



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 9, 2026 – 11:08 AM UTC

PDB ID : 6UEE / pdb_00006uee
Title : Pseudomonas aeruginosa LpxA Complex Structure with Ligand
Authors : Chen, Y.; Kroeck, K.; Sacco, M.
Deposited on : 2019-09-20
Resolution : 2.10 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

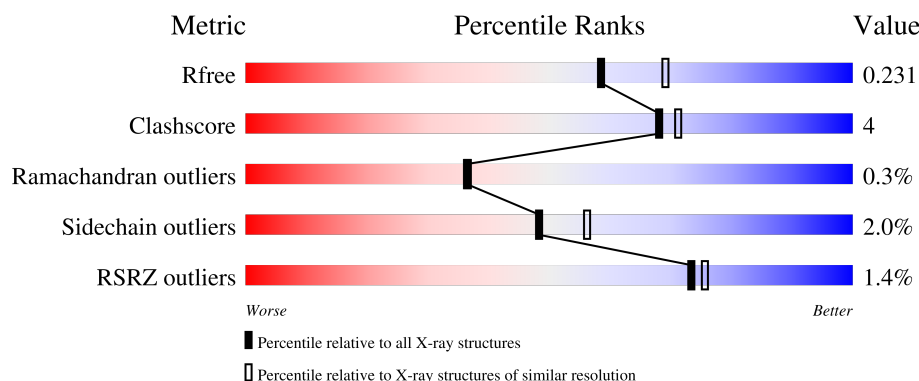
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.10 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	6658 (2.10-2.10)
Clashscore	190562	7164 (2.10-2.10)
Ramachandran outliers	187476	7099 (2.10-2.10)
Sidechain outliers	187428	7100 (2.10-2.10)
RSRZ outliers	180081	6662 (2.10-2.10)

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	 3% 88% 11%
1	B	258	 93% 7%
1	C	258	 2% 91% 8% .
1	D	258	 1% 91% 8%
1	E	258	 2% 87% 12%

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Mol	Chain	Length	Quality of chain
1	F	258	2% 85% 14%

2 Entry composition [i](#)

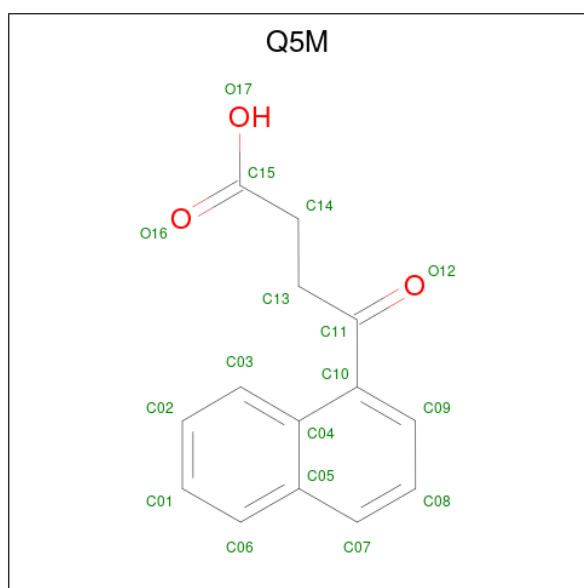
There are 4 unique types of molecules in this entry. The entry contains 12310 atoms, of which 0 are hydrogens and 0 are deuteriums.

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.

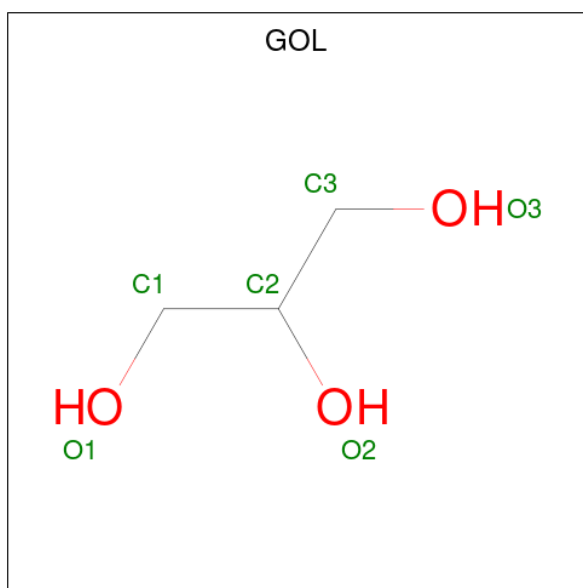
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	258	Total	C	N	O	S	0	1	0
			1955	1224	356	369	6			
1	B	257	Total	C	N	O	S	0	1	0
			1965	1230	361	368	6			
1	C	256	Total	C	N	O	S	0	0	0
			1936	1213	354	363	6			
1	D	257	Total	C	N	O	S	0	1	0
			1965	1229	363	366	7			
1	E	257	Total	C	N	O	S	0	0	0
			1954	1224	357	367	6			
1	F	257	Total	C	N	O	S	0	1	0
			1957	1225	358	368	6			

- Molecule 2 is 4-(naphthalen-1-yl)-4-oxobutanoic acid (CCD ID: Q5M) (formula: C₁₄H₁₂O₃) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	1	Total C O 17 14 3	0	1
2	A	1	Total C O 17 14 3	0	0
2	A	1	Total C O 17 14 3	0	0
2	C	1	Total C O 17 14 3	0	1
2	D	1	Total C O 17 14 3	0	1
2	E	1	Total C O 17 14 3	0	0
2	E	1	Total C O 17 14 3	0	0
2	E	1	Total C O 17 14 3	0	0

- Molecule 3 is GLYCEROL (CCD ID: GOL) (formula: $C_3H_8O_3$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total C O 6 3 3	0	0
3	B	1	Total C O 6 3 3	0	0
3	B	1	Total C O 6 3 3	0	0
3	C	1	Total C O 6 3 3	0	0

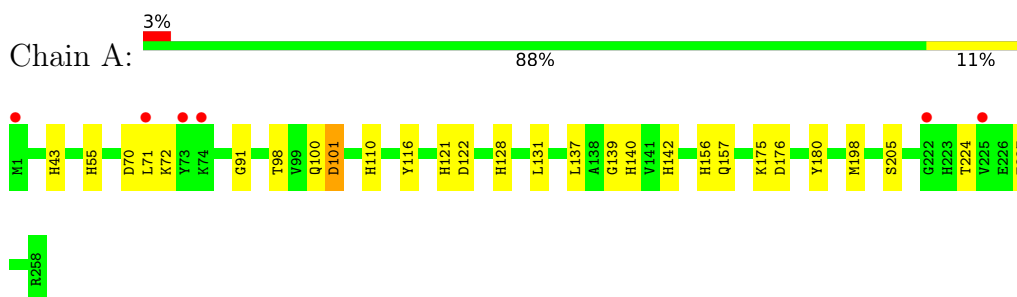
- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	74	Total 74	O 74	0	3
4	B	82	Total 82	O 82	0	5
4	C	46	Total 46	O 46	0	4
4	D	72	Total 72	O 72	0	4
4	E	71	Total 71	O 71	0	3
4	F	73	Total 73	O 73	0	2

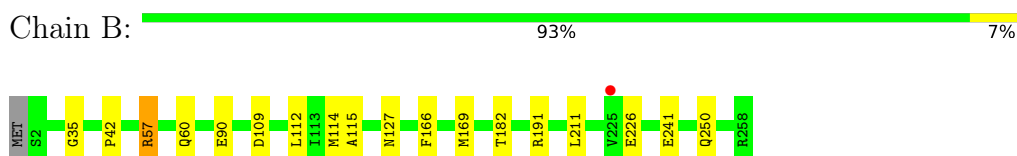
3 Residue-property plots

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.

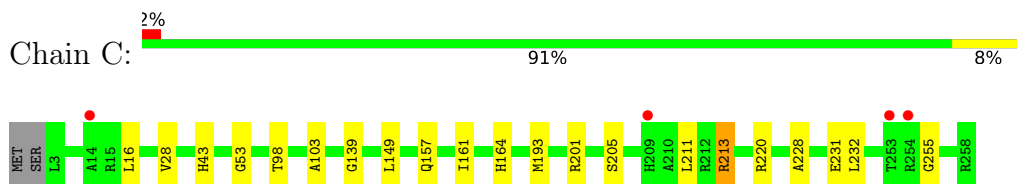
- Molecule 1: Acyl-[acyl-carrier-protein]--UDP-N-acetylglucosamine O-acyltransferase



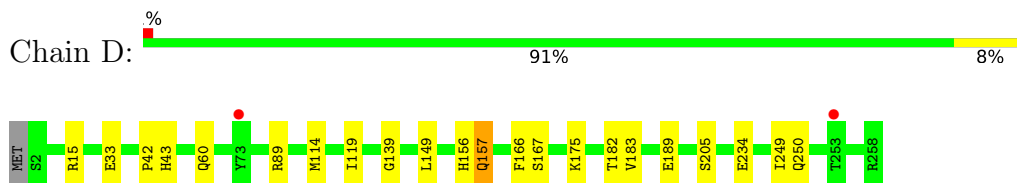
- Molecule 1: Acyl-[acyl-carrier-protein]--UDP-N-acetylglucosamine O-acyltransferase



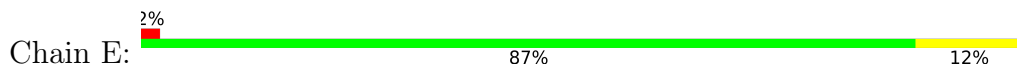
- Molecule 1: Acyl-[acyl-carrier-protein]--UDP-N-acetylglucosamine O-acyltransferase

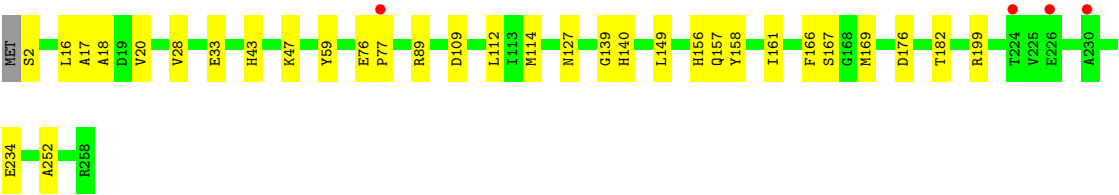


- Molecule 1: Acyl-[acyl-carrier-protein]--UDP-N-acetylglucosamine O-acyltransferase

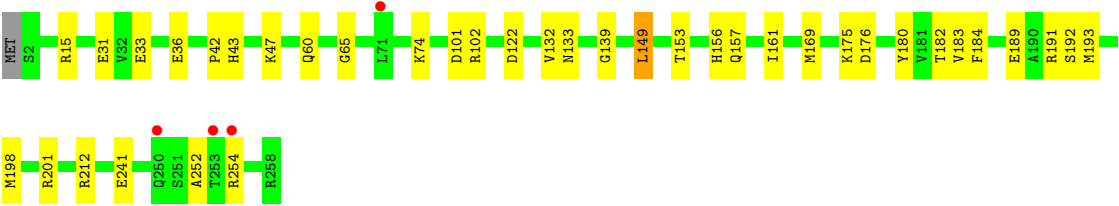
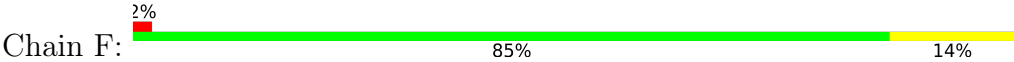


- Molecule 1: Acyl-[acyl-carrier-protein]--UDP-N-acetylglucosamine O-acyltransferase





● 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	80.31Å 82.56Å 221.89Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	66.32 – 2.10 66.32 – 2.10	Depositor EDS
% Data completeness (in resolution range)	82.3 (66.32-2.10) 82.3 (66.32-2.10)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.46 (at 2.10Å)	Xtriage
Refinement program	REFMAC 5.8.0253	Depositor
R, R_{free}	0.182 , 0.249 (Not available) , 0.231	Depositor DCC
R_{free} test set	3469 reflections (3.99%)	wwPDB-VP
Wilson B-factor (Å ²)	24.2	Xtriage
Anisotropy	0.205	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.35 , 42.3	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	0.035 for k,h,-l	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	12310	wwPDB-VP
Average B, all atoms (Å ²)	28.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.57% 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: Q5M, GOL

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	1.09	0/1997	1.33	2/2713 (0.1%)
1	B	1.07	0/2007	1.38	3/2724 (0.1%)
1	C	1.07	0/1977	1.37	1/2685 (0.0%)
1	D	1.05	0/2007	1.37	2/2722 (0.1%)
1	E	1.07	0/1996	1.38	0/2710
1	F	1.06	0/1999	1.38	2/2715 (0.1%)
All	All	1.07	0/11983	1.37	10/16269 (0.1%)

There are no bond length outliers.

All (10) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	255	GLY	CA-C-O	-6.52	117.61	122.37
1	A	249	ILE	CA-C-N	5.59	128.08	120.54
1	A	249	ILE	C-N-CA	5.59	128.08	120.54
1	B	35	GLY	CA-C-N	5.52	128.68	120.90
1	B	35	GLY	C-N-CA	5.52	128.68	120.90
1	F	161	ILE	CA-C-N	5.38	125.21	120.10
1	F	161	ILE	C-N-CA	5.38	125.21	120.10
1	B	57	ARG	CB-CA-C	5.33	118.36	110.14
1	D	119	ILE	CA-C-N	5.11	124.96	120.10
1	D	119	ILE	C-N-CA	5.11	124.96	120.10

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	1955	0	1899	18	0
1	B	1965	0	1925	8	0
1	C	1936	0	1890	11	0
1	D	1965	0	1923	11	0
1	E	1954	0	1913	18	0
1	F	1957	0	1904	20	0
2	A	51	0	0	2	0
2	C	17	0	0	0	0
2	D	17	0	0	1	0
2	E	51	0	0	2	0
3	A	6	0	8	0	0
3	B	12	0	16	1	0
3	C	6	0	8	2	0
4	A	74	0	0	2	0
4	B	82	0	0	1	0
4	C	46	0	0	3	0
4	D	72	0	0	0	0
4	E	71	0	0	2	0
4	F	73	0	0	5	0
All	All	12310	0	11486	85	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 (85) 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:F:31:GLU:OE1	4:F:301:HOH:O	1.81	0.99
1:A:156:HIS:ND1	2:A:301[A]:Q5M:O16	2.14	0.79
1:C:220:ARG:NH1	4:C:401:HOH:O	2.16	0.78
1:E:33:GLU:OE2	4:E:401:HOH:O	2.04	0.76
1:B:112:LEU:HD21	1:B:114:MET:HE2	1.71	0.70
1:A:101:ASP:OD2	1:A:140:HIS:ND1	2.24	0.68
1:F:176:ASP:OD2	1:F:252:ALA:HA	1.93	0.68
1:D:156:HIS:CE1	1:E:169:MET:HE2	2.32	0.65

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:43:HIS:ND1	1:C:43:HIS:CE1	2.65	0.64
2:E:302:Q5M:O12	2:E:302:Q5M:C03	2.51	0.59
1:F:33:GLU:HB3	4:F:305:HOH:O	2.04	0.57
1:C:213:ARG:HG2	1:C:213:ARG:HH21	1.68	0.57
1:A:70:ASP:C	1:A:72:LYS:H	2.14	0.54
1:B:57:ARG:NH1	3:B:501:GOL:O1	2.40	0.54
1:C:213:ARG:NH1	1:C:231:GLU:OE2	2.41	0.54
3:C:302:GOL:C1	4:C:425:HOH:O	2.57	0.52
1:F:157:GLN:HG2	4:F:348:HOH:O	2.10	0.52
1:F:212:ARG:NH2	4:F:302:HOH:O	2.26	0.51
1:A:98:THR:HB	1:A:100:GLN:NE2	2.26	0.51
1:E:16:LEU:HD11	1:E:28:VAL:HG11	1.93	0.50
1:D:183:VAL:HA	1:D:189:GLU:O	2.12	0.50
1:F:183:VAL:HA	1:F:189:GLU:O	2.12	0.50
1:A:121:HIS:HD2	1:A:122:ASP:OD2	1.95	0.48
1:C:16:LEU:HD11	1:C:28:VAL:HG11	1.94	0.48
1:B:211:LEU:HD11	1:B:241:GLU:HB3	1.94	0.48
1:A:142:HIS:HB3	4:A:460:HOH:O	2.13	0.48
1:B:42:PRO:O	1:B:60:GLN:HA	2.14	0.47
1:E:156:HIS:CE1	1:F:169:MET:HE2	2.50	0.46
4:B:670:HOH:O	1:D:250:GLN:CB	2.63	0.46
1:E:2:SER:N	4:E:405:HOH:O	2.47	0.46
1:F:182:THR:HG22	1:F:184:PHE:CE1	2.51	0.46
1:F:149:LEU:HG	1:F:153:THR:HG21	1.96	0.46
1:A:139:GLY:O	1:A:157:GLN:HA	2.15	0.46
1:A:176:ASP:OD2	1:A:252:ALA:HA	2.16	0.46
1:A:91:GLY:HA3	1:A:116:TYR:CE1	2.51	0.46
1:E:139:GLY:O	1:E:157:GLN:HA	2.16	0.46
1:E:176:ASP:OD2	1:E:252:ALA:HA	2.14	0.46
1:F:139:GLY:O	1:F:157:GLN:HA	2.16	0.46
3:C:302:GOL:H12	4:C:425:HOH:O	2.16	0.45
1:C:139:GLY:O	1:C:157:GLN:HA	2.15	0.45
1:C:193:MET:HE2	1:C:211:LEU:O	2.17	0.45
1:F:132:VAL:HG12	1:F:133:ASN:N	2.32	0.45
1:A:131:LEU:HD21	1:A:137:LEU:HD11	1.99	0.45
1:D:43:HIS:CE1	1:F:43:HIS:ND1	2.85	0.45
1:E:166:PHE:O	1:E:182:THR:HA	2.17	0.45
1:B:112:LEU:CD2	1:B:114:MET:HE2	2.45	0.45
1:C:228:ALA:O	1:C:232:LEU:HG	2.17	0.44
1:D:139:GLY:O	1:D:157:GLN:HA	2.18	0.44
1:E:18:ALA:HB1	2:E:303:Q5M:C04	2.48	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:224:THR:O	1:A:227:GLU:HB2	2.18	0.43
1:D:42:PRO:O	1:D:60:GLN:HA	2.18	0.43
1:F:180:TYR:HB3	1:F:198:MET:HE2	2.01	0.43
1:E:149:LEU:HA	1:E:167:SER:OG	2.19	0.43
1:E:59:TYR:HB2	1:E:89:ARG:C	2.43	0.43
1:F:182:THR:CG2	1:F:184:PHE:HE1	2.32	0.43
1:E:112:LEU:HD21	1:E:114:MET:HE2	2.00	0.43
1:E:109:ASP:O	1:E:127:ASN:HA	2.19	0.42
1:A:98:THR:HB	1:A:100:GLN:HE21	1.84	0.42
1:F:101:ASP:OD2	1:F:122:ASP:HB3	2.19	0.42
1:A:55:HIS:ND1	4:A:401:HOH:O	2.29	0.42
1:B:90:GLU:O	1:B:115:ALA:HA	2.19	0.42
1:E:149:LEU:HD21	1:E:161:ILE:HG21	2.02	0.42
1:A:110:HIS:O	1:A:128:HIS:HA	2.19	0.42
1:C:164:HIS:NE2	1:C:201:ARG:HG3	2.34	0.42
1:B:109:ASP:O	1:B:127:ASN:HA	2.20	0.42
2:D:301[B]:Q5M:C14	4:F:348:HOH:O	2.68	0.42
1:B:166:PHE:O	1:B:182:THR:HA	2.19	0.41
1:A:157:GLN:HG3	2:A:301[A]:Q5M:O17	2.20	0.41
1:D:89:ARG:HB2	1:D:114[B]:MET:HA	2.02	0.41
1:F:175:LYS:HG2	1:F:254:ARG:O	2.20	0.41
1:A:70:ASP:C	1:A:72:LYS:N	2.79	0.41
1:C:149:LEU:HD21	1:C:161:ILE:HG21	2.02	0.41
1:D:166:PHE:O	1:D:182:THR:HA	2.21	0.41
1:E:76:GLU:HB3	1:E:77:PRO:HD2	2.02	0.41
1:D:15:ARG:HB2	1:D:33:GLU:HG2	2.01	0.41
1:A:180:TYR:HB3	1:A:198:MET:HE2	2.02	0.41
1:F:42:PRO:O	1:F:60:GLN:HA	2.21	0.41
1:E:140:HIS:O	1:E:158:TYR:HA	2.21	0.41
1:D:149:LEU:HA	1:D:167:SER:OG	2.20	0.40
1:E:17:ALA:HB3	1:E:20:VAL:HG23	2.03	0.40
1:F:47:LYS:O	1:F:65:GLY:HA3	2.21	0.40
1:F:156:HIS:HD2	1:F:157:GLN:O	2.05	0.40
1:F:180:TYR:OH	1:F:241:GLU:HA	2.21	0.40
1:C:98:THR:O	1:C:103:ALA:HA	2.20	0.40
1:D:43:HIS:ND1	1:E:43:HIS:CE1	2.89	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	257/258 (100%)	241 (94%)	14 (5%)	2 (1%)	16	12
1	B	256/258 (99%)	244 (95%)	12 (5%)	0	100	100
1	C	254/258 (98%)	239 (94%)	14 (6%)	1 (0%)	30	28
1	D	256/258 (99%)	246 (96%)	10 (4%)	0	100	100
1	E	255/258 (99%)	242 (95%)	13 (5%)	0	100	100
1	F	256/258 (99%)	243 (95%)	12 (5%)	1 (0%)	30	28
All	All	1534/1548 (99%)	1455 (95%)	75 (5%)	4 (0%)	36	36

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	F	192	SER
1	A	71	LEU
1	C	53	GLY
1	A	101	ASP

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	201/206 (98%)	199 (99%)	2 (1%)	68	76
1	B	204/206 (99%)	199 (98%)	5 (2%)	42	48
1	C	199/206 (97%)	197 (99%)	2 (1%)	68	76

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	D	203/206 (98%)	198 (98%)	5 (2%)	42	48
1	E	203/206 (98%)	200 (98%)	3 (2%)	57	65
1	F	202/206 (98%)	194 (96%)	8 (4%)	28	29
All	All	1212/1236 (98%)	1187 (98%)	25 (2%)	48	54

All (25) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	175	LYS
1	A	205	SER
1	B	169	MET
1	B	191[A]	ARG
1	B	191[B]	ARG
1	B	226	GLU
1	B	250	GLN
1	C	205	SER
1	C	213	ARG
1	D	157	GLN
1	D	175	LYS
1	D	205	SER
1	D	234	GLU
1	D	249	ILE
1	E	47	LYS
1	E	199	ARG
1	E	234	GLU
1	F	15	ARG
1	F	36	GLU
1	F	74	LYS
1	F	102	ARG
1	F	149	LEU
1	F	191	ARG
1	F	193	MET
1	F	201	ARG

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	100	GLN
1	A	121	HIS
1	A	128	HIS

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Mol	Chain	Res	Type
1	A	142	HIS
1	B	157	GLN
1	B	221	GLN
1	C	134	ASN
1	C	250	GLN
1	E	157	GLN
1	E	223	HIS
1	F	156	HIS
1	F	209	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](#)

12 ligands are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z > 2$	Counts	RMSZ	$\# Z > 2$
2	Q5M	E	302	-	18,18,18	1.84	3 (16%)	24,24,24	2.22	6 (25%)
3	GOL	A	303	-	5,5,5	0.11	0	5,5,5	0.28	0
2	Q5M	A	304	-	18,18,18	1.32	2 (11%)	24,24,24	1.69	7 (29%)
2	Q5M	A	302	-	18,18,18	2.30	4 (22%)	24,24,24	1.46	4 (16%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	Q5M	E	301	-	18,18,18	1.76	2 (11%)	24,24,24	1.43	3 (12%)
3	GOL	B	501	-	5,5,5	0.09	0	5,5,5	0.22	0
3	GOL	C	302	-	5,5,5	0.12	0	5,5,5	0.34	0
2	Q5M	D	301[B]	-	18,18,18	1.31	2 (11%)	24,24,24	1.54	3 (12%)
2	Q5M	E	303	-	18,18,18	2.15	3 (16%)	24,24,24	4.33	11 (45%)
3	GOL	B	502	-	5,5,5	0.14	0	5,5,5	0.53	0
2	Q5M	C	301[B]	-	18,18,18	1.64	3 (16%)	24,24,24	1.15	1 (4%)
2	Q5M	A	301[A]	-	18,18,18	1.66	3 (16%)	24,24,24	1.71	5 (20%)

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	Q5M	E	302	-	-	3/9/9/9	0/2/2/2
3	GOL	A	303	-	-	0/4/4/4	-
2	Q5M	A	304	-	-	1/9/9/9	0/2/2/2
2	Q5M	A	302	-	-	5/9/9/9	0/2/2/2
2	Q5M	E	301	-	-	1/9/9/9	0/2/2/2
3	GOL	B	501	-	-	2/4/4/4	-
3	GOL	C	302	-	-	4/4/4/4	-
2	Q5M	D	301[B]	-	-	1/9/9/9	0/2/2/2
2	Q5M	E	303	-	-	2/9/9/9	0/2/2/2
3	GOL	B	502	-	-	2/4/4/4	-
2	Q5M	C	301[B]	-	-	2/9/9/9	0/2/2/2
2	Q5M	A	301[A]	-	-	4/9/9/9	0/2/2/2

All (22) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	E	303	Q5M	C10-C11	7.25	1.55	1.49
2	A	302	Q5M	C10-C11	7.20	1.55	1.49
2	C	301[B]	Q5M	C10-C11	4.97	1.53	1.49
2	E	301	Q5M	C10-C11	4.30	1.53	1.49
2	A	301[A]	Q5M	C10-C11	4.23	1.53	1.49
2	E	302	Q5M	C10-C11	4.22	1.53	1.49
2	D	301[B]	Q5M	C10-C11	3.40	1.52	1.49
2	E	301	Q5M	C04-C05	-3.15	1.37	1.43

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	E	302	Q5M	C04-C05	-2.93	1.37	1.43
2	A	301[A]	Q5M	C13-C11	2.64	1.55	1.51
2	A	301[A]	Q5M	C04-C05	-2.59	1.38	1.43
2	E	302	Q5M	C08-C07	2.54	1.42	1.36
2	E	303	Q5M	C02-C03	2.53	1.42	1.36
2	C	301[B]	Q5M	C04-C05	-2.41	1.38	1.43
2	D	301[B]	Q5M	C04-C05	-2.38	1.38	1.43
2	A	302	Q5M	C14-C15	2.36	1.56	1.50
2	E	303	Q5M	C10-C04	2.28	1.47	1.42
2	A	302	Q5M	C13-C11	2.17	1.54	1.51
2	A	304	Q5M	C10-C11	2.06	1.51	1.49
2	A	304	Q5M	C14-C15	2.05	1.55	1.50
2	C	301[B]	Q5M	O12-C11	-2.05	1.18	1.22
2	A	302	Q5M	C08-C07	2.01	1.41	1.36

All (40) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	E	303	Q5M	C04-C10-C11	12.56	134.44	122.28
2	E	303	Q5M	C09-C10-C11	-11.25	108.84	118.41
2	E	303	Q5M	C13-C11-C10	6.73	130.56	119.65
2	E	302	Q5M	C04-C10-C11	-5.97	116.50	122.28
2	E	303	Q5M	C06-C05-C04	4.66	125.14	119.12
2	A	301[A]	Q5M	C14-C13-C11	-4.51	107.09	112.60
2	E	302	Q5M	C14-C13-C11	-4.51	107.09	112.60
2	E	302	Q5M	C09-C10-C11	4.43	122.19	118.41
2	D	301[B]	Q5M	C13-C11-C10	-4.30	112.68	119.65
2	E	303	Q5M	O12-C11-C10	-4.29	115.45	122.95
2	A	304	Q5M	O12-C11-C10	-4.06	115.83	122.95
2	E	302	Q5M	O12-C11-C10	-3.95	116.03	122.95
2	E	303	Q5M	O12-C11-C13	-3.62	113.99	120.37
2	A	302	Q5M	O12-C11-C10	-3.62	116.61	122.95
2	E	303	Q5M	C07-C05-C06	-3.50	115.02	123.01
2	A	302	Q5M	C13-C11-C10	3.23	124.88	119.65
2	E	303	Q5M	O17-C15-O16	-3.18	115.16	123.33
2	E	303	Q5M	O17-C15-C14	3.11	123.83	114.00
2	D	301[B]	Q5M	C14-C13-C11	-3.04	108.89	112.60
2	A	304	Q5M	C13-C11-C10	2.98	124.49	119.65
2	E	301	Q5M	C04-C10-C11	-2.92	119.45	122.28
2	A	301[A]	Q5M	O17-C15-C14	2.84	122.96	114.00
2	E	303	Q5M	C01-C02-C03	2.75	124.08	120.40
2	E	303	Q5M	C09-C10-C04	-2.63	116.72	119.63

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	E	301	Q5M	C09-C10-C11	2.61	120.64	118.41
2	E	301	Q5M	O12-C11-C10	-2.60	118.39	122.95
2	A	304	Q5M	O17-C15-O16	-2.55	116.78	123.33
2	A	302	Q5M	O17-C15-C14	2.55	122.05	114.00
2	A	301[A]	Q5M	O12-C11-C10	-2.47	118.62	122.95
2	A	301[A]	Q5M	O17-C15-O16	-2.25	117.54	123.33
2	A	304	Q5M	C03-C04-C05	2.19	120.75	117.92
2	E	302	Q5M	C13-C11-C10	2.19	123.20	119.65
2	E	302	Q5M	O17-C15-C14	2.15	120.78	114.00
2	D	301[B]	Q5M	C03-C04-C05	2.14	120.69	117.92
2	A	301[A]	Q5M	C04-C10-C11	-2.12	120.23	122.28
2	A	302	Q5M	O17-C15-O16	-2.11	117.91	123.33
2	A	304	Q5M	O17-C15-C14	2.07	120.56	114.00
2	A	304	Q5M	C04-C10-C11	-2.06	120.29	122.28
2	C	301[B]	Q5M	C14-C13-C11	2.02	115.07	112.60
2	A	304	Q5M	C03-C04-C10	-2.02	120.25	123.28

There are no chirality outliers.

All (27) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	D	301[B]	Q5M	C11-C13-C14-C15
2	E	302	Q5M	C11-C13-C14-C15
2	E	303	Q5M	C04-C10-C11-O12
3	C	302	GOL	C1-C2-C3-O3
2	C	301[B]	Q5M	C10-C11-C13-C14
2	C	301[B]	Q5M	O12-C11-C13-C14
2	A	302	Q5M	C11-C13-C14-C15
3	B	501	GOL	C1-C2-C3-O3
3	B	502	GOL	C1-C2-C3-O3
3	B	502	GOL	O2-C2-C3-O3
3	C	302	GOL	O2-C2-C3-O3
2	A	304	Q5M	C11-C13-C14-C15
2	E	302	Q5M	C10-C11-C13-C14
3	B	501	GOL	O2-C2-C3-O3
3	C	302	GOL	O1-C1-C2-O2
2	A	301[A]	Q5M	O12-C11-C13-C14
2	E	302	Q5M	O12-C11-C13-C14
2	A	302	Q5M	C10-C11-C13-C14
3	C	302	GOL	O1-C1-C2-C3
2	A	301[A]	Q5M	C10-C11-C13-C14
2	E	303	Q5M	C04-C10-C11-C13

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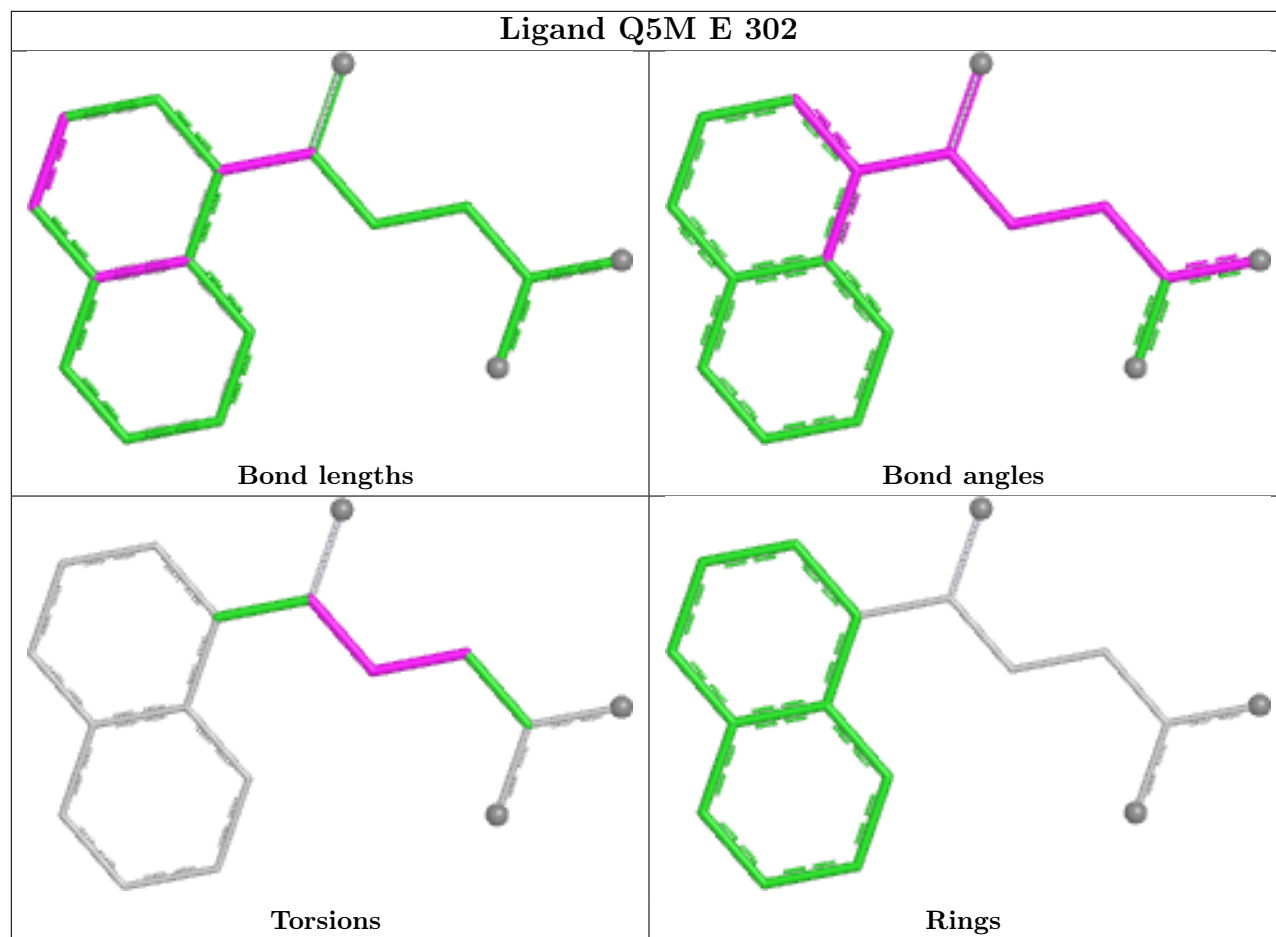
Mol	Chain	Res	Type	Atoms
2	A	302	Q5M	O12-C11-C13-C14
2	E	301	Q5M	C10-C11-C13-C14
2	A	301[A]	Q5M	C13-C14-C15-O17
2	A	301[A]	Q5M	C13-C14-C15-O16
2	A	302	Q5M	C13-C14-C15-O17
2	A	302	Q5M	C13-C14-C15-O16

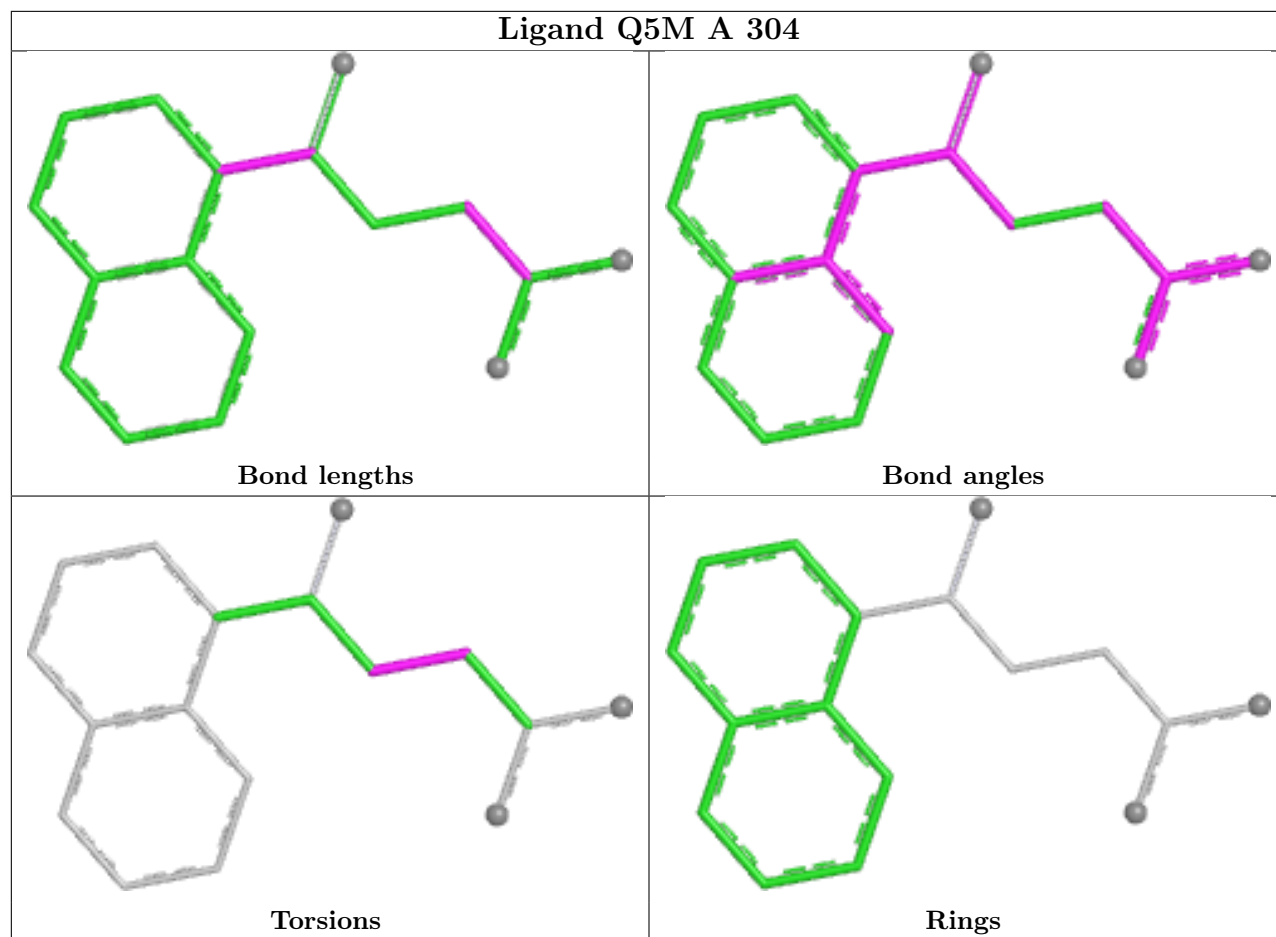
There are no ring outliers.

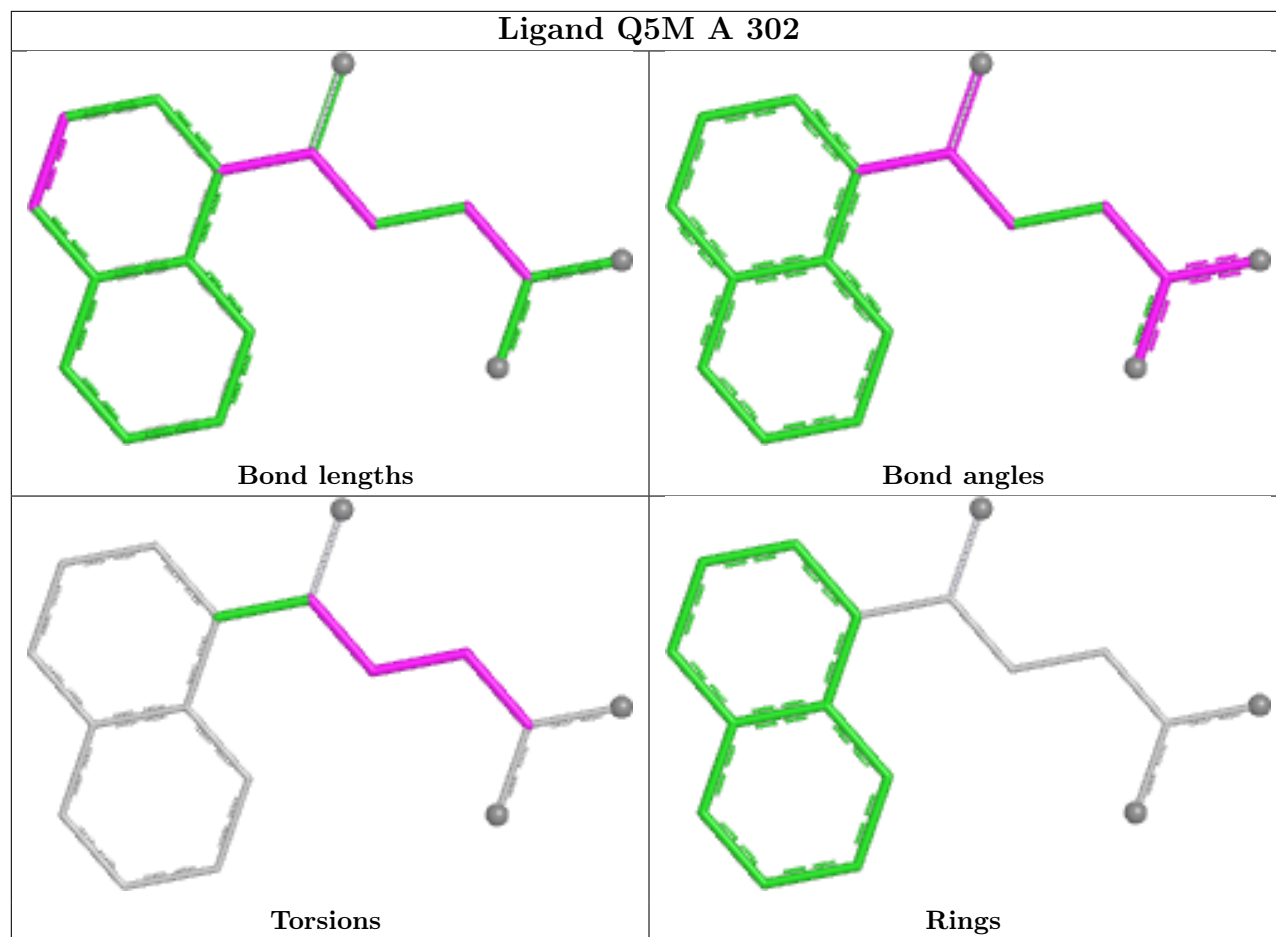
6 monomers are involved in 8 short contacts:

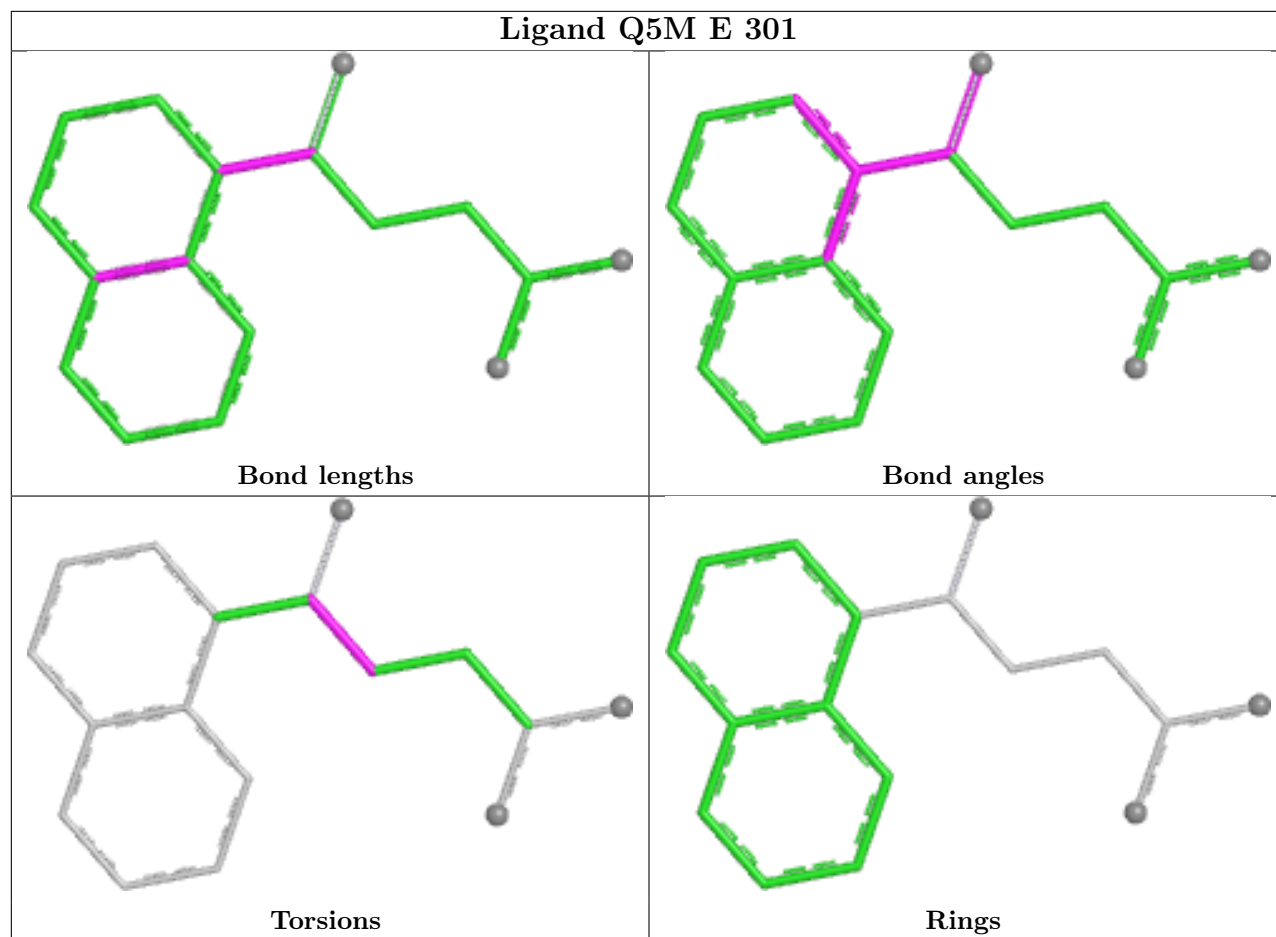
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	E	302	Q5M	1	0
3	B	501	GOL	1	0
3	C	302	GOL	2	0
2	D	301[B]	Q5M	1	0
2	E	303	Q5M	1	0
2	A	301[A]	Q5M	2	0

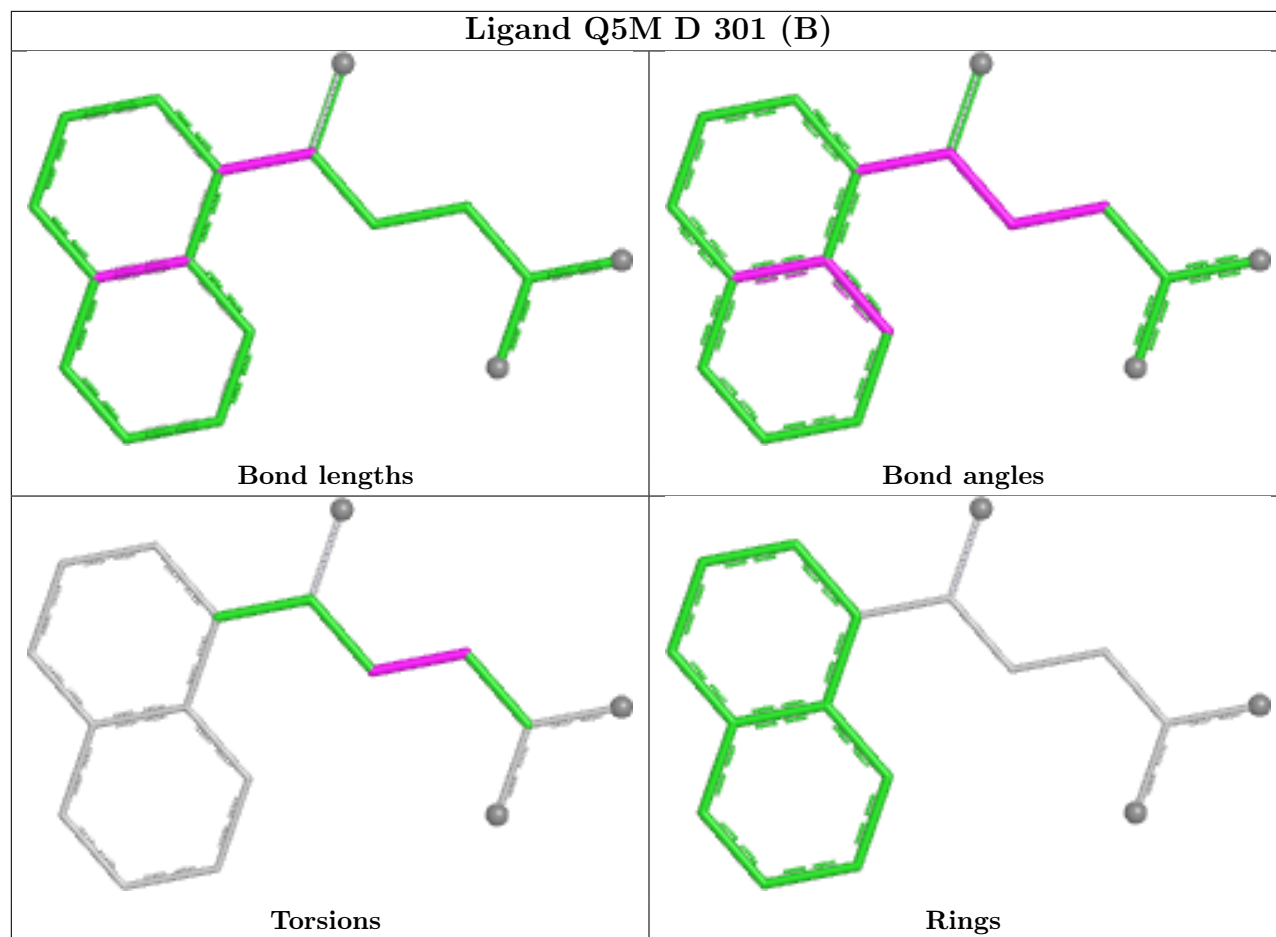
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

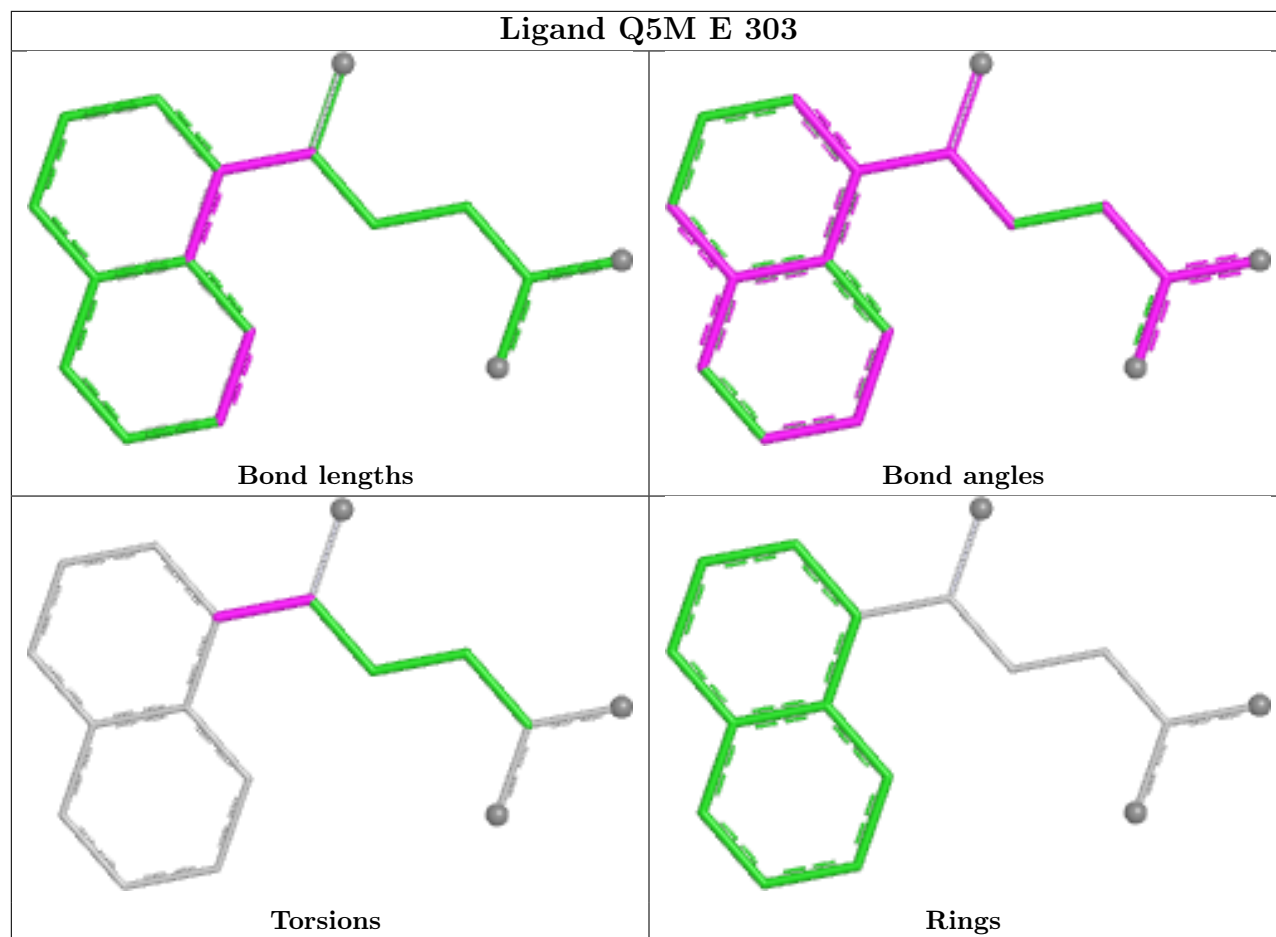




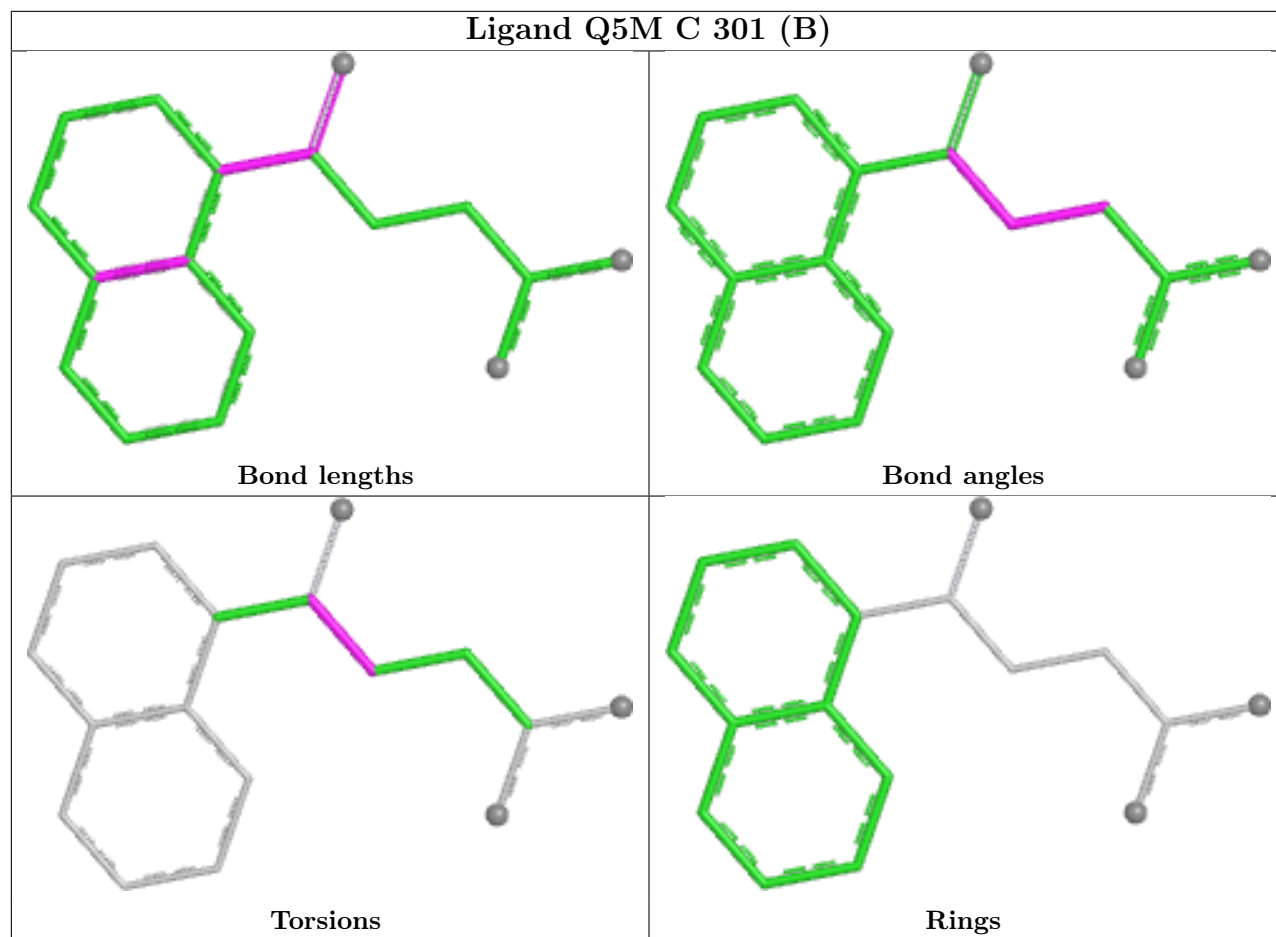


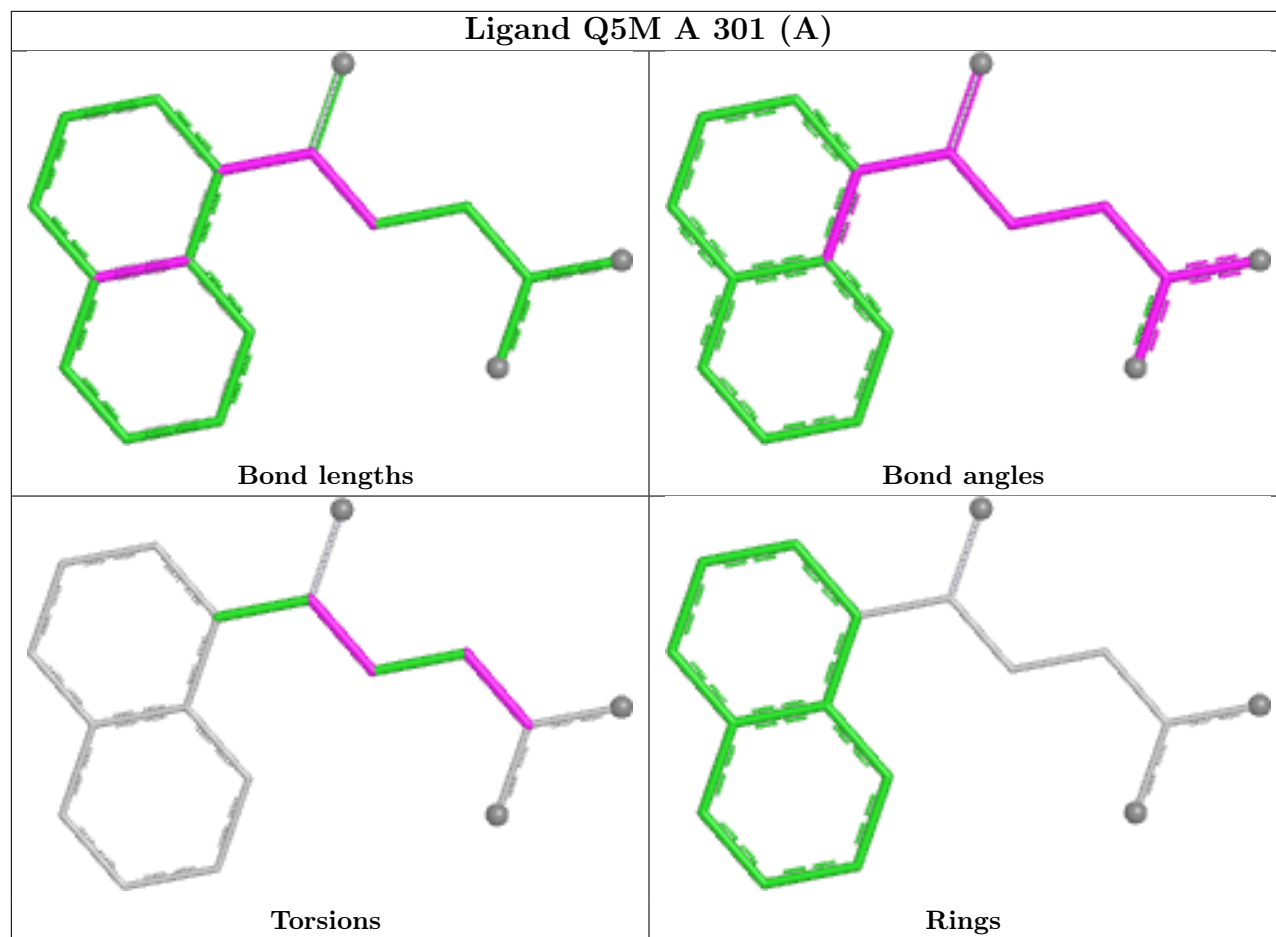






Ligand Q5M C 301 (B)





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	258/258 (100%)	-0.05	7 (2%)	56	59	12, 24, 47, 66	1 (0%)
1	B	257/258 (99%)	-0.20	1 (0%)	88	90	13, 24, 40, 53	1 (0%)
1	C	256/258 (99%)	0.07	4 (1%)	70	73	16, 30, 50, 57	0
1	D	257/258 (99%)	-0.08	2 (0%)	82	84	9, 24, 43, 65	1 (0%)
1	E	257/258 (99%)	0.03	4 (1%)	70	73	16, 29, 50, 64	0
1	F	257/258 (99%)	-0.02	4 (1%)	70	73	16, 25, 45, 54	1 (0%)
All	All	1542/1548 (99%)	-0.04	22 (1%)	73	75	9, 26, 47, 66	4 (0%)

All (22) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	253	THR	4.3
1	A	73	TYR	3.9
1	A	71	LEU	3.6
1	A	74	LYS	3.1
1	A	222	GLY	2.9
1	A	225	VAL	2.9
1	B	225	VAL	2.8
1	C	209	HIS	2.8
1	A	1	MET	2.8
1	F	250[A]	GLN	2.7
1	F	253	THR	2.7
1	A	253	THR	2.6
1	C	254	ARG	2.6
1	D	73	TYR	2.5
1	E	224	THR	2.4
1	F	71	LEU	2.3
1	C	14	ALA	2.3
1	E	77	PRO	2.2
1	E	230	ALA	2.2

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Mol	Chain	Res	Type	RSRZ
1	E	226	GLU	2.1
1	F	254	ARG	2.1
1	C	253	THR	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](#)

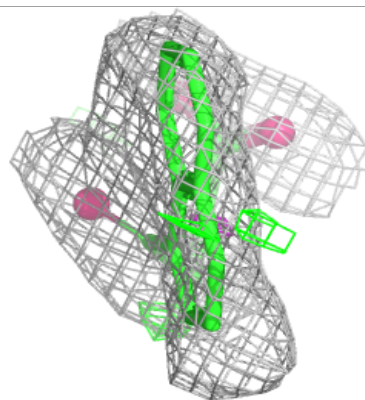
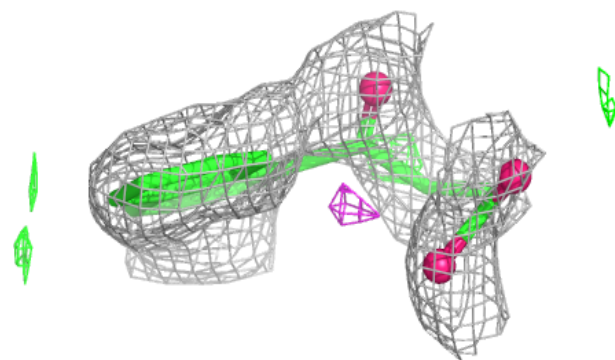
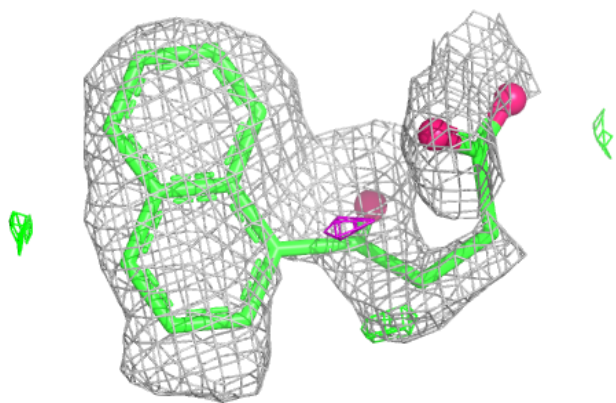
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists 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	Q5M	A	302	17/17	0.83	0.14	37,42,52,53	0
2	Q5M	A	301[A]	17/17	0.86	0.12	17,18,28,35	17
3	GOL	C	302	6/6	0.86	0.14	48,53,54,55	0
3	GOL	B	501	6/6	0.87	0.15	50,52,53,56	0
2	Q5M	E	303	17/17	0.87	0.14	37,47,51,54	0
3	GOL	A	303	6/6	0.88	0.13	46,50,51,51	0
3	GOL	B	502	6/6	0.91	0.09	33,36,39,39	0
2	Q5M	E	302	17/17	0.91	0.09	25,29,41,41	0
2	Q5M	C	301[B]	17/17	0.92	0.10	24,27,38,45	17
2	Q5M	D	301[B]	17/17	0.93	0.09	11,13,24,26	17
2	Q5M	A	304	17/17	0.94	0.09	20,23,45,47	0
2	Q5M	E	301	17/17	0.94	0.08	23,25,40,43	0

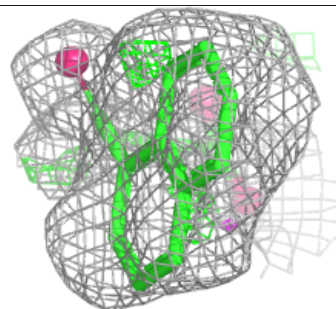
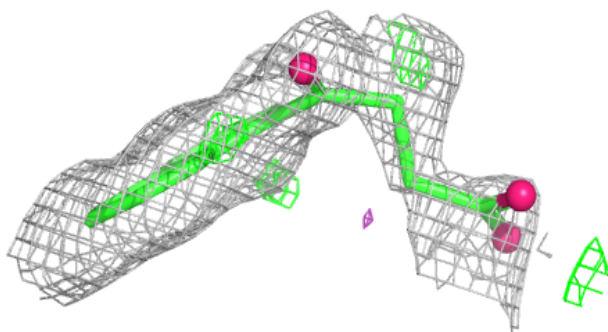
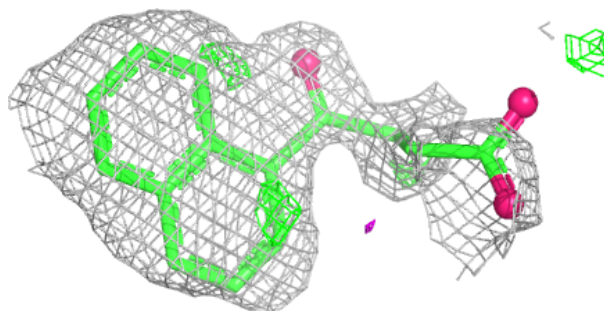
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around Q5M 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)

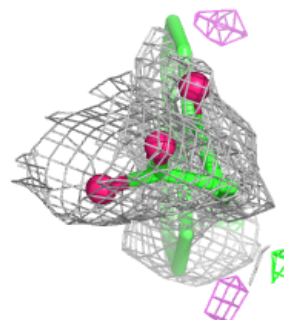
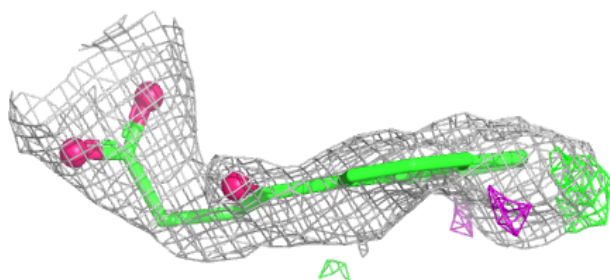
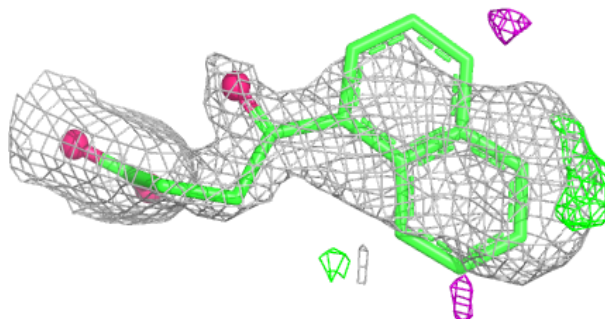
**Electron density around Q5M A 301 (A):**

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

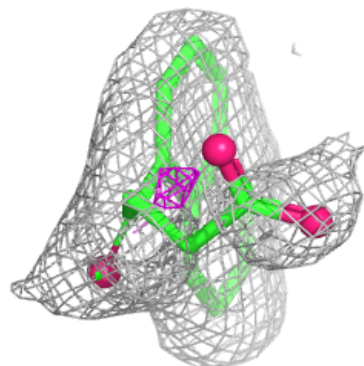
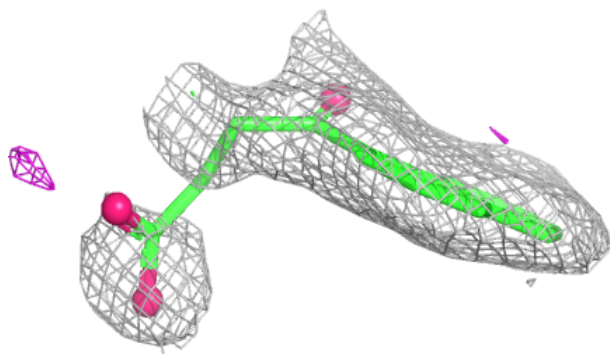
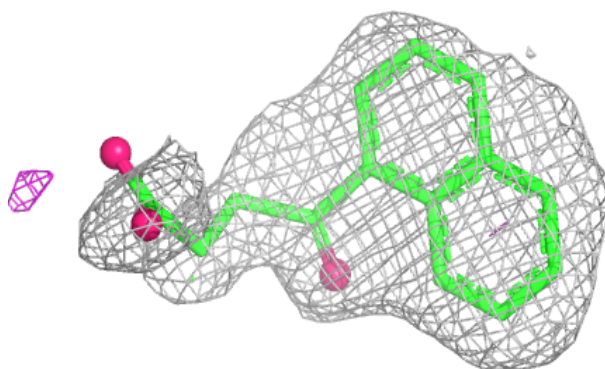


Electron density around Q5M E 303:

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

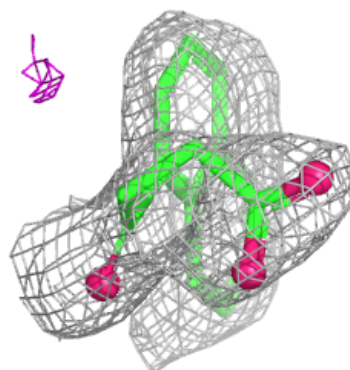
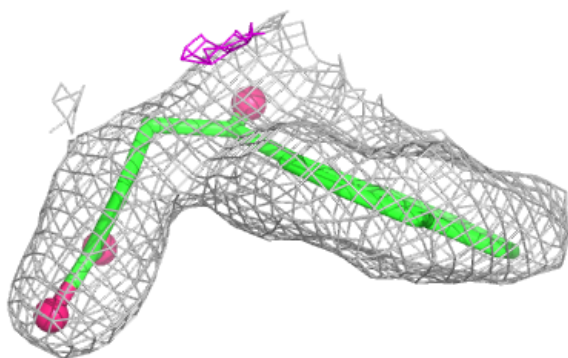
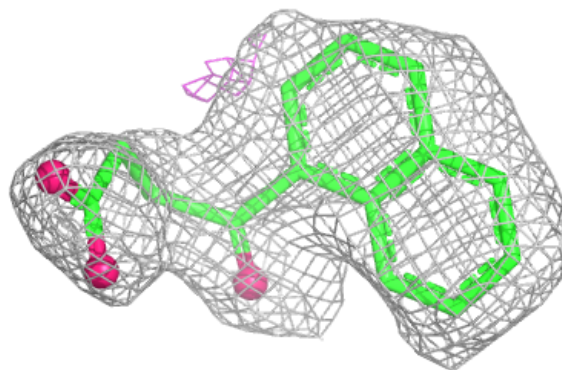
**Electron density around Q5M E 302:**

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

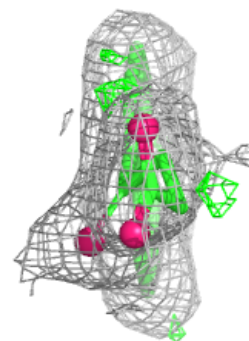
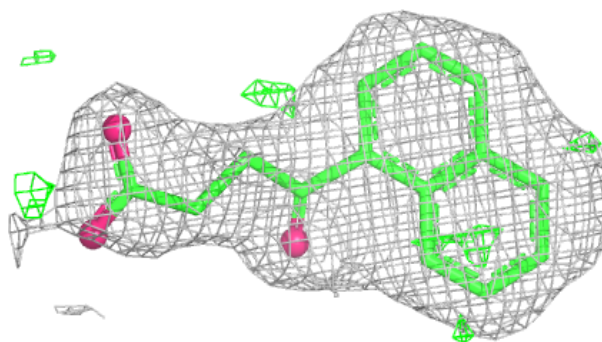


Electron density around Q5M C 301 (B):

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

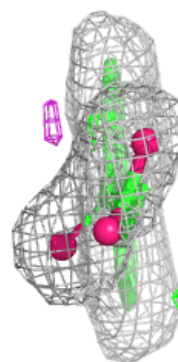
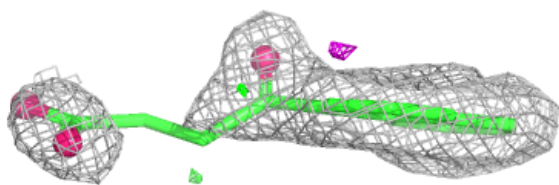
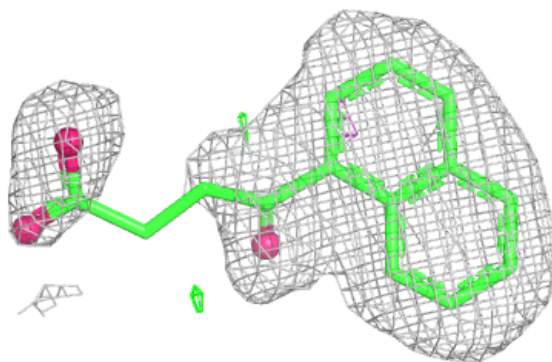
**Electron density around Q5M D 301 (B):**

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

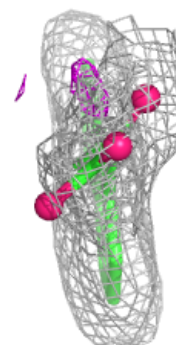
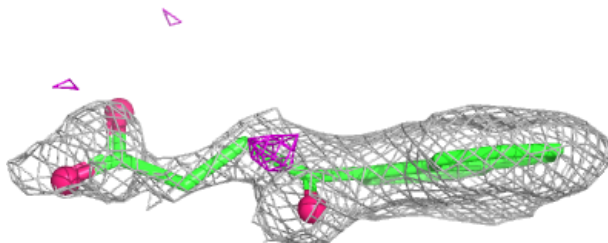
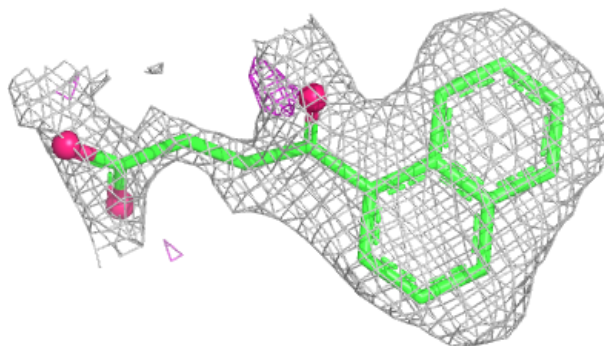


Electron density around Q5M A 304:

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

**Electron density around Q5M 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)



6.5 Other polymers [i](#)

There are no such residues in this entry.