



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 9, 2026 – 04:09 AM UTC

PDB ID : 1WT1 / pdb_00001wt1
Title : Mutant ABO(H) blood group glycosyltransferase with bound UDP and acceptor
Authors : Lee, H.J.; Barry, C.H.; Borisova, S.N.; Seto, N.O.L.; Zheng, R.B.; Blancher, A.; Evans, S.V.; Palcic, M.M.
Deposited on : 2004-11-12
Resolution : 1.55 Å(reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

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

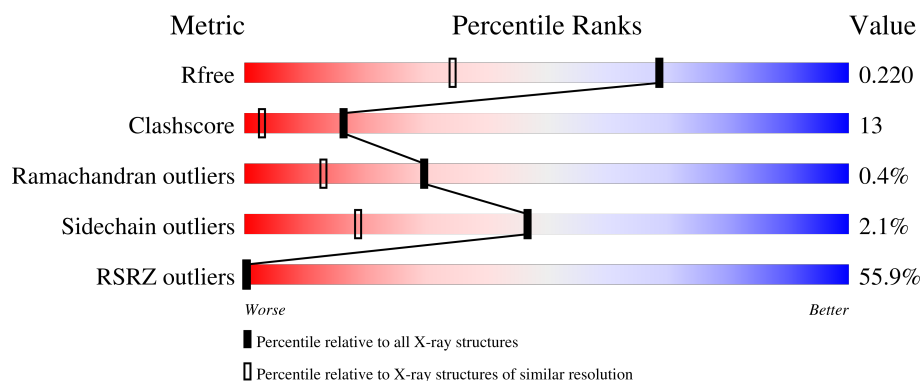
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.55 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	180053	2145 (1.56-1.56)
Clashscore	190562	2189 (1.56-1.56)
Ramachandran outliers	187476	2153 (1.56-1.56)
Sidechain outliers	187428	2150 (1.56-1.56)
RSRZ outliers	180081	2146 (1.56-1.56)

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

Mol	Chain	Length	Quality of chain
1	A	292	50% 67% 21% 10%
2	B	2	50% 50%

2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 2436 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 Histo-blood group ABO system transferase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	263	Total	C	N	O	S	0	0	0
			2153	1400	369	374	10			

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	63	MET	-	initiating methionine	UNP P16442
A	268	ARG	GLY	engineered mutation	UNP P16442

- Molecule 2 is an oligosaccharide called alpha-L-fucopyranose-(1-2)-hexyl beta-D-galactopyranoside.

Mol	Chain	Residues	Atoms			ZeroOcc	AltConf	Trace
2	B	2	Total	C	O	0	0	0
			28	18	10			

- Molecule 3 is MERCURY (II) ION (CCD ID: HG) (formula: Hg).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	4	Total	Hg	0	0
			4	4		

- Molecule 4 is URIDINE-5'-DIPHOSPHATE (CCD ID: UDP) (formula: C₉H₁₄N₂O₁₂P₂).



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

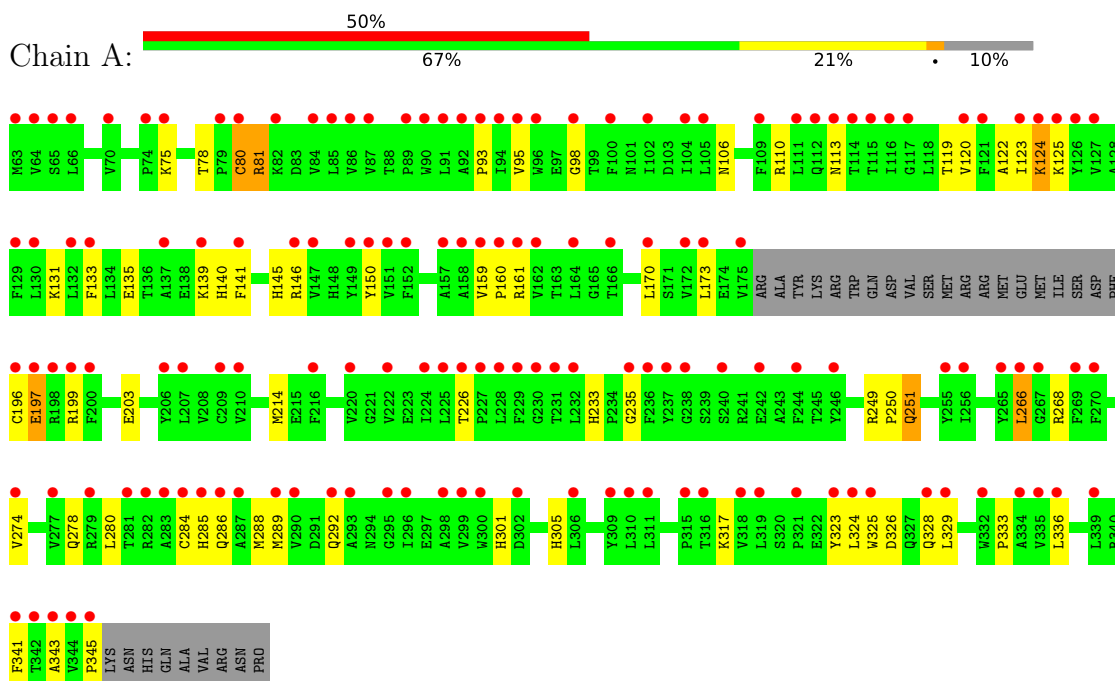
- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	226	Total	O	0	0
			226	226		

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: Histo-blood group ABO system transferase



- Molecule 2: alpha-L-fucopyranose-(1-2)-hexyl beta-D-galactopyranoside



4 Data and refinement statistics

Property	Value	Source
Space group	C 2 2 21	Depositor
Cell constants a, b, c, α , β , γ	52.70Å 150.30Å 79.50Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	20.00 – 1.55 20.00 – 1.55	Depositor EDS
% Data completeness (in resolution range)	(Not available) (20.00-1.55) 96.2 (20.00-1.55)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	3.00 (at 1.55Å)	Xtriage
Refinement program	unknown	Depositor
R, R_{free}	0.209 , 0.248 0.207 , 0.220	Depositor DCC
R_{free} test set	267 reflections (0.60%)	wwPDB-VP
Wilson B-factor (Å ²)	22.1	Xtriage
Anisotropy	0.249	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.42 , 45.1	EDS
L-test for twinning ²	$\langle L \rangle = 0.51$, $\langle L^2 \rangle = 0.34$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	2436	wwPDB-VP
Average B, all atoms (Å ²)	23.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.11% 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: FUC, HG, BHG, 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	0.34	0/2214	0.91	6/3010 (0.2%)

There are no bond length outliers.

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	95	VAL	N-CA-C	6.44	117.70	107.98
1	A	268	ARG	N-CA-C	6.15	120.37	112.26
1	A	124	LYS	CB-CA-C	-5.77	109.90	116.54
1	A	141	PHE	N-CA-C	5.31	116.96	108.41
1	A	301	HIS	CB-CA-C	-5.16	110.61	116.54
1	A	301	HIS	N-CA-C	5.01	115.92	108.31

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	2153	0	2142	57	0
2	B	28	0	33	2	0
3	A	4	0	0	0	0
4	A	25	0	11	0	0
5	A	226	0	0	4	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
All	All	2436	0	2186	57	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 13.

All (57) 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:A:125:LYS:HD3	1:A:125:LYS:H	1.29	0.94
1:A:233:HIS:HD2	1:A:235:GLY:H	1.20	0.88
1:A:226:THR:HG21	1:A:317:LYS:HB2	1.72	0.72
1:A:123:ILE:HG22	1:A:124:LYS:HG3	1.72	0.71
1:A:125:LYS:HD3	1:A:125:LYS:N	2.05	0.70
1:A:139:LYS:O	1:A:139:LYS:HD3	1.90	0.70
1:A:125:LYS:H	1:A:125:LYS:CD	2.07	0.67
1:A:251:GLN:NE2	1:A:251:GLN:H	1.92	0.67
1:A:233:HIS:HA	1:A:266:LEU:HD22	1.78	0.65
1:A:328:GLN:NE2	1:A:345:PRO:HB3	2.17	0.60
1:A:139:LYS:HD2	1:A:140:HIS:CE1	2.39	0.58
1:A:197:GLU:HG3	5:A:1071:HOH:O	2.05	0.56
1:A:329:LEU:HD12	2:B:2:FUC:H4	1.86	0.56
1:A:266:LEU:HG	1:A:324:LEU:HD13	1.87	0.55
1:A:80:CYS:O	1:A:81:ARG:HB2	2.08	0.52
1:A:333:PRO:HD2	1:A:336:LEU:HD12	1.92	0.52
1:A:131:LYS:O	1:A:135:GLU:HG3	2.10	0.52
1:A:233:HIS:CD2	1:A:235:GLY:H	2.12	0.52
1:A:75:LYS:HB2	1:A:78:THR:HB	1.93	0.51
1:A:122:ALA:C	1:A:123:ILE:HD12	2.36	0.50
1:A:285:HIS:O	1:A:289:MET:HG3	2.12	0.50
1:A:139:LYS:HD2	1:A:140:HIS:NE2	2.27	0.49
1:A:274:VAL:O	1:A:278:GLN:HG3	2.12	0.49
1:A:325:TRP:CZ3	1:A:336:LEU:HD11	2.47	0.49
1:A:196:CYS:HB3	5:A:1039:HOH:O	2.11	0.48
1:A:93:PRO:HG2	1:A:317:LYS:HG2	1.96	0.48
1:A:323:TYR:O	1:A:341:PHE:HB3	2.13	0.48
1:A:120:VAL:HG11	1:A:133:PHE:CZ	2.49	0.48
1:A:196:CYS:SG	1:A:199:ARG:HB2	2.54	0.48
1:A:80:CYS:O	1:A:81:ARG:CB	2.61	0.48
1:A:280:LEU:C	1:A:280:LEU:HD23	2.39	0.47
1:A:106:ASN:OD1	1:A:145:HIS:HE1	1.97	0.47
1:A:328:GLN:HE22	1:A:345:PRO:HB3	1.76	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:173:LEU:HD22	1:A:173:LEU:N	2.30	0.46
1:A:123:ILE:HD12	1:A:123:ILE:N	2.32	0.45
1:A:251:GLN:H	1:A:251:GLN:HE21	1.62	0.44
1:A:233:HIS:HE1	2:B:1:BHG:O4	2.01	0.44
1:A:324:LEU:HD23	1:A:324:LEU:C	2.43	0.44
1:A:110:ARG:HD2	1:A:110:ARG:HA	1.86	0.44
1:A:226:THR:HB	1:A:317:LYS:HD2	2.00	0.43
1:A:123:ILE:CG2	1:A:124:LYS:HG3	2.45	0.43
1:A:170:LEU:C	1:A:170:LEU:HD23	2.44	0.43
1:A:286:GLN:HA	1:A:289:MET:HE3	2.01	0.42
1:A:305:HIS:HE1	5:A:1015:HOH:O	2.01	0.42
1:A:286:GLN:HA	1:A:289:MET:CE	2.50	0.42
1:A:325:TRP:CE3	1:A:336:LEU:HD11	2.55	0.42
1:A:113:ASN:HD21	1:A:146:ARG:HH11	1.68	0.41
1:A:214:MET:SD	1:A:343:ALA:HA	2.60	0.41
1:A:159:VAL:HA	1:A:160:PRO:HD3	1.92	0.41
1:A:139:LYS:HD3	1:A:139:LYS:C	2.46	0.41
1:A:199:ARG:O	1:A:203:GLU:HG3	2.21	0.41
1:A:289:MET:HA	1:A:292:GLN:HG2	2.01	0.41
1:A:284:CYS:O	1:A:288:MET:HG3	2.20	0.41
1:A:119:THR:HG22	1:A:150:TYR:HB2	2.03	0.41
1:A:249:ARG:HA	1:A:250:PRO:HD3	1.92	0.41
1:A:80:CYS:SG	1:A:98:GLY:O	2.73	0.40
1:A:326:ASP:HB2	5:A:1000:HOH:O	2.20	0.40

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	259/292 (89%)	252 (97%)	6 (2%)	1 (0%)	30 13

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	81	ARG

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	234/261 (90%)	229 (98%)	5 (2%)	47 19

All (5) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	80	CYS
1	A	161	ARG
1	A	197	GLU
1	A	251	GLN
1	A	266	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (12) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	73	GLN
1	A	112	GLN
1	A	113	ASN
1	A	145	HIS
1	A	155	GLN
1	A	169	GLN
1	A	233	HIS
1	A	251	GLN
1	A	285	HIS
1	A	286	GLN
1	A	305	HIS
1	A	328	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

2 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	BHG	B	1	2	18,18,18	0.92	1 (5%)	23,23,23	0.81	1 (4%)
2	FUC	B	2	2	10,10,11	0.51	0	14,14,16	0.32	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	BHG	B	1	2	-	0/9/29/29	0/1/1/1
2	FUC	B	2	2	-	-	0/1/1/1

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	1	BHG	C4'-C3'	2.10	1.62	1.51

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	1	BHG	O1-C1'-C2'	-2.94	99.39	109.37

There are no chirality outliers.

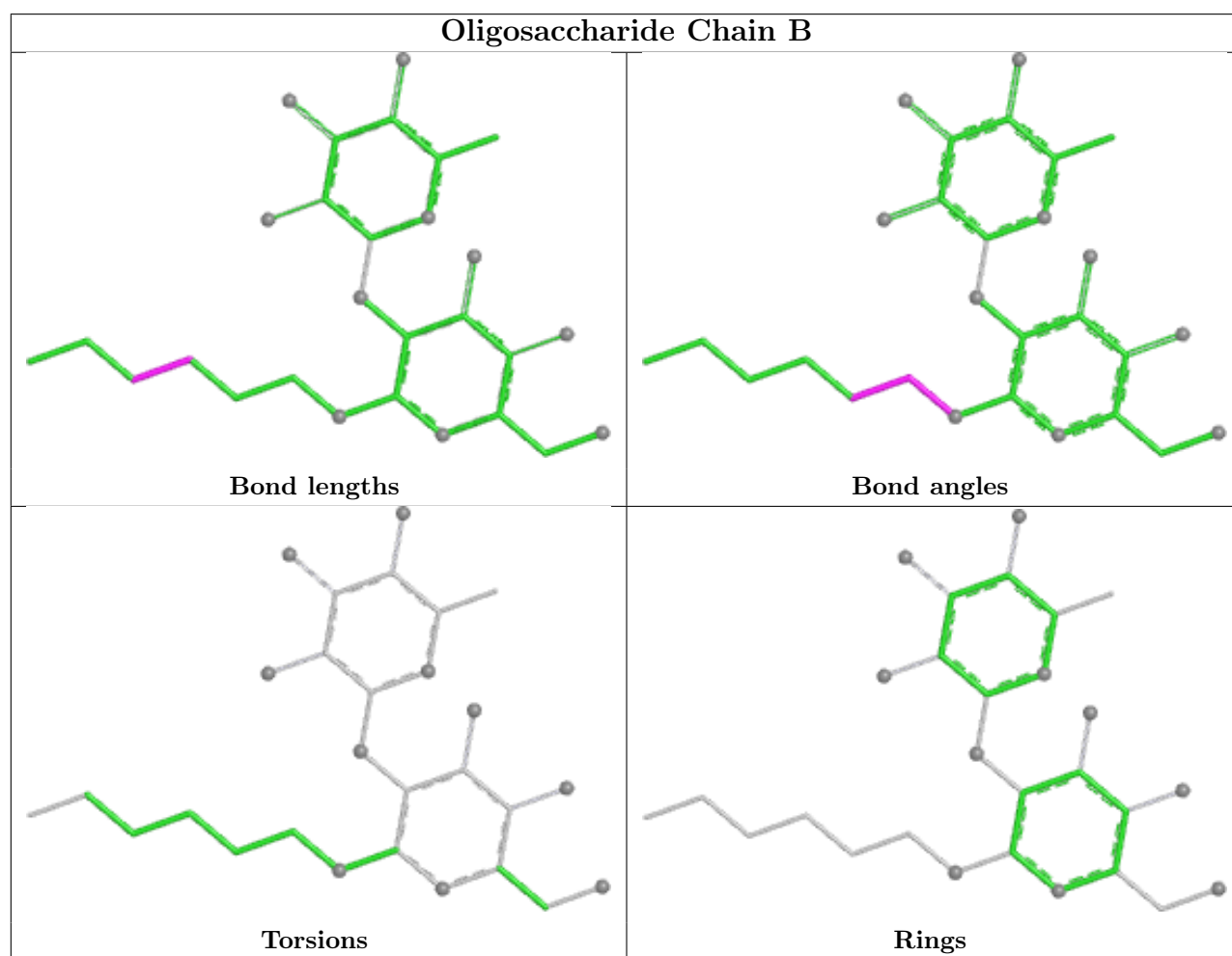
There are no torsion outliers.

There are no ring outliers.

2 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	2	FUC	1	0
2	B	1	BHG	1	0

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



5.6 Ligand geometry [i](#)

Of 5 ligands modelled in this entry, 4 are monoatomic - leaving 1 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
4	UDP	A	475	-	25,26,26	1.92	3 (12%)	38,40,40	1.21	4 (10%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	UDP	A	475	-	-	3/16/32/32	0/2/2/2

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	A	475	UDP	C6-C5	7.39	1.52	1.35
4	A	475	UDP	PB-O1B	3.83	1.62	1.50
4	A	475	UDP	C4-N3	2.29	1.42	1.38

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	A	475	UDP	O3B-PB-O2B	3.17	119.69	107.80
4	A	475	UDP	O2A-PA-O3A	2.94	115.22	107.27
4	A	475	UDP	O3B-PB-O3A	2.76	113.89	104.64
4	A	475	UDP	PA-O5'-C5'	2.19	133.91	121.35

There are no chirality outliers.

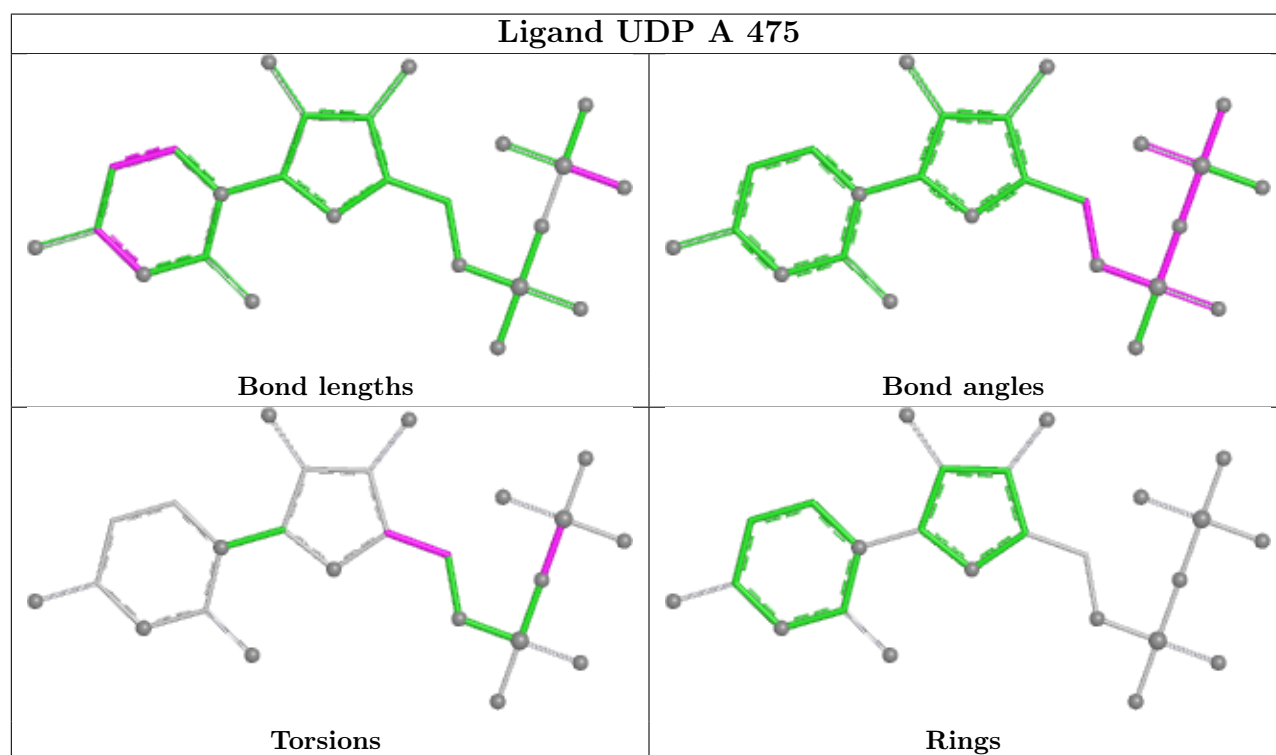
All (3) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	475	UDP	PA-O3A-PB-O3B
4	A	475	UDP	O4'-C4'-C5'-O5'
4	A	475	UDP	PA-O3A-PB-O1B

There are no ring outliers.

No monomer is involved in short contacts.

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.



5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data ⓘ

6.1 Protein, DNA and RNA chains ⓘ

In the following table, the column labelled ‘#RSRZ> 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 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	263/292 (90%)	2.08	147 (55%) 0 0	12, 20, 33, 57	0

All (147) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	80	CYS	8.1
1	A	329	LEU	6.2
1	A	196	CYS	5.1
1	A	209	CYS	4.1
1	A	266	LEU	4.1
1	A	121	PHE	4.0
1	A	123	ILE	3.6
1	A	293	ALA	3.5
1	A	345	PRO	3.5
1	A	292	GLN	3.4
1	A	197	GLU	3.4
1	A	343	ALA	3.4
1	A	281	THR	3.4
1	A	161	ARG	3.3
1	A	344	VAL	3.3
1	A	112	GLN	3.2
1	A	63	MET	3.2
1	A	342	THR	3.2
1	A	79	PRO	3.1
1	A	335	VAL	3.1
1	A	172	VAL	3.1
1	A	92	ALA	3.1
1	A	302	ASP	3.0
1	A	299	VAL	3.0
1	A	96	TRP	3.0
1	A	87	VAL	3.0
1	A	120	VAL	3.0

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Mol	Chain	Res	Type	RSRZ
1	A	199	ARG	2.9
1	A	336	LEU	2.9
1	A	139	LYS	2.9
1	A	220	VAL	2.9
1	A	207	LEU	2.8
1	A	157	ALA	2.8
1	A	321	PRO	2.8
1	A	270	PHE	2.8
1	A	224	ILE	2.8
1	A	65	SER	2.7
1	A	339	LEU	2.7
1	A	90	TRP	2.7
1	A	127	VAL	2.7
1	A	147	VAL	2.7
1	A	319	LEU	2.7
1	A	74	PRO	2.7
1	A	129	PHE	2.7
1	A	82	LYS	2.6
1	A	86	VAL	2.6
1	A	95	VAL	2.6
1	A	283	ALA	2.6
1	A	318	VAL	2.6
1	A	300	TRP	2.6
1	A	236	PHE	2.6
1	A	255	TYR	2.6
1	A	284	CYS	2.5
1	A	102	ILE	2.5
1	A	113	ASN	2.5
1	A	126	TYR	2.5
1	A	170	LEU	2.5
1	A	198	ARG	2.5
1	A	93	PRO	2.5
1	A	298	ALA	2.5
1	A	166	THR	2.5
1	A	267	GLY	2.5
1	A	306	LEU	2.5
1	A	309	TYR	2.5
1	A	124	LYS	2.5
1	A	226	THR	2.5
1	A	277	VAL	2.5
1	A	295	GLY	2.4
1	A	94	ILE	2.4

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Mol	Chain	Res	Type	RSRZ
1	A	200	PHE	2.4
1	A	269	PHE	2.4
1	A	290	VAL	2.4
1	A	91	LEU	2.4
1	A	111	LEU	2.4
1	A	162	VAL	2.4
1	A	89	PRO	2.4
1	A	256	ILE	2.4
1	A	146	ARG	2.4
1	A	173	LEU	2.4
1	A	109	PHE	2.4
1	A	222	VAL	2.3
1	A	130	LEU	2.3
1	A	206	TYR	2.3
1	A	246	TYR	2.3
1	A	98	GLY	2.3
1	A	235	GLY	2.3
1	A	137	ALA	2.3
1	A	100	PHE	2.3
1	A	244	PHE	2.3
1	A	64	VAL	2.3
1	A	84	VAL	2.3
1	A	160	PRO	2.3
1	A	227	PRO	2.3
1	A	117	GLY	2.3
1	A	324	LEU	2.3
1	A	323	TYR	2.3
1	A	75	LYS	2.3
1	A	141	PHE	2.3
1	A	230	GLY	2.3
1	A	225	LEU	2.3
1	A	114	THR	2.2
1	A	175	VAL	2.2
1	A	274	VAL	2.2
1	A	240	SER	2.2
1	A	115	THR	2.2
1	A	152	PHE	2.2
1	A	85	LEU	2.2
1	A	105	LEU	2.2
1	A	242	GLU	2.2
1	A	332	TRP	2.2
1	A	285	HIS	2.2

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Mol	Chain	Res	Type	RSRZ
1	A	132	LEU	2.1
1	A	228	LEU	2.1
1	A	310	LEU	2.1
1	A	158	ALA	2.1
1	A	287	ALA	2.1
1	A	104	ILE	2.1
1	A	238	GLY	2.1
1	A	296	ILE	2.1
1	A	237	TYR	2.1
1	A	279	ARG	2.1
1	A	133	PHE	2.1
1	A	341	PHE	2.1
1	A	70	VAL	2.1
1	A	159	VAL	2.1
1	A	164	LEU	2.1
1	A	282	ARG	2.1
1	A	286	GLN	2.1
1	A	328	GLN	2.1
1	A	66	LEU	2.1
1	A	232	LEU	2.1
1	A	125	LYS	2.1
1	A	149	TYR	2.1
1	A	265	TYR	2.1
1	A	216	PHE	2.0
1	A	229	PHE	2.0
1	A	151	VAL	2.0
1	A	334	ALA	2.0
1	A	311	LEU	2.0
1	A	116	ILE	2.0
1	A	289	MET	2.0
1	A	231	THR	2.0
1	A	315	PRO	2.0
1	A	316	THR	2.0
1	A	325	TRP	2.0
1	A	210	VAL	2.0
1	A	150	TYR	2.0

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

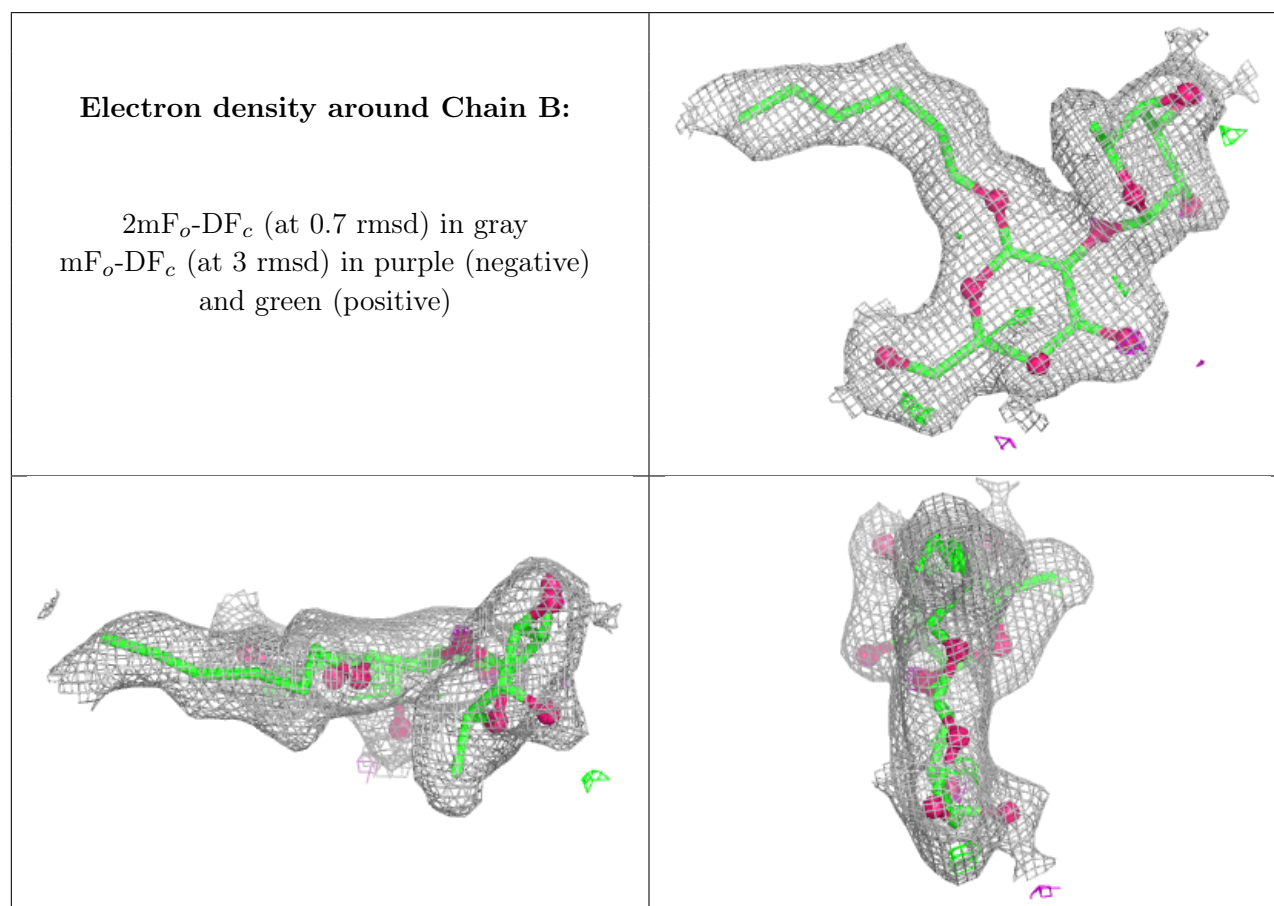
There are no non-standard protein/DNA/RNA residues in this entry.

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, 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
2	FUC	B	2	10/11	0.72	0.14	22,24,25,26	0
2	BHG	B	1	18/18	0.81	0.14	19,21,33,35	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.

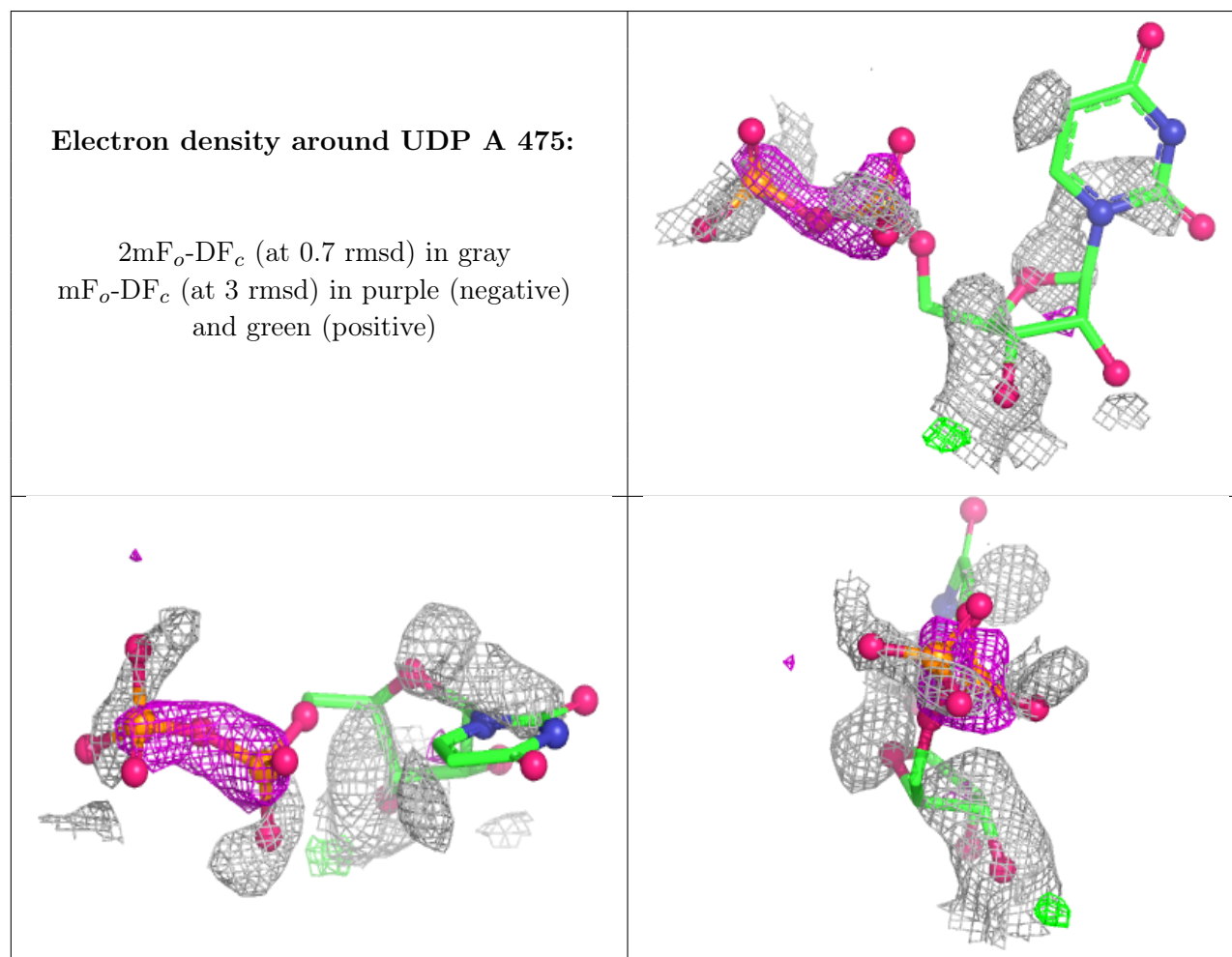


6.4 Ligands [i](#)

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($\text{\AA}^2$)	Q<0.9
4	UDP	A	475	25/25	0.19	0.25	64,65,71,71	0
3	HG	A	402	1/1	0.92	0.14	53,53,53,53	1
3	HG	A	404	1/1	0.94	0.23	61,61,61,61	1
3	HG	A	401	1/1	0.95	0.08	34,34,34,34	1
3	HG	A	403	1/1	0.95	0.13	40,40,40,40	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.



6.5 Other polymers [i](#)

There are no such residues in this entry.