



Full wwPDB X-ray Structure Validation Report ⓘ

Sep 19, 2023 – 09:10 PM EDT

PDB ID : 5EGL
Title : The structural and biochemical characterization of acyl-coa hydrolase from Staphylococcus aureus in complex with Butyryl Coenzyme A, Coenzyme A, and Coenzyme A disulfide
Authors : Khandokar, Y.B.; Srivastava, P.S.; Forwood, J.K.
Deposited on : 2015-10-27
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 : 4.02b-467
Mogul : 1.8.5 (274361), CSD as541be (2020)
Xtrriage (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

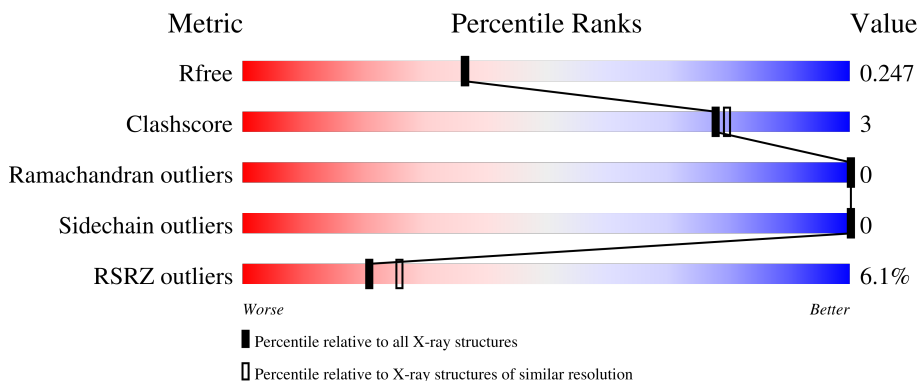
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.10 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}	130704	5197 (2.10-2.10)
Clashscore	141614	5710 (2.10-2.10)
Ramachandran outliers	138981	5647 (2.10-2.10)
Sidechain outliers	138945	5648 (2.10-2.10)
RSRZ outliers	127900	5083 (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	176	 3% 87% 6% 7%
1	B	176	 3% 88% 6% 7%
1	C	176	 10% 89% 5% 7%

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
2	BCO	A	201	X	-	-	-

2 Entry composition [i](#)

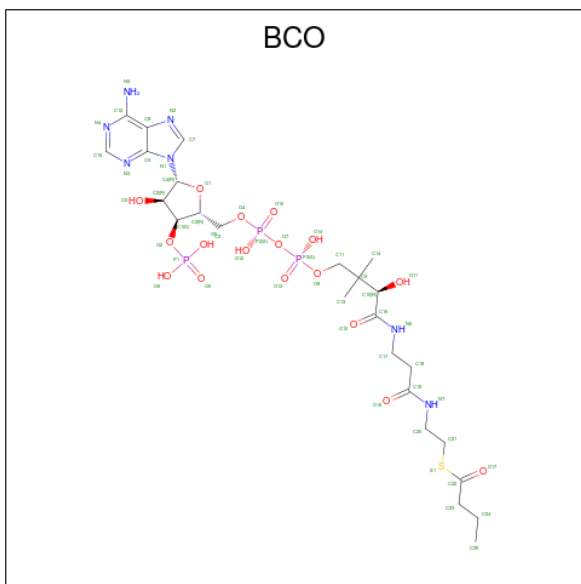
There are 5 unique types of molecules in this entry. The entry contains 8275 atoms, of which 3963 are hydrogens and 0 are deuteriums.

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 CoA Hydrolase.

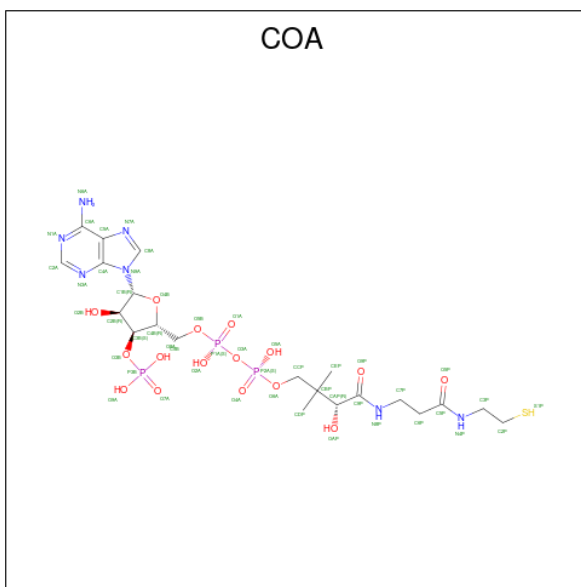
Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
			Total	C	H	N	O	S			
1	A	164	2576	818	1278	223	249	8	0	0	0
1	B	164	2578	816	1279	227	248	8	0	0	0
1	C	164	2576	818	1278	223	249	8	0	0	0

- Molecule 2 is Butyryl Coenzyme A (three-letter code: BCO) (formula: $C_{25}H_{42}N_7O_{17}P_3S$).



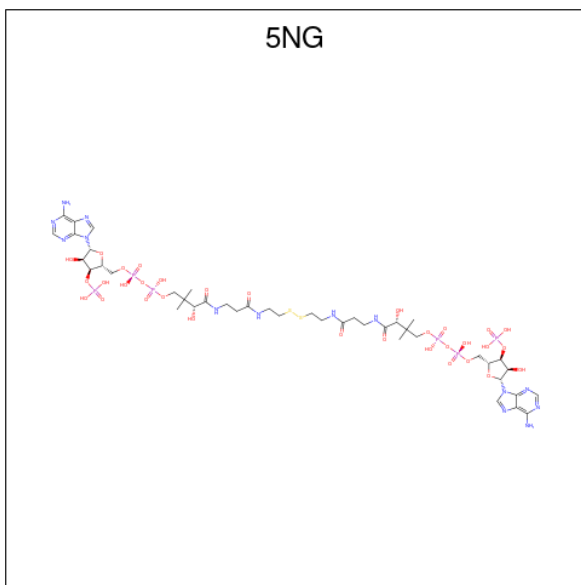
Mol	Chain	Residues	Atoms							ZeroOcc	AltConf
			Total	C	H	N	O	P	S		
2	A	1	87	25	34	7	17	3	1	0	0

- Molecule 3 is COENZYME A (three-letter code: COA) (formula: $C_{21}H_{36}N_7O_{16}P_3S$).



Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	
			Total	C	H	N	O	P			S
3	B	1	80	21	32	7	16	3	1	0	0

- Molecule 4 is [[(2 {S},3 {S},4 {R},5 {R})-5-(6-aminopurin-9-yl)-4-oxidanyl-3-phosphonooxy-oxolan-2-yl]methoxy-oxidanyl-phosphoryl] [(3 {R})-4-[[3-[2-[2-[3-[[2 {R})-4-[[[(2 {R},3 {S},4 {R},5 {R})-5-(6-aminopurin-9-yl)-4-oxidanyl-3-phosphonooxy-oxolan-2-yl]methoxy-oxidanyl-phosphoryl]oxy-oxidanyl-phosphoryl]oxy-3,3-dimethyl-2-oxidanyl-butanoyl]amino]propanoylamino]ethyl-disulfanyl]ethylamino]-3-oxidanylidene-propyl]amino]-2,2-dimethyl-3-oxidanyl-4-oxidanylidene-butyl] hydrogen phosphate (three-letter code: 5NG) (formula: C₄₂H₇₀N₁₄O₃₂P₆S₂).



Mol	Chain	Residues	Atoms							ZeroOcc	AltConf
			Total	C	H	N	O	P	S		
4	C	1	158	42	62	14	32	6	2	0	0

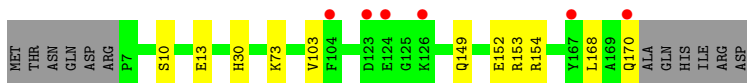
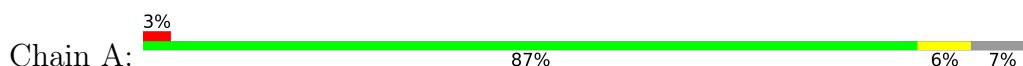
- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	82	Total	O	0	0
			82	82		
5	B	80	Total	O	0	0
			80	80		
5	C	58	Total	O	0	0
			58	58		

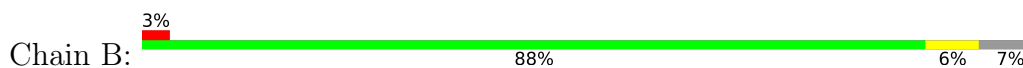
3 Residue-property plots [i](#)

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.

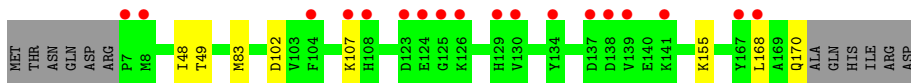
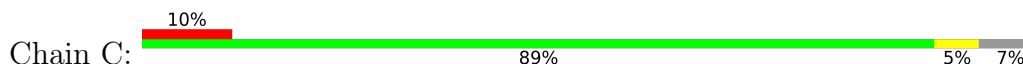
- Molecule 1: Acyl CoA Hydrolase



- Molecule 1: Acyl CoA Hydrolase



- Molecule 1: Acyl CoA Hydrolase



4 Data and refinement statistics

Property	Value	Source
Space group	P 65 2 2	Depositor
Cell constants a, b, c, α , β , γ	142.26Å 142.26Å 163.89Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	39.84 – 2.10 39.84 – 2.10	Depositor EDS
% Data completeness (in resolution range)	100.0 (39.84-2.10) 97.1 (39.84-2.10)	Depositor EDS
R_{merge}	0.03	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.75 (at 2.10Å)	Xtrriage
Refinement program	PHENIX dev_1894	Depositor
R, R_{free}	0.212 , 0.246 0.214 , 0.247	Depositor DCC
R_{free} test set	2939 reflections (5.11%)	wwPDB-VP
Wilson B-factor (Å ²)	36.3	Xtrriage
Anisotropy	0.097	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.41 , 45.2	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	8275	wwPDB-VP
Average B, all atoms (Å ²)	50.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.73% 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: COA, 5NG, BCO

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	0.35	0/1325	0.55	0/1792
1	B	0.33	0/1325	0.52	0/1790
1	C	0.32	0/1325	0.52	0/1792
All	All	0.34	0/3975	0.53	0/5374

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	1298	1278	1278	7	0
1	B	1299	1279	1279	9	0
1	C	1298	1278	1278	5	0
2	A	53	34	40	3	0
3	B	48	32	32	1	0
4	C	96	62	0	4	0
5	A	82	0	0	3	2
5	B	80	0	0	1	0
5	C	58	0	0	1	2
All	All	4312	3963	3907	23	2

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 (23) 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)
3:B:201:COA:C1B	3:B:201:COA:O4B	1.65	1.17
4:C:201:5NG:O77	4:C:201:5NG:C76	1.67	1.09
1:A:149:GLN:O	1:A:152:GLU:HG2	1.94	0.68
1:A:103:VAL:O	5:A:301:HOH:O	2.10	0.68
5:A:306:HOH:O	1:B:162:LYS:NZ	2.33	0.60
4:C:201:5NG:O54	5:C:301:HOH:O	2.16	0.58
1:C:102:ASP:HB3	1:C:107:LYS:HB3	1.87	0.56
1:B:18:LYS:HB3	1:B:80:TYR:HB2	1.89	0.55
2:A:201:BCO:O16	1:B:71:PRO:HA	2.09	0.53
1:B:21:GLN:NE2	4:C:201:5NG:O54	2.42	0.50
1:A:10:SER:OG	1:A:13:GLU:HG3	2.13	0.48
1:C:49:THR:HG21	1:C:83:MET:HA	1.95	0.47
2:A:201:BCO:H42	1:B:28:ASN:HD22	1.80	0.46
1:A:153:ARG:NH2	5:A:305:HOH:O	2.32	0.45
1:A:30:HIS:O	1:A:73:LYS:NZ	2.51	0.44
1:B:21:GLN:HG3	1:C:48:ILE:HG12	1.99	0.44
1:A:168:LEU:O	1:A:170:GLN:N	2.49	0.43
1:B:14:SER:OG	5:B:302:HOH:O	2.21	0.43
1:C:155:LYS:HE2	4:C:201:5NG:O19	2.19	0.42
1:B:126:LYS:HD2	1:B:126:LYS:N	2.35	0.42
1:B:6:ARG:HB2	1:B:7:PRO:HD2	2.02	0.41
1:C:168:LEU:O	1:C:170:GLN:N	2.52	0.41
1:A:154:ARG:HD3	2:A:201:BCO:C15	2.51	0.40

All (2) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:A:332:HOH:O	5:C:305:HOH:O[6_554]	2.15	0.05
5:A:327:HOH:O	5:C:323:HOH:O[6_554]	2.17	0.03

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	162/176 (92%)	160 (99%)	2 (1%)	0	100	100
1	B	160/176 (91%)	160 (100%)	0	0	100	100
1	C	162/176 (92%)	160 (99%)	2 (1%)	0	100	100
All	All	484/528 (92%)	480 (99%)	4 (1%)	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	142/153 (93%)	142 (100%)	0	100	100
1	B	141/153 (92%)	141 (100%)	0	100	100
1	C	142/153 (93%)	142 (100%)	0	100	100
All	All	425/459 (93%)	425 (100%)	0	100	100

There are no protein residues with a non-rotameric sidechain to report.

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

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](#)

3 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
3	COA	B	201	-	41,50,50	4.23	15 (36%)	52,75,75	1.81	9 (17%)
2	BCO	A	201	-	47,55,55	3.66	19 (40%)	58,81,81	2.30	14 (24%)
4	5NG	C	201	-	85,101,101	3.45	27 (31%)	108,152,152	1.48	16 (14%)

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
3	COA	B	201	-	-	10/44/64/64	0/3/3/3
2	BCO	A	201	-	1/1/14/14	19/50/70/70	0/3/3/3
4	5NG	C	201	-	-	25/91/131/131	0/6/6/6

All (61) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	B	201	COA	O4B-C1B	17.50	1.65	1.41
2	A	201	BCO	O1-C4	15.20	1.62	1.41
3	B	201	COA	C2B-C1B	-13.50	1.33	1.53

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	201	BCO	C2-C4	-11.76	1.35	1.53
4	C	201	5NG	C18-C20	-11.21	1.27	1.52
4	C	201	5NG	O16-C17	-10.39	1.26	1.41
4	C	201	5NG	O77-C76	10.01	1.67	1.45
4	C	201	5NG	C18-C17	9.03	1.67	1.53
4	C	201	5NG	C58-N57	8.56	1.52	1.33
4	C	201	5NG	C43-N45	8.16	1.51	1.33
3	B	201	COA	C9P-N8P	8.13	1.51	1.33
4	C	201	5NG	O77-C78	-7.57	1.30	1.41
4	C	201	5NG	C81-C76	-7.11	1.33	1.52
3	B	201	COA	C5P-N4P	6.67	1.48	1.33
4	C	201	5NG	C38-N40	6.64	1.48	1.33
4	C	201	5NG	O16-C15	6.08	1.58	1.45
2	A	201	BCO	O1-C3	-6.03	1.31	1.45
2	A	201	BCO	C16-N6	5.93	1.46	1.33
2	A	201	BCO	C23-C22	5.91	1.56	1.50
2	A	201	BCO	C19-N7	5.79	1.46	1.33
3	B	201	COA	O4B-C4B	-5.73	1.32	1.45
4	C	201	5NG	P22-O21	5.14	1.69	1.59
4	C	201	5NG	O80-C79	-4.76	1.31	1.43
4	C	201	5NG	C42-C43	4.67	1.60	1.51
4	C	201	5NG	C79-C78	4.39	1.60	1.53
4	C	201	5NG	P83-O82	4.25	1.67	1.59
4	C	201	5NG	C14-C15	-4.19	1.38	1.51
4	C	201	5NG	C53-N52	4.13	1.42	1.33
2	A	201	BCO	C22-S1	4.12	1.86	1.76
4	C	201	5NG	C30-N31	3.97	1.48	1.34
3	B	201	COA	C6A-N6A	3.40	1.46	1.34
4	C	201	5NG	O21-C20	3.17	1.55	1.44
3	B	201	COA	P3B-O3B	3.11	1.65	1.59
3	B	201	COA	C2A-N3A	3.01	1.36	1.32
2	A	201	BCO	P1-O2	3.01	1.65	1.59
3	B	201	COA	O3B-C3B	-2.94	1.33	1.44
2	A	201	BCO	C12-N5	2.84	1.44	1.34
4	C	201	5NG	P10-O13	2.77	1.70	1.59
2	A	201	BCO	O16-C19	-2.71	1.17	1.23
2	A	201	BCO	C15-N3	2.69	1.36	1.32
2	A	201	BCO	P2-O4	2.65	1.70	1.59
2	A	201	BCO	C8-C6	-2.64	1.34	1.40
2	A	201	BCO	C1-C3	2.60	1.59	1.52
4	C	201	5NG	C91-N92	2.59	1.43	1.34
3	B	201	COA	OAP-CAP	-2.59	1.37	1.42

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	C	201	5NG	C55-C53	2.47	1.56	1.51
2	A	201	BCO	O2-C1	-2.47	1.35	1.44
3	B	201	COA	O5P-C5P	-2.41	1.18	1.23
2	A	201	BCO	O3-C2	2.34	1.48	1.43
2	A	201	BCO	C13-C9	2.33	1.58	1.53
4	C	201	5NG	O05-C04	-2.32	1.36	1.43
2	A	201	BCO	O15-C16	-2.25	1.18	1.23
3	B	201	COA	O9P-C9P	-2.20	1.19	1.23
2	A	201	BCO	O11-C10	-2.18	1.38	1.42
4	C	201	5NG	C79-C81	2.15	1.57	1.52
4	C	201	5NG	O44-C43	-2.15	1.18	1.23
3	B	201	COA	C5A-C4A	-2.15	1.35	1.40
4	C	201	5NG	O54-C53	-2.13	1.18	1.23
3	B	201	COA	C3B-C4B	2.11	1.58	1.52
4	C	201	5NG	P67-O66	2.10	1.67	1.59
3	B	201	COA	C7P-C6P	2.00	1.57	1.51

All (39) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	201	COA	C5A-C6A-N6A	6.77	130.65	120.35
2	A	201	BCO	C8-C12-N5	6.54	130.29	120.35
2	A	201	BCO	C23-C22-S1	6.18	120.65	113.46
2	A	201	BCO	C18-C19-N7	5.96	126.46	116.42
2	A	201	BCO	N3-C15-N4	-5.40	120.24	128.68
2	A	201	BCO	C17-C18-C19	-5.27	103.57	112.36
3	B	201	COA	N3A-C2A-N1A	-5.27	120.44	128.68
4	C	201	5NG	C36-C38-N40	5.24	127.02	116.58
4	C	201	5NG	O16-C17-C18	-4.82	99.88	106.93
4	C	201	5NG	N34-C33-N32	-4.55	121.56	128.68
3	B	201	COA	N6A-C6A-N1A	-4.55	109.14	118.57
2	A	201	BCO	N5-C12-N4	-4.41	109.43	118.57
2	A	201	BCO	C21-C20-N7	-4.29	103.40	112.42
2	A	201	BCO	C21-S1-C22	4.18	114.89	101.87
4	C	201	5NG	N95-C94-N93	-4.10	122.27	128.68
4	C	201	5NG	C41-C42-C43	3.81	118.70	112.36
2	A	201	BCO	O16-C19-N7	-3.79	115.86	123.01
2	A	201	BCO	C14-C9-C10	3.67	115.18	108.82
3	B	201	COA	C6P-C5P-N4P	3.45	122.22	116.42
3	B	201	COA	C7P-C6P-C5P	-3.43	106.65	112.36
2	A	201	BCO	O17-C22-C23	-3.30	120.09	123.99
4	C	201	5NG	P10-O09-P06	-3.13	122.10	132.83

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	C	201	5NG	O39-C38-N40	-3.08	116.39	122.99
4	C	201	5NG	C55-C53-N52	3.06	121.57	116.42
4	C	201	5NG	O77-C78-C79	-2.97	102.58	106.93
4	C	201	5NG	C01-C02-C36	2.75	113.58	108.82
3	B	201	COA	P2A-O3A-P1A	-2.63	123.81	132.83
2	A	201	BCO	O17-C22-S1	-2.59	119.25	122.61
3	B	201	COA	CDP-CBP-CAP	2.54	113.23	108.82
3	B	201	COA	O5P-C5P-N4P	-2.48	118.33	123.01
4	C	201	5NG	C96-C90-N89	-2.44	106.86	109.40
4	C	201	5NG	P71-O70-P67	-2.42	124.53	132.83
4	C	201	5NG	C41-N40-C38	2.41	126.89	122.59
2	A	201	BCO	O16-C19-C18	-2.37	117.68	122.02
4	C	201	5NG	O54-C53-N52	-2.34	118.60	123.01
4	C	201	5NG	O44-C43-N45	-2.30	118.67	123.01
2	A	201	BCO	P3-O7-P2	-2.27	125.03	132.83
4	C	201	5NG	C81-C79-C78	2.10	104.53	99.89
3	B	201	COA	C6P-C7P-N8P	2.00	115.93	111.90

All (1) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
2	A	201	BCO	C10

All (54) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	201	BCO	C1-O2-P1-O6
2	A	201	BCO	O11-C10-C9-C11
2	A	201	BCO	O11-C10-C9-C14
2	A	201	BCO	N7-C20-C21-S1
2	A	201	BCO	C20-C21-S1-C22
2	A	201	BCO	O17-C22-S1-C21
2	A	201	BCO	C23-C22-S1-C21
2	A	201	BCO	C22-C23-C24-C25
3	B	201	COA	CAP-CBP-CCP-O6A
3	B	201	COA	O9P-C9P-CAP-OAP
3	B	201	COA	C2P-C3P-N4P-C5P
4	C	201	5NG	C01-C02-C36-O37
4	C	201	5NG	C01-C02-C36-C38
4	C	201	5NG	C03-C02-C36-O37
4	C	201	5NG	C03-C02-C36-C38
4	C	201	5NG	C04-C02-C36-O37

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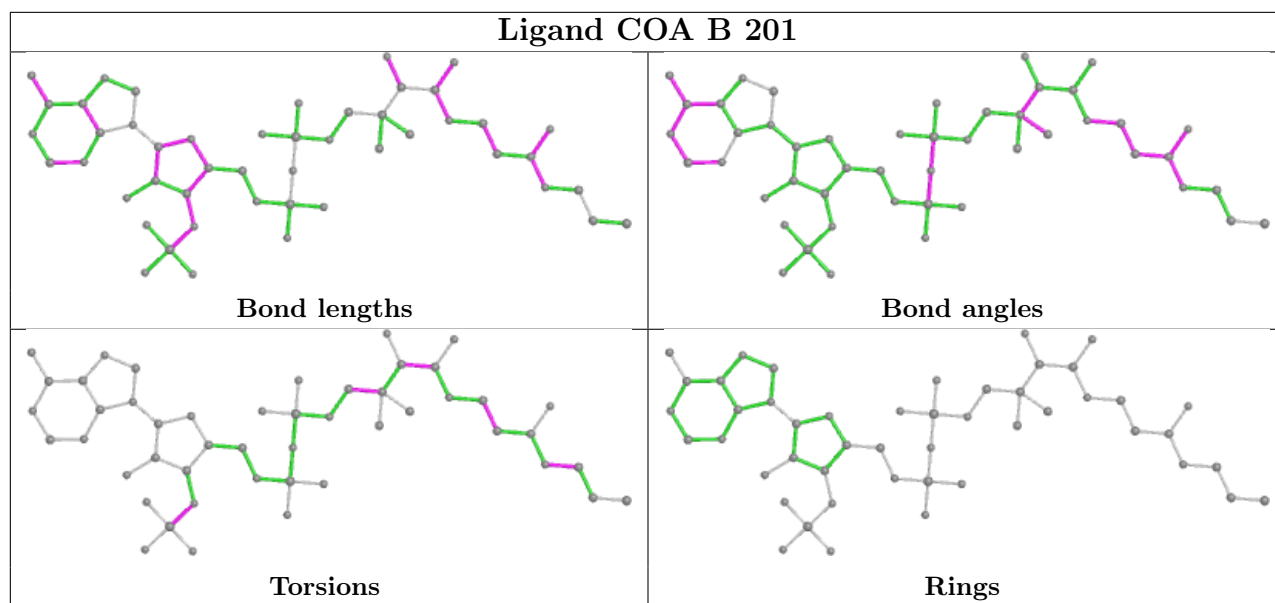
Mol	Chain	Res	Type	Atoms
4	C	201	5NG	C04-C02-C36-C38
4	C	201	5NG	P10-O09-P06-O05
4	C	201	5NG	C14-O13-P10-O11
4	C	201	5NG	C36-C38-N40-C41
4	C	201	5NG	C47-S48-S49-C50
4	C	201	5NG	S49-C50-C51-N52
2	A	201	BCO	C18-C19-N7-C20
4	C	201	5NG	C55-C53-N52-C51
4	C	201	5NG	O39-C38-N40-C41
2	A	201	BCO	O16-C19-N7-C20
4	C	201	5NG	O54-C53-N52-C51
4	C	201	5NG	O13-C14-C15-O16
3	B	201	COA	CDP-CBP-CCP-O6A
3	B	201	COA	CEP-CBP-CCP-O6A
4	C	201	5NG	C55-C56-N57-C58
2	A	201	BCO	O11-C10-C16-O15
2	A	201	BCO	O11-C10-C9-C13
2	A	201	BCO	O11-C10-C16-N6
3	B	201	COA	N8P-C9P-CAP-OAP
3	B	201	COA	C5P-C6P-C7P-N8P
4	C	201	5NG	N40-C41-C42-C43
2	A	201	BCO	C16-C10-C9-C14
4	C	201	5NG	C14-O13-P10-O09
4	C	201	5NG	C20-O21-P22-O24
2	A	201	BCO	P2-O7-P3-O14
4	C	201	5NG	C14-O13-P10-O12
2	A	201	BCO	C16-C10-C9-C11
4	C	201	5NG	O13-C14-C15-C20
2	A	201	BCO	P3-O7-P2-O10
3	B	201	COA	O9P-C9P-CAP-CBP
3	B	201	COA	N8P-C9P-CAP-CBP
4	C	201	5NG	O37-C36-C38-O39
4	C	201	5NG	O37-C36-C38-N40
4	C	201	5NG	C46-C47-S48-S49
4	C	201	5NG	C51-C50-S49-S48
2	A	201	BCO	C16-C10-C9-C13
3	B	201	COA	C3B-O3B-P3B-O9A
2	A	201	BCO	P3-O7-P2-O12

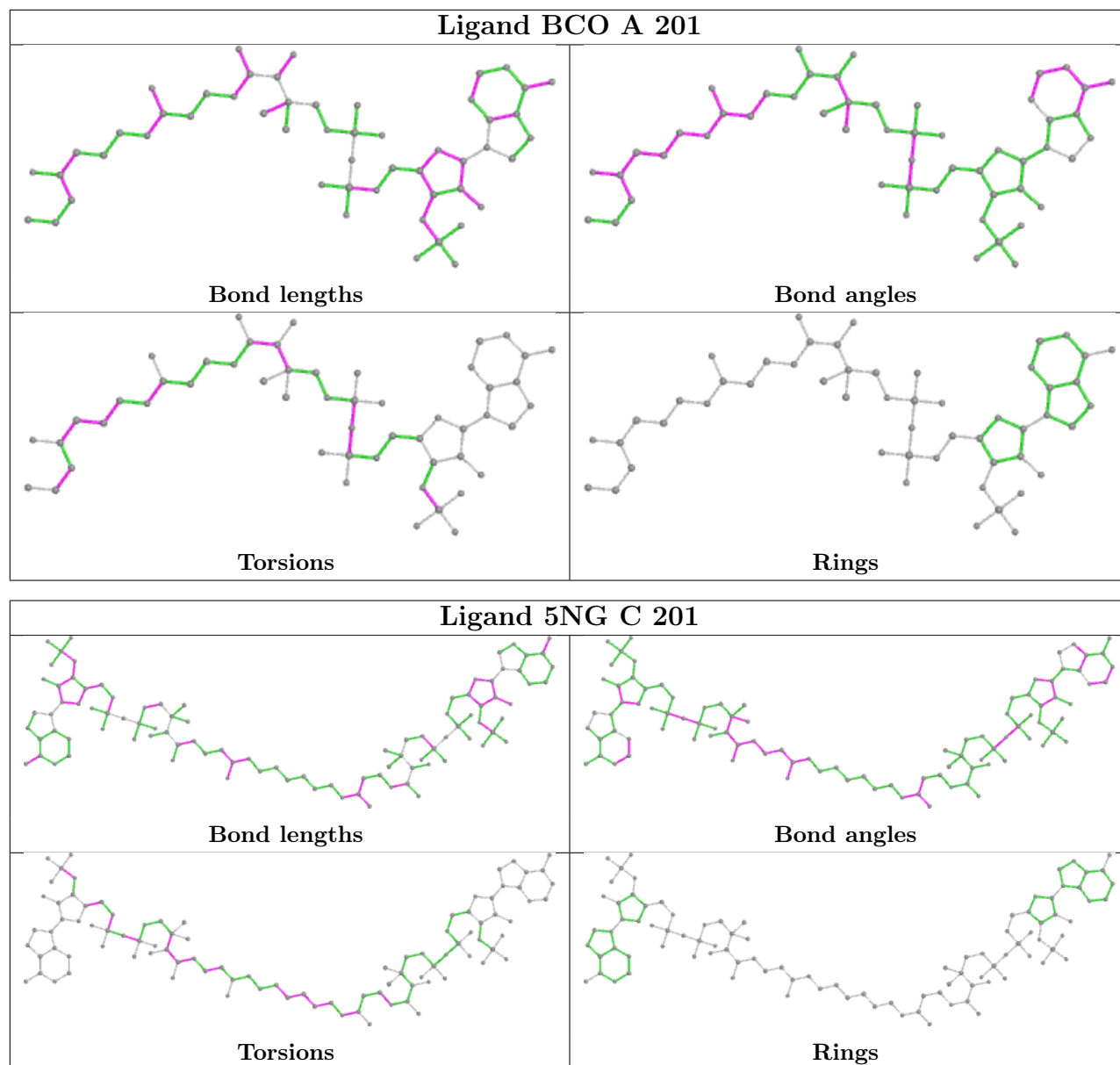
There are no ring outliers.

3 monomers are involved in 8 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	B	201	COA	1	0
2	A	201	BCO	3	0
4	C	201	5NG	4	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	164/176 (93%)	0.13	6 (3%) 41 48	22, 33, 65, 92	0
1	B	164/176 (93%)	0.25	6 (3%) 41 48	29, 40, 68, 87	0
1	C	164/176 (93%)	0.62	18 (10%) 5 7	29, 51, 79, 90	0
All	All	492/528 (93%)	0.33	30 (6%) 21 26	22, 43, 74, 92	0

All (30) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	8	MET	5.1
1	C	7	PRO	4.8
1	A	123	ASP	4.8
1	A	124	GLU	4.1
1	C	141	LYS	3.9
1	C	129	HIS	3.6
1	C	123	ASP	3.5
1	A	170	GLN	3.5
1	C	124	GLU	3.3
1	B	124	GLU	3.2
1	B	7	PRO	3.2
1	C	138	ASP	3.1
1	C	168	LEU	3.0
1	A	104	PHE	3.0
1	B	123	ASP	3.0
1	C	108	HIS	2.9
1	B	126	LYS	2.8
1	B	108	HIS	2.7
1	C	126	LYS	2.6
1	A	167	TYR	2.5
1	C	134	TYR	2.4
1	C	104	PHE	2.2
1	C	167	TYR	2.2

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Mol	Chain	Res	Type	RSRZ
1	A	126	LYS	2.2
1	C	107	LYS	2.2
1	C	130	VAL	2.1
1	C	125	GLY	2.1
1	C	139	VAL	2.1
1	C	137	ASP	2.0
1	B	6	ARG	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](#)

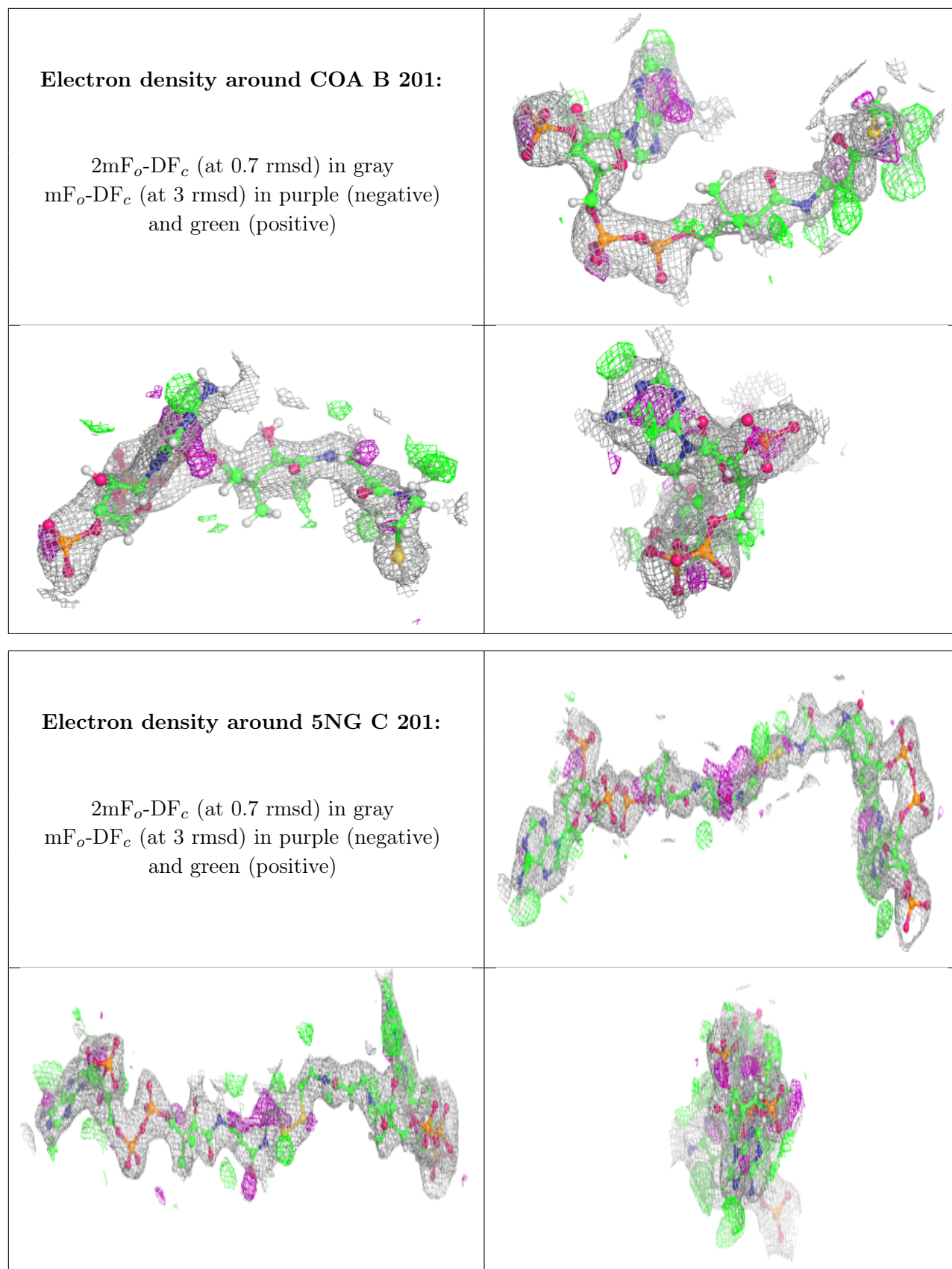
There are no monosaccharides in this entry.

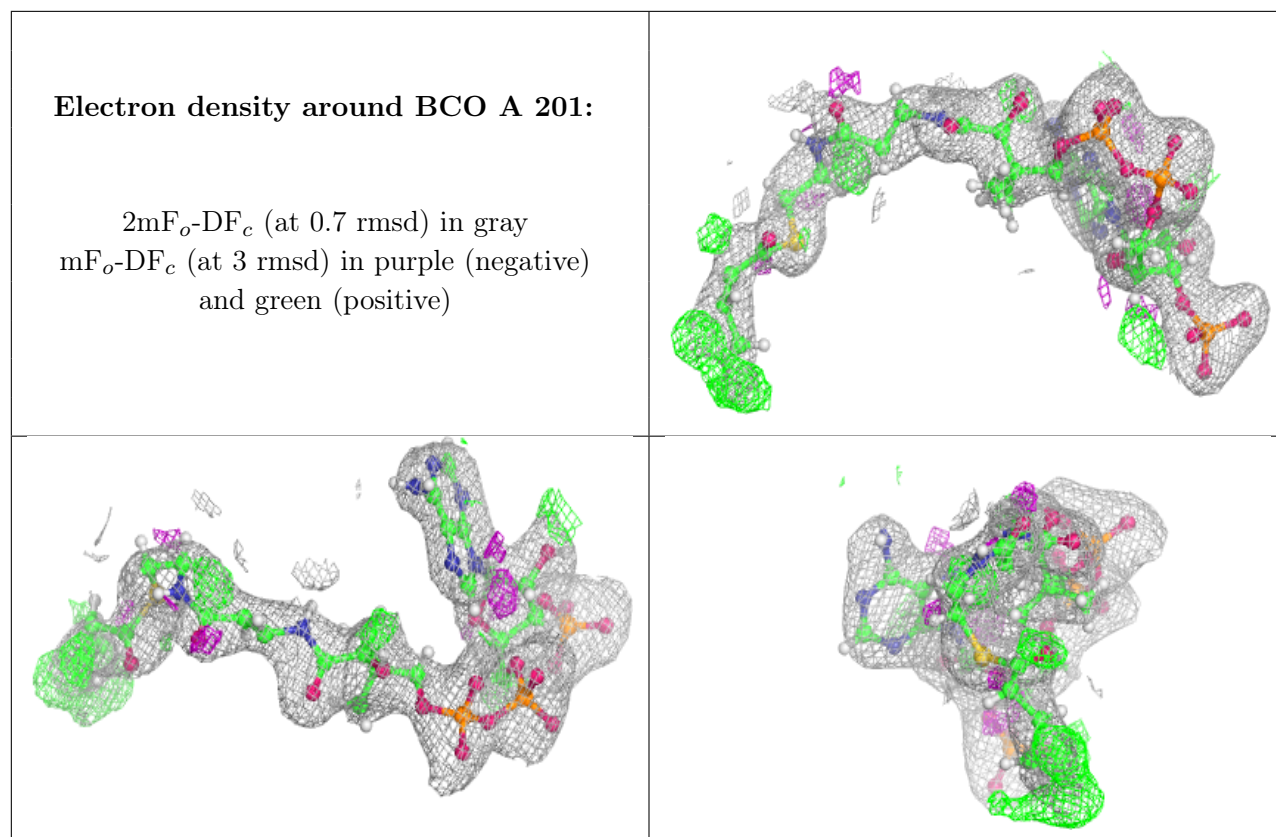
6.4 Ligands [i](#)

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(Å ²)	Q<0.9
3	COA	B	201	48/48	0.87	0.23	42,80,107,111	0
4	5NG	C	201	96/96	0.90	0.14	36,58,74,97	0
2	BCO	A	201	53/53	0.91	0.12	40,54,73,75	0

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





6.5 Other polymers [i](#)

There are no such residues in this entry.