



Full wwPDB X-ray Structure Validation Report ⓘ

Oct 4, 2023 – 12:23 AM EDT

PDB ID : 6OFY
Title : Crystal Structure of Arachidonic Acid bound to V349I murine COX-2
Authors : Malkowski, M.G.
Deposited on : 2019-04-01
Resolution : 2.20 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 : 4.02b-467
Mogul : 1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix) : 1.13
EDS : 2.35.1
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac : 5.8.0158
CCP4 : 7.0.044 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.35.1

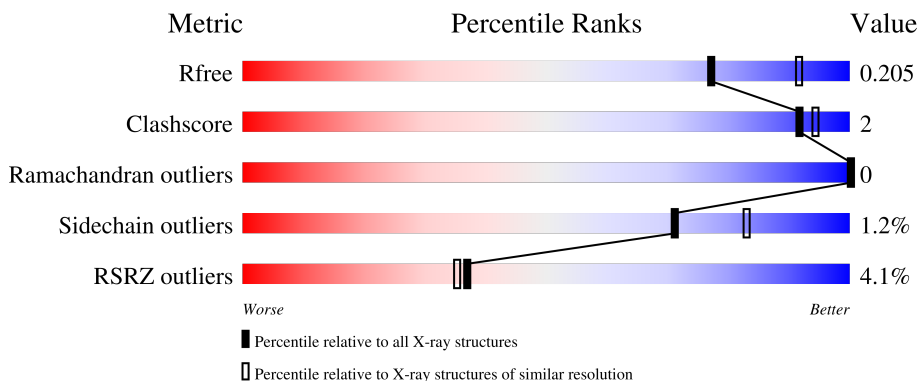
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

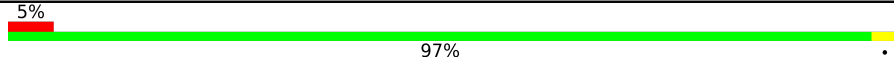
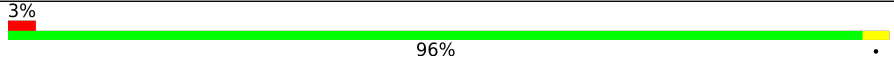
The reported resolution of this entry is 2.20 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	4898 (2.20-2.20)
Clashscore	141614	5594 (2.20-2.20)
Ramachandran outliers	138981	5503 (2.20-2.20)
Sidechain outliers	138945	5504 (2.20-2.20)
RSRZ outliers	127900	4800 (2.20-2.20)

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	552	
1	B	552	

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
3	COH	A	605	X	-	-	-
3	COH	B	605	X	-	-	-
5	AKR	A	607	-	X	X	-

2 Entry composition

There are 7 unique types of molecules in this entry. The entry contains 9754 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 Prostaglandin G/H synthase 2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	551	4393	2840	736	792	25	0	2	0
1	B	552	4377	2825	734	793	25	0	3	0

There are 8 discrepancies between the modelled and reference sequences:

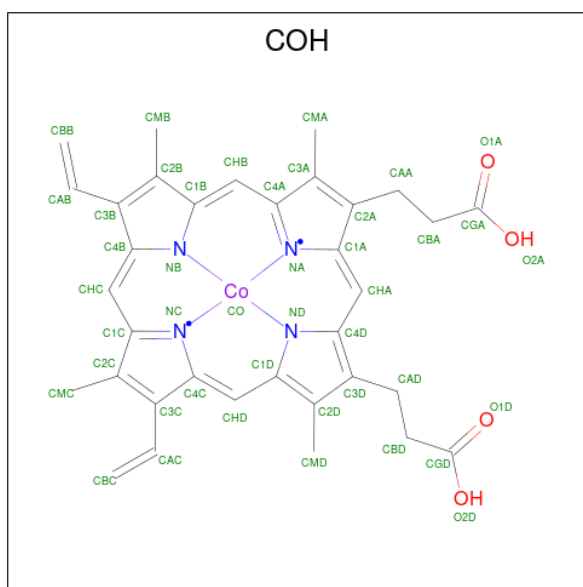
Chain	Residue	Modelled	Actual	Comment	Reference
A	32	HIS	-	expression tag	UNP Q05769
A	33	HIS	-	expression tag	UNP Q05769
A	34	HIS	-	expression tag	UNP Q05769
A	350	ILE	VAL	engineered mutation	UNP Q05769
B	32	HIS	-	expression tag	UNP Q05769
B	33	HIS	-	expression tag	UNP Q05769
B	34	HIS	-	expression tag	UNP Q05769
B	350	ILE	VAL	engineered mutation	UNP Q05769

- Molecule 2 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: C₈H₁₅NO₆).



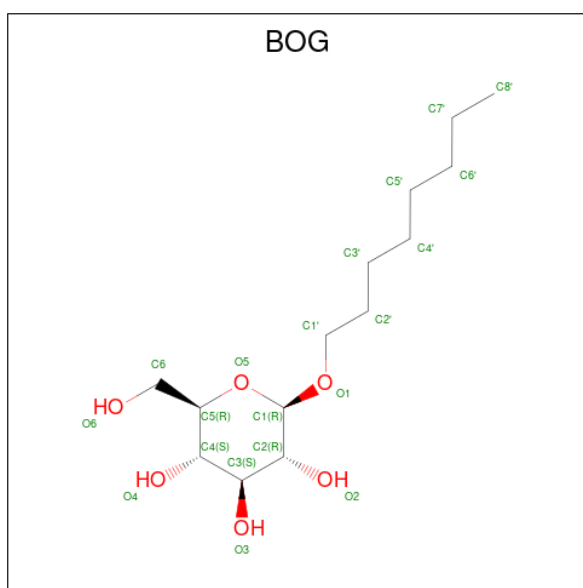
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	N	O		
2	A	1	Total 14	8	1	5	0	0
2	A	1	Total 14	8	1	5	0	0
2	A	1	Total 14	8	1	5	0	0
2	A	1	Total 14	8	1	5	0	0
2	B	1	Total 14	8	1	5	0	0
2	B	1	Total 14	8	1	5	0	0
2	B	1	Total 14	8	1	5	0	0
2	B	1	Total 14	8	1	5	0	0

- Molecule 3 is PROTOPORPHYRIN IX CONTAINING CO (three-letter code: COH) (formula: $C_{34}H_{32}CoN_4O_4$).



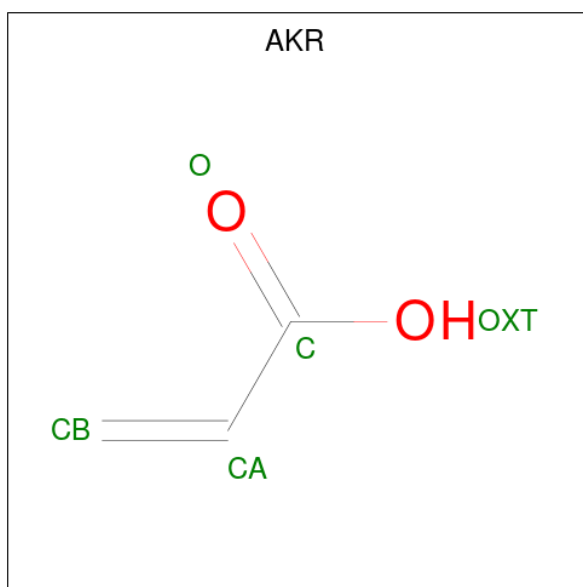
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	
3	A	1	Total	C	Co	N	O	0	0
			43	34	1	4	4		
3	B	1	Total	C	Co	N	O	0	0
			43	34	1	4	4		

- Molecule 4 is octyl beta-D-glucopyranoside (three-letter code: BOG) (formula: $C_{14}H_{28}O_6$).



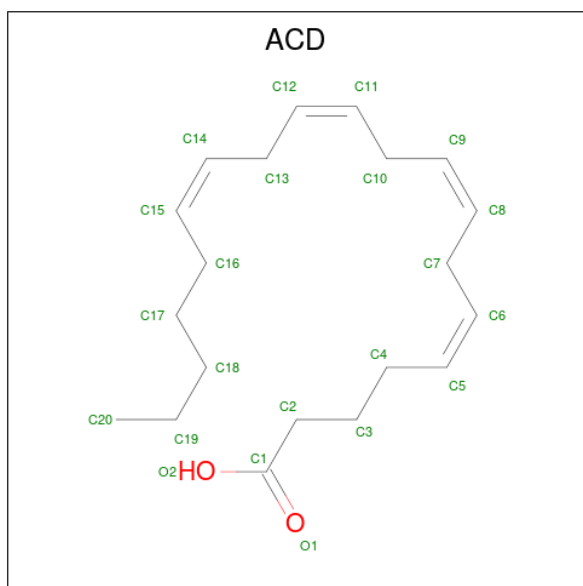
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf	
4	A	1	Total	C	O	0	0
			20	14	6		

- Molecule 5 is ACRYLIC ACID (three-letter code: AKR) (formula: $C_3H_4O_2$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	A	1	Total	C	O	0	0
			4	2	2		

- Molecule 6 is ARACHIDONIC ACID (three-letter code: ACD) (formula: $C_{20}H_{32}O_2$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	A	1	Total	C	O	0	0
			22	20	2		
6	B	1	Total	C	O	0	0
			22	20	2		

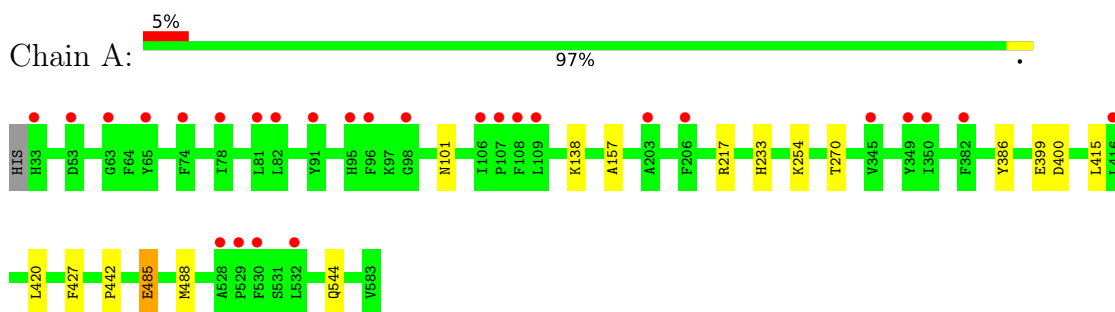
- Molecule 7 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	360	Total 360	O 360	0	0
7	B	358	Total 358	O 358	0	0

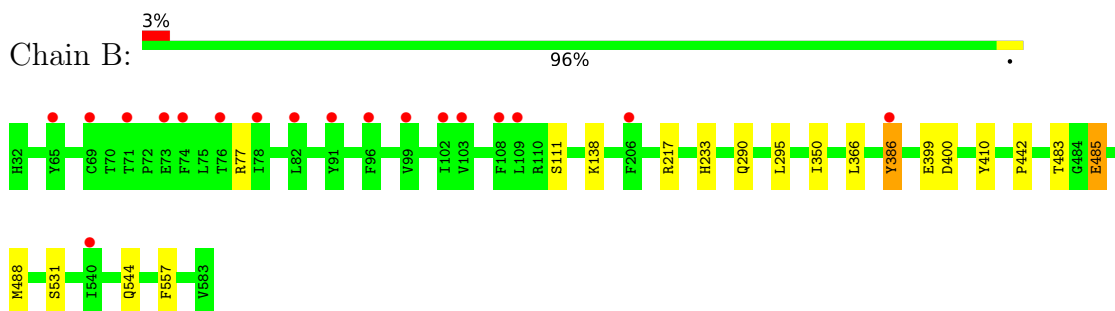
3 Residue-property plots [i](#)

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: Prostaglandin G/H synthase 2



- Molecule 1: Prostaglandin G/H synthase 2



4 Data and refinement statistics

Property	Value	Source
Space group	I 2 2 2	Depositor
Cell constants a, b, c, α , β , γ	123.15Å 135.10Å 182.88Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	42.29 – 2.20 42.29 – 2.20	Depositor EDS
% Data completeness (in resolution range)	99.7 (42.29-2.20) 99.8 (42.29-2.20)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.09 (at 2.20Å)	Xtrriage
Refinement program	PHENIX (1.14_3260: ???)	Depositor
R, R_{free}	0.162 , 0.205 0.162 , 0.205	Depositor DCC
R_{free} test set	3769 reflections (4.88%)	wwPDB-VP
Wilson B-factor (Å ²)	30.9	Xtrriage
Anisotropy	0.622	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.34 , 56.5	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	0.96	EDS
Total number of atoms	9754	wwPDB-VP
Average B, all atoms (Å ²)	37.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.86% 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: COH, BOG, AKR, ACD, NAG

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	0/4529	0.55	0/6161
1	B	0.44	0/4511	0.56	0/6141
All	All	0.45	0/9040	0.55	0/12302

There are no bond length outliers.

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	4393	0	4195	12	0
1	B	4377	0	4144	15	0
2	A	56	0	51	3	0
2	B	56	0	51	2	0
3	A	43	0	30	0	0
3	B	43	0	30	0	0
4	A	20	0	28	0	0
5	A	4	0	0	2	0
6	A	22	0	31	1	0
6	B	22	0	31	6	0
7	A	360	0	0	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
7	B	358	0	0	1	0
All	All	9754	0	8591	28	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 2.

All (28) 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)
5:A:607:AKR:CA	5:A:607:AKR:C	2.49	0.90
1:B:531:SER:HB2	6:B:606:ACD:H162	1.72	0.71
1:A:157:ALA:H	5:A:607:AKR:CA	2.07	0.67
1:B:531:SER:OG	6:B:606:ACD:H181	1.94	0.67
1:A:217:ARG:HH11	2:A:603:NAG:H83	1.62	0.65
1:A:415:LEU:HD11	1:A:420:LEU:HD12	1.83	0.60
1:B:483:THR:OG1	1:B:485:GLU:OE1	2.15	0.58
1:B:295:LEU:HA	1:B:410:TYR:CE1	2.45	0.51
1:B:111:SER:HB3	1:B:366:LEU:HD21	1.93	0.50
6:B:606:ACD:H201	7:B:1034:HOH:O	2.10	0.50
1:A:101:ASN:ND2	7:A:704:HOH:O	2.43	0.50
1:B:485:GLU:OE2	1:B:488:MET:N	2.40	0.49
1:A:138:LYS:HE2	1:B:544:GLN:O	2.13	0.48
1:B:350:ILE:HG23	6:B:606:ACD:H72	1.94	0.48
1:B:217:ARG:HE	2:B:603:NAG:H83	1.79	0.48
1:B:531:SER:CB	6:B:606:ACD:H162	2.42	0.47
1:B:295:LEU:HA	1:B:410:TYR:CD1	2.51	0.46
1:A:217:ARG:NH1	2:A:603:NAG:H83	2.28	0.45
1:A:544:GLN:O	1:B:138:LYS:HE2	2.17	0.45
1:B:399:GLU:HB3	1:B:400:ASP:H	1.57	0.44
1:B:217:ARG:HE	2:B:603:NAG:C8	2.31	0.44
1:A:485:GLU:OE1	1:A:488:MET:HB2	2.18	0.43
6:A:608:ACD:H41	6:A:608:ACD:H71	1.70	0.43
1:A:217:ARG:HH11	2:A:603:NAG:C8	2.31	0.42
1:A:399:GLU:HB3	1:A:400:ASP:H	1.66	0.41
1:A:254:LYS:HE2	1:A:270:THR:HG22	2.02	0.41
1:A:427:PHE:HD1	1:A:427:PHE:HA	1.75	0.40
1:B:386[A]:TYR:HE1	6:B:606:ACD:H161	1.85	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	551/552 (100%)	538 (98%)	13 (2%)	0	100	100
1	B	553/552 (100%)	539 (98%)	14 (2%)	0	100	100
All	All	1104/1104 (100%)	1077 (98%)	27 (2%)	0	100	100

There are no Ramachandran outliers to report.

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	468/494 (95%)	463 (99%)	5 (1%)	73	85
1	B	461/494 (93%)	453 (98%)	8 (2%)	60	74
All	All	929/988 (94%)	916 (99%)	13 (1%)	71	80

All (13) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	233	HIS
1	A	386[A]	TYR
1	A	386[B]	TYR
1	A	442	PRO
1	A	485	GLU
1	B	77	ARG
1	B	233	HIS
1	B	290	GLN

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Mol	Chain	Res	Type
1	B	386[A]	TYR
1	B	386[B]	TYR
1	B	442	PRO
1	B	485	GLU
1	B	557	PHE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	101	ASN
1	B	387	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 monosaccharides in this entry.

5.6 Ligand geometry [i](#)

14 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	$\# Z > 2$
4	BOG	A	606	-	20,20,20	0.98	1 (5%)	25,25,25	1.18	2 (8%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	NAG	A	603	-	14,14,15	1.38	2 (14%)	17,19,21	1.66	5 (29%)
2	NAG	B	604	1	14,14,15	1.46	2 (14%)	17,19,21	1.79	4 (23%)
2	NAG	B	602	1	14,14,15	1.43	2 (14%)	17,19,21	1.55	6 (35%)
3	COH	A	605	1	45,50,50	1.68	13 (28%)	57,82,82	1.95	14 (24%)
5	AKR	A	607	-	3,3,4	13.77	1 (33%)	3,3,4	3.96	2 (66%)
2	NAG	A	604	1	14,14,15	1.36	2 (14%)	17,19,21	2.03	6 (35%)
6	ACD	B	606	-	21,21,21	1.02	1 (4%)	21,21,21	0.68	0
6	ACD	A	608	-	21,21,21	0.88	1 (4%)	21,21,21	0.70	0
2	NAG	A	602	1	14,14,15	1.42	1 (7%)	17,19,21	1.78	4 (23%)
2	NAG	B	603	-	14,14,15	1.61	1 (7%)	17,19,21	1.62	4 (23%)
2	NAG	A	601	1	14,14,15	1.45	1 (7%)	17,19,21	1.60	4 (23%)
3	COH	B	605	1	45,50,50	1.66	12 (26%)	57,82,82	1.97	14 (24%)
2	NAG	B	601	-	14,14,15	1.64	1 (7%)	17,19,21	1.57	5 (29%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	BOG	A	606	-	-	4/11/31/31	0/1/1/1
2	NAG	A	603	-	-	4/6/23/26	0/1/1/1
2	NAG	B	604	1	-	2/6/23/26	0/1/1/1
3	COH	A	605	1	1/1/3/9	8/14/54/54	-
2	NAG	B	602	1	-	0/6/23/26	0/1/1/1
6	ACD	B	606	-	-	7/19/19/19	-
2	NAG	A	604	1	-	2/6/23/26	0/1/1/1
6	ACD	A	608	-	-	8/19/19/19	-
2	NAG	A	602	1	-	0/6/23/26	0/1/1/1
2	NAG	B	603	-	-	4/6/23/26	0/1/1/1
2	NAG	A	601	1	-	2/6/23/26	0/1/1/1
3	COH	B	605	1	1/1/3/9	9/14/54/54	-
2	NAG	B	601	-	-	2/6/23/26	0/1/1/1

All (41) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	A	607	AKR	CA-C	23.83	2.49	1.49
2	B	601	NAG	C1-C2	4.40	1.58	1.52
2	B	603	NAG	C1-C2	4.18	1.58	1.52
6	B	606	ACD	C2-C1	3.77	1.59	1.50
3	A	605	COH	C4B-NB	-3.72	1.32	1.38
3	B	605	COH	C4B-NB	-3.57	1.32	1.38
3	B	605	COH	CMB-C2B	3.31	1.57	1.50
2	B	604	NAG	C1-C2	3.20	1.57	1.52
3	A	605	COH	CMB-C2B	3.16	1.57	1.50
2	A	601	NAG	C1-C2	3.16	1.57	1.52
6	A	608	ACD	C2-C1	3.12	1.57	1.50
2	A	604	NAG	C1-C2	3.09	1.56	1.52
2	A	602	NAG	C1-C2	3.04	1.56	1.52
3	B	605	COH	C1D-ND	-2.81	1.28	1.36
3	A	605	COH	C1A-NA	2.76	1.44	1.39
3	B	605	COH	C1A-NA	2.73	1.44	1.39
3	A	605	COH	CO-ND	2.72	2.10	1.97
3	B	605	COH	CHB-C1B	2.72	1.43	1.38
3	A	605	COH	C3C-C2C	2.69	1.42	1.37
2	B	602	NAG	C1-C2	2.64	1.56	1.52
2	A	604	NAG	C3-C2	2.64	1.58	1.52
3	A	605	COH	C4D-ND	2.62	1.43	1.36
3	B	605	COH	CO-ND	2.62	2.10	1.97
3	B	605	COH	C1C-NC	-2.61	1.33	1.38
3	A	605	COH	C1D-ND	-2.57	1.29	1.36
3	A	605	COH	C1C-NC	-2.54	1.33	1.38
3	B	605	COH	CBC-CAC	2.54	1.42	1.30
3	A	605	COH	CBC-CAC	2.52	1.42	1.30
4	A	606	BOG	C4-C3	2.49	1.58	1.52
3	B	605	COH	C3C-C2C	2.43	1.42	1.37
3	B	605	COH	C4D-ND	2.42	1.42	1.36
3	A	605	COH	CHB-C1B	2.42	1.43	1.38
3	A	605	COH	CHA-C1A	2.37	1.41	1.35
3	A	605	COH	C1A-C2A	2.30	1.49	1.45
3	B	605	COH	C1A-C2A	2.30	1.49	1.45
2	B	602	NAG	C3-C2	2.27	1.57	1.52
3	B	605	COH	CHA-C1A	2.27	1.40	1.35
2	B	604	NAG	C3-C2	2.19	1.57	1.52
3	A	605	COH	O2D-CGD	-2.16	1.23	1.30
2	A	603	NAG	C4-C5	2.15	1.57	1.53
2	A	603	NAG	O3-C3	-2.01	1.38	1.43

All (70) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	604	NAG	C2-N2-C7	-5.51	115.05	122.90
5	A	607	AKR	O-C-CA	-5.43	101.17	122.33
3	B	605	COH	C4C-C3C-C2C	-5.21	102.98	107.11
3	A	605	COH	C3B-C2B-C1B	-5.02	102.29	107.08
3	A	605	COH	C4C-C3C-C2C	-4.90	103.22	107.11
3	B	605	COH	CBD-CAD-C3D	-4.85	104.34	112.62
2	B	604	NAG	C2-N2-C7	-4.73	116.17	122.90
3	A	605	COH	C2B-C1B-NB	4.66	114.81	110.81
3	B	605	COH	C3B-C2B-C1B	-4.64	102.64	107.08
2	A	602	NAG	C2-N2-C7	-4.32	116.75	122.90
3	B	605	COH	C3C-C4C-NC	4.28	114.10	109.67
5	A	607	AKR	OXT-C-CA	4.20	132.52	115.18
2	B	603	NAG	C2-N2-C7	-4.18	116.95	122.90
2	A	601	NAG	C2-N2-C7	-3.99	117.22	122.90
3	B	605	COH	C2B-C1B-NB	3.98	114.24	110.81
3	A	605	COH	C1A-NA-C4A	-3.98	100.88	105.05
3	A	605	COH	C3C-C4C-NC	3.97	113.78	109.67
2	A	603	NAG	C2-N2-C7	-3.87	117.39	122.90
3	A	605	COH	CBD-CAD-C3D	-3.72	106.28	112.62
3	B	605	COH	C1A-NA-C4A	-3.52	101.36	105.05
2	A	604	NAG	C6-C5-C4	-3.35	105.17	113.00
3	B	605	COH	CMD-C2D-C3D	3.19	130.95	124.94
3	A	605	COH	CMD-C2D-C3D	3.10	130.78	124.94
3	B	605	COH	C1D-C2D-C3D	-3.02	104.90	107.00
2	B	601	NAG	C2-N2-C7	-2.94	118.71	122.90
3	A	605	COH	C1D-C2D-C3D	-2.92	104.96	107.00
2	B	604	NAG	C6-C5-C4	-2.89	106.23	113.00
2	A	602	NAG	C6-C5-C4	-2.88	106.26	113.00
2	B	602	NAG	C2-N2-C7	-2.82	118.89	122.90
3	B	605	COH	CMD-C2D-C1D	-2.80	124.15	128.46
2	A	604	NAG	C4-C3-C2	-2.80	106.92	111.02
2	A	602	NAG	C1-C2-N2	-2.79	105.72	110.49
2	A	603	NAG	C1-C2-N2	-2.75	105.79	110.49
3	A	605	COH	CMD-C2D-C1D	-2.74	124.26	128.46
2	B	601	NAG	C6-C5-C4	-2.70	106.68	113.00
3	A	605	COH	CMC-C2C-C1C	-2.66	120.99	125.04
3	B	605	COH	CMC-C2C-C1C	-2.63	121.03	125.04
3	A	605	COH	C3A-C4A-NA	2.63	113.85	110.83
2	B	602	NAG	C4-C3-C2	-2.62	107.18	111.02
2	B	602	NAG	C6-C5-C4	-2.58	106.97	113.00
2	B	603	NAG	O3-C3-C2	-2.53	104.23	109.47
2	B	603	NAG	C6-C5-C4	-2.51	107.13	113.00
2	A	603	NAG	O4-C4-C3	-2.47	104.65	110.35

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	601	NAG	C1-C2-N2	-2.44	106.32	110.49
2	A	601	NAG	C6-C5-C4	-2.33	107.54	113.00
2	A	603	NAG	C6-C5-C4	-2.32	107.58	113.00
2	B	603	NAG	O4-C4-C3	-2.30	105.03	110.35
2	B	602	NAG	O3-C3-C2	-2.28	104.75	109.47
2	B	601	NAG	C4-C3-C2	-2.23	107.75	111.02
3	B	605	COH	CHC-C1C-NC	-2.21	120.75	124.82
4	A	606	BOG	C1-C2-C3	-2.21	105.40	110.00
2	A	604	NAG	C1-C2-N2	-2.19	106.75	110.49
2	B	602	NAG	C1-C2-N2	-2.18	106.77	110.49
2	A	602	NAG	O4-C4-C3	-2.17	105.33	110.35
2	B	604	NAG	C4-C3-C2	-2.16	107.85	111.02
3	B	605	COH	CHB-C1B-NB	-2.14	121.95	124.83
2	A	603	NAG	O3-C3-C2	-2.14	105.04	109.47
2	B	601	NAG	O4-C4-C3	-2.14	105.41	110.35
3	A	605	COH	O2D-CGD-O1D	-2.12	118.01	123.30
3	B	605	COH	C3A-C4A-NA	2.12	113.26	110.83
2	B	604	NAG	C1-C2-N2	-2.11	106.89	110.49
2	A	601	NAG	C4-C3-C2	-2.10	107.95	111.02
3	B	605	COH	CBA-CAA-C2A	2.09	118.43	112.63
3	A	605	COH	CHB-C4A-C3A	-2.07	121.74	124.98
3	A	605	COH	CHC-C1C-NC	-2.07	121.02	124.82
4	A	606	BOG	O2-C2-C3	-2.06	105.58	110.35
2	B	602	NAG	C3-C4-C5	-2.02	106.63	110.24
2	A	601	NAG	O4-C4-C3	-2.01	105.70	110.35
2	A	604	NAG	O4-C4-C3	-2.00	105.72	110.35
2	A	604	NAG	C3-C4-C5	-2.00	106.67	110.24

All (2) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
3	A	605	COH	NB
3	B	605	COH	NB

All (52) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	B	605	COH	C2B-C3B-CAB-CBB
3	B	605	COH	C4B-C3B-CAB-CBB
6	B	606	ACD	C12-C13-C14-C15
2	A	603	NAG	O5-C5-C6-O6
2	A	601	NAG	O5-C5-C6-O6

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Mol	Chain	Res	Type	Atoms
2	B	603	NAG	O5-C5-C6-O6
2	A	603	NAG	C4-C5-C6-O6
2	A	601	NAG	C4-C5-C6-O6
3	A	605	COH	C2A-CAA-CBA-CGA
2	B	604	NAG	O5-C5-C6-O6
2	B	604	NAG	C4-C5-C6-O6
2	B	603	NAG	C4-C5-C6-O6
2	A	603	NAG	C8-C7-N2-C2
2	A	603	NAG	O7-C7-N2-C2
2	B	603	NAG	C8-C7-N2-C2
2	B	603	NAG	O7-C7-N2-C2
6	B	606	ACD	C1-C2-C3-C4
6	A	608	ACD	C16-C17-C18-C19
4	A	606	BOG	C4'-C5'-C6'-C7'
4	A	606	BOG	C1'-C2'-C3'-C4'
2	A	604	NAG	O5-C5-C6-O6
2	A	604	NAG	C4-C5-C6-O6
6	B	606	ACD	C15-C16-C17-C18
3	A	605	COH	C2B-C3B-CAB-CBB
3	A	605	COH	C2C-C3C-CAC-CBC
3	B	605	COH	C2C-C3C-CAC-CBC
3	A	605	COH	C4C-C3C-CAC-CBC
3	B	605	COH	C4C-C3C-CAC-CBC
3	B	605	COH	C2A-CAA-CBA-CGA
6	A	608	ACD	C15-C16-C17-C18
4	A	606	BOG	C3'-C4'-C5'-C6'
6	A	608	ACD	C11-C10-C9-C8
6	A	608	ACD	C11-C12-C13-C14
6	B	606	ACD	C5-C6-C7-C8
6	B	606	ACD	C11-C10-C9-C8
3	A	605	COH	C4B-C3B-CAB-CBB
3	B	605	COH	C1A-C2A-CAA-CBA
4	A	606	BOG	C5'-C6'-C7'-C8'
2	B	601	NAG	C4-C5-C6-O6
6	B	606	ACD	C16-C17-C18-C19
2	B	601	NAG	O5-C5-C6-O6
3	B	605	COH	C3A-C2A-CAA-CBA
6	A	608	ACD	C6-C7-C8-C9
6	A	608	ACD	C9-C10-C11-C12
3	B	605	COH	CAA-CBA-CGA-O2A
3	A	605	COH	CAD-CBD-CGD-O2D
6	A	608	ACD	O1-C1-C2-C3

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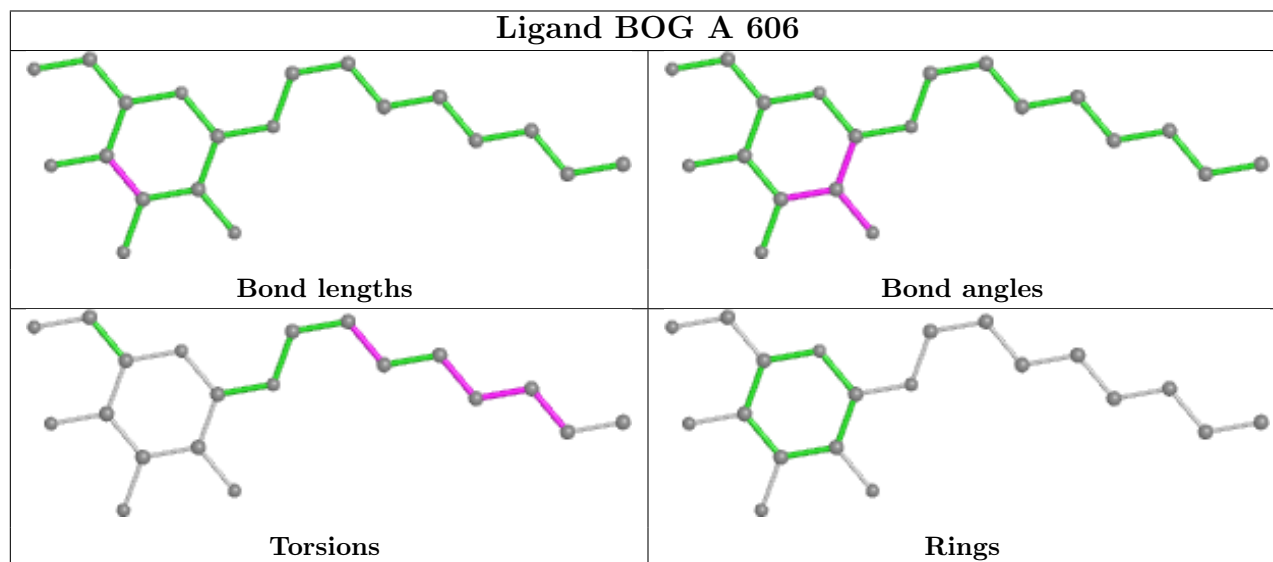
Mol	Chain	Res	Type	Atoms
3	B	605	COH	CAA-CBA-CGA-O1A
6	B	606	ACD	C14-C15-C16-C17
3	A	605	COH	CAD-CBD-CGD-O1D
6	A	608	ACD	O2-C1-C2-C3
3	A	605	COH	C3D-CAD-CBD-CGD

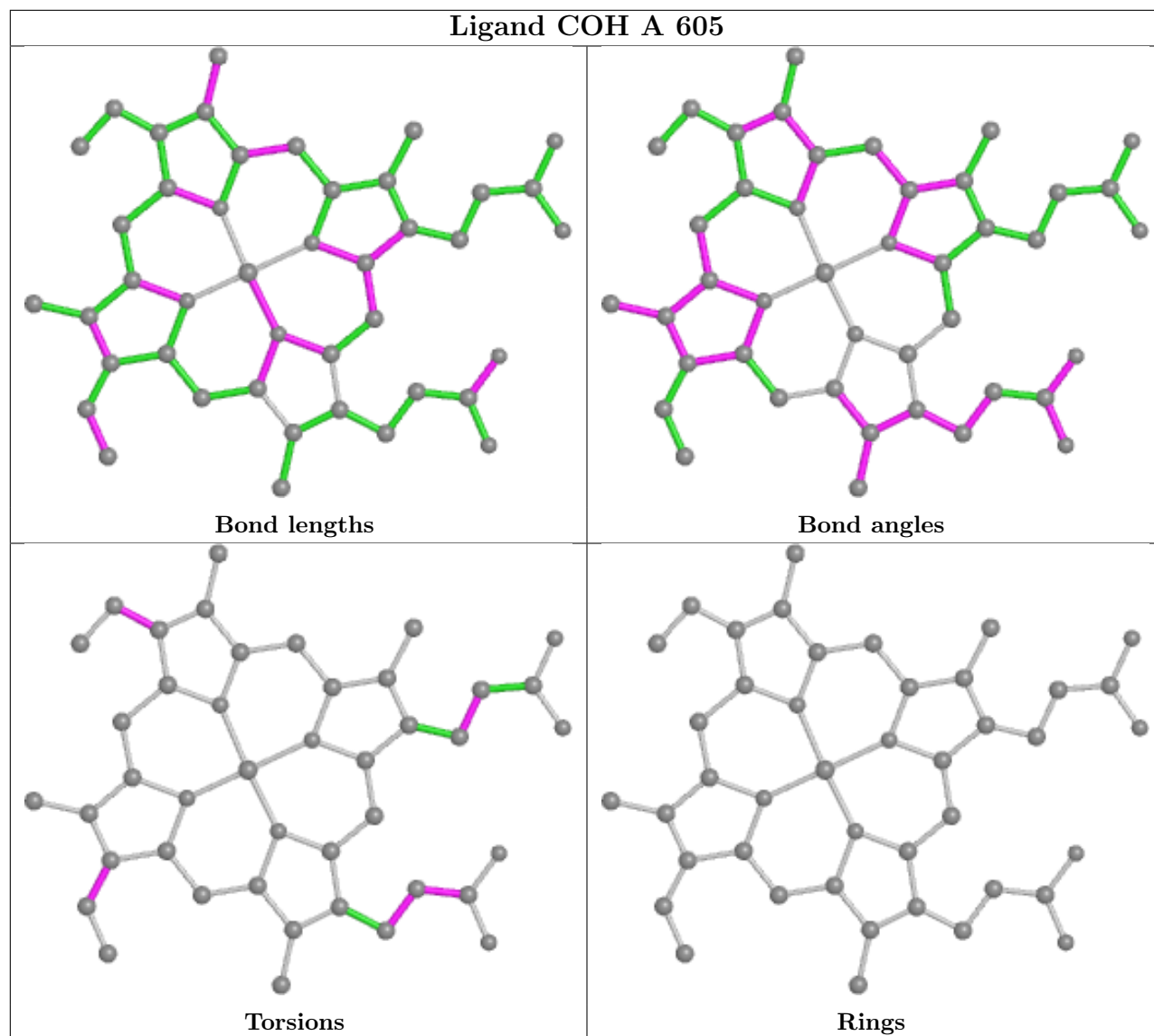
There are no ring outliers.

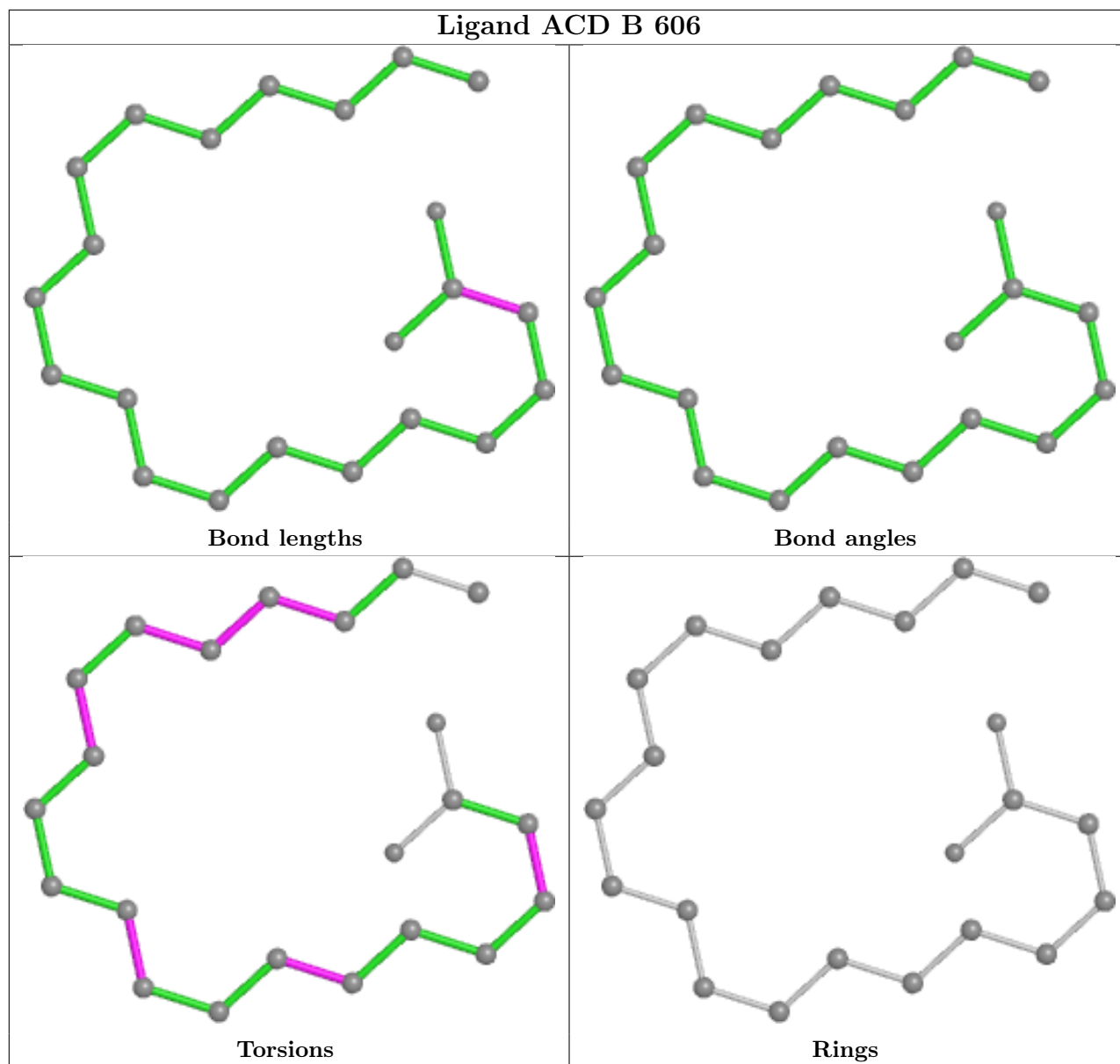
5 monomers are involved in 14 short contacts:

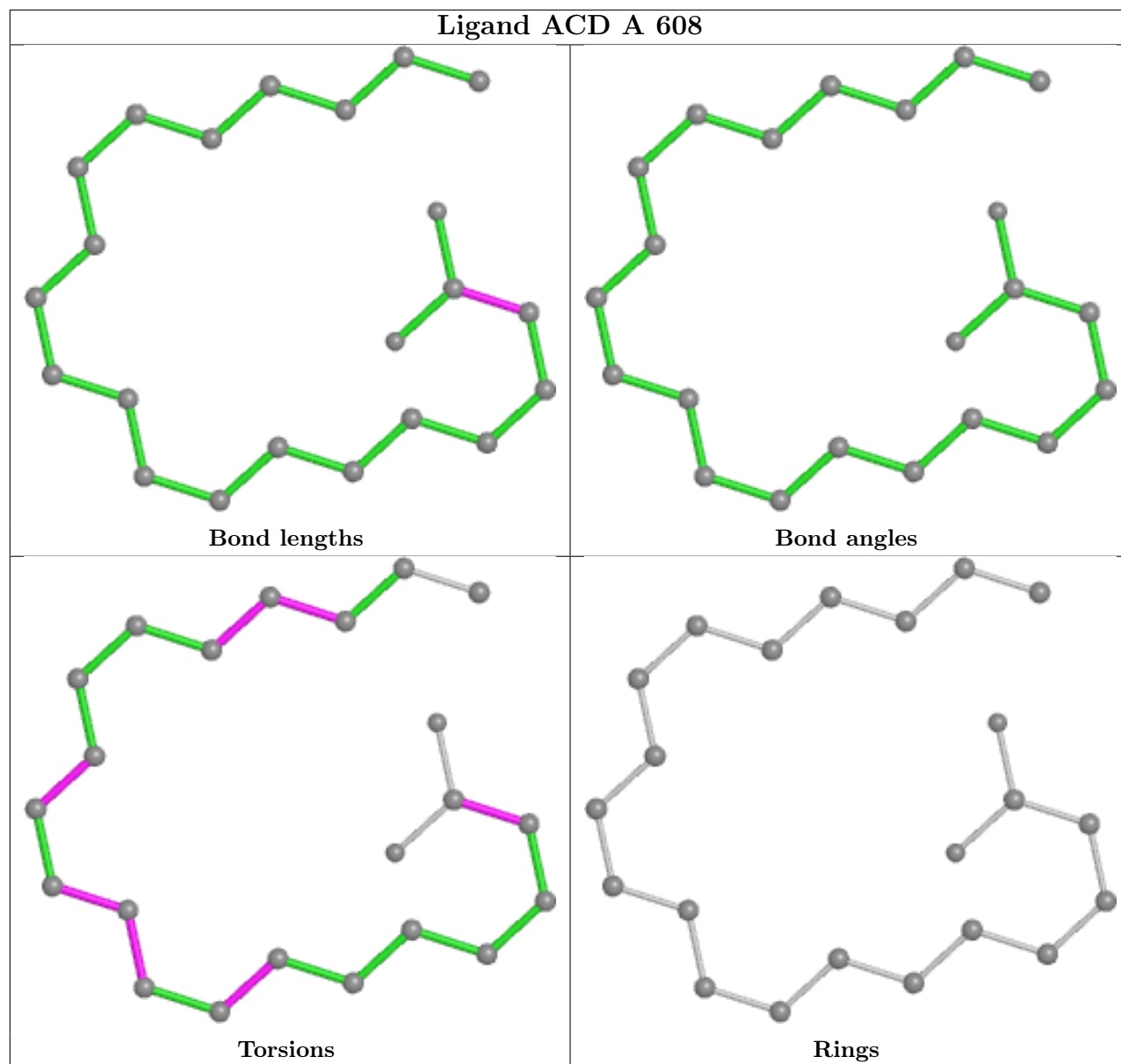
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	603	NAG	3	0
5	A	607	AKR	2	0
6	B	606	ACD	6	0
6	A	608	ACD	1	0
2	B	603	NAG	2	0

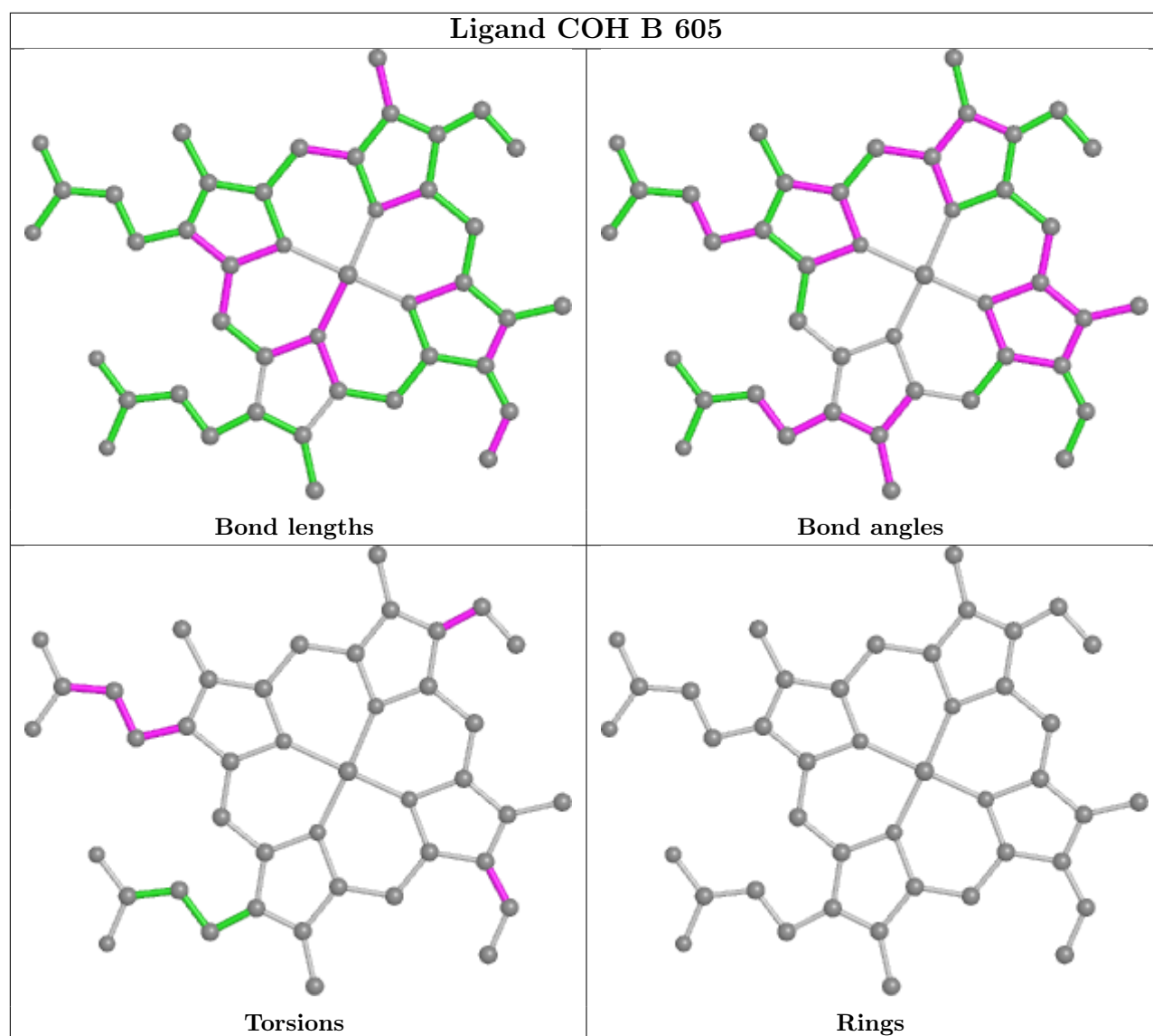
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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











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	551/552 (99%)	-0.07	27 (4%) 29 28	18, 35, 59, 80	0
1	B	552/552 (100%)	-0.11	18 (3%) 46 44	19, 33, 59, 88	0
All	All	1103/1104 (99%)	-0.09	45 (4%) 37 35	18, 34, 59, 88	0

All (45) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	65	TYR	5.0
1	A	65	TYR	4.0
1	A	74	PHE	3.8
1	B	69	CYS	3.5
1	B	102	ILE	3.4
1	A	96	PHE	3.4
1	A	91	TYR	3.3
1	B	74	PHE	3.3
1	A	108	PHE	3.1
1	A	349	TYR	2.9
1	B	82	LEU	2.9
1	A	81	LEU	2.9
1	A	106	ILE	2.8
1	A	98	GLY	2.7
1	A	78	ILE	2.6
1	B	386[A]	TYR	2.6
1	A	107	PRO	2.5
1	A	109	LEU	2.5
1	A	95	HIS	2.5
1	B	91	TYR	2.5
1	A	33	HIS	2.5
1	A	345	VAL	2.4
1	A	532	LEU	2.4
1	B	96	PHE	2.4

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Mol	Chain	Res	Type	RSRZ
1	B	206	PHE	2.4
1	B	103	VAL	2.4
1	A	53	ASP	2.3
1	A	382	PHE	2.3
1	B	109	LEU	2.3
1	A	206	PHE	2.3
1	B	108	PHE	2.3
1	B	73	GLU	2.3
1	B	71	THR	2.2
1	A	203	ALA	2.2
1	B	76	THR	2.2
1	A	350	ILE	2.2
1	A	82	LEU	2.2
1	B	78	ILE	2.1
1	A	528	ALA	2.1
1	A	63	GLY	2.1
1	B	99	VAL	2.1
1	A	416	LEU	2.0
1	B	540	ILE	2.0
1	A	529	PRO	2.0
1	A	530	PHE	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 monosaccharides in this entry.

6.4 Ligands [i](#)

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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
5	AKR	A	607	4/5	0.71	0.18	27,43,52,58	0
6	ACD	B	606	22/22	0.80	0.35	20,54,59,74	0

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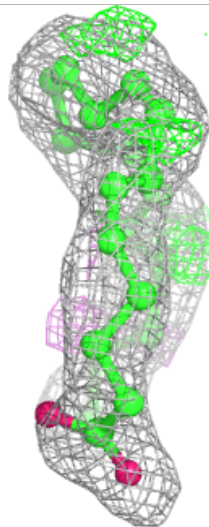
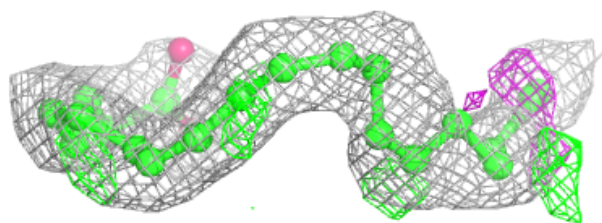
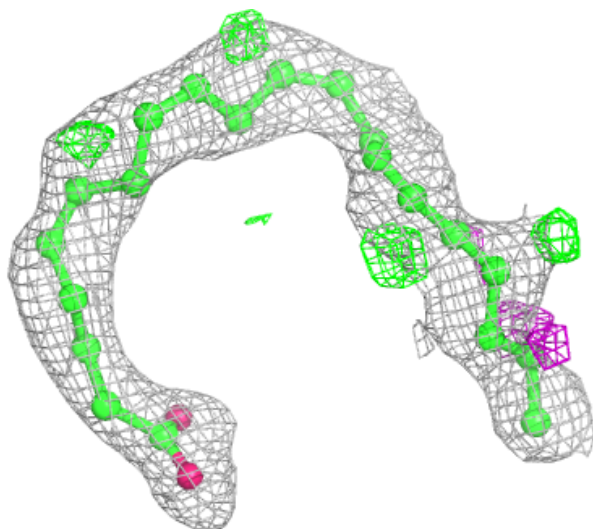
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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
2	NAG	A	604	14/15	0.81	0.32	53,70,81,81	0
2	NAG	B	604	14/15	0.83	0.24	55,75,86,86	0
3	COH	A	605	43/43	0.83	0.26	43,57,77,87	43
2	NAG	B	603	14/15	0.84	0.26	40,62,71,77	0
3	COH	B	605	43/43	0.85	0.24	31,50,83,86	43
2	NAG	B	601	14/15	0.86	0.26	50,66,79,82	0
2	NAG	A	601	14/15	0.91	0.18	40,60,70,74	0
6	ACD	A	608	22/22	0.93	0.36	33,42,52,55	0
2	NAG	A	603	14/15	0.93	0.10	40,51,61,70	0
4	BOG	A	606	20/20	0.94	0.12	32,41,48,49	0
2	NAG	A	602	14/15	0.95	0.09	19,32,38,42	0
2	NAG	B	602	14/15	0.96	0.09	17,30,41,45	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.

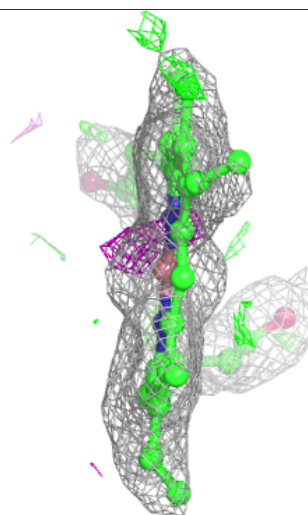
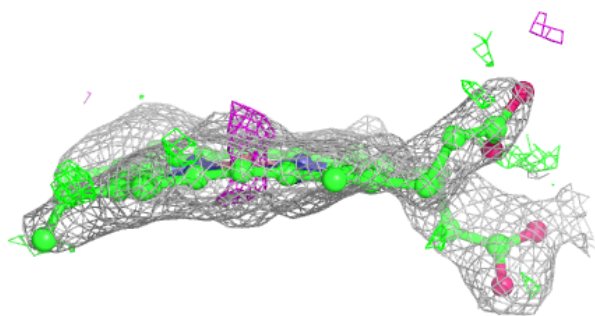
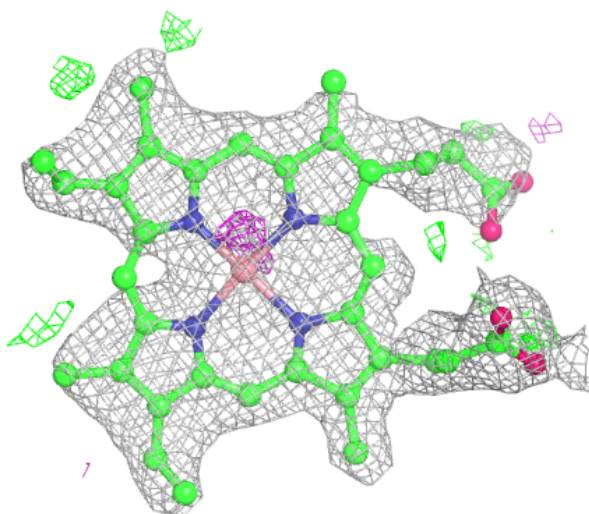
Electron density around ACD B 606:

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



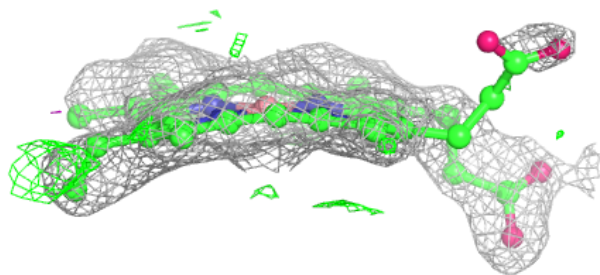
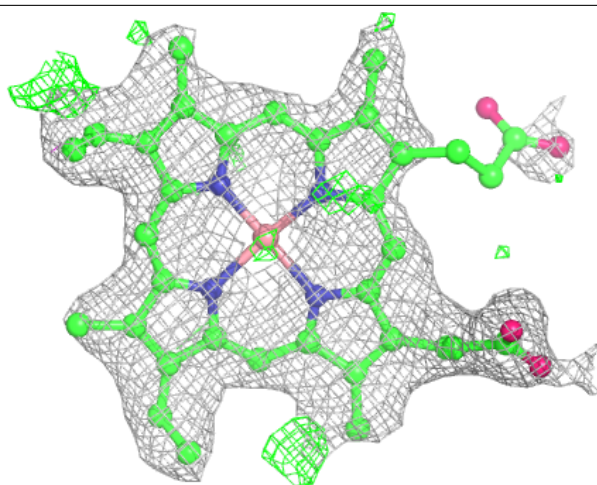
Electron density around COH A 605:

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



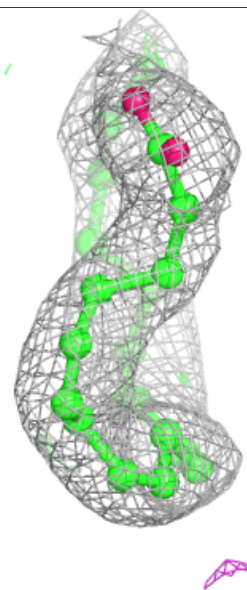
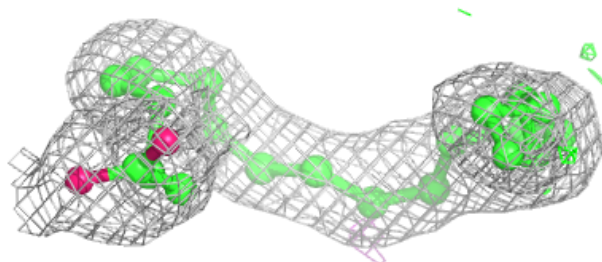
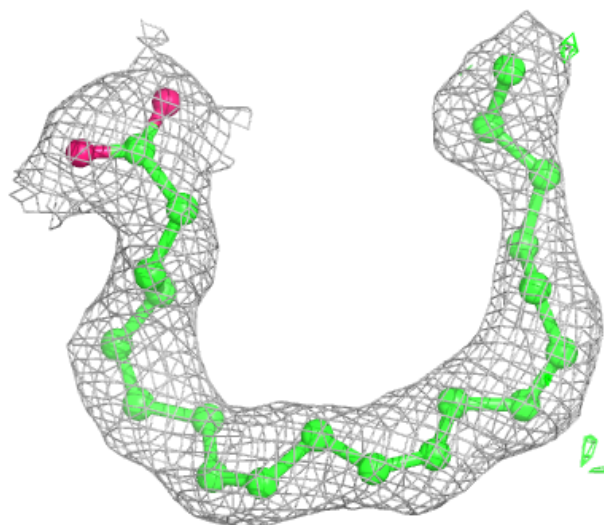
Electron density around COH B 605:

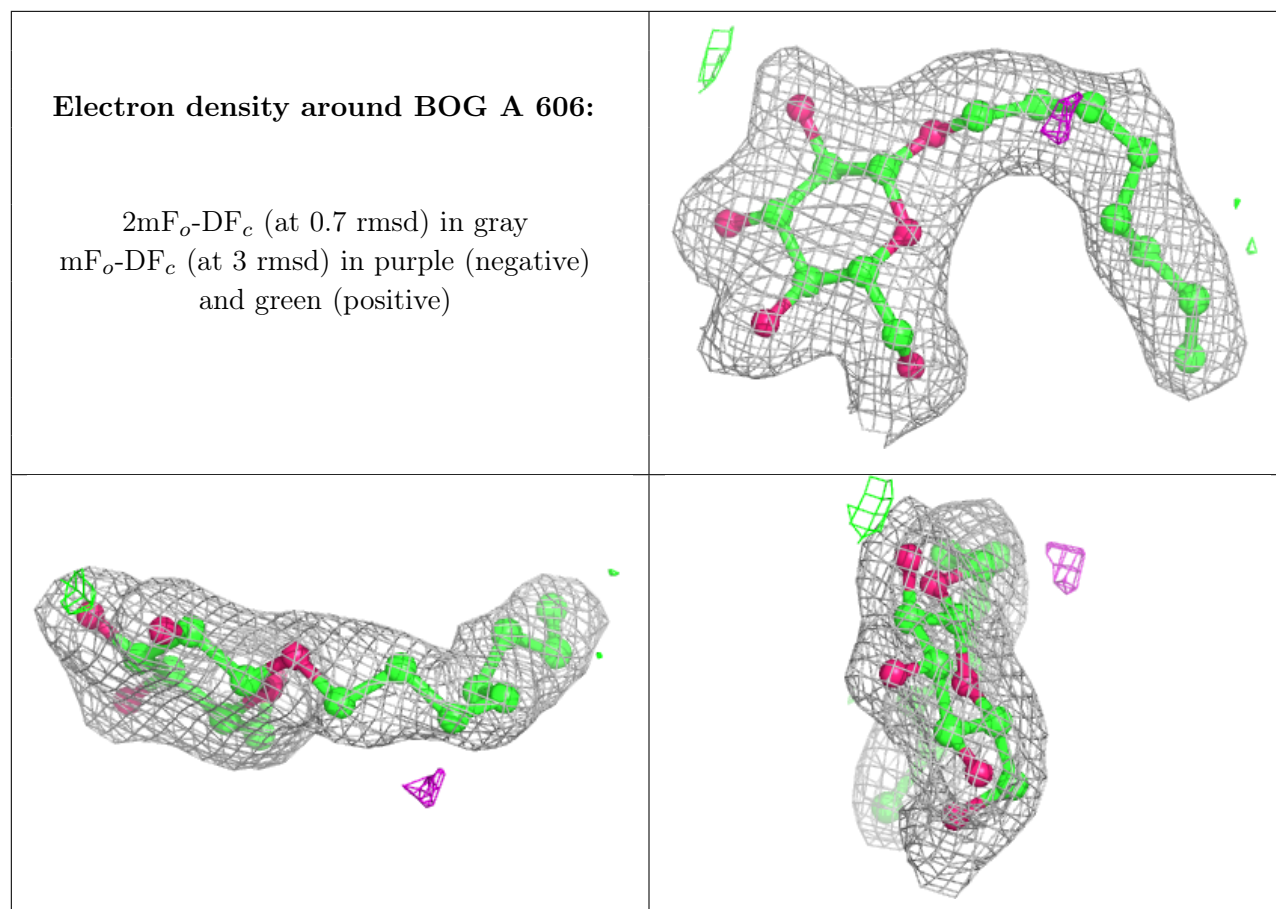
$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



Electron density around ACD A 608:

$2mF_o-DF_c$ (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.