



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 9, 2026 – 11:49 AM UTC

PDB ID : 6WKQ / pdb_00006wkq
Title : 1.98 Angstrom Resolution Crystal Structure of NSP16-NSP10 Heterodimer from SARS-CoV-2 in Complex with Sinefungin
Authors : Minasov, G.; Shuvalova, L.; Rosas-Lemus, M.; Kiryukhina, O.; Satchell, K.J.F.; Center for Structural Genomics of Infectious Diseases (CSGID)
Deposited on : 2020-04-16
Resolution : 1.98 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

MolProbity	:	4-5-2 with Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

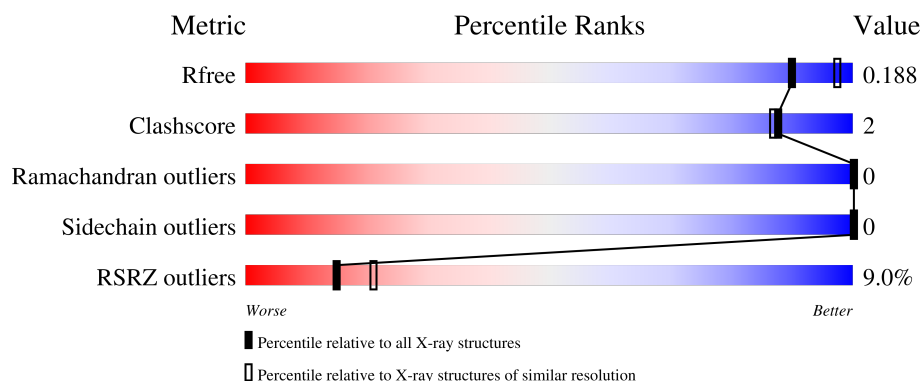
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.98 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	180053	1506 (1.98-1.98)
Clashscore	190562	1534 (1.98-1.98)
Ramachandran outliers	187476	1518 (1.98-1.98)
Sidechain outliers	187428	1518 (1.98-1.98)
RSRZ outliers	180081	1506 (1.98-1.98)

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	301	9% 92% 7%
1	C	301	7% 94% •
2	B	142	11% 82% • 14%
2	D	142	8% 79% • 18%

2 Entry composition

There are 7 unique types of molecules in this entry. The entry contains 7361 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 2'-O-methyltransferase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	297	Total	C	N	O	S	0	13	0
			2430	1550	405	458	17			
1	C	294	Total	C	N	O	S	0	8	0
			2365	1510	396	442	17			

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	6796	SER	-	expression tag	UNP P0DTD1
A	6797	ASN	-	expression tag	UNP P0DTD1
A	6798	ALA	-	expression tag	UNP P0DTD1
C	6796	SER	-	expression tag	UNP P0DTD1
C	6797	ASN	-	expression tag	UNP P0DTD1
C	6798	ALA	-	expression tag	UNP P0DTD1

- Molecule 2 is a protein called Non-structural protein 10.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	122	Total	C	N	O	S	0	1	0
			917	570	155	175	17			
2	D	116	Total	C	N	O	S	0	1	0
			864	539	145	165	15			

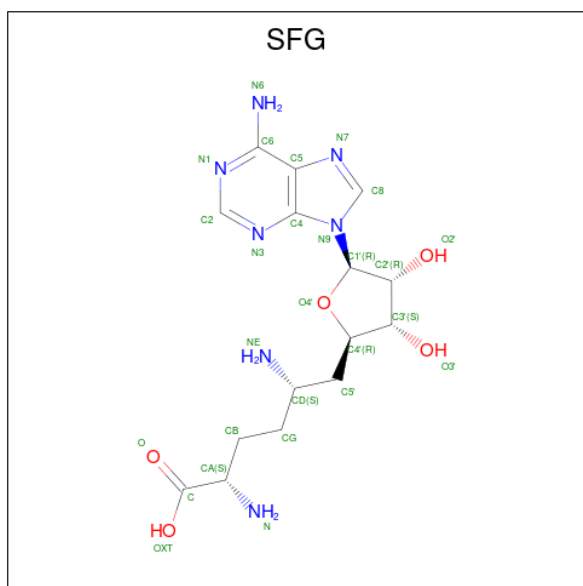
There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	4251	SER	-	expression tag	UNP P0DTD1
B	4252	ASN	-	expression tag	UNP P0DTD1
B	4253	ALA	-	expression tag	UNP P0DTD1
D	4251	SER	-	expression tag	UNP P0DTD1
D	4252	ASN	-	expression tag	UNP P0DTD1
D	4253	ALA	-	expression tag	UNP P0DTD1

- Molecule 3 is SODIUM ION (CCD ID: NA) (formula: Na).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	2	Total	Na	0	0
			2	2		
3	C	2	Total	Na	0	0
			2	2		

- Molecule 4 is SINEFUNGIN (CCD ID: SFG) (formula: C₁₅H₂₃N₇O₅) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	A	1	Total	C	N	O	0	0
			27	15	7	5		
4	C	1	Total	C	N	O	0	0
			27	15	7	5		

- Molecule 5 is FORMIC ACID (CCD ID: FMT) (formula: CH₂O₂).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	A	1	Total	C	O	0	0
			3	1	2		
5	A	1	Total	C	O	0	0
			3	1	2		
5	A	1	Total	C	O	0	0
			3	1	2		
5	A	1	Total	C	O	0	0
			3	1	2		
5	A	1	Total	C	O	0	0
			3	1	2		
5	C	1	Total	C	O	0	0
			3	1	2		
5	C	1	Total	C	O	0	0
			3	1	2		
5	C	1	Total	C	O	0	0
			3	1	2		
5	C	1	Total	C	O	0	0
			3	1	2		
5	C	1	Total	C	O	0	0
			3	1	2		
5	C	1	Total	C	O	0	0
			3	1	2		

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	C	1	Total	C	O	0	0
			3	1	2		

- Molecule 6 is ZINC ION (CCD ID: ZN) (formula: Zn) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	B	2	Total	Zn	0	0
			2	2		
6	D	2	Total	Zn	0	0
			2	2		

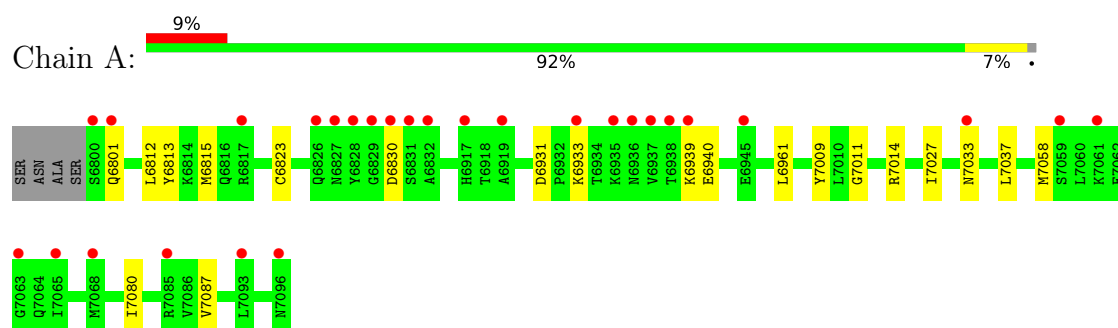
- Molecule 7 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	237	Total	O	0	24
			257	257		
7	B	81	Total	O	0	6
			87	87		
7	C	249	Total	O	0	16
			263	263		
7	D	69	Total	O	0	2
			71	71		

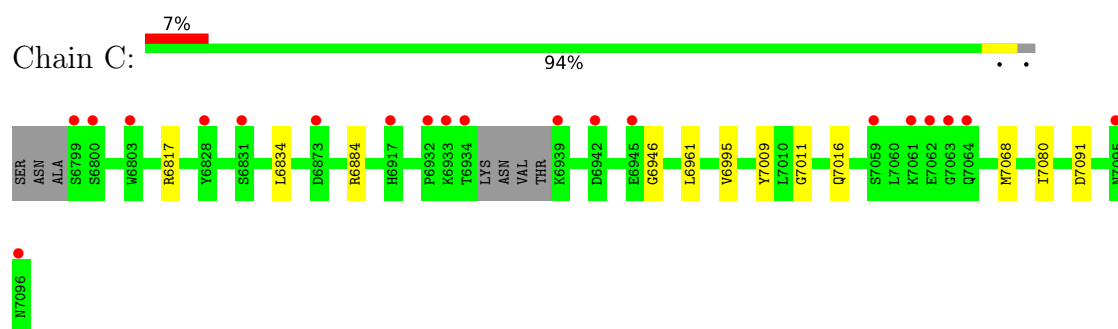
3 Residue-property plots [i](#)

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.

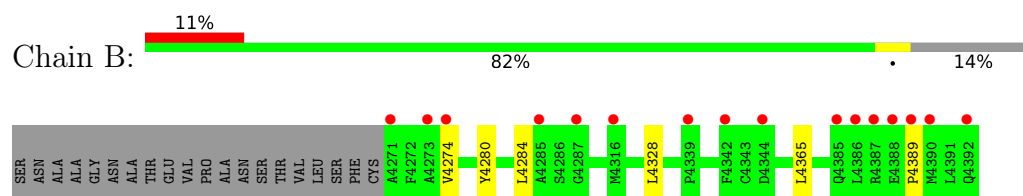
• Molecule 1: 2'-O-methyltransferase



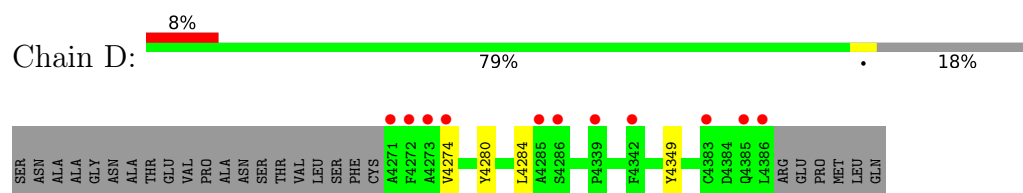
• Molecule 1: 2'-O-methyltransferase



• Molecule 2: Non-structural protein 10



• Molecule 2: Non-structural protein 10



4 Data and refinement statistics

Property	Value	Source
Space group	P 32 2 1	Depositor
Cell constants a, b, c, α , β , γ	166.25Å 166.25Å 98.14Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	29.92 – 1.98 29.92 – 1.98	Depositor EDS
% Data completeness (in resolution range)	100.0 (29.92-1.98) 100.0 (29.92-1.98)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	0.07	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.37 (at 1.98Å)	Xtriage
Refinement program	REFMAC 5.8.0258	Depositor
R, R_{free}	0.162 , 0.180 0.169 , 0.188	Depositor DCC
R_{free} test set	5357 reflections (4.94%)	wwPDB-VP
Wilson B-factor (Å ²)	31.7	Xtriage
Anisotropy	0.125	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.39 , 51.8	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	0.023 for -h,-k,l	Xtriage
F_o, F_c correlation	0.97	EDS
Total number of atoms	7361	wwPDB-VP
Average B, all atoms (Å ²)	41.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.11% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

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

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: SFG, NA, FMT, ZN

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	0.96	0/2482	1.17	2/3368 (0.1%)
1	C	0.96	0/2415	1.15	0/3274
2	B	1.01	0/937	1.22	1/1268 (0.1%)
2	D	1.02	0/883	1.22	0/1198
All	All	0.98	0/6717	1.18	3/9108 (0.0%)

There are no bond length outliers.

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	4389	PRO	N-CA-C	-5.72	102.22	111.19
1	A	7014	ARG	N-CA-C	-5.54	106.36	113.23
1	A	6801	GLN	N-CA-C	-5.13	106.99	113.20

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	2430	0	2406	14	0
1	C	2365	0	2348	9	0
2	B	917	0	878	3	0
2	D	864	0	826	3	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	A	2	0	0	0	0
3	C	2	0	0	0	0
4	A	27	0	22	0	0
4	C	27	0	22	0	0
5	A	18	0	6	0	0
5	C	27	0	9	1	0
6	B	2	0	0	0	0
6	D	2	0	0	0	0
7	A	257	0	0	1	0
7	B	87	0	0	0	0
7	C	263	0	0	1	0
7	D	71	0	0	0	0
All	All	7361	0	6517	26	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 (26) 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:C:7016[B]:GLN:OE1	7:C:7299[B]:HOH:O	2.14	0.66
1:C:6884:ARG:HB3	2:D:4349:TYR:OH	2.06	0.55
1:C:6834:LEU:HD21	1:C:6995[B]:VAL:CG2	2.36	0.54
1:A:6812[B]:LEU:HD12	1:A:6815:MET:HE3	1.89	0.54
1:C:6961:LEU:HB2	1:C:7080:ILE:HB	1.92	0.50
2:B:4280:TYR:CE2	2:B:4284:LEU:HD11	2.49	0.48
1:C:6946:GLY:N	5:C:7105:FMT:O2	2.42	0.47
2:D:4280:TYR:CE2	2:D:4284:LEU:HD11	2.51	0.46
1:A:6823:CYS:HB2	1:A:7027[A]:ILE:HD12	1.97	0.46
1:A:7009:TYR:CZ	1:A:7011:GLY:HA2	2.50	0.46
1:A:6830:ASP:CB	1:A:7037:LEU:HD12	2.45	0.46
1:A:6830:ASP:HB3	1:A:7037:LEU:HD12	1.98	0.45
2:B:4328:LEU:HD22	2:B:4365:LEU:HD11	1.99	0.45
1:A:6812[A]:LEU:HD23	1:A:6815:MET:CE	2.47	0.44
1:C:7009:TYR:CZ	1:C:7011:GLY:HA2	2.52	0.44
2:B:4274:VAL:CG1	2:D:4274:VAL:HG11	2.48	0.44
1:A:7033:ASN:HB3	7:A:7387:HOH:O	2.19	0.43
1:A:6812[B]:LEU:HA	1:A:6815:MET:CE	2.50	0.42
1:A:6939:LYS:O	1:A:6940:GLU:C	2.62	0.41
1:A:7087:VAL:HG13	1:C:7091:ASP:HB3	2.00	0.41
1:A:6813:TYR:OH	1:A:7033:ASN:OD1	2.35	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:7068:MET:SD	1:C:7068:MET:C	3.03	0.41
1:A:6961:LEU:HB2	1:A:7080:ILE:HB	2.02	0.41
1:A:6931:ASP:CG	1:A:6933:LYS:HG2	2.46	0.40
1:C:6817:ARG:HG2	1:C:6817:ARG:O	2.21	0.40
1:A:7058:MET:O	1:A:7080:ILE:HA	2.21	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	308/301 (102%)	299 (97%)	9 (3%)	0	100	100
1	C	298/301 (99%)	289 (97%)	9 (3%)	0	100	100
2	B	121/142 (85%)	116 (96%)	5 (4%)	0	100	100
2	D	115/142 (81%)	112 (97%)	3 (3%)	0	100	100
All	All	842/886 (95%)	816 (97%)	26 (3%)	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	269/260 (104%)	269 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	C	261/260 (100%)	261 (100%)	0	100	100
2	B	101/115 (88%)	101 (100%)	0	100	100
2	D	95/115 (83%)	95 (100%)	0	100	100
All	All	726/750 (97%)	726 (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. All (6) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	6804	GLN
1	A	6885	GLN
1	A	6956	GLN
2	B	4367	ASN
1	C	6816	GLN
2	D	4367	ASN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

There are no non-standard protein/DNA/RNA residues in this entry.

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 25 ligands modelled in this entry, 8 are monoatomic - leaving 17 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	$\# Z > 2$
5	FMT	A	7104	-	2,2,2	0.20	0	1,1,1	0.16	0
4	SFG	A	7103	-	28,29,29	1.34	5 (17%)	34,42,42	2.09	10 (29%)
5	FMT	C	7107	-	2,2,2	0.21	0	1,1,1	0.18	0
5	FMT	C	7112	-	2,2,2	0.24	0	1,1,1	0.16	0
5	FMT	C	7109	-	2,2,2	0.20	0	1,1,1	0.17	0
5	FMT	A	7108	-	2,2,2	0.23	0	1,1,1	0.16	0
5	FMT	A	7109	-	2,2,2	0.27	0	1,1,1	0.17	0
5	FMT	C	7105	-	2,2,2	0.29	0	1,1,1	0.12	0
5	FMT	C	7106	-	2,2,2	0.22	0	1,1,1	0.19	0
5	FMT	C	7104	-	2,2,2	0.22	0	1,1,1	0.19	0
5	FMT	C	7108	-	2,2,2	0.22	0	1,1,1	0.16	0
5	FMT	A	7106	-	2,2,2	0.24	0	1,1,1	0.16	0
5	FMT	C	7110	-	2,2,2	0.28	0	1,1,1	0.15	0
4	SFG	C	7103	-	28,29,29	1.35	4 (14%)	34,42,42	2.08	11 (32%)
5	FMT	A	7105	-	2,2,2	0.26	0	1,1,1	0.19	0
5	FMT	C	7111	-	2,2,2	0.26	0	1,1,1	0.15	0
5	FMT	A	7107	-	2,2,2	0.25	0	1,1,1	0.15	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	SFG	A	7103	-	-	4/17/33/33	0/3/3/3
4	SFG	C	7103	-	-	2/17/33/33	0/3/3/3

All (9) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	C	7103	SFG	C5-C4	4.55	1.47	1.39
4	A	7103	SFG	C5-C4	4.09	1.46	1.39
4	A	7103	SFG	C5-N7	-2.63	1.34	1.39
4	C	7103	SFG	C5-C6	2.57	1.48	1.41
4	A	7103	SFG	C5-C6	2.50	1.48	1.41
4	C	7103	SFG	C8-N7	2.41	1.36	1.31
4	C	7103	SFG	C5-N7	-2.19	1.35	1.39
4	A	7103	SFG	C4-N9	-2.18	1.33	1.37
4	A	7103	SFG	C8-N7	2.06	1.35	1.31

All (21) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	C	7103	SFG	C5-C4-N3	-5.62	118.98	126.72
4	A	7103	SFG	C5-C4-N3	-5.57	119.04	126.72
4	A	7103	SFG	N3-C4-N9	4.63	135.04	127.17
4	C	7103	SFG	N3-C4-N9	4.47	134.77	127.17
4	A	7103	SFG	N3-C2-N1	-3.87	122.73	128.58
4	C	7103	SFG	N3-C2-N1	-3.87	122.73	128.58
4	C	7103	SFG	C2-N3-C4	3.84	121.22	111.83
4	A	7103	SFG	C2-N3-C4	3.74	120.96	111.83
4	C	7103	SFG	C4-C5-N7	-3.47	106.62	110.58
4	A	7103	SFG	C4-N9-C8	3.33	109.23	105.74
4	C	7103	SFG	O4'-C1'-N9	3.27	114.36	108.09
4	A	7103	SFG	C4-C5-N7	-3.24	106.88	110.58
4	C	7103	SFG	C4-N9-C8	2.94	108.82	105.74
4	A	7103	SFG	C5-N7-C8	2.80	107.86	103.45
4	C	7103	SFG	C5-N7-C8	2.75	107.78	103.45
4	A	7103	SFG	O4'-C1'-N9	2.69	113.25	108.09
4	A	7103	SFG	N9-C8-N7	-2.69	110.12	113.94
4	C	7103	SFG	N9-C8-N7	-2.40	110.53	113.94
4	C	7103	SFG	C6-C5-N7	2.23	136.38	132.09
4	A	7103	SFG	C2-N1-C6	2.08	122.14	118.73
4	C	7103	SFG	C2-N1-C6	2.02	122.05	118.73

There are no chirality outliers.

All (6) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	C	7103	SFG	OXT-C-CA-CB
4	C	7103	SFG	O-C-CA-CB
4	A	7103	SFG	OXT-C-CA-CB
4	A	7103	SFG	O-C-CA-CB
4	A	7103	SFG	O-C-CA-N
4	A	7103	SFG	OXT-C-CA-N

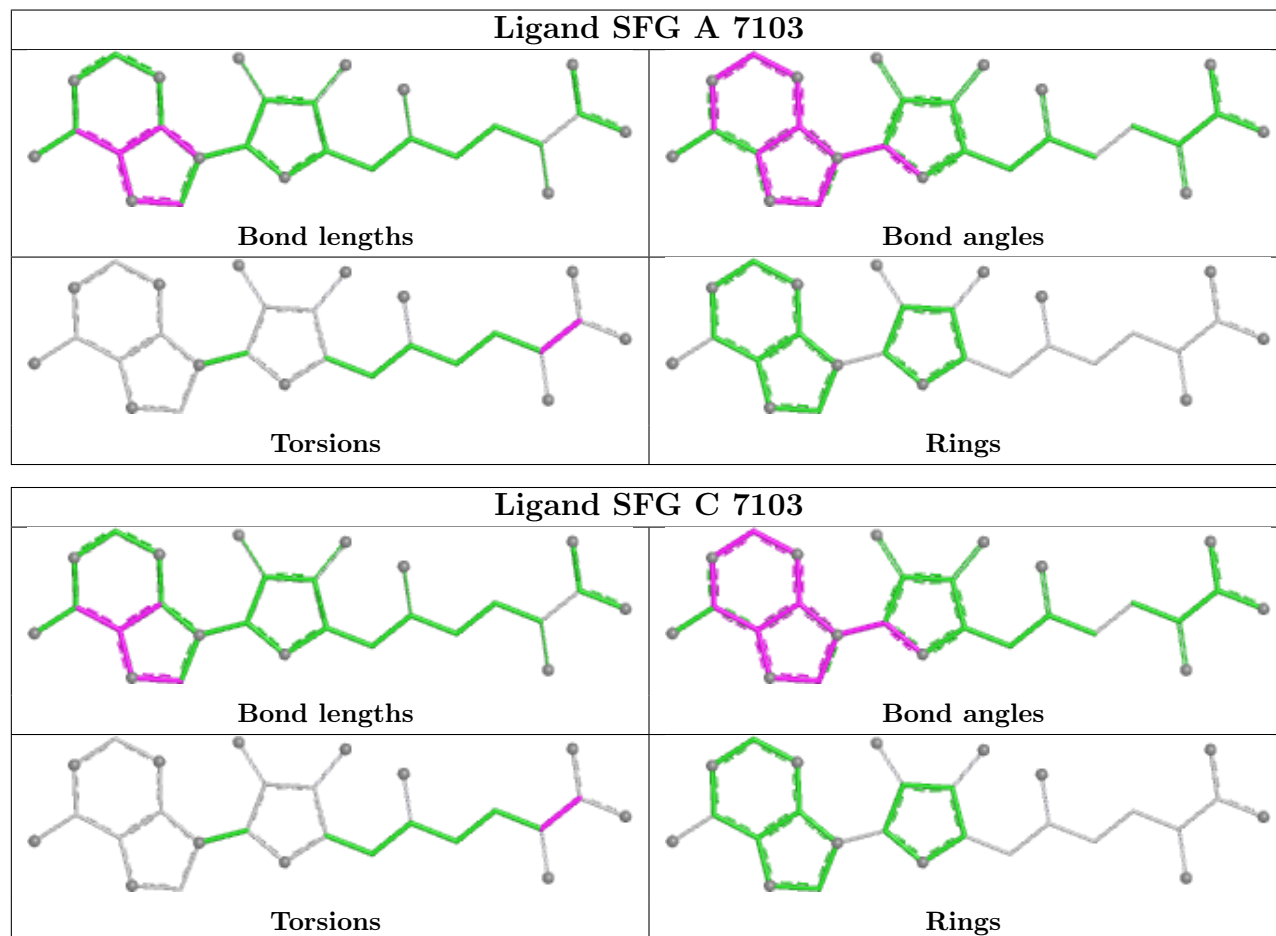
There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	C	7105	FMT	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 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	297/301 (98%)	0.29	28 (9%) 14 19	13, 33, 72, 113	13 (4%)
1	C	294/301 (97%)	0.14	20 (6%) 23 31	13, 31, 64, 101	8 (2%)
2	B	122/142 (85%)	0.67	16 (13%) 7 10	23, 47, 79, 112	1 (0%)
2	D	116/142 (81%)	0.68	11 (9%) 14 19	26, 45, 82, 127	1 (0%)
All	All	829/886 (93%)	0.35	75 (9%) 15 21	13, 35, 76, 127	23 (2%)

All (75) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	D	4386	LEU	9.5
1	A	6937	VAL	6.7
1	C	6803	TRP	6.4
1	A	6938	THR	6.3
2	B	4386	LEU	5.7
1	A	6828	TYR	5.5
2	D	4271	ALA	4.9
1	C	6799	SER	4.9
1	A	6829	GLY	4.6
1	C	6934	THR	4.5
1	A	6935	LYS	4.5
1	A	6831	SER	4.5
1	C	6932	PRO	4.3
1	C	6800	SER	4.3
2	B	4271	ALA	4.2
2	B	4387	ARG	4.1
1	A	6919	ALA	4.0
1	C	6828	TYR	3.9
2	B	4316[A]	MET	3.8
1	C	6939	LYS	3.8
1	A	6830	ASP	3.8

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Mol	Chain	Res	Type	RSRZ
1	A	7096	ASN	3.7
2	D	4273	ALA	3.7
1	A	6800	SER	3.6
2	B	4342	PHE	3.6
2	D	4339	PRO	3.3
1	A	6936	ASN	3.3
2	D	4342	PHE	3.3
1	A	6939	LYS	3.2
1	C	7061	LYS	3.1
1	A	7065	ILE	3.0
1	A	7068	MET	2.9
2	B	4274	VAL	2.9
1	C	7096	ASN	2.9
1	C	6933	LYS	2.9
1	C	7063	GLY	2.7
2	B	4392	GLN	2.7
1	C	7059	SER	2.6
1	A	7033	ASN	2.6
1	A	7061	LYS	2.6
1	A	7085	ARG	2.6
2	D	4274	VAL	2.6
1	A	6945	GLU	2.6
2	B	4285	ALA	2.6
1	A	6933	LYS	2.5
1	C	6917	HIS	2.5
1	C	7062	GLU	2.5
2	B	4389	PRO	2.5
1	A	6827	ASN	2.5
1	A	6826	GLN	2.5
2	D	4385	GLN	2.5
1	A	7063	GLY	2.4
2	B	4339	PRO	2.4
2	D	4285	ALA	2.4
1	C	7064	GLN	2.4
1	A	6917	HIS	2.4
2	D	4286	SER	2.4
2	B	4273	ALA	2.3
1	C	6942	ASP	2.3
2	B	4385	GLN	2.3
2	D	4272	PHE	2.3
2	B	4344	ASP	2.3
2	B	4388	GLU	2.3

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Mol	Chain	Res	Type	RSRZ
1	C	7095	ASN	2.3
1	A	6801	GLN	2.2
1	A	6817	ARG	2.2
2	B	4287	GLY	2.2
1	A	7093	LEU	2.2
1	A	7059	SER	2.1
1	C	6831[A]	SER	2.1
1	A	6832	ALA	2.1
1	C	6945	GLU	2.0
2	B	4390	MET	2.0
2	D	4383	CYS	2.0
1	C	6873	ASP	2.0

6.2 Non-standard residues in protein, DNA, RNA chains [i](#)

There are no non-standard protein/DNA/RNA residues in this entry.

6.3 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

6.4 Ligands [i](#)

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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
3	NA	A	7102	1/1	0.79	0.21	53,53,53,53	1
3	NA	C	7102	1/1	0.83	0.18	55,55,55,55	1
5	FMT	C	7107	3/3	0.86	0.15	50,50,52,53	0
5	FMT	A	7104	3/3	0.87	0.13	48,48,52,54	0
5	FMT	C	7110	3/3	0.89	0.15	54,54,60,62	0
5	FMT	C	7112	3/3	0.90	0.15	57,57,63,64	0
3	NA	C	7101	1/1	0.91	0.17	43,43,43,43	0
5	FMT	C	7108	3/3	0.92	0.12	56,56,56,57	0
5	FMT	A	7106	3/3	0.93	0.11	53,53,55,56	0
5	FMT	A	7107	3/3	0.94	0.11	48,48,53,54	0
5	FMT	C	7105	3/3	0.94	0.19	41,41,44,46	0

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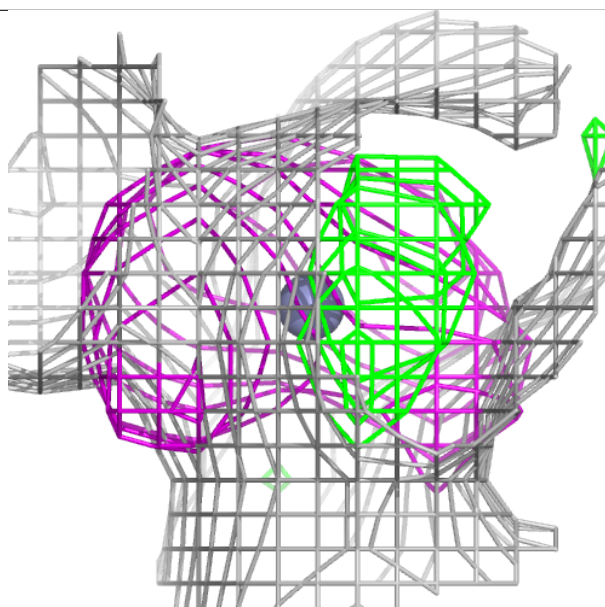
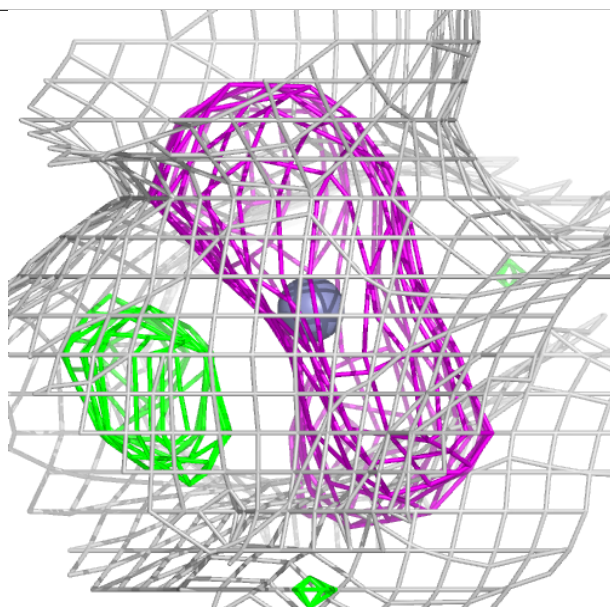
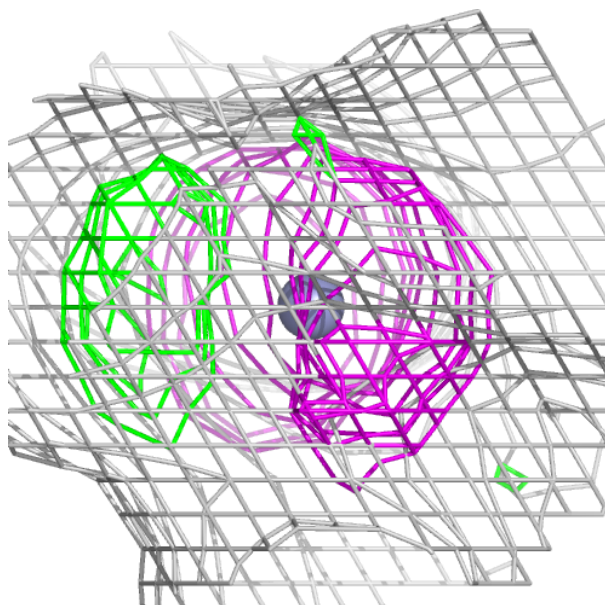
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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
5	FMT	C	7109	3/3	0.95	0.17	38,38,41,50	0
5	FMT	A	7108	3/3	0.95	0.17	52,52,53,53	0
5	FMT	C	7111	3/3	0.95	0.13	51,51,57,58	0
3	NA	A	7101	1/1	0.95	0.13	48,48,48,48	0
6	ZN	B	4402	1/1	0.95	0.08	49,49,49,49	0
5	FMT	A	7109	3/3	0.96	0.10	53,53,54,56	0
5	FMT	C	7104	3/3	0.96	0.07	33,33,33,34	0
5	FMT	C	7106	3/3	0.97	0.06	38,38,39,39	0
4	SFG	C	7103	27/27	0.97	0.05	24,27,29,30	0
4	SFG	A	7103	27/27	0.97	0.05	26,28,32,34	0
5	FMT	A	7105	3/3	0.97	0.09	30,30,31,32	0
6	ZN	D	4402	1/1	0.97	0.08	54,54,54,54	0
6	ZN	D	4401	1/1	0.98	0.04	36,36,36,36	0
6	ZN	B	4401	1/1	0.98	0.04	39,39,39,39	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.

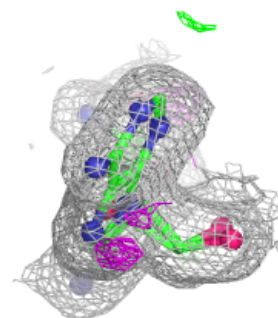
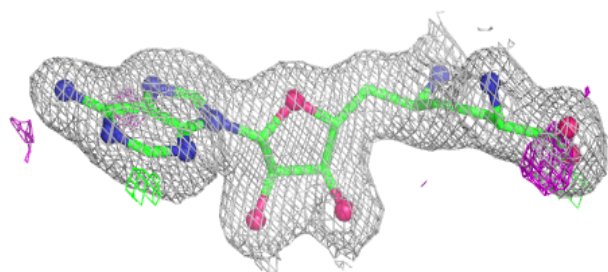
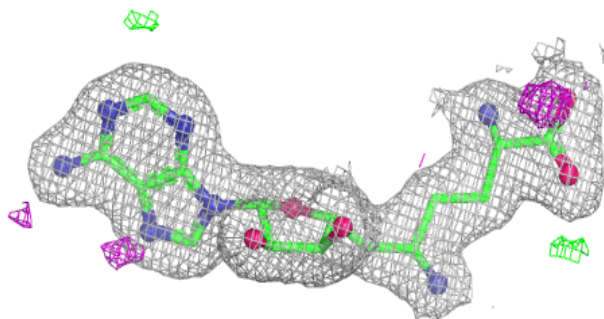
Electron density around ZN B 4402:

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

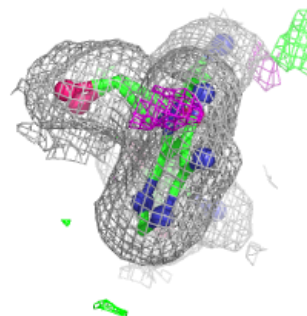
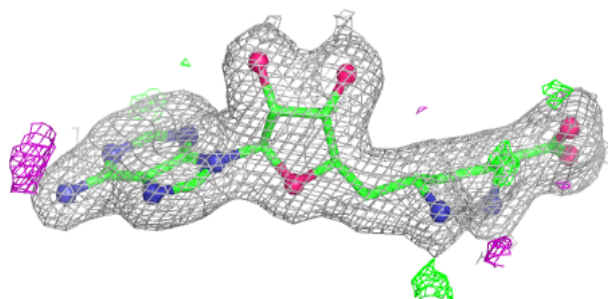
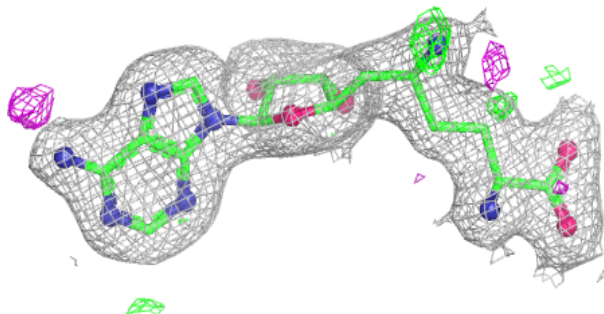


Electron density around SFG C 7103:

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 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

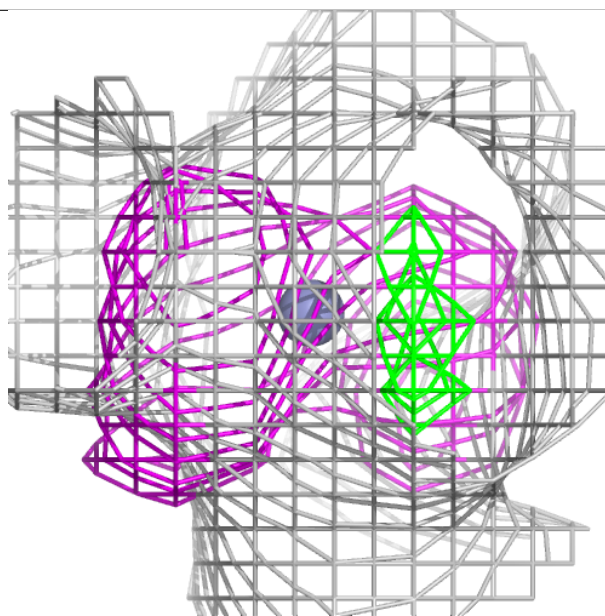
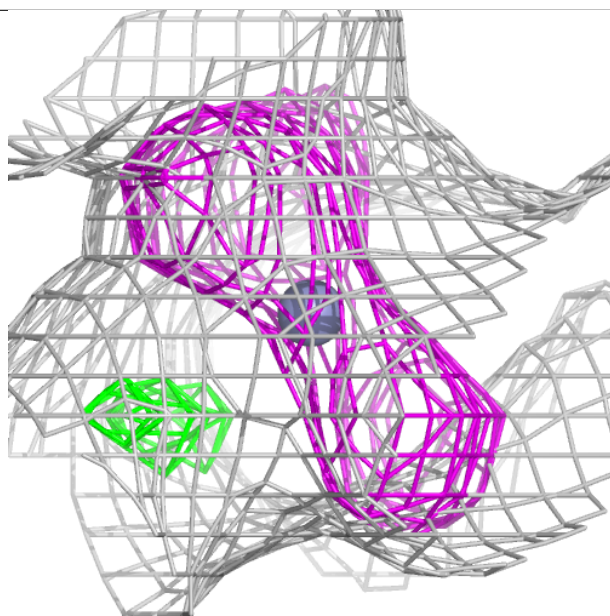
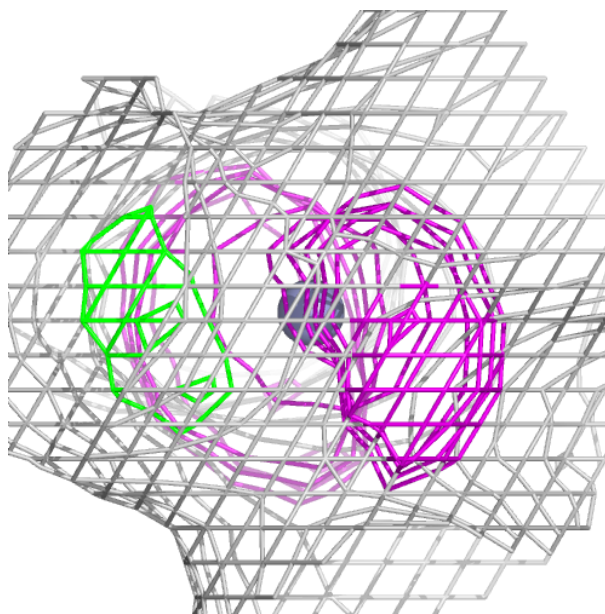
**Electron density around SFG A 7103:**

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



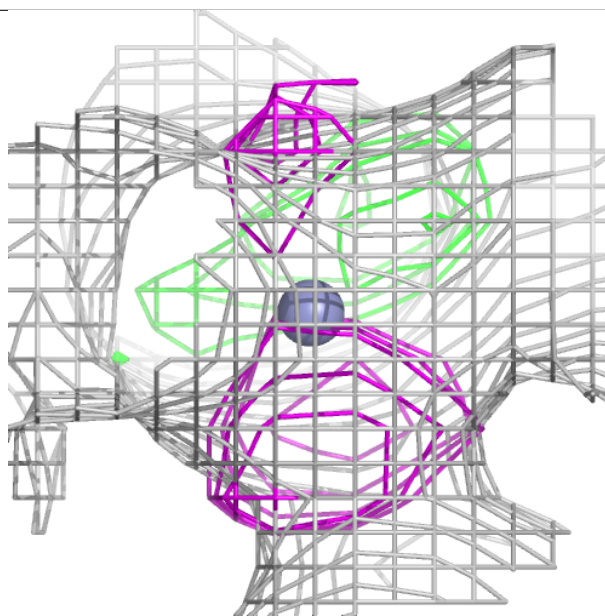
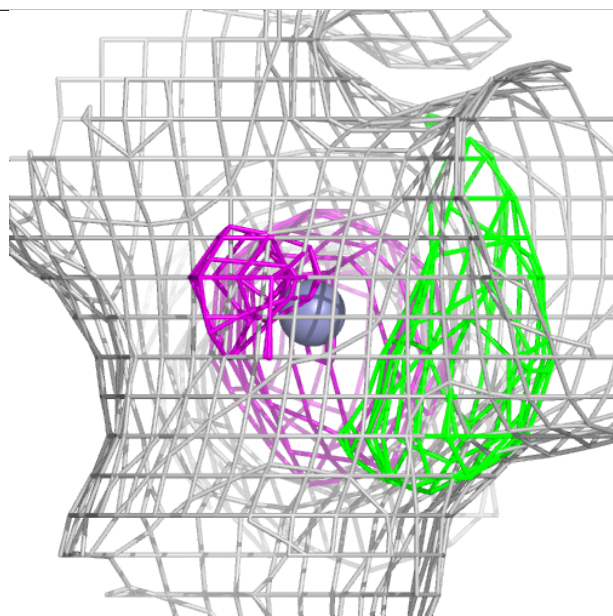
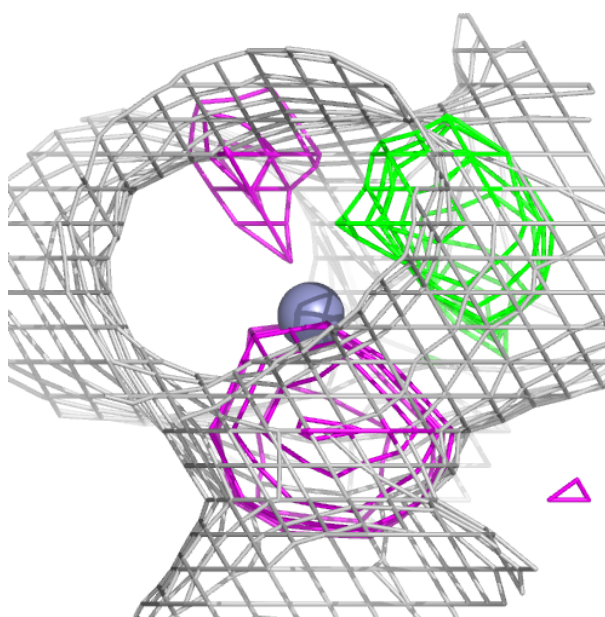
Electron density around ZN D 4402:

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 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



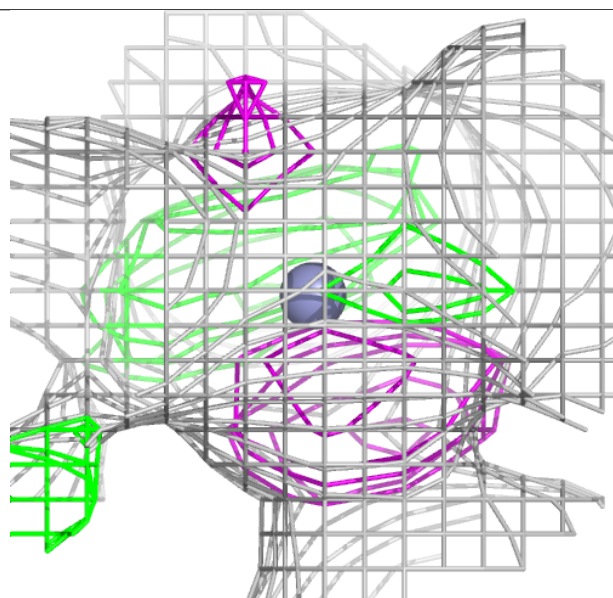
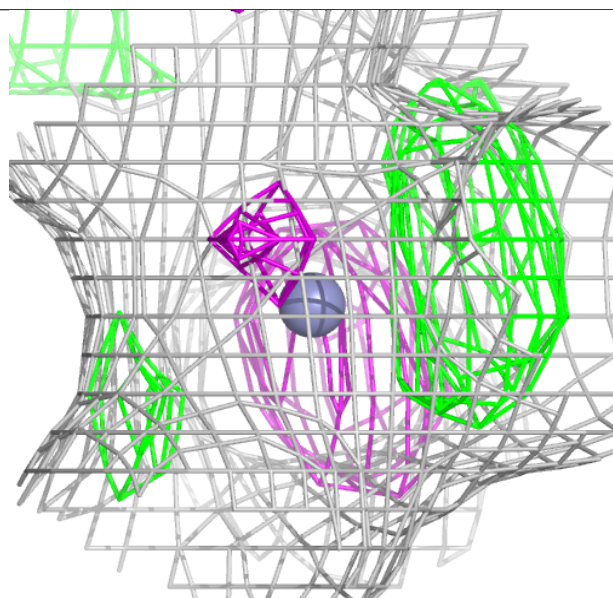
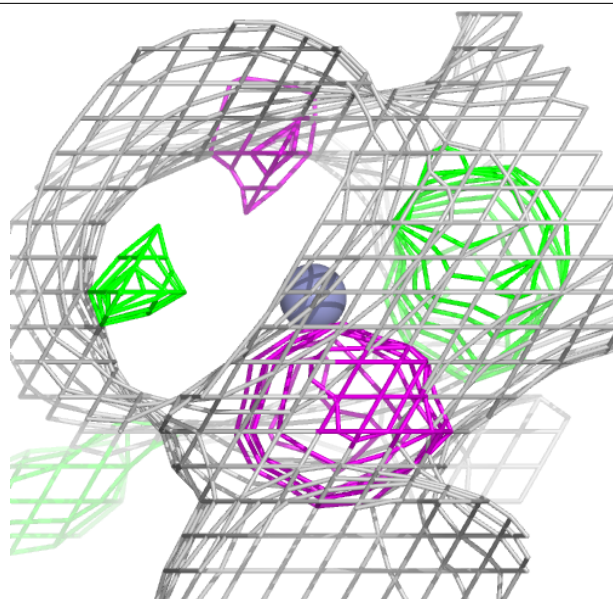
Electron density around ZN D 4401:

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



Electron density around ZN B 4401:

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



6.5 Other polymers ⓘ

There are no such residues in this entry.