wwPDB X-ray Structure Validation Summary Report (i)

May 13, 2020 – 01:58 am BST

PDB ID	:	4WXB
Title	:	Crystal Structure of Serine Hydroxymethyltransferase from Streptococcus thermophilus
Authors	:	Hernandez, K.; Zelen, I.; Petrillo, G.; Uson, I.; Wandtke, C.; Bujons, J.; Joglar, J.; Parella, T.; Clapes, P.
Deposited on	:	2014-11-13
Resolution	:	2.05 Å(reported)

This is a wwPDB X-ray Structure Validation Summary 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 (i) symbol.

The following versions of software and data (see references (i)) were used in the production of this report:

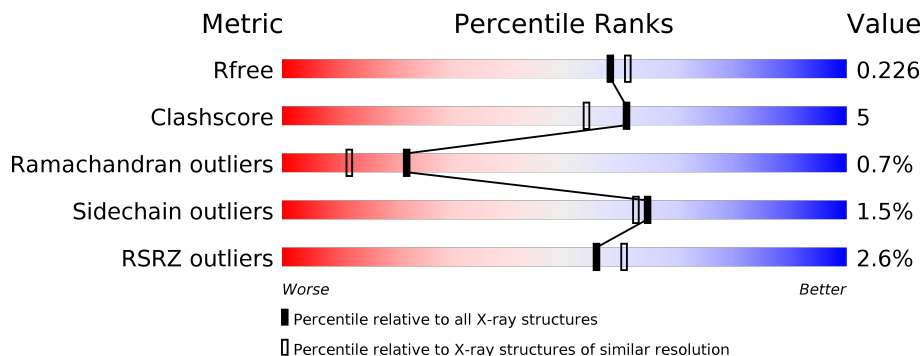|		
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.11
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.11

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 2.05 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	Percentile Ranks	Value
Rfree		0.226
Clashscore		5
Ramachandran outliers		0.7%
Sidechain outliers		1.5%
RSRZ outliers		2.6%

Worse   *Better*

■ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	1692 (2.04-2.04)
Clashscore	141614	1773 (2.04-2.04)
Ramachandran outliers	138981	1752 (2.04-2.04)
Sidechain outliers	138945	1752 (2.04-2.04)
RSRZ outliers	127900	1672 (2.04-2.04)

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 on 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 <=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	428	3% 83% 11% · ·
1	B	428	% 83% 10% · 7%
1	C	428	% 86% 7% · 7%
1	D	428	5% 83% 11% · ·

2 Entry composition (i)

There are 6 unique types of molecules in this entry. The entry contains 13047 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 Serine hydroxymethyltransferase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	410	Total 3124	C 1979	N 536	O 600	S 9	0	0	0
1	B	400	Total 3061	C 1942	N 522	O 588	S 9	0	0	0
1	C	400	Total 3061	C 1942	N 522	O 588	S 9	0	0	0
1	D	410	Total 3124	C 1979	N 536	O 600	S 9	0	0	0

There are 48 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-11	MET	-	initiating methionine	UNP Q5M0B4
A	-10	ARG	-	expression tag	UNP Q5M0B4
A	-9	GLY	-	expression tag	UNP Q5M0B4
A	-8	SER	-	expression tag	UNP Q5M0B4
A	-7	HIS	-	expression tag	UNP Q5M0B4
A	-6	HIS	-	expression tag	UNP Q5M0B4
A	-5	HIS	-	expression tag	UNP Q5M0B4
A	-4	HIS	-	expression tag	UNP Q5M0B4
A	-3	HIS	-	expression tag	UNP Q5M0B4
A	-2	HIS	-	expression tag	UNP Q5M0B4
A	-1	GLY	-	expression tag	UNP Q5M0B4
A	0	SER	-	expression tag	UNP Q5M0B4
B	-11	MET	-	initiating methionine	UNP Q5M0B4
B	-10	ARG	-	expression tag	UNP Q5M0B4
B	-9	GLY	-	expression tag	UNP Q5M0B4
B	-8	SER	-	expression tag	UNP Q5M0B4
B	-7	HIS	-	expression tag	UNP Q5M0B4
B	-6	HIS	-	expression tag	UNP Q5M0B4
B	-5	HIS	-	expression tag	UNP Q5M0B4
B	-4	HIS	-	expression tag	UNP Q5M0B4
B	-3	HIS	-	expression tag	UNP Q5M0B4

Continued on next page...

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
B	-2	HIS	-	expression tag	UNP Q5M0B4
B	-1	GLY	-	expression tag	UNP Q5M0B4
B	0	SER	-	expression tag	UNP Q5M0B4
C	-11	MET	-	initiating methionine	UNP Q5M0B4
C	-10	ARG	-	expression tag	UNP Q5M0B4
C	-9	GLY	-	expression tag	UNP Q5M0B4
C	-8	SER	-	expression tag	UNP Q5M0B4
C	-7	HIS	-	expression tag	UNP Q5M0B4
C	-6	HIS	-	expression tag	UNP Q5M0B4
C	-5	HIS	-	expression tag	UNP Q5M0B4
C	-4	HIS	-	expression tag	UNP Q5M0B4
C	-3	HIS	-	expression tag	UNP Q5M0B4
C	-2	HIS	-	expression tag	UNP Q5M0B4
C	-1	GLY	-	expression tag	UNP Q5M0B4
C	0	SER	-	expression tag	UNP Q5M0B4
D	-11	MET	-	initiating methionine	UNP Q5M0B4
D	-10	ARG	-	expression tag	UNP Q5M0B4
D	-9	GLY	-	expression tag	UNP Q5M0B4
D	-8	SER	-	expression tag	UNP Q5M0B4
D	-7	HIS	-	expression tag	UNP Q5M0B4
D	-6	HIS	-	expression tag	UNP Q5M0B4
D	-5	HIS	-	expression tag	UNP Q5M0B4
D	-4	HIS	-	expression tag	UNP Q5M0B4
D	-3	HIS	-	expression tag	UNP Q5M0B4
D	-2	HIS	-	expression tag	UNP Q5M0B4
D	-1	GLY	-	expression tag	UNP Q5M0B4
D	0	SER	-	expression tag	UNP Q5M0B4

- Molecule 2 is CITRIC ACID (three-letter code: CIT) (formula: $C_6H_8O_7$) (labeled as "Ligand of Interest" by author).
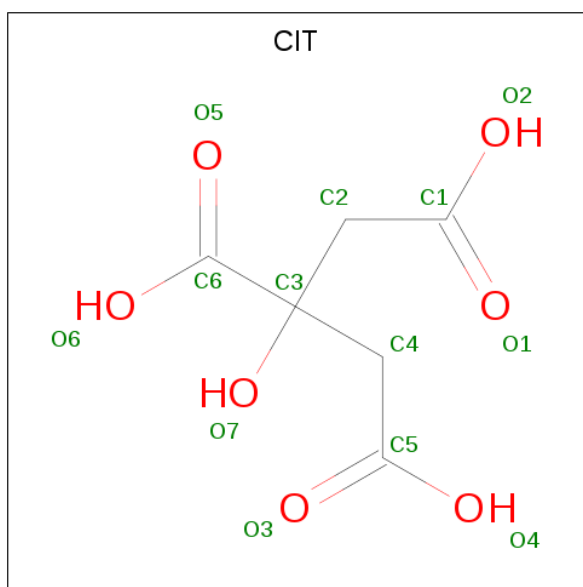
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	A	1	Total 13	C 6	O 7	0	0
2	B	1	Total 13	C 6	O 7	0	0
2	C	1	Total 13	C 6	O 7	0	0
2	D	1	Total 13	C 6	O 7	0	0

- Molecule 3 is CACODYLATE ION (three-letter code: CAC) (formula: $C_2H_6AsO_2$) (labeled as "Ligand of Interest" by author).
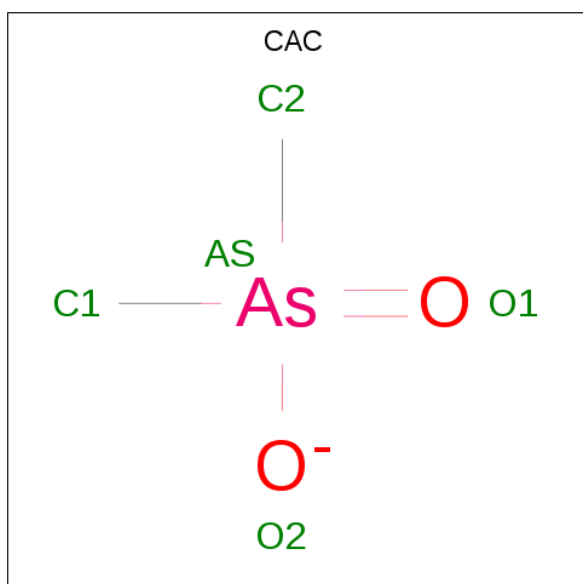
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	1	Total 5	As 1	C 2	O 2	0	0
3	B	1	Total 5	As 1	C 2	O 2	0	0
3	C	1	Total 5	As 1	C 2	O 2	0	0
3	D	1	Total 5	As 1	C 2	O 2	0	0

- Molecule 4 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$) (labeled as "Ligand of Interest" by author).
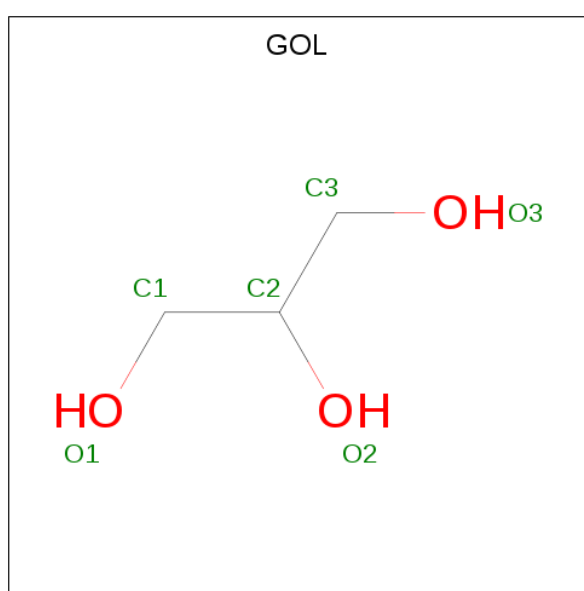
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total 6	C 3	O 3	0	0
4	B	1	Total 6	C 3	O 3	0	0
4	C	1	Total 6	C 3	O 3	0	0
4	D	1	Total 6	C 3	O 3	0	0

- Molecule 5 is SODIUM ION (three-letter code: NA) (formula: Na) (labeled as "Ligand of Interest" by author).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	B	1	Total 1	Na 1	0	0

Continued on next page...

Continued from previous page...

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	D	1	Total 1	Na 1	0	0
5	C	1	Total 1	Na 1	0	0

- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	194	Total 194	O 194	0	0
6	B	135	Total 135	O 135	0	0
6	C	177	Total 177	O 177	0	0
6	D	72	Total 72	O 72	0	0

3 Residue-property plots ⓘ

These plots are drawn for all protein, RNA and DNA 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: Serine hydroxymethyltransferase
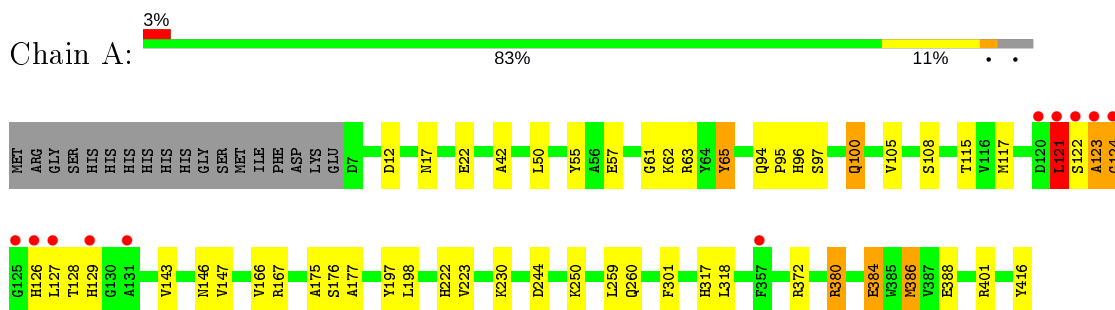
- Molecule 1: Serine hydroxymethyltransferase
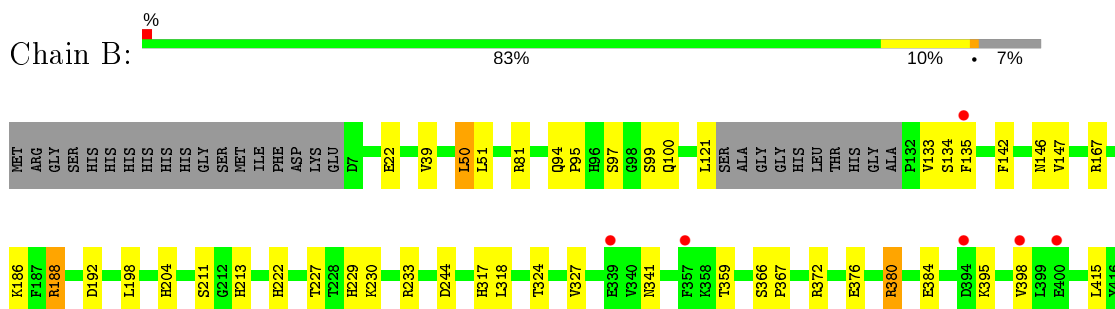
- Molecule 1: Serine hydroxymethyltransferase
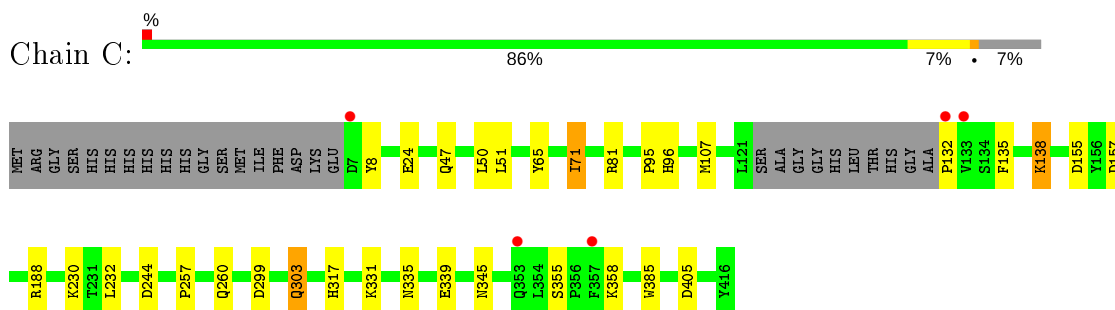
- Molecule 1: Serine hydroxymethyltransferase
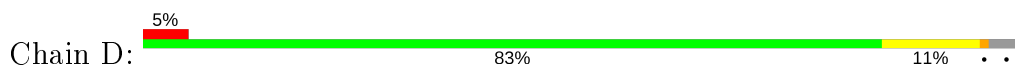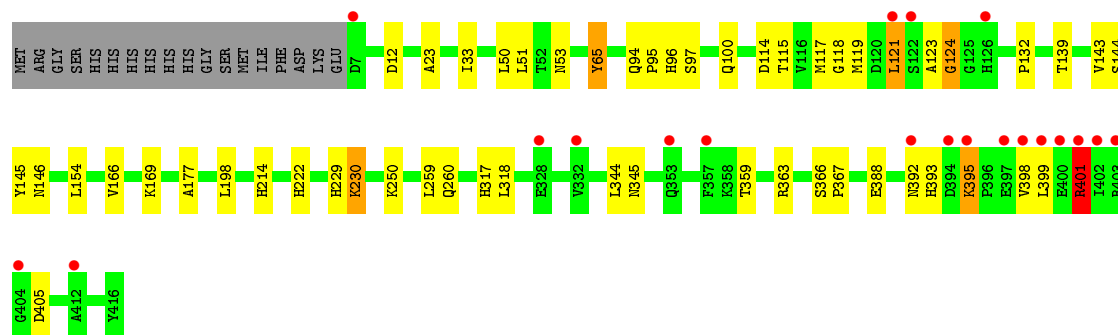
4 Data and refinement statistics (i)

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α, β, γ	202.10Å 113.43Å 133.39Å 90.00° 93.85° 90.00°	Depositor
Resolution (Å)	66.54 – 2.05 66.54 – 2.05	Depositor EDS
% Data completeness (in resolution range)	99.7 (66.54-2.05) 99.7 (66.54-2.05)	Depositor EDS
R_{merge}	0.10	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.97 (at 2.05Å)	Xtriage
Refinement program	REFMAC 5.8.0069	Depositor
R, R_{free}	0.191 , 0.221 0.200 , 0.226	Depositor DCC
R_{free} test set	9372 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å^2)	32.0	Xtriage
Anisotropy	0.035	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.37 , 42.4	EDS
L-test for twinning[2]	$< |L| > = 0.49$, $< L^2 > = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	13047	wwPDB-VP
Average B, all atoms (Å^2)	38.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.77% of the height of the origin peak. No significant pseudotranslation is detected.*

---

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ 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: CAC, GOL, CIT, NA

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	1.07	3/3187 (0.1%)	1.02	10/4327 (0.2%)
1	B	0.93	0/3121	0.97	11/4235 (0.3%)
1	C	1.04	1/3121 (0.0%)	1.02	9/4235 (0.2%)
1	D	0.82	1/3187 (0.0%)	0.89	4/4327 (0.1%)
All	All	0.97	5/12616 (0.0%)	0.98	34/17124 (0.2%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	1

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	65	TYR	CE1-CZ	6.72	1.47	1.38
1	A	416	TYR	CE1-CZ	6.04	1.46	1.38
1	A	197	TYR	CG-CD2	5.73	1.46	1.39
1	D	65	TYR	CE1-CZ	5.48	1.45	1.38
1	A	65	TYR	CE1-CZ	5.08	1.45	1.38

The worst 5 of 34 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	188	ARG	NE-CZ-NH2	-9.52	115.54	120.30
1	C	155	ASP	CB-CG-OD1	8.29	125.76	118.30
1	B	188	ARG	NE-CZ-NH1	8.23	124.41	120.30
1	B	233	ARG	NE-CZ-NH2	-8.16	116.22	120.30

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	12	ASP	CB-CG-OD2	-7.68	111.38	118.30

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	123	ALA	Peptide

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	3124	0	3102	34	0
1	B	3061	0	3046	29	0
1	C	3061	0	3046	16	0
1	D	3124	0	3102	42	0
2	A	13	0	5	1	0
2	B	13	0	5	2	0
2	C	13	0	5	0	0
2	D	13	0	5	0	0
3	A	5	0	0	0	0
3	B	5	0	0	2	0
3	C	5	0	0	1	0
3	D	5	0	0	0	0
4	A	6	0	8	0	0
4	B	6	0	8	0	0
4	C	6	0	8	0	0
4	D	6	0	8	0	0
5	B	1	0	0	0	0
5	C	1	0	0	0	0
5	D	1	0	0	0	0
6	A	194	0	0	1	0
6	B	135	0	0	0	0
6	C	177	0	0	2	0
6	D	72	0	0	6	0
All	All	13047	0	12348	112	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 5.

The worst 5 of 112 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:198:LEU:H	1:D:222:HIS:HD2	1.10	0.97
1:B:198:LEU:H	1:B:222:HIS:HD2	1.21	0.86
1:A:123:ALA:HB2	1:A:146:ASN:OD1	1.77	0.85
1:D:198:LEU:H	1:D:222:HIS:CD2	1.94	0.83
1:A:198:LEU:H	1:A:222:HIS:HD2	1.27	0.80

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	408/428 (95%)	388 (95%)	14 (3%)	6 (2%)	10	3
1	B	396/428 (92%)	384 (97%)	10 (2%)	2 (0%)	29	18
1	C	396/428 (92%)	384 (97%)	11 (3%)	1 (0%)	41	31
1	D	408/428 (95%)	389 (95%)	16 (4%)	3 (1%)	22	12
All	All	1608/1712 (94%)	1545 (96%)	51 (3%)	12 (1%)	22	12

5 of 12 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	121	LEU
1	B	230	LYS
1	C	230	LYS
1	D	230	LYS
1	A	126	HIS

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	327/343 (95%)	323 (99%)	4 (1%)	71	70
1	B	322/343 (94%)	319 (99%)	3 (1%)	78	79
1	C	322/343 (94%)	315 (98%)	7 (2%)	52	46
1	D	327/343 (95%)	322 (98%)	5 (2%)	65	63
All	All	1298/1372 (95%)	1279 (98%)	19 (2%)	65	63

5 of 19 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	C	47	GLN
1	C	71	ILE
1	D	121	LEU
1	C	24	GLU
1	D	169	LYS

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 41 such sidechains are listed below:

Mol	Chain	Res	Type
1	C	17	ASN
1	C	260	GLN
1	D	260	GLN
1	C	27	GLN
1	C	100	GLN

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 carbohydrates in this entry.

5.6 Ligand geometry (i)

Of 15 ligands modelled in this entry, 3 are monoatomic - leaving 12 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#$|Z| > 2$	Counts	RMSZ	#$|Z| > 2$
4	GOL	A	503	-	5,5,5	0.61	0	5,5,5	1.12	0
4	GOL	C	504	-	5,5,5	0.61	0	5,5,5	0.70	0
3	CAC	A	502	-	0,4,4	0.00	-	0,6,6	0.00	-
3	CAC	C	502	-	0,4,4	0.00	-	0,6,6	0.00	-
3	CAC	B	502	-	0,4,4	0.00	-	0,6,6	0.00	-
2	CIT	C	501	-	3,12,12	2.92	1 (33%)	3,17,17	3.06	2 (66%)
2	CIT	B	501	-	3,12,12	2.70	2 (66%)	3,17,17	3.07	2 (66%)
2	CIT	D	501	-	3,12,12	2.60	2 (66%)	3,17,17	2.91	2 (66%)
3	CAC	D	502	-	0,4,4	0.00	-	0,6,6	0.00	-
4	GOL	B	504	-	5,5,5	0.45	0	5,5,5	0.77	0
2	CIT	A	501	-	3,12,12	2.79	2 (66%)	3,17,17	3.33	2 (66%)
4	GOL	D	504	-	5,5,5	0.43	0	5,5,5	1.15	0

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	GOL	A	503	-	-	0/4/4/4	-
4	GOL	C	504	-	-	2/4/4/4	-
2	CIT	C	501	-	-	0/6/16/16	-
2	CIT	B	501	-	-	0/6/16/16	-
2	CIT	D	501	-	-	0/6/16/16	-
4	GOL	B	504	-	-	2/4/4/4	-

Continued on next page...

Continued from previous page...

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	CIT	A	501	-	-	1/6/16/16	-
4	GOL	D	504	-	-	1/4/4/4	-

The worst 5 of 7 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	501	CIT	C4-C3	-4.98	1.47	1.54
2	A	501	CIT	C4-C3	-4.06	1.49	1.54
2	B	501	CIT	C4-C3	-3.94	1.49	1.54
2	D	501	CIT	C4-C3	-3.39	1.50	1.54
2	D	501	CIT	C2-C3	-2.56	1.51	1.54

The worst 5 of 8 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	501	CIT	C3-C2-C1	-4.80	107.30	114.98
2	C	501	CIT	C3-C2-C1	-4.52	107.75	114.98
2	A	501	CIT	C3-C2-C1	-4.46	107.85	114.98
2	D	501	CIT	C3-C2-C1	-4.26	108.17	114.98
2	A	501	CIT	C4-C3-C2	-3.45	100.09	109.33

There are no chirality outliers.

5 of 6 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	C	504	GOL	O1-C1-C2-C3
4	B	504	GOL	O1-C1-C2-C3
4	C	504	GOL	O1-C1-C2-O2
4	B	504	GOL	O1-C1-C2-O2
2	A	501	CIT	C6-C3-C4-C5

There are no ring outliers.

4 monomers are involved in 6 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	C	502	CAC	1	0
3	B	502	CAC	2	0
2	B	501	CIT	2	0
2	A	501	CIT	1	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths,

bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less then 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 GOL A 503

Bond lengths

Bond angles

Torsions

Rings

Ligand GOL C 504

Bond lengths

Bond angles

Torsions

Rings

Ligand CAC A 502

Bond lengths

Bond angles

Torsions

Rings

Ligand CAC C 502

Bond lengths

Bond angles

Torsions

Rings

Ligand CAC B 502

Bond lengths

Bond angles

Torsions

Rings

Ligand CIT C 501

Bond lengths

Bond angles

Torsions

Rings

Ligand CIT B 501

Bond lengths

Bond angles

Torsions

Rings

Ligand CIT D 501

Bond lengths

Bond angles

Torsions

Rings

Ligand CAC D 502

Bond lengths

Bond angles

Torsions

Rings

Ligand GOL B 504

Bond lengths

Bond angles

Torsions

Rings

Ligand CIT A 501

Bond lengths

Bond angles

Torsions

Rings

Ligand GOL D 504

Bond lengths

Bond angles

Torsions

Rings

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

6 Fit of model and data (i)

6.1 Protein, DNA and RNA chains (i)

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2			OWAB(Å^2)	Q<0.9
1	A	410/428 (95%)	-0.22	11 (2%)	54	59	21, 30, 53, 115	0
1	B	400/428 (93%)	-0.06	6 (1%)	73	76	21, 35, 63, 87	0
1	C	400/428 (93%)	-0.34	5 (1%)	77	79	19, 30, 55, 87	0
1	D	410/428 (95%)	0.03	20 (4%)	29	31	30, 45, 70, 111	1 (0%)
All	All	1620/1712 (94%)	-0.14	42 (2%)	56	60	19, 35, 64, 115	1 (0%)

The worst 5 of 42 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	122	SER	5.6
1	A	123	ALA	5.1
1	D	122	SER	5.0
1	D	398	VAL	4.0
1	D	121	LEU	3.9

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 carbohydrates 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	CAC	C	502	5/5	0.86	0.35	29,36,42,51	5
5	NA	C	503	1/1	0.86	0.10	40,40,40,40	0
4	GOL	D	504	6/6	0.86	0.14	48,58,59,61	0
5	NA	D	503	1/1	0.87	0.09	48,48,48,48	0
3	CAC	A	502	5/5	0.89	0.20	39,55,63,74	5
3	CAC	B	502	5/5	0.93	0.35	39,43,45,51	5
4	GOL	C	504	6/6	0.94	0.16	34,44,44,48	0
3	CAC	D	502	5/5	0.94	0.29	50,50,52,60	5
4	GOL	B	504	6/6	0.95	0.10	36,40,44,44	0
2	CIT	B	501	13/13	0.95	0.14	27,34,38,44	13
4	GOL	A	503	6/6	0.95	0.10	30,38,40,42	0
5	NA	B	503	1/1	0.96	0.10	41,41,41,41	0
2	CIT	D	501	13/13	0.96	0.29	23,27,29,29	13
2	CIT	A	501	13/13	0.96	0.14	22,28,33,35	13
2	CIT	C	501	13/13	0.96	0.11	21,24,29,33	13

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 CAC C 502:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
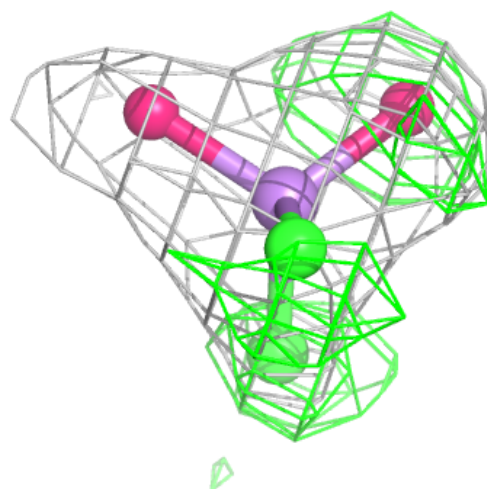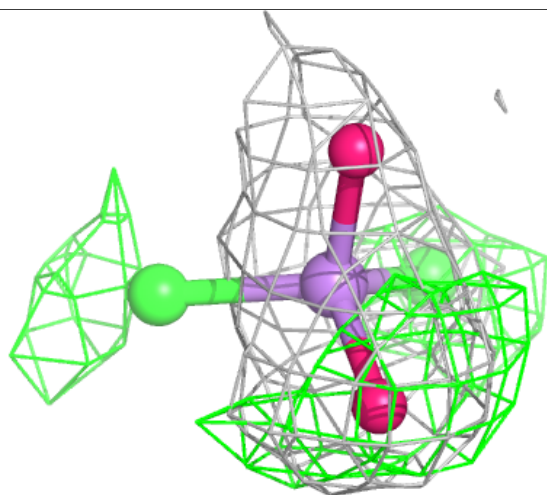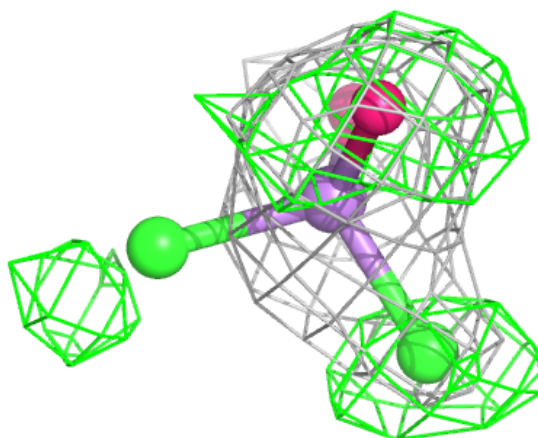
Electron density around NA C 503:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
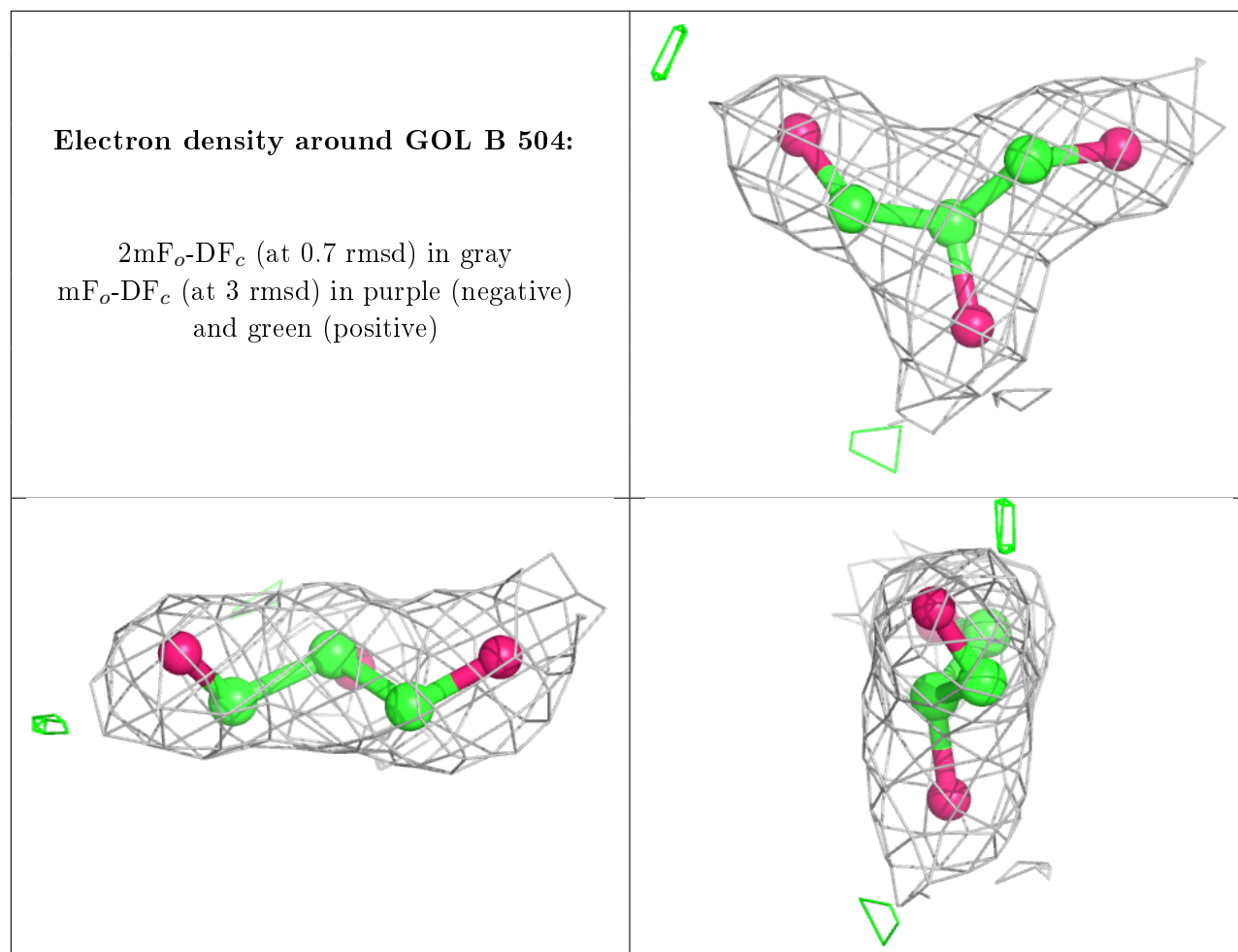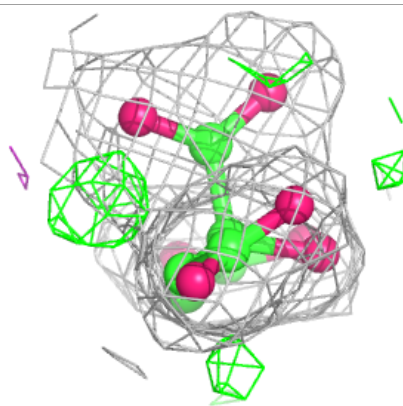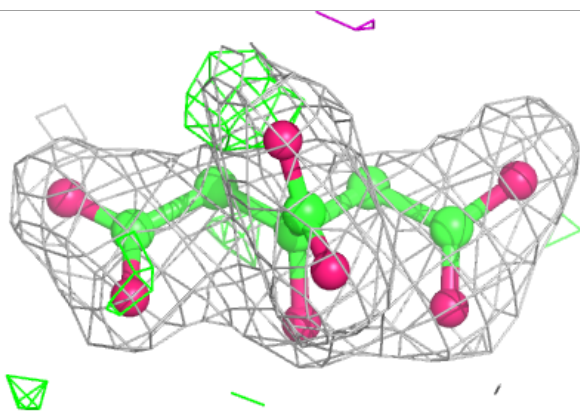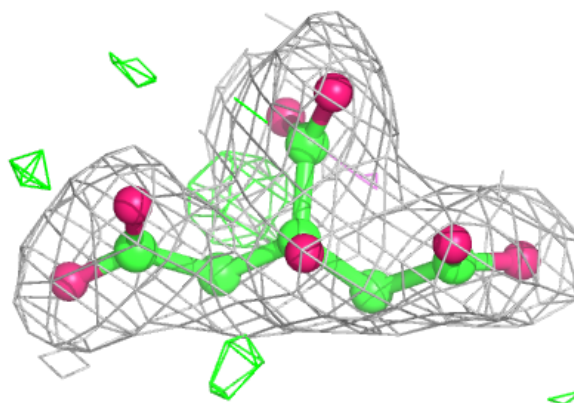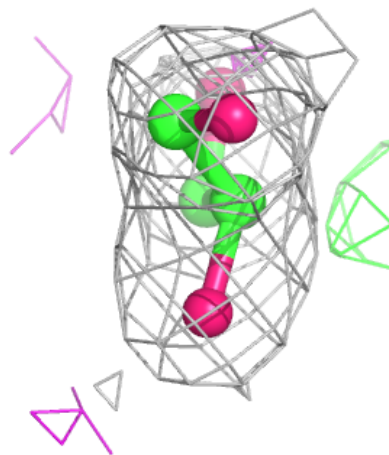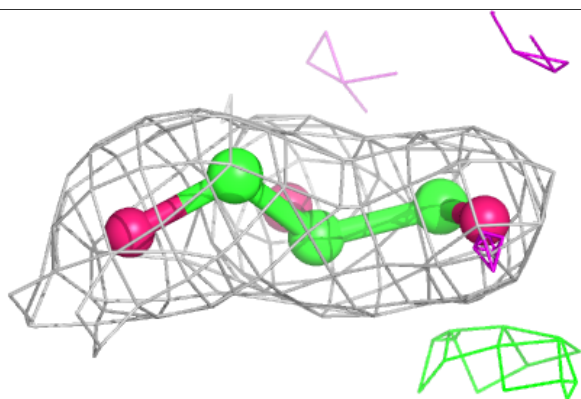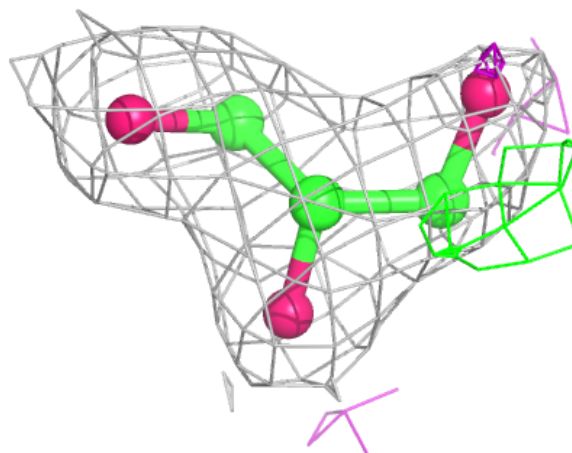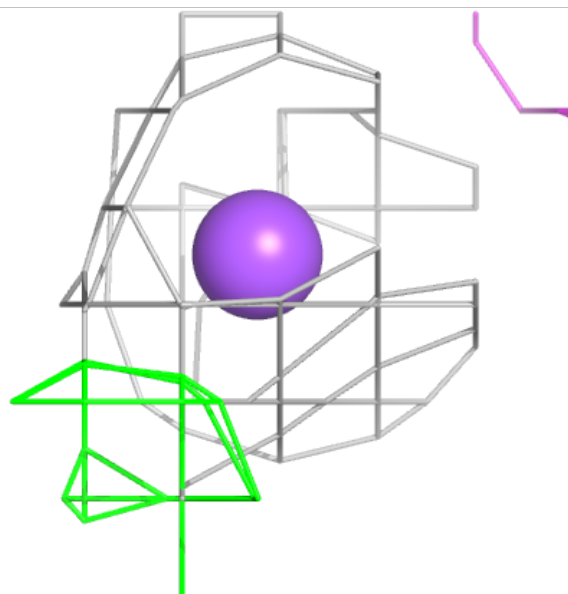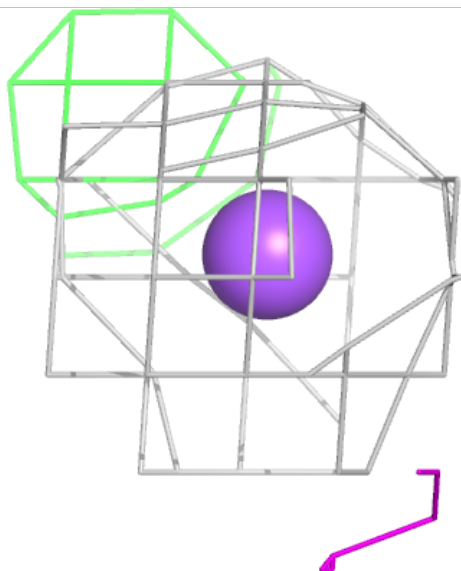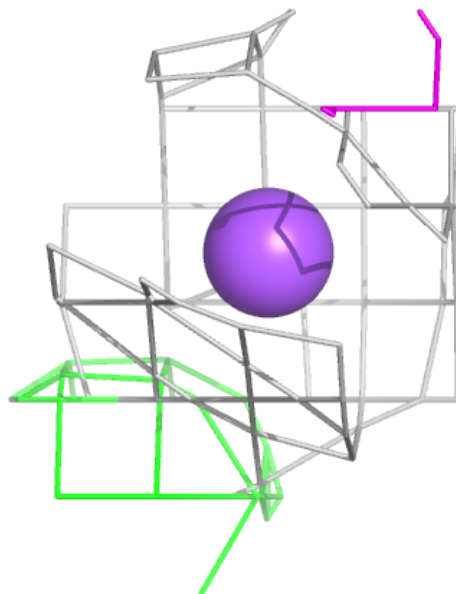and green (positive)
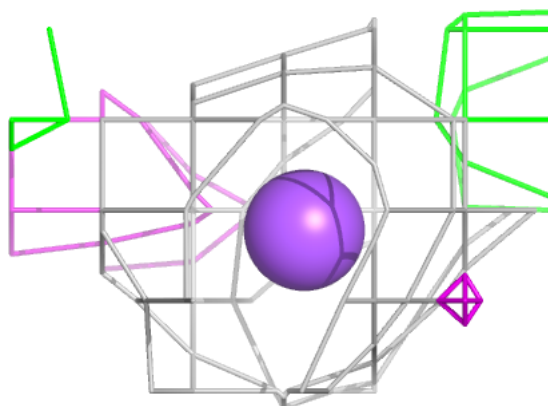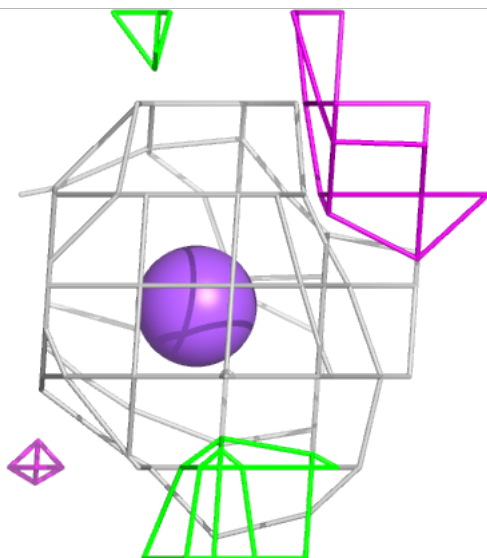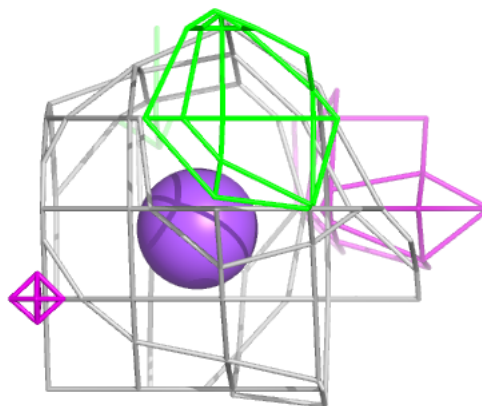
Electron density around GOL D 504:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
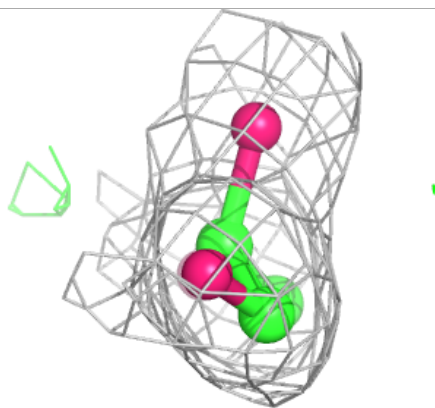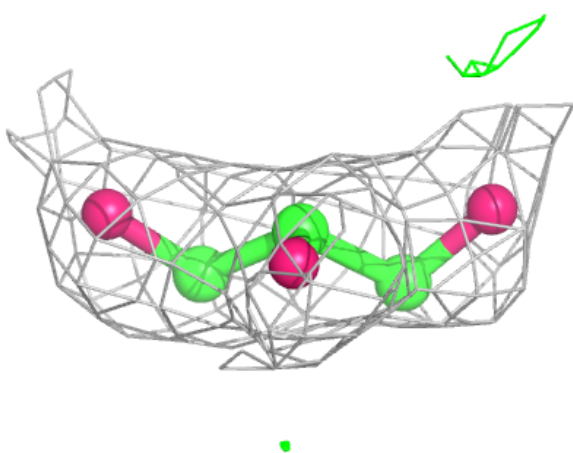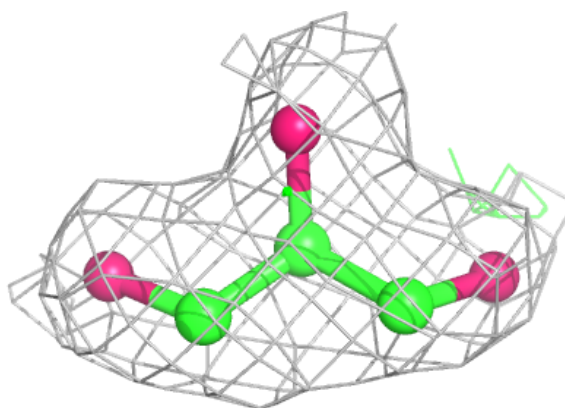
Electron density around NA D 503:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
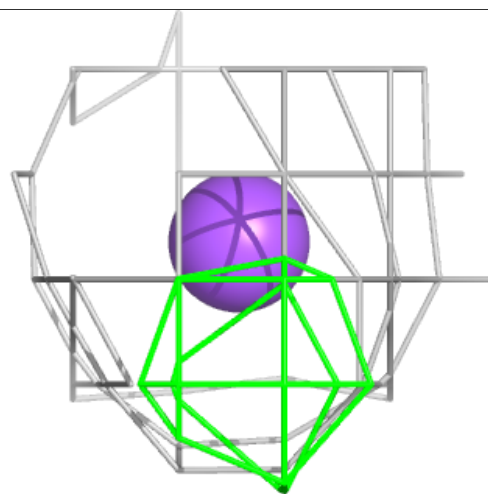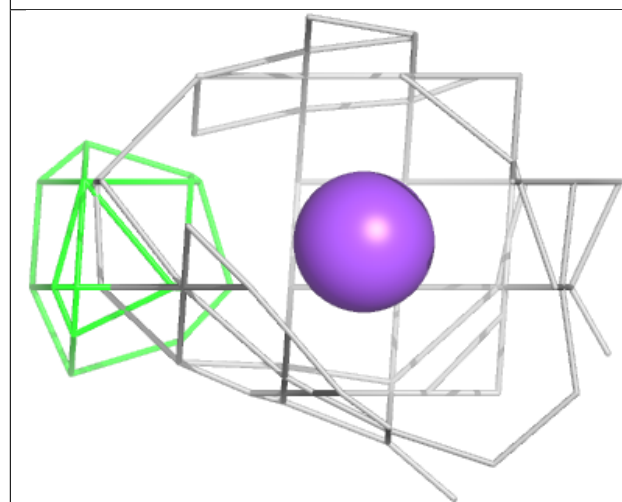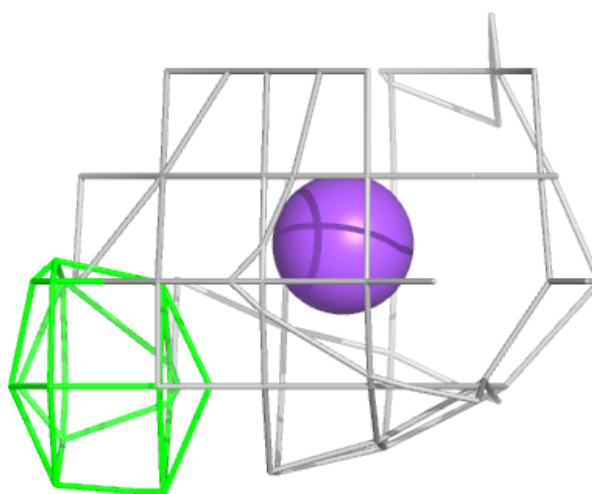
Electron density around CAC A 502:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
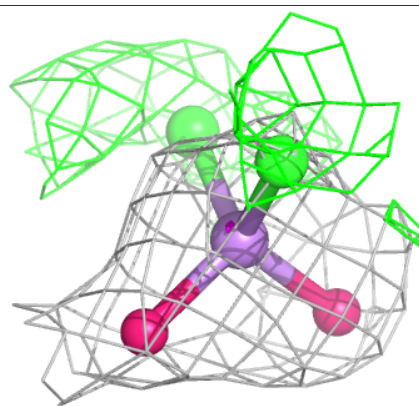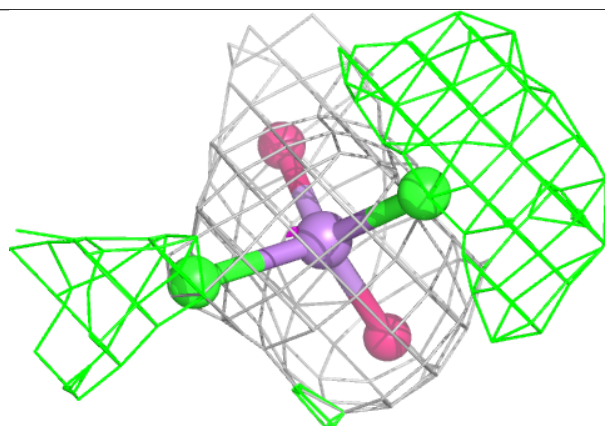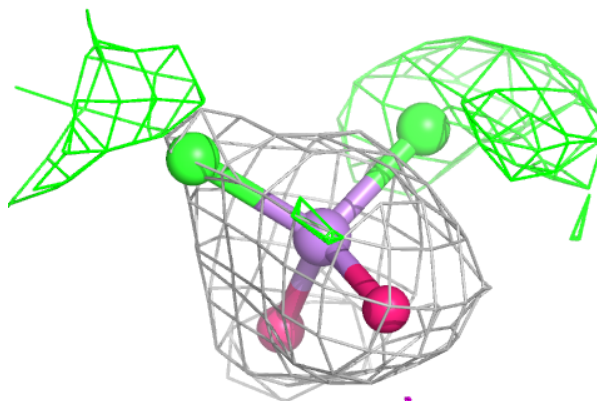
Electron density around CAC B 502:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
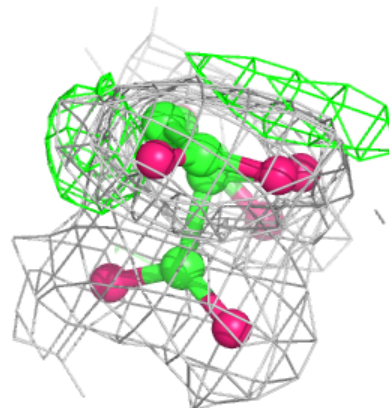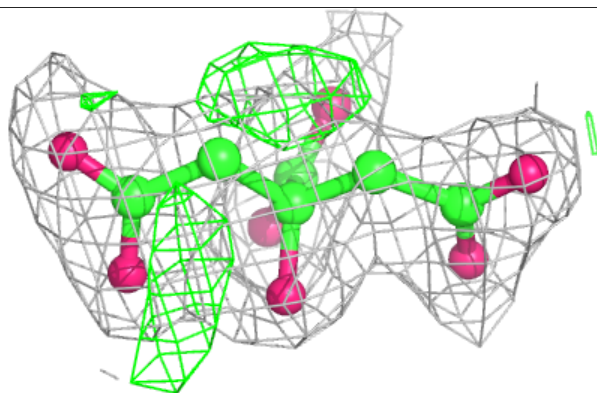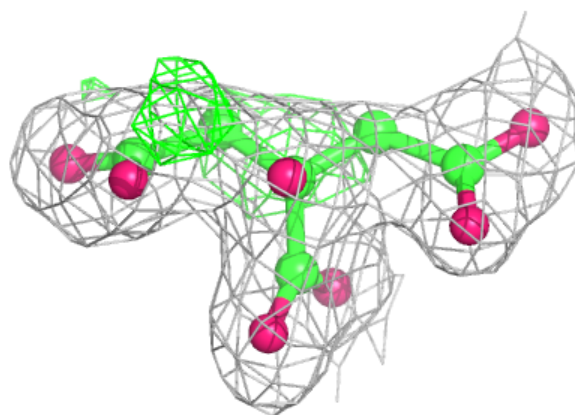and green (positive)
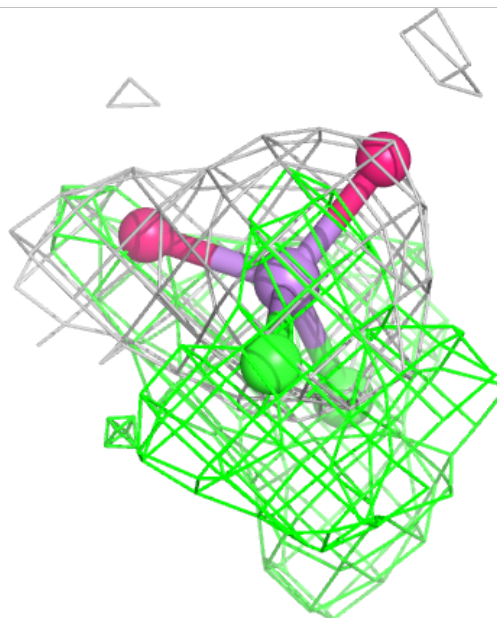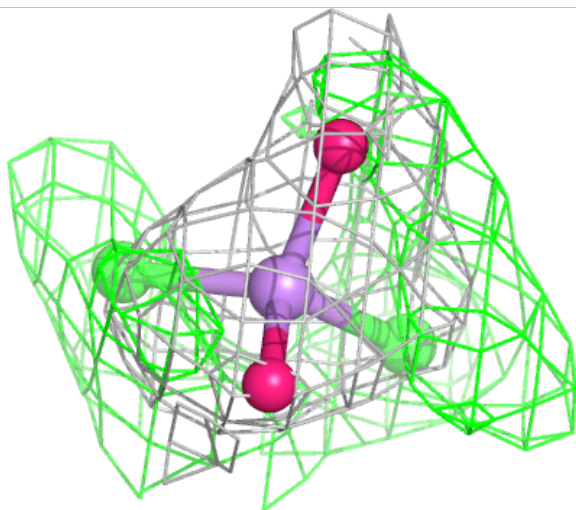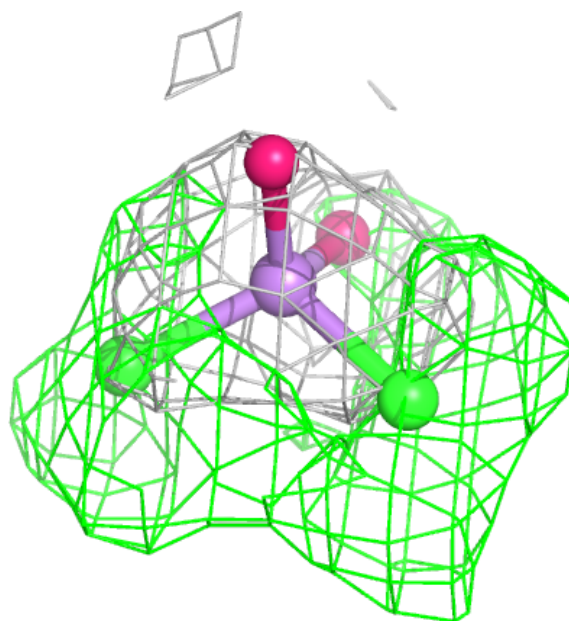
Electron density around GOL C 504:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
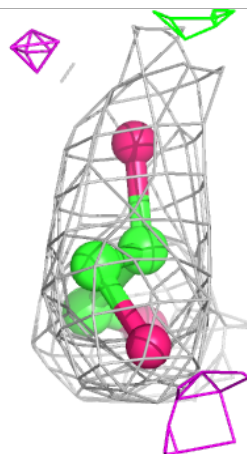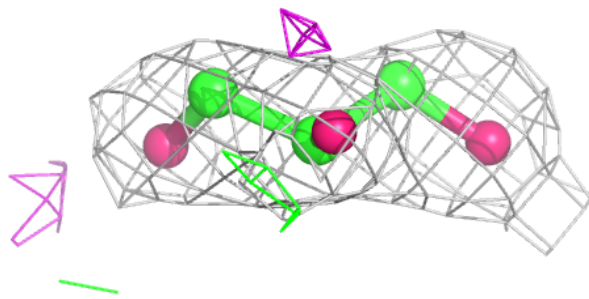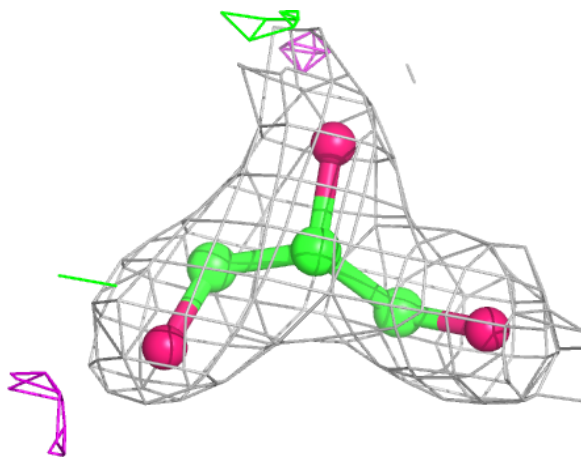
Electron density around CAC D 502:

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

Electron density around GOL B 504:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
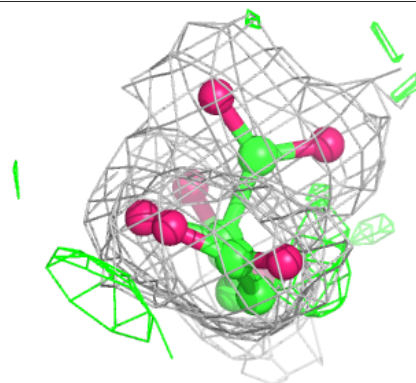and green (positive)
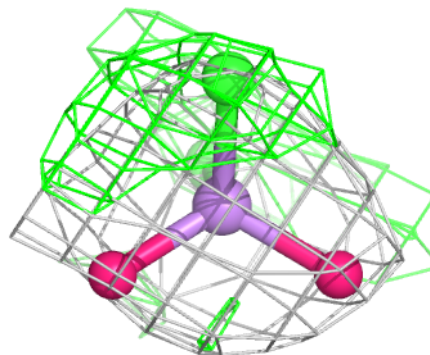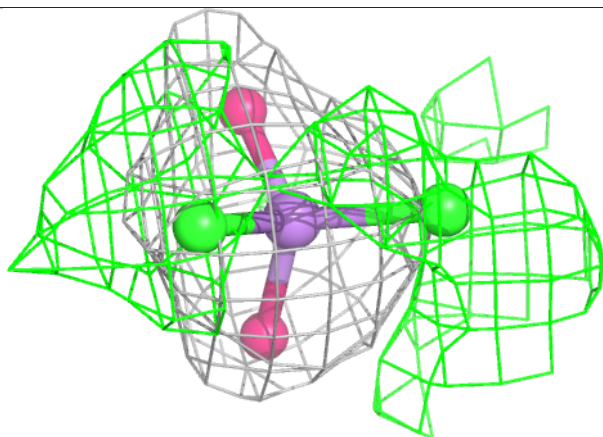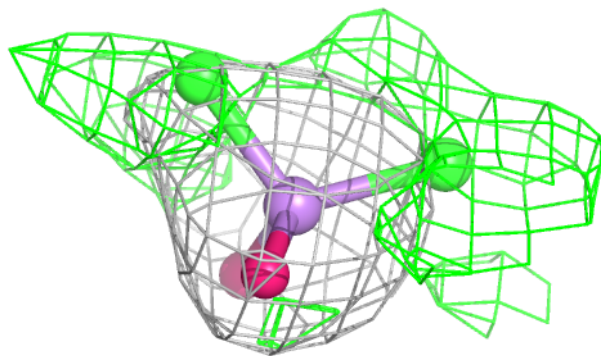
Electron density around CIT B 501:

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

Electron density around GOL A 503:

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

Electron density around NA B 503:

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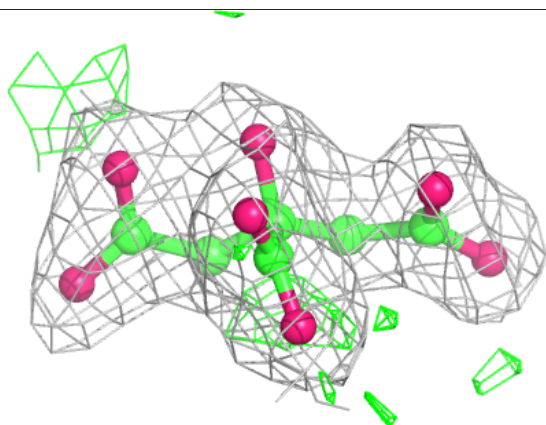$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)

Electron density around CIT D 501:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray

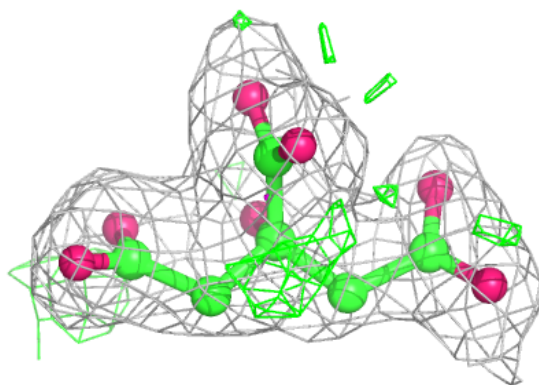$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)

Electron density around CIT A 501:
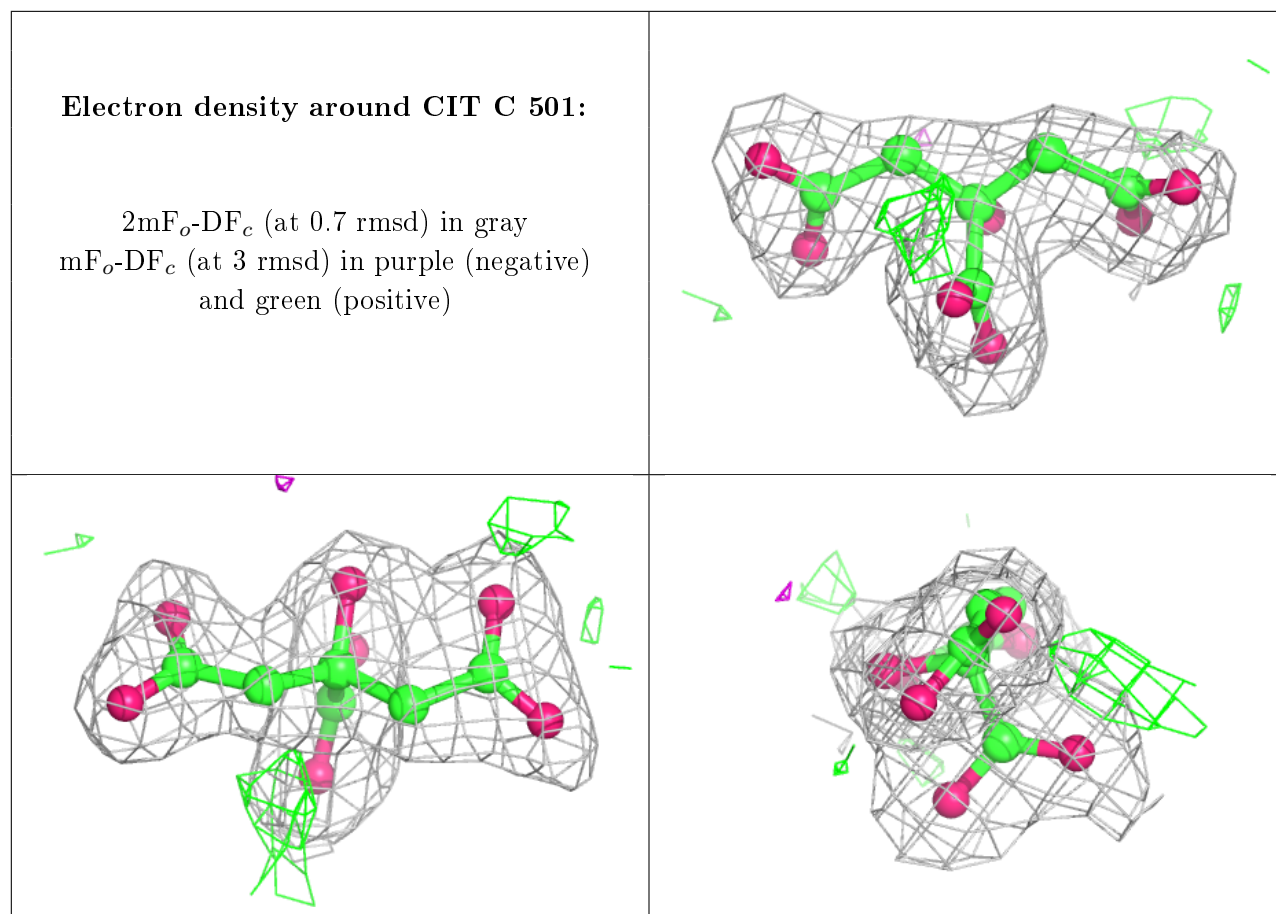
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

Electron density around CIT C 501:

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

6.5 Other polymers (i)

There are no such residues in this entry.