



# Full wwPDB X-ray Structure Validation Report ⓘ

Dec 8, 2023 – 02:15 am GMT

PDB ID : 2C1D  
Title : Crystal structure of SoxXA from *P. pantotrophus*  
Authors : Dambe, T.; Quentmeier, A.; Rother, D.; Friedrich, C.; Scheidig, A.J.  
Deposited on : 2005-09-13  
Resolution : 1.92 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at [validation@mail.wwpdb.org](mailto:validation@mail.wwpdb.org)

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

MolProbity : 4.02b-467  
Mogul : 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

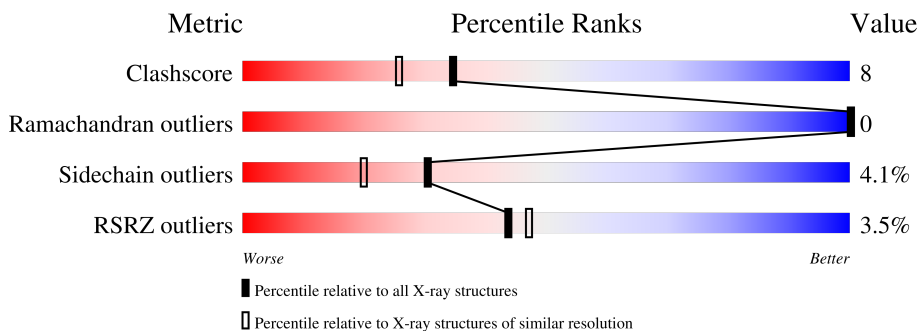
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 1.92 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.



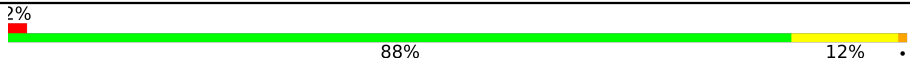

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
Clashscore	141614	8644 (1.94-1.90)
Ramachandran outliers	138981	8530 (1.94-1.90)
Sidechain outliers	138945	8530 (1.94-1.90)
RSRZ outliers	127900	7793 (1.94-1.90)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions  $\leq 5\%$ . The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	264	
1	C	264	
1	E	264	
1	G	264	
2	B	137	
2	D	137	

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Mol	Chain	Length	Quality of chain
2	F	137	 2% 88% 12% •
2	H	137	 % 89% 7% •

## 2 Entry composition [i](#)

There are 5 unique types of molecules in this entry. The entry contains 14878 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 SOXA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	264	2044	1262	359	403	20	0	0	0
1	C	264	2044	1262	359	403	20	0	0	0
1	E	264	2044	1262	359	403	20	0	0	0
1	G	264	2044	1262	359	403	20	0	0	0

- Molecule 2 is a protein called SOXX.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	137	1005	638	166	195	6	0	0	0
2	D	137	1006	638	166	196	6	0	0	0
2	F	137	1006	638	166	196	6	0	0	0
2	H	137	1006	638	166	196	6	0	0	0

- Molecule 3 is HEME C (three-letter code: HEC) (formula:  $C_{34}H_{34}FeN_4O_4$ ).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	
3	A	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
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	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	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		
3	G	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
3	G	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
3	H	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		

- Molecule 4 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	4	Total 4	Zn 4	0	0
4	C	3	Total 3	Zn 3	0	0
4	E	2	Total 2	Zn 2	0	0
4	G	3	Total 3	Zn 3	0	0

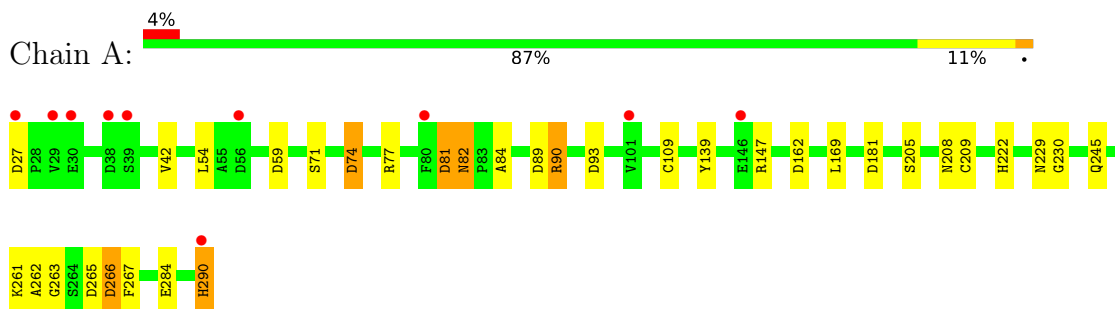
- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	336	Total 336	O 336	0	0
5	B	176	Total 176	O 176	0	0
5	C	356	Total 356	O 356	0	0
5	D	206	Total 206	O 206	0	0
5	E	350	Total 350	O 350	0	0
5	F	191	Total 191	O 191	0	0
5	G	332	Total 332	O 332	0	0
5	H	204	Total 204	O 204	0	0

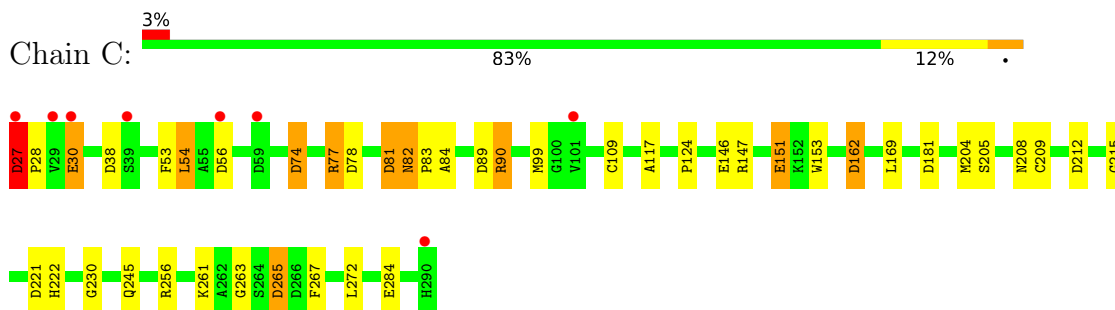
### 3 Residue-property plots [i](#)

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.

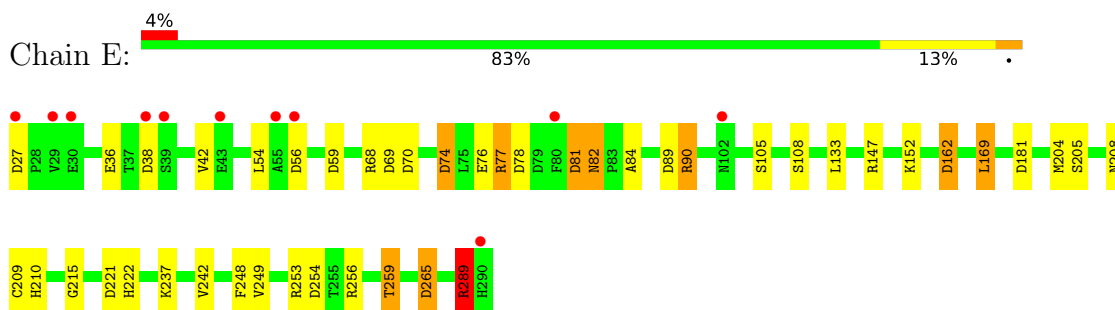
- Molecule 1: SOXA



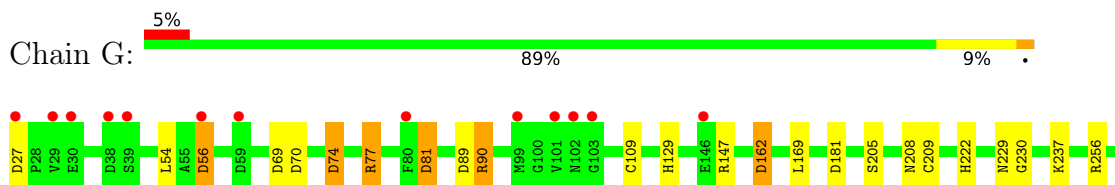
- Molecule 1: SOXA



- Molecule 1: SOXA

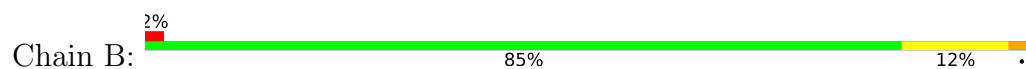


- Molecule 1: SOXA

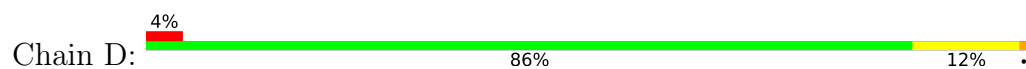




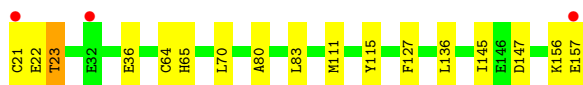
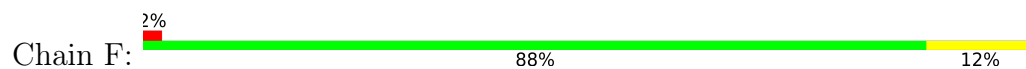
- Molecule 2: SOXX



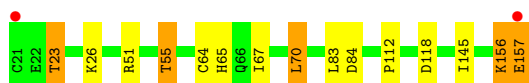
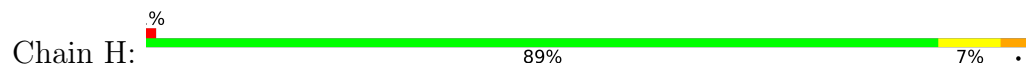
- Molecule 2: SOXX



- Molecule 2: SOXX



- Molecule 2: SOXX





## 4 Data and refinement statistics i

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	42.86Å 180.01Å 117.93Å 90.00° 92.83° 90.00°	Depositor
Resolution (Å)	119.52 – 1.92 19.52 – 1.92	Depositor EDS
% Data completeness (in resolution range)	93.0 (119.52-1.92) 93.1 (19.52-1.92)	Depositor EDS
$R_{merge}$	0.08	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	7.71 (at 1.92Å)	Xtrriage
Refinement program	REFMAC 5.1.24	Depositor
R, $R_{free}$	0.159 , 0.211 0.174 , (Not available)	Depositor DCC
$R_{free}$ test set	No test flags present.	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	16.9	Xtrriage
Anisotropy	0.612	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.37 , 64.6	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.52$ , $\langle L^2 \rangle = 0.35$	Xtrriage
Estimated twinning fraction	0.065 for h,-k,-l	Xtrriage
$F_o, F_c$ correlation	0.96	EDS
Total number of atoms	14878	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	31.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 45.43 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 1.3231e-04. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical values of  $\langle |L| \rangle$ ,  $\langle L^2 \rangle$  for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

## 5 Model quality [i](#)

### 5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: HEC, CSS, ZN

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	0.64	0/2078	0.95	13/2807 (0.5%)
1	C	0.64	0/2078	0.95	16/2807 (0.6%)
1	E	0.66	0/2078	1.00	19/2807 (0.7%)
1	G	0.62	0/2078	0.92	15/2807 (0.5%)
2	B	0.62	0/1027	0.81	1/1400 (0.1%)
2	D	0.65	0/1028	0.81	1/1400 (0.1%)
2	F	0.62	0/1028	0.77	1/1400 (0.1%)
2	H	0.66	0/1028	0.82	1/1400 (0.1%)
All	All	0.64	0/12423	0.91	67/16828 (0.4%)

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
2	D	0	1
2	H	0	1
All	All	0	2

There are no bond length outliers.

All (67) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	E	289	ARG	NE-CZ-NH2	-13.05	113.78	120.30
1	G	77	ARG	NE-CZ-NH2	-10.15	115.22	120.30
1	A	266	ASP	CB-CG-OD1	9.64	126.98	118.30
1	E	77	ARG	NE-CZ-NH2	-9.46	115.57	120.30
1	C	77	ARG	NE-CZ-NH2	-9.18	115.71	120.30
1	E	289	ARG	NE-CZ-NH1	8.77	124.68	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	E	265	ASP	CB-CG-OD2	8.48	125.93	118.30
1	C	77	ARG	NE-CZ-NH1	8.34	124.47	120.30
1	C	181	ASP	CB-CG-OD2	8.20	125.68	118.30
1	C	265	ASP	CB-CG-OD2	8.14	125.63	118.30
1	A	77	ARG	NE-CZ-NH2	-8.11	116.25	120.30
1	E	77	ARG	NE-CZ-NH1	8.09	124.34	120.30
1	E	90	ARG	NE-CZ-NH2	-8.04	116.28	120.30
1	C	90	ARG	NE-CZ-NH1	7.92	124.26	120.30
1	A	90	ARG	NE-CZ-NH2	-7.74	116.43	120.30
1	G	77	ARG	NE-CZ-NH1	7.71	124.16	120.30
1	A	90	ARG	NE-CZ-NH1	7.34	123.97	120.30
1	C	90	ARG	NE-CZ-NH2	-7.34	116.63	120.30
1	A	181	ASP	CB-CG-OD2	7.32	124.89	118.30
1	E	69	ASP	CB-CG-OD2	7.28	124.85	118.30
1	G	90	ARG	NE-CZ-NH2	-7.12	116.74	120.30
1	G	69	ASP	CB-CG-OD2	7.05	124.65	118.30
1	A	266	ASP	OD1-CG-OD2	-6.93	110.13	123.30
1	C	56	ASP	CB-CG-OD2	6.82	124.44	118.30
1	C	256	ARG	NE-CZ-NH2	-6.77	116.92	120.30
1	A	265	ASP	CB-CG-OD2	6.69	124.32	118.30
1	E	74	ASP	CB-CG-OD2	6.52	124.17	118.30
1	E	90	ARG	NE-CZ-NH1	6.43	123.52	120.30
1	C	256	ARG	NE-CZ-NH1	6.42	123.51	120.30
1	G	162	ASP	CB-CG-OD1	6.41	124.07	118.30
1	G	256	ARG	NE-CZ-NH1	6.40	123.50	120.30
1	C	162	ASP	CB-CG-OD1	6.38	124.04	118.30
1	G	256	ARG	NE-CZ-NH2	-6.20	117.20	120.30
1	A	77	ARG	NE-CZ-NH1	6.17	123.39	120.30
1	E	256	ARG	NE-CZ-NH2	-6.12	117.24	120.30
1	A	89	ASP	CB-CG-OD2	6.08	123.77	118.30
1	C	89	ASP	CB-CG-OD2	5.98	123.68	118.30
1	G	90	ARG	NE-CZ-NH1	5.93	123.27	120.30
1	A	74	ASP	CB-CG-OD2	5.93	123.64	118.30
1	A	93	ASP	CB-CG-OD2	5.92	123.63	118.30
1	C	27	ASP	CB-CG-OD2	5.91	123.62	118.30
1	E	221	ASP	CB-CG-OD2	5.90	123.61	118.30
1	E	181	ASP	CB-CG-OD2	5.83	123.55	118.30
1	G	181	ASP	CB-CG-OD2	5.82	123.53	118.30
1	G	56	ASP	CB-CG-OD2	5.81	123.53	118.30
2	D	88	ASP	CB-CG-OD2	5.81	123.53	118.30
1	A	59	ASP	CB-CG-OD2	5.74	123.47	118.30
1	G	70	ASP	CB-CG-OD2	5.71	123.44	118.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	G	81	ASP	CB-CG-OD2	5.69	123.42	118.30
1	E	59	ASP	CB-CG-OD2	5.68	123.42	118.30
1	C	74	ASP	CB-CG-OD2	5.66	123.39	118.30
1	E	70	ASP	CB-CG-OD2	5.63	123.37	118.30
1	E	81	ASP	CB-CG-OD2	5.59	123.33	118.30
1	E	162	ASP	CB-CG-OD1	5.52	123.27	118.30
1	C	81	ASP	CB-CG-OD2	5.51	123.26	118.30
1	C	212	ASP	CB-CG-OD2	5.38	123.14	118.30
1	C	221	ASP	CB-CG-OD2	5.37	123.13	118.30
1	E	38	ASP	CB-CG-OD2	5.30	123.07	118.30
2	H	84	ASP	CB-CG-OD2	5.26	123.04	118.30
1	G	266	ASP	CB-CG-OD2	5.20	122.98	118.30
1	A	81	ASP	CB-CG-OD2	5.19	122.97	118.30
1	G	74	ASP	CB-CG-OD2	5.18	122.96	118.30
2	B	96	ARG	NE-CZ-NH1	5.13	122.86	120.30
2	F	147	ASP	CB-CG-OD2	5.13	122.91	118.30
1	G	89	ASP	CB-CG-OD2	5.05	122.84	118.30
1	E	147	ARG	NE-CZ-NH2	-5.01	117.80	120.30
1	E	56	ASP	CB-CG-OD2	5.00	122.80	118.30

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
2	D	21	CYS	Peptide
2	H	156	LYS	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	2044	0	1935	29	1
1	C	2044	0	1935	43	1
1	E	2044	0	1934	29	1
1	G	2044	0	1935	21	1
2	B	1005	0	983	19	0
2	D	1006	0	983	18	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	F	1006	0	983	15	0
2	H	1006	0	983	14	0
3	A	86	0	62	13	0
3	B	43	0	31	8	0
3	C	86	0	62	12	0
3	D	43	0	31	9	0
3	E	86	0	61	7	0
3	F	43	0	31	11	0
3	G	86	0	62	10	0
3	H	43	0	31	8	0
4	A	4	0	0	0	0
4	C	3	0	0	0	0
4	E	2	0	0	0	0
4	G	3	0	0	0	0
5	A	336	0	0	3	0
5	B	176	0	0	5	0
5	C	356	0	0	6	0
5	D	206	0	0	2	0
5	E	350	0	0	1	0
5	F	191	0	0	6	0
5	G	332	0	0	2	0
5	H	204	0	0	1	0
All	All	14878	0	12042	206	4

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 8.

All (206) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:F:64:CYS:SG	3:F:1158:HEC:CAC	2.10	1.39
2:D:64:CYS:SG	3:D:1158:HEC:CAC	2.13	1.36
2:H:64:CYS:SG	3:H:1158:HEC:CAC	2.16	1.34
1:C:109:CYS:SG	3:C:1291:HEC:CAC	2.16	1.32
2:B:64:CYS:SG	3:B:1158:HEC:CAC	2.20	1.30
1:A:109:CYS:SG	3:A:1291:HEC:CAC	2.22	1.27
1:C:209:CYS:SG	3:C:1292:HEC:CAC	2.22	1.26
1:E:209:CYS:SG	3:E:1292:HEC:CAC	2.23	1.25
1:G:109:CYS:SG	3:G:1291:HEC:CAC	2.31	1.19
1:A:209:CYS:SG	3:A:1292:HEC:CAC	2.31	1.18
2:D:64:CYS:SG	3:D:1158:HEC:HAC	1.87	1.10

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:64:CYS:SG	3:B:1158:HEC:HAC	1.90	1.10
1:G:209:CYS:SG	3:G:1292:HEC:CAC	2.40	1.08
2:H:64:CYS:SG	3:H:1158:HEC:HAC	1.89	1.08
2:F:64:CYS:SG	3:F:1158:HEC:HAC	1.94	1.05
1:C:109:CYS:SG	3:C:1291:HEC:HAC	1.95	1.03
1:A:109:CYS:SG	3:A:1291:HEC:HAC	1.99	1.00
1:C:209:CYS:SG	3:C:1292:HEC:HAC	2.04	0.97
1:E:209:CYS:SG	3:E:1292:HEC:HAC	2.03	0.96
1:C:27:ASP:OD2	1:C:222:HIS:NE2	2.00	0.94
1:C:245:GLN:HE21	1:C:263:GLY:H	1.15	0.93
1:G:109:CYS:SG	3:G:1291:HEC:HAC	2.08	0.92
1:G:205:SER:H	1:G:208:ASN:HD22	1.15	0.90
1:A:245:GLN:HE21	1:A:263:GLY:H	1.19	0.90
1:E:27:ASP:N	1:E:222:HIS:HE2	1.71	0.89
1:G:27:ASP:N	1:G:222:HIS:HE2	1.72	0.85
1:E:249:VAL:O	1:E:259:THR:HG21	1.77	0.83
1:A:27:ASP:N	1:A:222:HIS:HE2	1.77	0.83
1:C:27:ASP:N	5:C:2003:HOH:O	2.14	0.79
3:F:1158:HEC:CGD	5:F:2187:HOH:O	2.34	0.76
1:A:209:CYS:SG	3:A:1292:HEC:C3C	2.75	0.75
1:E:253:ARG:HD2	2:F:127:PHE:O	1.85	0.75
1:C:245:GLN:HE22	1:C:267:PHE:HB3	1.52	0.74
1:C:245:GLN:NE2	1:C:263:GLY:H	1.86	0.73
1:C:209:CYS:SG	3:C:1292:HEC:C3C	2.76	0.73
1:C:109:CYS:HG	3:C:1291:HEC:HAC	1.52	0.72
1:E:209:CYS:SG	3:E:1292:HEC:C3C	2.77	0.72
3:D:1158:HEC:HMB1	3:D:1158:HEC:HBB3	1.71	0.71
2:F:64:CYS:SG	3:F:1158:HEC:CBC	2.78	0.71
1:C:205:SER:H	1:C:208:ASN:HD22	1.37	0.71
1:A:245:GLN:NE2	1:A:263:GLY:H	1.88	0.71
2:H:65:HIS:HE1	3:H:1158:HEC:NA	1.88	0.71
2:B:86:ALA:HB3	5:B:2173:HOH:O	1.91	0.70
1:A:209:CYS:SG	3:A:1292:HEC:HAC	2.26	0.70
2:F:64:CYS:SG	3:F:1158:HEC:C3C	2.79	0.70
1:A:245:GLN:HE22	1:A:267:PHE:HB3	1.56	0.70
1:A:139:TYR:HB2	5:A:2170:HOH:O	1.93	0.69
1:C:27:ASP:OD1	1:C:215:GLY:O	2.10	0.68
1:G:205:SER:H	1:G:208:ASN:ND2	1.91	0.68
2:B:65:HIS:CE1	2:B:80:ALA:HB3	2.28	0.67
1:G:90:ARG:HD2	1:G:162:ASP:OD2	1.93	0.67
1:E:27:ASP:N	1:E:27:ASP:OD2	2.28	0.67

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:F:1158:HEC:HMB1	3:F:1158:HEC:HBB3	1.75	0.67
2:D:64:CYS:SG	3:D:1158:HEC:C3C	2.83	0.66
1:A:109:CYS:SG	3:A:1291:HEC:C3C	2.82	0.66
2:H:64:CYS:SG	3:H:1158:HEC:C3C	2.83	0.66
2:H:23:THR:HG22	5:H:2003:HOH:O	1.94	0.66
1:A:261:LYS:HD2	1:A:262:ALA:N	2.11	0.66
1:G:209:CYS:SG	3:G:1292:HEC:C3C	2.84	0.66
1:C:109:CYS:SG	3:C:1291:HEC:C3C	2.84	0.66
2:H:51:ARG:O	2:H:55:THR:HG23	1.95	0.65
2:D:45:ASN:C	2:D:45:ASN:HD22	1.99	0.65
3:D:1158:HEC:HBC3	3:D:1158:HEC:HMC1	1.77	0.65
2:B:155:LEU:HB2	5:B:2173:HOH:O	1.96	0.65
1:C:151:GLU:HG2	5:C:2202:HOH:O	1.97	0.64
1:A:205:SER:H	1:A:208:ASN:HD22	1.45	0.64
3:B:1158:HEC:HBB3	3:B:1158:HEC:HMB1	1.78	0.64
1:E:205:SER:H	1:E:208:ASN:HD22	1.43	0.64
2:B:45:ASN:C	2:B:45:ASN:HD22	2.00	0.64
2:D:64:CYS:HG	3:D:1158:HEC:HAC	1.61	0.64
1:C:90:ARG:CD	1:C:162:ASP:OD2	2.46	0.63
1:A:90:ARG:HD2	1:A:162:ASP:OD2	1.98	0.63
1:C:82:ASN:C	1:C:82:ASN:HD22	2.02	0.63
2:B:64:CYS:SG	3:B:1158:HEC:C3C	2.87	0.63
1:C:205:SER:H	1:C:208:ASN:ND2	1.97	0.63
1:C:27:ASP:N	1:C:28:PRO:HD2	2.14	0.63
1:E:249:VAL:O	1:E:259:THR:CG2	2.47	0.62
1:G:90:ARG:CD	1:G:162:ASP:OD2	2.47	0.62
3:A:1291:HEC:HBB3	3:A:1291:HEC:HMB1	1.82	0.62
1:G:109:CYS:SG	3:G:1291:HEC:C3C	2.87	0.62
3:C:1291:HEC:HBC3	3:C:1291:HEC:HMC1	1.81	0.62
1:E:205:SER:H	1:E:208:ASN:ND2	1.99	0.60
1:G:209:CYS:SG	3:G:1292:HEC:CBC	2.88	0.60
1:A:82:ASN:HD22	1:A:82:ASN:C	2.04	0.60
1:C:81:ASP:HB2	5:C:2085:HOH:O	2.02	0.59
2:F:21:CYS:HB2	5:F:2033:HOH:O	2.02	0.59
1:C:90:ARG:HD2	1:C:162:ASP:OD2	2.03	0.58
2:D:141:ASN:ND2	2:D:144:GLN:H	2.01	0.58
2:B:65:HIS:CD2	2:B:83:LEU:HD21	2.38	0.58
2:D:157:GLU:HA	5:D:2201:HOH:O	2.03	0.58
1:E:90:ARG:HD2	1:E:162:ASP:OD2	2.04	0.58
1:C:27:ASP:CG	1:C:215:GLY:O	2.42	0.58
1:C:109:CYS:SG	3:C:1291:HEC:CBC	2.87	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:90:ARG:CD	1:E:162:ASP:OD2	2.53	0.57
3:F:1158:HEC:HMC1	3:F:1158:HEC:HBC3	1.86	0.57
1:A:90:ARG:CD	1:A:162:ASP:OD2	2.53	0.56
2:B:141:ASN:C	2:B:141:ASN:HD22	2.08	0.56
1:G:81:ASP:OD2	5:G:2093:HOH:O	2.18	0.56
2:F:64:CYS:HG	3:F:1158:HEC:HAC	1.66	0.56
1:C:90:ARG:HD3	1:C:162:ASP:OD2	2.06	0.56
2:D:64:CYS:SG	3:D:1158:HEC:CBC	2.87	0.55
1:A:27:ASP:N	1:A:222:HIS:NE2	2.52	0.55
2:B:112:PRO:HD3	3:B:1158:HEC:HBC2	1.87	0.55
3:F:1158:HEC:O1D	5:F:2187:HOH:O	2.17	0.55
3:H:1158:HEC:HMB1	3:H:1158:HEC:HBB3	1.87	0.55
2:B:157:GLU:HG2	5:B:2109:HOH:O	2.07	0.55
2:H:51:ARG:O	2:H:55:THR:CG2	2.55	0.54
2:F:156:LYS:O	2:F:157:GLU:HB2	2.07	0.54
1:A:82:ASN:ND2	1:A:84:ALA:H	2.06	0.54
1:E:82:ASN:HD22	1:E:82:ASN:C	2.11	0.54
1:E:36:GLU:HB2	1:E:78:ASP:HB2	1.91	0.53
1:A:81:ASP:HB2	5:A:2079:HOH:O	2.09	0.52
1:C:38:ASP:HB2	5:C:2018:HOH:O	2.10	0.52
1:C:124:PRO:HG2	1:C:272:LEU:HA	1.92	0.51
1:C:147:ARG:HB3	3:C:1291:HEC:HBC2	1.93	0.51
2:F:21:CYS:CB	5:F:2033:HOH:O	2.59	0.51
3:A:1291:HEC:HBC3	3:A:1291:HEC:HMC1	1.93	0.51
3:A:1292:HEC:HBB3	3:A:1292:HEC:HMB1	1.92	0.50
2:B:141:ASN:ND2	2:B:144:GLN:H	2.08	0.50
2:D:26:LYS:HD3	5:D:2151:HOH:O	2.11	0.50
2:H:156:LYS:O	2:H:157:GLU:HB2	2.11	0.50
1:A:109:CYS:HG	3:A:1291:HEC:HAC	1.75	0.50
1:A:147:ARG:HB3	3:A:1291:HEC:HBC2	1.93	0.50
1:E:169:LEU:HG	5:E:2339:HOH:O	2.11	0.50
2:B:21:CYS:HB2	5:B:2027:HOH:O	2.11	0.50
1:E:27:ASP:N	1:E:215:GLY:O	2.45	0.50
1:E:204:MET:HA	1:E:208:ASN:HD22	1.77	0.49
1:A:209:CYS:SG	3:A:1292:HEC:CBC	2.98	0.49
1:C:245:GLN:NE2	1:C:267:PHE:HB3	2.25	0.49
2:B:65:HIS:ND1	2:B:80:ALA:HB3	2.27	0.49
1:C:82:ASN:ND2	1:C:84:ALA:H	2.10	0.49
1:G:147:ARG:HB3	3:G:1291:HEC:HBC2	1.94	0.49
2:D:141:ASN:HD22	2:D:141:ASN:C	2.15	0.49
1:G:290:HIS:CE1	5:G:2327:HOH:O	2.65	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:68:ARG:HD2	1:E:289:ARG:HG3	1.95	0.49
2:H:65:HIS:ND1	2:H:83:LEU:HD21	2.28	0.49
1:A:205:SER:H	1:A:208:ASN:ND2	2.11	0.48
1:C:209:CYS:SG	3:C:1292:HEC:CBC	2.95	0.48
2:B:23:THR:HG22	5:B:2003:HOH:O	2.12	0.48
1:E:76:GLU:OE2	1:E:289:ARG:NH2	2.46	0.48
1:G:230:GLY:HA2	1:G:284:GLU:HB2	1.96	0.48
1:A:290:HIS:CD2	1:A:290:HIS:C	2.87	0.48
1:E:78:ASP:OD2	1:E:81:ASP:OD2	2.32	0.48
1:G:27:ASP:N	1:G:222:HIS:NE2	2.52	0.48
1:C:146:GLU:HG3	5:C:2087:HOH:O	2.13	0.48
3:E:1291:HEC:HMC1	3:E:1291:HEC:HBC3	1.96	0.48
2:H:67:ILE:HG21	2:H:70:LEU:HD22	1.95	0.47
1:C:30:GLU:HG2	5:C:2004:HOH:O	2.13	0.47
2:D:115:TYR:HB2	2:D:145:ILE:CD1	2.44	0.47
1:C:53:PHE:CE1	1:C:54:LEU:HD13	2.50	0.47
2:D:115:TYR:HB2	2:D:145:ILE:HD11	1.95	0.47
2:H:64:CYS:SG	3:H:1158:HEC:CBC	2.93	0.47
3:D:1158:HEC:HBB3	3:D:1158:HEC:CMB	2.42	0.46
3:H:1158:HEC:HMC1	3:H:1158:HEC:HBC3	1.97	0.46
1:C:204:MET:HA	1:C:208:ASN:HD22	1.81	0.46
1:E:82:ASN:ND2	1:E:84:ALA:H	2.13	0.46
1:C:117:ALA:O	1:G:129:HIS:HD2	1.99	0.45
3:B:1158:HEC:HBC3	3:B:1158:HEC:HMC1	1.98	0.45
2:F:65:HIS:CE1	2:F:80:ALA:HB3	2.52	0.45
2:F:115:TYR:HB2	2:F:145:ILE:CD1	2.47	0.45
2:D:33:GLY:O	2:D:97:GLY:HA3	2.17	0.45
1:E:105:SER:O	1:E:108:SER:HB2	2.16	0.45
1:E:90:ARG:HD3	1:E:162:ASP:OD2	2.17	0.45
2:B:67:ILE:HG21	2:B:70:LEU:HD22	1.98	0.45
1:G:209:CYS:SG	3:G:1292:HEC:HBC3	2.56	0.45
2:B:65:HIS:HD2	2:B:83:LEU:HD21	1.82	0.45
1:E:253:ARG:NH1	1:E:254:ASP:OD1	2.50	0.45
1:A:169:LEU:HD13	5:A:2325:HOH:O	2.18	0.44
2:F:23:THR:HG22	5:F:2004:HOH:O	2.17	0.44
1:E:74:ASP:HA	1:E:77:ARG:HD2	2.00	0.43
3:E:1292:HEC:HMB1	3:E:1292:HEC:HBB3	1.99	0.43
1:A:82:ASN:HD22	1:A:84:ALA:H	1.64	0.43
1:C:82:ASN:HD22	1:C:84:ALA:H	1.65	0.43
1:C:230:GLY:HA2	1:C:284:GLU:HB2	2.00	0.43
3:C:1291:HEC:HMB1	3:C:1291:HEC:HBB3	2.00	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:65:HIS:CE1	2:D:83:LEU:HD21	2.54	0.43
2:H:112:PRO:HD3	3:H:1158:HEC:HBC2	2.00	0.43
1:C:82:ASN:HD22	1:C:83:PRO:N	2.16	0.43
1:E:248:PHE:CD2	3:E:1292:HEC:HMB2	2.52	0.43
1:A:109:CYS:SG	3:A:1291:HEC:CBC	2.98	0.43
2:B:64:CYS:SG	3:B:1158:HEC:CBC	2.97	0.43
2:D:65:HIS:ND1	2:D:83:LEU:HD21	2.33	0.43
2:D:112:PRO:HD3	3:D:1158:HEC:HBC2	2.00	0.43
1:G:74:ASP:HA	1:G:77:ARG:HD2	2.00	0.43
1:E:82:ASN:HD22	1:E:84:ALA:H	1.66	0.43
2:D:156:LYS:O	2:D:157:GLU:CB	2.66	0.43
2:D:156:LYS:O	2:D:157:GLU:HB2	2.18	0.43
1:G:209:CYS:SG	3:G:1292:HEC:HAC	2.51	0.43
1:C:82:ASN:C	1:C:82:ASN:ND2	2.72	0.42
1:A:245:GLN:NE2	1:A:267:PHE:HB3	2.29	0.42
3:F:1158:HEC:HBB3	3:F:1158:HEC:CMB	2.48	0.42
1:C:74:ASP:HA	1:C:77:ARG:HD2	2.01	0.42
1:C:245:GLN:HE22	1:C:267:PHE:CB	2.27	0.41
1:G:90:ARG:HD3	1:G:162:ASP:OD2	2.17	0.41
2:F:65:HIS:CD2	2:F:83:LEU:HD21	2.55	0.41
1:E:36:GLU:HB2	1:E:78:ASP:CB	2.49	0.41
1:A:230:GLY:HA2	1:A:284:GLU:HB2	2.03	0.41
3:G:1291:HEC:HBC3	3:G:1291:HEC:HMC1	2.04	0.40
2:H:65:HIS:CE1	2:H:83:LEU:HD21	2.56	0.40
2:B:111:MET:HB2	3:B:1158:HEC:C1D	2.51	0.40
1:C:78:ASP:OD2	1:C:81:ASP:OD2	2.39	0.40
1:E:210:HIS:CE1	3:E:1292:HEC:ND	2.89	0.40
2:F:23:THR:HG21	5:F:2025:HOH:O	2.20	0.40
2:F:111:MET:HB2	3:F:1158:HEC:C1D	2.52	0.40
1:C:99:MET:CE	1:C:153:TRP:HZ2	2.34	0.40
2:H:26:LYS:HE2	2:H:118:ASP:OD2	2.21	0.40

All (4) 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:C:81:ASP:OD2	1:C:265:ASP:OD2[1_455]	2.08	0.12
1:A:74:ASP:OD1	1:A:266:ASP:OD1[1_655]	2.10	0.10
1:G:81:ASP:OD2	1:G:265:ASP:OD1[1_655]	2.11	0.09
1:E:81:ASP:OD2	1:E:265:ASP:OD2[1_455]	2.12	0.08

## 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	261/264 (99%)	256 (98%)	5 (2%)	0	100	100
1	C	261/264 (99%)	255 (98%)	6 (2%)	0	100	100
1	E	261/264 (99%)	256 (98%)	5 (2%)	0	100	100
1	G	261/264 (99%)	256 (98%)	5 (2%)	0	100	100
2	B	135/137 (98%)	132 (98%)	3 (2%)	0	100	100
2	D	135/137 (98%)	132 (98%)	3 (2%)	0	100	100
2	F	135/137 (98%)	131 (97%)	4 (3%)	0	100	100
2	H	135/137 (98%)	131 (97%)	4 (3%)	0	100	100
All	All	1584/1604 (99%)	1549 (98%)	35 (2%)	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	218/218 (100%)	212 (97%)	6 (3%)	43	34
1	C	218/218 (100%)	211 (97%)	7 (3%)	39	29
1	E	218/218 (100%)	207 (95%)	11 (5%)	24	13
1	G	218/218 (100%)	212 (97%)	6 (3%)	43	34
2	B	103/103 (100%)	95 (92%)	8 (8%)	12	4
2	D	103/103 (100%)	98 (95%)	5 (5%)	25	14

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	F	103/103 (100%)	98 (95%)	5 (5%)	25	14
2	H	103/103 (100%)	98 (95%)	5 (5%)	25	14
All	All	1284/1284 (100%)	1231 (96%)	53 (4%)	30	20

All (53) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	42	VAL
1	A	54	LEU
1	A	71	SER
1	A	82	ASN
1	A	229	ASN
1	A	290	HIS
2	B	22	GLU
2	B	23	THR
2	B	45	ASN
2	B	70	LEU
2	B	73	VAL
2	B	103	LYS
2	B	136	LEU
2	B	141	ASN
1	C	27	ASP
1	C	30	GLU
1	C	54	LEU
1	C	82	ASN
1	C	151	GLU
1	C	169	LEU
1	C	261	LYS
2	D	23	THR
2	D	32	GLU
2	D	45	ASN
2	D	70	LEU
2	D	141	ASN
1	E	42	VAL
1	E	54	LEU
1	E	82	ASN
1	E	89	ASP
1	E	133	LEU
1	E	152	LYS
1	E	169	LEU
1	E	237	LYS

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Mol	Chain	Res	Type
1	E	242	VAL
1	E	259	THR
1	E	289	ARG
2	F	22	GLU
2	F	23	THR
2	F	36	GLU
2	F	70	LEU
2	F	136	LEU
1	G	54	LEU
1	G	56	ASP
1	G	169	LEU
1	G	229	ASN
1	G	237	LYS
1	G	261	LYS
2	H	23	THR
2	H	55	THR
2	H	70	LEU
2	H	145	ILE
2	H	157	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (27) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	82	ASN
1	A	170	GLN
1	A	208	ASN
1	A	229	ASN
1	A	245	GLN
1	A	290	HIS
2	B	45	ASN
2	B	141	ASN
2	B	143	GLN
1	C	82	ASN
1	C	208	ASN
1	C	229	ASN
1	C	245	GLN
2	D	45	ASN
2	D	141	ASN
2	D	143	GLN
1	E	82	ASN
1	E	208	ASN
1	E	229	ASN

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Mol	Chain	Res	Type
1	E	246	HIS
2	F	143	GLN
1	G	111	GLN
1	G	129	HIS
1	G	208	ASN
1	G	229	ASN
1	G	246	HIS
2	H	143	GLN

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

4 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	CSS	C	251	1,3	4,6,7	0.80	0	1,6,8	0.57	0
1	CSS	E	251	1,3	4,6,7	0.79	0	1,6,8	0.49	0
1	CSS	G	251	1,3	4,6,7	0.51	0	1,6,8	0.73	0
1	CSS	A	251	1,3	4,6,7	0.87	0	1,6,8	0.23	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
1	CSS	C	251	1,3	-	0/1/5/7	-
1	CSS	E	251	1,3	-	0/1/5/7	-
1	CSS	G	251	1,3	-	0/1/5/7	-
1	CSS	A	251	1,3	-	0/1/5/7	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

## 5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

Of 24 ligands modelled in this entry, 12 are monoatomic - leaving 12 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 2$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
3	HEC	G	1291	1,4	32,50,50	2.14	7 (21%)	24,82,82	1.61	3 (12%)
3	HEC	A	1291	1,4	32,50,50	2.15	5 (15%)	24,82,82	1.47	4 (16%)
3	HEC	G	1292	1	32,50,50	2.34	6 (18%)	24,82,82	1.76	6 (25%)
3	HEC	B	1158	2	32,50,50	2.35	7 (21%)	24,82,82	1.57	6 (25%)
3	HEC	C	1292	1	32,50,50	2.22	5 (15%)	24,82,82	1.79	7 (29%)
3	HEC	E	1291	1,4	32,50,50	2.31	7 (21%)	24,82,82	1.79	5 (20%)
3	HEC	H	1158	2	32,50,50	2.39	5 (15%)	24,82,82	1.62	6 (25%)
3	HEC	E	1292	1	32,50,50	2.30	5 (15%)	24,82,82	1.56	5 (20%)
3	HEC	C	1291	1,4	32,50,50	2.15	5 (15%)	24,82,82	1.57	4 (16%)
3	HEC	A	1292	1	32,50,50	2.29	7 (21%)	24,82,82	1.87	6 (25%)
3	HEC	F	1158	2	32,50,50	2.40	6 (18%)	24,82,82	1.33	3 (12%)
3	HEC	D	1158	2	32,50,50	2.39	8 (25%)	24,82,82	1.53	5 (20%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral

centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '2' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	HEC	G	1291	1,4	-	1/10/54/54	-
3	HEC	A	1291	1,4	-	0/10/54/54	-
3	HEC	G	1292	1	-	2/10/54/54	-
3	HEC	B	1158	2	-	5/10/54/54	-
3	HEC	C	1292	1	-	4/10/54/54	-
3	HEC	E	1291	1,4	-	0/10/54/54	-
3	HEC	H	1158	2	-	5/10/54/54	-
3	HEC	E	1292	1	-	2/10/54/54	-
3	HEC	C	1291	1,4	-	0/10/54/54	-
3	HEC	A	1292	1	-	4/10/54/54	-
3	HEC	F	1158	2	-	2/10/54/54	-
3	HEC	D	1158	2	-	2/10/54/54	-

All (73) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	E	1292	HEC	C2B-C3B	-7.62	1.32	1.40
3	G	1292	HEC	C2B-C3B	-7.56	1.32	1.40
3	A	1292	HEC	C2B-C3B	-7.16	1.33	1.40
3	F	1158	HEC	C2B-C3B	-6.95	1.33	1.40
3	D	1158	HEC	C2B-C3B	-6.95	1.33	1.40
3	H	1158	HEC	C2B-C3B	-6.92	1.33	1.40
3	H	1158	HEC	C3C-C2C	-6.71	1.33	1.40
3	C	1292	HEC	C2B-C3B	-6.48	1.34	1.40
3	B	1158	HEC	C2B-C3B	-6.47	1.34	1.40
3	A	1291	HEC	C2B-C3B	-6.22	1.34	1.40
3	C	1292	HEC	C3C-C2C	-6.16	1.34	1.40
3	F	1158	HEC	C3C-C2C	-6.12	1.34	1.40
3	G	1291	HEC	C2B-C3B	-5.81	1.34	1.40
3	B	1158	HEC	C3C-C2C	-5.78	1.34	1.40
3	G	1291	HEC	C3D-C2D	5.73	1.54	1.37
3	D	1158	HEC	C3C-C2C	-5.71	1.34	1.40
3	E	1291	HEC	C2B-C3B	-5.64	1.34	1.40
3	C	1291	HEC	C3D-C2D	5.55	1.54	1.37
3	B	1158	HEC	C3D-C2D	5.45	1.53	1.37
3	E	1292	HEC	C3C-C2C	-5.38	1.35	1.40
3	C	1291	HEC	C2B-C3B	-5.37	1.35	1.40
3	A	1292	HEC	C3C-C2C	-5.36	1.35	1.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	C	1291	HEC	C3C-C2C	-5.13	1.35	1.40
3	H	1158	HEC	C3D-C2D	5.11	1.52	1.37
3	G	1292	HEC	C3C-C2C	-5.07	1.35	1.40
3	F	1158	HEC	C3D-C2D	5.05	1.52	1.37
3	E	1291	HEC	C3D-C2D	5.04	1.52	1.37
3	E	1291	HEC	CMC-C2C	5.02	1.63	1.51
3	E	1291	HEC	C3C-C2C	-4.97	1.35	1.40
3	A	1291	HEC	C3D-C2D	4.94	1.52	1.37
3	C	1292	HEC	C3D-C2D	4.69	1.51	1.37
3	A	1292	HEC	C3D-C2D	4.63	1.51	1.37
3	D	1158	HEC	C3D-C2D	4.60	1.51	1.37
3	A	1291	HEC	C3C-C2C	-4.59	1.36	1.40
3	G	1292	HEC	C3D-C2D	4.49	1.51	1.37
3	C	1292	HEC	CBC-CAC	-4.33	1.33	1.49
3	E	1292	HEC	C3D-C2D	4.27	1.50	1.37
3	G	1292	HEC	CBC-CAC	-4.14	1.34	1.49
3	F	1158	HEC	CBC-CAC	-4.01	1.34	1.49
3	E	1292	HEC	CBC-CAC	-4.01	1.34	1.49
3	A	1292	HEC	CBC-CAC	-3.99	1.34	1.49
3	B	1158	HEC	CBC-CAC	-3.99	1.34	1.49
3	D	1158	HEC	CBC-CAC	-3.81	1.35	1.49
3	C	1291	HEC	CBC-CAC	-3.72	1.35	1.49
3	A	1291	HEC	CBC-CAC	-3.69	1.35	1.49
3	G	1292	HEC	CBB-CAB	-3.69	1.35	1.49
3	E	1292	HEC	CBB-CAB	-3.56	1.36	1.49
3	C	1291	HEC	CBB-CAB	-3.48	1.36	1.49
3	E	1291	HEC	CBC-CAC	-3.48	1.36	1.49
3	E	1291	HEC	CBB-CAB	-3.47	1.36	1.49
3	G	1291	HEC	CBC-CAC	-3.46	1.36	1.49
3	H	1158	HEC	CBC-CAC	-3.44	1.36	1.49
3	C	1292	HEC	CBB-CAB	-3.42	1.36	1.49
3	G	1291	HEC	CBB-CAB	-3.36	1.36	1.49
3	F	1158	HEC	CBB-CAB	-3.35	1.36	1.49
3	A	1292	HEC	CBB-CAB	-3.26	1.37	1.49
3	A	1291	HEC	CBB-CAB	-3.23	1.37	1.49
3	H	1158	HEC	CBB-CAB	-3.22	1.37	1.49
3	D	1158	HEC	CBB-CAB	-3.22	1.37	1.49
3	B	1158	HEC	CBB-CAB	-3.01	1.38	1.49
3	D	1158	HEC	CAD-C3D	2.93	1.56	1.52
3	G	1291	HEC	C3C-C2C	-2.76	1.37	1.40
3	B	1158	HEC	CAD-C3D	2.75	1.56	1.52
3	F	1158	HEC	CAD-C3D	2.72	1.56	1.52

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	G	1291	HEC	CMC-C2C	2.48	1.57	1.51
3	G	1292	HEC	C1D-ND	2.41	1.41	1.36
3	G	1291	HEC	CAD-C3D	2.38	1.55	1.52
3	E	1291	HEC	O2A-CGA	-2.29	1.23	1.30
3	A	1292	HEC	CAD-C3D	2.19	1.55	1.52
3	D	1158	HEC	CAA-C2A	2.13	1.56	1.52
3	D	1158	HEC	C1D-CHD	-2.07	1.35	1.41
3	A	1292	HEC	O2D-CGD	-2.07	1.23	1.30
3	B	1158	HEC	CMD-C2D	2.00	1.55	1.51

All (60) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	E	1291	HEC	CMC-C2C-C3C	-5.69	119.13	125.82
3	G	1291	HEC	CMC-C2C-C3C	-4.33	120.73	125.82
3	A	1292	HEC	CMC-C2C-C3C	4.18	130.74	125.82
3	A	1292	HEC	CMC-C2C-C1C	-4.18	122.04	128.46
3	E	1292	HEC	CMC-C2C-C1C	-3.95	122.39	128.46
3	G	1292	HEC	CMC-C2C-C1C	-3.94	122.41	128.46
3	A	1291	HEC	CMC-C2C-C1C	-3.60	122.93	128.46
3	C	1292	HEC	CMC-C2C-C1C	-3.59	122.95	128.46
3	C	1291	HEC	CMB-C2B-C1B	-3.34	123.33	128.46
3	H	1158	HEC	CMC-C2C-C1C	-3.32	123.36	128.46
3	C	1292	HEC	CBD-CAD-C3D	-3.18	107.19	112.62
3	H	1158	HEC	CMB-C2B-C1B	-3.16	123.60	128.46
3	A	1291	HEC	CBA-CAA-C2A	-3.13	107.33	112.60
3	G	1292	HEC	CBD-CAD-C3D	-3.13	107.28	112.62
3	C	1292	HEC	CMB-C2B-C1B	-3.11	123.68	128.46
3	H	1158	HEC	CBD-CAD-C3D	-3.09	107.35	112.62
3	D	1158	HEC	C1D-C2D-C3D	-3.07	104.86	107.00
3	E	1291	HEC	CMB-C2B-C1B	-3.06	123.76	128.46
3	F	1158	HEC	CBD-CAD-C3D	-3.04	107.43	112.62
3	C	1291	HEC	CMC-C2C-C1C	-3.04	123.80	128.46
3	C	1292	HEC	CMC-C2C-C3C	3.00	129.35	125.82
3	G	1292	HEC	CMB-C2B-C1B	-2.99	123.87	128.46
3	G	1292	HEC	C1D-C2D-C3D	-2.97	104.93	107.00
3	B	1158	HEC	CAA-CBA-CGA	-2.95	105.50	113.76
3	E	1292	HEC	CMC-C2C-C3C	2.91	129.25	125.82
3	D	1158	HEC	CMA-C3A-C2A	2.91	130.42	124.94
3	G	1291	HEC	CMC-C2C-C1C	-2.86	124.06	128.46
3	F	1158	HEC	CMC-C2C-C1C	-2.85	124.09	128.46
3	E	1292	HEC	CBD-CAD-C3D	-2.84	107.78	112.62

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	1292	HEC	CBD-CAD-C3D	-2.80	107.85	112.62
3	B	1158	HEC	CMC-C2C-C1C	-2.76	124.22	128.46
3	H	1158	HEC	C1D-C2D-C3D	-2.76	105.08	107.00
3	C	1292	HEC	C1D-C2D-C3D	-2.75	105.08	107.00
3	B	1158	HEC	CMA-C3A-C2A	2.72	130.07	124.94
3	G	1292	HEC	CMC-C2C-C3C	2.72	129.01	125.82
3	A	1292	HEC	C1D-C2D-C3D	-2.68	105.13	107.00
3	E	1291	HEC	C1D-C2D-C3D	-2.68	105.13	107.00
3	A	1292	HEC	CMB-C2B-C1B	-2.67	124.35	128.46
3	G	1292	HEC	CBA-CAA-C2A	-2.66	108.13	112.60
3	B	1158	HEC	CBD-CAD-C3D	-2.64	108.11	112.62
3	D	1158	HEC	CMC-C2C-C1C	-2.64	124.41	128.46
3	B	1158	HEC	CMB-C2B-C1B	-2.62	124.43	128.46
3	A	1291	HEC	CMB-C2B-C1B	-2.54	124.56	128.46
3	D	1158	HEC	CMB-C2B-C1B	-2.51	124.61	128.46
3	E	1292	HEC	O2A-CGA-CBA	2.41	121.78	114.03
3	G	1291	HEC	CMB-C2B-C1B	-2.39	124.79	128.46
3	H	1158	HEC	O1A-CGA-CBA	-2.29	115.74	123.08
3	C	1291	HEC	CMA-C3A-C2A	2.27	129.23	124.94
3	E	1292	HEC	CMB-C2B-C1B	-2.25	125.00	128.46
3	A	1292	HEC	CBA-CAA-C2A	-2.23	108.84	112.60
3	C	1292	HEC	O2D-CGD-CBD	2.21	121.13	114.03
3	D	1158	HEC	CBA-CAA-C2A	-2.21	108.89	112.60
3	E	1291	HEC	CMB-C2B-C3B	2.13	128.33	125.82
3	A	1291	HEC	CBD-CAD-C3D	-2.09	109.06	112.62
3	B	1158	HEC	O1A-CGA-CBA	-2.05	116.50	123.08
3	C	1292	HEC	O2A-CGA-CBA	2.03	120.56	114.03
3	E	1291	HEC	CMA-C3A-C2A	2.03	128.77	124.94
3	F	1158	HEC	CMC-C2C-C3C	2.01	128.18	125.82
3	C	1291	HEC	CMB-C2B-C3B	2.00	128.18	125.82
3	H	1158	HEC	O2A-CGA-CBA	2.00	120.46	114.03

There are no chirality outliers.

All (27) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	B	1158	HEC	C3D-CAD-CBD-CGD
3	H	1158	HEC	C3D-CAD-CBD-CGD
3	B	1158	HEC	CAD-CBD-CGD-O1D
3	F	1158	HEC	CAA-CBA-CGA-O1A
3	F	1158	HEC	CAA-CBA-CGA-O2A
3	H	1158	HEC	CAD-CBD-CGD-O2D

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Mol	Chain	Res	Type	Atoms
3	H	1158	HEC	CAD-CBD-CGD-O1D
3	D	1158	HEC	CAA-CBA-CGA-O1A
3	B	1158	HEC	CAD-CBD-CGD-O2D
3	C	1292	HEC	CAA-CBA-CGA-O2A
3	H	1158	HEC	CAA-CBA-CGA-O1A
3	A	1292	HEC	CAA-CBA-CGA-O2A
3	A	1292	HEC	CAA-CBA-CGA-O1A
3	B	1158	HEC	CAA-CBA-CGA-O2A
3	H	1158	HEC	CAA-CBA-CGA-O2A
3	C	1292	HEC	CAD-CBD-CGD-O2D
3	G	1292	HEC	CAD-CBD-CGD-O2D
3	D	1158	HEC	CAA-CBA-CGA-O2A
3	B	1158	HEC	CAA-CBA-CGA-O1A
3	E	1292	HEC	CAD-CBD-CGD-O1D
3	E	1292	HEC	CAD-CBD-CGD-O2D
3	G	1292	HEC	CAD-CBD-CGD-O1D
3	C	1292	HEC	CAD-CBD-CGD-O1D
3	A	1292	HEC	CAD-CBD-CGD-O2D
3	A	1292	HEC	CAD-CBD-CGD-O1D
3	G	1291	HEC	CAD-CBD-CGD-O2D
3	C	1292	HEC	CAA-CBA-CGA-O1A

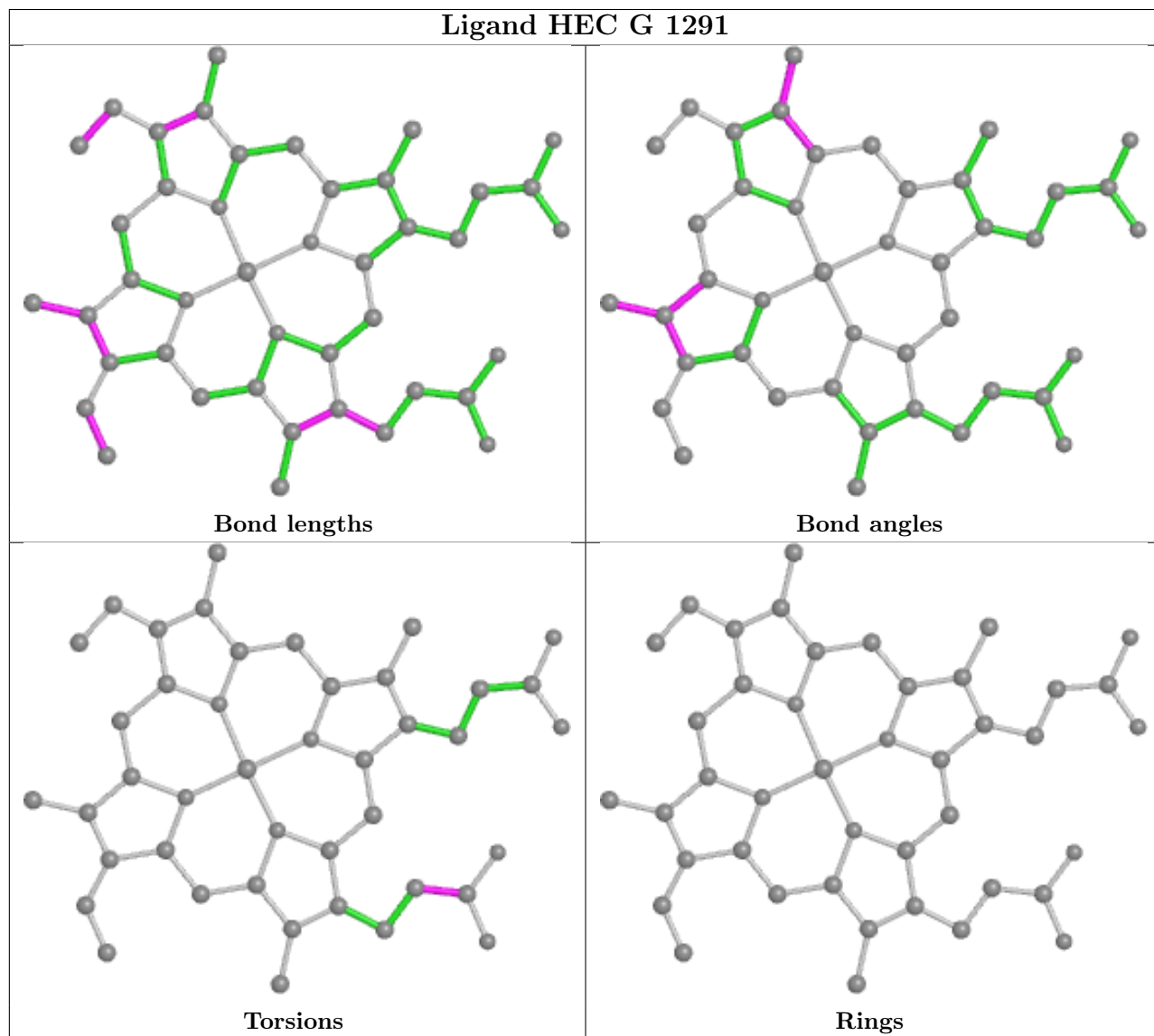
There are no ring outliers.

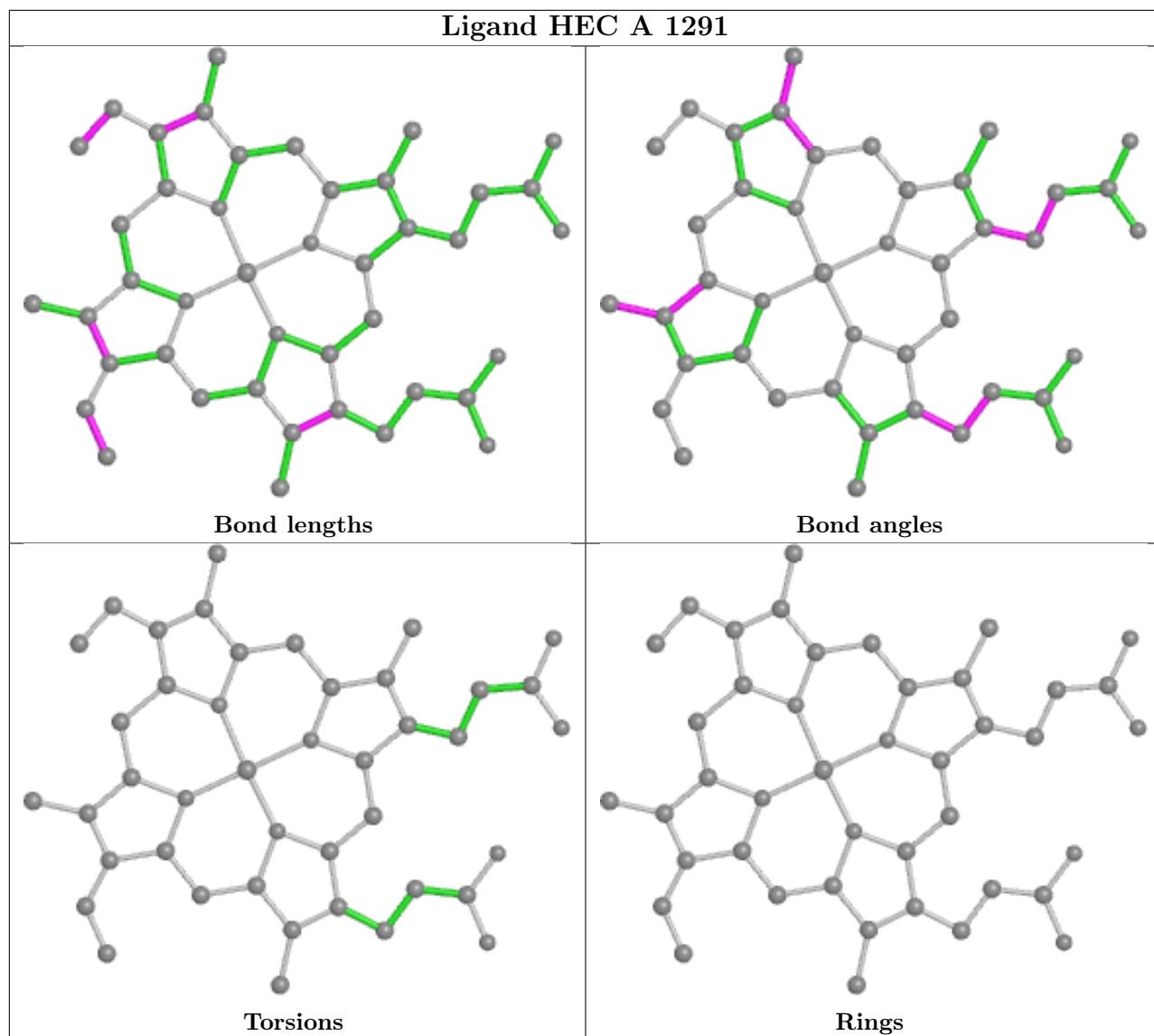
12 monomers are involved in 78 short contacts:

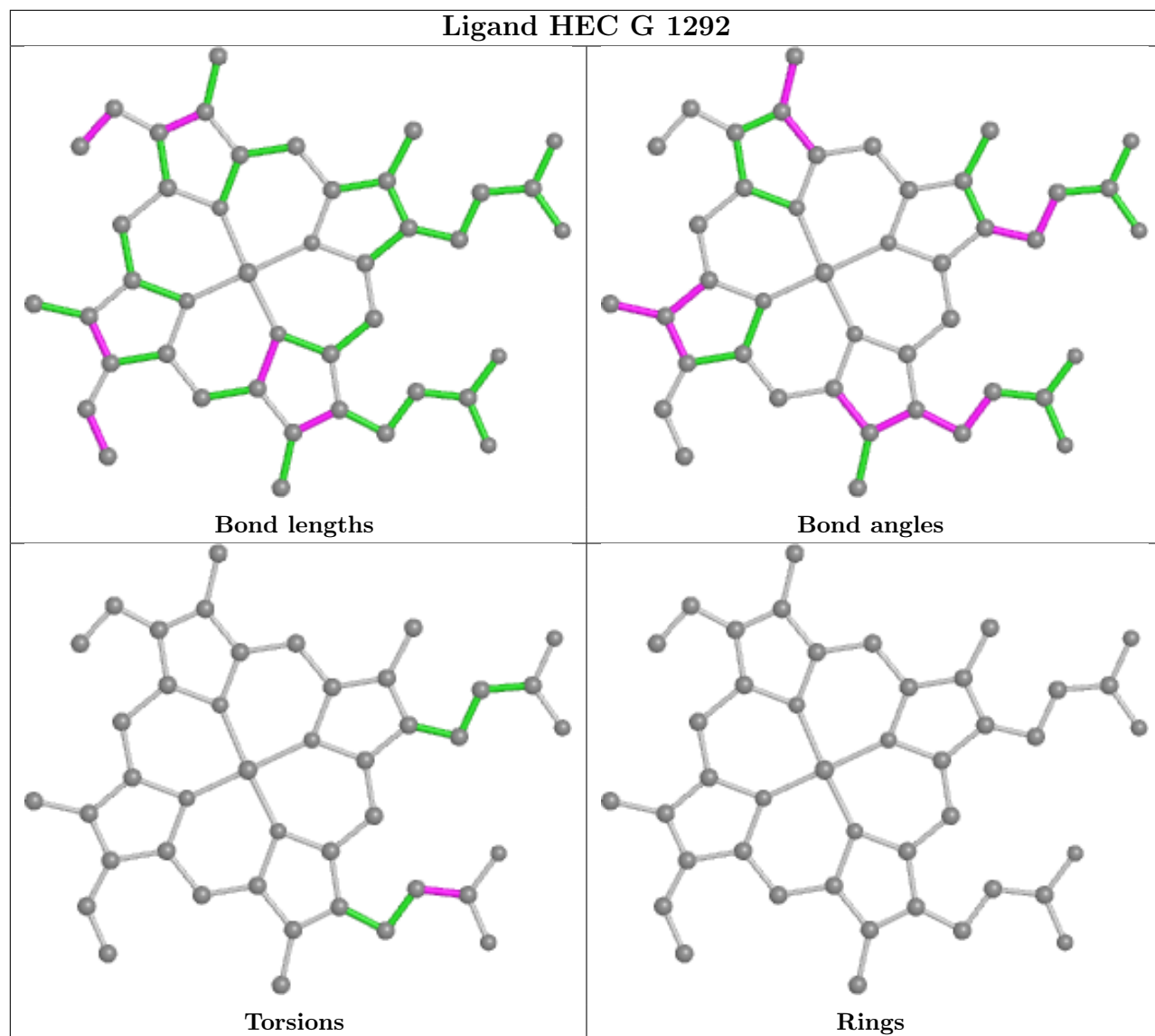
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	G	1291	HEC	5	0
3	A	1291	HEC	8	0
3	G	1292	HEC	5	0
3	B	1158	HEC	8	0
3	C	1292	HEC	4	0
3	E	1291	HEC	1	0
3	H	1158	HEC	8	0
3	E	1292	HEC	6	0
3	C	1291	HEC	8	0
3	A	1292	HEC	5	0
3	F	1158	HEC	11	0
3	D	1158	HEC	9	0

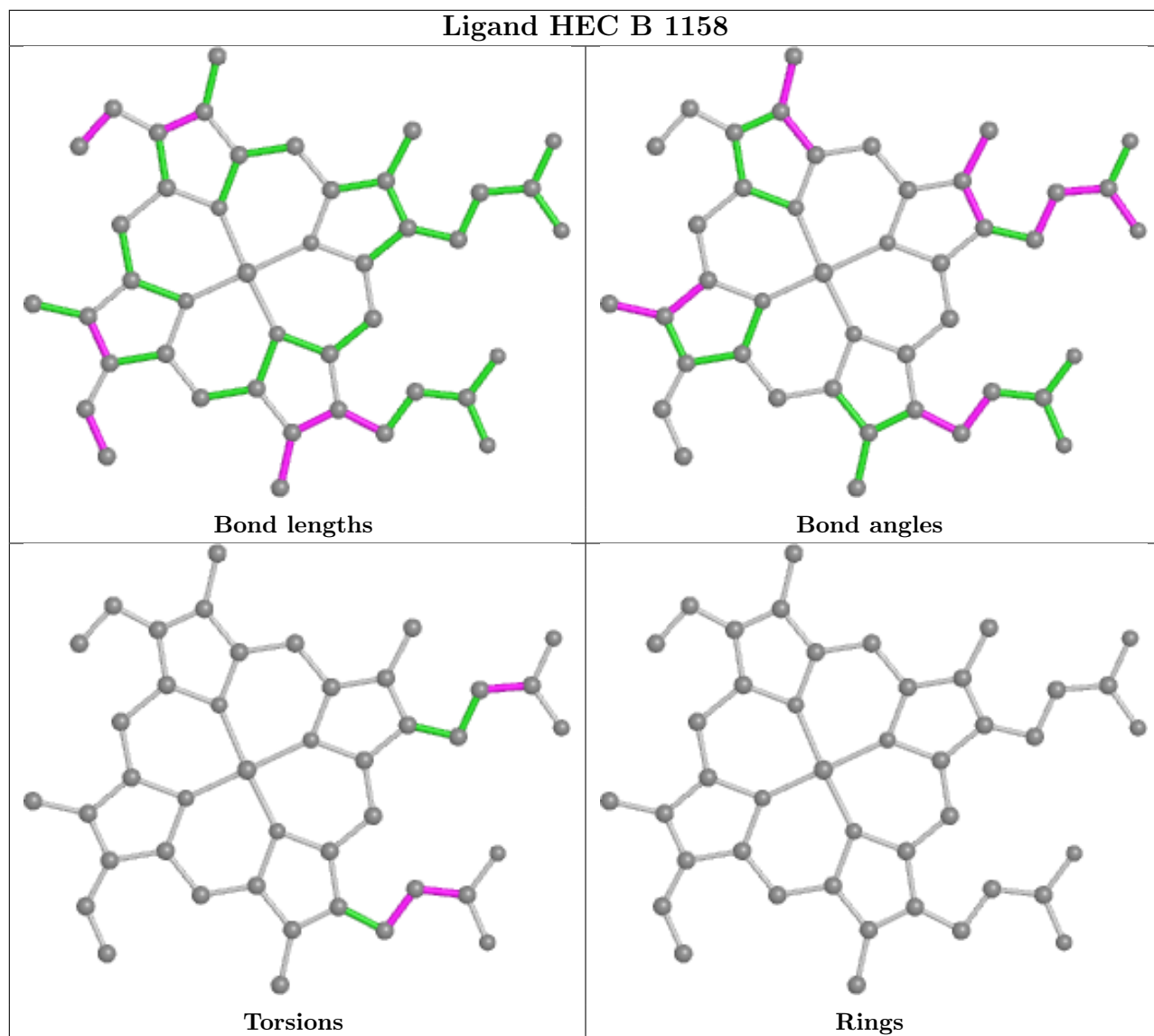
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will

also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

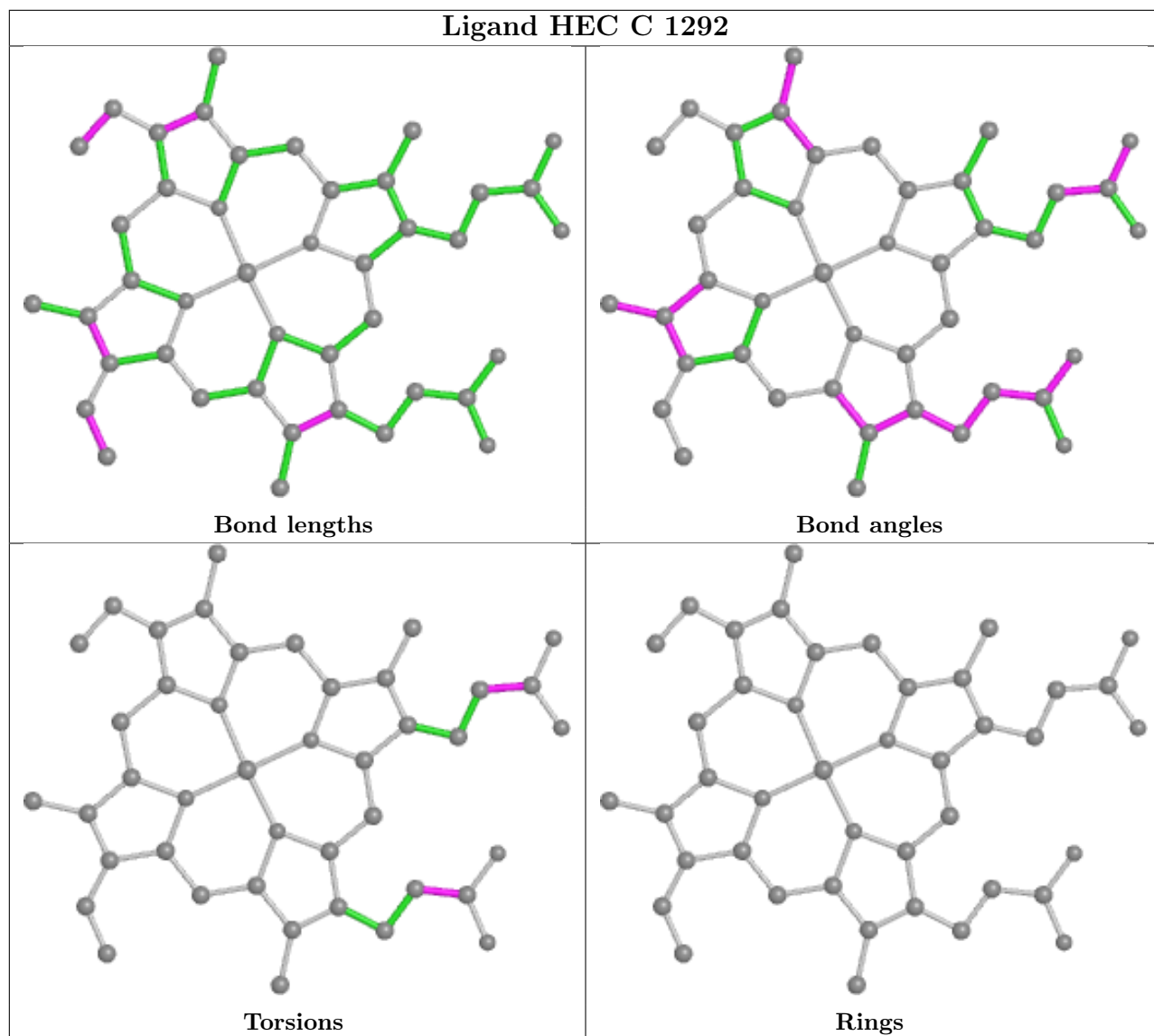


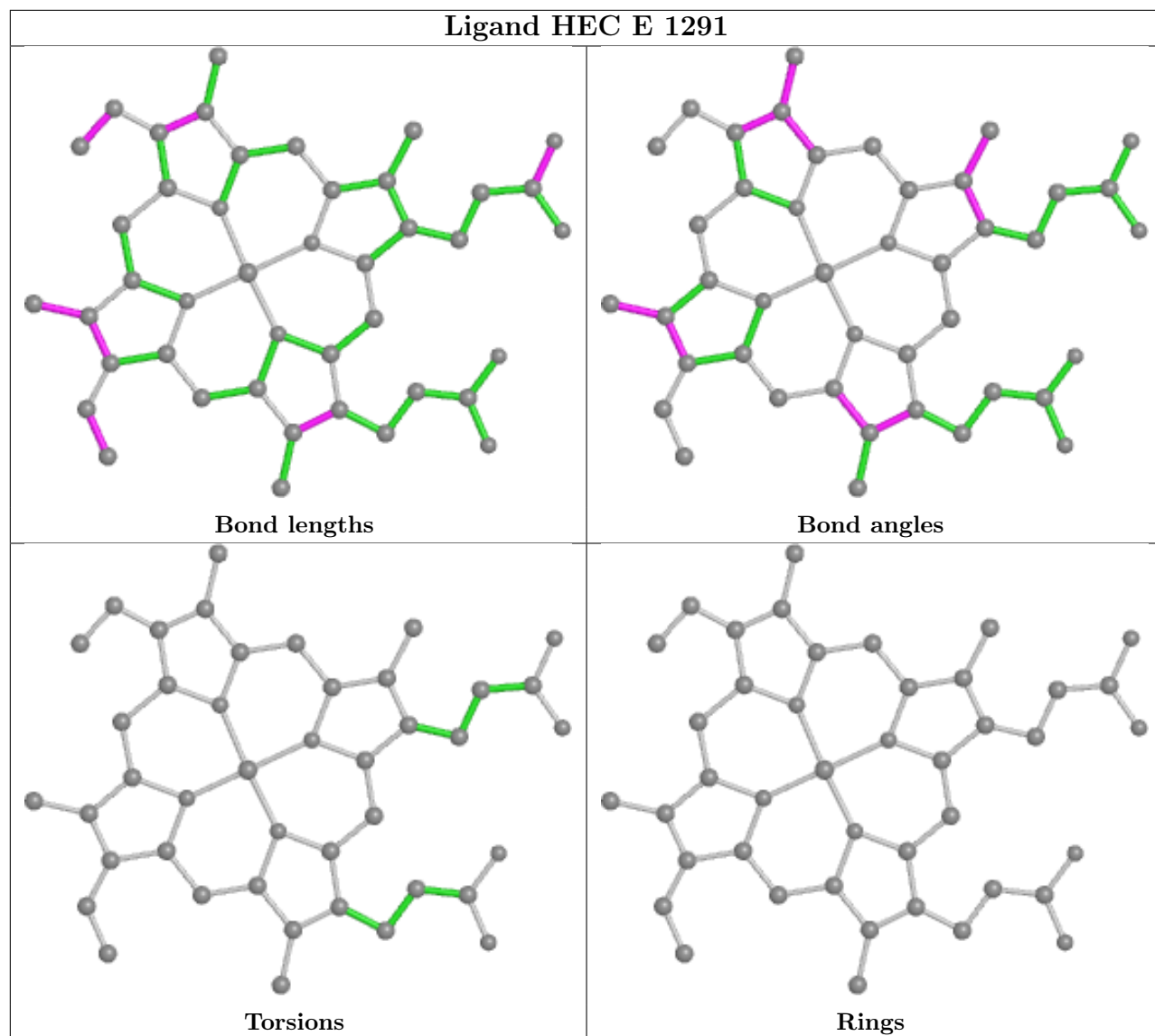


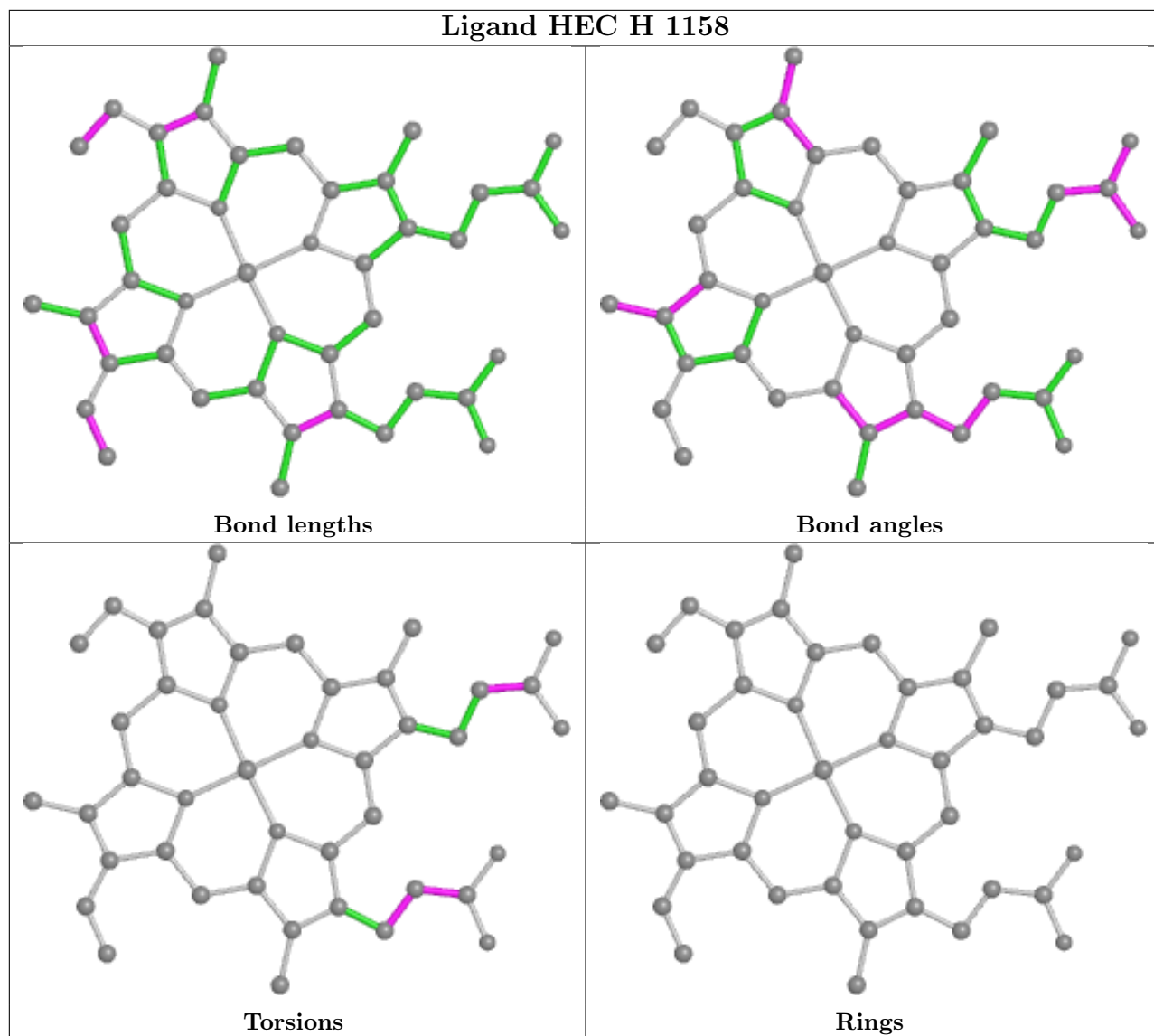


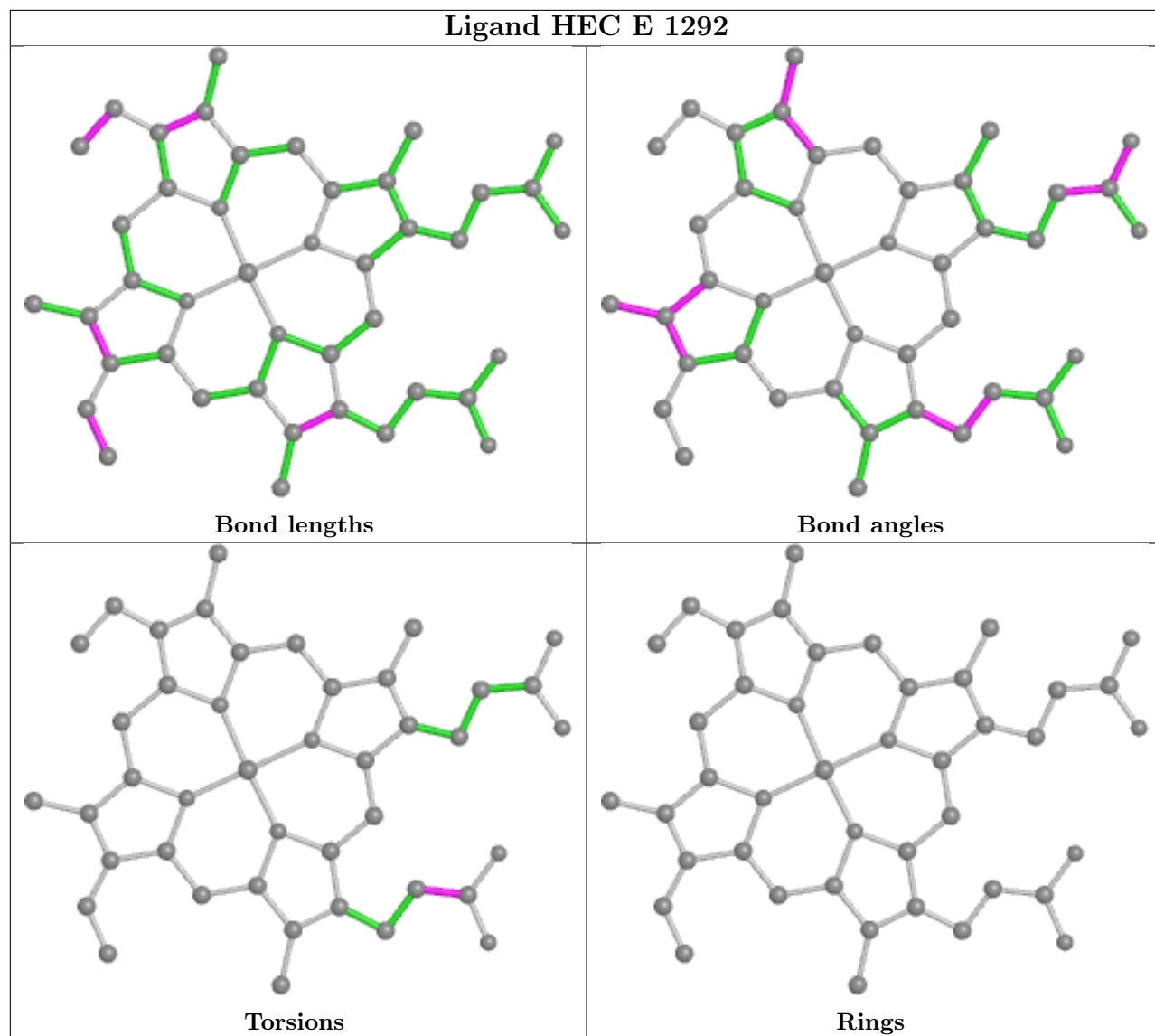


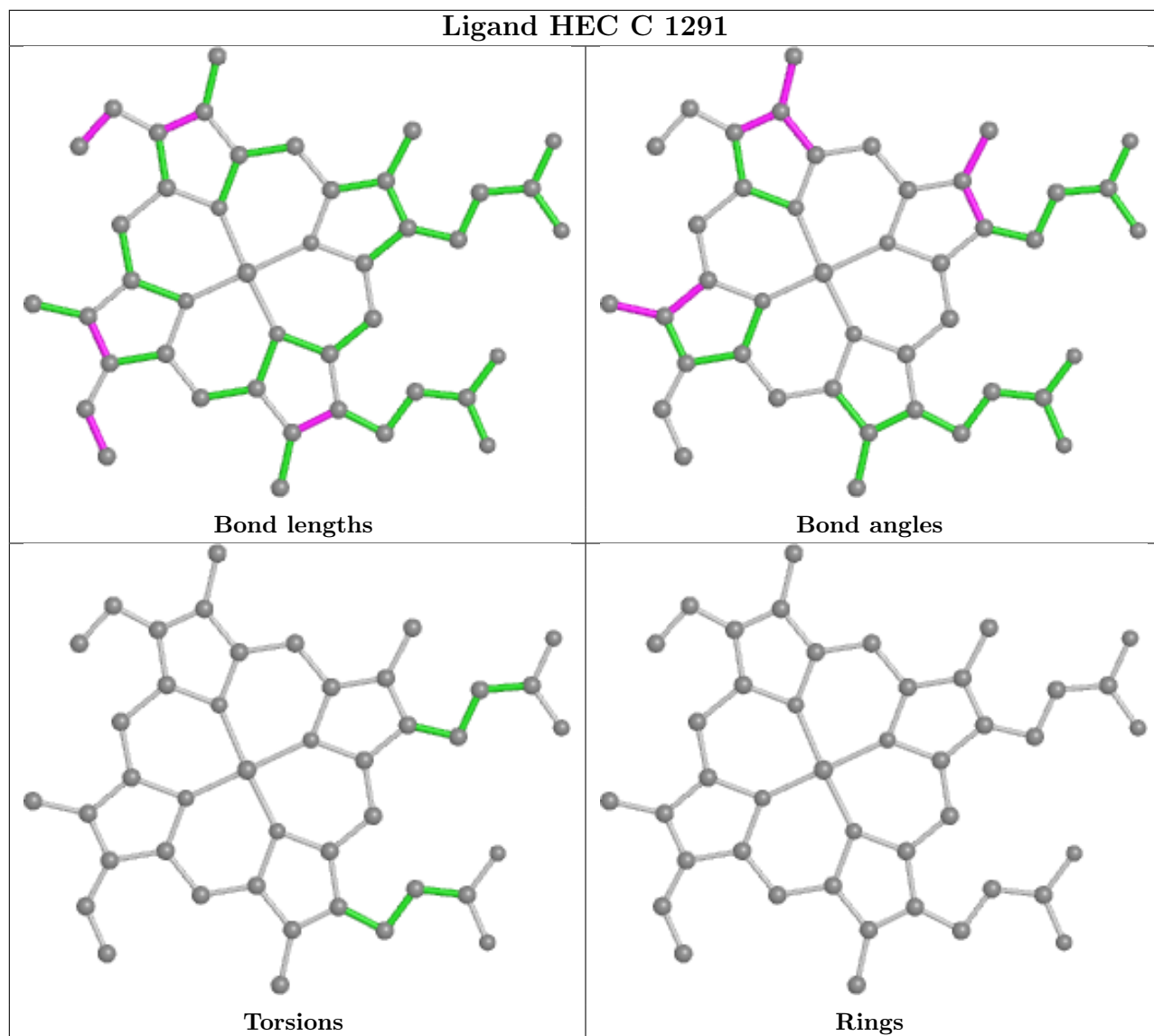


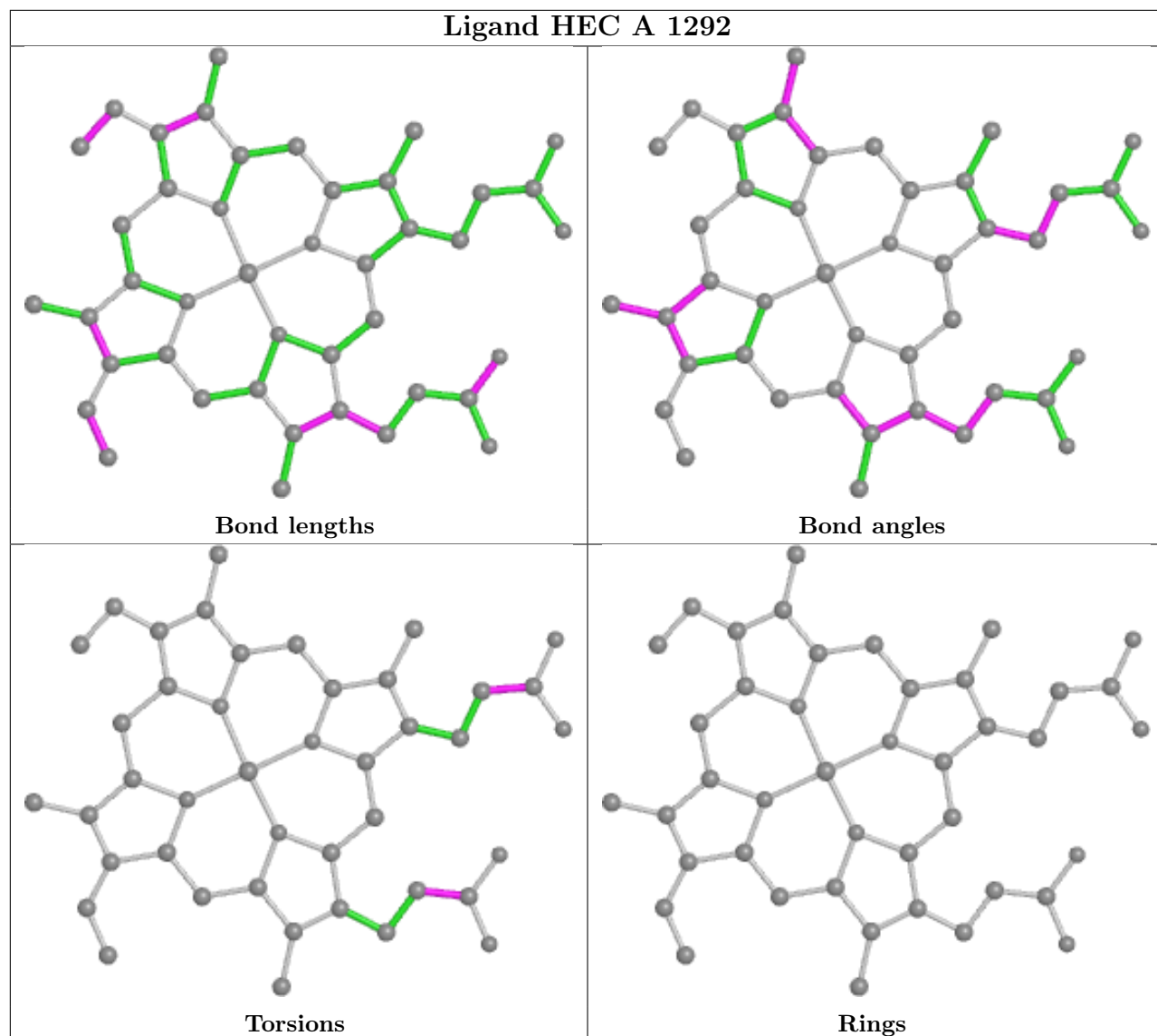


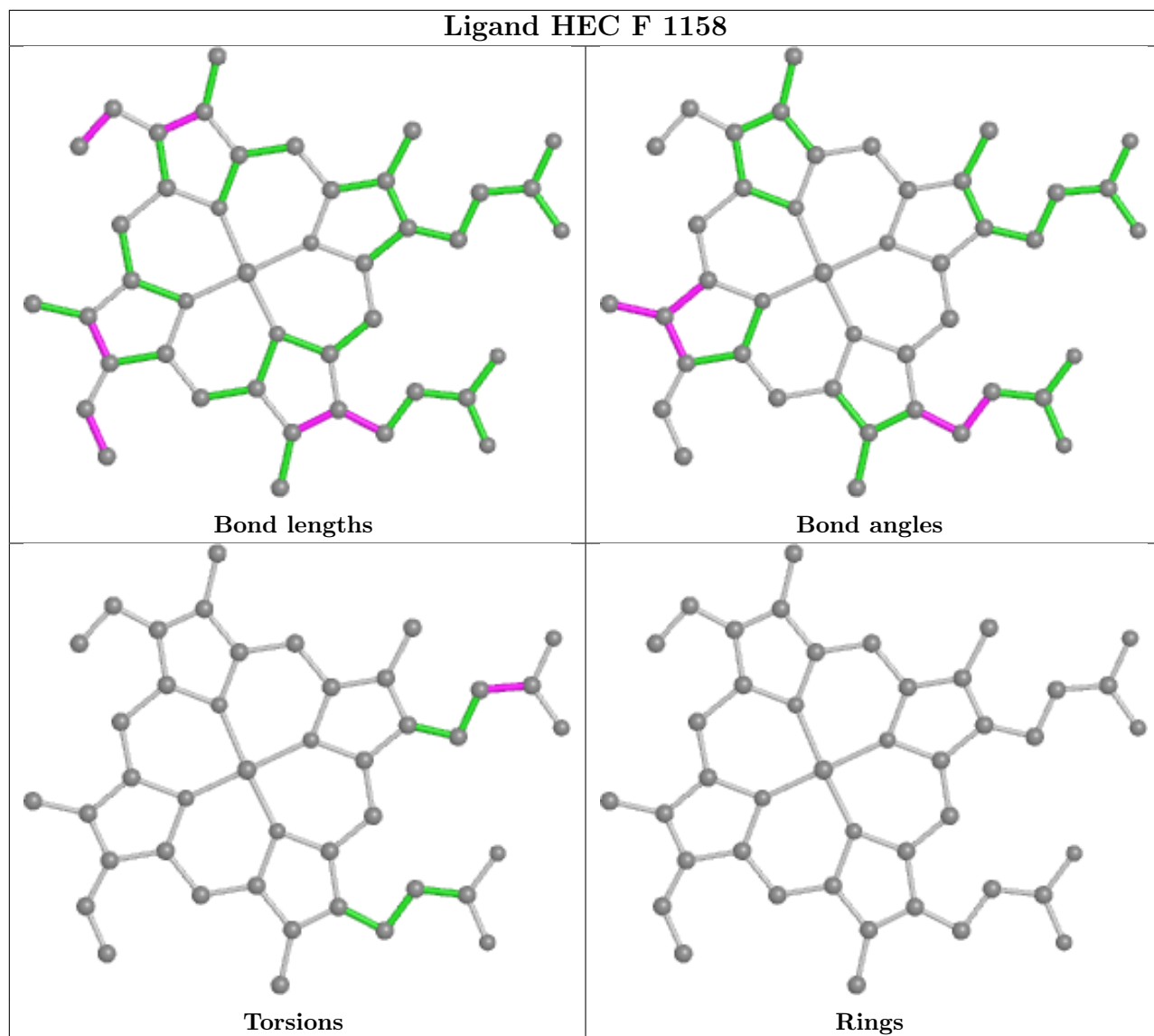


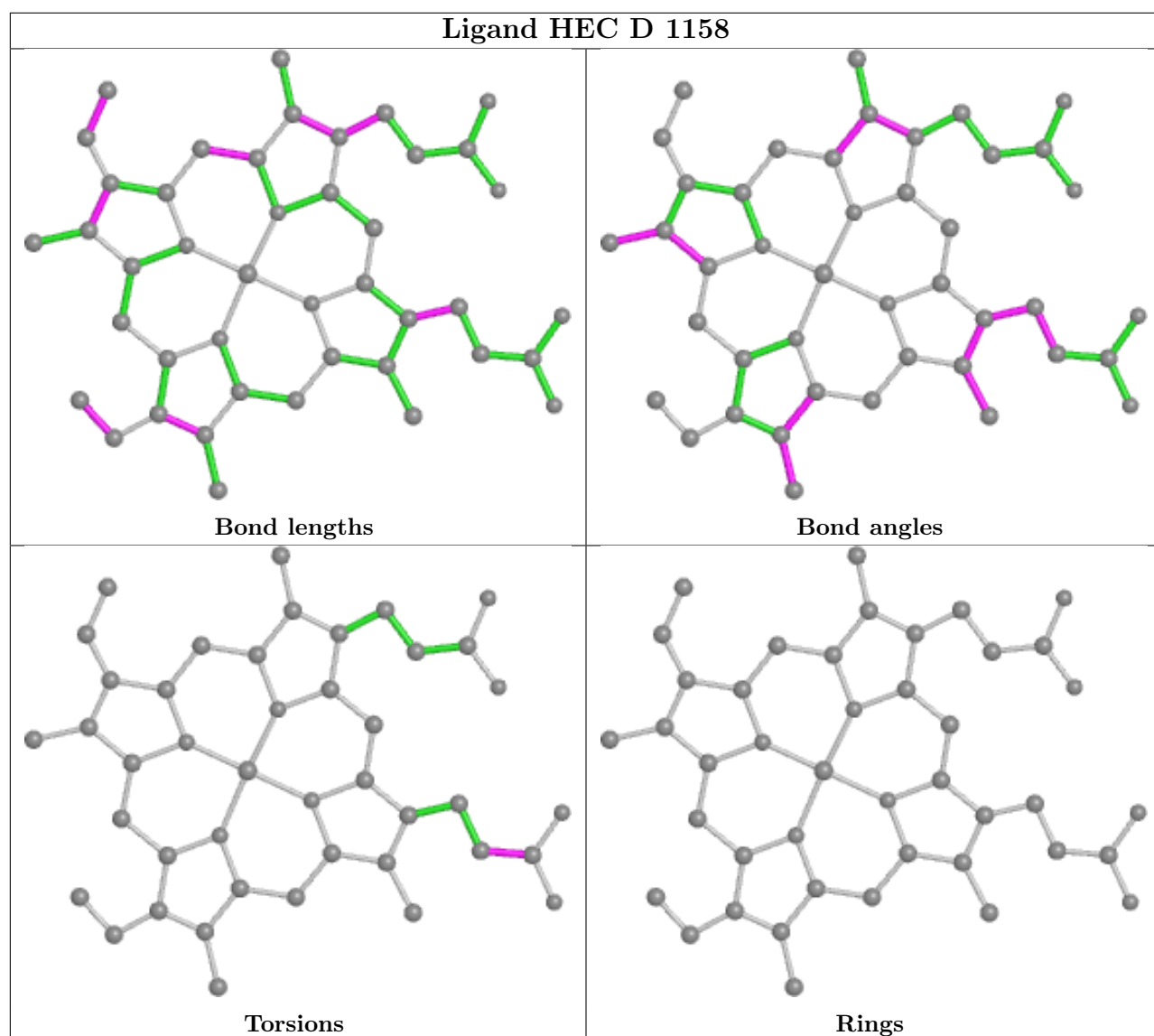












## 5.7 Other polymers [\(i\)](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [\(i\)](#)

There are no chain breaks in this entry.



## 6 Fit of model and data

### 6.1 Protein, DNA and RNA chains

In the following table, the column labelled ‘#RSRZ > 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95<sup>th</sup> percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q < 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å <sup>2</sup> )	Q<0.9
1	A	263/264 (99%)	0.13	10 (3%) 40 43	22, 28, 41, 51	0
1	C	263/264 (99%)	0.08	8 (3%) 50 53	21, 27, 39, 49	0
1	E	263/264 (99%)	0.10	11 (4%) 36 39	21, 27, 41, 53	0
1	G	263/264 (99%)	0.16	14 (5%) 26 29	22, 27, 42, 51	0
2	B	137/137 (100%)	0.33	3 (2%) 62 65	25, 31, 41, 59	0
2	D	137/137 (100%)	0.26	5 (3%) 42 46	24, 29, 39, 55	0
2	F	137/137 (100%)	0.25	3 (2%) 62 65	25, 31, 41, 57	0
2	H	137/137 (100%)	0.14	2 (1%) 73 76	23, 28, 37, 55	0
All	All	1600/1604 (99%)	0.16	56 (3%) 44 47	21, 28, 41, 59	0

All (56) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	F	21	CYS	10.0
2	H	21	CYS	9.9
2	D	21	CYS	9.9
2	B	21	CYS	9.6
2	F	157	GLU	6.6
2	H	157	GLU	5.9
2	D	157	GLU	5.8
1	C	101	VAL	4.5
1	E	30	GLU	4.2
1	A	29	VAL	4.2
1	C	30	GLU	4.1
1	G	30	GLU	3.9
1	A	56	ASP	3.9
2	B	157	GLU	3.9
1	E	29	VAL	3.9
1	E	102	ASN	3.9

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
1	A	27	ASP	3.8
1	G	29	VAL	3.7
1	E	38	ASP	3.6
1	G	290	HIS	3.5
1	A	30	GLU	3.5
1	E	27	ASP	3.5
1	A	39	SER	3.4
1	E	80	PHE	3.4
1	A	290	HIS	3.3
1	G	56	ASP	3.3
1	G	39	SER	3.3
1	C	56	ASP	3.1
1	G	102	ASN	3.1
1	A	101	VAL	3.1
1	E	290	HIS	3.0
1	A	38	ASP	3.0
1	G	80	PHE	2.9
1	G	59	ASP	2.8
1	G	146	GLU	2.8
1	C	27	ASP	2.7
1	E	56	ASP	2.6
1	E	55	ALA	2.6
1	C	290	HIS	2.6
1	G	27	ASP	2.6
1	C	29	VAL	2.6
1	G	103	GLY	2.5
2	D	36	GLU	2.4
2	B	99	VAL	2.4
2	D	99	VAL	2.3
1	G	38	ASP	2.3
1	G	99	MET	2.3
1	C	39	SER	2.3
1	A	80	PHE	2.2
2	D	107	GLU	2.2
1	E	39	SER	2.1
1	A	146	GLU	2.1
1	E	43	GLU	2.1
1	G	101	VAL	2.1
1	C	59	ASP	2.1
2	F	32	GLU	2.0

## 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, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
1	CSS	A	251	7/8	0.95	0.09	25,26,28,31	0
1	CSS	E	251	7/8	0.96	0.09	24,25,27,28	0
1	CSS	G	251	7/8	0.96	0.10	23,23,27,29	0
1	CSS	C	251	7/8	0.98	0.07	23,24,26,30	0

## 6.3 Carbohydrates [i](#)

There are no monosaccharides in this entry.

## 6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

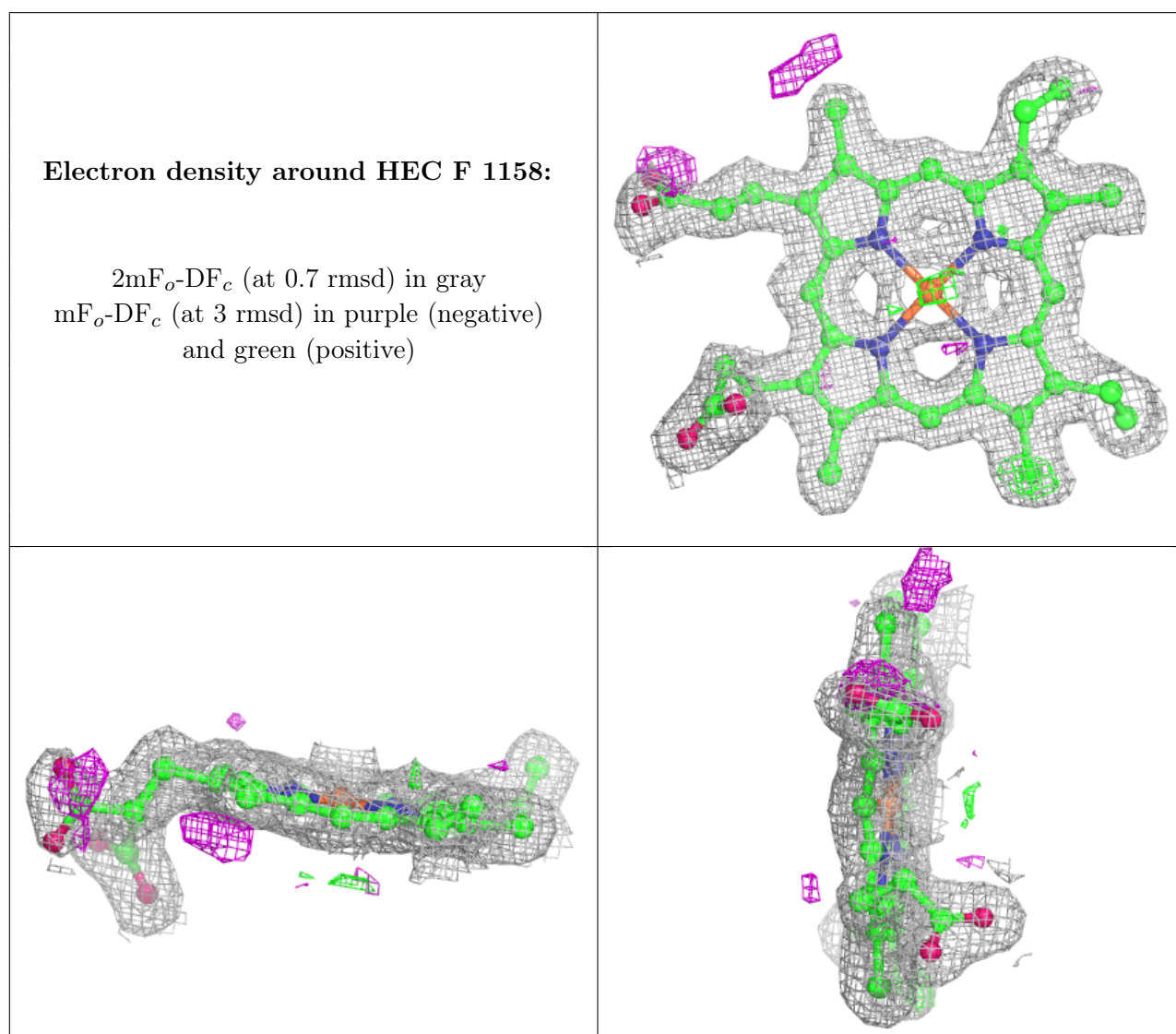
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
4	ZN	A	1295	1/1	0.89	0.09	65,65,65,65	0
4	ZN	G	1295	1/1	0.93	0.09	62,62,62,62	0
3	HEC	F	1158	43/43	0.94	0.13	24,27,37,48	0
3	HEC	B	1158	43/43	0.94	0.13	25,30,39,43	0
3	HEC	D	1158	43/43	0.94	0.13	23,27,40,47	0
3	HEC	E	1291	43/43	0.95	0.12	2,23,27,27	0
4	ZN	E	1294	1/1	0.95	0.09	64,64,64,64	0
3	HEC	H	1158	43/43	0.95	0.11	21,25,37,43	0
4	ZN	C	1294	1/1	0.96	0.06	62,62,62,62	0
3	HEC	C	1291	43/43	0.96	0.12	2,24,28,33	0
3	HEC	G	1291	43/43	0.96	0.12	2,25,27,28	0
3	HEC	A	1292	43/43	0.97	0.10	21,24,27,29	0
3	HEC	E	1292	43/43	0.97	0.11	21,23,27,29	0
3	HEC	C	1292	43/43	0.97	0.10	18,22,25,27	0
3	HEC	A	1291	43/43	0.97	0.12	22,26,28,32	0
3	HEC	G	1292	43/43	0.97	0.10	19,23,27,28	0
4	ZN	E	1293	1/1	0.99	0.04	33,33,33,33	0
4	ZN	A	1293	1/1	0.99	0.04	32,32,32,32	0

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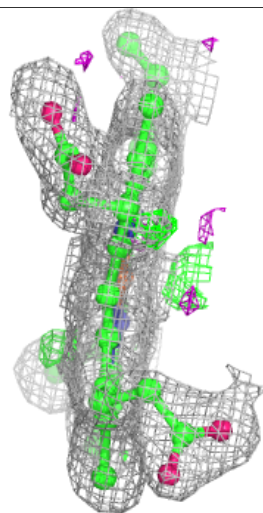
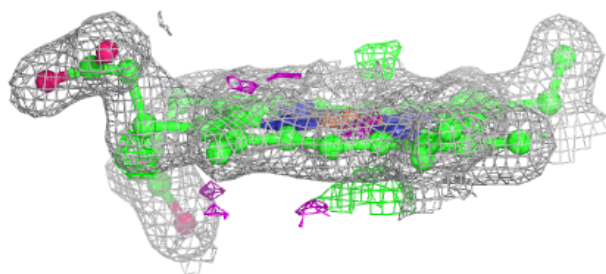
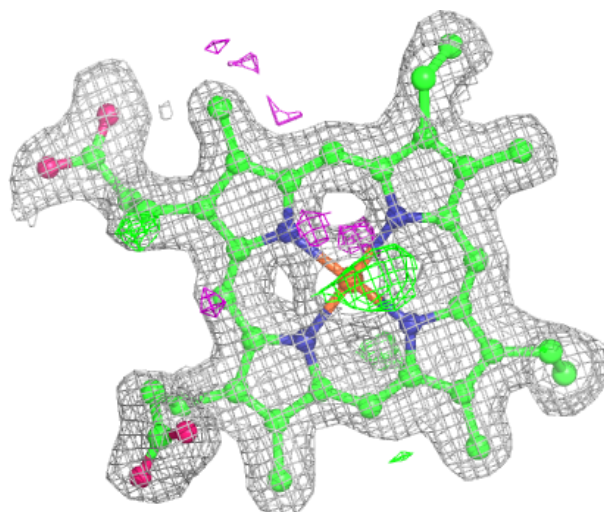
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
4	ZN	C	1295	1/1	0.99	0.05	25,25,25,25	0
4	ZN	C	1293	1/1	1.00	0.03	32,32,32,32	0
4	ZN	A	1294	1/1	1.00	0.04	25,25,25,25	0
4	ZN	G	1293	1/1	1.00	0.04	31,31,31,31	0
4	ZN	G	1294	1/1	1.00	0.03	26,26,26,26	0
4	ZN	A	1296	1/1	1.00	0.03	24,24,24,24	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.



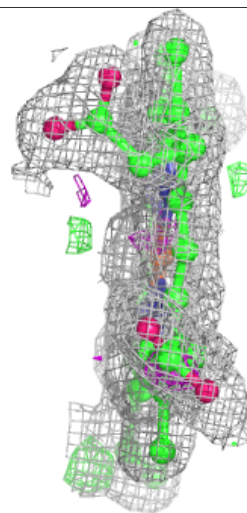
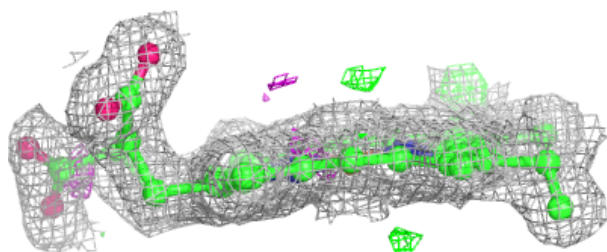
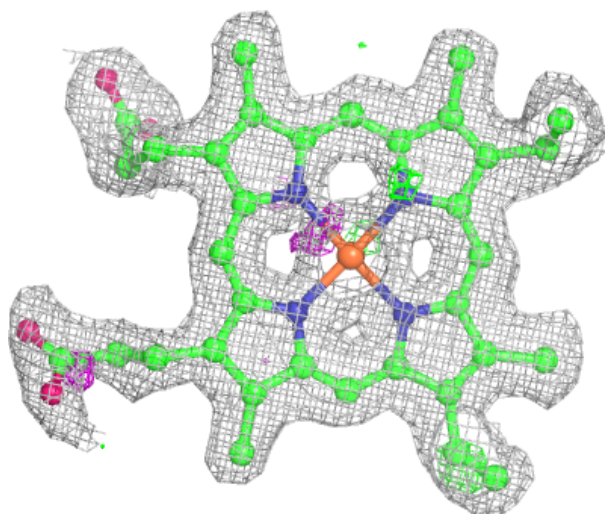
**Electron density around HEC B 1158:**

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



**Electron density around HEC D 1158:**

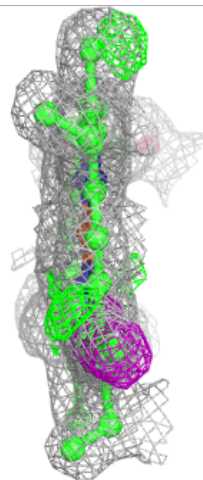
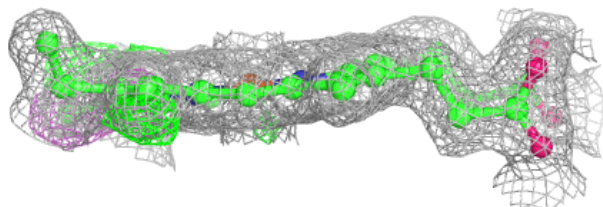
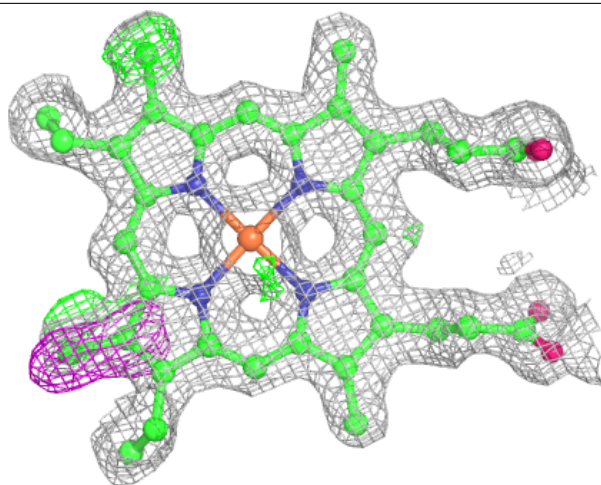
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 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)





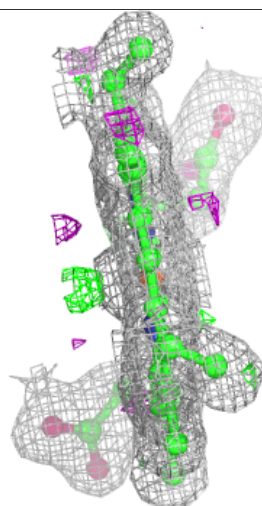
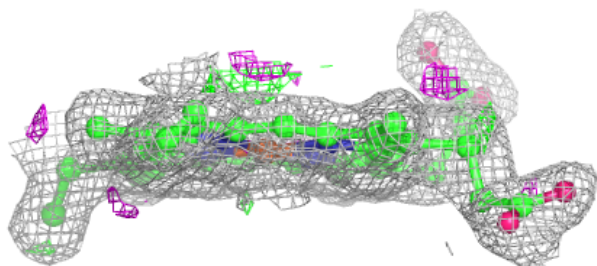
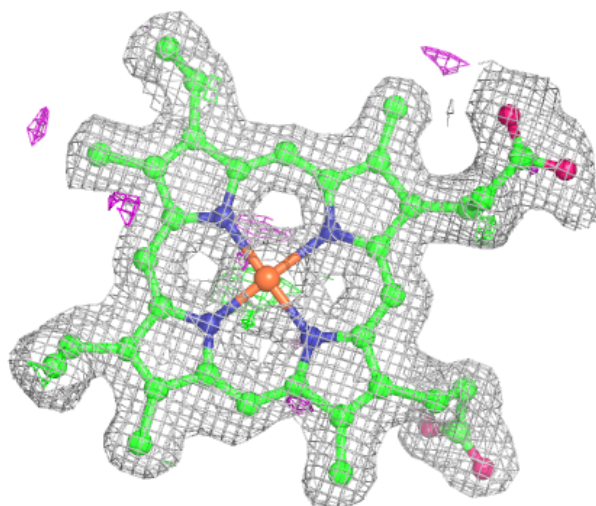
**Electron density around HEC E 1291:**

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and green (positive)



**Electron density around HEC H 1158:**

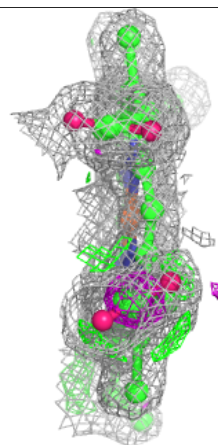
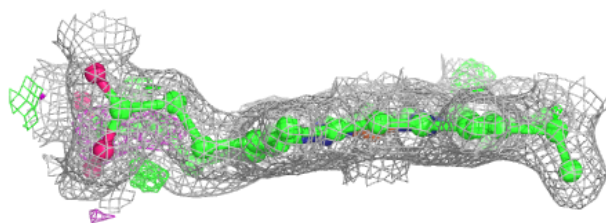
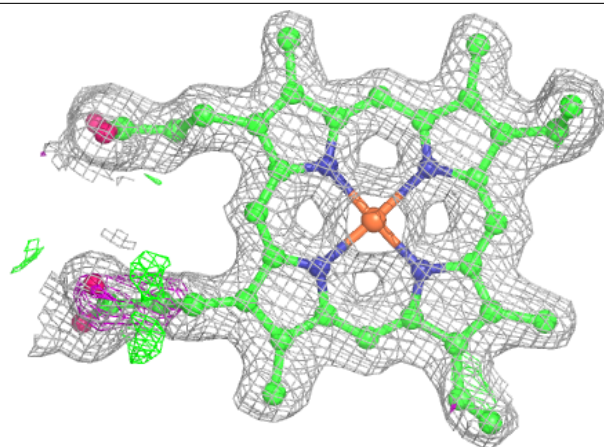
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 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)





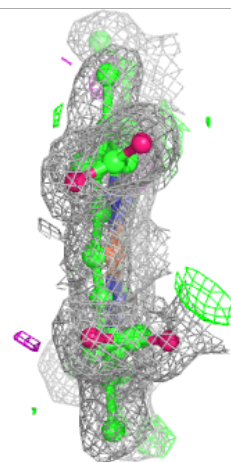
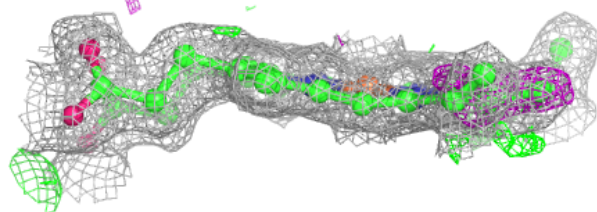
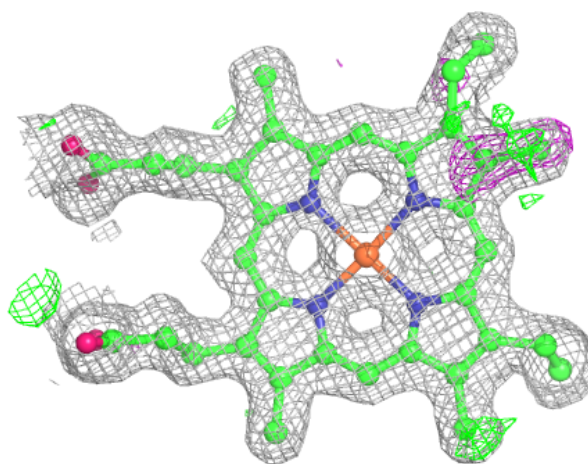
**Electron density around HEC C 1291:**

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and green (positive)



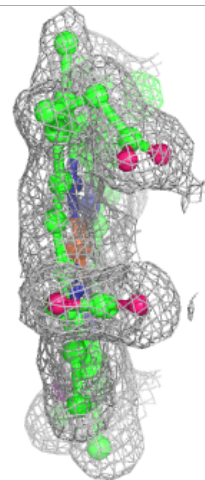
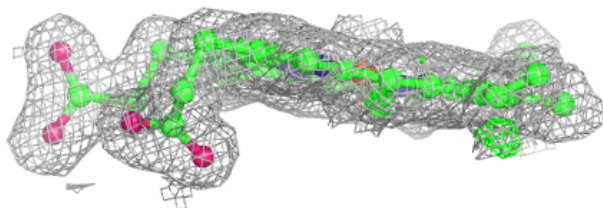
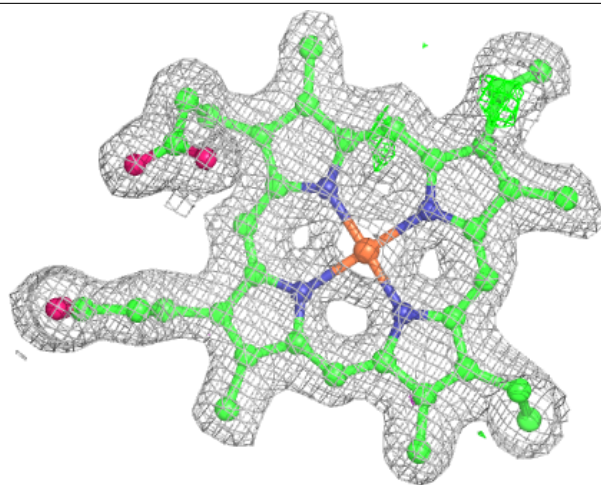
**Electron density around HEC G 1291:**

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



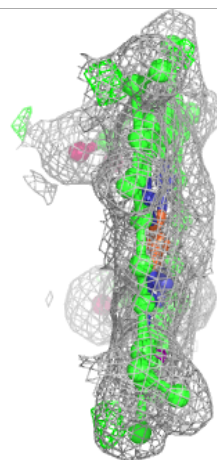
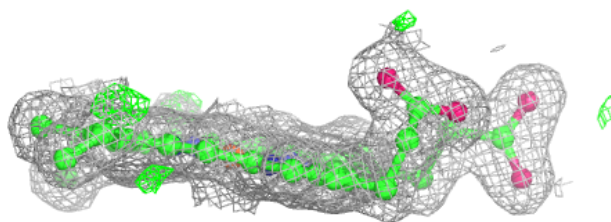
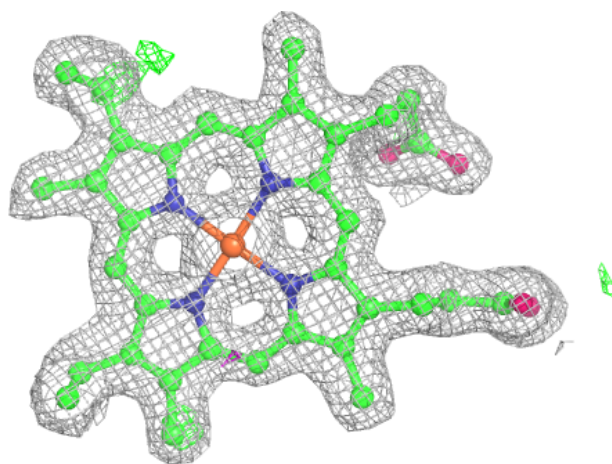
**Electron density around HEC A 1292:**

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



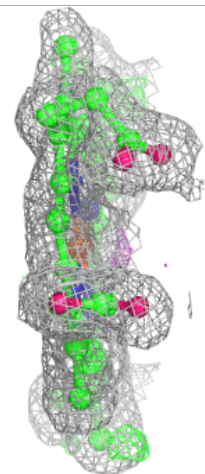
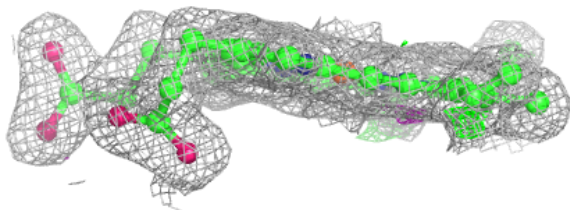
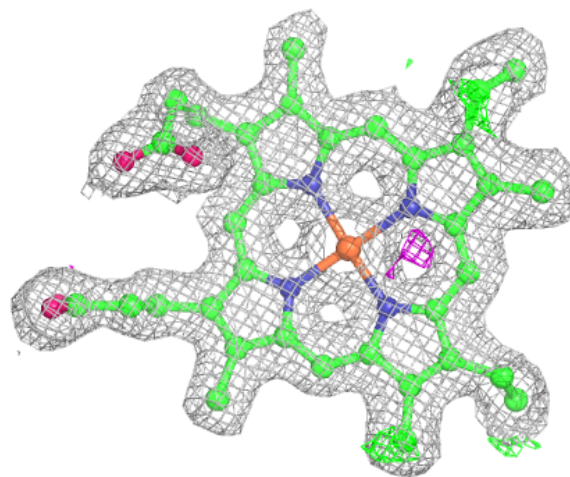
**Electron density around HEC E 1292:**

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and green (positive)



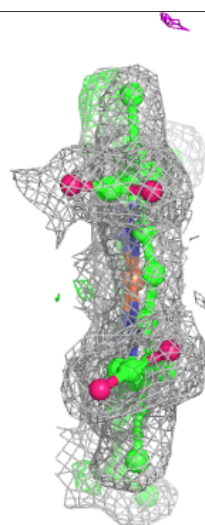
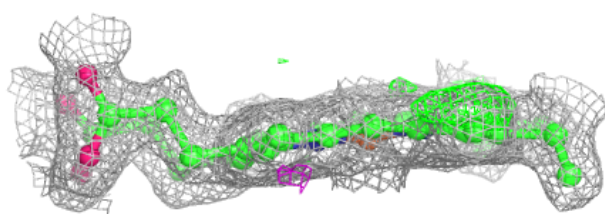
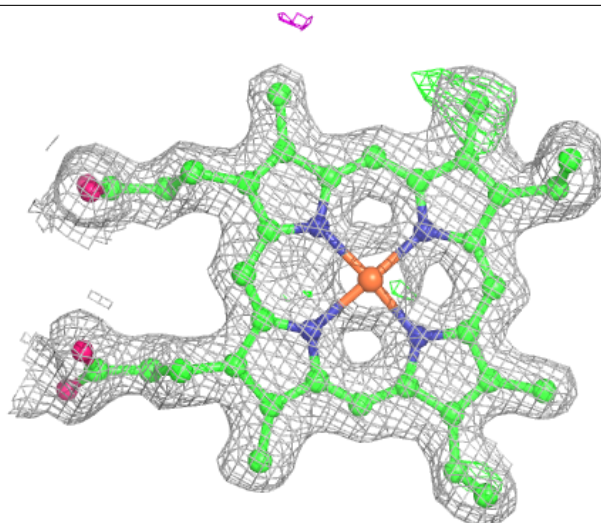
**Electron density around HEC C 1292:**

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and green (positive)

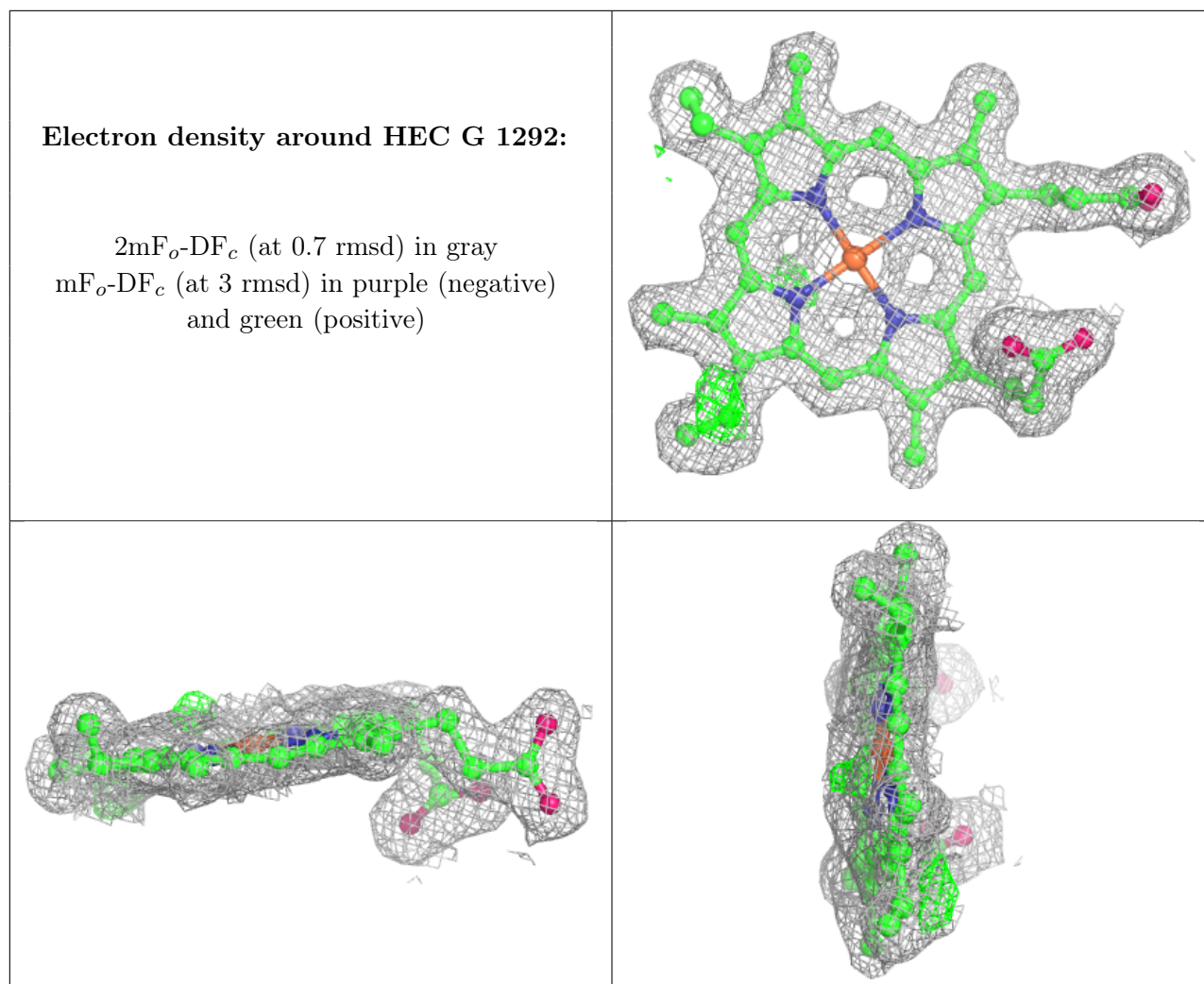


**Electron density around HEC A 1291:**

$2mF_o-DF_c$  (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.