



Full wwPDB X-ray Structure Validation Report ⓘ

Jul 16, 2026 – 03:27 AM JST

PDB ID : 9VLU / pdb_00009vlu
Title : Crystal structure of the functional unit (HtH1-h) of hemocyanin from *Haliotis discus hannai*
Authors : Zhao, G.H.; Yang, H.C.
Deposited on : 2025-06-26
Resolution : 2.00 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	:	1.8.5 (274361), CSD as541be (2020)
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	:	9.0.015 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.50

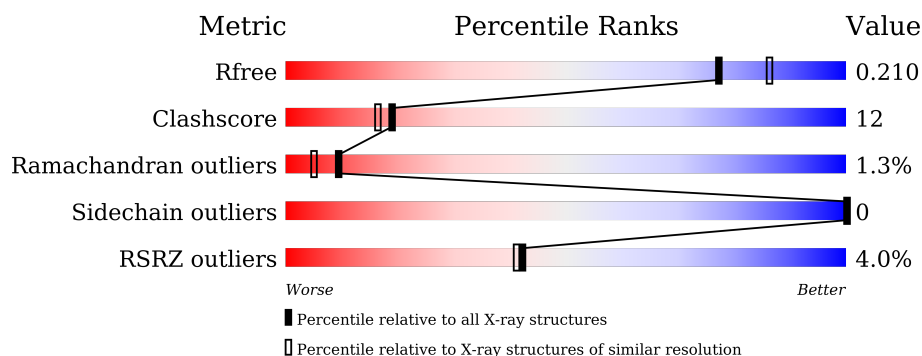
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.00 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	10052 (2.00-2.00)
Clashscore	190562	11152 (2.00-2.00)
Ramachandran outliers	187476	11031 (2.00-2.00)
Sidechain outliers	187428	11029 (2.00-2.00)
RSRZ outliers	180081	10067 (2.00-2.00)

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	489	4% 81% 17% ..
2	B	489	3% 84% 15% .
2	C	489	5% 78% 20% .

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

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
3	EOH	A	501	-	-	X	-
3	EOH	B	501	-	-	X	-

2 Entry composition

There are 8 unique types of molecules in this entry. The entry contains 13102 atoms, of which 20 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 Hemocyanin type 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	489	Total	C	N	O	S	0	0	0
			3978	2556	678	724	20			

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	102	ASN	ASP	conflict	UNP A0A7R6RYX0
A	?	-	THR	deletion	UNP A0A7R6RYX0
A	329	GLU	ASP	conflict	UNP A0A7R6RYX0
A	380	TYR	ALA	conflict	UNP A0A7R6RYX0

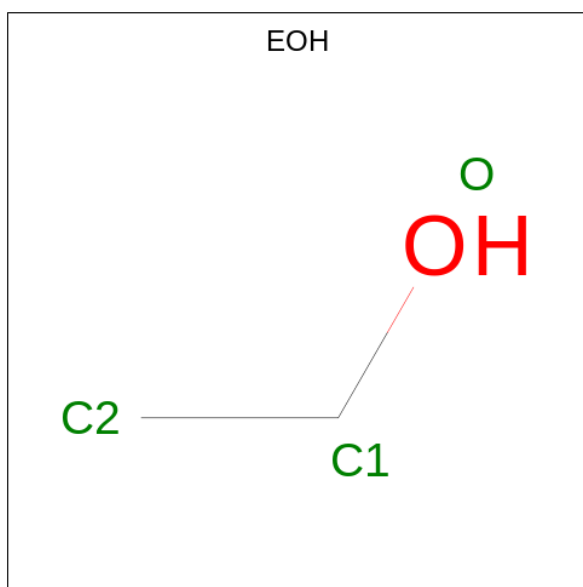
- Molecule 2 is a protein called Hemocyanin type 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	489	Total	C	N	O	S	0	0	0
			3977	2555	678	724	20			
2	C	489	Total	C	N	O	S	0	0	0
			3967	2548	678	721	20			

There are 6 discrepancies between the modelled and reference sequences:

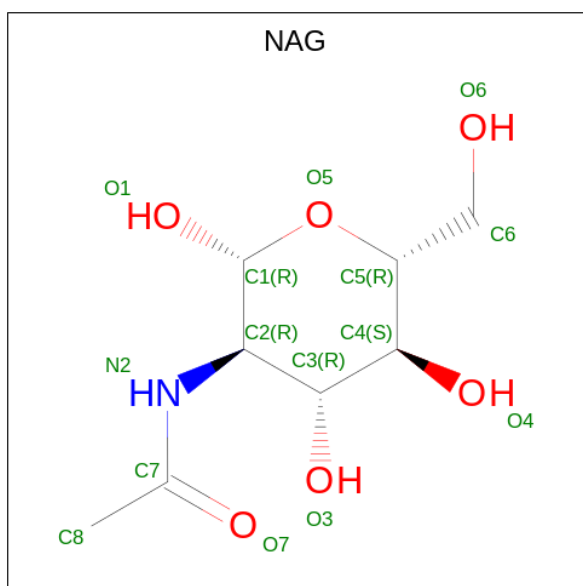
Chain	Residue	Modelled	Actual	Comment	Reference
B	102	ASN	ASP	conflict	UNP A0A7R6RYX0
B	?	-	THR	deletion	UNP A0A7R6RYX0
B	380	TYR	ALA	conflict	UNP A0A7R6RYX0
C	102	ASN	ASP	conflict	UNP A0A7R6RYX0
C	?	-	THR	deletion	UNP A0A7R6RYX0
C	380	TYR	ALA	conflict	UNP A0A7R6RYX0

- Molecule 3 is ETHANOL (CCD ID: EOH) (formula: C₂H₆O) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	1	Total	C	H	O	0	0
			9	2	6	1		
3	B	1	Total	C	H	O	0	0
			9	2	6	1		
3	C	1	Total	C	H	O	0	0
			9	2	6	1		

- Molecule 4 is 2-acetamido-2-deoxy-beta-D-glucopyranose (CCD ID: NAG) (formula: $C_8H_{15}NO_6$) (labeled as "Ligand of Interest" by depositor).

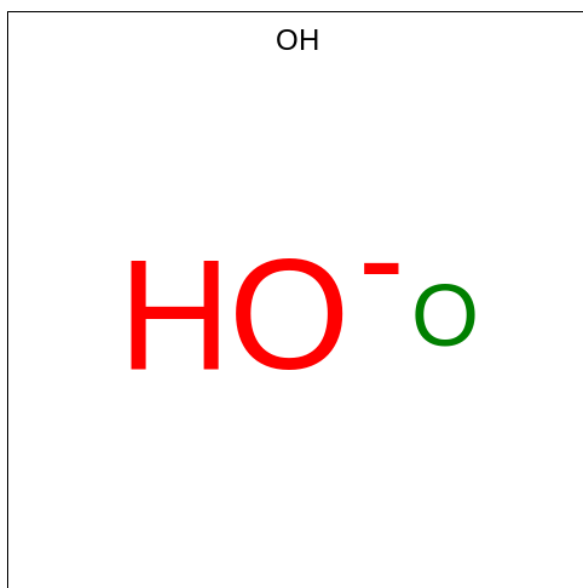


Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total C N O 14 8 1 5	0	0
4	B	1	Total C N O 14 8 1 5	0	0
4	C	1	Total C N O 14 8 1 5	0	0

- Molecule 5 is COPPER (II) ION (CCD ID: CU) (formula: Cu) (labeled as "Ligand of Interest" by depositor).

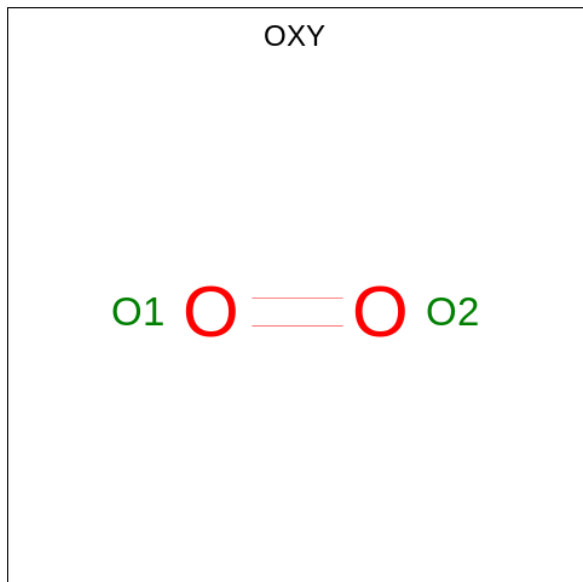
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	2	Total Cu 2 2	0	0
5	B	2	Total Cu 2 2	0	0
5	C	2	Total Cu 2 2	0	0

- Molecule 6 is HYDROXIDE ION (CCD ID: OH) (formula: HO) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	1	Total H O 2 1 1	0	0
6	C	1	Total H O 2 1 1	0	0

- Molecule 7 is OXYGEN MOLECULE (CCD ID: OXY) (formula: O₂) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	B	1	Total	O	0	0
			2	2		

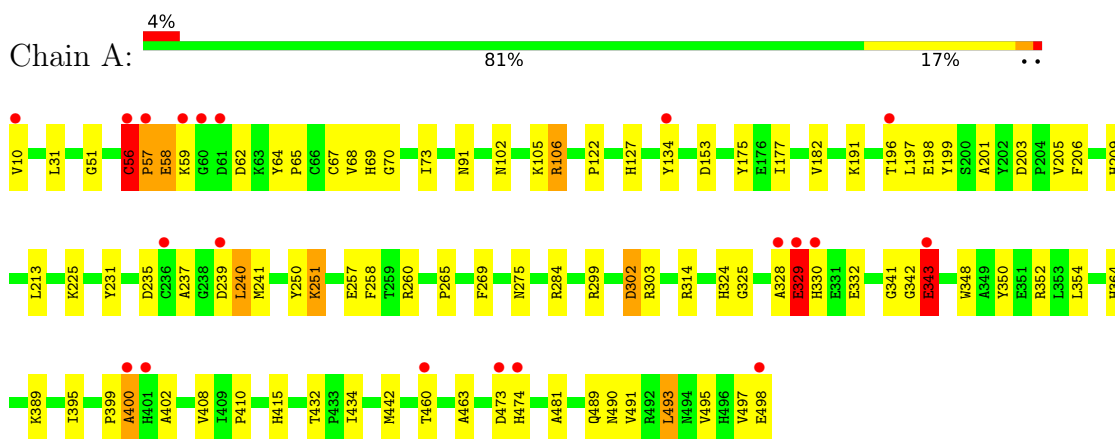
- Molecule 8 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
8	A	380	Total	O	0	0
			380	380		
8	B	407	Total	O	0	0
			407	407		
8	C	312	Total	O	0	0
			312	312		

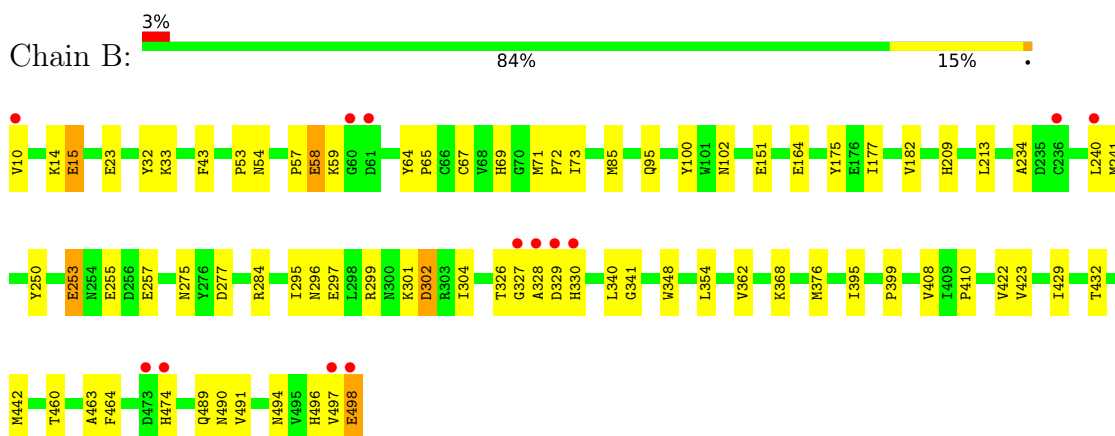
3 Residue-property plots

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density ($RSRZ > 2$). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

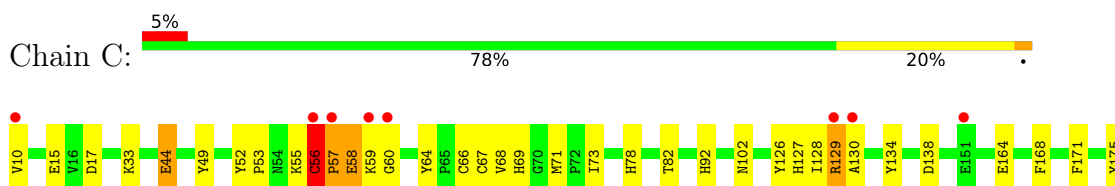
• Molecule 1: Hemocyanin type 1

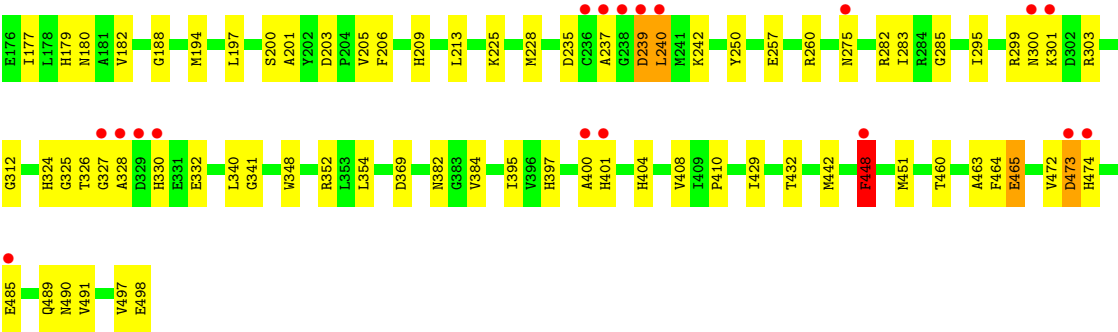


• Molecule 2: Hemocyanin type 1



• Molecule 2: Hemocyanin type 1





4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	168.57Å 117.67Å 97.59Å 90.00° 96.64° 90.00°	Depositor
Resolution (Å)	28.60 – 2.00 28.60 – 2.00	Depositor EDS
% Data completeness (in resolution range)	99.5 (28.60-2.00) 99.6 (28.60-2.00)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.65 (at 2.00Å)	Xtriage
Refinement program	PHENIX 1.21_5207	Depositor
R, R_{free}	0.168 , 0.209 0.168 , 0.210	Depositor DCC
R_{free} test set	6354 reflections (4.98%)	wwPDB-VP
Wilson B-factor (Å ²)	26.2	Xtriage
Anisotropy	0.496	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.37 , 41.9	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	13102	wwPDB-VP
Average B, all atoms (Å ²)	29.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.06% 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: CU, EOH, OH, NAG, OXY

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	0.42	0/4094	0.90	15/5554 (0.3%)
2	B	0.44	0/4093	0.88	13/5553 (0.2%)
2	C	0.39	0/4082	0.67	5/5538 (0.1%)
All	All	0.42	0/12269	0.82	33/16645 (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	3
2	B	0	2
2	C	0	4
All	All	0	9

There are no bond length outliers.

All (33) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	253	GLU	OE1-CD-OE2	-19.27	76.65	122.90
2	B	297	GLU	OE1-CD-OE2	-18.57	78.33	122.90
1	A	329	GLU	CG-CD-OE1	18.21	160.28	118.40
2	B	253	GLU	CG-CD-OE1	17.98	159.76	118.40
1	A	343	GLU	CG-CD-OE1	17.39	158.40	118.40
2	B	297	GLU	CG-CD-OE2	-17.26	78.70	118.40
2	B	297	GLU	CG-CD-OE1	16.77	156.96	118.40
1	A	329	GLU	OE1-CD-OE2	-16.40	83.55	122.90
1	A	343	GLU	CG-CD-OE2	-16.14	81.27	118.40
2	B	253	GLU	CG-CD-OE2	-15.34	83.11	118.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	329	GLU	CG-CD-OE2	-14.74	84.49	118.40
1	A	343	GLU	OE1-CD-OE2	-14.69	87.65	122.90
1	A	493	LEU	CB-CG-CD2	-9.94	80.87	110.70
2	B	15	GLU	CB-CG-CD	7.98	126.16	112.60
2	C	448	PHE	CB-CG-CD2	-7.36	108.18	120.70
1	A	493	LEU	CB-CG-CD1	7.24	132.42	110.70
1	A	493	LEU	CD1-CG-CD2	-7.20	94.97	110.80
2	C	465	GLU	CA-CB-CG	7.11	128.31	114.10
2	C	448	PHE	N-CA-C	6.79	125.26	110.80
2	B	498	GLU	CB-CG-CD	-6.78	101.08	112.60
1	A	106	ARG	CD-NE-CZ	6.76	133.86	124.40
1	A	343	GLU	CA-CB-CG	-6.46	101.18	114.10
1	A	302	ASP	CB-CG-OD2	-5.79	105.08	118.40
2	B	15	GLU	CG-CD-OE2	-5.36	106.07	118.40
2	B	15	GLU	CG-CD-OE1	5.29	130.57	118.40
1	A	251	LYS	CB-CG-CD	-5.24	99.25	111.30
2	C	55	LYS	CA-C-N	-5.15	109.23	121.80
2	C	55	LYS	C-N-CA	-5.15	109.23	121.80
2	B	330	HIS	CA-C-N	5.12	130.29	122.65
2	B	330	HIS	C-N-CA	5.12	130.29	122.65
1	A	342	GLY	CA-C-N	-5.11	112.19	120.72
1	A	342	GLY	C-N-CA	-5.11	112.19	120.72
2	B	498	GLU	CA-CB-CG	5.03	124.15	114.10

There are no chirality outliers.

All (9) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	329	GLU	Sidechain
1	A	343	GLU	Sidechain
1	A	56	CYS	Peptide
2	B	302	ASP	Sidechain
2	B	497	VAL	Peptide
2	C	239	ASP	Peptide
2	C	448	PHE	Sidechain
2	C	465	GLU	Sidechain
2	C	56	CYS	Peptide

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	3978	0	3820	104	0
2	B	3977	0	3818	72	0
2	C	3967	0	3809	94	0
3	A	3	6	6	10	0
3	B	3	6	6	6	0
3	C	3	6	6	0	0
4	A	14	0	13	0	0
4	B	14	0	13	0	0
4	C	14	0	13	0	0
5	A	2	0	0	0	0
5	B	2	0	0	0	0
5	C	2	0	0	0	0
6	A	1	1	0	0	0
6	C	1	1	0	0	0
7	B	2	0	0	0	0
8	A	380	0	0	28	2
8	B	407	0	0	21	2
8	C	312	0	0	17	0
All	All	13082	20	11504	276	3

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 12.

All (276) 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)
2:B:67:CYS:SG	2:B:69:HIS:HE1	1.43	1.40
1:A:67:CYS:SG	1:A:69:HIS:HE1	1.55	1.30
2:C:67:CYS:SG	2:C:69:HIS:HE1	1.53	1.29
2:B:302:ASP:OD1	2:B:399:PRO:HA	1.37	1.23
2:B:67:CYS:SG	2:B:69:HIS:CE1	2.35	1.18
1:A:67:CYS:SG	1:A:69:HIS:CE1	2.43	1.12
2:B:33:LYS:NZ	8:B:602:HOH:O	1.87	1.08
2:C:67:CYS:SG	2:C:69:HIS:CE1	2.46	1.08
1:A:329:GLU:HG2	1:A:330:HIS:H	1.21	1.05

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:497:VAL:HG12	1:A:498:GLU:H	1.21	1.03
2:B:10:VAL:HG22	2:B:275:ASN:HD21	1.24	0.98
2:B:301:LYS:NZ	8:B:603:HOH:O	1.95	0.98
1:A:314:ARG:NH1	8:A:602:HOH:O	1.95	0.98
2:C:239:ASP:OD1	2:C:242:LYS:NZ	2.02	0.92
2:C:448:PHE:HD1	8:C:836:HOH:O	1.53	0.91
2:C:485:GLU:OE1	8:C:601:HOH:O	1.90	0.89
2:C:326:THR:O	2:C:328:ALA:N	2.05	0.89
2:C:197:LEU:HD11	2:C:340:LEU:HB3	1.52	0.89
1:A:56:CYS:O	1:A:58:GLU:N	2.08	0.86
2:B:423:VAL:O	2:B:498:GLU:HB2	1.75	0.86
2:B:422:VAL:CG1	2:B:498:GLU:HG2	2.09	0.83
2:B:10:VAL:HG22	2:B:275:ASN:ND2	1.93	0.83
2:C:332:GLU:OE1	8:C:603:HOH:O	1.96	0.83
1:A:198:GLU:OE2	8:A:603:HOH:O	1.98	0.81
1:A:10:VAL:HG22	1:A:275:ASN:ND2	1.96	0.80
2:C:10:VAL:HG22	2:C:275:ASN:OD1	1.82	0.80
2:B:57:PRO:O	2:B:58:GLU:HB3	1.83	0.79
1:A:10:VAL:HG22	1:A:275:ASN:HD21	1.47	0.79
1:A:241:MET:HE2	1:A:269:PHE:CE2	2.17	0.78
2:B:102:ASN:HD21	2:B:284:ARG:H	1.27	0.78
1:A:56:CYS:C	1:A:58:GLU:H	1.90	0.78
1:A:251:LYS:HD3	1:A:251:LYS:N	1.97	0.78
1:A:474:HIS:N	8:A:604:HOH:O	1.99	0.78
2:B:328:ALA:HB1	8:B:604:HOH:O	1.84	0.78
2:B:14:LYS:NZ	2:B:23:GLU:OE2	2.17	0.78
1:A:91:ASN:ND2	8:A:612:HOH:O	2.16	0.77
2:C:44:GLU:OE2	2:C:128:ILE:O	2.02	0.77
1:A:343:GLU:O	1:A:343:GLU:HG2	1.84	0.77
1:A:257:GLU:OE1	1:A:257:GLU:N	2.18	0.76
2:B:33:LYS:HE3	8:B:886:HOH:O	1.83	0.76
2:C:127:HIS:HB2	2:C:134:TYR:CE2	2.19	0.76
2:C:44:GLU:HG2	2:C:126:TYR:OH	1.85	0.76
2:C:57:PRO:HD3	2:C:64:TYR:CE2	2.20	0.76
2:C:472:VAL:O	2:C:473:ASP:HB3	1.86	0.76
3:A:501:EOH:O	8:A:606:HOH:O	2.03	0.76
1:A:251:LYS:NZ	8:A:605:HOH:O	2.00	0.75
2:B:422:VAL:HG12	2:B:498:GLU:HG2	1.69	0.75
2:C:10:VAL:HG13	2:C:275:ASN:HD21	1.51	0.75
1:A:68:VAL:HG11	1:A:73:ILE:HG13	1.69	0.75
2:B:341:GLY:HA2	8:B:613:HOH:O	1.86	0.75

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:257:GLU:HG2	1:A:258:PHE:N	2.02	0.75
2:B:57:PRO:O	8:B:605:HOH:O	2.04	0.75
2:C:228:MET:SD	8:C:912:HOH:O	2.45	0.74
2:C:448:PHE:CD1	8:C:836:HOH:O	2.35	0.74
1:A:196:THR:HG23	1:A:199:TYR:H	1.52	0.73
1:A:497:VAL:HG12	1:A:498:GLU:N	1.98	0.73
1:A:58:GLU:OE1	8:A:605:HOH:O	2.08	0.71
1:A:434:ILE:HD11	8:A:649:HOH:O	1.91	0.71
2:B:304:ILE:HD12	2:B:362:VAL:HG11	1.73	0.71
2:C:44:GLU:HG3	2:C:129:ARG:NH2	2.05	0.71
1:A:460:THR:OG1	8:A:607:HOH:O	2.08	0.70
2:B:277:ASP:OD2	8:B:606:HOH:O	2.09	0.70
1:A:225:LYS:HG2	1:A:231:TYR:CE1	2.27	0.70
2:C:197:LEU:CD1	2:C:340:LEU:HB3	2.22	0.69
2:C:257:GLU:HB3	2:C:260:ARG:NH2	2.07	0.69
1:A:493:LEU:HD13	1:A:495:VAL:HG23	1.74	0.69
1:A:241:MET:HE2	1:A:269:PHE:HE2	1.57	0.68
1:A:328:ALA:HB2	8:A:656:HOH:O	1.93	0.68
3:B:501:EOH:C1	8:B:611:HOH:O	2.41	0.68
2:B:43:PHE:HD1	2:B:85:MET:HE1	1.57	0.68
1:A:303:ARG:NH2	8:A:609:HOH:O	2.13	0.68
1:A:69:HIS:CE1	1:A:197:LEU:HD12	2.29	0.68
2:C:282:ARG:NH1	2:C:285:GLY:O	2.27	0.67
2:C:78:HIS:O	2:C:82:THR:HG23	1.95	0.67
2:C:128:ILE:O	2:C:129:ARG:HB2	1.94	0.67
1:A:241:MET:HE3	1:A:265:PRO:HB2	1.77	0.67
2:C:404:HIS:ND1	8:C:609:HOH:O	2.27	0.67
1:A:239:ASP:O	8:A:610:HOH:O	2.13	0.67
2:C:197:LEU:HD11	2:C:340:LEU:CB	2.24	0.67
2:B:164:GLU:HG2	2:B:295:ILE:HG23	1.76	0.66
2:B:73:ILE:HD11	2:B:241:MET:SD	2.36	0.66
2:C:129:ARG:N	8:C:602:HOH:O	1.92	0.66
2:C:56:CYS:O	2:C:58:GLU:N	2.28	0.66
2:B:43:PHE:CD1	2:B:85:MET:HE1	2.32	0.65
1:A:10:VAL:HG12	8:A:961:HOH:O	1.97	0.64
1:A:329:GLU:HG2	1:A:330:HIS:N	2.02	0.64
3:A:501:EOH:C2	8:A:606:HOH:O	2.43	0.64
2:C:352:ARG:HH12	2:C:498:GLU:CD	2.05	0.64
1:A:251:LYS:HD3	1:A:251:LYS:H	1.61	0.64
2:B:429:ILE:HD11	2:B:464:PHE:CE2	2.33	0.64
1:A:400:ALA:O	8:A:611:HOH:O	2.16	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:225:LYS:NZ	8:C:612:HOH:O	2.31	0.63
1:A:70:GLY:CA	3:A:501:EOH:H21	2.28	0.63
2:C:326:THR:C	2:C:328:ALA:H	2.07	0.62
2:B:422:VAL:HG12	2:B:498:GLU:CG	2.31	0.61
1:A:343:GLU:O	1:A:343:GLU:CG	2.49	0.61
2:C:128:ILE:O	2:C:129:ARG:CB	2.48	0.61
2:C:82:THR:HG22	8:C:844:HOH:O	2.00	0.61
2:C:473:ASP:C	2:C:497:VAL:HG11	2.27	0.60
2:B:302:ASP:OD1	2:B:399:PRO:CA	2.32	0.60
2:B:10:VAL:HG13	2:B:275:ASN:OD1	2.01	0.60
1:A:62:ASP:HA	8:A:617:HOH:O	2.01	0.59
1:A:56:CYS:C	1:A:58:GLU:N	2.55	0.59
2:C:58:GLU:HB2	2:C:250:TYR:CE2	2.37	0.59
1:A:177:ILE:HG13	1:A:354:LEU:HD13	1.85	0.59
1:A:497:VAL:CG1	1:A:498:GLU:H	2.05	0.59
1:A:352:ARG:NH1	8:A:608:HOH:O	2.09	0.59
2:C:303:ARG:NH1	8:C:604:HOH:O	2.11	0.59
2:B:151:GLU:OE1	8:B:603:HOH:O	2.17	0.58
1:A:70:GLY:HA2	3:A:501:EOH:H21	1.85	0.58
1:A:175:TYR:CZ	1:A:213:LEU:HG	2.39	0.58
2:C:177:ILE:HG13	2:C:354:LEU:HD13	1.86	0.57
1:A:302:ASP:OD1	1:A:400:ALA:N	2.36	0.57
3:B:501:EOH:H11	8:B:611:HOH:O	2.00	0.57
2:B:348:TRP:CE2	3:B:501:EOH:H22	2.39	0.57
1:A:332:GLU:OE2	1:A:364:HIS:HD2	1.88	0.56
2:B:460:THR:HG23	2:B:463:ALA:HB2	1.87	0.56
2:B:474:HIS:NE2	2:C:239:ASP:OD2	2.38	0.56
2:C:102:ASN:ND2	8:C:614:HOH:O	2.38	0.56
2:C:300:ASN:OD1	2:C:401:HIS:NE2	2.38	0.56
1:A:257:GLU:OE2	8:A:613:HOH:O	2.18	0.56
1:A:239:ASP:O	1:A:240:LEU:CB	2.54	0.56
2:C:58:GLU:HB2	2:C:250:TYR:CD2	2.41	0.56
1:A:389:LYS:HE3	8:A:924:HOH:O	2.06	0.55
1:A:68:VAL:HG11	1:A:73:ILE:CG1	2.35	0.55
3:B:501:EOH:H12	8:B:611:HOH:O	2.01	0.55
2:C:49:TYR:O	2:C:66:CYS:HB2	2.08	0.54
2:C:451:MET:HE2	8:C:836:HOH:O	2.06	0.54
2:B:58:GLU:HB2	2:B:250:TYR:CD2	2.42	0.54
3:B:501:EOH:H21	8:B:613:HOH:O	2.08	0.54
1:A:324:HIS:HD2	1:A:325:GLY:O	1.90	0.54
2:C:164:GLU:HG3	2:C:295:ILE:HG23	1.89	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:501:EOH:H23	8:A:606:HOH:O	2.06	0.53
2:B:340:LEU:CB	8:B:611:HOH:O	2.57	0.53
1:A:473:ASP:OD1	1:A:474:HIS:CD2	2.61	0.53
1:A:57:PRO:HD3	1:A:64:TYR:CE2	2.44	0.53
2:C:299:ARG:O	2:C:400:ALA:O	2.27	0.53
2:C:460:THR:HG22	2:C:463:ALA:HB2	1.91	0.53
2:C:460:THR:CG2	2:C:463:ALA:HB2	2.38	0.53
1:A:197:LEU:HD22	1:A:341:GLY:N	2.24	0.53
2:B:234:ALA:CB	2:B:241:MET:HE3	2.39	0.53
2:C:260:ARG:NE	8:C:616:HOH:O	2.40	0.53
3:A:501:EOH:C1	8:A:711:HOH:O	2.57	0.52
2:C:197:LEU:HD13	2:C:341:GLY:N	2.25	0.52
1:A:415:HIS:ND1	8:A:615:HOH:O	2.34	0.52
1:A:191:LYS:O	1:A:196:THR:HG21	2.10	0.52
2:C:326:THR:C	2:C:328:ALA:N	2.65	0.52
2:B:57:PRO:O	2:B:58:GLU:CB	2.54	0.52
2:C:194:MET:HA	2:C:200:SER:CB	2.40	0.52
1:A:350:TYR:OH	3:A:501:EOH:H23	2.10	0.52
1:A:251:LYS:H	1:A:251:LYS:CD	2.24	0.51
2:C:239:ASP:O	2:C:240:LEU:CB	2.59	0.51
1:A:225:LYS:HG2	1:A:231:TYR:CD1	2.45	0.51
1:A:493:LEU:CD1	1:A:495:VAL:HG23	2.40	0.51
2:B:73:ILE:HG22	2:B:73:ILE:O	2.10	0.50
2:B:257:GLU:OE1	8:B:607:HOH:O	2.18	0.50
2:C:56:CYS:C	2:C:58:GLU:N	2.68	0.50
2:C:442:MET:HE1	2:C:491:VAL:HG12	1.93	0.50
2:C:68:VAL:HG11	2:C:73:ILE:CG1	2.41	0.50
2:C:352:ARG:NH1	2:C:498:GLU:OE1	2.42	0.50
1:A:237:ALA:HB1	1:A:240:LEU:HD23	1.94	0.49
2:B:340:LEU:HB2	8:B:611:HOH:O	2.11	0.49
2:C:175:TYR:CZ	2:C:213:LEU:HG	2.46	0.49
2:C:395:ILE:HB	2:C:408:VAL:HB	1.94	0.49
1:A:106:ARG:NE	1:A:153:ASP:OD2	2.44	0.49
2:C:71:MET:HE3	8:C:751:HOH:O	2.12	0.49
2:B:73:ILE:HG13	2:B:240:LEU:HG	1.94	0.49
1:A:260:ARG:NE	8:A:614:HOH:O	2.34	0.49
2:C:33:LYS:HE2	2:C:92:HIS:O	2.13	0.49
2:B:326:THR:HG23	2:B:327:GLY:N	2.28	0.49
2:C:282:ARG:O	2:C:283:ILE:HD13	2.12	0.48
1:A:489:GLN:O	1:A:490:ASN:HB2	2.13	0.48
1:A:127:HIS:HB2	1:A:134:TYR:CE1	2.48	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:72:PRO:HB3	8:B:760:HOH:O	2.13	0.48
1:A:460:THR:HG23	1:A:463:ALA:HB2	1.95	0.48
1:A:329:GLU:CG	1:A:330:HIS:H	2.06	0.48
1:A:442:MET:HE1	1:A:491:VAL:HG12	1.95	0.48
2:C:324:HIS:HD2	2:C:325:GLY:O	1.96	0.48
1:A:182:VAL:HB	1:A:209:HIS:CE1	2.49	0.48
2:C:489:GLN:O	2:C:490:ASN:HB2	2.14	0.48
1:A:239:ASP:O	1:A:240:LEU:HB2	2.14	0.47
1:A:251:LYS:N	1:A:251:LYS:CD	2.72	0.47
2:C:429:ILE:HD11	2:C:464:PHE:CE2	2.49	0.47
2:C:52:TYR:CG	2:C:53:PRO:HA	2.50	0.47
2:C:369:ASP:OD2	2:C:397:HIS:HD2	1.98	0.47
1:A:102:ASN:O	1:A:105:LYS:HG2	2.13	0.47
1:A:284:ARG:CA	8:A:651:HOH:O	2.63	0.47
1:A:302:ASP:OD1	1:A:399:PRO:HA	2.14	0.47
1:A:497:VAL:CG1	1:A:498:GLU:N	2.70	0.47
1:A:64:TYR:HB2	1:A:65:PRO:HD2	1.95	0.47
1:A:493:LEU:HD12	1:A:493:LEU:O	2.15	0.47
2:B:32:TYR:HD2	2:B:33:LYS:HD3	1.79	0.46
1:A:395:ILE:HB	1:A:408:VAL:HB	1.97	0.46
1:A:299:ARG:O	1:A:400:ALA:O	2.34	0.46
2:B:175:TYR:CZ	2:B:213:LEU:HG	2.51	0.46
2:C:194:MET:HA	2:C:200:SER:HB2	1.98	0.46
2:C:239:ASP:O	2:C:240:LEU:HB2	2.16	0.46
2:B:348:TRP:CZ2	3:B:501:EOH:H22	2.52	0.46
2:B:474:HIS:CD2	2:C:239:ASP:OD2	2.68	0.45
2:B:182:VAL:HB	2:B:209:HIS:CE1	2.51	0.45
2:B:255:GLU:HB2	8:B:947:HOH:O	2.16	0.45
2:C:201:ALA:HA	2:C:206:PHE:CD2	2.51	0.45
2:C:56:CYS:O	2:C:57:PRO:C	2.59	0.45
2:B:73:ILE:O	2:B:73:ILE:CG2	2.64	0.45
2:B:241:MET:HE3	8:B:760:HOH:O	2.17	0.45
1:A:399:PRO:O	1:A:400:ALA:C	2.60	0.45
2:C:68:VAL:HG11	2:C:73:ILE:HG12	1.97	0.45
1:A:51:GLY:HA2	1:A:65:PRO:HB3	1.99	0.45
1:A:203:ASP:CG	1:A:205:VAL:HG12	2.42	0.45
2:B:329:ASP:OD1	2:B:329:ASP:O	2.35	0.45
2:C:71:MET:HG2	8:C:744:HOH:O	2.16	0.45
1:A:196:THR:OG1	1:A:198:GLU:OE1	2.34	0.44
1:A:58:GLU:HB2	1:A:250:TYR:CE2	2.53	0.44
1:A:257:GLU:N	1:A:257:GLU:CD	2.75	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:168:PHE:O	2:C:171:PHE:HB3	2.16	0.44
2:C:57:PRO:O	2:C:58:GLU:C	2.60	0.44
1:A:473:ASP:N	8:A:604:HOH:O	2.47	0.44
1:A:493:LEU:HD13	1:A:495:VAL:CG2	2.45	0.44
2:B:326:THR:CG2	2:B:327:GLY:N	2.81	0.44
2:B:241:MET:CE	8:B:760:HOH:O	2.65	0.44
1:A:70:GLY:HA3	3:A:501:EOH:H21	2.00	0.44
2:B:410:PRO:HA	2:B:432:THR:O	2.18	0.44
2:C:301:LYS:NZ	2:C:303:ARG:HG2	2.32	0.44
2:C:485:GLU:H	2:C:485:GLU:CD	2.24	0.43
1:A:31:LEU:HD23	1:A:122:PRO:HB2	1.99	0.43
2:B:10:VAL:N	2:B:275:ASN:OD1	2.52	0.43
2:C:68:VAL:HG21	2:C:73:ILE:HD11	2.01	0.43
1:A:284:ARG:HA	8:A:651:HOH:O	2.18	0.43
2:B:53:PRO:O	2:B:54:ASN:HB2	2.19	0.43
2:B:71:MET:HG2	8:B:695:HOH:O	2.17	0.43
2:B:177:ILE:HG13	2:B:354:LEU:HD13	2.01	0.43
2:B:58:GLU:HB2	2:B:250:TYR:CE2	2.53	0.43
2:B:64:TYR:HB2	2:B:65:PRO:HD2	2.00	0.43
2:B:423:VAL:C	2:B:498:GLU:HB2	2.41	0.43
2:C:138:ASP:HB3	2:C:188:GLY:HA3	2.00	0.43
2:B:494:ASN:HB3	2:C:448:PHE:HE2	1.83	0.42
2:C:129:ARG:O	2:C:130:ALA:C	2.62	0.42
2:B:95:GLN:HA	2:B:95:GLN:NE2	2.34	0.42
2:B:253:GLU:OE2	2:B:253:GLU:HA	2.20	0.42
1:A:175:TYR:CE1	1:A:213:LEU:HG	2.54	0.42
1:A:399:PRO:HD2	1:A:402:ALA:CB	2.49	0.42
2:C:282:ARG:C	2:C:283:ILE:HD13	2.44	0.42
2:B:15:GLU:N	2:B:100:TYR:CE1	2.87	0.42
2:C:235:ASP:CB	8:C:834:HOH:O	2.67	0.42
1:A:410:PRO:HA	1:A:432:THR:O	2.19	0.42
1:A:389:LYS:HA	1:A:389:LYS:HD3	1.40	0.42
1:A:235:ASP:OD1	1:A:235:ASP:N	2.50	0.42
1:A:284:ARG:HA	8:A:955:HOH:O	2.19	0.42
1:A:410:PRO:HB3	1:A:434:ILE:HG23	2.02	0.42
2:C:382:ASN:OD1	2:C:384:VAL:HG23	2.19	0.42
1:A:460:THR:CG2	1:A:463:ALA:HB2	2.50	0.42
2:B:368:LYS:N	2:B:368:LYS:HD3	2.33	0.42
2:C:182:VAL:HB	2:C:209:HIS:CE1	2.54	0.42
2:C:194:MET:HE3	2:C:194:MET:HB3	1.58	0.42
2:C:237:ALA:HB1	2:C:240:LEU:HD23	2.01	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:312:GLY:HA2	2:C:348:TRP:CE2	2.54	0.41
2:C:410:PRO:HA	2:C:432:THR:O	2.20	0.41
1:A:481:ALA:HB2	1:A:491:VAL:CG1	2.50	0.41
2:B:395:ILE:HB	2:B:408:VAL:HB	2.02	0.41
2:B:422:VAL:HA	2:B:496:HIS:O	2.20	0.41
2:C:179:HIS:CE1	2:C:180:ASN:OD1	2.73	0.41
1:A:10:VAL:CG2	1:A:275:ASN:HD21	2.24	0.41
2:B:442:MET:HE1	2:B:491:VAL:HG12	2.02	0.41
1:A:251:LYS:HB2	1:A:251:LYS:HE2	1.71	0.41
2:B:296:ASN:O	2:B:299:ARG:HB2	2.21	0.41
3:A:501:EOH:H11	8:A:711:HOH:O	2.19	0.41
2:B:489:GLN:O	2:B:490:ASN:HB2	2.21	0.41
1:A:348:TRP:CH2	3:A:501:EOH:H22	2.56	0.41
2:C:203:ASP:CG	2:C:205:VAL:HG12	2.46	0.41
2:B:376:MET:HE2	2:B:376:MET:HB2	1.95	0.41
2:C:474:HIS:HA	2:C:497:VAL:CG1	2.51	0.41
2:B:340:LEU:N	8:B:611:HOH:O	2.24	0.40
2:C:15:GLU:OE2	2:C:17:ASP:HB2	2.21	0.40
1:A:201:ALA:HA	1:A:206:PHE:CD2	2.56	0.40
2:C:282:ARG:NE	8:C:620:HOH:O	2.46	0.40
2:C:197:LEU:HD13	2:C:341:GLY:H	1.87	0.40

All (3) 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)
8:A:969:HOH:O	8:A:969:HOH:O[2_554]	2.08	0.12
8:A:645:HOH:O	8:B:764:HOH:O[3_555]	2.16	0.04
8:B:921:HOH:O	8:B:946:HOH:O[2_554]	2.17	0.03

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	487/489 (100%)	463 (95%)	18 (4%)	6 (1%)	10	6
2	B	487/489 (100%)	464 (95%)	21 (4%)	2 (0%)	30	27
2	C	487/489 (100%)	450 (92%)	26 (5%)	11 (2%)	5	2
All	All	1461/1467 (100%)	1377 (94%)	65 (4%)	19 (1%)	9	5

All (19) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	56	CYS
1	A	57	PRO
1	A	400	ALA
2	C	56	CYS
2	C	57	PRO
2	C	58	GLU
2	C	129	ARG
2	C	240	LEU
1	A	240	LEU
2	C	44	GLU
2	C	327	GLY
1	A	58	GLU
1	A	59	LYS
2	C	59	LYS
2	C	60	GLY
2	B	59	LYS
2	B	58	GLU
2	C	330	HIS
2	C	473	ASP

5.3.2 Protein sidechains ⓘ

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	426/430 (99%)	426 (100%)	0	100	100
2	B	426/430 (99%)	426 (100%)	0	100	100
2	C	424/430 (99%)	424 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
All	All	1276/1290 (99%)	1276 (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 (21) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	54	ASN
1	A	95	GLN
1	A	262	ASN
1	A	289	ASN
1	A	363	HIS
1	A	364	HIS
1	A	462	ASN
1	A	490	ASN
2	B	84	GLN
2	B	95	GLN
2	B	102	ASN
2	B	296	ASN
2	B	330	HIS
2	B	490	ASN
2	C	127	HIS
2	C	179	HIS
2	C	275	ASN
2	C	289	ASN
2	C	366	HIS
2	C	397	HIS
2	C	404	HIS

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry

Of 15 ligands modelled in this entry, 6 are monoatomic and 2 are modelled with single atom - leaving 7 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	NAG	B	502	2	14,14,15	0.61	0	17,19,21	0.66	1 (5%)
4	NAG	C	502	2	14,14,15	0.47	0	17,19,21	0.84	1 (5%)
3	EOH	B	501	-	2,2,2	0.53	0	1,1,1	0.12	0
7	OXY	B	505	5	1,1,1	0.08	0	-		
3	EOH	C	501	-	2,2,2	0.44	0	1,1,1	0.12	0
3	EOH	A	501	-	2,2,2	0.44	0	1,1,1	0.24	0
4	NAG	A	502	1	14,14,15	0.95	1 (7%)	17,19,21	0.90	1 (5%)

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	NAG	B	502	2	-	0/6/23/26	0/1/1/1
4	NAG	C	502	2	-	0/6/23/26	0/1/1/1
4	NAG	A	502	1	-	2/6/23/26	0/1/1/1

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	A	502	NAG	O5-C1	3.24	1.48	1.43

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	A	502	NAG	C1-O5-C5	3.16	116.47	112.19
4	C	502	NAG	C1-O5-C5	3.01	116.27	112.19
4	B	502	NAG	C1-O5-C5	2.32	115.33	112.19

There are no chirality outliers.

All (2) torsion outliers are listed below:

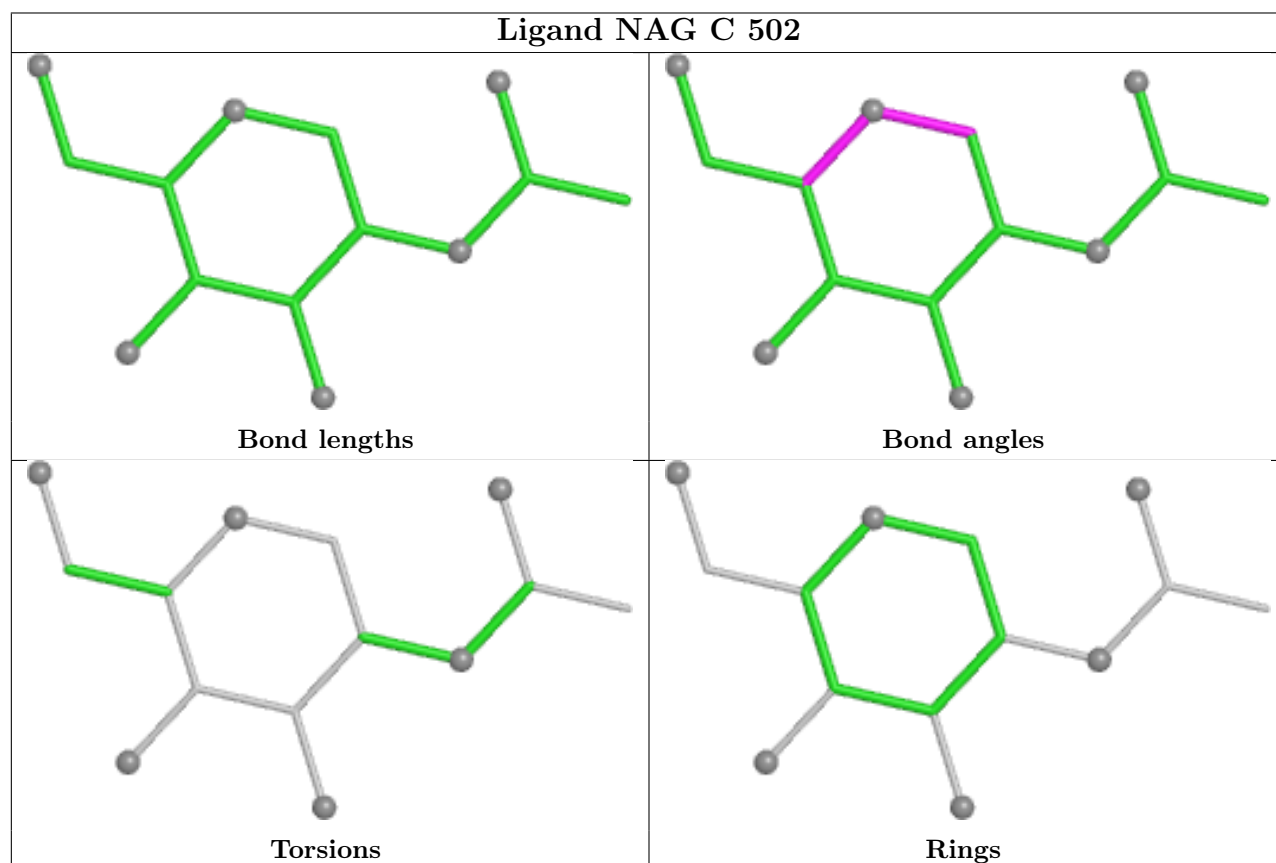
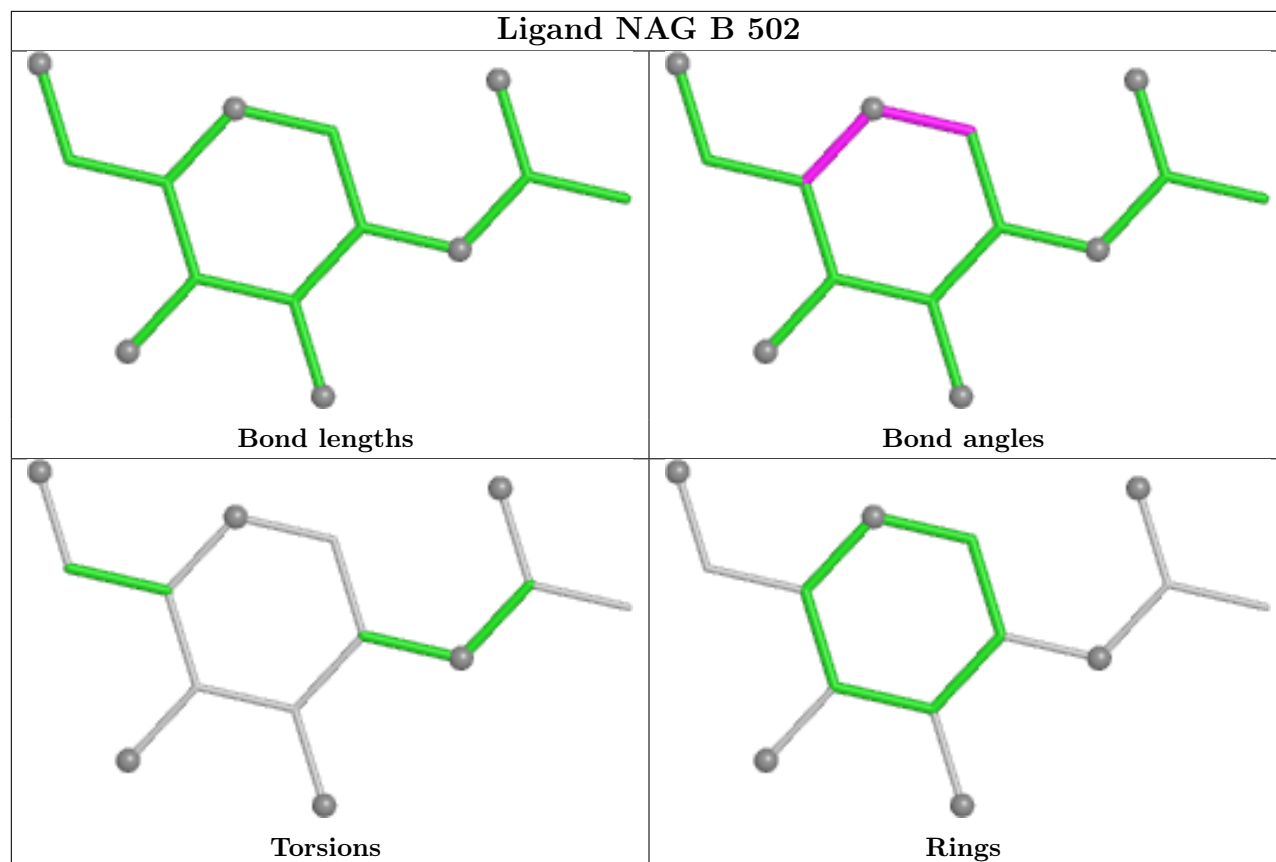
Mol	Chain	Res	Type	Atoms
4	A	502	NAG	C4-C5-C6-O6
4	A	502	NAG	O5-C5-C6-O6

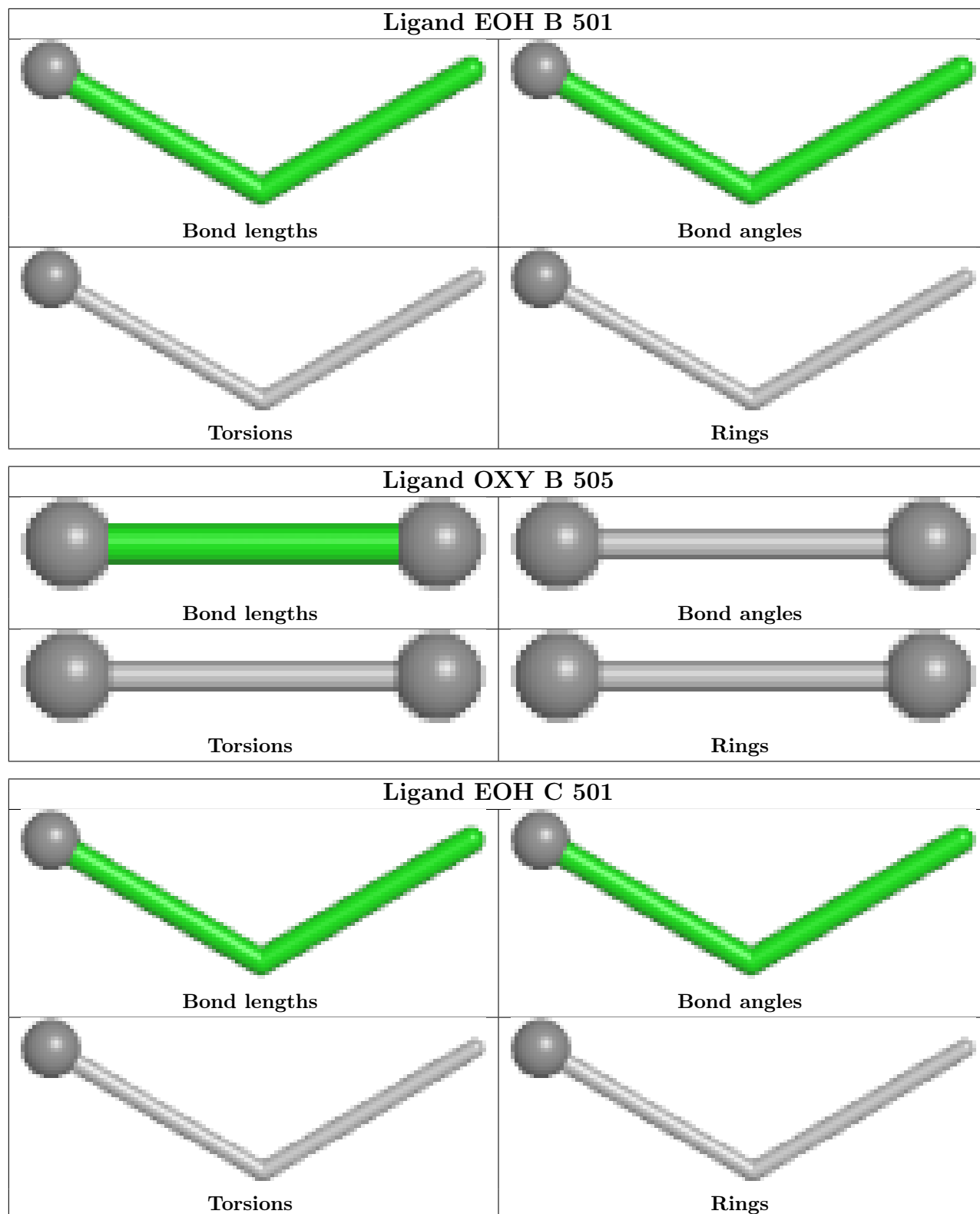
There are no ring outliers.

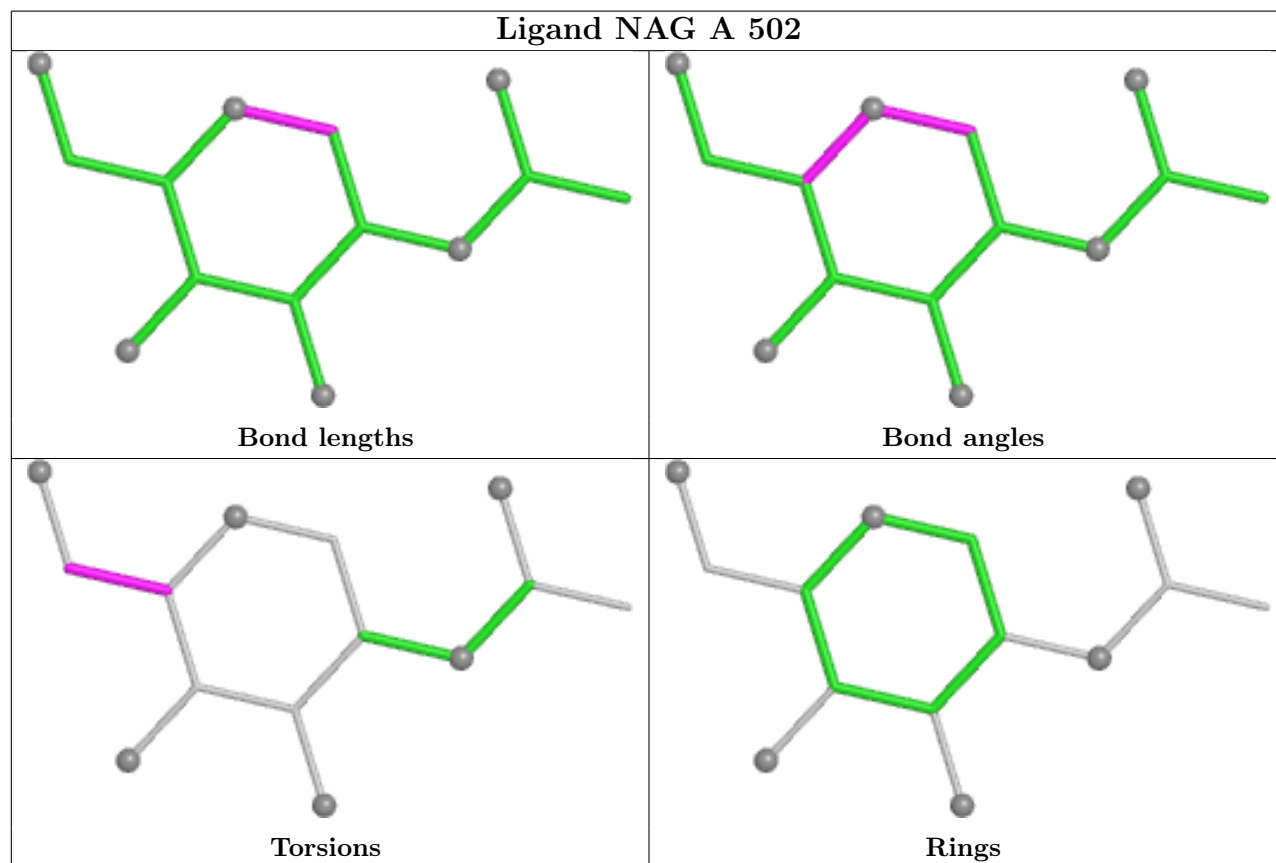
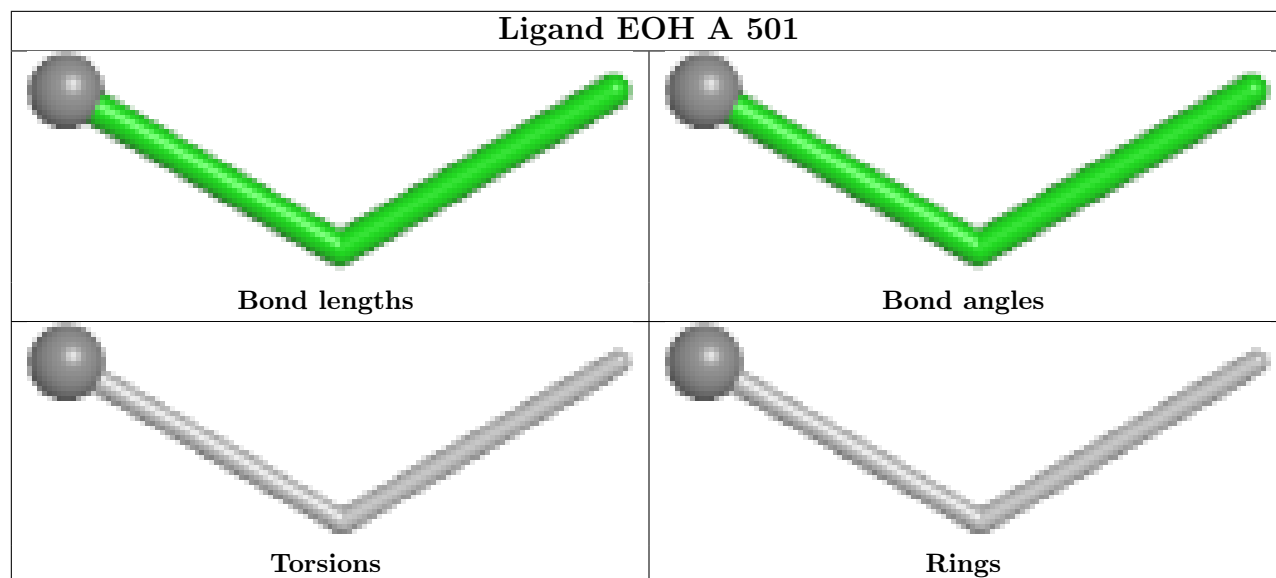
2 monomers are involved in 16 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	B	501	EOH	6	0
3	A	501	EOH	10	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 ⓘ

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	489/489 (100%)	-0.13	20 (4%) 41 40	16, 27, 43, 66	0
2	B	489/489 (100%)	-0.24	13 (2%) 56 55	16, 25, 40, 70	0
2	C	489/489 (100%)	0.17	26 (5%) 32 31	18, 30, 48, 67	0
All	All	1467/1467 (100%)	-0.07	59 (4%) 42 41	16, 27, 44, 70	0

All (59) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	C	328	ALA	5.5
1	A	328	ALA	5.3
2	C	236	CYS	4.7
2	B	330	HIS	4.7
2	C	301	LYS	4.3
2	C	56	CYS	4.1
2	C	57	PRO	4.1
2	B	498	GLU	4.1
2	C	10	VAL	4.0
2	C	239	ASP	3.9
2	C	473	ASP	3.9
1	A	57	PRO	3.9
2	C	329	ASP	3.6
1	A	400	ALA	3.6
2	B	60	GLY	3.5
2	B	329	ASP	3.5
2	B	10	VAL	3.5
2	C	60	GLY	3.3
1	A	56	CYS	3.2
2	B	328	ALA	3.1
1	A	10	VAL	3.1
2	B	473	ASP	3.0
2	B	474	HIS	3.0

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Mol	Chain	Res	Type	RSRZ
2	C	401	HIS	2.9
1	A	343	GLU	2.9
2	C	300	ASN	2.9
1	A	239	ASP	2.9
1	A	329	GLU	2.8
2	C	448	PHE	2.8
2	C	240	LEU	2.8
1	A	61	ASP	2.7
1	A	401	HIS	2.7
2	B	61	ASP	2.7
1	A	60	GLY	2.7
1	A	330	HIS	2.6
1	A	474	HIS	2.6
1	A	498	GLU	2.5
2	C	474	HIS	2.5
1	A	473	ASP	2.5
2	C	237	ALA	2.5
2	C	59	LYS	2.5
2	C	130	ALA	2.4
2	C	400	ALA	2.4
1	A	236	CYS	2.3
2	B	240	LEU	2.3
2	C	330	HIS	2.3
2	C	238	GLY	2.2
2	C	327	GLY	2.2
2	B	327	GLY	2.2
1	A	460	THR	2.2
2	C	151	GLU	2.1
1	A	196	THR	2.1
2	C	129	ARG	2.1
1	A	134	TYR	2.1
1	A	59	LYS	2.1
2	C	275	ASN	2.0
2	B	236	CYS	2.0
2	B	497	VAL	2.0
2	C	485	GLU	2.0

6.2 Non-standard residues in protein, DNA, RNA chains ⓘ

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](#)

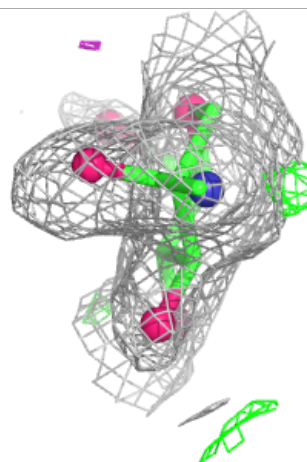
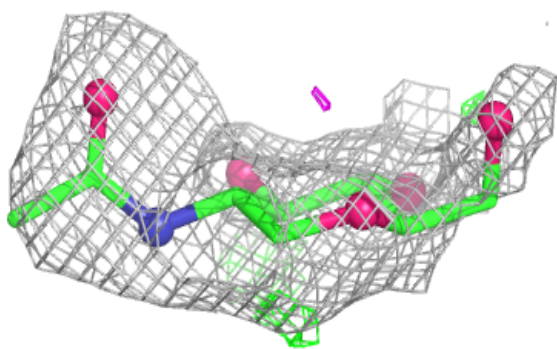
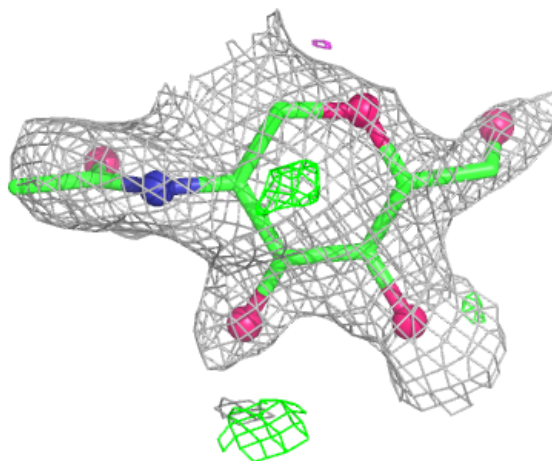
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
4	NAG	A	502	14/15	0.63	0.15	50,60,64,68	0
3	EOH	B	501	3/3	0.67	0.20	20,25,35,39	0
4	NAG	C	502	14/15	0.68	0.15	52,61,66,69	0
4	NAG	B	502	14/15	0.73	0.13	45,51,60,60	0
3	EOH	C	501	3/3	0.80	0.14	29,35,42,42	0
3	EOH	A	501	3/3	0.82	0.28	31,37,44,44	0
7	OXY	B	505	2/2	0.91	0.18	25,25,25,29	0
6	OH	A	505	1/1	0.94	0.08	27,27,27,33	0
5	CU	A	504	1/1	0.94	0.06	37,37,37,37	0
5	CU	B	504	1/1	0.96	0.06	30,30,30,30	0
6	OH	C	505	1/1	0.97	0.07	31,31,31,37	0
5	CU	C	504	1/1	0.98	0.03	37,37,37,37	0
5	CU	A	503	1/1	0.99	0.02	24,24,24,24	0
5	CU	C	503	1/1	0.99	0.03	28,28,28,28	0
5	CU	B	503	1/1	0.99	0.02	22,22,22,22	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.

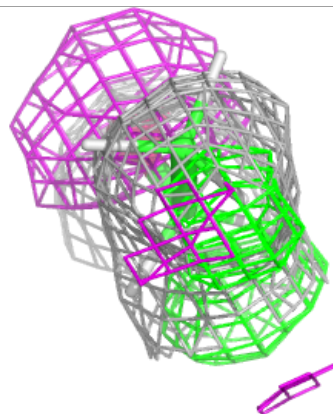
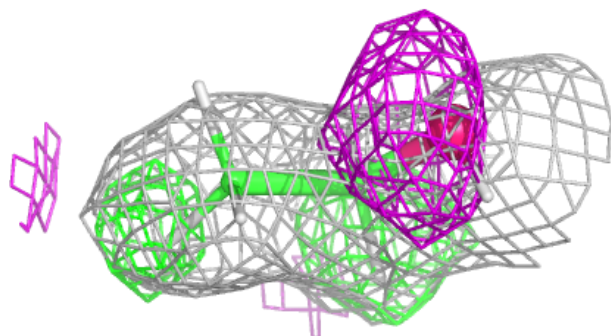
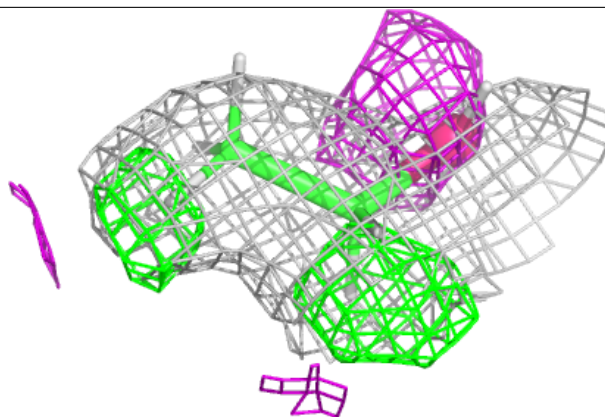
Electron density around NAG A 502:

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

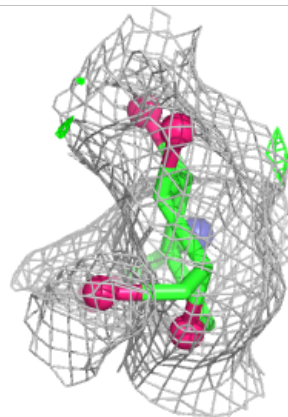
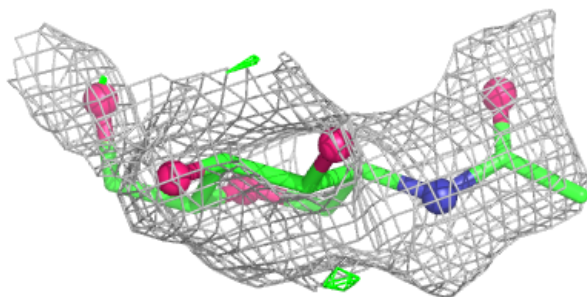
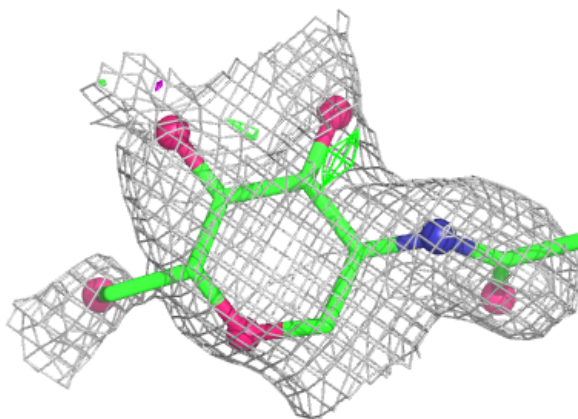


Electron density around EOH B 501:

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

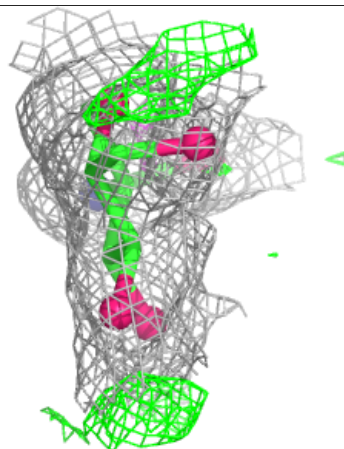
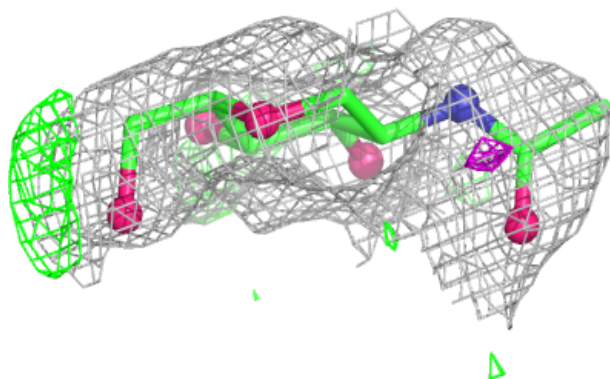
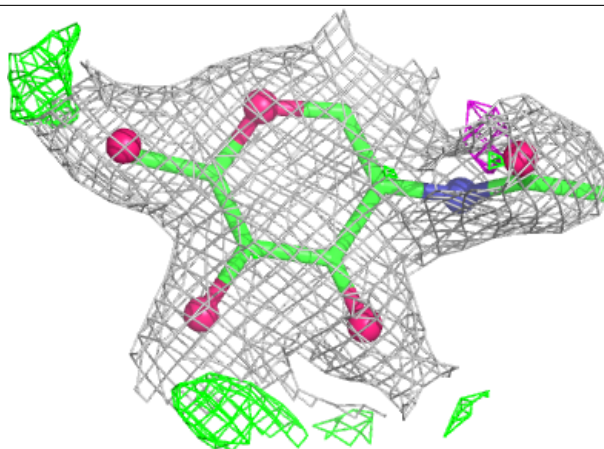
**Electron density around NAG C 502:**

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



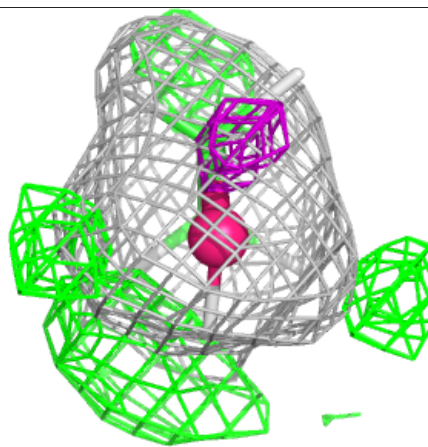
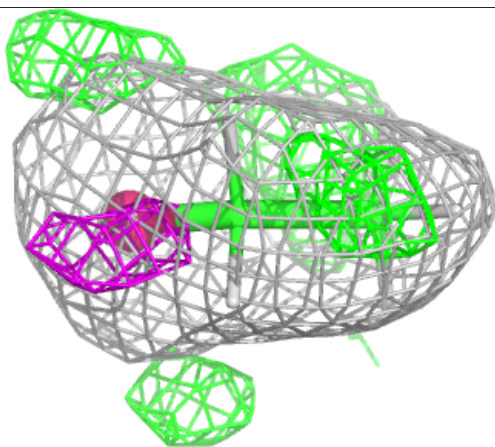
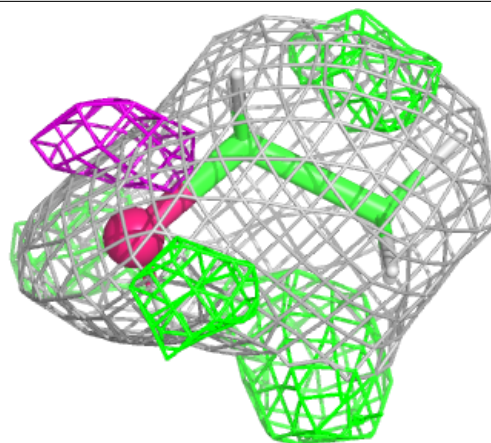
Electron density around NAG B 502:

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



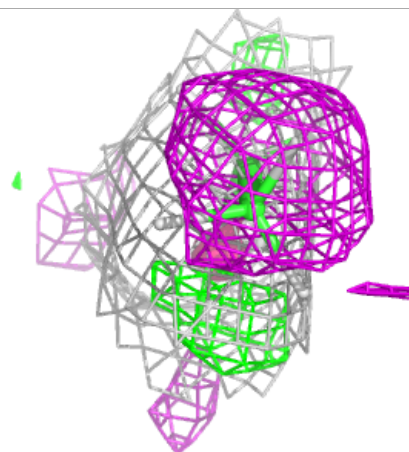
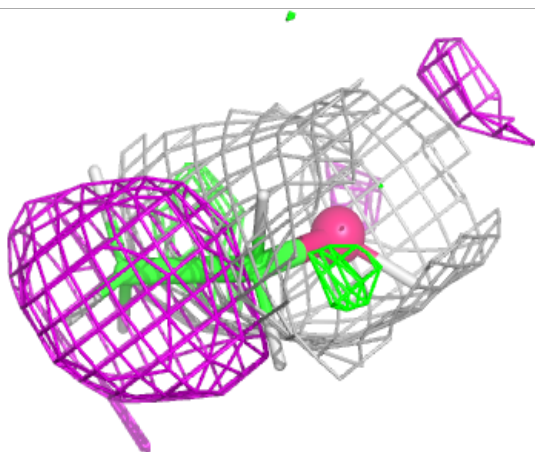
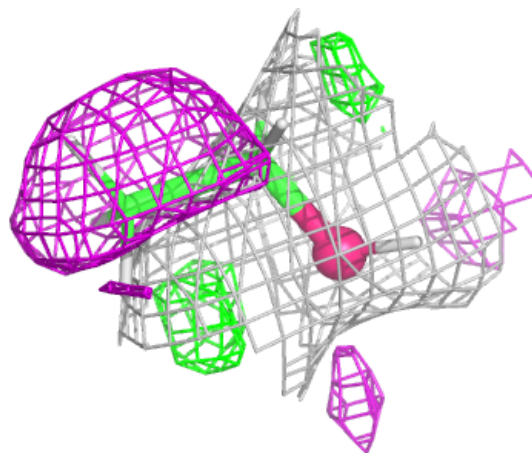
Electron density around EOH C 501:

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



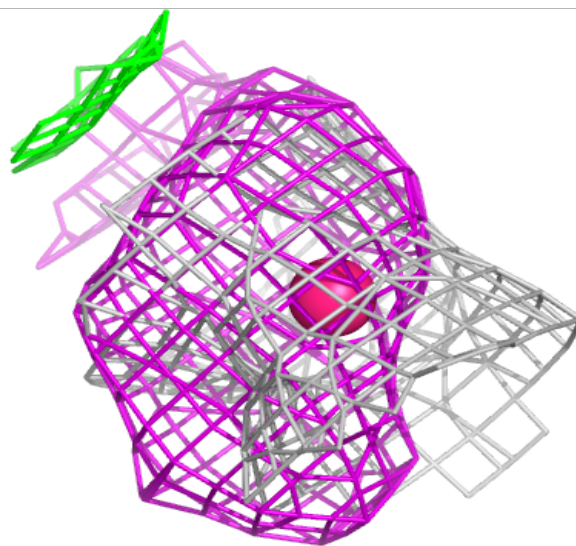
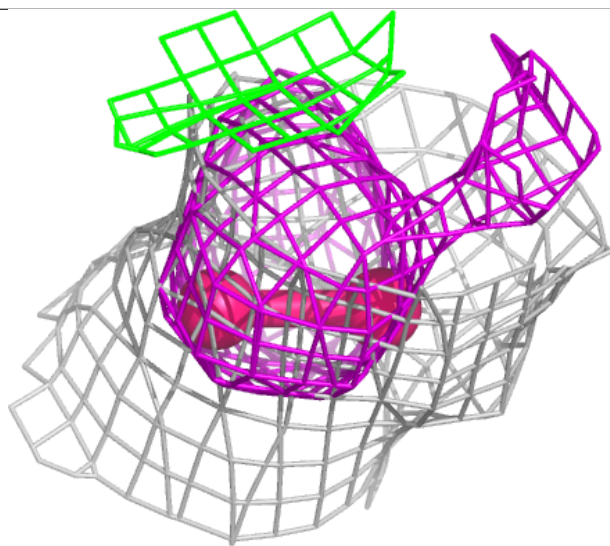
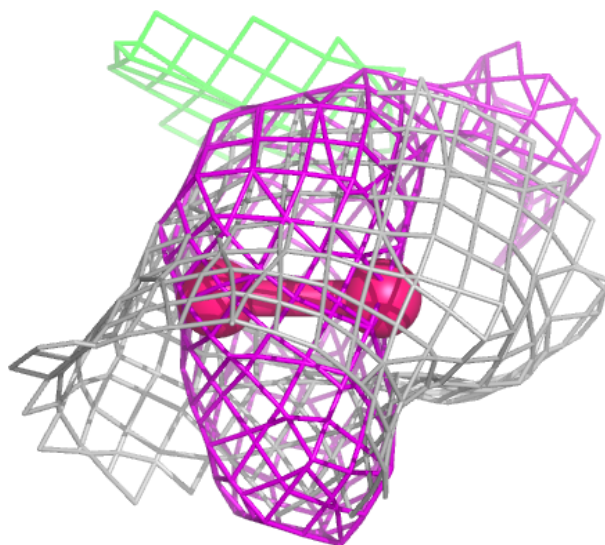
Electron density around EOH A 501:

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



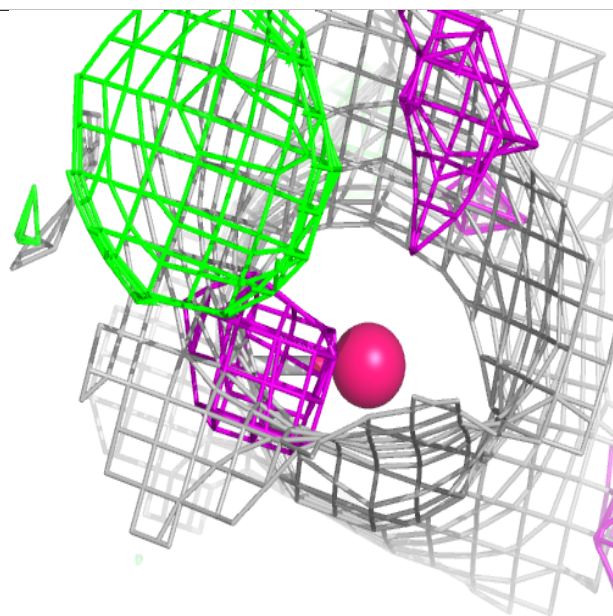
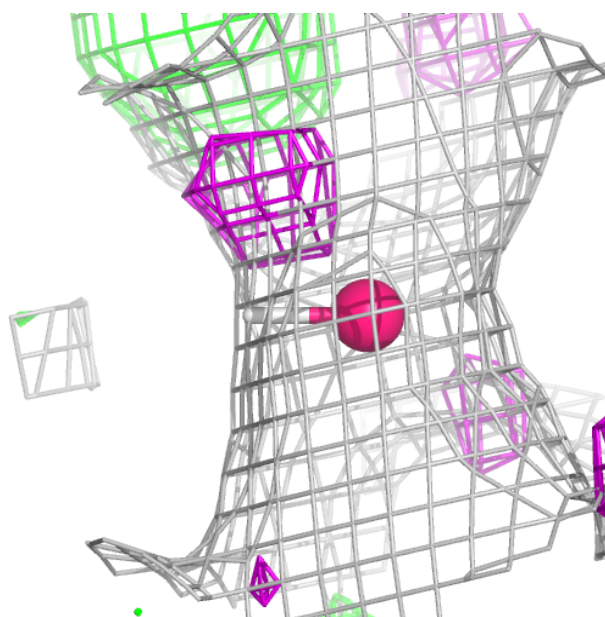
Electron density around OXY B 505:

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



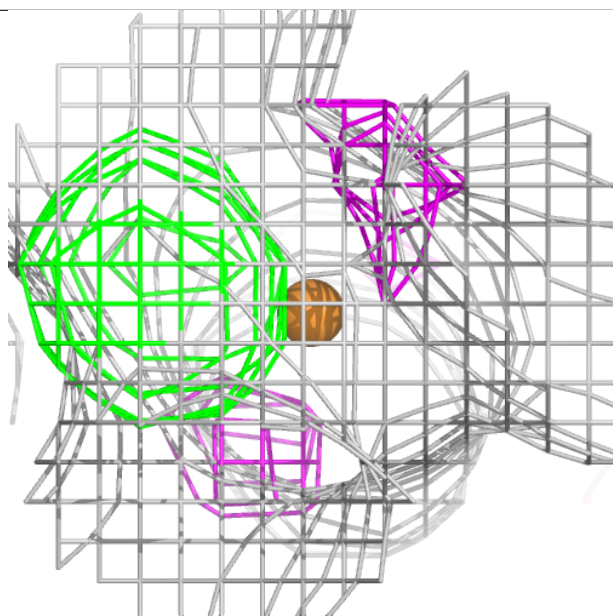
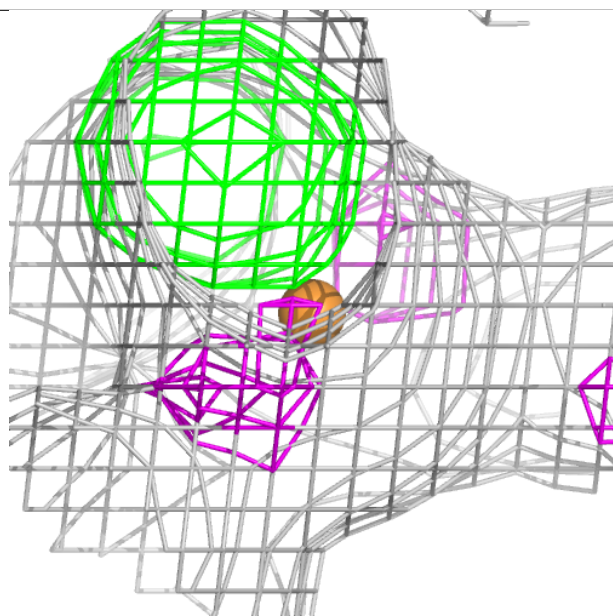
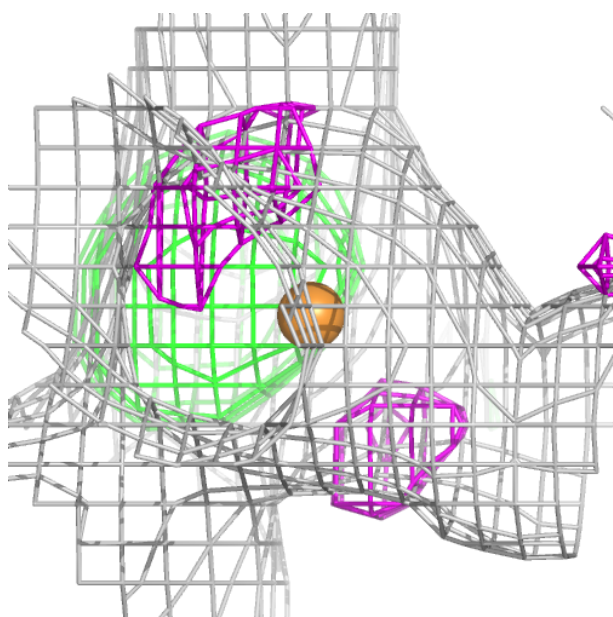
Electron density around OH A 505:

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



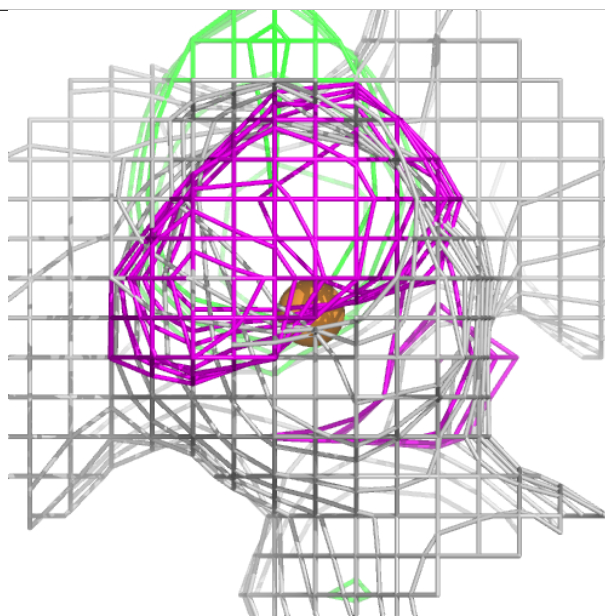
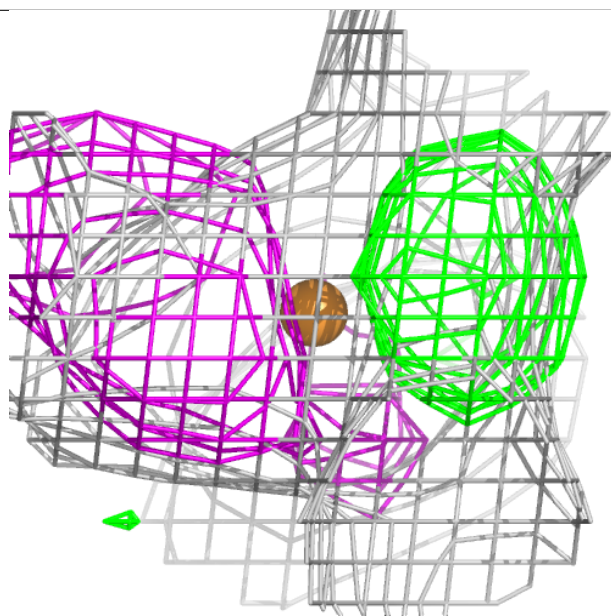
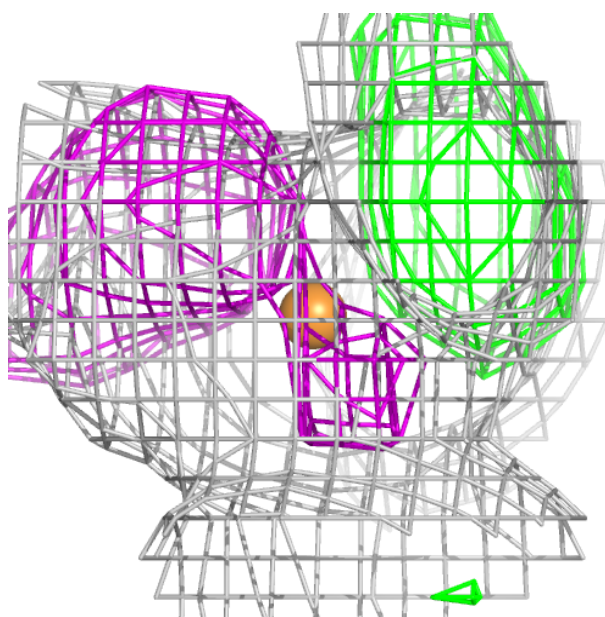
Electron density around CU A 504:

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and green (positive)



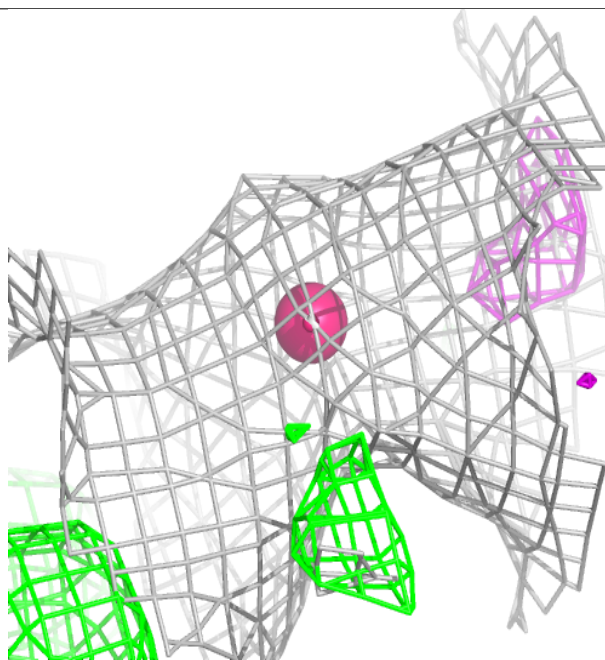
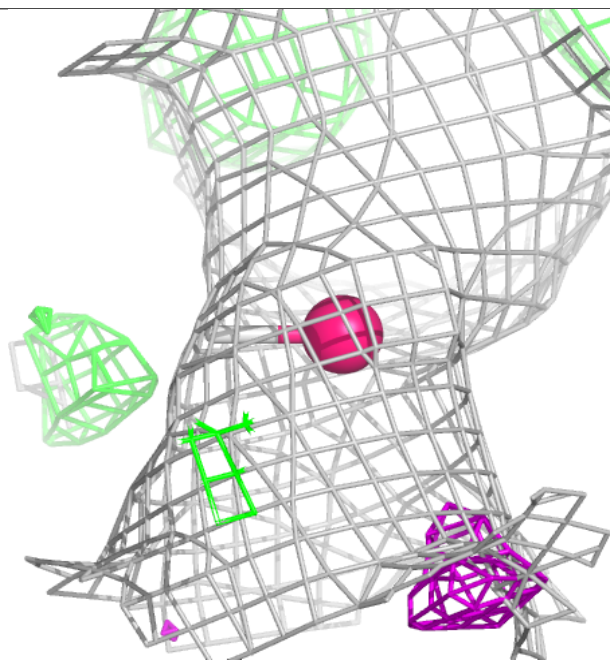
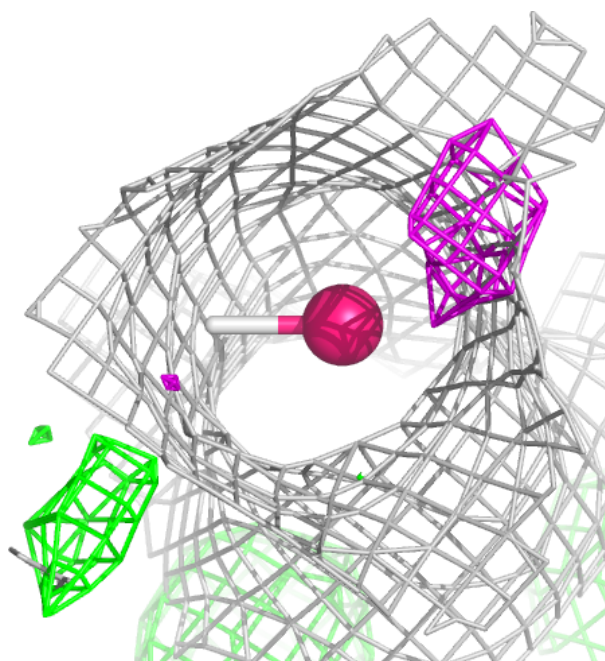
Electron density around CU B 504:

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



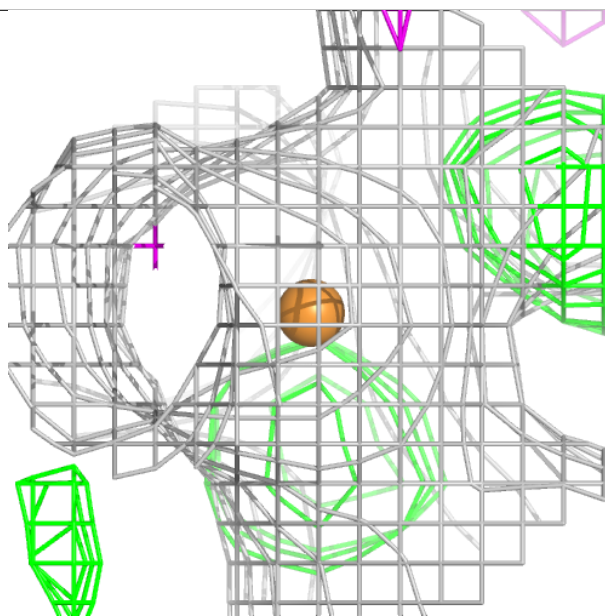
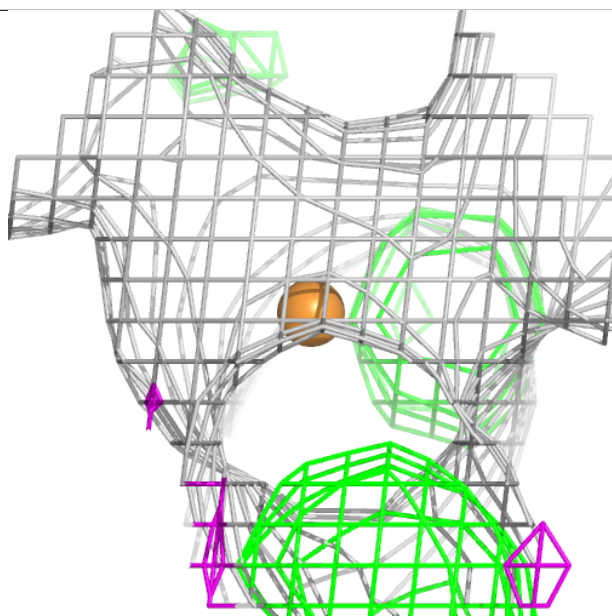
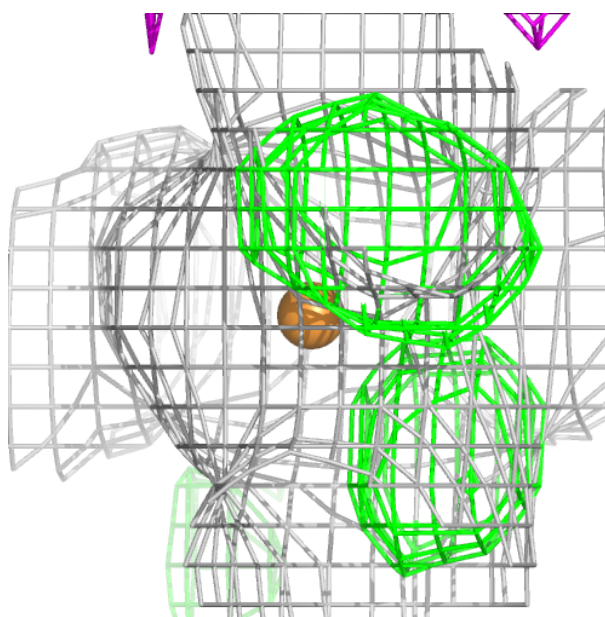
Electron density around OH C 505:

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



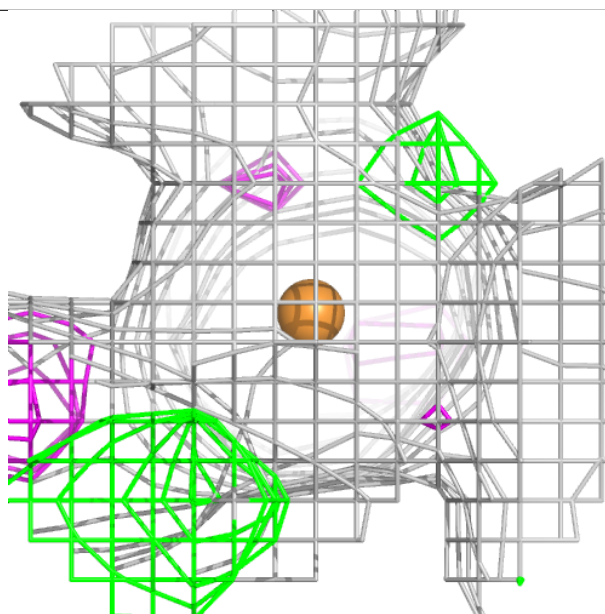
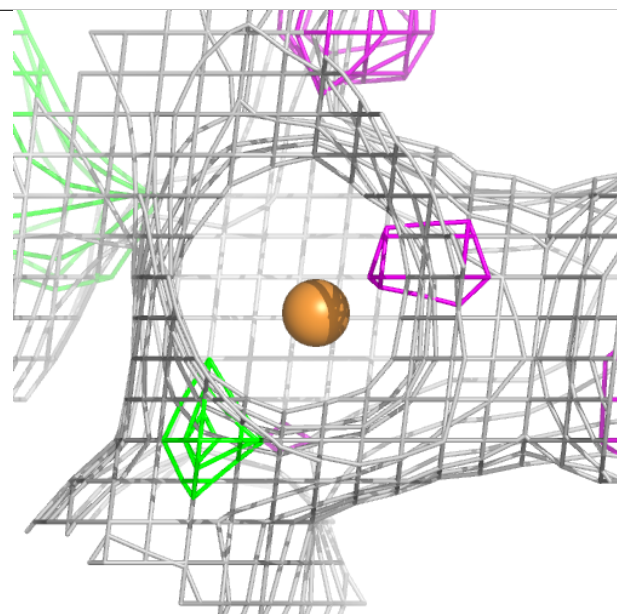
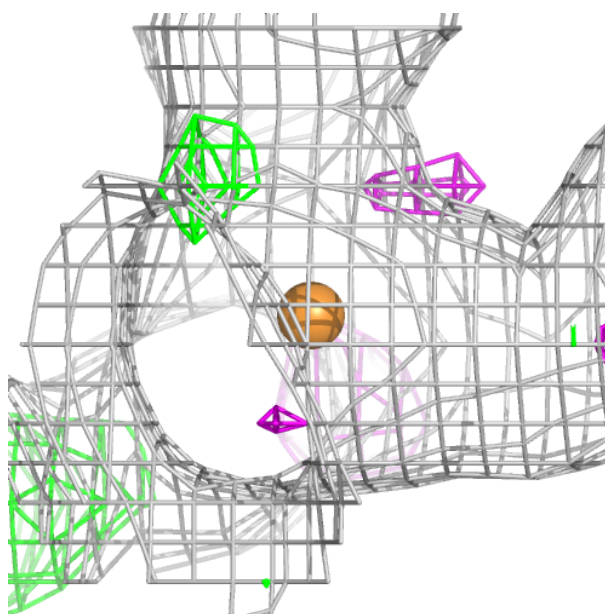
Electron density around CU C 504:

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



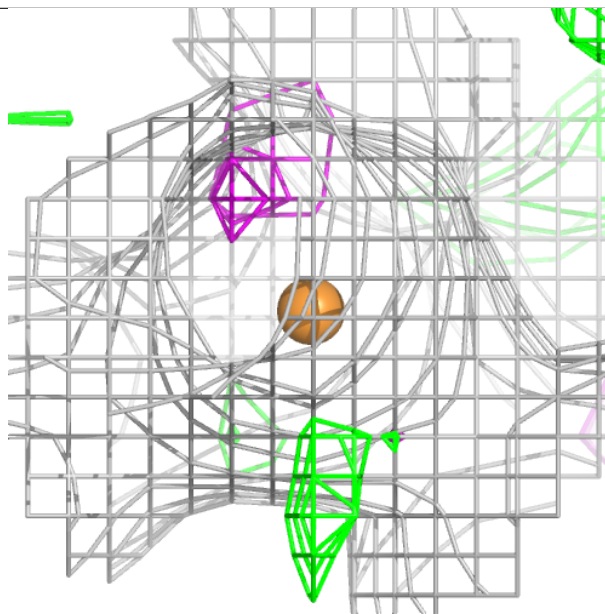
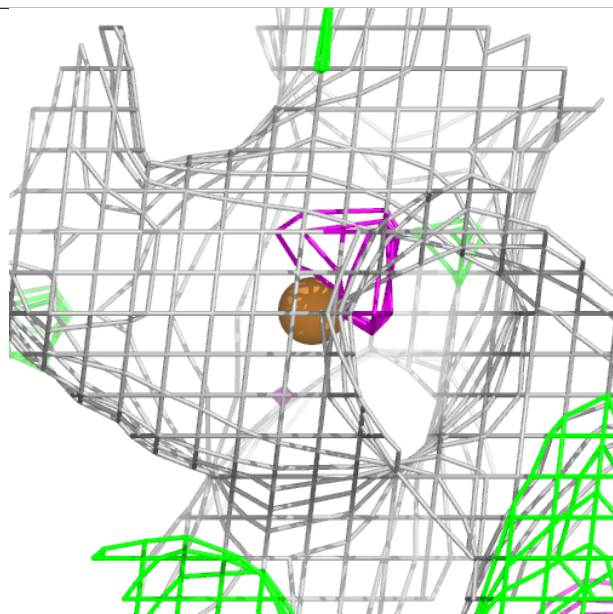
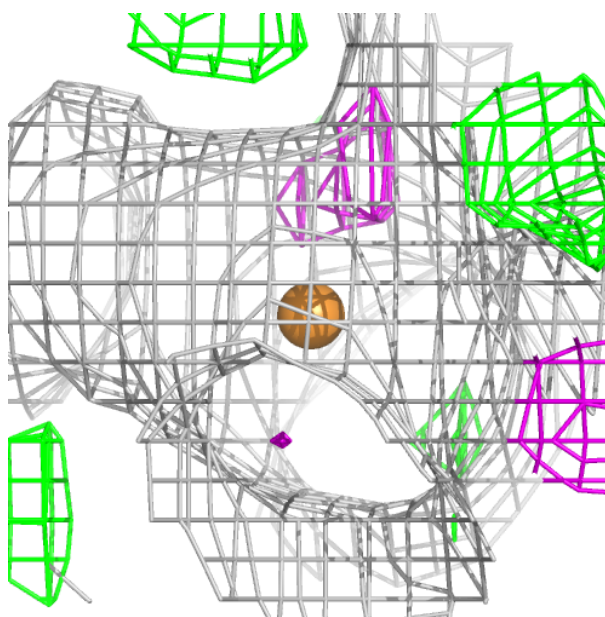
Electron density around CU A 503:

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



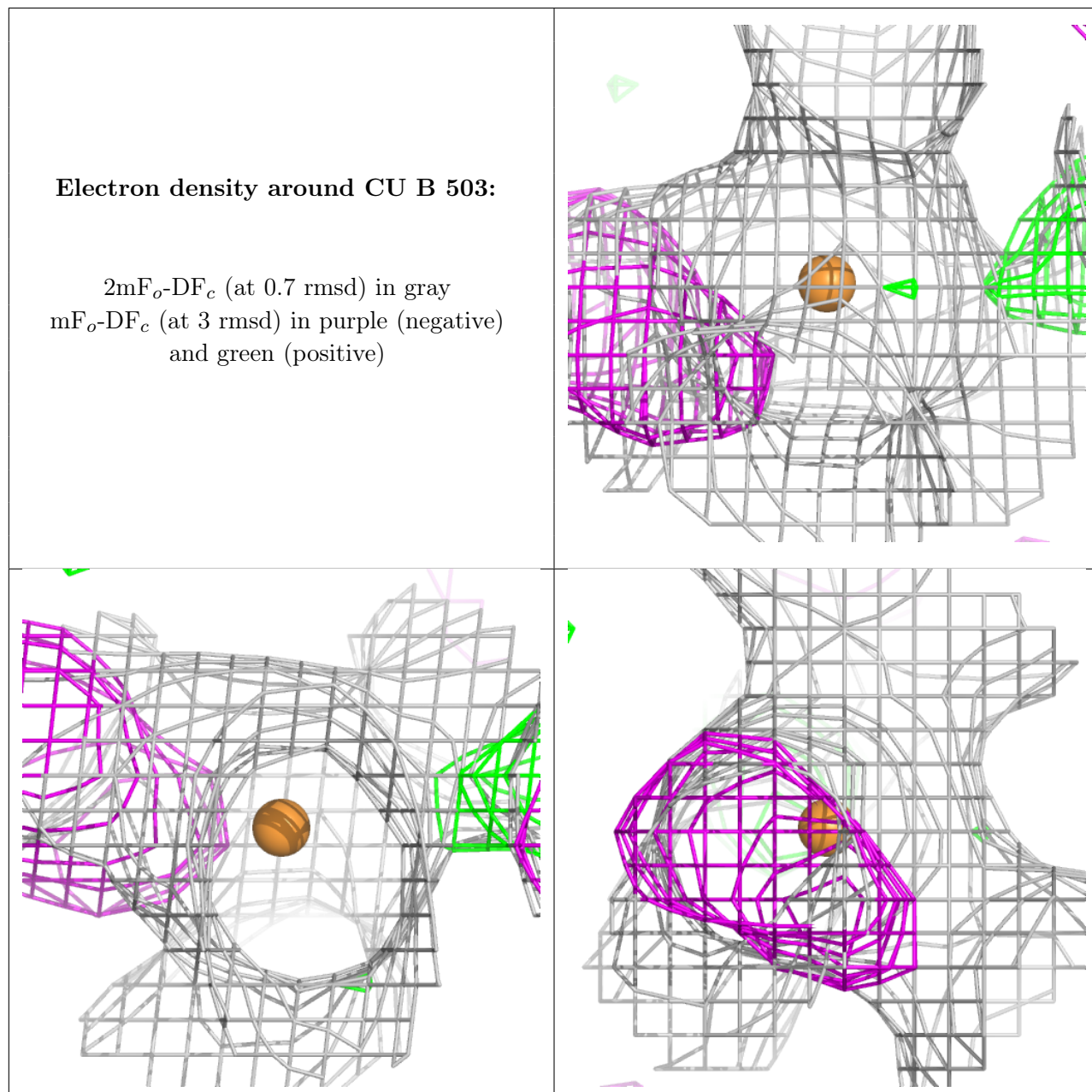
Electron density around CU C 503:

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



Electron density around CU B 503:

$2mF_o - DF_c$ (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.