



# wwPDB X-ray Structure Validation Summary Report ⓘ

Mar 14, 2026 – 04:21 PM UTC

PDB ID : 6WID / pdb\_00006wid  
Title : Nucleotide incorporation intermediate into quaternary complex of human Polymerase Mu on a complementary DNA double-strand break substrate  
Authors : Kaminski, A.M.; Kunkel, T.A.; Pedersen, L.C.; Bebenek, K.  
Deposited on : 2020-04-09  
Resolution : 1.50 Å (reported)

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

We welcome your comments at [validation@mail.wwpdb.org](mailto:validation@mail.wwpdb.org)

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

MolProbity : 4-5-2 with Phenix2.0  
Mogul : 2022.3.0, CSD as543be (2022)  
Xtriage (Phenix) : 2.0  
EDS : 3.0  
Buster-report : wwPDB partial adaption of 1.1.7 (2018)  
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)  
CCP4 : 9.0.010 (Gargrove)  
Density-Fitness : 1.0.12  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.49

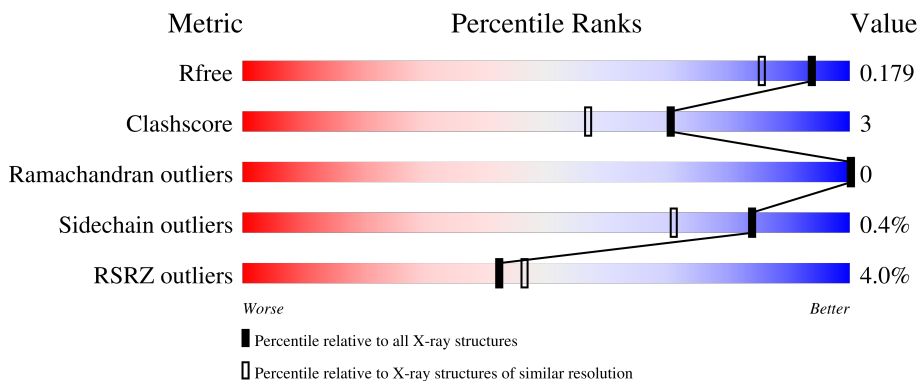
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 1.50 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	180053	4037 (1.50-1.50)
Clashscore	190562	4235 (1.50-1.50)
Ramachandran outliers	187476	4153 (1.50-1.50)
Sidechain outliers	187428	4150 (1.50-1.50)
RSRZ outliers	180081	4039 (1.50-1.50)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions  $\leq 5\%$ . The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	356	 4% 87% 5% 7%
2	T	6	 50% 50%
3	U	3	 100%
4	P	5	 60% 40%
5	D	4	 100%

## 2 Entry composition [i](#)

There are 14 unique types of molecules in this entry. The entry contains 3575 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 DNA-directed DNA/RNA polymerase mu.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	330	2729	1740	486	493	10	0	24	0

There are 18 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	127	GLY	-	expression tag	UNP Q9NP87
A	128	SER	-	expression tag	UNP Q9NP87
A	129	ALA	-	expression tag	UNP Q9NP87
A	130	ALA	-	expression tag	UNP Q9NP87
A	131	ALA	-	expression tag	UNP Q9NP87
A	?	-	PRO	deletion	UNP Q9NP87
A	?	-	GLY	deletion	UNP Q9NP87
A	?	-	ALA	deletion	UNP Q9NP87
A	?	-	ALA	deletion	UNP Q9NP87
A	?	-	VAL	deletion	UNP Q9NP87
A	?	-	GLY	deletion	UNP Q9NP87
A	?	-	GLY	deletion	UNP Q9NP87
A	?	-	SER	deletion	UNP Q9NP87
A	?	-	THR	deletion	UNP Q9NP87
A	?	-	ARG	deletion	UNP Q9NP87
A	?	-	PRO	deletion	UNP Q9NP87
A	?	-	CYS	deletion	UNP Q9NP87
A	410	GLY	PRO	linker	UNP Q9NP87

- Molecule 2 is a DNA chain called DNA (5'-D(\*CP\*GP\*GP\*CP\*AP\*T)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	P			
2	T	6	158	77	31	44	6	0	2	0

- Molecule 3 is a DNA chain called DNA (5'-D(\*AP\*CP\*G)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	P			
3	U	3	59	29	13	15	2	0	0	0

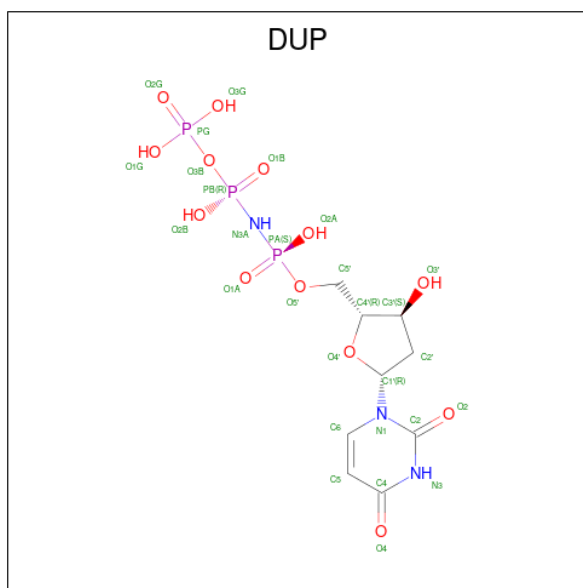
- Molecule 4 is a DNA chain called DNA (5'-D(\*CP\*GP\*TP\*AP\*T)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	P			
4	P	5	120	59	22	34	5	0	2	0

- Molecule 5 is a DNA chain called DNA (5'-D(P\*GP\*CP\*CP\*G)-3').

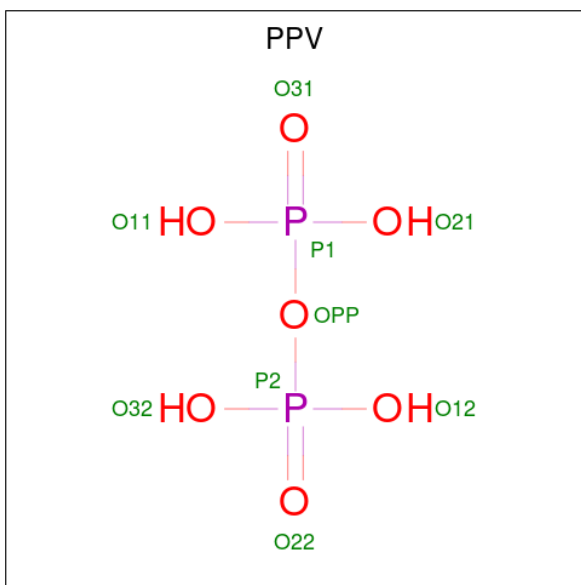
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	P			
5	D	4	83	38	16	25	4	0	0	0

- Molecule 6 is 2'-DEOXYURIDINE 5'-ALPHA,BETA-IMIDO-TRIPHOSPHATE (CCD ID: DUP) (formula: C<sub>9</sub>H<sub>16</sub>N<sub>3</sub>O<sub>13</sub>P<sub>3</sub>) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	N	O	P		
6	A	1	28	9	3	13	3	0	1

- Molecule 7 is PYROPHOSPHATE (CCD ID: PPV) (formula: H<sub>4</sub>O<sub>7</sub>P<sub>2</sub>) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	A	1	Total O P 9 7 2	0	1

- Molecule 8 is MAGNESIUM ION (CCD ID: MG) (formula: Mg) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
8	A	2	Total Mg 2 2	0	0

- Molecule 9 is SODIUM ION (CCD ID: NA) (formula: Na).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
9	A	1	Total Na 1 1	0	0

- Molecule 10 is CHLORIDE ION (CCD ID: CL) (formula: Cl).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
10	A	1	Total Cl 1 1	0	0

- Molecule 11 is PENTAETHYLENE GLYCOL (CCD ID: 1PE) (formula: C<sub>10</sub>H<sub>22</sub>O<sub>6</sub>).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
11	A	1	Total	C	O	0	0
			13	8	5		

- Molecule 12 is GLYCEROL (CCD ID: GOL) (formula:  $C_3H_8O_3$ ).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
12	A	1	Total	C	O	0	0
			5	3	2		
12	A	1	Total	C	O	0	0
			6	3	3		

- Molecule 13 is DI(HYDROXYETHYL)ETHER (CCD ID: PEG) (formula:  $C_4H_{10}O_3$ ).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
13	A	1	Total	C	O	0	0
			7	4	3		

- Molecule 14 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
14	A	262	Total	O	0	6
			265	265		
14	T	28	Total	O	0	1
			29	29		
14	U	13	Total	O	0	0
			13	13		
14	P	26	Total	O	0	1
			26	26		
14	D	21	Total	O	0	1
			21	21		



## 4 Data and refinement statistics i

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	60.19Å 62.04Å 118.32Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	31.02 – 1.50 31.02 – 1.50	Depositor EDS
% Data completeness (in resolution range)	99.6 (31.02-1.50) 97.3 (31.02-1.50)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	0.08	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.73 (at 1.50Å)	Xtrriage
Refinement program	PHENIX 1.16_3549	Depositor
R, $R_{free}$	0.164 , 0.177 0.165 , 0.179	Depositor DCC
$R_{free}$ test set	2195 reflections (3.08%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	13.4	Xtrriage
Anisotropy	0.133	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.38 , 49.2	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	0.018 for k,h,-l	Xtrriage
$F_o, F_c$ correlation	0.96	EDS
Total number of atoms	3575	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	19.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.91% of the height of the origin peak. No significant pseudotranslation is detected.*

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

<sup>2</sup>Theoretical values of  $\langle |L| \rangle$ ,  $\langle L^2 \rangle$  for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

## 5 Model quality [i](#)

### 5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: GOL, PPV, DUP, CL, 1PE, PEG, MG, 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	0.39	0/2795	0.52	0/3787
2	T	0.51	0/177	0.69	0/272
3	U	0.56	0/66	0.59	0/100
4	P	0.47	0/132	0.68	0/197
5	D	0.54	0/92	0.87	0/138
All	All	0.41	0/3262	0.56	0/4494

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	2729	0	2644	14	0
2	T	158	0	92	2	0
3	U	59	0	35	0	0
4	P	120	0	69	7	0
5	D	83	0	45	0	0
6	A	28	0	10	0	0
7	A	9	0	0	0	0
8	A	2	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
9	A	1	0	0	0	0
10	A	1	0	0	0	0
11	A	13	0	17	0	0
12	A	11	0	12	2	0
13	A	7	0	10	0	0
14	A	265	0	0	3	1
14	D	21	0	0	0	0
14	P	26	0	0	4	0
14	T	29	0	0	0	0
14	U	13	0	0	0	0
All	All	3575	0	2934	21	1

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 3.

The worst 5 of 21 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:177[B]:LEU:HD21	1:A:442:ARG:CZ	2.31	0.60
4:P:5[B]:DT:P	14:P:102:HOH:O	2.62	0.56
4:P:4[B]:DA:H5''	14:P:102:HOH:O	2.06	0.55
1:A:248:VAL:HG12	12:A:709:GOL:H2	1.90	0.54
1:A:266:ARG:HG2	1:A:280[B]:LEU:HD21	1.91	0.53

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
14:A:1025:HOH:O	14:A:1041:HOH:O[4_445]	2.13	0.07

## 5.3 Torsion angles [i](#)

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

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	A	350/356 (98%)	340 (97%)	10 (3%)	0	100 100

There are no Ramachandran outliers to report.

### 5.3.2 Protein sidechains [i](#)

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	280/301 (93%)	279 (100%)	1 (0%)	84 71

All (1) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	329	HIS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	152	HIS
1	A	219	HIS
1	A	274	GLN
1	A	426	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 10 ligands modelled in this entry, 4 are monoatomic - leaving 6 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 2$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
13	PEG	A	710	-	6,6,6	0.42	0	5,5,5	0.36	0
12	GOL	A	709	-	5,5,5	1.52	1 (20%)	5,5,5	0.75	0
7	PPV	A	702[B]	8	6,8,8	0.83	0	12,13,13	1.51	2 (16%)
11	1PE	A	707	-	12,12,15	0.52	0	11,11,14	0.27	0
12	GOL	A	708	-	4,4,5	1.21	1 (25%)	4,4,5	0.96	0
6	DUP	A	701[A]	8	28,29,29	1.33	4 (14%)	39,45,45	1.85	9 (23%)

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
13	PEG	A	710	-	-	1/4/4/4	-
12	GOL	A	709	-	-	2/4/4/4	-
7	PPV	A	702[B]	8	-	0/6/6/6	-
11	1PE	A	707	-	-	0/10/10/13	-
12	GOL	A	708	-	-	2/2/2/4	-
6	DUP	A	701[A]	8	-	4/19/34/34	0/2/2/2

The worst 5 of 6 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	A	701[A]	DUP	PB-O2B	-2.97	1.48	1.56
6	A	701[A]	DUP	C4-N3	-2.54	1.34	1.38

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	A	701[A]	DUP	C2-N3	-2.50	1.33	1.38
12	A	709	GOL	O2-C2	-2.43	1.36	1.43
6	A	701[A]	DUP	C2-N1	-2.29	1.34	1.38

The worst 5 of 11 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	A	701[A]	DUP	O2B-PB-O1B	4.64	119.82	109.87
6	A	701[A]	DUP	N3-C2-N1	4.09	120.21	114.89
6	A	701[A]	DUP	O2A-PA-O1A	3.77	117.96	109.87
6	A	701[A]	DUP	C4-N3-C2	-3.68	122.04	126.61
6	A	701[A]	DUP	O1B-PB-N3A	-3.37	106.81	111.77

There are no chirality outliers.

5 of 9 torsion outliers are listed below:

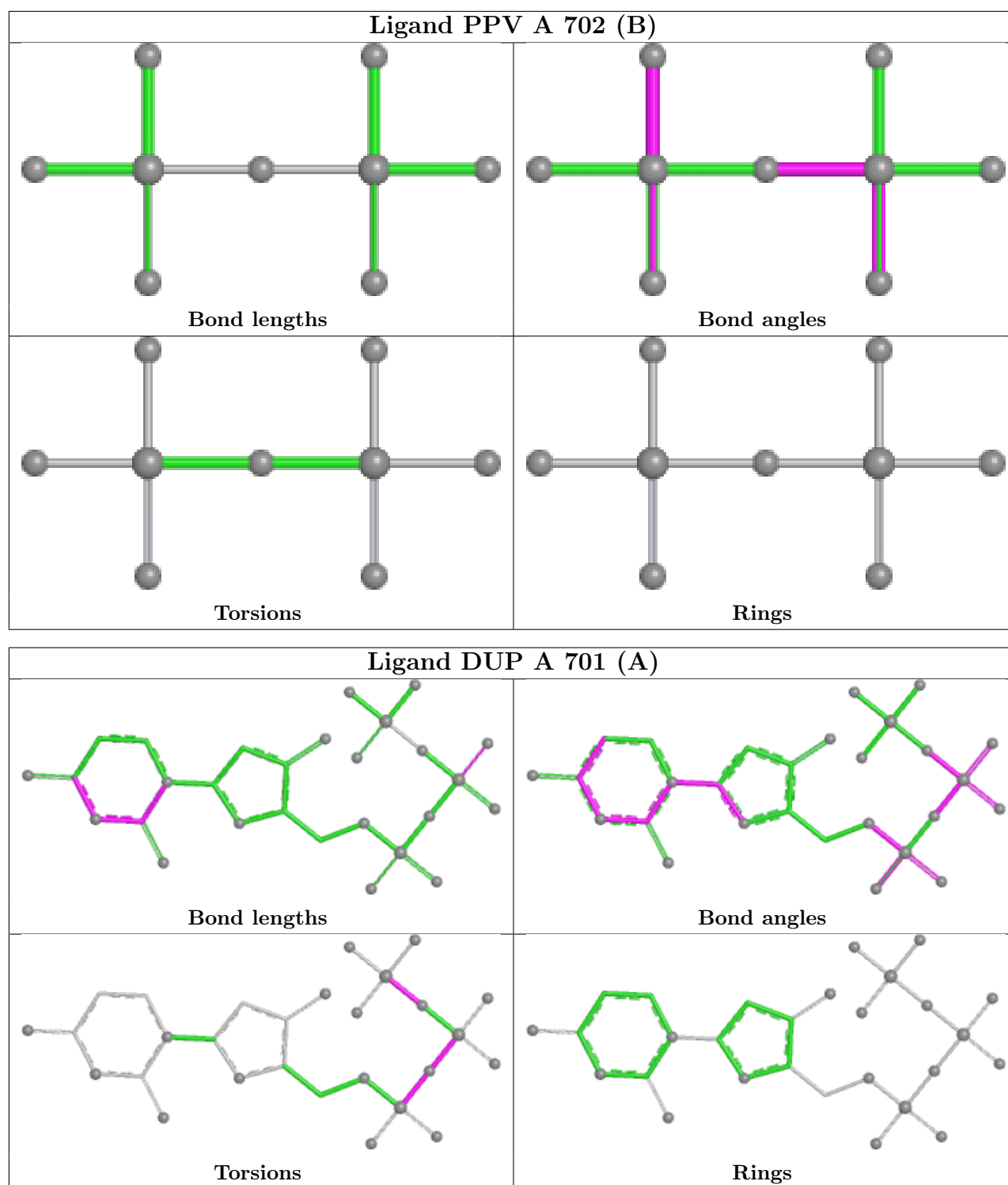
Mol	Chain	Res	Type	Atoms
6	A	701[A]	DUP	PB-N3A-PA-O1A
6	A	701[A]	DUP	PA-N3A-PB-O1B
6	A	701[A]	DUP	PB-O3B-PG-O1G
12	A	708	GOL	O2-C2-C3-O3
12	A	709	GOL	C1-C2-C3-O3

There are no ring outliers.

2 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
12	A	709	GOL	1	0
12	A	708	GOL	1	0

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



## 5.7 Other polymers [\(i\)](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues

There are no chain breaks in this entry.

## 6 Fit of model and data [i](#)

### 6.1 Protein, DNA and RNA chains [i](#)

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å <sup>2</sup> )	Q<0.9
1	A	330/356 (92%)	0.11	14 (4%) 40 44	5, 17, 35, 53	28 (8%)
2	T	6/6 (100%)	-0.63	0 100 100	9, 10, 14, 17	2 (33%)
3	U	3/3 (100%)	-1.07	0 100 100	11, 11, 11, 12	0
4	P	5/5 (100%)	-0.92	0 100 100	5, 5, 11, 13	2 (40%)
5	D	4/4 (100%)	-0.76	0 100 100	14, 14, 16, 18	0
All	All	348/374 (93%)	0.06	14 (4%) 42 46	5, 16, 35, 53	32 (9%)

The worst 5 of 14 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	137	TRP	8.9
1	A	384	ALA	5.8
1	A	135	PRO	5.8
1	A	385	PHE	3.9
1	A	221[A]	VAL	3.0

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

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

### 6.3 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

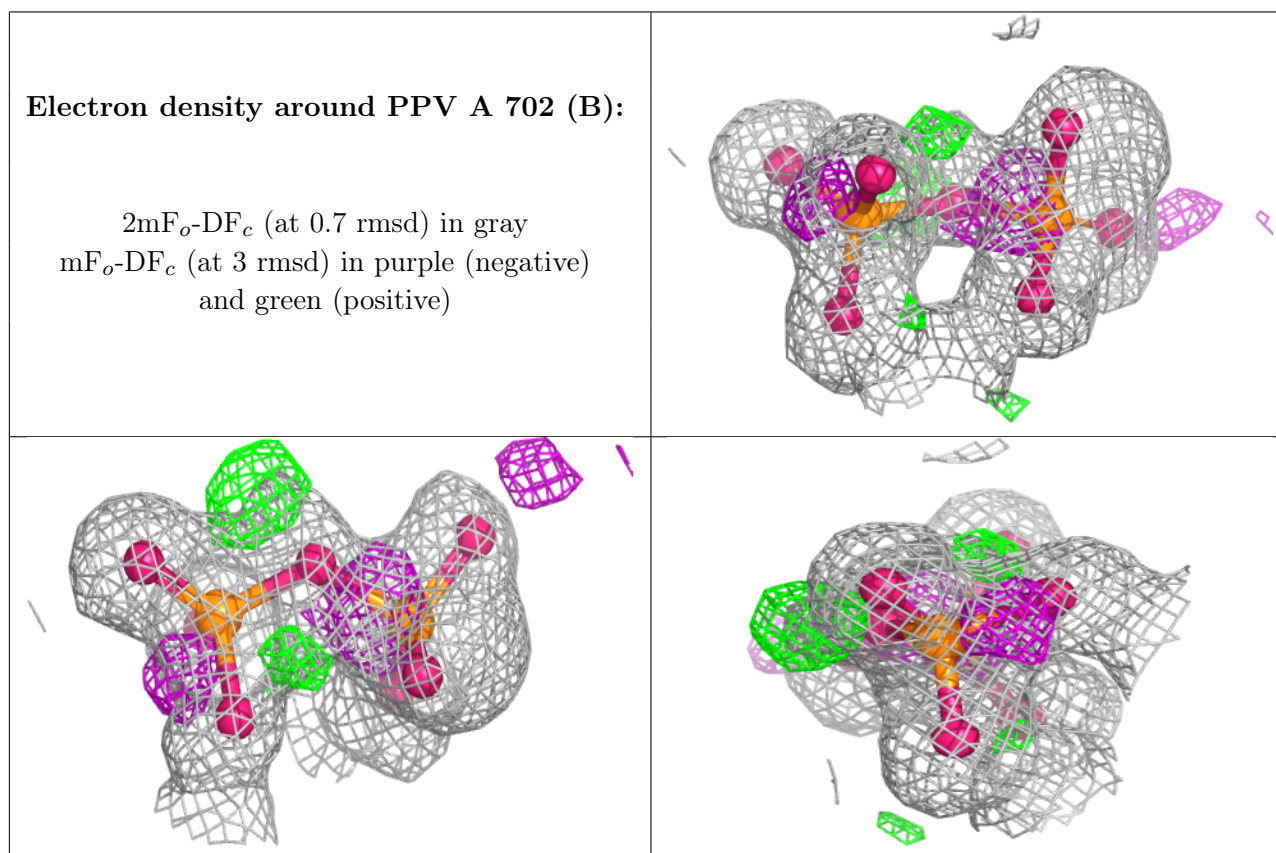
### 6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum,

median, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

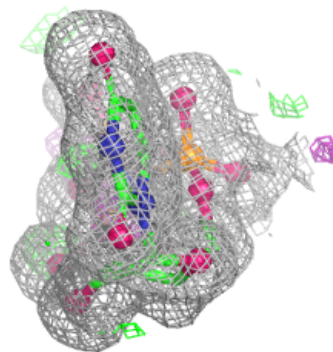
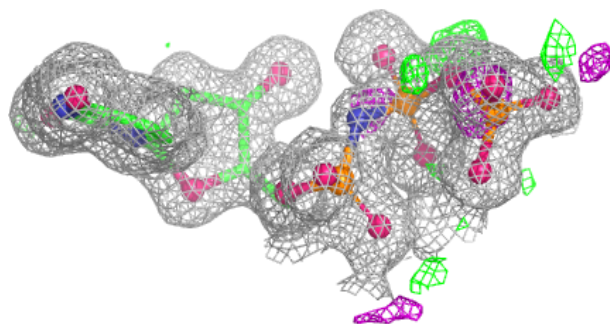
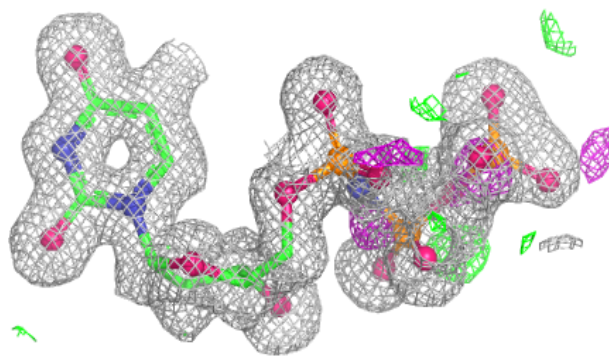
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
12	GOL	A	708	5/6	0.70	0.27	40,42,42,44	5
13	PEG	A	710	7/7	0.81	0.17	35,41,44,47	0
12	GOL	A	709	6/6	0.84	0.17	26,41,41,46	0
10	CL	A	706	1/1	0.86	0.16	46,46,46,46	0
11	1PE	A	707	13/16	0.91	0.11	24,30,38,40	0
7	PPV	A	702[B]	9/9	0.94	0.07	9,13,17,17	9
6	DUP	A	701[A]	28/28	0.98	0.05	4,7,16,19	28
9	NA	A	705	1/1	0.99	0.04	11,11,11,11	0
8	MG	A	704	1/1	0.99	0.02	10,10,10,10	0
8	MG	A	703	1/1	1.00	0.06	12,12,12,12	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.



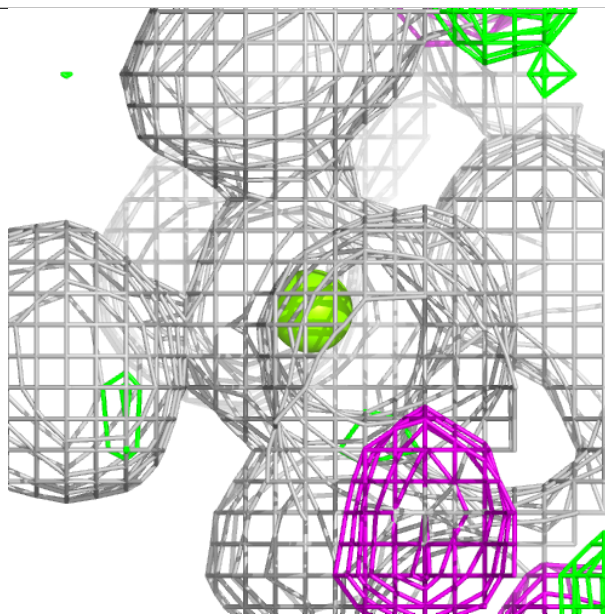
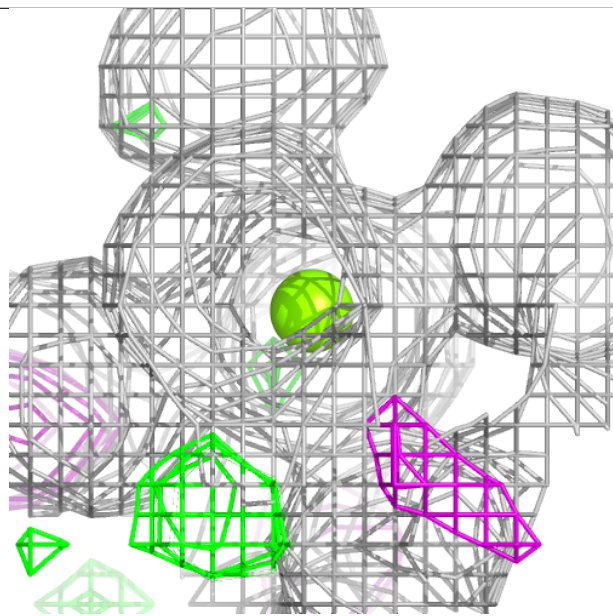
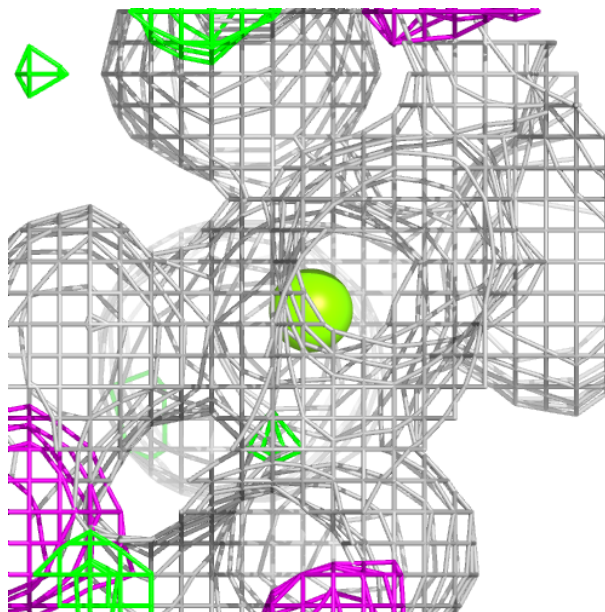
**Electron density around DUP A 701 (A):**

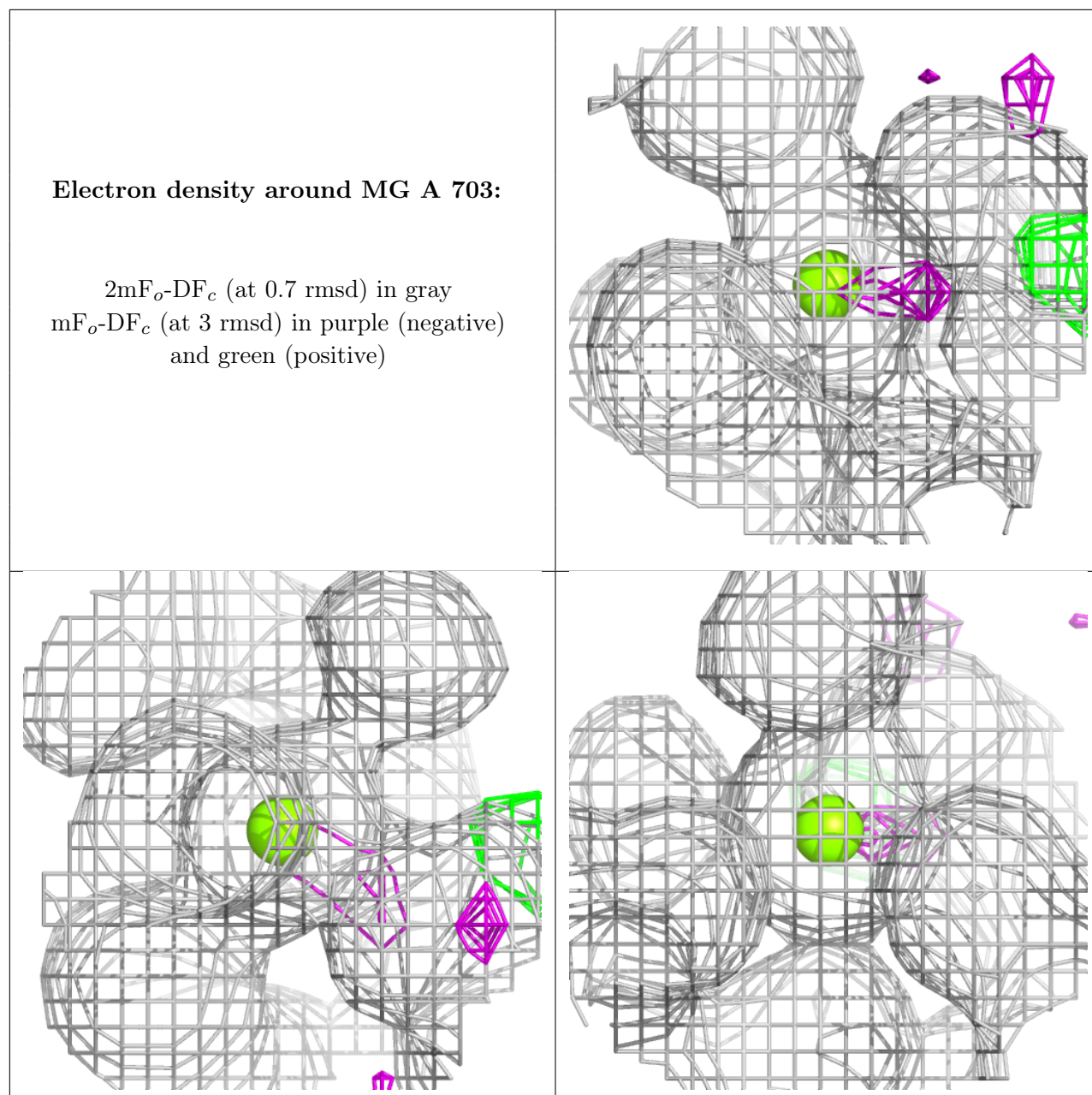
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)



**Electron density around MG 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)





## 6.5 Other polymers [i](#)

There are no such residues in this entry.