



wwPDB X-ray Structure Validation Summary Report ⓘ

Apr 26, 2026 – 10:16 AM EDT

PDB ID : 7YP3 / pdb_00007yp3
Title : Crystal structure of elaiophylin glycosyltransferase in complex with elaiophylin
Authors : Xu, T.; Liu, Q.; Gan, Q.; Liu, J.
Deposited on : 2022-08-02
Resolution : 2.10 Å(reported)

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

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

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

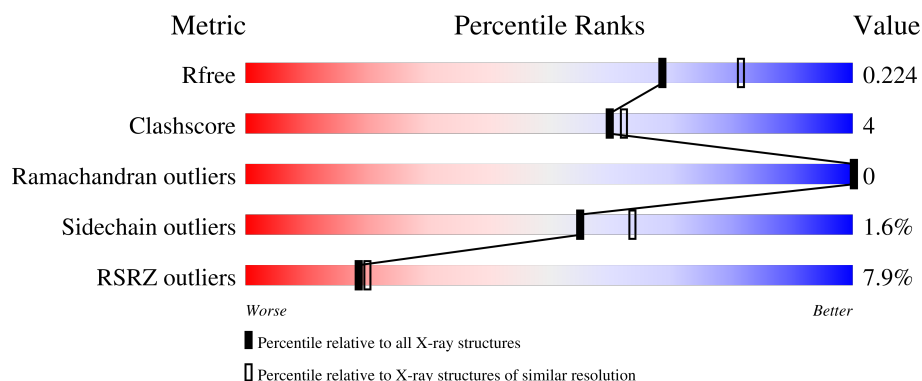
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.10 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	180053	6658 (2.10-2.10)
Clashscore	190562	7164 (2.10-2.10)
Ramachandran outliers	187476	7099 (2.10-2.10)
Sidechain outliers	187428	7100 (2.10-2.10)
RSRZ outliers	180081	6662 (2.10-2.10)

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	437	3% 83% 10% 6%
1	B	437	10% 83% 9% 7%
1	C	437	9% 82% 10% 7%
1	D	437	6% 84% 8% 7%
1	E	437	10% 82% 10% 7%

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Mol	Chain	Length	Quality of chain
1	F	437	6% 85% 10%
1	G	437	7% 82% 10% 7%

2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 24066 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 Glycosyltransferase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	409	Total	C	N	O	S	0	0	0
			3225	2052	565	595	13			
1	B	408	Total	C	N	O	S	0	3	0
			3234	2060	564	595	15			
1	C	408	Total	C	N	O	S	0	1	0
			3223	2052	564	593	14			
1	D	408	Total	C	N	O	S	0	0	0
			3218	2048	564	593	13			
1	E	408	Total	C	N	O	S	0	0	0
			3218	2048	564	593	13			
1	F	419	Total	C	N	O	S	0	1	0
			3289	2090	578	608	13			
1	G	408	Total	C	N	O	S	0	0	0
			3218	2048	564	593	13			

There are 140 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-19	MET	-	initiating methionine	UNP E5L4T5
A	-18	GLY	-	expression tag	UNP E5L4T5
A	-17	SER	-	expression tag	UNP E5L4T5
A	-16	SER	-	expression tag	UNP E5L4T5
A	-15	HIS	-	expression tag	UNP E5L4T5
A	-14	HIS	-	expression tag	UNP E5L4T5
A	-13	HIS	-	expression tag	UNP E5L4T5
A	-12	HIS	-	expression tag	UNP E5L4T5
A	-11	HIS	-	expression tag	UNP E5L4T5
A	-10	HIS	-	expression tag	UNP E5L4T5
A	-9	SER	-	expression tag	UNP E5L4T5
A	-8	SER	-	expression tag	UNP E5L4T5
A	-7	GLY	-	expression tag	UNP E5L4T5
A	-6	LEU	-	expression tag	UNP E5L4T5
A	-5	VAL	-	expression tag	UNP E5L4T5

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Chain	Residue	Modelled	Actual	Comment	Reference
A	-4	PRO	-	expression tag	UNP E5L4T5
A	-3	ARG	-	expression tag	UNP E5L4T5
A	-2	GLY	-	expression tag	UNP E5L4T5
A	-1	SER	-	expression tag	UNP E5L4T5
A	0	HIS	-	expression tag	UNP E5L4T5
B	-19	MET	-	initiating methionine	UNP E5L4T5
B	-18	GLY	-	expression tag	UNP E5L4T5
B	-17	SER	-	expression tag	UNP E5L4T5
B	-16	SER	-	expression tag	UNP E5L4T5
B	-15	HIS	-	expression tag	UNP E5L4T5
B	-14	HIS	-	expression tag	UNP E5L4T5
B	-13	HIS	-	expression tag	UNP E5L4T5
B	-12	HIS	-	expression tag	UNP E5L4T5
B	-11	HIS	-	expression tag	UNP E5L4T5
B	-10	HIS	-	expression tag	UNP E5L4T5
B	-9	SER	-	expression tag	UNP E5L4T5
B	-8	SER	-	expression tag	UNP E5L4T5
B	-7	GLY	-	expression tag	UNP E5L4T5
B	-6	LEU	-	expression tag	UNP E5L4T5
B	-5	VAL	-	expression tag	UNP E5L4T5
B	-4	PRO	-	expression tag	UNP E5L4T5
B	-3	ARG	-	expression tag	UNP E5L4T5
B	-2	GLY	-	expression tag	UNP E5L4T5
B	-1	SER	-	expression tag	UNP E5L4T5
B	0	HIS	-	expression tag	UNP E5L4T5
C	-19	MET	-	initiating methionine	UNP E5L4T5
C	-18	GLY	-	expression tag	UNP E5L4T5
C	-17	SER	-	expression tag	UNP E5L4T5
C	-16	SER	-	expression tag	UNP E5L4T5
C	-15	HIS	-	expression tag	UNP E5L4T5
C	-14	HIS	-	expression tag	UNP E5L4T5
C	-13	HIS	-	expression tag	UNP E5L4T5
C	-12	HIS	-	expression tag	UNP E5L4T5
C	-11	HIS	-	expression tag	UNP E5L4T5
C	-10	HIS	-	expression tag	UNP E5L4T5
C	-9	SER	-	expression tag	UNP E5L4T5
C	-8	SER	-	expression tag	UNP E5L4T5
C	-7	GLY	-	expression tag	UNP E5L4T5
C	-6	LEU	-	expression tag	UNP E5L4T5
C	-5	VAL	-	expression tag	UNP E5L4T5
C	-4	PRO	-	expression tag	UNP E5L4T5
C	-3	ARG	-	expression tag	UNP E5L4T5

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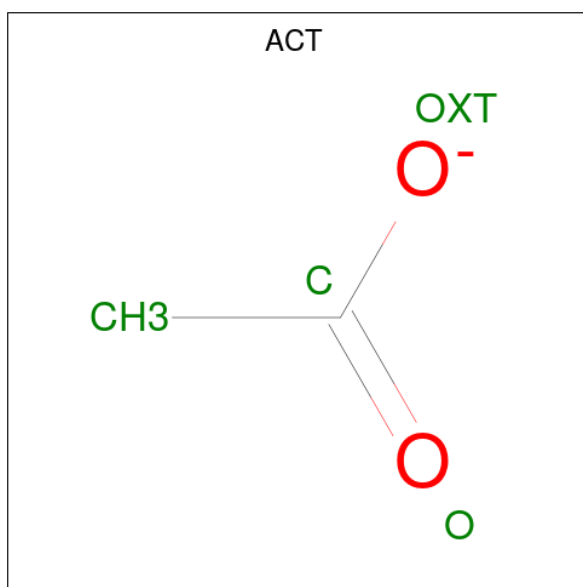
Chain	Residue	Modelled	Actual	Comment	Reference
C	-2	GLY	-	expression tag	UNP E5L4T5
C	-1	SER	-	expression tag	UNP E5L4T5
C	0	HIS	-	expression tag	UNP E5L4T5
D	-19	MET	-	initiating methionine	UNP E5L4T5
D	-18	GLY	-	expression tag	UNP E5L4T5
D	-17	SER	-	expression tag	UNP E5L4T5
D	-16	SER	-	expression tag	UNP E5L4T5
D	-15	HIS	-	expression tag	UNP E5L4T5
D	-14	HIS	-	expression tag	UNP E5L4T5
D	-13	HIS	-	expression tag	UNP E5L4T5
D	-12	HIS	-	expression tag	UNP E5L4T5
D	-11	HIS	-	expression tag	UNP E5L4T5
D	-10	HIS	-	expression tag	UNP E5L4T5
D	-9	SER	-	expression tag	UNP E5L4T5
D	-8	SER	-	expression tag	UNP E5L4T5
D	-7	GLY	-	expression tag	UNP E5L4T5
D	-6	LEU	-	expression tag	UNP E5L4T5
D	-5	VAL	-	expression tag	UNP E5L4T5
D	-4	PRO	-	expression tag	UNP E5L4T5
D	-3	ARG	-	expression tag	UNP E5L4T5
D	-2	GLY	-	expression tag	UNP E5L4T5
D	-1	SER	-	expression tag	UNP E5L4T5
D	0	HIS	-	expression tag	UNP E5L4T5
E	-19	MET	-	initiating methionine	UNP E5L4T5
E	-18	GLY	-	expression tag	UNP E5L4T5
E	-17	SER	-	expression tag	UNP E5L4T5
E	-16	SER	-	expression tag	UNP E5L4T5
E	-15	HIS	-	expression tag	UNP E5L4T5
E	-14	HIS	-	expression tag	UNP E5L4T5
E	-13	HIS	-	expression tag	UNP E5L4T5
E	-12	HIS	-	expression tag	UNP E5L4T5
E	-11	HIS	-	expression tag	UNP E5L4T5
E	-10	HIS	-	expression tag	UNP E5L4T5
E	-9	SER	-	expression tag	UNP E5L4T5
E	-8	SER	-	expression tag	UNP E5L4T5
E	-7	GLY	-	expression tag	UNP E5L4T5
E	-6	LEU	-	expression tag	UNP E5L4T5
E	-5	VAL	-	expression tag	UNP E5L4T5
E	-4	PRO	-	expression tag	UNP E5L4T5
E	-3	ARG	-	expression tag	UNP E5L4T5
E	-2	GLY	-	expression tag	UNP E5L4T5
E	-1	SER	-	expression tag	UNP E5L4T5

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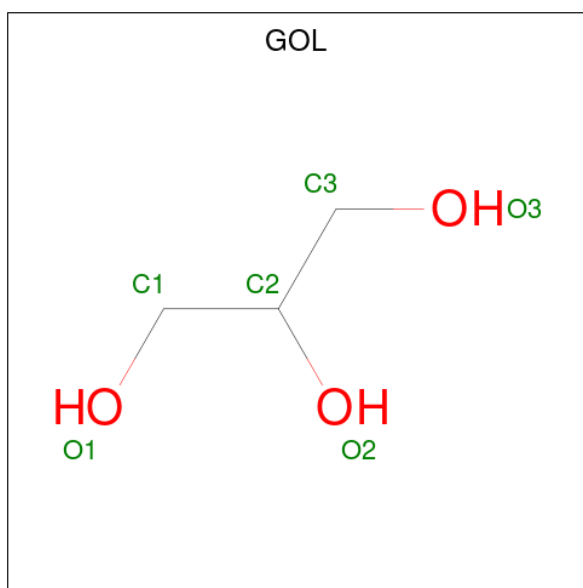
Chain	Residue	Modelled	Actual	Comment	Reference
E	0	HIS	-	expression tag	UNP E5L4T5
F	-19	MET	-	initiating methionine	UNP E5L4T5
F	-18	GLY	-	expression tag	UNP E5L4T5
F	-17	SER	-	expression tag	UNP E5L4T5
F	-16	SER	-	expression tag	UNP E5L4T5
F	-15	HIS	-	expression tag	UNP E5L4T5
F	-14	HIS	-	expression tag	UNP E5L4T5
F	-13	HIS	-	expression tag	UNP E5L4T5
F	-12	HIS	-	expression tag	UNP E5L4T5
F	-11	HIS	-	expression tag	UNP E5L4T5
F	-10	HIS	-	expression tag	UNP E5L4T5
F	-9	SER	-	expression tag	UNP E5L4T5
F	-8	SER	-	expression tag	UNP E5L4T5
F	-7	GLY	-	expression tag	UNP E5L4T5
F	-6	LEU	-	expression tag	UNP E5L4T5
F	-5	VAL	-	expression tag	UNP E5L4T5
F	-4	PRO	-	expression tag	UNP E5L4T5
F	-3	ARG	-	expression tag	UNP E5L4T5
F	-2	GLY	-	expression tag	UNP E5L4T5
F	-1	SER	-	expression tag	UNP E5L4T5
F	0	HIS	-	expression tag	UNP E5L4T5
G	-19	MET	-	initiating methionine	UNP E5L4T5
G	-18	GLY	-	expression tag	UNP E5L4T5
G	-17	SER	-	expression tag	UNP E5L4T5
G	-16	SER	-	expression tag	UNP E5L4T5
G	-15	HIS	-	expression tag	UNP E5L4T5
G	-14	HIS	-	expression tag	UNP E5L4T5
G	-13	HIS	-	expression tag	UNP E5L4T5
G	-12	HIS	-	expression tag	UNP E5L4T5
G	-11	HIS	-	expression tag	UNP E5L4T5
G	-10	HIS	-	expression tag	UNP E5L4T5
G	-9	SER	-	expression tag	UNP E5L4T5
G	-8	SER	-	expression tag	UNP E5L4T5
G	-7	GLY	-	expression tag	UNP E5L4T5
G	-6	LEU	-	expression tag	UNP E5L4T5
G	-5	VAL	-	expression tag	UNP E5L4T5
G	-4	PRO	-	expression tag	UNP E5L4T5
G	-3	ARG	-	expression tag	UNP E5L4T5
G	-2	GLY	-	expression tag	UNP E5L4T5
G	-1	SER	-	expression tag	UNP E5L4T5
G	0	HIS	-	expression tag	UNP E5L4T5

- Molecule 2 is ACETATE ION (CCD ID: ACT) (formula: C₂H₃O₂).



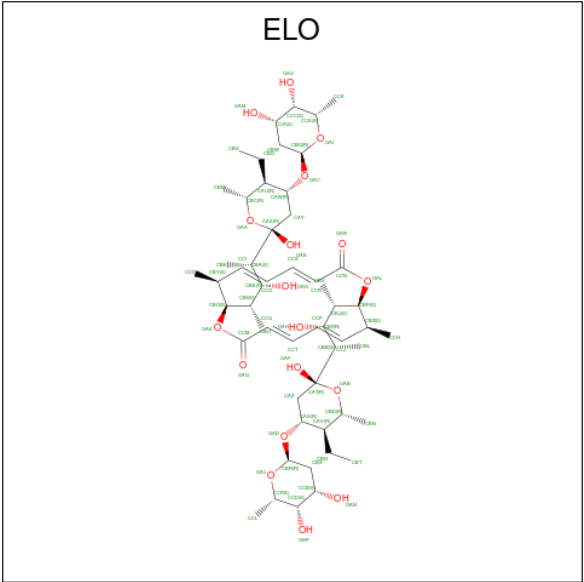
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	A	1	Total	C	O	0	0
			4	2	2		
2	A	1	Total	C	O	0	0
			4	2	2		
2	A	1	Total	C	O	0	0
			4	2	2		
2	B	1	Total	C	O	0	0
			4	2	2		
2	B	1	Total	C	O	0	0
			4	2	2		
2	D	1	Total	C	O	0	0
			4	2	2		
2	D	1	Total	C	O	0	0
			4	2	2		
2	E	1	Total	C	O	0	0
			4	2	2		
2	F	1	Total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

- Molecule 3 is GLYCEROL (CCD ID: GOL) (formula: $C_3H_8O_3$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	C	O	0	0
			6	3	3		
3	A	1	Total	C	O	0	0
			6	3	3		
3	B	1	Total	C	O	0	0
			6	3	3		
3	B	1	Total	C	O	0	0
			6	3	3		
3	C	1	Total	C	O	0	0
			6	3	3		
3	E	1	Total	C	O	0	0
			6	3	3		
3	F	1	Total	C	O	0	0
			6	3	3		
3	F	1	Total	C	O	0	0
			6	3	3		
3	F	1	Total	C	O	0	0
			6	3	3		
3	G	1	Total	C	O	0	0
			6	3	3		
3	G	1	Total	C	O	0	0
			6	3	3		

- Molecule 4 is Elaiophylin (CCD ID: ELO) (formula: $C_{54}H_{88}O_{18}$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	B	1	Total	C	O	0	1
			72	54	18		
4	C	1	Total	C	O	0	1
			72	54	18		
4	D	1	Total	C	O	0	1
			72	54	18		
4	E	1	Total	C	O	0	1
			72	54	18		
4	F	1	Total	C	O	0	0
			72	54	18		

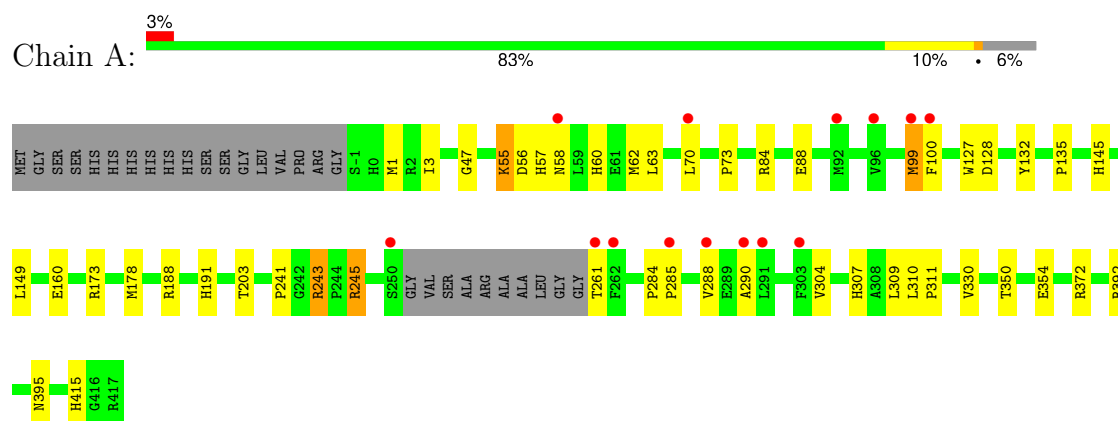
- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	197	Total	O	0	0
			197	197		
5	B	198	Total	O	0	0
			198	198		
5	C	100	Total	O	0	0
			100	100		
5	D	84	Total	O	0	0
			84	84		
5	E	60	Total	O	0	0
			60	60		
5	F	227	Total	O	0	0
			227	227		
5	G	93	Total	O	0	0
			93	93		

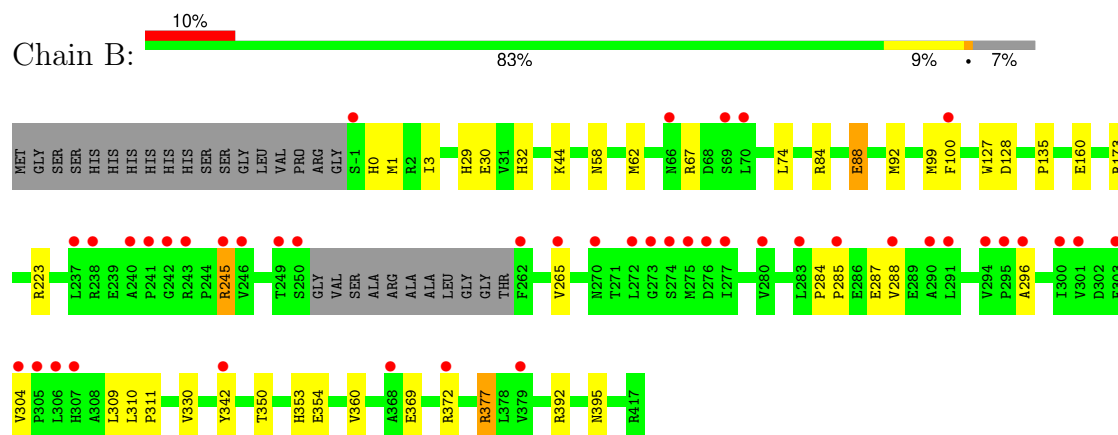
3 Residue-property plots [i](#)

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.

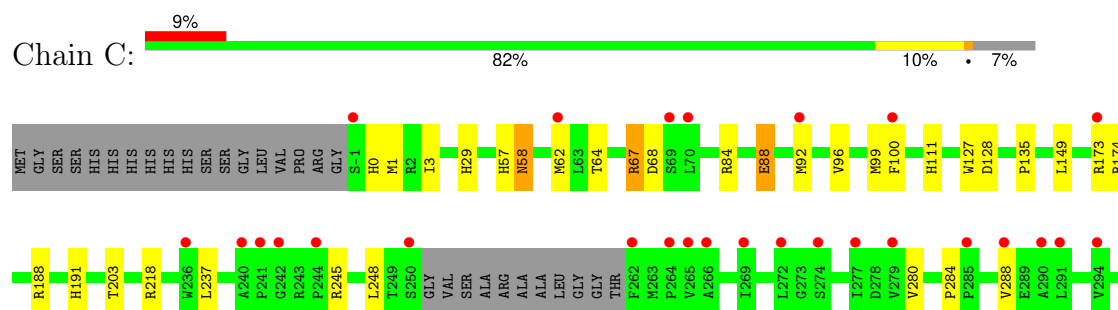
• Molecule 1: Glycosyltransferase



• Molecule 1: Glycosyltransferase

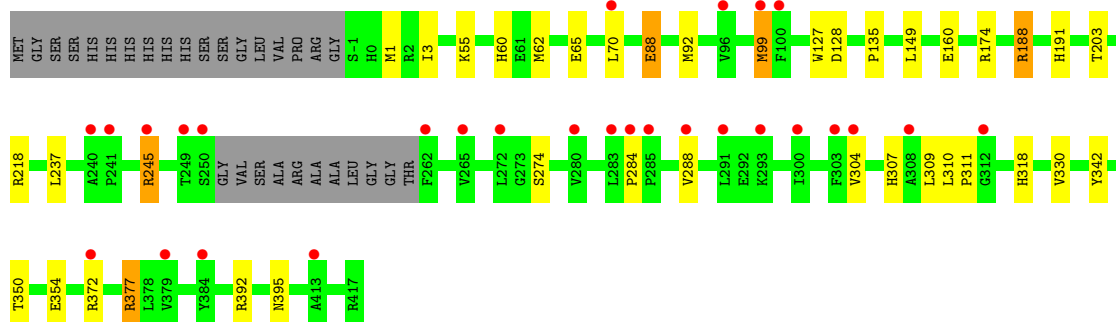
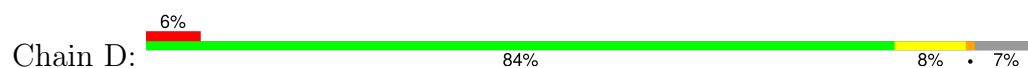


• Molecule 1: Glycosyltransferase

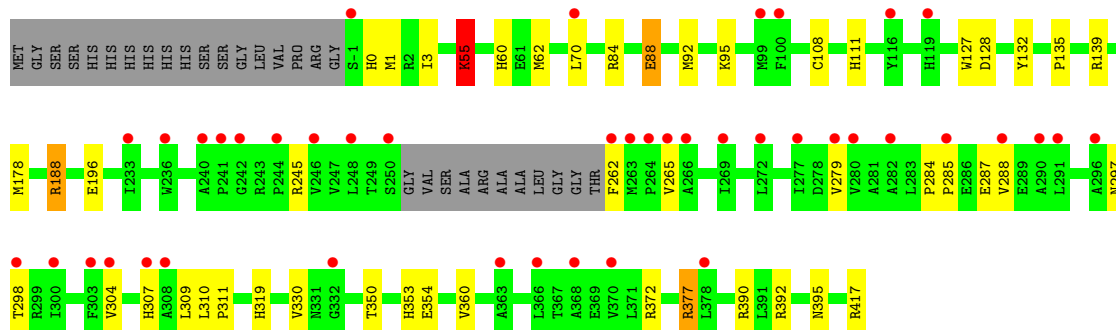
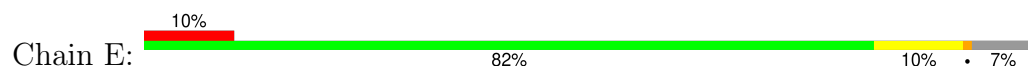




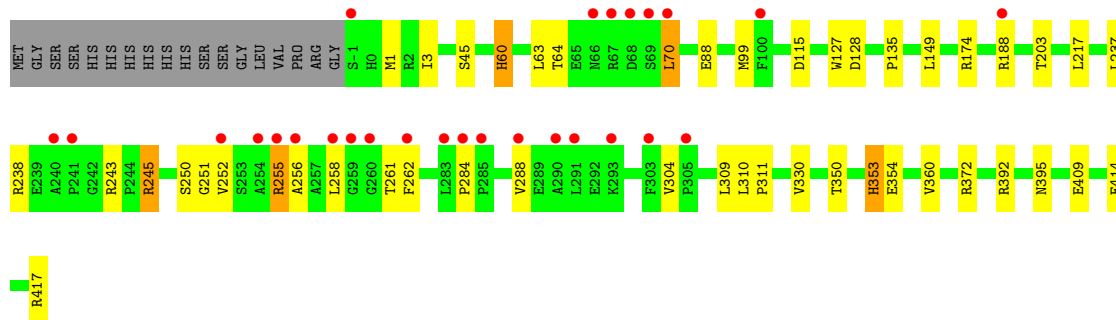
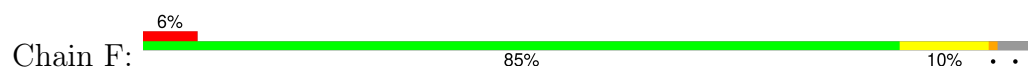
• Molecule 1: Glycosyltransferase



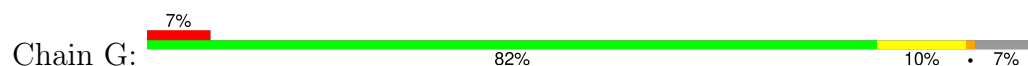
• Molecule 1: Glycosyltransferase

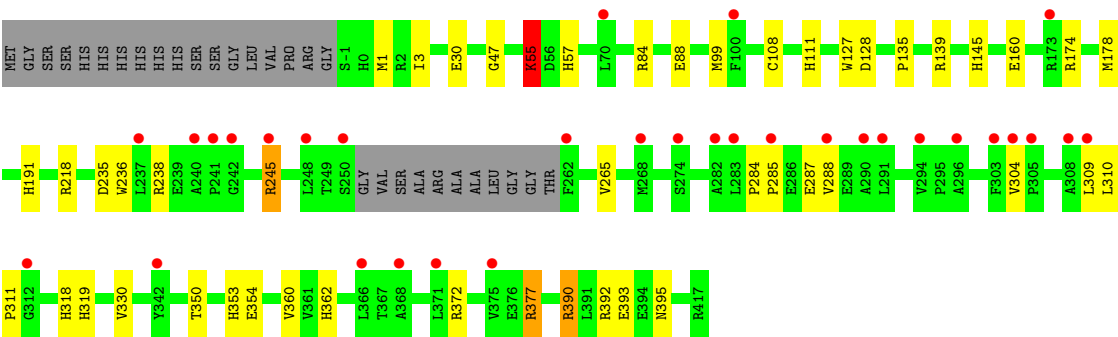


• Molecule 1: Glycosyltransferase



• Molecule 1: Glycosyltransferase





4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	228.10Å 98.13Å 176.51Å 90.00° 103.26° 90.00°	Depositor
Resolution (Å)	76.01 – 2.10 76.01 – 2.10	Depositor EDS
% Data completeness (in resolution range)	98.6 (76.01-2.10) 98.6 (76.01-2.10)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.48 (at 2.10Å)	Xtriage
Refinement program	REFMAC 5.8.0352	Depositor
R, R_{free}	0.188 , 0.217 0.197 , 0.224	Depositor DCC
R_{free} test set	10990 reflections (4.97%)	wwPDB-VP
Wilson B-factor (Å ²)	36.8	Xtriage
Anisotropy	0.583	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.35 , 42.1	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	24066	wwPDB-VP
Average B, all atoms (Å ²)	57.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.31% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

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

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: GOL, ELO, ACT

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	0.68	6/3314 (0.2%)	0.92	2/4531 (0.0%)
1	B	0.67	2/3332 (0.1%)	0.91	0/4553
1	C	0.64	6/3315 (0.2%)	0.88	0/4531
1	D	0.65	4/3307 (0.1%)	0.89	0/4521
1	E	0.64	5/3307 (0.2%)	0.90	1/4521 (0.0%)
1	F	0.70	2/3382 (0.1%)	0.93	1/4624 (0.0%)
1	G	0.68	7/3307 (0.2%)	0.90	1/4521 (0.0%)
All	All	0.67	32/23264 (0.1%)	0.90	5/31802 (0.0%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	7
1	B	0	7
1	C	0	7
1	D	0	7
1	E	0	8
1	F	0	8
1	G	0	9
All	All	0	53

The worst 5 of 32 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	G	57	HIS	CE1-NE2	7.18	1.39	1.32
1	G	191	HIS	CE1-NE2	6.72	1.39	1.32
1	B	32	HIS	CE1-NE2	6.62	1.39	1.32
1	A	307	HIS	CE1-NE2	6.52	1.39	1.32

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	111	HIS	CE1-NE2	6.32	1.38	1.32

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	245	ARG	CB-CG-CD	5.81	124.66	111.30
1	F	88	GLU	CB-CG-CD	5.64	122.18	112.60
1	G	55	LYS	CB-CG-CD	5.31	123.52	111.30
1	E	55	LYS	CB-CG-CD	5.19	123.24	111.30
1	A	243	ARG	O-C-N	-5.04	118.48	121.71

There are no chirality outliers.

5 of 53 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	173	ARG	Sidechain
1	A	188	ARG	Sidechain
1	A	243	ARG	Sidechain
1	A	245	ARG	Sidechain
1	A	84	ARG	Sidechain

5.2 Too-close contacts ⓘ

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3225	0	3161	20	0
1	B	3234	0	3178	29	0
1	C	3223	0	3163	33	0
1	D	3218	0	3154	26	0
1	E	3218	0	3154	30	0
1	F	3289	0	3228	26	0
1	G	3218	0	3154	23	0
2	A	12	0	9	0	0
2	B	8	0	6	0	0
2	D	8	0	6	0	0
2	E	4	0	3	0	0
2	F	12	0	9	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	G	12	0	9	1	0
3	A	12	0	16	1	0
3	B	12	0	16	0	0
3	C	6	0	8	0	0
3	E	6	0	8	0	0
3	F	18	0	24	1	0
3	G	12	0	16	1	0
4	B	72	0	0	7	0
4	C	72	0	0	9	0
4	D	72	0	0	11	0
4	E	72	0	0	13	0
4	F	72	0	0	0	0
5	A	197	0	0	5	0
5	B	198	0	0	3	0
5	C	100	0	0	3	0
5	D	84	0	0	2	0
5	E	60	0	0	3	0
5	F	227	0	0	3	0
5	G	93	0	0	7	0
All	All	24066	0	22322	197	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 4.

The worst 5 of 197 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)
4:D:501[B]:ELO:CCR	4:D:501[B]:ELO:CCP	2.46	0.92
4:D:501[B]:ELO:CCQ	4:D:501[B]:ELO:CCO	2.49	0.91
1:D:99:MET:HE3	1:E:95:LYS:HE3	1.55	0.89
1:B:99[A]:MET:HE2	1:C:99[A]:MET:HE2	1.55	0.88
4:E:501[A]:ELO:CCQ	4:E:501[A]:ELO:CCO	2.53	0.87

There are no symmetry-related clashes.

5.3 Torsion angles

5.3.1 Protein backbone

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	405/437 (93%)	396 (98%)	9 (2%)	0	100	100
1	B	407/437 (93%)	398 (98%)	9 (2%)	0	100	100
1	C	405/437 (93%)	396 (98%)	9 (2%)	0	100	100
1	D	404/437 (92%)	395 (98%)	9 (2%)	0	100	100
1	E	404/437 (92%)	396 (98%)	8 (2%)	0	100	100
1	F	418/437 (96%)	407 (97%)	11 (3%)	0	100	100
1	G	404/437 (92%)	396 (98%)	8 (2%)	0	100	100
All	All	2847/3059 (93%)	2784 (98%)	63 (2%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains

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	347/366 (95%)	342 (99%)	5 (1%)	59	67
1	B	349/366 (95%)	345 (99%)	4 (1%)	65	74
1	C	347/366 (95%)	341 (98%)	6 (2%)	53	62
1	D	346/366 (94%)	339 (98%)	7 (2%)	48	56
1	E	346/366 (94%)	341 (99%)	5 (1%)	59	67
1	F	352/366 (96%)	346 (98%)	6 (2%)	53	62
1	G	346/366 (94%)	340 (98%)	6 (2%)	53	62

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
All	All	2433/2562 (95%)	2394 (98%)	39 (2%)	55 64

5 of 39 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	F	70	LEU
1	G	99	MET
1	F	99	MET
1	F	261	THR
1	G	178	MET

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 19 such sidechains are listed below:

Mol	Chain	Res	Type
1	F	353	HIS
1	G	119	HIS
1	G	353	HIS
1	G	66	ASN
1	D	402	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](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

30 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	$\# Z > 2$
2	ACT	E	502	-	3,3,3	1.14	0	3,3,3	0.81	0
2	ACT	A	503	-	3,3,3	1.15	0	3,3,3	0.83	0
3	GOL	G	505	-	5,5,5	0.19	0	5,5,5	0.56	0
3	GOL	C	502	-	5,5,5	0.12	0	5,5,5	0.45	0
4	ELO	B	501[A]	-	72,76,76	2.02	19 (26%)	84,112,112	2.18	28 (33%)
3	GOL	F	505	-	5,5,5	0.27	0	5,5,5	0.45	0
3	GOL	F	506	-	5,5,5	0.14	0	5,5,5	0.35	0
2	ACT	F	503	-	3,3,3	1.04	0	3,3,3	0.81	0
2	ACT	G	503	-	3,3,3	0.90	0	3,3,3	1.02	0
3	GOL	B	505	-	5,5,5	0.25	0	5,5,5	0.60	0
2	ACT	B	503	-	3,3,3	1.20	0	3,3,3	0.77	0
4	ELO	F	501	-	72,76,76	2.27	26 (36%)	84,112,112	2.30	28 (33%)
2	ACT	A	501	-	3,3,3	1.03	0	3,3,3	0.83	0
3	GOL	A	505	-	5,5,5	0.21	0	5,5,5	0.47	0
4	ELO	E	501[A]	-	72,76,76	1.95	17 (23%)	84,112,112	2.22	26 (30%)
2	ACT	F	504	-	3,3,3	1.43	0	3,3,3	0.56	0
4	ELO	C	501[B]	-	72,76,76	1.79	19 (26%)	84,112,112	2.10	27 (32%)
4	ELO	D	501[B]	-	72,76,76	1.86	21 (29%)	84,112,112	2.22	27 (32%)
2	ACT	G	501	-	3,3,3	1.25	0	3,3,3	0.74	0
2	ACT	A	502	-	3,3,3	1.16	0	3,3,3	0.64	0
2	ACT	D	502	-	3,3,3	1.13	0	3,3,3	0.68	0
3	GOL	G	504	-	5,5,5	0.39	0	5,5,5	0.52	0
3	GOL	B	504	-	5,5,5	0.24	0	5,5,5	0.44	0
2	ACT	F	502	-	3,3,3	0.91	0	3,3,3	0.97	0
3	GOL	E	503	-	5,5,5	0.16	0	5,5,5	0.53	0
2	ACT	G	502	-	3,3,3	0.91	0	3,3,3	0.82	0
2	ACT	B	502	-	3,3,3	1.08	0	3,3,3	0.93	0
3	GOL	F	507	-	5,5,5	0.17	0	5,5,5	0.41	0
3	GOL	A	504	-	5,5,5	0.27	0	5,5,5	0.46	0
2	ACT	D	503	-	3,3,3	1.21	0	3,3,3	0.89	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	ELO	B	501[A]	-	-	28/78/146/146	0/4/5/5
3	GOL	F	505	-	-	4/4/4/4	-
3	GOL	F	506	-	-	0/4/4/4	-
4	ELO	E	501[A]	-	-	28/78/146/146	0/4/5/5
4	ELO	C	501[B]	-	-	14/78/146/146	0/4/5/5
4	ELO	D	501[B]	-	-	36/78/146/146	0/4/5/5
3	GOL	B	505	-	-	4/4/4/4	-
3	GOL	F	507	-	-	3/4/4/4	-
3	GOL	A	504	-	-	2/4/4/4	-
3	GOL	G	505	-	-	2/4/4/4	-
4	ELO	F	501	-	-	29/78/146/146	0/4/5/5
3	GOL	G	504	-	-	4/4/4/4	-
3	GOL	B	504	-	-	0/4/4/4	-
3	GOL	E	503	-	-	2/4/4/4	-
3	GOL	A	505	-	-	4/4/4/4	-
3	GOL	C	502	-	-	2/4/4/4	-

The worst 5 of 102 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	E	501[A]	ELO	CCA-CCC	-6.56	1.42	1.52
4	F	501	ELO	CBY-CCI	-6.30	1.36	1.51
4	B	501[A]	ELO	CBY-CCI	-6.11	1.36	1.51
4	F	501	ELO	CBW-CBQ	5.59	1.65	1.50
4	B	501[A]	ELO	OAL-CBP	5.24	1.52	1.44

The worst 5 of 136 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	E	501[A]	ELO	OAA-CBC-CBM	7.09	114.57	105.94
4	D	501[B]	ELO	OAO-CCC-CCA	-6.91	95.96	110.05
4	F	501	ELO	OAO-CCC-CCA	-6.80	96.17	110.05
4	F	501	ELO	OAA-CBC-CBM	6.76	114.17	105.94
4	F	501	ELO	OAK-CBO-CBY	6.15	117.28	107.12

There are no chirality outliers.

5 of 162 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	505	GOL	C1-C2-C3-O3
3	C	502	GOL	O1-C1-C2-C3
3	E	503	GOL	C1-C2-C3-O3
3	F	505	GOL	O1-C1-C2-C3
3	G	504	GOL	O1-C1-C2-C3

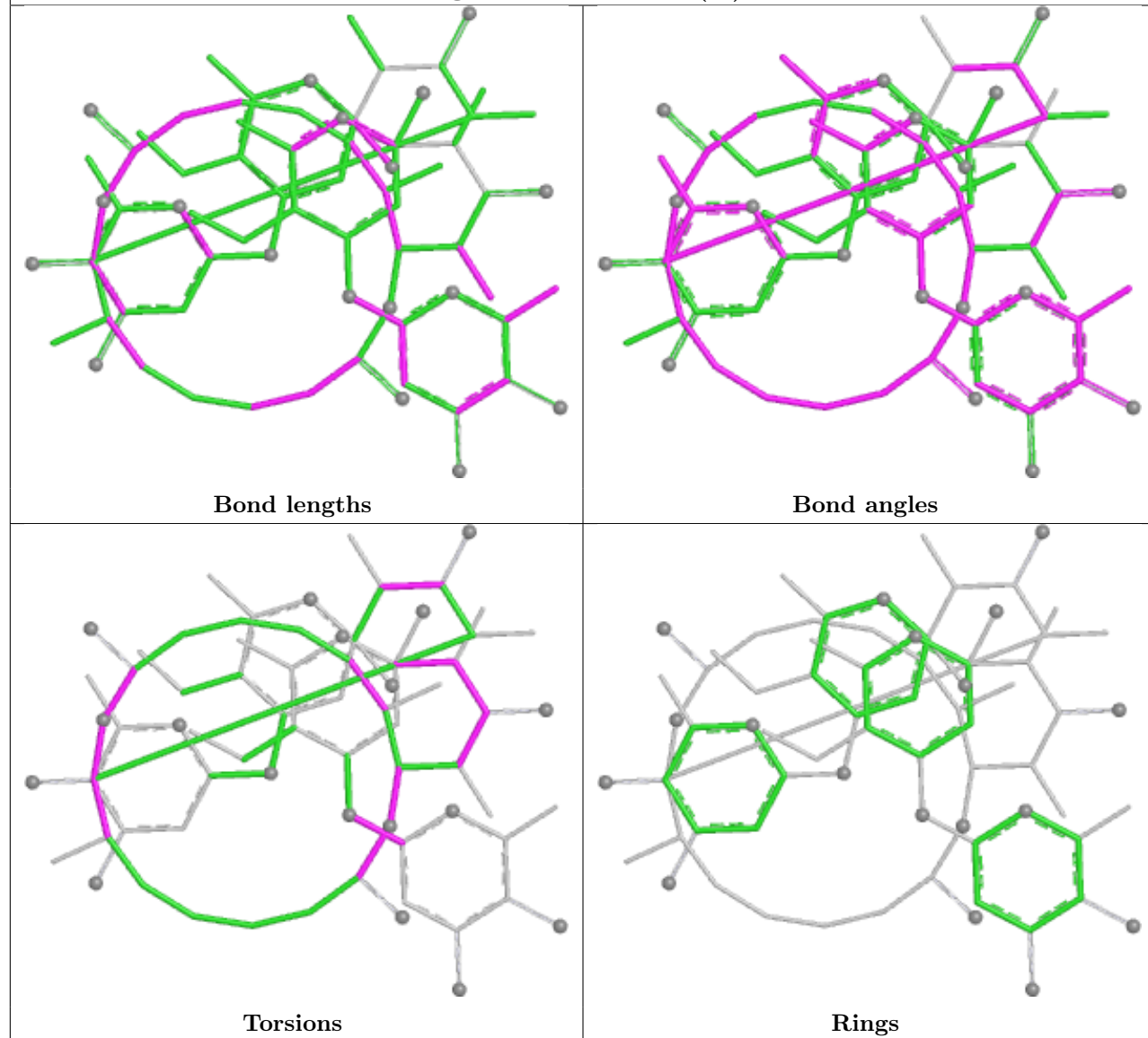
There are no ring outliers.

9 monomers are involved in 45 short contacts:

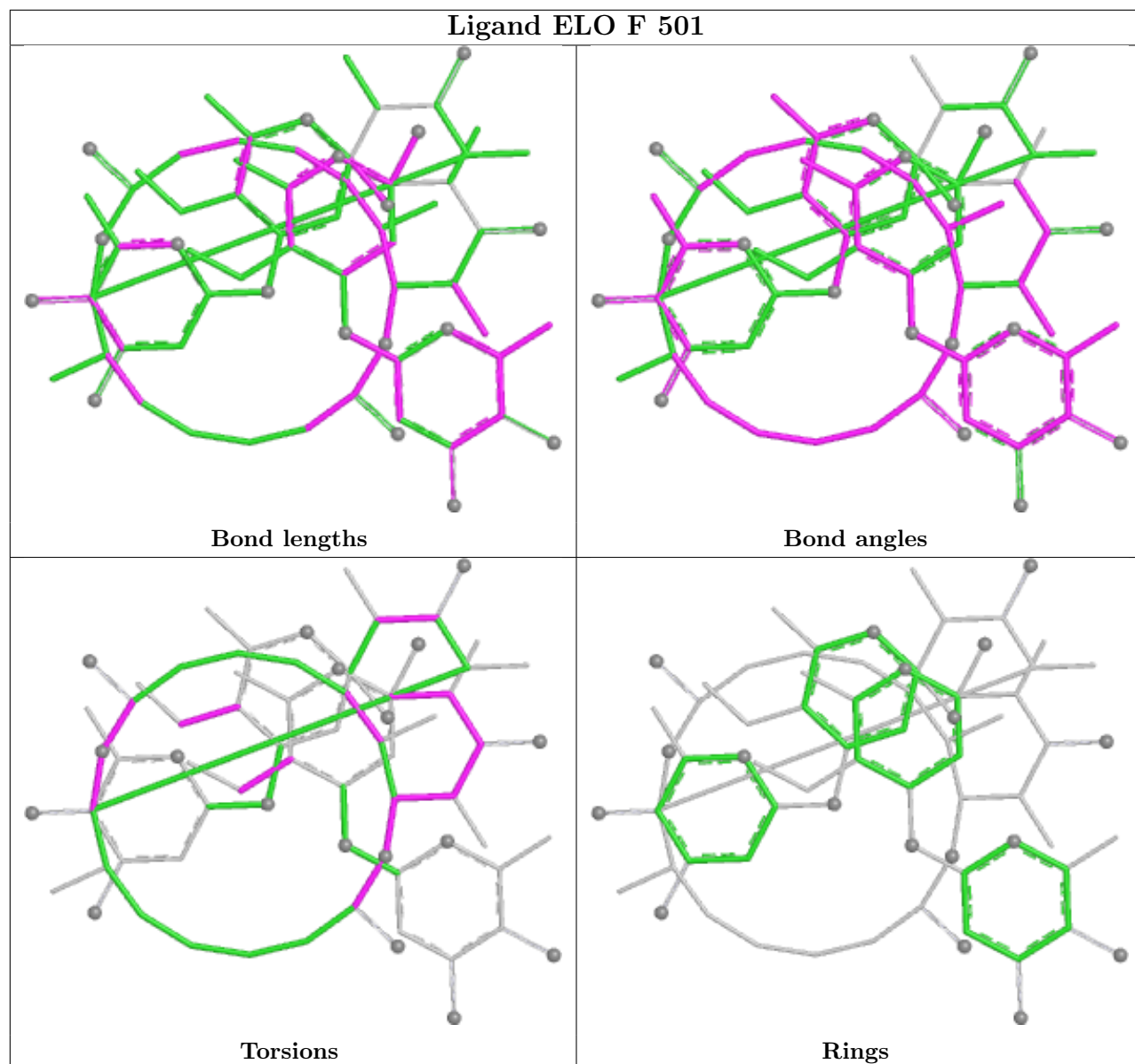
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	G	505	GOL	1	0
4	B	501[A]	ELO	7	0
3	F	506	GOL	1	0
3	A	505	GOL	1	0
4	E	501[A]	ELO	13	0
2	F	504	ACT	1	0
4	C	501[B]	ELO	9	0
4	D	501[B]	ELO	11	0
2	G	502	ACT	1	0

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.

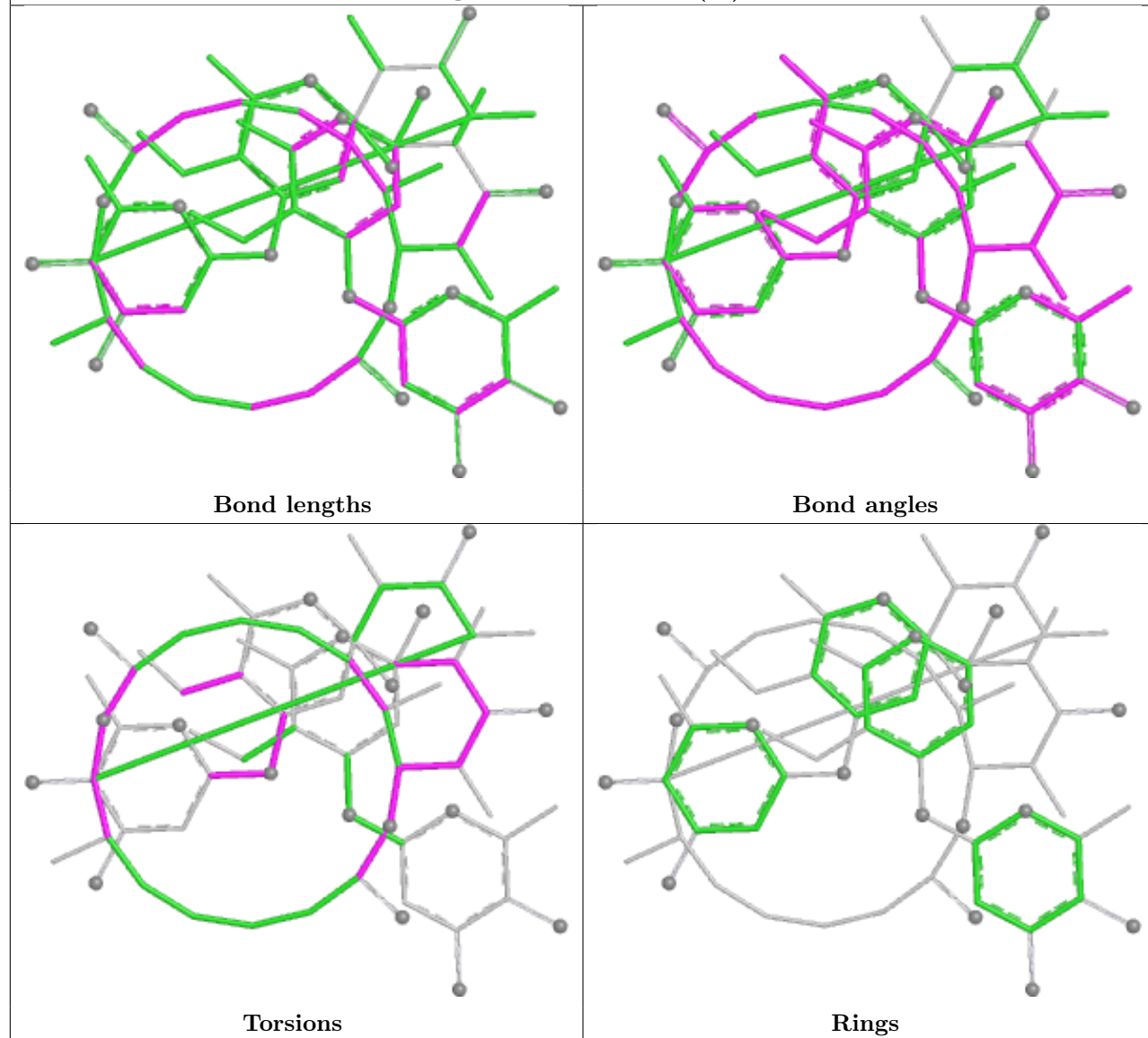
Ligand ELO B 501 (A)



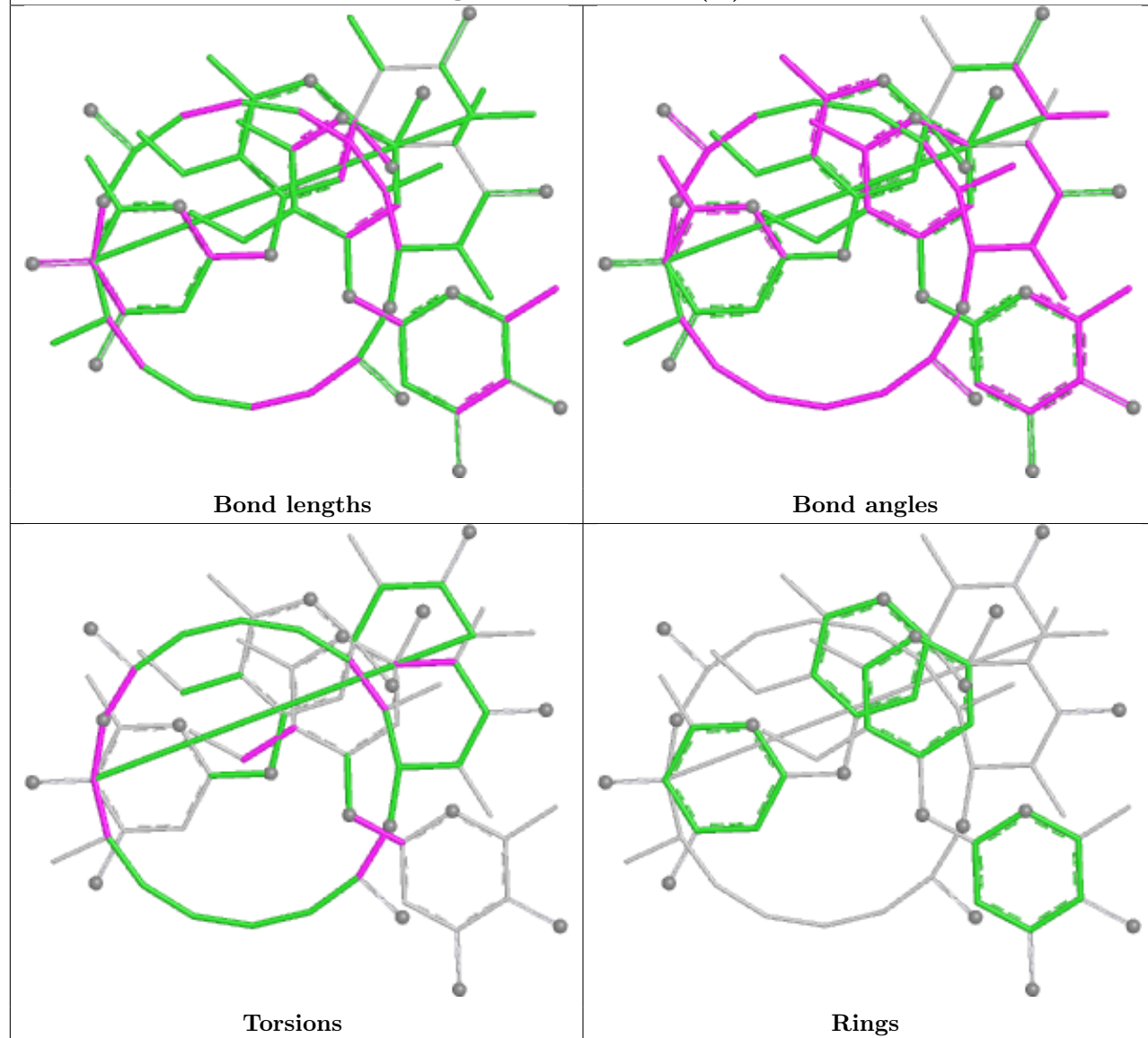
Ligand ELO F 501

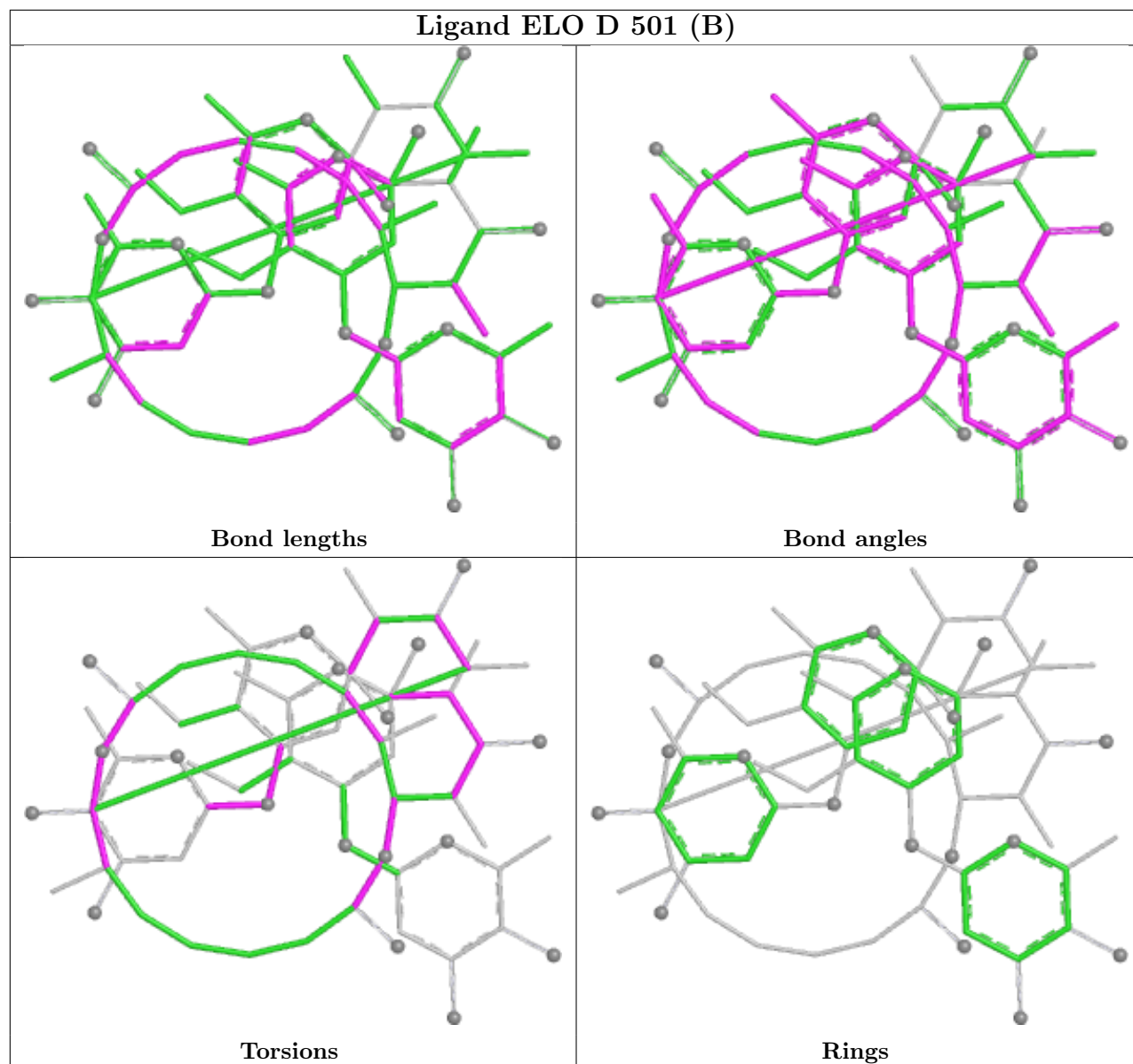


Ligand ELO E 501 (A)



Ligand ELO C 501 (B)





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	409/437 (93%)	0.07	14 (3%)	48	50	30, 42, 75, 129	0
1	B	408/437 (93%)	0.33	44 (10%)	11	11	21, 41, 110, 150	3 (0%)
1	C	408/437 (93%)	0.61	40 (9%)	13	13	32, 56, 120, 168	1 (0%)
1	D	408/437 (93%)	0.57	28 (6%)	23	24	39, 57, 104, 146	0
1	E	408/437 (93%)	0.78	43 (10%)	11	12	38, 60, 116, 158	0
1	F	419/437 (95%)	0.05	27 (6%)	25	27	27, 39, 105, 145	1 (0%)
1	G	408/437 (93%)	0.56	32 (7%)	19	20	30, 55, 106, 169	0
All	All	2868/3059 (93%)	0.42	228 (7%)	18	20	21, 50, 109, 169	5 (0%)

The worst 5 of 228 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	100	PHE	6.3
1	C	100	PHE	6.0
1	E	100	PHE	6.0
1	B	70	LEU	6.0
1	E	262	PHE	5.6

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 oligosaccharides in this entry.

6.4 Ligands ⓘ

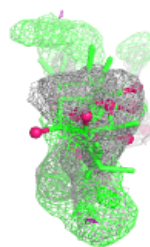
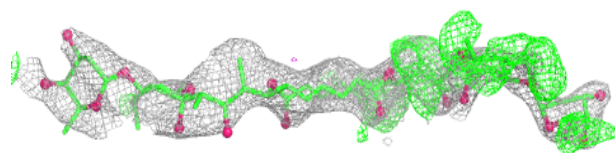
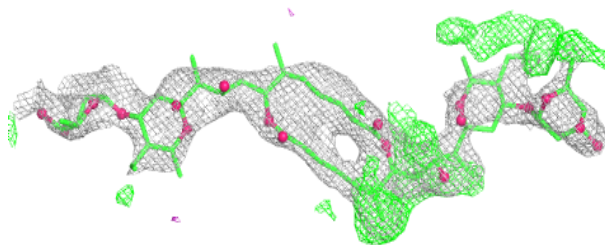
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
3	GOL	F	507	6/6	0.76	0.18	70,83,92,93	0
2	ACT	A	503	4/4	0.79	0.15	63,66,70,72	0
4	ELO	B	501[A]	72/72	0.79	0.26	32,56,87,96	72
4	ELO	E	501[A]	72/72	0.79	0.29	44,66,159,169	72
3	GOL	F	506	6/6	0.80	0.14	70,73,77,81	0
4	ELO	D	501[B]	72/72	0.80	0.28	39,73,139,145	72
2	ACT	D	503	4/4	0.80	0.18	59,63,64,71	0
2	ACT	B	502	4/4	0.81	0.18	72,72,75,83	0
4	ELO	C	501[B]	72/72	0.81	0.24	36,53,66,68	72
3	GOL	A	505	6/6	0.83	0.18	67,83,85,87	0
3	GOL	G	504	6/6	0.83	0.20	53,69,70,72	0
4	ELO	F	501	72/72	0.83	0.21	29,44,52,63	72
2	ACT	B	503	4/4	0.84	0.20	76,80,81,87	0
2	ACT	A	501	4/4	0.85	0.14	49,55,60,64	0
3	GOL	A	504	6/6	0.86	0.14	40,58,63,70	0
3	GOL	F	505	6/6	0.86	0.20	48,71,75,83	0
2	ACT	F	504	4/4	0.87	0.14	48,59,62,63	0
3	GOL	B	505	6/6	0.89	0.14	40,53,64,66	0
2	ACT	G	503	4/4	0.89	0.16	61,62,64,66	0
3	GOL	E	503	6/6	0.90	0.13	58,62,69,70	0
2	ACT	F	503	4/4	0.90	0.16	50,50,55,62	0
3	GOL	B	504	6/6	0.90	0.12	43,54,55,60	0
2	ACT	G	501	4/4	0.90	0.16	45,57,57,62	0
3	GOL	C	502	6/6	0.90	0.16	67,79,85,94	0
2	ACT	D	502	4/4	0.91	0.12	66,67,69,69	0
2	ACT	A	502	4/4	0.93	0.14	53,58,61,63	0
2	ACT	G	502	4/4	0.93	0.11	54,56,58,59	0
2	ACT	E	502	4/4	0.94	0.10	59,65,71,73	0
3	GOL	G	505	6/6	0.95	0.09	57,63,68,72	0
2	ACT	F	502	4/4	0.95	0.09	43,44,49,49	0

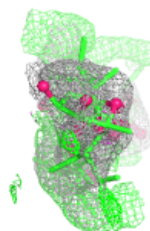
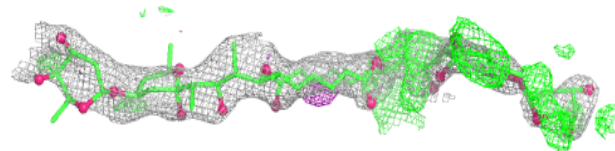
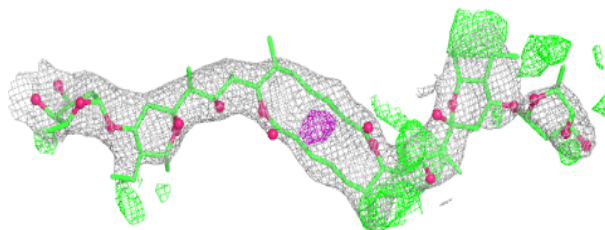
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around ELO B 501 (A):

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

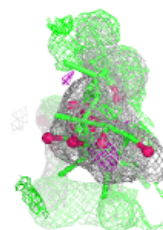
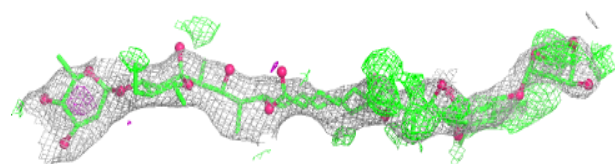
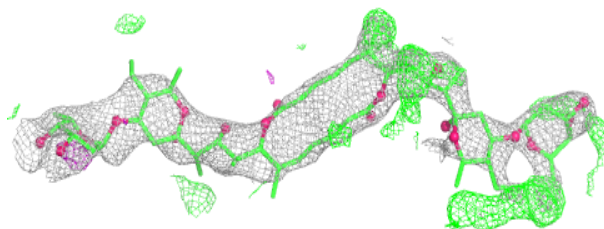
**Electron density around ELO E 501 (A):**

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

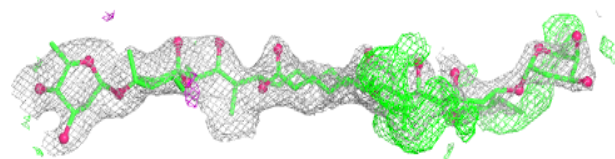
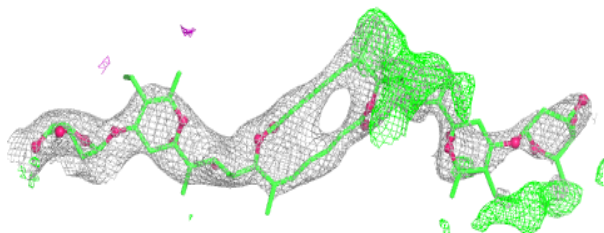


Electron density around ELO D 501 (B):

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

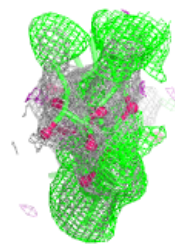
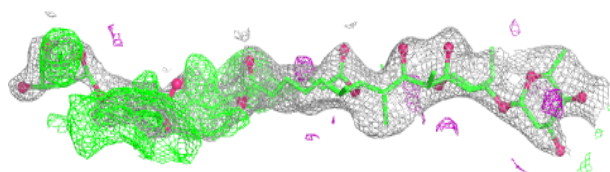
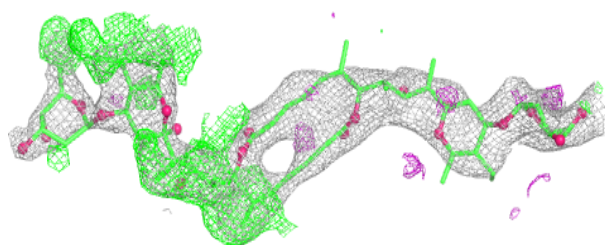
**Electron density around ELO C 501 (B):**

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



Electron density around ELO F 501:

$2mF_o-DF_c$ (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.