometry i

Bond lengths and bond angles in the following residue types are not validated in this section: HEM, EDO, SO4, GLC

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	1.17	4/3237 (0.1%)	1.01	9/4391 (0.2%)
1	B	1.18	7/3251 (0.2%)	1.06	16/4414 (0.4%)
1	C	1.20	7/3255 (0.2%)	1.06	14/4416 (0.3%)
1	D	1.17	5/3274 (0.2%)	1.02	12/4439 (0.3%)
1	E	1.20	6/3265 (0.2%)	1.05	14/4427 (0.3%)
1	F	1.17	6/3258 (0.2%)	1.07	21/4420 (0.5%)
All	All	1.18	35/19540 (0.2%)	1.04	86/26507 (0.3%)

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	D	0	1

The worst 5 of 35 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	236	GLU	CD-OE1	9.28	1.35	1.25
1	D	315	GLU	CD-OE1	8.82	1.35	1.25
1	F	272	GLU	CD-OE1	6.71	1.33	1.25
1	E	151	GLU	CD-OE2	-6.52	1.18	1.25
1	B	309	GLU	CB-CG	6.49	1.64	1.52

The worst 5 of 86 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	378	ARG	NE-CZ-NH1	10.78	125.69	120.30
1	B	363	ARG	NE-CZ-NH2	-10.43	115.09	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	F	242	LEU	CB-CG-CD2	-9.77	94.39	111.00
1	B	111	ARG	NE-CZ-NH1	9.31	124.96	120.30
1	B	363	ARG	NE-CZ-NH1	9.21	124.90	120.30

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	D	165	GLY	Peptide

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	3171	0	3105	53	0
1	B	3181	0	3091	65	0
1	C	3180	0	3116	49	0
1	D	3205	0	3134	59	0
1	E	3199	0	3132	51	0
1	F	3186	0	3126	64	0
2	G	77	0	63	13	0
2	H	77	0	63	22	0
2	I	77	0	63	19	0
2	J	77	0	63	10	0
2	K	77	0	60	24	0
2	L	77	0	61	2	0
3	A	43	0	30	6	0
3	B	43	0	30	6	0
3	C	43	0	30	5	0
3	D	43	0	30	6	0
3	E	43	0	30	6	0
3	F	43	0	30	10	0
4	A	10	0	0	8	0
4	B	15	0	0	5	0
4	C	15	0	0	3	0
4	D	15	0	0	5	0
4	E	15	0	0	5	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	F	15	0	0	5	0
5	A	4	0	5	0	0
5	B	4	0	5	1	0
5	C	4	0	5	1	0
5	D	4	0	5	0	0
5	E	4	0	5	0	0
5	F	4	0	5	0	0
6	A	448	0	0	17	0
6	B	439	0	0	15	0
6	C	457	0	0	13	0
6	D	431	0	0	12	0
6	E	445	0	0	14	1
6	F	417	0	0	20	1
All	All	22588	0	19287	432	1

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 11.

The worst 5 of 432 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:E:169:HIS:O	1:E:175:ILE:HD11	1.28	1.29
2:K:1:GLC:O2	2:K:7:GLC:C3	1.84	1.25
2:K:1:GLC:H2	2:K:7:GLC:O3	1.40	1.21
2:K:1:GLC:O2	2:K:7:GLC:H3	1.37	1.19
2:I:6:GLC:O3	2:I:7:GLC:H2	1.43	1.15

All (1) 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)
6:E:2187:HOH:O	6:F:2414:HOH:O[3_545]	1.89	0.31

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	405/407 (100%)	393 (97%)	12 (3%)	0	100	100
1	B	407/407 (100%)	394 (97%)	13 (3%)	0	100	100
1	C	407/407 (100%)	391 (96%)	16 (4%)	0	100	100
1	D	407/407 (100%)	395 (97%)	12 (3%)	0	100	100
1	E	406/407 (100%)	395 (97%)	11 (3%)	0	100	100
1	F	406/407 (100%)	397 (98%)	9 (2%)	0	100	100
All	All	2438/2442 (100%)	2365 (97%)	73 (3%)	0	100	100

There are no Ramachandran outliers to report.

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	340/349 (97%)	332 (98%)	8 (2%)	49	36
1	B	341/349 (98%)	330 (97%)	11 (3%)	39	25
1	C	343/349 (98%)	330 (96%)	13 (4%)	33	18
1	D	346/349 (99%)	336 (97%)	10 (3%)	42	28
1	E	345/349 (99%)	333 (96%)	12 (4%)	36	21
1	F	346/349 (99%)	337 (97%)	9 (3%)	46	32
All	All	2061/2094 (98%)	1998 (97%)	63 (3%)	42	26

5 of 63 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	C	372[A]	ASP
1	F	99[A]	ARG
1	D	99[B]	ARG

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Mol	Chain	Res	Type
1	F	77	TYR
1	F	168	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 46 such sidechains are listed below:

Mol	Chain	Res	Type
1	D	346	ASN
1	E	346	ASN
1	E	86	HIS
1	E	294	HIS
1	F	86	HIS

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

42 monosaccharides 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
2	GLC	G	1	2	11,11,12	0.81	0	15,15,17	2.57	6 (40%)
2	GLC	G	2	2	11,11,12	1.15	1 (9%)	15,15,17	2.54	9 (60%)
2	GLC	G	3	2	11,11,12	1.11	0	15,15,17	2.44	7 (46%)
2	GLC	G	4	2	11,11,12	0.59	0	15,15,17	2.98	6 (40%)
2	GLC	G	5	2	11,11,12	0.76	0	15,15,17	2.52	7 (46%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	GLC	G	6	2	11,11,12	0.65	0	15,15,17	3.78	9 (60%)
2	GLC	G	7	2	11,11,12	0.68	0	15,15,17	2.49	7 (46%)
2	GLC	H	1	2	11,11,12	0.79	0	15,15,17	2.22	9 (60%)
2	GLC	H	2	2	11,11,12	1.63	1 (9%)	15,15,17	3.77	8 (53%)
2	GLC	H	3	2	11,11,12	0.94	1 (9%)	15,15,17	4.52	8 (53%)
2	GLC	H	4	2	11,11,12	0.75	0	15,15,17	2.65	10 (66%)
2	GLC	H	5	2	11,11,12	1.26	2 (18%)	15,15,17	2.75	6 (40%)
2	GLC	H	6	2	11,11,12	0.90	1 (9%)	15,15,17	3.70	9 (60%)
2	GLC	H	7	2	11,11,12	0.87	0	15,15,17	2.37	5 (33%)
2	GLC	I	1	2	11,11,12	1.30	1 (9%)	15,15,17	2.13	7 (46%)
2	GLC	I	2	2	11,11,12	1.81	1 (9%)	15,15,17	2.99	10 (66%)
2	GLC	I	3	2	11,11,12	1.68	2 (18%)	15,15,17	3.58	9 (60%)
2	GLC	I	4	2	11,11,12	0.77	0	15,15,17	3.03	8 (53%)
2	GLC	I	5	2	11,11,12	0.85	1 (9%)	15,15,17	2.10	6 (40%)
2	GLC	I	6	2	11,11,12	0.79	0	15,15,17	2.50	6 (40%)
2	GLC	I	7	2	11,11,12	0.91	0	15,15,17	2.76	6 (40%)
2	GLC	J	1	2	11,11,12	0.73	0	15,15,17	1.91	4 (26%)
2	GLC	J	2	2	11,11,12	0.91	0	15,15,17	2.90	7 (46%)
2	GLC	J	3	2	11,11,12	1.08	1 (9%)	15,15,17	3.15	9 (60%)
2	GLC	J	4	2	11,11,12	0.52	0	15,15,17	2.54	8 (53%)
2	GLC	J	5	2	11,11,12	0.57	0	15,15,17	1.80	6 (40%)
2	GLC	J	6	2	11,11,12	0.90	0	15,15,17	2.93	5 (33%)
2	GLC	J	7	2	11,11,12	0.59	0	15,15,17	2.92	5 (33%)
2	GLC	K	1	2	11,11,12	0.74	0	15,15,17	2.04	6 (40%)
2	GLC	K	2	2	11,11,12	1.00	0	15,15,17	2.48	5 (33%)
2	GLC	K	3	2	11,11,12	1.28	2 (18%)	15,15,17	3.35	11 (73%)
2	GLC	K	4	2	11,11,12	1.42	1 (9%)	15,15,17	3.38	8 (53%)
2	GLC	K	5	2	11,11,12	0.82	0	15,15,17	4.26	10 (66%)
2	GLC	K	6	2	11,11,12	0.84	0	15,15,17	2.80	9 (60%)
2	GLC	K	7	2	11,11,12	1.37	1 (9%)	15,15,17	3.68	6 (40%)
2	GLC	L	1	2	11,11,12	1.12	2 (18%)	15,15,17	2.94	8 (53%)
2	GLC	L	2	2	11,11,12	0.74	0	15,15,17	2.39	8 (53%)
2	GLC	L	3	2	11,11,12	0.59	0	15,15,17	1.75	5 (33%)
2	GLC	L	4	2	11,11,12	0.57	0	15,15,17	2.18	5 (33%)
2	GLC	L	5	2	11,11,12	0.63	0	15,15,17	2.39	9 (60%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	GLC	L	6	2	11,11,12	0.62	0	15,15,17	3.49	8 (53%)
2	GLC	L	7	2	11,11,12	0.88	1 (9%)	15,15,17	4.07	11 (73%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	GLC	G	1	2	1/1/4/5	2/2/19/22	0/1/1/1
2	GLC	G	2	2	-	1/2/19/22	0/1/1/1
2	GLC	G	3	2	-	0/2/19/22	0/1/1/1
2	GLC	G	4	2	-	2/2/19/22	0/1/1/1
2	GLC	G	5	2	-	2/2/19/22	0/1/1/1
2	GLC	G	6	2	-	1/2/19/22	0/1/1/1
2	GLC	G	7	2	1/1/4/5	2/2/19/22	0/1/1/1
2	GLC	H	1	2	1/1/4/5	1/2/19/22	0/1/1/1
2	GLC	H	2	2	-	2/2/19/22	0/1/1/1
2	GLC	H	3	2	-	2/2/19/22	0/1/1/1
2	GLC	H	4	2	-	2/2/19/22	0/1/1/1
2	GLC	H	5	2	-	0/2/19/22	0/1/1/1
2	GLC	H	6	2	-	0/2/19/22	0/1/1/1
2	GLC	H	7	2	1/1/4/5	2/2/19/22	0/1/1/1
2	GLC	I	1	2	1/1/4/5	2/2/19/22	0/1/1/1
2	GLC	I	2	2	-	1/2/19/22	0/1/1/1
2	GLC	I	3	2	-	0/2/19/22	0/1/1/1
2	GLC	I	4	2	-	1/2/19/22	0/1/1/1
2	GLC	I	5	2	-	0/2/19/22	0/1/1/1
2	GLC	I	6	2	-	1/2/19/22	0/1/1/1
2	GLC	I	7	2	1/1/4/5	0/2/19/22	0/1/1/1
2	GLC	J	1	2	-	0/2/19/22	0/1/1/1
2	GLC	J	2	2	-	2/2/19/22	0/1/1/1
2	GLC	J	3	2	-	0/2/19/22	0/1/1/1
2	GLC	J	4	2	-	1/2/19/22	0/1/1/1
2	GLC	J	5	2	-	2/2/19/22	0/1/1/1
2	GLC	J	6	2	-	1/2/19/22	0/1/1/1
2	GLC	J	7	2	1/1/4/5	1/2/19/22	0/1/1/1
2	GLC	K	1	2	1/1/4/5	2/2/19/22	0/1/1/1
2	GLC	K	2	2	-	1/2/19/22	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	GLC	K	3	2	-	2/2/19/22	0/1/1/1
2	GLC	K	4	2	1/1/4/5	1/2/19/22	0/1/1/1
2	GLC	K	5	2	-	2/2/19/22	0/1/1/1
2	GLC	K	6	2	-	2/2/19/22	0/1/1/1
2	GLC	K	7	2	1/1/4/5	0/2/19/22	0/1/1/1
2	GLC	L	1	2	-	2/2/19/22	0/1/1/1
2	GLC	L	2	2	-	2/2/19/22	0/1/1/1
2	GLC	L	3	2	-	0/2/19/22	0/1/1/1
2	GLC	L	4	2	1/1/4/5	0/2/19/22	0/1/1/1
2	GLC	L	5	2	-	2/2/19/22	0/1/1/1
2	GLC	L	6	2	1/1/4/5	0/2/19/22	1/1/1/1
2	GLC	L	7	2	-	0/2/19/22	0/1/1/1

The worst 5 of 19 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	I	2	GLC	O5-C1	5.13	1.51	1.43
2	H	2	GLC	O5-C1	4.84	1.51	1.43
2	I	3	GLC	C2-C3	4.05	1.58	1.52
2	K	7	GLC	C2-C3	3.08	1.57	1.52
2	K	3	GLC	O5-C5	2.69	1.48	1.43

The worst 5 of 311 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	L	7	GLC	C3-C4-C5	-9.98	92.44	110.24
2	G	6	GLC	C3-C4-C5	-9.49	93.32	110.24
2	K	4	GLC	O5-C5-C4	-9.47	87.79	110.83
2	H	3	GLC	C1-C2-C3	-9.27	98.28	109.67
2	L	1	GLC	O5-C5-C6	-8.95	93.17	107.20

5 of 12 chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
2	G	1	GLC	C1
2	G	7	GLC	C1
2	H	1	GLC	C1
2	H	7	GLC	C1
2	I	1	GLC	C1

5 of 47 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	H	7	GLC	C4-C5-C6-O6
2	K	3	GLC	O5-C5-C6-O6
2	L	2	GLC	O5-C5-C6-O6
2	H	7	GLC	O5-C5-C6-O6
2	I	1	GLC	C4-C5-C6-O6

All (1) ring outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	L	6	GLC	C1-C2-C3-C4-C5-O5

33 monomers are involved in 90 short contacts:

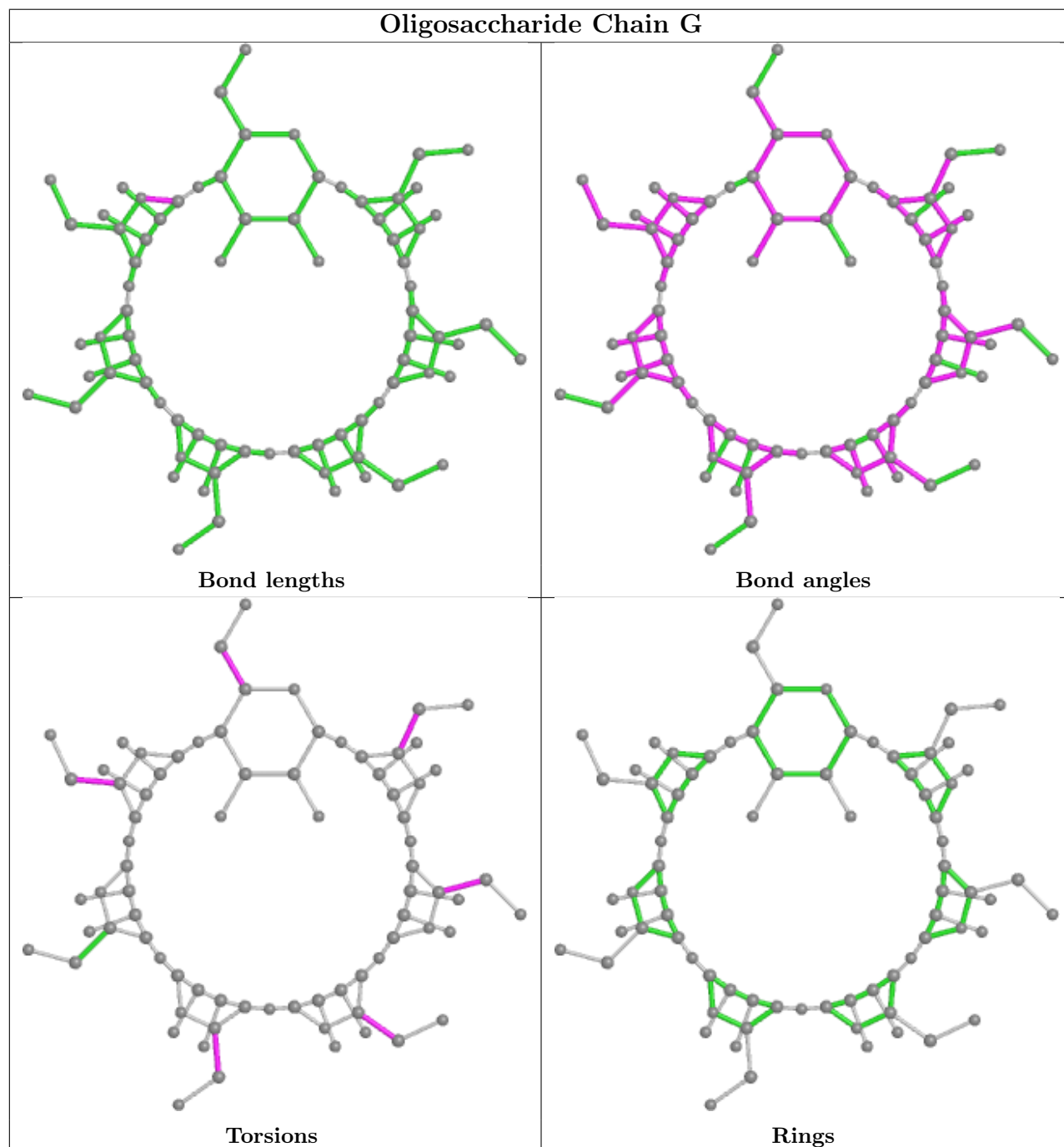
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	L	1	GLC	1	0
2	H	2	GLC	7	0
2	K	6	GLC	10	0
2	L	2	GLC	1	0
2	H	6	GLC	4	0
2	K	5	GLC	5	0
2	I	3	GLC	4	0
2	G	6	GLC	2	0
2	J	7	GLC	2	0
2	K	7	GLC	10	0
2	K	2	GLC	3	0
2	I	2	GLC	6	0
2	H	1	GLC	8	0
2	J	1	GLC	4	0
2	H	5	GLC	7	0
2	J	3	GLC	4	0
2	G	7	GLC	2	0
2	K	3	GLC	3	0
2	G	1	GLC	2	0
2	J	6	GLC	2	0
2	G	3	GLC	7	0
2	G	5	GLC	3	0
2	H	4	GLC	2	0
2	G	2	GLC	7	0
2	I	7	GLC	7	0
2	I	1	GLC	6	0
2	G	4	GLC	2	0
2	I	5	GLC	4	0
2	I	6	GLC	8	0

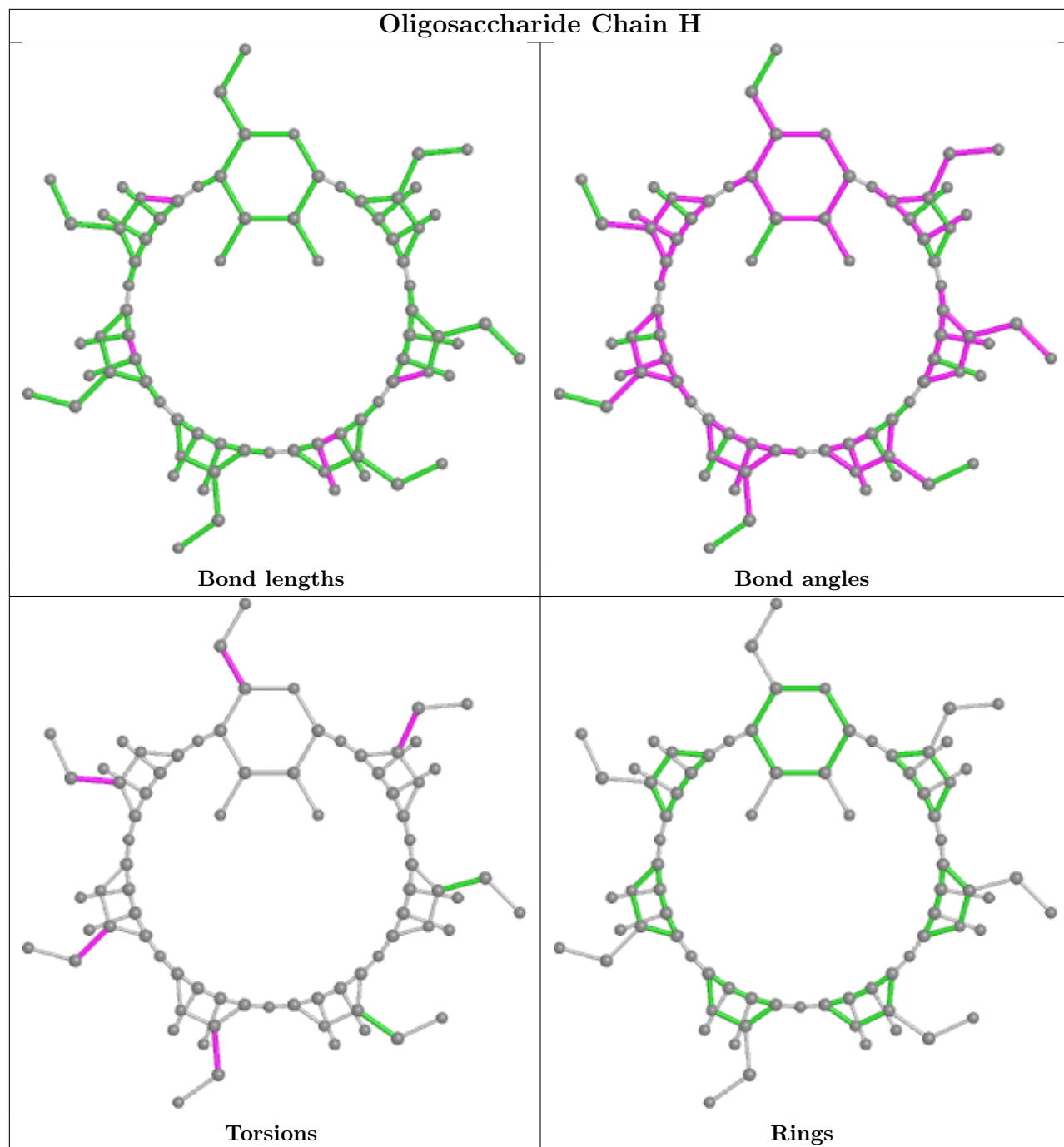
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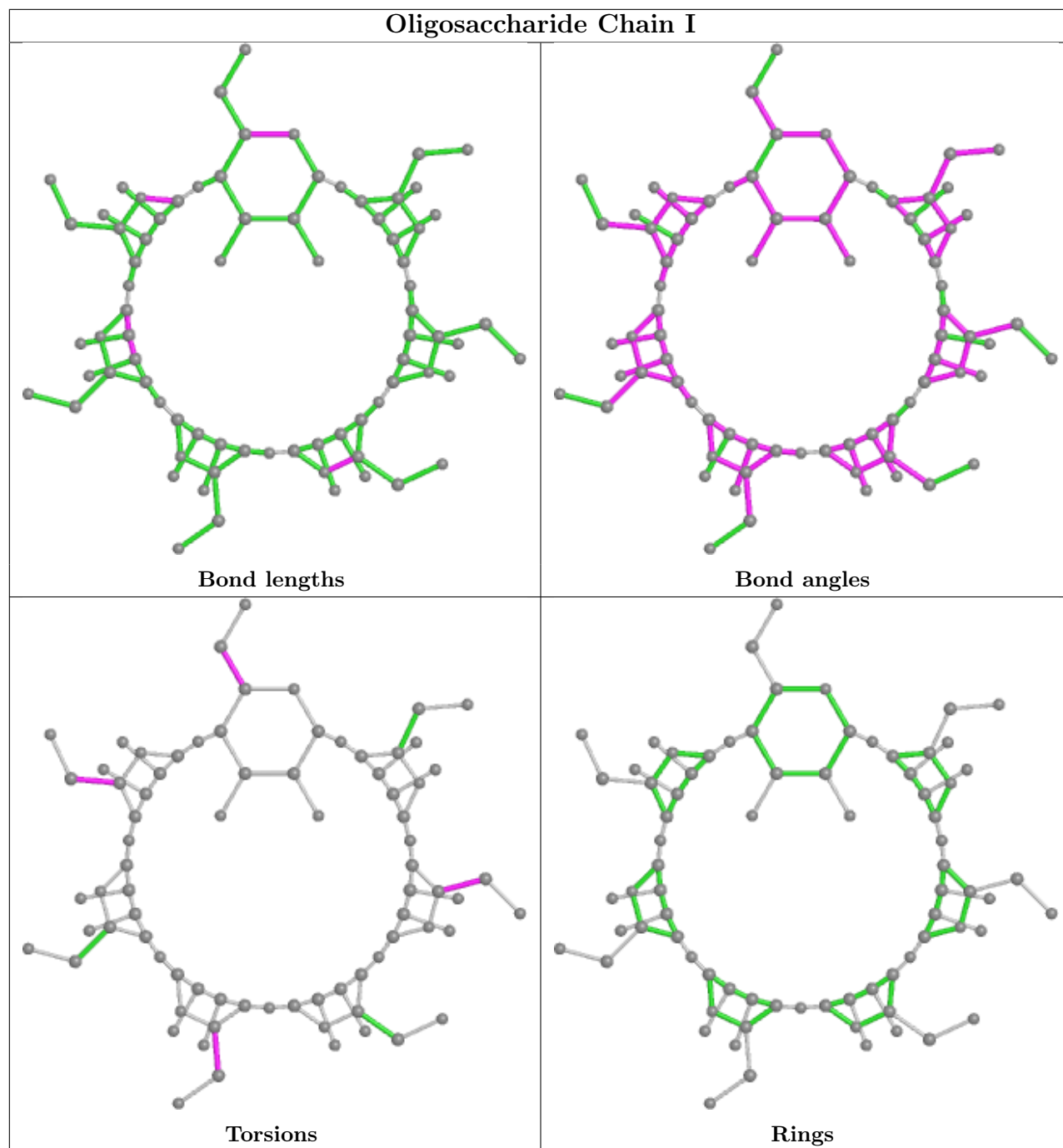
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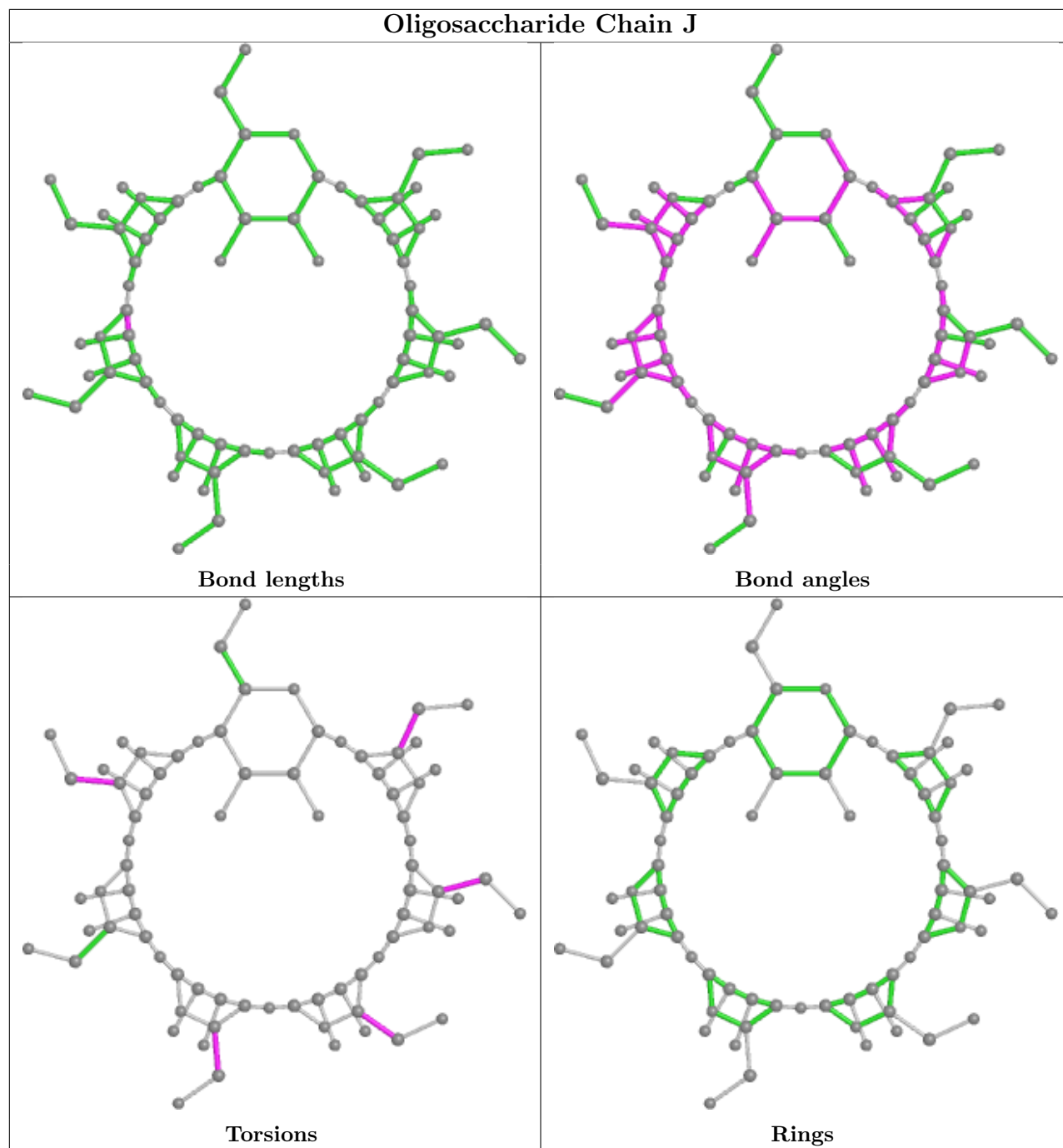
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	H	3	GLC	3	0
2	H	7	GLC	7	0
2	J	4	GLC	4	0
2	K	1	GLC	11	0

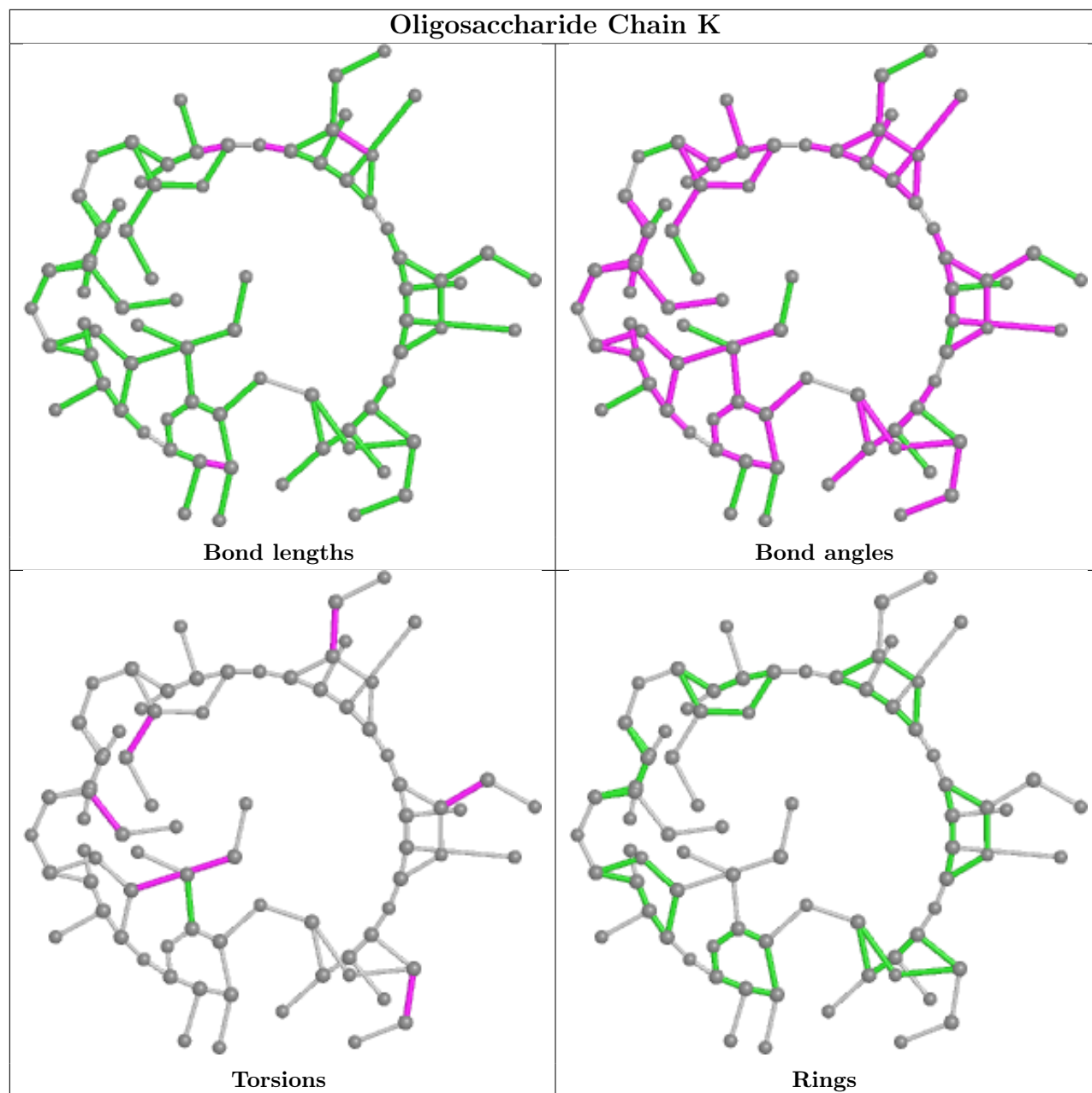
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.

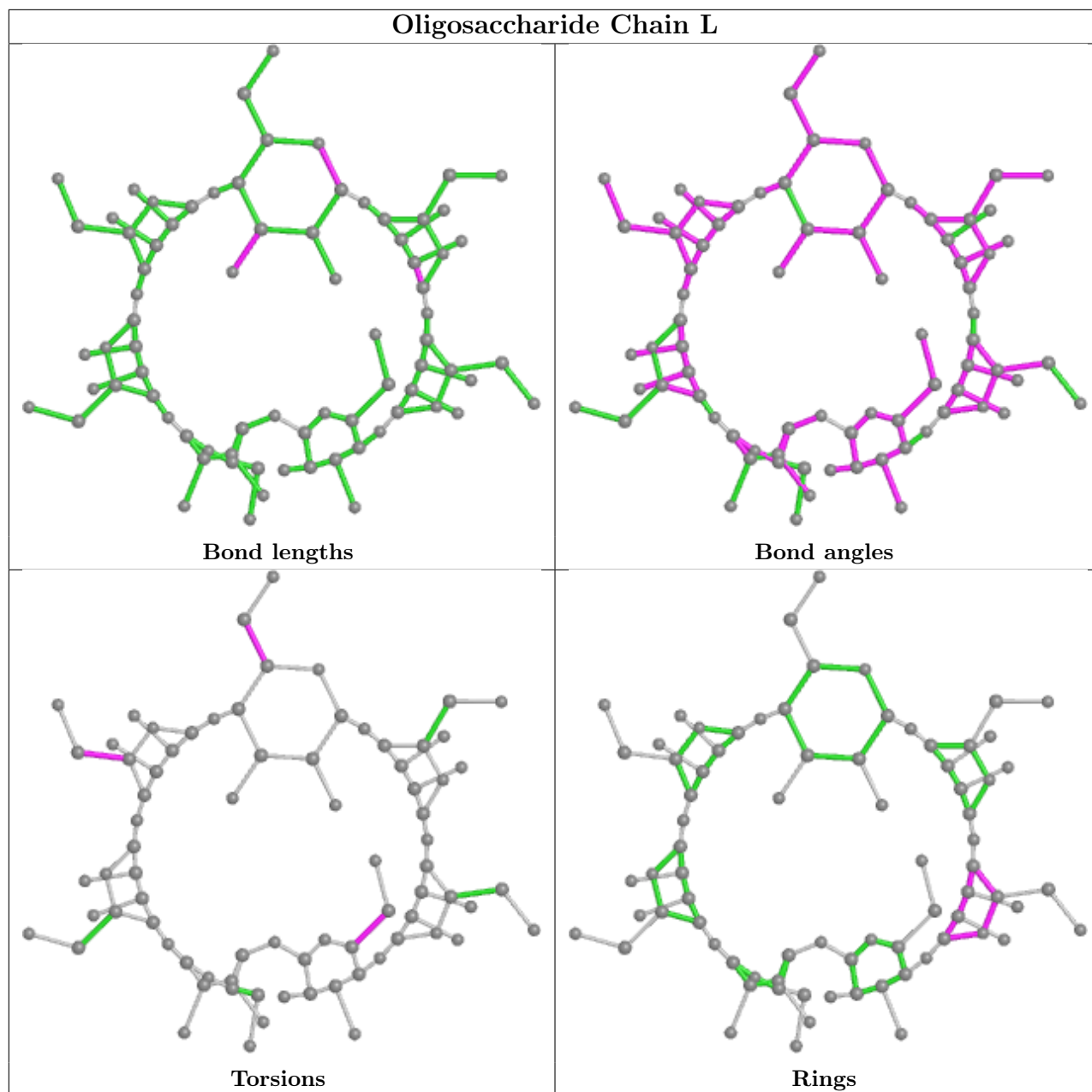












5.6 Ligand geometry [i](#)

29 ligands 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
4	SO4	C	1405	-	4,4,4	0.70	0	6,6,6	0.57	0
3	HEM	A	1402	1,5	41,50,50	2.17	9 (21%)	45,82,82	2.15	16 (35%)
4	SO4	F	1405	-	4,4,4	0.84	0	6,6,6	0.72	0
4	SO4	A	1404	-	4,4,4	0.66	0	6,6,6	1.12	0
4	SO4	A	1405	-	4,4,4	0.57	0	6,6,6	0.80	0
5	EDO	D	1407	3	3,3,3	1.18	0	2,2,2	0.86	0
4	SO4	E	1406	1	4,4,4	0.48	0	6,6,6	0.66	0
5	EDO	E	1407	3	3,3,3	1.41	0	2,2,2	0.93	0
3	HEM	C	1402	1,5	41,50,50	2.10	10 (24%)	45,82,82	2.07	12 (26%)
4	SO4	D	1405	-	4,4,4	0.92	0	6,6,6	0.57	0
4	SO4	E	1405	-	4,4,4	0.76	0	6,6,6	0.52	0
4	SO4	B	1406	-	4,4,4	0.68	0	6,6,6	0.73	0
4	SO4	C	1406	-	4,4,4	0.53	0	6,6,6	0.85	0
4	SO4	F	1404	-	4,4,4	0.65	0	6,6,6	0.61	0
4	SO4	D	1406	-	4,4,4	0.74	0	6,6,6	1.08	0
3	HEM	E	1402	1,5	41,50,50	2.23	12 (29%)	45,82,82	1.87	13 (28%)
3	HEM	F	1402	1,5	41,50,50	2.04	10 (24%)	45,82,82	1.78	10 (22%)
5	EDO	A	1406	3	3,3,3	1.36	0	2,2,2	0.97	0
4	SO4	B	1407	-	4,4,4	0.53	0	6,6,6	0.64	0
4	SO4	B	1408	-	4,4,4	0.69	0	6,6,6	0.88	0
5	EDO	C	1407	3	3,3,3	0.85	0	2,2,2	0.11	0
4	SO4	F	1406	-	4,4,4	0.40	0	6,6,6	0.58	0
4	SO4	C	1404	-	4,4,4	0.67	0	6,6,6	0.91	0
5	EDO	B	1409	3	3,3,3	1.41	0	2,2,2	1.00	0
3	HEM	B	1402	1,5	41,50,50	2.21	15 (36%)	45,82,82	1.93	10 (22%)
3	HEM	D	1402	1,5	41,50,50	2.08	10 (24%)	45,82,82	1.71	11 (24%)
4	SO4	D	1404	-	4,4,4	0.73	0	6,6,6	0.61	0
5	EDO	F	1407	3	3,3,3	1.33	0	2,2,2	0.77	0
4	SO4	E	1404	-	4,4,4	0.59	0	6,6,6	0.61	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
5	EDO	C	1407	3	-	1/1/1/1	-
5	EDO	D	1407	3	-	1/1/1/1	-
3	HEM	E	1402	1,5	-	1/12/54/54	-
3	HEM	F	1402	1,5	-	1/12/54/54	-
5	EDO	E	1407	3	-	1/1/1/1	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	HEM	C	1402	1,5	-	1/12/54/54	-
3	HEM	A	1402	1,5	-	1/12/54/54	-
5	EDO	B	1409	3	-	1/1/1/1	-
3	HEM	B	1402	1,5	-	0/12/54/54	-
5	EDO	A	1406	3	-	1/1/1/1	-
3	HEM	D	1402	1,5	-	1/12/54/54	-
5	EDO	F	1407	3	-	1/1/1/1	-

The worst 5 of 66 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	1402	HEM	C3D-C2D	8.34	1.54	1.36
3	E	1402	HEM	C3D-C2D	8.22	1.54	1.36
3	C	1402	HEM	C3D-C2D	8.05	1.53	1.36
3	F	1402	HEM	C3D-C2D	7.42	1.52	1.36
3	B	1402	HEM	C3D-C2D	7.34	1.52	1.36

The worst 5 of 72 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	C	1402	HEM	C4D-ND-C1D	8.05	113.39	105.07
3	A	1402	HEM	C4D-ND-C1D	6.29	111.57	105.07
3	E	1402	HEM	C4D-ND-C1D	5.97	111.24	105.07
3	F	1402	HEM	C4D-ND-C1D	5.69	110.95	105.07
3	A	1402	HEM	C4C-CHD-C1D	5.48	129.79	122.56

There are no chirality outliers.

5 of 11 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	B	1409	EDO	O1-C1-C2-O2
5	D	1407	EDO	O1-C1-C2-O2
5	A	1406	EDO	O1-C1-C2-O2
5	F	1407	EDO	O1-C1-C2-O2
3	D	1402	HEM	C2A-CAA-CBA-CGA

There are no ring outliers.

14 monomers are involved in 72 short contacts:

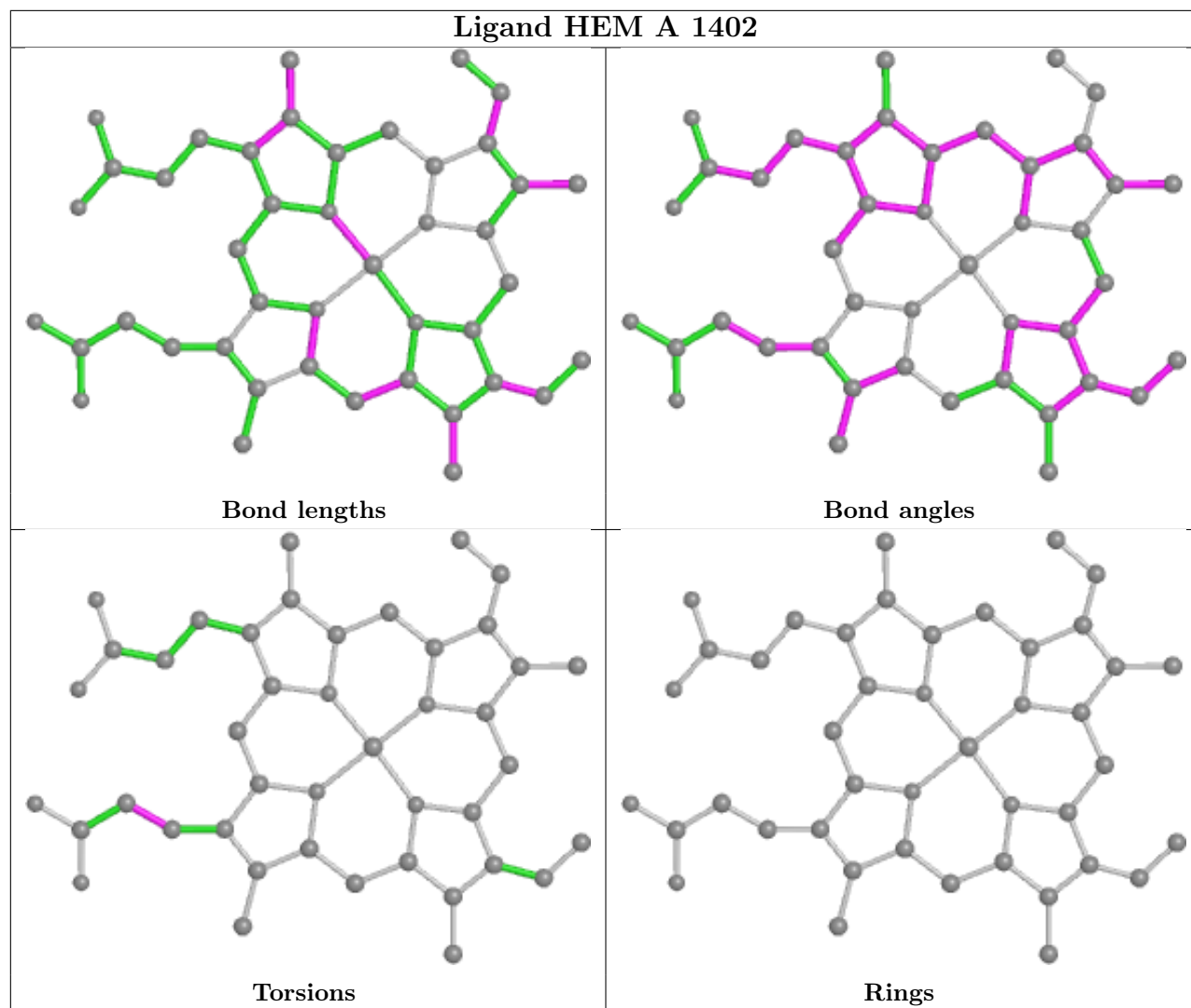
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	1402	HEM	6	0

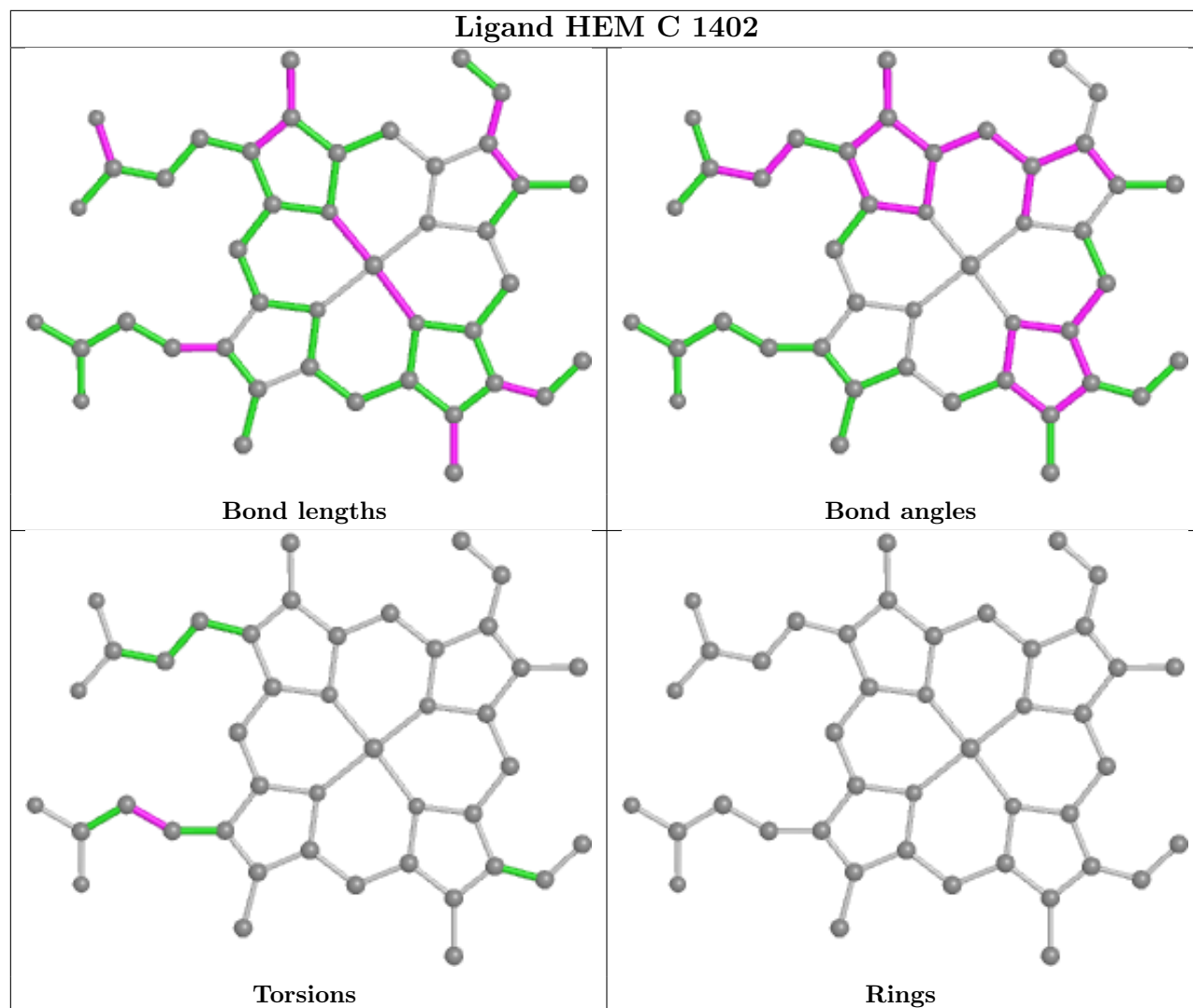
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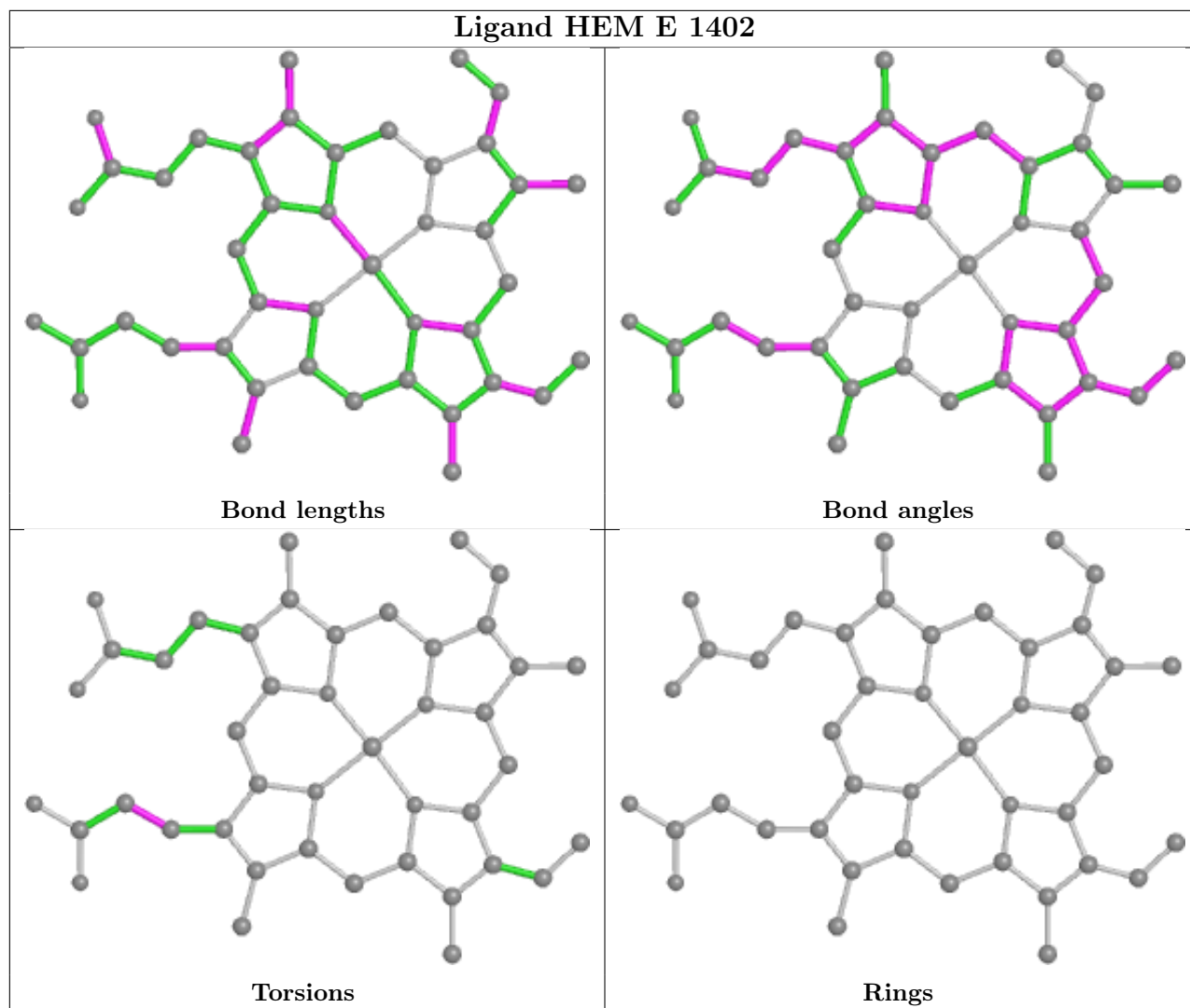
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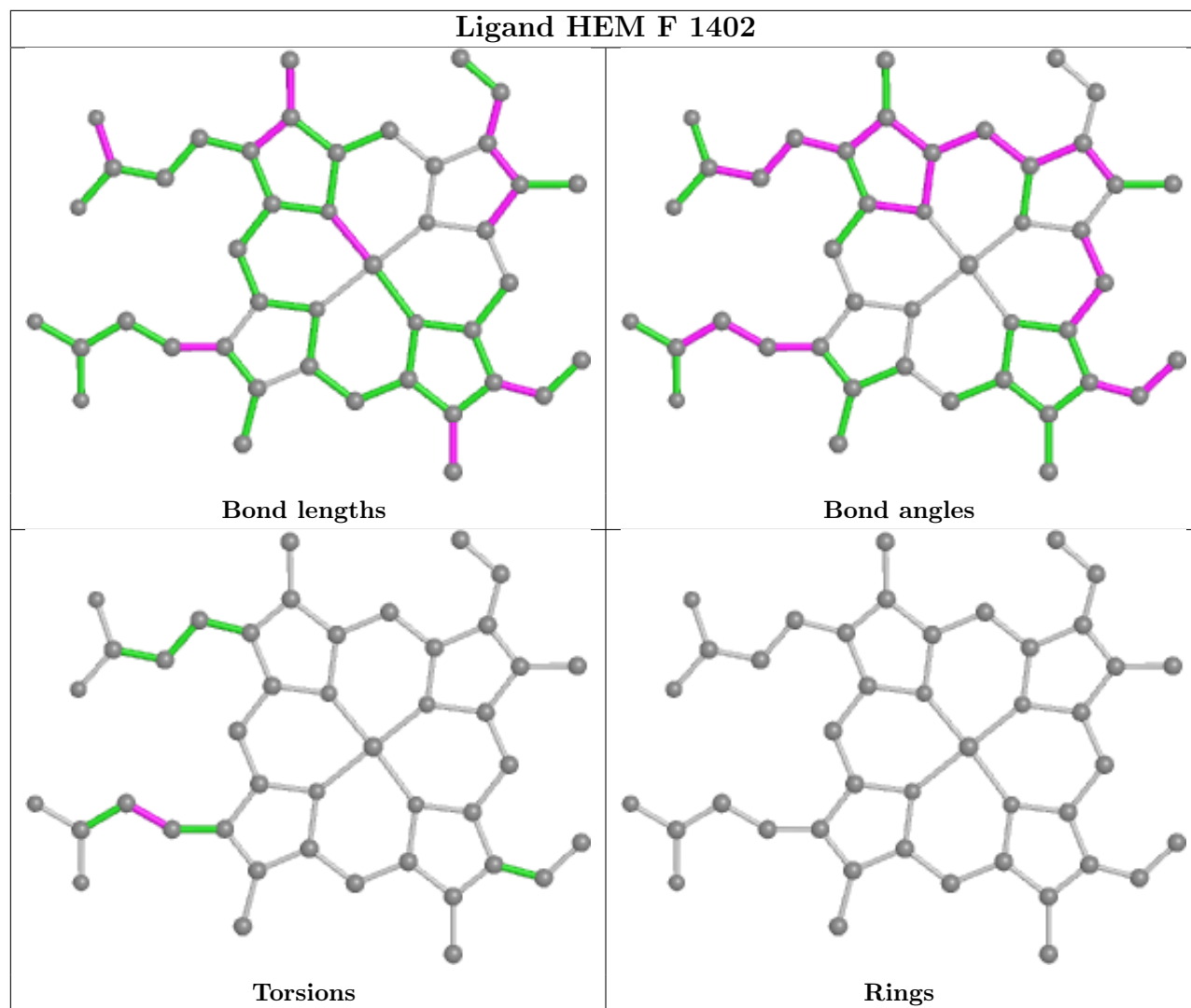
Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	A	1404	SO4	8	0
4	E	1406	SO4	5	0
3	C	1402	HEM	5	0
4	C	1406	SO4	3	0
4	D	1406	SO4	5	0
3	E	1402	HEM	6	0
3	F	1402	HEM	10	0
4	B	1408	SO4	5	0
5	C	1407	EDO	1	0
4	F	1406	SO4	5	0
5	B	1409	EDO	1	0
3	B	1402	HEM	6	0
3	D	1402	HEM	6	0

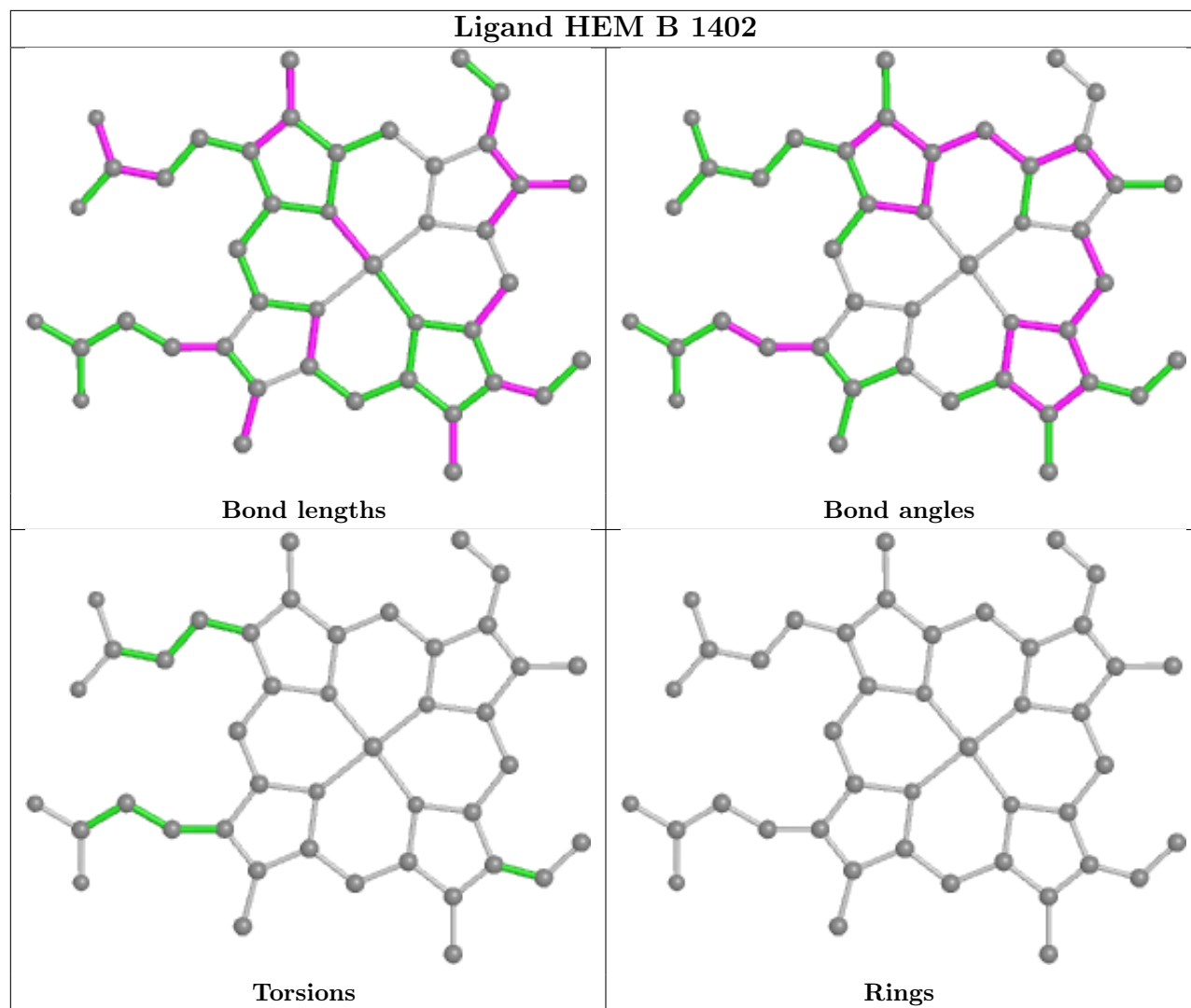
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

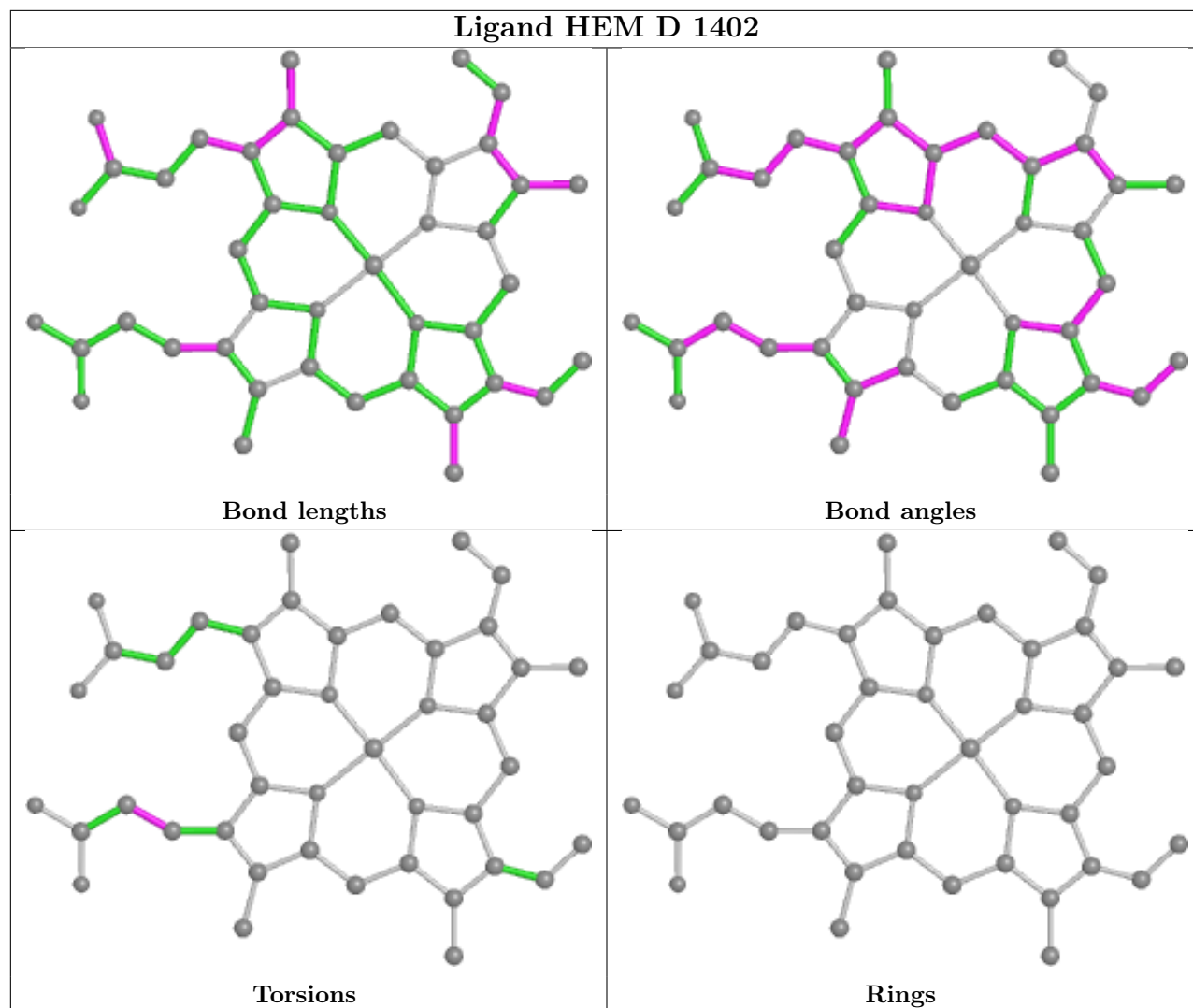












5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data [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	402/407 (98%)	-0.33	8 (1%) 65 71	12, 22, 44, 60	0
1	B	404/407 (99%)	-0.32	6 (1%) 73 79	12, 22, 44, 64	0
1	C	402/407 (98%)	-0.30	7 (1%) 70 75	12, 22, 43, 56	0
1	D	402/407 (98%)	-0.28	6 (1%) 73 79	12, 22, 43, 61	0
1	E	402/407 (98%)	-0.31	8 (1%) 65 71	12, 22, 43, 56	0
1	F	402/407 (98%)	-0.30	8 (1%) 65 71	12, 22, 44, 55	0
All	All	2414/2442 (98%)	-0.31	43 (1%) 68 74	12, 22, 44, 64	0

The worst 5 of 43 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	E	165	GLY	5.4
1	F	170	VAL	4.7
1	C	170	VAL	4.3
1	D	167	SER	4.2
1	B	165	GLY	4.1

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

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

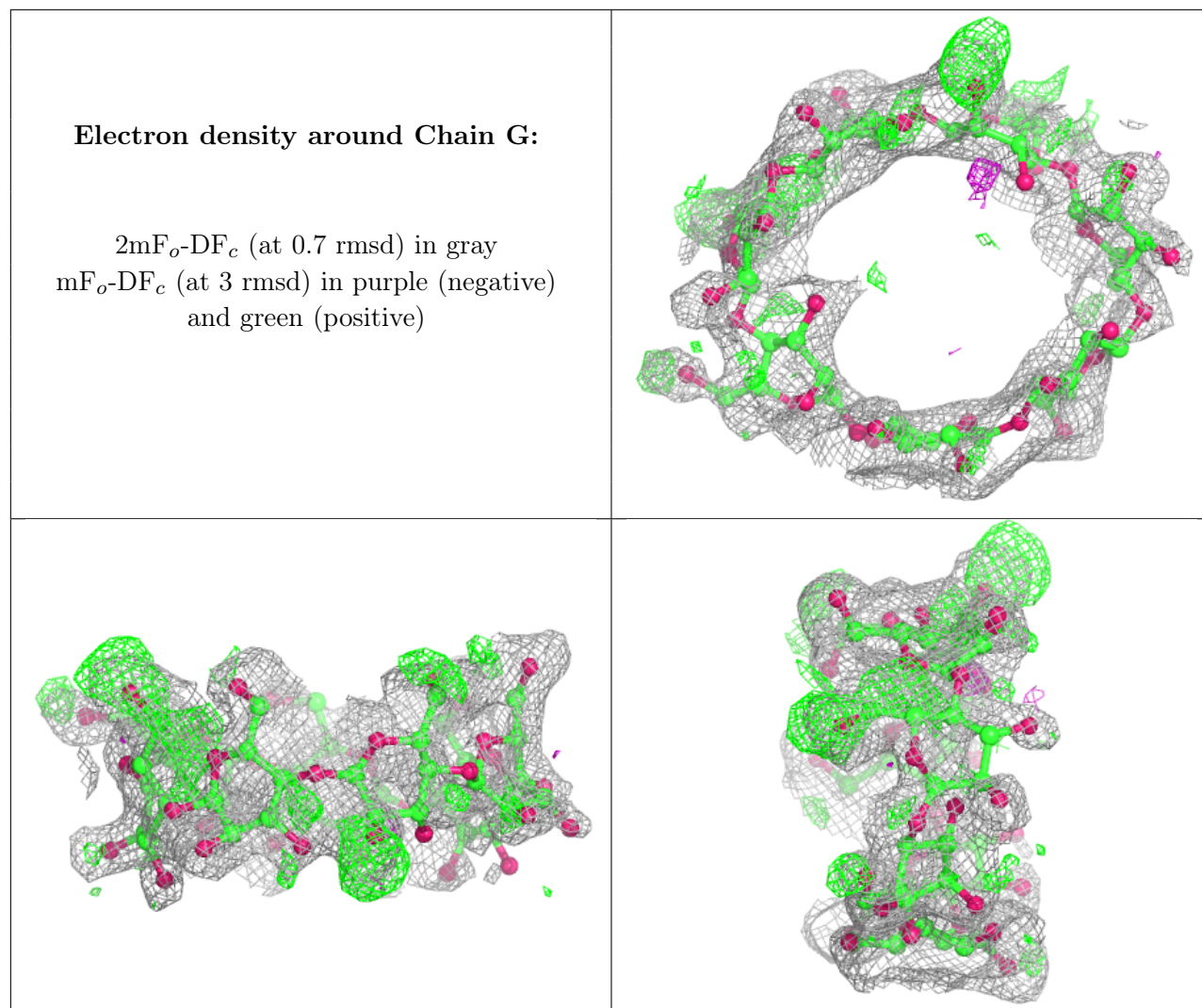
6.3 Carbohydrates [i](#)

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(\AA^2)	Q<0.9
2	GLC	H	3	11/12	0.80	0.18	21,36,41,43	11
2	GLC	G	5	11/12	0.85	0.20	38,41,45,49	11
2	GLC	G	3	11/12	0.85	0.22	21,38,44,45	11
2	GLC	I	3	11/12	0.86	0.16	22,32,39,40	11
2	GLC	I	2	11/12	0.87	0.15	24,34,37,42	11
2	GLC	H	2	11/12	0.87	0.18	24,33,35,39	11
2	GLC	K	4	11/12	0.87	0.19	25,36,39,39	11
2	GLC	J	1	11/12	0.88	0.15	34,39,42,42	11
2	GLC	G	6	11/12	0.88	0.15	33,39,43,43	11
2	GLC	G	2	11/12	0.89	0.15	30,37,40,44	11
2	GLC	K	7	11/12	0.89	0.13	35,38,42,43	11
2	GLC	L	5	11/12	0.89	0.14	33,40,44,45	11
2	GLC	I	6	11/12	0.90	0.13	33,39,42,44	11
2	GLC	G	7	11/12	0.90	0.16	36,40,43,46	11
2	GLC	J	2	11/12	0.90	0.14	24,34,38,40	11
2	GLC	J	7	11/12	0.91	0.18	33,42,44,44	11
2	GLC	H	5	11/12	0.91	0.17	36,38,40,41	11
2	GLC	H	6	11/12	0.91	0.13	36,39,45,45	11
2	GLC	L	2	11/12	0.91	0.17	35,39,40,44	11
2	GLC	L	4	11/12	0.91	0.15	38,44,45,48	11
2	GLC	I	4	11/12	0.91	0.14	30,34,37,40	11
2	GLC	L	7	11/12	0.91	0.15	32,35,37,39	11
2	GLC	J	3	11/12	0.92	0.16	32,35,37,37	11
2	GLC	L	1	11/12	0.92	0.13	32,34,38,39	11
2	GLC	I	5	11/12	0.92	0.16	40,45,46,50	11
2	GLC	L	3	11/12	0.92	0.12	38,42,44,46	11
2	GLC	K	3	11/12	0.92	0.13	35,38,40,42	11
2	GLC	G	1	11/12	0.92	0.14	37,38,41,42	11
2	GLC	L	6	11/12	0.92	0.15	26,39,40,41	11
2	GLC	K	6	11/12	0.92	0.21	37,40,41,49	11
2	GLC	K	2	11/12	0.93	0.12	36,39,42,42	11
2	GLC	H	7	11/12	0.93	0.12	34,38,42,43	11
2	GLC	J	4	11/12	0.93	0.14	37,39,42,44	11
2	GLC	H	4	11/12	0.93	0.13	34,37,40,41	11
2	GLC	J	6	11/12	0.94	0.14	36,40,42,43	11
2	GLC	G	4	11/12	0.94	0.13	34,41,46,48	11
2	GLC	K	5	11/12	0.94	0.12	28,35,37,39	11
2	GLC	J	5	11/12	0.94	0.12	38,43,47,51	11
2	GLC	I	1	11/12	0.95	0.12	32,36,38,41	11
2	GLC	K	1	11/12	0.95	0.12	33,36,39,40	11
2	GLC	H	1	11/12	0.95	0.13	34,39,45,46	11
2	GLC	I	7	11/12	0.96	0.08	32,37,39,43	11

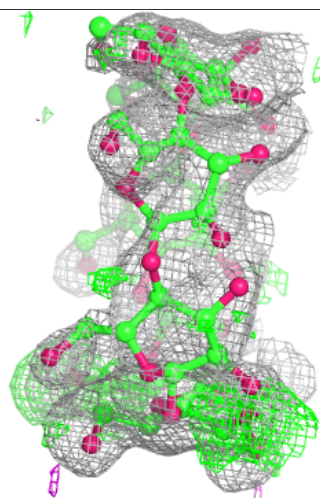
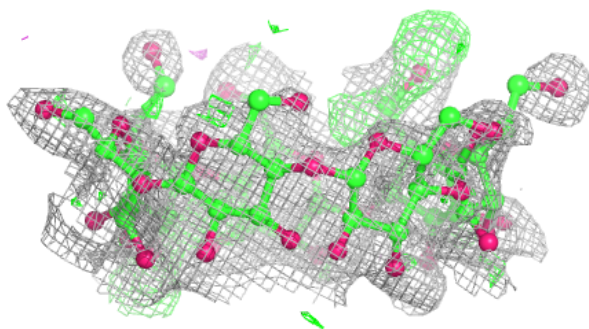
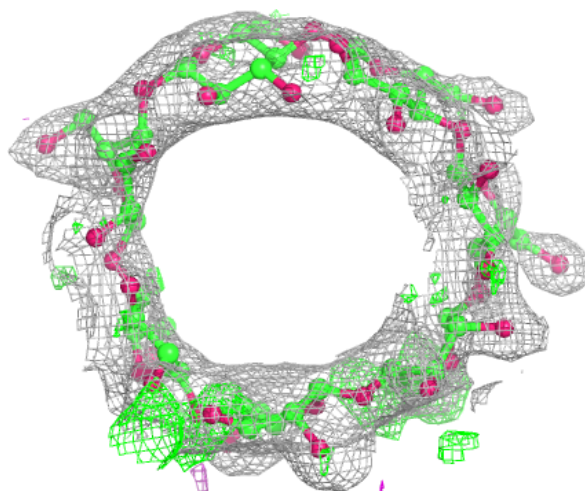
The following is a graphical depiction of the model fit to experimental electron density for oligosac-

charide. Each fit is shown from different orientation to approximate a three-dimensional view.



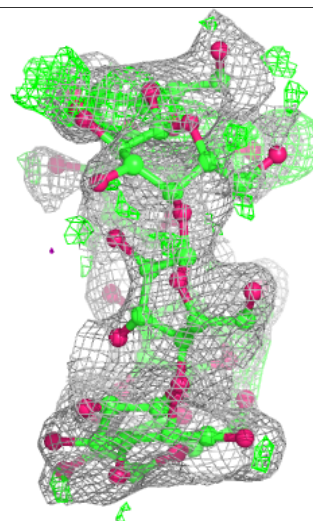
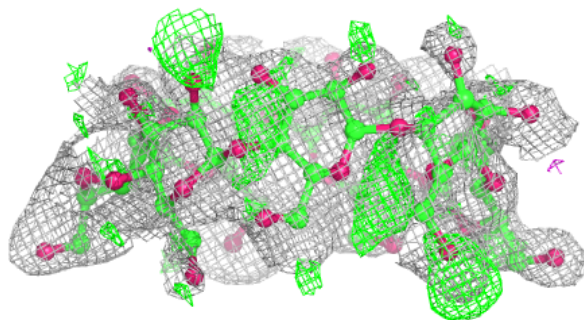
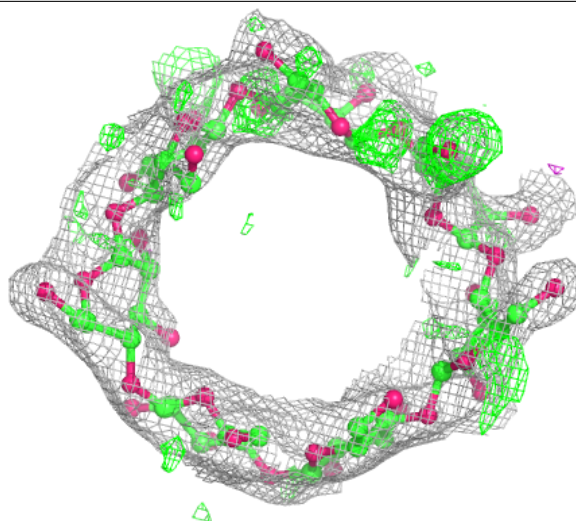
Electron density around Chain H:

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



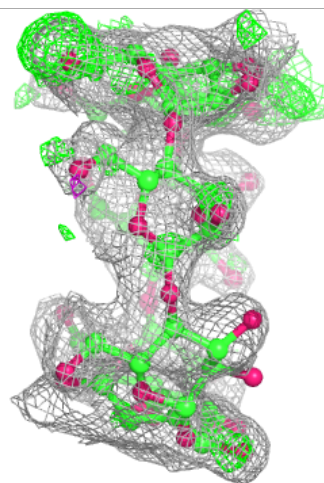
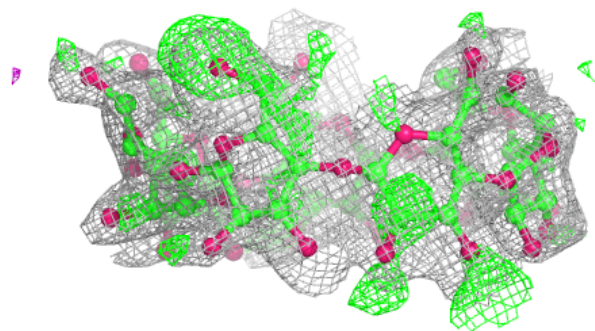
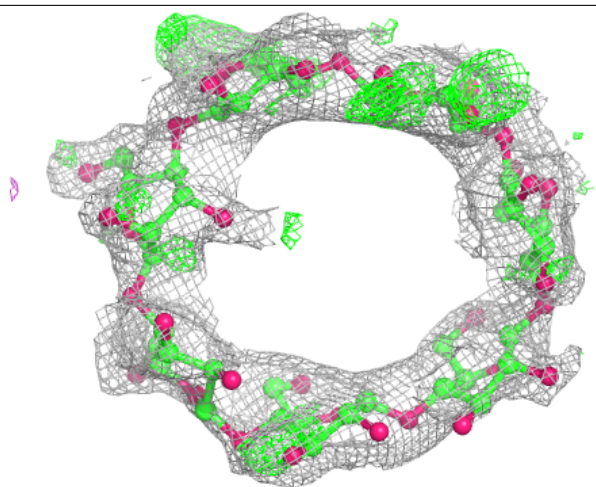
Electron density around Chain I:

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



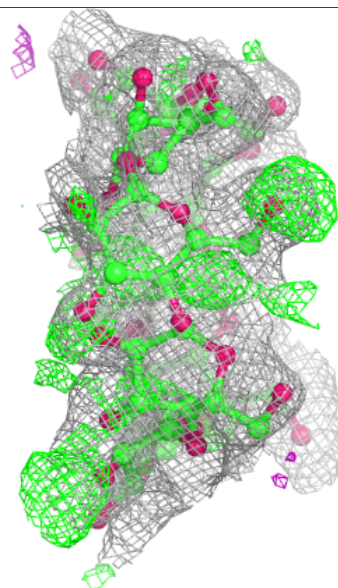
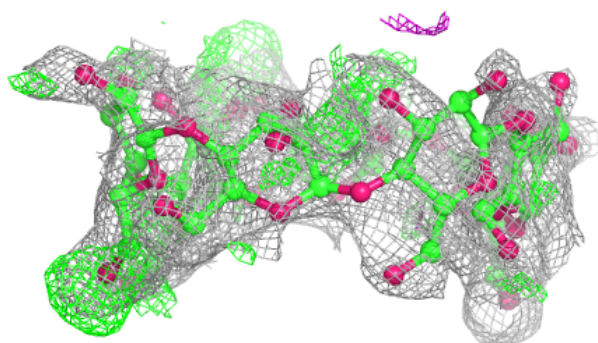
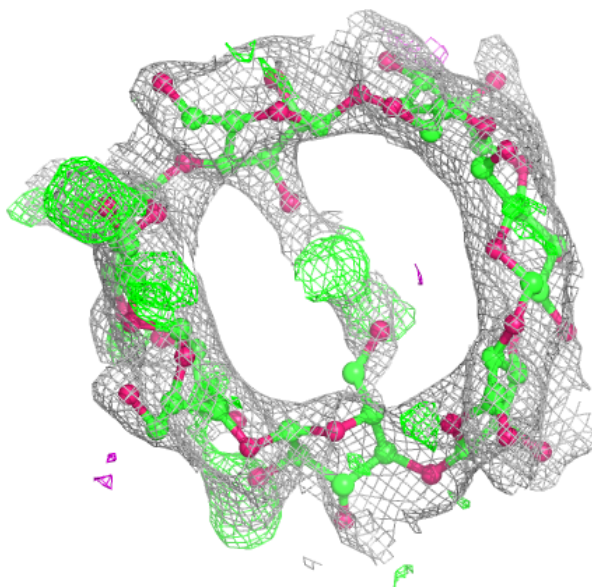
Electron density around Chain J:

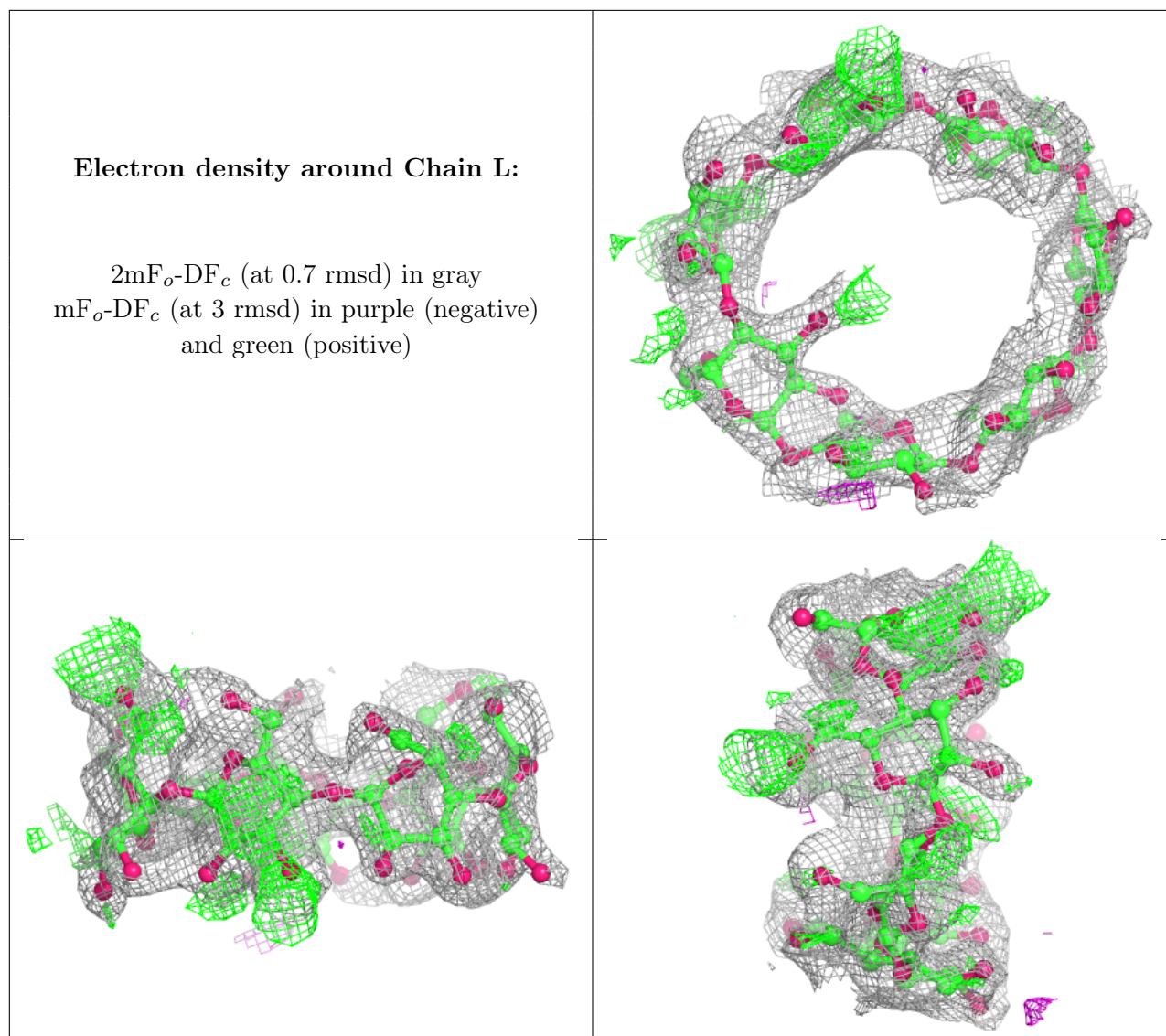
$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



Electron density around Chain K:

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





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(Å ²)	Q<0.9
5	EDO	B	1409	4/4	0.89	0.15	19,20,22,32	0
4	SO4	C	1406	5/5	0.95	0.57	32,42,45,47	0
4	SO4	D	1405	5/5	0.95	0.18	30,31,35,35	0
4	SO4	B	1408	5/5	0.95	0.50	30,43,45,49	0
5	EDO	E	1407	4/4	0.95	0.14	22,23,23,31	0
4	SO4	F	1405	5/5	0.96	0.21	33,34,36,37	0
5	EDO	A	1406	4/4	0.96	0.10	19,22,23,30	0

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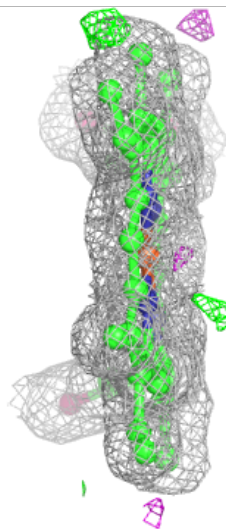
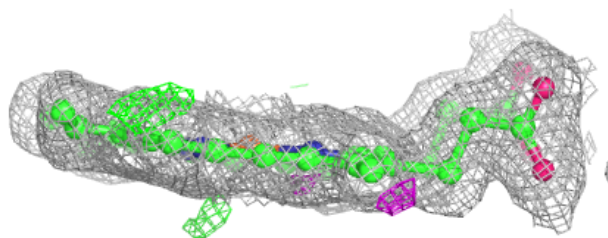
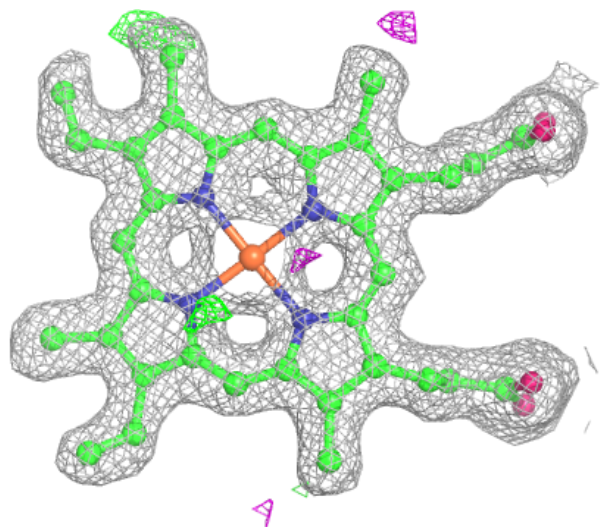
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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
4	SO4	D	1406	5/5	0.96	0.55	29,44,46,47	0
4	SO4	E	1406	5/5	0.96	0.50	29,41,44,49	0
4	SO4	B	1406	5/5	0.97	0.14	30,30,35,36	0
4	SO4	F	1406	5/5	0.97	0.54	27,41,41,48	0
4	SO4	E	1404	5/5	0.97	0.15	27,28,31,32	0
4	SO4	E	1405	5/5	0.97	0.20	34,34,35,38	0
5	EDO	D	1407	4/4	0.97	0.11	19,20,21,34	0
4	SO4	C	1405	5/5	0.97	0.17	33,33,35,36	0
5	EDO	F	1407	4/4	0.97	0.12	18,21,22,27	0
4	SO4	F	1404	5/5	0.98	0.16	25,25,31,32	0
4	SO4	A	1405	5/5	0.98	0.14	27,30,31,33	0
4	SO4	D	1404	5/5	0.98	0.14	25,26,31,31	0
3	HEM	A	1402	43/43	0.98	0.09	11,14,17,22	0
4	SO4	B	1407	5/5	0.98	0.12	23,29,30,31	0
5	EDO	C	1407	4/4	0.98	0.11	21,23,26,30	0
3	HEM	F	1402	43/43	0.98	0.09	10,14,19,28	0
4	SO4	C	1404	5/5	0.98	0.12	26,28,29,32	0
4	SO4	A	1404	5/5	0.98	0.50	27,42,43,44	0
3	HEM	B	1402	43/43	0.99	0.09	10,13,16,24	0
3	HEM	C	1402	43/43	0.99	0.09	9,14,17,24	0
3	HEM	D	1402	43/43	0.99	0.09	8,14,16,22	0
3	HEM	E	1402	43/43	0.99	0.09	9,14,17,22	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.

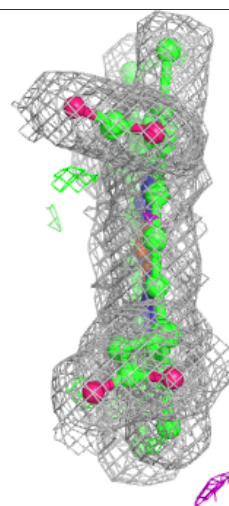
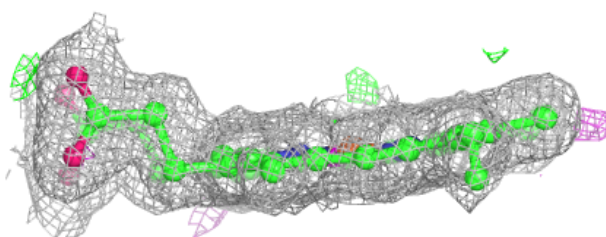
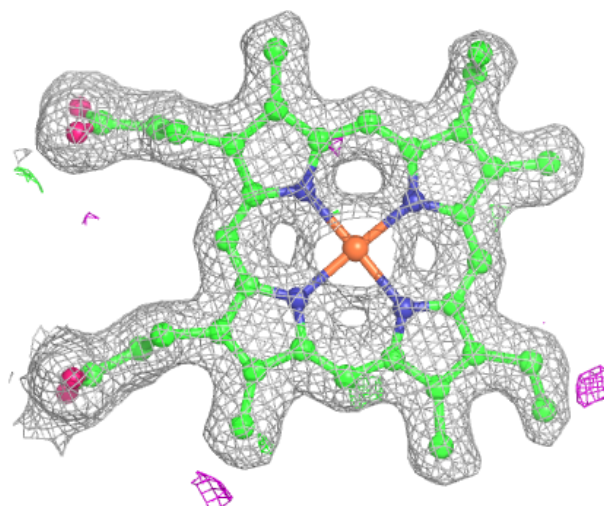
Electron density around HEM A 1402:

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



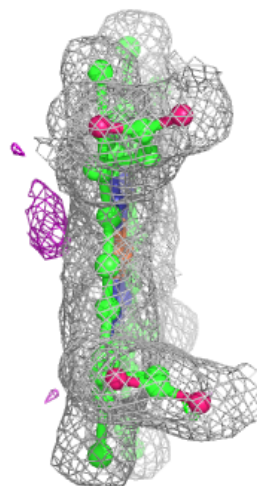
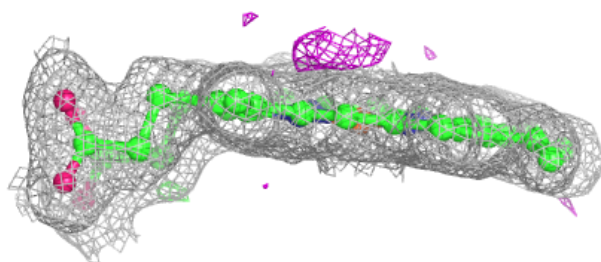
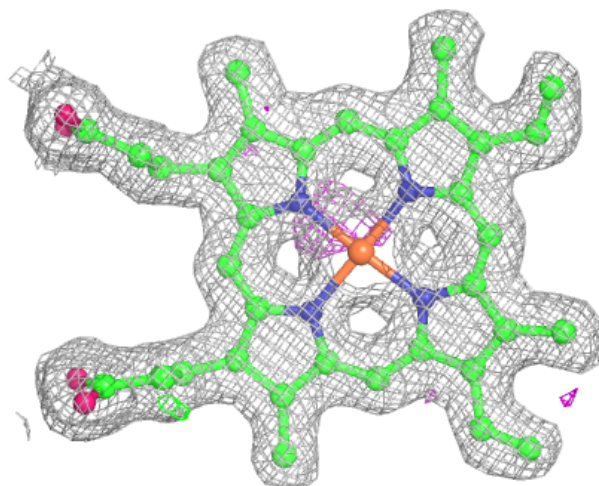
Electron density around HEM F 1402:

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



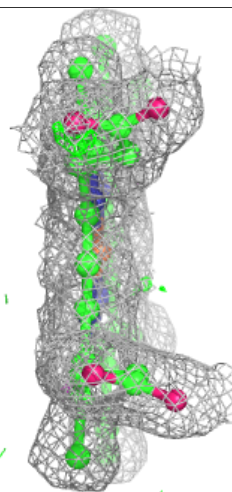
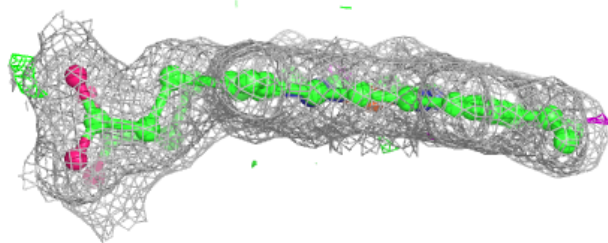
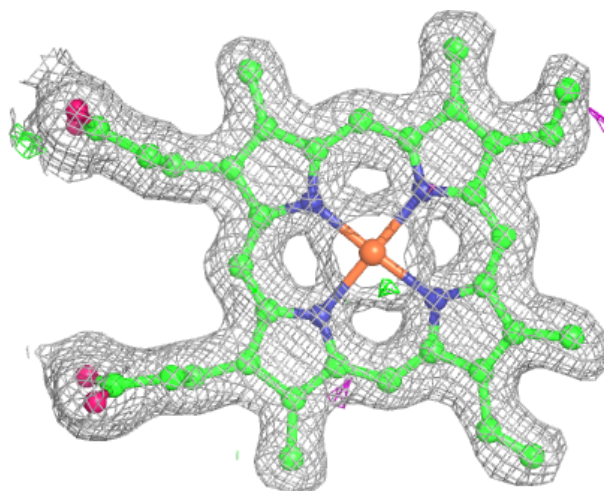
Electron density around HEM B 1402:

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



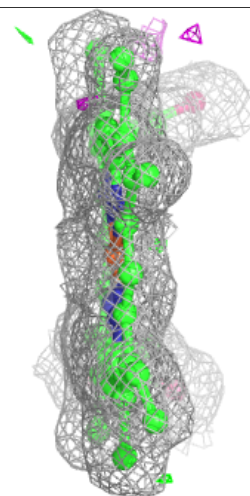
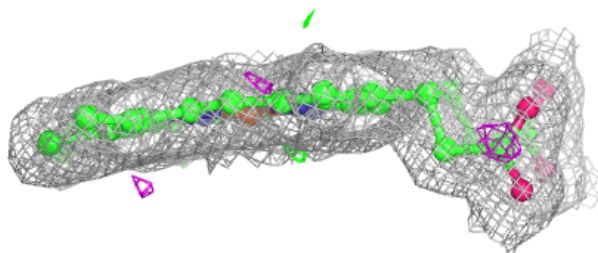
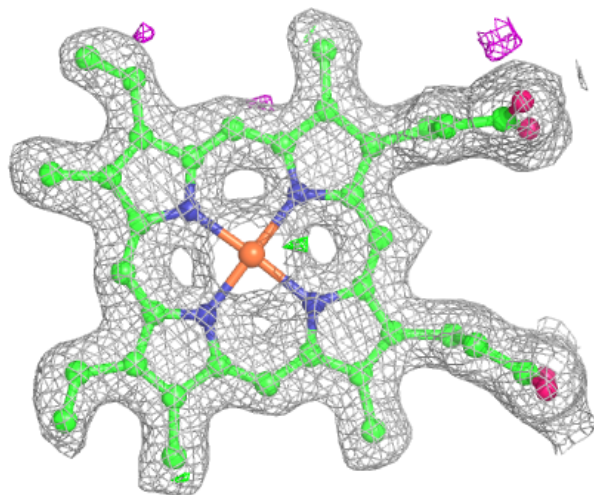
Electron density around HEM C 1402:

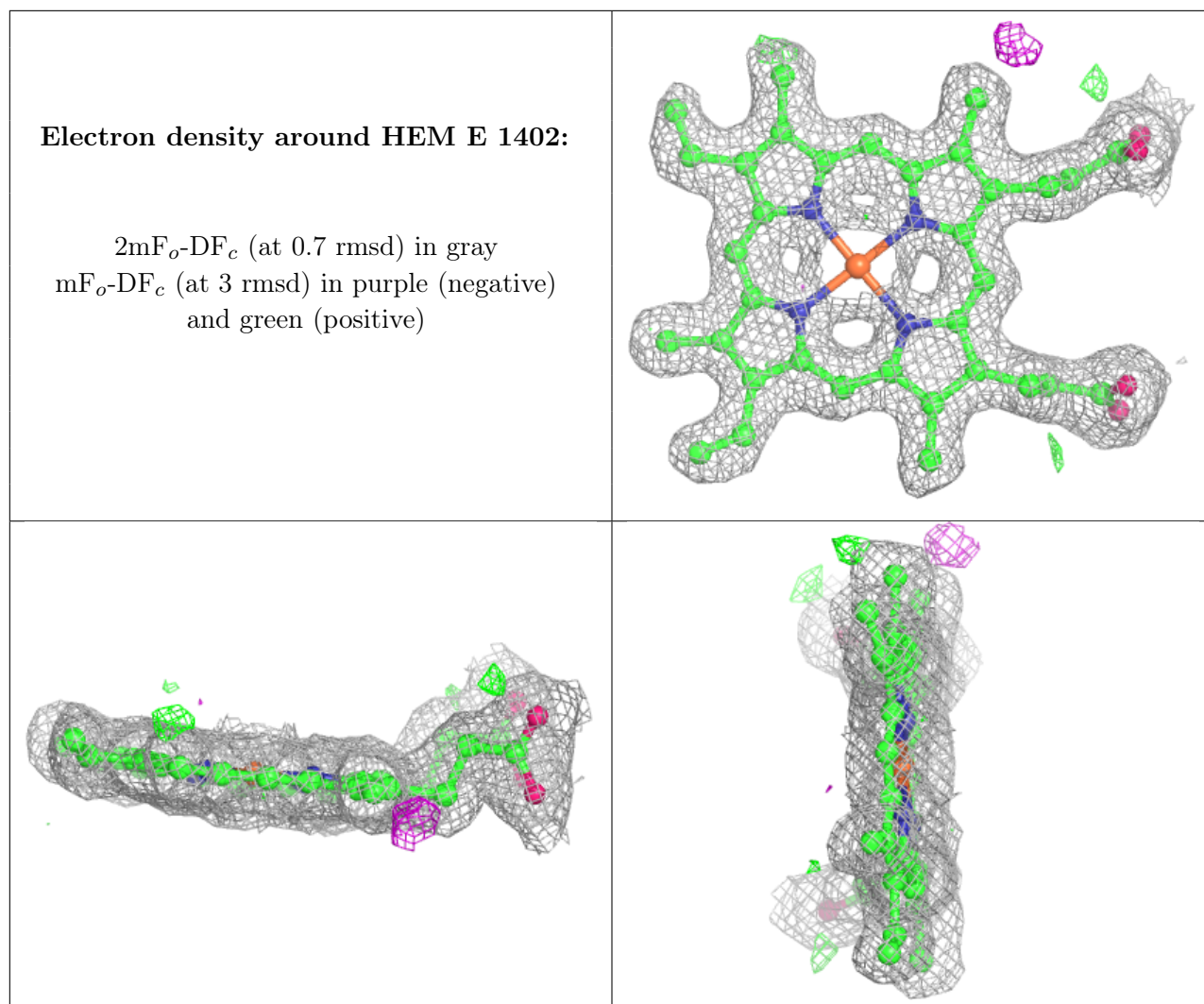
$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



Electron density around HEM D 1402:

$2mF_o-DF_c$ (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.