WORLDWIDE wwPDB PROTEIN DATA BANK

Full wwPDB X-ray Structure Validation Report (i)

Nov 20, 2023 – 06:34 PM JST

PDB ID	:	7D5R
Title	:	Structure of the Ca2+-bound C646A mutant of peptidylarginine deiminase type III (PAD3)
Authors	:	Mashimo, R.; Akimoto, M.; Unno, M.
Deposited on	:	2020-09-28
Resolution	:	3.15 Å(reported)

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

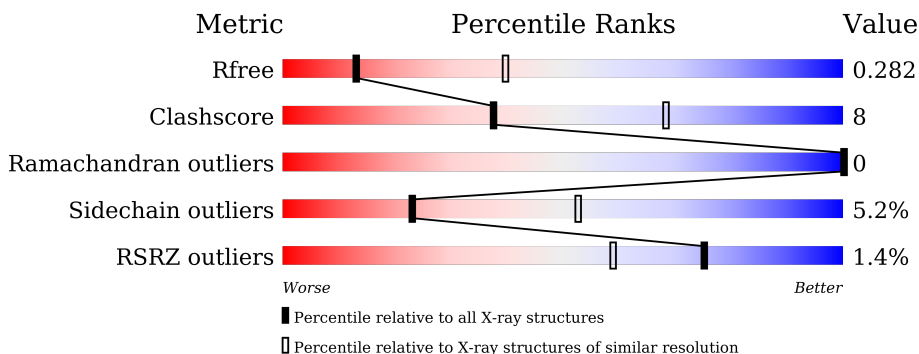|		
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.36
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

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 3.15 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		0.282
Clashscore		8
Ramachandran outliers		0
Sidechain outliers		5.2%
RSRZ outliers		1.4%

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	1626 (3.18-3.10)
Clashscore	141614	1735 (3.18-3.10)
Ramachandran outliers	138981	1677 (3.18-3.10)
Sidechain outliers	138945	1677 (3.18-3.10)
RSRZ outliers	127900	1588 (3.18-3.10)

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	664	2% · 71% · 21% · 7%
1	B	664	% · 74% · 20% · 5%

2 Entry composition (i)

There are 4 unique types of molecules in this entry. The entry contains 9873 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 Protein-arginine deiminase type-3.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	619	Total 4867	C 3118	N 828	O 890	S 31	0	0	0
1	B	634	Total 4980	C 3181	N 847	O 919	S 33	0	0	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	646	ALA	CYS	engineered mutation	UNP Q9ULW8
B	646	ALA	CYS	engineered mutation	UNP Q9ULW8

- Molecule 2 is CALCIUM ION (three-letter code: CA) (formula: Ca) (labeled as "Ligand of Interest" by depositor).

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

- Molecule 3 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$).

GOL

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

- Molecule 4 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

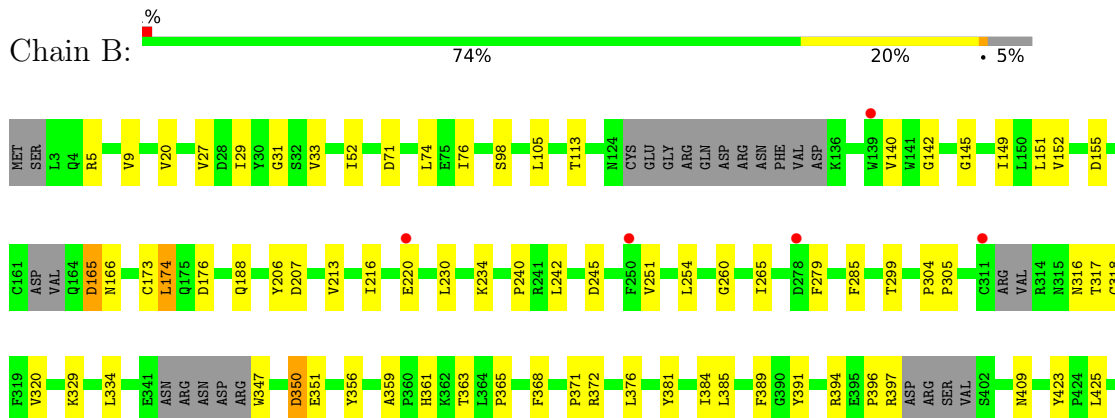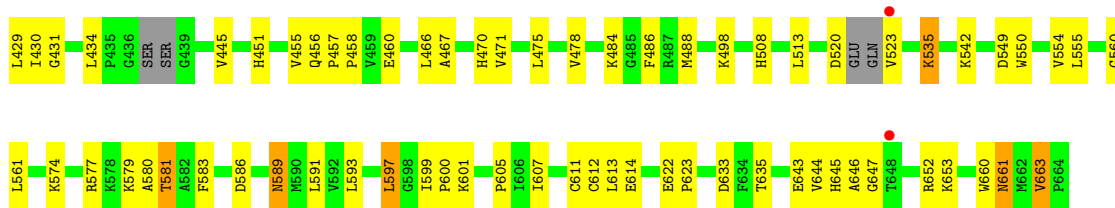| Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	1	Total 1	Cl 1	0	0
4	B	3	Total 3	Cl 3	0	0

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: Protein-arginine deiminase type-3

- Molecule 1: Protein-arginine deiminase type-3

L429 I430 G431 L434 P435 G436 SER SER G439 V445 H451 V455 Q456 P457 P458 V459 E460 L466 A467 H470 V471 L475 V478 K484 G485 F486 R487 M488 K498 H508 L513 D520 GLU GLN V523 K535 K542 D549 W550 V554 L555 G560

L561 K574 R577 K578 K579 A580 T581 A582 F583 D586 N589 M590 L591 V592 L593 L597 G598 I599 P600 K601 P605 I606 I607 C611 C612 L613 E614 E622 P623 D633 F634 T635 E643 V644 H645 A646 G647 T648 R652 K653 W660 N661 M662 V663 P664
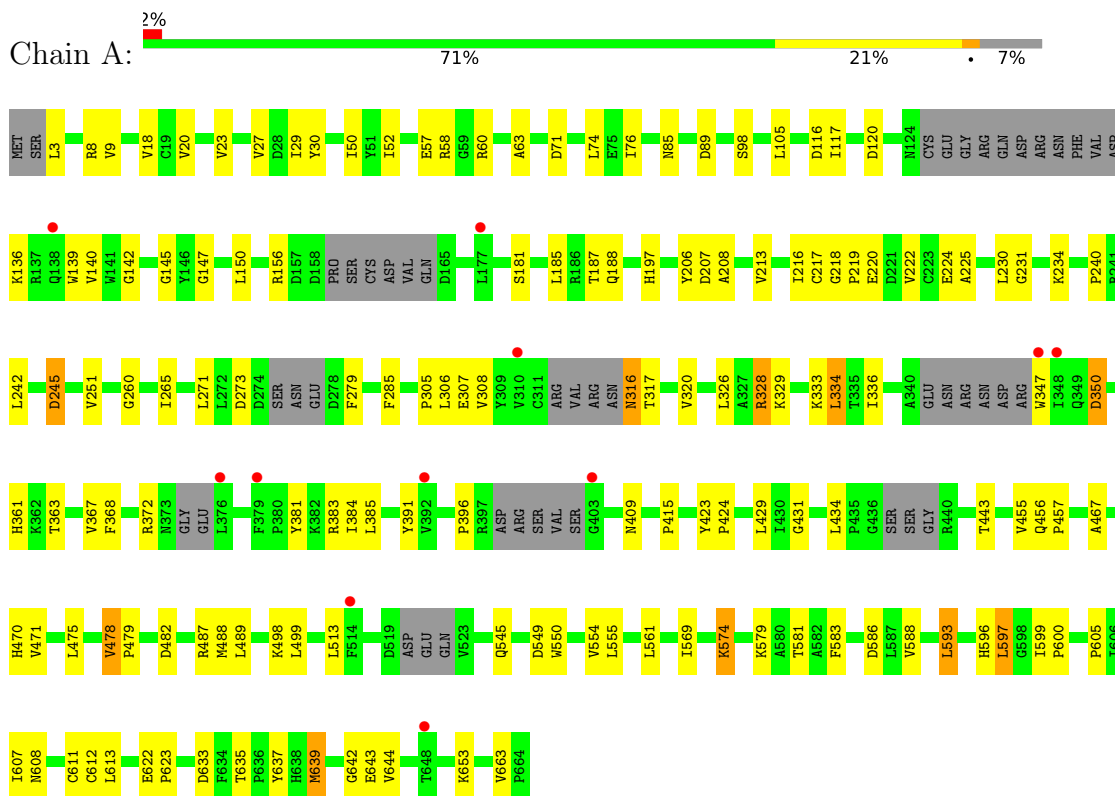
4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	H 3	Depositor
Cell constants a, b, c, α, β, γ	114.54Å 114.54Å 326.77Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	34.07 – 3.15 36.31 – 3.15	Depositor EDS
% Data completeness (in resolution range)	99.1 (34.07-3.15) 99.5 (36.31-3.15)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	3.05 (at 3.12Å)	Xtriage
Refinement program	PHENIX 1.14_3260	Depositor
R, R_{free}	0.233 , 0.281 0.233 , 0.282	Depositor DCC
R_{free} test set	1294 reflections (4.70%)	wwPDB-VP
Wilson B-factor (Å^2)	73.0	Xtriage
Anisotropy	0.712	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.32 , 35.2	EDS
L-test for twinning[2]	$< |L| > = 0.50$, $< L^2 > = 0.33$	Xtriage
Estimated twinning fraction	0.478 for -h-k,k,-l	Xtriage
F_o,F_c correlation	0.92	EDS
Total number of atoms	9873	wwPDB-VP
Average B, all atoms (Å^2)	84.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.15% 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 ⓘ

5.1   Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: GOL, CA, CL

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	0.24	0/4989	0.43	0/6782
1	B	0.25	0/5105	0.44	0/6940
All	All	0.24	0/10094	0.44	0/13722

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 ⓘ

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	4867	0	4742	81	0
1	B	4980	0	4846	71	0
2	A	5	0	0	0	0
2	B	5	0	0	0	0
3	A	6	0	8	0	0
3	B	6	0	8	0	0
4	A	1	0	0	0	0
4	B	3	0	0	1	0
All	All	9873	0	9604	149	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 8.

All (149) 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:B:385:LEU:HD21	1:B:391:TYR:HB2	1.49	0.94
1:A:187:THR:O	1:A:245:ASP:HA	1.80	0.80
1:B:498:LYS:NZ	4:B:909:CL:CL	2.52	0.79
1:A:213:VAL:HG22	1:A:230:LEU:HB2	1.67	0.77
1:B:213:VAL:HG22	1:B:230:LEU:HB2	1.67	0.76
1:A:187:THR:C	1:A:245:ASP:HA	2.07	0.75
1:A:385:LEU:HD21	1:A:391:TYR:HB2	1.69	0.75
1:A:396:PRO:HB3	1:A:443:THR:HG21	1.72	0.71
1:B:574:LYS:HB2	1:B:581:THR:HG23	1.73	0.69
1:A:142:GLY:HA2	1:A:663:VAL:HG22	1.73	0.68
1:B:350:ASP:OD2	1:B:470:HIS:NE2	2.27	0.68
1:B:520:ASP:OD1	1:B:523:VAL:N	2.28	0.66
1:A:120:ASP:OD1	1:A:136:LYS:NZ	2.30	0.65
1:A:197:HIS:NE2	1:A:273:ASP:OD1	2.31	0.64
1:B:142:GLY:HA2	1:B:663:VAL:HG22	1.80	0.63
1:B:140:VAL:HG23	1:B:145:GLY:HA2	1.80	0.62
1:B:484:LYS:NZ	1:B:560:GLY:O	2.32	0.62
1:B:152:VAL:O	1:B:166:ASN:ND2	2.32	0.62
1:A:140:VAL:HG23	1:A:145:GLY:HA2	1.82	0.61
1:A:350:ASP:OD2	1:A:470:HIS:NE2	2.34	0.61
1:B:347:TRP:HA	1:B:647:GLY:HA2	1.83	0.60
1:A:569:ILE:HD12	1:A:588:VAL:HG12	1.84	0.59
1:B:466:LEU:HA	1:B:580:ALA:HB3	1.84	0.58
1:A:347:TRP:HB2	1:A:372:ARG:HH22	1.67	0.58
1:A:639:MET:N	1:A:639:MET:SD	2.72	0.58
1:A:409:ASN:HA	1:A:471:VAL:H	1.70	0.57
1:B:173:CYS:HB3	1:B:176:ASP:HB2	1.87	0.57
1:A:27:VAL:HB	1:A:76:ILE:HG13	1.87	0.56
1:A:150:LEU:HD13	1:A:251:VAL:HG23	1.86	0.56
1:A:222:VAL:HG22	1:A:224:GLU:H	1.71	0.56
1:B:206:TYR:OH	1:B:260:GLY:O	2.24	0.56
1:B:5:ARG:HH22	1:B:20:VAL:H	1.53	0.56
1:A:206:TYR:OH	1:A:260:GLY:O	2.24	0.55
1:A:586:ASP:HB3	1:A:643:GLU:HG3	1.89	0.55
1:B:240:PRO:HG2	1:B:242:LEU:HG	1.89	0.55
1:B:586:ASP:HB3	1:B:643:GLU:HG3	1.88	0.55
1:B:305:PRO:HG3	1:B:593:LEU:HB3	1.90	0.54
1:B:371:PRO:HB3	1:B:396:PRO:HD3	1.91	0.53
1:B:535:LYS:H	1:B:535:LYS:HD3	1.74	0.53
1:A:316:ASN:N	1:A:316:ASN:OD1	2.42	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:356:TYR:HA	1:B:365:PRO:HA	1.91	0.53
1:B:513:LEU:HG	1:B:605:PRO:HD3	1.92	0.52
1:B:661:ASN:N	1:B:661:ASN:OD1	2.42	0.52
1:A:85:ASN:N	1:A:89:ASP:OD2	2.32	0.52
1:B:467:ALA:HB2	1:B:579:LYS:HB3	1.90	0.52
1:A:217:CYS:O	1:A:219:PRO:HD3	2.10	0.52
1:B:27:VAL:HB	1:B:76:ILE:HG13	1.92	0.52
1:A:305:PRO:HG3	1:A:593:LEU:HB3	1.93	0.51
1:B:589:ASN:ND2	1:B:643:GLU:HB2	2.25	0.51
1:A:478:VAL:HG22	1:A:479:PRO:HD2	1.92	0.51
1:A:50:ILE:HG22	1:A:63:ALA:HB3	1.93	0.51
1:B:484:LYS:HD2	1:B:561:LEU:HD23	1.93	0.51
1:A:306:LEU:HG	1:A:653:LYS:HD2	1.92	0.50
1:A:188:GLN:HG2	1:A:245:ASP:HB2	1.94	0.50
1:A:116:ASP:HB3	1:A:188:GLN:HB2	1.93	0.50
1:A:18:VAL:HG11	1:A:197:HIS:HE1	1.76	0.50
1:B:213:VAL:HG12	1:B:251:VAL:HG13	1.93	0.50
1:A:607:ILE:HG13	1:A:608:ASN:H	1.77	0.49
1:B:188:GLN:HG2	1:B:245:ASP:HB2	1.95	0.49
1:B:409:ASN:HA	1:B:471:VAL:H	1.78	0.49
1:A:216:ILE:HD11	1:A:220:GLU:H	1.77	0.49
1:A:409:ASN:HD21	1:A:431:GLY:HA3	1.78	0.49
1:A:334:LEU:HD12	1:A:336:ILE:HD11	1.94	0.49
1:B:98:SER:HB2	1:B:105:LEU:HD11	1.96	0.48
1:B:207:ASP:HB3	1:B:265:ILE:HG23	1.95	0.48
1:A:605:PRO:HG2	1:A:612:CYS:SG	2.54	0.48
1:B:216:ILE:HD11	1:B:220:GLU:H	1.79	0.48
1:A:328:ARG:HG3	1:A:329:LYS:N	2.29	0.47
1:A:218:GLY:H	1:A:225:ALA:HB1	1.78	0.47
1:A:429:LEU:HD13	1:A:475:LEU:HD21	1.96	0.47
1:B:304:PRO:HB2	1:B:653:LYS:HD2	1.95	0.47
1:B:455:VAL:HG13	1:B:456:GLN:HG3	1.97	0.47
1:A:240:PRO:HG2	1:A:242:LEU:HG	1.96	0.47
1:B:20:VAL:HG21	1:B:285:PHE:CG	2.49	0.47
1:A:307:GLU:HG2	1:A:333:LYS:HG2	1.96	0.47
1:A:498:LYS:HG3	1:B:31:GLY:HA2	1.95	0.47
1:B:597:LEU:HD13	1:B:599:ILE:HD11	1.96	0.47
1:A:71:ASP:HB3	1:A:74:LEU:HG	1.97	0.47
1:A:467:ALA:HA	1:A:579:LYS:HB2	1.97	0.46
1:B:409:ASN:HD21	1:B:431:GLY:HA3	1.79	0.46
1:B:151:LEU:HD21	1:B:359:ALA:HB2	1.96	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:429:LEU:HD13	1:B:475:LEU:HD21	1.96	0.46
1:B:600:PRO:HG3	1:B:644:VAL:HG12	1.98	0.46
1:B:351:GLU:HG2	1:B:376:LEU:HB2	1.97	0.46
1:A:513:LEU:HG	1:A:605:PRO:HD3	1.97	0.46
1:A:222:VAL:HG13	1:A:225:ALA:HB2	1.98	0.46
1:A:455:VAL:HG13	1:A:456:GLN:HG3	1.98	0.46
1:A:633:ASP:OD1	1:A:637:TYR:HB2	2.16	0.45
1:A:597:LEU:HD13	1:A:599:ILE:HD11	1.97	0.45
1:A:8:ARG:NE	1:B:549:ASP:OD2	2.43	0.45
1:B:173:CYS:SG	1:B:174:LEU:N	2.89	0.45
1:B:409:ASN:OD1	1:B:471:VAL:N	2.50	0.45
1:A:181:SER:HB2	1:A:251:VAL:HG22	1.99	0.45
1:B:605:PRO:HG2	1:B:612:CYS:SG	2.57	0.45
1:B:622:GLU:N	1:B:623:PRO:HD2	2.31	0.45
1:A:20:VAL:HG21	1:A:285:PHE:CG	2.51	0.44
1:A:98:SER:HB2	1:A:105:LEU:HD11	2.00	0.44
1:A:423:TYR:HE2	1:A:457:PRO:HG2	1.83	0.44
1:B:589:ASN:HD21	1:B:646:ALA:N	2.15	0.44
1:A:622:GLU:N	1:A:623:PRO:HD2	2.31	0.44
1:A:488:MET:SD	1:A:555:LEU:HD23	2.58	0.44
1:A:574:LYS:HG2	1:A:583:PHE:HA	2.00	0.44
1:B:488:MET:SD	1:B:555:LEU:HD23	2.58	0.44
1:A:9:VAL:HG23	1:A:29:ILE:HG22	1.99	0.43
1:A:308:VAL:O	1:A:334:LEU:HA	2.18	0.43
1:B:230:LEU:HA	1:B:234:LYS:HB2	2.00	0.43
1:B:423:TYR:HE2	1:B:457:PRO:HG2	1.83	0.43
1:B:589:ASN:ND2	1:B:645:HIS:HB3	2.32	0.43
1:A:545:GLN:NE2	1:A:549:ASP:OD1	2.51	0.43
1:B:508:HIS:CD2	1:B:607:ILE:HG23	2.53	0.43
1:A:188:GLN:HA	1:A:245:ASP:HB2	2.01	0.43
1:B:155:ASP:O	1:B:165:ASP:HB2	2.18	0.43
1:A:317:THR:HG22	1:A:320:VAL:H	1.84	0.43
1:A:207:ASP:HB3	1:A:265:ILE:HG23	2.01	0.43
1:A:600:PRO:HG3	1:A:644:VAL:HG12	2.01	0.43
1:B:71:ASP:HB3	1:B:74:LEU:HG	2.00	0.43
1:A:230:LEU:HA	1:A:234:LYS:HB2	2.00	0.43
1:A:213:VAL:HG12	1:A:251:VAL:HG12	2.01	0.43
1:A:347:TRP:CZ3	1:A:642:GLY:HA3	2.54	0.43
1:B:317:THR:OG1	1:B:318:CYS:N	2.51	0.43
1:B:611:CYS:SG	1:B:613:LEU:HB2	2.58	0.43
1:A:139:TRP:CD1	1:A:147:GLY:HA3	2.54	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:367:VAL:HG11	1:A:384:ILE:HG21	2.01	0.42
1:A:611:CYS:SG	1:A:613:LEU:HB2	2.59	0.42
1:A:326:LEU:HD11	1:A:596:HIS:HB3	2.00	0.42
1:B:29:ILE:HD11	1:B:33:VAL:HG22	2.02	0.42
1:A:499:LEU:HD23	1:A:613:LEU:HD23	2.01	0.42
1:B:486:PHE:CZ	1:B:561:LEU:HD21	2.55	0.42
1:B:601:LYS:HG3	1:B:614:GLU:OE2	2.20	0.42
1:A:117:ILE:HD12	1:A:271:LEU:HD22	2.02	0.42
1:B:299:THR:HB	1:B:652:ARG:HB2	2.02	0.41
1:B:394:ARG:HB3	1:B:445:VAL:HG22	2.02	0.41
1:B:550:TRP:CH2	1:B:554:VAL:HG21	2.55	0.41
1:A:3:LEU:HG	1:A:23:VAL:HG13	2.02	0.41
1:A:489:LEU:HD13	1:A:569:ILE:HD11	2.02	0.41
1:A:30:TYR:CD1	1:B:542:LYS:HG2	2.55	0.41
1:A:482:ASP:CG	1:A:487:ARG:HH12	2.23	0.41
1:B:329:LYS:HA	1:B:329:LYS:HD2	1.83	0.41
1:A:156:ARG:HH21	1:A:385:LEU:HB2	1.84	0.41
1:A:208:ALA:HB1	1:A:231:GLY:O	2.21	0.41
1:A:415:PRO:HB3	1:A:424:PRO:HA	2.02	0.41
1:B:9:VAL:HG23	1:B:29:ILE:HG22	2.02	0.41
1:B:574:LYS:HG3	1:B:583:PHE:HA	2.03	0.41
1:B:589:ASN:HD21	1:B:646:ALA:H	1.69	0.41
1:A:8:ARG:HB2	1:A:30:TYR:CZ	2.56	0.41
1:A:185:LEU:HG	1:A:187:THR:HG23	2.03	0.40
1:A:550:TRP:CH2	1:A:554:VAL:HG21	2.56	0.40
1:B:430:ILE:HD11	1:B:460:GLU:HG2	2.03	0.40
1:B:451:HIS:CE1	1:B:458:PRO:HG2	2.57	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	599/664 (90%)	569 (95%)	30 (5%)	0	100	100
1	B	618/664 (93%)	583 (94%)	35 (6%)	0	100	100
All	All	1217/1328 (92%)	1152 (95%)	65 (5%)	0	100	100

There are no Ramachandran outliers to report.

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	537/587 (92%)	513 (96%)	24 (4%)	27	59
1	B	552/587 (94%)	519 (94%)	33 (6%)	19	48
All	All	1089/1174 (93%)	1032 (95%)	57 (5%)	23	53

All (57) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	52	ILE
1	A	57	GLU
1	A	58	ARG
1	A	60	ARG
1	A	245	ASP
1	A	279	PHE
1	A	316	ASN
1	A	328	ARG
1	A	334	LEU
1	A	350	ASP
1	A	361	HIS
1	A	363	THR
1	A	368	PHE
1	A	381	TYR
1	A	383	ARG
1	A	434	LEU
1	A	478	VAL
1	A	561	LEU

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Mol	Chain	Res	Type
1	A	574	LYS
1	A	581	THR
1	A	593	LEU
1	A	597	LEU
1	A	635	THR
1	A	639	MET
1	B	52	ILE
1	B	113	THR
1	B	149	ILE
1	B	165	ASP
1	B	174	LEU
1	B	254	LEU
1	B	279	PHE
1	B	316	ASN
1	B	320	VAL
1	B	334	LEU
1	B	350	ASP
1	B	361	HIS
1	B	363	THR
1	B	368	PHE
1	B	372	ARG
1	B	381	TYR
1	B	384	ILE
1	B	389	PHE
1	B	397	ARG
1	B	425	LEU
1	B	434	LEU
1	B	478	VAL
1	B	535	LYS
1	B	577	ARG
1	B	581	THR
1	B	589	ASN
1	B	591	LEU
1	B	597	LEU
1	B	633	ASP
1	B	635	THR
1	B	660	TRP
1	B	661	ASN
1	B	663	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (3) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	228	HIS
1	B	228	HIS
1	B	589	ASN

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 16 ligands modelled in this entry, 14 are monoatomic - leaving 2 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	GOL	B	907	-	5,5,5	0.90	0	5,5,5	1.00	0
3	GOL	A	706	-	5,5,5	0.93	0	5,5,5	1.00	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	GOL	B	907	-	-	0/4/4/4	-
3	GOL	A	706	-	-	0/4/4/4	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

6 Fit of model and data ⓘ

6.1 Protein, DNA and RNA chains ⓘ

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled 'Q< 0.9' lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2			OWAB(Å^2)	Q<0.9
1	A	619/664 (93%)	0.21	11 (1%)	68	49	41, 80, 129, 169	0
1	B	634/664 (95%)	0.21	7 (1%)	80	66	41, 81, 135, 203	0
All	All	1253/1328 (94%)	0.21	18 (1%)	75	59	41, 80, 133, 203	0

All (18) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	311	CYS	4.3
1	B	523	VAL	2.7
1	A	514	PHE	2.5
1	B	278	ASP	2.5
1	A	403	GLY	2.4
1	A	177	LEU	2.4
1	B	250	PHE	2.3
1	A	138	GLN	2.3
1	B	648	THR	2.3
1	A	379	PHE	2.2
1	A	392	VAL	2.2
1	A	310	VAL	2.2
1	A	347	TRP	2.2
1	A	648	THR	2.2
1	B	220	GLU	2.1
1	B	139	TRP	2.1
1	A	376	LEU	2.0
1	A	348	ILE	2.0

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

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

6.3 Carbohydrates (i)

There are no monosaccharides in this entry.

6.4 Ligands (i)

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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
3	GOL	A	706	6/6	0.72	0.20	82,89,104,111	0
3	GOL	B	907	6/6	0.77	0.22	54,77,92,97	0
4	CL	A	707	1/1	0.86	0.17	88,88,88,88	0
2	CA	B	906	1/1	0.87	0.15	88,88,88,88	0
4	CL	B	901	1/1	0.88	0.17	83,83,83,83	0
4	CL	B	909	1/1	0.88	0.34	101,101,101,101	0
2	CA	A	703	1/1	0.90	0.13	84,84,84,84	0
2	CA	A	704	1/1	0.91	0.14	77,77,77,77	0
2	CA	A	705	1/1	0.94	0.14	95,95,95,95	0
2	CA	B	902	1/1	0.94	0.12	99,99,99,99	0
2	CA	B	904	1/1	0.95	0.12	81,81,81,81	0
4	CL	B	908	1/1	0.97	0.23	74,74,74,74	0
2	CA	B	905	1/1	0.97	0.12	78,78,78,78	0
2	CA	B	903	1/1	0.98	0.18	54,54,54,54	0
2	CA	A	701	1/1	0.98	0.12	82,82,82,82	0
2	CA	A	702	1/1	0.99	0.18	59,59,59,59	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 CA B 906:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
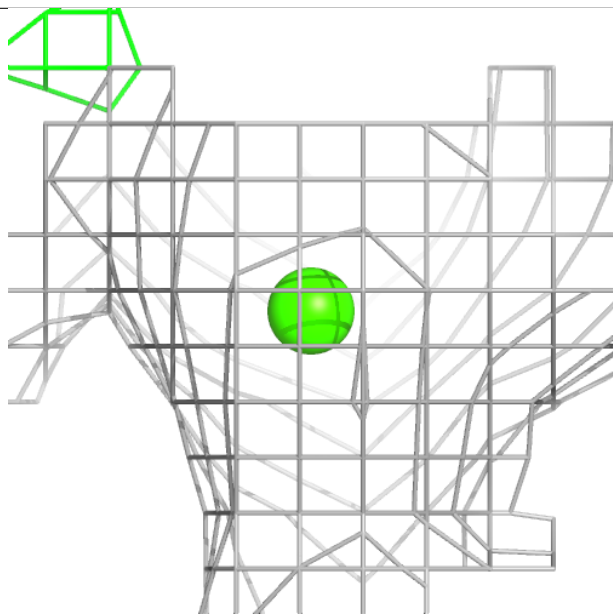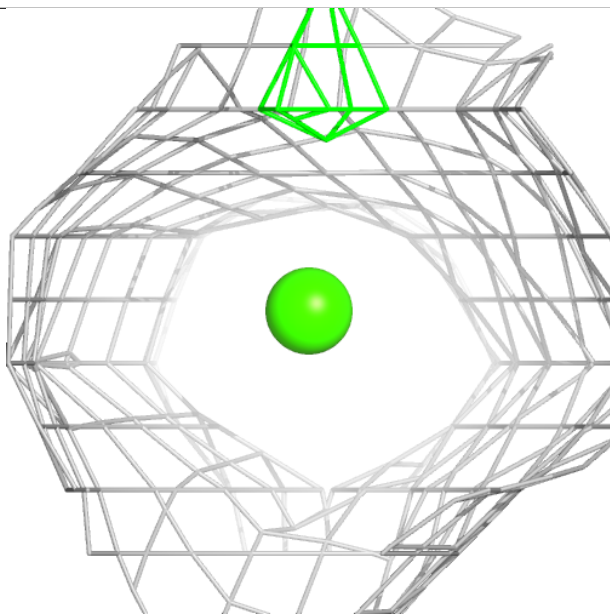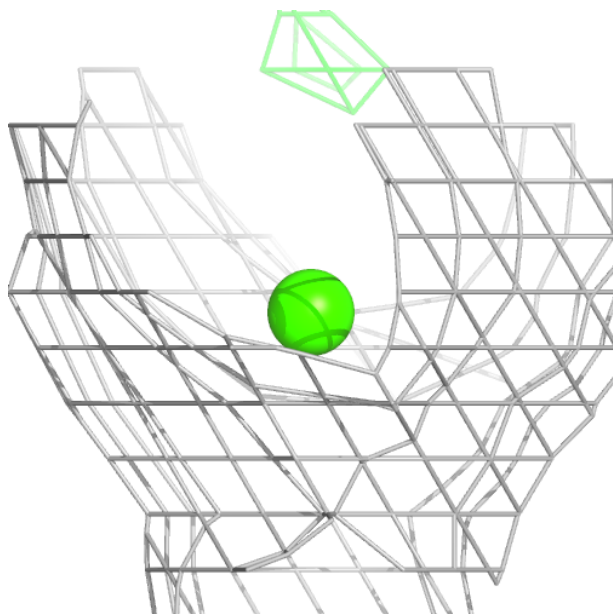
Electron density around CA A 703:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
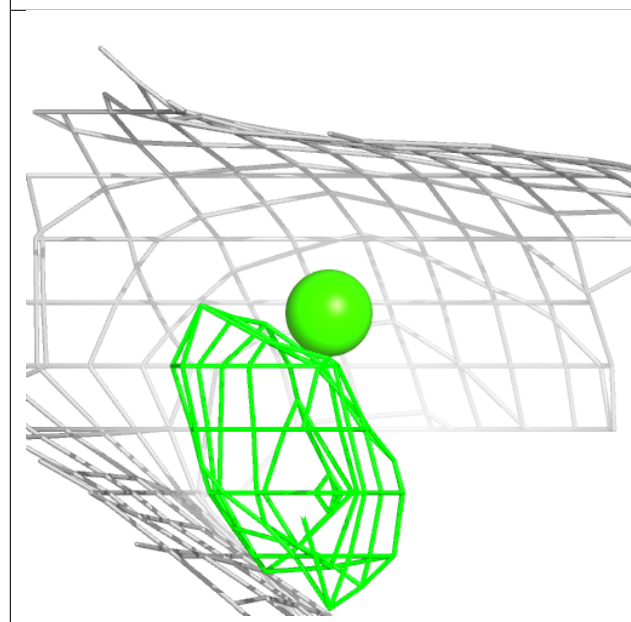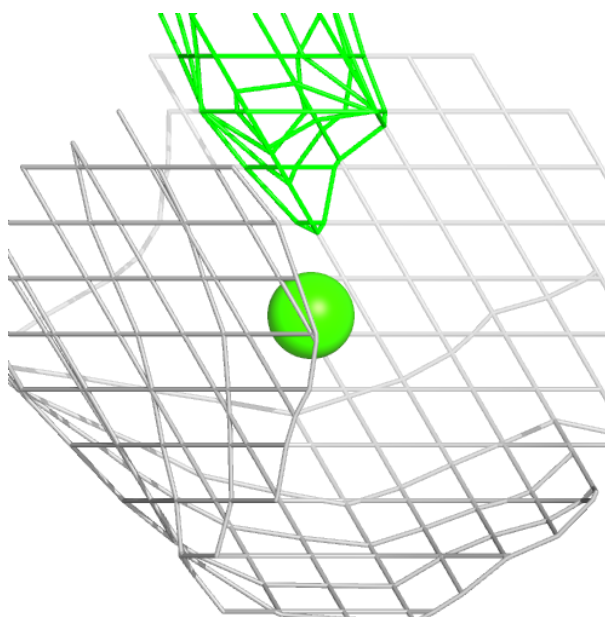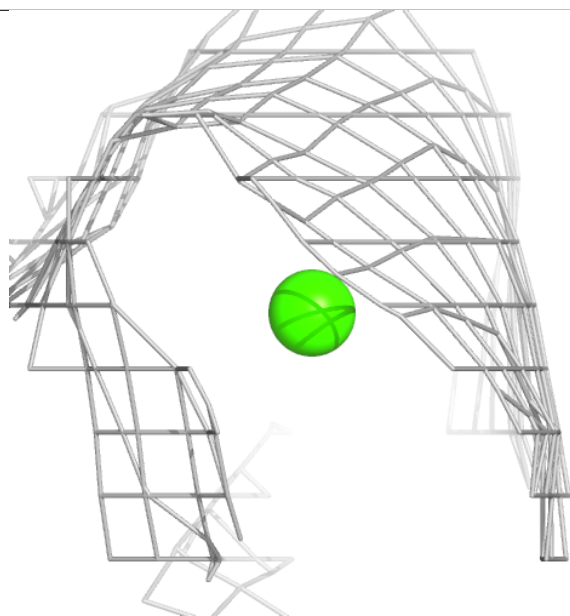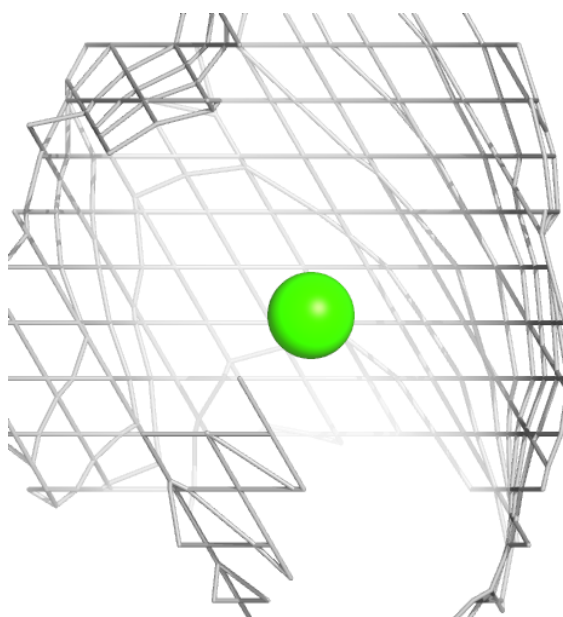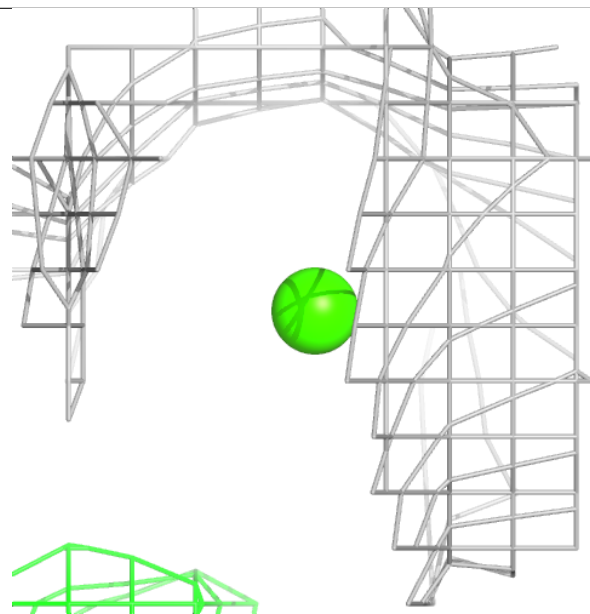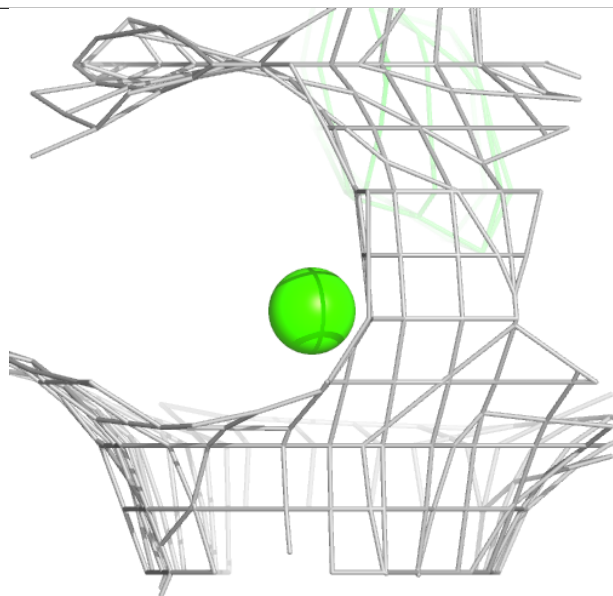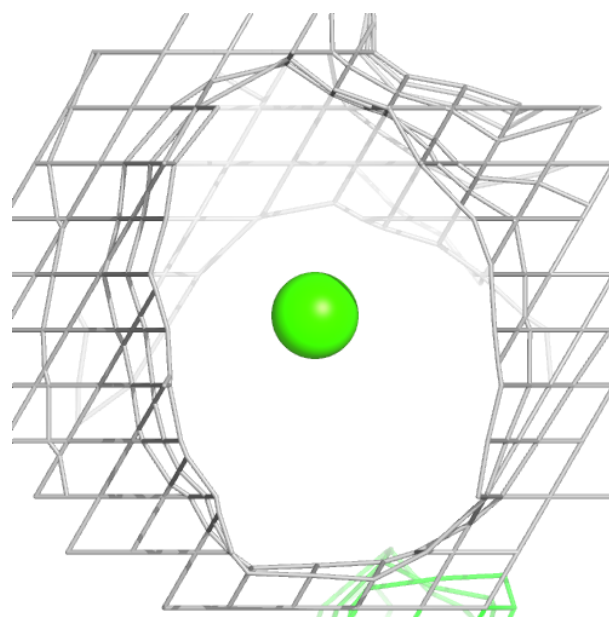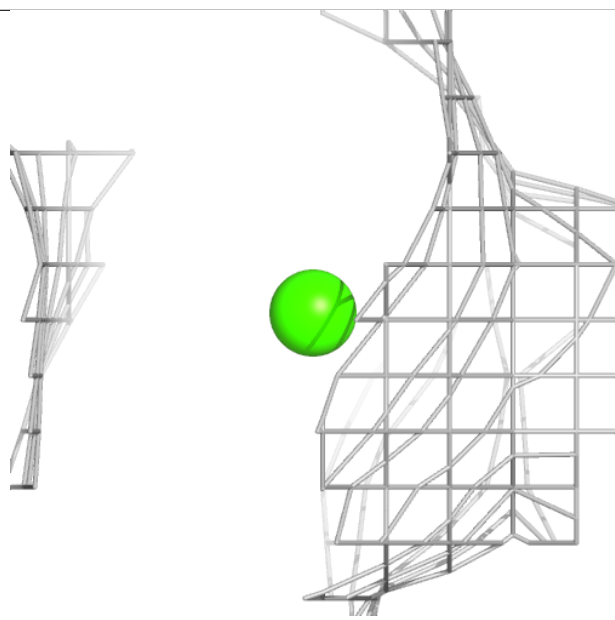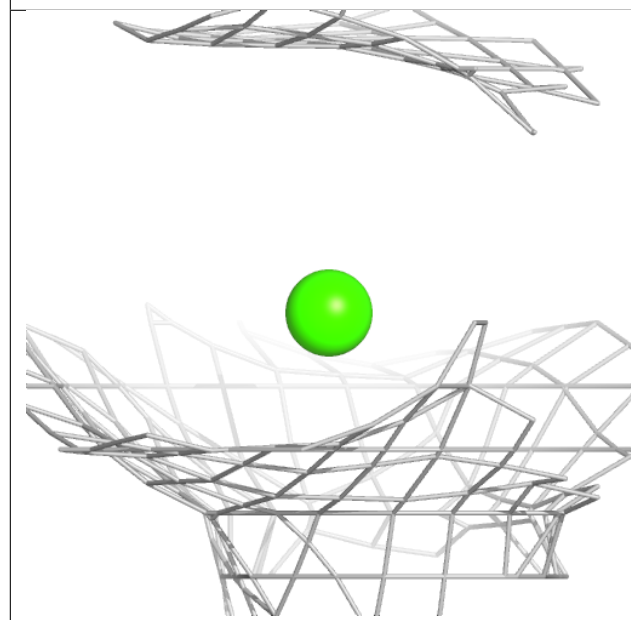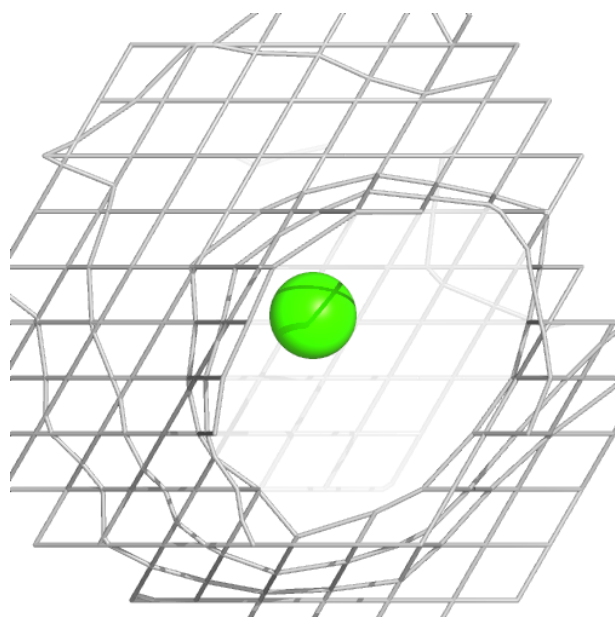and green (positive)
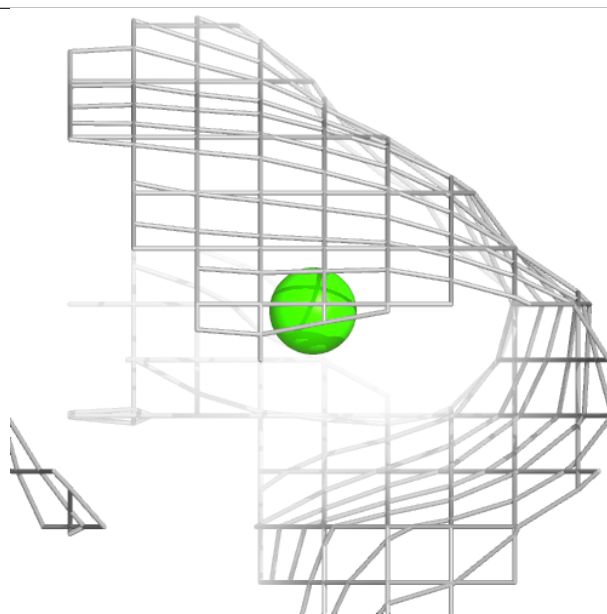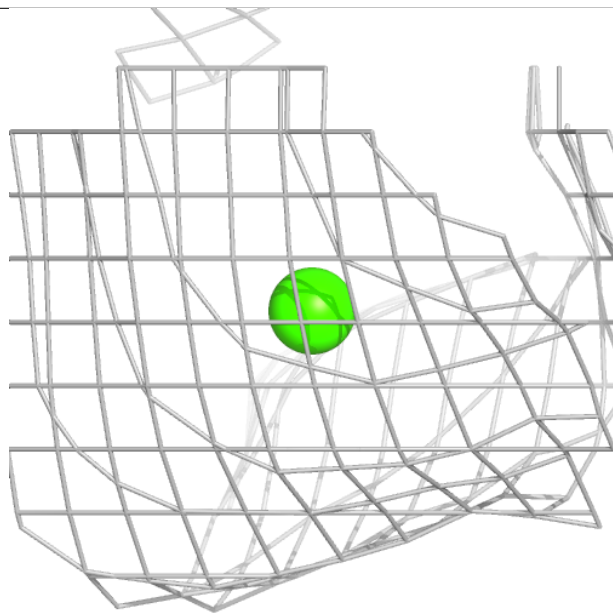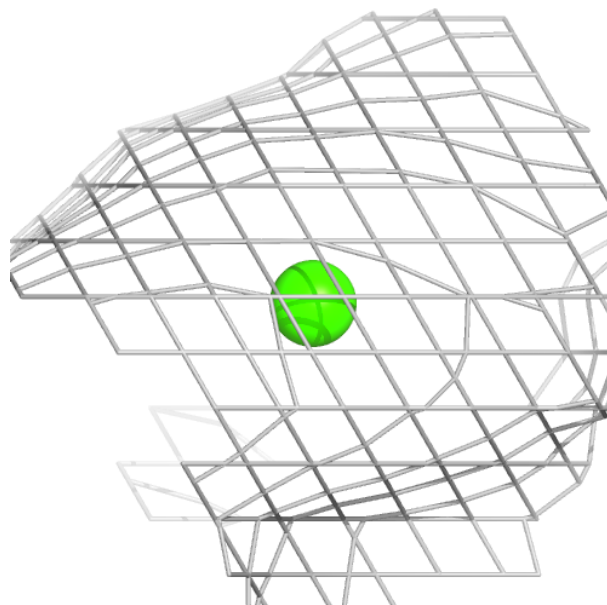
Electron density around CA A 704:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
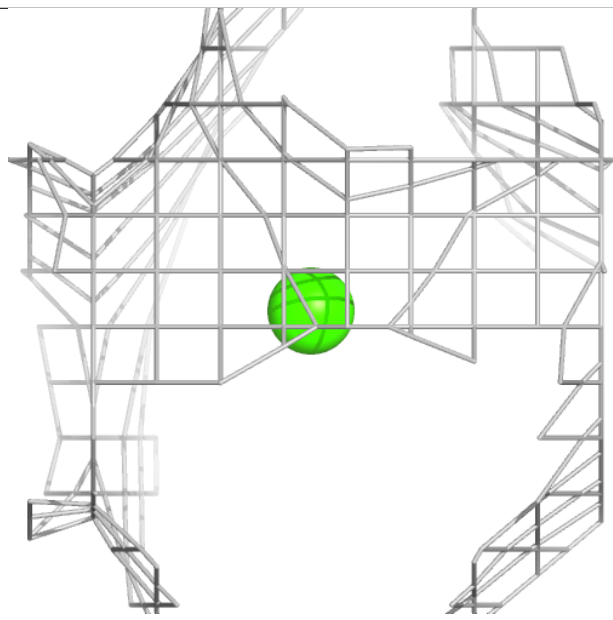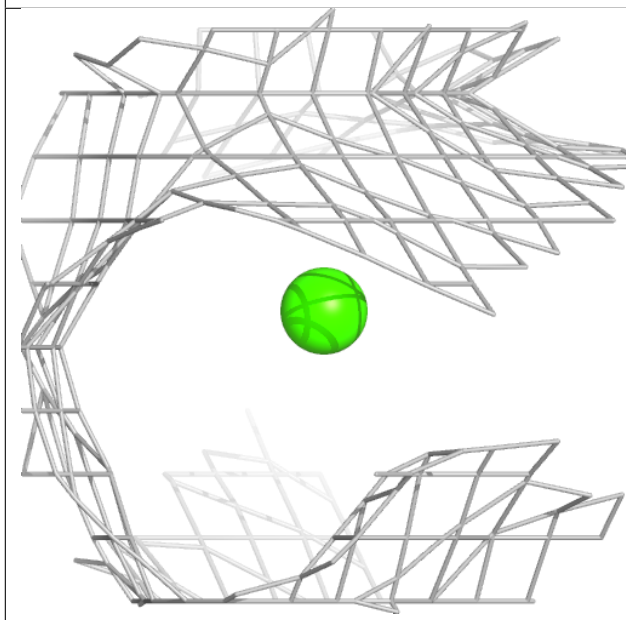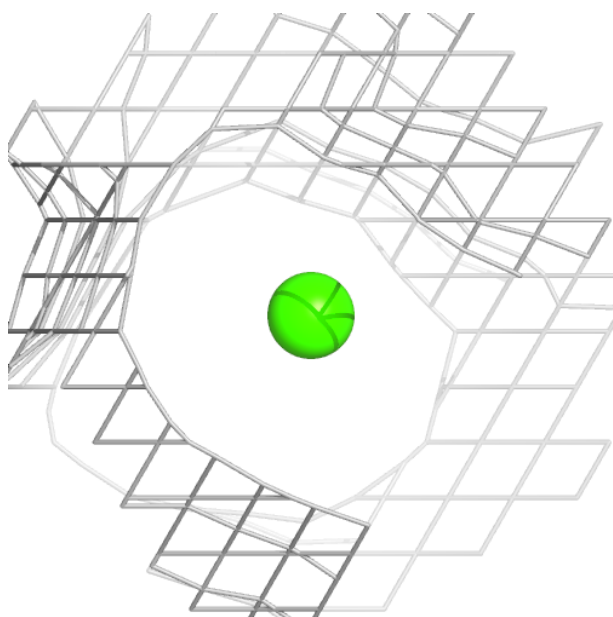
Electron density around CA A 705:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
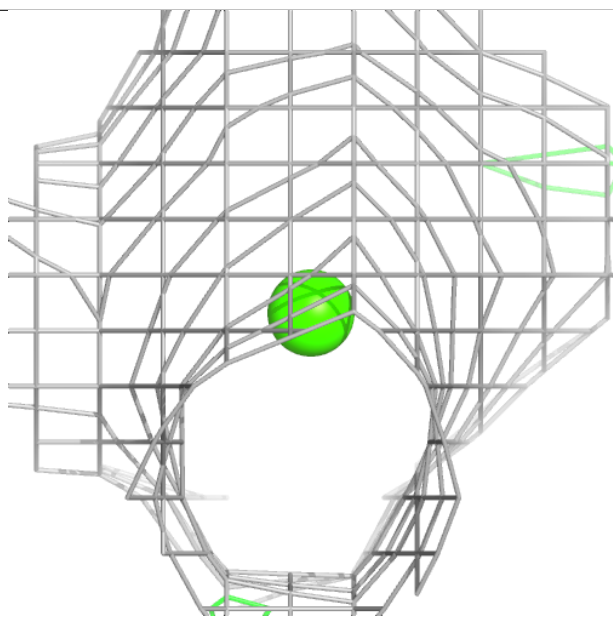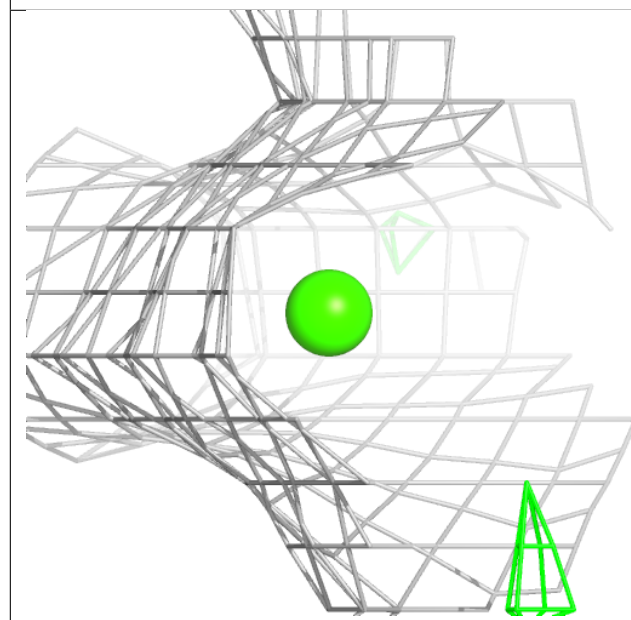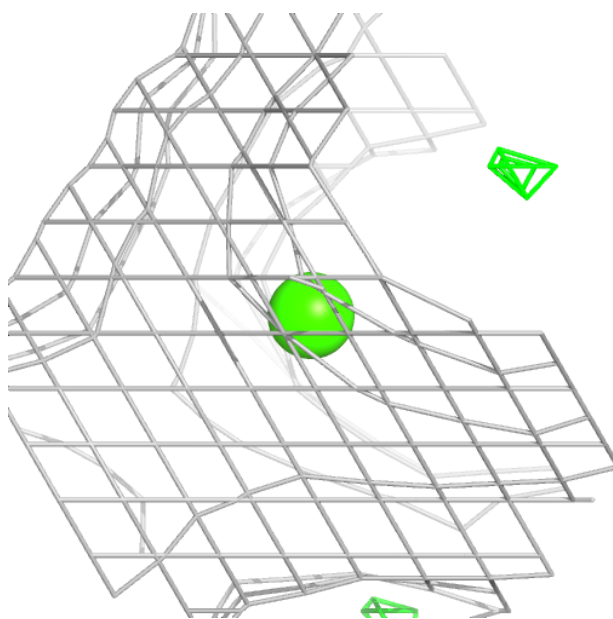
Electron density around CA B 902:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
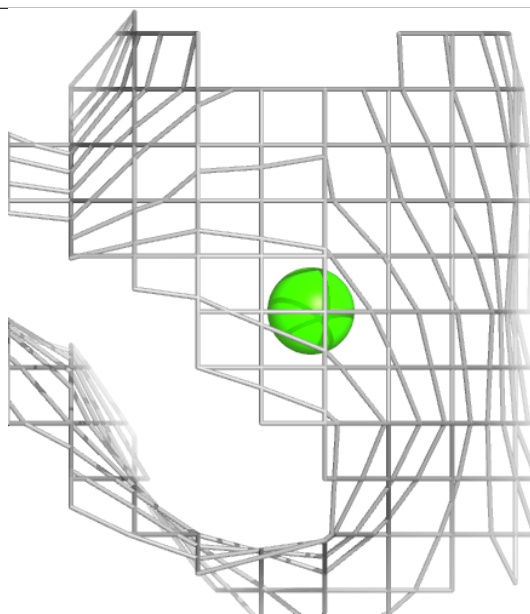$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
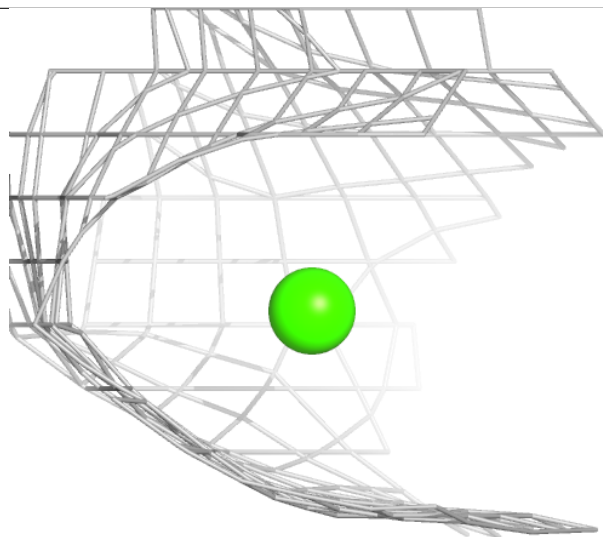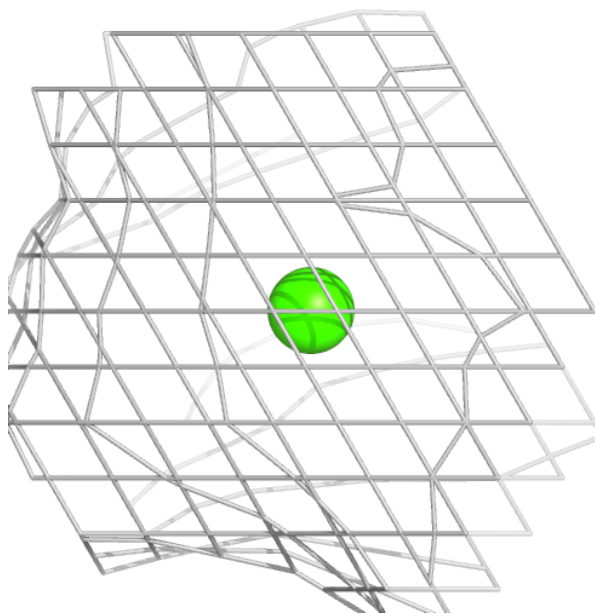and green (positive)
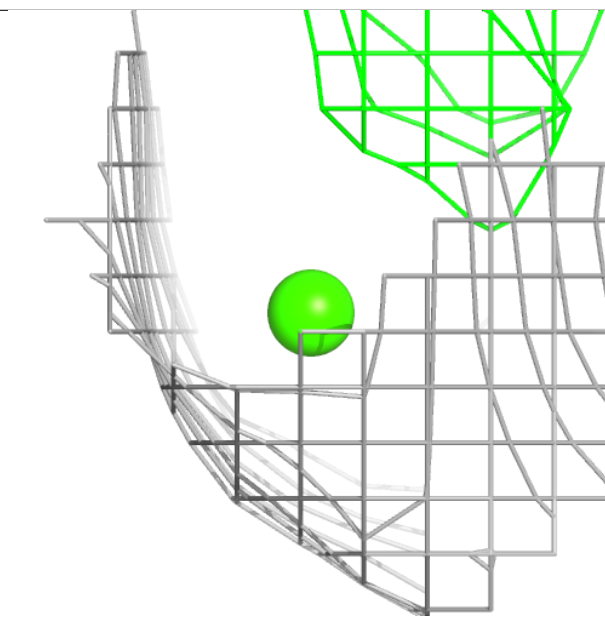
Electron density around CA B 904:

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

Electron density around CA B 905:

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

Electron density around CA B 903:

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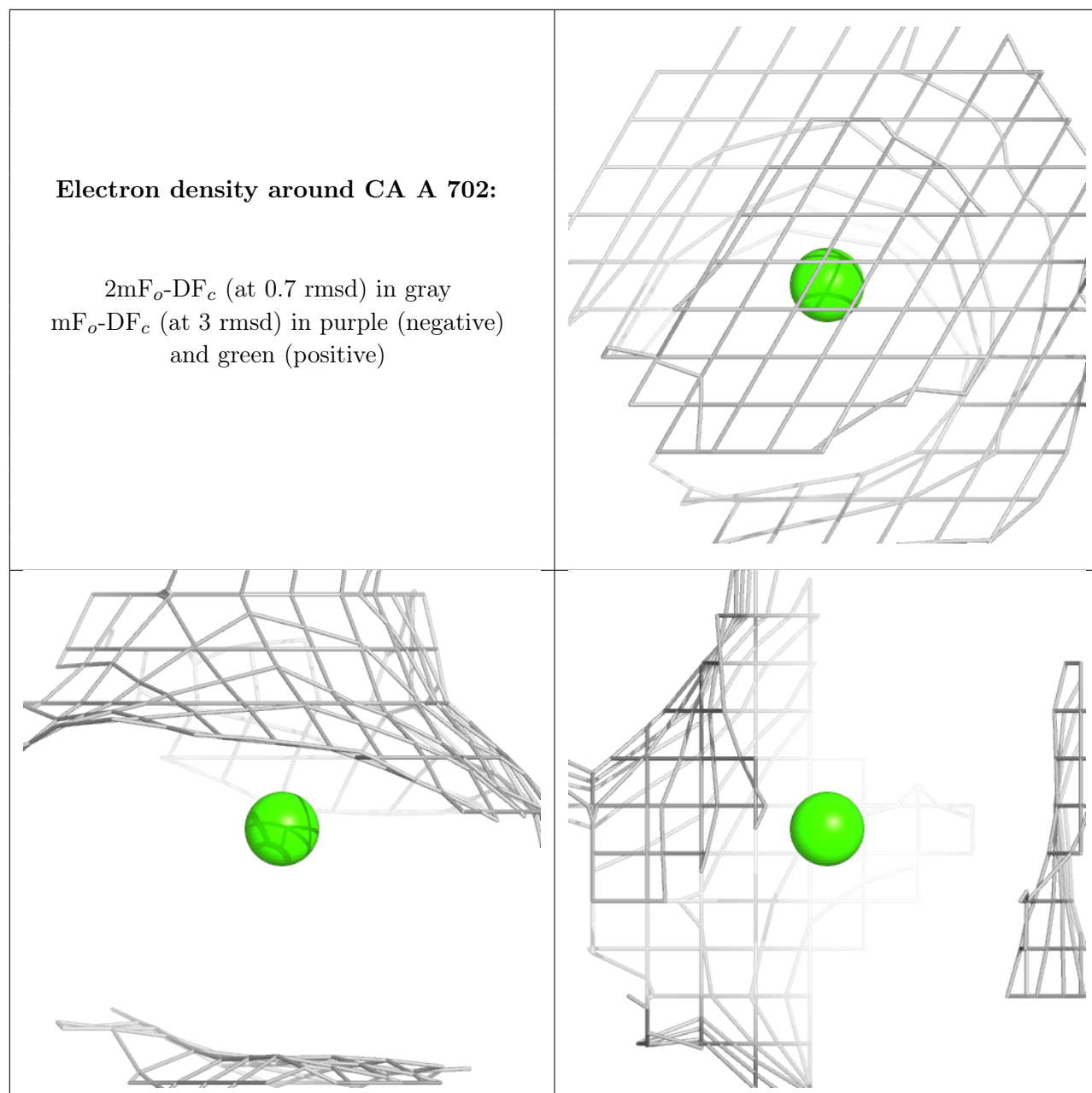and green (positive)

Electron density around CA A 701:

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

Electron density around CA A 702:

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.