



Full wwPDB X-ray Structure Validation Report ⓘ

Apr 25, 2026 – 05:46 PM EDT

PDB ID : 6UEG / pdb_00006ueg
Title : Pseudomonas aeruginosa LpxA Complex Structure with Ligand
Authors : Chen, Y.; Kroeck, K.; Sacco, M.
Deposited on : 2019-09-20
Resolution : 2.00 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

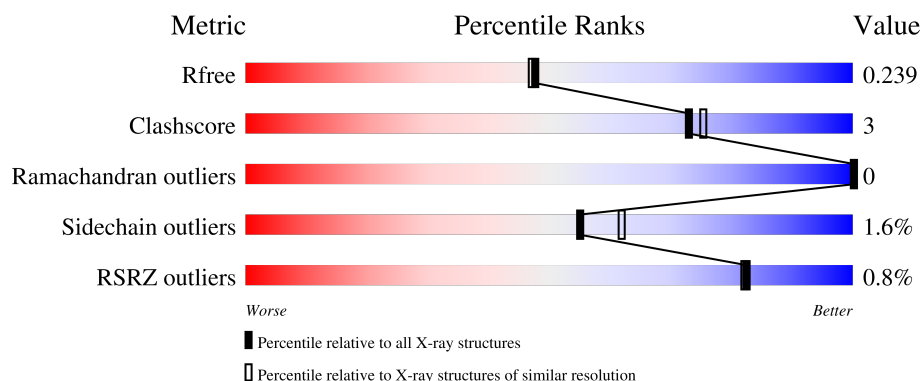
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.00 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	180053	10052 (2.00-2.00)
Clashscore	190562	11152 (2.00-2.00)
Ramachandran outliers	187476	11031 (2.00-2.00)
Sidechain outliers	187428	11029 (2.00-2.00)
RSRZ outliers	180081	10067 (2.00-2.00)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for ≥ 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	258	2% 95% 5%
1	B	258	89% 10%
1	C	258	93% 7%
1	D	258	1% 90% 9%
1	E	258	92% 8%

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Mol	Chain	Length	Quality of chain
1	F	258	% 88% 11%

2 Entry composition [i](#)

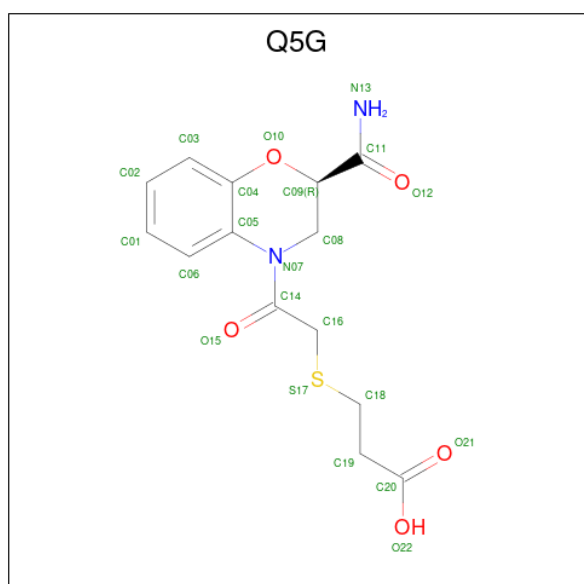
There are 4 unique types of molecules in this entry. The entry contains 12737 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 Acyl-[acyl-carrier-protein]--UDP-N-acetylglucosamine O-acyltransferase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	257	Total	C	N	O	S	0	1	0
			1972	1232	364	370	6			
1	B	257	Total	C	N	O	S	0	4	0
			1999	1249	372	372	6			
1	C	256	Total	C	N	O	S	0	0	0
			1948	1221	356	365	6			
1	D	257	Total	C	N	O	S	0	0	0
			1956	1225	359	366	6			
1	E	257	Total	C	N	O	S	0	0	0
			1966	1230	363	367	6			
1	F	257	Total	C	N	O	S	0	1	0
			1971	1233	364	368	6			

- Molecule 2 is 3-($\{2-[(2R)-2\text{-carbamoyl-}2,3\text{-dihydro-}4H\text{-}1,4\text{-benzoxazin-}4\text{-yl}]-2\text{-oxoethyl}\}$ sulfanyl)propanoic acid (CCD ID: Q5G) (formula: $C_{14}H_{16}N_2O_5S$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	N	O	S	0	0
			22	14	2	5	1		
2	A	1	Total	C	N	O	S	0	0
			22	14	2	5	1		
2	C	1	Total	C	N	O	S	0	0
			22	14	2	5	1		
2	D	1	Total	C	N	O	S	0	0
			22	14	2	5	1		
2	E	1	Total	C	N	O	S	0	0
			22	14	2	5	1		
2	F	1	Total	C	N	O	S	0	0
			22	14	2	5	1		

- 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		

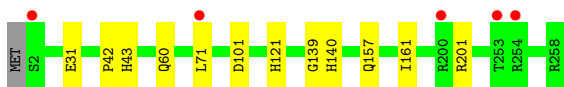
- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	112	Total	O	0	10
			116	116		
4	B	158	Total	O	0	4
			161	161		
4	C	118	Total	O	0	10
			122	122		
4	D	131	Total	O	0	6
			134	134		
4	E	123	Total	O	0	6
			127	127		
4	F	130	Total	O	0	6
			132	132		

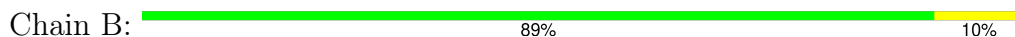
3 Residue-property plots

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: Acyl-[acyl-carrier-protein]--UDP-N-acetylglucosamine O-acyltransferase



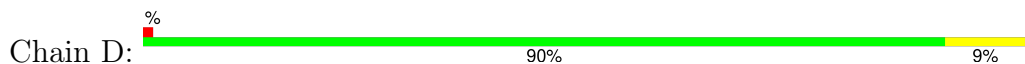
- Molecule 1: Acyl-[acyl-carrier-protein]--UDP-N-acetylglucosamine O-acyltransferase



- Molecule 1: Acyl-[acyl-carrier-protein]--UDP-N-acetylglucosamine O-acyltransferase



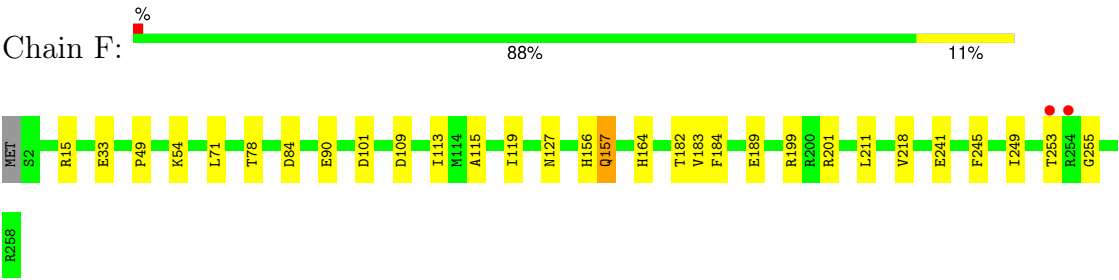
- Molecule 1: Acyl-[acyl-carrier-protein]--UDP-N-acetylglucosamine O-acyltransferase



- Molecule 1: Acyl-[acyl-carrier-protein]--UDP-N-acetylglucosamine O-acyltransferase



- Molecule 1: Acyl-[acyl-carrier-protein]--UDP-N-acetylglucosamine O-acyltransferase



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	80.39Å 82.52Å 224.02Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	55.43 – 2.00 55.43 – 2.00	Depositor EDS
% Data completeness (in resolution range)	82.7 (55.43-2.00) 82.7 (55.43-2.00)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.09	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.04 (at 2.00Å)	Xtriage
Refinement program	REFMAC 5.8.0253	Depositor
R, R_{free}	0.176 , 0.236 0.183 , 0.239	Depositor DCC
R_{free} test set	4307 reflections (4.25%)	wwPDB-VP
Wilson B-factor (Å ²)	20.5	Xtriage
Anisotropy	0.162	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.35 , 37.7	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	0.028 for k,h,-l	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	12737	wwPDB-VP
Average B, all atoms (Å ²)	25.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.35% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

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

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: CA, Q5G

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	1.04	0/2014	1.34	2/2732 (0.1%)
1	B	1.04	0/2042	1.31	2/2770 (0.1%)
1	C	1.03	0/1990	1.36	5/2702 (0.2%)
1	D	1.07	1/1998 (0.1%)	1.36	0/2712
1	E	1.06	0/2008	1.35	0/2724
1	F	1.05	0/2013	1.38	6/2731 (0.2%)
All	All	1.05	1/12065 (0.0%)	1.35	15/16371 (0.1%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	D	192	SER	CA-CB	-5.23	1.50	1.54

All (15) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	F	255	GLY	CA-C-O	-8.16	116.92	122.22
1	A	161	ILE	CA-C-N	6.33	126.11	120.10
1	A	161	ILE	C-N-CA	6.33	126.11	120.10
1	F	101	ASP	O-C-N	6.15	125.38	120.83
1	C	255	GLY	CA-C-O	-5.99	118.32	122.22
1	F	157	GLN	CB-CA-C	5.85	120.09	109.62
1	F	253	THR	CA-C-N	5.58	128.53	120.38
1	F	253	THR	C-N-CA	5.58	128.53	120.38
1	C	119	ILE	CA-C-N	5.44	125.27	120.10
1	C	119	ILE	C-N-CA	5.44	125.27	120.10
1	C	18	ALA	CA-C-N	5.13	129.29	120.72
1	C	18	ALA	C-N-CA	5.13	129.29	120.72
1	F	101	ASP	CA-C-O	-5.06	116.89	119.77
1	B	119	ILE	CA-C-N	5.04	126.22	120.53

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	119	ILE	C-N-CA	5.04	126.22	120.53

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1972	0	1931	7	0
1	B	1999	0	1960	19	0
1	C	1948	0	1908	7	0
1	D	1956	0	1918	17	0
1	E	1966	0	1935	9	0
1	F	1971	0	1936	20	0
2	A	44	0	0	4	0
2	C	22	0	0	0	0
2	D	22	0	0	1	0
2	E	22	0	0	0	0
2	F	22	0	0	3	0
3	B	1	0	0	0	0
4	A	116	0	0	0	0
4	B	161	0	0	0	0
4	C	122	0	0	1	0
4	D	134	0	0	0	0
4	E	127	0	0	1	0
4	F	132	0	0	0	0
All	All	12737	0	11588	76	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 3.

All (76) 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:D:169:MET:HE2	1:F:156:HIS:CD2	2.13	0.83

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:182[A]:THR:HG22	1:B:184:PHE:CE1	2.14	0.81
1:F:156:HIS:HB3	2:F:301:Q5G:O21	1.97	0.64
1:C:57:ARG:NH1	4:C:502[B]:HOH:O	2.24	0.63
1:C:19:ASP:HB3	1:C:37:GLY:H	1.64	0.63
1:A:101:ASP:OD2	1:A:140:HIS:ND1	2.22	0.61
1:B:79[B]:ARG:NE	1:B:104:GLU:OE1	2.33	0.61
1:D:169:MET:CE	1:F:156:HIS:CD2	2.84	0.60
1:F:182:THR:CG2	1:F:184:PHE:HE1	2.16	0.58
1:D:113:ILE:HD13	1:D:119:ILE:HD11	1.86	0.58
1:B:166:PHE:HD2	1:B:182[A]:THR:HG23	1.69	0.57
1:B:182[A]:THR:CG2	1:B:184:PHE:CE1	2.86	0.57
1:F:218:VAL:HG21	1:F:249:ILE:HD13	1.87	0.56
1:F:201[B]:ARG:NE	1:F:201[B]:ARG:HA	2.20	0.56
1:B:182[A]:THR:HG22	1:B:184:PHE:HE1	1.65	0.56
1:D:139:GLY:O	1:D:157:GLN:HA	2.06	0.56
1:F:182:THR:CG2	1:F:184:PHE:CE1	2.88	0.55
1:B:184:PHE:CD1	1:B:191:ARG:HG3	2.41	0.55
1:E:16:LEU:HD11	1:E:28:VAL:HG11	1.90	0.52
1:F:245:PHE:CZ	1:F:249:ILE:HD11	2.45	0.51
1:F:164:HIS:CE1	1:F:201[A]:ARG:HD3	2.45	0.51
1:D:156:HIS:CD2	1:E:169:MET:CE	2.92	0.51
1:E:119:ILE:HD12	1:E:125:ILE:HD11	1.93	0.51
1:E:139:GLY:O	1:E:157:GLN:HA	2.12	0.50
2:D:301:Q5G:O15	2:D:301:Q5G:C06	2.58	0.50
1:A:43:HIS:ND1	1:C:43:HIS:CE1	2.79	0.50
2:A:302:Q5G:N13	1:B:70:ASP:OD2	2.45	0.50
1:E:76:GLU:HB3	1:E:77:PRO:HD2	1.93	0.49
1:D:113:ILE:HD13	1:D:119:ILE:CD1	2.43	0.48
1:A:139:GLY:O	1:A:157:GLN:HA	2.12	0.48
1:D:67:ASP:OD1	1:D:96:ARG:NH2	2.43	0.48
1:C:139:GLY:O	1:C:157:GLN:HA	2.13	0.48
1:D:197:GLY:O	1:D:201:ARG:HD3	2.14	0.48
1:F:183:VAL:HA	1:F:189:GLU:O	2.14	0.47
1:A:42:PRO:O	1:A:60:GLN:HA	2.14	0.47
1:E:100:GLN:OE1	1:E:100:GLN:N	2.46	0.47
1:B:218:VAL:HG21	1:B:249:ILE:CD1	2.45	0.46
1:F:157:GLN:H	2:F:301:Q5G:C19	2.29	0.46
1:F:211:LEU:HD11	1:F:241:GLU:HB3	1.98	0.45
1:D:218:VAL:HG21	1:D:249:ILE:CD1	2.47	0.45
1:F:109:ASP:O	1:F:127:ASN:HA	2.17	0.45
1:F:182:THR:HG22	1:F:184:PHE:CE1	2.51	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:301:Q5G:O15	2:A:301:Q5G:C06	2.65	0.44
1:D:169:MET:HE2	1:F:156:HIS:CG	2.53	0.44
1:B:226:GLU:H	1:B:226:GLU:CD	2.25	0.44
1:C:42:PRO:O	1:C:60:GLN:HA	2.17	0.44
1:E:89:ARG:HB3	1:E:90:GLU:OE1	2.18	0.43
1:F:15:ARG:O	1:F:33:GLU:HA	2.18	0.43
1:F:90:GLU:O	1:F:115:ALA:HA	2.18	0.43
2:A:302:Q5G:O15	2:A:302:Q5G:C06	2.66	0.43
1:B:182[A]:THR:CG2	1:B:184:PHE:HE1	2.31	0.43
1:B:234:GLU:HA	1:E:199:ARG:HB3	2.00	0.43
1:B:201[B]:ARG:NE	1:B:201[B]:ARG:HA	2.34	0.43
1:D:218:VAL:HG21	1:D:249:ILE:HD13	2.00	0.43
1:D:90:GLU:O	1:D:115:ALA:HA	2.18	0.43
1:B:76:GLU:HB3	1:B:77:PRO:HD2	2.01	0.42
1:D:166:PHE:O	1:D:182:THR:HA	2.19	0.42
1:A:201:ARG:NE	1:A:201:ARG:HA	2.33	0.42
1:A:43:HIS:CE1	1:B:43:HIS:ND1	2.87	0.42
1:D:109:ASP:O	1:D:127:ASN:HA	2.20	0.42
1:D:3:LEU:HD13	1:D:3:LEU:HA	1.88	0.42
1:B:183:VAL:HA	1:B:189:GLU:O	2.20	0.42
1:C:61:PHE:O	1:C:91:GLY:HA2	2.20	0.42
1:D:47:LYS:O	1:D:65:GLY:HA3	2.20	0.42
1:E:246:ARG:HD3	4:E:437:HOH:O	2.20	0.42
2:F:301:Q5G:O15	2:F:301:Q5G:C06	2.68	0.42
1:D:42:PRO:O	1:D:60:GLN:HA	2.20	0.41
1:F:54:LYS:O	1:F:84:ASP:HA	2.20	0.41
1:F:49:PRO:HD2	1:F:78:THR:O	2.20	0.41
1:A:121:HIS:HE1	1:A:140:HIS:NE2	2.19	0.41
2:A:302:Q5G:C08	2:A:302:Q5G:S17	3.09	0.41
1:B:169:MET:CE	1:C:156:HIS:CD2	3.04	0.41
1:B:89:ARG:HB3	1:B:90:GLU:OE1	2.21	0.41
1:F:113:ILE:HD13	1:F:119:ILE:HD11	2.03	0.41
1:B:192:SER:OG	1:B:193:MET:N	2.50	0.40
1:B:42:PRO:O	1:B:60:GLN:HA	2.20	0.40

There are no symmetry-related clashes.

5.3 Torsion angles

5.3.1 Protein backbone

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	256/258 (99%)	246 (96%)	10 (4%)	0	100	100
1	B	259/258 (100%)	248 (96%)	11 (4%)	0	100	100
1	C	254/258 (98%)	243 (96%)	11 (4%)	0	100	100
1	D	255/258 (99%)	243 (95%)	12 (5%)	0	100	100
1	E	255/258 (99%)	243 (95%)	12 (5%)	0	100	100
1	F	256/258 (99%)	248 (97%)	8 (3%)	0	100	100
All	All	1535/1548 (99%)	1471 (96%)	64 (4%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	205/206 (100%)	202 (98%)	3 (2%)	57	64
1	B	208/206 (101%)	205 (99%)	3 (1%)	59	66
1	C	202/206 (98%)	199 (98%)	3 (2%)	57	64
1	D	203/206 (98%)	199 (98%)	4 (2%)	48	54
1	E	205/206 (100%)	199 (97%)	6 (3%)	37	40
1	F	205/206 (100%)	203 (99%)	2 (1%)	68	75
All	All	1228/1236 (99%)	1207 (98%)	21 (2%)	55	60

All (21) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	31[A]	GLU
1	A	31[B]	GLU
1	A	71	LEU
1	B	36	GLU
1	B	74	LYS
1	B	226	GLU
1	C	36	GLU
1	C	205	SER
1	C	235	SER
1	D	2	SER
1	D	3	LEU
1	D	74	LYS
1	D	169	MET
1	E	102	ARG
1	E	175	LYS
1	E	205	SER
1	E	226	GLU
1	E	231	GLU
1	E	253	THR
1	F	71	LEU
1	F	199	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (15) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	21	GLN
1	A	55	HIS
1	A	95	HIS
1	A	128	HIS
1	A	209	HIS
1	A	221	GLN
1	A	238	GLN
1	A	250	GLN
1	B	238	GLN
1	C	134	ASN
1	D	55	HIS
1	D	157	GLN
1	E	142	HIS
1	F	142	HIS
1	F	157	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 ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 7 ligands modelled in this entry, 1 is monoatomic - leaving 6 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	Q5G	A	301	-	23,23,23	3.13	7 (30%)	25,31,31	2.56	7 (28%)
2	Q5G	F	301	-	23,23,23	3.31	11 (47%)	25,31,31	2.36	8 (32%)
2	Q5G	D	301	-	23,23,23	2.96	7 (30%)	25,31,31	1.96	7 (28%)
2	Q5G	A	302	-	23,23,23	3.57	9 (39%)	25,31,31	1.89	6 (24%)
2	Q5G	C	301	-	23,23,23	3.03	12 (52%)	25,31,31	3.38	10 (40%)
2	Q5G	E	301	-	23,23,23	3.10	10 (43%)	25,31,31	2.99	10 (40%)

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	Q5G	A	301	-	-	4/15/27/27	0/2/2/2
2	Q5G	F	301	-	-	5/15/27/27	0/2/2/2

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	Q5G	D	301	-	-	4/15/27/27	0/2/2/2
2	Q5G	A	302	-	-	6/15/27/27	0/2/2/2
2	Q5G	C	301	-	-	2/15/27/27	0/2/2/2
2	Q5G	E	301	-	-	6/15/27/27	0/2/2/2

All (56) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	302	Q5G	O10-C04	9.68	1.51	1.38
2	F	301	Q5G	C14-N07	9.00	1.49	1.36
2	A	302	Q5G	C14-N07	8.99	1.49	1.36
2	A	301	Q5G	C14-N07	8.75	1.49	1.36
2	F	301	Q5G	O10-C04	8.31	1.49	1.38
2	A	301	Q5G	O10-C04	8.16	1.49	1.38
2	E	301	Q5G	O10-C04	8.04	1.48	1.38
2	C	301	Q5G	O10-C04	7.95	1.48	1.38
2	D	301	Q5G	C14-N07	7.82	1.47	1.36
2	E	301	Q5G	C14-N07	7.49	1.47	1.36
2	D	301	Q5G	O10-C04	7.45	1.48	1.38
2	C	301	Q5G	C14-N07	7.08	1.46	1.36
2	D	301	Q5G	C11-N13	5.98	1.47	1.32
2	A	301	Q5G	C11-N13	5.73	1.46	1.32
2	C	301	Q5G	C11-N13	5.60	1.46	1.32
2	F	301	Q5G	C11-N13	5.33	1.45	1.32
2	A	302	Q5G	C11-N13	5.26	1.45	1.32
2	E	301	Q5G	C11-N13	5.11	1.44	1.32
2	A	302	Q5G	C05-N07	4.73	1.49	1.41
2	A	302	Q5G	C08-C09	3.92	1.56	1.52
2	A	302	Q5G	C06-C05	3.66	1.45	1.39
2	F	301	Q5G	C05-N07	3.44	1.47	1.41
2	E	301	Q5G	C05-N07	3.42	1.47	1.41
2	A	301	Q5G	C05-N07	3.42	1.47	1.41
2	D	301	Q5G	C05-N07	3.31	1.46	1.41
2	C	301	Q5G	C08-N07	-3.27	1.40	1.46
2	F	301	Q5G	C06-C05	3.11	1.44	1.39
2	F	301	Q5G	C08-N07	-3.07	1.40	1.46
2	E	301	Q5G	O12-C11	-3.06	1.18	1.23
2	E	301	Q5G	C08-N07	-2.96	1.40	1.46
2	A	302	Q5G	C09-C11	2.64	1.54	1.51
2	C	301	Q5G	C06-C05	2.59	1.43	1.39
2	D	301	Q5G	C08-N07	-2.57	1.41	1.46

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	F	301	Q5G	C02-C01	2.52	1.43	1.38
2	C	301	Q5G	C16-S17	2.48	1.87	1.81
2	C	301	Q5G	C05-N07	2.48	1.45	1.41
2	D	301	Q5G	C09-C11	2.42	1.54	1.51
2	E	301	Q5G	C02-C03	2.40	1.43	1.38
2	F	301	Q5G	C05-C04	2.38	1.44	1.40
2	F	301	Q5G	O12-C11	-2.38	1.19	1.23
2	A	301	Q5G	C06-C05	2.34	1.43	1.39
2	E	301	Q5G	C06-C05	2.34	1.43	1.39
2	A	302	Q5G	C05-C04	2.34	1.43	1.40
2	A	301	Q5G	C09-C11	2.32	1.54	1.51
2	C	301	Q5G	C16-C14	2.32	1.55	1.51
2	E	301	Q5G	O15-C14	-2.29	1.18	1.23
2	C	301	Q5G	C02-C01	2.26	1.43	1.38
2	A	302	Q5G	C02-C03	2.22	1.42	1.38
2	D	301	Q5G	C06-C05	2.21	1.43	1.39
2	C	301	Q5G	O12-C11	-2.15	1.19	1.23
2	E	301	Q5G	C16-S17	2.14	1.86	1.81
2	F	301	Q5G	C02-C03	2.07	1.42	1.38
2	F	301	Q5G	C16-C14	2.05	1.54	1.51
2	C	301	Q5G	O21-C20	2.02	1.28	1.22
2	C	301	Q5G	C02-C03	2.02	1.42	1.38
2	A	301	Q5G	C08-N07	-2.01	1.42	1.46

All (48) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	301	Q5G	C09-C11-N13	11.36	124.13	117.33
2	E	301	Q5G	C09-C11-N13	10.09	123.37	117.33
2	A	301	Q5G	C09-C11-N13	8.75	122.57	117.33
2	C	301	Q5G	O12-C11-C09	-6.75	114.56	118.77
2	F	301	Q5G	C09-C11-N13	6.55	121.25	117.33
2	E	301	Q5G	C18-S17-C16	6.09	111.76	101.72
2	D	301	Q5G	C18-S17-C16	5.63	111.01	101.72
2	C	301	Q5G	C18-C19-C20	-5.41	105.38	113.12
2	C	301	Q5G	C18-S17-C16	-5.33	92.93	101.72
2	F	301	Q5G	C18-S17-C16	5.15	110.22	101.72
2	A	302	Q5G	C09-C11-N13	5.05	120.35	117.33
2	A	301	Q5G	C18-S17-C16	4.73	109.51	101.72
2	E	301	Q5G	O10-C04-C03	3.86	123.25	116.20
2	A	302	Q5G	O10-C04-C03	3.86	123.24	116.20
2	E	301	Q5G	O12-C11-C09	-3.66	116.49	118.77

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	302	Q5G	C16-C14-N07	3.63	122.96	117.24
2	A	301	Q5G	O10-C04-C03	3.61	122.79	116.20
2	F	301	Q5G	C18-C19-C20	3.54	118.19	113.12
2	A	301	Q5G	C14-C16-S17	-3.52	102.71	113.81
2	D	301	Q5G	O10-C04-C03	3.46	122.51	116.20
2	C	301	Q5G	C14-C16-S17	-3.19	103.73	113.81
2	D	301	Q5G	C09-C11-N13	3.05	119.16	117.33
2	C	301	Q5G	O10-C04-C03	3.05	121.77	116.20
2	E	301	Q5G	O10-C04-C05	-3.05	117.13	122.03
2	E	301	Q5G	C14-C16-S17	-3.04	104.22	113.81
2	A	301	Q5G	O12-C11-C09	-3.01	116.89	118.77
2	D	301	Q5G	O10-C04-C05	-3.01	117.19	122.03
2	F	301	Q5G	O10-C04-C03	2.88	121.46	116.20
2	F	301	Q5G	C14-C16-S17	-2.80	104.96	113.81
2	D	301	Q5G	C14-C16-S17	-2.70	105.29	113.81
2	F	301	Q5G	C01-C02-C03	2.61	123.46	120.24
2	A	301	Q5G	O10-C04-C05	-2.55	117.93	122.03
2	E	301	Q5G	C04-O10-C09	-2.53	108.99	115.33
2	C	301	Q5G	C01-C02-C03	2.52	123.35	120.24
2	C	301	Q5G	C04-O10-C09	-2.51	109.03	115.33
2	A	302	Q5G	O15-C14-C16	-2.48	116.25	121.19
2	E	301	Q5G	C16-C14-N07	2.29	120.85	117.24
2	E	301	Q5G	O15-C14-N07	-2.28	118.52	121.70
2	A	302	Q5G	O10-C04-C05	-2.28	118.36	122.03
2	D	301	Q5G	C08-N07-C05	2.27	121.85	115.09
2	F	301	Q5G	O22-C20-C19	2.26	121.13	114.00
2	A	301	Q5G	C18-C19-C20	2.20	116.28	113.12
2	D	301	Q5G	O12-C11-C09	-2.16	117.42	118.77
2	E	301	Q5G	O22-C20-C19	2.11	120.66	114.00
2	C	301	Q5G	O10-C04-C05	-2.11	118.64	122.03
2	C	301	Q5G	C06-C05-C04	2.10	121.73	118.62
2	A	302	Q5G	C19-C18-S17	-2.06	105.92	112.60
2	F	301	Q5G	O10-C04-C05	-2.03	118.77	122.03

There are no chirality outliers.

All (27) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	301	Q5G	O10-C09-C11-O12
2	A	302	Q5G	N07-C14-C16-S17
2	A	302	Q5G	O15-C14-C16-S17
2	A	302	Q5G	C14-C16-S17-C18

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Mol	Chain	Res	Type	Atoms
2	D	301	Q5G	O10-C09-C11-O12
2	E	301	Q5G	C08-C09-C11-N13
2	E	301	Q5G	O10-C09-C11-O12
2	E	301	Q5G	O10-C09-C11-N13
2	F	301	Q5G	C08-C09-C11-O12
2	F	301	Q5G	C08-C09-C11-N13
2	F	301	Q5G	O10-C09-C11-N13
2	F	301	Q5G	O10-C09-C11-O12
2	F	301	Q5G	S17-C18-C19-C20
2	A	302	Q5G	C18-C19-C20-O21
2	A	302	Q5G	C18-C19-C20-O22
2	C	301	Q5G	C18-C19-C20-O22
2	E	301	Q5G	C18-C19-C20-O22
2	A	301	Q5G	C08-C09-C11-O12
2	A	302	Q5G	C08-C09-C11-O12
2	D	301	Q5G	C08-C09-C11-O12
2	A	301	Q5G	S17-C18-C19-C20
2	A	301	Q5G	C19-C18-S17-C16
2	D	301	Q5G	C19-C18-S17-C16
2	C	301	Q5G	C18-C19-C20-O21
2	E	301	Q5G	C18-C19-C20-O21
2	D	301	Q5G	C14-C16-S17-C18
2	E	301	Q5G	C19-C18-S17-C16

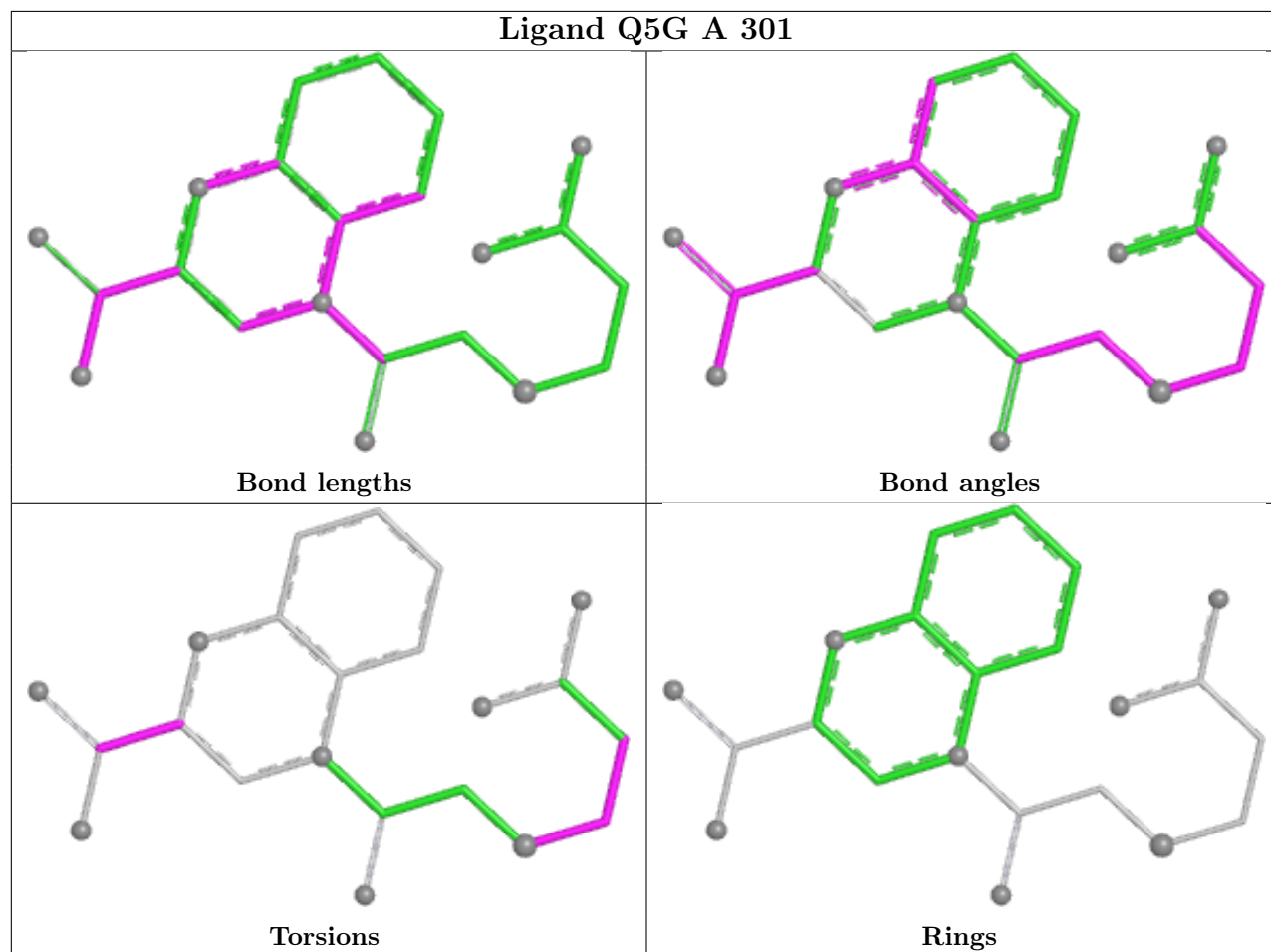
There are no ring outliers.

4 monomers are involved in 8 short contacts:

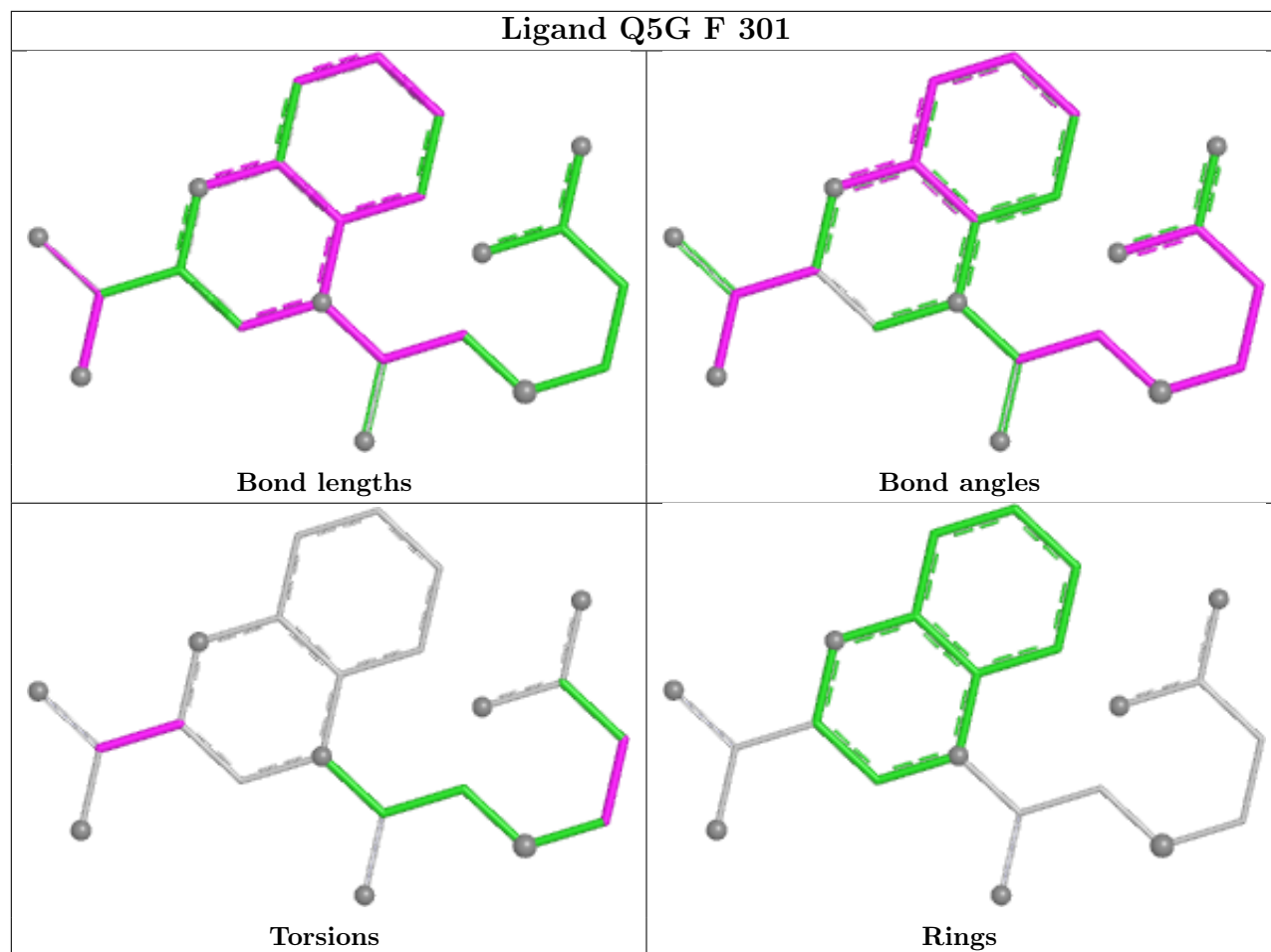
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	301	Q5G	1	0
2	F	301	Q5G	3	0
2	D	301	Q5G	1	0
2	A	302	Q5G	3	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and

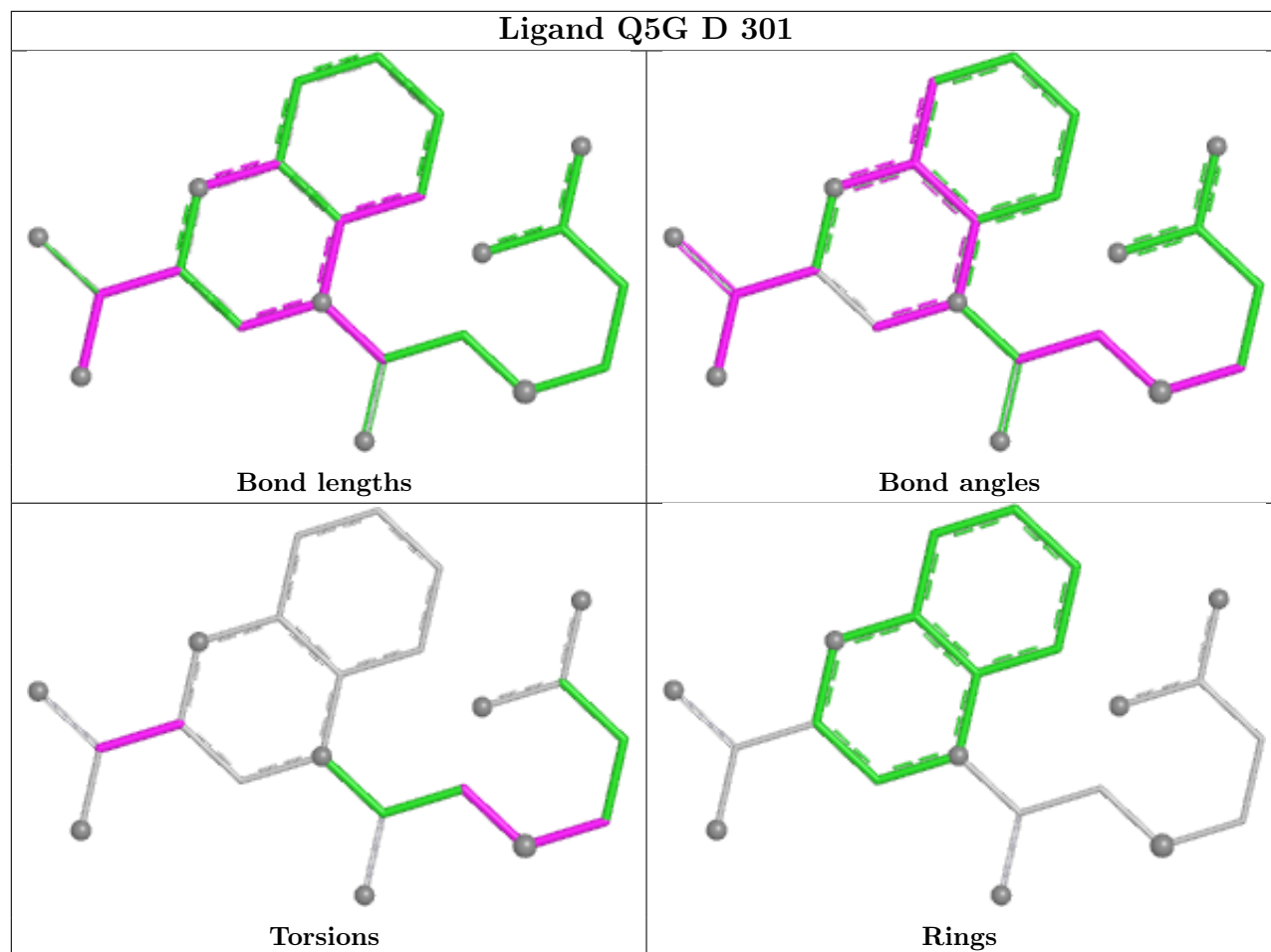
any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.



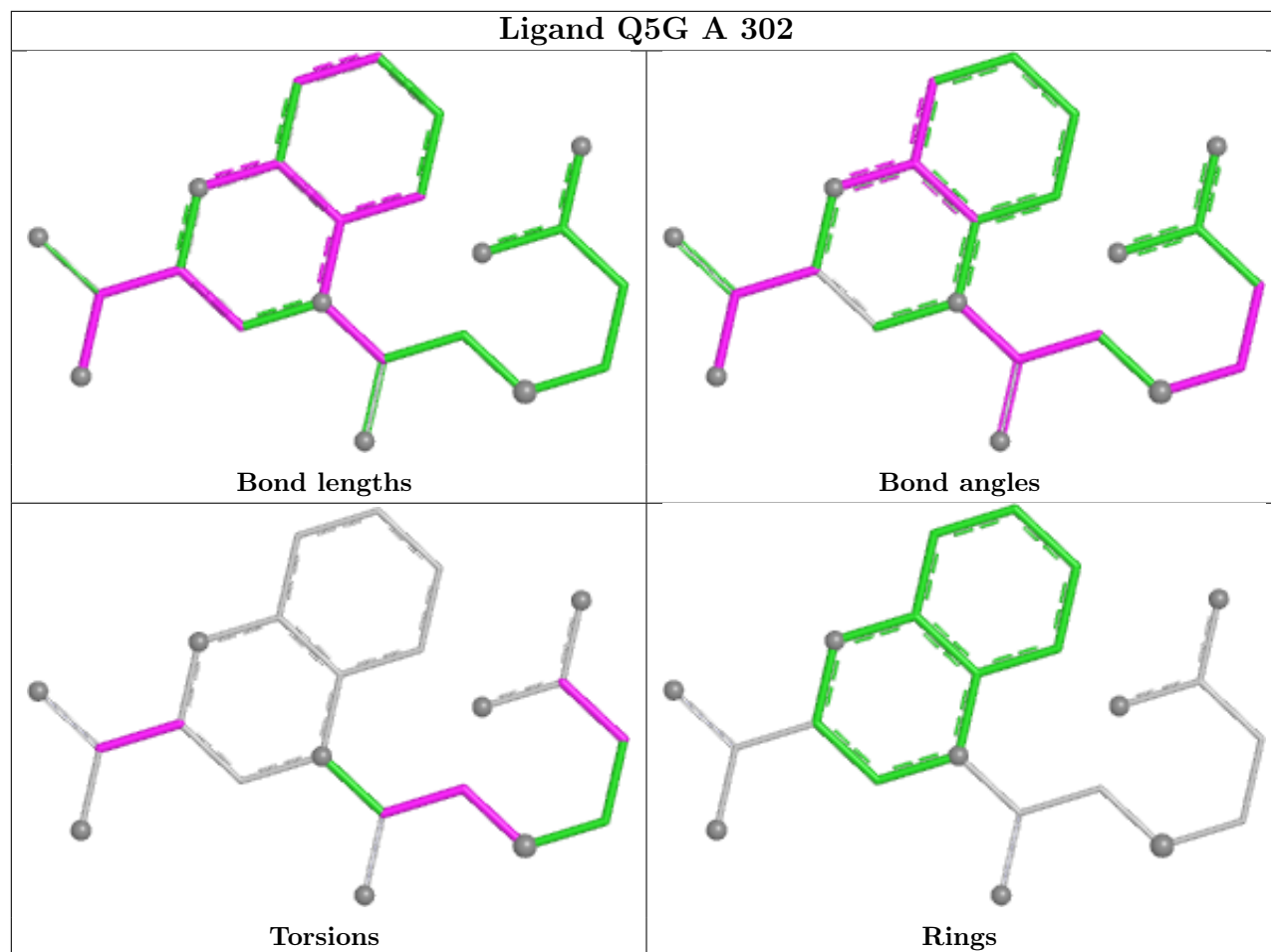
Ligand Q5G F 301



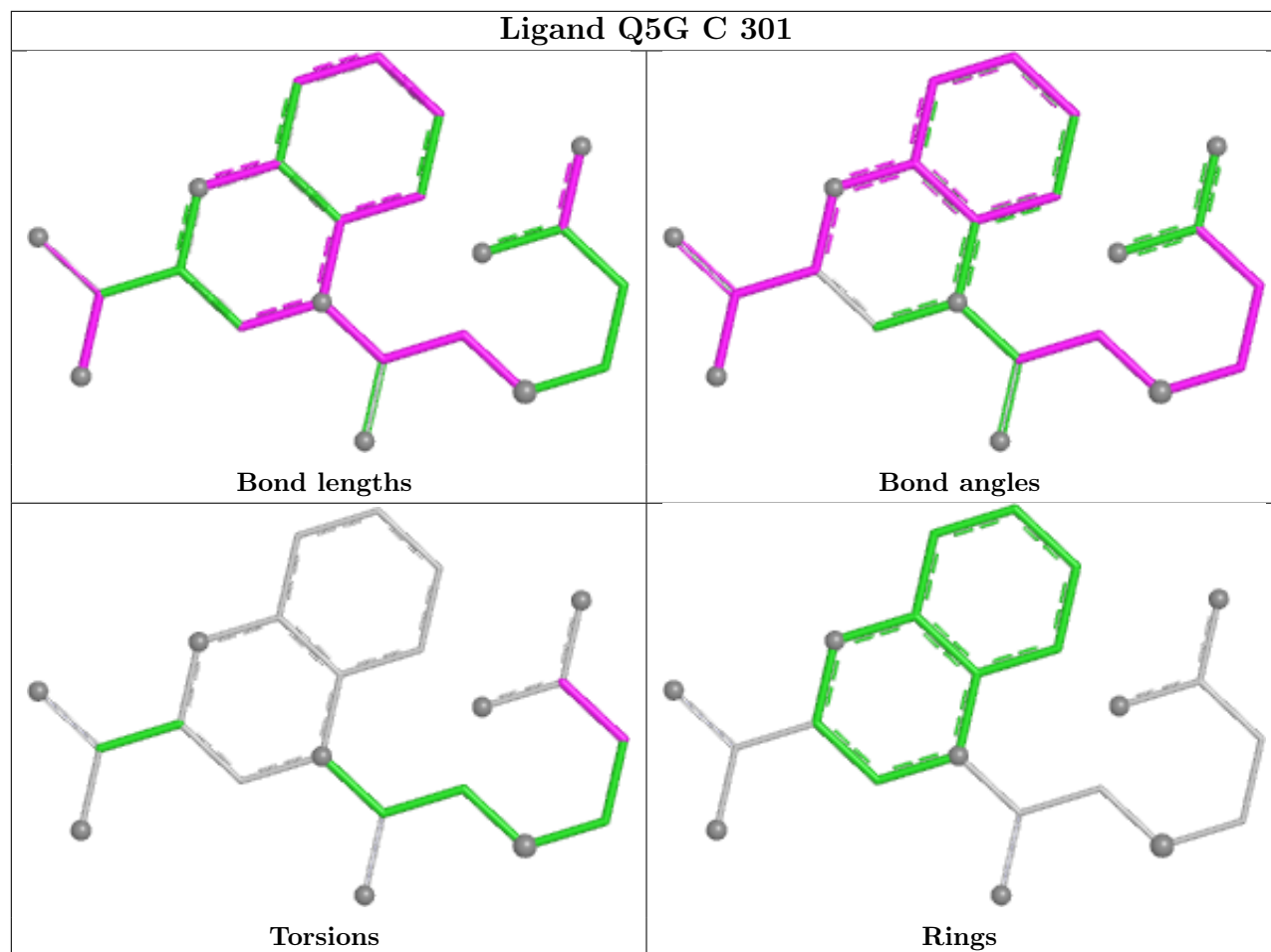
Ligand Q5G D 301

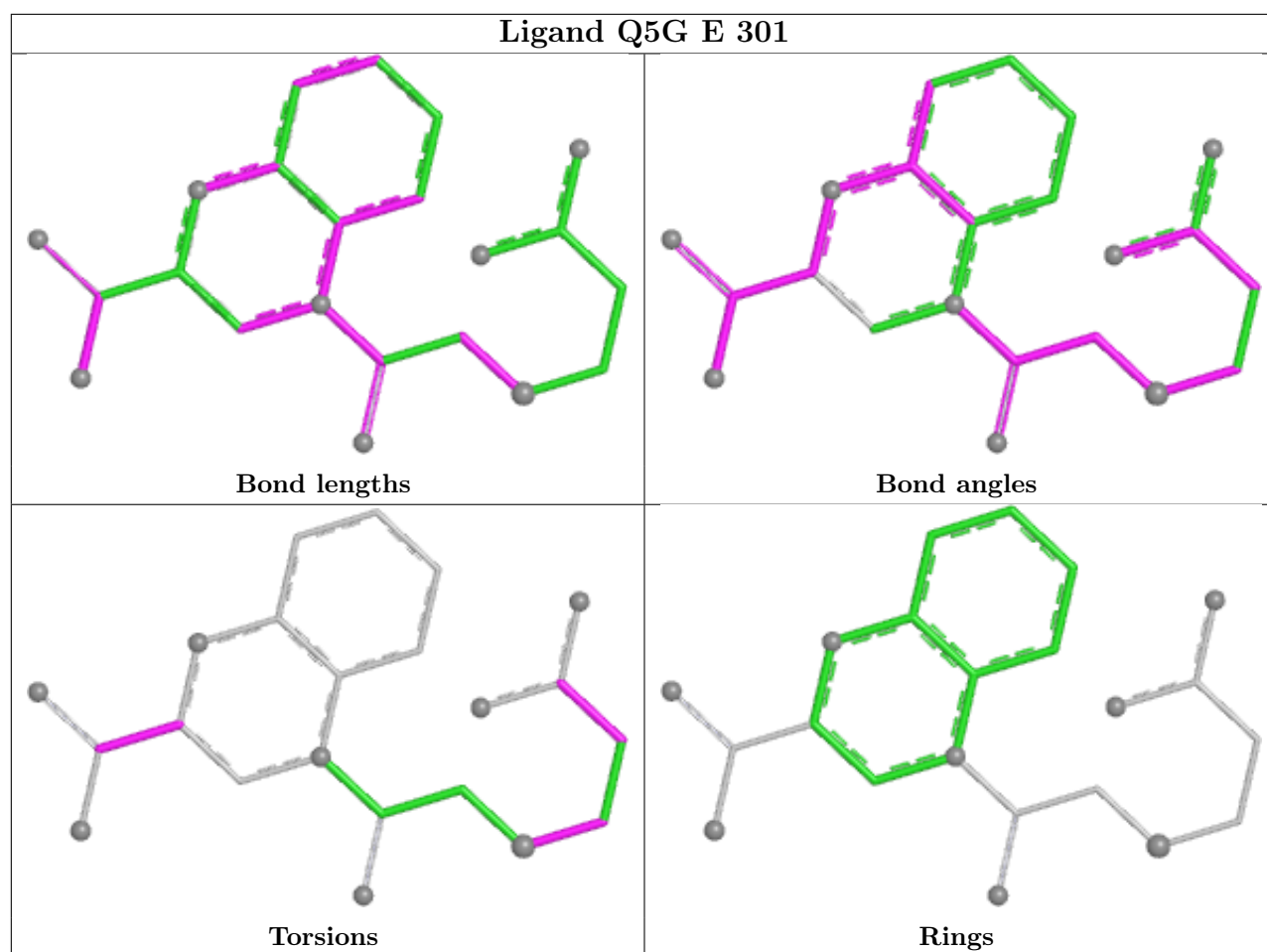


Ligand Q5G A 302



Ligand Q5G C 301





5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data [i](#)

6.1 Protein, DNA and RNA chains [i](#)

In the following table, the column labelled ‘#RSRZ> 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q< 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	257/258 (99%)	-0.17	5 (1%) 66 66	12, 22, 52, 73	1 (0%)
1	B	257/258 (99%)	-0.36	1 (0%) 88 88	6, 19, 39, 49	4 (1%)
1	C	256/258 (99%)	-0.22	1 (0%) 88 88	12, 24, 43, 54	0
1	D	257/258 (99%)	-0.26	3 (1%) 76 76	13, 21, 44, 64	0
1	E	257/258 (99%)	-0.13	0 100 100	13, 25, 45, 65	0
1	F	257/258 (99%)	-0.25	2 (0%) 82 82	13, 22, 41, 70	1 (0%)
All	All	1541/1548 (99%)	-0.23	12 (0%) 82 82	6, 22, 45, 73	6 (0%)

All (12) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	253	THR	3.0
1	A	2	SER	2.9
1	F	254	ARG	2.7
1	A	200	ARG	2.6
1	F	253	THR	2.4
1	A	71	LEU	2.3
1	D	254	ARG	2.2
1	A	253	THR	2.2
1	C	19	ASP	2.2
1	A	254	ARG	2.1
1	B	77	PRO	2.1
1	D	2	SER	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](#)

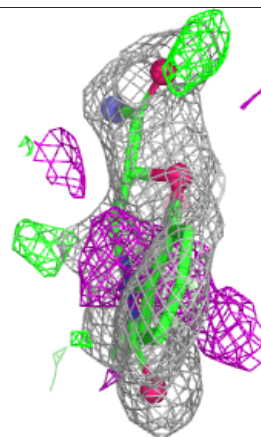
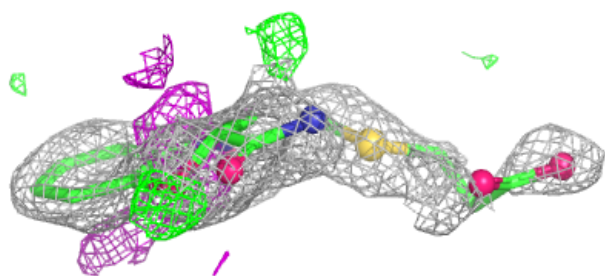
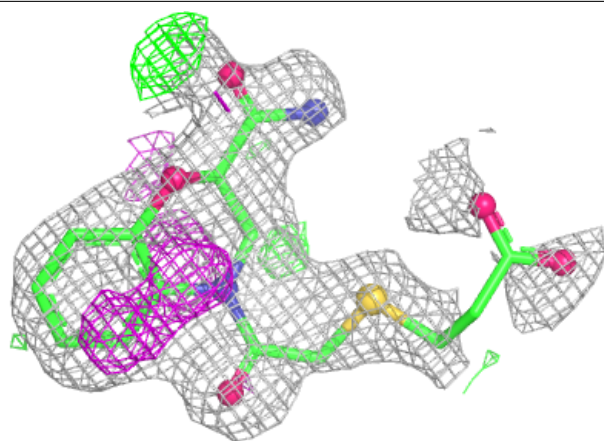
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
2	Q5G	A	302	22/22	0.80	0.16	35,49,60,62	0
2	Q5G	F	301	22/22	0.82	0.14	32,40,53,55	0
2	Q5G	A	301	22/22	0.84	0.14	32,44,61,64	0
2	Q5G	D	301	22/22	0.88	0.11	25,33,51,52	0
3	CA	B	301	1/1	0.91	0.10	52,52,52,52	0
2	Q5G	E	301	22/22	0.92	0.09	23,31,42,42	0
2	Q5G	C	301	22/22	0.93	0.09	17,26,38,44	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.

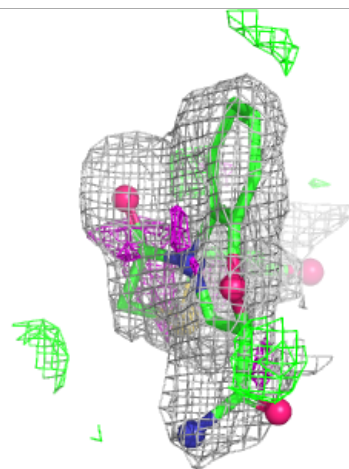
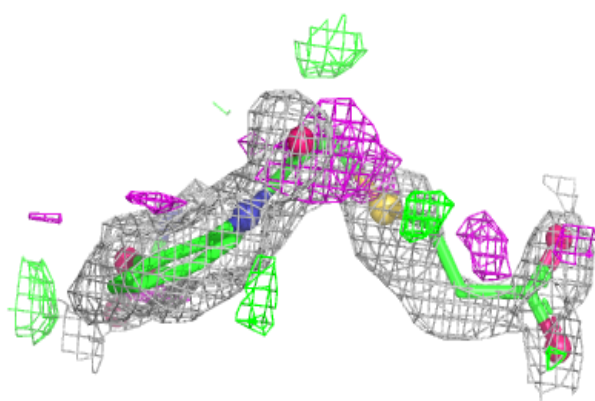
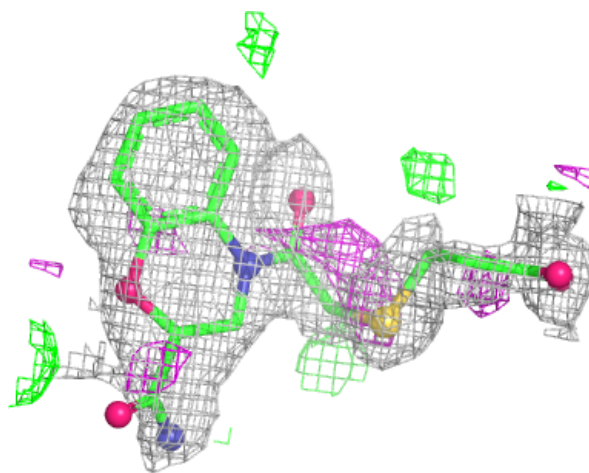
Electron density around Q5G A 302:

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



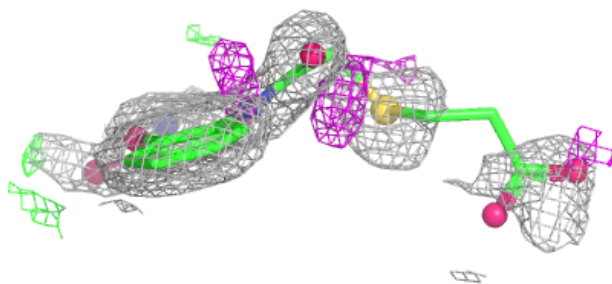
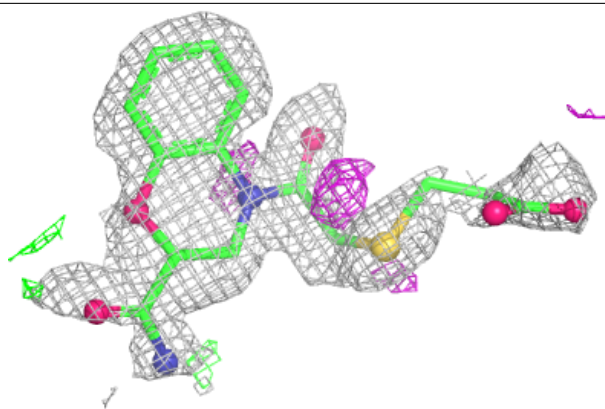
Electron density around Q5G F 301:

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



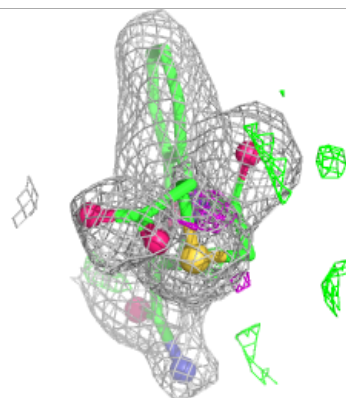
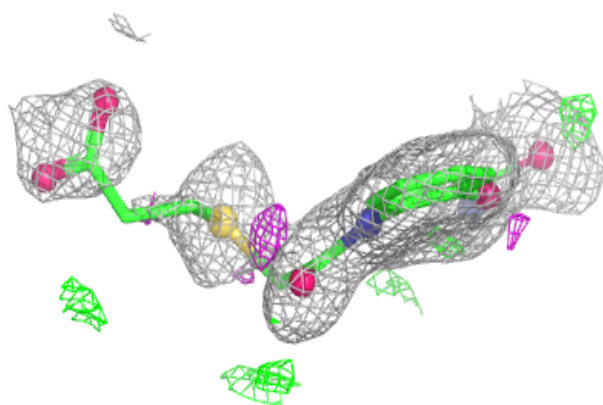
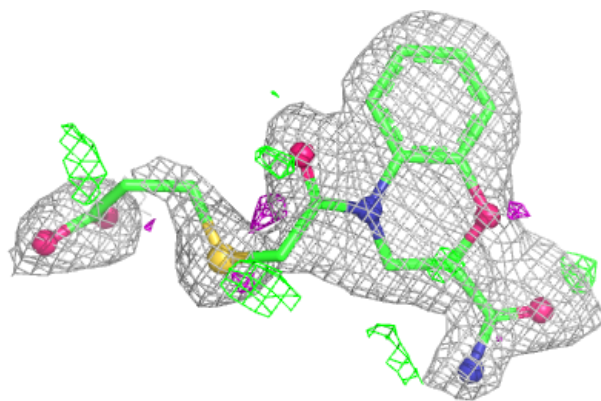
Electron density around Q5G A 301:

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



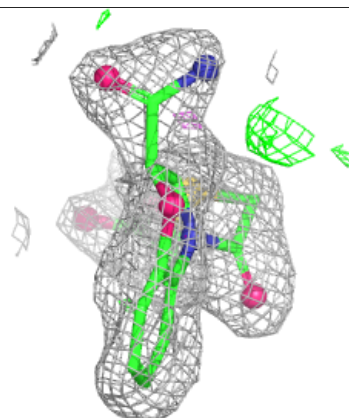
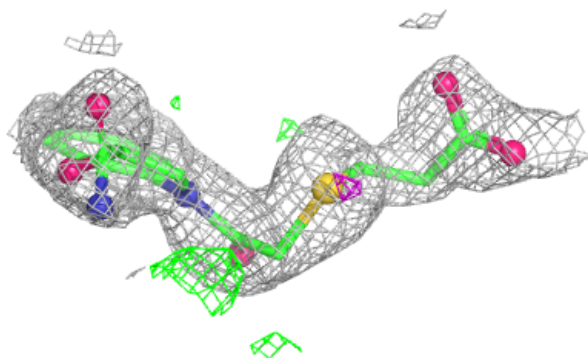
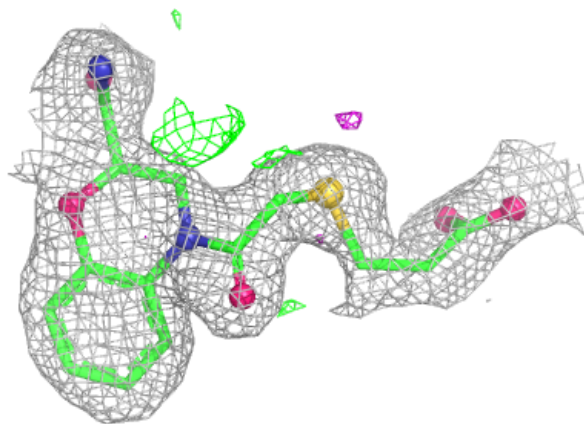
Electron density around Q5G D 301:

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



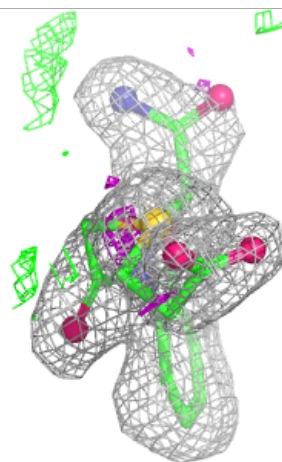
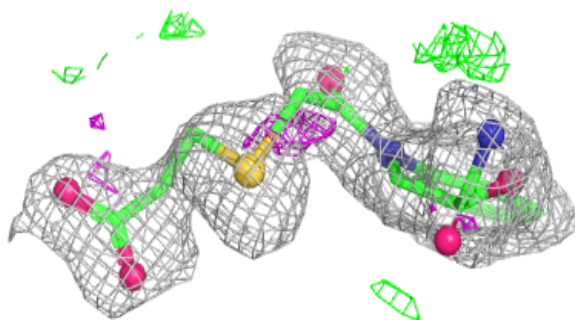
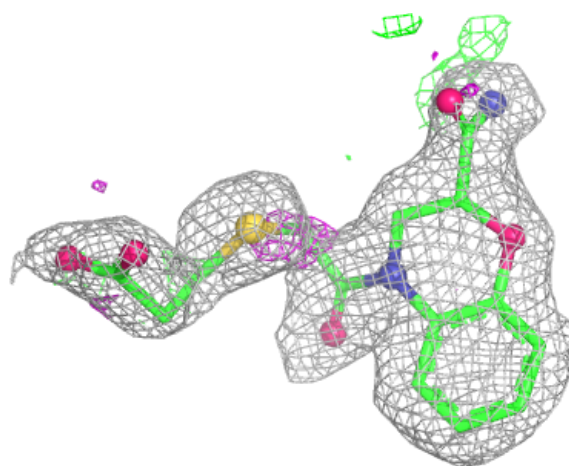
Electron density around Q5G E 301:

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



Electron density around Q5G C 301:

$2mF_o-DF_c$ (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.