



# wwPDB X-ray Structure Validation Summary Report ⓘ

Jan 16, 2024 – 03:23 am GMT

PDB ID : 6QCL  
Title : Citryl-CoA lyase core module of Chlorobium limicola ATP citrate lyase in complex with acetyl-CoA and L-malate  
Authors : Verstraete, K.; Verschueren, K.  
Deposited on : 2018-12-28  
Resolution : 1.60 Å(reported)

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

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<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

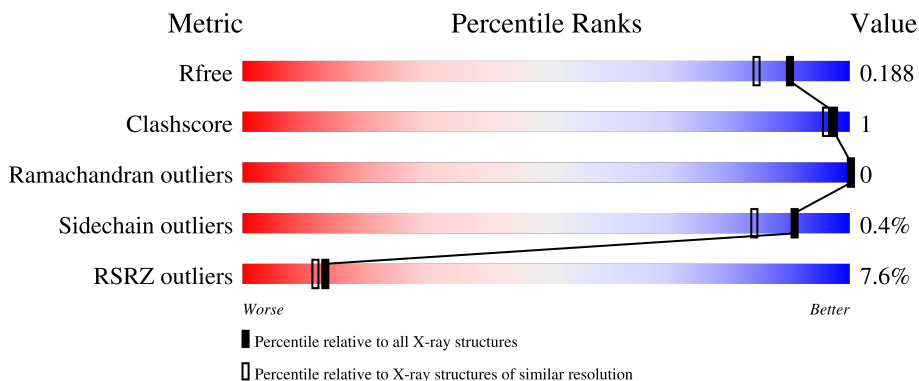
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 1.60 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	3398 (1.60-1.60)
Clashscore	141614	3665 (1.60-1.60)
Ramachandran outliers	138981	3564 (1.60-1.60)
Sidechain outliers	138945	3563 (1.60-1.60)
RSRZ outliers	127900	3321 (1.60-1.60)

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	262	 9% 81% 18%
1	B	262	 19% 90% 9%
1	C	262	 23% 99%
1	D	262	 6% 97%
1	E	262	 96%

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Mol	Chain	Length	Quality of chain
1	F	262	<p>% 96%</p>
1	G	262	<p>98%</p>
1	H	262	<p>% 98%</p>

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
3	LMR	G	1000	-	X	-	-

## 2 Entry composition [i](#)

There are 7 unique types of molecules in this entry. The entry contains 33116 atoms, of which 16022 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 ATP-citrate lyase alpha-subunit.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace	
			Total	C	H	N	O				S
1	A	215	3341	1067	1660	282	321	11	0	4	0
1	B	239	3750	1198	1872	317	351	12	0	3	0
1	C	261	4065	1291	2036	346	379	13	0	3	0
1	D	261	4065	1291	2036	346	379	13	0	3	0
1	E	256	4043	1283	2031	344	373	12	0	4	0
1	F	256	4051	1284	2034	345	376	12	0	5	0
1	G	261	4101	1302	2057	349	380	13	0	4	0
1	H	261	4114	1305	2064	350	382	13	0	7	0

There are 32 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	347	GLY	-	expression tag	UNP Q9AJC4
A	348	SER	-	expression tag	UNP Q9AJC4
A	349	HIS	-	expression tag	UNP Q9AJC4
A	350	MET	-	expression tag	UNP Q9AJC4
B	347	GLY	-	expression tag	UNP Q9AJC4
B	348	SER	-	expression tag	UNP Q9AJC4
B	349	HIS	-	expression tag	UNP Q9AJC4
B	350	MET	-	expression tag	UNP Q9AJC4
C	347	GLY	-	expression tag	UNP Q9AJC4
C	348	SER	-	expression tag	UNP Q9AJC4
C	349	HIS	-	expression tag	UNP Q9AJC4
C	350	MET	-	expression tag	UNP Q9AJC4
D	347	GLY	-	expression tag	UNP Q9AJC4

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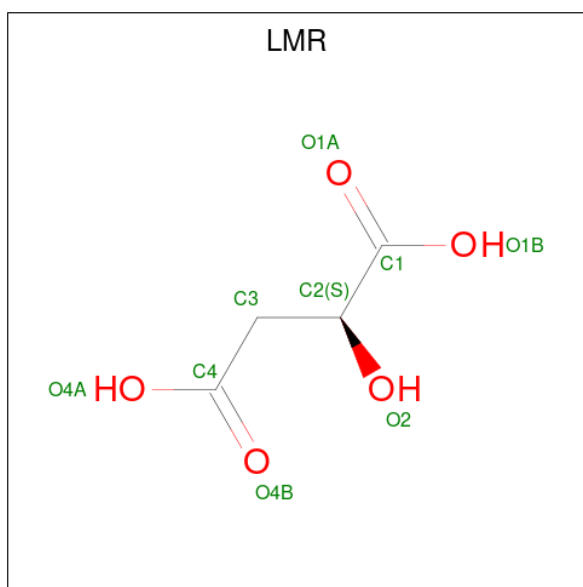
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Chain	Residue	Modelled	Actual	Comment	Reference
D	348	SER	-	expression tag	UNP Q9AJC4
D	349	HIS	-	expression tag	UNP Q9AJC4
D	350	MET	-	expression tag	UNP Q9AJC4
E	347	GLY	-	expression tag	UNP Q9AJC4
E	348	SER	-	expression tag	UNP Q9AJC4
E	349	HIS	-	expression tag	UNP Q9AJC4
E	350	MET	-	expression tag	UNP Q9AJC4
F	347	GLY	-	expression tag	UNP Q9AJC4
F	348	SER	-	expression tag	UNP Q9AJC4
F	349	HIS	-	expression tag	UNP Q9AJC4
F	350	MET	-	expression tag	UNP Q9AJC4
G	347	GLY	-	expression tag	UNP Q9AJC4
G	348	SER	-	expression tag	UNP Q9AJC4
G	349	HIS	-	expression tag	UNP Q9AJC4
G	350	MET	-	expression tag	UNP Q9AJC4
H	347	GLY	-	expression tag	UNP Q9AJC4
H	348	SER	-	expression tag	UNP Q9AJC4
H	349	HIS	-	expression tag	UNP Q9AJC4
H	350	MET	-	expression tag	UNP Q9AJC4

- Molecule 2 is CALCIUM ION (three-letter code: CA) (formula: Ca).

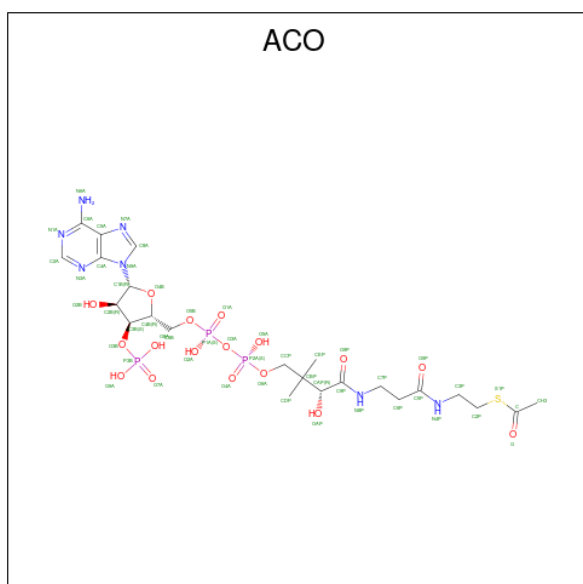
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	1	Total Ca 1 1	0	0
2	B	1	Total Ca 1 1	0	0

- Molecule 3 is (2S)-2-hydroxybutanedioic acid (three-letter code: LMR) (formula: C<sub>4</sub>H<sub>6</sub>O<sub>5</sub>) (labeled as "Ligand of Interest" by depositor).



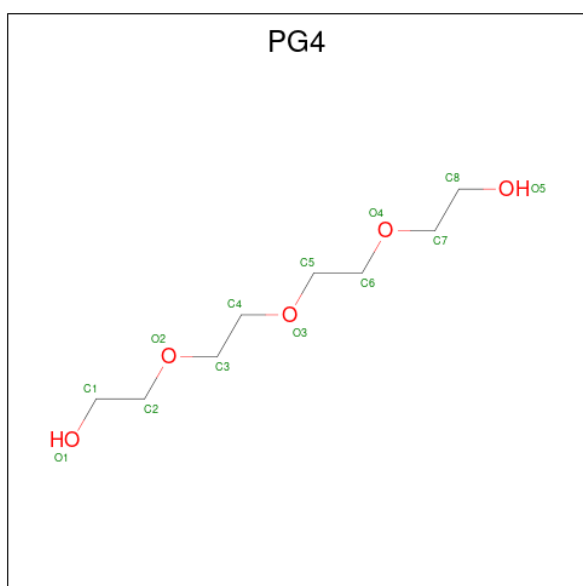
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf	
3	E	1	Total	C	H	O	0	0
			13	4	4	5		
3	F	1	Total	C	H	O	0	0
			13	4	4	5		
3	G	1	Total	C	H	O	0	0
			13	4	4	5		
3	H	1	Total	C	H	O	0	0
			13	4	4	5		

- Molecule 4 is ACETYL COENZYME \*A (three-letter code: ACO) (formula:  $C_{23}H_{38}N_7O_{17}P_3S$ ) (labeled as "Ligand of Interest" by depositor).



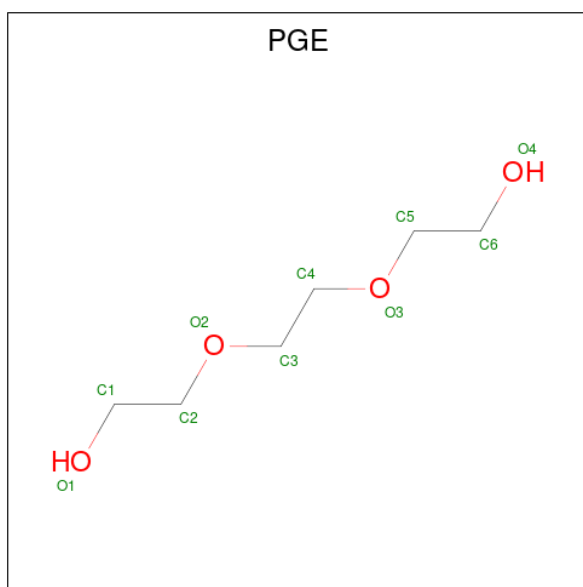
Mol	Chain	Residues	Atoms							ZeroOcc	AltConf
			Total	C	H	N	O	P	S		
4	E	1	89	23	38	7	17	3	1	0	0
4	F	1	89	23	38	7	17	3	1	0	0
4	G	1	89	23	38	7	17	3	1	0	0
4	H	1	89	23	38	7	17	3	1	0	0

- Molecule 5 is TETRAETHYLENE GLYCOL (three-letter code: PG4) (formula:  $C_8H_{18}O_5$ ).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	H	O		
5	E	1	31	8	18	5	0	0
5	F	1	31	8	18	5	0	0

- Molecule 6 is TRIETHYLENE GLYCOL (three-letter code: PGE) (formula:  $C_6H_{14}O_4$ ).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	H	O		
6	G	1	24	6	14	4	0	0
6	H	1	24	6	14	4	0	0

- Molecule 7 is water.

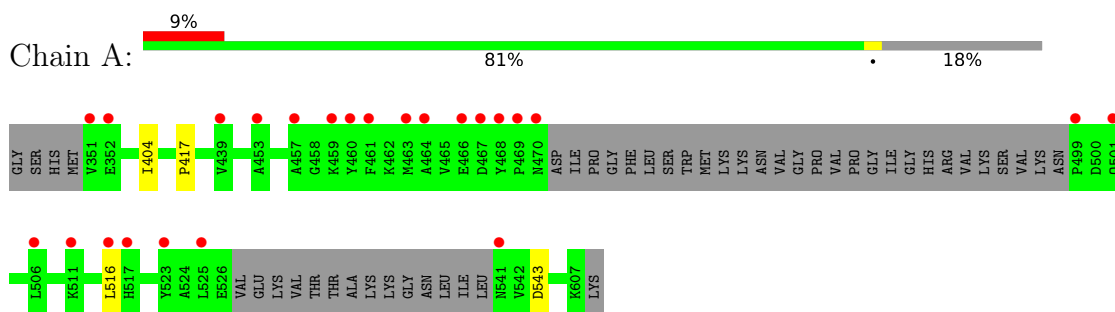
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	O		
7	A	100	100	100	0	0
7	B	108	108	108	0	0
7	C	107	107	107	0	0
7	D	136	136	136	0	0
7	E	151	151	151	0	0
7	F	137	137	137	0	0
7	G	182	182	182	0	0
7	H	145	145	145	0	0



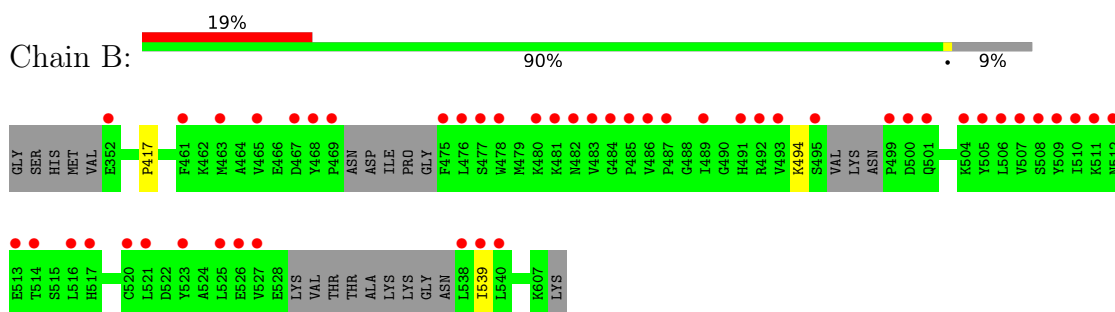
### 3 Residue-property plots [i](#)

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.

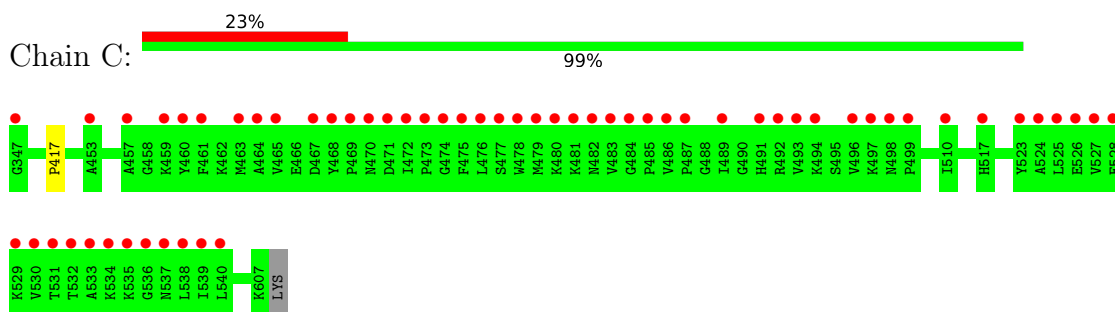
- Molecule 1: ATP-citrate lyase alpha-subunit



- Molecule 1: ATP-citrate lyase alpha-subunit

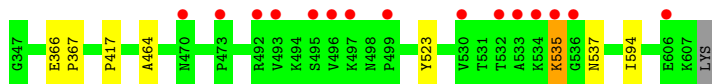


- Molecule 1: ATP-citrate lyase alpha-subunit



- Molecule 1: ATP-citrate lyase alpha-subunit





- Molecule 1: ATP-citrate lyase alpha-subunit

Chain E: 96%



- Molecule 1: ATP-citrate lyase alpha-subunit

Chain F: 96%



- Molecule 1: ATP-citrate lyase alpha-subunit

Chain G: 98%



- Molecule 1: ATP-citrate lyase alpha-subunit

Chain H: 98%



## 4 Data and refinement statistics i

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	102.73Å 100.82Å 105.01Å 90.00° 102.99° 90.00°	Depositor
Resolution (Å)	45.62 – 1.60 45.62 – 1.60	Depositor EDS
% Data completeness (in resolution range)	98.8 (45.62-1.60) 98.9 (45.62-1.60)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.33 (at 1.60Å)	Xtrriage
Refinement program	BUSTER 2.10.3	Depositor
R, $R_{free}$	0.157 , 0.177 0.169 , 0.188	Depositor DCC
$R_{free}$ test set	13820 reflections (5.10%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	17.2	Xtrriage
Anisotropy	0.291	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.44 , 54.7	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.48$ , $\langle L^2 \rangle = 0.31$	Xtrriage
Estimated twinning fraction	0.017 for l,-k,h	Xtrriage
$F_o, F_c$ correlation	0.97	EDS
Total number of atoms	33116	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	27.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.42% of the height of the origin peak. No significant pseudotranslation is detected.*

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

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

## 5 Model quality [i](#)

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

Bond lengths and bond angles in the following residue types are not validated in this section: CA, PGE, ACO, LMR, PG4

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	0.53	0/1731	0.61	0/2344
1	B	0.51	0/1917	0.60	0/2593
1	C	0.51	0/2081	0.60	0/2819
1	D	0.51	0/2081	0.62	0/2819
1	E	0.50	0/2055	0.59	0/2785
1	F	0.49	0/2060	0.61	0/2791
1	G	0.52	0/2088	0.60	0/2830
1	H	0.51	0/2108	0.62	0/2857
All	All	0.51	0/16121	0.61	0/21838

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

### 5.2 Too-close contacts [i](#)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1681	1660	1638	4	0
1	B	1878	1872	1868	3	0
1	C	2029	2036	2025	3	0
1	D	2029	2036	2025	5	0
1	E	2012	2031	2027	6	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	F	2017	2034	2027	2	0
1	G	2044	2057	2053	4	0
1	H	2050	2064	2050	5	0
2	A	1	0	0	0	0
2	B	1	0	0	0	0
3	E	9	4	4	1	0
3	F	9	4	4	1	0
3	G	9	4	4	1	0
3	H	9	4	4	0	0
4	E	51	38	34	1	0
4	F	51	38	34	1	0
4	G	51	38	34	1	0
4	H	51	38	34	0	0
5	E	13	18	18	0	0
5	F	13	18	18	1	0
6	G	10	14	14	0	0
6	H	10	14	14	0	0
7	A	100	0	0	1	0
7	B	108	0	0	1	0
7	C	107	0	0	1	0
7	D	136	0	0	0	0
7	E	151	0	0	0	0
7	F	137	0	0	1	0
7	G	182	0	0	0	0
7	H	145	0	0	0	0
All	All	17094	16022	15929	27	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 1.

The worst 5 of 27 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:B:417:PRO:HB3	1:H:357[B]:THR:HG21	1.86	0.58
1:B:417:PRO:CB	1:H:357[B]:THR:HG21	2.34	0.57
1:D:535:LYS:HD2	1:D:537:ASN:OD1	2.04	0.57
7:C:728:HOH:O	1:E:357[B]:THR:HG22	2.05	0.56
1:A:417:PRO:CB	1:G:357[B]:THR:HG21	2.35	0.56

There are no symmetry-related clashes.

## 5.3 Torsion angles [i](#)

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

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	213/262 (81%)	212 (100%)	1 (0%)	0	100	100
1	B	234/262 (89%)	234 (100%)	0	0	100	100
1	C	262/262 (100%)	259 (99%)	3 (1%)	0	100	100
1	D	262/262 (100%)	261 (100%)	1 (0%)	0	100	100
1	E	258/262 (98%)	254 (98%)	4 (2%)	0	100	100
1	F	259/262 (99%)	255 (98%)	4 (2%)	0	100	100
1	G	263/262 (100%)	258 (98%)	5 (2%)	0	100	100
1	H	266/262 (102%)	260 (98%)	6 (2%)	0	100	100
All	All	2017/2096 (96%)	1993 (99%)	24 (1%)	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	183/219 (84%)	182 (100%)	1 (0%)	88	80
1	B	203/219 (93%)	203 (100%)	0	100	100
1	C	221/219 (101%)	221 (100%)	0	100	100
1	D	221/219 (101%)	220 (100%)	1 (0%)	88	80
1	E	218/219 (100%)	216 (99%)	2 (1%)	78	65
1	F	219/219 (100%)	218 (100%)	1 (0%)	88	80

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	G	222/219 (101%)	222 (100%)	0	100	100
1	H	225/219 (103%)	224 (100%)	1 (0%)	91	84
All	All	1712/1752 (98%)	1706 (100%)	6 (0%)	91	84

5 of 6 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	E	517	HIS
1	F	415	HIS
1	H	514	THR
1	D	535	LYS
1	A	543	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

## 5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

Of 14 ligands modelled in this entry, 2 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
4	ACO	G	1001	-	45,53,53	0.75	1 (2%)	56,79,79	0.64	1 (1%)
3	LMR	F	1000	-	8,8,8	1.93	4 (50%)	10,10,10	2.68	4 (40%)
3	LMR	H	1000	-	8,8,8	1.41	2 (25%)	10,10,10	2.56	3 (30%)
5	PG4	E	1002	-	12,12,12	0.17	0	11,11,11	0.25	0
5	PG4	F	1002	-	12,12,12	0.33	0	11,11,11	0.84	1 (9%)
6	PGE	H	1002	-	9,9,9	0.20	0	8,8,8	0.13	0
3	LMR	E	1000	-	8,8,8	0.38	0	10,10,10	1.13	1 (10%)
4	ACO	E	1001	-	45,53,53	0.72	1 (2%)	56,79,79	0.65	0
4	ACO	F	1001	-	45,53,53	0.70	1 (2%)	56,79,79	0.71	0
4	ACO	H	1001	-	45,53,53	0.69	1 (2%)	56,79,79	0.69	0
3	LMR	G	1000	-	8,8,8	1.90	4 (50%)	10,10,10	2.83	5 (50%)
6	PGE	G	1002	-	9,9,9	0.14	0	8,8,8	0.21	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
4	ACO	G	1001	-	-	3/47/67/67	0/3/3/3
3	LMR	F	1000	-	-	2/8/8/8	-
3	LMR	H	1000	-	-	4/8/8/8	-
5	PG4	E	1002	-	-	2/10/10/10	-
5	PG4	F	1002	-	-	5/10/10/10	-
6	PGE	H	1002	-	-	4/7/7/7	-
3	LMR	E	1000	-	-	5/8/8/8	-
4	ACO	E	1001	-	-	3/47/67/67	0/3/3/3
4	ACO	F	1001	-	-	3/47/67/67	0/3/3/3
4	ACO	H	1001	-	-	2/47/67/67	0/3/3/3
3	LMR	G	1000	-	-	2/8/8/8	-
6	PGE	G	1002	-	-	0/7/7/7	-

The worst 5 of 14 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	F	1000	LMR	O4B-C4	3.59	1.34	1.22
4	F	1001	ACO	P3B-O3B	3.40	1.65	1.59
3	H	1000	LMR	O1A-C1	3.22	1.32	1.22

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	G	1000	LMR	O1A-C1	3.17	1.31	1.22
4	E	1001	ACO	P3B-O3B	3.06	1.65	1.59

The worst 5 of 15 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	G	1000	LMR	O1A-C1-C2	-5.68	111.43	122.54
3	F	1000	LMR	O1A-C1-C2	-5.68	111.44	122.54
3	H	1000	LMR	O1A-C1-C2	-5.52	111.75	122.54
3	H	1000	LMR	O1B-C1-C2	5.16	124.06	112.72
3	G	1000	LMR	O1B-C1-C2	5.10	123.93	112.72

There are no chirality outliers.

5 of 35 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	F	1002	PG4	O2-C3-C4-O3
5	E	1002	PG4	O2-C3-C4-O3
6	H	1002	PGE	O1-C1-C2-O2
6	H	1002	PGE	O2-C3-C4-O3
3	E	1000	LMR	O1B-C1-C2-C3

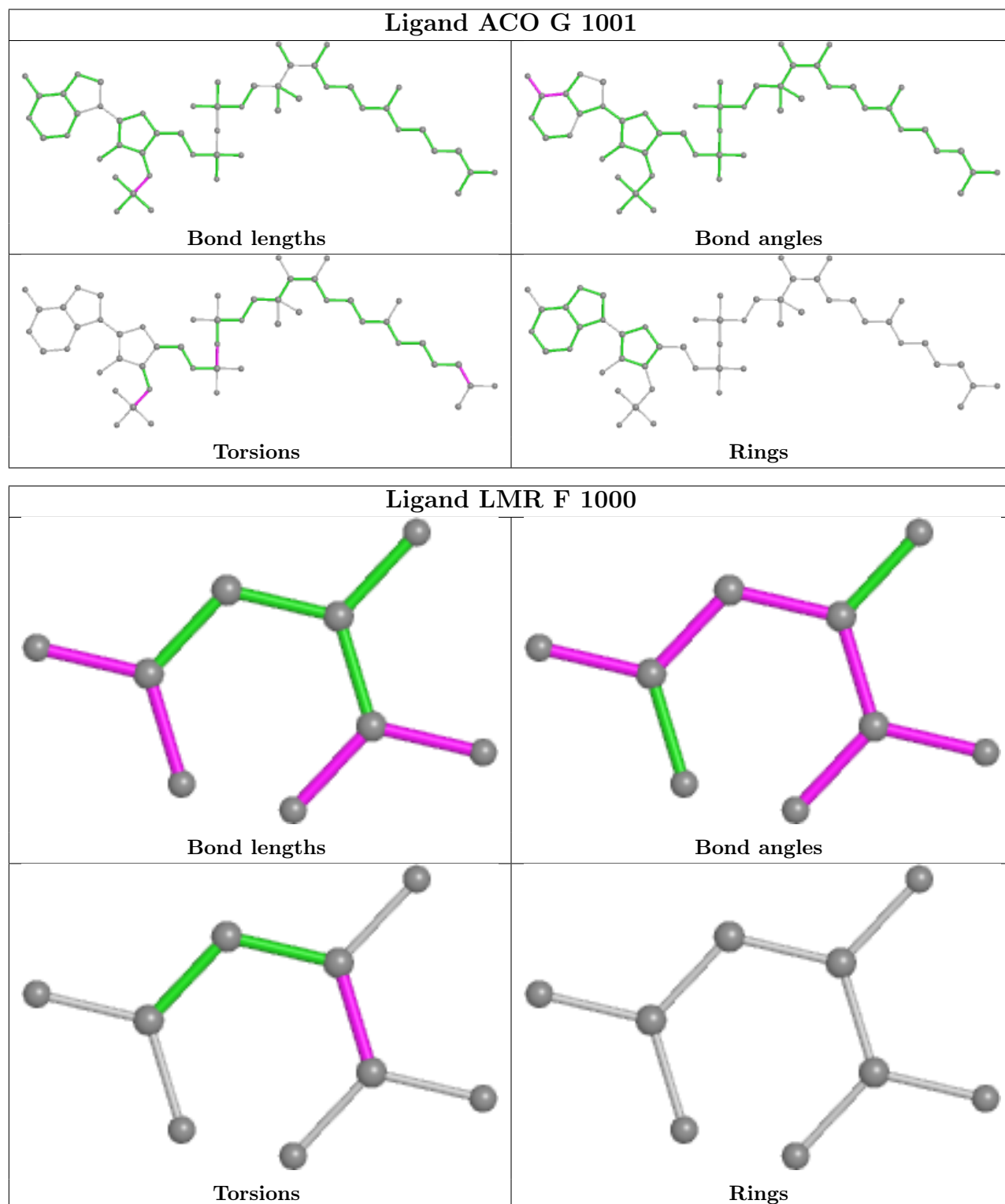
There are no ring outliers.

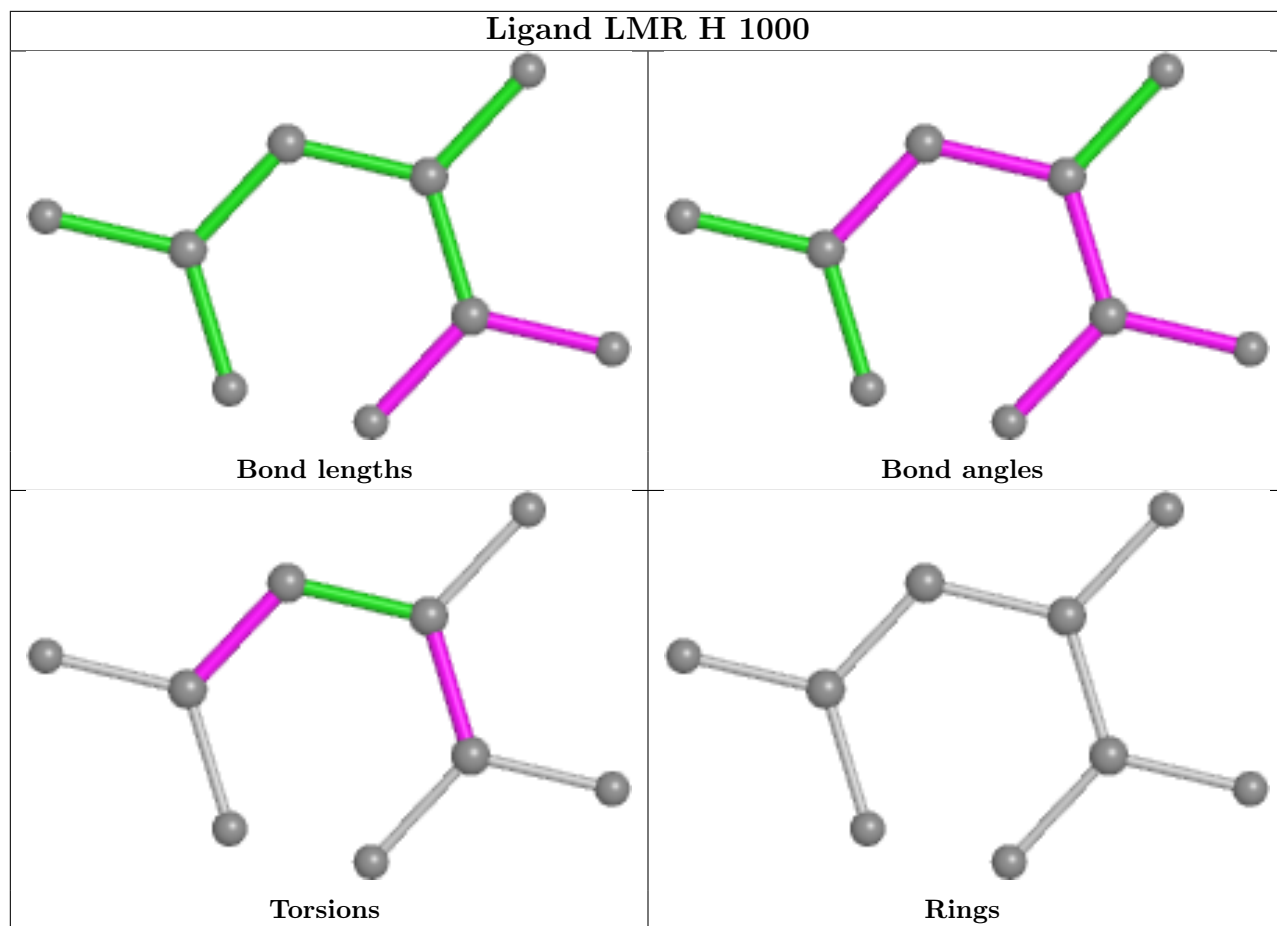
7 monomers are involved in 4 short contacts:

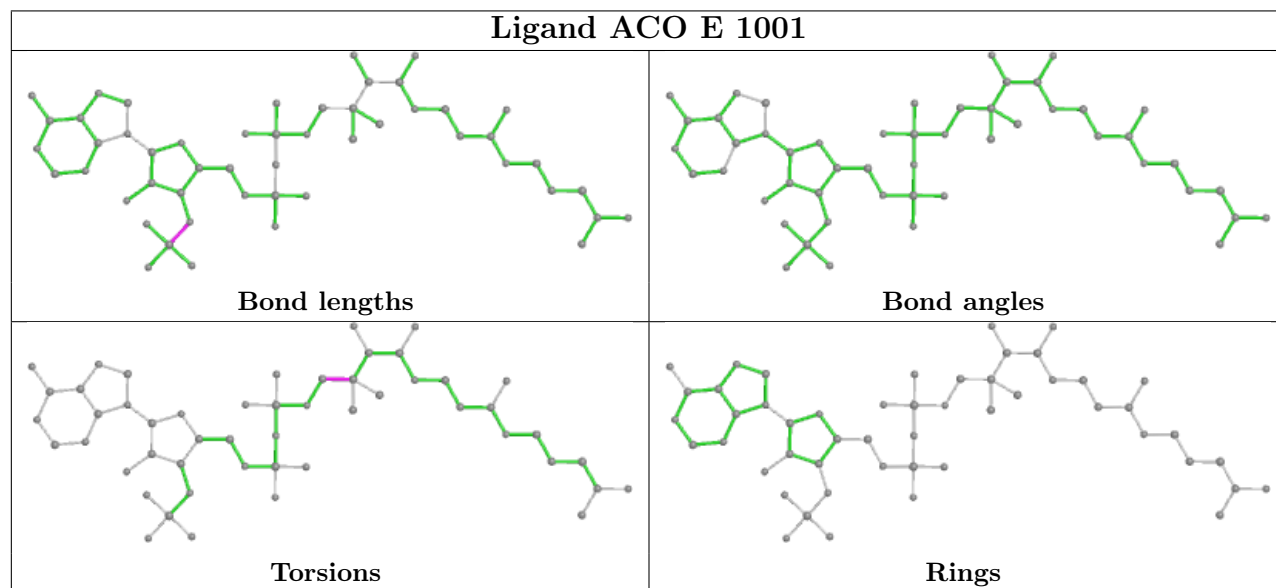
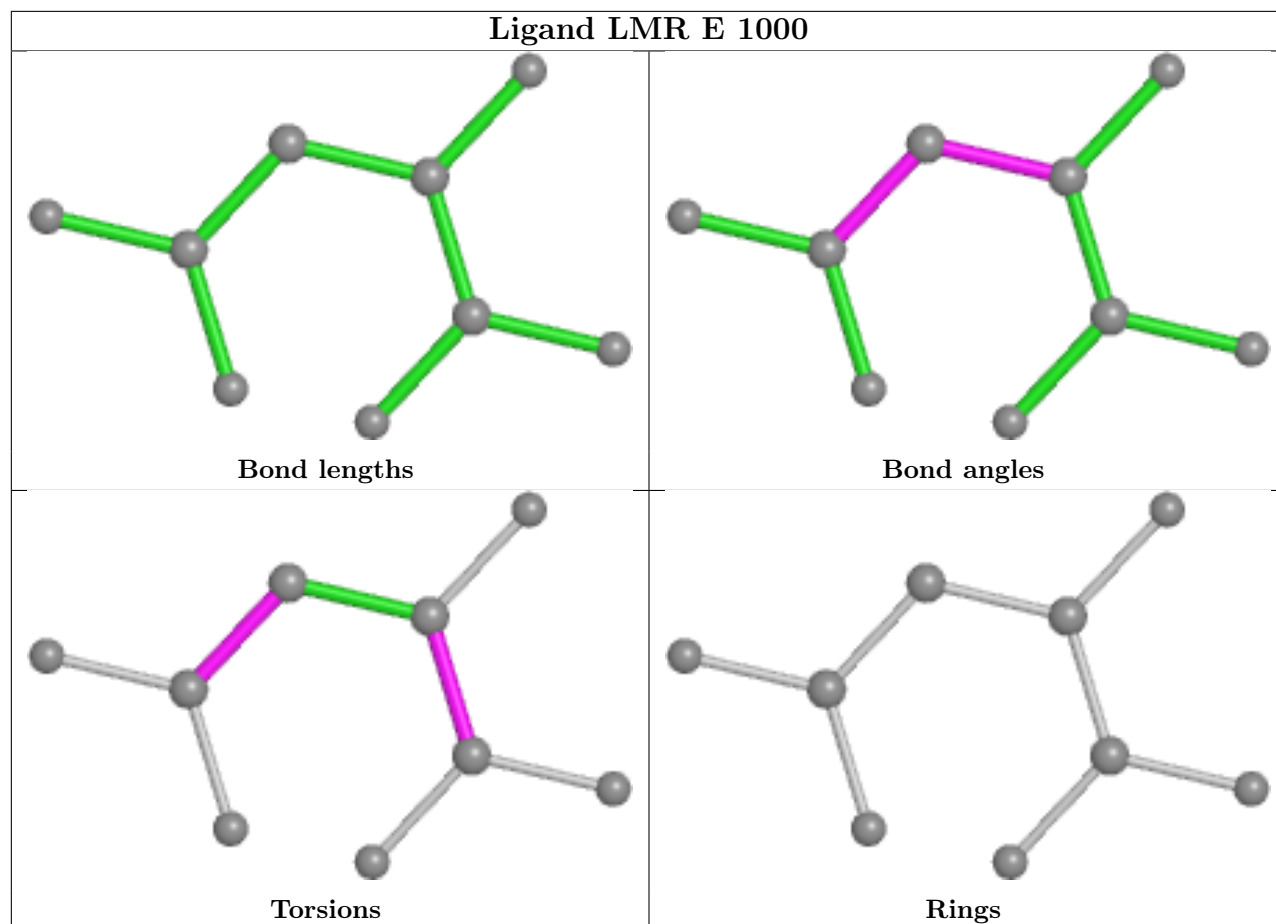
Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	G	1001	ACO	1	0
3	F	1000	LMR	1	0
5	F	1002	PG4	1	0
3	E	1000	LMR	1	0
4	E	1001	ACO	1	0
4	F	1001	ACO	1	0
3	G	1000	LMR	1	0

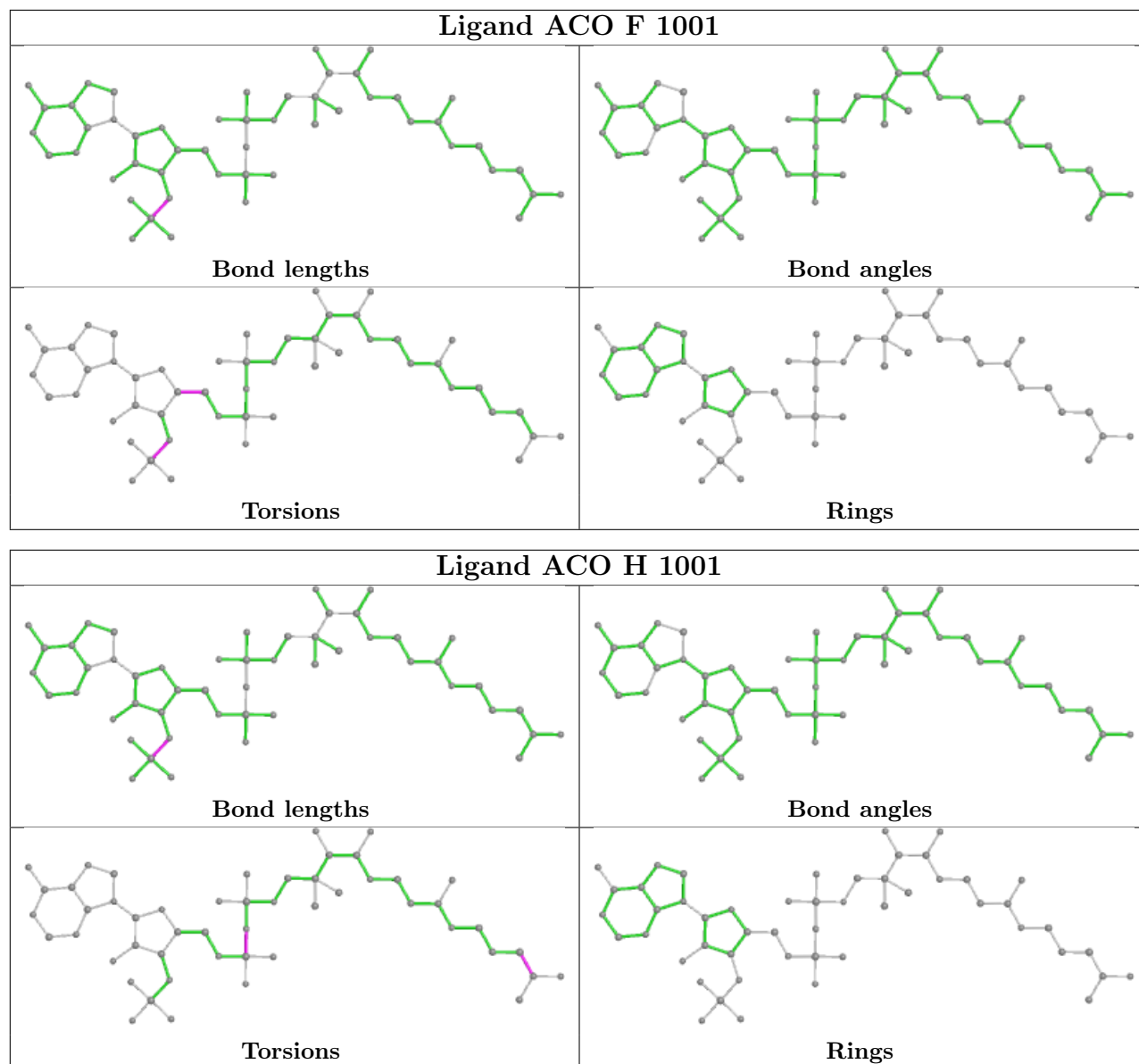
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the

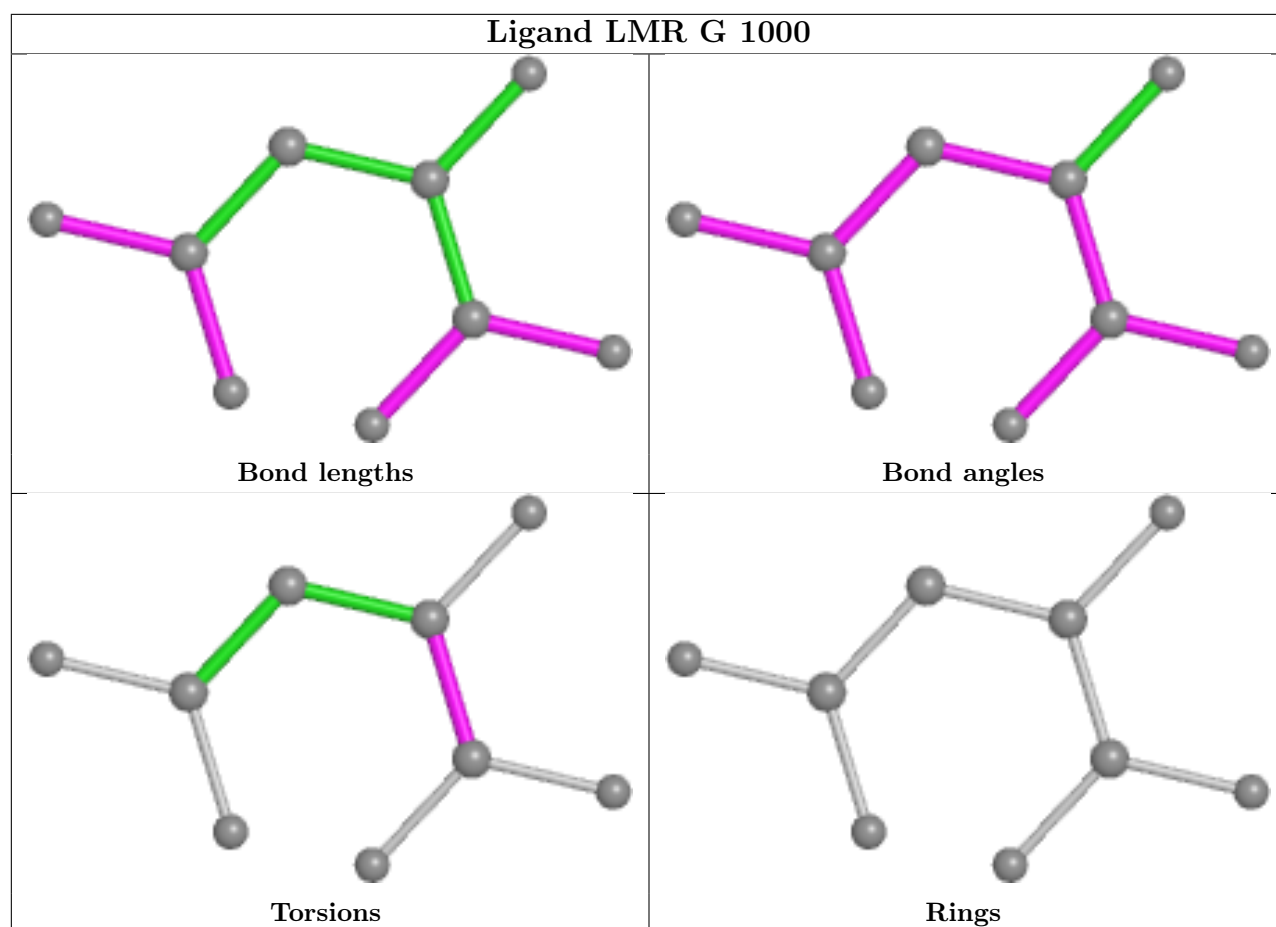
average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents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











## 5.7 Other polymers [i](#)

There are no such residues in this entry.

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

There are no chain breaks in this entry.

## 6 Fit of model and data [i](#)

### 6.1 Protein, DNA and RNA chains [i](#)

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å <sup>2</sup> )	Q<0.9
1	A	215/262 (82%)	0.35	24 (11%) 5 4	12, 22, 68, 98	0
1	B	239/262 (91%)	0.79	49 (20%) 1 0	12, 27, 62, 79	0
1	C	261/262 (99%)	1.09	59 (22%) 0 0	11, 26, 78, 112	0
1	D	261/262 (99%)	0.14	15 (5%) 23 21	12, 23, 47, 83	0
1	E	256/262 (97%)	-0.16	1 (0%) 92 92	12, 22, 46, 88	0
1	F	256/262 (97%)	-0.15	2 (0%) 86 86	11, 22, 51, 85	0
1	G	261/262 (99%)	-0.25	1 (0%) 92 92	12, 18, 38, 78	0
1	H	261/262 (99%)	-0.27	2 (0%) 86 86	12, 20, 38, 72	0
All	All	2010/2096 (95%)	0.18	153 (7%) 13 12	11, 22, 57, 112	0

The worst 5 of 153 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	483	VAL	9.7
1	C	496	VAL	9.6
1	C	493	VAL	8.7
1	C	535	LYS	8.3
1	C	536	GLY	8.3

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

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

### 6.3 Carbohydrates [i](#)

There are no monosaccharides in this entry.

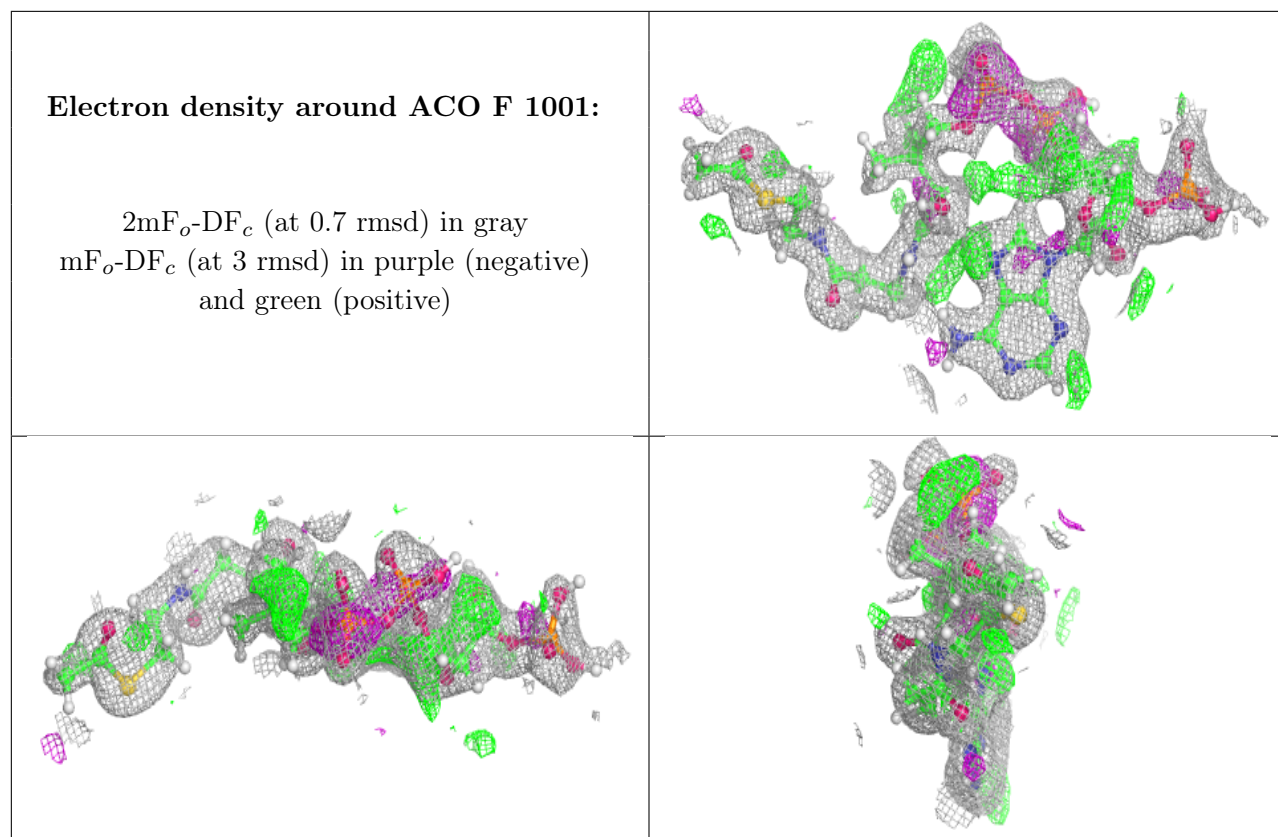
## 6.4 Ligands

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
5	PG4	E	1002	13/13	0.77	0.14	39,47,53,54	0
4	ACO	F	1001	51/51	0.81	0.15	20,32,58,63	0
5	PG4	F	1002	13/13	0.81	0.12	30,37,42,45	0
3	LMR	F	1000	9/9	0.88	0.15	25,30,34,35	0
6	PGE	G	1002	10/10	0.88	0.11	39,43,50,52	0
6	PGE	H	1002	10/10	0.90	0.11	40,42,46,50	0
3	LMR	E	1000	9/9	0.93	0.10	24,24,28,28	0
4	ACO	E	1001	51/51	0.95	0.08	12,24,43,46	0
3	LMR	H	1000	9/9	0.96	0.07	17,20,22,23	0
4	ACO	G	1001	51/51	0.97	0.07	11,18,38,44	0
4	ACO	H	1001	51/51	0.97	0.07	12,20,39,48	0
3	LMR	G	1000	9/9	0.98	0.07	15,20,22,24	0
2	CA	B	701	1/1	0.99	0.06	15,15,15,15	0
2	CA	A	701	1/1	1.00	0.06	14,14,14,14	0

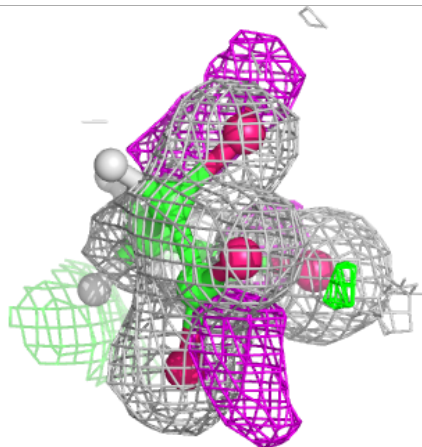
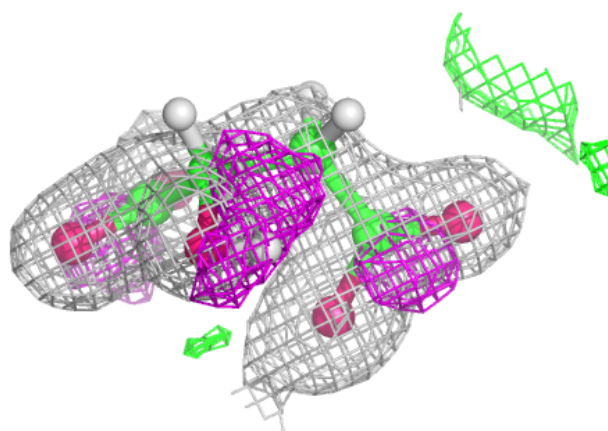
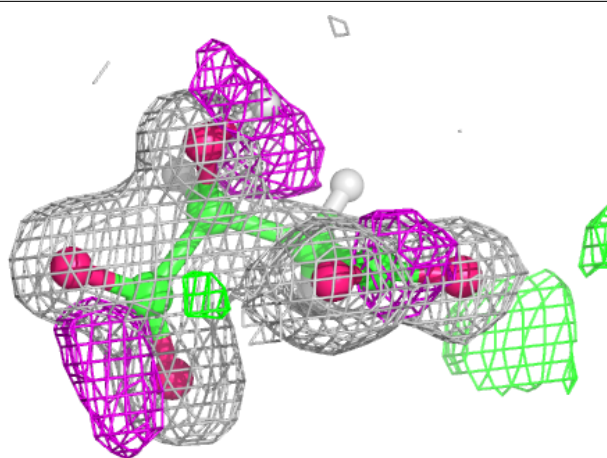
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.





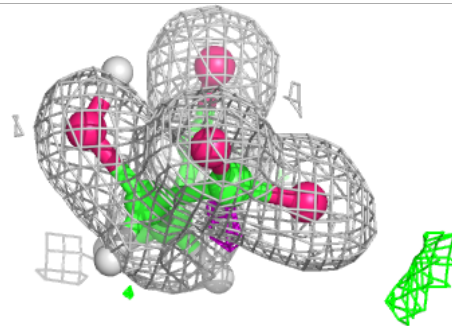
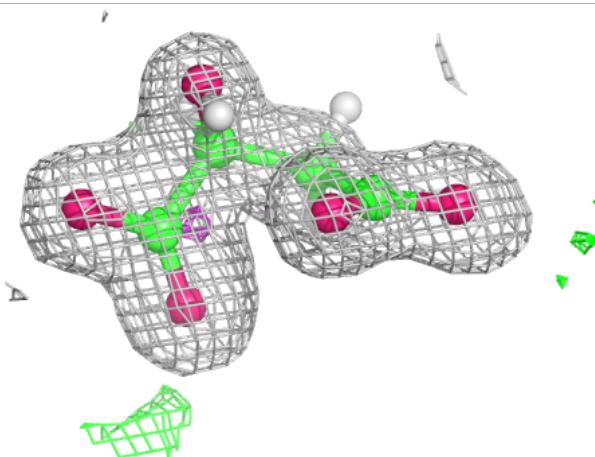
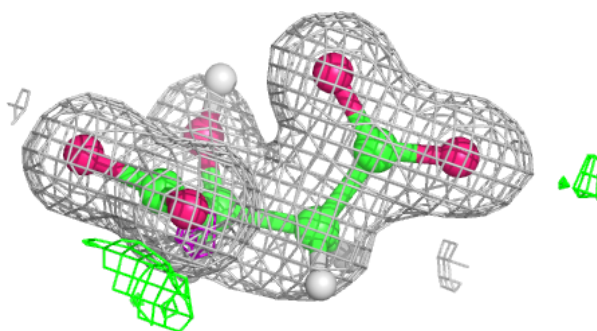
**Electron density around LMR F 1000:**

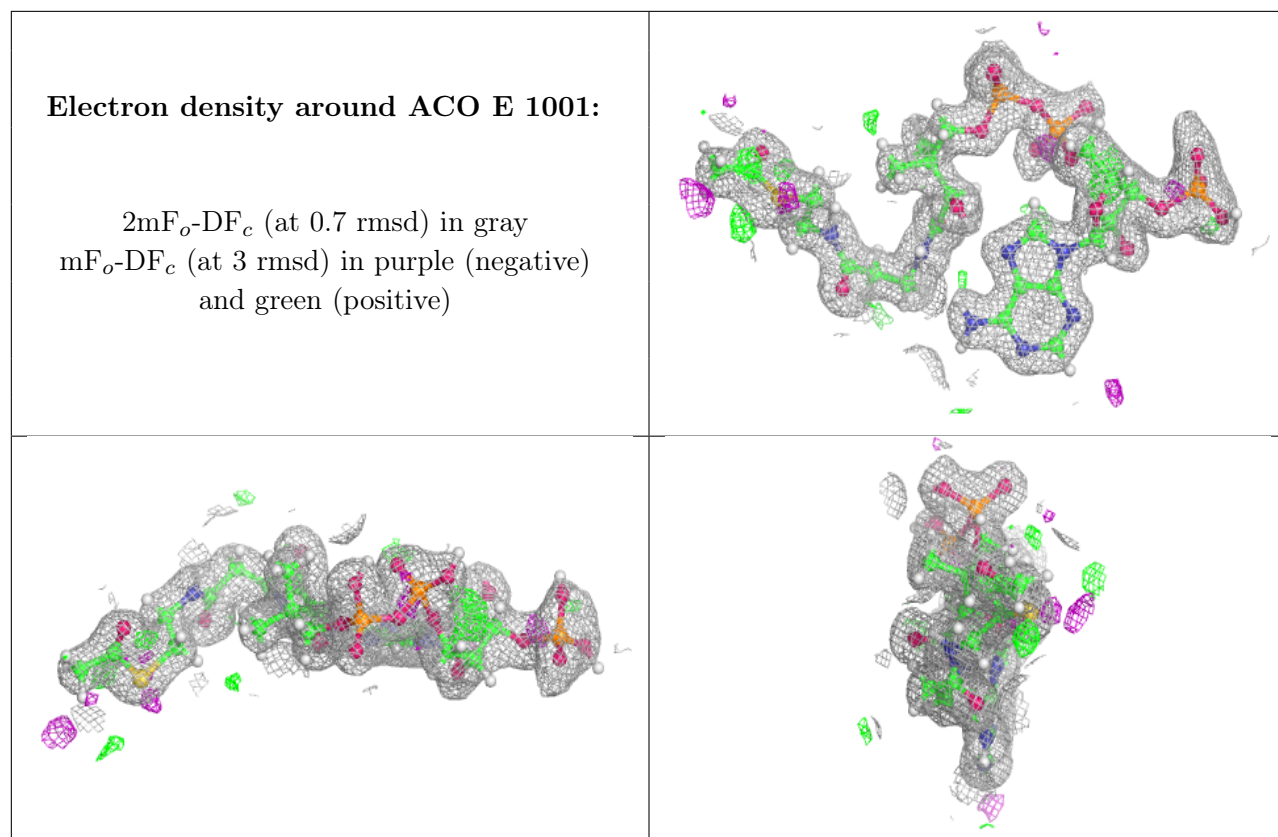
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)



**Electron density around LMR E 1000:**

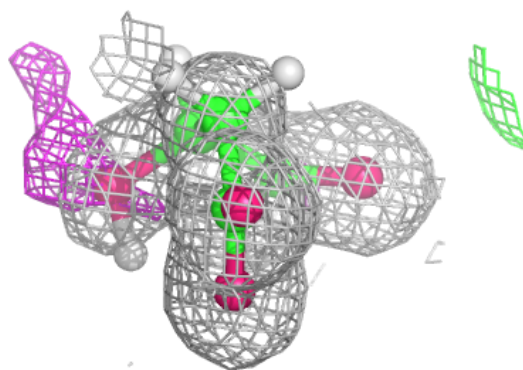
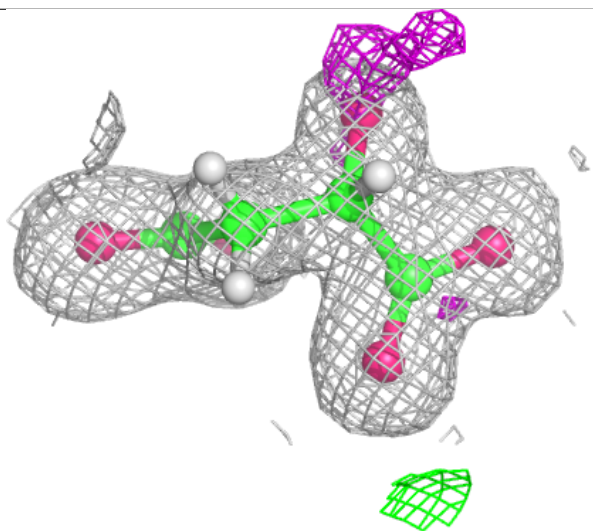
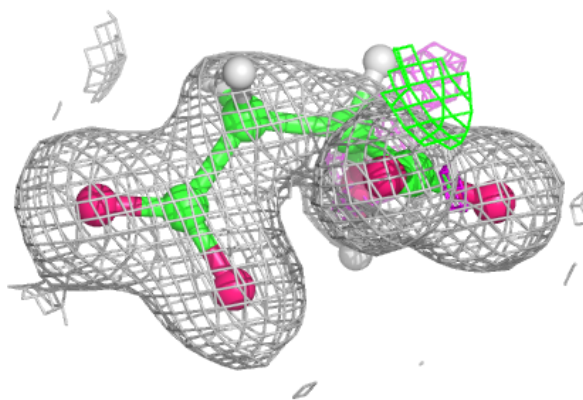
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)





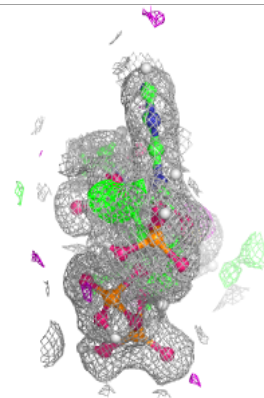
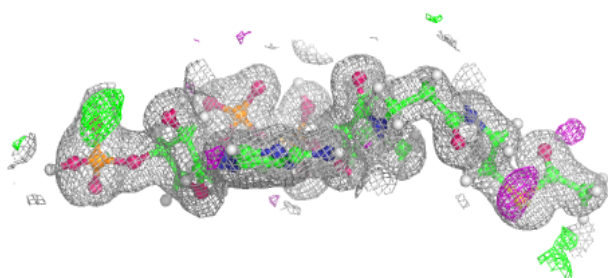
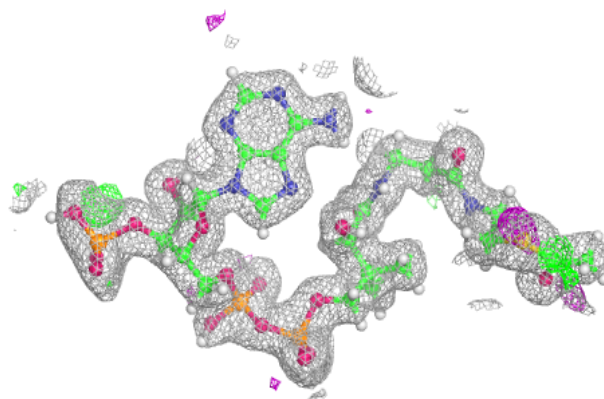
**Electron density around LMR H 1000:**

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

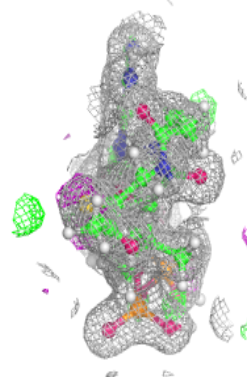
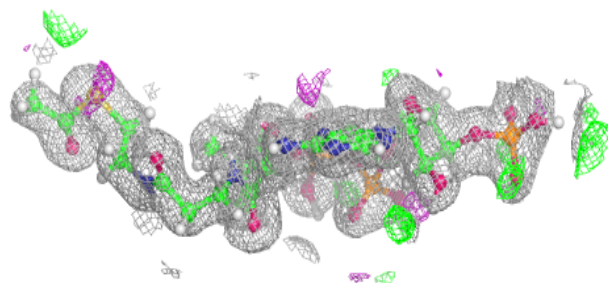
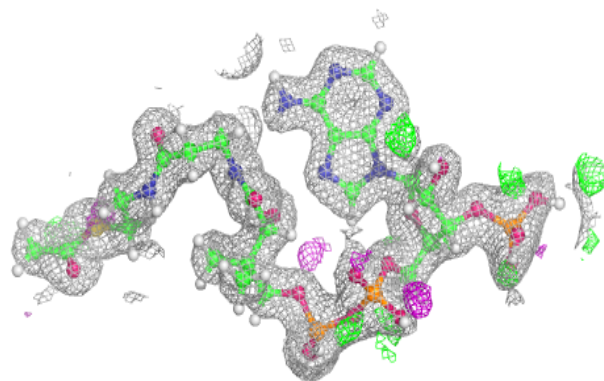


**Electron density around ACO G 1001:**

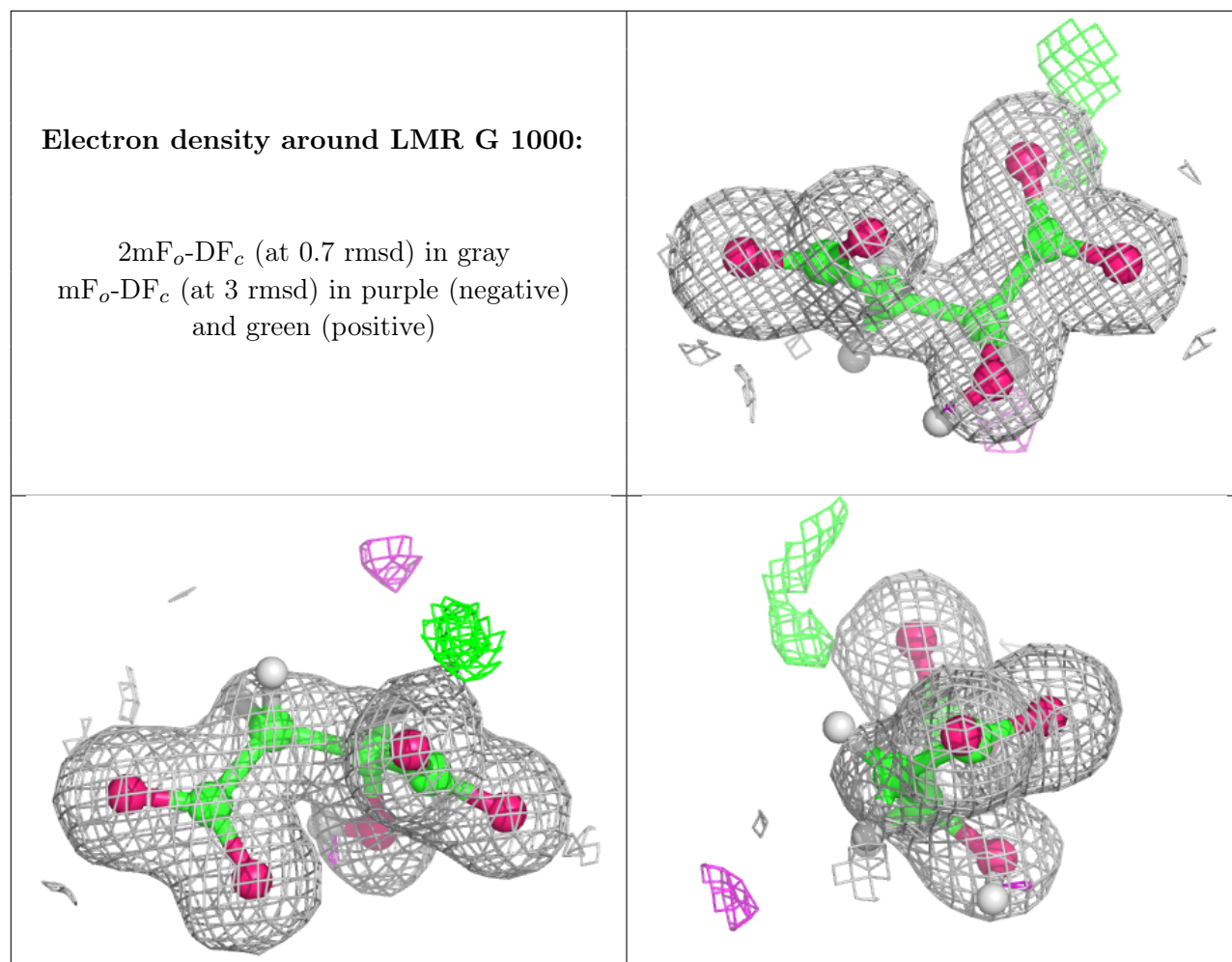
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)

**Electron density around ACO H 1001:**

$2mF_o-DF_c$  (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.