



# Full wwPDB X-ray Structure Validation Report ⓘ

Jan 6, 2025 – 12:10 PM JST

PDB ID : 9KZL  
Title : Crystal structure of the functional unit (HtH1-h) of hemocyanin from Haliotis discus hannai, Containing a met site  
Authors : Zhao, G.H.; Yang, H.C.  
Deposited on : 2024-12-10  
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](mailto: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>.

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

MolProbity : 4.02b-467  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
Xtriage (Phenix) : 1.21  
EDS : 3.0  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)  
CCP4 : 9.0.004 (Gargrove)  
Density-Fitness : 1.0.11  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.40

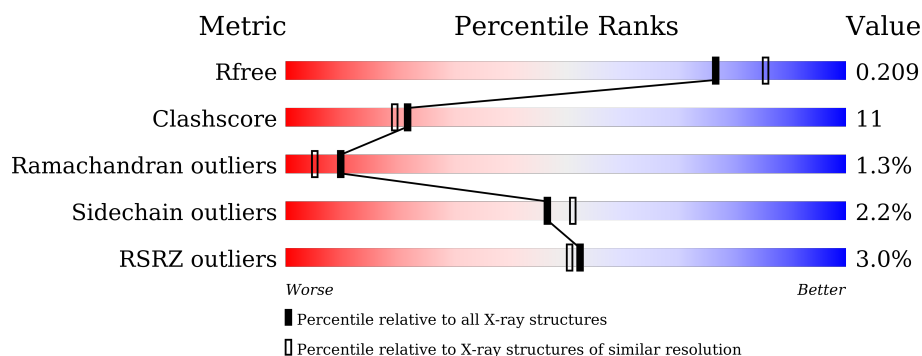
# 1 Overall quality at a glance

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))
$R_{free}$	164625	9409 (2.00-2.00)
Clashscore	180529	10737 (2.00-2.00)
Ramachandran outliers	177936	10628 (2.00-2.00)
Sidechain outliers	177891	10627 (2.00-2.00)
RSRZ outliers	164620	9409 (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  $\geq 3$ , 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	<div> <div>3%</div> <div> <div></div> <div>81%</div> <div>17%</div> <div>.</div> </div> </div>
2	B	489	<div> <div>2%</div> <div> <div></div> <div>84%</div> <div>15%</div> <div>.</div> </div> </div>
2	C	489	<div> <div>4%</div> <div> <div></div> <div>80%</div> <div>18%</div> <div>.</div> </div> </div>

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
4	EOH	A	502	-	-	X	-
4	EOH	B	502	-	-	X	-
7	O	B	505	-	-	X	-

## 2 Entry composition

There are 8 unique types of molecules in this entry. The entry contains 13136 atoms, of which 56 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

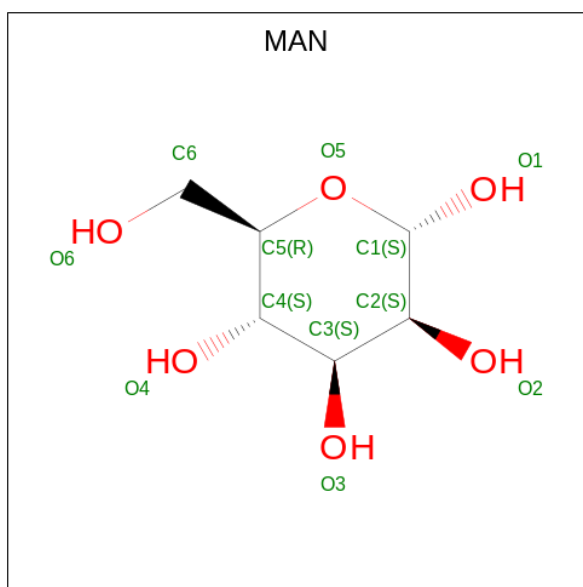
- Molecule 2 is a protein called Hemocyanin type 1.

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:

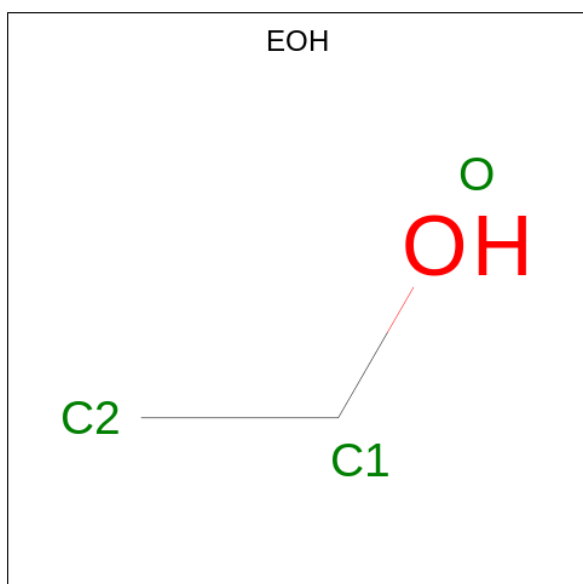
Chain	Residue	Modelled	Actual	Comment	Reference
B	102	ASN	ASP	conflict	UNP A0A7R6RYX0
B	?	-	THR	deletion	UNP A0A7R6RYX0
B	380	TYR	ALA	conflict	UNP A0A7R6RYX0
C	102	ASN	ASP	conflict	UNP A0A7R6RYX0
C	?	-	THR	deletion	UNP A0A7R6RYX0
C	380	TYR	ALA	conflict	UNP A0A7R6RYX0

- Molecule 3 is alpha-D-mannopyranose (three-letter code: MAN) (formula: C<sub>6</sub>H<sub>12</sub>O<sub>6</sub>) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	1	Total	C	H	O	0	0
			24	6	12	6		
3	B	1	Total	C	H	O	0	0
			24	6	12	6		
3	C	1	Total	C	H	O	0	0
			24	6	12	6		

- Molecule 4 is ETHANOL (three-letter code: EOH) (formula:  $C_2H_6O$ ) (labeled as "Ligand of Interest" by depositor).

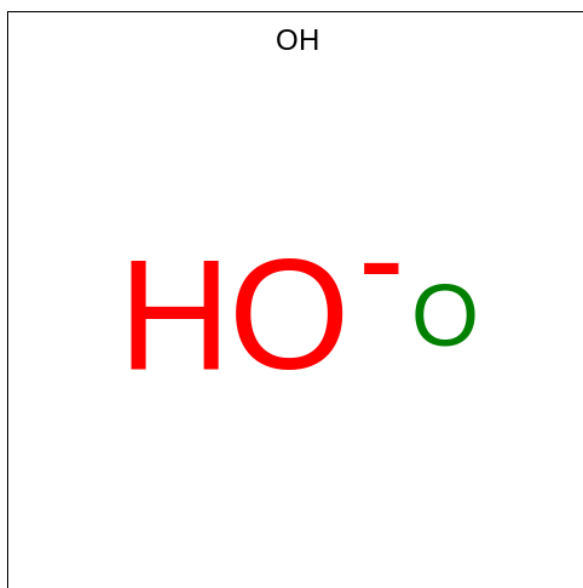


Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total C H O 9 2 6 1	0	0
4	B	1	Total C H O 9 2 6 1	0	0
4	C	1	Total C H O 9 2 6 1	0	0

- Molecule 5 is COPPER (II) ION (three-letter code: 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 (three-letter code: 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 ATOM (three-letter code: O) (formula: O) (labeled as "Ligand of Interest" by depositor).

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

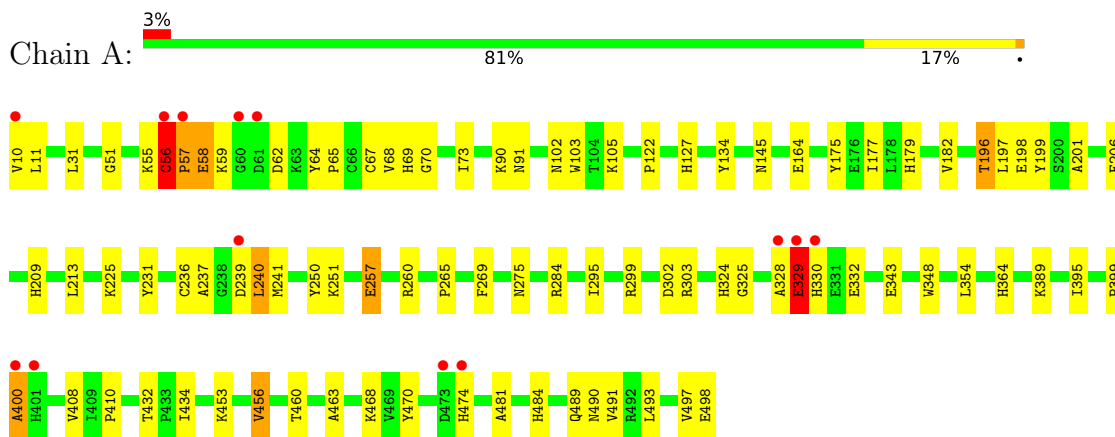
- Molecule 8 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
8	A	379	Total 379	O 379	0	0
8	B	410	Total 410	O 410	0	0
8	C	314	Total 314	O 314	0	0

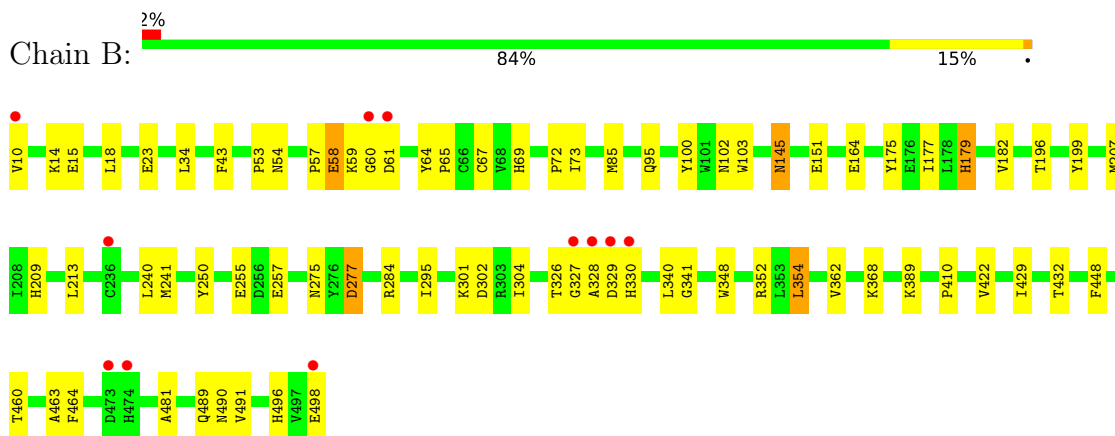
### 3 Residue-property plots [i](#)

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

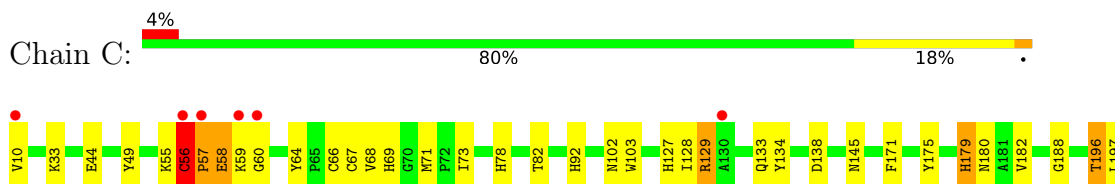
- Molecule 1: Hemocyanin type 1



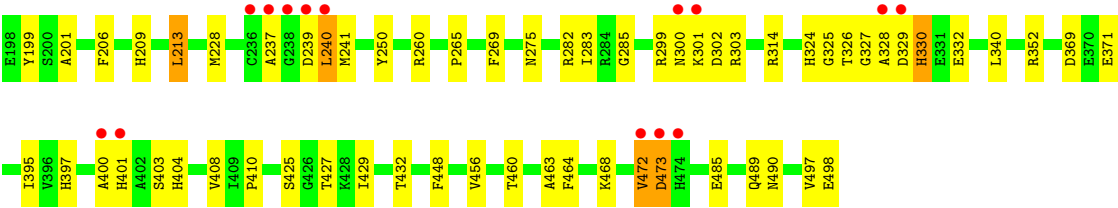
- Molecule 2: Hemocyanin type 1



- 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, $\alpha$ , $\beta$ , $\gamma$	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)	98.9 (28.60-2.00) 98.9 (28.60-2.00)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.69 (at 2.00Å)	Xtriage
Refinement program	PHENIX 1.21_5207	Depositor
R, $R_{free}$	0.167 , 0.209 0.167 , 0.209	Depositor DCC
$R_{free}$ test set	6375 reflections (4.99%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	26.0	Xtriage
Anisotropy	0.497	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.37 , 43.4	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
$F_o, F_c$ correlation	0.96	EDS
Total number of atoms	13136	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	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.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical 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: MAN, OH, CU, O, EOH

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	0.39	0/4094	0.58	1/5554 (0.0%)
2	B	0.40	0/4093	0.59	0/5553
2	C	0.37	0/4082	0.57	1/5538 (0.0%)
All	All	0.39	0/12269	0.58	2/16645 (0.0%)

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
2	C	0	1
All	All	0	2

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	55	LYS	C-N-CA	-5.19	108.72	121.70
2	C	55	LYS	C-N-CA	-5.17	108.76	121.70

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	56	CYS	Peptide
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	3821	87	0
2	B	3977	0	3819	69	0
2	C	3967	0	3810	85	0
3	A	12	12	12	5	0
3	B	12	12	12	1	0
3	C	12	12	12	1	0
4	A	3	6	6	9	0
4	B	3	6	6	6	0
4	C	3	6	6	0	0
5	A	2	0	0	0	0
5	B	2	0	0	1	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	4	0
8	A	379	0	0	20	1
8	B	410	0	0	18	1
8	C	314	0	0	14	0
All	All	13080	56	11504	249	2

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 11.

All (249) 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	1.55	1.30
1:A:67:CYS:SG	1:A:69:HIS:HE1	1.59	1.24
1:A:67:CYS:SG	1:A:69:HIS:CE1	2.43	1.10
2:C:67:CYS:SG	2:C:69:HIS:HE1	1.73	1.10
2:B:67:CYS:SG	2:B:69:HIS:CE1	2.46	1.06
2:B:10:VAL:HG22	2:B:275:ASN:HD21	1.22	1.01
1:A:257:GLU:OE1	8:A:602:HOH:O	1.79	1.01
2:C:67:CYS:SG	2:C:69:HIS:CE1	2.57	0.97
2:B:301:LYS:NZ	8:B:602:HOH:O	1.97	0.97

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:179:HIS:NE2	7:B:505:O:O	1.97	0.97
2:C:282:ARG:NH1	2:C:285:GLY:O	1.98	0.96
2:C:485:GLU:OE2	8:C:601:HOH:O	1.85	0.95
1:A:56:CYS:O	1:A:58:GLU:N	2.03	0.91
2:B:145:ASN:OD1	3:B:501:MAN:O2	1.89	0.89
1:A:497:VAL:HG12	1:A:498:GLU:H	1.37	0.88
1:A:434:ILE:HD11	8:A:635:HOH:O	1.73	0.87
2:C:314:ARG:NH1	8:C:605:HOH:O	2.08	0.87
2:B:196:THR:HG23	2:B:199:TYR:H	1.36	0.87
2:C:10:VAL:HG22	2:C:275:ASN:OD1	1.78	0.82
1:A:198:GLU:OE2	8:A:603:HOH:O	1.96	0.82
2:B:10:VAL:HG22	2:B:275:ASN:ND2	1.94	0.82
2:C:332:GLU:OE2	8:C:603:HOH:O	1.95	0.82
2:B:328:ALA:HB1	8:B:603:HOH:O	1.79	0.82
1:A:58:GLU:OE1	8:A:605:HOH:O	1.98	0.81
4:A:502:EOH:O	8:A:604:HOH:O	1.97	0.81
2:C:237:ALA:HB1	2:C:240:LEU:HD23	1.62	0.81
5:B:504:CU:CU	7:B:505:O:O	1.31	0.81
4:B:502:EOH:H12	8:B:606:HOH:O	1.81	0.81
2:B:102:ASN:HD21	2:B:284:ARG:H	1.26	0.80
2:C:228:MET:SD	8:C:914:HOH:O	2.39	0.79
1:A:474:HIS:N	8:A:606:HOH:O	2.01	0.78
1:A:10:VAL:HG22	1:A:275:ASN:HD21	1.46	0.78
1:A:241:MET:HE3	1:A:265:PRO:HB2	1.63	0.78
2:B:57:PRO:O	2:B:58:GLU:HB3	1.84	0.78
7:B:505:O:O	7:B:506:O:O	2.02	0.77
2:C:485:GLU:OE1	8:C:604:HOH:O	2.01	0.77
1:A:10:VAL:HG22	1:A:275:ASN:ND2	1.99	0.77
2:C:57:PRO:HD3	2:C:64:TYR:CE1	2.19	0.77
1:A:145:ASN:HD21	3:A:501:MAN:H3	1.47	0.76
2:C:10:VAL:HG13	2:C:275:ASN:HD21	1.51	0.76
1:A:56:CYS:C	1:A:58:GLU:H	1.88	0.76
1:A:460:THR:OG1	8:A:607:HOH:O	2.04	0.75
1:A:91:ASN:ND2	8:A:611:HOH:O	2.20	0.73
2:B:73:ILE:HD11	2:B:241:MET:SD	2.28	0.73
1:A:497:VAL:HG12	1:A:498:GLU:N	2.02	0.73
2:B:57:PRO:O	8:B:604:HOH:O	2.06	0.73
2:B:151:GLU:OE1	8:B:602:HOH:O	2.08	0.72
2:C:196:THR:CG2	2:C:199:TYR:H	2.02	0.72
2:C:56:CYS:O	2:C:58:GLU:N	2.22	0.72
1:A:68:VAL:HG11	1:A:73:ILE:HG13	1.74	0.70

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:341:GLY:HA2	8:B:610:HOH:O	1.91	0.70
2:C:472:VAL:O	2:C:473:ASP:HB2	1.90	0.70
1:A:303:ARG:NH2	8:A:609:HOH:O	2.10	0.69
1:A:225:LYS:HG2	1:A:231:TYR:CE1	2.27	0.69
2:C:326:THR:O	2:C:328:ALA:N	2.23	0.69
2:B:277:ASP:OD1	8:B:605:HOH:O	2.10	0.69
2:C:196:THR:HG22	2:C:199:TYR:H	1.55	0.69
1:A:196:THR:CG2	1:A:199:TYR:H	2.06	0.68
1:A:239:ASP:O	8:A:608:HOH:O	2.10	0.68
1:A:400:ALA:O	8:A:610:HOH:O	2.11	0.68
1:A:70:GLY:CA	4:A:502:EOH:H21	2.23	0.68
2:C:78:HIS:O	2:C:82:THR:HG23	1.95	0.67
1:A:145:ASN:ND2	3:A:501:MAN:H3	2.10	0.67
1:A:10:VAL:HG12	8:A:962:HOH:O	1.94	0.67
2:C:127:HIS:HB2	2:C:134:TYR:CE1	2.29	0.66
2:B:348:TRP:CE2	4:B:502:EOH:H22	2.31	0.65
1:A:145:ASN:ND2	3:A:501:MAN:O1	2.30	0.65
2:C:329:ASP:O	2:C:330:HIS:HB2	1.96	0.65
2:B:164:GLU:HG2	2:B:295:ILE:HG23	1.79	0.64
2:C:352:ARG:HH12	2:C:498:GLU:CD	2.01	0.63
2:B:429:ILE:HD11	2:B:464:PHE:CE2	2.34	0.63
1:A:328:ALA:HB2	8:A:670:HOH:O	1.98	0.63
2:C:129:ARG:N	8:C:602:HOH:O	1.95	0.62
2:C:241:MET:HE3	2:C:265:PRO:HB2	1.80	0.61
2:C:128:ILE:O	2:C:129:ARG:CB	2.46	0.61
1:A:62:ASP:HA	8:A:619:HOH:O	1.98	0.61
2:B:10:VAL:HG13	2:B:275:ASN:OD1	2.00	0.61
2:B:196:THR:CG2	2:B:199:TYR:H	2.11	0.61
1:A:410:PRO:HB3	1:A:434:ILE:CG2	2.30	0.60
1:A:497:VAL:CG1	1:A:498:GLU:H	2.11	0.60
2:C:58:GLU:HB2	2:C:250:TYR:CE2	2.37	0.60
4:A:502:EOH:H12	8:A:656:HOH:O	2.00	0.59
2:B:340:LEU:CB	8:B:606:HOH:O	2.50	0.59
2:C:82:THR:HG22	8:C:830:HOH:O	2.02	0.59
1:A:175:TYR:CZ	1:A:213:LEU:HG	2.38	0.59
2:C:58:GLU:HB2	2:C:250:TYR:CD2	2.38	0.58
1:A:257:GLU:CD	1:A:257:GLU:H	2.06	0.58
2:C:197:LEU:CD1	2:C:340:LEU:HB3	2.33	0.58
1:A:251:LYS:HE2	1:A:251:LYS:H	1.68	0.57
1:A:196:THR:HG22	1:A:199:TYR:H	1.70	0.57
2:C:133:GLN:HG3	8:C:686:HOH:O	2.04	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:145:ASN:HD21	3:A:501:MAN:C3	2.15	0.56
4:B:502:EOH:C1	8:B:606:HOH:O	2.48	0.56
2:C:352:ARG:NH1	2:C:498:GLU:OE2	2.36	0.56
2:C:300:ASN:OD1	2:C:401:HIS:NE2	2.38	0.56
2:C:303:ARG:NH1	8:C:606:HOH:O	2.08	0.55
2:C:128:ILE:O	2:C:129:ARG:HB2	2.06	0.55
1:A:145:ASN:HD21	3:A:501:MAN:C2	2.19	0.55
2:C:44:GLU:OE1	2:C:128:ILE:O	2.25	0.55
1:A:70:GLY:HA2	4:A:502:EOH:H21	1.89	0.54
2:C:282:ARG:O	2:C:283:ILE:HD13	2.06	0.54
1:A:241:MET:HE2	1:A:269:PHE:CE2	2.42	0.54
1:A:57:PRO:HD3	1:A:64:TYR:CE2	2.43	0.53
1:A:68:VAL:HG11	1:A:73:ILE:CG1	2.37	0.53
2:B:58:GLU:HB2	2:B:250:TYR:CD2	2.43	0.53
2:B:490:ASN:O	8:B:608:HOH:O	2.19	0.53
2:C:239:ASP:O	2:C:240:LEU:CB	2.56	0.53
2:C:460:THR:CG2	2:C:463:ALA:HB2	2.38	0.53
1:A:332:GLU:OE1	1:A:364:HIS:HD2	1.91	0.53
4:A:502:EOH:C2	8:A:604:HOH:O	2.56	0.53
2:B:460:THR:HG23	2:B:463:ALA:HB2	1.91	0.53
2:C:369:ASP:OD2	2:C:397:HIS:HD2	1.92	0.53
1:A:348:TRP:CZ2	4:A:502:EOH:H11	2.44	0.53
2:C:239:ASP:O	2:C:240:LEU:HB3	2.08	0.52
1:A:241:MET:HE3	1:A:265:PRO:CB	2.38	0.52
2:C:427:THR:O	2:C:472:VAL:HG22	2.09	0.52
2:C:68:VAL:HG11	2:C:73:ILE:CG1	2.39	0.52
2:B:352:ARG:HH12	2:B:498:GLU:CD	2.12	0.52
2:C:473:ASP:C	2:C:497:VAL:HG11	2.30	0.52
1:A:239:ASP:O	1:A:240:LEU:CB	2.58	0.52
2:B:73:ILE:HG22	2:B:73:ILE:O	2.10	0.52
2:C:102:ASN:ND2	8:C:621:HOH:O	2.43	0.52
2:C:179:HIS:CE1	2:C:180:ASN:OD1	2.63	0.52
2:B:57:PRO:O	2:B:58:GLU:CB	2.54	0.52
4:B:502:EOH:H21	8:B:610:HOH:O	2.09	0.51
2:C:301:LYS:HE3	2:C:303:ARG:CG	2.40	0.51
2:B:95:GLN:HE21	2:B:95:GLN:HA	1.75	0.51
2:B:340:LEU:HB2	8:B:606:HOH:O	2.10	0.51
2:C:71:MET:HG2	8:C:752:HOH:O	2.09	0.51
2:C:314:ARG:NH1	8:C:620:HOH:O	2.43	0.51
2:B:14:LYS:HE3	2:B:23:GLU:OE2	2.11	0.51
1:A:241:MET:HE2	1:A:269:PHE:HE2	1.73	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:324:HIS:HD2	1:A:325:GLY:O	1.94	0.51
1:A:410:PRO:HB3	1:A:434:ILE:HG23	1.93	0.51
2:B:73:ILE:CD1	2:B:241:MET:SD	2.99	0.51
2:B:177:ILE:HG13	2:B:354:LEU:HG	1.92	0.51
2:B:326:THR:HG23	2:B:327:GLY:N	2.25	0.50
2:C:299:ARG:O	2:C:400:ALA:O	2.29	0.50
2:B:257:GLU:OE2	8:B:607:HOH:O	2.18	0.50
2:B:15:GLU:HG2	2:B:100:TYR:CE2	2.46	0.50
1:A:460:THR:CG2	1:A:463:ALA:HB2	2.43	0.49
2:B:340:LEU:N	8:B:606:HOH:O	2.13	0.49
1:A:251:LYS:H	1:A:251:LYS:CE	2.25	0.49
2:C:49:TYR:O	2:C:66:CYS:HB2	2.13	0.49
2:C:404:HIS:ND1	8:C:607:HOH:O	2.15	0.49
2:B:10:VAL:N	2:B:275:ASN:OD1	2.46	0.49
1:A:70:GLY:HA3	4:A:502:EOH:H21	1.93	0.48
2:B:255:GLU:HG3	8:B:945:HOH:O	2.13	0.48
2:C:241:MET:HE1	2:C:269:PHE:CE2	2.49	0.48
1:A:481:ALA:HB2	1:A:491:VAL:CG1	2.44	0.48
2:C:472:VAL:O	2:C:473:ASP:CB	2.61	0.48
1:A:56:CYS:C	1:A:58:GLU:N	2.54	0.48
1:A:284:ARG:HG2	8:A:651:HOH:O	2.13	0.48
1:A:239:ASP:O	1:A:240:LEU:HB2	2.14	0.47
1:A:182:VAL:HB	1:A:209:HIS:CE1	2.50	0.47
1:A:456:VAL:CG1	1:A:484:HIS:HA	2.44	0.47
1:A:241:MET:CE	1:A:269:PHE:CE2	2.97	0.47
2:C:197:LEU:HD13	2:C:340:LEU:HB3	1.96	0.47
2:C:489:GLN:O	2:C:490:ASN:HB2	2.15	0.47
1:A:127:HIS:HB2	1:A:134:TYR:CE1	2.49	0.47
4:A:502:EOH:C1	8:A:656:HOH:O	2.59	0.47
2:C:324:HIS:HD2	2:C:325:GLY:O	1.97	0.47
1:A:329:GLU:HB2	1:A:330:HIS:H	1.64	0.47
2:C:175:TYR:CZ	2:C:213:LEU:HD13	2.49	0.47
1:A:11:LEU:HD11	1:A:90:LYS:HD2	1.96	0.46
2:C:429:ILE:HD11	2:C:464:PHE:CE2	2.50	0.46
2:B:182:VAL:HB	2:B:209:HIS:CE1	2.50	0.46
2:C:326:THR:C	2:C:328:ALA:H	2.16	0.46
1:A:70:GLY:HA2	4:A:502:EOH:C2	2.46	0.46
2:B:73:ILE:HG13	2:B:240:LEU:HG	1.97	0.46
2:B:53:PRO:O	2:B:54:ASN:HB2	2.16	0.46
2:C:425:SER:OG	2:C:473:ASP:O	2.24	0.46
1:A:237:ALA:HB1	1:A:240:LEU:HD23	1.98	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:201:ALA:HA	2:C:206:PHE:CD2	2.51	0.45
1:A:260:ARG:NE	8:A:627:HOH:O	2.47	0.45
2:C:301:LYS:HD2	2:C:302:ASP:O	2.17	0.45
2:B:304:ILE:HD12	2:B:362:VAL:HG11	1.98	0.45
1:A:175:TYR:CE1	1:A:213:LEU:HG	2.52	0.45
2:B:175:TYR:CZ	2:B:213:LEU:HG	2.52	0.45
2:C:460:THR:HG22	2:C:463:ALA:HB2	1.99	0.45
1:A:489:GLN:O	1:A:490:ASN:HB2	2.17	0.45
2:C:145:ASN:OD1	3:C:501:MAN:H3	2.17	0.45
2:C:241:MET:CE	2:C:269:PHE:CE2	3.01	0.44
1:A:225:LYS:HG2	1:A:231:TYR:CD1	2.52	0.44
1:A:31:LEU:HD23	1:A:122:PRO:HB2	1.98	0.44
2:C:237:ALA:O	2:C:241:MET:HG2	2.17	0.44
1:A:58:GLU:HB2	1:A:250:TYR:CE2	2.53	0.44
2:B:348:TRP:CZ2	4:B:502:EOH:H22	2.51	0.44
2:C:68:VAL:HG21	2:C:73:ILE:HD11	1.99	0.44
2:B:64:TYR:HB2	2:B:65:PRO:HD2	1.99	0.44
2:C:56:CYS:O	2:C:57:PRO:C	2.55	0.44
2:C:56:CYS:C	2:C:58:GLU:N	2.69	0.44
2:C:33:LYS:HE2	2:C:92:HIS:O	2.18	0.44
1:A:102:ASN:O	1:A:105:LYS:HG2	2.17	0.44
1:A:460:THR:HG23	1:A:463:ALA:HB2	2.00	0.44
2:B:34:LEU:HG	2:B:43:PHE:HB2	2.00	0.44
2:B:241:MET:HE3	8:B:712:HOH:O	2.17	0.44
2:C:260:ARG:NE	8:C:614:HOH:O	2.36	0.44
2:C:468:LYS:HE3	2:C:468:LYS:HB3	1.76	0.44
2:C:326:THR:HG23	2:C:371:GLU:HB3	1.99	0.44
1:A:51:GLY:HA2	1:A:65:PRO:HB3	2.00	0.43
2:B:422:VAL:HA	2:B:496:HIS:O	2.18	0.43
1:A:196:THR:HG23	1:A:199:TYR:H	1.80	0.43
2:B:304:ILE:CD1	2:B:362:VAL:HG11	2.47	0.43
2:B:326:THR:CG2	2:B:327:GLY:N	2.81	0.43
1:A:251:LYS:NZ	8:A:605:HOH:O	2.19	0.43
1:A:328:ALA:C	1:A:329:GLU:HG3	2.38	0.43
2:B:73:ILE:O	2:B:73:ILE:CG2	2.66	0.43
2:B:489:GLN:O	2:B:490:ASN:HB2	2.18	0.43
2:C:68:VAL:HG11	2:C:73:ILE:HG13	1.99	0.43
2:C:138:ASP:HB3	2:C:188:GLY:HA3	1.99	0.43
2:B:179:HIS:CE1	7:B:505:O:O	2.69	0.43
2:B:481:ALA:HB2	2:B:491:VAL:CG1	2.48	0.43
2:C:68:VAL:HG11	2:C:73:ILE:HG12	1.99	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:481:ALA:HB2	1:A:491:VAL:HG11	2.00	0.43
1:A:64:TYR:HB2	1:A:65:PRO:HD2	2.00	0.43
1:A:299:ARG:O	1:A:400:ALA:O	2.37	0.43
1:A:395:ILE:HB	1:A:408:VAL:HB	2.00	0.43
2:B:72:PRO:HB3	8:B:712:HOH:O	2.18	0.43
2:C:410:PRO:HA	2:C:432:THR:O	2.19	0.43
1:A:389:LYS:HB2	1:A:389:LYS:HE2	1.90	0.42
2:B:85:MET:CE	2:B:207:MET:CE	2.97	0.42
2:B:69:HIS:HB3	4:B:502:EOH:H23	2.02	0.42
2:B:410:PRO:HA	2:B:432:THR:O	2.20	0.42
2:C:395:ILE:HB	2:C:408:VAL:HB	2.01	0.42
1:A:410:PRO:HA	1:A:432:THR:O	2.19	0.42
1:A:177:ILE:HG13	1:A:354:LEU:HG	2.02	0.42
2:C:302:ASP:OD2	2:C:397:HIS:HE1	2.03	0.42
1:A:399:PRO:O	1:A:400:ALA:C	2.58	0.41
1:A:201:ALA:HA	1:A:206:PHE:CD2	2.55	0.41
2:B:448:PHE:CE2	2:C:448:PHE:CE2	3.08	0.41
2:C:302:ASP:OD1	2:C:400:ALA:N	2.53	0.41
2:B:196:THR:HG23	2:B:199:TYR:N	2.19	0.41
2:B:368:LYS:N	2:B:368:LYS:HD3	2.32	0.41
2:C:57:PRO:O	2:C:58:GLU:C	2.59	0.41
2:C:282:ARG:C	2:C:283:ILE:HD13	2.41	0.41
2:B:95:GLN:HA	2:B:95:GLN:NE2	2.35	0.41
2:C:182:VAL:HB	2:C:209:HIS:CE1	2.55	0.41
1:A:164:GLU:HG2	1:A:295:ILE:HG23	2.03	0.41
2:B:58:GLU:HB2	2:B:250:TYR:CE2	2.55	0.41
2:B:85:MET:HE2	2:B:207:MET:CE	2.51	0.41
2:B:95:GLN:HE21	2:B:95:GLN:CA	2.33	0.41
2:C:369:ASP:OD2	2:C:397:HIS:CD2	2.72	0.41
2:B:18:LEU:O	8:B:609:HOH:O	2.22	0.41
1:A:468:LYS:HD3	1:A:470:TYR:OH	2.21	0.40
1:A:410:PRO:HB3	1:A:434:ILE:HG22	2.03	0.40
2:B:389:LYS:HA	2:B:389:LYS:HD3	1.91	0.40
2:C:179:HIS:HB2	2:C:213:LEU:HG	2.03	0.40
2:B:60:GLY:O	2:B:61:ASP:CB	2.70	0.40

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

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
8:B:903:HOH:O	8:B:948:HOH:O[2_554]	2.14	0.06

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
8:A:968:HOH:O	8:A:968:HOH:O[2_554]	2.17	0.03

## 5.3 Torsion angles [i](#)

### 5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	487/489 (100%)	466 (96%)	14 (3%)	7 (1%)	9	4
2	B	487/489 (100%)	468 (96%)	16 (3%)	3 (1%)	22	17
2	C	487/489 (100%)	456 (94%)	22 (4%)	9 (2%)	7	3
All	All	1461/1467 (100%)	1390 (95%)	52 (4%)	19 (1%)	10	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	129	ARG
1	A	240	LEU
2	C	58	GLU
2	C	240	LEU
2	C	327	GLY
1	A	58	GLU
1	A	59	LYS
2	C	59	LYS
2	C	60	GLY
2	C	473	ASP
2	B	59	LYS
1	A	329	GLU
2	B	329	ASP

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Mol	Chain	Res	Type
2	B	58	GLU

### 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%)	414 (97%)	12 (3%)	38	40
2	B	426/430 (99%)	419 (98%)	7 (2%)	58	64
2	C	424/430 (99%)	415 (98%)	9 (2%)	48	53
All	All	1276/1290 (99%)	1248 (98%)	28 (2%)	47	51

All (28) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	103	TRP
1	A	179	HIS
1	A	196	THR
1	A	197	LEU
1	A	236	CYS
1	A	257	GLU
1	A	302	ASP
1	A	329	GLU
1	A	343	GLU
1	A	453	LYS
1	A	456	VAL
1	A	493	LEU
2	B	103	TRP
2	B	145	ASN
2	B	179	HIS
2	B	277	ASP
2	B	302	ASP
2	B	330	HIS
2	B	354	LEU
2	C	103	TRP
2	C	171	PHE

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Mol	Chain	Res	Type
2	C	179	HIS
2	C	196	THR
2	C	213	LEU
2	C	330	HIS
2	C	403	SER
2	C	456	VAL
2	C	472	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (5) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	145	ASN
1	A	364	HIS
2	B	95	GLN
2	C	275	ASN
2	C	397	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 [i](#)

Of 16 ligands modelled in this entry, 8 are monoatomic and 2 are modelled with single atom - leaving 6 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	EOH	A	502	-	2,2,2	0.30	0	1,1,1	0.72	0
4	EOH	C	502	-	2,2,2	0.34	0	1,1,1	0.44	0
3	MAN	C	501	-	12,12,12	0.61	0	17,17,17	0.89	0
3	MAN	B	501	-	12,12,12	0.65	0	17,17,17	2.23	6 (35%)
3	MAN	A	501	-	12,12,12	0.52	0	17,17,17	1.06	1 (5%)
4	EOH	B	502	-	2,2,2	0.40	0	1,1,1	0.32	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
3	MAN	B	501	-	-	2/2/22/22	0/1/1/1
3	MAN	A	501	-	-	2/2/22/22	0/1/1/1
3	MAN	C	501	-	-	0/2/22/22	0/1/1/1

There are no bond length outliers.

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	501	MAN	O5-C1-C2	6.06	121.10	110.28
3	B	501	MAN	O4-C4-C3	-2.98	103.47	110.35
3	B	501	MAN	O2-C2-C1	-2.56	103.22	109.16
3	A	501	MAN	C1-O5-C5	2.50	118.39	113.66
3	B	501	MAN	C1-C2-C3	2.48	115.46	110.31
3	B	501	MAN	C1-O5-C5	2.38	118.15	113.66
3	B	501	MAN	O1-C1-C2	-2.35	102.42	109.03

There are no chirality outliers.

All (4) torsion outliers are listed below:

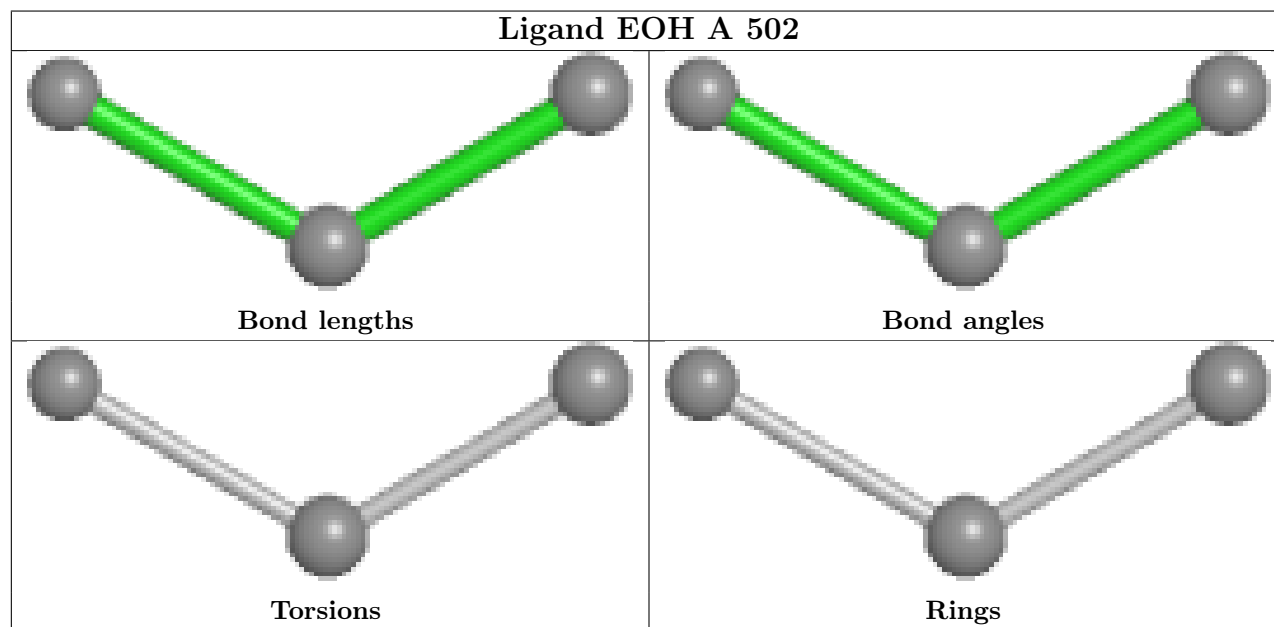
Mol	Chain	Res	Type	Atoms
3	A	501	MAN	O5-C5-C6-O6
3	A	501	MAN	C4-C5-C6-O6
3	B	501	MAN	O5-C5-C6-O6
3	B	501	MAN	C4-C5-C6-O6

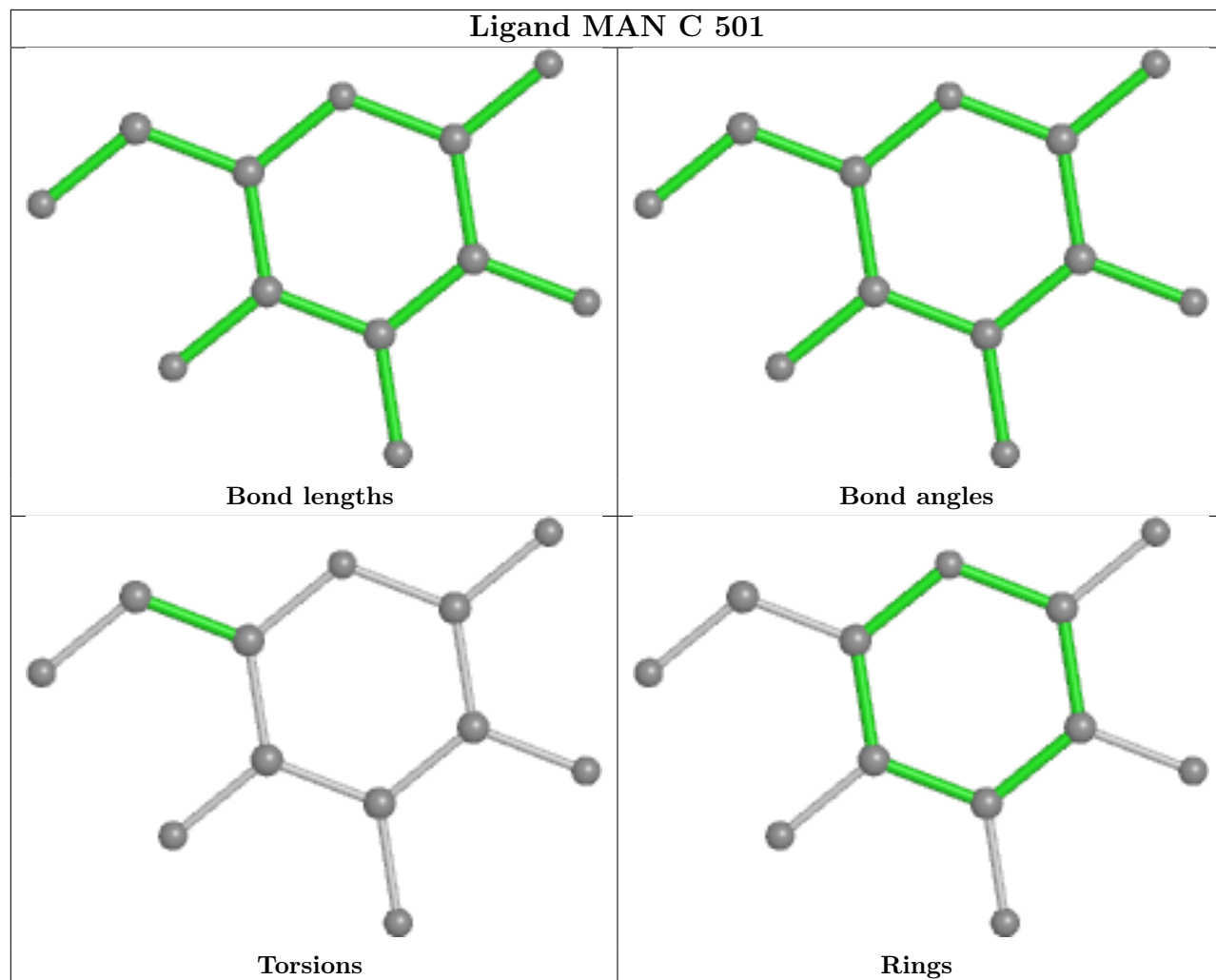
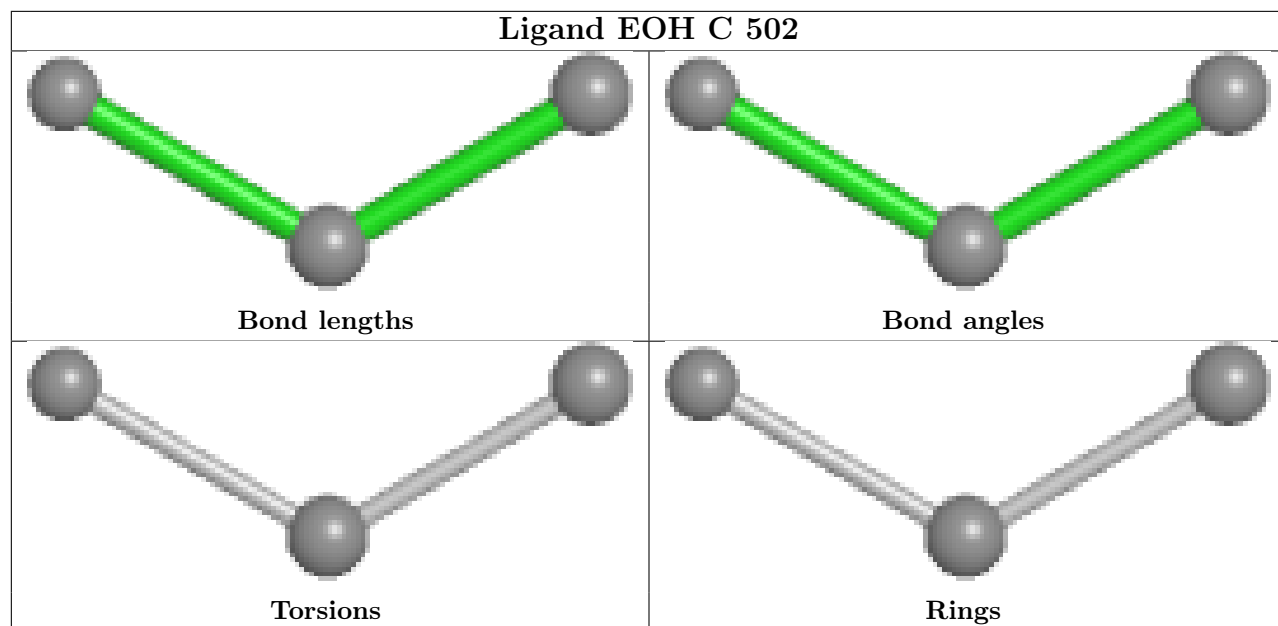
There are no ring outliers.

5 monomers are involved in 22 short contacts:

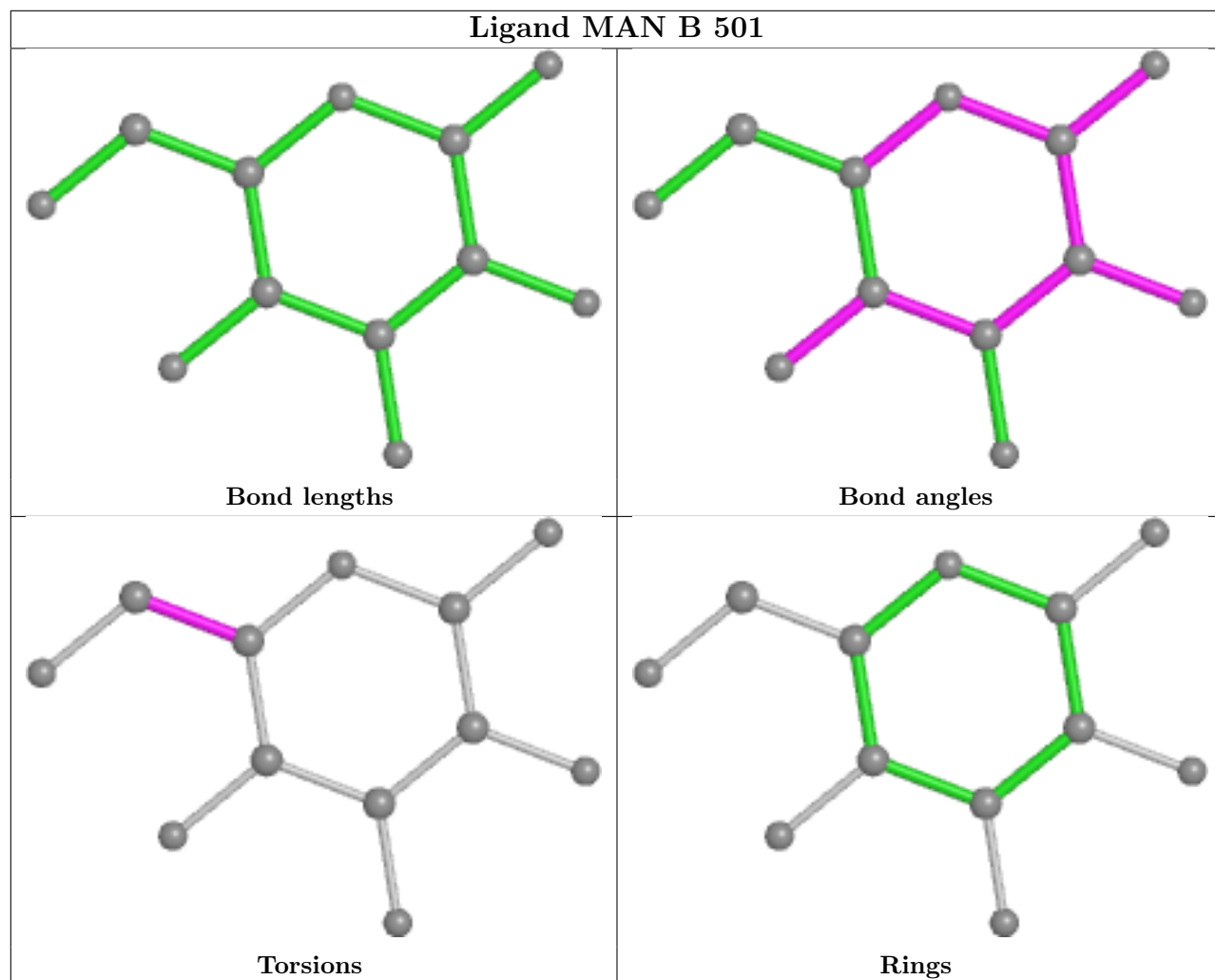
Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	A	502	EOH	9	0
3	C	501	MAN	1	0
3	B	501	MAN	1	0
3	A	501	MAN	5	0
4	B	502	EOH	6	0

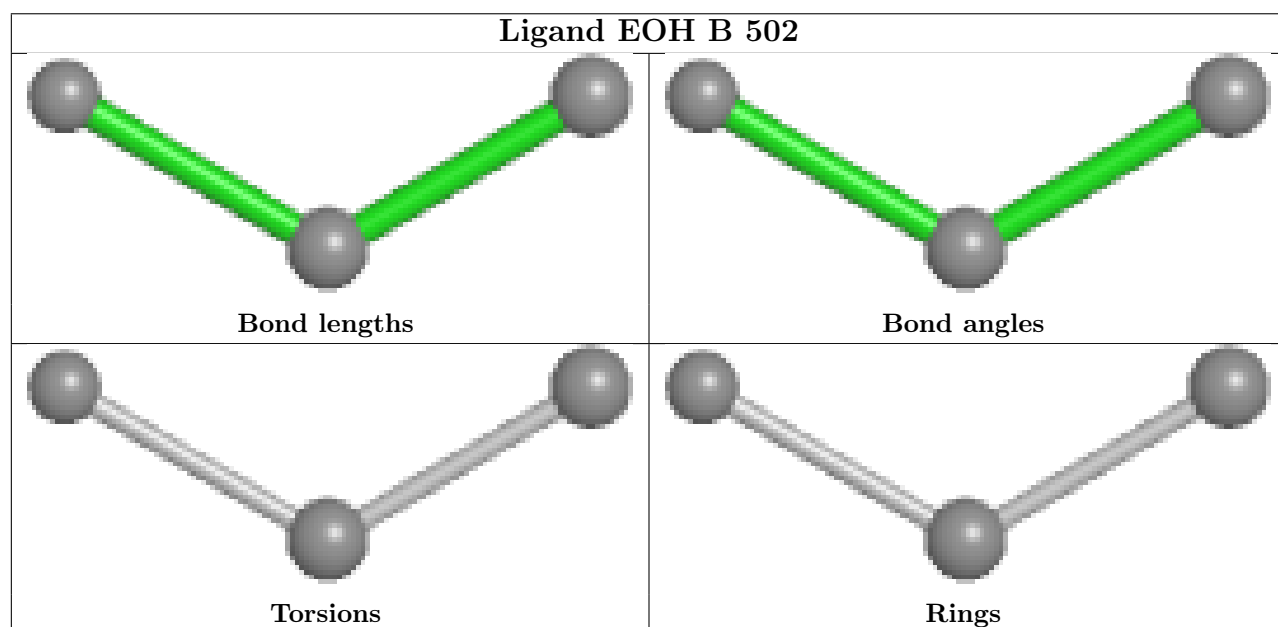
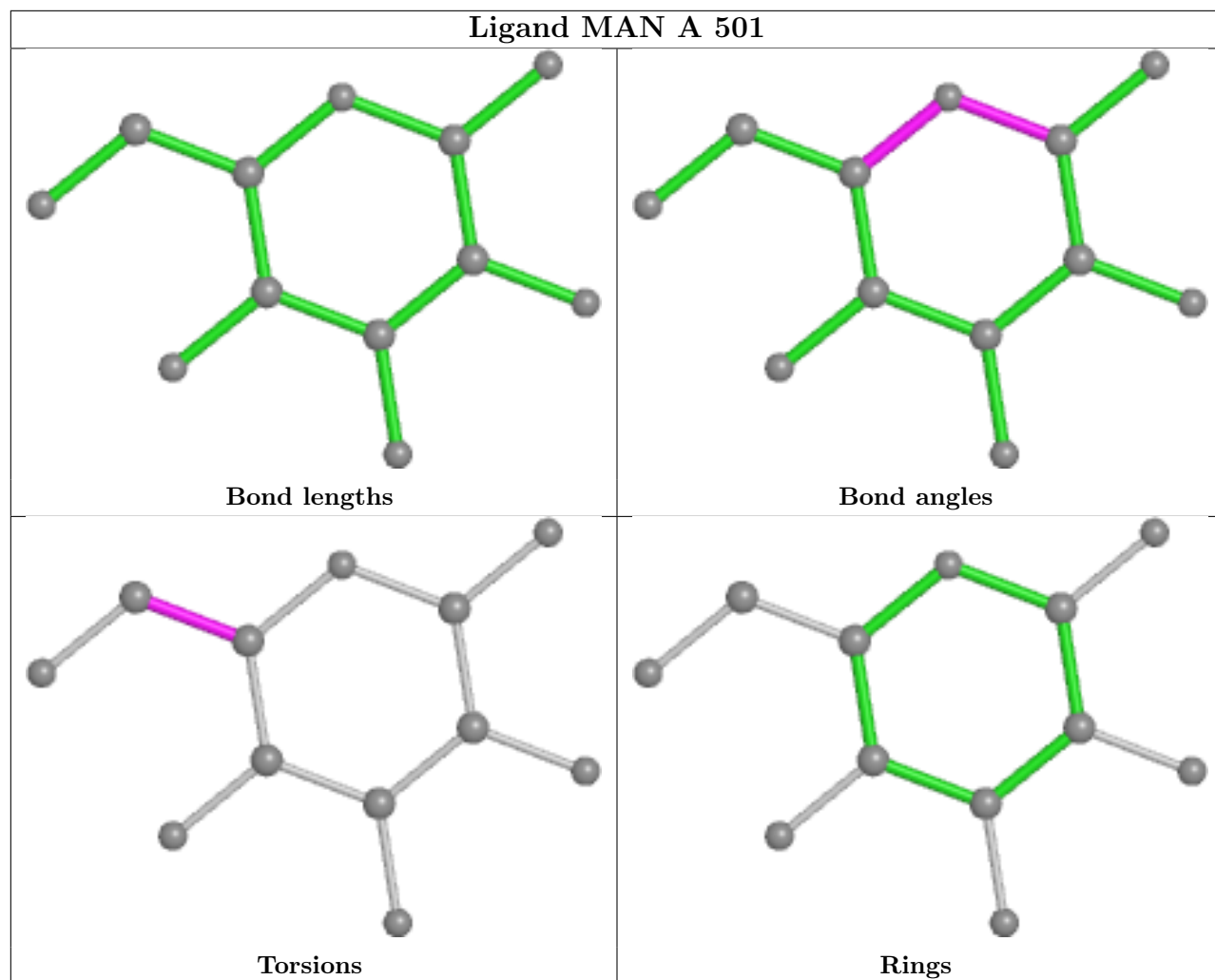
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. 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, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	489/489 (100%)	-0.27	13 (2%) 56 54	16, 27, 42, 65	0
2	B	489/489 (100%)	-0.37	11 (2%) 62 60	15, 25, 39, 67	0
2	C	489/489 (100%)	0.02	20 (4%) 42 40	18, 30, 48, 66	0
All	All	1467/1467 (100%)	-0.20	44 (2%) 52 51	15, 27, 44, 67	0

All (44) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	C	328	ALA	5.5
1	A	328	ALA	5.1
2	B	330	HIS	4.4
2	C	57	PRO	4.1
1	A	57	PRO	4.1
2	C	236	CYS	4.1
2	C	56	CYS	4.0
2	C	10	VAL	4.0
2	C	473	ASP	3.8
2	C	301	LYS	3.7
2	B	10	VAL	3.5
2	B	60	GLY	3.5
2	B	498	GLU	3.5
2	C	329	ASP	3.3
1	A	56	CYS	3.3
1	A	10	VAL	3.3
2	C	239	ASP	3.2
1	A	400	ALA	3.1
2	B	329	ASP	3.0
2	B	328	ALA	2.9
1	A	239	ASP	2.9
2	C	60	GLY	2.9
2	C	240	LEU	2.8

*Continued on next page...*

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Mol	Chain	Res	Type	RSRZ
2	B	473	ASP	2.8
2	C	474	HIS	2.7
2	C	401	HIS	2.7
1	A	60	GLY	2.6
1	A	61	ASP	2.6
1	A	401	HIS	2.6
2	B	61	ASP	2.5
2	C	59	LYS	2.5
2	C	300	ASN	2.5
1	A	473	ASP	2.4
2	C	237	ALA	2.4
1	A	330	HIS	2.4
2	C	130	ALA	2.3
2	C	400	ALA	2.3
2	B	327	GLY	2.3
1	A	474	HIS	2.2
2	B	474	HIS	2.2
2	B	236	CYS	2.1
1	A	329	GLU	2.0
2	C	238	GLY	2.0
2	C	472	VAL	2.0

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

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

## 6.3 Carbohydrates [i](#)

There are no monosaccharides in this entry.

## 6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95<sup>th</sup> 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( $\text{\AA}^2$ )	Q<0.9
3	MAN	A	501	12/12	0.40	0.16	67,79,93,94	0
3	MAN	B	501	12/12	0.55	0.15	56,67,78,78	0

*Continued on next page...*

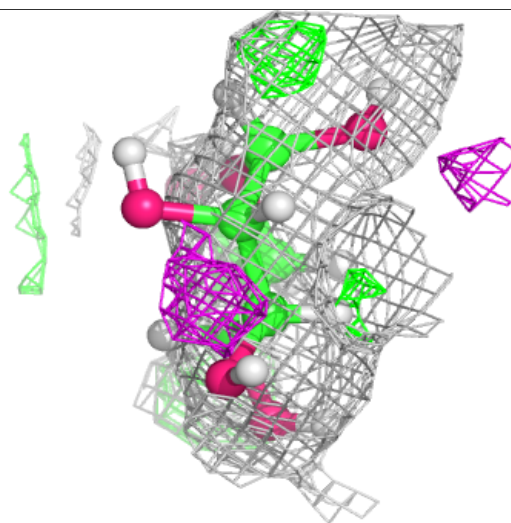
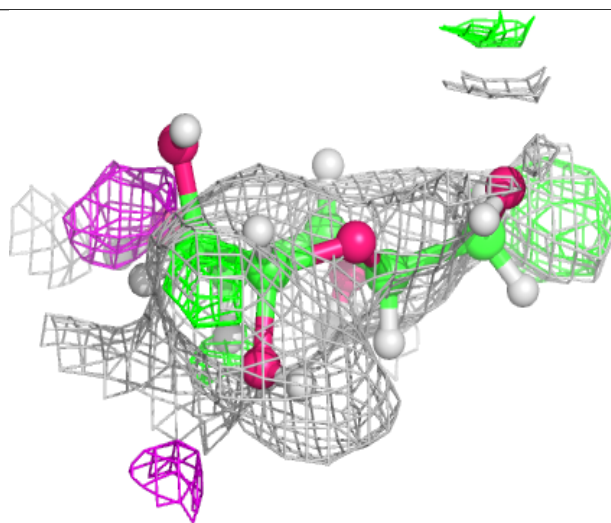
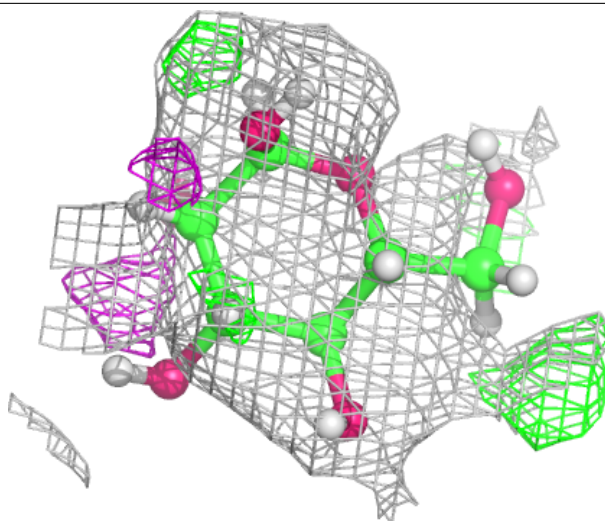
*Continued from previous page...*

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
3	MAN	C	501	12/12	0.60	0.16	60,76,89,93	0
4	EOH	B	502	3/3	0.67	0.20	21,25,34,38	0
4	EOH	C	502	3/3	0.77	0.15	28,34,41,41	0
4	EOH	A	502	3/3	0.78	0.31	30,37,44,44	0
6	OH	A	505	1/1	0.94	0.08	27,27,27,33	0
5	CU	A	504	1/1	0.95	0.06	37,37,37,37	0
7	O	B	506	1/1	0.96	0.17	22,22,22,22	0
6	OH	C	505	1/1	0.97	0.06	31,31,31,37	0
5	CU	C	504	1/1	0.98	0.03	37,37,37,37	0
7	O	B	505	1/1	0.98	0.07	16,16,16,16	0
5	CU	B	504	1/1	0.98	0.05	32,32,32,32	0
5	CU	C	503	1/1	0.99	0.03	29,29,29,29	0
5	CU	B	503	1/1	0.99	0.02	23,23,23,23	0
5	CU	A	503	1/1	0.99	0.02	24,24,24,24	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.

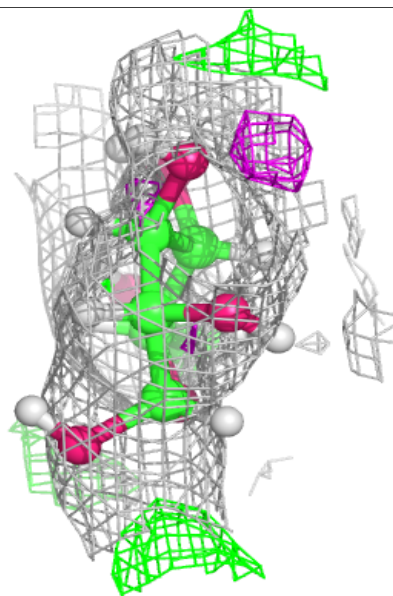
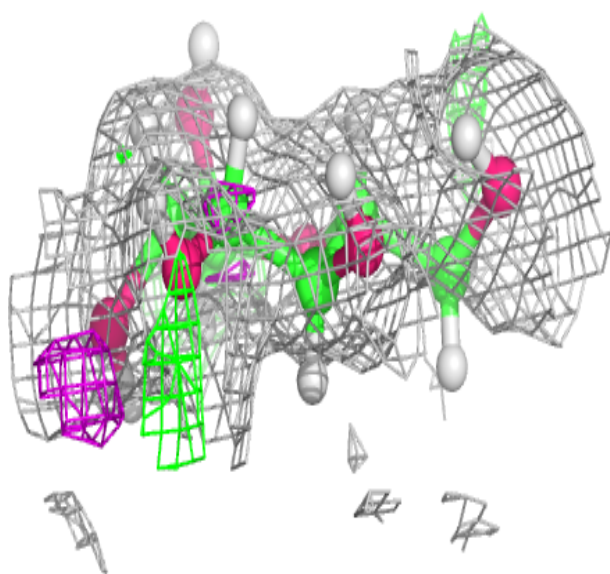
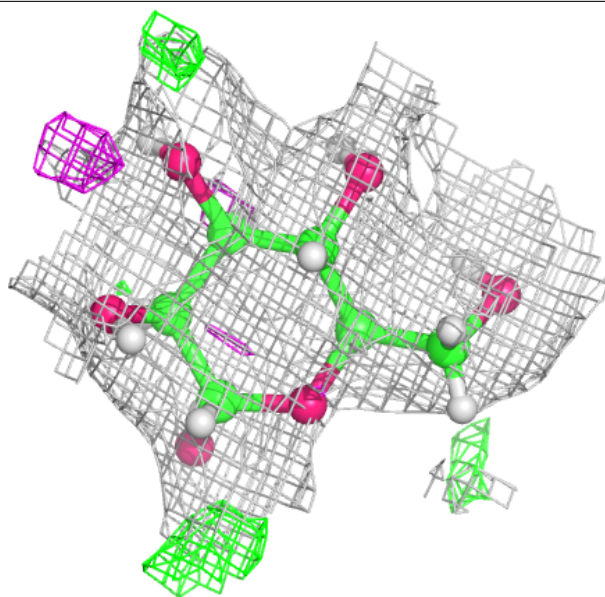
**Electron density around MAN A 501:**

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



**Electron density around MAN B 501:**

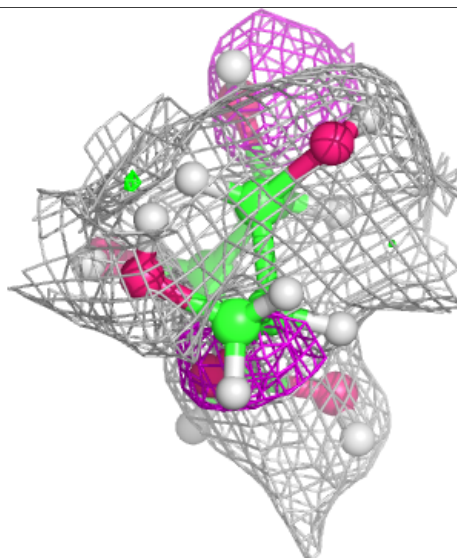
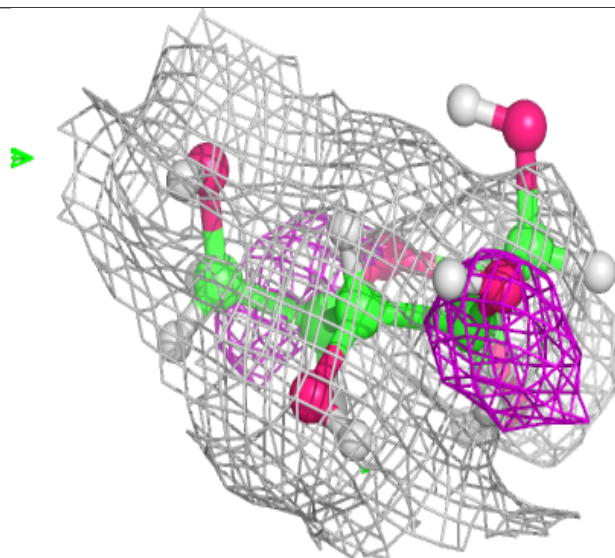
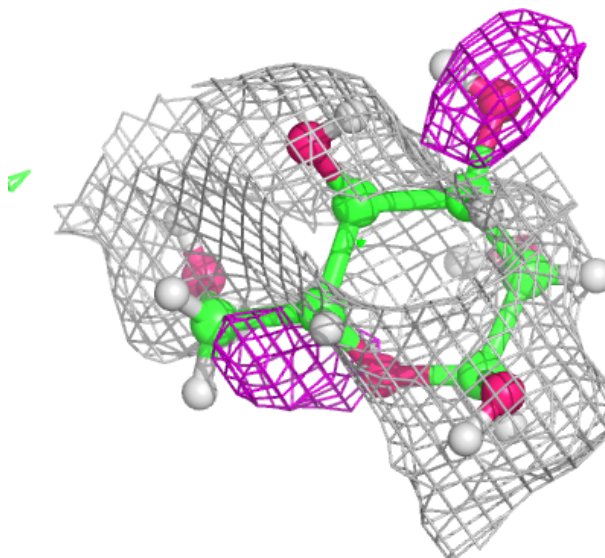
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)





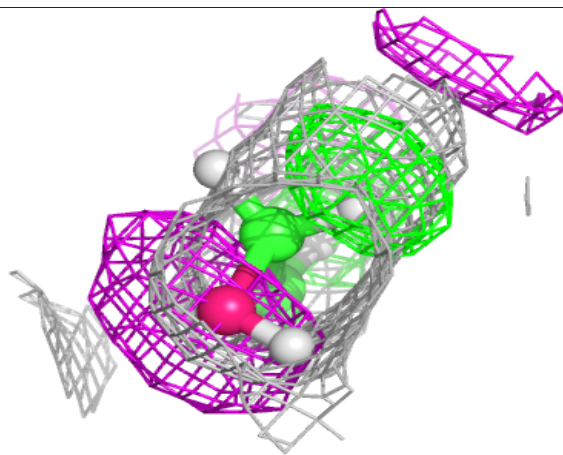
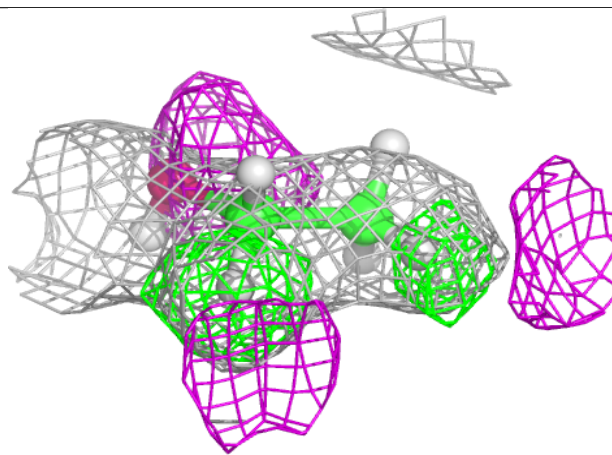
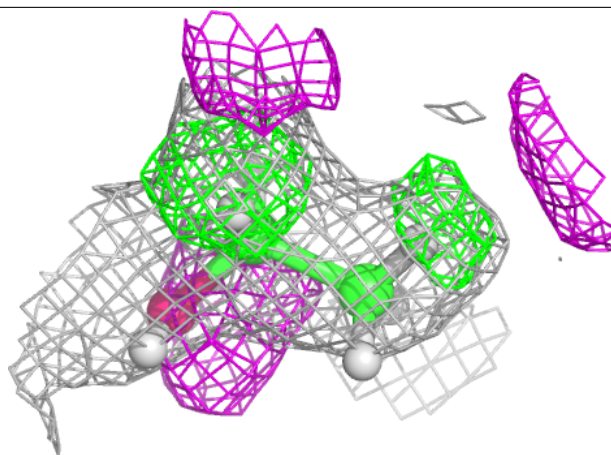
**Electron density around MAN C 501:**

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



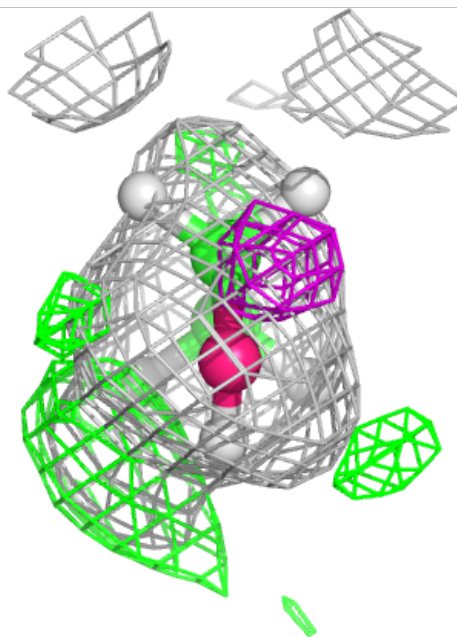
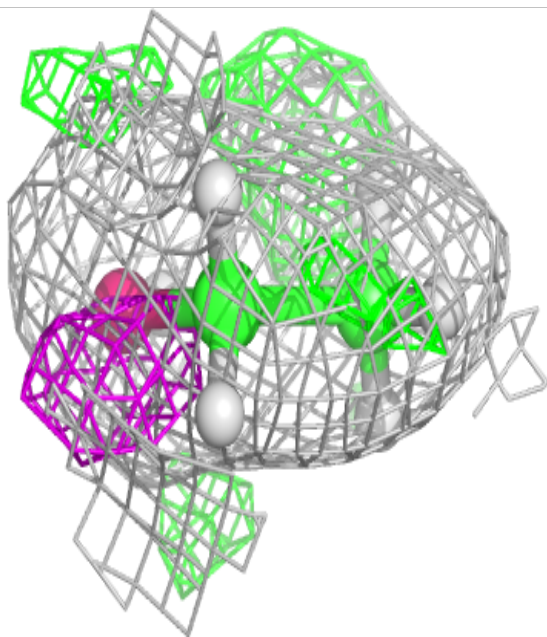
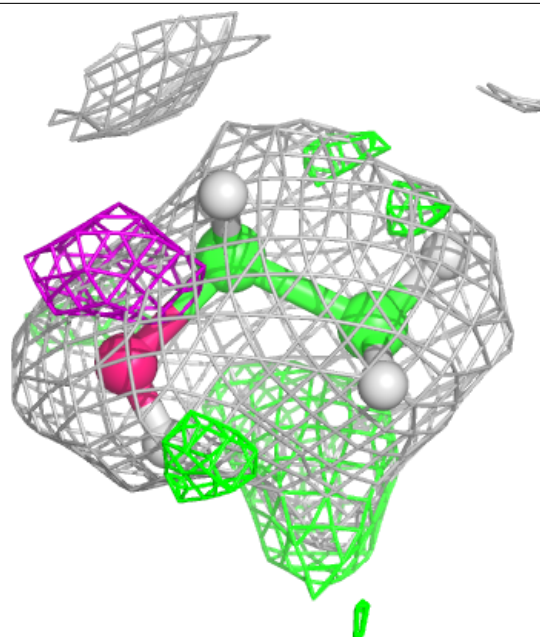
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and green (positive)



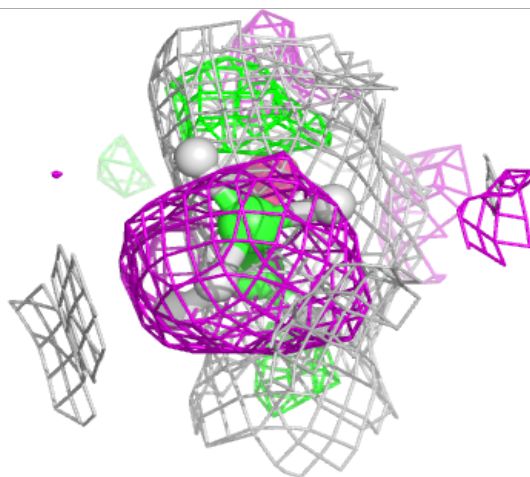
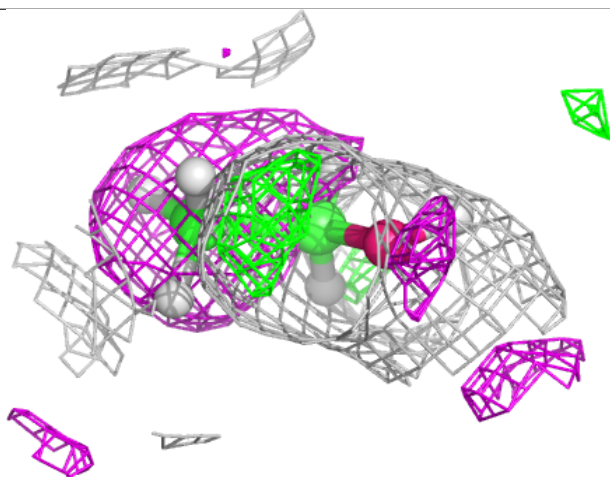
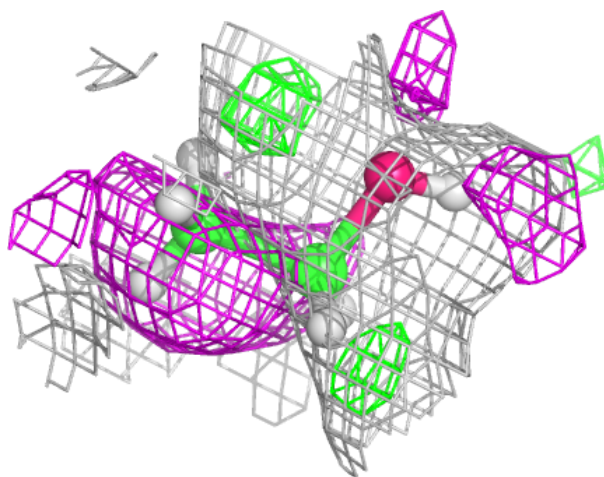
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 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)



**Electron density around EOH A 502:**

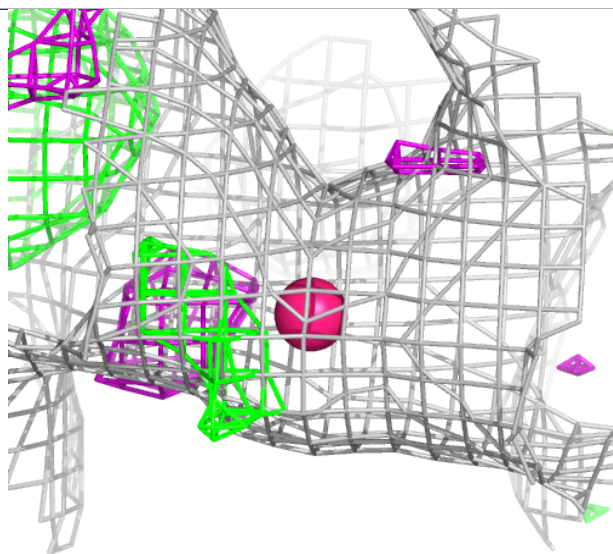
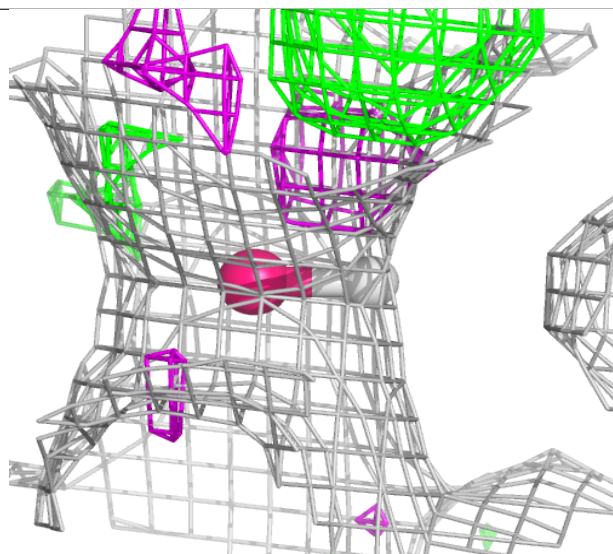
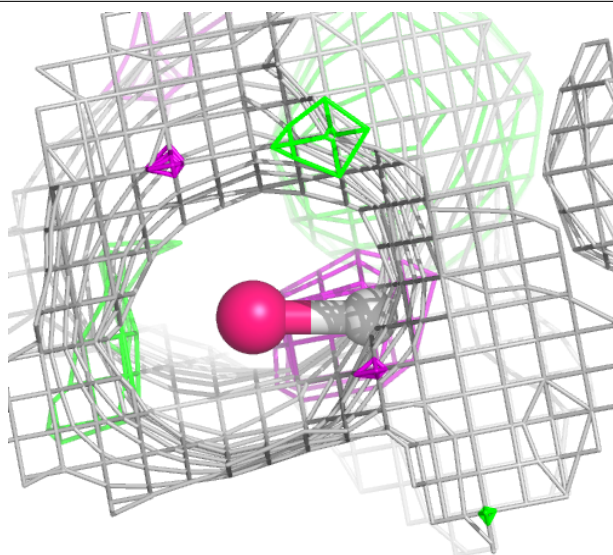
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 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)





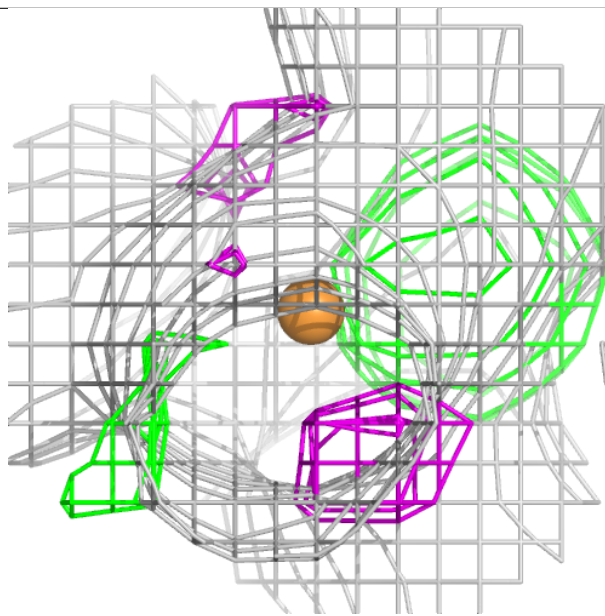
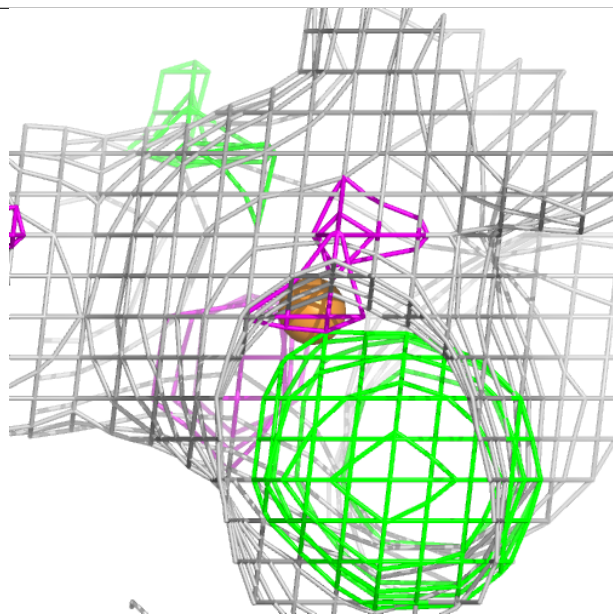
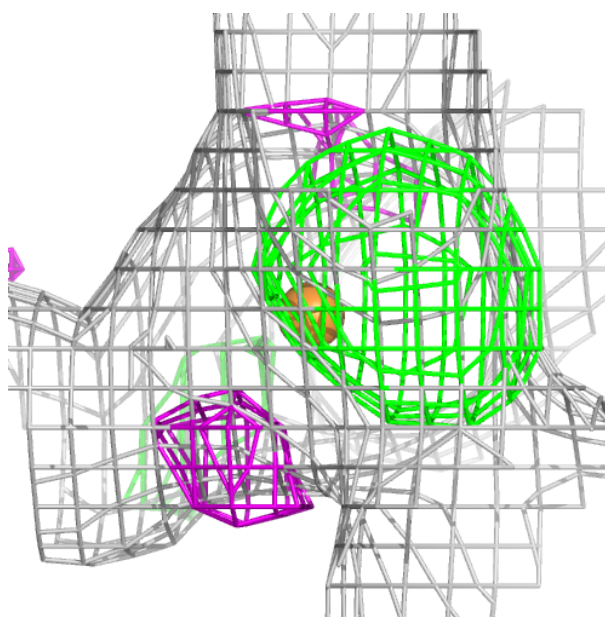
**Electron density around OH A 505:**

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and green (positive)



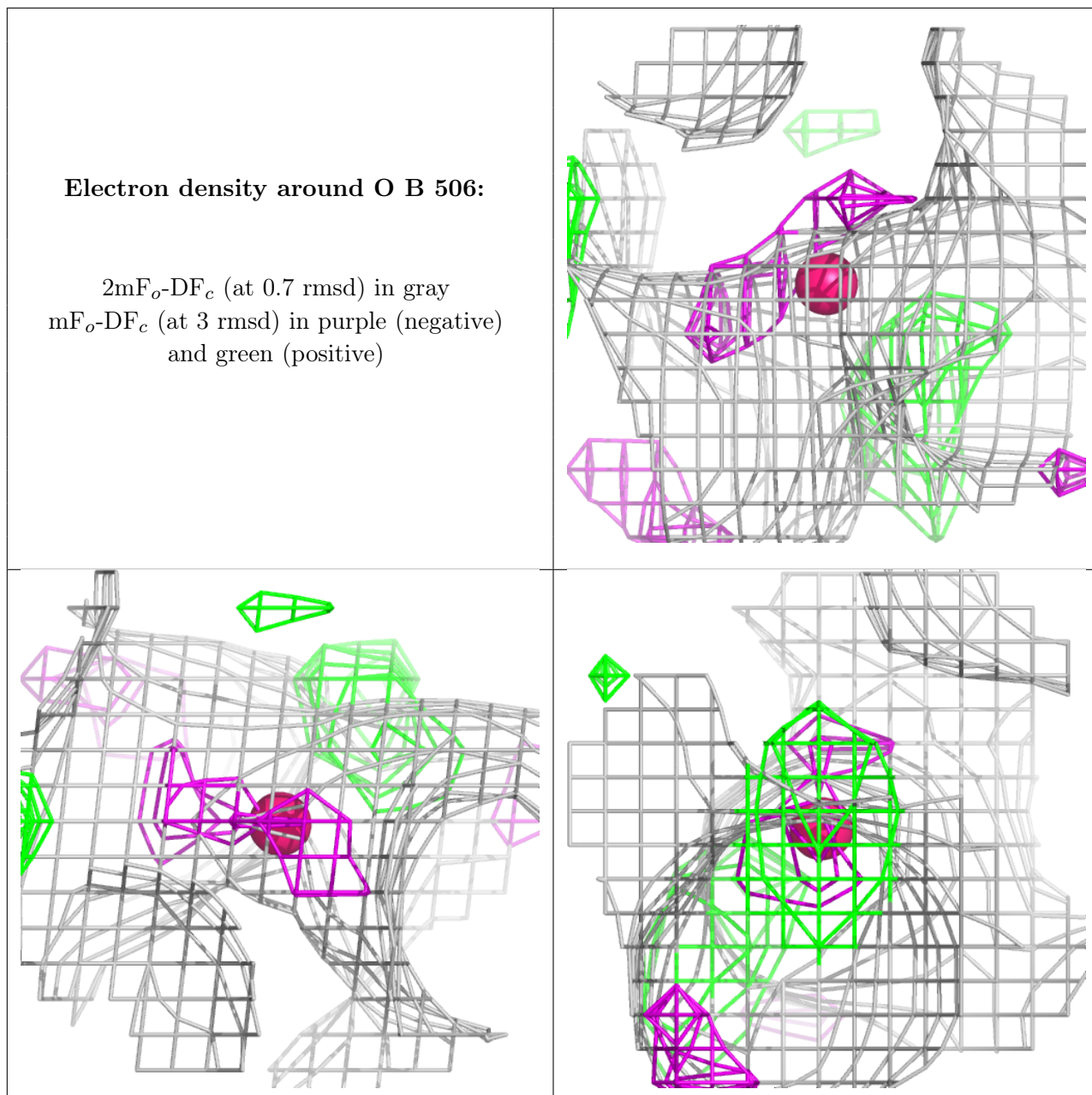
**Electron density around CU A 504:**

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and green (positive)



**Electron density around O B 506:**

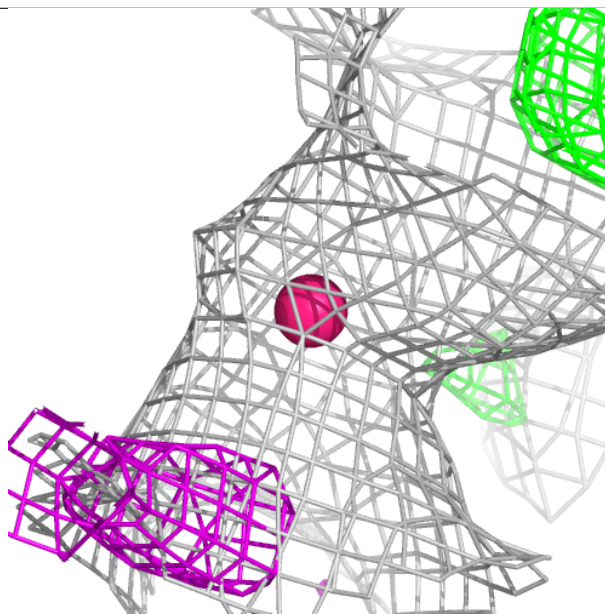
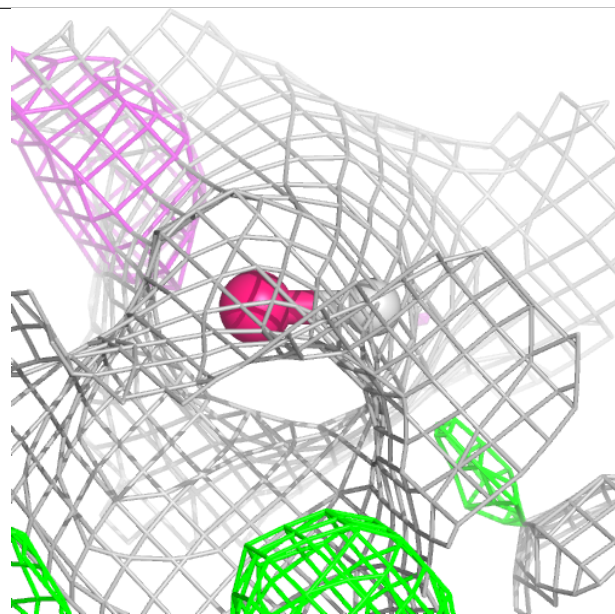
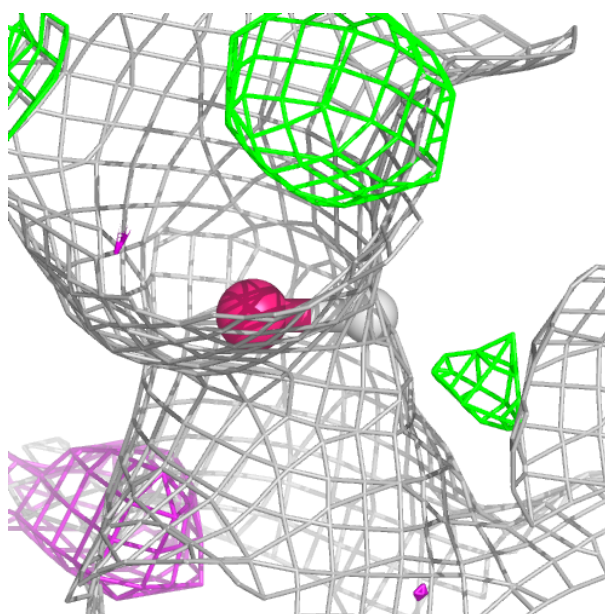
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)





**Electron density around OH C 505:**

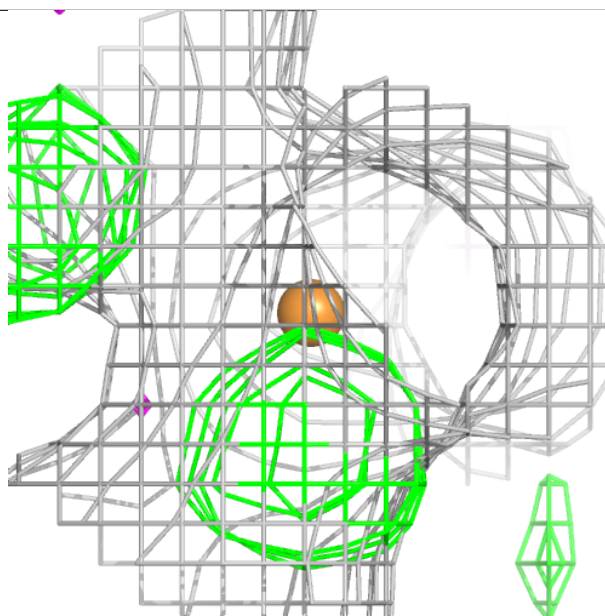
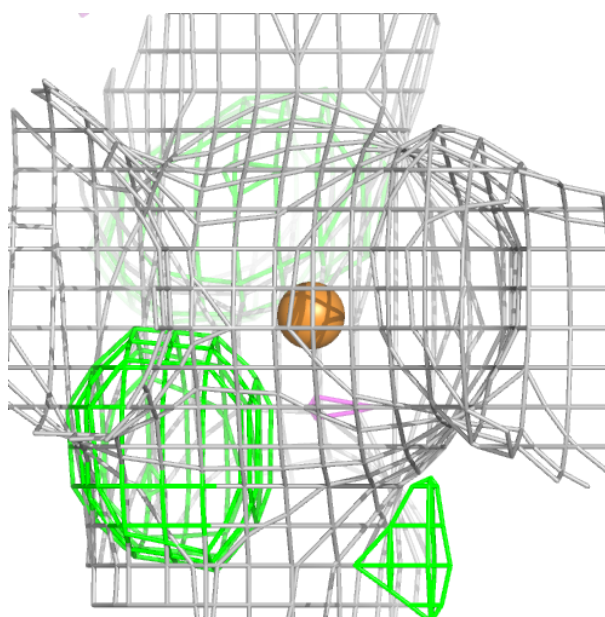
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 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)





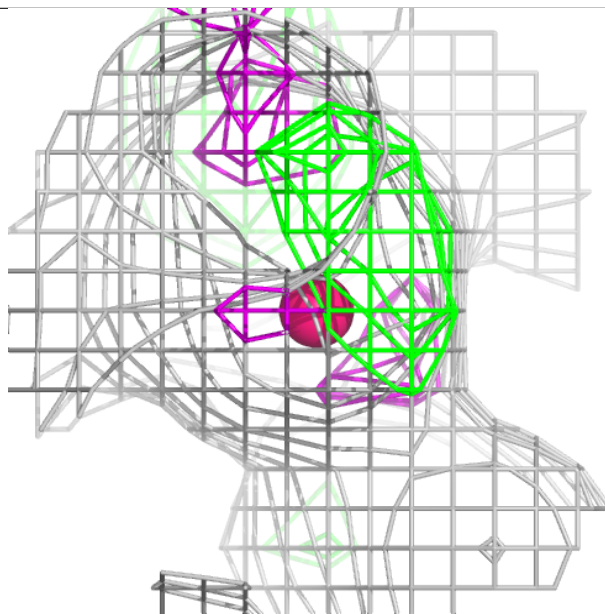
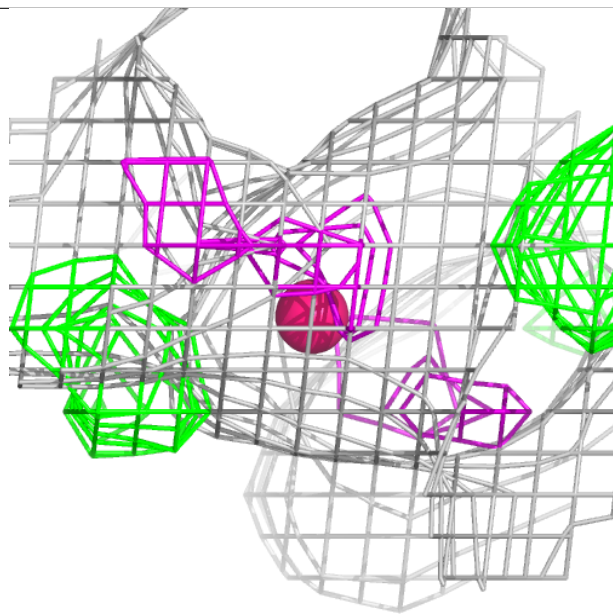
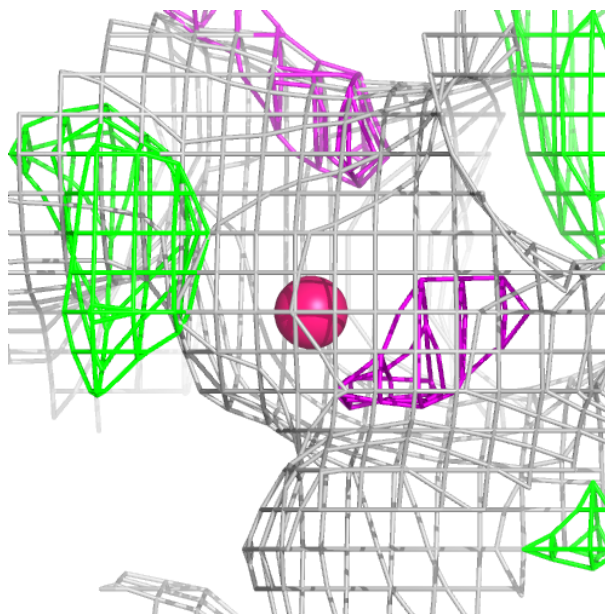
**Electron density around CU C 504:**

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and green (positive)



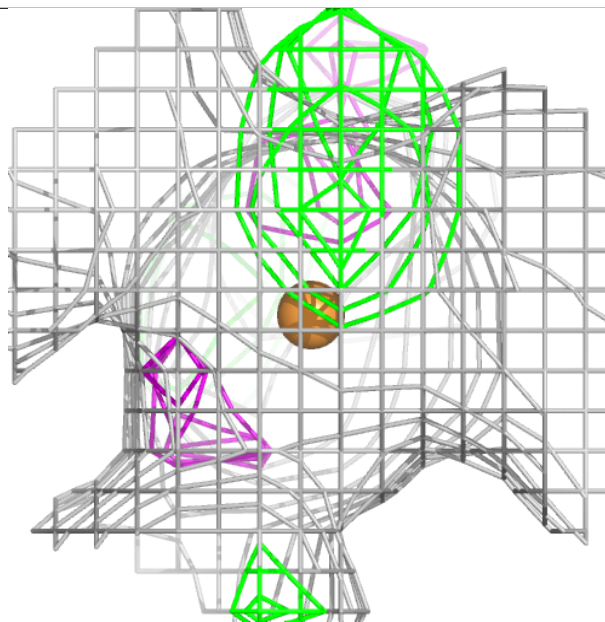
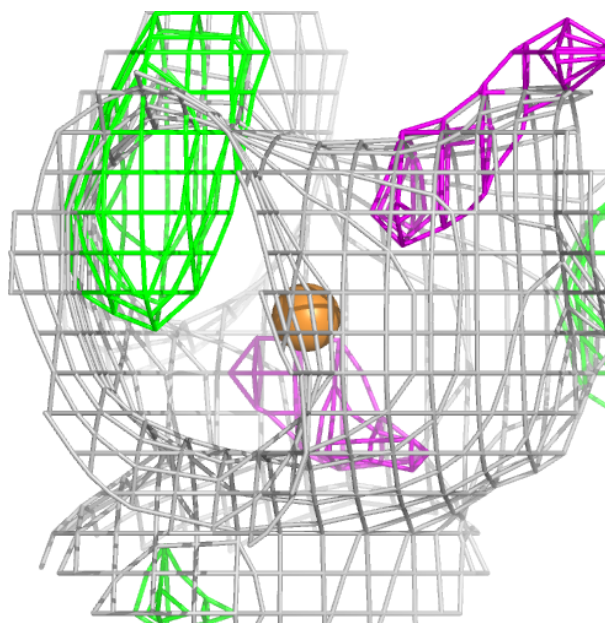
**Electron density around O B 505:**

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and green (positive)



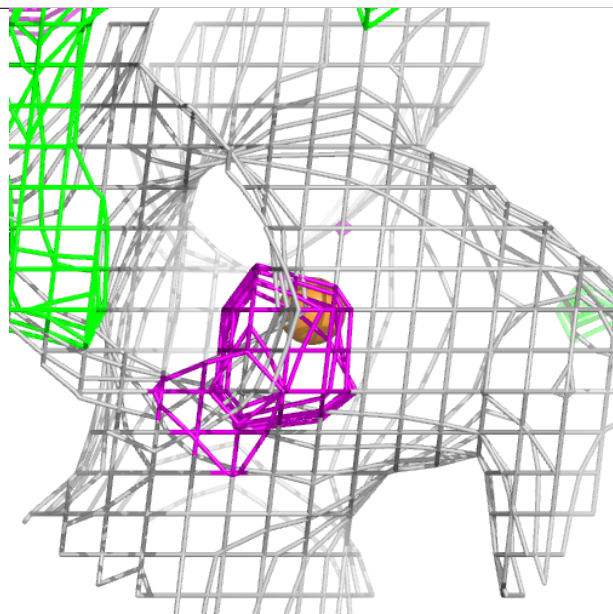
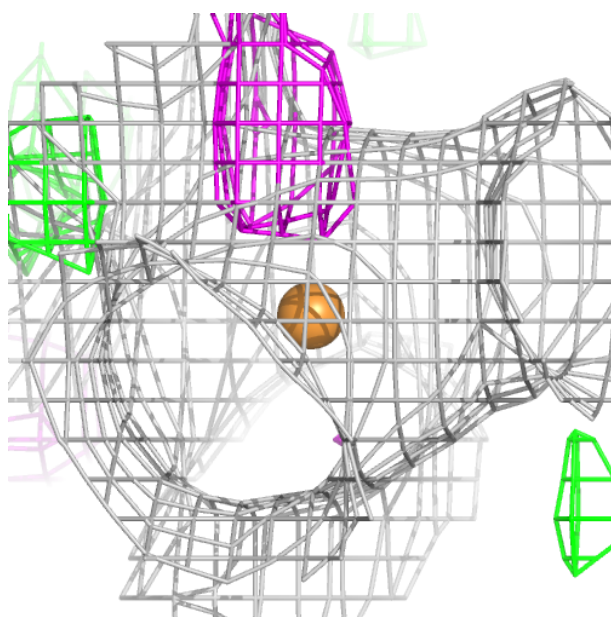
**Electron density around CU B 504:**

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and green (positive)



**Electron density around CU C 503:**

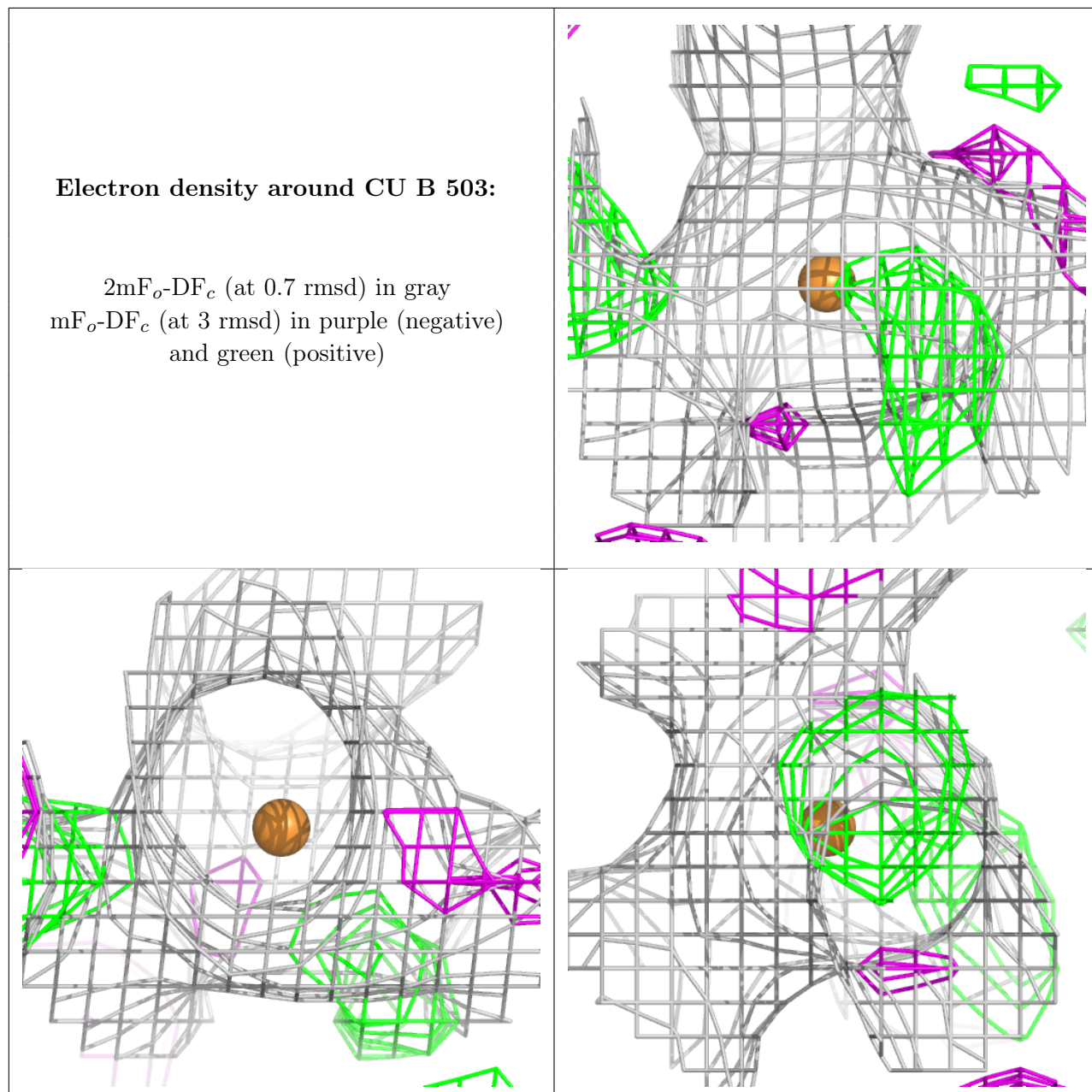
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and green (positive)





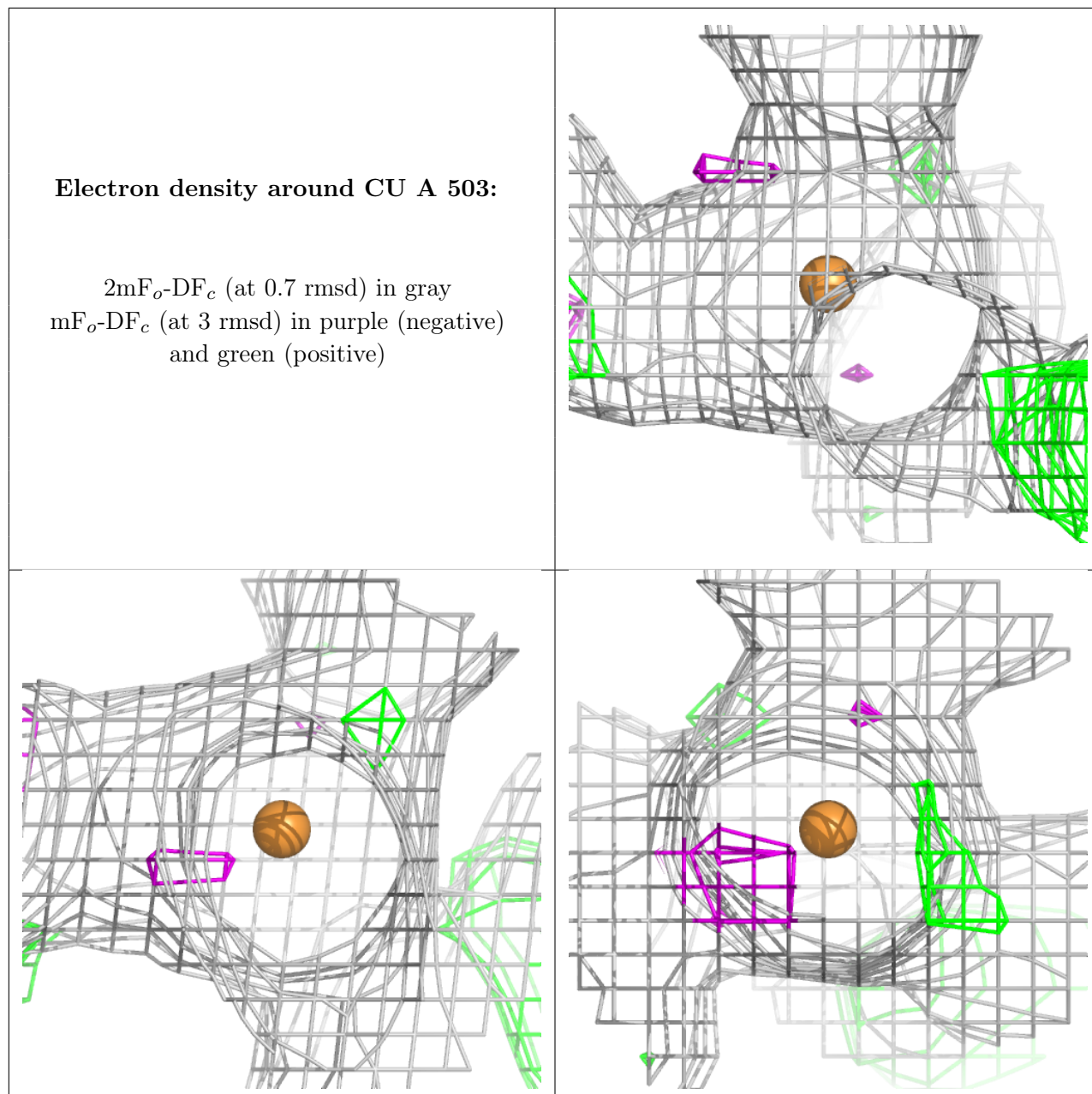
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and green (positive)



**Electron density around CU A 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.