



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 5, 2026 – 04:28 PM UTC

PDB ID : 6VGC / pdb_00006vgc
Title : Crystal Structures of FLAP bound to DG-031
Authors : Ho, J.D.; Lee, M.R.; Rauch, C.T.; Aznavour, K.; Park, J.S.; Luz, J.G.;
Antonyamy, S.; Condon, B.; Maletic, M.; Zhang, A.; Hickey, M.J.; Hughes,
N.E.; Chandrasekhar, S.; Sloan, A.V.; Gooding, K.; Harvey, A.; Yu, X.P.;
Kahl, S.D.; Norman, B.H.
Deposited on : 2020-01-07
Resolution : 2.37 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](#) ①) were used in the production of this report:

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

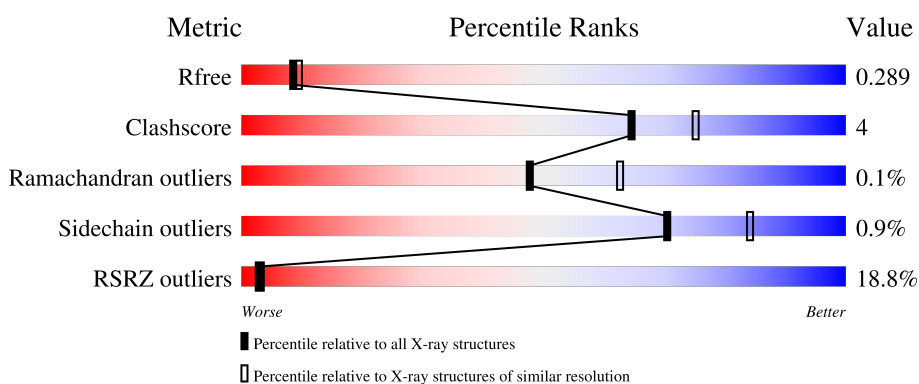
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.37 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.



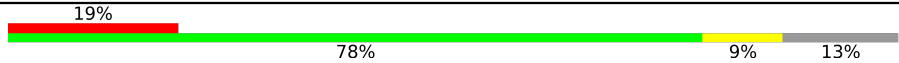
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	180053	7164 (2.40-2.36)
Clashscore	190562	7722 (2.40-2.36)
Ramachandran outliers	187476	7626 (2.40-2.36)
Sidechain outliers	187428	7627 (2.40-2.36)
RSRZ outliers	180081	7170 (2.40-2.36)

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	171	 14% 81% 6% 16%
1	B	171	 12% 78% 8% 13%
1	C	171	 13% 82% 6% 12%
1	D	171	 23% 84% 6% 9%
1	E	171	 18% 79% 11% 10%

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Mol	Chain	Length	Quality of chain
1	F	171	 <p>A horizontal bar chart representing the quality of chain. The bar is divided into four segments: a red segment on the left labeled '19%', a large green segment labeled '78%', a yellow segment labeled '9%', and a grey segment on the right labeled '13%'.</p>

2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 7340 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 5-lipoxygenase-activating protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	144	1134	757	175	198	4	0	0	0
1	B	149	1174	782	184	204	4	0	0	0
1	C	151	1191	796	183	208	4	0	0	0
1	D	155	1221	815	187	215	4	0	0	0
1	E	154	1225	815	194	212	4	0	0	0
1	F	148	1152	772	174	202	4	0	0	0

There are 72 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-1	MET	-	initiating methionine	UNP P20292
A	0	SER	-	expression tag	UNP P20292
A	1	LEU	-	expression tag	UNP P20292
A	148	ALA	LYS	conflict	UNP P20292
A	162	GLU	-	expression tag	UNP P20292
A	163	GLY	-	expression tag	UNP P20292
A	164	HIS	-	expression tag	UNP P20292
A	165	HIS	-	expression tag	UNP P20292
A	166	HIS	-	expression tag	UNP P20292
A	167	HIS	-	expression tag	UNP P20292
A	168	HIS	-	expression tag	UNP P20292
A	169	HIS	-	expression tag	UNP P20292
B	-1	MET	-	initiating methionine	UNP P20292
B	0	SER	-	expression tag	UNP P20292
B	1	LEU	-	expression tag	UNP P20292
B	148	ALA	LYS	conflict	UNP P20292
B	162	GLU	-	expression tag	UNP P20292

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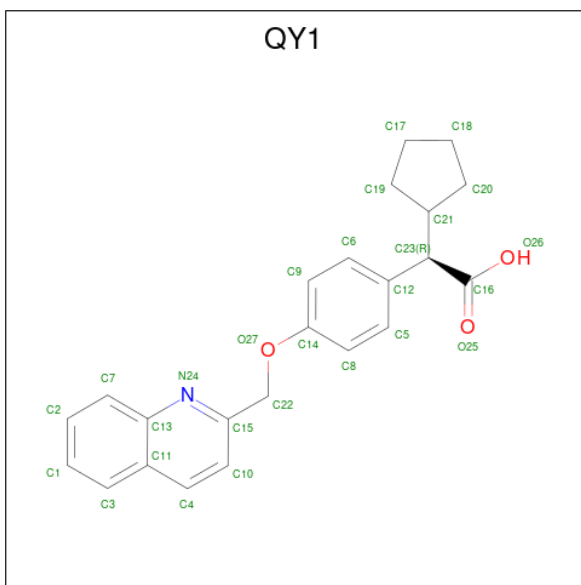
Chain	Residue	Modelled	Actual	Comment	Reference
B	163	GLY	-	expression tag	UNP P20292
B	164	HIS	-	expression tag	UNP P20292
B	165	HIS	-	expression tag	UNP P20292
B	166	HIS	-	expression tag	UNP P20292
B	167	HIS	-	expression tag	UNP P20292
B	168	HIS	-	expression tag	UNP P20292
B	169	HIS	-	expression tag	UNP P20292
C	-1	MET	-	initiating methionine	UNP P20292
C	0	SER	-	expression tag	UNP P20292
C	1	LEU	-	expression tag	UNP P20292
C	148	ALA	LYS	conflict	UNP P20292
C	162	GLU	-	expression tag	UNP P20292
C	163	GLY	-	expression tag	UNP P20292
C	164	HIS	-	expression tag	UNP P20292
C	165	HIS	-	expression tag	UNP P20292
C	166	HIS	-	expression tag	UNP P20292
C	167	HIS	-	expression tag	UNP P20292
C	168	HIS	-	expression tag	UNP P20292
C	169	HIS	-	expression tag	UNP P20292
D	-1	MET	-	initiating methionine	UNP P20292
D	0	SER	-	expression tag	UNP P20292
D	1	LEU	-	expression tag	UNP P20292
D	148	ALA	LYS	conflict	UNP P20292
D	162	GLU	-	expression tag	UNP P20292
D	163	GLY	-	expression tag	UNP P20292
D	164	HIS	-	expression tag	UNP P20292
D	165	HIS	-	expression tag	UNP P20292
D	166	HIS	-	expression tag	UNP P20292
D	167	HIS	-	expression tag	UNP P20292
D	168	HIS	-	expression tag	UNP P20292
D	169	HIS	-	expression tag	UNP P20292
E	-1	MET	-	initiating methionine	UNP P20292
E	0	SER	-	expression tag	UNP P20292
E	1	LEU	-	expression tag	UNP P20292
E	148	ALA	LYS	conflict	UNP P20292
E	162	GLU	-	expression tag	UNP P20292
E	163	GLY	-	expression tag	UNP P20292
E	164	HIS	-	expression tag	UNP P20292
E	165	HIS	-	expression tag	UNP P20292
E	166	HIS	-	expression tag	UNP P20292
E	167	HIS	-	expression tag	UNP P20292
E	168	HIS	-	expression tag	UNP P20292

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Chain	Residue	Modelled	Actual	Comment	Reference
E	169	HIS	-	expression tag	UNP P20292
F	-1	MET	-	initiating methionine	UNP P20292
F	0	SER	-	expression tag	UNP P20292
F	1	LEU	-	expression tag	UNP P20292
F	148	ALA	LYS	conflict	UNP P20292
F	162	GLU	-	expression tag	UNP P20292
F	163	GLY	-	expression tag	UNP P20292
F	164	HIS	-	expression tag	UNP P20292
F	165	HIS	-	expression tag	UNP P20292
F	166	HIS	-	expression tag	UNP P20292
F	167	HIS	-	expression tag	UNP P20292
F	168	HIS	-	expression tag	UNP P20292
F	169	HIS	-	expression tag	UNP P20292

- Molecule 2 is (2R)-cyclopentyl{4-[(quinolin-2-yl)methoxy]phenyl}acetic acid (CCD ID: QY1) (formula: C₂₃H₂₃NO₃) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	N	O		
2	A	1	Total	C	N	O	0	0
			27	23	1	3		
2	B	1	Total	C	N	O	0	0
			27	23	1	3		
2	C	1	Total	C	N	O	0	0
			27	23	1	3		
2	D	1	Total	C	N	O	0	0
			27	23	1	3		

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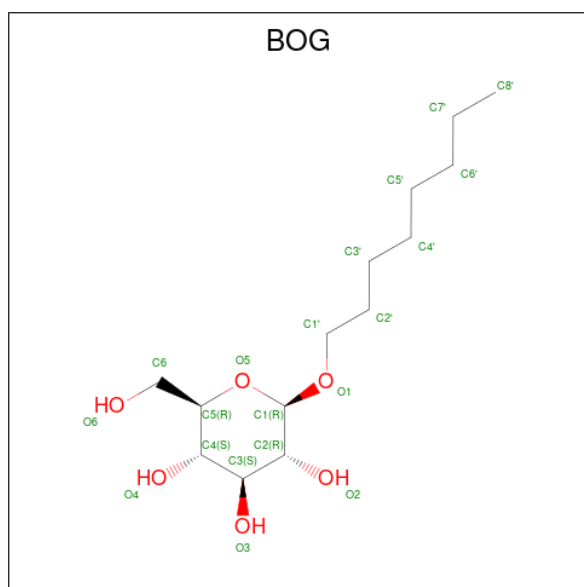
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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf	
2	E	1	Total	C	N	O	0	0
			27	23	1	3		
2	F	1	Total	C	N	O	0	0
			27	23	1	3		

- Molecule 3 is CALCIUM ION (CCD ID: CA) (formula: Ca).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	B	1	Total	Ca	0	0
			1	1		
3	D	1	Total	Ca	0	0
			1	1		

- Molecule 4 is octyl beta-D-glucopyranoside (CCD ID: BOG) (formula: C₁₄H₂₈O₆).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	F	1	Total	C	O	0	0
			20	14	6		

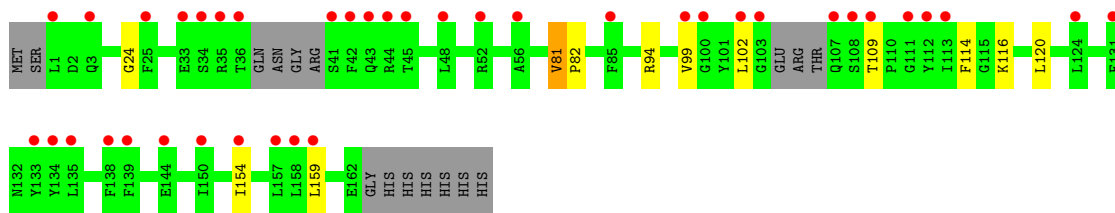
- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	11	Total	O	0	0
			11	11		
5	B	14	Total	O	0	0
			14	14		

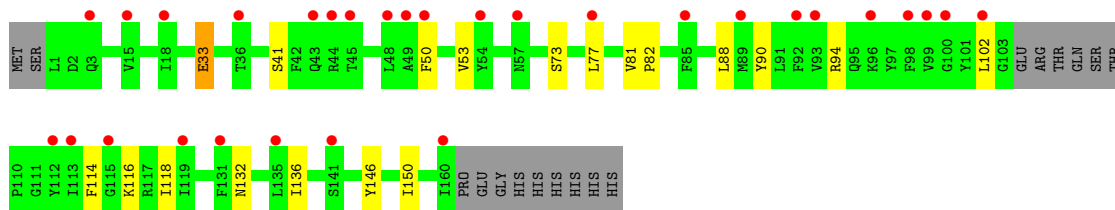
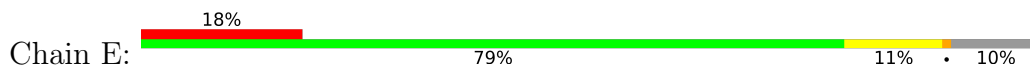
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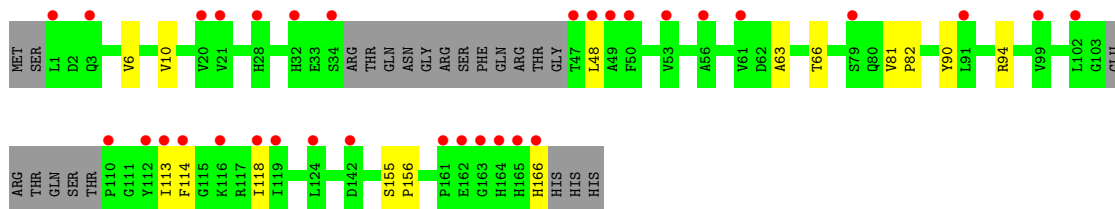
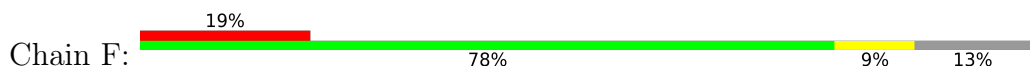
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	C	10	Total 10	O 10	0	0
5	D	8	Total 8	O 8	0	0
5	E	7	Total 7	O 7	0	0
5	F	9	Total 9	O 9	0	0



● Molecule 1: 5-lipoxygenase-activating protein



● Molecule 1: 5-lipoxygenase-activating protein



4 Data and refinement statistics i

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	65.91Å 101.49Å 111.86Å 90.00° 99.83° 90.00°	Depositor
Resolution (Å)	30.00 – 2.37 30.00 – 2.37	Depositor EDS
% Data completeness (in resolution range)	97.7 (30.00-2.37) 97.7 (30.00-2.37)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.04	Depositor
$\langle I/\sigma(I) \rangle$ ¹	3.43 (at 2.37Å)	Xtrriage
Refinement program	REFMAC 5.5.0109	Depositor
R, R_{free}	0.254 , 0.285 0.256 , 0.289	Depositor DCC
R_{free} test set	2896 reflections (4.94%)	wwPDB-VP
Wilson B-factor (Å ²)	47.2	Xtrriage
Anisotropy	0.247	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.32 , 49.9	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.93	EDS
Total number of atoms	7340	wwPDB-VP
Average B, all atoms (Å ²)	57.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.84% 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: BOG, QY1, CA

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	0.45	0/1163	0.83	0/1580
1	B	0.49	1/1204 (0.1%)	0.84	0/1634
1	C	0.47	0/1221	0.83	0/1660
1	D	0.48	1/1252 (0.1%)	0.83	0/1703
1	E	0.45	0/1256	0.79	0/1705
1	F	0.46	0/1183	0.83	0/1611
All	All	0.47	2/7279 (0.0%)	0.83	0/9893

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	81	VAL	CA-CB	5.90	1.57	1.54
1	D	81	VAL	CA-CB	5.61	1.56	1.54

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	1134	0	1122	8	0
1	B	1174	0	1157	8	0
1	C	1191	0	1186	9	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	D	1221	0	1215	7	0
1	E	1225	0	1231	10	0
1	F	1152	0	1124	11	0
2	A	27	0	0	6	0
2	B	27	0	0	2	0
2	C	27	0	0	5	0
2	D	27	0	0	1	0
2	E	27	0	0	6	0
2	F	27	0	0	3	0
3	B	1	0	0	0	0
3	D	1	0	0	0	0
4	F	20	0	28	0	0
5	A	11	0	0	1	0
5	B	14	0	0	0	0
5	C	10	0	0	0	0
5	D	8	0	0	0	0
5	E	7	0	0	0	0
5	F	9	0	0	0	0
All	All	7340	0	7063	56	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 4.

All (56) 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:116:LYS:HZ1	2:A:201:QY1:C16	1.63	1.11
1:A:116:LYS:NZ	2:A:201:QY1:C16	2.27	0.98
2:E:201:QY1:C19	2:E:201:QY1:O25	2.25	0.83
2:B:201:QY1:C20	1:F:166:HIS:HD2	2.02	0.73
1:C:94:ARG:HG2	1:C:114:PHE:CE2	2.24	0.72
1:C:116:LYS:HG2	2:C:201:QY1:C8	2.21	0.69
1:A:116:LYS:NZ	2:A:201:QY1:O25	2.24	0.68
1:D:109:THR:HB	1:E:41:SER:HA	1.78	0.65
2:E:201:QY1:O25	2:E:201:QY1:C17	2.48	0.61
1:A:116:LYS:CE	2:A:201:QY1:O25	2.49	0.60
1:C:94:ARG:HG2	1:C:114:PHE:HE2	1.64	0.60
2:A:201:QY1:N24	5:A:301:HOH:O	2.30	0.60
1:F:6:VAL:O	1:F:10:VAL:HG23	2.01	0.60
2:E:201:QY1:C10	2:E:201:QY1:C9	2.81	0.58
1:B:53:VAL:HG22	1:B:102:LEU:HD22	1.84	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:63:ALA:HB2	2:F:201:QY1:C7	2.37	0.55
1:E:116:LYS:HD3	2:E:201:QY1:O26	2.08	0.54
1:D:94:ARG:HG2	1:D:114:PHE:CE1	2.44	0.53
1:C:66:THR:HG21	2:C:201:QY1:C10	2.40	0.52
1:F:66:THR:HG21	2:F:201:QY1:C10	2.39	0.52
1:E:90:TYR:HB2	1:E:118:ILE:HG21	1.92	0.52
2:C:201:QY1:C6	2:C:201:QY1:C19	2.89	0.51
1:F:94:ARG:HG2	1:F:114:PHE:CE2	2.46	0.51
2:E:201:QY1:C9	2:E:201:QY1:C15	2.89	0.48
1:E:146:TYR:CZ	1:E:150:ILE:HD11	2.48	0.48
1:A:61:VAL:HG11	1:B:62:ASP:HA	1.95	0.48
1:D:99:VAL:HA	1:D:102:LEU:HD12	1.96	0.48
1:C:116:LYS:HG2	2:C:201:QY1:C5	2.43	0.48
1:E:53:VAL:HG22	1:E:102:LEU:HD22	1.96	0.47
1:F:94:ARG:HG2	1:F:114:PHE:HE2	1.78	0.47
1:B:37:GLN:HE22	1:B:47:THR:H	1.63	0.47
1:D:24:GLY:C	2:F:201:QY1:C20	2.89	0.46
1:B:12:LEU:HD11	1:B:75:GLY:HA3	1.96	0.46
2:E:201:QY1:C10	2:E:201:QY1:C14	2.93	0.46
1:B:0:SER:HB3	1:C:8:ASN:HB3	1.98	0.45
1:E:33:GLU:HG2	1:E:50:PHE:HA	1.98	0.45
1:A:81:VAL:HB	1:A:82:PRO:HD3	1.98	0.45
1:A:49:ALA:O	1:A:53:VAL:HG23	2.17	0.44
1:E:94:ARG:HG2	1:E:114:PHE:CE1	2.52	0.44
1:B:25:PHE:HA	2:C:201:QY1:C17	2.48	0.44
1:F:81:VAL:HB	1:F:82:PRO:HD3	1.99	0.44
1:E:81:VAL:HB	1:E:82:PRO:HD3	1.99	0.44
1:E:73:SER:O	1:E:77:LEU:HB2	2.18	0.43
1:D:81:VAL:HB	1:D:82:PRO:HD3	2.00	0.43
1:D:116:LYS:HD2	2:D:201:QY1:O25	2.19	0.43
1:F:113:ILE:H	1:F:113:ILE:HG13	1.72	0.43
2:B:201:QY1:C20	1:F:166:HIS:CD2	2.92	0.42
1:E:132:ASN:O	1:E:136:ILE:HG12	2.19	0.42
1:A:116:LYS:HZ2	2:A:201:QY1:C16	2.25	0.42
1:B:9:VAL:HG12	1:B:76:LEU:HD21	2.02	0.42
1:C:89:MET:HE3	1:D:159:LEU:HD23	2.02	0.41
1:F:90:TYR:HB2	1:F:118:ILE:HG21	2.02	0.41
1:C:11:LEU:O	1:C:15:VAL:HG12	2.21	0.41
1:C:12:LEU:HD11	1:C:75:GLY:HA3	2.04	0.40
1:B:81:VAL:HB	1:B:82:PRO:HD3	2.03	0.40
1:F:155:SER:HB3	1:F:156:PRO:HD3	2.03	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	138/171 (81%)	136 (99%)	2 (1%)	0	100	100
1	B	143/171 (84%)	140 (98%)	3 (2%)	0	100	100
1	C	145/171 (85%)	144 (99%)	1 (1%)	0	100	100
1	D	149/171 (87%)	147 (99%)	2 (1%)	0	100	100
1	E	150/171 (88%)	149 (99%)	1 (1%)	0	100	100
1	F	142/171 (83%)	139 (98%)	2 (1%)	1 (1%)	18	26
All	All	867/1026 (84%)	855 (99%)	11 (1%)	1 (0%)	48	62

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	F	48	LEU

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	119/146 (82%)	119 (100%)	0	100	100
1	B	122/146 (84%)	120 (98%)	2 (2%)	55	74
1	C	126/146 (86%)	125 (99%)	1 (1%)	73	85

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	D	130/146 (89%)	128 (98%)	2 (2%)	57	75
1	E	130/146 (89%)	128 (98%)	2 (2%)	57	75
1	F	119/146 (82%)	119 (100%)	0	100	100
All	All	746/876 (85%)	739 (99%)	7 (1%)	70	84

All (7) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	147	ILE
1	B	154	ILE
1	C	91	LEU
1	D	120	LEU
1	D	154	ILE
1	E	33	GLU
1	E	88	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	80	GLN
1	B	37	GLN
1	B	80	GLN
1	C	80	GLN
1	C	132	ASN
1	D	8	ASN
1	D	80	GLN
1	E	8	ASN
1	E	38	ASN
1	E	80	GLN
1	F	132	ASN
1	F	166	HIS

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 9 ligands modelled in this entry, 2 are monoatomic - leaving 7 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
2	QY1	F	201	-	30,30,30	0.87	1 (3%)	40,41,41	0.77	0
4	BOG	F	202	-	20,20,20	0.51	0	25,25,25	0.59	0
2	QY1	C	201	-	30,30,30	0.87	0	40,41,41	0.79	1 (2%)
2	QY1	E	201	-	30,30,30	0.87	1 (3%)	40,41,41	0.78	1 (2%)
2	QY1	A	201	-	30,30,30	0.87	0	40,41,41	0.85	1 (2%)
2	QY1	B	201	-	30,30,30	0.88	0	40,41,41	0.80	1 (2%)
2	QY1	D	201	-	30,30,30	0.87	0	40,41,41	0.75	1 (2%)

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	QY1	F	201	-	-	7/17/24/24	0/4/4/4
4	BOG	F	202	-	-	7/11/31/31	0/1/1/1
2	QY1	C	201	-	-	4/17/24/24	0/4/4/4
2	QY1	E	201	-	-	7/17/24/24	0/4/4/4
2	QY1	A	201	-	-	0/17/24/24	0/4/4/4
2	QY1	B	201	-	-	2/17/24/24	0/4/4/4
2	QY1	D	201	-	-	0/17/24/24	0/4/4/4

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	F	201	QY1	C15-N24	2.02	1.35	1.32
2	E	201	QY1	C15-N24	2.01	1.35	1.32

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	201	QY1	C12-C23-C16	3.13	112.98	107.75
2	B	201	QY1	C12-C23-C16	2.68	112.23	107.75
2	E	201	QY1	C12-C23-C16	2.46	111.86	107.75
2	C	201	QY1	C12-C23-C16	2.32	111.62	107.75
2	D	201	QY1	C12-C23-C16	2.16	111.37	107.75

There are no chirality outliers.

All (27) torsion outliers are listed below:

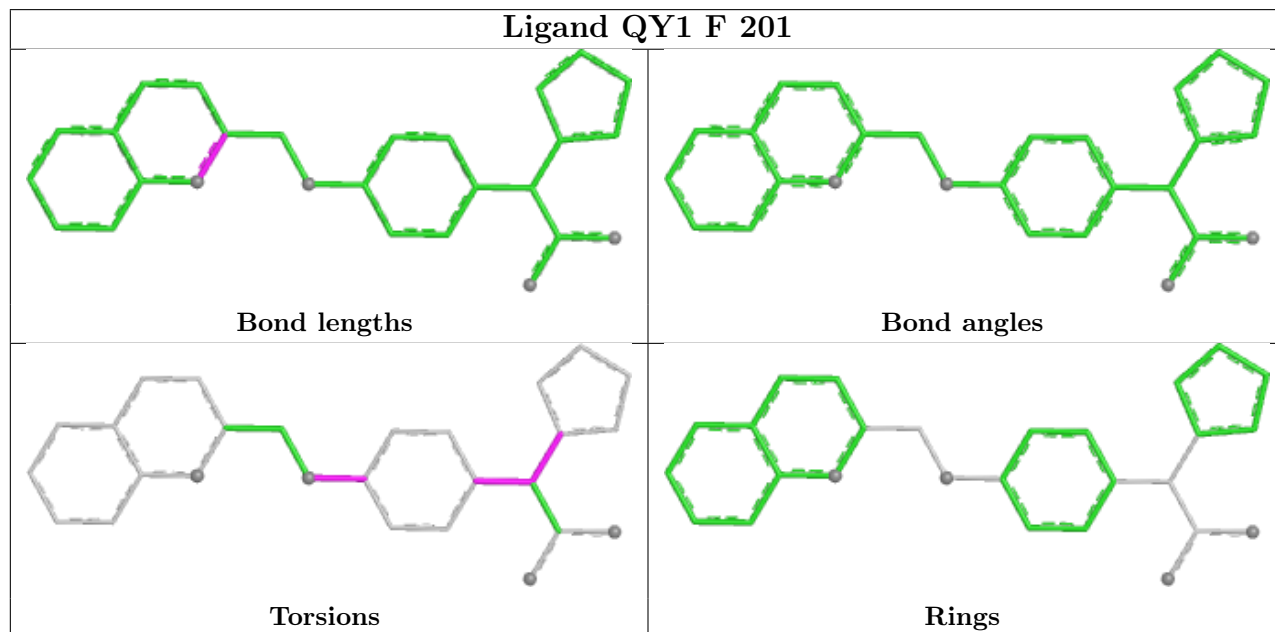
Mol	Chain	Res	Type	Atoms
2	C	201	QY1	C19-C21-C23-C16
2	C	201	QY1	C20-C21-C23-C16
2	E	201	QY1	C19-C21-C23-C12
2	E	201	QY1	C19-C21-C23-C16
2	E	201	QY1	C20-C21-C23-C12
2	E	201	QY1	C20-C21-C23-C16
2	F	201	QY1	C19-C21-C23-C16
2	F	201	QY1	C20-C21-C23-C12
2	F	201	QY1	C20-C21-C23-C16
4	F	202	BOG	O5-C5-C6-O6
4	F	202	BOG	C4-C5-C6-O6
2	C	201	QY1	C8-C14-O27-C22
2	C	201	QY1	C9-C14-O27-C22
2	F	201	QY1	C8-C14-O27-C22
2	F	201	QY1	C9-C14-O27-C22
4	F	202	BOG	C3'-C4'-C5'-C6'
4	F	202	BOG	O1-C1'-C2'-C3'
4	F	202	BOG	C2'-C1'-O1-C1
2	F	201	QY1	C6-C12-C23-C21
2	F	201	QY1	C5-C12-C23-C21
4	F	202	BOG	C2'-C3'-C4'-C5'
2	E	201	QY1	O25-C16-C23-C12
4	F	202	BOG	C5'-C6'-C7'-C8'
2	B	201	QY1	O25-C16-C23-C21
2	B	201	QY1	O26-C16-C23-C21
2	E	201	QY1	O26-C16-C23-C12
2	E	201	QY1	C6-C12-C23-C21

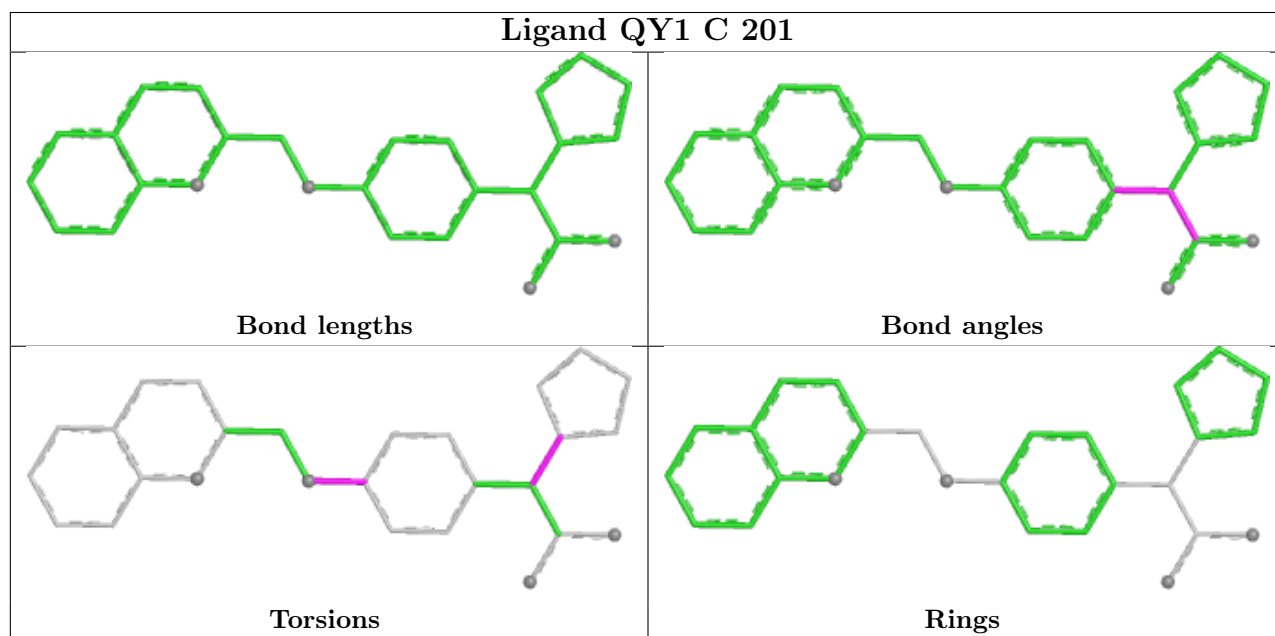
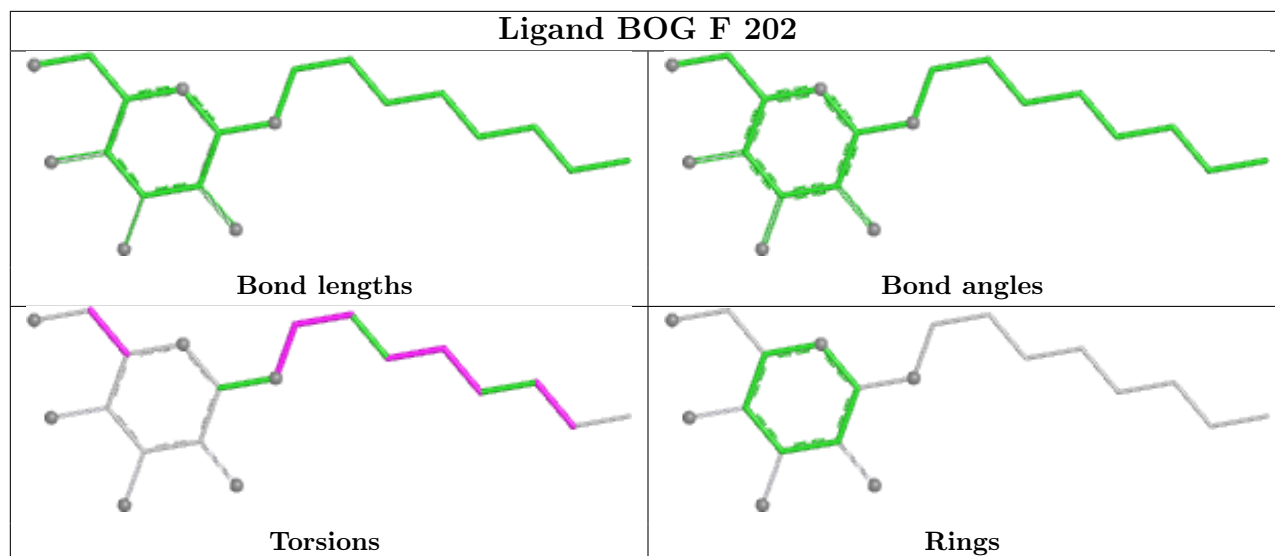
There are no ring outliers.

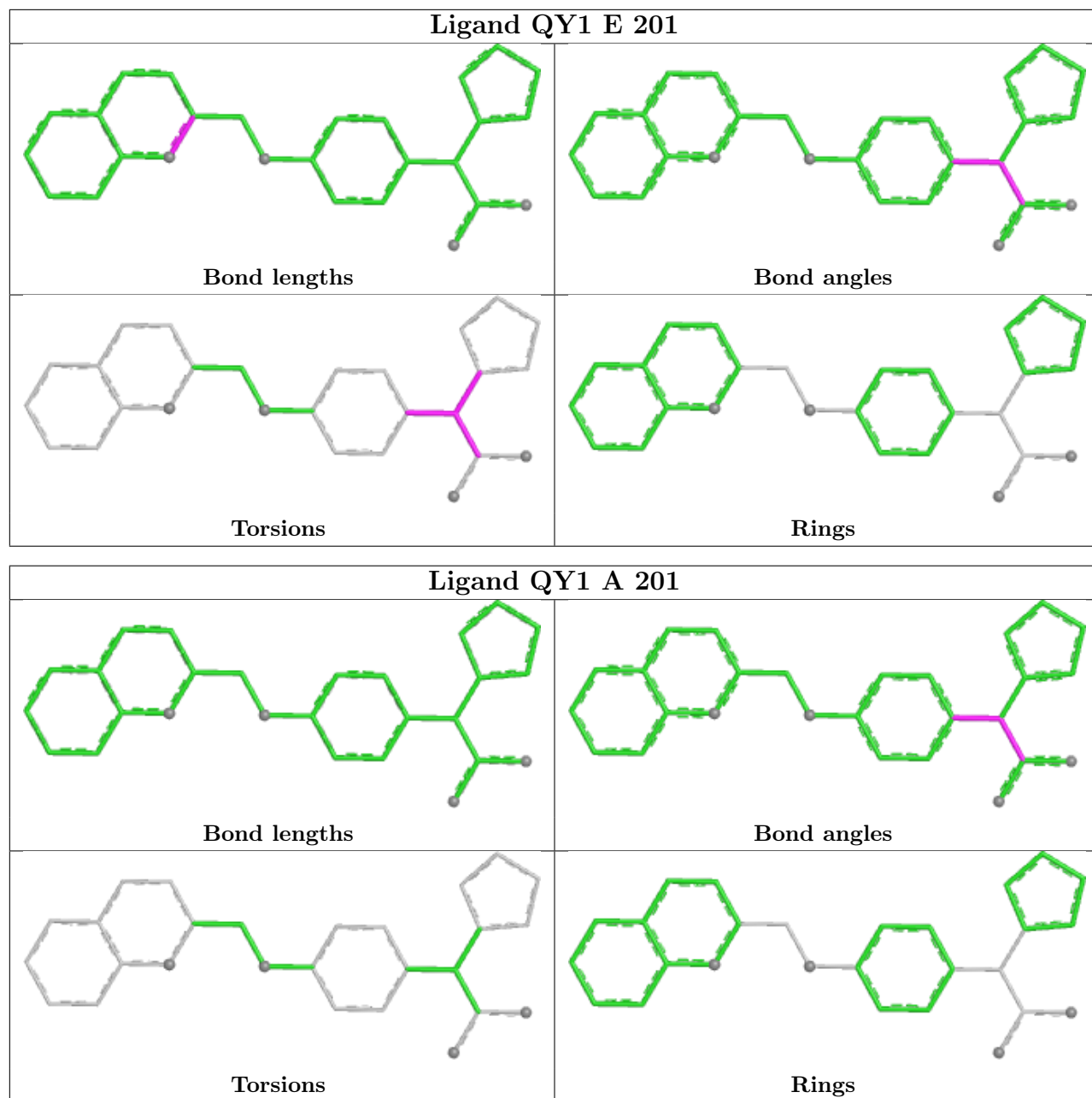
6 monomers are involved in 23 short contacts:

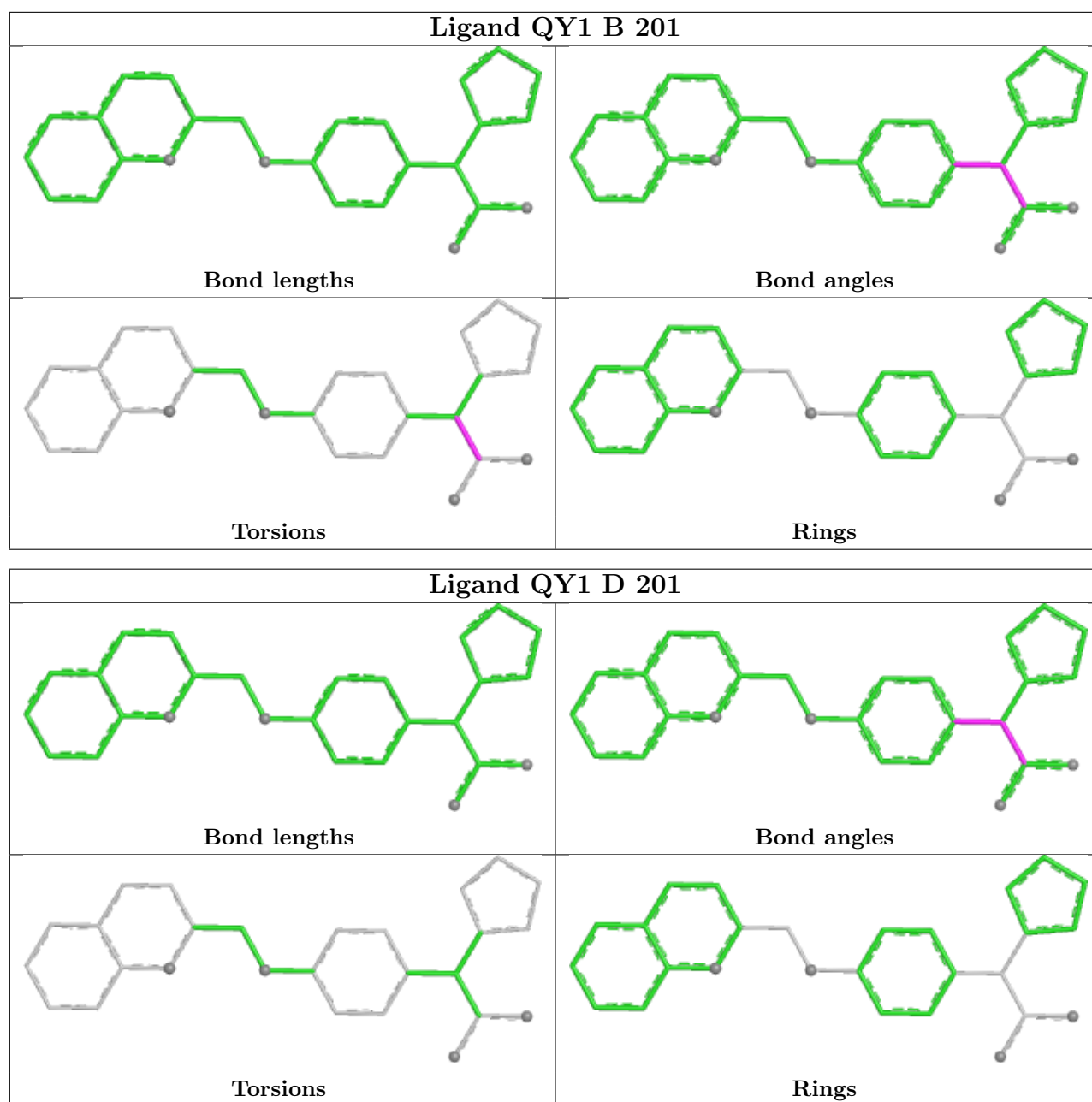
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	F	201	QY1	3	0
2	C	201	QY1	5	0
2	E	201	QY1	6	0
2	A	201	QY1	6	0
2	B	201	QY1	2	0
2	D	201	QY1	1	0

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









5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data

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	144/171 (84%)	0.99	24 (16%) 4 4	30, 46, 78, 81	0
1	B	149/171 (87%)	0.98	20 (13%) 7 6	20, 46, 86, 96	0
1	C	151/171 (88%)	1.06	23 (15%) 5 5	23, 50, 82, 87	0
1	D	155/171 (90%)	1.32	39 (25%) 1 1	41, 62, 88, 102	0
1	E	154/171 (90%)	1.36	30 (19%) 3 2	38, 59, 89, 98	0
1	F	148/171 (86%)	1.30	33 (22%) 2 2	42, 59, 85, 90	0
All	All	901/1026 (87%)	1.17	169 (18%) 3 3	20, 56, 85, 102	0

All (169) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	45	THR	9.0
1	A	46	GLY	5.5
1	C	1	LEU	5.3
1	C	159	LEU	5.1
1	F	113	ILE	5.0
1	A	133	TYR	4.8
1	E	3	GLN	4.7
1	B	157	LEU	4.6
1	D	113	ILE	4.5
1	B	43	GLN	4.5
1	C	0	SER	4.2
1	F	102	LEU	4.2
1	E	50	PHE	4.2
1	A	0	SER	4.1
1	E	57	ASN	4.0
1	D	159	LEU	4.0
1	A	45	THR	4.0
1	B	41	SER	4.0
1	E	54	TYR	4.0

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Mol	Chain	Res	Type	RSRZ
1	E	45	THR	3.9
1	C	158	LEU	3.9
1	F	32	HIS	3.9
1	C	3	GLN	3.9
1	F	47	THR	3.8
1	F	49	ALA	3.8
1	A	3	GLN	3.8
1	D	45	THR	3.7
1	A	111	GLY	3.7
1	F	99	VAL	3.7
1	F	110	PRO	3.6
1	A	36	THR	3.6
1	D	154	ILE	3.6
1	E	85	PHE	3.6
1	C	41	SER	3.5
1	C	157	LEU	3.5
1	F	166	HIS	3.4
1	E	102	LEU	3.4
1	D	138	PHE	3.3
1	D	100	GLY	3.3
1	E	160	ILE	3.3
1	F	165	HIS	3.3
1	E	77	LEU	3.2
1	A	85	PHE	3.2
1	D	133	TYR	3.2
1	B	0	SER	3.2
1	D	157	LEU	3.2
1	D	43	GLN	3.2
1	B	139	PHE	3.2
1	E	48	LEU	3.2
1	F	1	LEU	3.2
1	E	96	LYS	3.1
1	C	138	PHE	3.1
1	A	157	LEU	3.1
1	C	36	THR	3.1
1	D	131	PHE	3.1
1	C	35	ARG	3.1
1	D	102	LEU	3.1
1	A	146	TYR	3.0
1	A	153	THR	3.0
1	D	34	SER	3.0
1	F	34	SER	3.0

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Mol	Chain	Res	Type	RSRZ
1	D	103	GLY	3.0
1	B	150	ILE	3.0
1	D	36	THR	3.0
1	F	3	GLN	3.0
1	A	110	PRO	3.0
1	D	48	LEU	2.9
1	A	154	ILE	2.9
1	E	36	THR	2.9
1	D	3	GLN	2.9
1	D	41	SER	2.9
1	A	48	LEU	2.9
1	D	107	GLN	2.9
1	B	154	ILE	2.8
1	F	112	TYR	2.8
1	A	47	THR	2.7
1	C	102	LEU	2.7
1	F	114	PHE	2.7
1	B	49	ALA	2.7
1	D	139	PHE	2.7
1	E	43	GLN	2.7
1	C	77	LEU	2.7
1	D	1	LEU	2.7
1	B	32	HIS	2.7
1	B	138	PHE	2.7
1	F	162	GLU	2.7
1	B	131	PHE	2.6
1	B	37	GLN	2.5
1	E	99	VAL	2.5
1	F	61	VAL	2.5
1	C	139	PHE	2.5
1	F	50	PHE	2.5
1	B	146	TYR	2.5
1	D	111	GLY	2.5
1	D	99	VAL	2.5
1	E	44	ARG	2.5
1	A	135	LEU	2.5
1	E	135	LEU	2.4
1	F	56	ALA	2.4
1	D	33	GLU	2.4
1	E	92	PHE	2.4
1	E	113	ILE	2.4
1	B	1	LEU	2.4

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Mol	Chain	Res	Type	RSRZ
1	C	146	TYR	2.4
1	D	112	TYR	2.4
1	D	85	PHE	2.4
1	C	145	ASN	2.4
1	F	163	GLY	2.4
1	D	109	THR	2.4
1	F	20	VAL	2.4
1	A	158	LEU	2.4
1	D	158	LEU	2.4
1	E	115	GLY	2.3
1	D	42	PHE	2.3
1	F	124	LEU	2.3
1	A	35	ARG	2.3
1	F	28	HIS	2.3
1	B	4	GLU	2.3
1	A	150	ILE	2.3
1	B	110	PRO	2.3
1	C	156	PRO	2.3
1	E	49	ALA	2.3
1	F	79	SER	2.3
1	D	25	PHE	2.2
1	C	46	GLY	2.2
1	C	134	TYR	2.2
1	E	112	TYR	2.2
1	F	118	ILE	2.2
1	E	15	VAL	2.2
1	B	7	GLY	2.2
1	E	100	GLY	2.2
1	A	134	TYR	2.2
1	A	139	PHE	2.2
1	A	143	PHE	2.2
1	C	2	ASP	2.2
1	C	92	PHE	2.2
1	F	142	ASP	2.2
1	A	34	SER	2.2
1	D	52	ARG	2.1
1	E	89	MET	2.1
1	E	98	PHE	2.1
1	F	161	PRO	2.1
1	B	149	THR	2.1
1	E	141	SER	2.1
1	D	35	ARG	2.1

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Mol	Chain	Res	Type	RSRZ
1	A	101	TYR	2.1
1	D	144	GLU	2.1
1	D	150	ILE	2.1
1	E	18	ILE	2.1
1	E	119	ILE	2.1
1	F	164	HIS	2.1
1	E	131	PHE	2.1
1	D	44	ARG	2.1
1	D	56	ALA	2.1
1	F	116	LYS	2.1
1	D	135	LEU	2.1
1	F	119	ILE	2.1
1	D	134	TYR	2.1
1	C	85	PHE	2.1
1	F	48	LEU	2.0
1	F	91	LEU	2.0
1	E	93	VAL	2.0
1	F	21	VAL	2.0
1	F	53	VAL	2.0
1	B	111	GLY	2.0
1	C	103	GLY	2.0
1	D	108	SER	2.0
1	D	124	LEU	2.0
1	C	154	ILE	2.0

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

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

6.3 Carbohydrates [i](#)

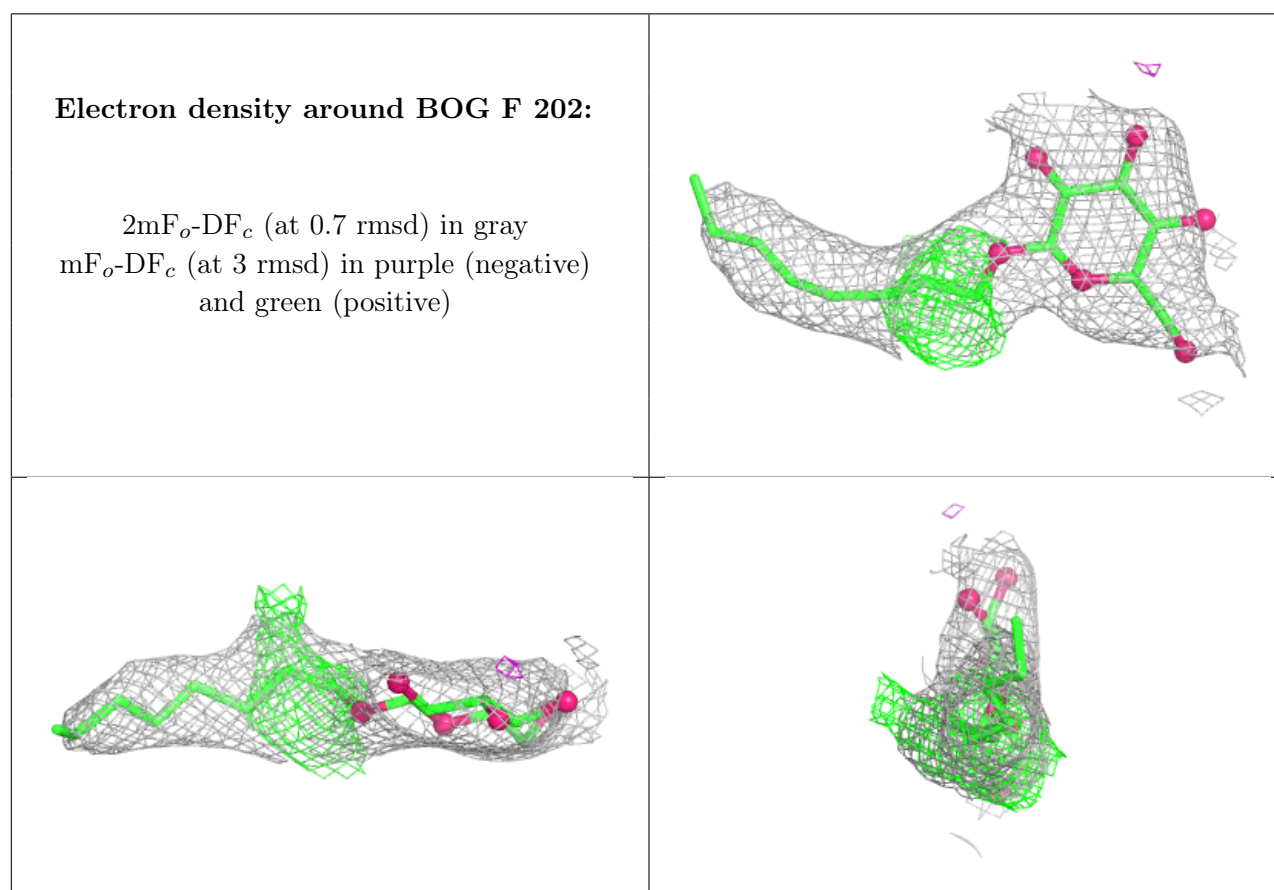
There are no oligosaccharides in this entry.

6.4 Ligands [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.

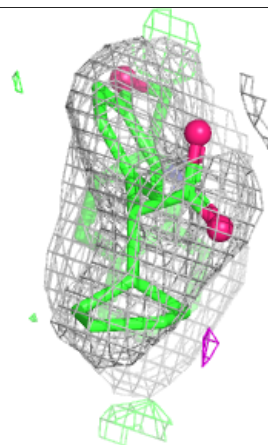
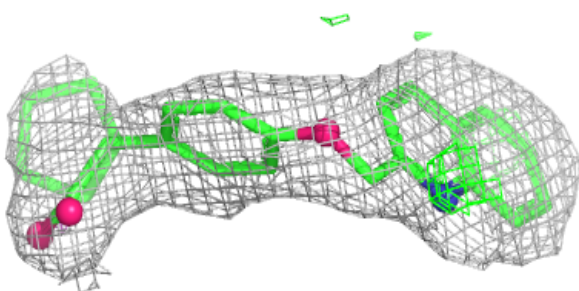
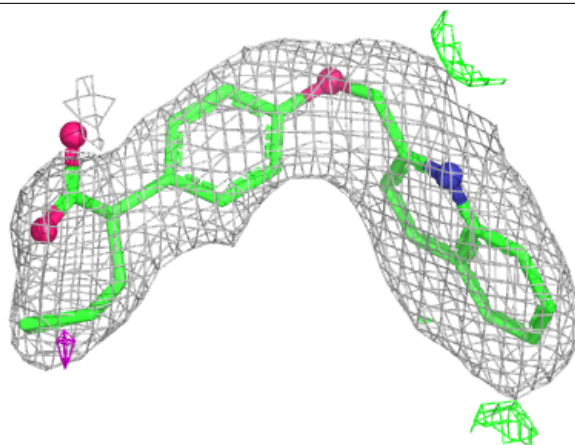
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
4	BOG	F	202	20/20	0.74	0.24	79,84,89,90	0
2	QY1	E	201	27/27	0.83	0.17	65,77,82,87	0
2	QY1	F	201	27/27	0.87	0.14	55,71,81,84	0
2	QY1	A	201	27/27	0.88	0.11	31,52,56,59	0
2	QY1	B	201	27/27	0.90	0.11	33,44,58,60	0
2	QY1	D	201	27/27	0.92	0.11	58,62,72,75	0
3	CA	B	202	1/1	0.92	0.12	81,81,81,81	0
2	QY1	C	201	27/27	0.92	0.12	38,57,70,75	0
3	CA	D	202	1/1	0.93	0.17	80,80,80,80	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.

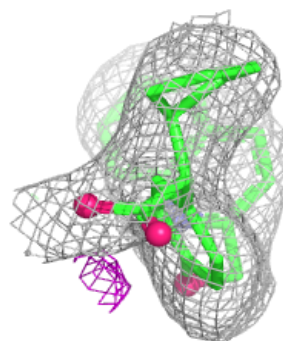
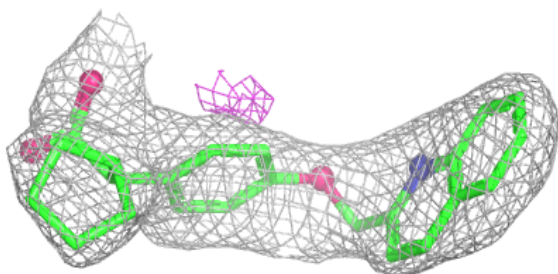
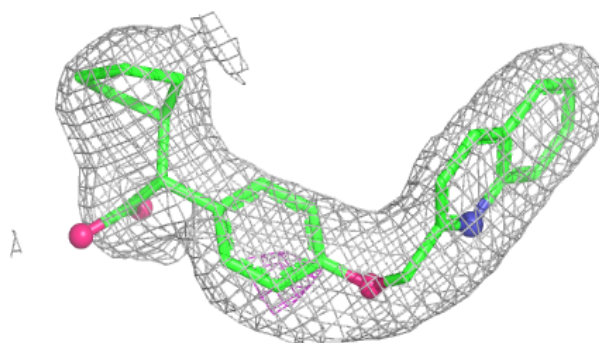


Electron density around QY1 E 201:

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

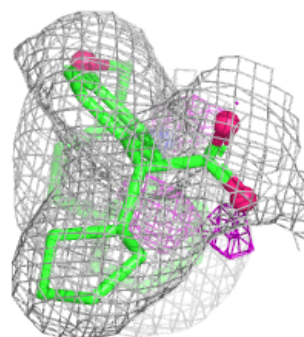
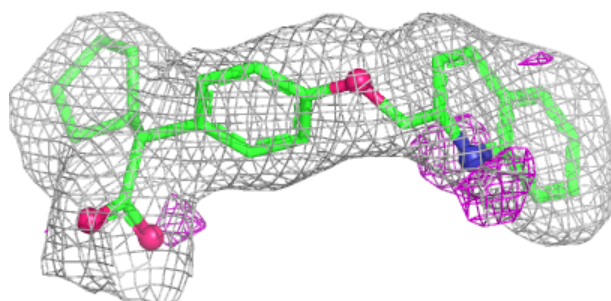
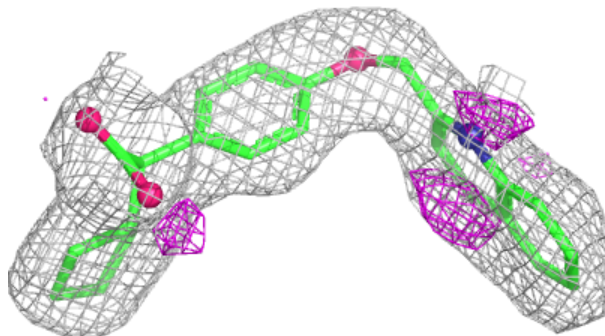
**Electron density around QY1 F 201:**

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

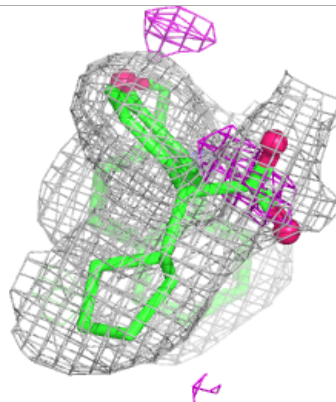
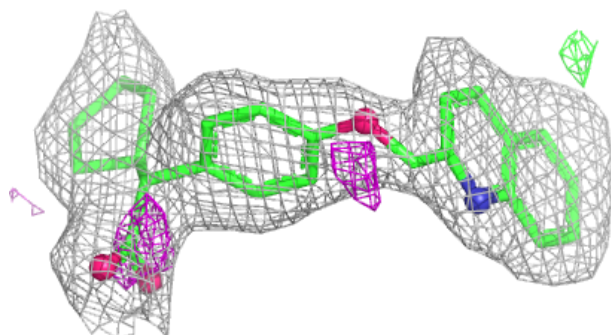
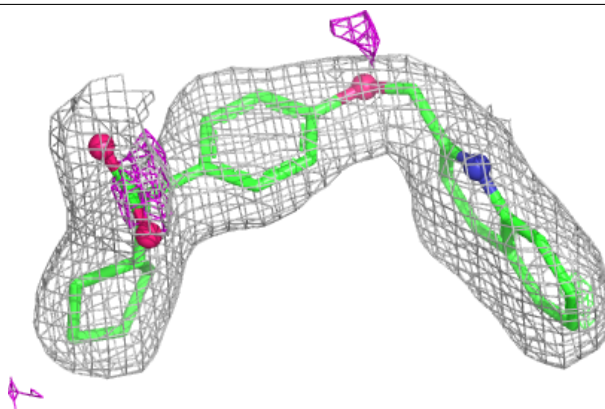


Electron density around QY1 A 201:

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

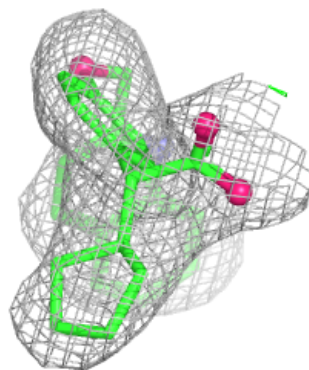
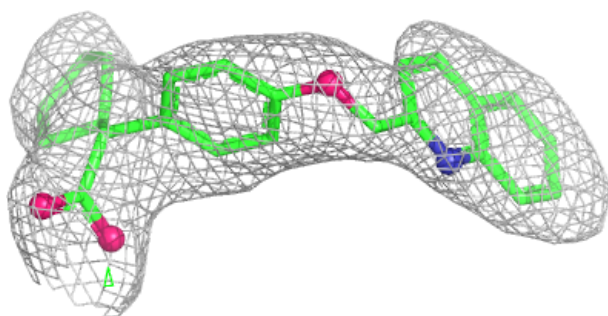
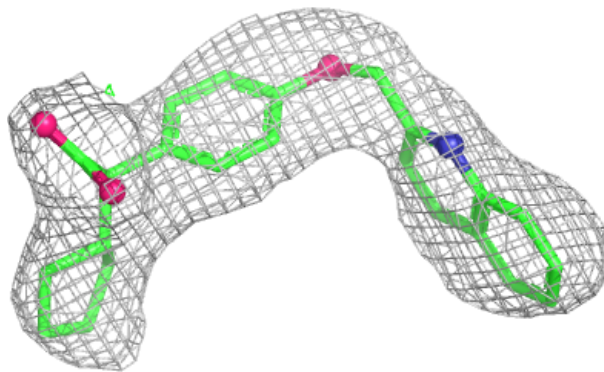
**Electron density around QY1 B 201:**

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

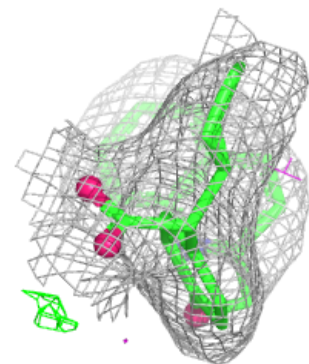
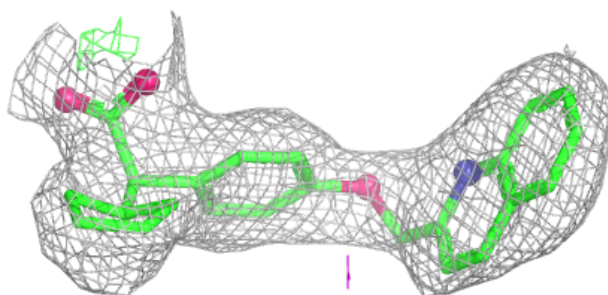


Electron density around QY1 D 201:

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

**Electron density around QY1 C 201:**

$2mF_o-DF_c$ (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.