



# wwPDB X-ray Structure Validation Summary Report ⓘ

Nov 16, 2023 – 02:54 AM JST

PDB ID : 6KIH  
Title : Sucrose-phosphate synthase (tll1590) from *Thermosynechococcus elongatus*  
Authors : Su, J.  
Deposited on : 2019-07-18  
Resolution : 3.00 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](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>.

---

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

MolProbity : 4.02b-467  
Mogul : 1.8.5 (274361), 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

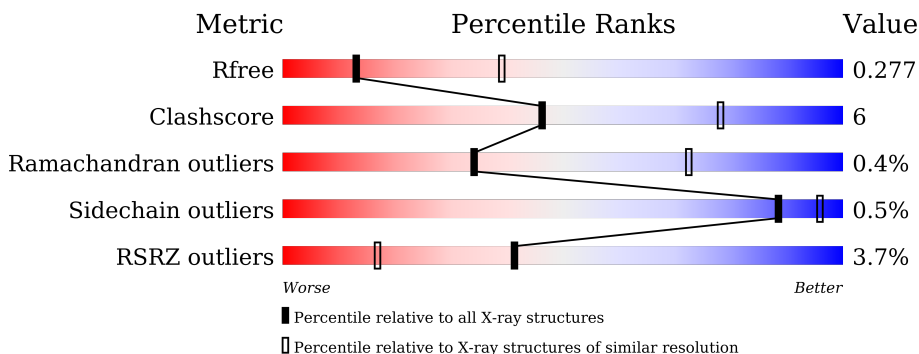
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 3.00 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	2092 (3.00-3.00)
Clashscore	141614	2416 (3.00-3.00)
Ramachandran outliers	138981	2333 (3.00-3.00)
Sidechain outliers	138945	2336 (3.00-3.00)
RSRZ outliers	127900	1990 (3.00-3.00)

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	455	 2% 76% 12% 12%
1	B	455	 3% 73% 14% 12%
1	C	455	 3% 75% 12% 12%
1	D	455	 2% 75% 13% 12%
1	E	455	 3% 75% 13% 12%
1	F	455	 2% 76% 11% 12%

*Continued on next page...*

Continued from previous page...

Mol	Chain	Length	Quality of chain
1	G	455	 2% 74% 13% 12%
1	H	455	 4% 75% 13% 12%
1	I	455	 4% 75% 13% 12%
1	J	455	 5% 74% 14% 12%
1	K	455	 5% 74% 13% 12%
1	L	455	 5% 74% 14% 12%
2	M	2	 100%
2	N	2	 100%
2	O	2	 100%
2	P	2	 100%
2	Q	2	 100%
2	R	2	 100%
2	S	2	 100%
2	T	2	 100%
2	U	2	 100%

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
2	GLC	S	1	-	-	X	-

## 2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 38160 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 Tll1590 protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	400	3139	2007	555	567	10	0	0	0
1	B	399	3132	2001	554	567	10	0	0	0
1	C	400	3140	2007	555	568	10	0	0	0
1	D	399	3132	2001	554	567	10	0	0	0
1	E	400	3139	2007	554	568	10	0	0	0
1	F	399	3127	1998	553	566	10	0	0	0
1	G	400	3140	2007	555	568	10	0	0	0
1	H	399	3131	2001	554	566	10	0	0	0
1	I	399	3131	2001	553	567	10	0	0	0
1	J	400	3140	2007	555	568	10	0	0	0
1	K	399	3130	2001	552	567	10	0	0	0
1	L	400	3136	2005	555	566	10	0	0	0

There are 36 discrepancies between the modelled and reference sequences:

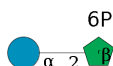
Chain	Residue	Modelled	Actual	Comment	Reference
A	-2	GLY	-	expression tag	UNP Q8DIJ5
A	-1	SER	-	expression tag	UNP Q8DIJ5
A	0	HIS	-	expression tag	UNP Q8DIJ5
B	-2	GLY	-	expression tag	UNP Q8DIJ5
B	-1	SER	-	expression tag	UNP Q8DIJ5

*Continued on next page...*

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
B	0	HIS	-	expression tag	UNP Q8DIJ5
C	-2	GLY	-	expression tag	UNP Q8DIJ5
C	-1	SER	-	expression tag	UNP Q8DIJ5
C	0	HIS	-	expression tag	UNP Q8DIJ5
D	-2	GLY	-	expression tag	UNP Q8DIJ5
D	-1	SER	-	expression tag	UNP Q8DIJ5
D	0	HIS	-	expression tag	UNP Q8DIJ5
E	-2	GLY	-	expression tag	UNP Q8DIJ5
E	-1	SER	-	expression tag	UNP Q8DIJ5
E	0	HIS	-	expression tag	UNP Q8DIJ5
F	-2	GLY	-	expression tag	UNP Q8DIJ5
F	-1	SER	-	expression tag	UNP Q8DIJ5
F	0	HIS	-	expression tag	UNP Q8DIJ5
G	-2	GLY	-	expression tag	UNP Q8DIJ5
G	-1	SER	-	expression tag	UNP Q8DIJ5
G	0	HIS	-	expression tag	UNP Q8DIJ5
H	-2	GLY	-	expression tag	UNP Q8DIJ5
H	-1	SER	-	expression tag	UNP Q8DIJ5
H	0	HIS	-	expression tag	UNP Q8DIJ5
I	-2	GLY	-	expression tag	UNP Q8DIJ5
I	-1	SER	-	expression tag	UNP Q8DIJ5
I	0	HIS	-	expression tag	UNP Q8DIJ5
J	-2	GLY	-	expression tag	UNP Q8DIJ5
J	-1	SER	-	expression tag	UNP Q8DIJ5
J	0	HIS	-	expression tag	UNP Q8DIJ5
K	-2	GLY	-	expression tag	UNP Q8DIJ5
K	-1	SER	-	expression tag	UNP Q8DIJ5
K	0	HIS	-	expression tag	UNP Q8DIJ5
L	-2	GLY	-	expression tag	UNP Q8DIJ5
L	-1	SER	-	expression tag	UNP Q8DIJ5
L	0	HIS	-	expression tag	UNP Q8DIJ5

- Molecule 2 is an oligosaccharide called 6-O-phosphono-beta-D-fructofuranose-(2-1)-alpha-D-glucopyranose.



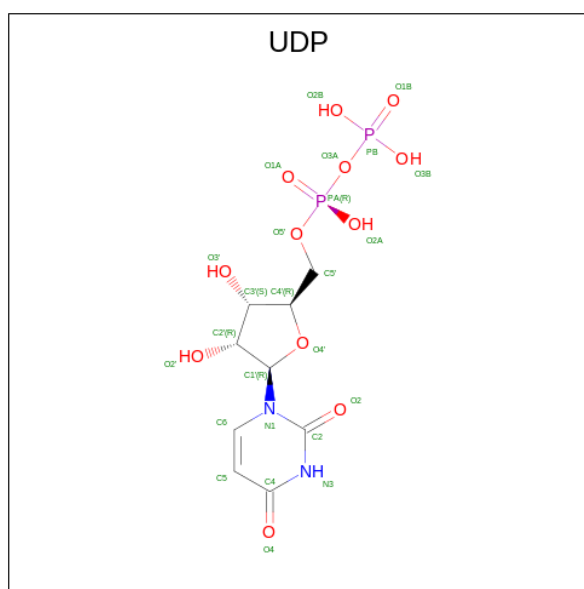
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	O	P			
2	M	2	27	12	14	1	0	0	0

Continued on next page...

Continued from previous page...

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
2	N	2	Total	C	O	P	0	0	0
			27	12	14	1			
2	O	2	Total	C	O	P	0	0	0
			27	12	14	1			
2	P	2	Total	C	O	P	0	0	0
			27	12	14	1			
2	Q	2	Total	C	O	P	0	0	0
			27	12	14	1			
2	R	2	Total	C	O	P	0	0	0
			27	12	14	1			
2	S	2	Total	C	O	P	0	0	0
			27	12	14	1			
2	T	2	Total	C	O	P	0	0	0
			27	12	14	1			
2	U	2	Total	C	O	P	0	0	0
			27	12	14	1			

- Molecule 3 is URIDINE-5'-DIPHOSPHATE (three-letter code: UDP) (formula: C<sub>9</sub>H<sub>14</sub>N<sub>2</sub>O<sub>12</sub>P<sub>2</sub>) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total	C	N	O	P	0	0
			25	9	2	12	2		
3	B	1	Total	C	N	O	P	0	0
			25	9	2	12	2		
3	C	1	Total	C	N	O	P	0	0
			25	9	2	12	2		

Continued on next page...

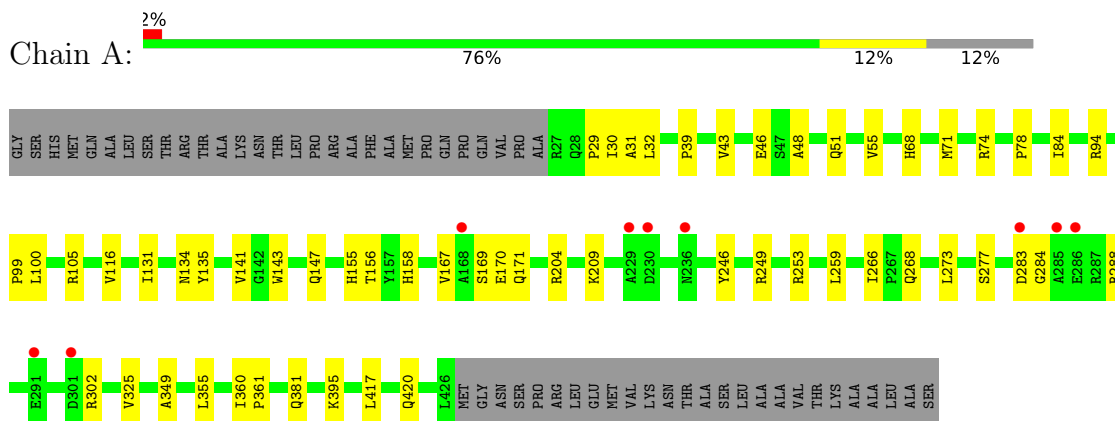
*Continued from previous page...*

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	D	1	Total	C	N	O	P	0	0
			25	9	2	12	2		
3	E	1	Total	C	N	O	P	0	0
			25	9	2	12	2		
3	F	1	Total	C	N	O	P	0	0
			25	9	2	12	2		
3	G	1	Total	C	N	O	P	0	0
			25	9	2	12	2		
3	H	1	Total	C	N	O	P	0	0
			25	9	2	12	2		
3	I	1	Total	C	N	O	P	0	0
			25	9	2	12	2		
3	J	1	Total	C	N	O	P	0	0
			25	9	2	12	2		
3	K	1	Total	C	N	O	P	0	0
			25	9	2	12	2		
3	L	1	Total	C	N	O	P	0	0
			25	9	2	12	2		

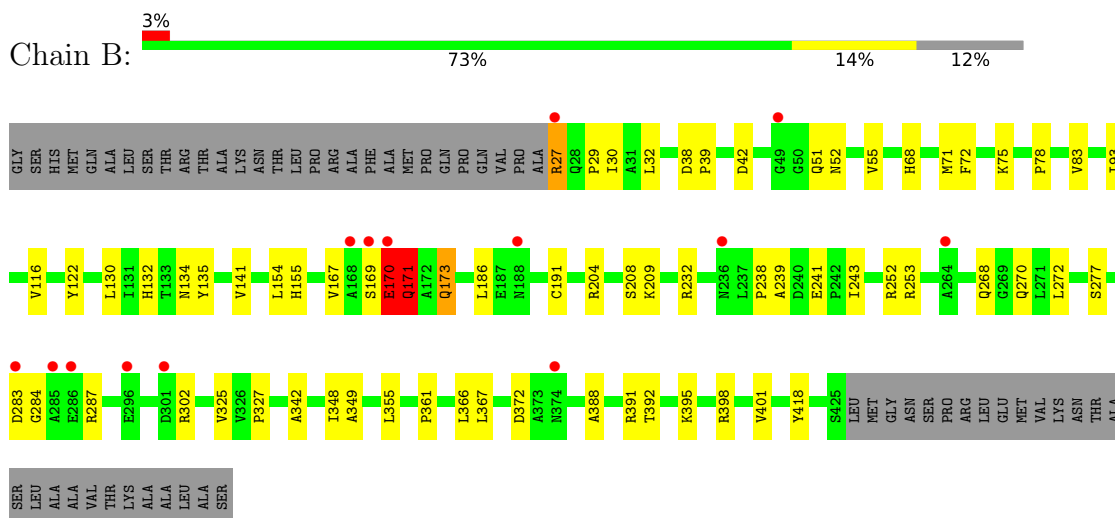
### 3 Residue-property plots [i](#)

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.

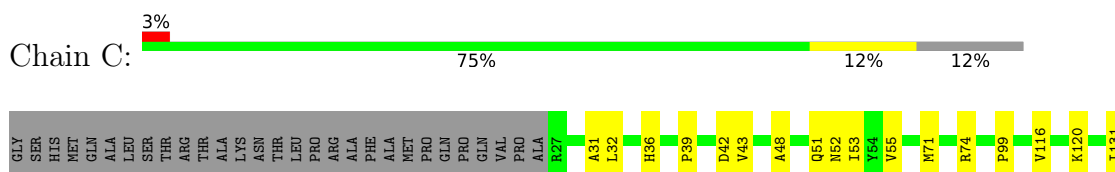
- Molecule 1: Tll1590 protein



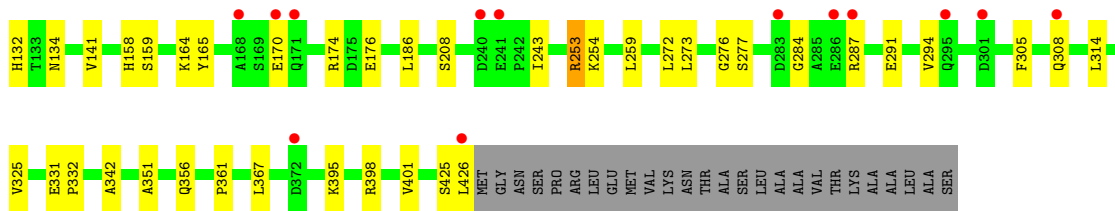
- Molecule 1: Tll1590 protein



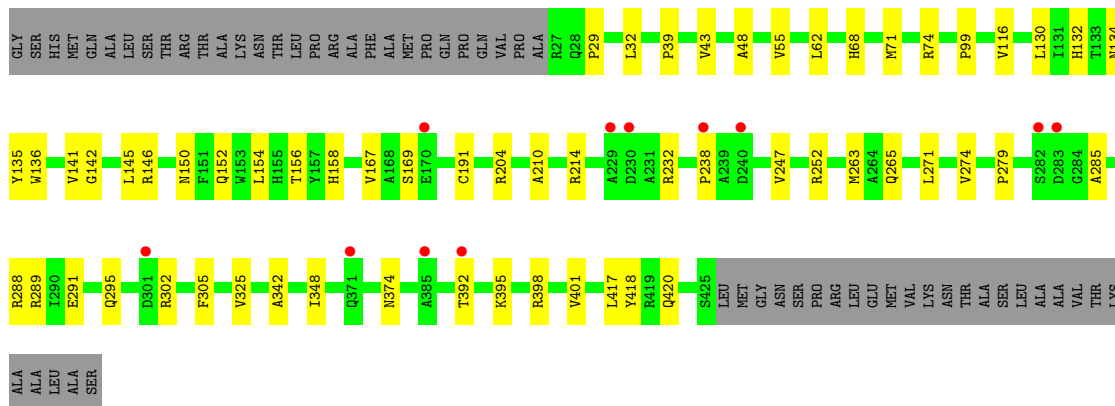
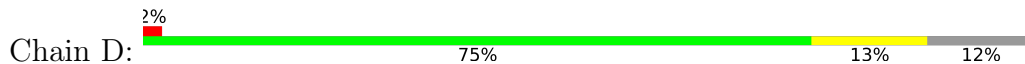
- Molecule 1: Tll1590 protein



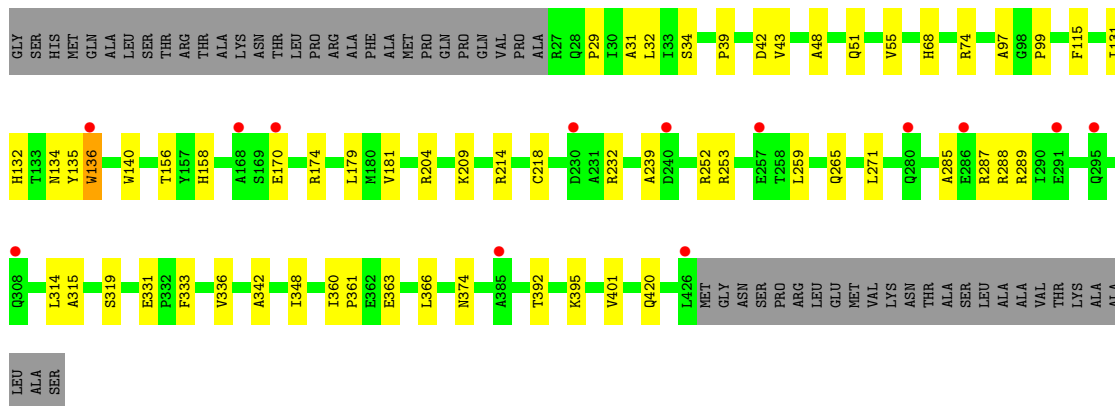
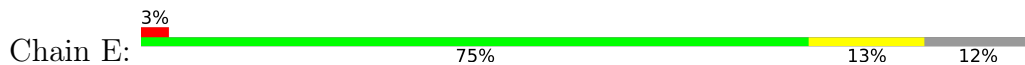




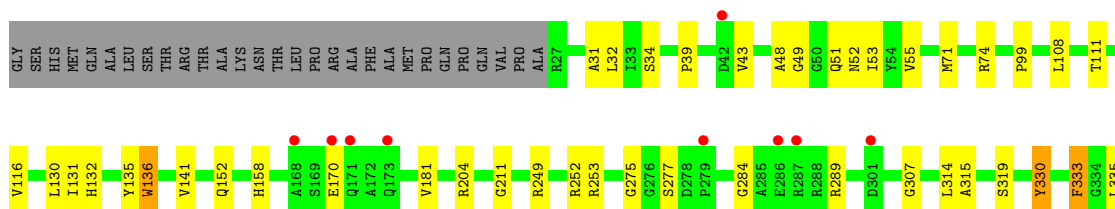
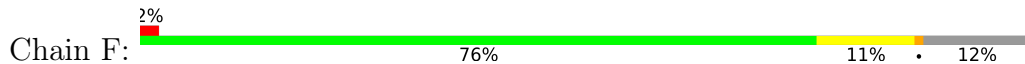
• Molecule 1: Tll1590 protein

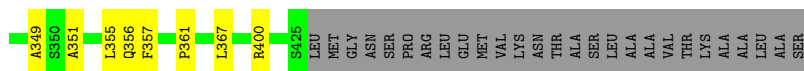


• Molecule 1: Tll1590 protein

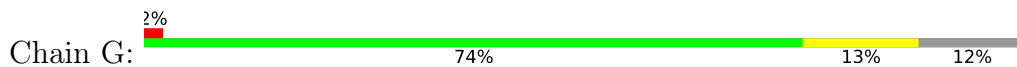


• Molecule 1: Tll1590 protein

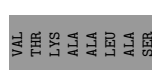
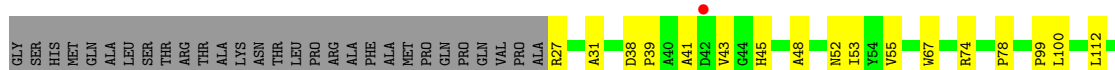
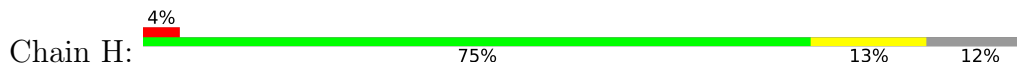




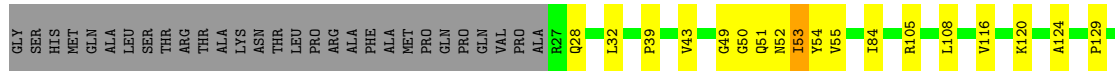
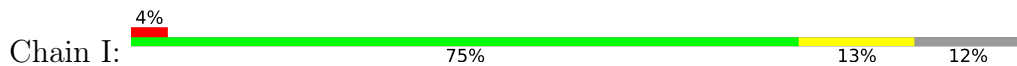
● Molecule 1: Tll1590 protein



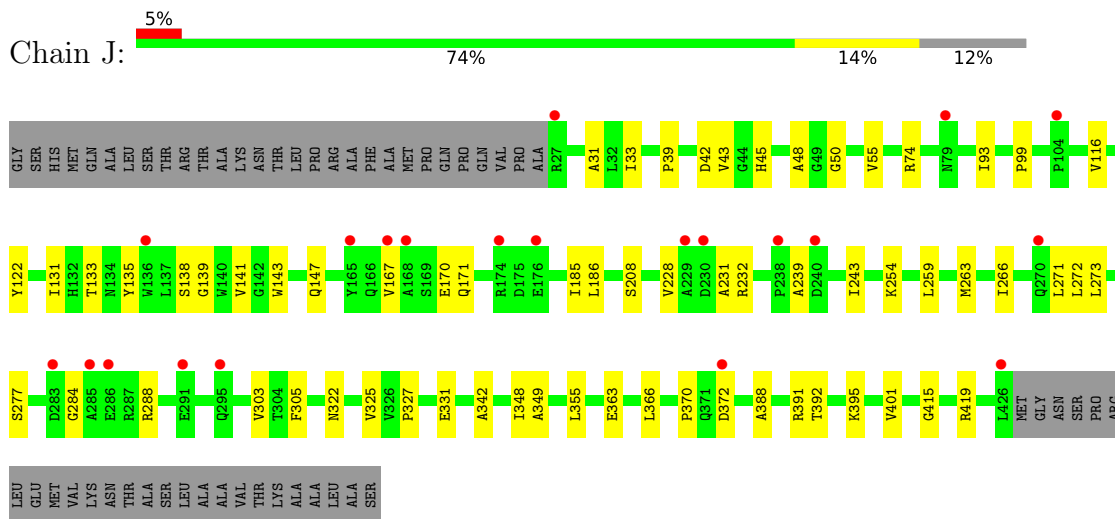
● Molecule 1: Tll1590 protein



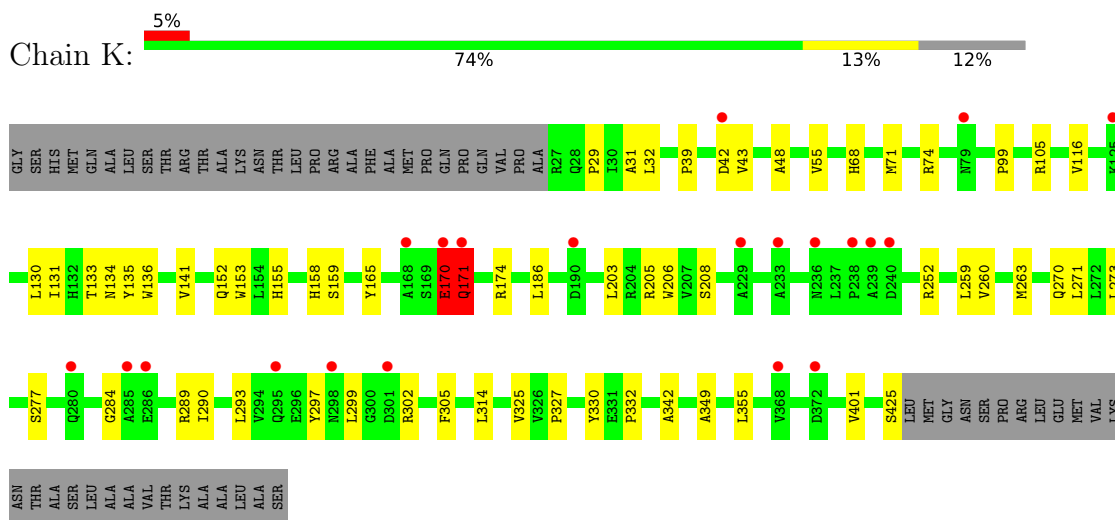
● Molecule 1: Tll1590 protein



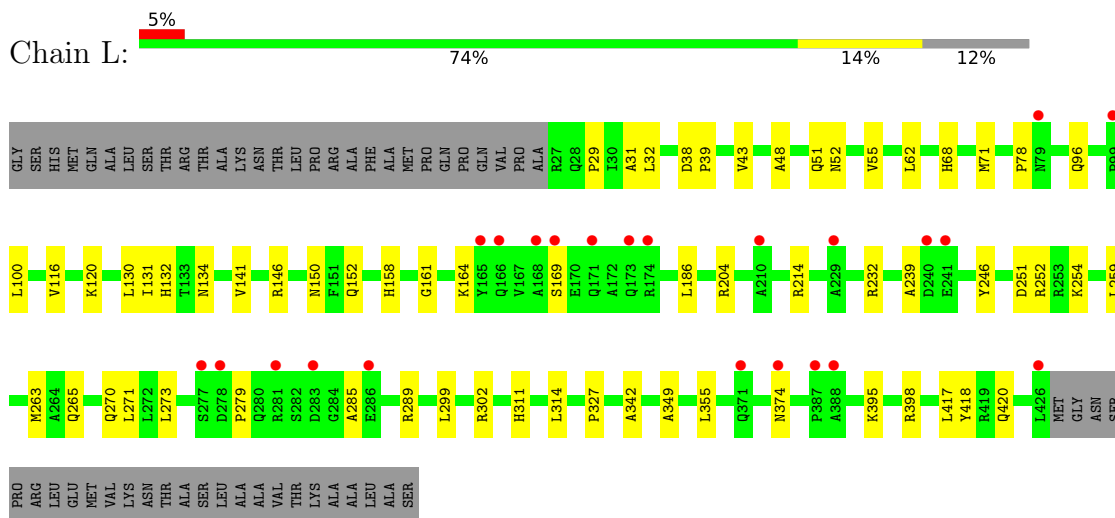
- Molecule 1: Tll1590 protein



- Molecule 1: Tll1590 protein



- Molecule 1: Tll1590 protein



- Molecule 2: 6-O-phosphono-beta-D-fructofuranose-(2-1)-alpha-D-glucopyranose

Chain M:  100%

GLC1  
F6P2

- Molecule 2: 6-O-phosphono-beta-D-fructofuranose-(2-1)-alpha-D-glucopyranose

Chain N:  100%

GLC1  
F6P2

- Molecule 2: 6-O-phosphono-beta-D-fructofuranose-(2-1)-alpha-D-glucopyranose

Chain O:  100%

GLC1  
F6P2

- Molecule 2: 6-O-phosphono-beta-D-fructofuranose-(2-1)-alpha-D-glucopyranose

Chain P:  100%

GLC1  
F6P2

- Molecule 2: 6-O-phosphono-beta-D-fructofuranose-(2-1)-alpha-D-glucopyranose

Chain Q:  100%

GLC1  
F6P2

- Molecule 2: 6-O-phosphono-beta-D-fructofuranose-(2-1)-alpha-D-glucopyranose

Chain R:  100%

GLC1  
F6P2

- Molecule 2: 6-O-phosphono-beta-D-fructofuranose-(2-1)-alpha-D-glucopyranose

Chain S:  100%

GLC1  
F6P2

- Molecule 2: 6-O-phosphono-beta-D-fructofuranose-(2-1)-alpha-D-glucopyranose

Chain T:  100%

GLC1  
F6F2

- Molecule 2: 6-O-phosphono-beta-D-fructofuranose-(2-1)-alpha-D-glucofuranose

Chain U:

100%

GLC1  
F6F2

## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	116.66Å 170.84Å 160.55Å 90.00° 96.43° 90.00°	Depositor
Resolution (Å)	19.90 – 3.00 19.90 – 3.00	Depositor EDS
% Data completeness (in resolution range)	99.0 (19.90-3.00) 99.0 (19.90-3.00)	Depositor EDS
$R_{merge}$	0.12	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.27 (at 2.98Å)	Xtrriage
Refinement program	PHENIX 1.17_3644	Depositor
R, $R_{free}$	0.266 , 0.278 0.271 , 0.277	Depositor DCC
$R_{free}$ test set	2000 reflections (1.63%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	72.1	Xtrriage
Anisotropy	0.404	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.31 , 38.1	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.46$ , $\langle L^2 \rangle = 0.29$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.89	EDS
Total number of atoms	38160	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	80.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 11.62% 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: F6P, GLC, UDP

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	0.39	0/3218	0.58	0/4386
1	B	0.39	0/3211	0.56	0/4377
1	C	0.37	0/3219	0.55	0/4388
1	D	0.39	0/3211	0.56	0/4377
1	E	0.38	0/3218	0.56	0/4386
1	F	0.40	0/3206	0.56	0/4372
1	G	0.37	0/3219	0.55	0/4388
1	H	0.36	0/3210	0.57	0/4375
1	I	0.38	0/3210	0.54	0/4375
1	J	0.37	0/3219	0.55	0/4388
1	K	0.37	0/3209	0.57	0/4373
1	L	0.35	0/3215	0.52	0/4383
All	All	0.38	0/38565	0.56	0/52568

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	3139	0	3095	32	0

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	B	3132	0	3084	47	0
1	C	3140	0	3095	33	0
1	D	3132	0	3084	35	0
1	E	3139	0	3093	33	0
1	F	3127	0	3070	36	0
1	G	3140	0	3095	36	0
1	H	3131	0	3082	39	0
1	I	3131	0	3082	52	0
1	J	3140	0	3095	38	0
1	K	3130	0	3080	43	0
1	L	3136	0	3091	37	0
2	M	27	0	19	4	0
2	N	27	0	20	2	0
2	O	27	0	20	8	0
2	P	27	0	20	5	0
2	Q	27	0	19	5	0
2	R	27	0	20	7	0
2	S	27	0	19	14	0
2	T	27	0	20	6	0
2	U	27	0	20	2	0
3	A	25	0	10	3	0
3	B	25	0	10	0	0
3	C	25	0	10	2	0
3	D	25	0	10	2	0
3	E	25	0	10	3	0
3	F	25	0	10	3	0
3	G	25	0	10	1	0
3	H	25	0	10	2	0
3	I	25	0	10	3	0
3	J	25	0	10	1	0
3	K	25	0	10	3	0
3	L	25	0	10	3	0
All	All	38160	0	37343	476	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 6.

The worst 5 of 476 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:S:2:F6P:O5	2:S:2:F6P:C2	1.63	1.28

*Continued on next page...*



Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:P:2:F6P:O5	2:P:2:F6P:C2	1.63	1.21
1:B:170:GLU:HG2	1:B:252:ARG:NE	1.70	1.07
1:B:170:GLU:HG2	1:B:252:ARG:CD	1.92	0.99
1:K:170:GLU:HG2	1:K:252:ARG:HD3	1.46	0.97

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	398/455 (88%)	371 (93%)	27 (7%)	0	100	100
1	B	397/455 (87%)	380 (96%)	15 (4%)	2 (0%)	29	68
1	C	398/455 (88%)	376 (94%)	22 (6%)	0	100	100
1	D	397/455 (87%)	377 (95%)	18 (4%)	2 (0%)	29	68
1	E	398/455 (88%)	371 (93%)	25 (6%)	2 (0%)	29	68
1	F	397/455 (87%)	367 (92%)	27 (7%)	3 (1%)	19	57
1	G	398/455 (88%)	373 (94%)	23 (6%)	2 (0%)	29	68
1	H	397/455 (87%)	368 (93%)	26 (6%)	3 (1%)	19	57
1	I	397/455 (87%)	373 (94%)	24 (6%)	0	100	100
1	J	398/455 (88%)	375 (94%)	22 (6%)	1 (0%)	41	76
1	K	397/455 (87%)	379 (96%)	15 (4%)	3 (1%)	19	57
1	L	398/455 (88%)	371 (93%)	27 (7%)	0	100	100
All	All	4770/5460 (87%)	4481 (94%)	271 (6%)	18 (0%)	34	72

5 of 18 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	171	GLN

Continued on next page...

*Continued from previous page...*

Mol	Chain	Res	Type
1	D	136	TRP
1	E	136	TRP
1	F	136	TRP
1	H	171	GLN

### 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	320/366 (87%)	318 (99%)	2 (1%)	86	95
1	B	320/366 (87%)	315 (98%)	5 (2%)	62	86
1	C	321/366 (88%)	319 (99%)	2 (1%)	86	95
1	D	320/366 (87%)	320 (100%)	0	100	100
1	E	321/366 (88%)	321 (100%)	0	100	100
1	F	318/366 (87%)	317 (100%)	1 (0%)	92	97
1	G	321/366 (88%)	319 (99%)	2 (1%)	86	95
1	H	319/366 (87%)	317 (99%)	2 (1%)	86	95
1	I	320/366 (87%)	319 (100%)	1 (0%)	92	97
1	J	321/366 (88%)	320 (100%)	1 (0%)	92	97
1	K	320/366 (87%)	316 (99%)	4 (1%)	69	89
1	L	320/366 (87%)	319 (100%)	1 (0%)	92	97
All	All	3841/4392 (88%)	3820 (100%)	21 (0%)	88	96

5 of 21 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	I	53	ILE
1	K	170	GLU
1	L	395	LYS
1	K	171	GLN
1	K	136	TRP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 53 such sidechains are listed below:

Mol	Chain	Res	Type
1	H	155	HIS
1	J	51	GLN
1	L	173	GLN
1	I	28	GLN
1	I	158	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](#)

18 monosaccharides are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
2	GLC	M	1	2	11,11,12	2.05	4 (36%)	15,15,17	2.00	4 (26%)
2	F6P	M	2	2	15,16,16	3.63	5 (33%)	17,25,25	1.32	2 (11%)
2	GLC	N	1	2	11,11,12	1.84	4 (36%)	15,15,17	1.91	3 (20%)
2	F6P	N	2	2	15,16,16	3.95	5 (33%)	17,25,25	1.18	2 (11%)
2	GLC	O	1	2	11,11,12	1.94	4 (36%)	15,15,17	1.72	4 (26%)
2	F6P	O	2	2	15,16,16	3.74	5 (33%)	17,25,25	1.55	5 (29%)
2	GLC	P	1	2	11,11,12	1.92	4 (36%)	15,15,17	2.58	8 (53%)
2	F6P	P	2	2	15,16,16	4.02	6 (40%)	17,25,25	1.27	2 (11%)
2	GLC	Q	1	2	11,11,12	1.57	2 (18%)	15,15,17	1.50	2 (13%)
2	F6P	Q	2	2	15,16,16	3.95	5 (33%)	17,25,25	0.84	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
2	GLC	R	1	2	11,11,12	1.88	4 (36%)	15,15,17	2.12	5 (33%)
2	F6P	R	2	2	15,16,16	3.77	6 (40%)	17,25,25	1.52	3 (17%)
2	GLC	S	1	2	11,11,12	1.40	2 (18%)	15,15,17	3.50	8 (53%)
2	F6P	S	2	2	15,16,16	4.01	5 (33%)	17,25,25	1.25	2 (11%)
2	GLC	T	1	2	11,11,12	1.80	4 (36%)	15,15,17	1.45	2 (13%)
2	F6P	T	2	2	15,16,16	3.73	6 (40%)	17,25,25	0.94	1 (5%)
2	GLC	U	1	2	11,11,12	2.17	5 (45%)	15,15,17	2.01	5 (33%)
2	F6P	U	2	2	15,16,16	3.78	5 (33%)	17,25,25	0.97	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
2	GLC	M	1	2	-	2/2/19/22	0/1/1/1
2	F6P	M	2	2	-	5/9/28/28	0/1/1/1
2	GLC	N	1	2	-	0/2/19/22	0/1/1/1
2	F6P	N	2	2	-	7/9/28/28	0/1/1/1
2	GLC	O	1	2	-	0/2/19/22	0/1/1/1
2	F6P	O	2	2	-	2/9/28/28	0/1/1/1
2	GLC	P	1	2	-	0/2/19/22	0/1/1/1
2	F6P	P	2	2	-	9/9/28/28	0/1/1/1
2	GLC	Q	1	2	-	2/2/19/22	0/1/1/1
2	F6P	Q	2	2	-	4/9/28/28	0/1/1/1
2	GLC	R	1	2	-	0/2/19/22	0/1/1/1
2	F6P	R	2	2	-	5/9/28/28	0/1/1/1
2	GLC	S	1	2	-	2/2/19/22	0/1/1/1
2	F6P	S	2	2	-	8/9/28/28	0/1/1/1
2	GLC	T	1	2	-	2/2/19/22	0/1/1/1
2	F6P	T	2	2	-	5/9/28/28	0/1/1/1
2	GLC	U	1	2	-	0/2/19/22	0/1/1/1
2	F6P	U	2	2	-	1/9/28/28	0/1/1/1

The worst 5 of 81 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	P	2	F6P	O5-C2	13.11	1.63	1.43

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	S	2	F6P	O5-C2	13.03	1.63	1.43
2	Q	2	F6P	O5-C2	12.93	1.63	1.43
2	N	2	F6P	O5-C2	12.87	1.63	1.43
2	T	2	F6P	O5-C2	12.24	1.62	1.43

The worst 5 of 58 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	S	1	GLC	O4-C4-C5	-7.22	91.37	109.30
2	S	1	GLC	O5-C1-C2	-6.46	100.81	110.77
2	S	1	GLC	C1-O5-C5	-6.02	104.04	112.19
2	U	1	GLC	C1-O5-C5	5.59	119.76	112.19
2	N	1	GLC	C1-C2-C3	4.95	115.75	109.67

There are no chirality outliers.

5 of 54 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	M	2	F6P	O1-C1-C2-O2
2	M	2	F6P	O1-C1-C2-C3
2	M	2	F6P	O1-C1-C2-O5
2	N	2	F6P	O1-C1-C2-O2
2	N	2	F6P	O1-C1-C2-C3

There are no ring outliers.

18 monomers are involved in 53 short contacts:

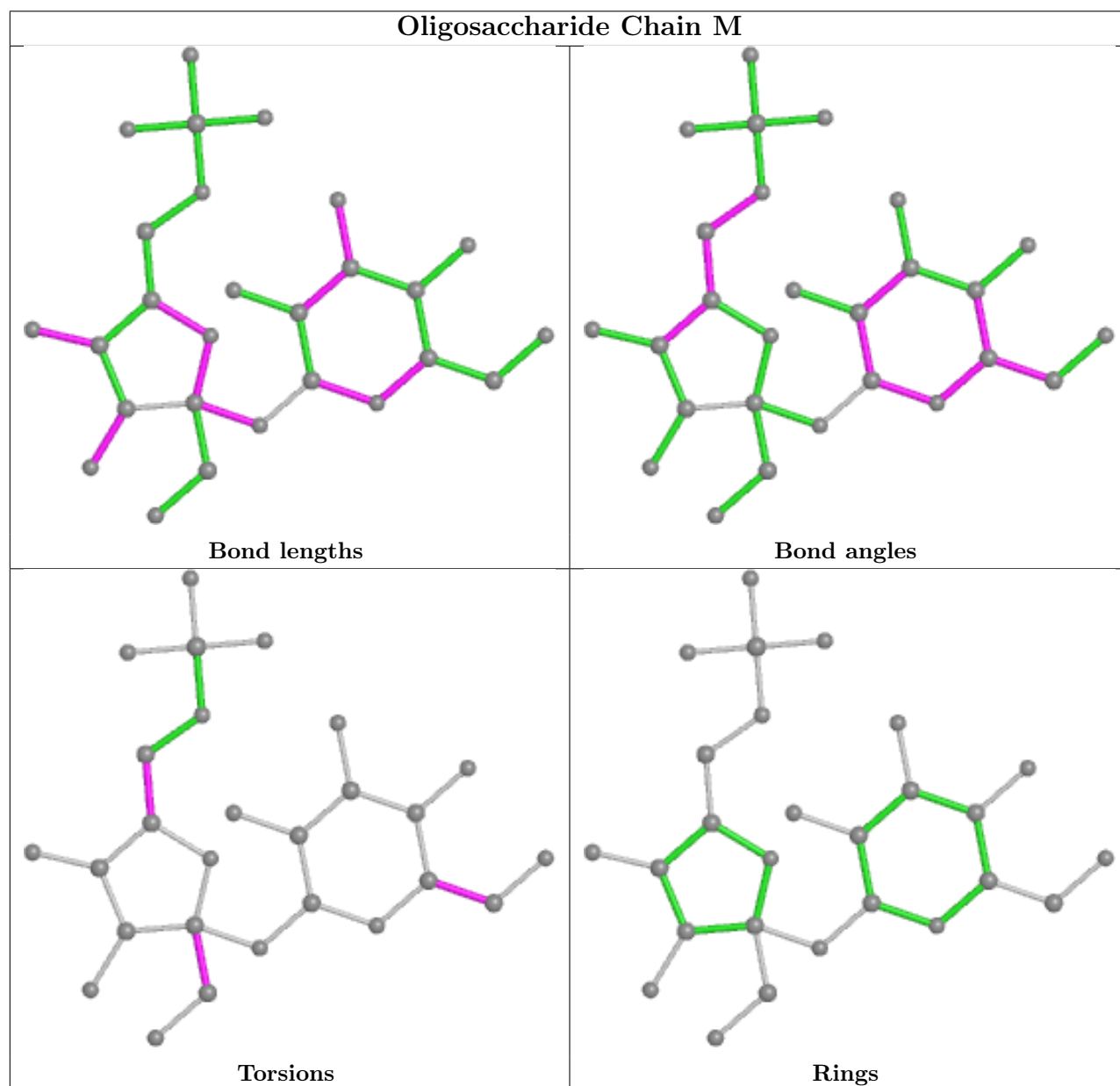
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	S	1	GLC	10	0
2	U	2	F6P	1	0
2	M	1	GLC	2	0
2	N	2	F6P	1	0
2	Q	2	F6P	4	0
2	P	1	GLC	2	0
2	O	1	GLC	5	0
2	O	2	F6P	4	0
2	Q	1	GLC	1	0
2	R	2	F6P	2	0
2	S	2	F6P	4	0
2	U	1	GLC	1	0
2	N	1	GLC	1	0

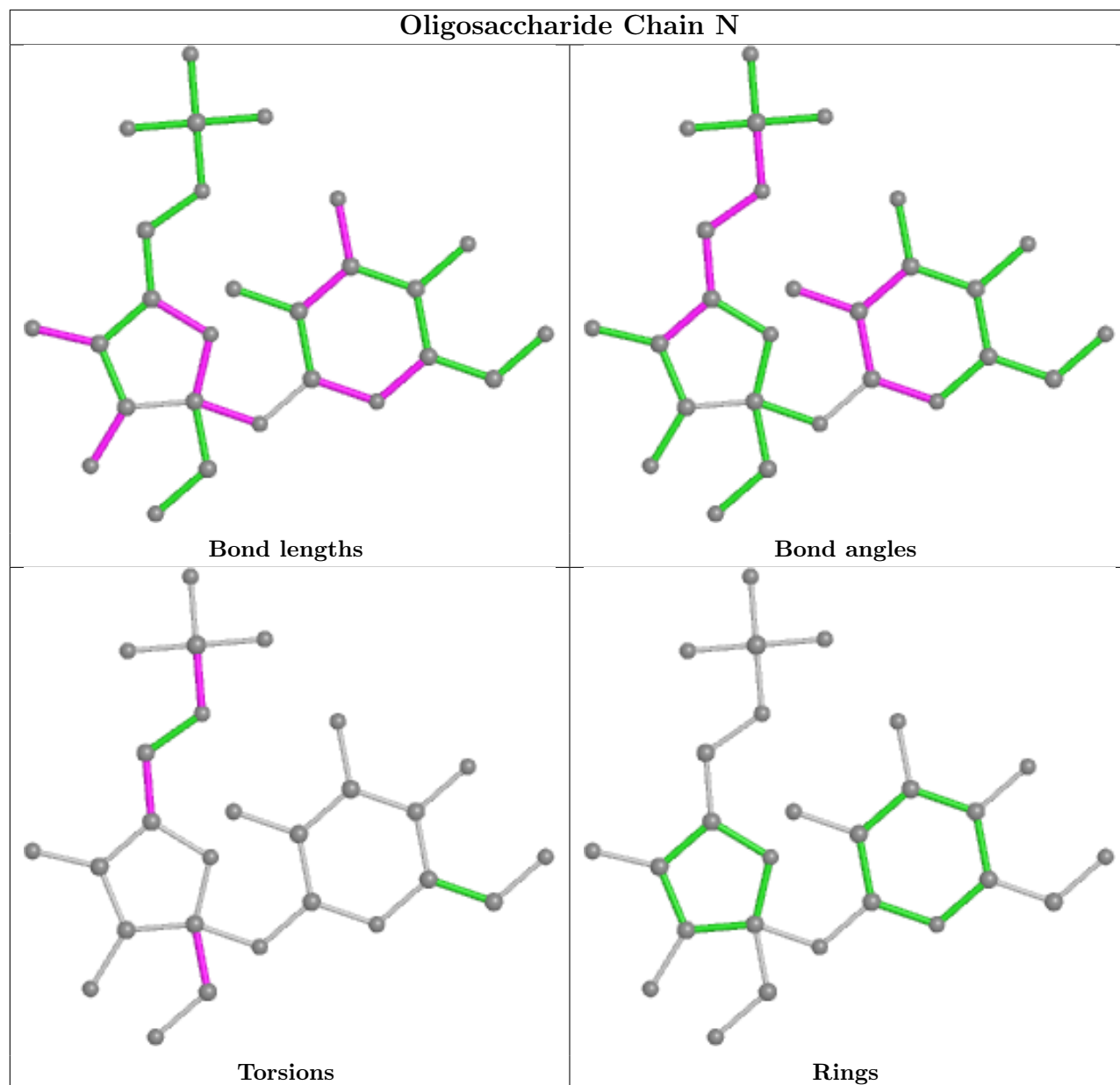
*Continued on next page...*

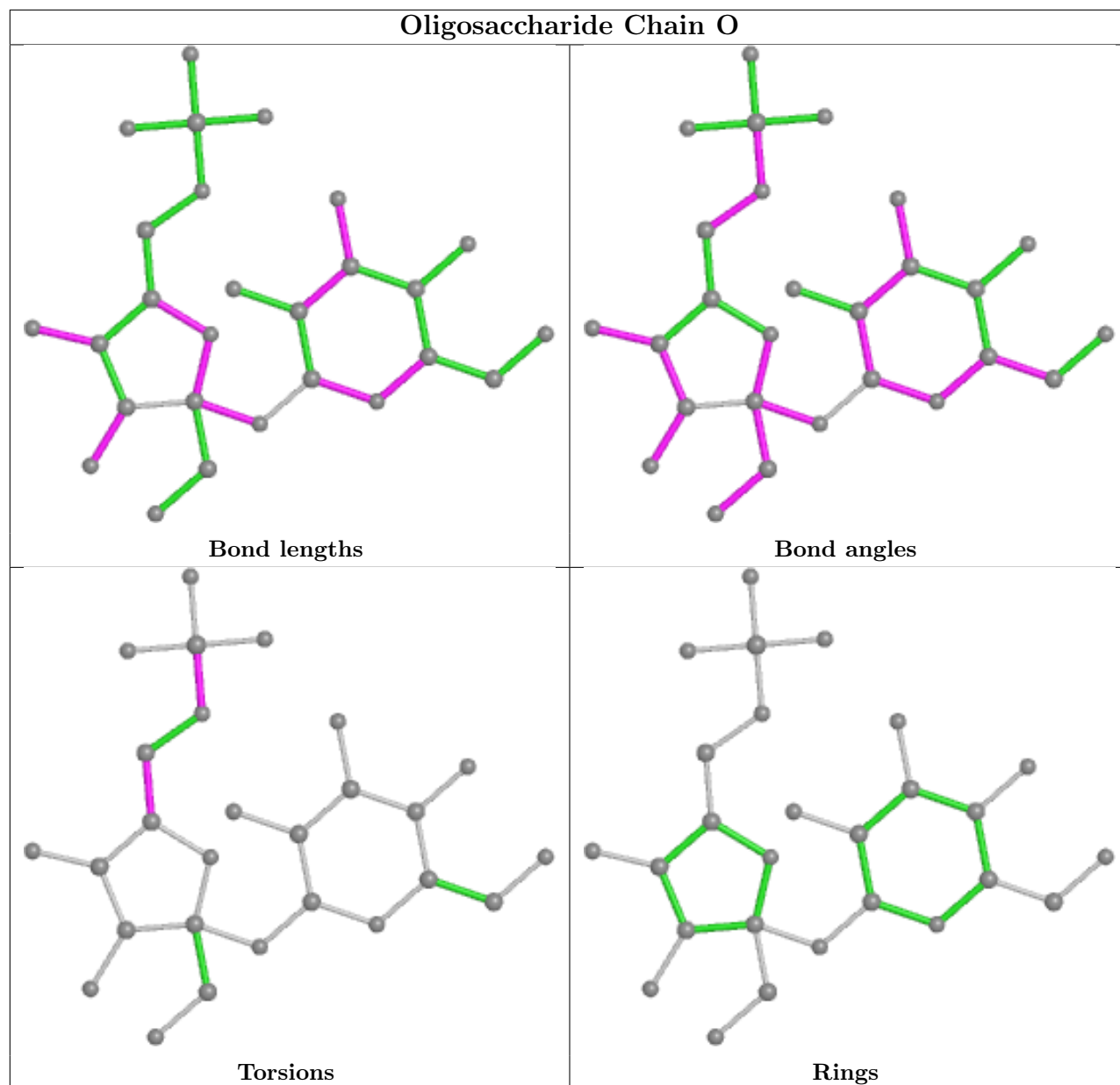
Continued from previous page...

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	P	2	F6P	3	0
2	T	1	GLC	2	0
2	M	2	F6P	2	0
2	R	1	GLC	5	0
2	T	2	F6P	4	0

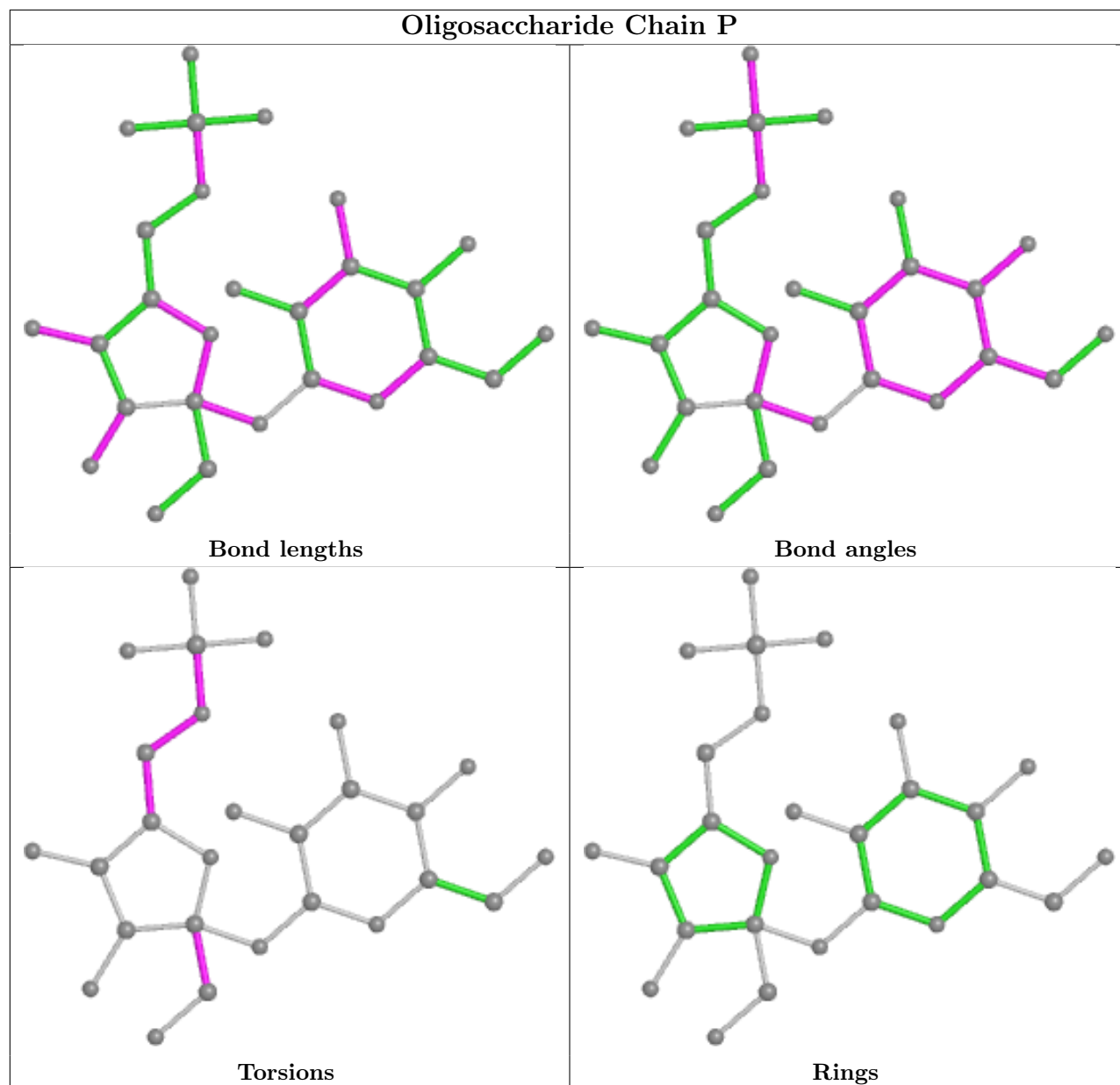
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.

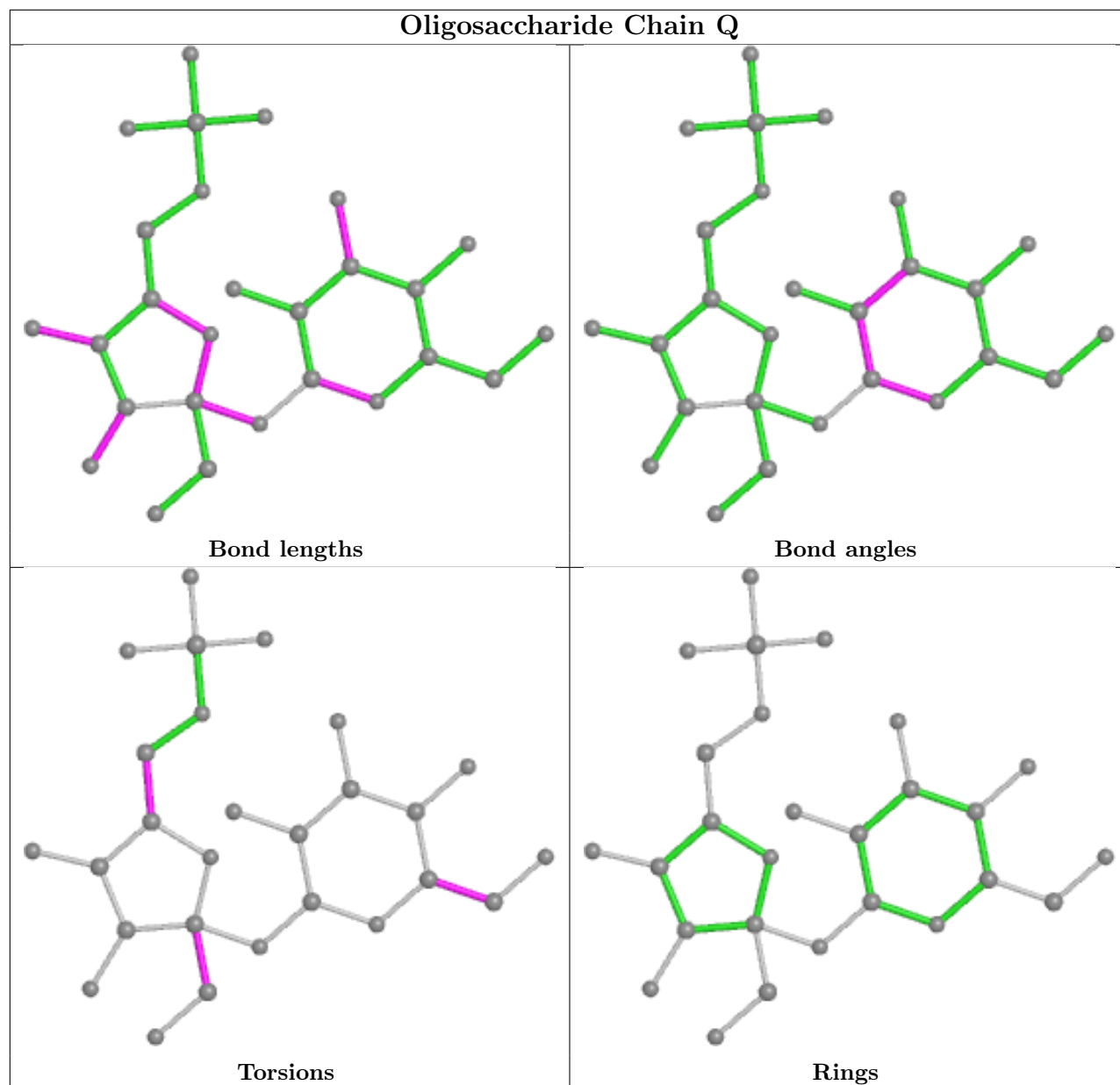


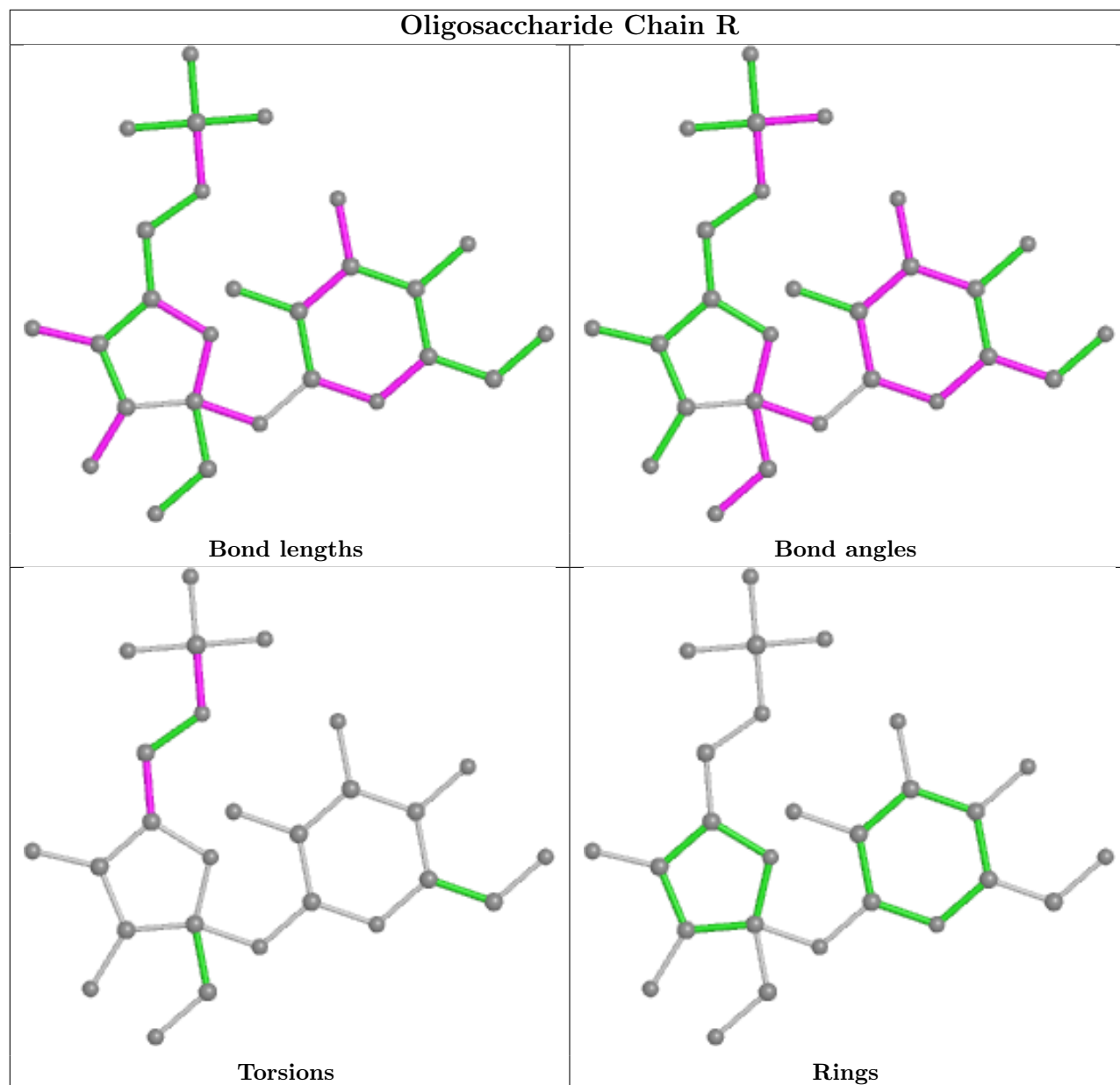


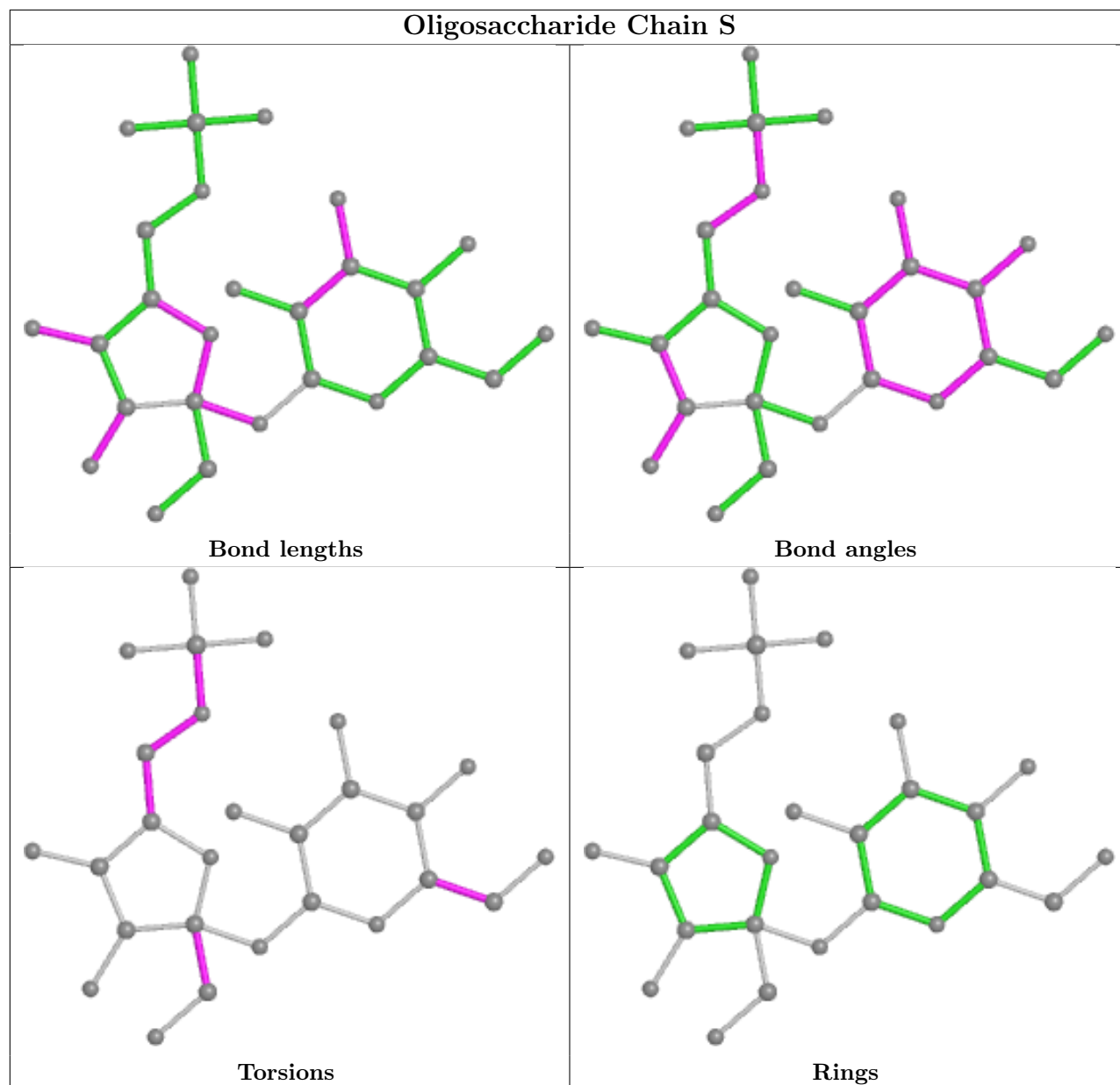


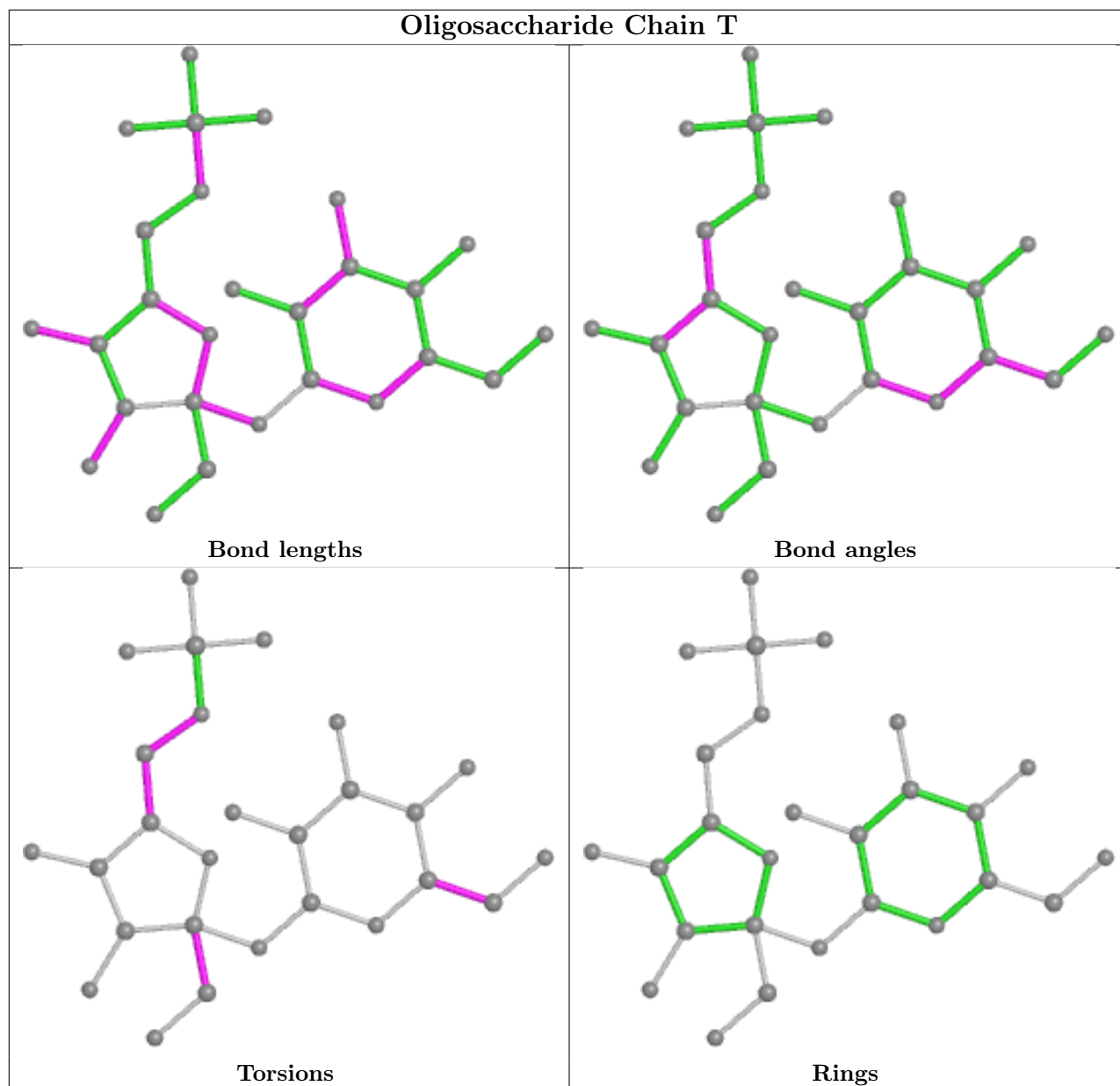


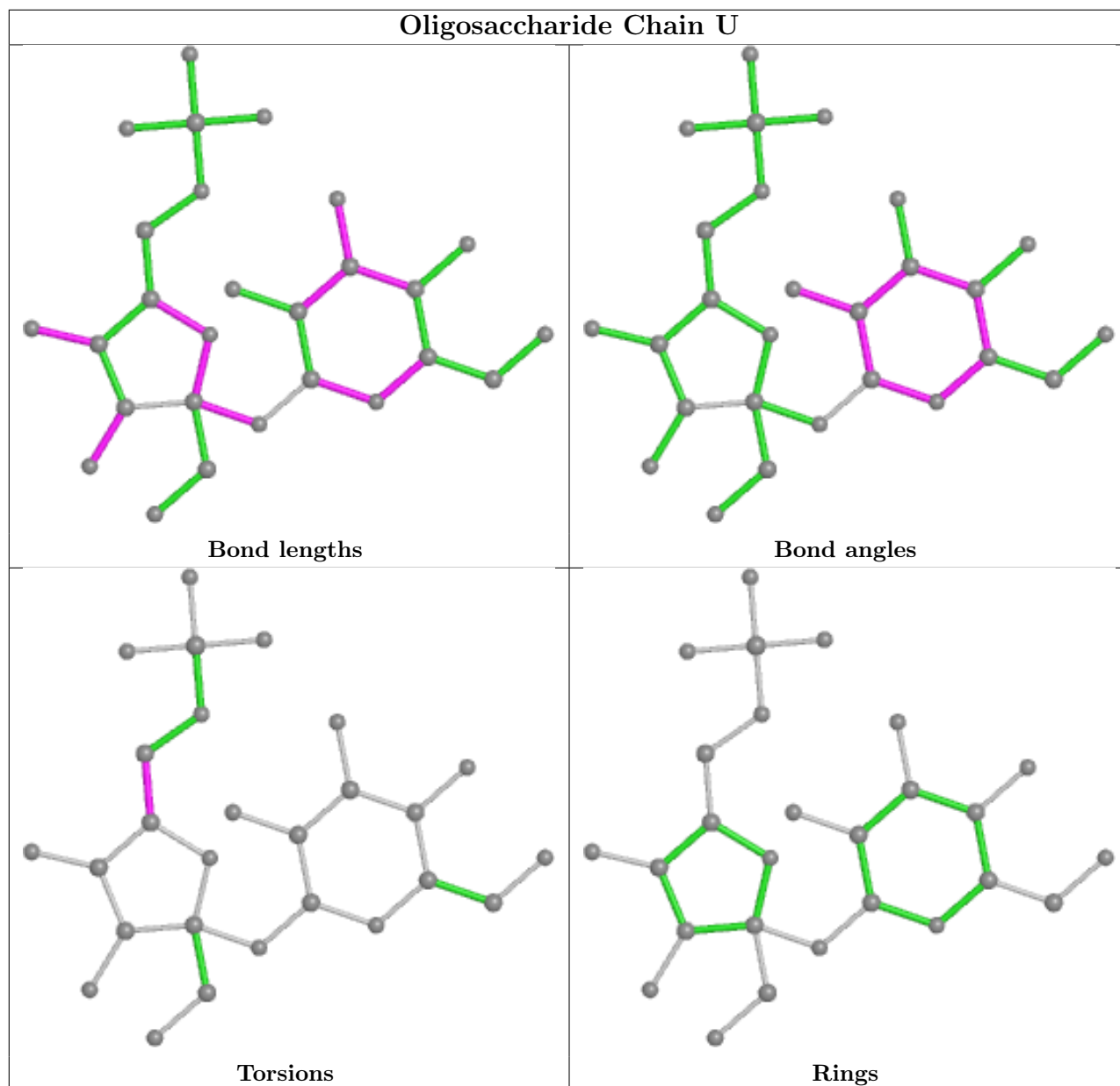












## 5.6 Ligand geometry [i](#)

12 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
3	UDP	B	701	-	24,26,26	3.25	13 (54%)	37,40,40	2.68	10 (27%)
3	UDP	I	602	-	24,26,26	3.24	12 (50%)	37,40,40	2.82	13 (35%)
3	UDP	C	602	-	24,26,26	3.23	12 (50%)	37,40,40	2.76	12 (32%)
3	UDP	A	602	-	24,26,26	3.31	15 (62%)	37,40,40	2.83	11 (29%)
3	UDP	K	602	-	24,26,26	3.39	14 (58%)	37,40,40	2.88	14 (37%)
3	UDP	L	602	-	24,26,26	3.43	12 (50%)	37,40,40	3.05	14 (37%)
3	UDP	H	602	-	24,26,26	3.29	13 (54%)	37,40,40	2.81	13 (35%)
3	UDP	J	701	-	24,26,26	3.34	12 (50%)	37,40,40	2.66	14 (37%)
3	UDP	E	602	-	24,26,26	3.34	13 (54%)	37,40,40	2.90	14 (37%)
3	UDP	G	701	-	24,26,26	3.12	13 (54%)	37,40,40	2.67	11 (29%)
3	UDP	D	602	-	24,26,26	3.51	15 (62%)	37,40,40	2.98	12 (32%)
3	UDP	F	602	-	24,26,26	3.53	14 (58%)	37,40,40	2.82	13 (35%)

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
3	UDP	B	701	-	-	6/16/32/32	0/2/2/2
3	UDP	I	602	-	-	4/16/32/32	0/2/2/2
3	UDP	C	602	-	-	3/16/32/32	0/2/2/2
3	UDP	A	602	-	-	4/16/32/32	0/2/2/2
3	UDP	K	602	-	-	3/16/32/32	0/2/2/2
3	UDP	L	602	-	-	3/16/32/32	0/2/2/2
3	UDP	H	602	-	-	5/16/32/32	0/2/2/2
3	UDP	J	701	-	-	4/16/32/32	0/2/2/2
3	UDP	E	602	-	-	3/16/32/32	0/2/2/2
3	UDP	G	701	-	-	2/16/32/32	0/2/2/2
3	UDP	D	602	-	-	6/16/32/32	0/2/2/2
3	UDP	F	602	-	-	5/16/32/32	0/2/2/2

The worst 5 of 158 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	L	602	UDP	C4-N3	-9.56	1.21	1.38
3	F	602	UDP	C4-N3	-9.47	1.21	1.38

*Continued on next page...*

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	K	602	UDP	C4-N3	-9.27	1.22	1.38
3	D	602	UDP	C4-N3	-8.97	1.22	1.38
3	J	701	UDP	C4-N3	-8.85	1.22	1.38

The worst 5 of 151 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	D	602	UDP	C6-N1-C2	-9.49	108.86	120.99
3	L	602	UDP	C6-N1-C2	-9.34	109.04	120.99
3	E	602	UDP	C6-N1-C2	-8.92	109.58	120.99
3	H	602	UDP	C6-N1-C2	-8.56	110.05	120.99
3	F	602	UDP	C6-N1-C2	-8.40	110.25	120.99

There are no chirality outliers.

5 of 48 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	602	UDP	PA-O3A-PB-O3B
3	B	701	UDP	O4'-C4'-C5'-O5'
3	B	701	UDP	C5'-O5'-PA-O1A
3	B	701	UDP	C5'-O5'-PA-O3A
3	C	602	UDP	PB-O3A-PA-O5'

There are no ring outliers.

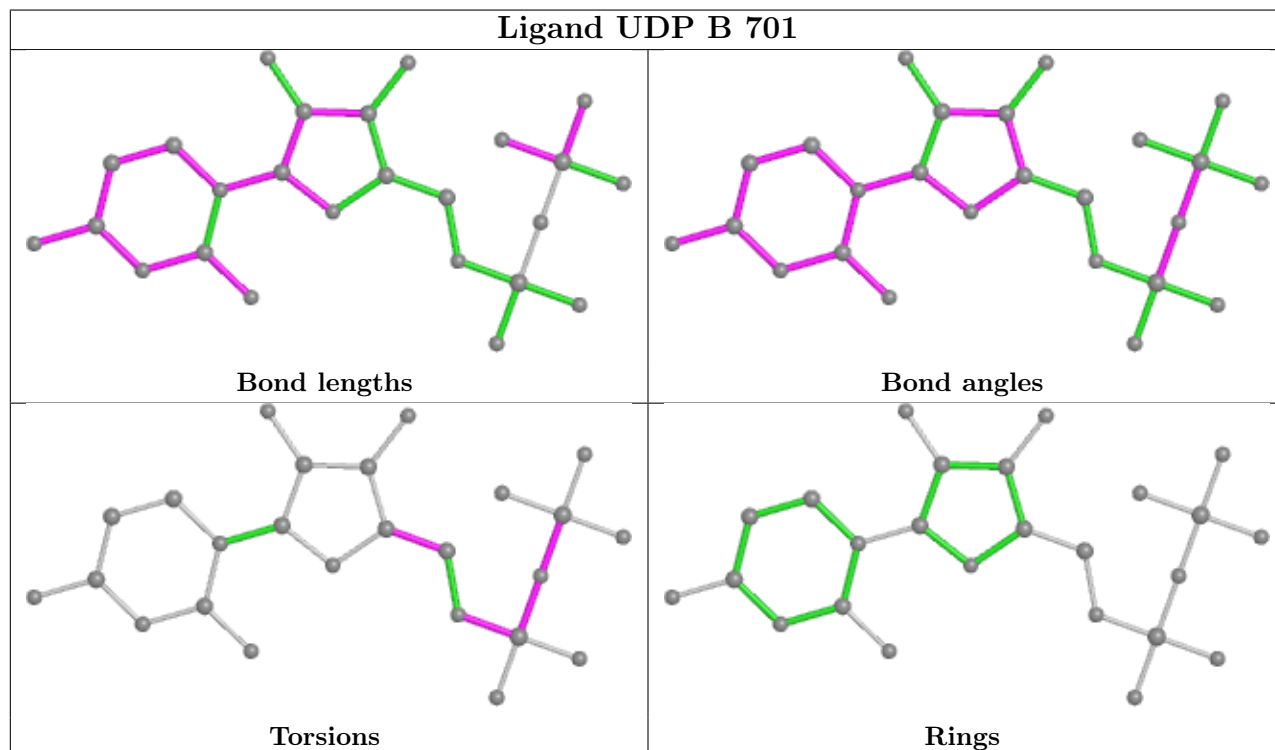
11 monomers are involved in 26 short contacts:

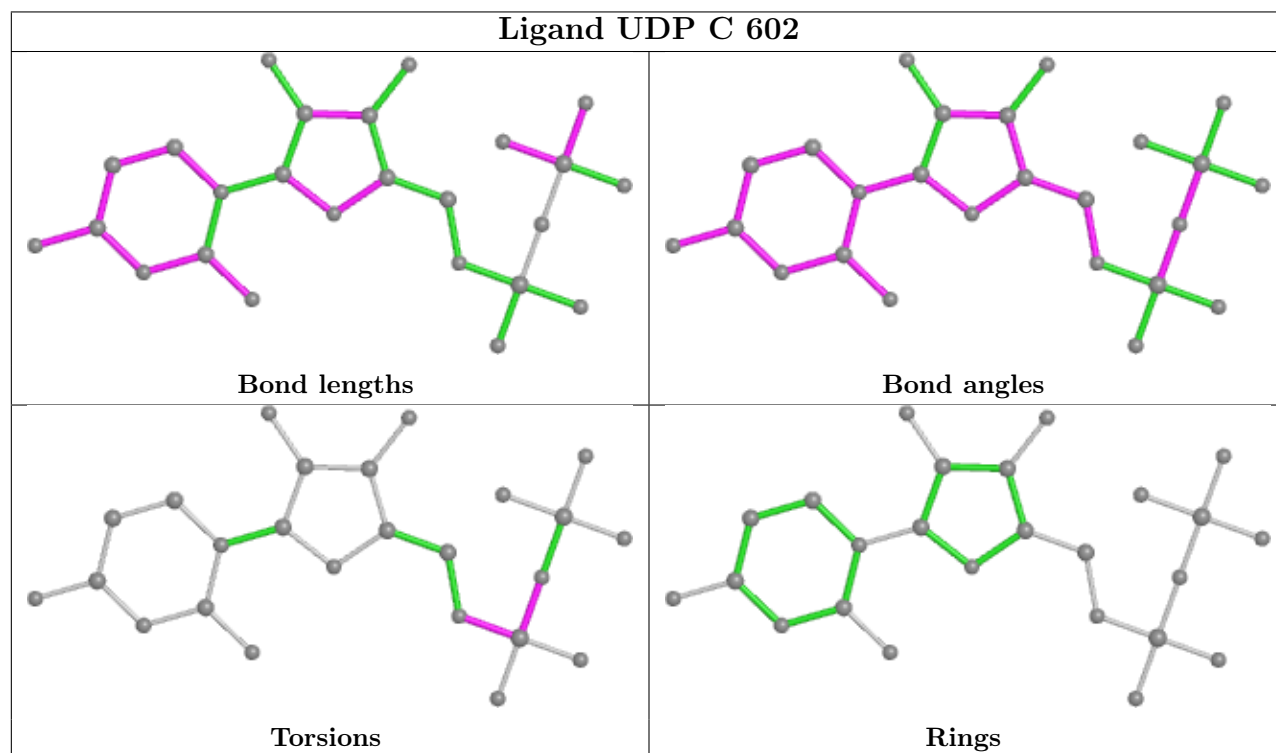
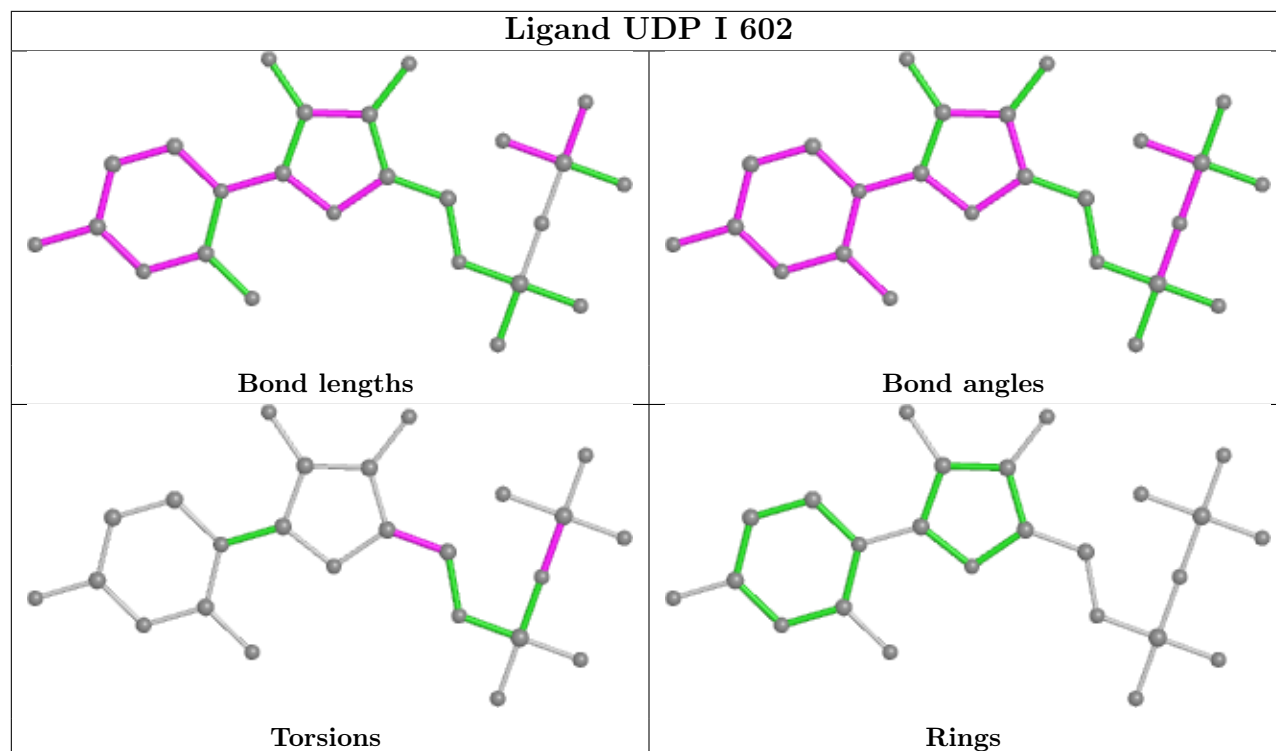
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	I	602	UDP	3	0
3	C	602	UDP	2	0
3	A	602	UDP	3	0
3	K	602	UDP	3	0
3	L	602	UDP	3	0
3	H	602	UDP	2	0
3	J	701	UDP	1	0
3	E	602	UDP	3	0
3	G	701	UDP	1	0
3	D	602	UDP	2	0
3	F	602	UDP	3	0

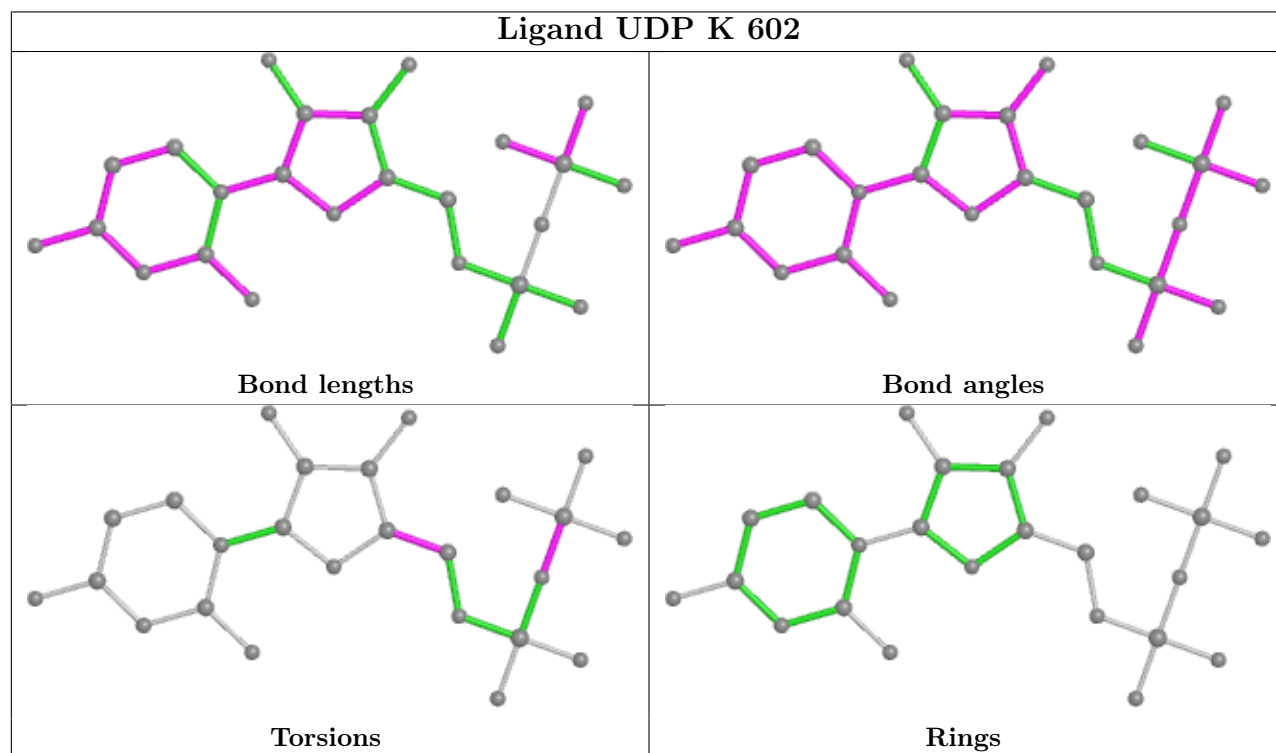
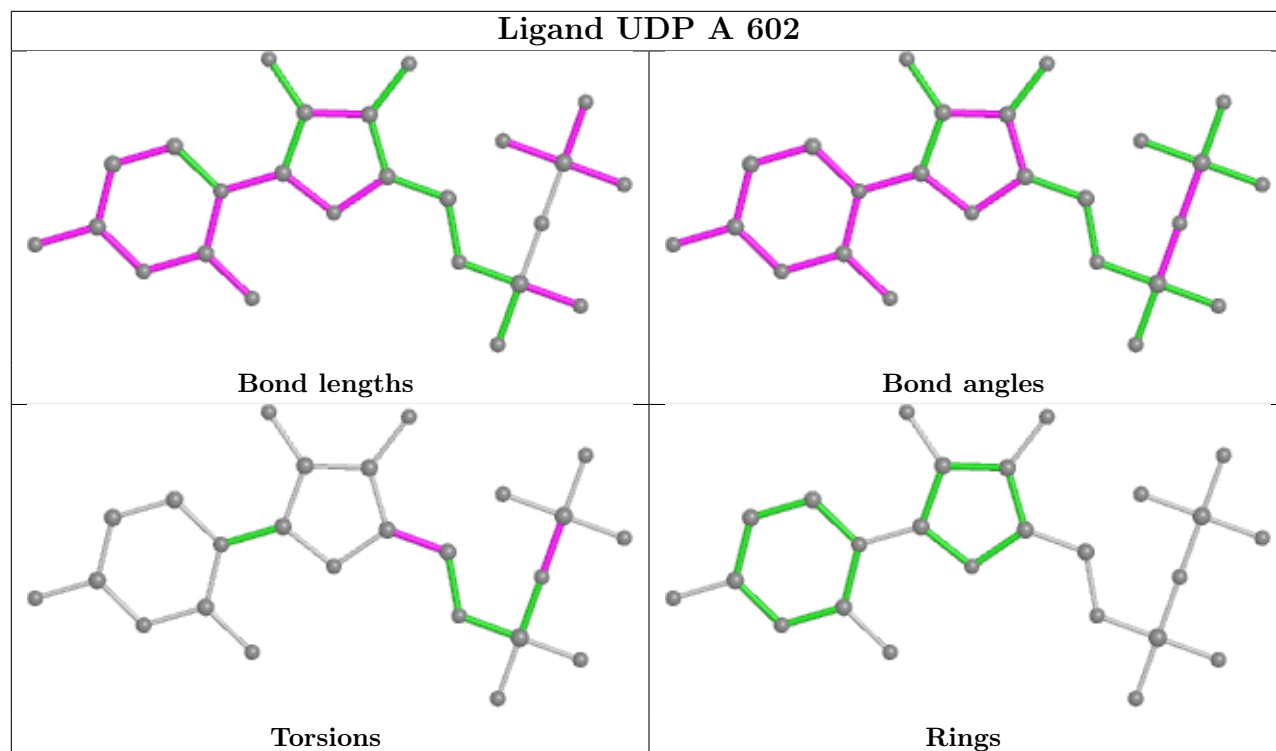
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In

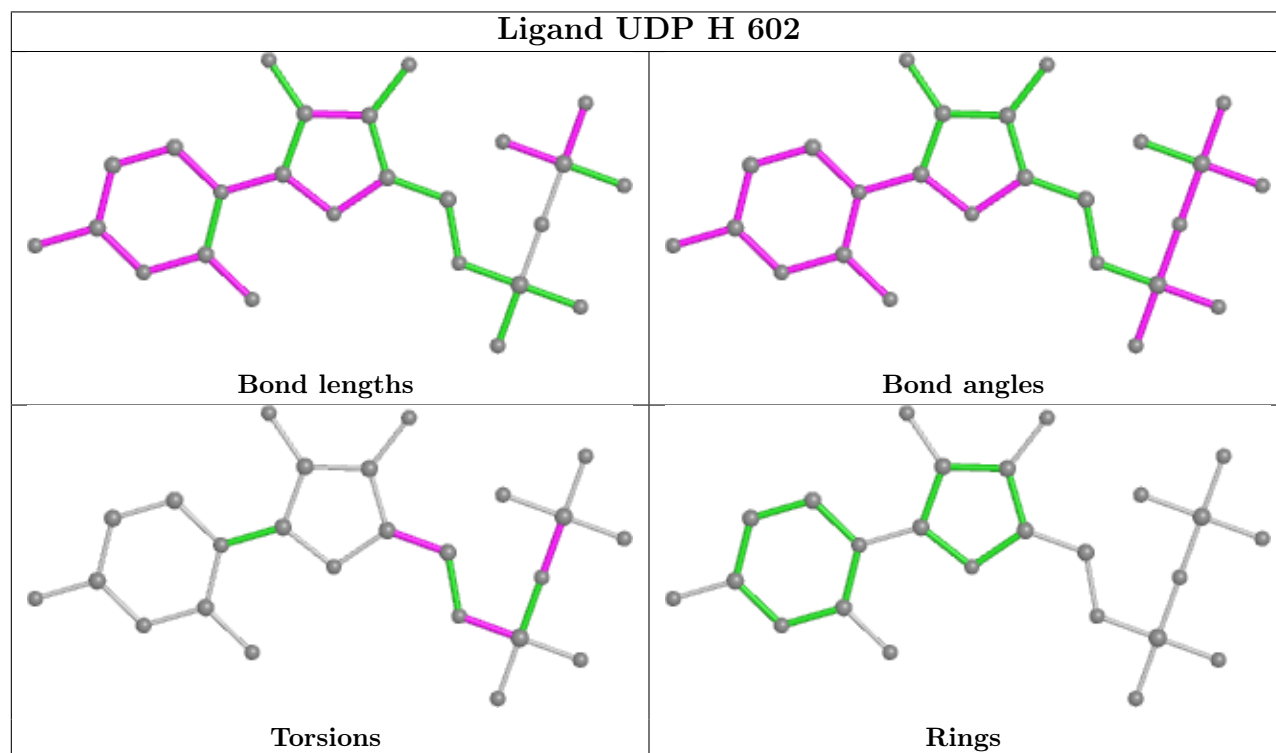
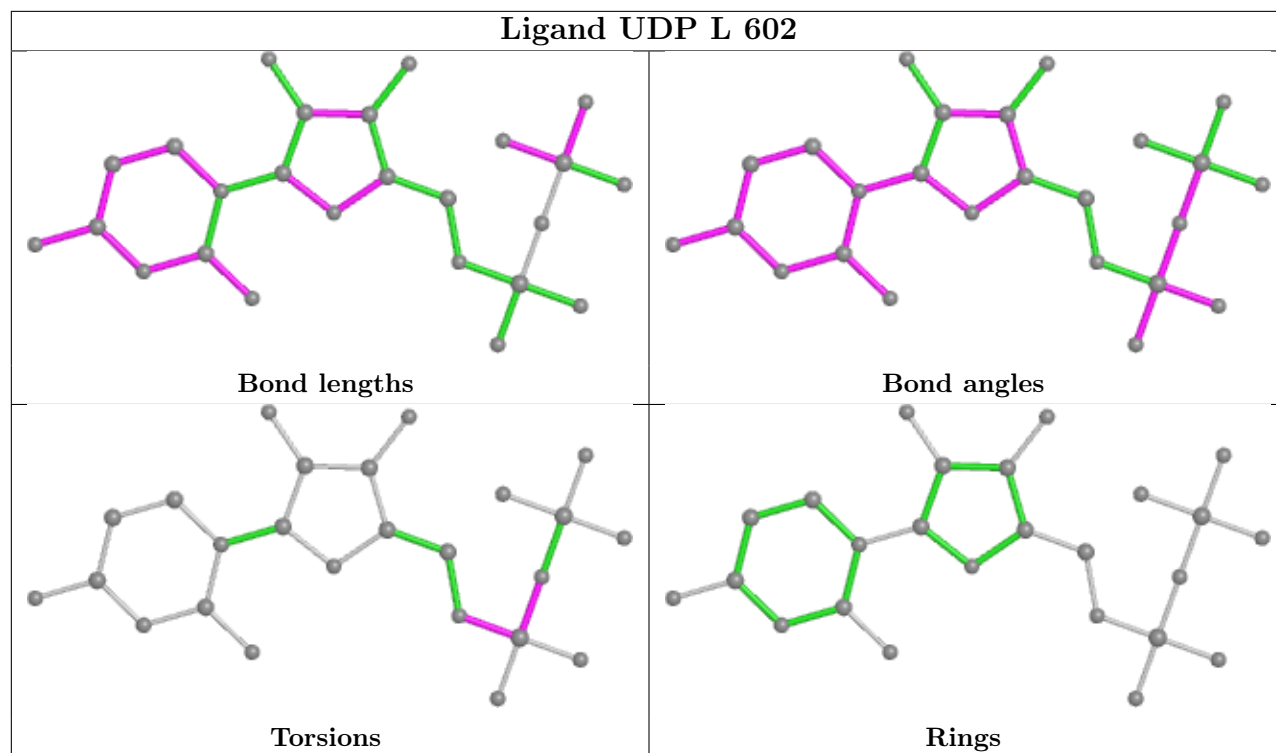


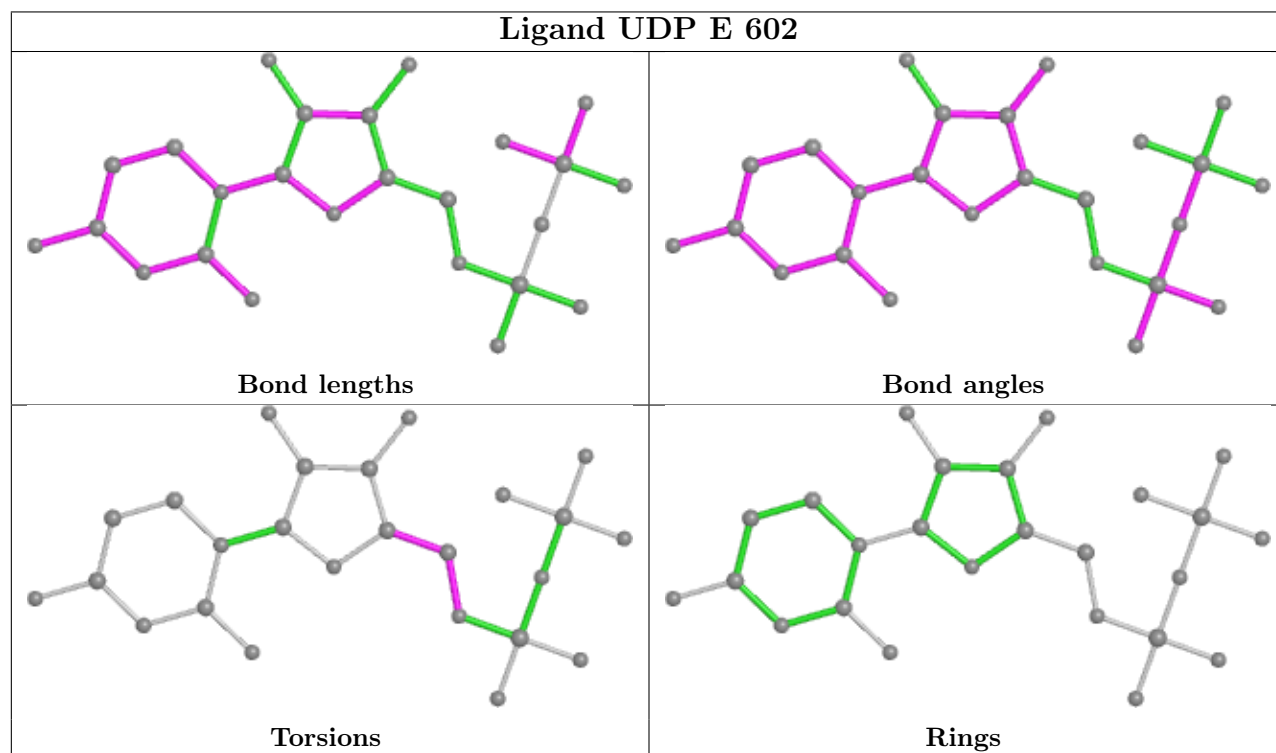
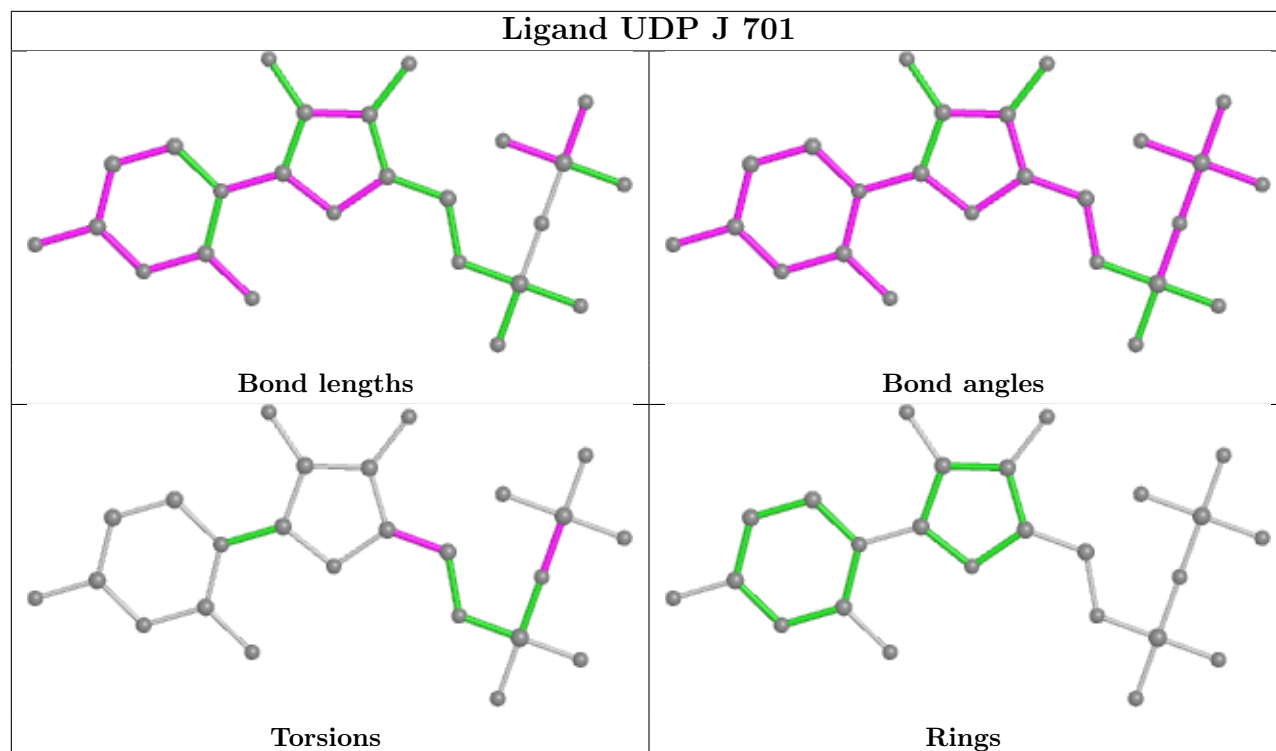
addition, ligands with molecular weight  $> 250$  and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. 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.

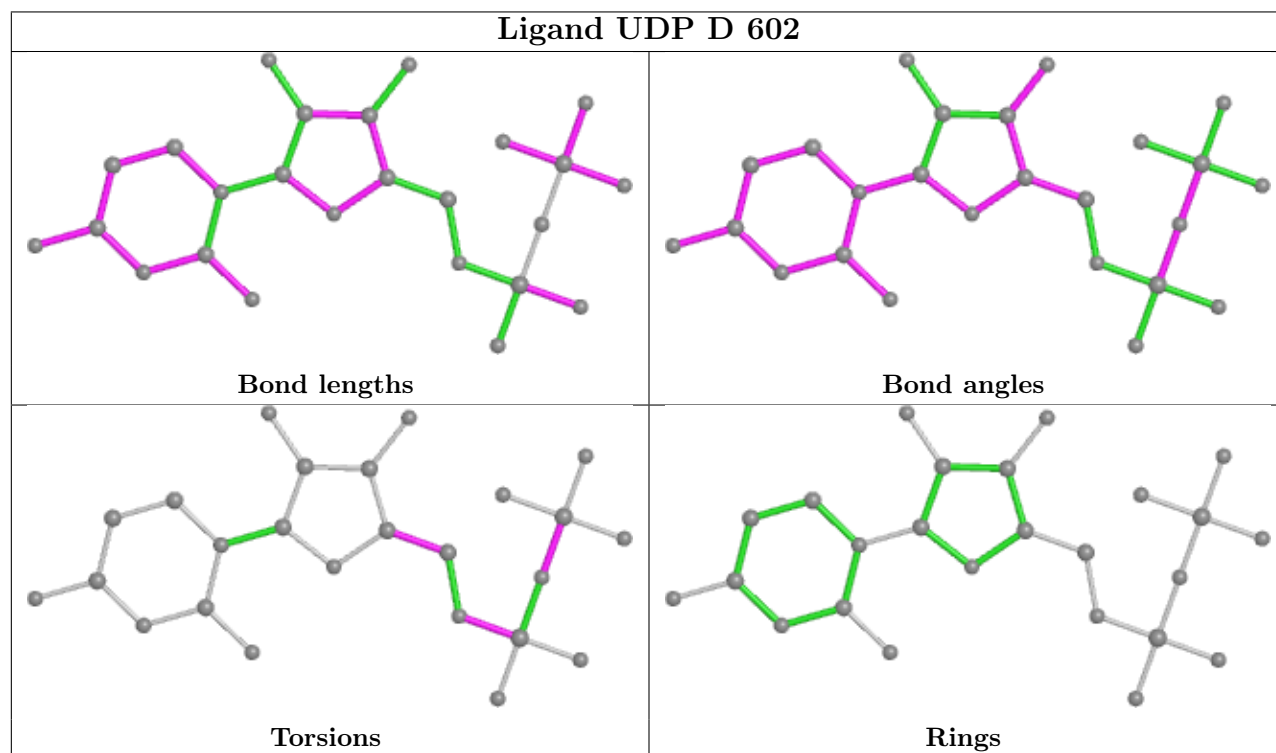
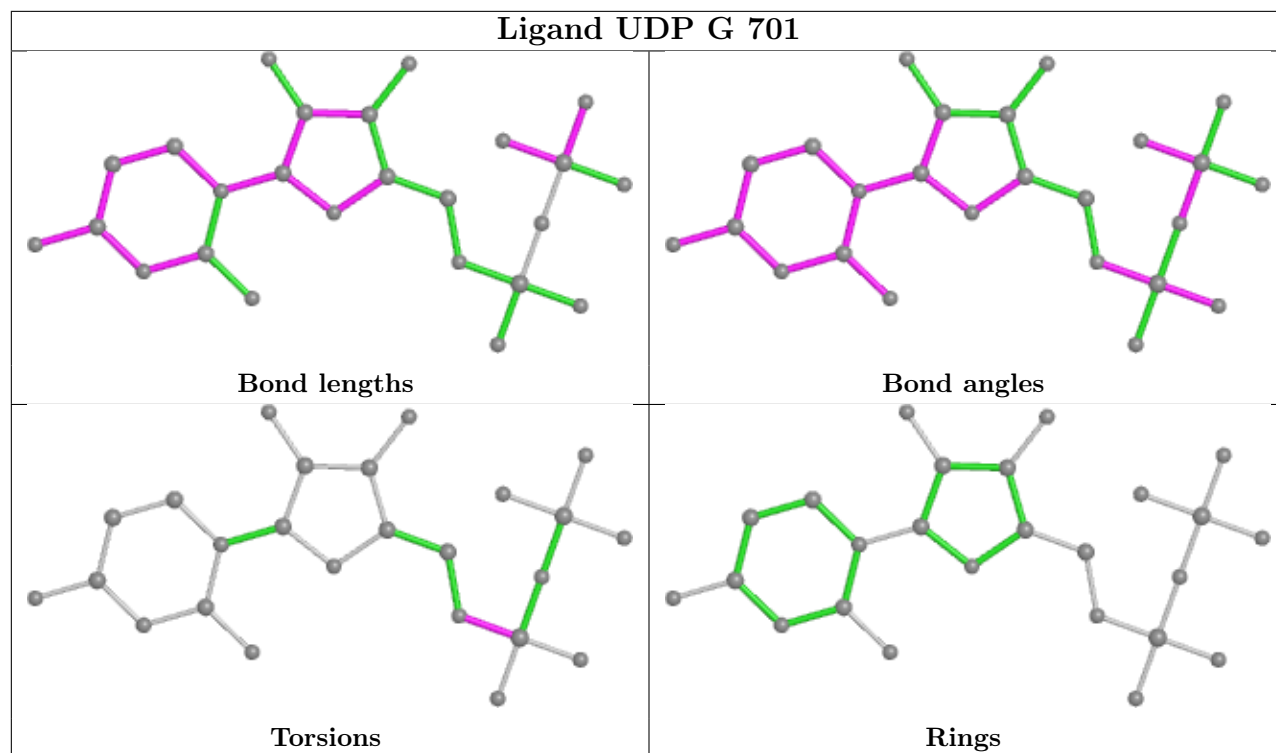


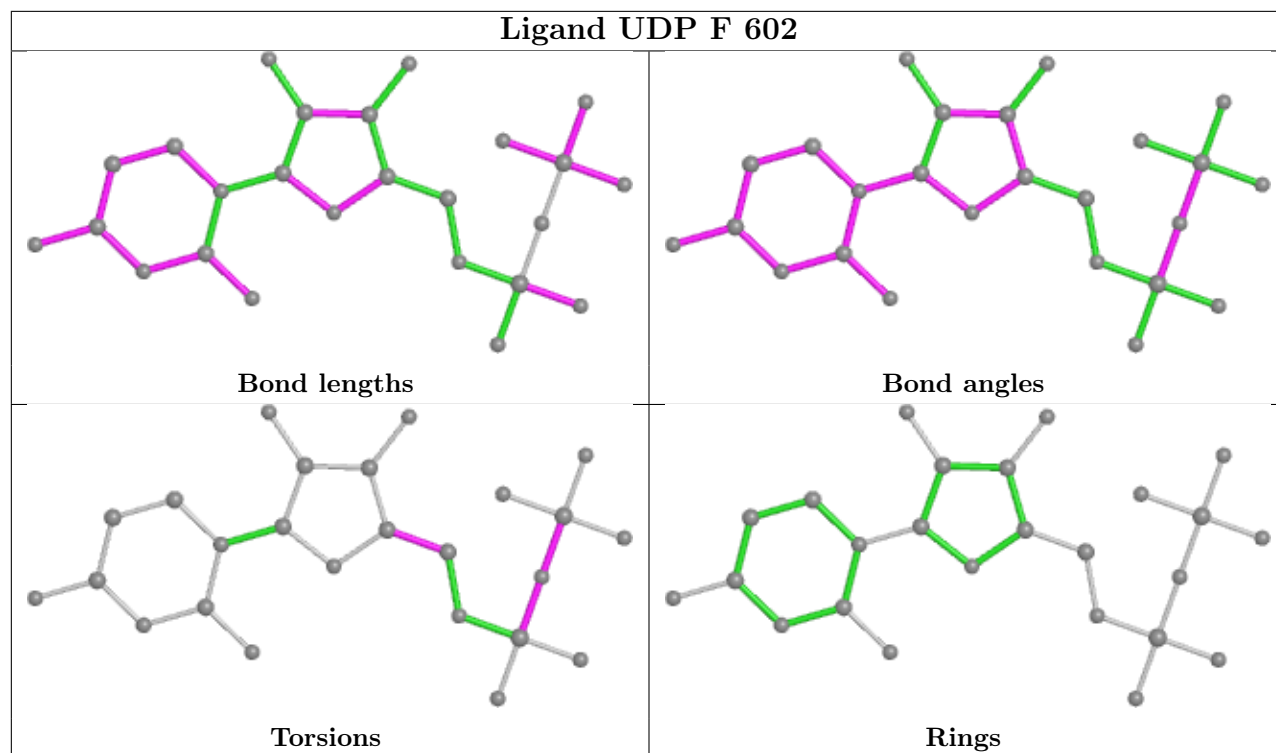












## 5.7 Other polymers [i](#)

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	400/455 (87%)	-0.07	9 (2%) 60 31	50, 66, 87, 99	0
1	B	399/455 (87%)	0.09	14 (3%) 44 18	52, 73, 100, 107	0
1	C	400/455 (87%)	0.08	13 (3%) 46 20	51, 77, 110, 118	0
1	D	399/455 (87%)	0.06	11 (2%) 53 25	50, 73, 99, 109	0
1	E	400/455 (87%)	0.05	13 (3%) 46 20	48, 76, 107, 113	0
1	F	399/455 (87%)	0.03	9 (2%) 60 31	30, 73, 97, 111	0
1	G	400/455 (87%)	0.12	9 (2%) 60 31	57, 78, 100, 108	0
1	H	399/455 (87%)	0.25	16 (4%) 38 15	58, 85, 119, 125	0
1	I	399/455 (87%)	0.23	19 (4%) 30 11	30, 83, 108, 116	0
1	J	400/455 (87%)	0.30	21 (5%) 26 10	60, 88, 112, 118	0
1	K	399/455 (87%)	0.34	21 (5%) 26 10	61, 90, 123, 131	0
1	L	400/455 (87%)	0.45	23 (5%) 23 7	63, 91, 126, 131	0
All	All	4794/5460 (87%)	0.16	178 (3%) 41 17	30, 79, 111, 131	0

The worst 5 of 178 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	L	426	LEU	8.2
1	H	168	ALA	6.5
1	H	283	ASP	6.0
1	B	168	ALA	5.9
1	F	286	GLU	5.7

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

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



### 6.3 Carbohydrates [i](#)

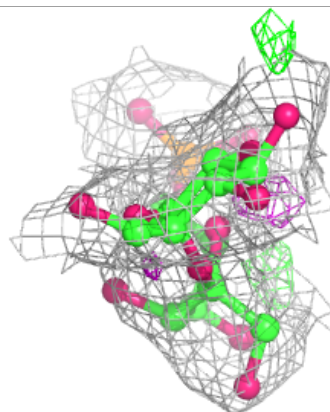
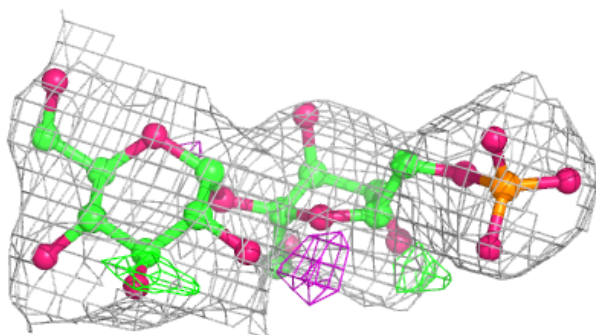
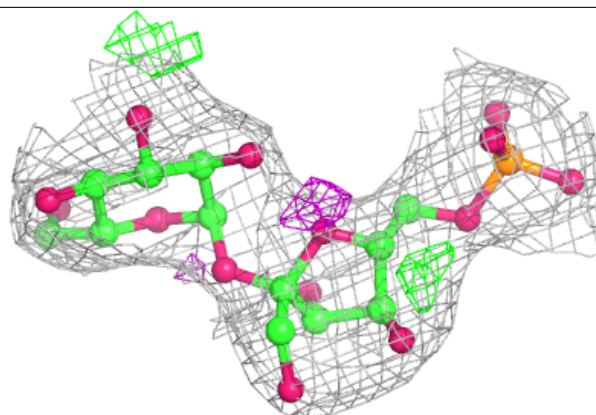
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 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
2	GLC	S	1	11/12	0.75	0.39	66,107,137,166	0
2	F6P	U	2	16/16	0.77	0.33	103,135,158,176	0
2	GLC	T	1	11/12	0.81	0.27	96,102,110,113	0
2	F6P	R	2	16/16	0.85	0.23	82,92,106,109	0
2	F6P	S	2	16/16	0.85	0.27	73,113,134,135	0
2	GLC	U	1	11/12	0.86	0.28	103,113,128,134	0
2	F6P	P	2	16/16	0.88	0.22	67,78,95,95	0
2	F6P	T	2	16/16	0.88	0.26	88,102,123,130	0
2	F6P	O	2	16/16	0.90	0.19	59,78,91,93	0
2	GLC	R	1	11/12	0.91	0.16	52,77,87,87	0
2	GLC	O	1	11/12	0.91	0.18	57,64,74,74	0
2	GLC	N	1	11/12	0.91	0.16	67,75,84,87	0
2	F6P	N	2	16/16	0.91	0.23	66,83,96,101	0
2	GLC	M	1	11/12	0.92	0.15	49,53,58,60	0
2	GLC	P	1	11/12	0.93	0.19	51,61,66,71	0
2	F6P	M	2	16/16	0.93	0.16	55,62,70,71	0
2	GLC	Q	1	11/12	0.94	0.20	60,62,68,69	0
2	F6P	Q	2	16/16	0.94	0.18	69,87,94,97	0

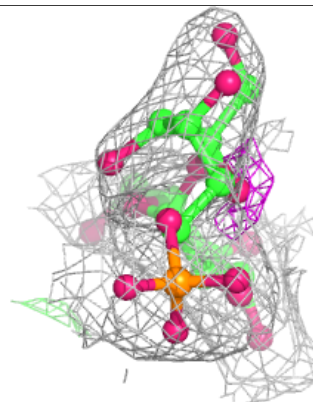
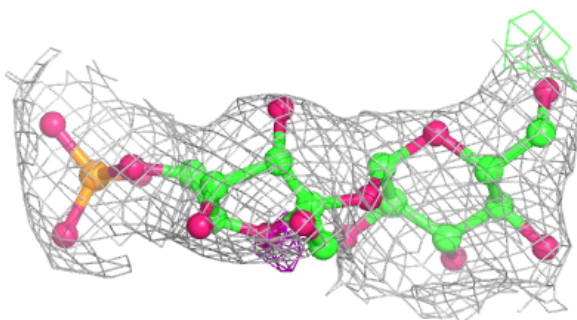
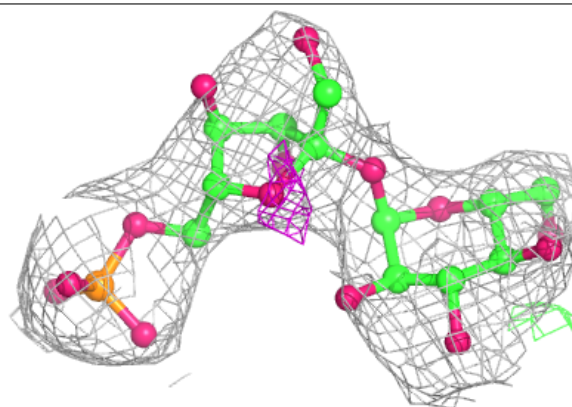
The following is a graphical depiction of the model fit to experimental electron density for oligosaccharide. Each fit is shown from different orientation to approximate a three-dimensional view.

**Electron density around Chain M:**

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

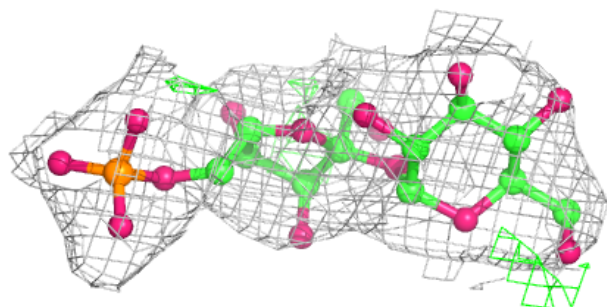
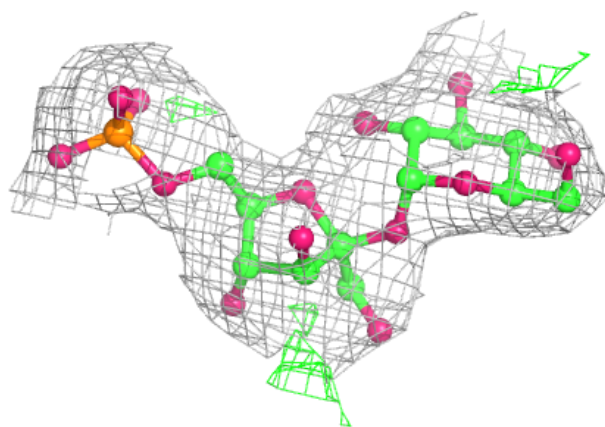
**Electron density around Chain N:**

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



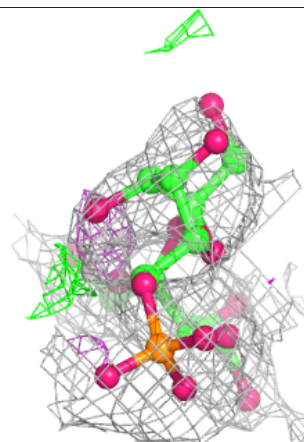
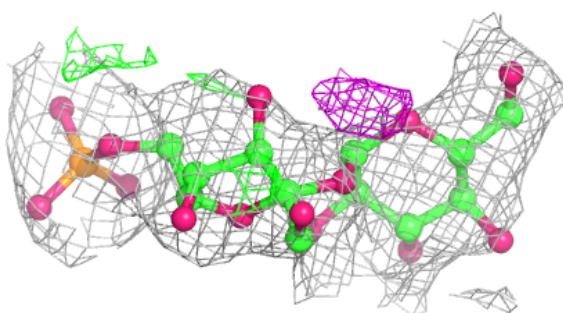
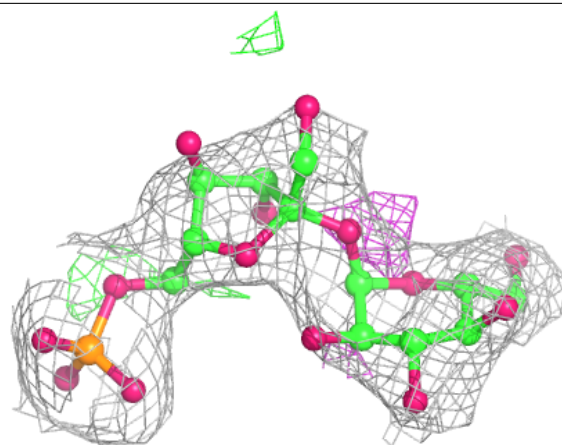
**Electron density around Chain O:**

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

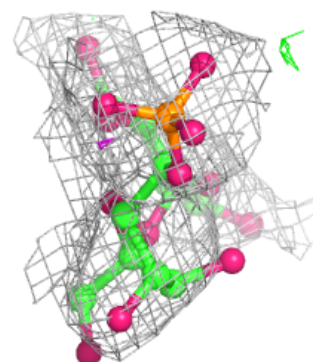
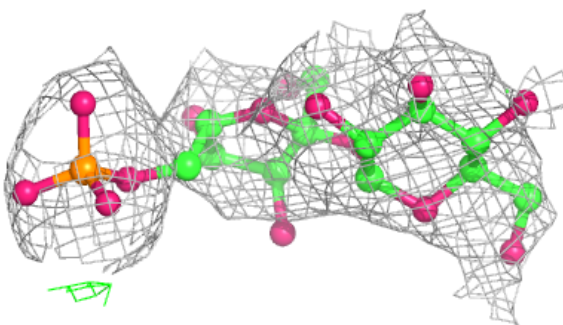
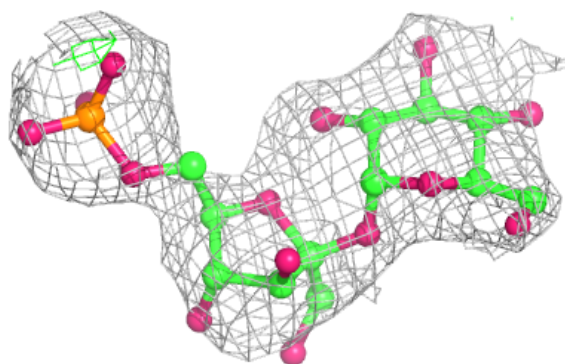


**Electron density around Chain P:**

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

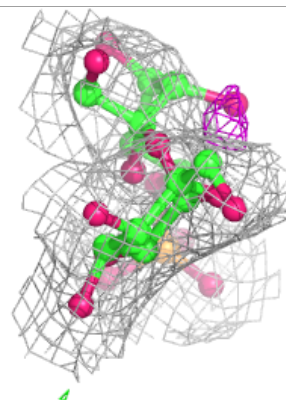
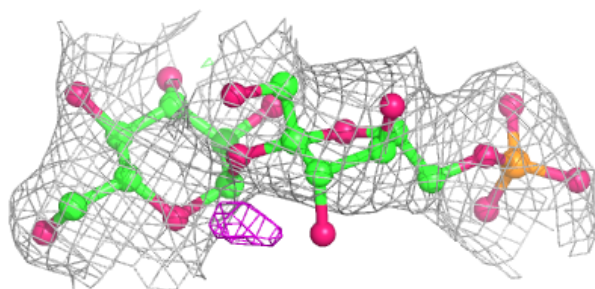
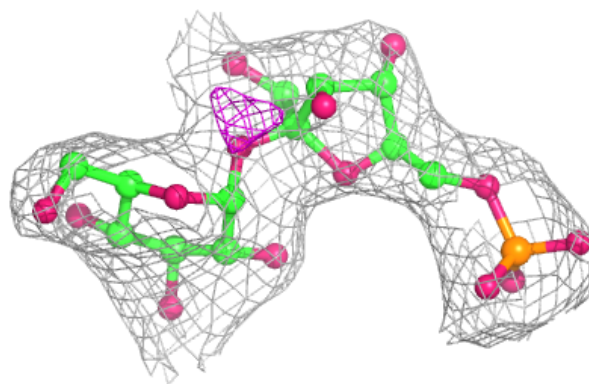
**Electron density around Chain Q:**

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

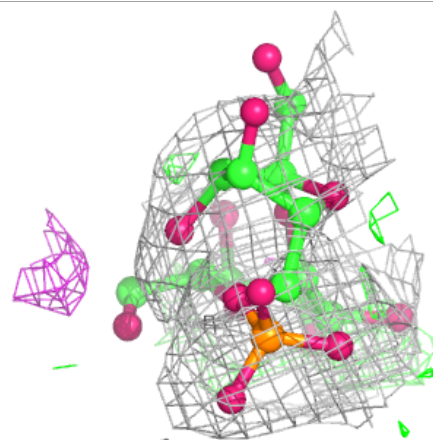
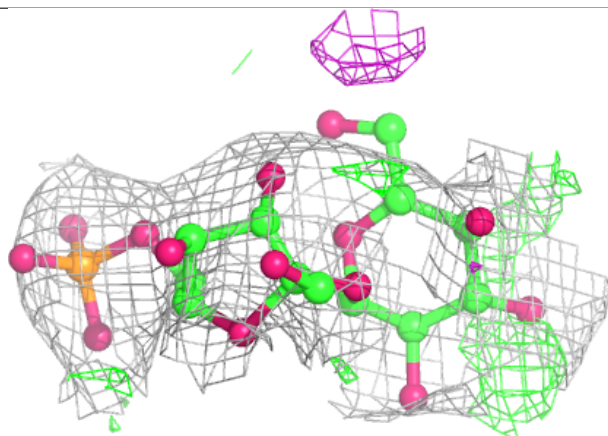
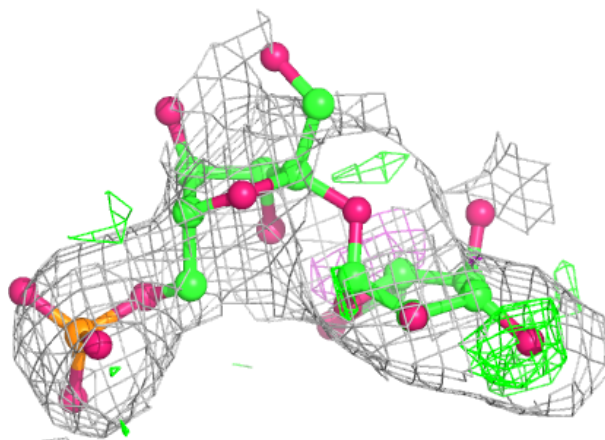


**Electron density around Chain R:**

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

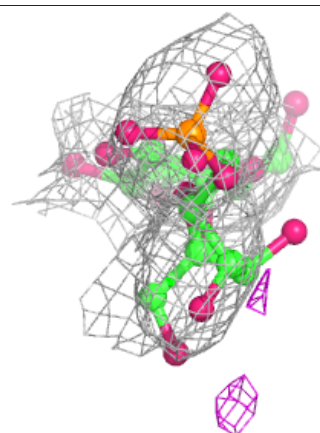
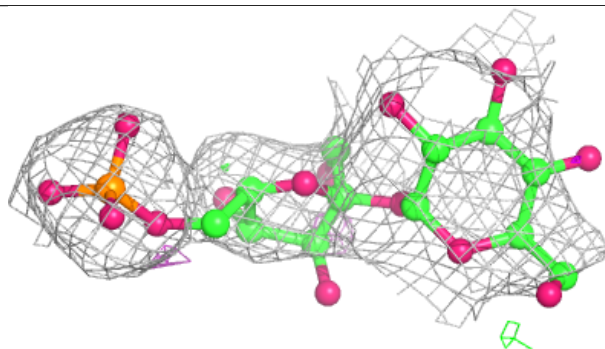
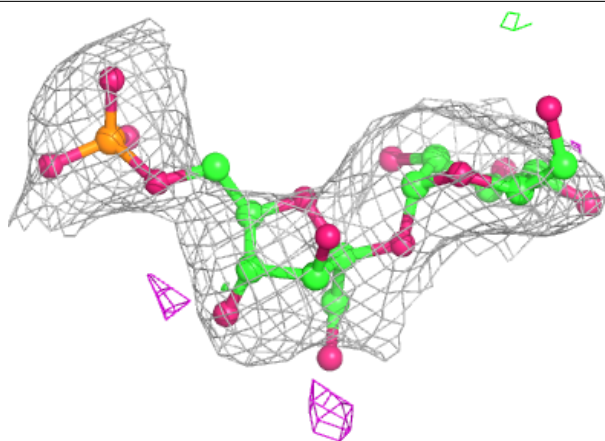
**Electron density around Chain S:**

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

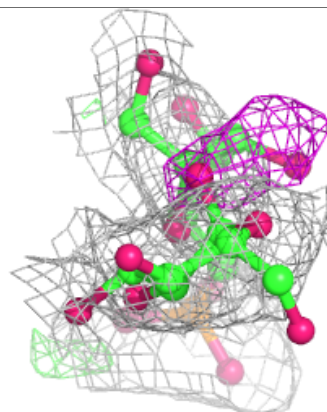
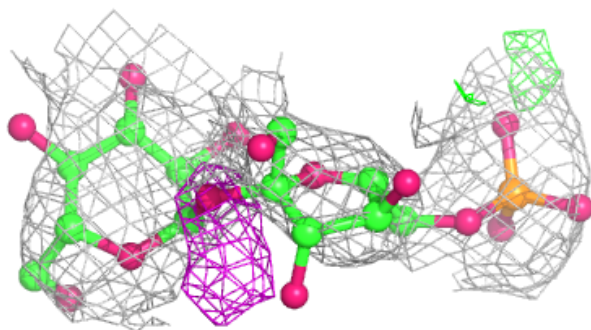
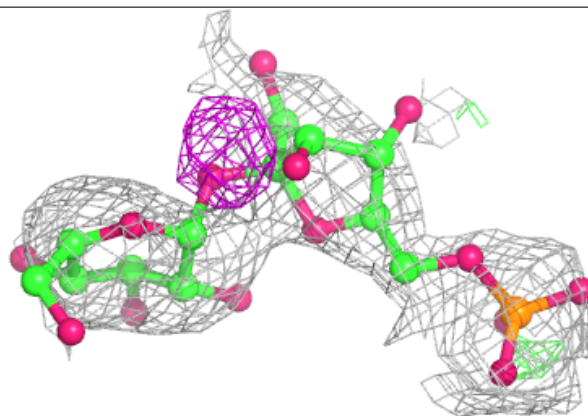


**Electron density around Chain T:**

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

**Electron density around Chain U:**

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



## 6.4 Ligands

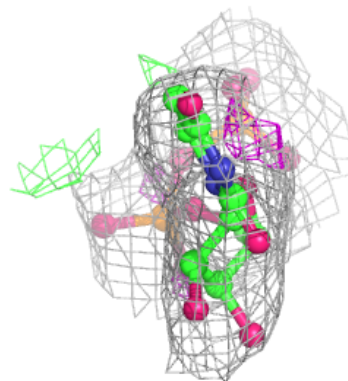
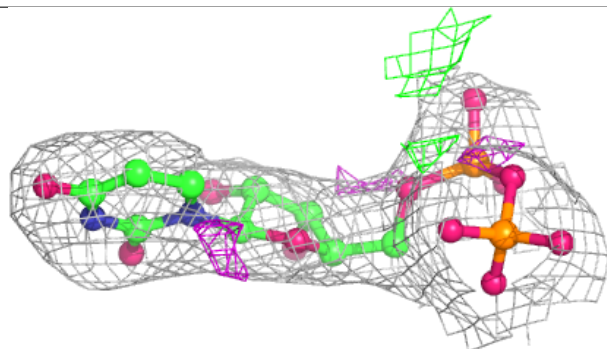
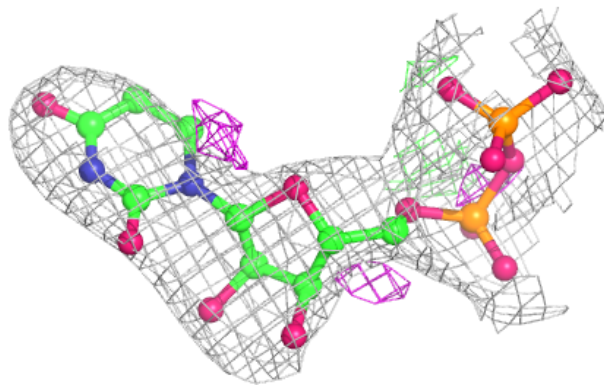
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled 'Q<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
3	UDP	L	602	25/25	0.89	0.22	83,97,108,118	0
3	UDP	J	701	25/25	0.90	0.21	68,75,82,84	0
3	UDP	H	602	25/25	0.94	0.14	60,68,86,89	0
3	UDP	K	602	25/25	0.94	0.15	66,74,88,95	0
3	UDP	I	602	25/25	0.94	0.15	59,70,79,91	0
3	UDP	F	602	25/25	0.95	0.14	54,60,69,78	0
3	UDP	C	602	25/25	0.95	0.15	49,62,70,73	0
3	UDP	D	602	25/25	0.95	0.15	43,56,64,71	0
3	UDP	G	701	25/25	0.96	0.14	53,62,71,72	0
3	UDP	E	602	25/25	0.96	0.16	56,63,70,70	0
3	UDP	A	602	25/25	0.96	0.14	43,48,56,63	0
3	UDP	B	701	25/25	0.97	0.12	45,57,65,67	0

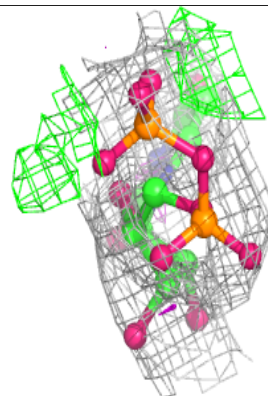
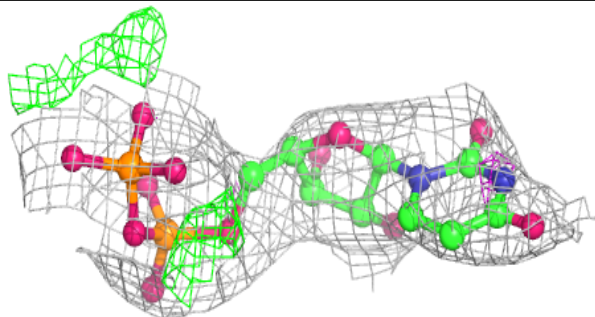
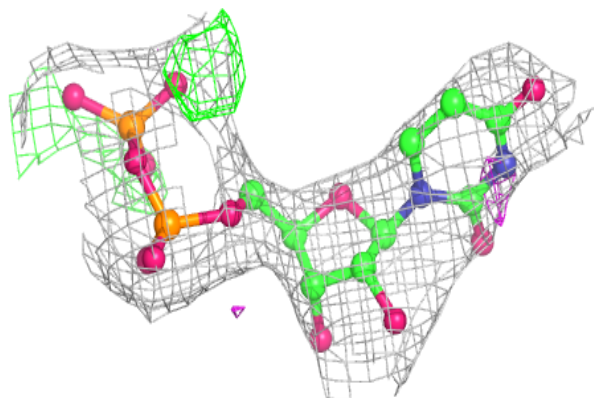
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

**Electron density around UDP L 602:**

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

**Electron density around UDP J 701:**

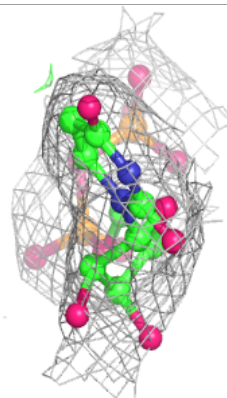
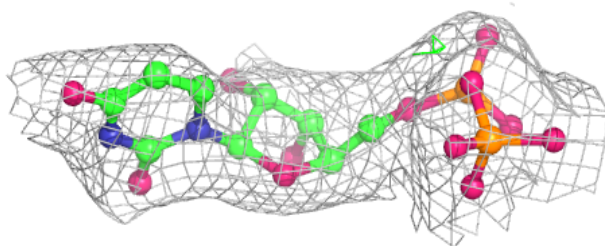
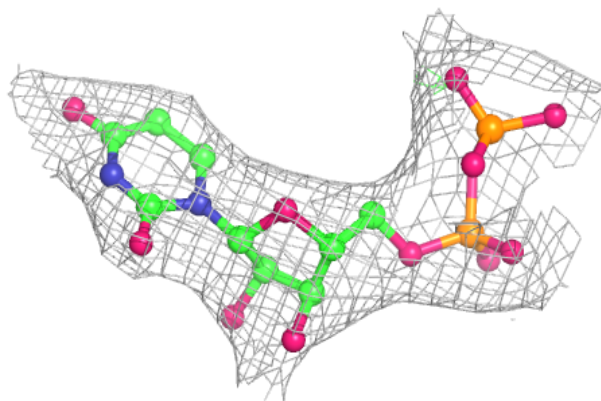
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)



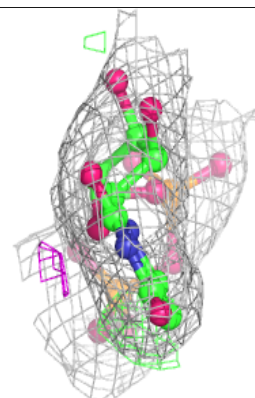
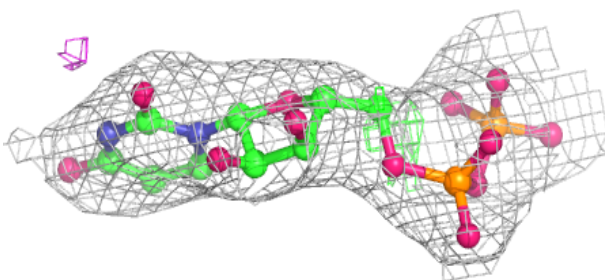
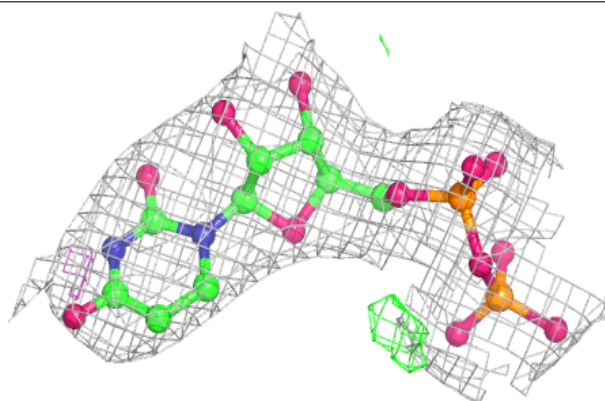


**Electron density around UDP H 602:**

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

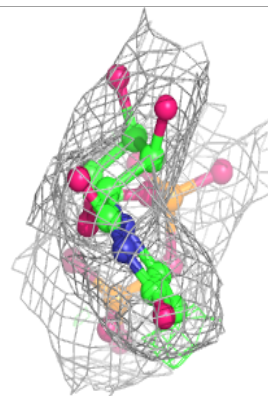
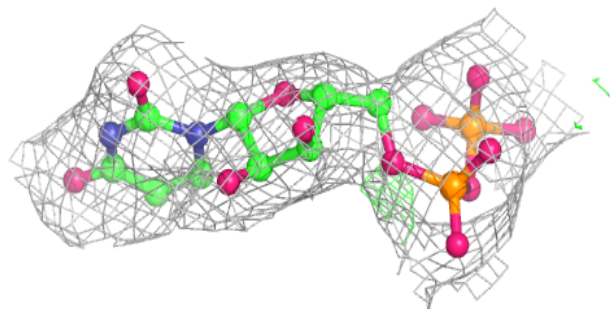
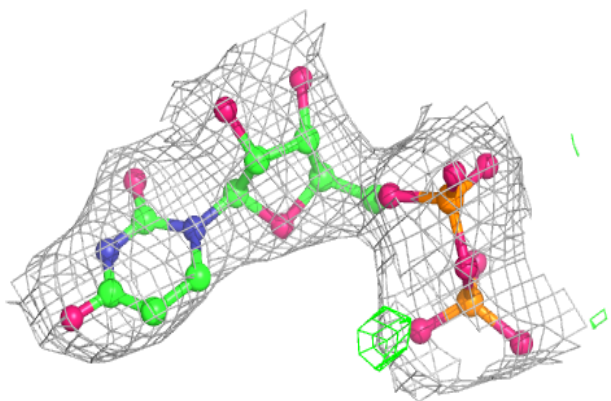
**Electron density around UDP K 602:**

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

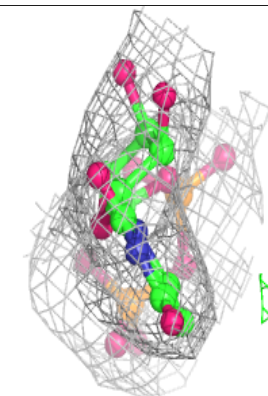
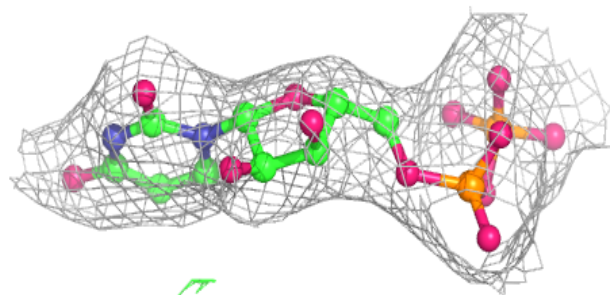
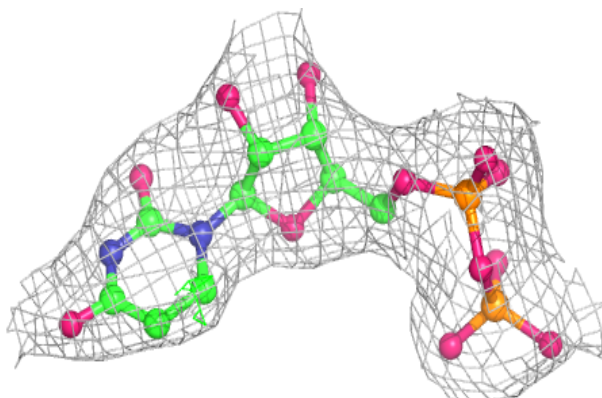


**Electron density around UDP I 602:**

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

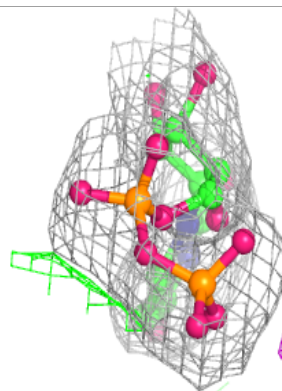
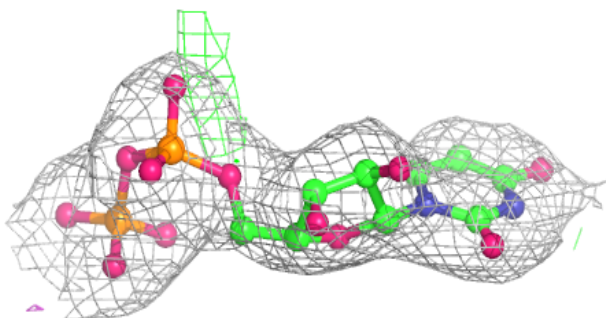
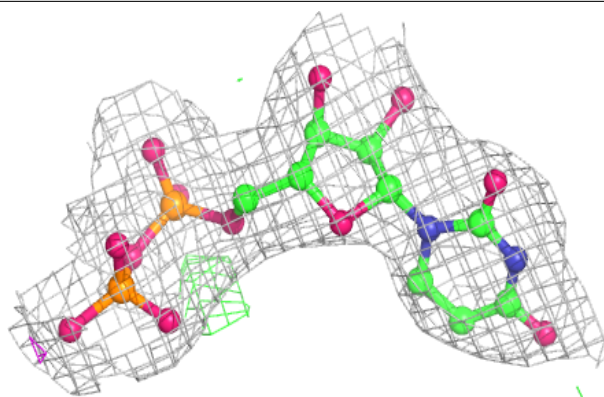
**Electron density around UDP F 602:**

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

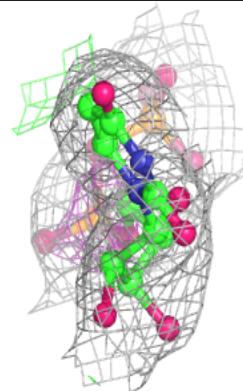
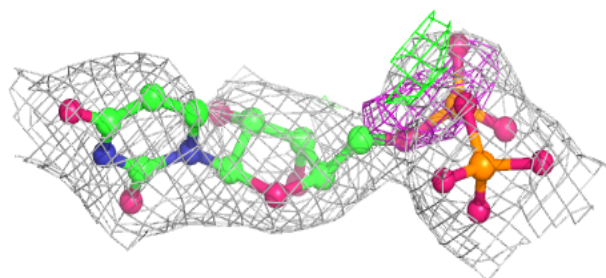
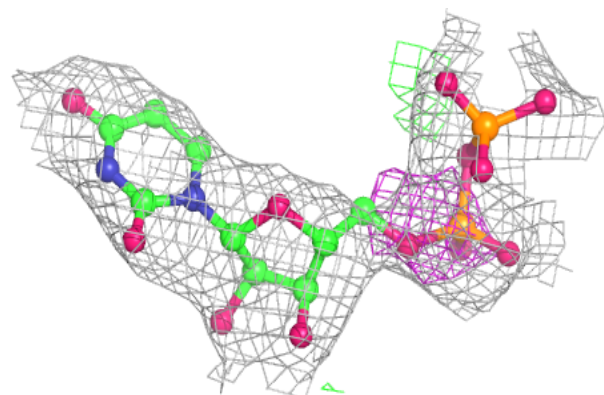


**Electron density around UDP C 602:**

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

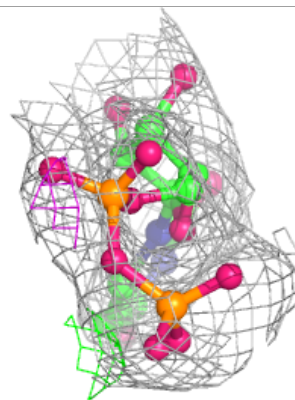
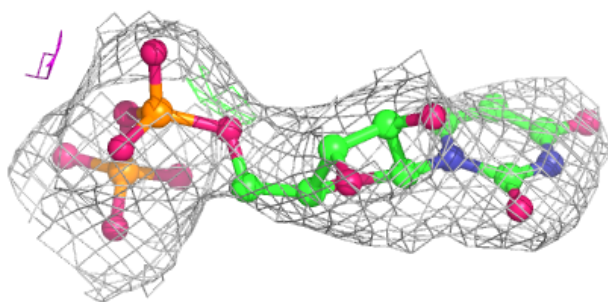
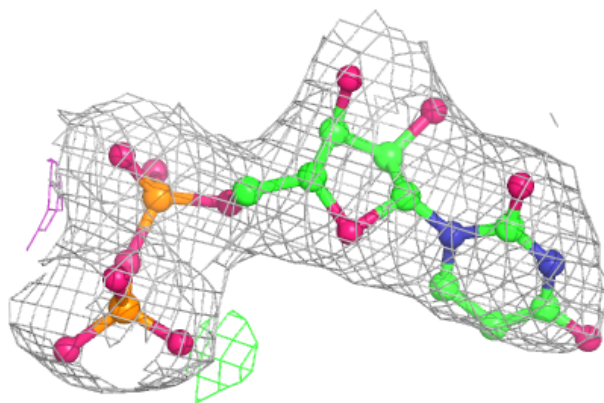
**Electron density around UDP D 602:**

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

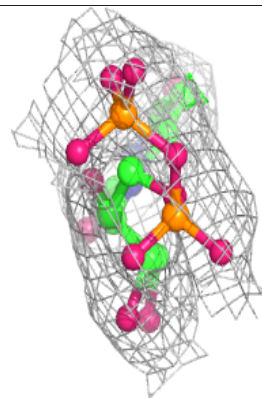
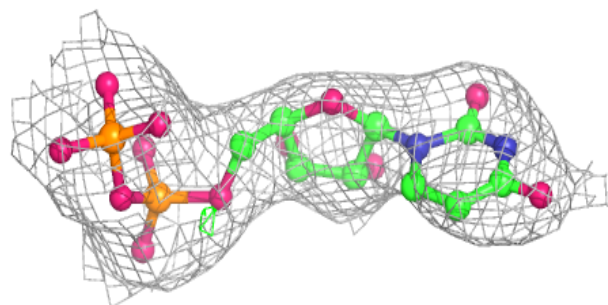
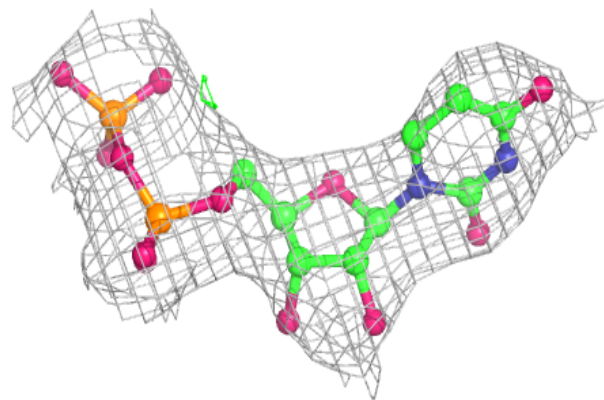


**Electron density around UDP G 701:**

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

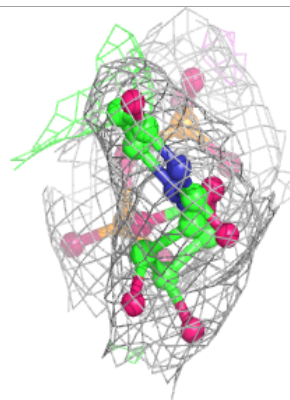
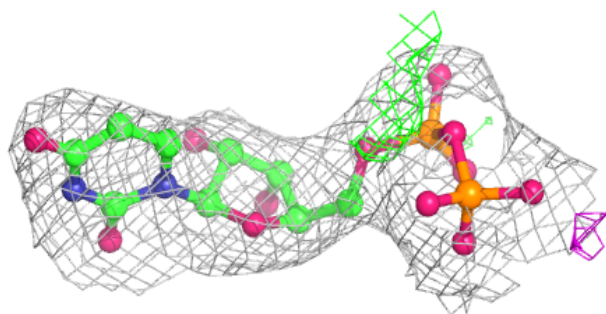
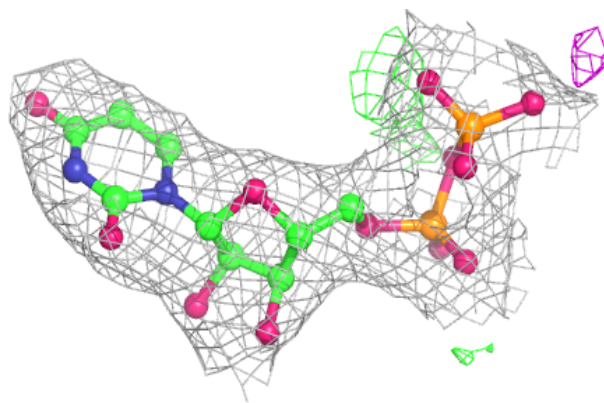
**Electron density around UDP E 602:**

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

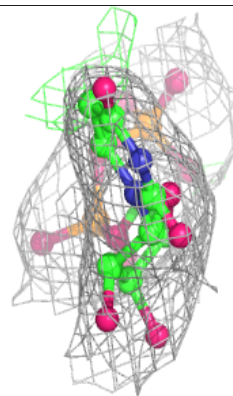
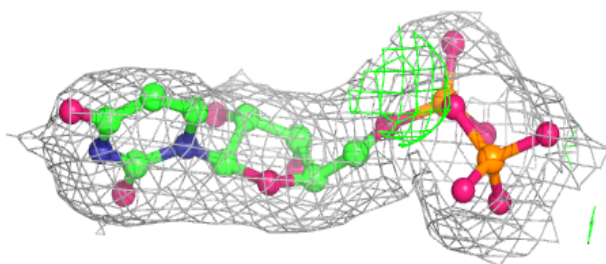
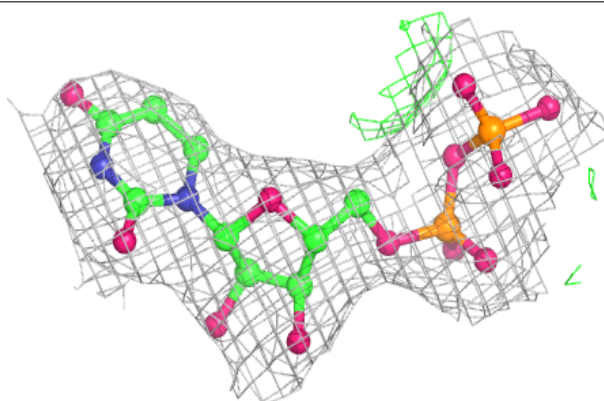


**Electron density around UDP A 602:**

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

**Electron density around UDP B 701:**

$2mF_o-DF_c$  (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.