



wwPDB X-ray Structure Validation Summary Report ⓘ

Aug 10, 2020 – 06:49 AM BST

PDB ID : 2Z2C
Title : MURA inhibited by unag-cnicin adduct
Authors : Steinbach, A.; Skarzynski, T.; Scheidig, A.J.; Klein, C.D.
Deposited on : 2007-05-17
Resolution : 2.05 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 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 : 2.13.1
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) : 2.13.1

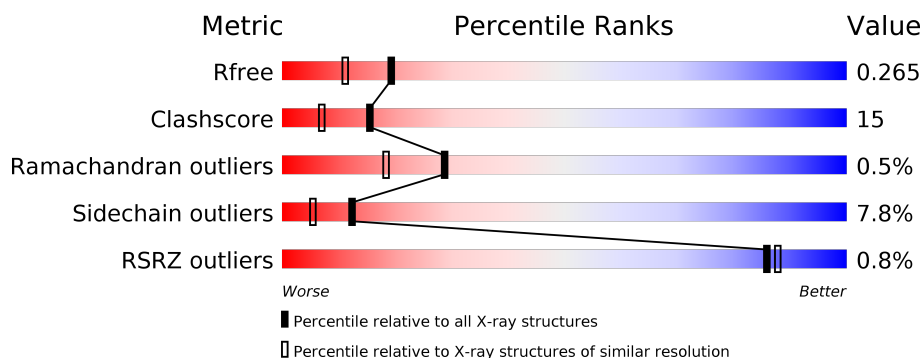
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.05 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	1692 (2.04-2.04)
Clashscore	141614	1773 (2.04-2.04)
Ramachandran outliers	138981	1752 (2.04-2.04)
Sidechain outliers	138945	1752 (2.04-2.04)
RSRZ outliers	127900	1672 (2.04-2.04)

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 on 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	423	<div> <div>%</div> <div> <div></div> <div>72%</div> <div>24%</div> <div>• •</div> </div> </div>
1	B	423	<div> <div></div> <div>76%</div> <div>19%</div> <div>• •</div> </div>
1	C	423	<div> <div>%</div> <div> <div></div> <div>71%</div> <div>24%</div> <div>• •</div> </div> </div>
1	D	423	<div> <div>%</div> <div> <div></div> <div>67%</div> <div>27%</div> <div>• •</div> </div> </div>

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 crite-

ria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
1	IAS	A	67	-	-	X	-
1	IAS	C	67	-	-	X	-
1	IAS	D	67	-	-	X	-

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 13786 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.

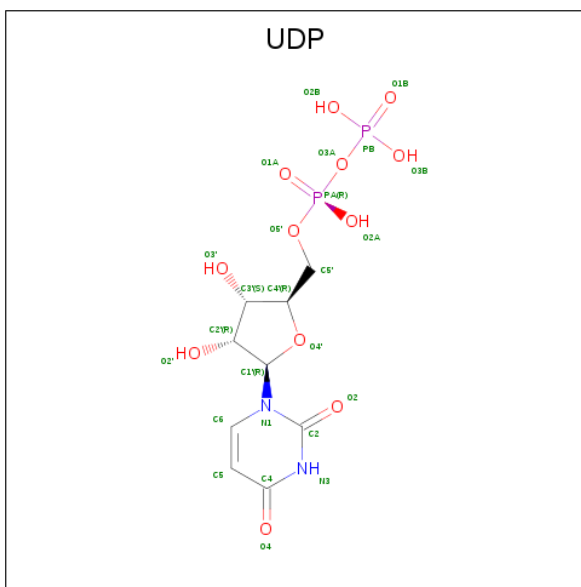
- Molecule 1 is a protein called UDP-N-acetylglucosamine 1-carboxyvinyltransferase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	418	Total	C	N	O	S	0	1	0
			3139	1971	558	594	16			
1	B	418	Total	C	N	O	S	0	9	0
			3185	2005	563	601	16			
1	C	418	Total	C	N	O	S	0	3	0
			3153	1982	561	594	16			
1	D	418	Total	C	N	O	S	0	3	0
			3149	1978	559	596	16			

There are 16 discrepancies between the modelled and reference sequences:

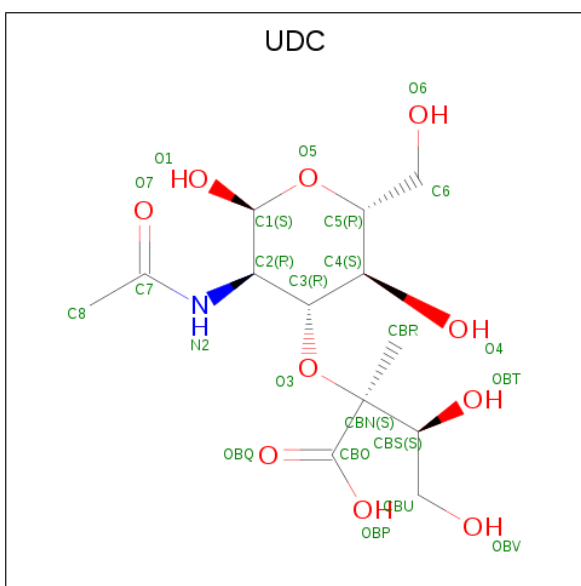
Chain	Residue	Modelled	Actual	Comment	Reference
A	420	LEU	-	SEE REMARK 999	UNP P0A749
A	421	VAL	-	SEE REMARK 999	UNP P0A749
A	422	PRO	-	SEE REMARK 999	UNP P0A749
A	423	ARG	-	SEE REMARK 999	UNP P0A749
B	420	LEU	-	SEE REMARK 999	UNP P0A749
B	421	VAL	-	SEE REMARK 999	UNP P0A749
B	422	PRO	-	SEE REMARK 999	UNP P0A749
B	423	ARG	-	SEE REMARK 999	UNP P0A749
C	420	LEU	-	SEE REMARK 999	UNP P0A749
C	421	VAL	-	SEE REMARK 999	UNP P0A749
C	422	PRO	-	SEE REMARK 999	UNP P0A749
C	423	ARG	-	SEE REMARK 999	UNP P0A749
D	420	LEU	-	SEE REMARK 999	UNP P0A749
D	421	VAL	-	SEE REMARK 999	UNP P0A749
D	422	PRO	-	SEE REMARK 999	UNP P0A749
D	423	ARG	-	SEE REMARK 999	UNP P0A749

- Molecule 2 is URIDINE-5'-DIPHOSPHATE (three-letter code: UDP) (formula: C₉H₁₄N₂O₁₂P₂).



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

- Molecule 3 is 2-acetamido-3-O-[(2S,3S)-2-carboxy-3,4-dihydroxybutan-2-yl]-2-deoxy-alpha-D-glucopyranose (three-letter code: UDC) (formula: C₁₃H₂₃NO₁₀).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	1	Total	C	N	O	0	1
			32	18	1	13		
3	B	1	Total	C	N	O	0	1
			32	18	1	13		
3	C	1	Total	C	N	O	0	1
			32	18	1	13		
3	D	1	Total	C	N	O	0	1
			32	18	1	13		

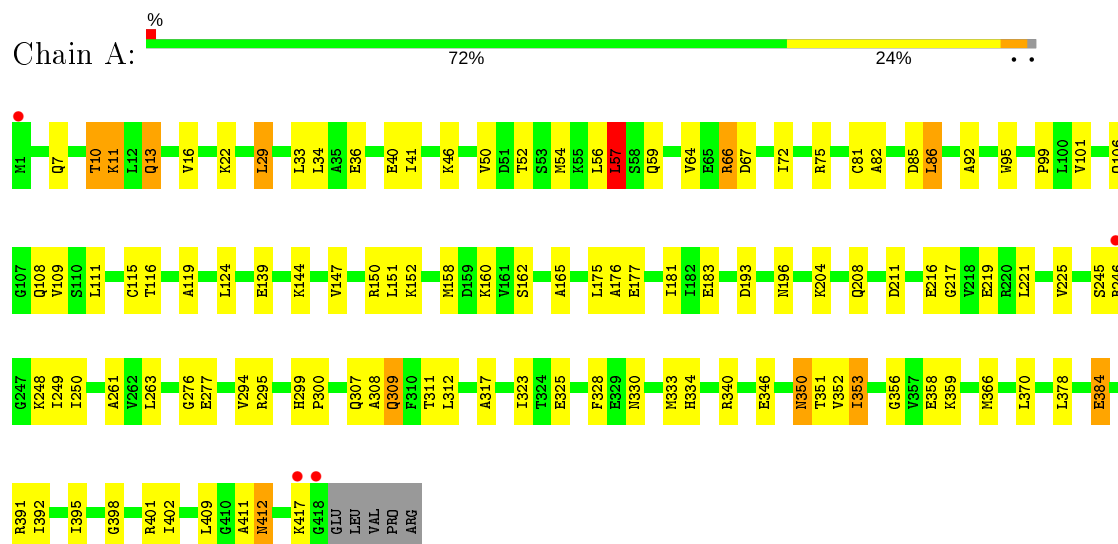
- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	220	Total	O	0	0
			220	220		
4	B	248	Total	O	0	0
			248	248		
4	C	257	Total	O	0	0
			257	257		
4	D	207	Total	O	0	0
			207	207		

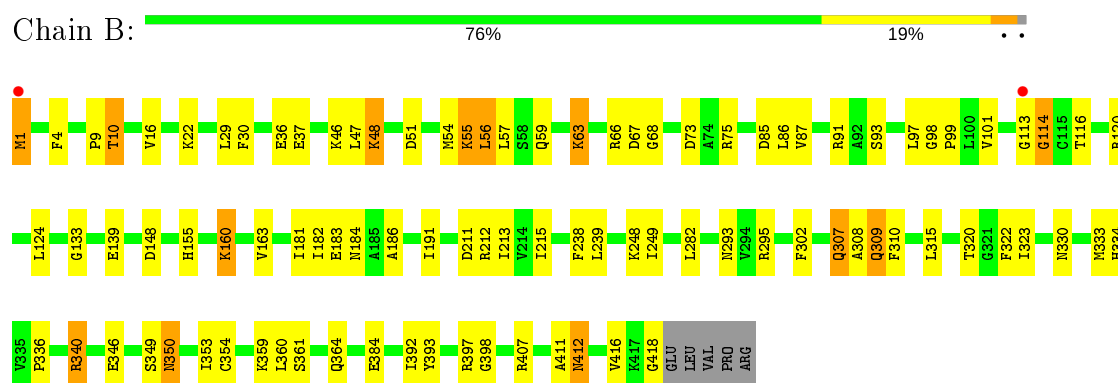
3 Residue-property plots

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.

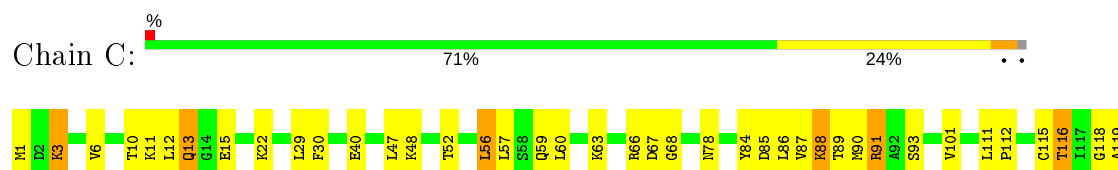
- Molecule 1: UDP-N-acetylglucosamine 1-carboxyvinyltransferase



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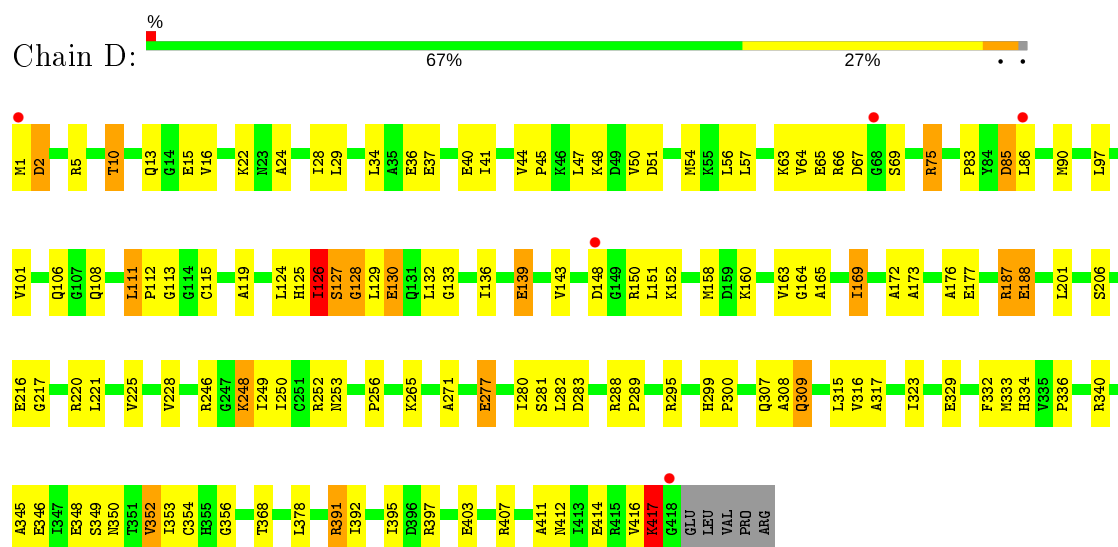


- Molecule 1: UDP-N-acetylglucosamine 1-carboxyvinyltransferase





• Molecule 1: UDP-N-acetylglucosamine 1-carboxyvinyltransferase



4 Data and refinement statistics

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α , β , γ	65.13Å 80.37Å 84.87Å 108.69° 111.07° 101.17°	Depositor
Resolution (Å)	19.14 – 2.05 19.14 – 2.05	Depositor EDS
% Data completeness (in resolution range)	93.8 (19.14-2.05) 94.2 (19.14-2.05)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	0.07	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.68 (at 2.06Å)	Xtriage
Refinement program	REFMAC 5.2.0019	Depositor
R, R_{free}	0.191 , 0.271 0.189 , 0.265	Depositor DCC
R_{free} test set	4202 reflections (4.99%)	wwPDB-VP
Wilson B-factor (Å ²)	23.6	Xtriage
Anisotropy	0.293	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.34 , 31.9	EDS
L-test for twinning ²	$\langle L \rangle = 0.47$, $\langle L^2 \rangle = 0.30$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	13786	wwPDB-VP
Average B, all atoms (Å ²)	10.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.17% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

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

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: UDC, UDP, IAS

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	0.74	0/3179	0.81	1/4304 (0.0%)
1	B	0.77	0/3262	0.83	1/4411 (0.0%)
1	C	0.73	0/3202	0.82	3/4334 (0.1%)
1	D	0.66	0/3197	0.79	1/4327 (0.0%)
All	All	0.73	0/12840	0.81	6/17376 (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	B	0	1
1	D	0	2
All	All	0	3

There are no bond length outliers.

The worst 5 of 6 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	91	ARG	NE-CZ-NH2	-8.72	115.94	120.30
1	C	371	ARG	NE-CZ-NH2	-6.52	117.04	120.30
1	D	127	SER	N-CA-C	-6.19	94.30	111.00
1	C	91	ARG	NE-CZ-NH1	5.85	123.23	120.30
1	B	340	ARG	NE-CZ-NH1	5.81	123.21	120.30

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	B	66	ARG	Mainchain
1	D	113	GLY	Peptide
1	D	126	ILE	Peptide

5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3139	0	3214	87	1
1	B	3185	0	3264	91	1
1	C	3153	0	3228	110	0
1	D	3149	0	3225	104	0
2	A	25	0	11	1	0
2	B	25	0	11	0	0
2	C	25	0	11	0	0
2	D	25	0	11	0	0
3	A	32	0	15	4	0
3	B	32	0	15	5	0
3	C	32	0	15	9	0
3	D	32	0	16	3	0
4	A	220	0	0	7	0
4	B	248	0	0	17	0
4	C	257	0	0	18	0
4	D	207	0	0	20	0
All	All	13786	0	13036	380	1

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 15.

The worst 5 of 380 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:66:ARG:C	1:C:67:IAS:N	1.74	1.41
1:A:66:ARG:C	1:A:67:IAS:N	1.76	1.38
1:B:350:ASN:HB3	4:B:1012:HOH:O	1.36	1.26
1:D:66:ARG:C	1:D:67:IAS:N	1.94	1.21
1:D:1:MET:HG2	1:D:391:ARG:HH21	1.16	1.10

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:358:GLU:OE2	1:B:10:THR:OG1[1_455]	2.01	0.19

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	415/423 (98%)	398 (96%)	16 (4%)	1 (0%)	47	39
1	B	424/423 (100%)	418 (99%)	4 (1%)	2 (0%)	29	18
1	C	417/423 (99%)	410 (98%)	6 (1%)	1 (0%)	47	39
1	D	417/423 (99%)	400 (96%)	13 (3%)	4 (1%)	15	6
All	All	1673/1692 (99%)	1626 (97%)	39 (2%)	8 (0%)	29	18

5 of 8 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	114	GLY
1	D	2	ASP
1	D	128	GLY
1	A	417	LYS
1	B	349	SER

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	331/335 (99%)	306 (92%)	25 (8%)	13	6
1	B	340/335 (102%)	321 (94%)	19 (6%)	21	12
1	C	333/335 (99%)	305 (92%)	28 (8%)	11	4
1	D	333/335 (99%)	299 (90%)	34 (10%)	7	2
All	All	1337/1340 (100%)	1231 (92%)	106 (8%)	12	5

5 of 106 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	C	13	GLN
1	C	160	LYS
1	D	277	GLU
1	C	56	LEU
1	C	88	LYS

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 42 such sidechains are listed below:

Mol	Chain	Res	Type
1	B	350	ASN
1	C	78	ASN
1	D	309	GLN
1	B	364	GLN
1	C	13	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

4 non-standard protein/DNA/RNA residues are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
1	IAS	B	67	1	4,7,8	1.02	0	2,8,10	1.03	0
1	IAS	D	67	1	4,7,8	0.72	0	2,8,10	1.51	0
1	IAS	A	67	1	4,7,8	1.02	0	2,8,10	0.94	0
1	IAS	C	67	1	4,7,8	0.62	0	2,8,10	0.71	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
1	IAS	B	67	1	-	1/3/7/8	-
1	IAS	D	67	1	-	2/3/7/8	-
1	IAS	A	67	1	-	0/3/7/8	-
1	IAS	C	67	1	-	0/3/7/8	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (3) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	D	67	IAS	N-CA-CB-CG
1	D	67	IAS	C-CA-CB-CG
1	B	67	IAS	N-CA-CB-CG

There are no ring outliers.

4 monomers are involved in 16 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	B	67	IAS	1	0
1	D	67	IAS	5	0
1	A	67	IAS	4	0
1	C	67	IAS	6	0

5.5 Carbohydrates ⓘ

There are no monosaccharides in this entry.

5.6 Ligand geometry

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	UDC	D	981[B]	-	18,23,24	1.53	4 (22%)	23,33,35	1.61	5 (21%)
2	UDP	C	970	3	20,26,26	2.30	7 (35%)	25,40,40	1.45	3 (12%)
2	UDP	A	950	3	20,26,26	2.34	8 (40%)	25,40,40	1.37	3 (12%)
2	UDP	D	980	3	20,26,26	1.99	4 (20%)	25,40,40	1.24	3 (12%)
3	UDC	B	961[B]	-	18,23,24	1.24	2 (11%)	23,33,35	1.12	2 (8%)
3	UDC	A	951[B]	-	18,23,24	1.24	2 (11%)	23,33,35	1.00	1 (4%)
3	UDC	B	961[A]	-	18,23,24	1.84	4 (22%)	23,33,35	1.22	3 (13%)
3	UDC	C	971[B]	-	18,23,24	1.10	1 (5%)	23,33,35	1.53	3 (13%)
2	UDP	B	960	3	20,26,26	2.01	5 (25%)	25,40,40	1.44	5 (20%)
3	UDC	A	951[A]	-	18,23,24	1.84	4 (22%)	23,33,35	1.39	2 (8%)
3	UDC	D	981[A]	-	18,23,24	1.86	6 (33%)	23,33,35	1.70	6 (26%)
3	UDC	C	971[A]	-	18,23,24	1.57	3 (16%)	23,33,35	1.87	4 (17%)

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	UDC	D	981[B]	-	-	8/18/42/45	0/1/1/1
2	UDP	C	970	3	-	5/14/32/32	0/2/2/2
2	UDP	A	950	3	-	5/14/32/32	0/2/2/2
2	UDP	D	980	3	-	6/14/32/32	0/2/2/2
3	UDC	B	961[B]	-	-	1/18/42/45	0/1/1/1
3	UDC	A	951[B]	-	-	3/18/42/45	0/1/1/1
3	UDC	B	961[A]	-	-	7/18/42/45	0/1/1/1
3	UDC	C	971[B]	-	-	6/18/42/45	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	UDP	B	960	3	-	4/14/32/32	0/2/2/2
3	UDC	A	951[A]	-	-	3/18/42/45	0/1/1/1
3	UDC	D	981[A]	-	-	1/18/42/45	0/1/1/1
3	UDC	C	971[A]	-	-	4/18/42/45	0/1/1/1

The worst 5 of 50 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	951[A]	UDC	OBT-CBS	-5.29	1.34	1.43
3	B	961[A]	UDC	OBT-CBS	-5.08	1.35	1.43
2	D	980	UDP	C6-N1	5.08	1.42	1.35
2	A	950	UDP	O4'-C1'	4.93	1.48	1.41
2	C	970	UDP	O4'-C1'	4.92	1.47	1.41

The worst 5 of 40 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	C	971[A]	UDC	OBT-CBS-CBU	-5.15	97.88	108.84
3	C	971[B]	UDC	C1-O5-C5	5.07	119.07	112.19
3	C	971[A]	UDC	C1-O5-C5	5.07	119.07	112.19
3	A	951[A]	UDC	OBT-CBS-CBU	-4.18	99.95	108.84
2	A	950	UDP	O3B-PB-O2B	3.82	122.23	107.64

There are no chirality outliers.

5 of 53 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	D	981[B]	UDC	O3-CBN-CBS-CBU
3	D	981[B]	UDC	CBN-CBS-CBU-OBV
3	D	981[B]	UDC	OBT-CBS-CBU-OBV
2	C	970	UDP	C2'-C1'-N1-C6
2	C	970	UDP	C5'-O5'-PA-O1A

There are no ring outliers.

8 monomers are involved in 22 short contacts:

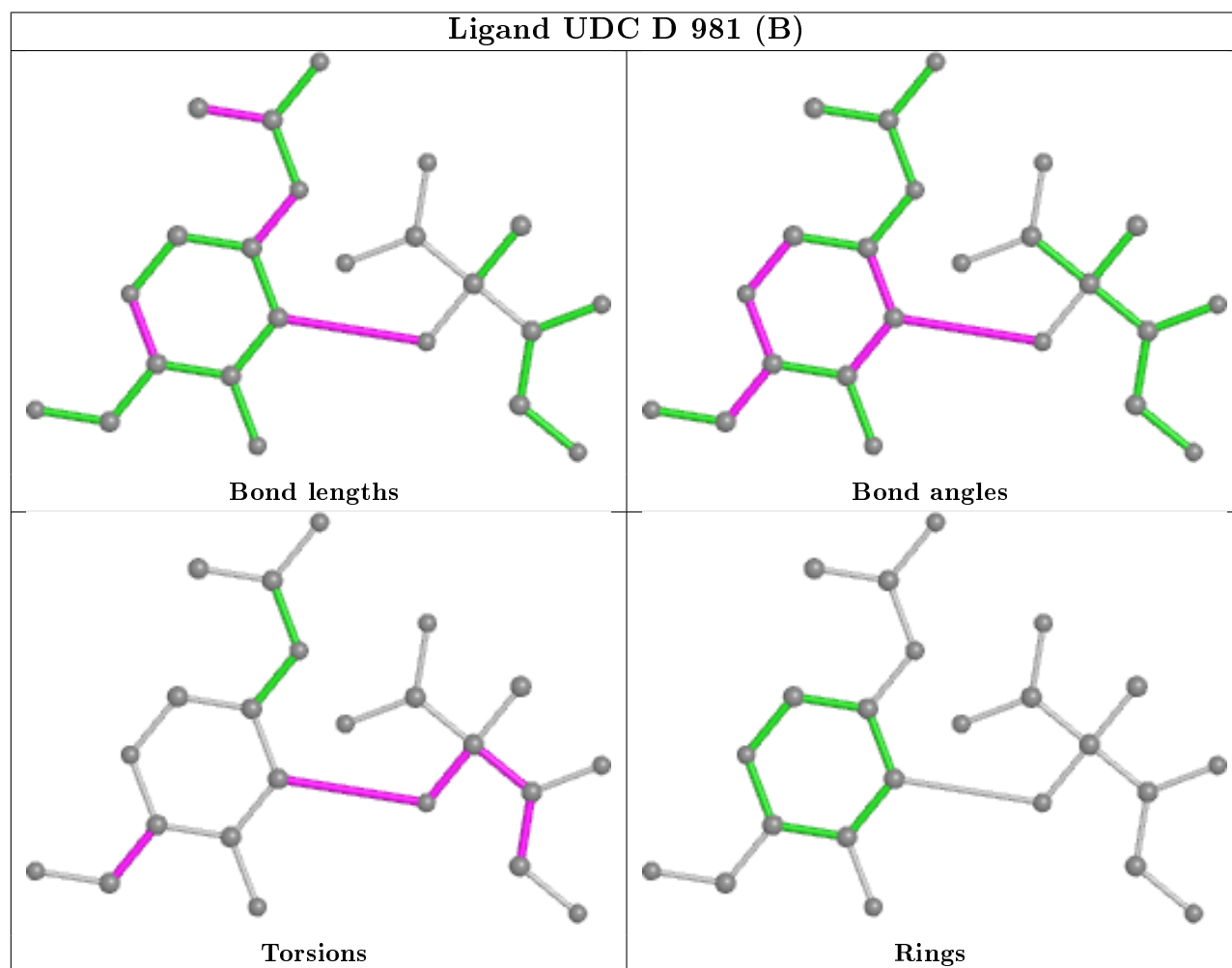
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	D	981[B]	UDC	1	0
2	A	950	UDP	1	0
3	B	961[B]	UDC	1	0

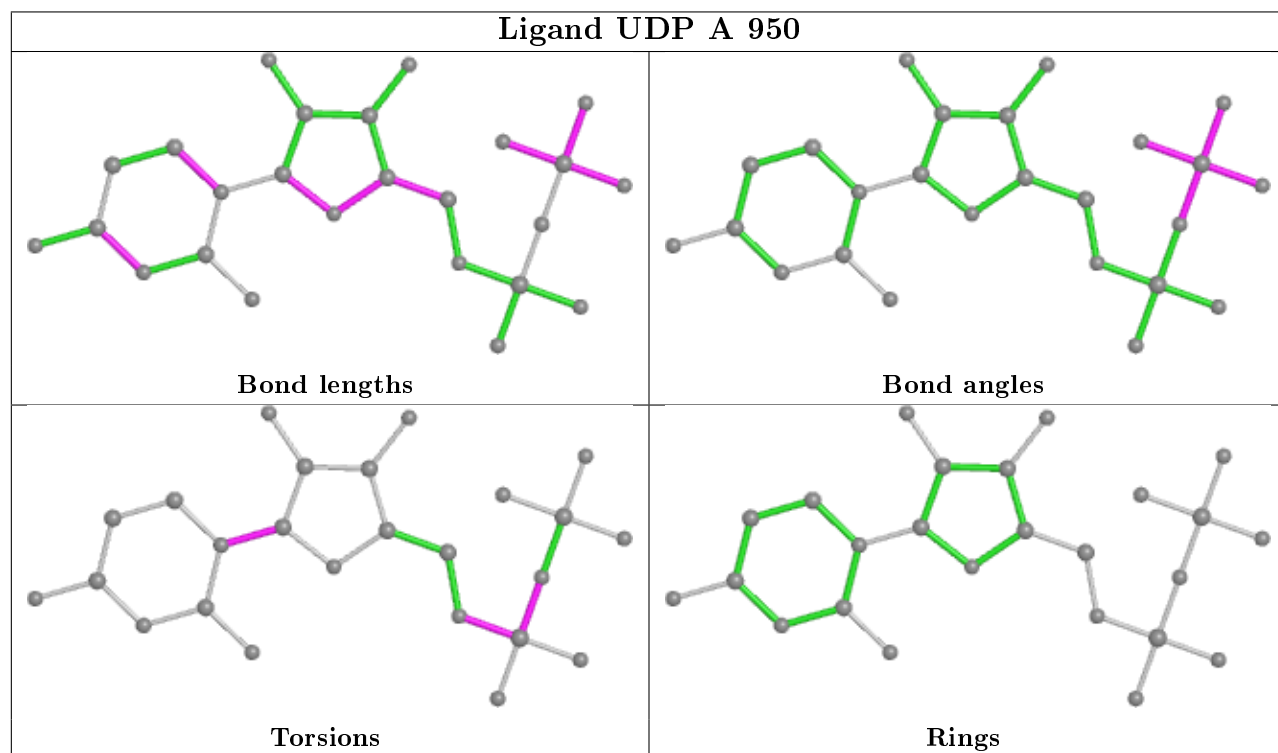
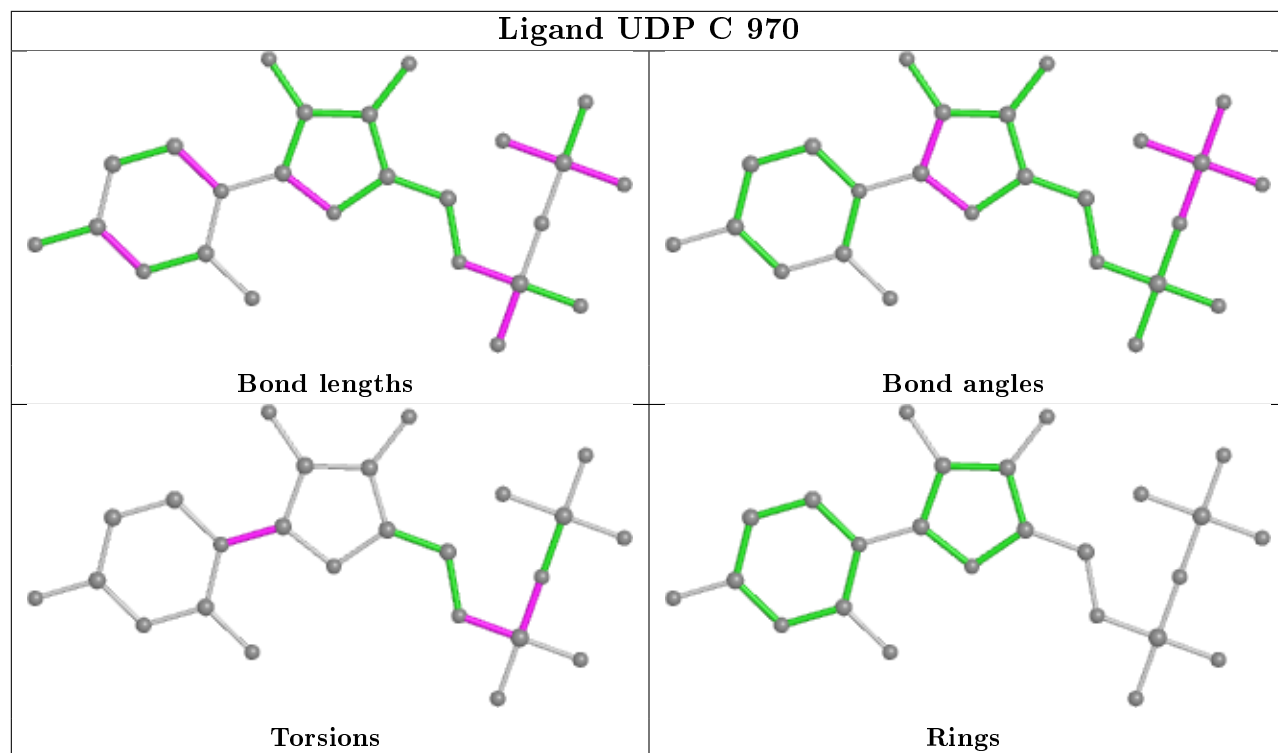
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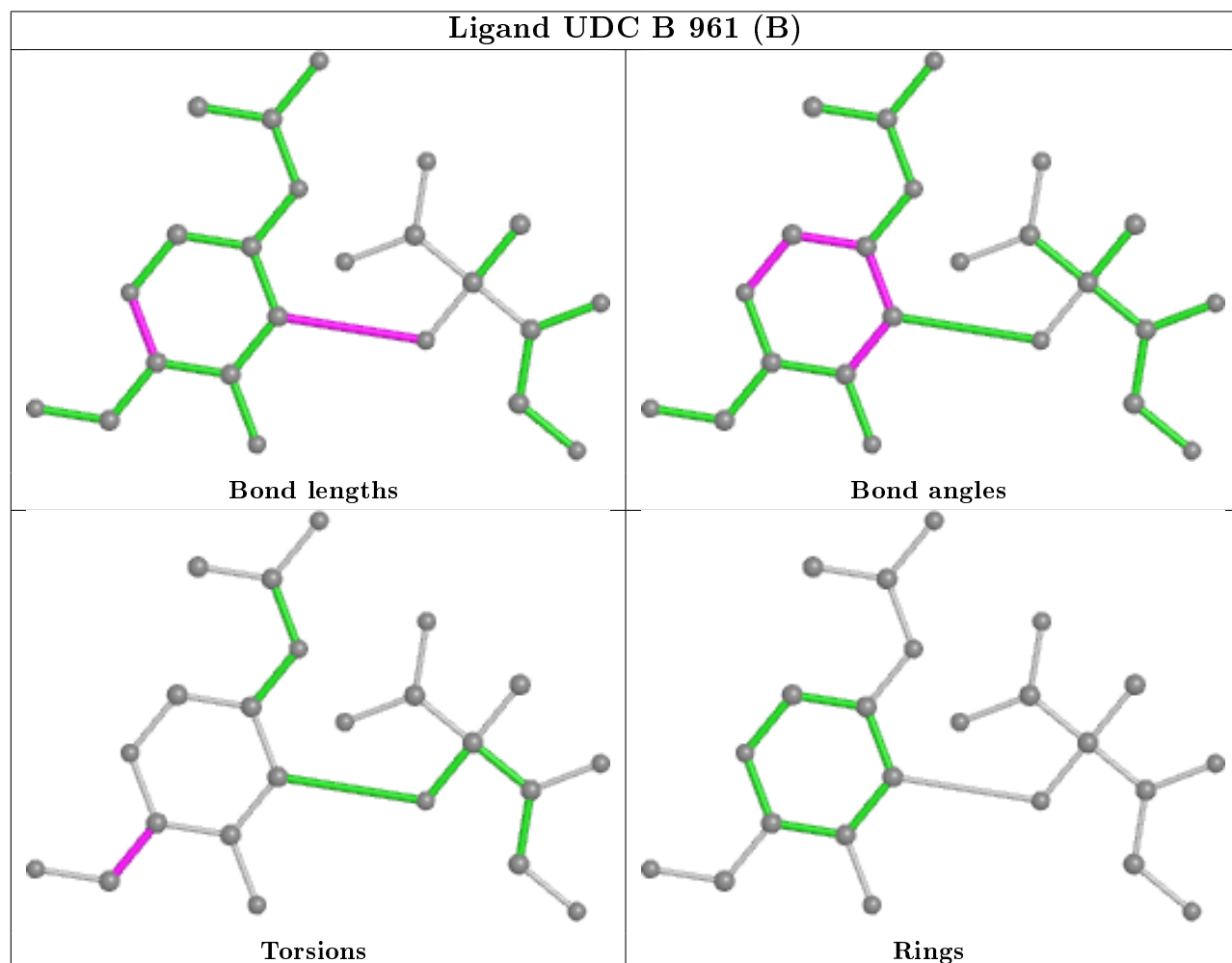
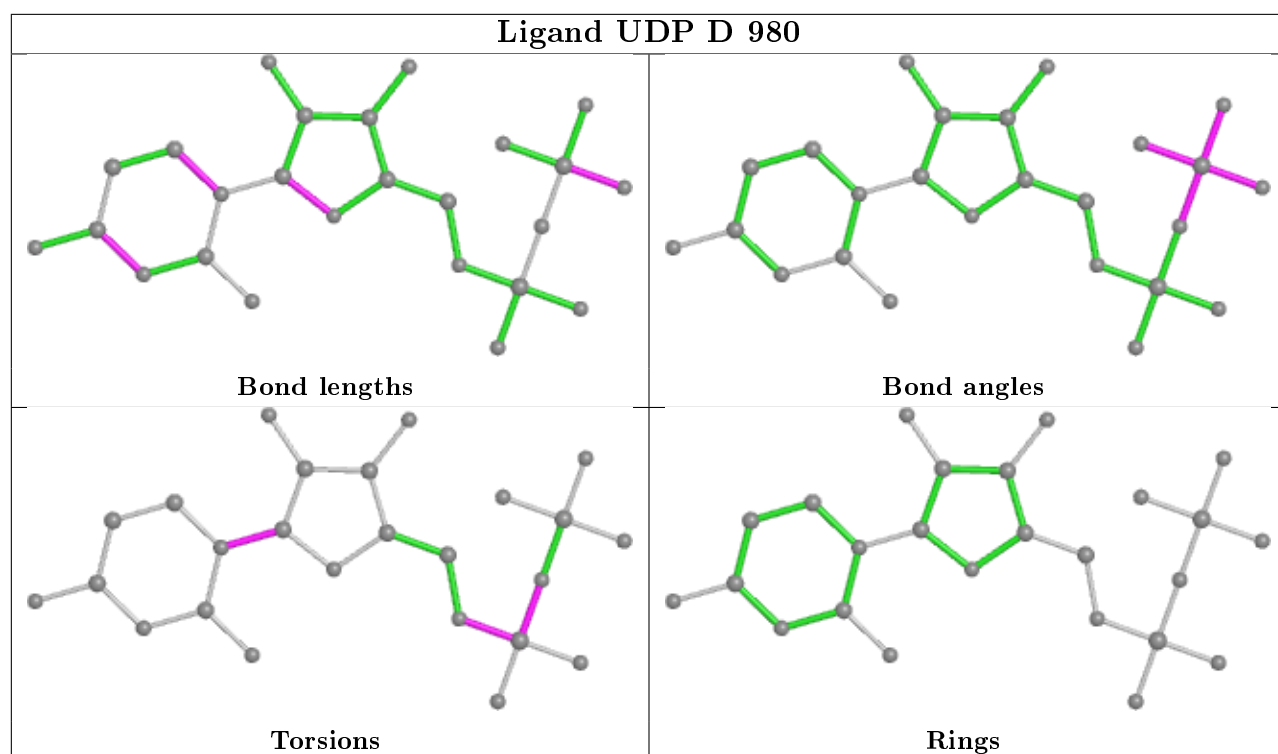
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Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	B	961[A]	UDC	4	0
3	C	971[B]	UDC	4	0
3	A	951[A]	UDC	4	0
3	D	981[A]	UDC	2	0
3	C	971[A]	UDC	5	0

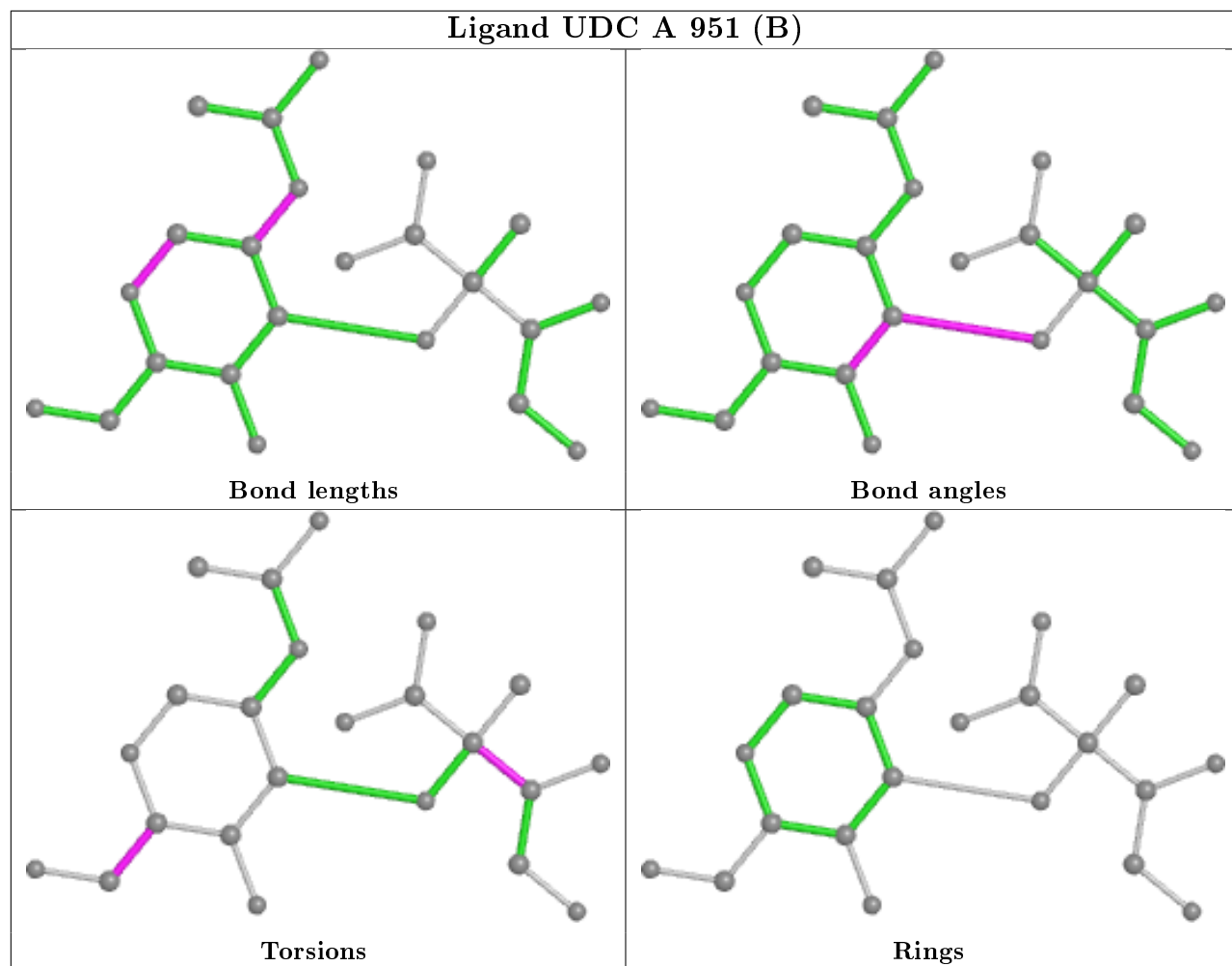
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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



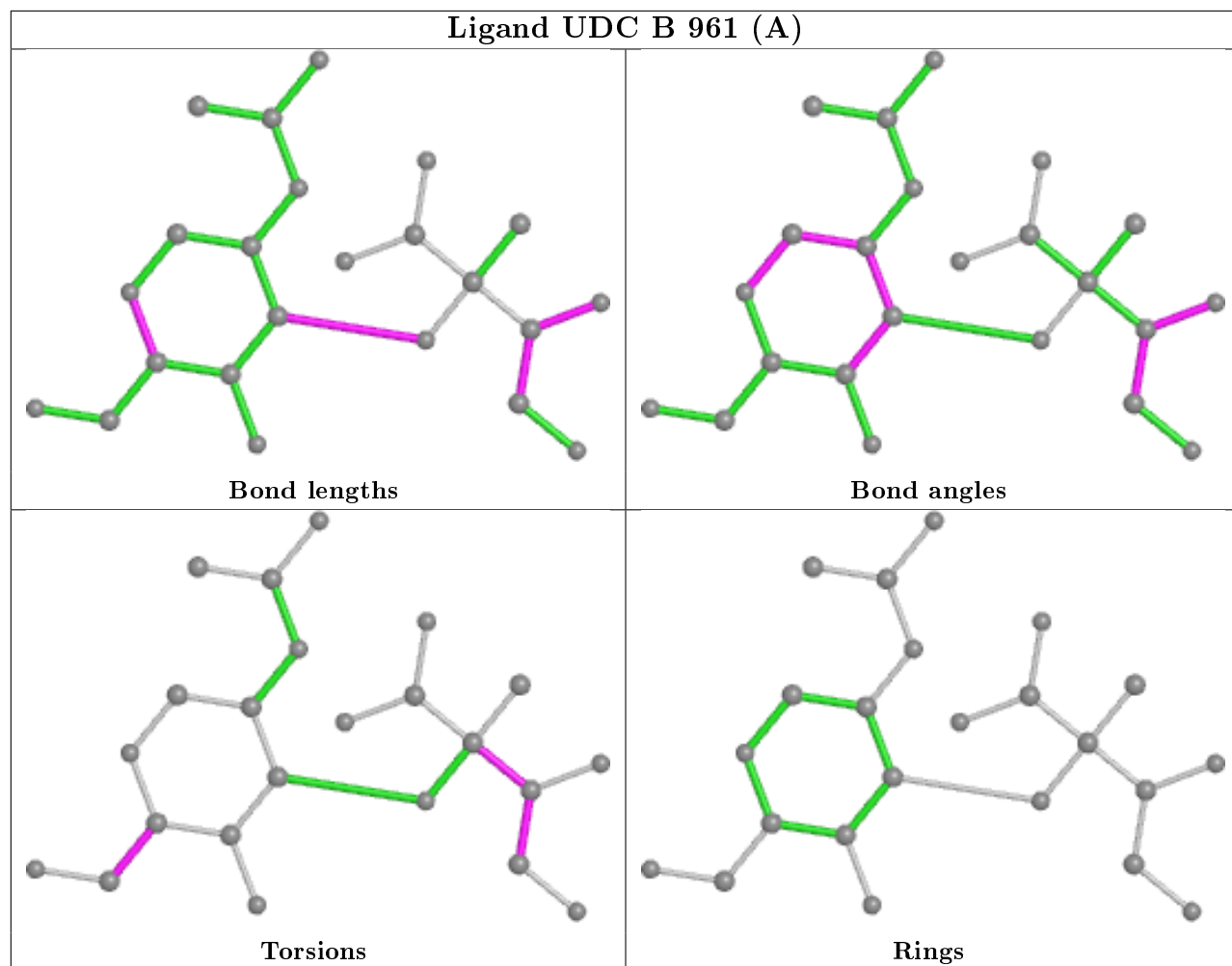




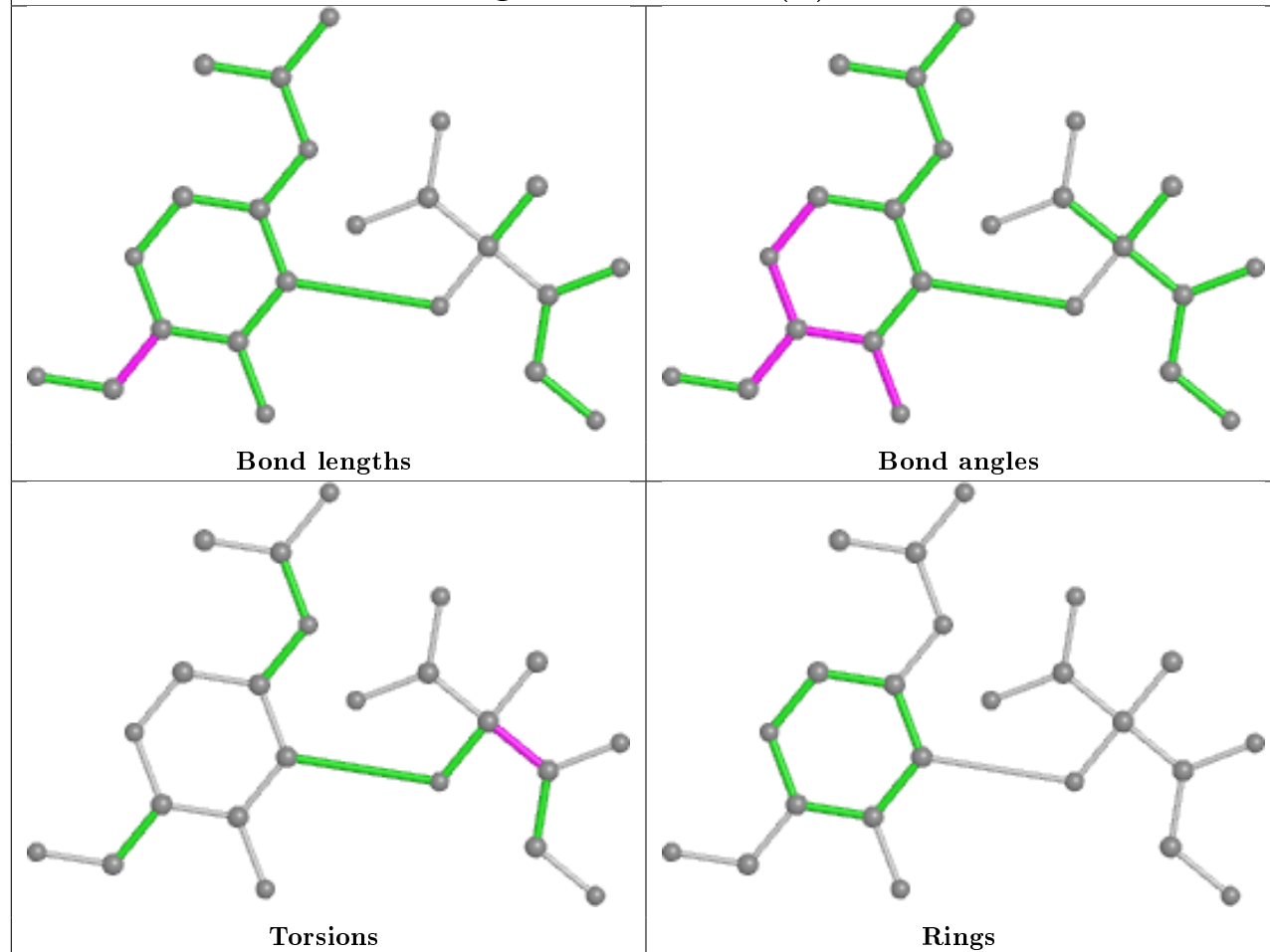
Ligand UDC A 951 (B)



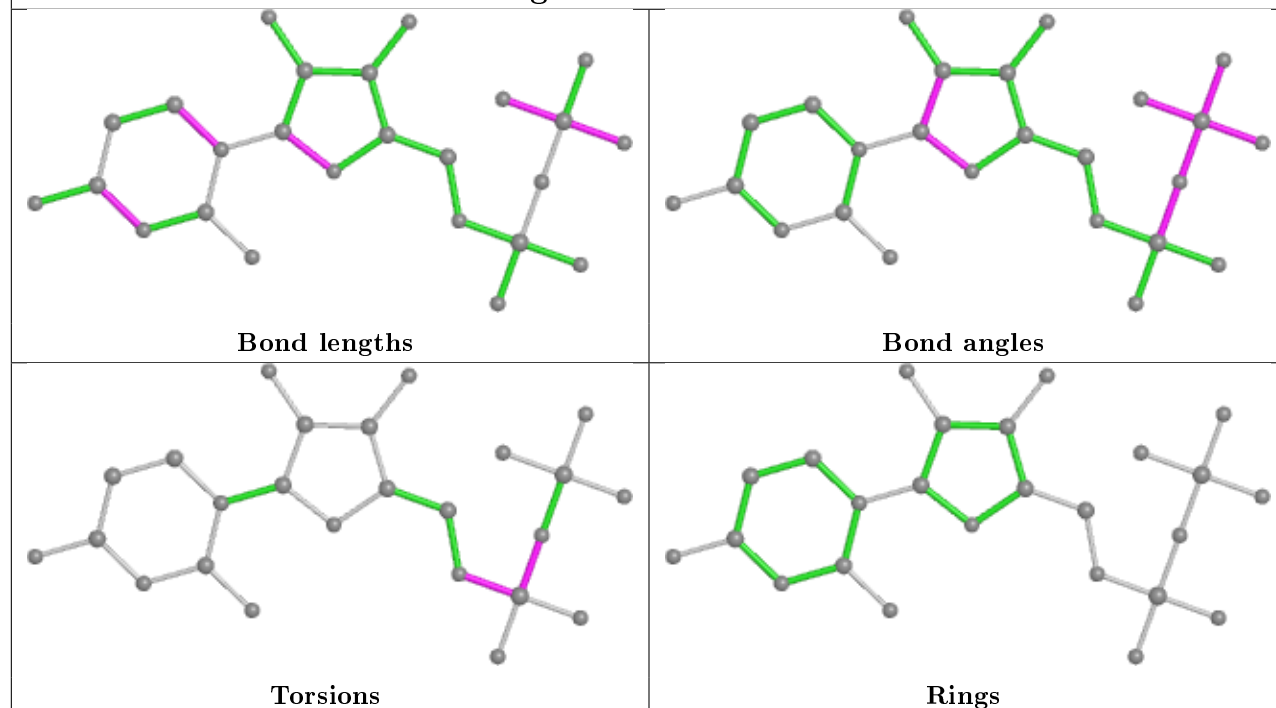
Ligand UDC B 961 (A)



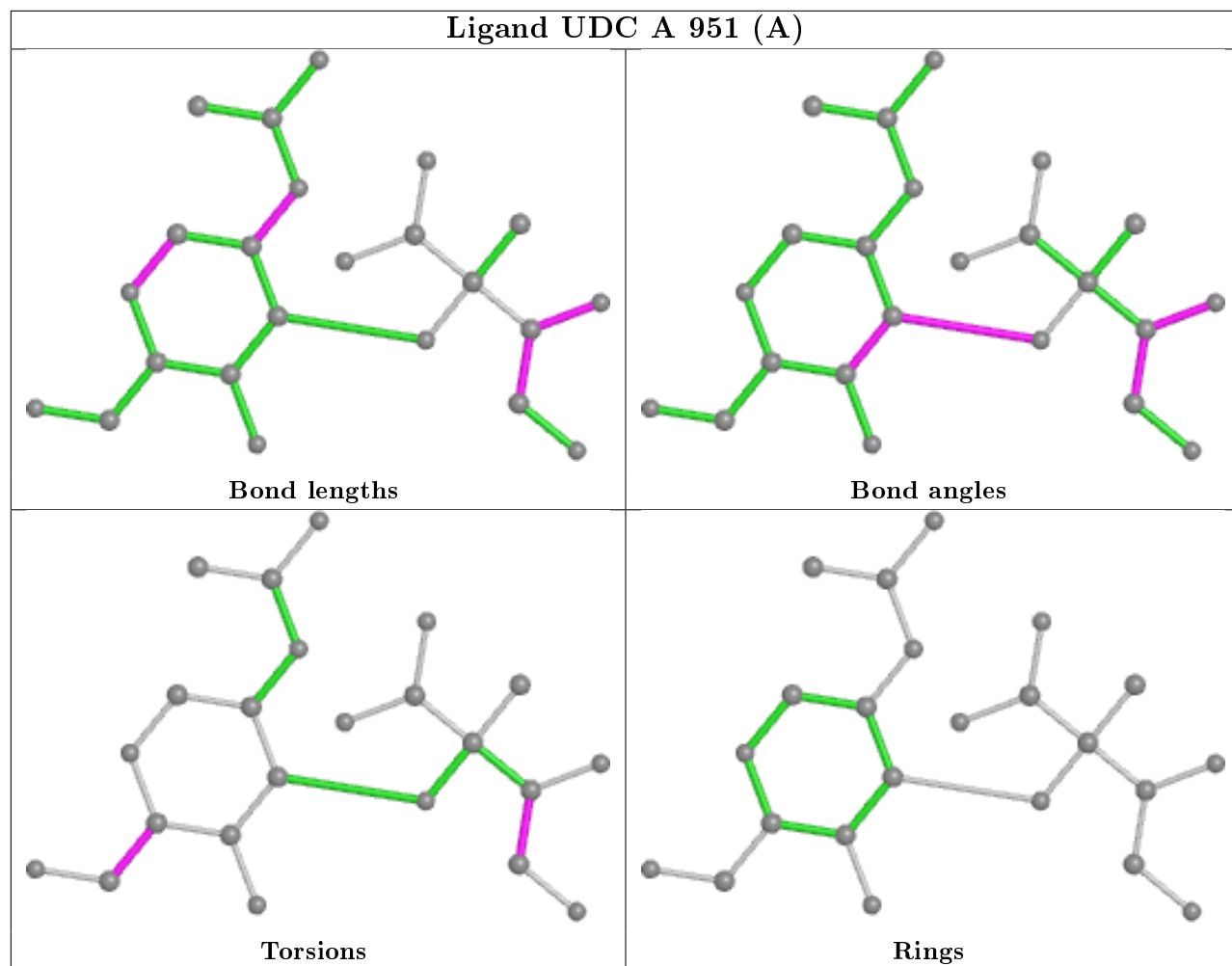
Ligand UDC C 971 (B)



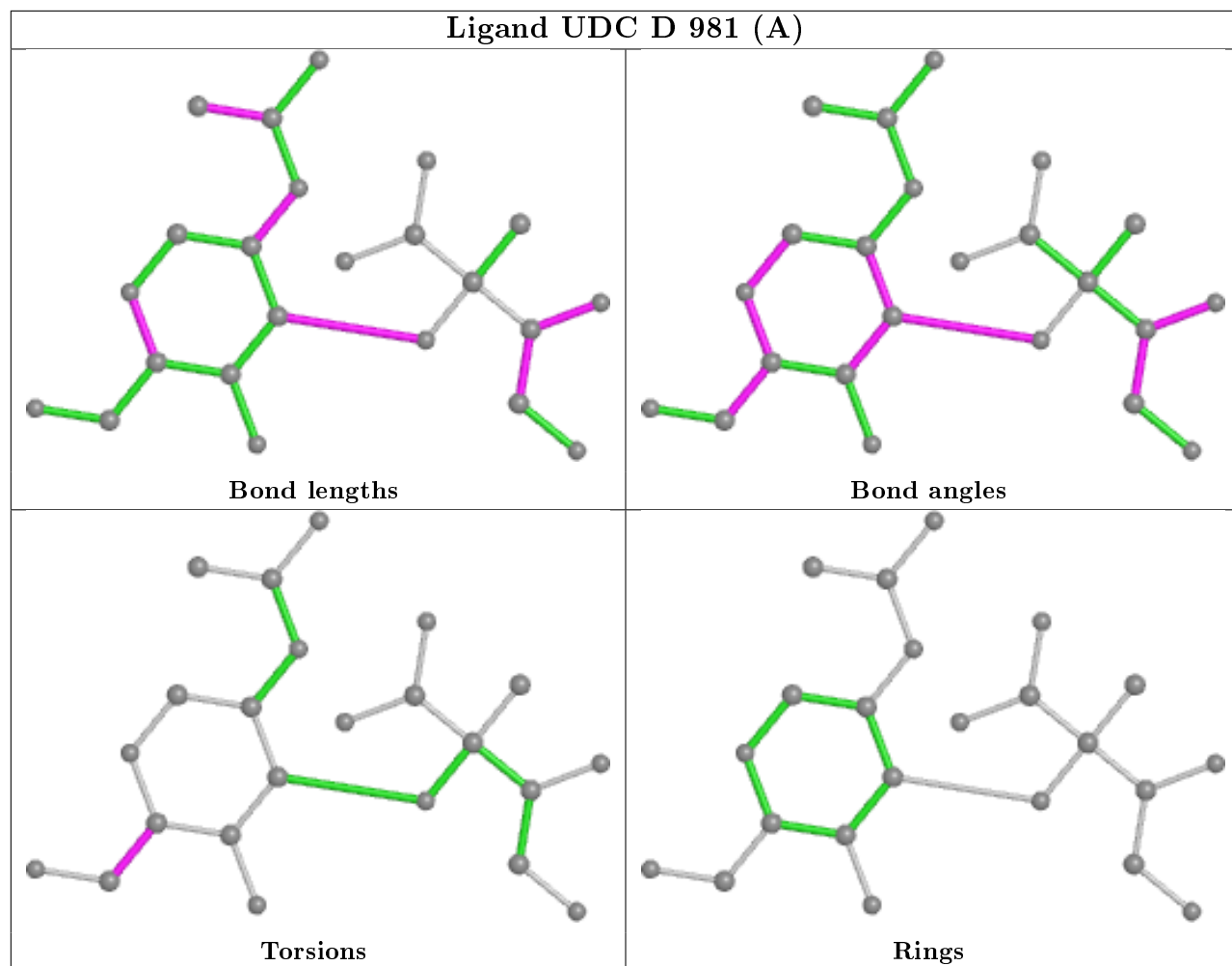
Ligand UDP B 960

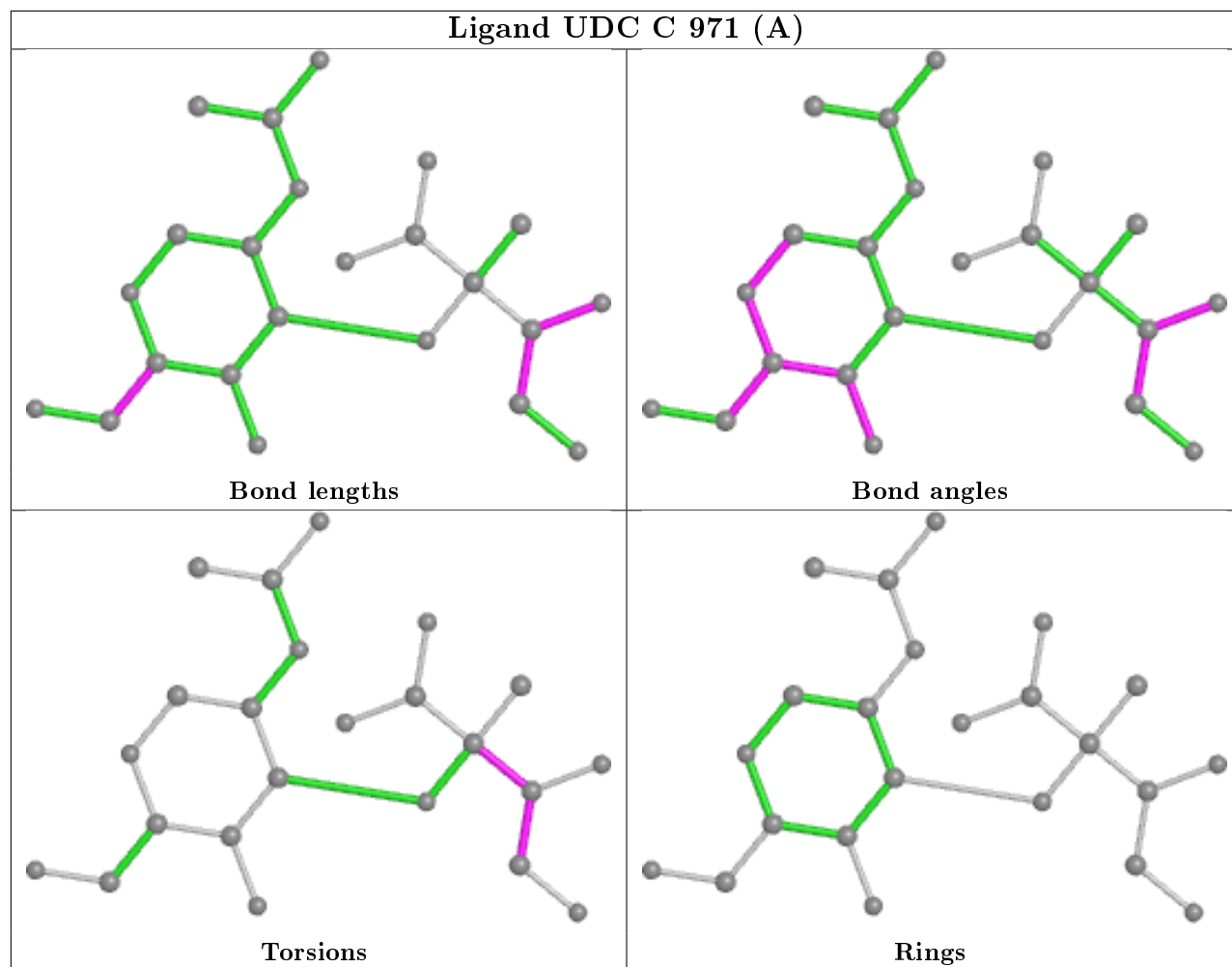


Ligand UDC A 951 (A)



Ligand UDC D 981 (A)





5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
1	B	2
1	A	2
1	D	2
1	C	2

The worst 5 of 8 chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	D	67:IAS	CG	68:GLY	N	2.19
1	D	66:ARG	C	67:IAS	N	1.94
1	B	67:IAS	CG	68:GLY	N	1.82
1	A	66:ARG	C	67:IAS	N	1.76
1	C	66:ARG	C	67:IAS	N	1.74

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	417/423 (98%)	-0.09	4 (0%) 82 84	3, 9, 18, 29	0
1	B	417/423 (98%)	-0.22	2 (0%) 91 92	3, 10, 18, 32	0
1	C	417/423 (98%)	-0.27	3 (0%) 87 89	3, 10, 17, 28	0
1	D	417/423 (98%)	0.04	5 (1%) 79 81	2, 9, 17, 28	0
All	All	1668/1692 (98%)	-0.14	14 (0%) 86 88	2, 9, 18, 32	0

The worst 5 of 14 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	1	MET	6.4
1	D	418	GLY	5.1
1	A	417	LYS	4.2
1	A	418	GLY	3.6
1	C	417	LYS	3.6

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

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 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
1	IAS	D	67	8/9	0.83	0.15	14,15,16,18	0
1	IAS	C	67	8/9	0.85	0.11	4,6,7,8	0
1	IAS	B	67	8/9	0.89	0.16	14,14,15,16	0
1	IAS	A	67	8/9	0.98	0.07	8,8,9,9	0

6.3 Carbohydrates [i](#)

There are no monosaccharides in this entry.

6.4 Ligands [i](#)

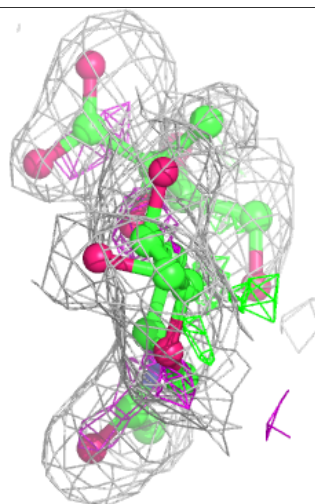
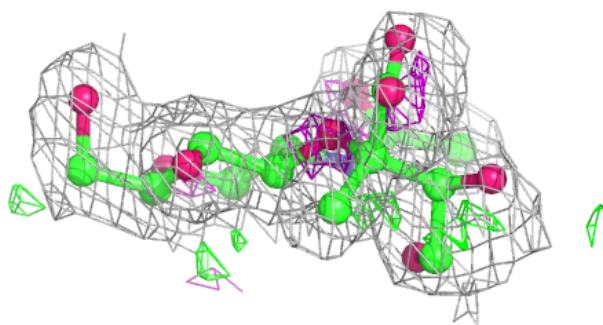
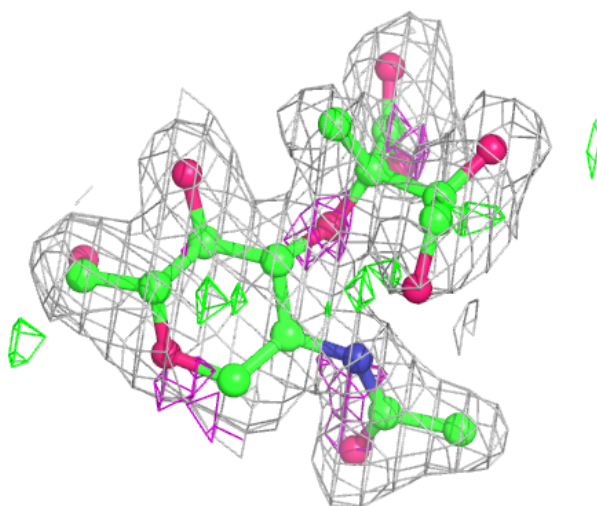
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
3	UDC	D	981[B]	23/24	0.92	0.13	2,2,5,6	9
3	UDC	D	981[A]	23/24	0.92	0.13	2,3,5,6	9
3	UDC	C	971[B]	23/24	0.94	0.10	2,2,2,2	9
3	UDC	A	951[A]	23/24	0.94	0.12	2,2,2,3	9
3	UDC	A	951[B]	23/24	0.94	0.12	2,2,2,3	9
3	UDC	C	971[A]	23/24	0.94	0.10	2,2,2,8	9
3	UDC	B	961[B]	23/24	0.95	0.12	2,2,2,2	9
3	UDC	B	961[A]	23/24	0.95	0.12	2,2,2,7	9
2	UDP	A	950	25/25	0.97	0.09	2,2,5,6	0
2	UDP	C	970	25/25	0.97	0.10	2,2,7,10	0
2	UDP	B	960	25/25	0.98	0.10	2,2,4,5	0
2	UDP	D	980	25/25	0.98	0.11	2,4,6,7	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.

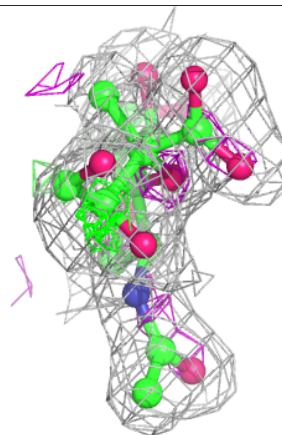
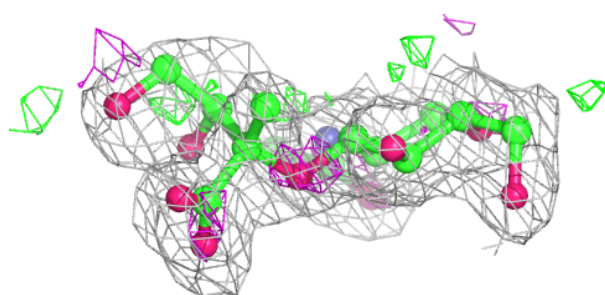
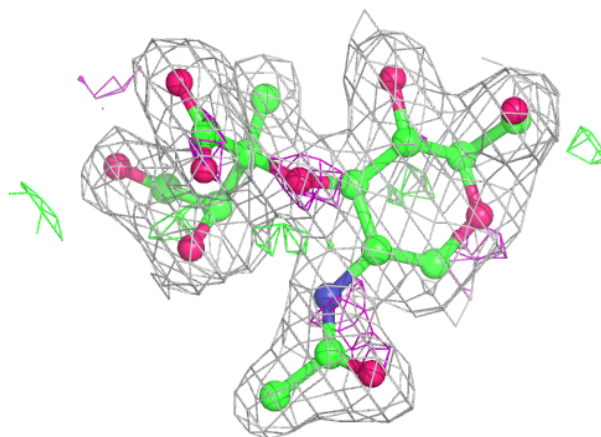
Electron density around UDC D 981 (B):

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



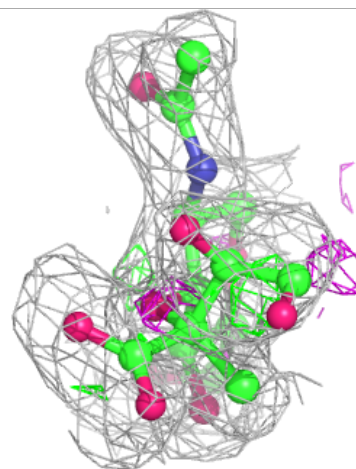
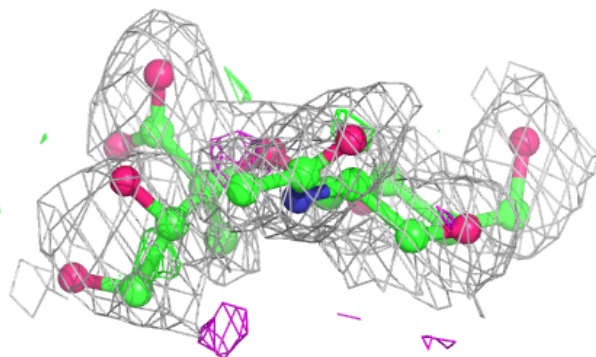
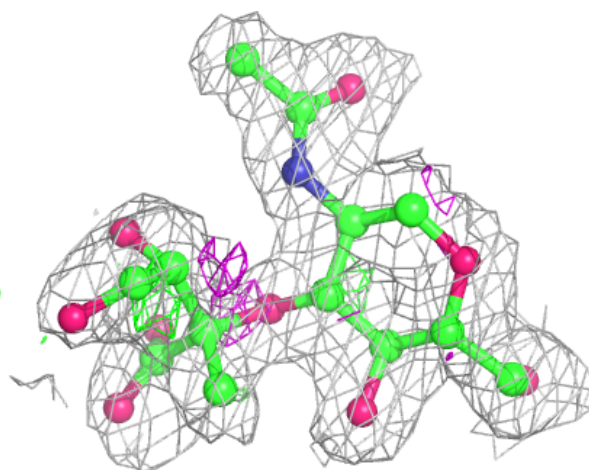
Electron density around UDC D 981 (A):

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



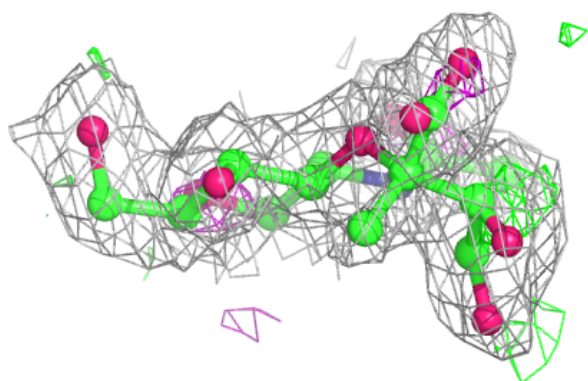
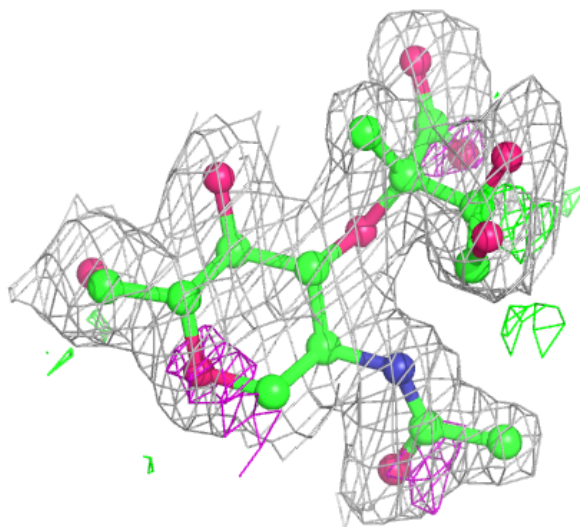
Electron density around UDC C 971 (B):

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and green (positive)



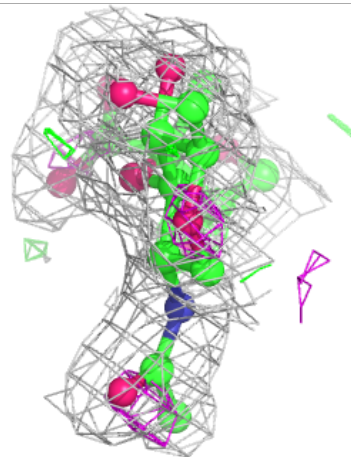
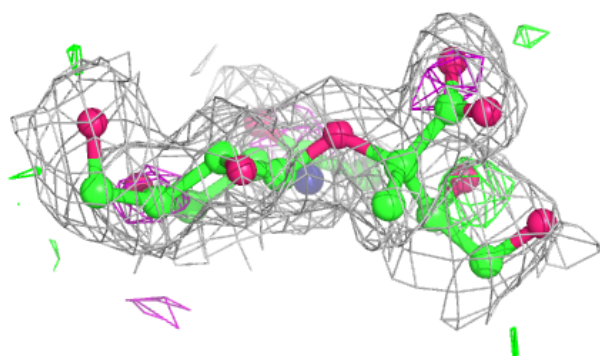
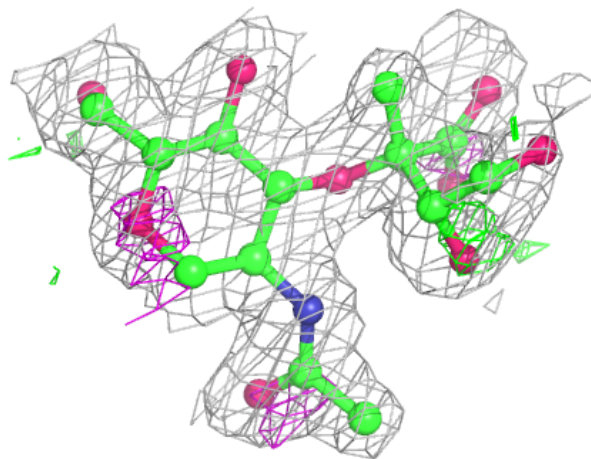
Electron density around UDC A 951 (A):

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and green (positive)



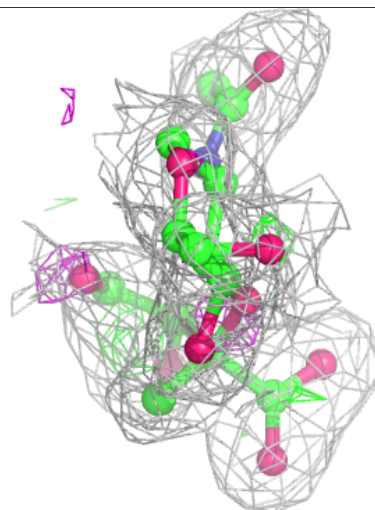
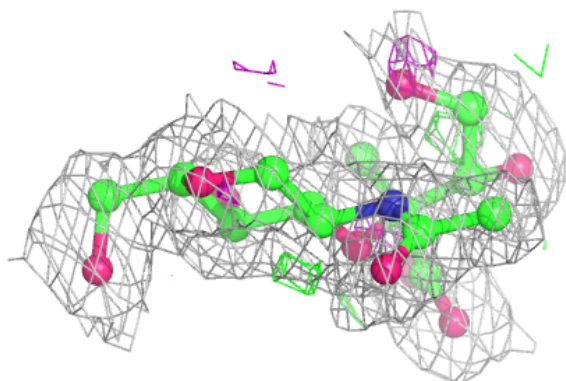
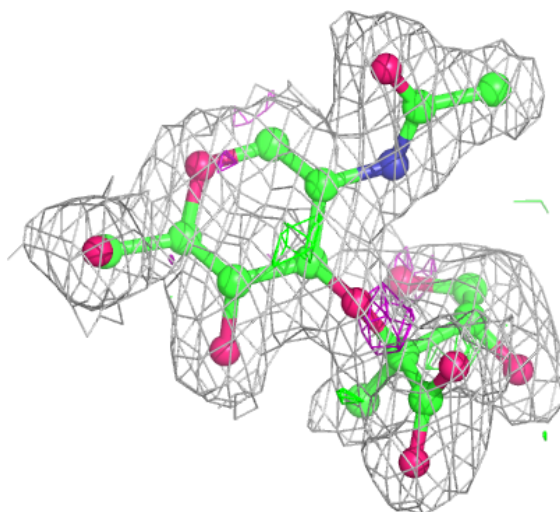
Electron density around UDC A 951 (B):

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and green (positive)



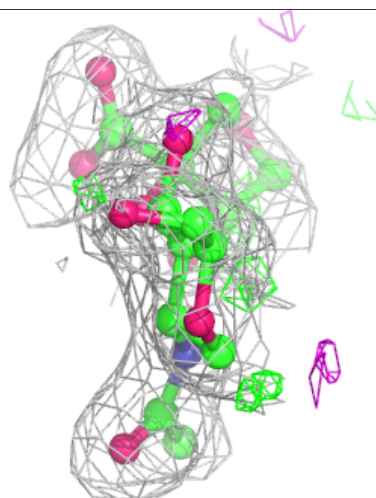
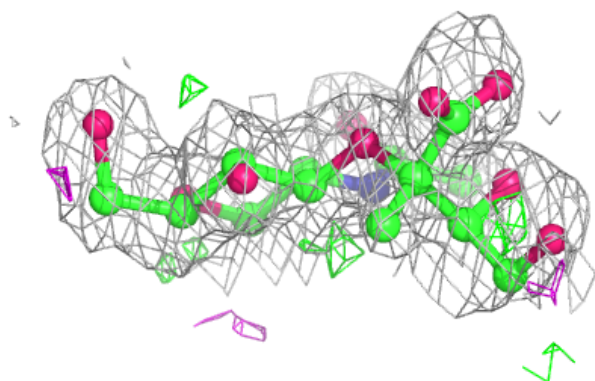
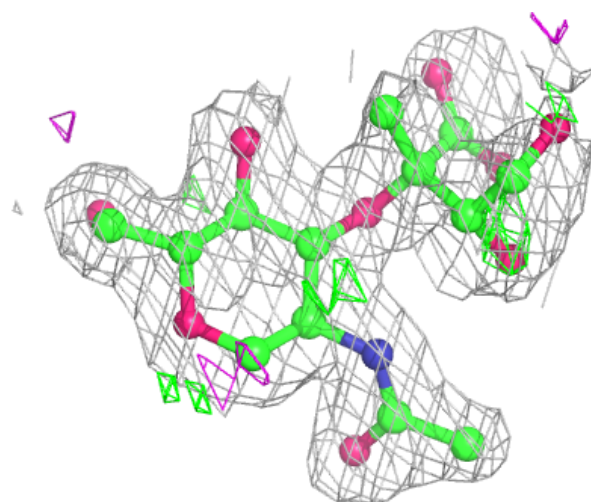
Electron density around UDC C 971 (A):

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and green (positive)



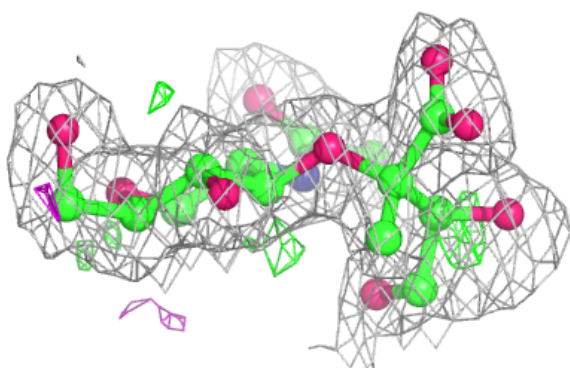
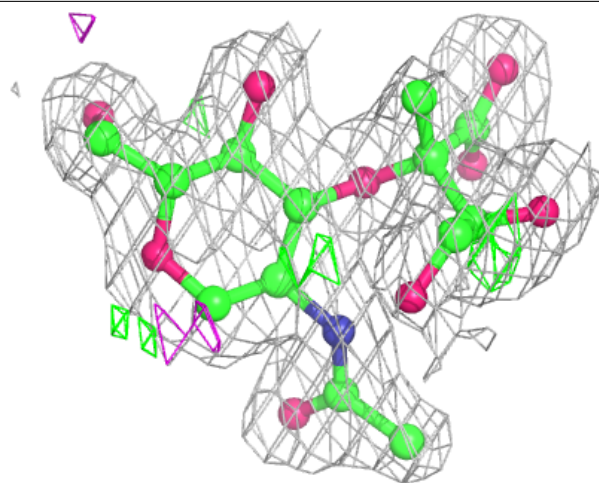
Electron density around UDC B 961 (B):

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and green (positive)



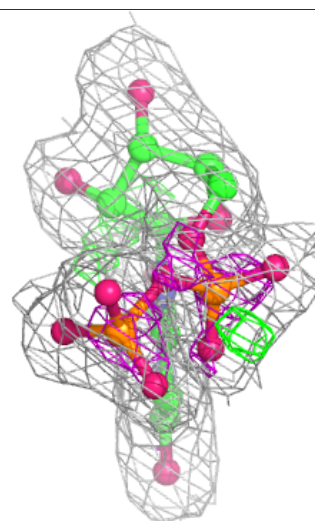
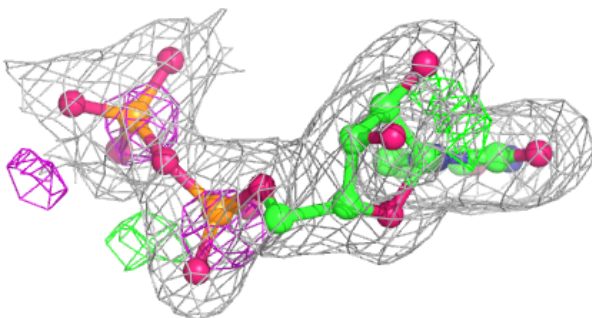
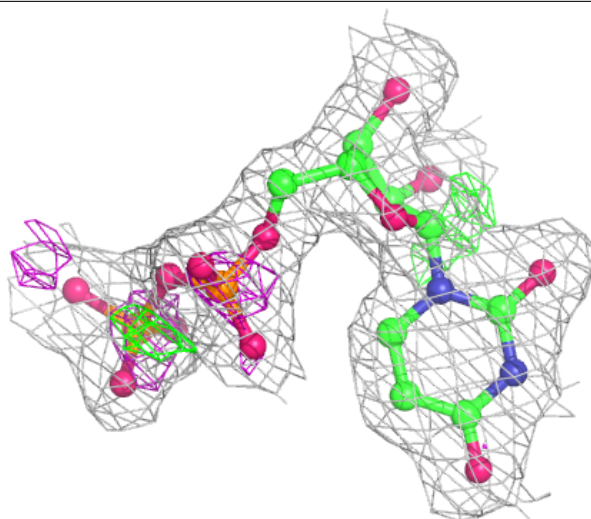
Electron density around UDC B 961 (A):

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and green (positive)



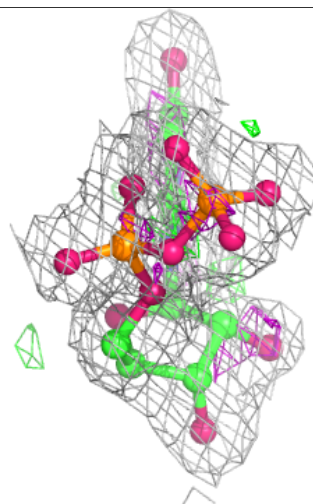
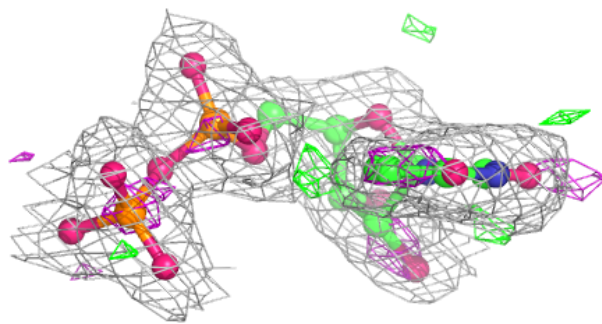
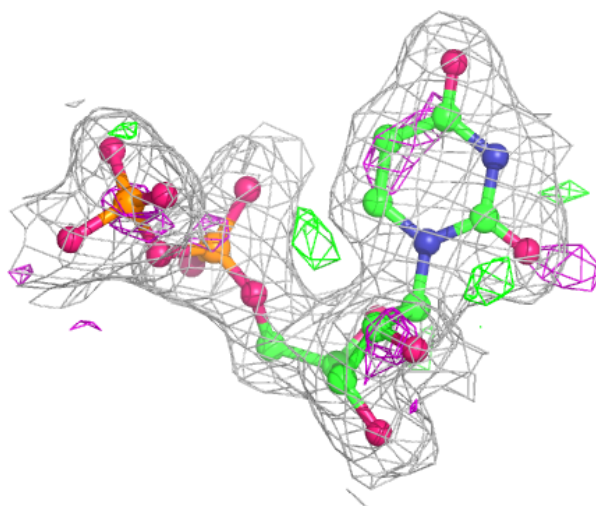
Electron density around UDP A 950:

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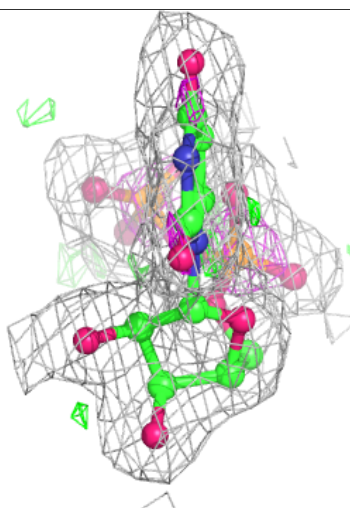
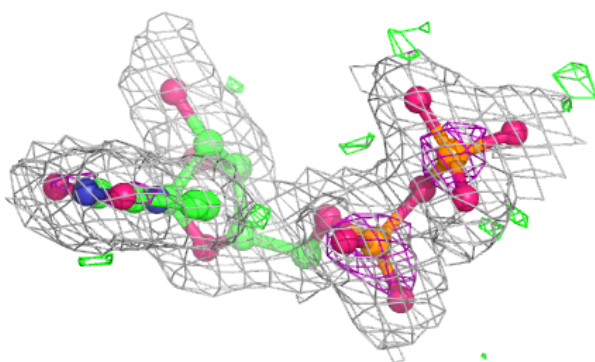
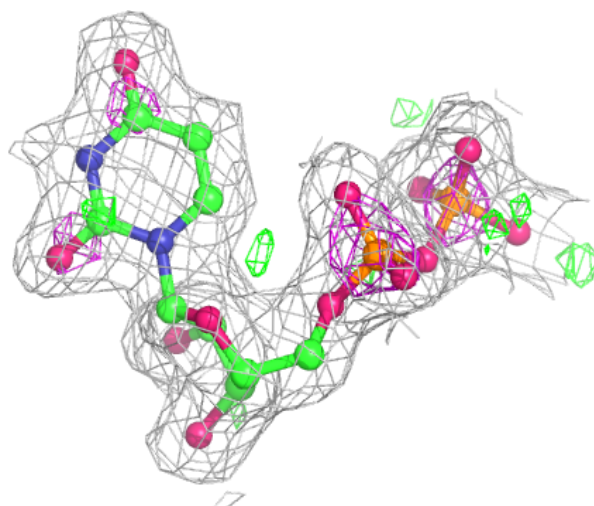
Electron density around UDP C 970:

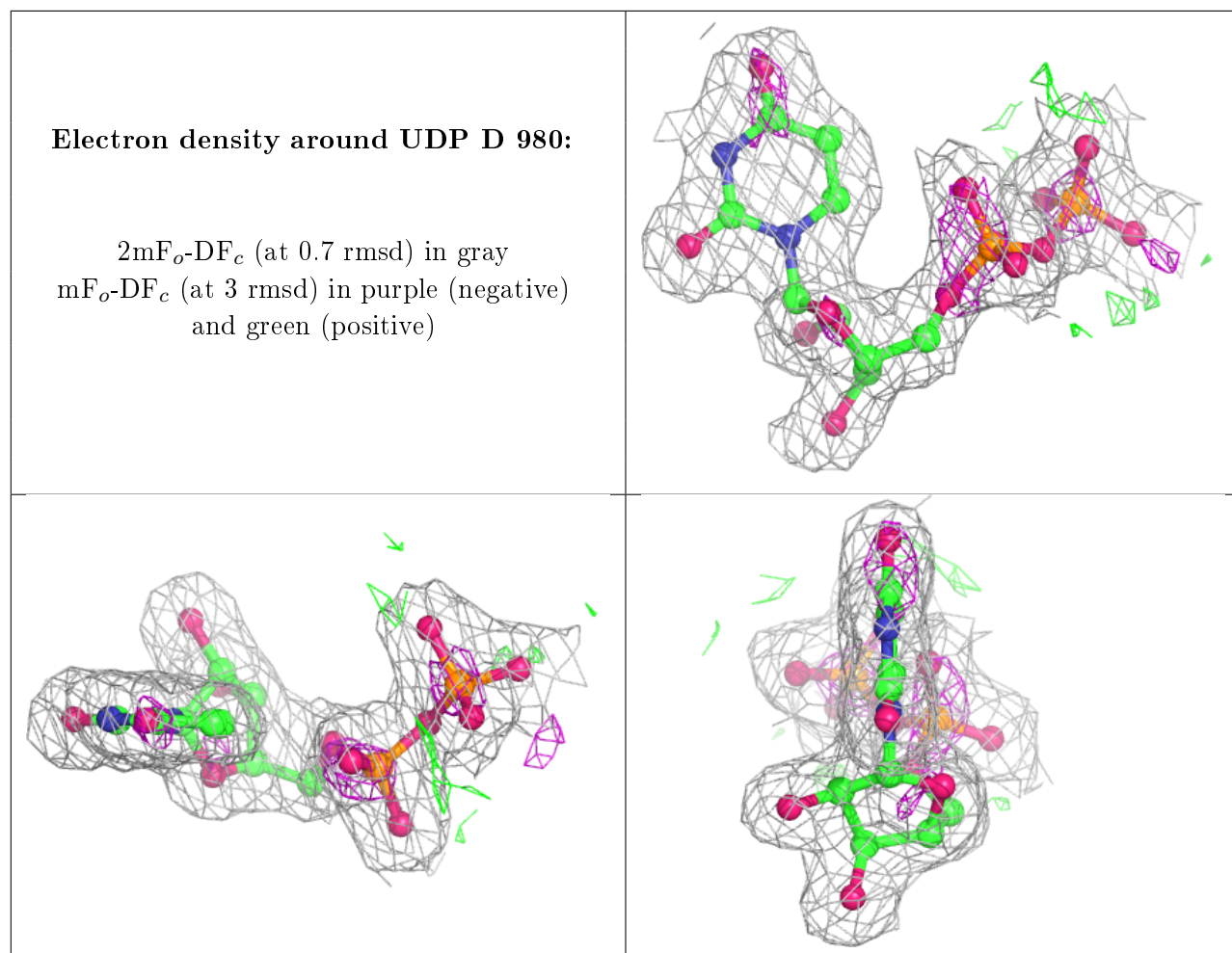
$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



Electron density around UDP B 960:

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





6.5 Other polymers ⓘ

There are no such residues in this entry.