Full wwPDB X-ray Structure Validation Report (i)

Jan 14, 2025 – 04:39 PM JST

PDB ID	:	8XWO
Title	:	Vibrio harveyi chitoporin in complex with minocycline
Authors	:	Sanram, S.; Suginta, W.; Robinson, R.C.
Deposited on	:	2024-01-16
Resolution	:	3.40 Å(reported)

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

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/XrayValidationReportHelp
with specific help available everywhere you see the (i) symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

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

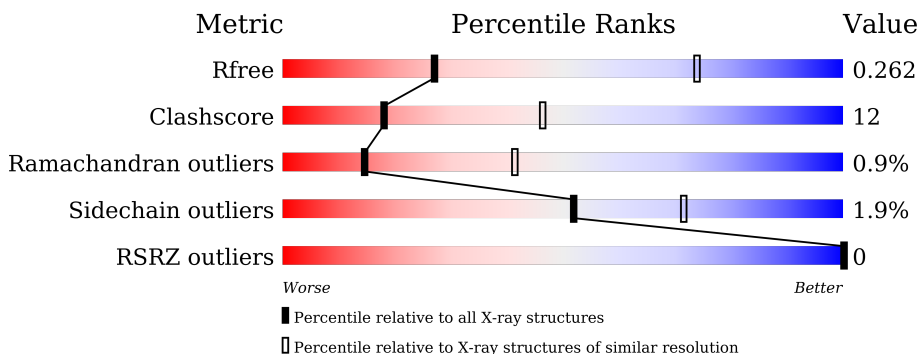|		
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.21
EDS	:	3.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.004 (Gargrove)
Density-Fitness	:	1.0.11
Ideal geometry (proteins)	:	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 3.40 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		0.262
Clashscore		12
Ramachandran outliers		0.9%
Sidechain outliers		1.9%
RSRZ outliers		0

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}	164625	1140 (3.46-3.34)
Clashscore	180529	1172 (3.46-3.34)
Ramachandran outliers	177936	1172 (3.46-3.34)
Sidechain outliers	177891	1172 (3.46-3.34)
RSRZ outliers	164620	1140 (3.46-3.34)

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	350	70% 24% • 5%
1	B	350	71% 23% 5%
1	C	350	71% 23% • 5%
1	D	350	67% 27% 5%
1	E	350	67% 27% • 5%
1	F	350	71% 23% • 5%

WORLDWIDE
wwPDB
PROTEIN DATA BANK

2 Entry composition ⓘ

There are 5 unique types of molecules in this entry. The entry contains 15612 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.
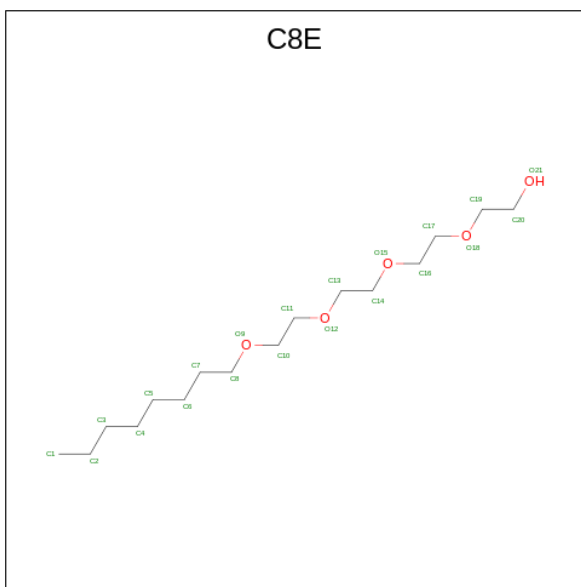
- Molecule 1 is a protein called Chitoporin.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	331	Total	C	N	O	S	0	0	0
			2566	1615	424	518	9			
1	B	331	Total	C	N	O	S	0	0	0
			2570	1616	426	519	9			
1	C	331	Total	C	N	O	S	0	0	0
			2553	1606	423	515	9			
1	D	331	Total	C	N	O	S	0	0	0
			2571	1618	426	518	9			
1	E	331	Total	C	N	O	S	0	0	0
			2564	1616	425	514	9			
1	F	331	Total	C	N	O	S	0	0	0
			2568	1618	424	517	9			

- Molecule 2 is (4S,4AS,5AR,12AS)-4,7-BIS(DIMETHYLAMINO)-3,10,12,12A-TETRAHYDROXY-1,11-DIOXO-1,4,4A,5,5A,6,11,12A-OCTAHYDROTETRACENE-2-CARBOXAMIDE (three-letter code: MIY) (formula: $C_{23}H_{27}N_3O_7$) (labeled as "Ligand of Interest" by depositor).
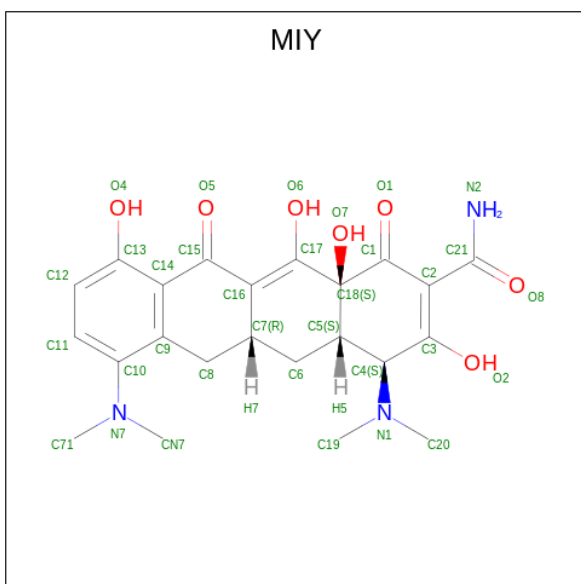
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total 33	C 23	N 3	O 7	0	0
2	D	1	Total 33	C 23	N 3	O 7	0	0
2	F	1	Total 33	C 23	N 3	O 7	0	0

- Molecule 3 is (HYDROXYETHYLOXY)TRI(ETHYLOXY)OCTANE (three-letter code: C8E) (formula: $C_{16}H_{34}O_5$) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total 16	C 13	O 3	0	0
3	A	1	Total 15	C 10	O 5	0	0
3	B	1	Total 10	C 6	O 4	0	0
3	B	1	Total 10	C 6	O 4	0	0
3	C	1	Total 13	C 8	O 5	0	0
3	D	1	Total 10	C 6	O 4	0	0
3	F	1	Total 10	C 6	O 4	0	0

- Molecule 4 is SODIUM ION (three-letter code: NA) (formula: Na) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	3	Total 3	Na 3	0	0
4	B	2	Total 2	Na 2	0	0
4	C	3	Total 3	Na 3	0	0
4	D	3	Total 3	Na 3	0	0
4	E	3	Total 3	Na 3	0	0
4	F	2	Total 2	Na 2	0	0

- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	8	Total 8	O 8	0	0
5	B	2	Total 2	O 2	0	0
5	C	3	Total 3	O 3	0	0
5	D	3	Total 3	O 3	0	0
5	E	2	Total 2	O 2	0	0
5	F	3	Total 3	O 3	0	0

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PROTEIN DATA BANK

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: Chitoporin

Chain A:

• Molecule 1: Chitoporin

Chain B:

• Molecule 1: Chitoporin

Chain C:

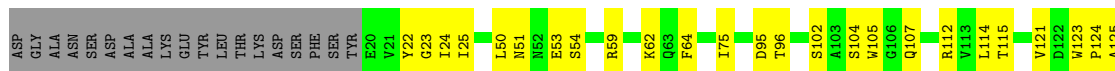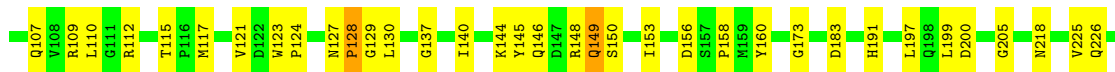K240 E252 M257 S258 A259 M262 K271 R282 Q298 R312 A313 R314 F318 G324 L325 D326 R330 W331 T332 S333 G334 T335 E341 Y348 Y349 F350

• Molecule 1: Chitoporin

Chain D:

67%   27%   5%

ASP GLY ALA ASN SER ASP ALA ALA LYS GLU TYR LEU THR LYS ASP SER PHE SER TYR E20 V21 Y22 G23 I24 Y31 M48 Q49 L50 N51 N52 E53 S54 R55 I56 G57 F58 R59 G60 K61 F71 I72 I75 E76 G77 V80 D81 P82 S83 G92 E93 R94 D95 T96

G99 L110 L114 M117 Y118 E119 L120 W123 P124 A125 S126 N127 P128 G129 L130 G131 D132 V133 Y134 G137 G138 A139 I140 K144 Y145 R148 Q149 T152 P158 M159 Y160 D174 D182 D183 Y184 W185 E204 N208 G213 Q214 Y221 G224 V225 Q226

F236 A237 Q238 Y239 K240 Y241 N248 E252 D255 M262 K271 N277 R282 D292 Q298 I299 M300 Y301 F302 V303 A307 V308 L309 Y310 R314 M315 F318 N319 D323 G324 L325 R330 G334 Y339 N340 E341 Y342 G345 V346 E347 Y348 Y349

F350

• Molecule 1: Chitoporin

Chain E:

67%   27%   • 5%

ASP GLY ALA ASN SER ASP ALA ALA LYS GLU TYR LEU THR LYS ASP SER PHE SER TYR E20 V21 Y22 G23 I24 I25 L50 N51 N52 E53 S54 R59 K62 Q63 F64 I75 D95 T96 S102 A103 S104 W105 G106 Q107 R112 V113 L114 T115 V121 D122 W123 P124 A125

S126 N127 P128 D132 V133 Y134 D135 W136 G137 K144 Y145 Q146 D147 R148 Q149 S150 N151 R154 W155 D156 S157 P158 M159 Y160 A161 D162 K163 I166 A172 G173 D183 Y184 Y192 K193 L197 R207 Q214 T215 Y221 Q226 F229 E230 N231 S234 F235 F236

A237 Q238 Y239 K240 S247 M257 G260 L261 M262 Y263 T264 Q269 Y270 K271 L272 D279 L280 E281 R282 L287 S296 A297 Q298 I299 M300 V303 A313 R314 M315 L322 D323 G324 A329 R330 S333 D338 Y339 N340 E341 Y342 E347 Y348 Y349 F350

• Molecule 1: Chitoporin

Chain F:

71%   23%   • 5%

ASP GLY ALA ASN SER ASP ALA ALA LYS GLU TYR LEU THR LYS ASP SER PHE SER TYR E20 G23 I24 R32 L50 E53 S54 R55 I56 K61 F67 E68 P69 I72 I75 E76 G77 G78 Y79 S83 F84 E87 G88 A89 G90 L91 G92 E93 R94 D95 T96

Q107 V108 R109 L110 G111 R112 T115 P116 M117 V121 D122 W123 P124 N127 P128 G129 L130 G137 I140 K144 Y145 Q146 D147 R148 Q149 S150 I153 D156 S157 P158 M159 Y160 G173 D183 H191 L197 Q198 L199 D200 G205 N218 V225 Q226

S234 E243 A244 E252 S258 M262 K271 N277 F278 D279 V294 Q298 V303 L309 R312 A313 R314 M315 F318 W331 T332 S333 G334 T335 E341 F350

4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α, β, γ	92.39Å 92.50Å 96.52Å 101.11° 101.14° 109.72°	Depositor
Resolution (Å)	20.02 – 3.40 20.02 – 3.40	Depositor EDS
% Data completeness (in resolution range)	94.5 (20.02-3.40) 94.5 (20.02-3.40)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.91 (at 3.44Å)	Xtriage
Refinement program	PHENIX 1.19.2_4158	Depositor
R, R_{free}	0.182 , 0.262 0.182 , 0.262	Depositor DCC
R_{free} test set	1695 reflections (4.64%)	wwPDB-VP
Wilson B-factor (Å^2)	53.7	Xtriage
Anisotropy	0.352	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.28 , 21.6	EDS
L-test for twinning [2]	$< |L| > = 0.48, < L^2 > = 0.31$	Xtriage
Estimated twinning fraction	0.448 for -k,-h,-l	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	15612	wwPDB-VP
Average B, all atoms (Å^2)	54.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.70% 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: MIY, C8E, NA

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#$|Z|$>5	RMSZ	#$|Z|$>5
1	A	0.53	0/2632	0.72	0/3569
1	B	0.51	0/2636	0.73	0/3573
1	C	0.51	0/2619	0.70	0/3552
1	D	0.52	0/2637	0.72	0/3573
1	E	0.53	0/2630	0.72	0/3564
1	F	0.51	0/2634	0.72	0/3570
All	All	0.52	0/15788	0.72	0/21401

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	2566	0	2316	66	0
1	B	2570	0	2322	54	0
1	C	2553	0	2290	63	0
1	D	2571	0	2329	74	0
1	E	2564	0	2319	66	0
1	F	2568	0	2329	53	0
2	A	33	0	24	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	D	33	0	24	2	0
2	F	33	0	24	3	0
3	A	31	0	44	4	0
3	B	20	0	26	0	0
3	C	13	0	17	0	0
3	D	10	0	13	1	0
3	F	10	0	13	0	0
4	A	3	0	0	0	0
4	B	2	0	0	0	0
4	C	3	0	0	0	0
4	D	3	0	0	0	0
4	E	3	0	0	0	0
4	F	2	0	0	0	0
5	A	8	0	0	0	0
5	B	2	0	0	1	0
5	C	3	0	0	0	0
5	D	3	0	0	1	0
5	E	2	0	0	0	0
5	F	3	0	0	0	0
All	All	15612	0	14090	357	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 12.

All (357) 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:F:173:GLY:HA3	1:F:183:ASP:HB2	1.36	1.05
1:E:173:GLY:HA3	1:E:183:ASP:HB2	1.44	0.97
1:B:51:ASN:HB2	1:B:83:SER:HB3	1.58	0.84
1:C:80:VAL:HG11	1:F:96:THR:HG21	1.60	0.82
1:A:146:GLN:HB3	1:A:149:GLN:HG2	1.63	0.80
1:E:128:PRO:HB3	1:E:271:LYS:HD3	1.63	0.79
1:D:262:MET:HG2	1:D:271:LYS:HE2	1.65	0.78
1:F:61:LYS:HG2	1:F:72:ILE:HG22	1.66	0.77
1:A:114:LEU:HD23	1:A:148:ARG:HB2	1.65	0.76
1:D:127:ASN:HB3	1:D:128:PRO:HD3	1.66	0.76
1:D:239:TYR:HB2	3:D:402:C8E:H192	1.68	0.76
1:C:128:PRO:HG3	1:C:271:LYS:HG2	1.67	0.76
1:D:252:GLU:HG2	1:D:282:ARG:HG3	1.66	0.75
1:B:53:GLU:O	1:B:55:ARG:NH1	2.20	0.75

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:348:TYR:CE1	1:E:62:LYS:HD2	2.23	0.74
1:E:51:ASN:ND2	1:E:53:GLU:OE2	2.21	0.73
1:E:280:LEU:HD23	1:E:287:LEU:HD23	1.70	0.73
1:E:296:SER:HB2	1:E:314:ARG:HB3	1.70	0.73
1:A:207:ARG:HD3	1:A:217:GLU:HG2	1.70	0.72
1:D:114:LEU:HD22	1:D:118:TYR:HD2	1.55	0.72
1:A:281:GLU:HG2	1:A:286:THR:HG22	1.72	0.71
1:F:112:ARG:NH1	1:F:150:SER:OG	2.24	0.71
1:C:80:VAL:HG13	1:F:92:GLY:HA3	1.73	0.70
1:A:281:GLU:HA	1:A:286:THR:HA	1.71	0.70
1:B:348:TYR:HE1	1:E:62:LYS:HD2	1.57	0.70
1:F:92:GLY:HA2	1:F:96:THR:OG1	1.92	0.69
1:D:137:GLY:O	1:D:277:ASN:ND2	2.26	0.69
1:E:137:GLY:HA2	1:E:333:SER:HB3	1.74	0.68
1:C:75:ILE:HD13	1:D:80:VAL:HG11	1.76	0.68
1:A:236:PHE:CE2	1:A:260:GLY:HA3	2.29	0.67
1:F:110:LEU:HD21	1:F:153:ILE:HD12	1.77	0.67
1:E:157:SER:HB3	1:E:166:ILE:H	1.59	0.66
1:F:23:GLY:HA3	1:F:350:PHE:CE2	2.30	0.66
1:F:83:SER:HG	1:F:84:PHE:HD1	1.43	0.66
1:E:146:GLN:HB3	1:E:149:GLN:HE21	1.61	0.66
1:D:61:LYS:HG2	1:D:72:ILE:HG22	1.76	0.66
1:B:20:GLU:N	5:B:501:HOH:O	2.29	0.65
1:D:53:GLU:O	1:D:55:ARG:NH1	2.28	0.65
1:A:298:GLN:HG3	1:A:312:ARG:HB3	1.78	0.65
1:D:139:ALA:O	1:D:330:ARG:NH1	2.29	0.65
1:A:23:GLY:HA3	1:A:350:PHE:CE2	2.30	0.65
1:B:61:LYS:HG2	1:B:72:ILE:HG22	1.79	0.64
1:F:137:GLY:O	1:F:277:ASN:ND2	2.30	0.64
1:E:173:GLY:HA3	1:E:183:ASP:CB	2.26	0.63
1:A:112:ARG:HB2	1:A:150:SER:HB3	1.81	0.62
1:C:25:ILE:HB	1:C:348:TYR:HB3	1.80	0.62
1:F:173:GLY:HA3	1:F:183:ASP:CB	2.23	0.62
1:A:102:SER:HB3	1:A:105:TRP:NE1	2.14	0.61
1:D:20:GLU:N	5:D:501:HOH:O	2.33	0.61
1:C:92:GLY:HA2	1:C:96:THR:OG1	2.00	0.61
1:B:114:LEU:HD22	1:B:118:TYR:HD2	1.66	0.61
1:A:115:THR:HG21	1:A:146:GLN:HB2	1.82	0.61
1:D:114:LEU:HD22	1:D:118:TYR:CD2	2.35	0.61
1:C:252:GLU:HG2	1:C:282:ARG:HG3	1.81	0.60
1:C:51:ASN:ND2	1:C:53:GLU:OE2	2.33	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:31:TYR:HB2	1:D:48:MET:HE2	1.83	0.60
1:B:77:GLY:O	1:B:94:ARG:HG3	2.01	0.60
1:C:102:SER:HB3	1:C:105:TRP:CE2	2.37	0.59
1:F:129:GLY:O	1:F:314:ARG:NH1	2.35	0.59
1:A:200:ASP:OD2	1:A:226:GLN:NE2	2.33	0.59
1:B:163:LYS:HD3	1:B:192:TYR:CE1	2.37	0.59
1:F:130:LEU:HA	1:F:294:VAL:HG11	1.85	0.58
1:B:303:VAL:HG22	1:E:64:PHE:HB3	1.86	0.58
1:D:75:ILE:HD12	1:F:56:ILE:HD11	1.85	0.58
1:D:298:GLN:HE21	1:D:300:MET:HB2	1.68	0.58
1:A:50:LEU:HB2	1:B:151:ASN:HA	1.85	0.58
1:E:163:LYS:HD2	1:E:192:TYR:OH	2.03	0.58
1:B:207:ARG:HH12	1:B:219:ASN:HD21	1.51	0.58
1:C:62:LYS:HD2	1:C:63:GLN:N	2.19	0.57
1:A:50:LEU:HD21	1:B:110:LEU:HD23	1.87	0.57
1:B:123:TRP:CZ3	1:B:127:ASN:ND2	2.72	0.57
1:E:128:PRO:HD3	1:E:271:LYS:HE2	1.86	0.57
1:A:87:GLU:HG3	1:B:93:GLU:HA	1.86	0.57
1:C:118:TYR:CG	1:C:147:ASP:HA	2.40	0.57
1:E:75:ILE:HA	1:E:96:THR:OG1	2.05	0.57
1:E:234:SER:HB2	1:E:262:MET:HG3	1.85	0.57
1:B:182:ASP:OD1	1:B:182:ASP:N	2.34	0.57
1:C:64:PHE:HB3	1:D:303:VAL:HG22	1.86	0.57
1:F:115:THR:HG21	1:F:146:GLN:HB2	1.87	0.57
1:B:215:THR:H	1:B:247:SER:HB3	1.69	0.56
1:D:128:PRO:HD2	1:D:130:LEU:HG	1.86	0.56
1:B:139:ALA:O	1:B:330:ARG:NH1	2.38	0.56
1:C:234:SER:HB2	1:C:262:MET:HG3	1.87	0.56
1:D:20:GLU:O	1:D:58:PHE:HA	2.04	0.56
1:E:135:ASP:HB3	1:E:136:TRP:CE3	2.41	0.56
1:E:315:MET:HG3	1:E:340:ASN:OD1	2.06	0.56
1:E:112:ARG:HD2	1:E:150:SER:HB3	1.88	0.56
1:F:67:PHE:CD1	1:F:69:PRO:HD2	2.42	0.55
1:C:26:ALA:H	1:C:54:SER:HB3	1.71	0.55
1:E:25:ILE:HB	1:E:348:TYR:HB3	1.88	0.55
1:A:50:LEU:HD12	1:B:152:THR:H	1.71	0.55
1:F:199:LEU:HD23	1:F:225:VAL:HG23	1.87	0.55
1:C:332:THR:H	1:C:335:THR:HG1	1.54	0.55
1:E:163:LYS:HD2	1:E:192:TYR:CZ	2.41	0.55
1:A:112:ARG:HA	1:A:150:SER:HA	1.87	0.55
1:D:22:TYR:O	1:D:22:TYR:CD1	2.60	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:229:PHE:HB2	1:C:231:ASN:OD1	2.07	0.54
1:D:252:GLU:CD	1:D:330:ARG:HH22	2.10	0.54
1:F:234:SER:OG	1:F:262:MET:HG3	2.08	0.54
1:E:229:PHE:HB2	1:E:231:ASN:OD1	2.07	0.54
1:B:248:ASN:OD1	1:B:250:VAL:HG23	2.08	0.54
1:C:234:SER:HB2	1:C:262:MET:CG	2.37	0.54
1:B:146:GLN:HB3	1:B:149:GLN:HG2	1.90	0.54
1:D:224:GLY:HA3	1:D:238:GLN:HG2	1.89	0.54
1:E:298:GLN:HE21	1:E:300:MET:HE2	1.73	0.54
1:B:214:GLN:HG3	1:B:325:LEU:HD12	1.89	0.54
1:D:23:GLY:O	1:D:24:ILE:HD13	2.08	0.53
1:D:158:PRO:HD2	1:D:160:TYR:CZ	2.43	0.53
1:B:241:TYR:OH	1:B:253:LYS:HE3	2.09	0.53
1:F:200:ASP:OD2	1:F:226:GLN:NE2	2.37	0.53
1:F:298:GLN:HG3	1:F:312:ARG:HG3	1.89	0.53
1:E:114:LEU:O	1:E:154:ARG:NH1	2.42	0.53
1:C:128:PRO:HD3	1:C:271:LYS:HE2	1.91	0.53
1:C:129:GLY:O	1:C:314:ARG:NH1	2.42	0.53
1:F:137:GLY:HA2	1:F:333:SER:HB3	1.91	0.52
1:A:92:GLY:HA2	1:A:96:THR:OG1	2.09	0.52
1:A:224:GLY:HA3	1:A:238:GLN:HG2	1.91	0.52
1:C:133:VAL:HA	1:C:137:GLY:HA3	1.91	0.52
1:F:127:ASN:OD1	1:F:271:LYS:NZ	2.41	0.52
1:B:207:ARG:HH11	1:B:217:GLU:HB3	1.74	0.52
1:F:197:LEU:HD22	1:F:225:VAL:HG22	1.89	0.52
1:A:49:GLN:NE2	1:A:84:PHE:H	2.07	0.52
1:A:117:MET:O	1:A:121:VAL:HG23	2.09	0.52
1:C:114:LEU:O	1:C:154:ARG:NH1	2.42	0.52
1:C:313:ALA:HA	1:C:341:GLU:O	2.10	0.52
1:D:255:ASP:N	1:D:255:ASP:OD1	2.42	0.52
1:A:110:LEU:HD21	1:A:153:ILE:HD12	1.92	0.52
1:D:149:GLN:HG2	1:D:185:TRP:HE1	1.75	0.52
1:E:23:GLY:HA3	1:E:350:PHE:CZ	2.45	0.52
1:B:114:LEU:HD22	1:B:118:TYR:CD2	2.45	0.52
1:A:22:TYR:OH	1:A:76:GLU:HB2	2.10	0.52
1:A:183:ASP:OD1	1:A:183:ASP:N	2.43	0.52
1:D:20:GLU:OE2	1:D:59:ARG:HD2	2.09	0.52
1:E:214:GLN:OE1	1:E:247:SER:HB3	2.10	0.52
1:E:257:MET:O	1:E:257:MET:HG3	2.10	0.52
1:E:296:SER:CB	1:E:314:ARG:HB3	2.37	0.52
1:A:134:TYR:CE1	1:A:240:LYS:HE2	2.45	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:213:GLY:O	1:D:214:GLN:HG3	2.11	0.51
1:D:252:GLU:OE2	1:D:282:ARG:NH1	2.43	0.51
1:D:292:ASP:OD1	1:D:319:ASN:ND2	2.43	0.51
1:C:159:MET:HB3	1:C:162:ASP:HA	1.91	0.51
1:D:134:TYR:O	1:D:240:LYS:NZ	2.43	0.51
1:E:159:MET:HB3	1:E:162:ASP:HA	1.92	0.51
1:C:124:PRO:HG3	1:C:226:GLN:CD	2.30	0.51
1:A:114:LEU:HD22	1:A:118:TYR:CD2	2.44	0.51
1:A:114:LEU:HD22	1:A:118:TYR:HD2	1.76	0.51
1:A:130:LEU:HA	1:A:294:VAL:HG11	1.92	0.51
1:A:89:ALA:HB1	1:A:93:GLU:OE1	2.11	0.51
1:D:182:ASP:OD1	1:D:182:ASP:N	2.42	0.51
1:F:148:ARG:O	1:F:149:GLN:HB2	2.10	0.51
1:D:318:PHE:HB3	1:D:334:GLY:HA3	1.91	0.51
1:D:117:MET:HE1	1:D:204:GLU:HB3	1.93	0.51
1:E:151:ASN:HB2	1:E:172:ALA:HB3	1.92	0.51
1:F:32:ARG:HG2	1:F:341:GLU:HB2	1.93	0.51
1:B:61:LYS:NZ	1:B:101:GLU:OE1	2.39	0.50
1:A:203:TYR:HB2	3:A:403:C8E:H101	1.94	0.50
1:A:323:ASP:HA	1:A:329:ALA:HA	1.93	0.50
1:E:107:GLN:O	1:E:107:GLN:HG3	2.10	0.50
1:E:146:GLN:OE1	1:E:149:GLN:NE2	2.44	0.50
1:C:151:ASN:HB2	1:C:172:ALA:HB3	1.92	0.50
1:D:282:ARG:NH2	1:D:323:ASP:O	2.45	0.50
1:D:252:GLU:OE2	1:D:330:ARG:NH2	2.45	0.50
1:D:110:LEU:HD23	1:F:50:LEU:HD21	1.93	0.50
1:A:135:ASP:HB3	1:A:136:TRP:CE3	2.46	0.50
1:F:89:ALA:HB1	1:F:93:GLU:OE1	2.12	0.50
1:D:214:GLN:OE1	1:D:248:ASN:HB3	2.12	0.49
1:E:161:ALA:HB3	1:E:163:LYS:HE3	1.95	0.49
1:D:31:TYR:HB2	1:D:48:MET:CE	2.42	0.49
1:B:92:GLY:HA2	1:B:96:THR:OG1	2.11	0.49
1:D:152:THR:H	1:F:50:LEU:HD12	1.76	0.49
1:C:191:HIS:HA	1:C:199:LEU:O	2.11	0.49
1:B:72:ILE:HG12	1:B:99:GLY:O	2.13	0.49
1:B:152:THR:HG1	1:B:185:TRP:HZ2	1.61	0.49
1:E:324:GLY:HA2	1:E:330:ARG:HH21	1.78	0.49
1:A:158:PRO:HD2	1:A:160:TYR:CZ	2.48	0.48
1:D:51:ASN:HB2	1:D:83:SER:HB3	1.95	0.48
1:E:115:THR:HG21	1:E:146:GLN:HB2	1.95	0.48
1:C:125:ALA:HA	1:C:236:PHE:CE1	2.49	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:264:THR:HG23	1:E:269:GLN:HB2	1.94	0.48
1:E:231:ASN:OD1	1:E:231:ASN:N	2.46	0.48
1:C:135:ASP:HB3	1:C:136:TRP:CE3	2.48	0.48
1:D:92:GLY:HA2	1:D:96:THR:OG1	2.13	0.48
1:A:236:PHE:CZ	1:A:260:GLY:HA3	2.49	0.48
1:B:164:PHE:HB2	1:B:192:TYR:HD1	1.79	0.48
1:B:124:PRO:HG3	1:B:226:GLN:OE1	2.14	0.48
1:E:125:ALA:HA	1:E:236:PHE:CE1	2.49	0.48
1:C:150:SER:HB3	1:D:81:ASP:OD2	2.14	0.47
1:F:107:GLN:OE1	1:F:109:ARG:HD3	2.14	0.47
1:F:144:LYS:HE2	1:F:145:TYR:CE1	2.49	0.47
1:A:278:PHE:CE2	3:A:402:C8E:H112	2.50	0.47
1:C:152:THR:H	1:D:50:LEU:HD12	1.78	0.47
1:D:149:GLN:HG2	1:D:185:TRP:NE1	2.28	0.47
1:D:302:PHE:HD1	1:D:308:VAL:HG12	1.79	0.47
1:F:243:GLU:HG3	1:F:244:ALA:N	2.29	0.47
1:F:117:MET:O	1:F:121:VAL:HG23	2.12	0.47
1:C:324:GLY:HA2	1:C:330:ARG:NH2	2.29	0.47
1:F:67:PHE:CE1	1:F:69:PRO:HD2	2.50	0.47
2:F:401:MIY:H193	2:F:401:MIY:H5	1.64	0.47
1:A:49:GLN:NE2	1:B:177:GLY:O	2.47	0.47
1:B:120:LEU:HD23	1:B:120:LEU:HA	1.62	0.47
1:C:62:LYS:HD2	1:C:63:GLN:H	1.80	0.47
2:D:401:MIY:O2	2:D:401:MIY:N2	2.47	0.47
1:E:102:SER:HB3	1:E:105:TRP:CE2	2.49	0.47
1:C:282:ARG:HD3	1:C:325:LEU:HD21	1.97	0.47
1:D:23:GLY:CA	1:D:56:ILE:HD13	2.45	0.47
1:D:183:ASP:HA	1:D:208:ASN:HB2	1.96	0.47
1:A:307:ALA:HA	1:A:347:GLU:O	2.15	0.47
1:E:313:ALA:HA	1:E:341:GLU:O	2.14	0.47
1:B:300:MET:HG3	1:B:310:TYR:HB3	1.96	0.47
1:C:24:ILE:O	1:C:54:SER:HA	2.15	0.47
1:D:221:TYR:CD2	1:D:241:TYR:HD2	2.33	0.47
1:C:154:ARG:HG3	1:C:169:ALA:HB2	1.97	0.46
1:E:134:TYR:CE1	1:E:240:LYS:HE2	2.50	0.46
1:E:300:MET:HE2	1:E:300:MET:HB2	1.76	0.46
1:A:300:MET:HG3	1:A:310:TYR:HB3	1.97	0.46
1:B:124:PRO:HG3	1:B:226:GLN:CD	2.35	0.46
1:C:29:ALA:HA	1:C:50:LEU:HD23	1.98	0.46
1:E:121:VAL:HG13	1:E:134:TYR:CD2	2.51	0.46
1:E:144:LYS:HD3	1:E:145:TYR:CZ	2.50	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:129:GLY:HA3	1:A:314:ARG:HD3	1.98	0.46
1:A:331:TRP:HB3	2:A:401:MIY:H712	1.98	0.46
1:C:114:LEU:HD22	1:C:118:TYR:HD2	1.79	0.46
1:C:298:GLN:OE1	1:C:312:ARG:NE	2.48	0.46
1:D:221:TYR:HD2	1:D:241:TYR:HD2	1.64	0.46
1:B:30:ALA:HA	1:B:343:SER:HB3	1.98	0.46
1:D:144:LYS:H	1:D:144:LYS:HG3	1.41	0.46
1:F:128:PRO:HD3	1:F:271:LYS:HE2	1.96	0.46
1:A:290:THR:HA	1:A:319:ASN:HB2	1.98	0.46
1:B:207:ARG:HH12	1:B:219:ASN:ND2	2.13	0.46
1:C:54:SER:O	1:C:80:VAL:HG23	2.16	0.46
1:C:62:LYS:HG2	1:D:348:TYR:CE1	2.51	0.46
1:D:120:LEU:HD23	1:D:120:LEU:HA	1.63	0.45
1:D:93:GLU:HA	1:F:87:GLU:HG3	1.98	0.45
1:C:184:TYR:CE1	1:C:207:ARG:HB2	2.51	0.45
1:F:318:PHE:HB3	1:F:334:GLY:HA3	1.98	0.45
1:A:24:ILE:HG21	1:A:55:ARG:NH2	2.32	0.45
1:D:72:ILE:HG12	1:D:99:GLY:O	2.16	0.45
1:B:115:THR:HG21	1:B:146:GLN:HB2	1.98	0.45
1:A:332:THR:H	1:A:335:THR:HG1	1.63	0.45
1:E:324:GLY:HA2	1:E:330:ARG:NH2	2.32	0.45
1:D:314:ARG:NH2	1:D:339:TYR:OH	2.50	0.45
1:A:160:TYR:N	1:A:164:PHE:O	2.49	0.45
1:E:22:TYR:CE1	1:E:59:ARG:HD3	2.51	0.45
1:F:77:GLY:HA2	1:F:91:LEU:HA	1.97	0.45
1:C:104:SER:O	1:C:158:PRO:HG2	2.17	0.45
1:E:23:GLY:HA3	1:E:350:PHE:CE2	2.51	0.45
1:A:298:GLN:NE2	1:A:300:MET:HE2	2.32	0.44
1:C:32:ARG:HG2	1:C:341:GLU:HB2	1.99	0.44
1:D:123:TRP:HA	1:D:124:PRO:HA	1.66	0.44
1:D:125:ALA:HA	1:D:236:PHE:CE1	2.52	0.44
1:B:112:ARG:HA	1:B:149:GLN:O	2.17	0.44
1:C:31:TYR:HA	1:C:48:MET:HA	1.99	0.44
1:C:184:TYR:CZ	1:C:207:ARG:HB2	2.52	0.44
1:C:324:GLY:HA2	1:C:330:ARG:HH21	1.82	0.44
1:E:234:SER:HB2	1:E:262:MET:CG	2.47	0.44
1:E:323:ASP:HA	1:E:329:ALA:HA	1.99	0.44
1:A:193:LYS:HZ1	1:A:228:TRP:HZ3	1.64	0.44
1:A:203:TYR:CE2	3:A:403:C8E:H141	2.52	0.44
1:E:260:GLY:HA2	1:E:272:LEU:O	2.17	0.44
1:F:75:ILE:HA	1:F:96:THR:HG23	2.00	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:112:ARG:HB2	1:B:150:SER:OG	2.17	0.44
1:D:148:ARG:HH21	2:D:401:MIY:H193	1.83	0.44
1:E:25:ILE:O	1:E:347:GLU:HA	2.18	0.44
1:E:193:LYS:HD2	1:E:197:LEU:O	2.17	0.44
1:F:205:GLY:HA2	1:F:218:ASN:O	2.17	0.44
1:B:118:TYR:OH	1:B:135:ASP:OD2	2.31	0.44
1:F:140:ILE:HD11	1:F:252:GLU:HB2	2.00	0.44
2:F:401:MIY:O1	2:F:401:MIY:O6	2.35	0.44
1:A:23:GLY:HA3	1:A:350:PHE:CZ	2.53	0.43
1:A:318:PHE:CD2	1:A:334:GLY:HA2	2.53	0.43
1:C:102:SER:HB3	1:C:105:TRP:NE1	2.32	0.43
1:A:348:TYR:CE1	1:B:62:LYS:HD3	2.52	0.43
1:A:64:PHE:HB3	1:E:303:VAL:HG22	1.99	0.43
1:A:129:GLY:O	1:A:314:ARG:NH1	2.44	0.43
1:B:184:TYR:CE1	1:B:207:ARG:HB2	2.54	0.43
1:A:197:LEU:HD23	1:A:197:LEU:HA	1.82	0.43
1:D:315:MET:HG3	1:D:340:ASN:OD1	2.18	0.43
1:B:68:GLU:H	1:B:68:GLU:HG2	1.59	0.43
1:E:123:TRP:HA	1:E:124:PRO:HA	1.72	0.43
1:F:53:GLU:HG2	1:F:79:TYR:CZ	2.53	0.43
1:A:128:PRO:HD3	1:A:271:LYS:HE2	2.01	0.43
1:C:53:GLU:HB3	1:C:79:TYR:CE1	2.54	0.43
1:C:74:GLN:HG2	1:C:95:ASP:O	2.19	0.43
1:C:114:LEU:HD22	1:C:118:TYR:CD2	2.54	0.43
1:B:107:GLN:OE1	1:B:109:ARG:HD3	2.19	0.43
1:A:150:SER:O	1:A:151:ASN:HB2	2.18	0.43
1:A:348:TYR:HE1	1:B:62:LYS:HD3	1.84	0.43
1:C:134:TYR:O	1:C:240:LYS:NZ	2.52	0.43
1:E:50:LEU:HA	1:E:50:LEU:HD23	1.75	0.42
1:D:50:LEU:HD23	1:D:50:LEU:HA	1.68	0.42
1:B:313:ALA:HA	1:B:341:GLU:O	2.18	0.42
1:C:257:MET:HG3	1:C:257:MET:O	2.17	0.42
1:F:83:SER:OG	1:F:84:PHE:HD1	2.02	0.42
1:F:331:TRP:HB2	2:F:401:MIY:H712	2.02	0.42
1:A:318:PHE:HB3	1:A:334:GLY:HA3	2.02	0.42
1:E:24:ILE:O	1:E:54:SER:HA	2.19	0.42
1:F:318:PHE:CD2	1:F:334:GLY:HA2	2.54	0.42
1:F:315:MET:HE3	1:F:315:MET:HB3	1.78	0.42
1:B:39:ALA:HA	1:B:42:ASP:HB2	2.01	0.42
1:C:50:LEU:HD23	1:C:50:LEU:HA	1.81	0.42
1:E:238:GLN:O	1:E:257:MET:HA	2.19	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:117:MET:HE3	1:D:145:TYR:CD1	2.54	0.42
1:D:140:ILE:CG2	1:D:144:LYS:HG2	2.50	0.42
1:C:231:ASN:OD1	1:C:231:ASN:N	2.53	0.41
1:E:214:GLN:HG3	1:E:215:THR:H	1.85	0.41
1:C:229:PHE:HZ	1:C:235:PHE:HE1	1.68	0.41
1:D:214:GLN:HE21	1:D:214:GLN:HB2	1.55	0.41
1:F:158:PRO:HD2	1:F:160:TYR:CZ	2.55	0.41
1:F:303:VAL:HB	1:F:309:LEU:HG	2.02	0.41
1:A:74:GLN:O	1:A:96:THR:HA	2.19	0.41
1:B:23:GLY:O	1:B:350:PHE:HA	2.21	0.41
1:C:168:ALA:HB2	1:C:188:ILE:HG13	2.02	0.41
1:D:307:ALA:HA	1:D:347:GLU:O	2.19	0.41
1:E:157:SER:HB3	1:E:166:ILE:O	2.20	0.41
1:A:72:ILE:HG12	1:A:99:GLY:O	2.20	0.41
1:A:123:TRP:HB3	1:A:124:PRO:CD	2.50	0.41
1:A:278:PHE:CE2	3:A:402:C8E:H132	2.55	0.41
1:C:134:TYR:CE1	1:C:240:LYS:HE2	2.55	0.41
1:C:238:GLN:O	1:C:257:MET:HA	2.20	0.41
1:E:282:ARG:HH22	1:E:322:LEU:HD11	1.85	0.41
1:F:24:ILE:O	1:F:54:SER:HA	2.20	0.41
1:F:146:GLN:HB3	1:F:149:GLN:HG2	2.01	0.41
1:F:332:THR:H	1:F:335:THR:HG1	1.68	0.41
1:C:318:PHE:HB3	1:C:334:GLY:HA3	2.03	0.41
1:D:61:LYS:HA	1:D:71:PHE:O	2.20	0.41
1:B:32:ARG:HG2	1:B:341:GLU:HB2	2.03	0.41
1:C:123:TRP:HA	1:C:124:PRO:HA	1.77	0.41
1:D:77:GLY:O	1:D:94:ARG:HD3	2.21	0.41
1:D:124:PRO:HG3	1:D:226:GLN:OE1	2.21	0.41
1:D:127:ASN:HB3	1:D:128:PRO:CD	2.44	0.41
1:F:123:TRP:HA	1:F:124:PRO:HA	1.55	0.41
1:A:123:TRP:O	1:A:124:PRO:C	2.59	0.41
1:B:20:GLU:O	1:B:58:PHE:HA	2.21	0.41
1:D:72:ILE:HG12	1:D:99:GLY:C	2.40	0.41
1:D:310:TYR:CZ	1:D:345:GLY:HA3	2.56	0.41
1:F:191:HIS:HA	1:F:199:LEU:O	2.20	0.41
1:A:53:GLU:O	1:A:55:ARG:NH1	2.53	0.41
1:C:324:GLY:C	1:C:326:ASP:H	2.24	0.41
1:D:31:TYR:O	1:D:341:GLU:HA	2.20	0.41
1:A:264:THR:HG23	1:A:268:TRP:O	2.21	0.41
1:C:252:GLU:OE2	1:C:282:ARG:NH1	2.54	0.41
1:E:125:ALA:HB2	1:E:238:GLN:NE2	2.36	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:283:ASP:O	1:B:285:LYS:HE2	2.20	0.40
1:C:236:PHE:O	1:C:259:ALA:HA	2.20	0.40
1:D:127:ASN:C	1:D:127:ASN:HD22	2.24	0.40
1:E:124:PRO:HG3	1:E:226:GLN:CD	2.41	0.40
1:E:104:SER:O	1:E:158:PRO:HG2	2.21	0.40
1:E:128:PRO:CD	1:E:271:LYS:HE2	2.50	0.40
1:F:197:LEU:HA	1:F:197:LEU:HD23	1.73	0.40
1:D:23:GLY:HA3	1:D:350:PHE:CE1	2.56	0.40
1:E:184:TYR:CE1	1:E:207:ARG:HB2	2.57	0.40
1:A:99:GLY:HA3	1:A:109:ARG:HA	2.03	0.40
1:A:123:TRP:HB3	1:A:124:PRO:HD3	2.04	0.40
1:B:129:GLY:O	1:B:314:ARG:NH1	2.55	0.40
1:B:158:PRO:HD2	1:B:160:TYR:CZ	2.56	0.40
1:D:183:ASP:N	1:D:183:ASP:OD1	2.55	0.40
1:E:342:TYR:CD1	1:E:342:TYR:N	2.90	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	329/350 (94%)	310 (94%)	15 (5%)	4 (1%)	11	35
1	B	329/350 (94%)	314 (95%)	13 (4%)	2 (1%)	22	50
1	C	329/350 (94%)	313 (95%)	15 (5%)	1 (0%)	37	66
1	D	329/350 (94%)	308 (94%)	17 (5%)	4 (1%)	11	35
1	E	329/350 (94%)	310 (94%)	16 (5%)	3 (1%)	14	41
1	F	329/350 (94%)	310 (94%)	16 (5%)	3 (1%)	14	41
All	All	1974/2100 (94%)	1865 (94%)	92 (5%)	17 (1%)	14	41

All (17) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	D	127	ASN
1	A	123	TRP
1	E	147	ASP
1	A	95	ASP
1	D	148	ARG
1	E	127	ASN
1	A	148	ARG
1	D	95	ASP
1	E	95	ASP
1	F	149	GLN
1	B	325	LEU
1	F	95	ASP
1	D	325	LEU
1	C	128	PRO
1	A	128	PRO
1	F	128	PRO
1	B	128	PRO

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	249/267 (93%)	248 (100%)	1 (0%)	89	93
1	B	250/267 (94%)	243 (97%)	7 (3%)	38	62
1	C	245/267 (92%)	239 (98%)	6 (2%)	44	66
1	D	250/267 (94%)	246 (98%)	4 (2%)	58	75
1	E	247/267 (92%)	240 (97%)	7 (3%)	38	62
1	F	250/267 (94%)	246 (98%)	4 (2%)	58	75
All	All	1491/1602 (93%)	1462 (98%)	29 (2%)	52	71

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

Mol	Chain	Res	Type
1	A	279	ASP
1	B	95	ASP

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Mol	Chain	Res	Type
1	B	132	ASP
1	B	145	TYR
1	B	154	ARG
1	B	293	ASP
1	B	312	ARG
1	B	315	MET
1	C	67	PHE
1	C	112	ARG
1	C	132	ASP
1	C	147	ASP
1	C	229	PHE
1	C	262	MET
1	D	127	ASN
1	D	132	ASP
1	D	174	ASP
1	D	342	TYR
1	E	132	ASP
1	E	156	ASP
1	E	157	SER
1	E	221	TYR
1	E	279	ASP
1	E	338	ASP
1	E	342	TYR
1	F	67	PHE
1	F	156	ASP
1	F	258	SER
1	F	279	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	28	GLN
1	D	298	GLN

5.3.3　RNA (i)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates (i)

There are no oligosaccharides in this entry.

5.6 Ligand geometry (i)

Of 26 ligands modelled in this entry, 16 are monoatomic - leaving 10 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	#$|Z| > 2$
2	MIY	D	401	-	35,36,36	1.21	2 (5%)	41,58,58	1.49	5 (12%)
2	MIY	F	401	-	35,36,36	1.24	3 (8%)	41,58,58	1.45	6 (14%)
3	C8E	C	401	-	12,12,20	0.46	0	11,11,19	0.33	0
3	C8E	B	402	-	9,9,20	0.50	0	8,8,19	0.36	0
2	MIY	A	401	-	35,36,36	1.16	2 (5%)	41,58,58	1.06	2 (4%)
3	C8E	F	402	-	9,9,20	0.59	0	8,8,19	0.63	0
3	C8E	A	402	-	15,15,20	0.45	0	14,14,19	0.46	0
3	C8E	D	402	-	9,9,20	0.56	0	8,8,19	0.55	0
3	C8E	B	401	-	9,9,20	0.54	0	8,8,19	0.46	0
3	C8E	A	403	-	14,14,20	0.52	0	13,13,19	0.41	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
2	MIY	D	401	-	-	2/12/70/70	0/4/4/4
2	MIY	F	401	-	-	1/12/70/70	0/4/4/4
3	C8E	C	401	-	-	7/10/10/18	-
3	C8E	B	402	-	-	4/7/7/18	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	MIY	A	401	-	-	2/12/70/70	0/4/4/4
3	C8E	F	402	-	-	4/7/7/18	-
3	C8E	A	402	-	-	9/13/13/18	-
3	C8E	D	402	-	-	3/7/7/18	-
3	C8E	B	401	-	-	5/7/7/18	-
3	C8E	A	403	-	-	10/12/12/18	-

All (7) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	D	401	MIY	C21-N2	5.84	1.49	1.33
2	F	401	MIY	C21-N2	5.61	1.48	1.33
2	A	401	MIY	C21-N2	5.50	1.48	1.33
2	F	401	MIY	O5-C15	2.36	1.28	1.23
2	A	401	MIY	O5-C15	2.33	1.28	1.23
2	D	401	MIY	O5-C15	2.27	1.28	1.23
2	F	401	MIY	C18-C5	2.26	1.55	1.53

All (13) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	F	401	MIY	C18-C1-C2	5.05	123.78	115.75
2	D	401	MIY	C7-C6-C5	-4.19	103.11	110.49
2	D	401	MIY	C15-C16-C17	4.02	121.98	118.80
2	F	401	MIY	C18-C5-C4	3.70	116.69	111.64
2	D	401	MIY	C18-C5-C4	3.31	116.16	111.64
2	A	401	MIY	C18-C5-C4	3.14	115.92	111.64
2	D	401	MIY	C1-C18-C17	2.61	112.94	109.88
2	A	401	MIY	C1-C18-C17	2.39	112.69	109.88
2	F	401	MIY	C5-C18-C1	2.31	113.69	111.05
2	D	401	MIY	C21-C2-C1	2.29	123.68	120.97
2	F	401	MIY	O7-C18-C17	-2.14	106.72	110.14
2	F	401	MIY	O1-C1-C2	-2.12	119.10	123.55
2	F	401	MIY	C15-C16-C17	2.06	120.43	118.80

There are no chirality outliers.

All (47) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	401	MIY	C3-C4-N1-C19

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Mol	Chain	Res	Type	Atoms
2	D	401	MIY	C5-C4-N1-C20
2	F	401	MIY	C5-C4-N1-C19
3	A	403	C8E	O12-C13-C14-O15
3	C	401	C8E	O12-C13-C14-O15
3	B	402	C8E	O12-C13-C14-O15
3	F	402	C8E	O12-C13-C14-O15
3	A	403	C8E	C16-C17-O18-C19
3	D	402	C8E	O15-C16-C17-O18
3	A	403	C8E	O18-C19-C20-O21
3	B	402	C8E	O18-C19-C20-O21
3	A	402	C8E	C3-C4-C5-C6
3	C	401	C8E	O18-C19-C20-O21
3	B	401	C8E	O15-C16-C17-O18
3	B	401	C8E	O12-C13-C14-O15
3	A	402	C8E	C2-C3-C4-C5
3	B	401	C8E	O18-C19-C20-O21
3	A	402	C8E	C4-C5-C6-C7
3	A	402	C8E	C1-C2-C3-C4
3	F	402	C8E	O15-C16-C17-O18
3	A	403	C8E	C7-C8-O9-C10
3	A	402	C8E	O12-C13-C14-O15
3	C	401	C8E	C13-C14-O15-C16
3	C	401	C8E	C20-C19-O18-C17
3	A	402	C8E	C13-C14-O15-C16
3	A	403	C8E	C10-C11-O12-C13
3	A	403	C8E	C17-C16-O15-C14
3	B	402	C8E	C20-C19-O18-C17
3	A	402	C8E	C5-C6-C7-C8
3	A	403	C8E	C20-C19-O18-C17
3	A	403	C8E	C13-C14-O15-C16
3	D	402	C8E	C13-C14-O15-C16
3	D	402	C8E	O18-C19-C20-O21
3	F	402	C8E	C13-C14-O15-C16
3	A	403	C8E	O15-C16-C17-O18
3	F	402	C8E	C20-C19-O18-C17
3	B	401	C8E	C17-C16-O15-C14
3	C	401	C8E	C14-C13-O12-C11
3	B	401	C8E	C16-C17-O18-C19
3	A	402	C8E	O9-C10-C11-O12
2	D	401	MIY	C9-C10-N7-C71
3	B	402	C8E	C16-C17-O18-C19
3	A	402	C8E	C14-C13-O12-C11

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Mol	Chain	Res	Type	Atoms
3	C	401	C8E	O15-C16-C17-O18
2	A	401	MIY	C5-C4-N1-C19
3	A	403	C8E	O9-C10-C11-O12
3	C	401	C8E	C17-C16-O15-C14

There are no ring outliers.

6 monomers are involved in 11 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	D	401	MIY	2	0
2	F	401	MIY	3	0
2	A	401	MIY	1	0
3	A	402	C8E	2	0
3	D	402	C8E	1	0
3	A	403	C8E	2	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 MIY D 401

Bond lengths

Bond angles

Torsions

Rings

Ligand MIY F 401

Bond lengths

Bond angles

Torsions

Rings

Ligand C8E C 401

Bond lengths

Bond angles

Torsions

Rings

Ligand C8E B 402

Bond lengths

Bond angles

Torsions

Rings

Ligand MIY A 401

Bond lengths

Bond angles

Torsions

Rings

Ligand C8E F 402

Bond lengths

Bond angles

Torsions

Rings

Ligand C8E A 402

Bond lengths

Bond angles

Torsions

Rings

Ligand C8E D 402

Bond lengths

Bond angles

Torsions

Rings

Ligand C8E B 401

Bond lengths

Bond angles

Torsions

Rings

Ligand C8E A 403

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(Å²)	Q<0.9
1	A	331/350 (94%)	-1.87	0	100	100	35, 52, 70, 86	0
1	B	331/350 (94%)	-1.83	0	100	100	33, 53, 73, 89	0
1	C	331/350 (94%)	-1.86	0	100	100	36, 53, 67, 84	0
1	D	331/350 (94%)	-1.85	0	100	100	32, 53, 73, 83	0
1	E	331/350 (94%)	-1.87	0	100	100	38, 53, 68, 89	0
1	F	331/350 (94%)	-1.86	0	100	100	35, 51, 69, 78	0
All	All	1986/2100 (94%)	-1.86	0	100	100	32, 52, 70, 89	0

There are no RSRZ outliers to report.

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(Å²)	Q<0.9
2	MIY	A	401	33/33	0.97	0.04	81,105,117,119	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å²)	Q<0.9
2	MIY	D	401	33/33	0.98	0.04	64,90,106,108	0
2	MIY	F	401	33/33	0.98	0.04	76,109,122,130	0
3	C8E	A	403	15/21	0.98	0.04	39,50,63,67	0
3	C8E	A	402	16/21	0.99	0.05	33,44,61,66	0
3	C8E	B	401	10/21	0.99	0.05	35,47,54,55	0
3	C8E	B	402	10/21	0.99	0.03	38,59,62,62	0
3	C8E	C	401	13/21	0.99	0.05	54,59,62,65	0
3	C8E	D	402	10/21	0.99	0.03	26,41,52,57	0
3	C8E	F	402	10/21	0.99	0.03	27,44,47,49	0
4	NA	A	405	1/1	0.99	0.03	45,45,45,45	0
4	NA	C	404	1/1	0.99	0.04	52,52,52,52	0
4	NA	D	403	1/1	0.99	0.02	34,34,34,34	0
4	NA	E	402	1/1	0.99	0.04	52,52,52,52	0
4	NA	F	403	1/1	0.99	0.04	28,28,28,28	0
4	NA	C	402	1/1	1.00	0.02	32,32,32,32	0
4	NA	C	403	1/1	1.00	0.03	32,32,32,32	0
4	NA	A	404	1/1	1.00	0.05	37,37,37,37	0
4	NA	A	406	1/1	1.00	0.01	32,32,32,32	0
4	NA	D	404	1/1	1.00	0.04	33,33,33,33	0
4	NA	D	405	1/1	1.00	0.02	63,63,63,63	0
4	NA	E	401	1/1	1.00	0.02	36,36,36,36	0
4	NA	B	403	1/1	1.00	0.02	36,36,36,36	0
4	NA	E	403	1/1	1.00	0.01	27,27,27,27	0
4	NA	B	404	1/1	1.00	0.02	33,33,33,33	0
4	NA	F	404	1/1	1.00	0.02	35,35,35,35	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 MIY A 401:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
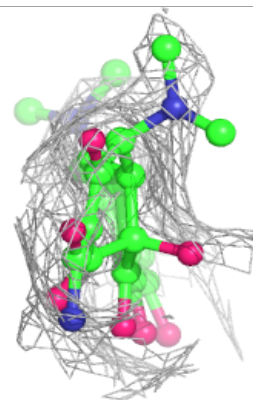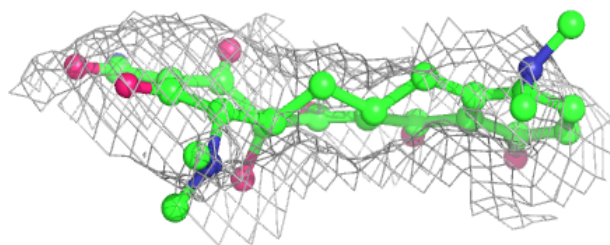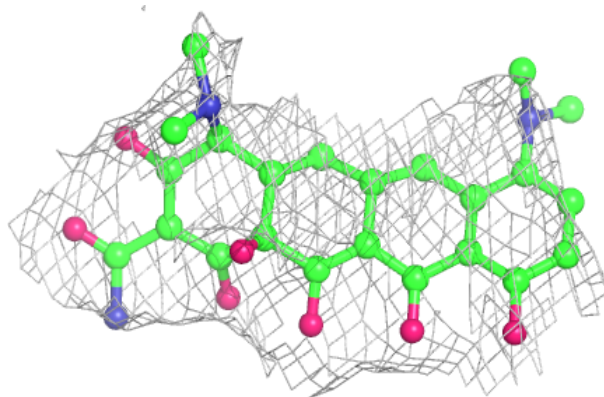
Electron density around MIY D 401:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
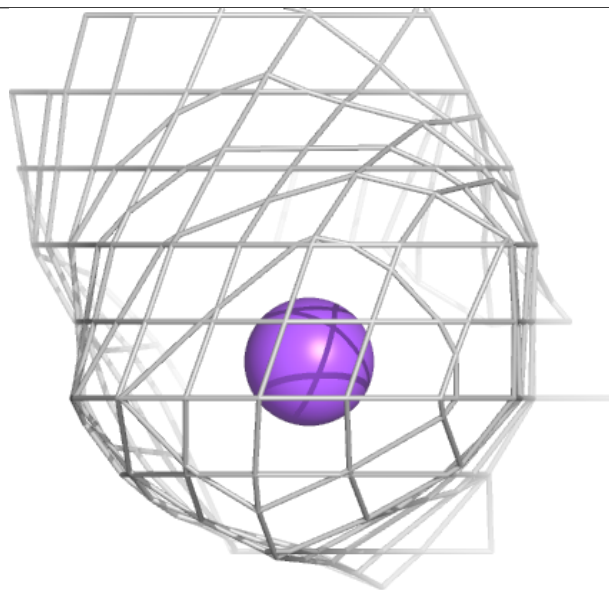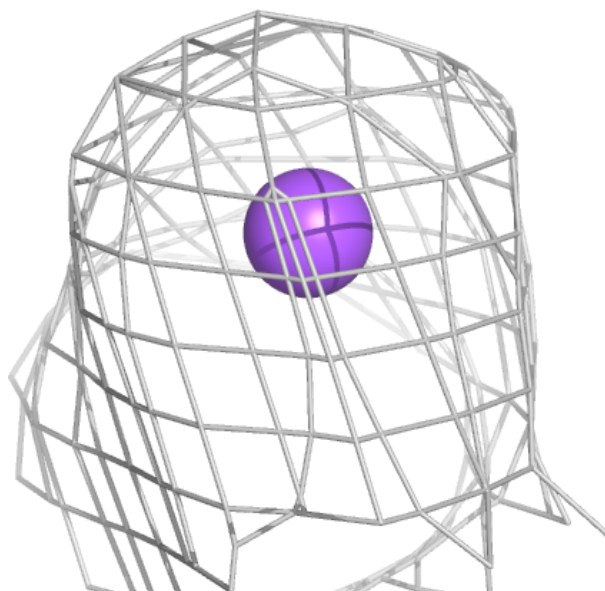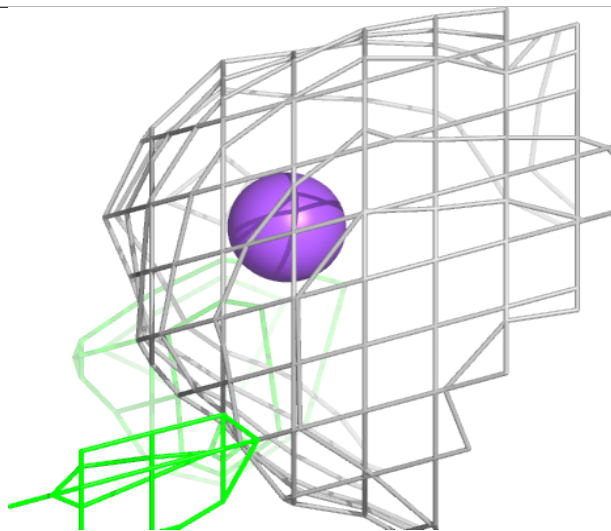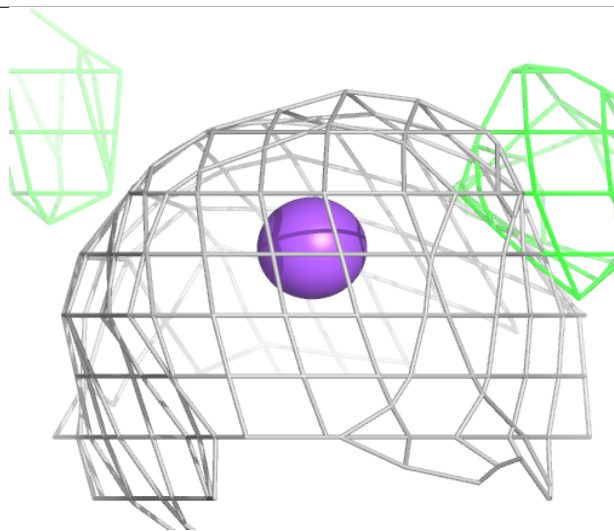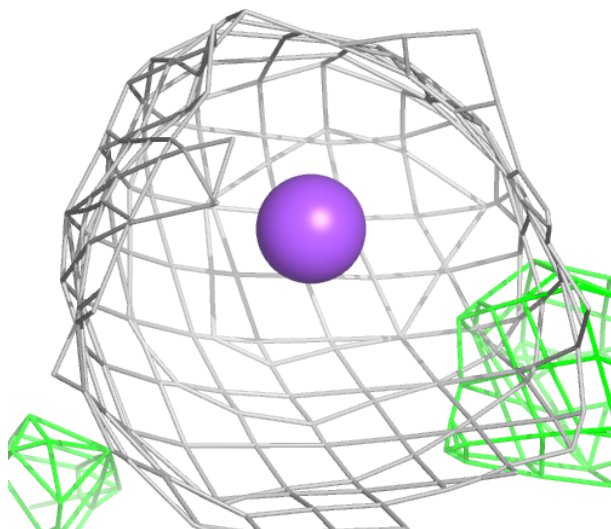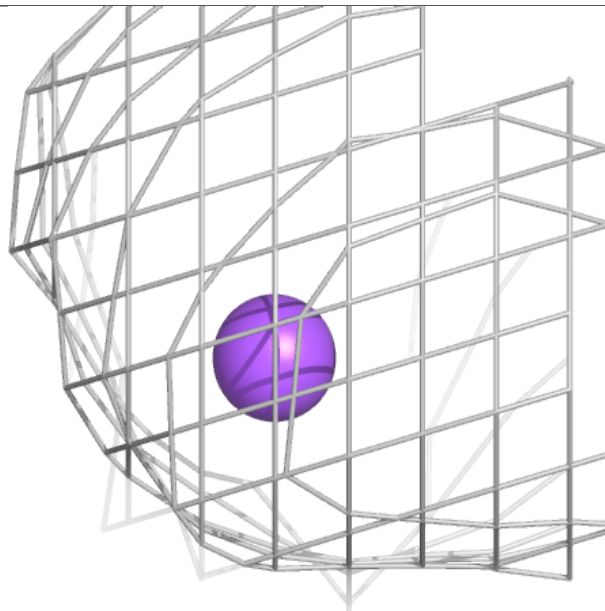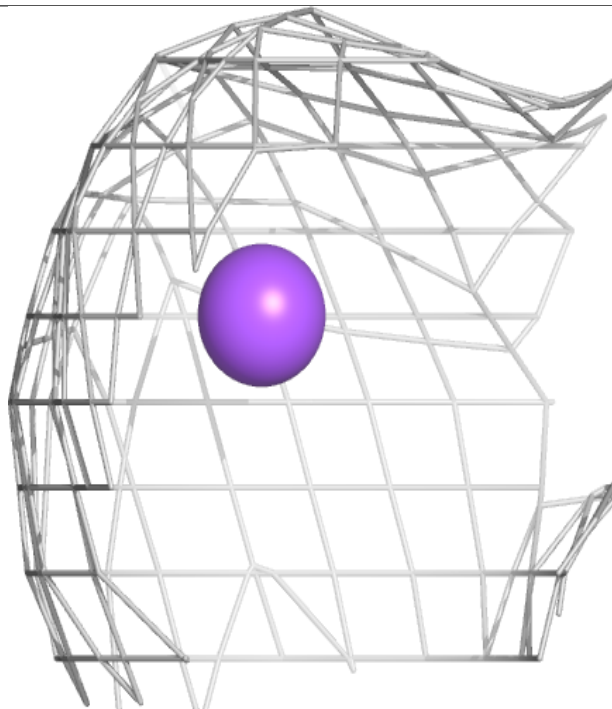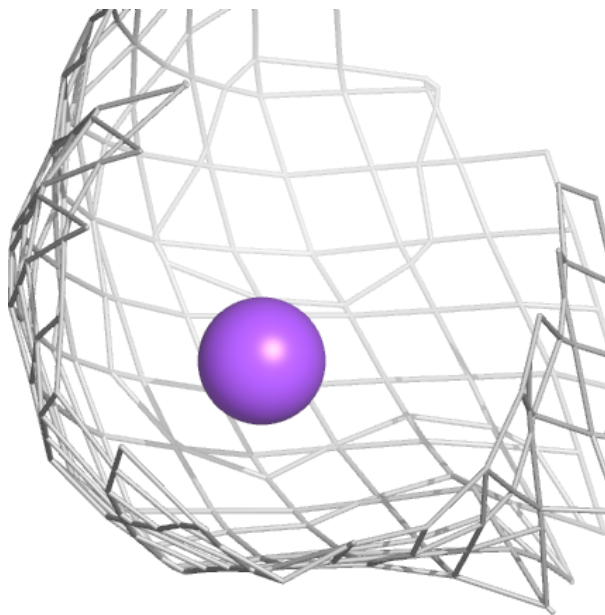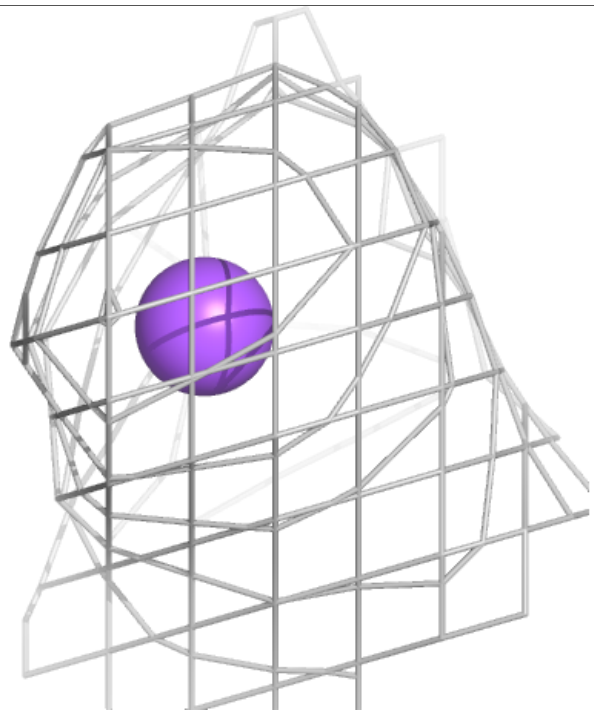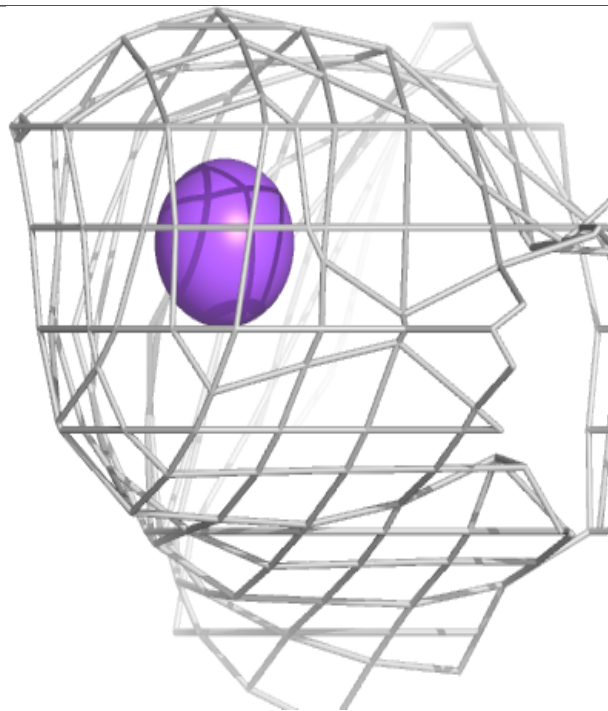$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
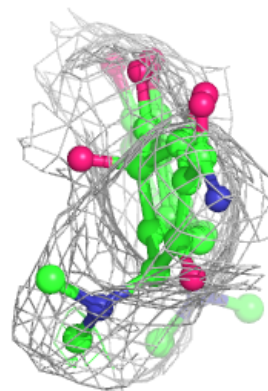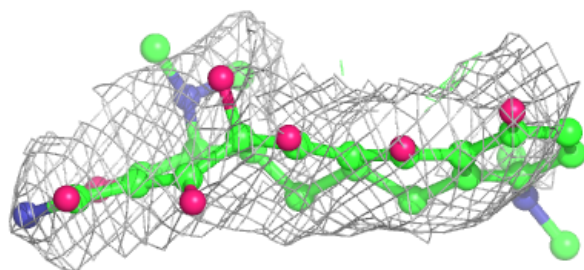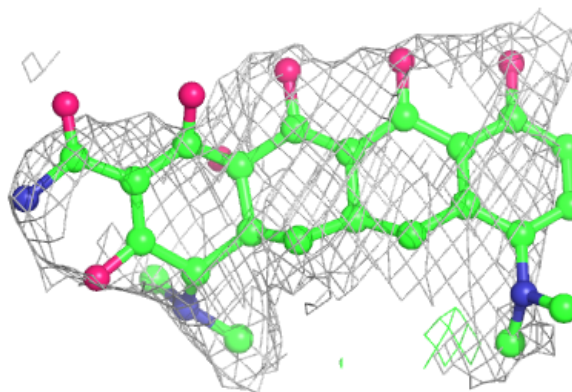
Electron density around MIY F 401:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
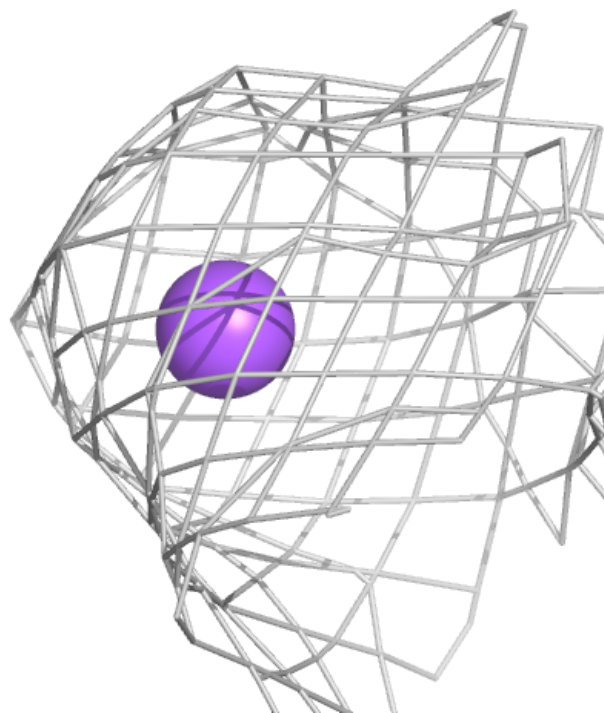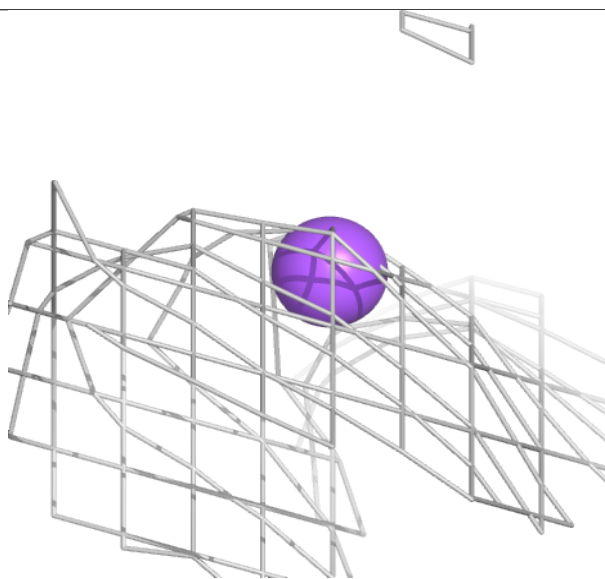mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
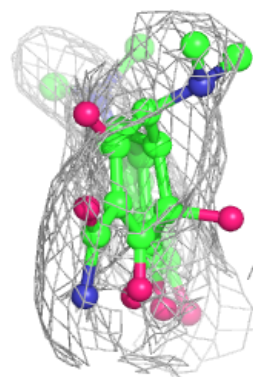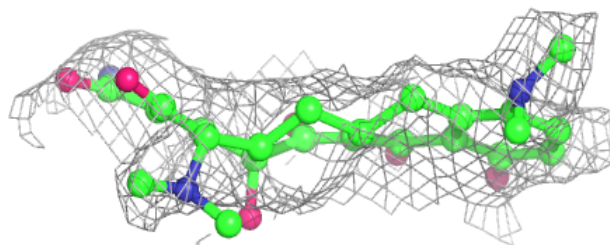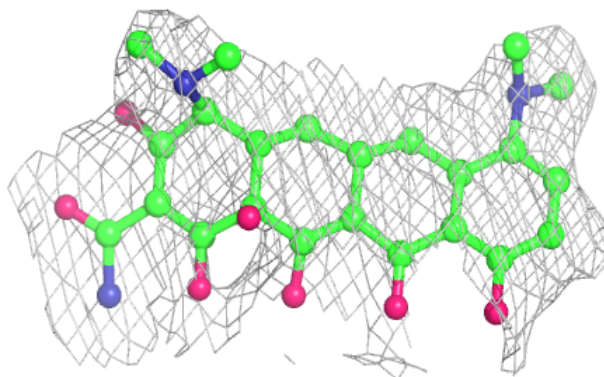
Electron density around C8E A 403:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
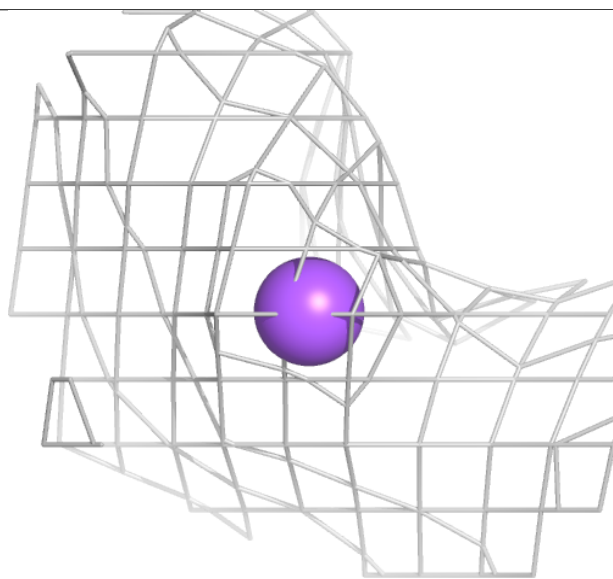and green (positive)
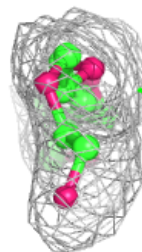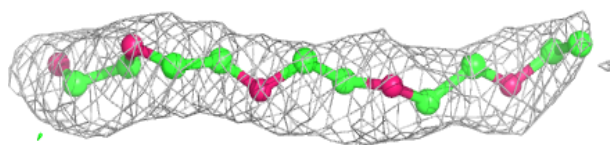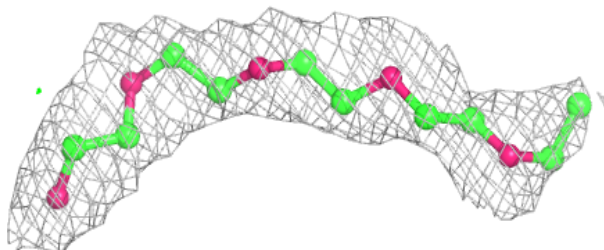
Electron density around C8E A 402:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
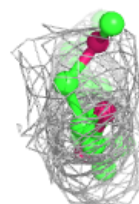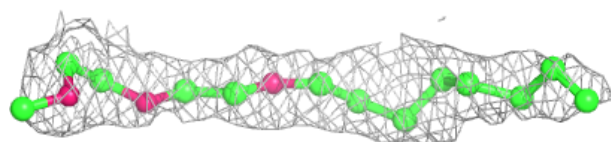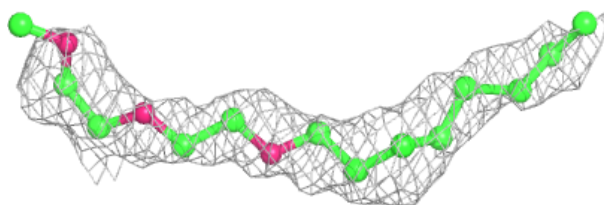
Electron density around C8E B 401:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
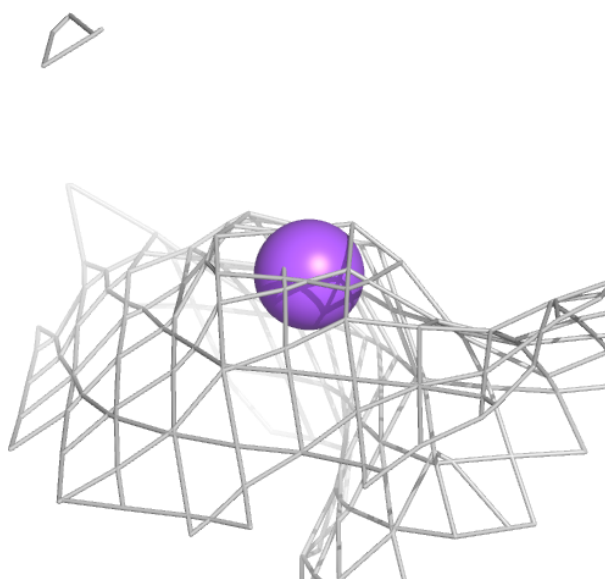and green (positive)
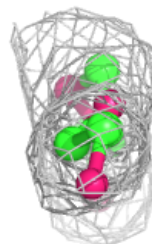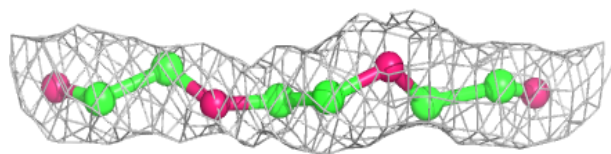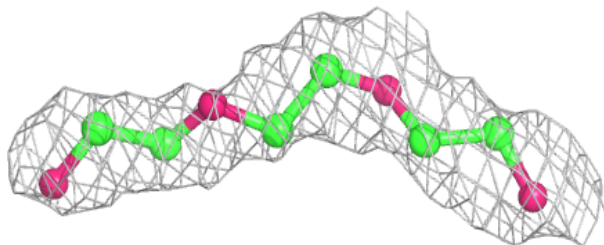
Electron density around C8E B 402:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)
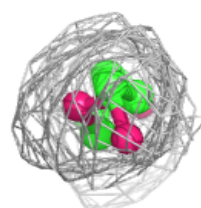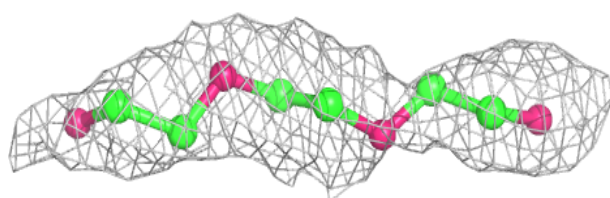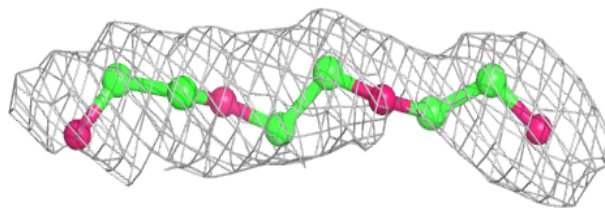
Electron density around C8E C 401:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
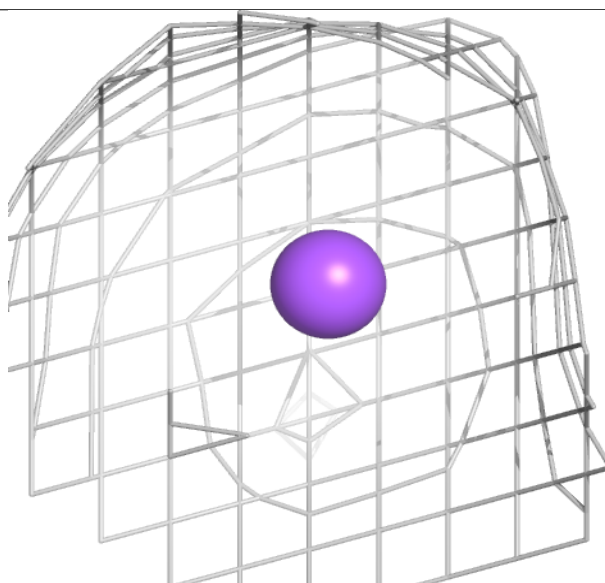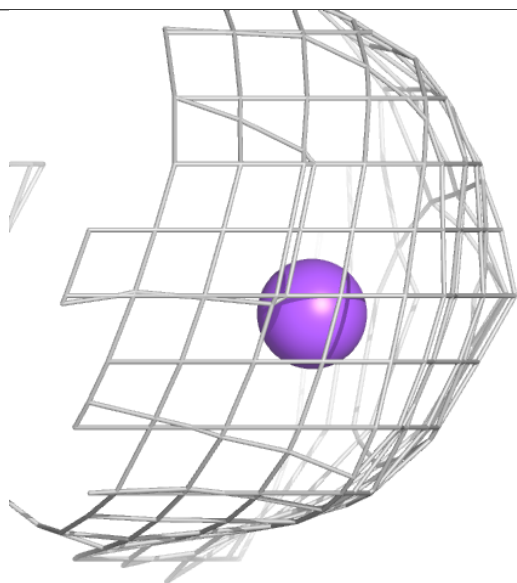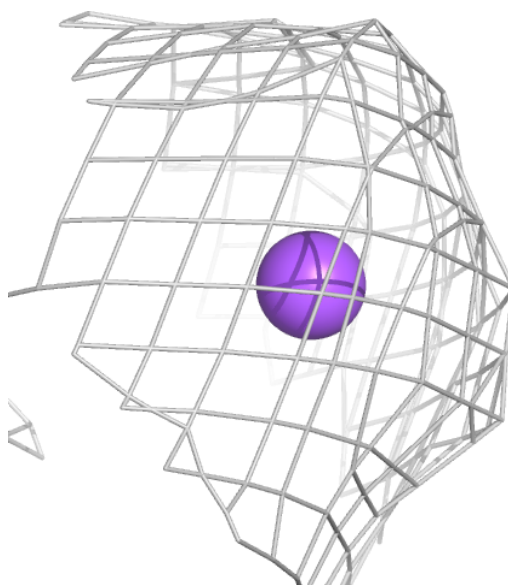and green (positive)
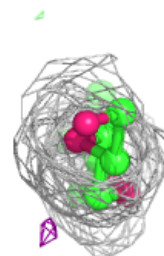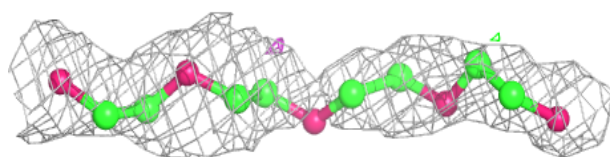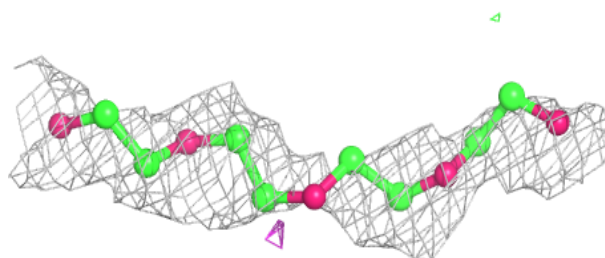
Electron density around C8E D 402:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
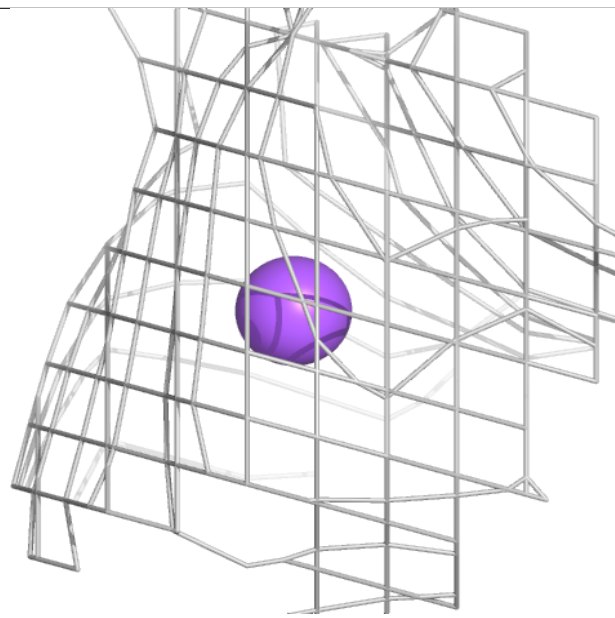and green (positive)
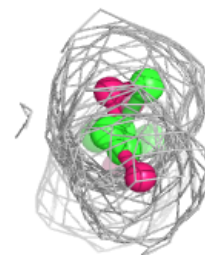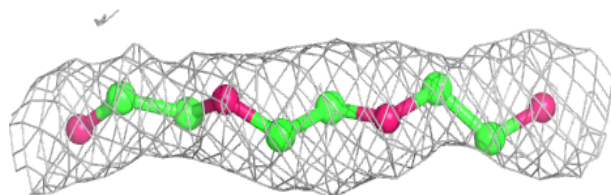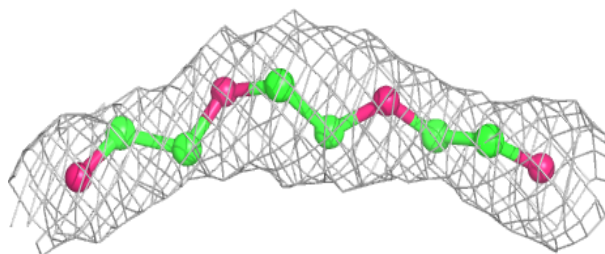
Electron density around C8E F 402:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
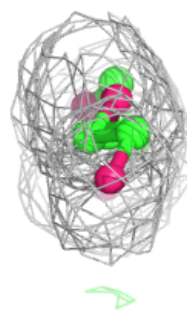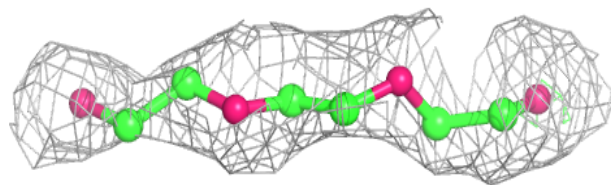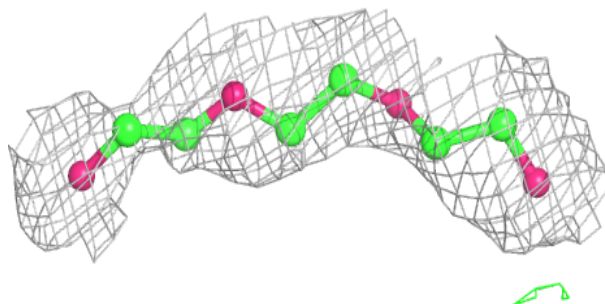
Electron density around NA A 405:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
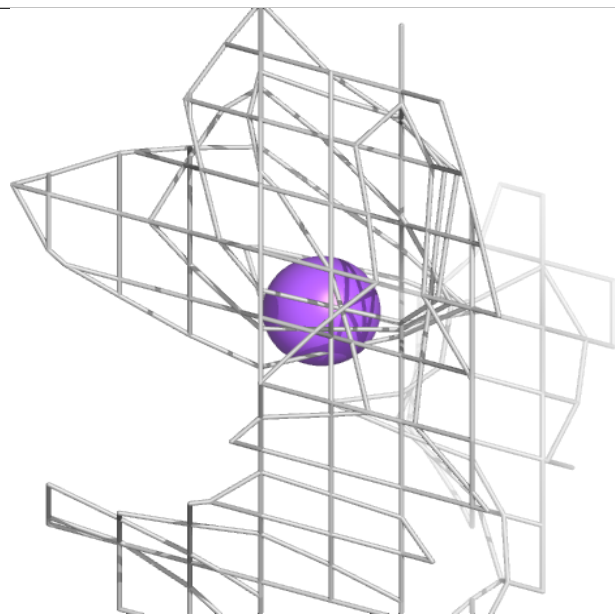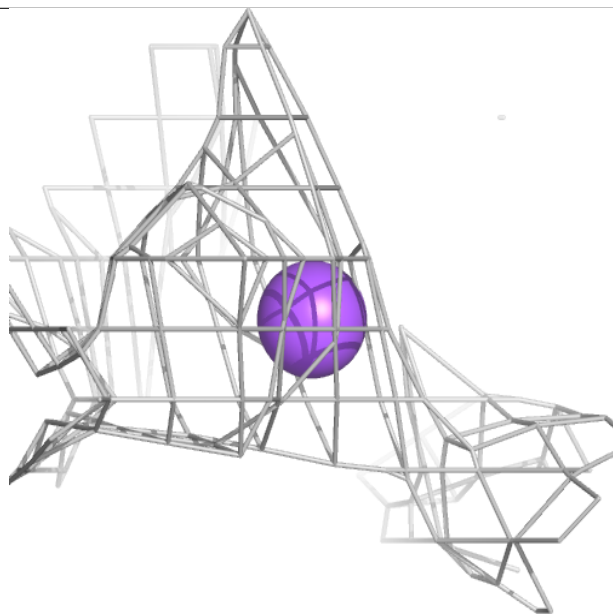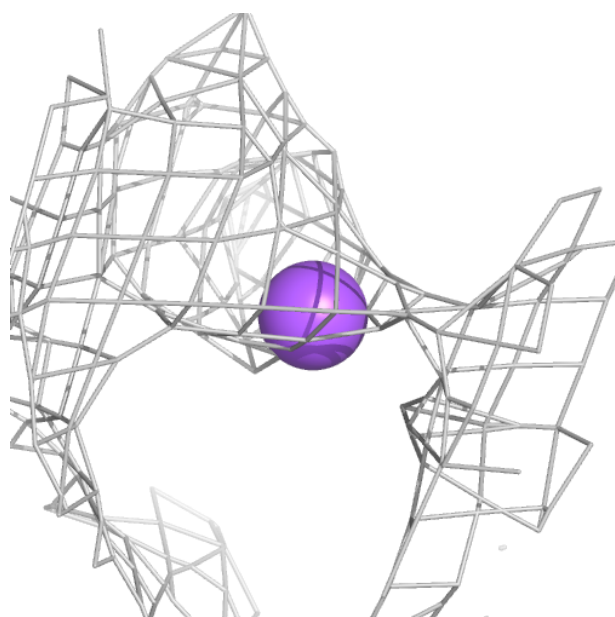
Electron density around NA C 404:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
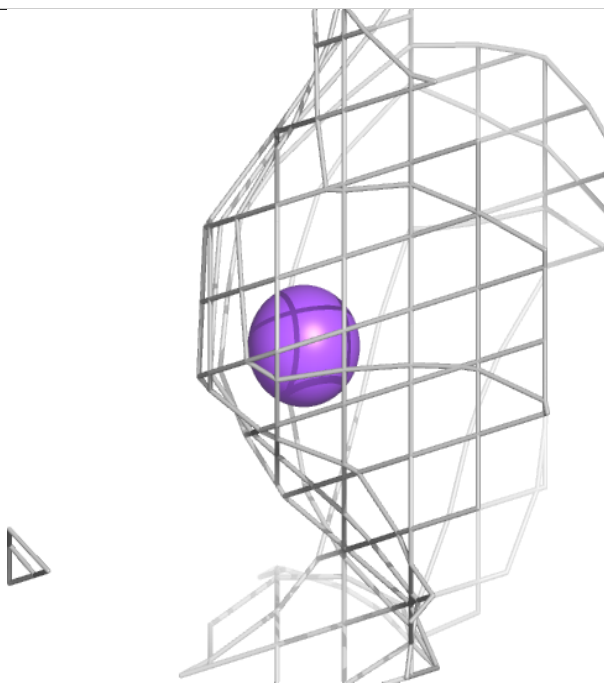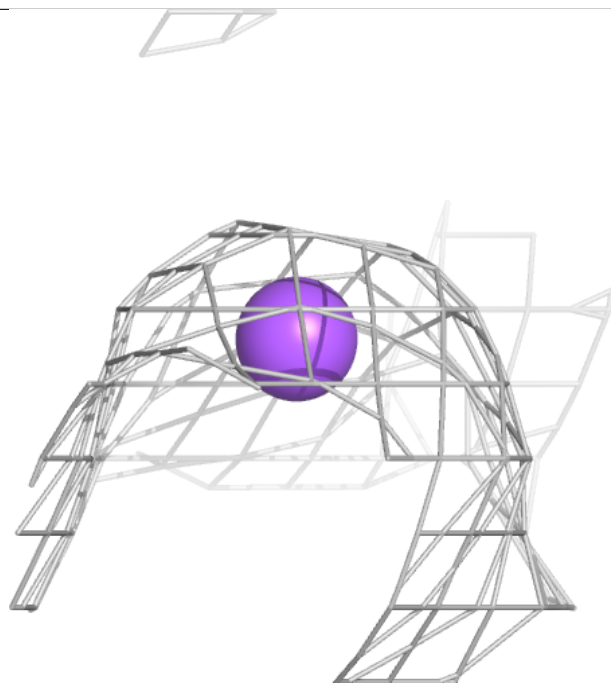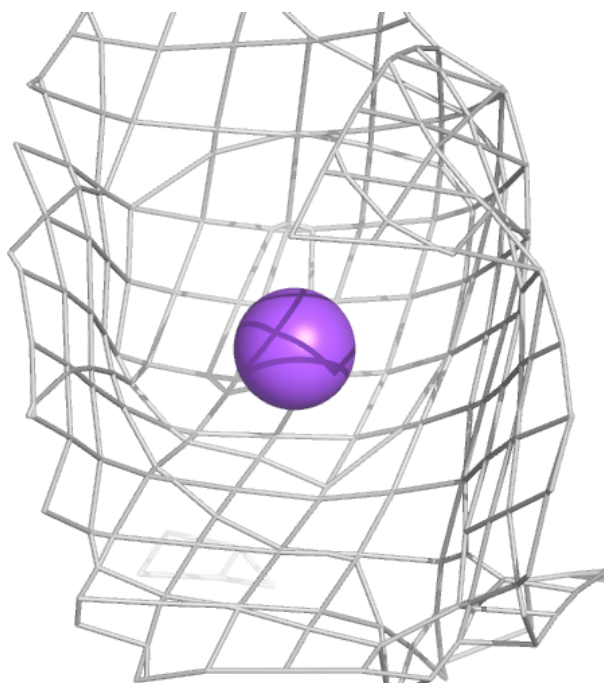
Electron density around NA D 403:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
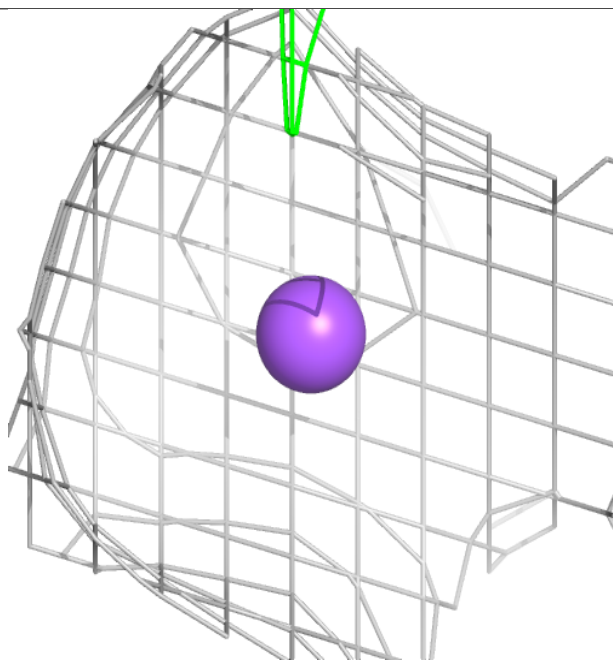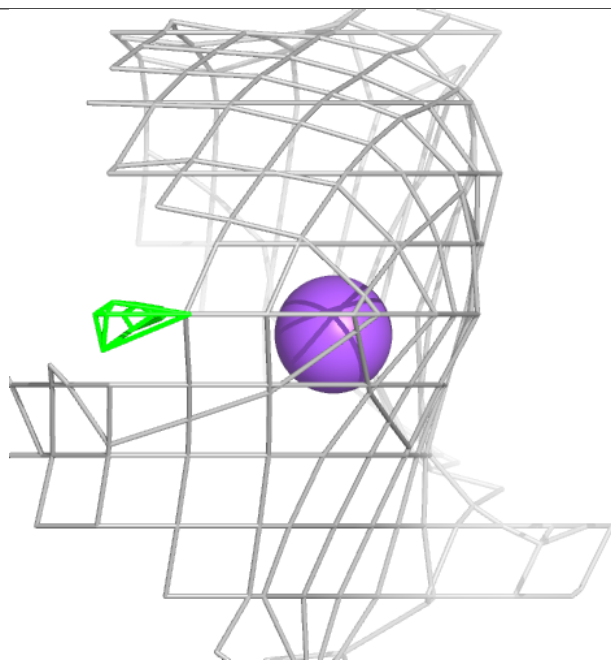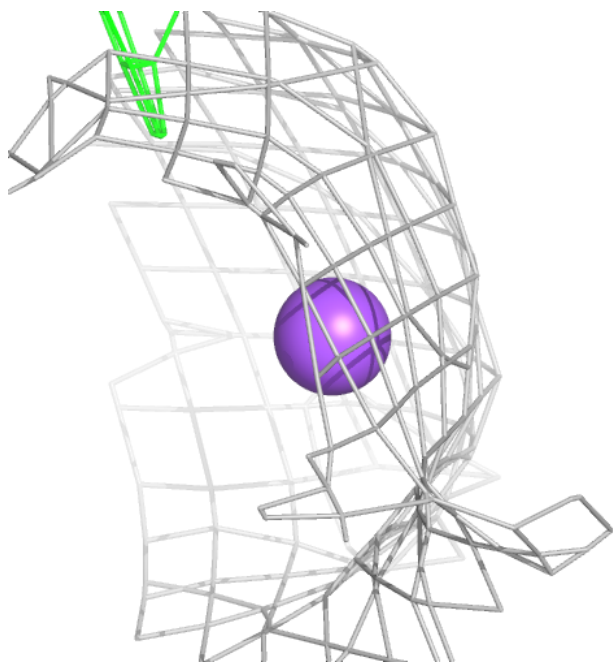
Electron density around NA E 402:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
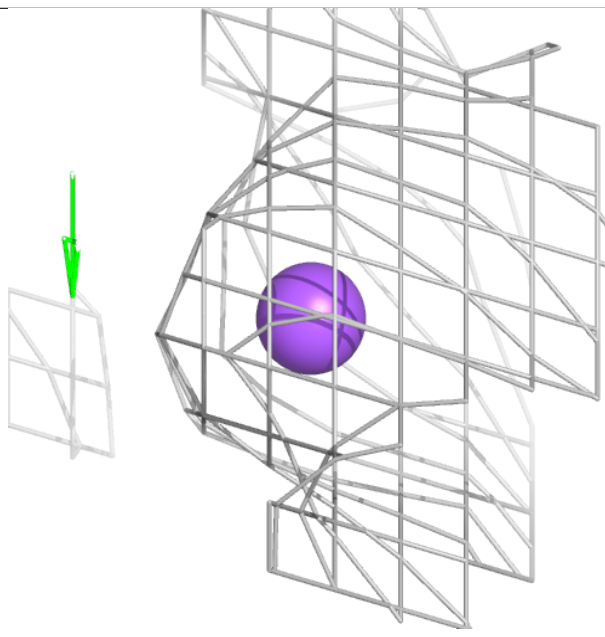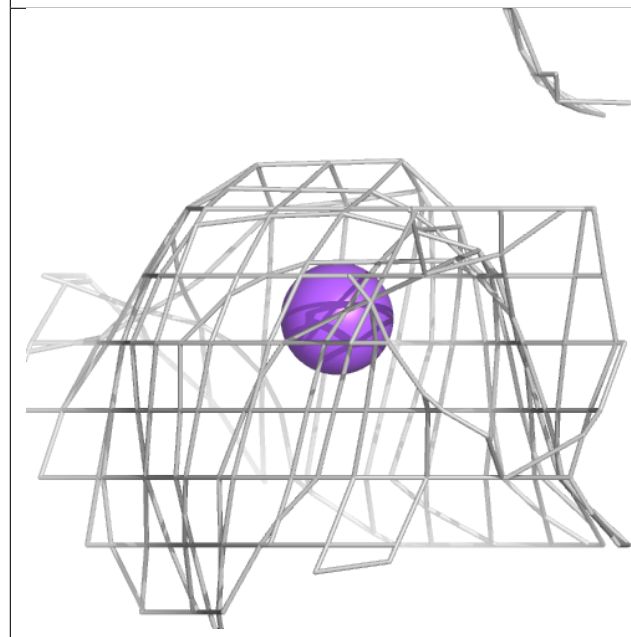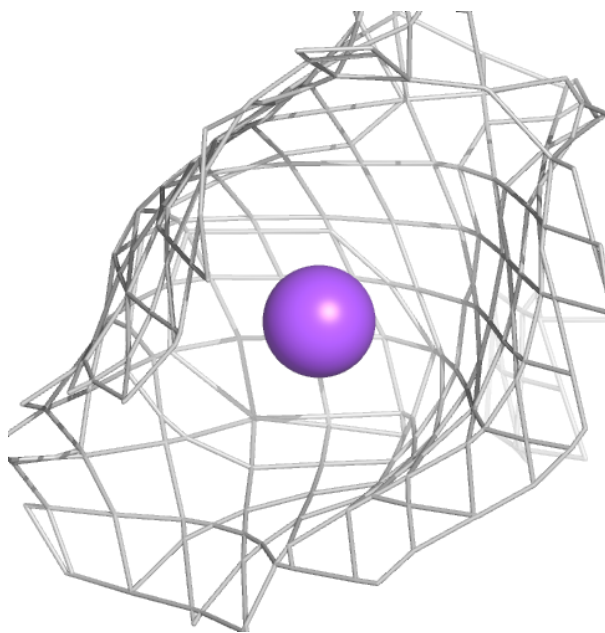
Electron density around NA F 403:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
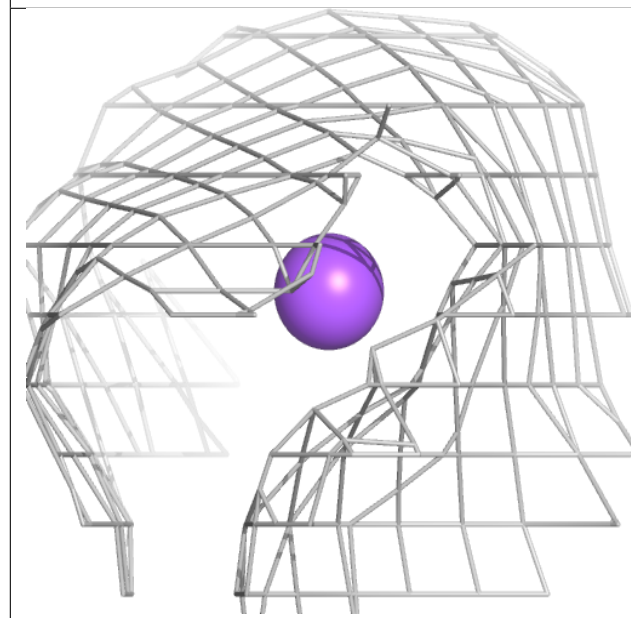$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
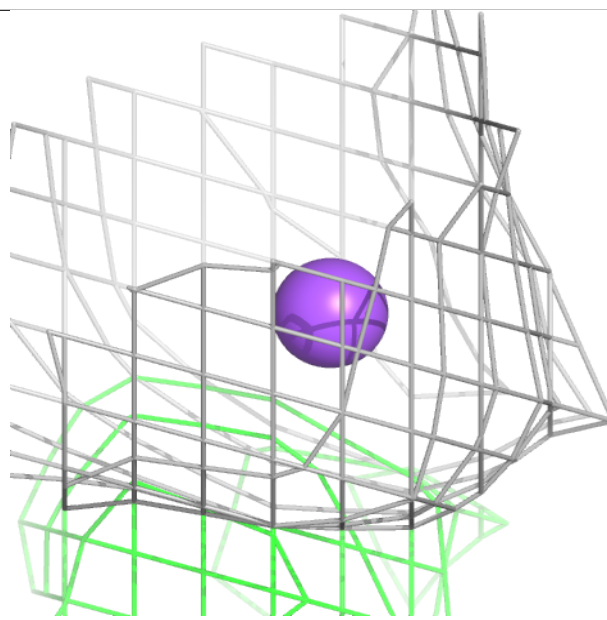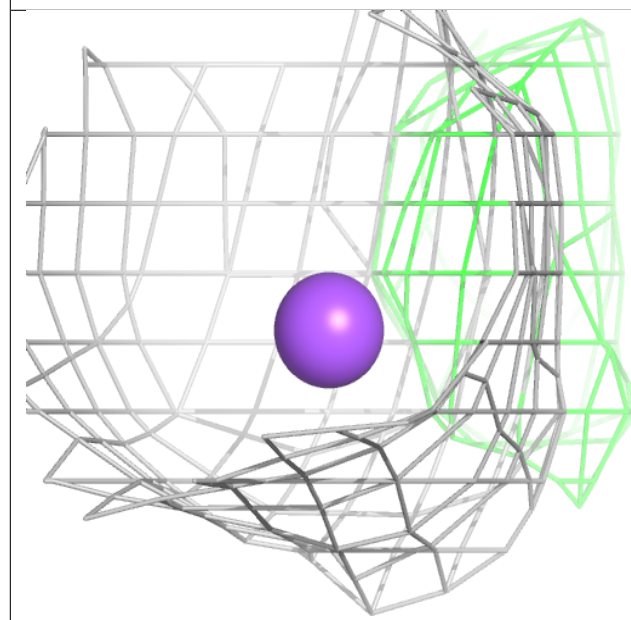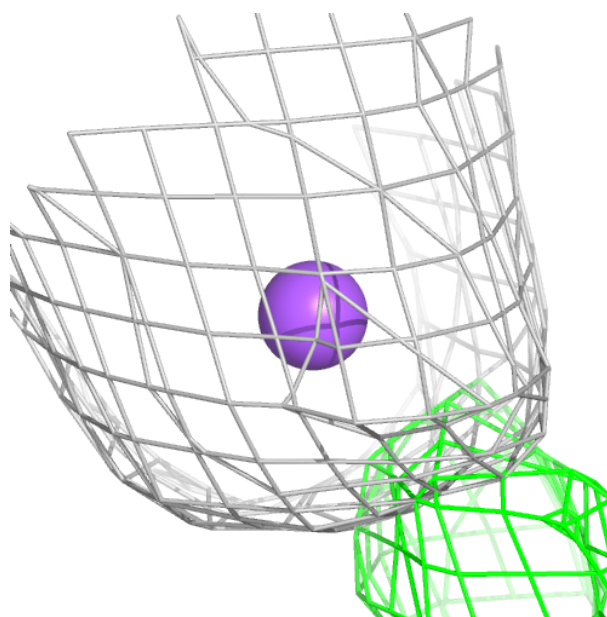
Electron density around NA C 402:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
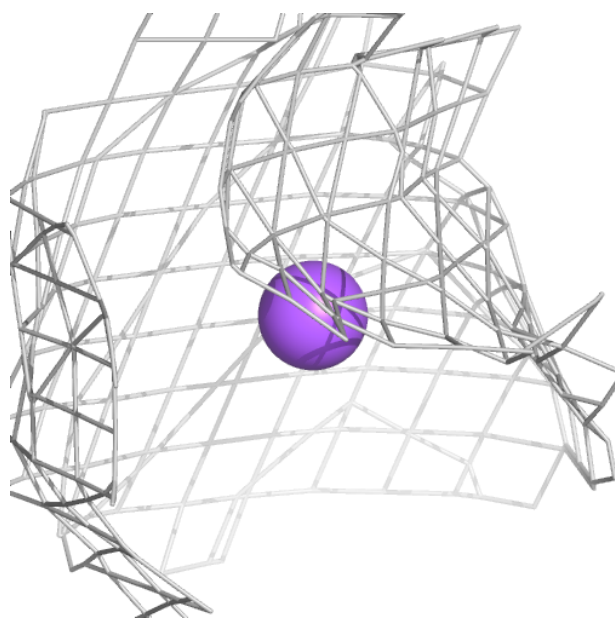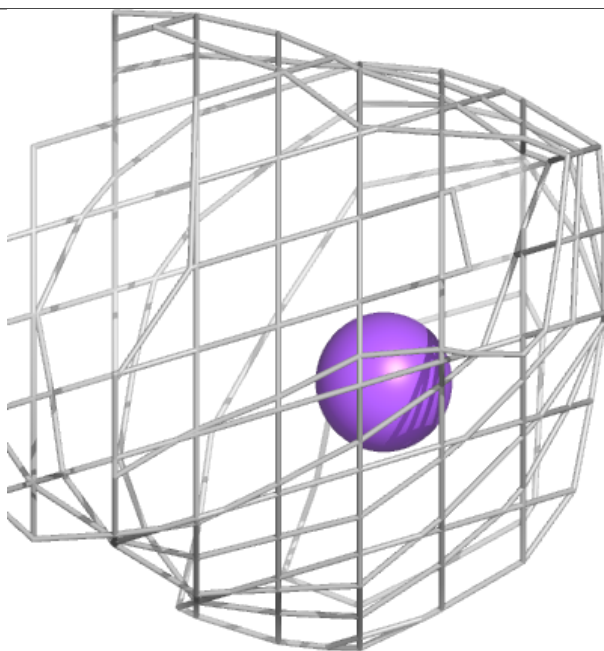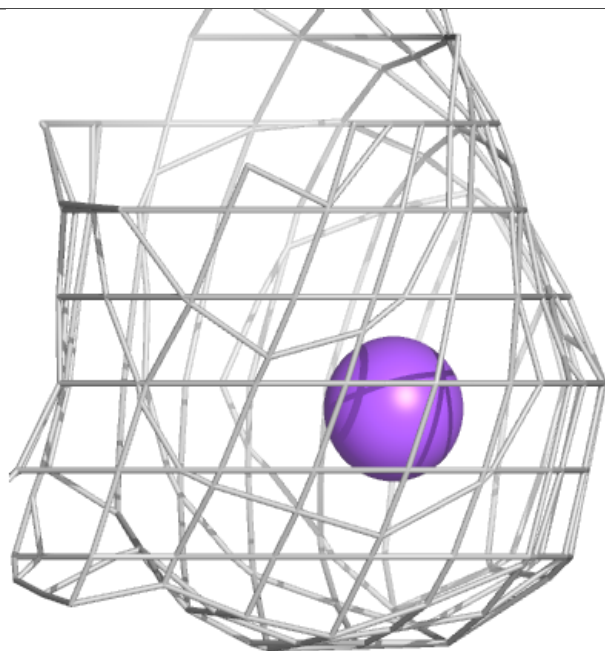and green (positive)
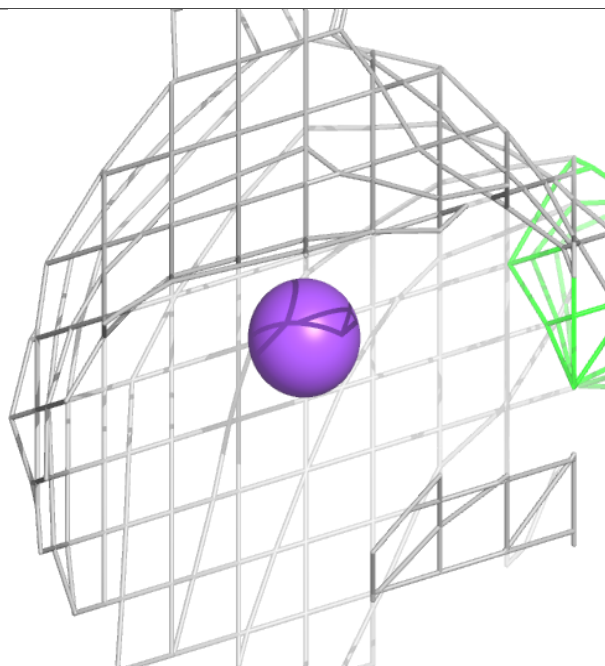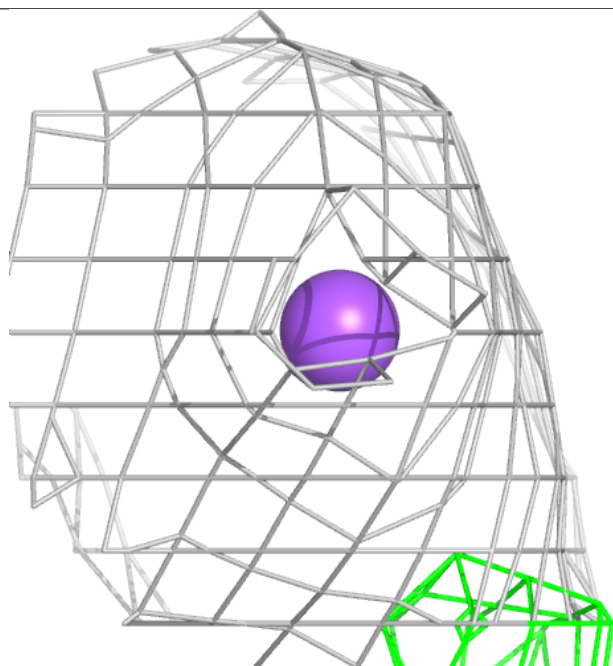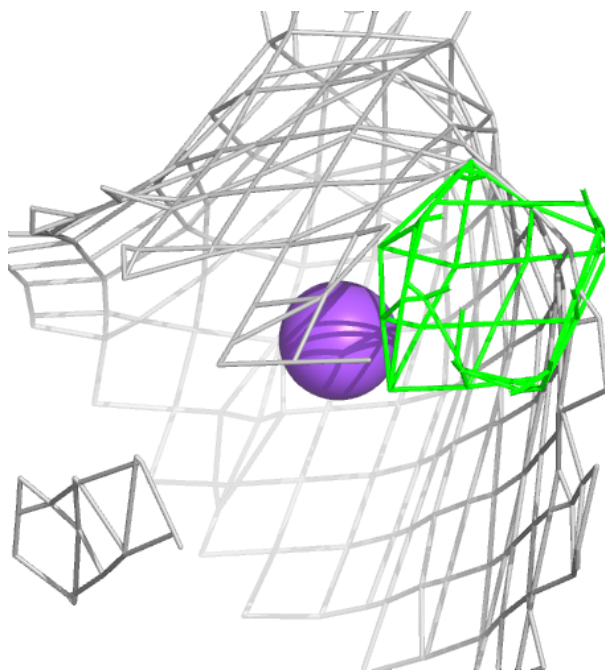
Electron density around NA C 403:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
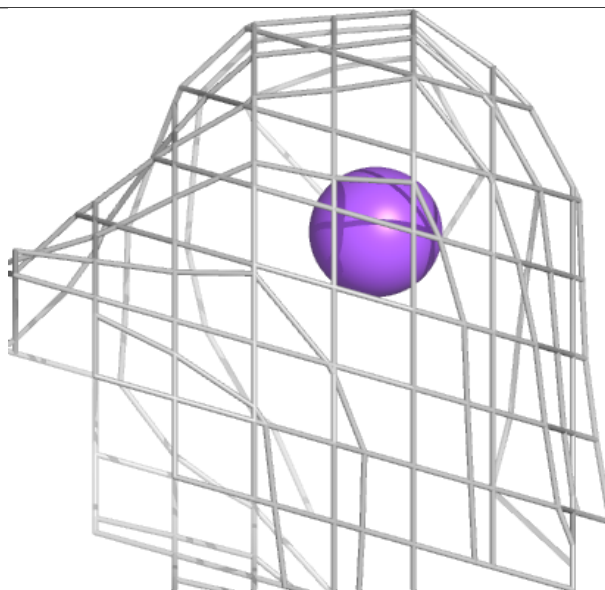
Electron density around NA A 404:

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

Electron density around NA A 406:

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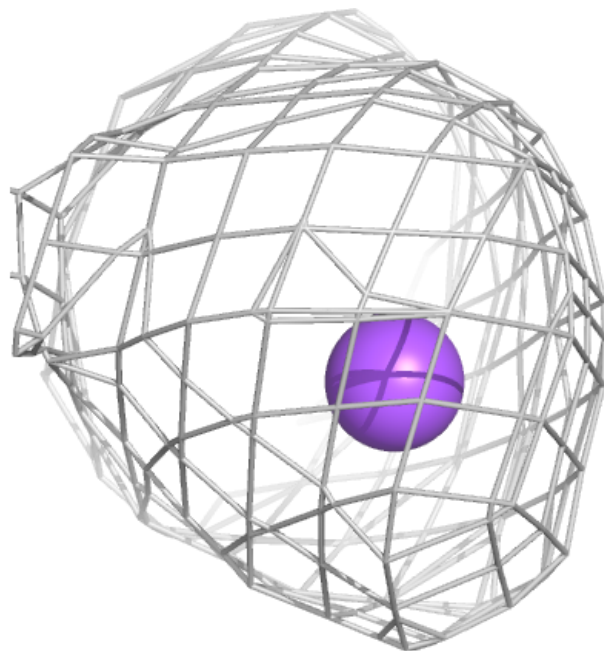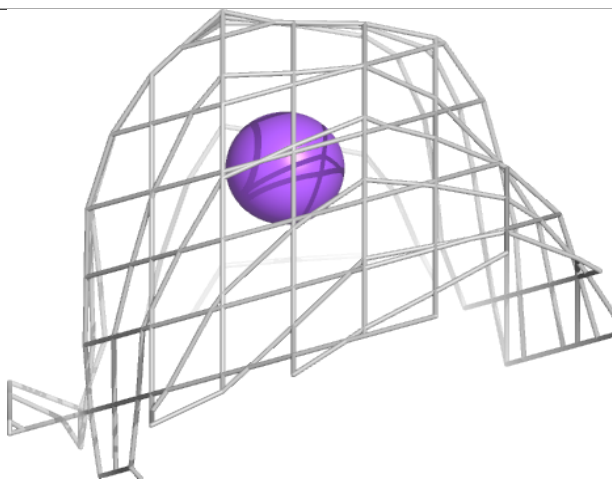and green (positive)

Electron density around NA D 404:

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

Electron density around NA D 405:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
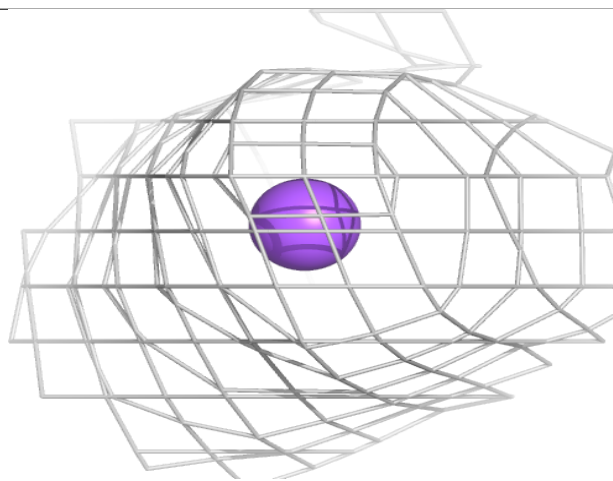and green (positive)

Electron density around NA E 401:

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

Electron density around NA B 403:

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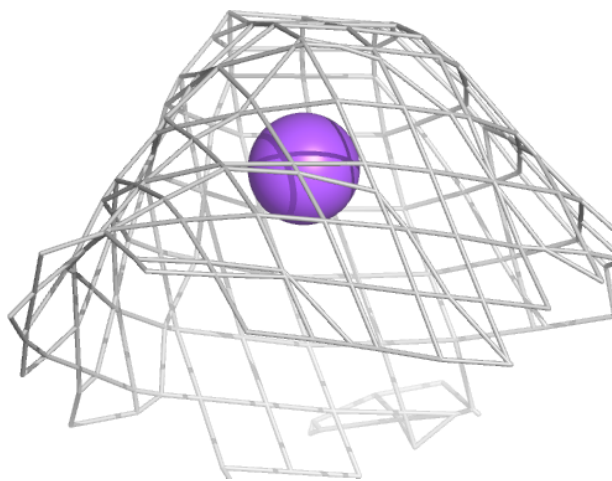and green (positive)

Electron density around NA E 403:

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

Electron density around NA B 404:
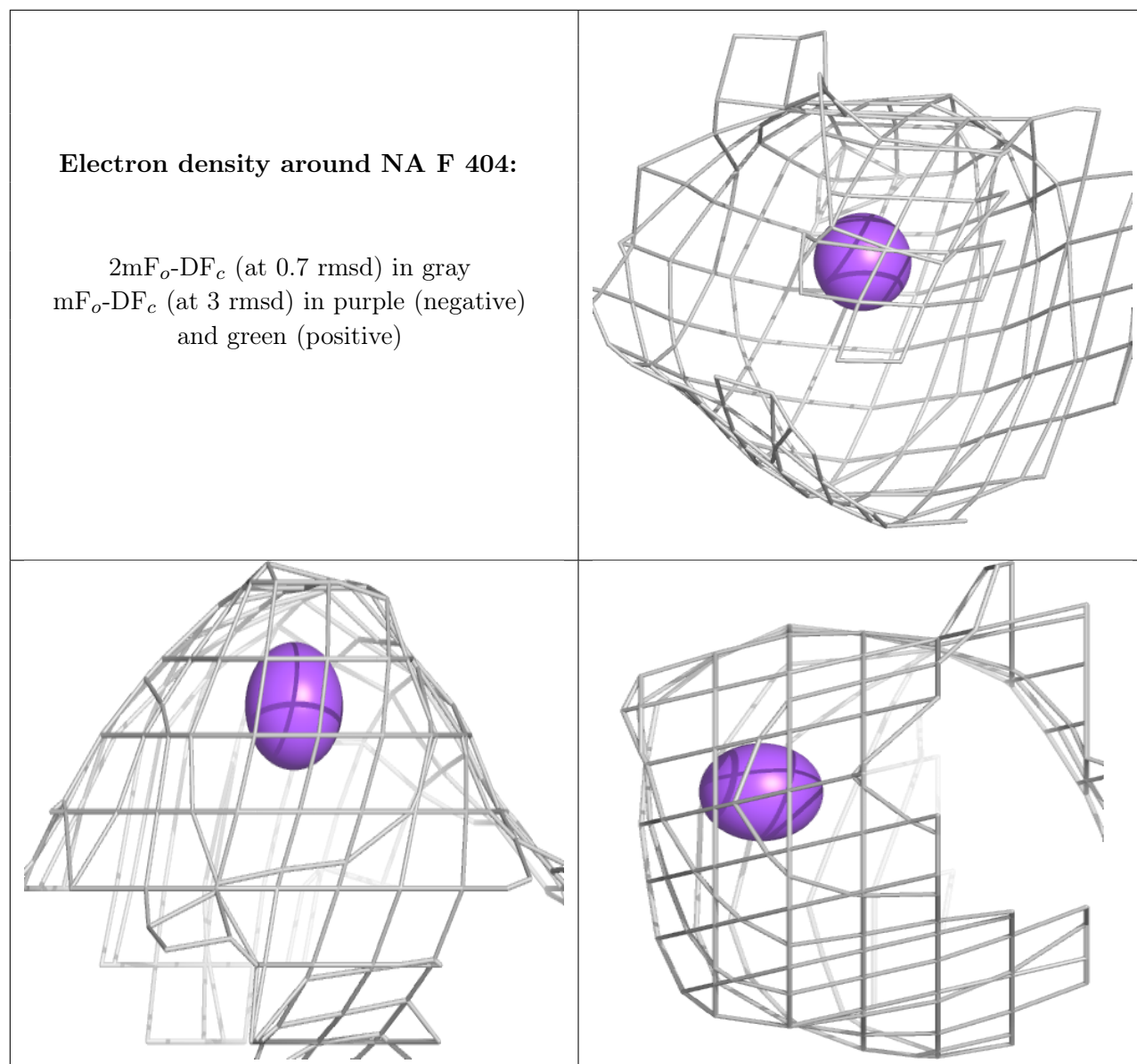
$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)

Electron density around NA F 404:

$2mF_o$-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.