WORLDWIDE PDB PROTEIN DATA BANK

Full wwPDB X-ray Structure Validation Report (i)

May 22, 2023 – 10:37 pm BST

PDB ID	:	8A6Z
Title	:	PcIDS1 in complex with Mn2+ and IPP
Authors	:	Ecker, F.; Boland, W.; Groll, M.
Deposited on	:	2022-06-20
Resolution	:	2.40 Å(reported)

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

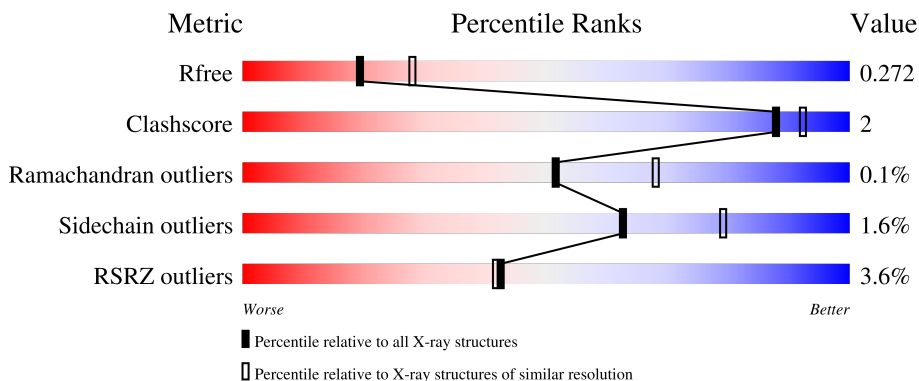|		
MolProbity	:	4.02b-467
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.33
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.33

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 2.40 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.
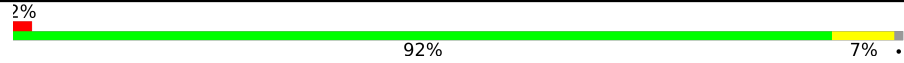
Metric	Percentile Ranks	Value
Rfree		0.272
Clashscore		2
Ramachandran outliers		0.1%
Sidechain outliers		1.6%
RSRZ outliers		3.6%

Worse   *Better*

■ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R$_{free}$	130704	3907 (2.40-2.40)
Clashscore	141614	4398 (2.40-2.40)
Ramachandran outliers	138981	4318 (2.40-2.40)
Sidechain outliers	138945	4319 (2.40-2.40)
RSRZ outliers	127900	3811 (2.40-2.40)

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 <=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	346	4% / 92% / 7% •
1	B	346	3% / 90% / 9% •
1	C	346	8% / 92% / 6% •
1	D	346	4% / 92% / 7% •
1	E	346	% / 93% / 6% •

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Full wwPDB X-ray Structure Validation Report

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Mol	Chain	Length	Quality of chain
1	F	346	

2 Entry composition (i)

There are 6 unique types of molecules in this entry. The entry contains 17387 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called Isoprenyl diphosphate synthase.

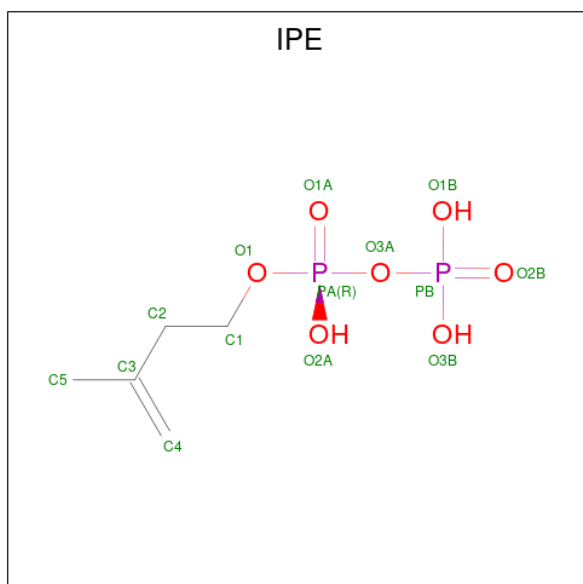| Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	342	Total	C	N	O	S	0	1	0
			2795	1791	471	515	18			
1	B	345	Total	C	N	O	S	0	0	0
			2804	1796	473	517	18			
1	C	340	Total	C	N	O	S	0	1	0
			2768	1774	464	512	18			
1	D	342	Total	C	N	O	S	0	0	0
			2784	1785	467	514	18			
1	E	342	Total	C	N	O	S	0	0	0
			2784	1785	467	514	18			
1	F	342	Total	C	N	O	S	0	2	0
			2798	1793	471	516	18			

There are 12 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	84	GLY	-	expression tag	UNP M1JS91
A	85	SER	-	expression tag	UNP M1JS91
B	84	GLY	-	expression tag	UNP M1JS91
B	85	SER	-	expression tag	UNP M1JS91
C	84	GLY	-	expression tag	UNP M1JS91
C	85	SER	-	expression tag	UNP M1JS91
D	84	GLY	-	expression tag	UNP M1JS91
D	85	SER	-	expression tag	UNP M1JS91
E	84	GLY	-	expression tag	UNP M1JS91
E	85	SER	-	expression tag	UNP M1JS91
F	84	GLY	-	expression tag	UNP M1JS91
F	85	SER	-	expression tag	UNP M1JS91

- Molecule 2 is MANGANESE (II) ION (three-letter code: MN) (formula: Mn) (labeled as "Ligand of Interest" by depositor).
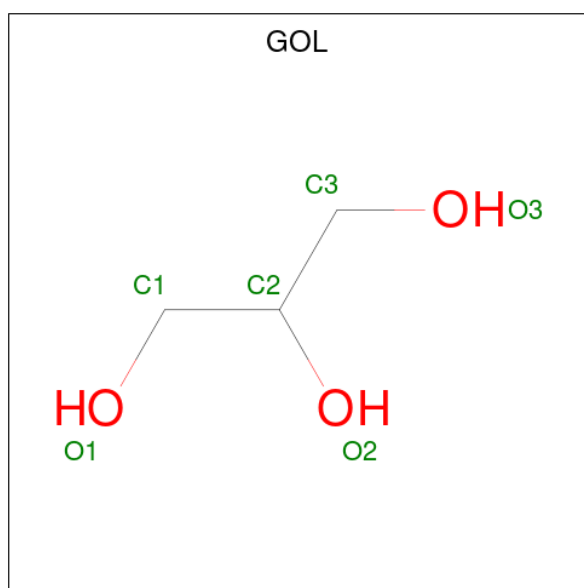
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	3	Total 3	Mn 3	0	0
2	B	3	Total 3	Mn 3	0	0
2	C	3	Total 3	Mn 3	0	0
2	D	3	Total 3	Mn 3	0	0
2	E	3	Total 3	Mn 3	0	0
2	F	3	Total 3	Mn 3	0	0

- Molecule 3 is 3-METHYLBUT-3-ENYL TRIHYDROGEN DIPHOSPHATE (three-letter code: IPE) (formula: $C_5H_{12}O_7P_2$) (labeled as "Ligand of Interest" by depositor).


Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	1	Total 14	C 5	O 7	P 2	0	0
3	A	1	Total 14	C 5	O 7	P 2	0	0
3	B	1	Total 14	C 5	O 7	P 2	0	0
3	B	1	Total 14	C 5	O 7	P 2	0	0
3	C	1	Total 14	C 5	O 7	P 2	0	0

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Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	C	1	Total 14	C 5	O 7	P 2	0	0
3	D	1	Total 14	C 5	O 7	P 2	0	0
3	D	1	Total 14	C 5	O 7	P 2	0	0
3	E	1	Total 14	C 5	O 7	P 2	0	0
3	E	1	Total 14	C 5	O 7	P 2	0	0
3	F	1	Total 14	C 5	O 7	P 2	0	0
3	F	1	Total 14	C 5	O 7	P 2	0	0

- Molecule 4 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$).

Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	B	1	Total 6	C 3	O 3	0	0
4	F	1	Total 6	C 3	O 3	0	0

- Molecule 5 is TRIETHYLENE GLYCOL (three-letter code: PGE) (formula: $C_6H_{14}O_4$).

PGE

Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	C	1	Total 10	C 6	O 4	0	0

- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	74	Total 75	O 75	0	1
6	B	69	Total 71	O 71	0	2
6	C	79	Total 80	O 80	0	1
6	D	71	Total 73	O 73	0	2
6	E	75	Total 75	O 75	0	0
6	F	72	Total 72	O 72	0	0

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: Isoprenyl diphosphate synthase
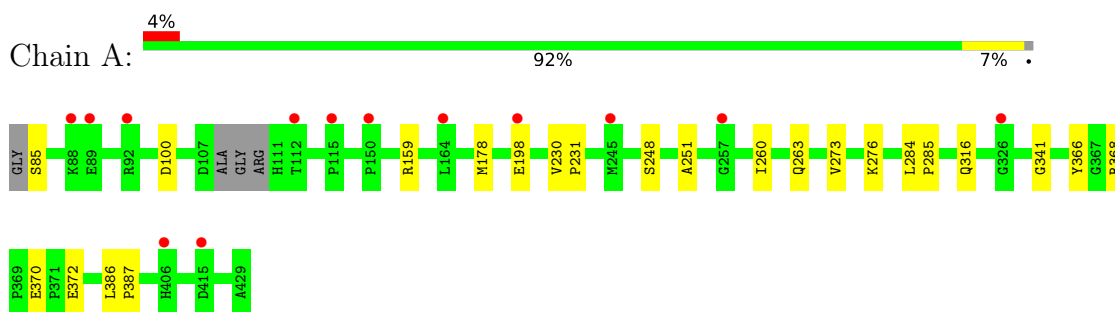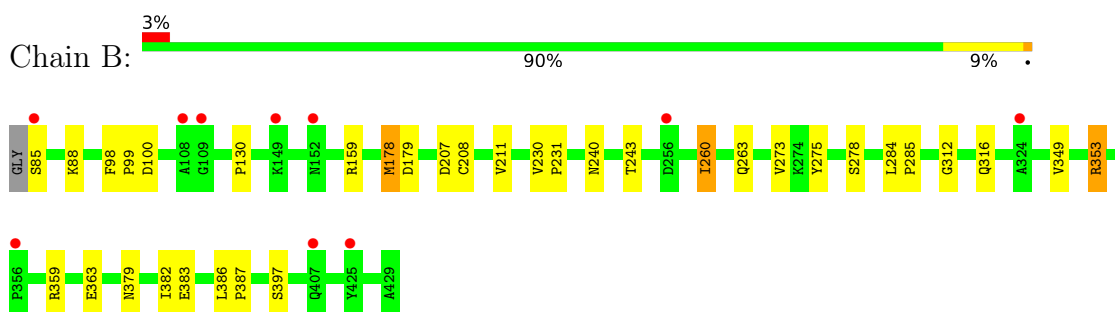
Chain A:

- Molecule 1: Isoprenyl diphosphate synthase

Chain B:

- Molecule 1: Isoprenyl diphosphate synthase

Chain C:

- Molecule 1: Isoprenyl diphosphate synthase

Chain D:

GLY S85 A96 P99 R103 D104 L105 T106 D107 ALA GLY ARG H111 T112 K119 K149 P150 E151 L164 L181 E186 T187 L209 S214 F223 S224 H225 V230 P231 N240 S262 Y280 L284 P285 Q300 Q303 Q329 L386 P387

S409 K410 A429

• Molecule 1: Isoprenyl diphosphate synthase

Chain E:

%

93% 6% •

GLY S85 P99 R103 D107 ALA GLY ARG H111 V129 P150 L175 M178 V230 P231 H237 K242 M245 L284 P285 R302 Q329 S344 V348 E370 S373 I377 L386 P387 S397 H406 A429

• Molecule 1: Isoprenyl diphosphate synthase

Chain F:

2%

92% 7% •

GLY S85 K88 D107 ALA GLY ARG H111 T112 N152 L175 E198 Y229 V230 P231 I232 I233 H237 K242 M245 D250 D256 Q263 V273 L284 P285 Q316 Q358 S373 I377 I382 E383 L386 P387 S397 A429
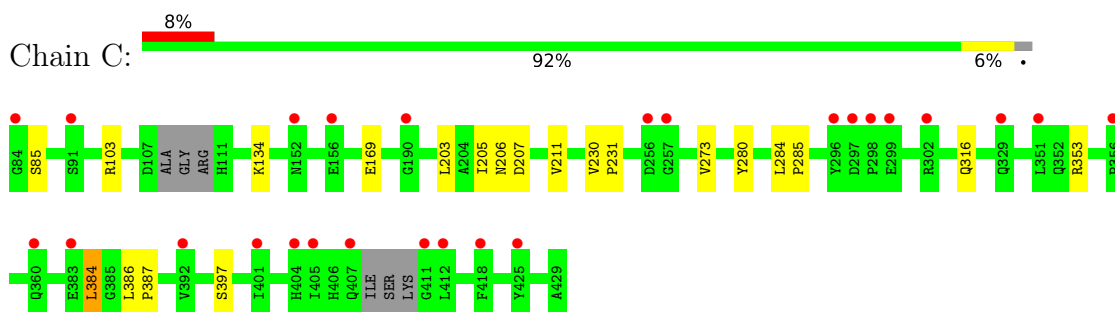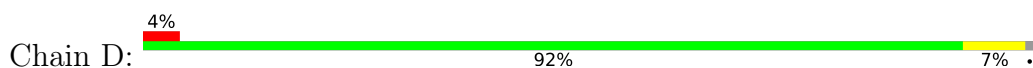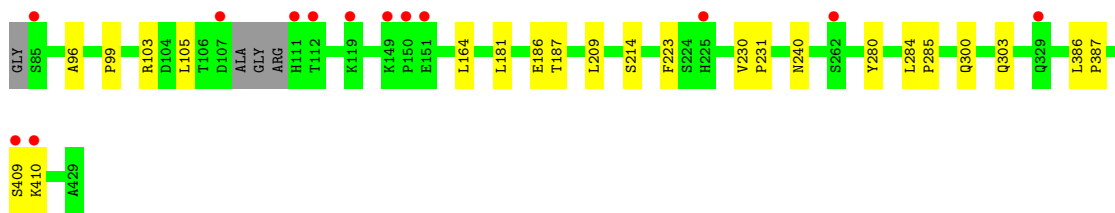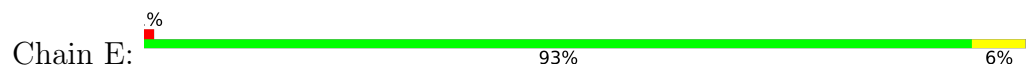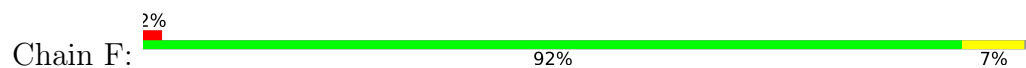
4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	57.94Å 186.74Å 213.29Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	15.00 – 2.40 14.99 – 2.40	Depositor EDS
% Data completeness (in resolution range)	98.2 (15.00-2.40) 98.7 (14.99-2.40)	Depositor EDS
R_{merge}	0.14	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	3.76 (at 2.39Å)	Xtriage
Refinement program	REFMAC 5.8.0258	Depositor
R, R_{free}	0.224 , 0.268 0.226 , 0.272	Depositor DCC
R_{free} test set	4502 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å^2)	29.8	Xtriage
Anisotropy	0.937	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.38 , 43.2	EDS
L-test for twinning[2]	$< |L| > = 0.44, < L^2 > = 0.27$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.91	EDS
Total number of atoms	17387	wwPDB-VP
Average B, all atoms (Å^2)	36.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 16.81% of the height of the origin peak. No significant pseudotranslation is detected.*

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[1]Intensities estimated from amplitudes.
[2]Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality (i)

5.1 Standard geometry (i)

Bond lengths and bond angles in the following residue types are not validated in this section: GOL, MN, PGE, IPE

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	0.67	0/2858	0.70	0/3856
1	B	0.66	0/2868	0.71	0/3871
1	C	0.68	0/2833	0.71	0/3822
1	D	0.66	0/2847	0.70	0/3842
1	E	0.66	0/2847	0.70	0/3842
1	F	0.66	0/2864	0.70	0/3864
All	All	0.67	0/17117	0.70	0/23097

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts (i)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	2795	0	2788	14	0
1	B	2804	0	2798	16	0
1	C	2768	0	2754	12	0
1	D	2784	0	2776	10	0
1	E	2784	0	2776	10	0
1	F	2798	0	2793	10	0
2	A	3	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	B	3	0	0	0	0
2	C	3	0	0	0	0
2	D	3	0	0	0	0
2	E	3	0	0	0	0
2	F	3	0	0	0	0
3	A	28	0	18	4	0
3	B	28	0	18	0	0
3	C	28	0	18	0	0
3	D	28	0	18	0	0
3	E	28	0	18	1	0
3	F	28	0	18	1	0
4	B	6	0	8	0	0
4	F	6	0	8	0	0
5	C	10	0	14	0	0
6	A	75	0	0	0	0
6	B	71	0	0	0	0
6	C	80	0	0	0	0
6	D	73	0	0	0	0
6	E	75	0	0	0	0
6	F	72	0	0	0	0
All	All	17387	0	16823	68	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 2.

All (68) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:276:LYS:HE3	3:A:505:IPE:H11	1.39	1.03
1:A:276:LYS:CE	3:A:505:IPE:H11	2.20	0.69
1:A:284:LEU:HB3	1:A:285:PRO:HD3	1.77	0.66
1:E:284:LEU:HB3	1:E:285:PRO:HD3	1.80	0.62
1:F:273:VAL:HG12	1:F:316:GLN:HG2	1.81	0.61
1:C:284:LEU:HB3	1:C:285:PRO:HD3	1.82	0.61
1:B:100:ASP:OD2	1:B:159:ARG:NH2	2.35	0.60
1:F:373:SER:O	1:F:377:ILE:HG12	2.02	0.59
1:A:368:ARG:HB3	1:A:370:GLU:OE2	2.03	0.59
1:A:100:ASP:OD2	1:A:159:ARG:NH1	2.36	0.58
3:A:504:IPE:C4	3:A:505:IPE:H22	2.32	0.58
1:B:260:ILE:HD12	1:B:263:GLN:HB2	1.85	0.58
1:E:329:GLN:HA	1:E:329:GLN:HE21	1.69	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:386:LEU:N	1:C:387:PRO:HD2	2.19	0.57
1:F:229:TYR:CZ	1:F:233:ILE:HD11	2.40	0.55
1:F:230:VAL:HB	1:F:231:PRO:HD3	1.88	0.55
1:B:284:LEU:HB3	1:B:285:PRO:HD3	1.91	0.52
1:B:386:LEU:N	1:B:387:PRO:CD	2.73	0.51
1:E:230:VAL:HB	1:E:231:PRO:HD3	1.92	0.51
1:D:284:LEU:HB3	1:D:285:PRO:HD3	1.93	0.51
1:A:230:VAL:HB	1:A:231:PRO:HD3	1.92	0.50
1:A:248:SER:OG	1:C:206:ASN:ND2	2.44	0.50
1:F:284:LEU:HB3	1:F:285:PRO:HD3	1.93	0.49
1:F:242:LYS:HA	1:F:245:MET:HE2	1.95	0.48
1:B:207:ASP:O	1:B:211:VAL:HG23	2.14	0.48
1:E:175:LEU:HB3	3:E:505:IPE:H51	1.96	0.48
1:E:99:PRO:O	1:E:103:ARG:HG2	2.14	0.48
1:C:353:ARG:HB2	1:C:384:LEU:CD2	2.45	0.47
1:D:303:GLN:OE1	1:D:409:SER:OG	2.33	0.47
1:B:359:ARG:O	1:B:363:GLU:HG2	2.14	0.47
1:A:273:VAL:HG12	1:A:316:GLN:HG2	1.96	0.46
1:A:178:MET:HG3	1:C:205:ILE:HG22	1.98	0.46
1:E:237:HIS:NE2	1:F:237:HIS:NE2	2.59	0.46
1:A:341:GLY:HA2	1:A:366:TYR:CE2	2.52	0.45
1:D:186:GLU:HG2	1:D:187:THR:HG23	1.97	0.45
1:E:242:LYS:HA	1:E:245:MET:HE2	1.98	0.45
1:D:386:LEU:N	1:D:387:PRO:CD	2.80	0.45
1:C:353:ARG:HB2	1:C:384:LEU:HD22	1.98	0.45
1:D:105:LEU:HD22	1:D:214:SER:HB2	1.98	0.45
1:F:386:LEU:N	1:F:387:PRO:CD	2.80	0.44
1:B:98:PHE:HB3	1:B:99:PRO:HD3	2.00	0.44
1:C:230:VAL:HB	1:C:231:PRO:HD3	1.98	0.44
1:A:260:ILE:HD12	1:A:263:GLN:OE1	2.18	0.44
1:B:230:VAL:HB	1:B:231:PRO:HD3	1.99	0.43
1:A:386:LEU:N	1:A:387:PRO:CD	2.82	0.43
1:B:278:SER:OG	1:B:312:GLY:HA3	2.18	0.43
1:C:273:VAL:HG12	1:C:316:GLN:HG2	2.01	0.43
1:E:373:SER:O	1:E:377:ILE:HG12	2.19	0.43
1:B:349:VAL:O	1:B:353:ARG:HG2	2.19	0.42
1:D:164:LEU:HG	1:D:223:PHE:CZ	2.54	0.42
1:A:276:LYS:HE3	3:A:505:IPE:C1	2.27	0.42
1:B:208:CYS:SG	1:D:209:LEU:HD11	2.59	0.42
1:E:386:LEU:N	1:E:387:PRO:CD	2.82	0.42
1:D:230:VAL:HB	1:D:231:PRO:HD3	2.01	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:178:MET:HG3	1:B:179:ASP:N	2.34	0.42
1:C:207:ASP:O	1:C:211:VAL:HG23	2.19	0.42
1:C:353:ARG:CB	1:C:384:LEU:CD2	2.98	0.42
1:F:175:LEU:HB3	3:F:506:IPE:H51	2.02	0.41
1:A:251:ALA:CB	1:C:203:LEU:HD13	2.50	0.41
1:B:273:VAL:HG12	1:B:316:GLN:HG2	2.03	0.41
1:D:96:ALA:O	1:D:99:PRO:HD2	2.20	0.41
1:C:134:LYS:HA	1:C:169:GLU:OE2	2.19	0.41
1:D:300:GLN:HG3	1:D:410:LYS:HB3	2.02	0.41
1:B:349:VAL:O	1:B:353:ARG:CG	2.69	0.41
1:B:379:ASN:HA	1:B:382:ILE:HD12	2.03	0.40
1:B:243:THR:HA	1:B:275:TYR:O	2.21	0.40
1:E:344:SER:O	1:E:348:VAL:HG23	2.21	0.40
1:F:358:GLN:NE2	1:F:383:GLU:OE1	2.36	0.40

There are no symmetry-related clashes.

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	339/346 (98%)	327 (96%)	12 (4%)	0	100	100
1	B	343/346 (99%)	330 (96%)	12 (4%)	1 (0%)	41	55
1	C	335/346 (97%)	325 (97%)	10 (3%)	0	100	100
1	D	338/346 (98%)	326 (96%)	12 (4%)	0	100	100
1	E	338/346 (98%)	328 (97%)	9 (3%)	1 (0%)	41	55
1	F	340/346 (98%)	324 (95%)	16 (5%)	0	100	100
All	All	2033/2076 (98%)	1960 (96%)	71 (4%)	2 (0%)	51	68

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	130	PRO
1	E	129	VAL

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	310/310 (100%)	307 (99%)	3 (1%)	76	88
1	B	310/310 (100%)	302 (97%)	8 (3%)	46	66
1	C	307/310 (99%)	302 (98%)	5 (2%)	62	79
1	D	309/310 (100%)	305 (99%)	4 (1%)	69	84
1	E	309/310 (100%)	305 (99%)	4 (1%)	69	84
1	F	311/310 (100%)	306 (98%)	5 (2%)	62	79
All	All	1856/1860 (100%)	1827 (98%)	29 (2%)	62	79

All (29) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	85	SER
1	A	198	GLU
1	A	372	GLU
1	B	85	SER
1	B	88	LYS
1	B	178	MET
1	B	240	ASN
1	B	260	ILE
1	B	353	ARG
1	B	383	GLU
1	B	397	SER
1	C	85	SER
1	C	103	ARG
1	C	280	TYR
1	C	384	LEU
1	C	397	SER
1	D	103	ARG

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Mol	Chain	Res	Type
1	D	181	LEU
1	D	240	ASN
1	D	280	TYR
1	E	178	MET
1	E	329	GLN
1	E	370	GLU
1	E	397	SER
1	F	85	SER
1	F	250	ASP
1	F	256	ASP
1	F	263	GLN
1	F	397	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such sidechains are listed below:

Mol	Chain	Res	Type
1	E	329	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no monosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 33 ligands modelled in this entry, 18 are monoatomic - leaving 15 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	$\#\|Z\| > 2$
3	IPE	C	505	-	11,13,13	0.60	0	15,19,19	0.62	0
4	GOL	B	504	-	5,5,5	0.09	0	5,5,5	0.28	0
3	IPE	C	506	2	11,13,13	0.65	0	15,19,19	0.76	0
3	IPE	B	506	2	11,13,13	0.62	0	15,19,19	0.76	0
3	IPE	D	504	-	11,13,13	0.59	0	15,19,19	0.61	0
3	IPE	E	504	-	11,13,13	0.57	0	15,19,19	0.69	0
4	GOL	F	504	-	5,5,5	0.13	0	5,5,5	0.32	0
3	IPE	A	504	-	11,13,13	0.60	0	15,19,19	0.82	0
3	IPE	F	505	-	11,13,13	0.61	0	15,19,19	0.65	0
5	PGE	C	504	-	9,9,9	0.19	0	8,8,8	0.06	0
3	IPE	A	505	2	11,13,13	0.92	1 (9%)	15,19,19	0.72	0
3	IPE	D	505	2	11,13,13	0.56	0	15,19,19	0.84	0
3	IPE	B	505	-	11,13,13	0.58	0	15,19,19	0.69	0
3	IPE	F	506	2	11,13,13	0.58	0	15,19,19	0.74	0
3	IPE	E	505	2	11,13,13	0.66	0	15,19,19	0.70	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	IPE	C	505	-	-	1/13/13/13	-
4	GOL	B	504	-	-	2/4/4/4	-
3	IPE	C	506	2	-	3/13/13/13	-
3	IPE	B	506	2	-	2/13/13/13	-
3	IPE	D	504	-	-	0/13/13/13	-
3	IPE	E	504	-	-	0/13/13/13	-
4	GOL	F	504	-	-	2/4/4/4	-
3	IPE	A	504	-	-	0/13/13/13	-
3	IPE	F	505	-	-	3/13/13/13	-
5	PGE	C	504	-	-	5/7/7/7	-
3	IPE	A	505	2	-	1/13/13/13	-
3	IPE	D	505	2	-	5/13/13/13	-
3	IPE	B	505	-	-	0/13/13/13	-
3	IPE	F	506	2	-	5/13/13/13	-
3	IPE	E	505	2	-	4/13/13/13	-

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	505	IPE	PA-O2A	-2.14	1.45	1.55

There are no bond angle outliers.

There are no chirality outliers.

All (33) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	505	IPE	O1-C1-C2-C3
3	B	506	IPE	C1-C2-C3-C5
3	C	505	IPE	PA-O3A-PB-O1B
3	C	506	IPE	O1-C1-C2-C3
3	D	505	IPE	O1-C1-C2-C3
3	D	505	IPE	C1-C2-C3-C5
3	E	505	IPE	O1-C1-C2-C3
3	E	505	IPE	C1-O1-PA-O1A
3	E	505	IPE	C1-O1-PA-O3A
3	F	506	IPE	O1-C1-C2-C3
3	F	506	IPE	C1-O1-PA-O3A
4	F	504	GOL	C1-C2-C3-O3
4	F	504	GOL	O2-C2-C3-O3
5	C	504	PGE	O1-C1-C2-O2
4	B	504	GOL	O1-C1-C2-C3
5	C	504	PGE	O2-C3-C4-O3
3	F	505	IPE	C1-C2-C3-C5
3	F	506	IPE	C1-C2-C3-C5
3	B	506	IPE	C1-C2-C3-C4
3	D	505	IPE	C1-C2-C3-C4
5	C	504	PGE	C1-C2-O2-C3
3	D	505	IPE	C1-O1-PA-O3A
3	F	505	IPE	PB-O3A-PA-O2A
5	C	504	PGE	C3-C4-O3-C5
3	E	505	IPE	C1-O1-PA-O2A
3	F	506	IPE	C1-O1-PA-O1A
3	F	506	IPE	C1-O1-PA-O2A
4	B	504	GOL	O1-C1-C2-O2
3	C	506	IPE	C1-O1-PA-O3A
3	F	505	IPE	PB-O3A-PA-O1A
5	C	504	PGE	O3-C5-C6-O4
3	C	506	IPE	C1-O1-PA-O1A
3	D	505	IPE	C1-O1-PA-O1A

There are no ring outliers.

4 monomers are involved in 6 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	504	IPE	1	0
3	A	505	IPE	4	0
3	F	506	IPE	1	0
3	E	505	IPE	1	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

Ligand IPE C 505

Bond lengths

Bond angles

Torsions

Rings

Ligand IPE C 506

Bond lengths

Bond angles

Torsions

Rings

Ligand IPE B 506

Bond lengths

Bond angles

Torsions

Rings

Ligand IPE D 504

Bond lengths

Bond angles

Torsions

Rings

Ligand IPE E 504

Bond lengths

Bond angles

Torsions

Rings

Ligand IPE A 504

Bond lengths

Bond angles

Torsions

Rings

Ligand IPE F 505

Bond lengths

Bond angles

Torsions

Rings

Ligand IPE A 505

Bond lengths

Bond angles

Torsions

Rings

Ligand IPE D 505

Bond lengths

Bond angles

Torsions

Rings

Ligand IPE B 505

Bond lengths

Bond angles

Torsions

Rings

Ligand IPE F 506

Bond lengths

Bond angles

Torsions

Rings

Ligand IPE E 505

Bond lengths | Bond angles | Torsions | Rings

5.7 Other polymers ⓘ

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	342/346 (98%)	0.11	13 (3%)	40	39	22, 32, 46, 58	0
1	B	345/346 (99%)	0.16	10 (2%)	51	50	23, 34, 49, 65	0
1	C	340/346 (98%)	0.48	26 (7%)	13	12	28, 44, 62, 83	0
1	D	342/346 (98%)	0.07	13 (3%)	40	39	24, 34, 49, 62	0
1	E	342/346 (98%)	-0.06	5 (1%)	73	72	23, 32, 45, 58	0
1	F	342/346 (98%)	0.10	6 (1%)	68	66	24, 35, 48, 61	0
All	All	2053/2076 (98%)	0.14	73 (3%)	42	42	22, 35, 53, 83	0

All (73) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	85	SER	4.9
1	C	91	SER	4.5
1	B	108	ALA	4.3
1	C	356	PRO	4.2
1	B	256	ASP	4.0
1	C	298	PRO	4.0
1	C	392	VAL	4.0
1	C	296	TYR	3.8
1	A	112	THR	3.8
1	C	297	ASP	3.8
1	A	198	GLU	3.8
1	C	84	GLY	3.7
1	C	299	GLU	3.7
1	D	107	ASP	3.6
1	C	383	GLU	3.3
1	F	382	ILE	3.2
1	A	115	PRO	3.2
1	D	112	THR	3.2
1	C	360	GLN	3.1

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Mol	Chain	Res	Type	RSRZ
1	D	410	LYS	3.1
1	E	302	ARG	3.1
1	C	411	GLY	3.1
1	B	109	GLY	3.0
1	F	198	GLU	2.9
1	F	152	ASN	2.9
1	F	88	LYS	2.8
1	C	404	HIS	2.8
1	C	156	GLU	2.8
1	B	149	LYS	2.7
1	A	89	GLU	2.7
1	A	92	ARG	2.7
1	C	302	ARG	2.7
1	A	406	HIS	2.6
1	C	256	ASP	2.6
1	B	425	TYR	2.6
1	D	150	PRO	2.6
1	E	406	HIS	2.6
1	C	405	ILE	2.6
1	F	107	ASP	2.6
1	C	401	ILE	2.5
1	C	412	LEU	2.5
1	D	225	HIS	2.5
1	C	418	PHE	2.4
1	D	151	GLU	2.4
1	E	85	SER	2.4
1	D	111	HIS	2.4
1	D	85	SER	2.4
1	A	415	ASP	2.4
1	A	88	LYS	2.4
1	B	324	ALA	2.4
1	C	329	GLN	2.4
1	C	407	GLN	2.4
1	D	262	SER	2.4
1	A	326	GLY	2.3
1	C	152	ASN	2.3
1	A	150	PRO	2.3
1	D	149	LYS	2.3
1	B	407	GLN	2.3
1	D	119	LYS	2.3
1	A	257	GLY	2.2
1	D	329	GLN	2.2

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Mol	Chain	Res	Type	RSRZ
1	C	257	GLY	2.2
1	A	245	MET	2.2
1	D	409	SER	2.1
1	C	190	GLY	2.1
1	F	112	THR	2.1
1	C	351	LEU	2.1
1	B	356	PRO	2.0
1	E	111	HIS	2.0
1	B	152	ASN	2.0
1	C	425	TYR	2.0
1	A	164	LEU	2.0
1	E	150	PRO	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 ⓘ

There are no monosaccharides in this entry.

6.4 Ligands ⓘ

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
5	PGE	C	504	10/10	0.76	0.23	33,49,52,52	0
4	GOL	B	504	6/6	0.83	0.17	45,45,46,47	0
4	GOL	F	504	6/6	0.86	0.22	39,42,46,51	0
2	MN	C	503	1/1	0.91	0.07	55,55,55,55	0
3	IPE	C	506	14/14	0.94	0.15	33,39,44,44	0
2	MN	A	502	1/1	0.94	0.07	35,35,35,35	0
2	MN	C	501	1/1	0.95	0.06	60,60,60,60	0
3	IPE	A	505	14/14	0.95	0.15	23,29,34,35	0
3	IPE	F	506	14/14	0.96	0.14	28,37,40,42	0
3	IPE	C	505	14/14	0.96	0.13	33,36,39,40	0
3	IPE	E	505	14/14	0.97	0.14	25,30,40,42	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\mathring{A}^2$)	Q<0.9
3	IPE	B	506	14/14	0.97	0.13	27,29,30,31	0
3	IPE	A	504	14/14	0.97	0.11	20,25,30,30	0
2	MN	C	502	1/1	0.97	0.07	54,54,54,54	0
3	IPE	D	505	14/14	0.97	0.12	31,34,38,38	0
2	MN	A	501	1/1	0.98	0.12	36,36,36,36	0
3	IPE	F	505	14/14	0.98	0.09	25,27,29,30	0
3	IPE	B	505	14/14	0.98	0.09	22,24,26,26	0
3	IPE	D	504	14/14	0.98	0.09	23,31,34,34	0
2	MN	A	503	1/1	0.98	0.05	29,29,29,29	0
3	IPE	E	504	14/14	0.98	0.09	22,25,31,34	0
2	MN	D	503	1/1	0.99	0.03	37,37,37,37	0
2	MN	E	501	1/1	0.99	0.05	38,38,38,38	0
2	MN	E	502	1/1	0.99	0.02	38,38,38,38	0
2	MN	E	503	1/1	0.99	0.08	30,30,30,30	0
2	MN	F	501	1/1	0.99	0.04	42,42,42,42	0
2	MN	F	502	1/1	0.99	0.07	43,43,43,43	0
2	MN	F	503	1/1	0.99	0.03	40,40,40,40	0
2	MN	B	503	1/1	0.99	0.08	42,42,42,42	0
2	MN	B	502	1/1	0.99	0.04	40,40,40,40	0
2	MN	D	501	1/1	0.99	0.04	36,36,36,36	0
2	MN	D	502	1/1	0.99	0.03	30,30,30,30	0
2	MN	B	501	1/1	1.00	0.10	36,36,36,36	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.
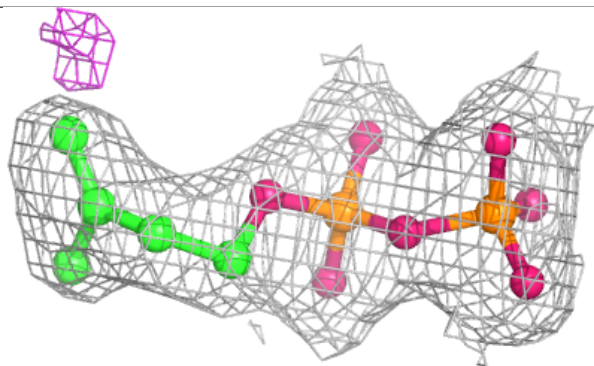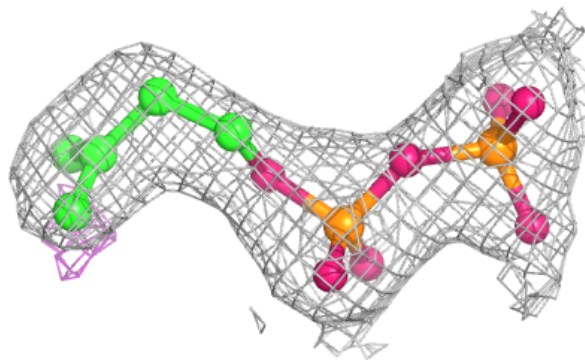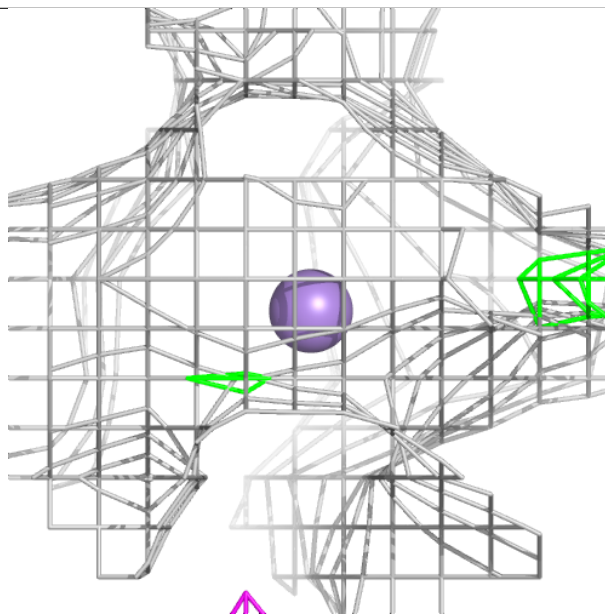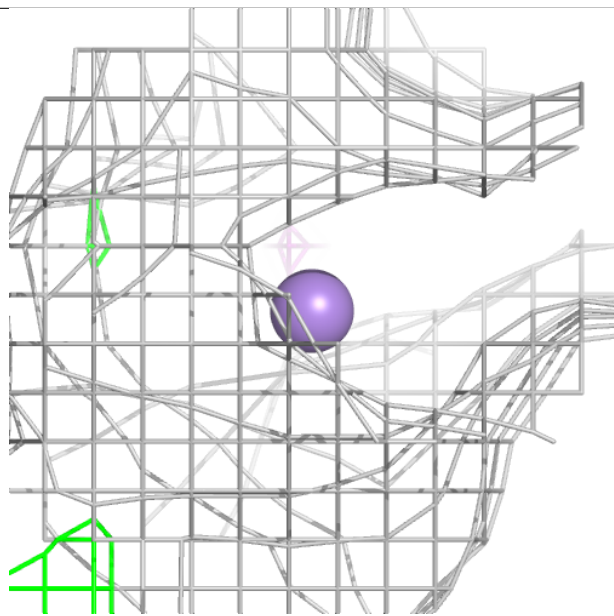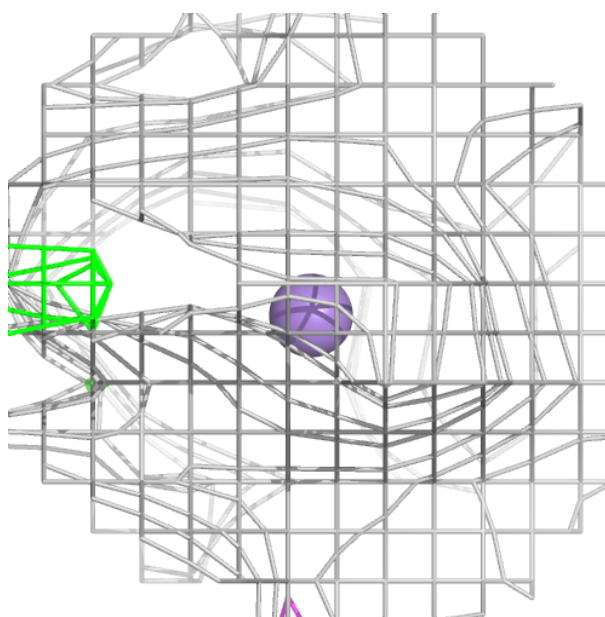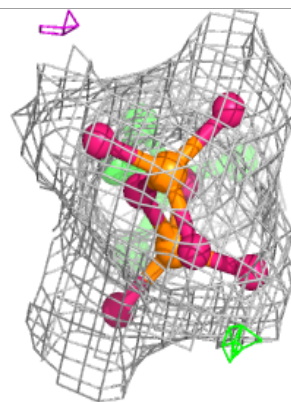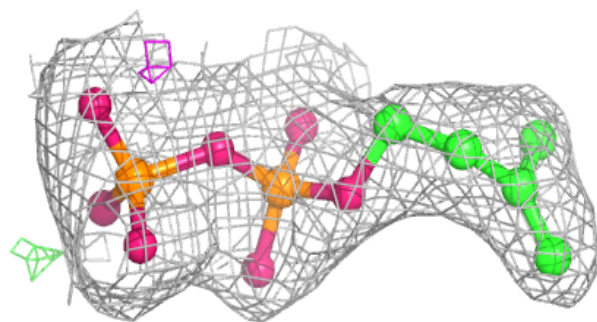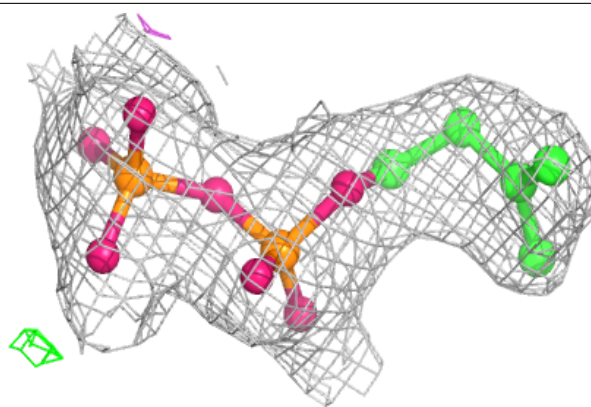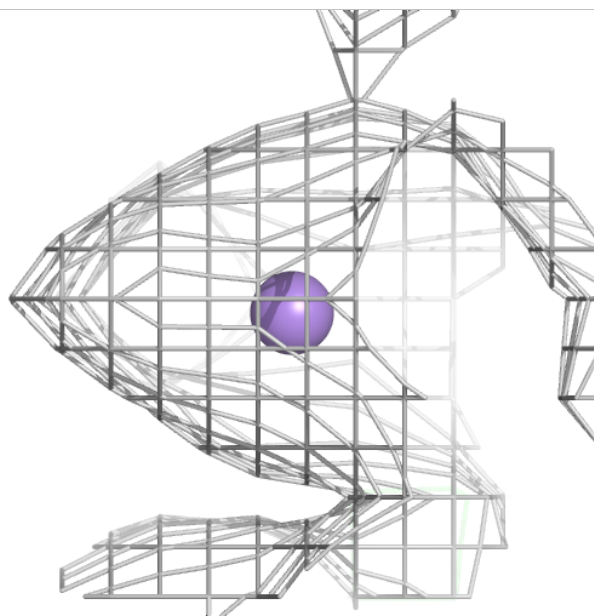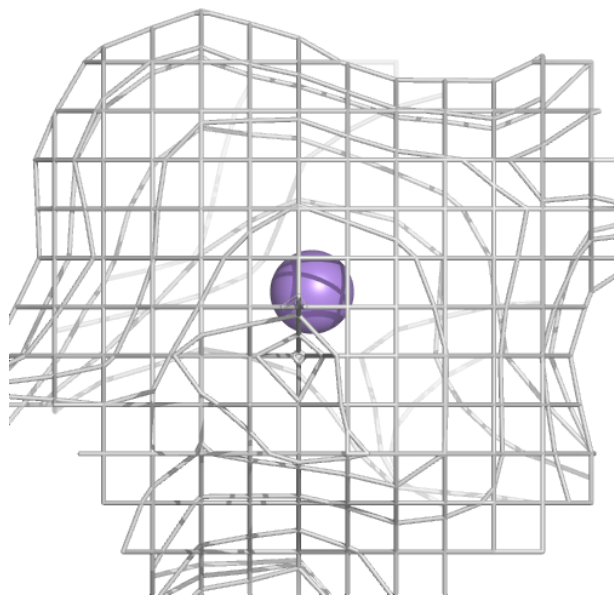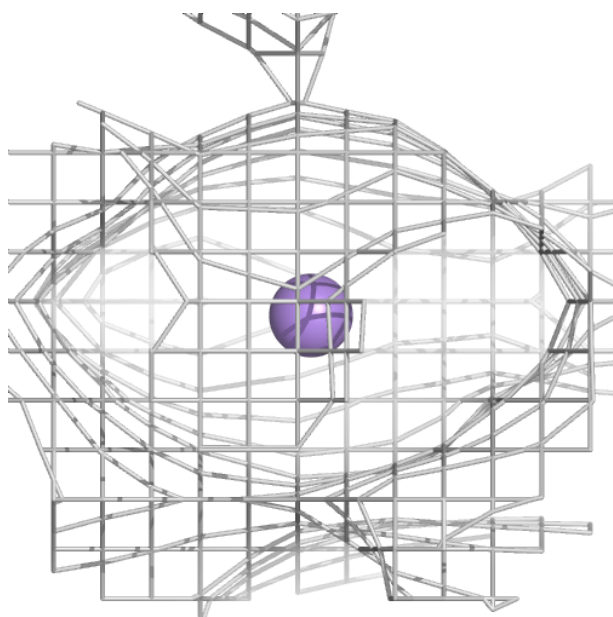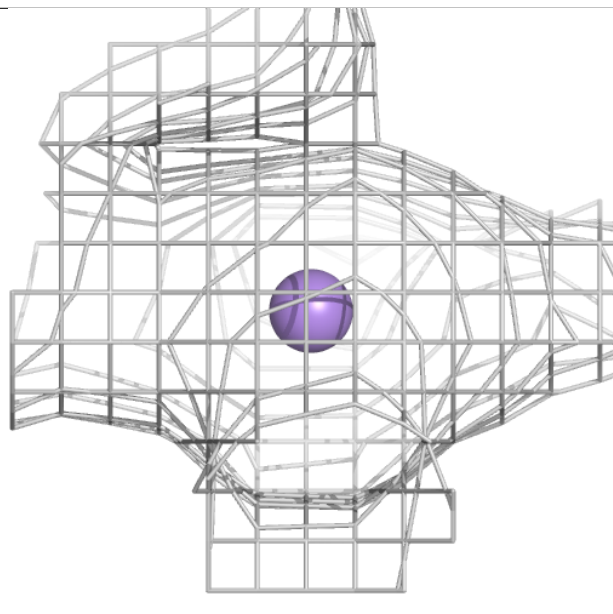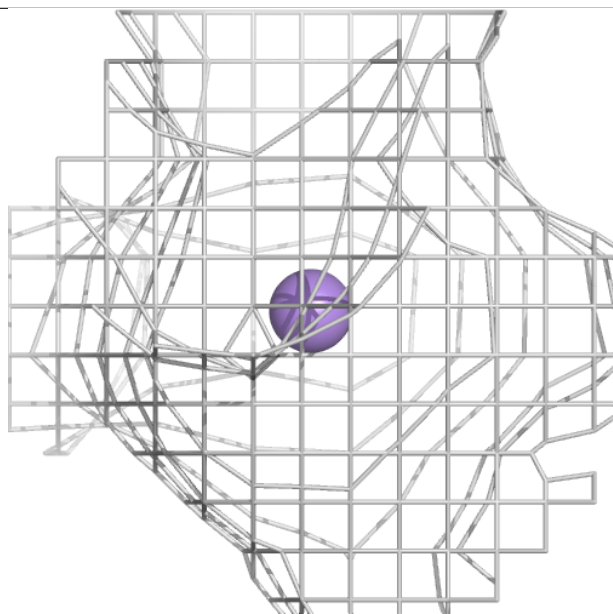
Electron density around MN C 503:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
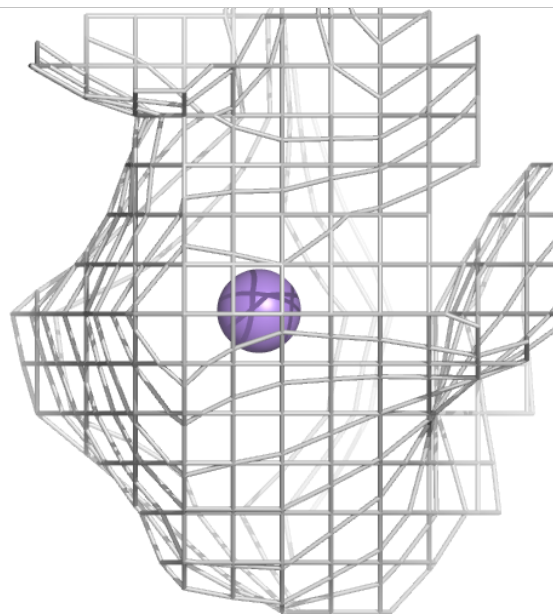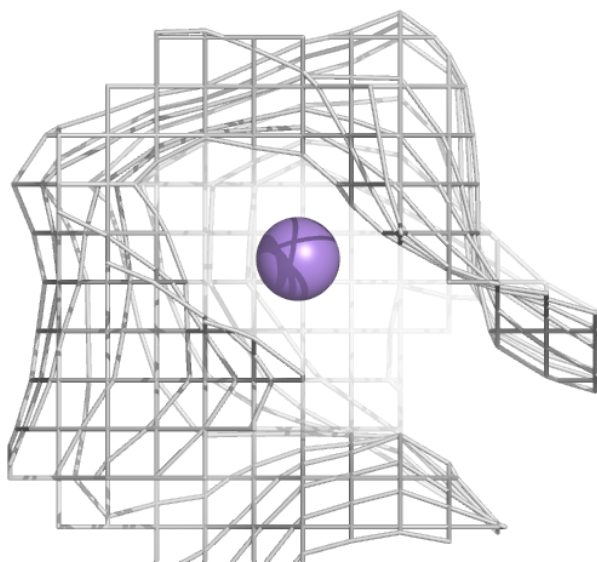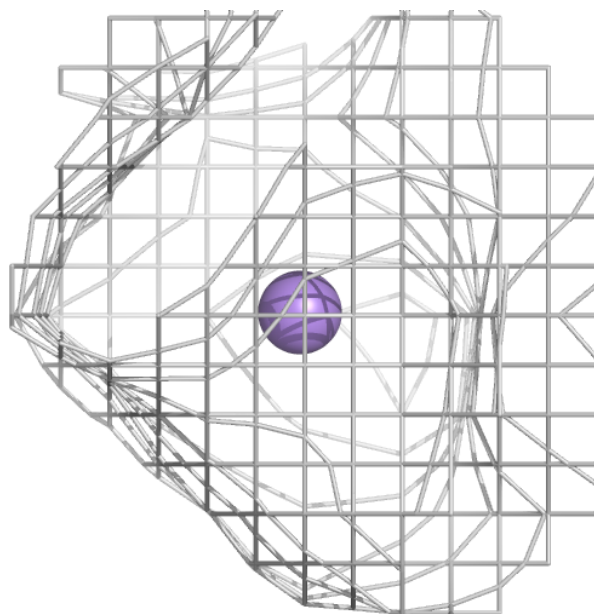
Electron density around IPE C 506:

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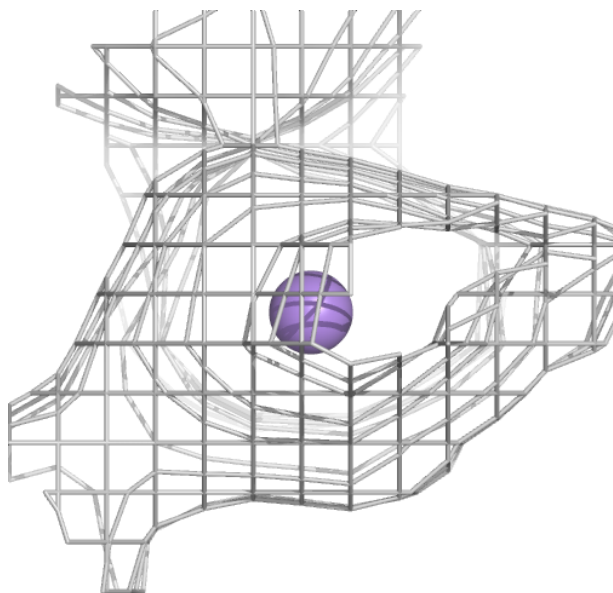and green (positive)
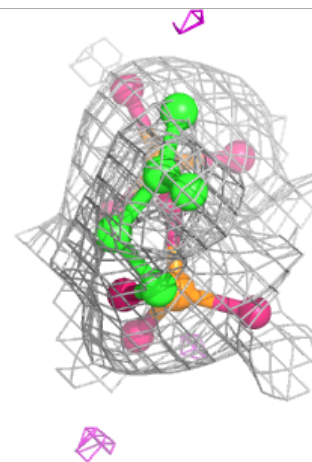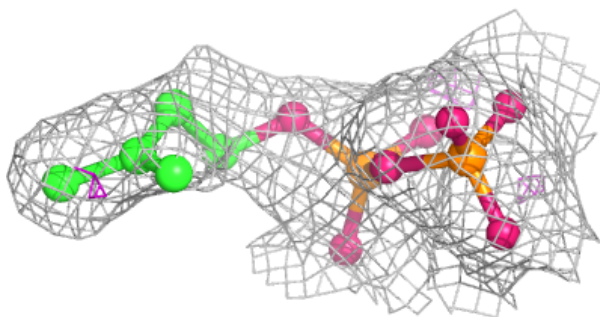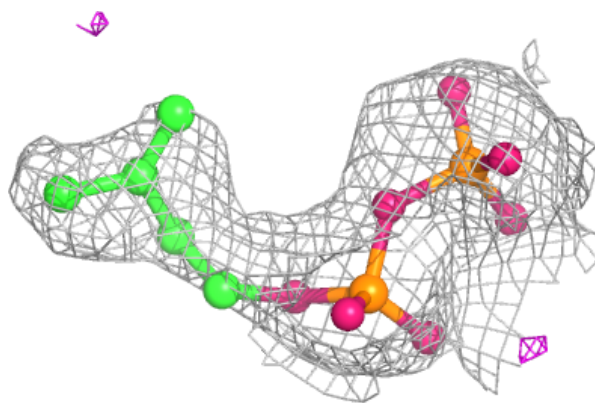
Electron density around MN A 502:

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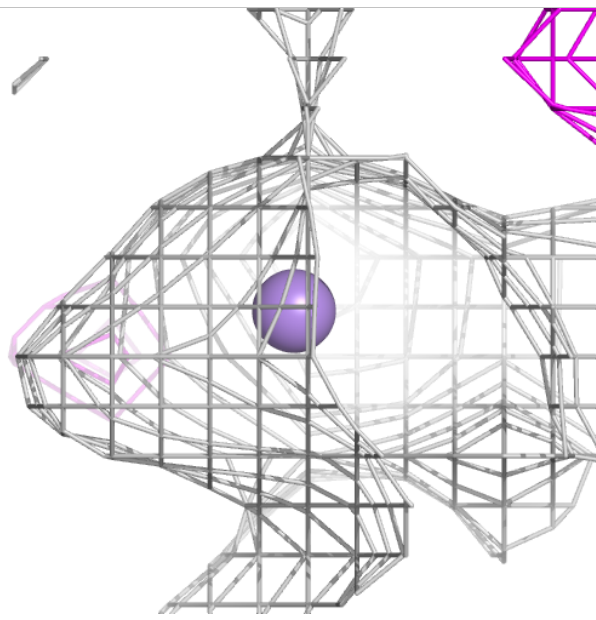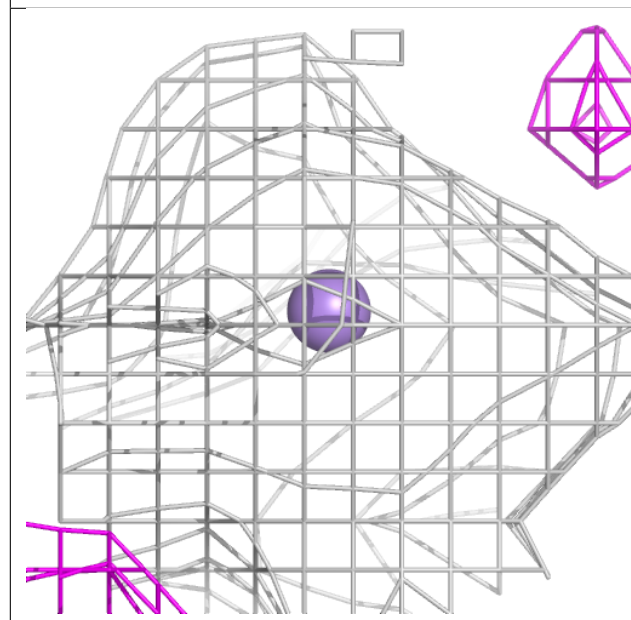and green (positive)
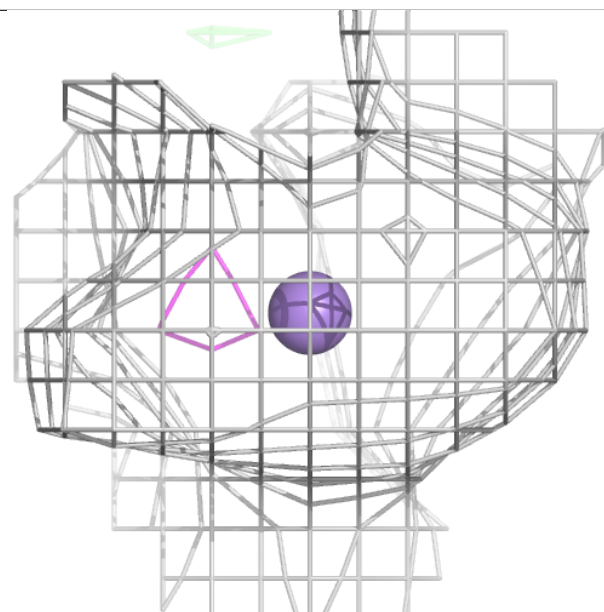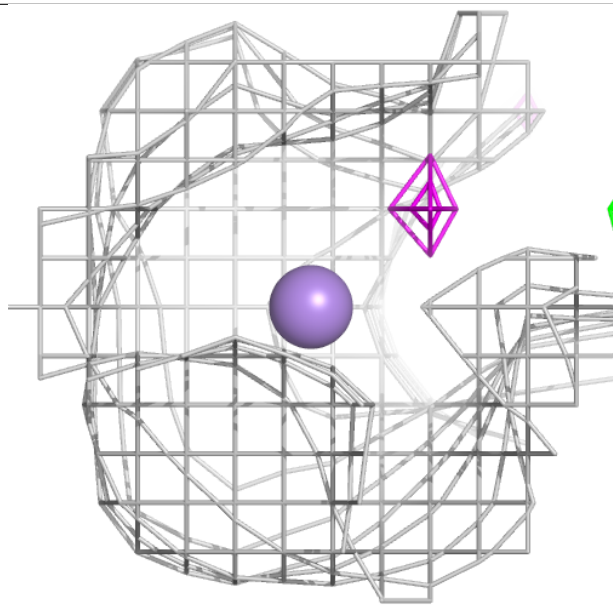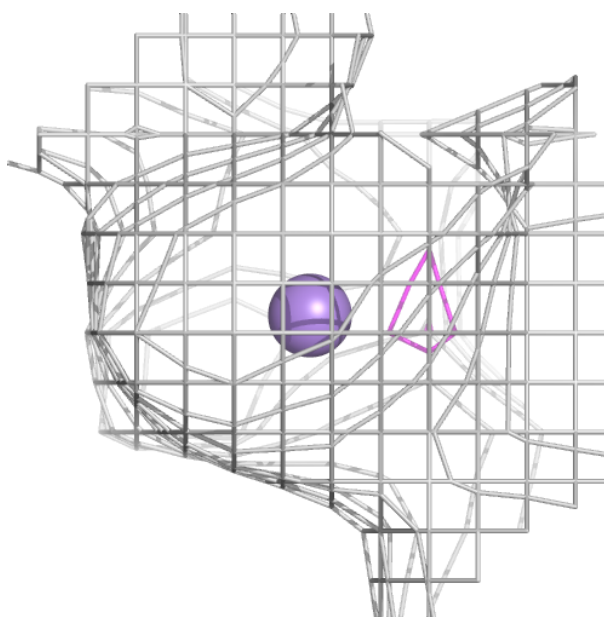
Electron density around MN C 501:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
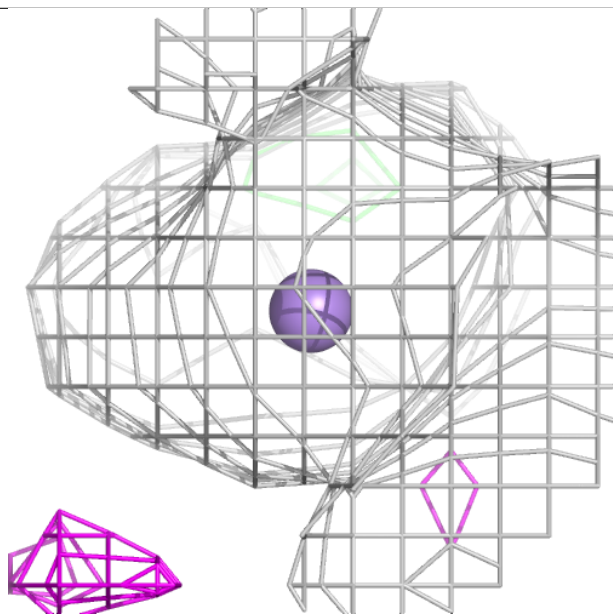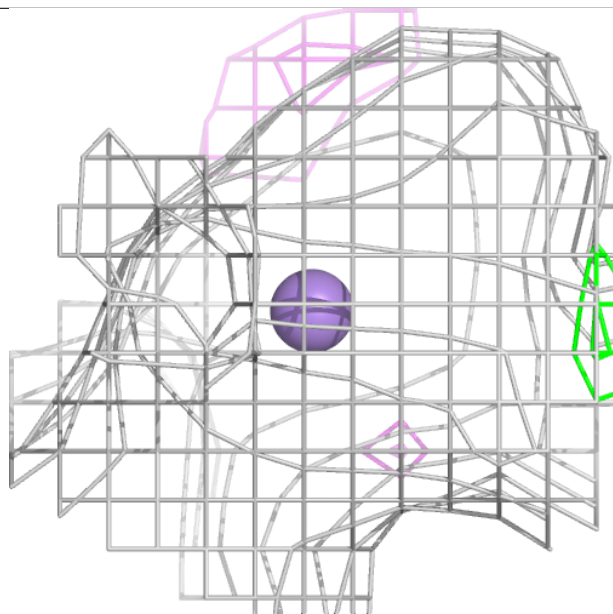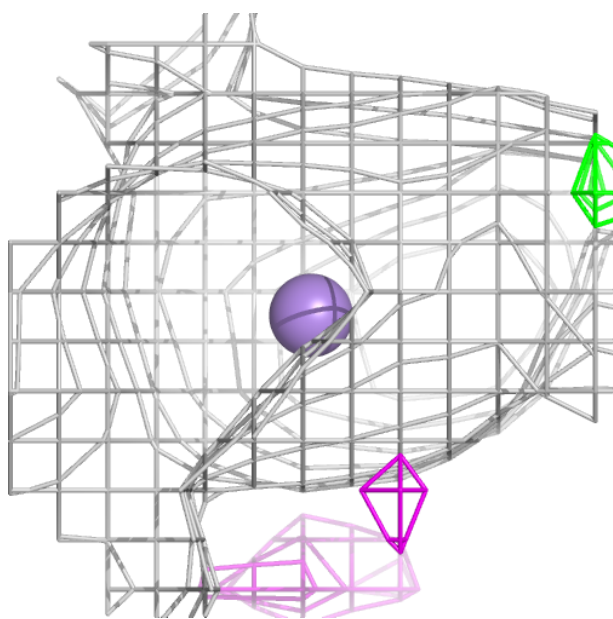
Electron density around IPE A 505:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
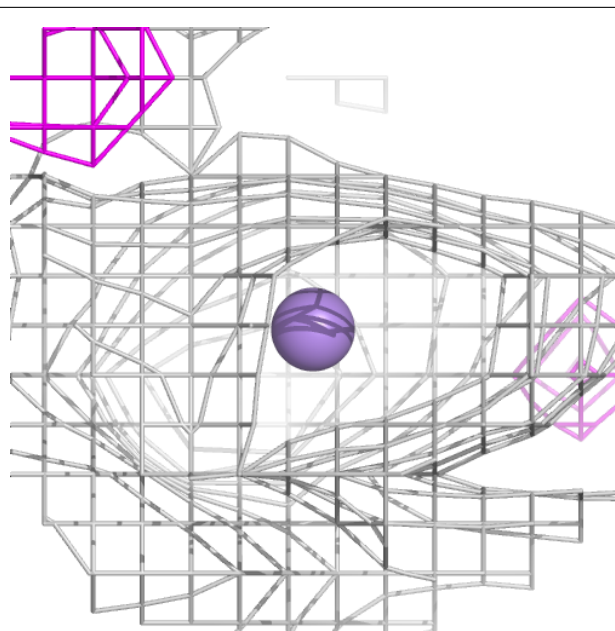and green (positive)
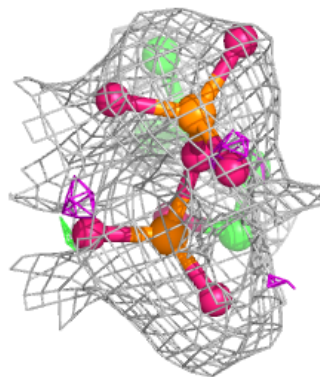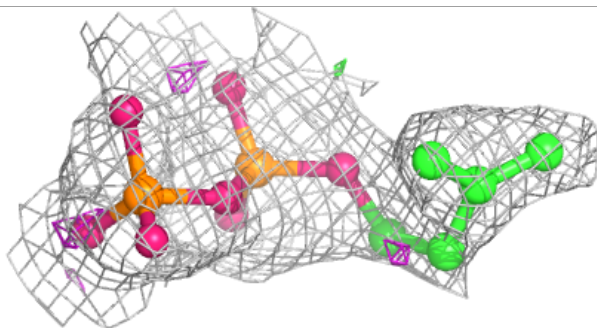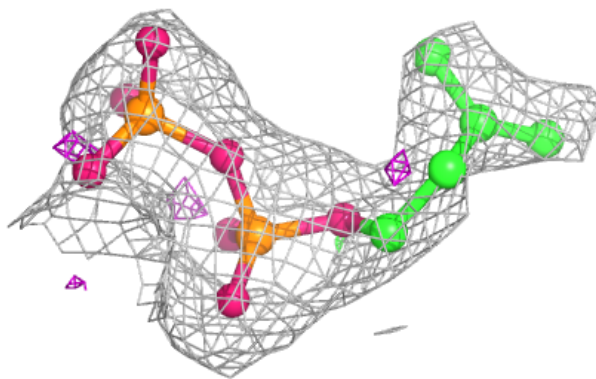
Electron density around IPE F 506:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
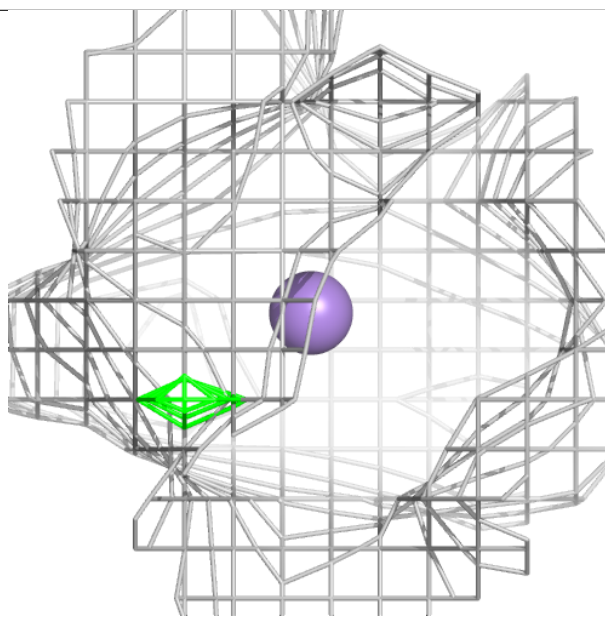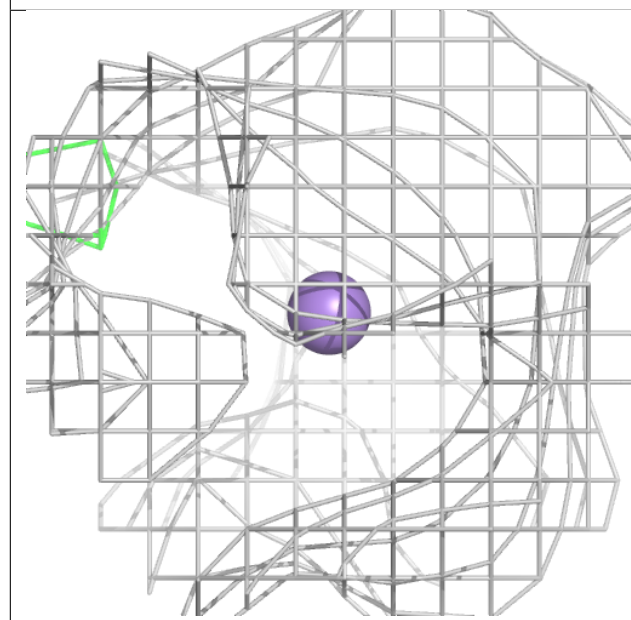and green (positive)
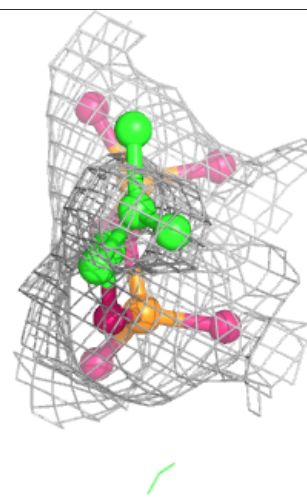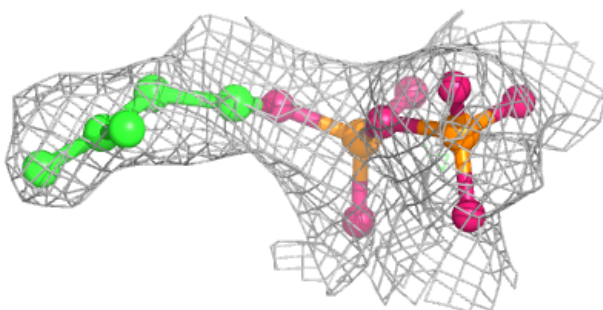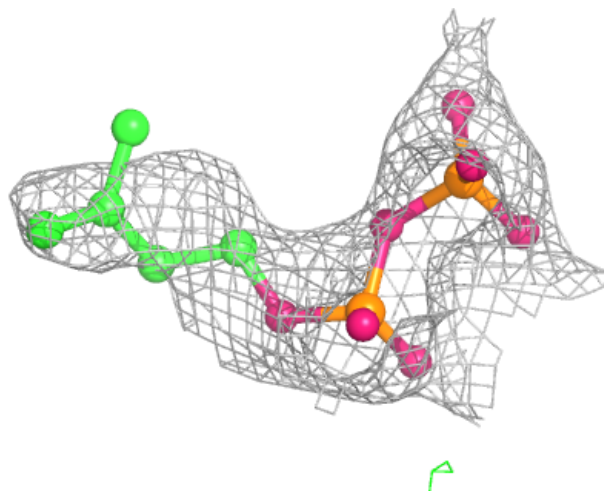
Electron density around IPE C 505:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)
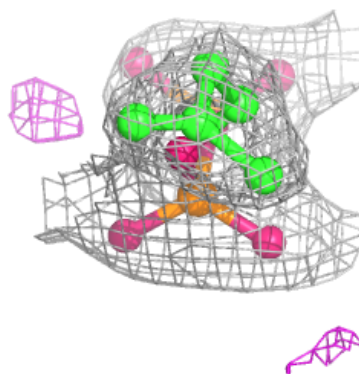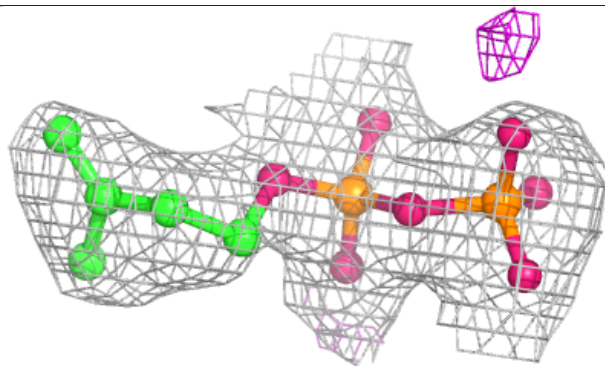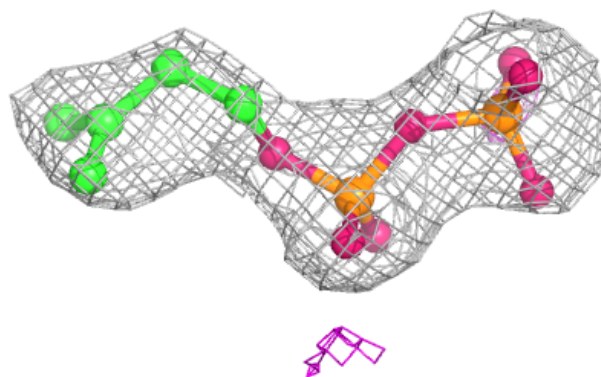
Electron density around IPE E 505:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
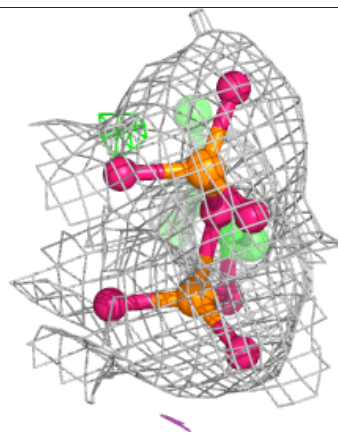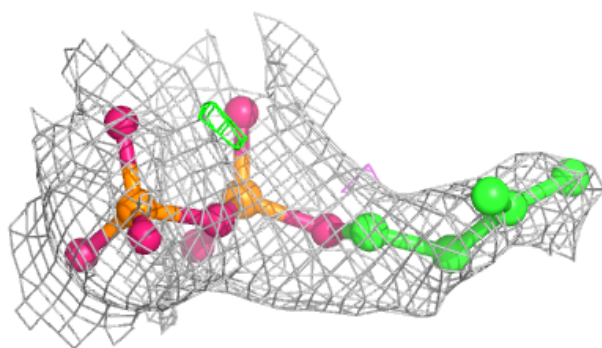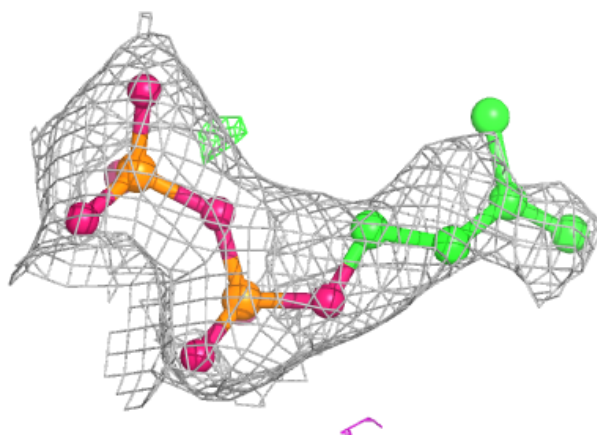
Electron density around IPE B 506:

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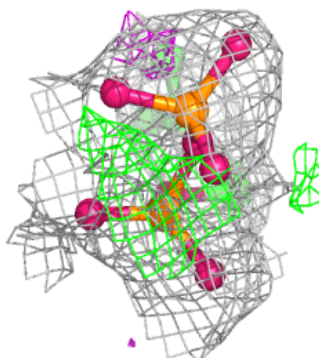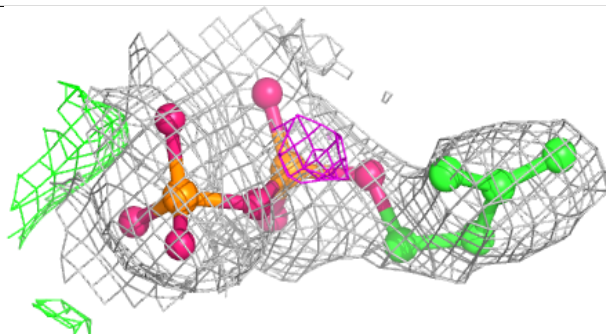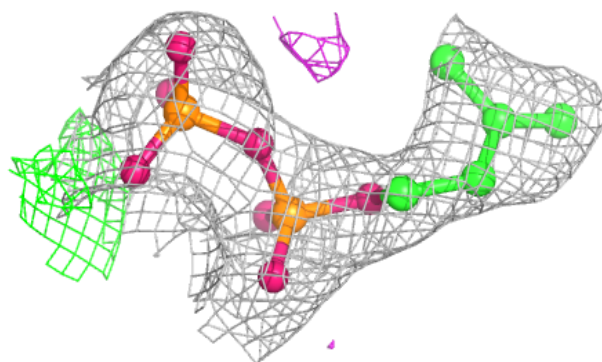
Electron density around IPE A 504:

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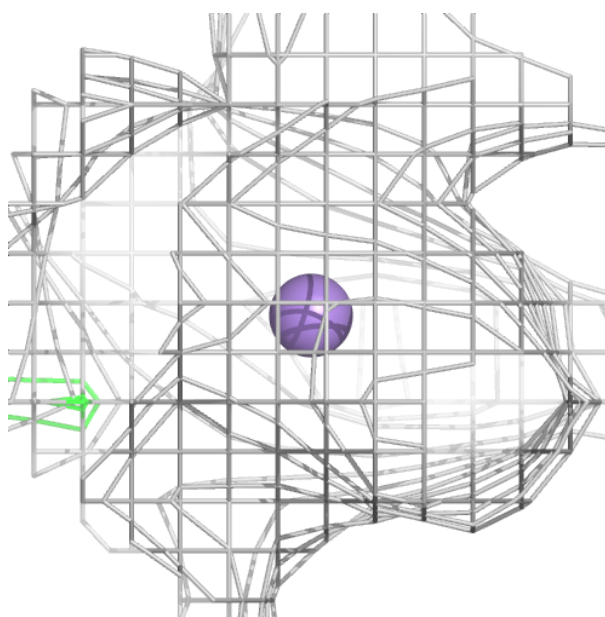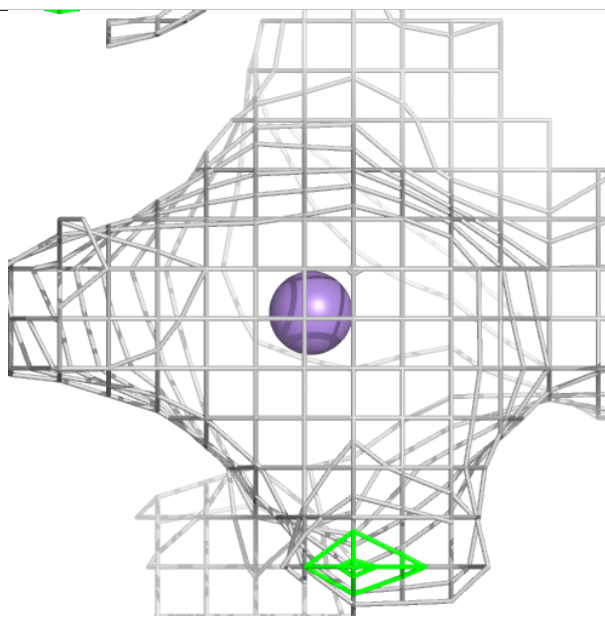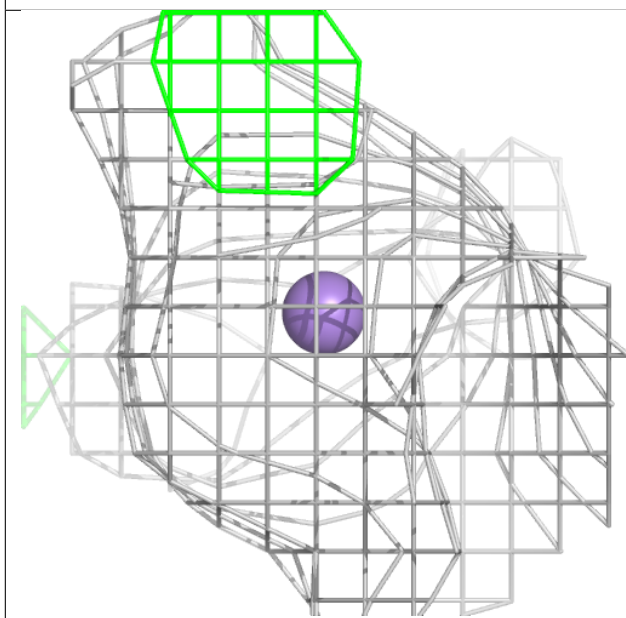and green (positive)
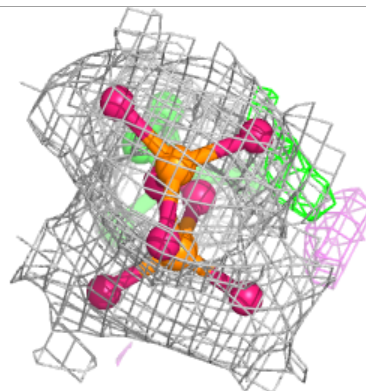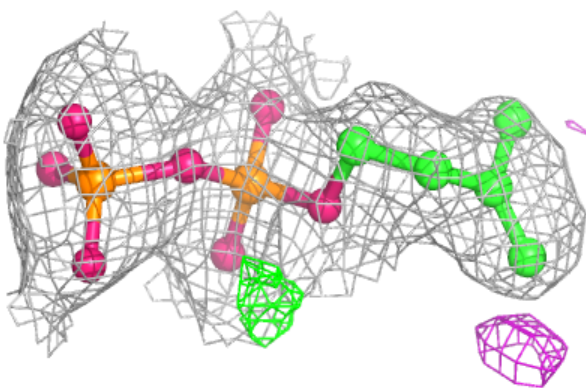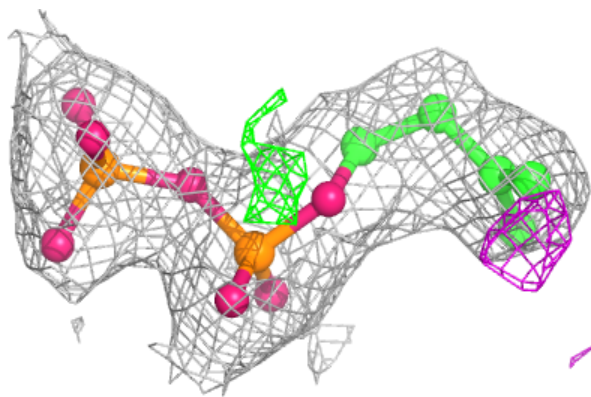
Electron density around MN C 502:

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

Full wwPDB X-ray Structure Validation Report
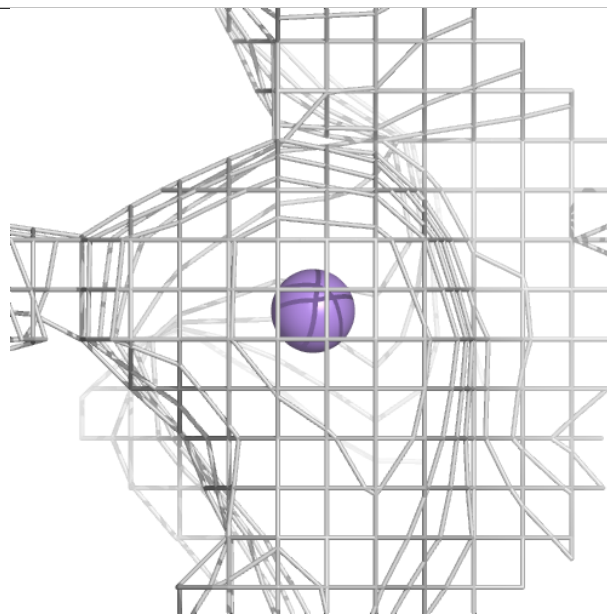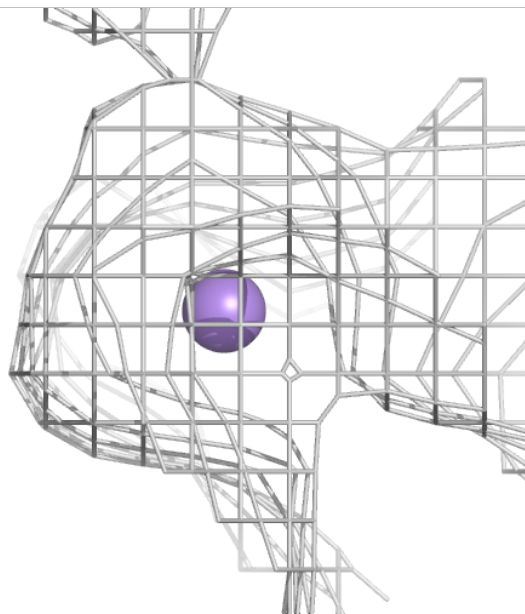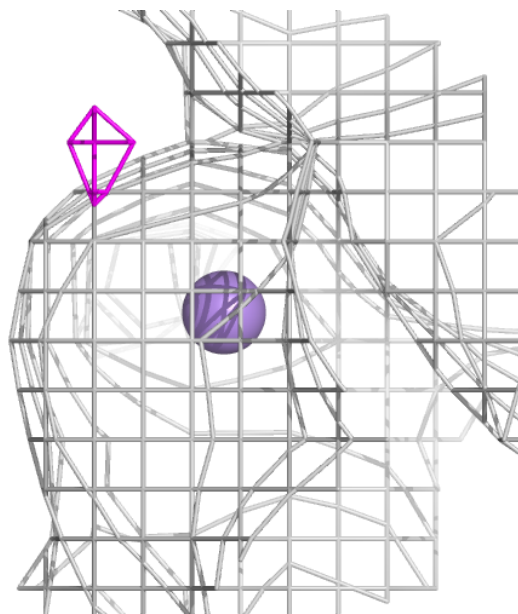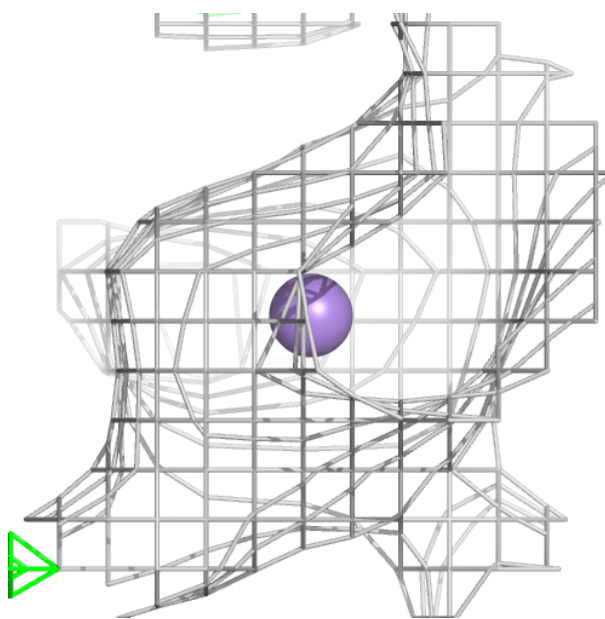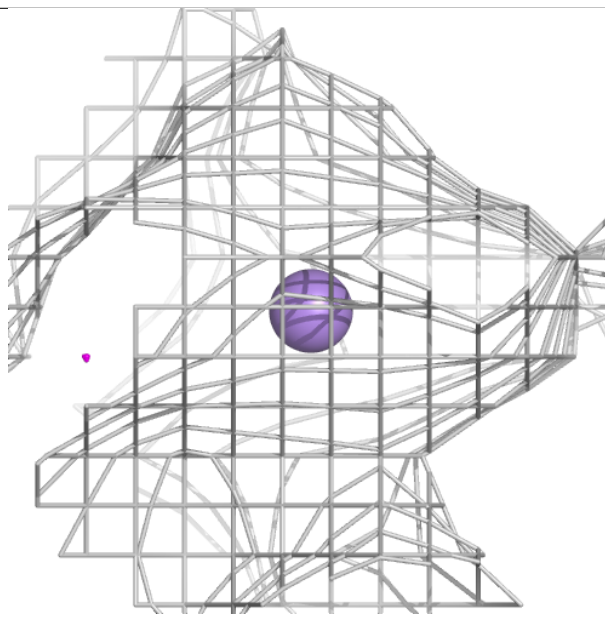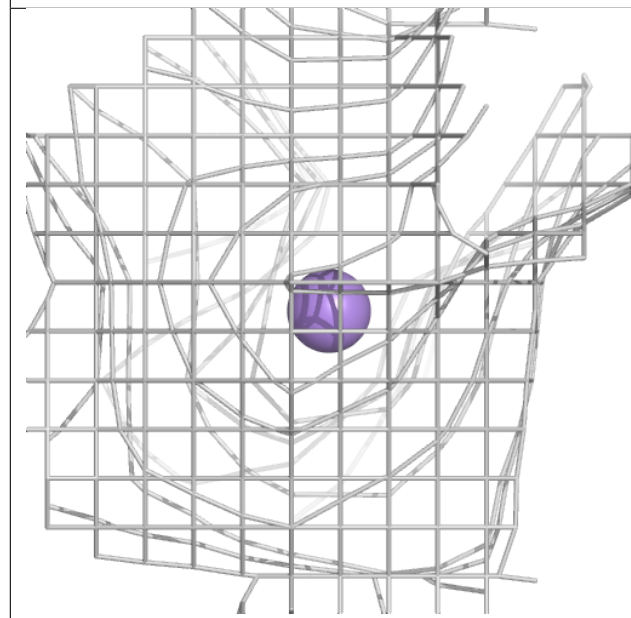
Electron density around IPE D 505:

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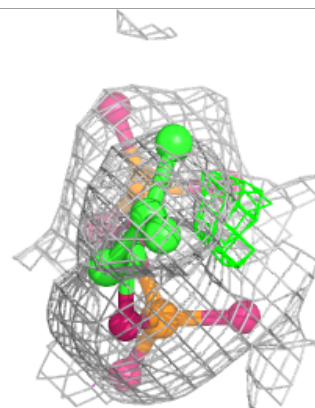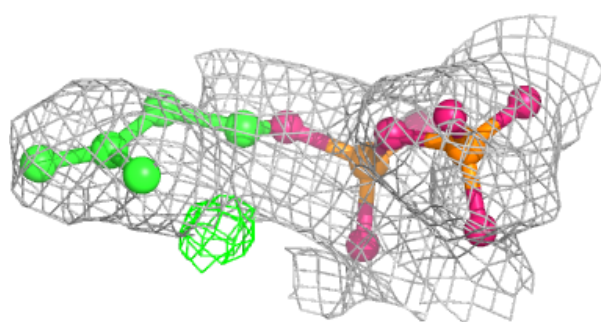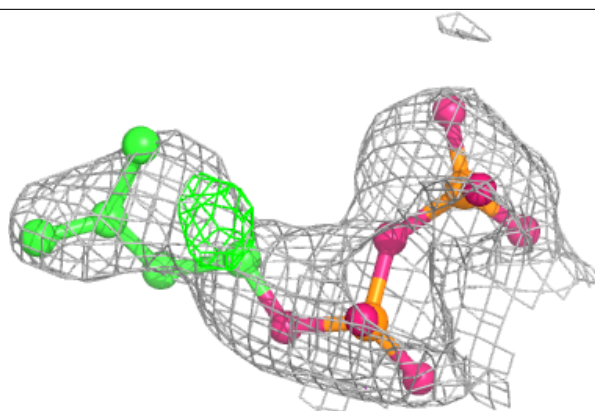
Electron density around MN A 501:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
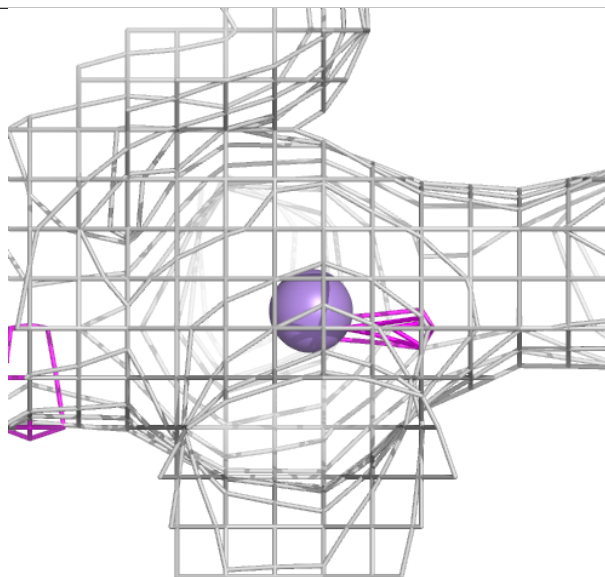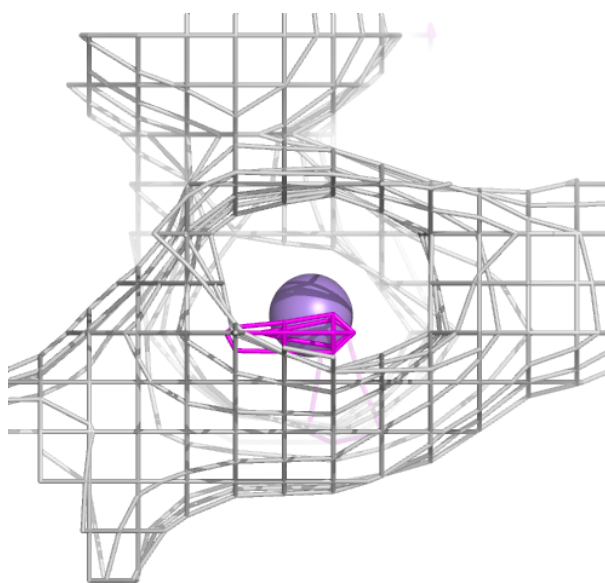
Electron density around IPE F 505:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
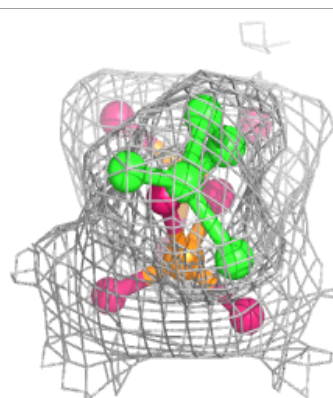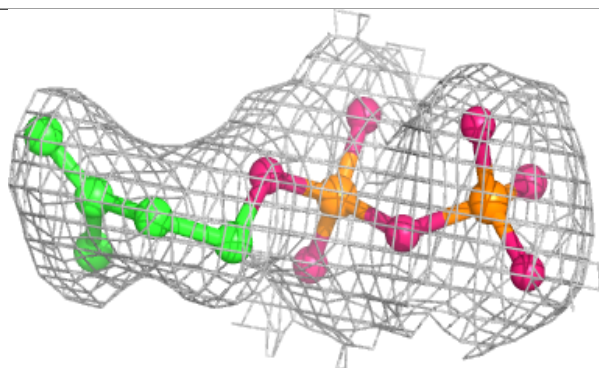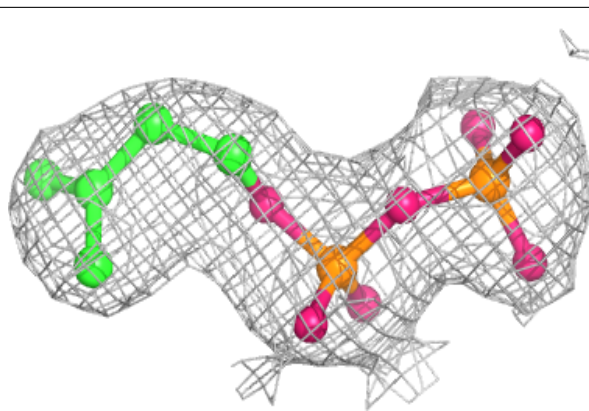
Electron density around IPE B 505:

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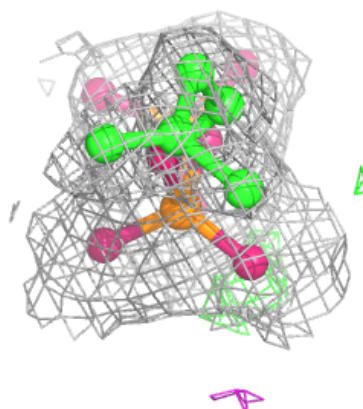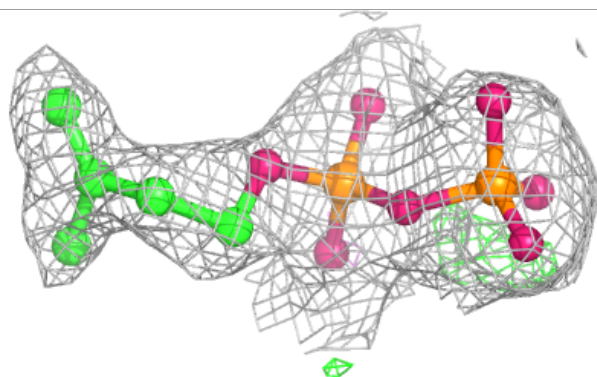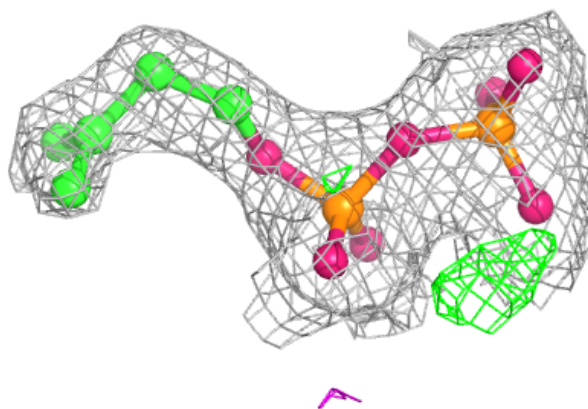
Electron density around IPE D 504:

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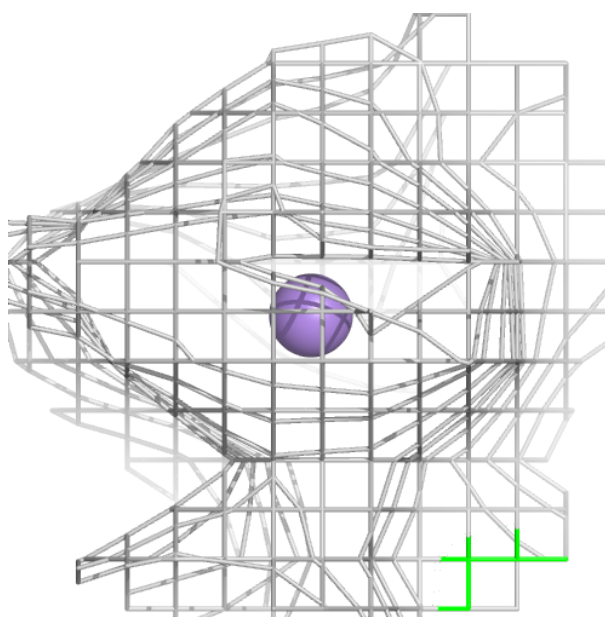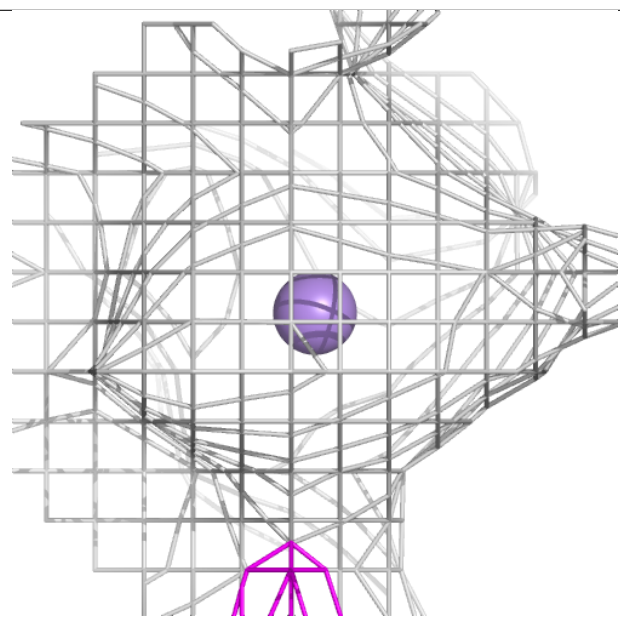mF_o-DF_c (at 3 rmsd) in purple (negative)
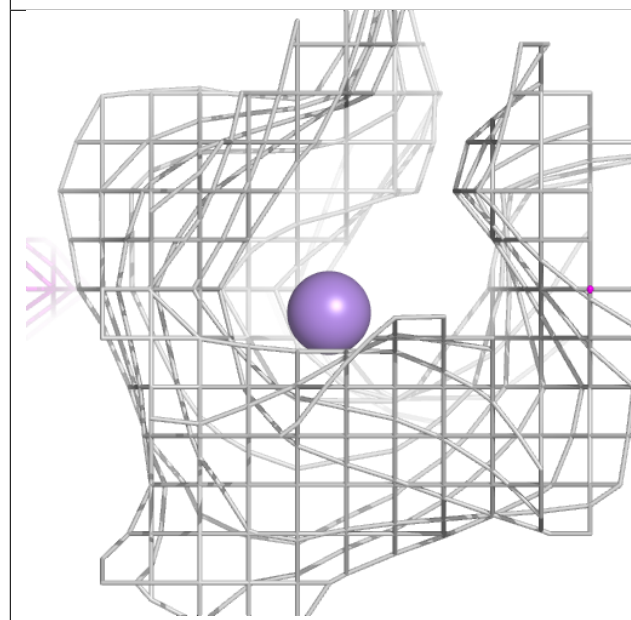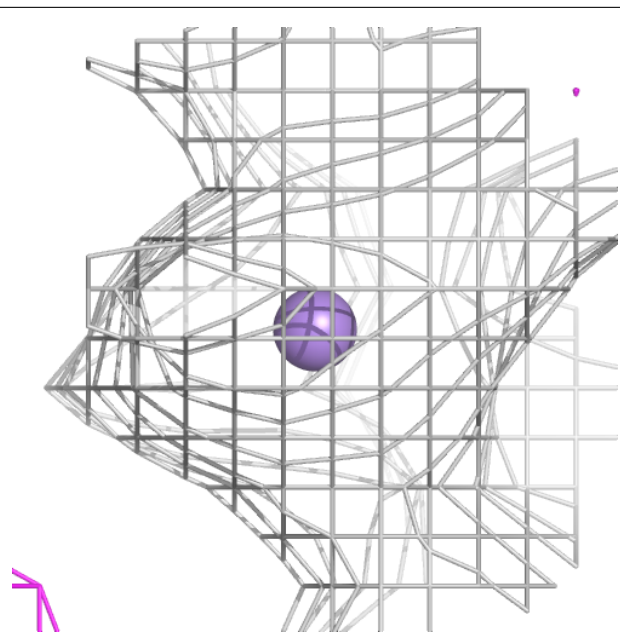and green (positive)
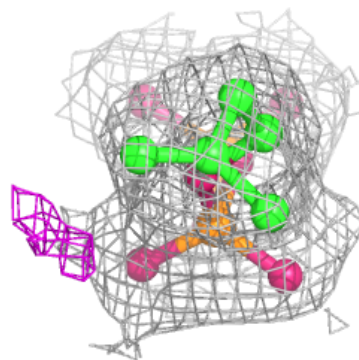
Electron density around MN A 503:

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

Electron density around IPE E 504:

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

Electron density around MN D 503:

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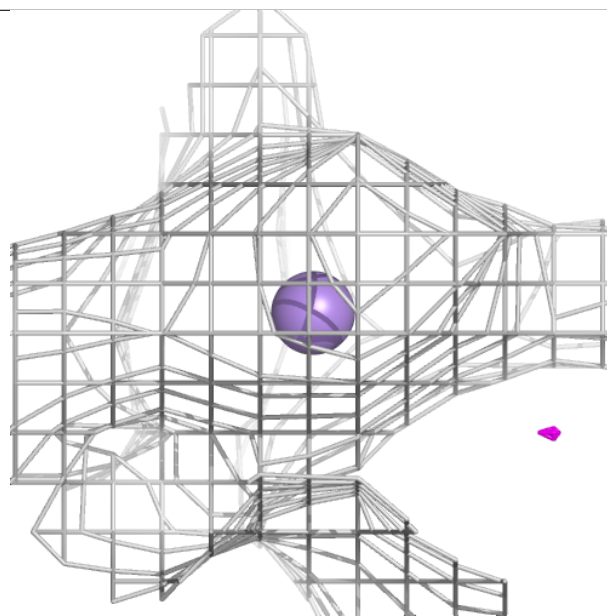$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
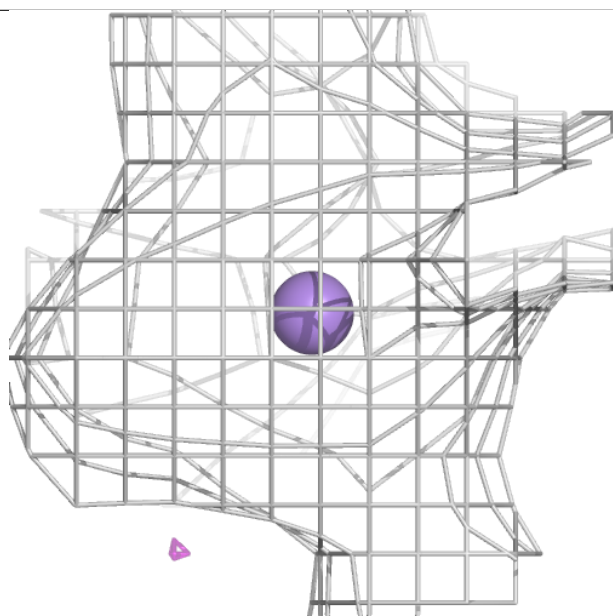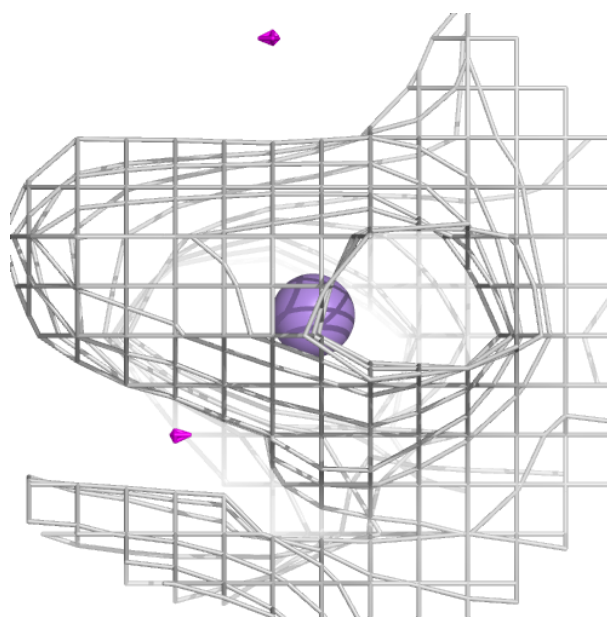and green (positive)

Electron density around MN E 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 MN E 502:

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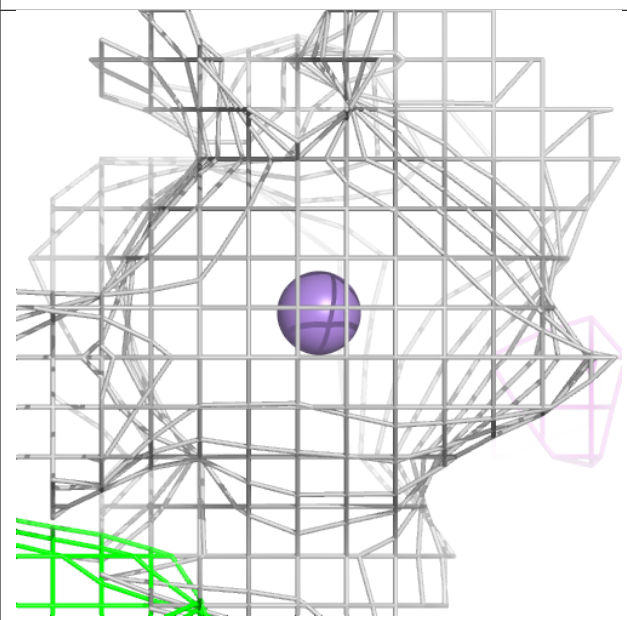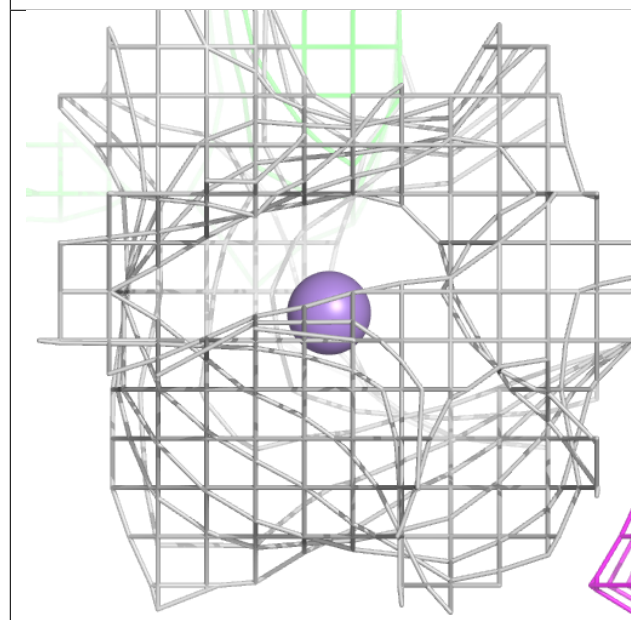and green (positive)

Electron density around MN E 503:

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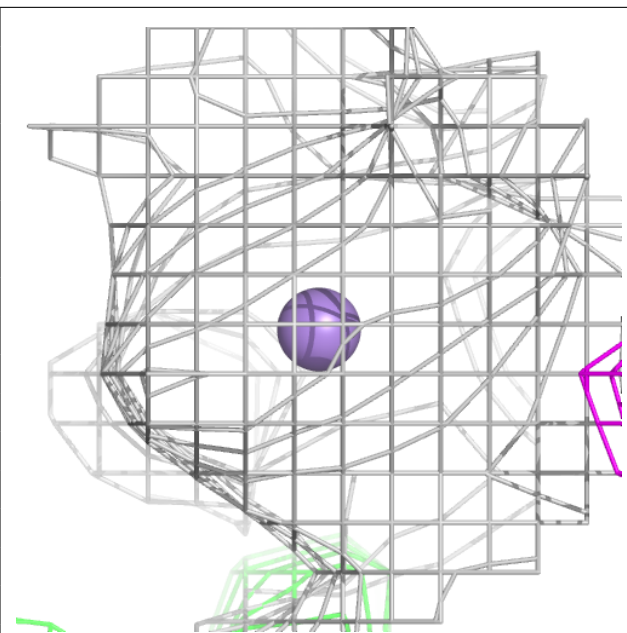
Electron density around MN F 501:

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

Electron density around MN F 502:

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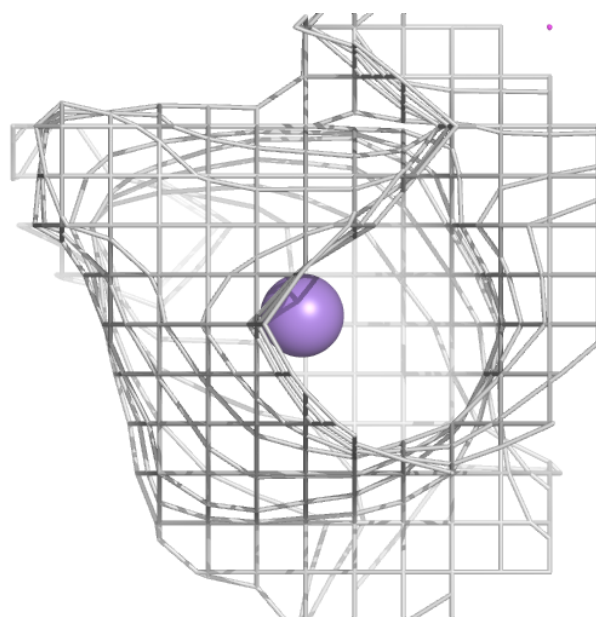$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative) and green (positive)

Electron density around MN F 503:

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

Electron density around MN B 503:

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

Electron density around MN B 502:

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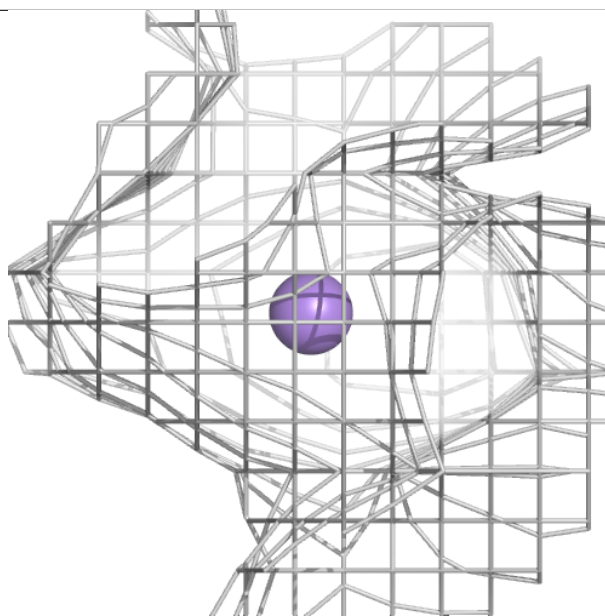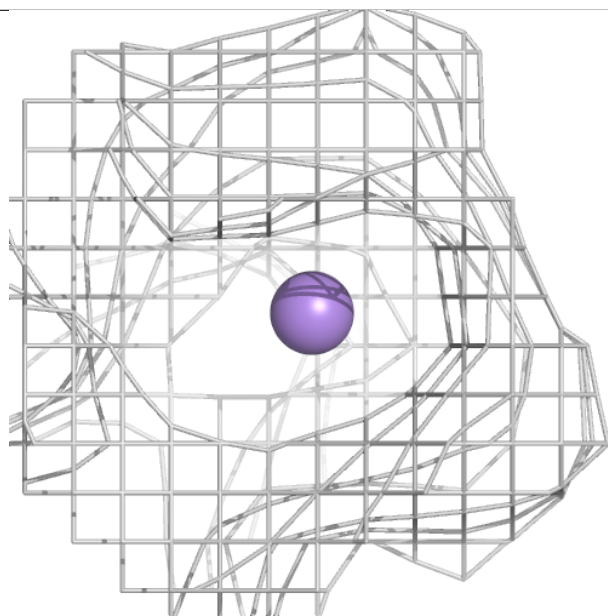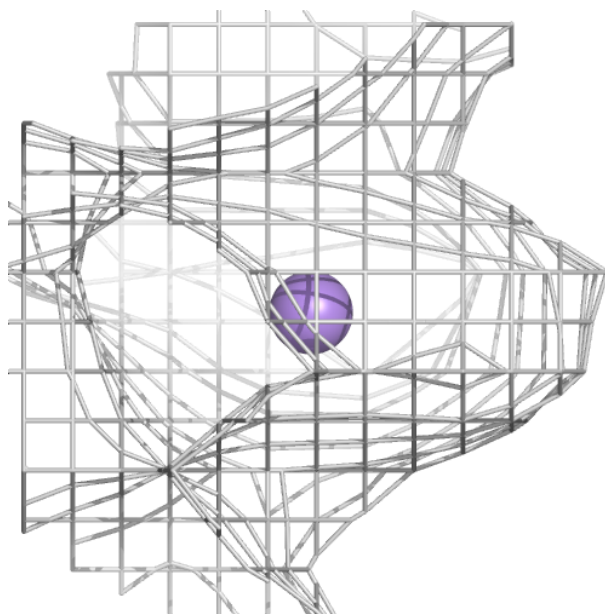and green (positive)

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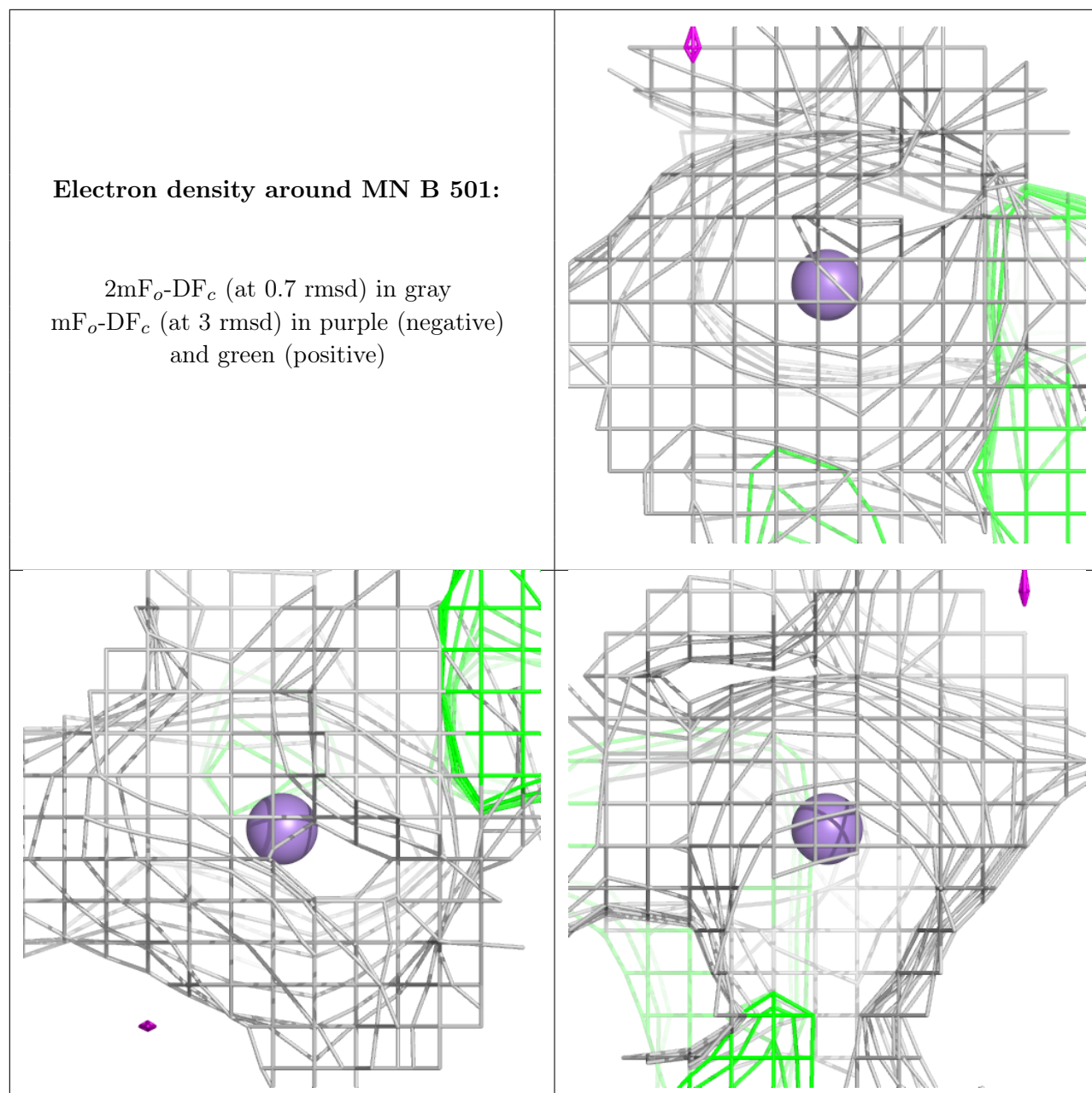
$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)

Electron density around MN 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)

6.5 Other polymers ⓘ

There are no such residues in this entry.