



# wwPDB X-ray Structure Validation Summary Report ⓘ

Aug 28, 2023 – 07:10 am BST

PDB ID : 8OIC  
Title : Trichomonas vaginalis riboside hydrolase (His-tagged)  
Authors : Patrone, M.; Stockman, B.J.; Degano, M.  
Deposited on : 2023-03-22  
Resolution : 2.80 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 : 4.02b-467  
Mogul : 1.8.4, CSD as541be (2020)  
Xtriage (Phenix) : 1.13  
EDS : 2.35  
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) : 2.35

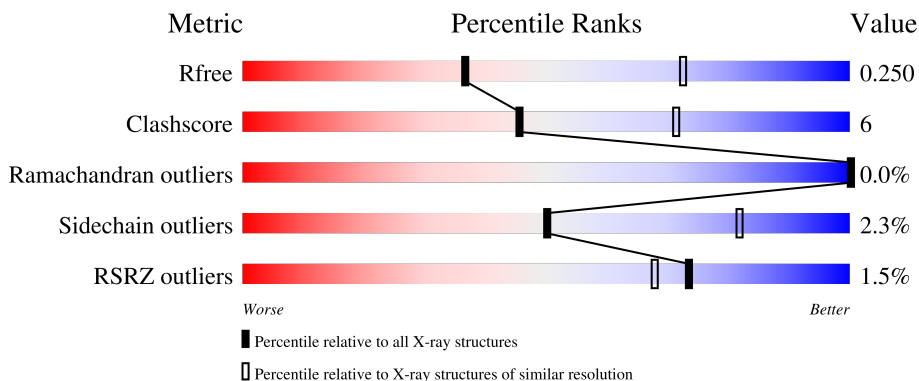
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.80 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.



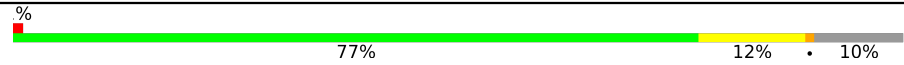

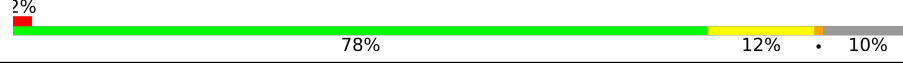
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	130704	3140 (2.80-2.80)
Clashscore	141614	3569 (2.80-2.80)
Ramachandran outliers	138981	3498 (2.80-2.80)
Sidechain outliers	138945	3500 (2.80-2.80)
RSRZ outliers	127900	3078 (2.80-2.80)

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	367	 81% 11% 7%
1	B	367	 79% 11% 9%
1	C	367	 80% 12% 8%
1	D	367	 78% 10% 11%
1	E	367	 78% 13% 7%

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Mol	Chain	Length	Quality of chain
1	F	367	 <p>% 77% 12% • 10%</p>
1	G	367	 <p>2% 81% 11% • 8%</p>
1	H	367	 <p>2% 78% 12% • 10%</p>

## 2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 21659 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 Inosine-uridine preferring nucleoside hydrolase family protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	340	2705	1736	446	506	17	0	1	0
1	B	333	2650	1700	437	496	17	0	1	0
1	C	338	2693	1728	444	504	17	0	1	0
1	D	326	2600	1669	428	486	17	0	1	0
1	E	340	2705	1736	446	506	17	0	1	0
1	F	330	2632	1690	435	490	17	0	1	0
1	G	339	2696	1731	445	503	17	0	1	0
1	H	332	2644	1698	437	492	17	0	1	0

There are 160 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-19	MET	-	initiating methionine	UNP A2FTT0
A	-18	GLY	-	expression tag	UNP A2FTT0
A	-17	SER	-	expression tag	UNP A2FTT0
A	-16	SER	-	expression tag	UNP A2FTT0
A	-15	HIS	-	expression tag	UNP A2FTT0
A	-14	HIS	-	expression tag	UNP A2FTT0
A	-13	HIS	-	expression tag	UNP A2FTT0
A	-12	HIS	-	expression tag	UNP A2FTT0
A	-11	HIS	-	expression tag	UNP A2FTT0
A	-10	HIS	-	expression tag	UNP A2FTT0
A	-9	SER	-	expression tag	UNP A2FTT0
A	-8	SER	-	expression tag	UNP A2FTT0
A	-7	GLY	-	expression tag	UNP A2FTT0

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Chain	Residue	Modelled	Actual	Comment	Reference
A	-6	LEU	-	expression tag	UNP A2FTT0
A	-5	VAL	-	expression tag	UNP A2FTT0
A	-4	PRO	-	expression tag	UNP A2FTT0
A	-3	ARG	-	expression tag	UNP A2FTT0
A	-2	GLY	-	expression tag	UNP A2FTT0
A	-1	SER	-	expression tag	UNP A2FTT0
A	0	HIS	-	expression tag	UNP A2FTT0
B	-19	MET	-	initiating methionine	UNP A2FTT0
B	-18	GLY	-	expression tag	UNP A2FTT0
B	-17	SER	-	expression tag	UNP A2FTT0
B	-16	SER	-	expression tag	UNP A2FTT0
B	-15	HIS	-	expression tag	UNP A2FTT0
B	-14	HIS	-	expression tag	UNP A2FTT0
B	-13	HIS	-	expression tag	UNP A2FTT0
B	-12	HIS	-	expression tag	UNP A2FTT0
B	-11	HIS	-	expression tag	UNP A2FTT0
B	-10	HIS	-	expression tag	UNP A2FTT0
B	-9	SER	-	expression tag	UNP A2FTT0
B	-8	SER	-	expression tag	UNP A2FTT0
B	-7	GLY	-	expression tag	UNP A2FTT0
B	-6	LEU	-	expression tag	UNP A2FTT0
B	-5	VAL	-	expression tag	UNP A2FTT0
B	-4	PRO	-	expression tag	UNP A2FTT0
B	-3	ARG	-	expression tag	UNP A2FTT0
B	-2	GLY	-	expression tag	UNP A2FTT0
B	-1	SER	-	expression tag	UNP A2FTT0
B	0	HIS	-	expression tag	UNP A2FTT0
C	-19	MET	-	initiating methionine	UNP A2FTT0
C	-18	GLY	-	expression tag	UNP A2FTT0
C	-17	SER	-	expression tag	UNP A2FTT0
C	-16	SER	-	expression tag	UNP A2FTT0
C	-15	HIS	-	expression tag	UNP A2FTT0
C	-14	HIS	-	expression tag	UNP A2FTT0
C	-13	HIS	-	expression tag	UNP A2FTT0
C	-12	HIS	-	expression tag	UNP A2FTT0
C	-11	HIS	-	expression tag	UNP A2FTT0
C	-10	HIS	-	expression tag	UNP A2FTT0
C	-9	SER	-	expression tag	UNP A2FTT0
C	-8	SER	-	expression tag	UNP A2FTT0
C	-7	GLY	-	expression tag	UNP A2FTT0
C	-6	LEU	-	expression tag	UNP A2FTT0
C	-5	VAL	-	expression tag	UNP A2FTT0

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Chain	Residue	Modelled	Actual	Comment	Reference
C	-4	PRO	-	expression tag	UNP A2FTT0
C	-3	ARG	-	expression tag	UNP A2FTT0
C	-2	GLY	-	expression tag	UNP A2FTT0
C	-1	SER	-	expression tag	UNP A2FTT0
C	0	HIS	-	expression tag	UNP A2FTT0
D	-19	MET	-	initiating methionine	UNP A2FTT0
D	-18	GLY	-	expression tag	UNP A2FTT0
D	-17	SER	-	expression tag	UNP A2FTT0
D	-16	SER	-	expression tag	UNP A2FTT0
D	-15	HIS	-	expression tag	UNP A2FTT0
D	-14	HIS	-	expression tag	UNP A2FTT0
D	-13	HIS	-	expression tag	UNP A2FTT0
D	-12	HIS	-	expression tag	UNP A2FTT0
D	-11	HIS	-	expression tag	UNP A2FTT0
D	-10	HIS	-	expression tag	UNP A2FTT0
D	-9	SER	-	expression tag	UNP A2FTT0
D	-8	SER	-	expression tag	UNP A2FTT0
D	-7	GLY	-	expression tag	UNP A2FTT0
D	-6	LEU	-	expression tag	UNP A2FTT0
D	-5	VAL	-	expression tag	UNP A2FTT0
D	-4	PRO	-	expression tag	UNP A2FTT0
D	-3	ARG	-	expression tag	UNP A2FTT0
D	-2	GLY	-	expression tag	UNP A2FTT0
D	-1	SER	-	expression tag	UNP A2FTT0
D	0	HIS	-	expression tag	UNP A2FTT0
E	-19	MET	-	initiating methionine	UNP A2FTT0
E	-18	GLY	-	expression tag	UNP A2FTT0
E	-17	SER	-	expression tag	UNP A2FTT0
E	-16	SER	-	expression tag	UNP A2FTT0
E	-15	HIS	-	expression tag	UNP A2FTT0
E	-14	HIS	-	expression tag	UNP A2FTT0
E	-13	HIS	-	expression tag	UNP A2FTT0
E	-12	HIS	-	expression tag	UNP A2FTT0
E	-11	HIS	-	expression tag	UNP A2FTT0
E	-10	HIS	-	expression tag	UNP A2FTT0
E	-9	SER	-	expression tag	UNP A2FTT0
E	-8	SER	-	expression tag	UNP A2FTT0
E	-7	GLY	-	expression tag	UNP A2FTT0
E	-6	LEU	-	expression tag	UNP A2FTT0
E	-5	VAL	-	expression tag	UNP A2FTT0
E	-4	PRO	-	expression tag	UNP A2FTT0
E	-3	ARG	-	expression tag	UNP A2FTT0

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Chain	Residue	Modelled	Actual	Comment	Reference
E	-2	GLY	-	expression tag	UNP A2FTT0
E	-1	SER	-	expression tag	UNP A2FTT0
E	0	HIS	-	expression tag	UNP A2FTT0
F	-19	MET	-	initiating methionine	UNP A2FTT0
F	-18	GLY	-	expression tag	UNP A2FTT0
F	-17	SER	-	expression tag	UNP A2FTT0
F	-16	SER	-	expression tag	UNP A2FTT0
F	-15	HIS	-	expression tag	UNP A2FTT0
F	-14	HIS	-	expression tag	UNP A2FTT0
F	-13	HIS	-	expression tag	UNP A2FTT0
F	-12	HIS	-	expression tag	UNP A2FTT0
F	-11	HIS	-	expression tag	UNP A2FTT0
F	-10	HIS	-	expression tag	UNP A2FTT0
F	-9	SER	-	expression tag	UNP A2FTT0
F	-8	SER	-	expression tag	UNP A2FTT0
F	-7	GLY	-	expression tag	UNP A2FTT0
F	-6	LEU	-	expression tag	UNP A2FTT0
F	-5	VAL	-	expression tag	UNP A2FTT0
F	-4	PRO	-	expression tag	UNP A2FTT0
F	-3	ARG	-	expression tag	UNP A2FTT0
F	-2	GLY	-	expression tag	UNP A2FTT0
F	-1	SER	-	expression tag	UNP A2FTT0
F	0	HIS	-	expression tag	UNP A2FTT0
G	-19	MET	-	initiating methionine	UNP A2FTT0
G	-18	GLY	-	expression tag	UNP A2FTT0
G	-17	SER	-	expression tag	UNP A2FTT0
G	-16	SER	-	expression tag	UNP A2FTT0
G	-15	HIS	-	expression tag	UNP A2FTT0
G	-14	HIS	-	expression tag	UNP A2FTT0
G	-13	HIS	-	expression tag	UNP A2FTT0
G	-12	HIS	-	expression tag	UNP A2FTT0
G	-11	HIS	-	expression tag	UNP A2FTT0
G	-10	HIS	-	expression tag	UNP A2FTT0
G	-9	SER	-	expression tag	UNP A2FTT0
G	-8	SER	-	expression tag	UNP A2FTT0
G	-7	GLY	-	expression tag	UNP A2FTT0
G	-6	LEU	-	expression tag	UNP A2FTT0
G	-5	VAL	-	expression tag	UNP A2FTT0
G	-4	PRO	-	expression tag	UNP A2FTT0
G	-3	ARG	-	expression tag	UNP A2FTT0
G	-2	GLY	-	expression tag	UNP A2FTT0
G	-1	SER	-	expression tag	UNP A2FTT0

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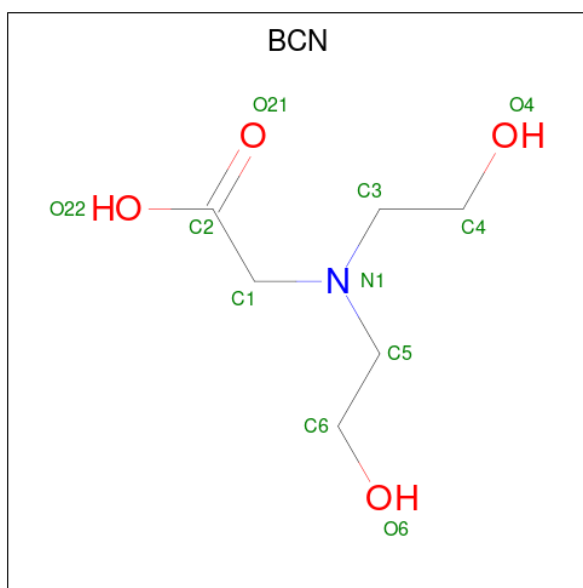
Chain	Residue	Modelled	Actual	Comment	Reference
G	0	HIS	-	expression tag	UNP A2FTT0
H	-19	MET	-	initiating methionine	UNP A2FTT0
H	-18	GLY	-	expression tag	UNP A2FTT0
H	-17	SER	-	expression tag	UNP A2FTT0
H	-16	SER	-	expression tag	UNP A2FTT0
H	-15	HIS	-	expression tag	UNP A2FTT0
H	-14	HIS	-	expression tag	UNP A2FTT0
H	-13	HIS	-	expression tag	UNP A2FTT0
H	-12	HIS	-	expression tag	UNP A2FTT0
H	-11	HIS	-	expression tag	UNP A2FTT0
H	-10	HIS	-	expression tag	UNP A2FTT0
H	-9	SER	-	expression tag	UNP A2FTT0
H	-8	SER	-	expression tag	UNP A2FTT0
H	-7	GLY	-	expression tag	UNP A2FTT0
H	-6	LEU	-	expression tag	UNP A2FTT0
H	-5	VAL	-	expression tag	UNP A2FTT0
H	-4	PRO	-	expression tag	UNP A2FTT0
H	-3	ARG	-	expression tag	UNP A2FTT0
H	-2	GLY	-	expression tag	UNP A2FTT0
H	-1	SER	-	expression tag	UNP A2FTT0
H	0	HIS	-	expression tag	UNP A2FTT0

- 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	1	Total Ca 1 1	0	0
2	B	1	Total Ca 1 1	0	0
2	C	1	Total Ca 1 1	0	0
2	D	1	Total Ca 1 1	0	0
2	E	1	Total Ca 1 1	0	0
2	F	1	Total Ca 1 1	0	0
2	G	1	Total Ca 1 1	0	0
2	H	1	Total Ca 1 1	0	0



- Molecule 3 is BICINE (three-letter code: BCN) (formula:  $C_6H_{13}NO_4$ ).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	1	Total	C	N	O	0	0
			11	6	1	4		
3	B	1	Total	C	N	O	0	0
			11	6	1	4		
3	C	1	Total	C	N	O	0	0
			11	6	1	4		
3	D	1	Total	C	N	O	0	0
			11	6	1	4		
3	E	1	Total	C	N	O	0	0
			11	6	1	4		
3	F	1	Total	C	N	O	0	0
			11	6	1	4		
3	G	1	Total	C	N	O	0	0
			11	6	1	4		
3	H	1	Total	C	N	O	0	0
			11	6	1	4		

- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	41	Total	O	0	0
			41	41		
4	B	29	Total	O	0	0
			29	29		
4	C	25	Total	O	0	0
			25	25		

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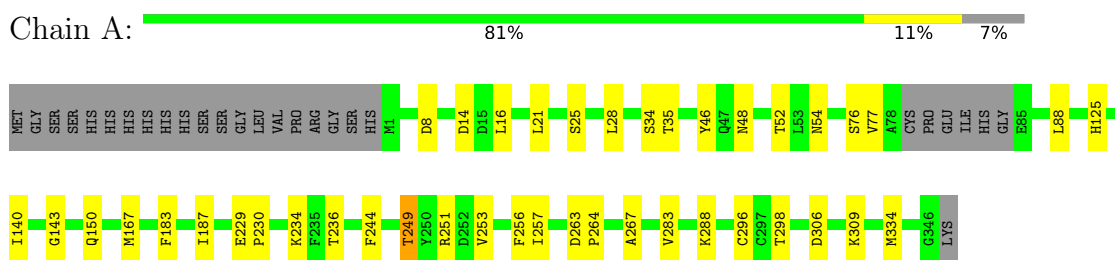
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<b>Mol</b>	<b>Chain</b>	<b>Residues</b>	<b>Atoms</b>	<b>ZeroOcc</b>	<b>AltConf</b>
4	D	25	Total O 25 25	0	0
4	E	32	Total O 32 32	0	0
4	F	36	Total O 36 36	0	0
4	G	24	Total O 24 24	0	0
4	H	26	Total O 26 26	0	0

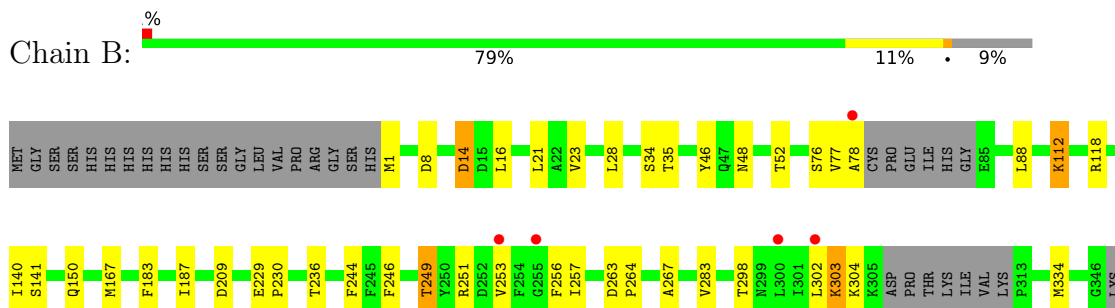
### 3 Residue-property plots [i](#)

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

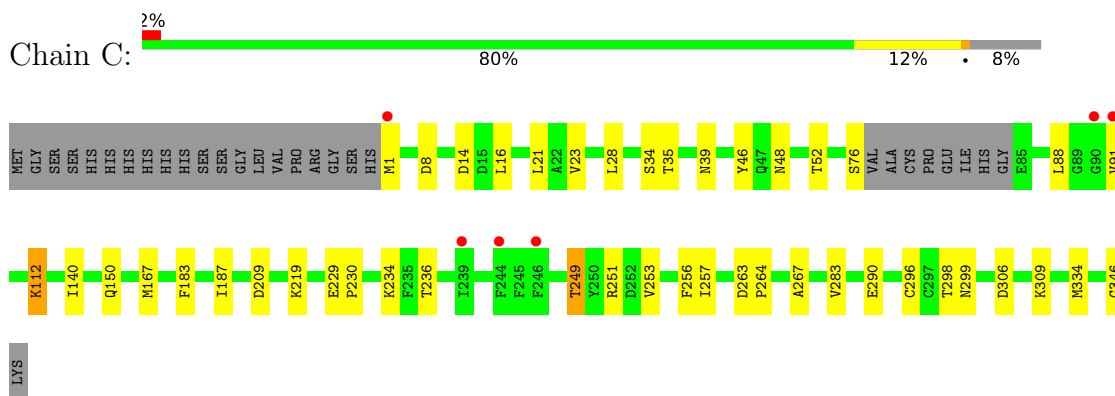
- Molecule 1: Inosine-uridine preferring nucleoside hydrolase family protein



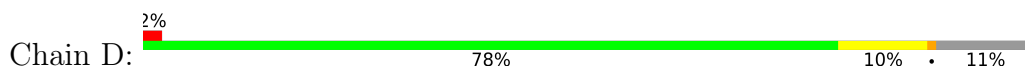
- Molecule 1: Inosine-uridine preferring nucleoside hydrolase family protein

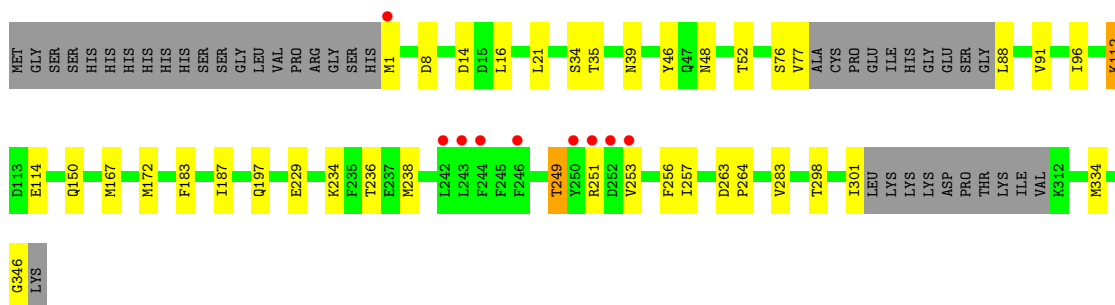


- Molecule 1: Inosine-uridine preferring nucleoside hydrolase family protein



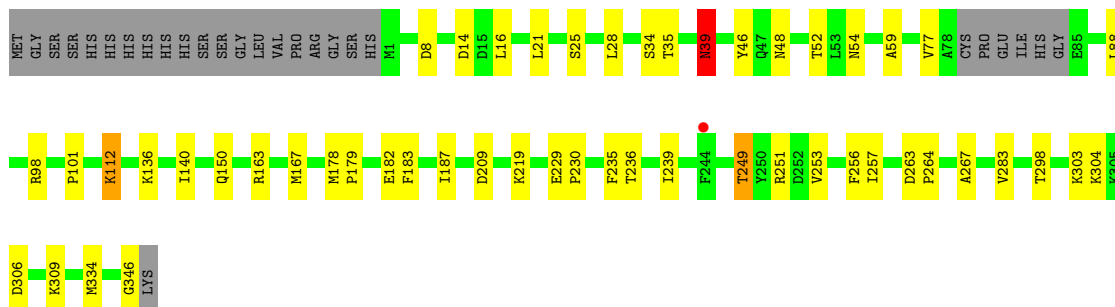
- Molecule 1: Inosine-uridine preferring nucleoside hydrolase family protein





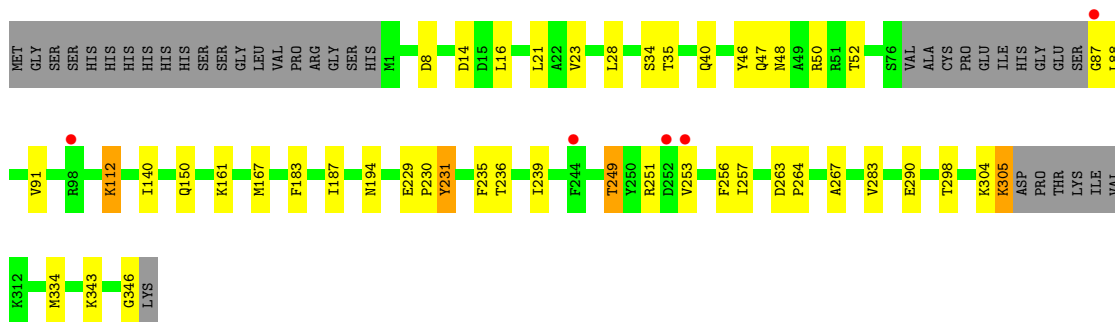
- Molecule 1: Inosine-uridine preferring nucleoside hydrolase family protein

Chain E: 78% 13% • 7%



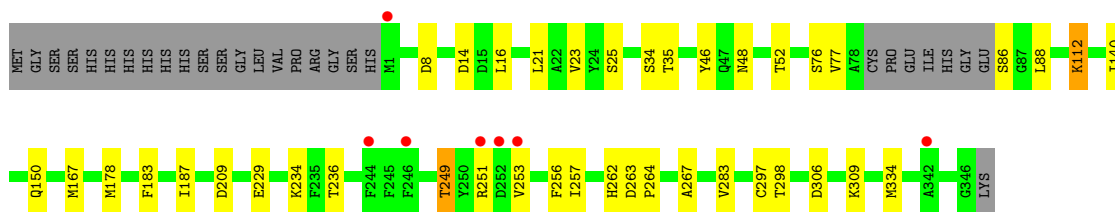
- Molecule 1: Inosine-uridine preferring nucleoside hydrolase family protein

Chain F: 77% 12% • 10%

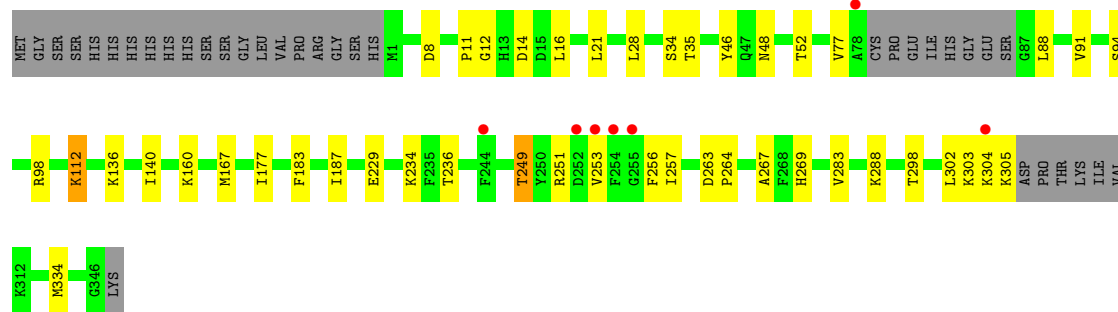
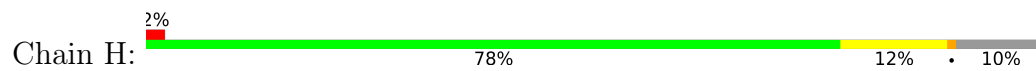


- Molecule 1: Inosine-uridine preferring nucleoside hydrolase family protein

Chain G: 81% 11% • 8%



- Molecule 1: Inosine-uridine preferring nucleoside hydrolase family protein



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	73.06Å 94.67Å 120.59Å 105.08° 89.96° 93.83°	Depositor
Resolution (Å)	116.42 – 2.80 116.42 – 2.51	Depositor EDS
% Data completeness (in resolution range)	98.6 (116.42-2.80) 98.4 (116.42-2.51)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	0.15	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.24 (at 2.52Å)	Xtrriage
Refinement program	REFMAC 5.8.0405	Depositor
R, $R_{free}$	0.209 , 0.251 0.212 , 0.250	Depositor DCC
$R_{free}$ test set	5261 reflections (5.02%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	50.7	Xtrriage
Anisotropy	0.129	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.38 , 60.0	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.51$ , $\langle L^2 \rangle = 0.34$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.94	EDS
Total number of atoms	21659	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	65.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 13.07% 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: BCN, CA

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	0.37	0/2772	0.62	0/3761
1	B	0.37	0/2715	0.62	0/3681
1	C	0.35	0/2760	0.60	0/3744
1	D	0.34	0/2665	0.60	0/3617
1	E	0.36	0/2772	0.63	1/3761 (0.0%)
1	F	0.35	0/2697	0.61	1/3656 (0.0%)
1	G	0.36	0/2763	0.60	0/3749
1	H	0.35	0/2709	0.60	0/3673
All	All	0.36	0/21853	0.61	2/29642 (0.0%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	B	0	1
1	E	0	1
1	G	0	1
1	H	0	1
All	All	0	4

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	E	39	ASN	CB-CA-C	7.37	125.14	110.40
1	F	231	TYR	CB-CG-CD1	-5.03	117.98	121.00

There are no chirality outliers.

All (4) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	B	118	ARG	Sidechain
1	E	98	ARG	Sidechain
1	G	86	SER	Peptide
1	H	304	LYS	Peptide

## 5.2 Too-close contacts

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	2705	0	2692	31	0
1	B	2650	0	2628	32	0
1	C	2693	0	2678	29	0
1	D	2600	0	2571	34	0
1	E	2705	0	2692	38	0
1	F	2632	0	2615	35	0
1	G	2696	0	2686	28	0
1	H	2644	0	2629	35	0
2	A	1	0	0	0	0
2	B	1	0	0	0	0
2	C	1	0	0	0	0
2	D	1	0	0	0	0
2	E	1	0	0	0	0
2	F	1	0	0	0	0
2	G	1	0	0	0	0
2	H	1	0	0	0	0
3	A	11	0	11	2	0
3	B	11	0	11	3	0
3	C	11	0	11	4	0
3	D	11	0	11	1	0
3	E	11	0	11	5	0
3	F	11	0	11	2	0
3	G	11	0	11	2	0
3	H	11	0	11	3	0
4	A	41	0	0	8	0
4	B	29	0	0	5	0
4	C	25	0	0	7	0
4	D	25	0	0	7	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	E	32	0	0	12	0
4	F	36	0	0	10	0
4	G	24	0	0	5	0
4	H	26	0	0	11	0
All	All	21659	0	21279	274	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 6.

The worst 5 of 274 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:D:346:GLY:C	4:D:511:HOH:O	1.99	0.99
1:F:47:GLN:HG3	4:F:535:HOH:O	1.63	0.98
1:A:25:SER:O	4:A:501:HOH:O	1.82	0.97
1:E:178:MET:CE	4:E:509:HOH:O	2.11	0.96
1:H:98:ARG:HD2	4:H:519:HOH:O	1.72	0.89

There are no symmetry-related clashes.

## 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	337/367 (92%)	318 (94%)	19 (6%)	0	100	100
1	B	328/367 (89%)	310 (94%)	17 (5%)	1 (0%)	41	72
1	C	335/367 (91%)	318 (95%)	17 (5%)	0	100	100
1	D	321/367 (88%)	305 (95%)	16 (5%)	0	100	100
1	E	337/367 (92%)	320 (95%)	17 (5%)	0	100	100
1	F	325/367 (89%)	309 (95%)	16 (5%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	G	336/367 (92%)	316 (94%)	20 (6%)	0	100	100
1	H	327/367 (89%)	310 (95%)	17 (5%)	0	100	100
All	All	2646/2936 (90%)	2506 (95%)	139 (5%)	1 (0%)	100	100

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	303	LYS

### 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	298/320 (93%)	293 (98%)	5 (2%)	60	87
1	B	291/320 (91%)	283 (97%)	8 (3%)	44	78
1	C	297/320 (93%)	288 (97%)	9 (3%)	41	75
1	D	286/320 (89%)	281 (98%)	5 (2%)	60	87
1	E	298/320 (93%)	290 (97%)	8 (3%)	44	78
1	F	289/320 (90%)	283 (98%)	6 (2%)	53	84
1	G	297/320 (93%)	291 (98%)	6 (2%)	55	84
1	H	290/320 (91%)	284 (98%)	6 (2%)	53	84
All	All	2346/2560 (92%)	2293 (98%)	53 (2%)	50	82

5 of 53 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	E	39	ASN
1	F	14	ASP
1	H	112	LYS
1	E	112	LYS
1	E	219	LYS

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

Mol	Chain	Res	Type
1	E	39	ASN

### 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 monosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

Of 16 ligands modelled in this entry, 8 are monoatomic - leaving 8 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	BCN	E	401	2	10,10,10	0.74	0	11,11,11	0.57	0
3	BCN	A	401	2	10,10,10	0.78	0	11,11,11	0.79	0
3	BCN	F	401	2	10,10,10	0.97	0	11,11,11	0.99	1 (9%)
3	BCN	H	401	2	10,10,10	0.72	0	11,11,11	0.78	0
3	BCN	C	401	2	10,10,10	0.83	0	11,11,11	0.58	0
3	BCN	D	401	2	10,10,10	0.90	0	11,11,11	0.89	0
3	BCN	B	401	2	10,10,10	0.94	0	11,11,11	1.22	1 (9%)
3	BCN	G	401	2	10,10,10	0.71	0	11,11,11	1.01	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	BCN	E	401	2	-	5/10/10/10	-
3	BCN	A	401	2	-	5/10/10/10	-
3	BCN	F	401	2	-	4/10/10/10	-
3	BCN	H	401	2	-	6/10/10/10	-
3	BCN	C	401	2	-	6/10/10/10	-
3	BCN	D	401	2	-	6/10/10/10	-
3	BCN	B	401	2	-	4/10/10/10	-
3	BCN	G	401	2	-	8/10/10/10	-

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	401	BCN	C2-C1-N1	2.64	122.26	113.63
3	F	401	BCN	C2-C1-N1	2.21	120.85	113.63

There are no chirality outliers.

5 of 44 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	C	401	BCN	N1-C1-C2-O22
3	C	401	BCN	N1-C5-C6-O6
3	D	401	BCN	N1-C3-C4-O4
3	E	401	BCN	C2-C1-N1-C5
3	G	401	BCN	C2-C1-N1-C5

There are no ring outliers.

8 monomers are involved in 22 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	E	401	BCN	5	0
3	A	401	BCN	2	0
3	F	401	BCN	2	0
3	H	401	BCN	3	0
3	C	401	BCN	4	0
3	D	401	BCN	1	0
3	B	401	BCN	3	0

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Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	G	401	BCN	2	0

## 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 [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	340/367 (92%)	-0.14	0 <b>100</b> <b>100</b>	36, 53, 82, 104	0
1	B	333/367 (90%)	-0.06	5 (1%) 73 68	41, 55, 93, 139	0
1	C	338/367 (92%)	0.08	6 (1%) 68 61	37, 69, 110, 142	0
1	D	326/367 (88%)	0.11	9 (2%) 53 43	45, 72, 116, 170	0
1	E	340/367 (92%)	-0.10	1 (0%) 94 93	36, 57, 88, 112	0
1	F	330/367 (89%)	0.03	5 (1%) 73 68	43, 60, 96, 136	0
1	G	339/367 (92%)	-0.03	7 (2%) 63 54	36, 62, 91, 122	0
1	H	332/367 (90%)	0.02	7 (2%) 63 54	44, 62, 103, 132	0
All	All	2678/2936 (91%)	-0.01	40 (1%) 73 68	36, 61, 99, 170	0

The worst 5 of 40 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	252	ASP	6.8
1	F	253	VAL	5.8
1	D	244	PHE	5.2
1	D	253	VAL	4.6
1	B	302	LEU	4.4

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

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

### 6.3 Carbohydrates [i](#)

There are no monosaccharides in this entry.

## 6.4 Ligands

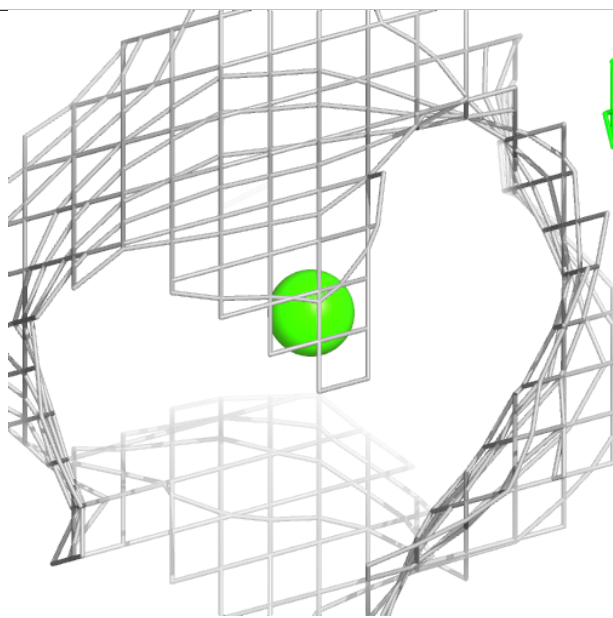
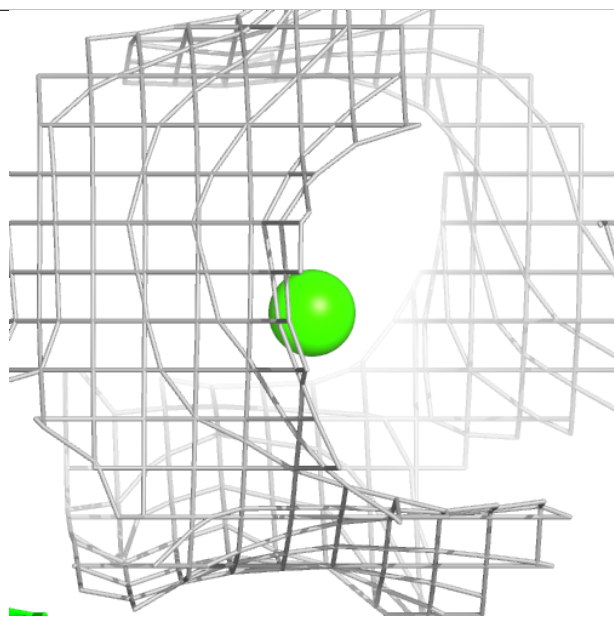
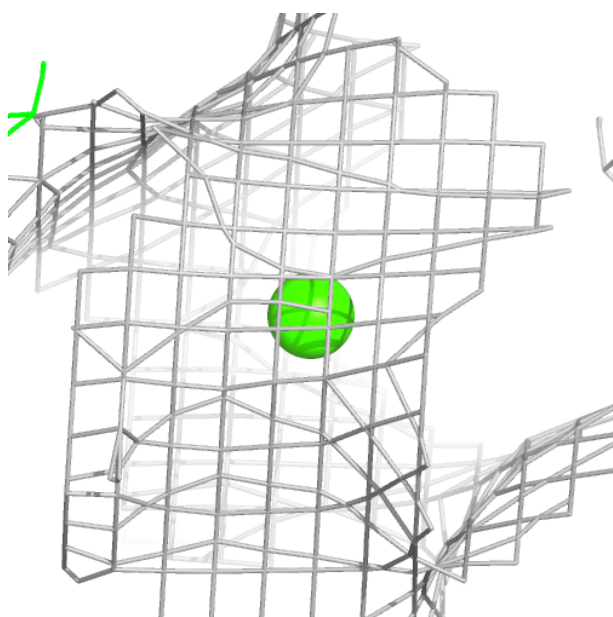
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled 'Q<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
3	BCN	D	401	11/11	0.81	0.18	66,81,90,92	0
3	BCN	A	401	11/11	0.82	0.18	56,62,68,68	0
3	BCN	H	401	11/11	0.83	0.17	67,85,90,90	0
3	BCN	G	401	11/11	0.85	0.19	64,68,74,77	0
3	BCN	C	401	11/11	0.86	0.18	71,85,103,104	0
3	BCN	B	401	11/11	0.86	0.18	60,71,81,81	0
3	BCN	E	401	11/11	0.89	0.21	62,81,85,87	0
3	BCN	F	401	11/11	0.91	0.17	61,67,78,82	0
2	CA	D	400	1/1	0.97	0.17	62,62,62,62	0
2	CA	G	400	1/1	0.98	0.12	49,49,49,49	0
2	CA	B	400	1/1	0.98	0.17	56,56,56,56	0
2	CA	E	400	1/1	0.98	0.13	55,55,55,55	0
2	CA	C	400	1/1	0.99	0.14	68,68,68,68	0
2	CA	F	400	1/1	0.99	0.16	55,55,55,55	0
2	CA	A	400	1/1	0.99	0.11	55,55,55,55	0
2	CA	H	400	1/1	0.99	0.15	58,58,58,58	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 D 400:**

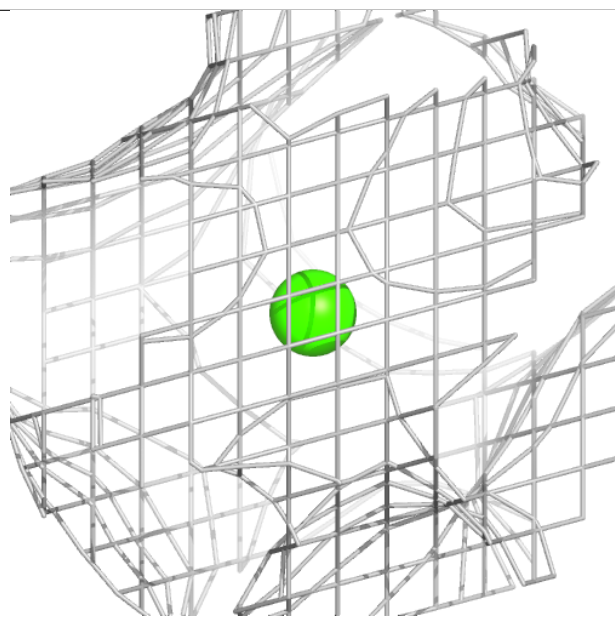
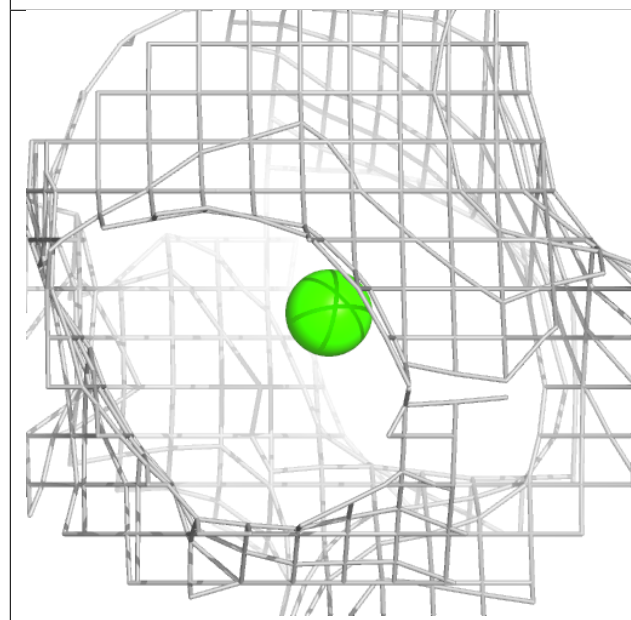
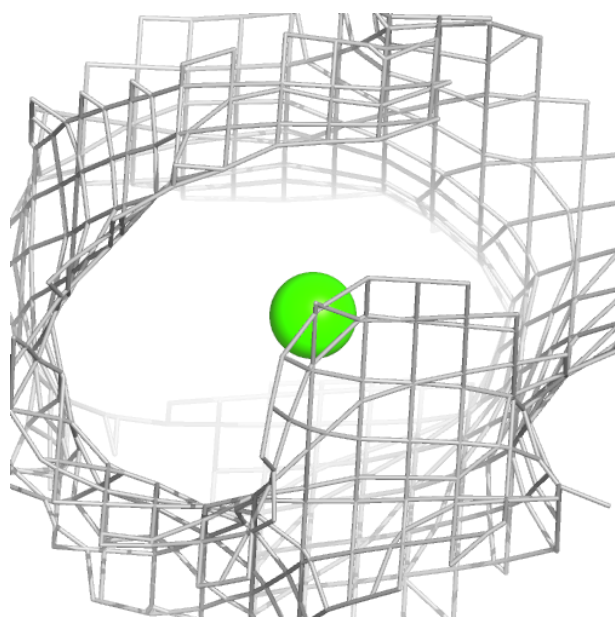
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)





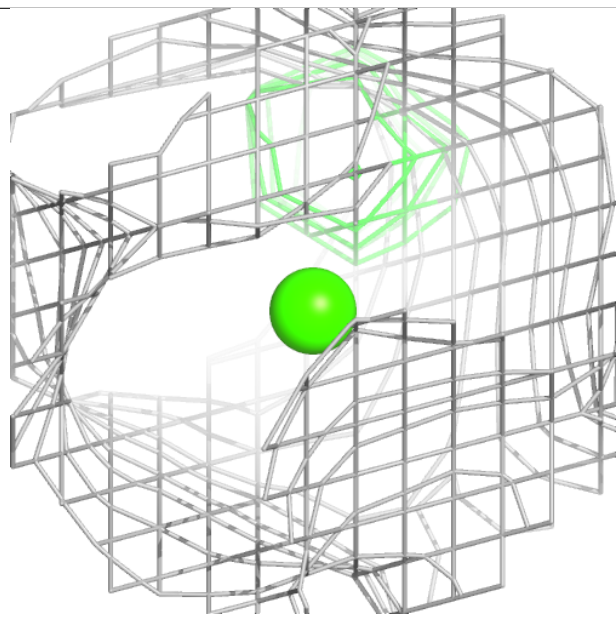
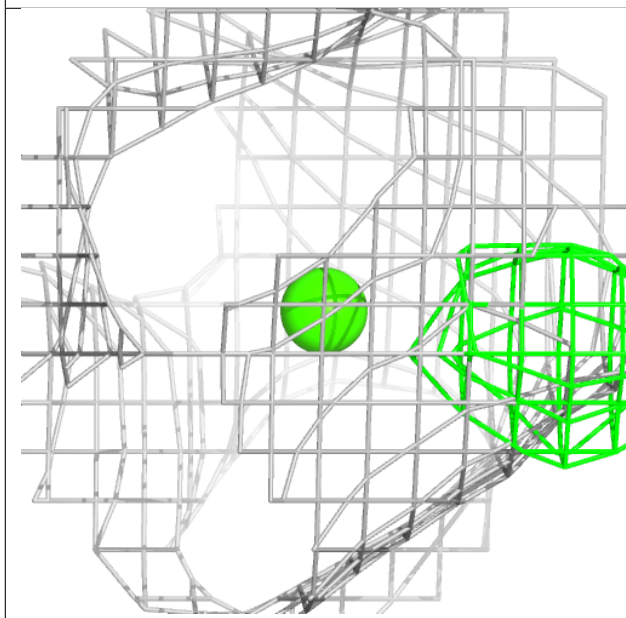
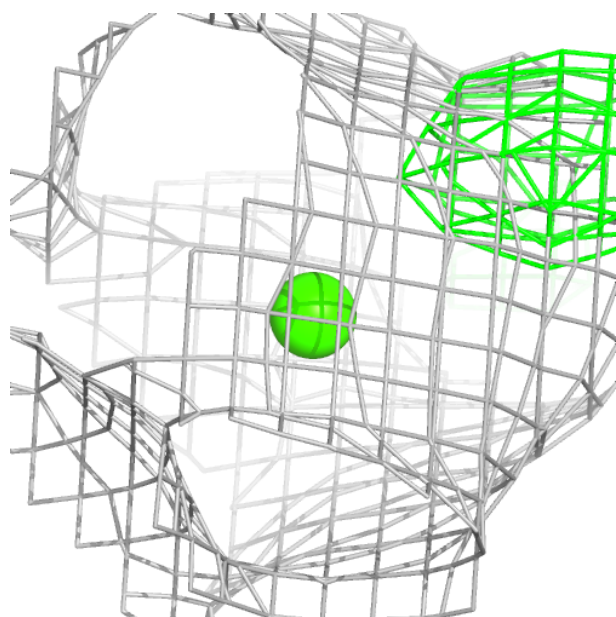
**Electron density around CA G 400:**

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



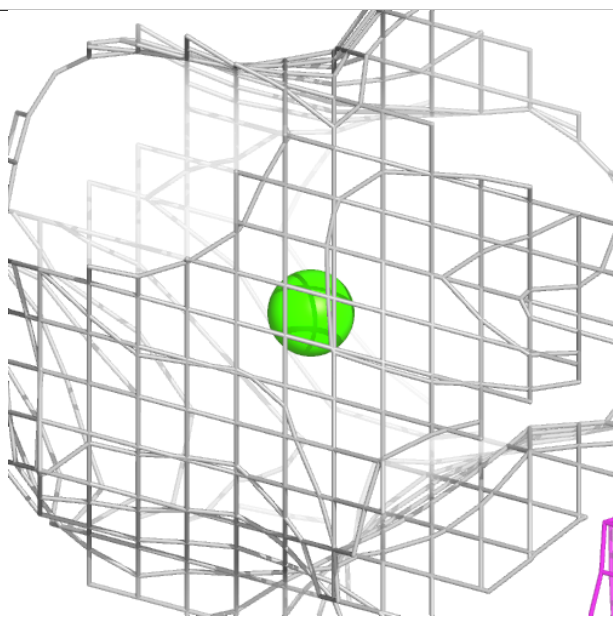
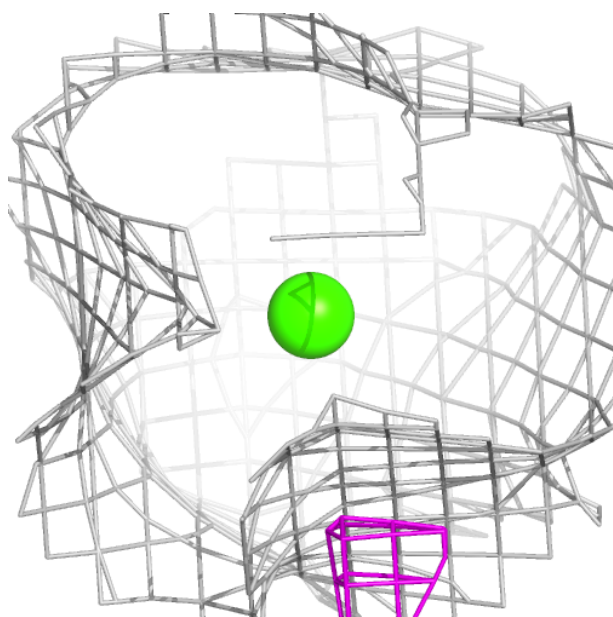
**Electron density around CA B 400:**

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



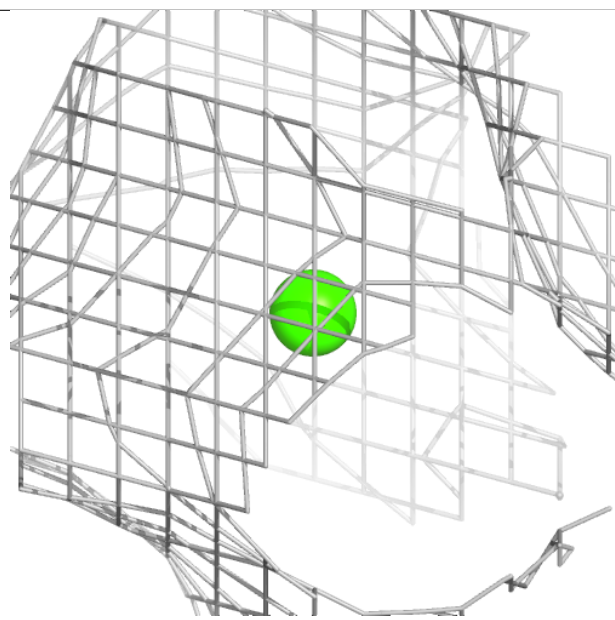
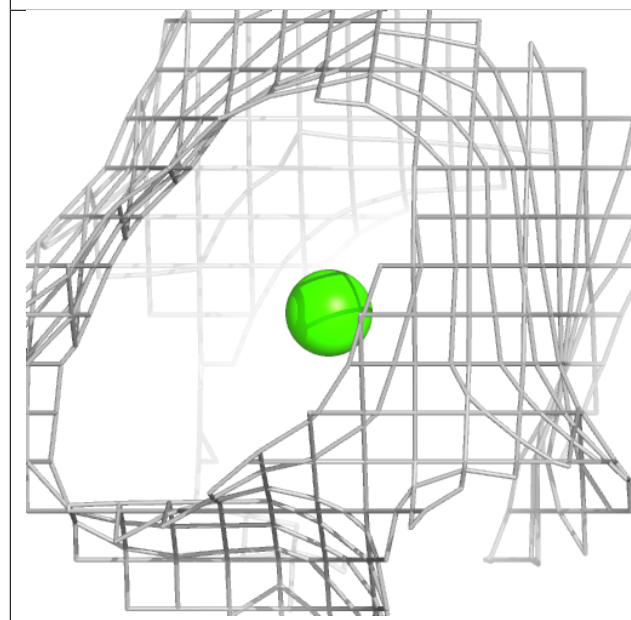
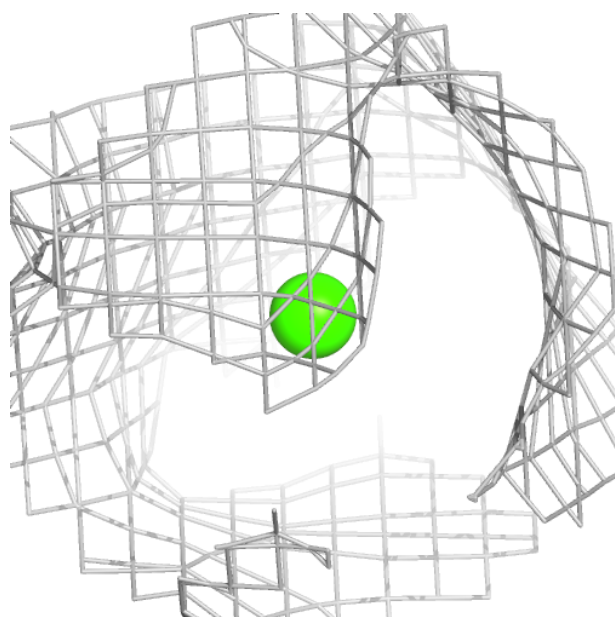
**Electron density around CA E 400:**

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



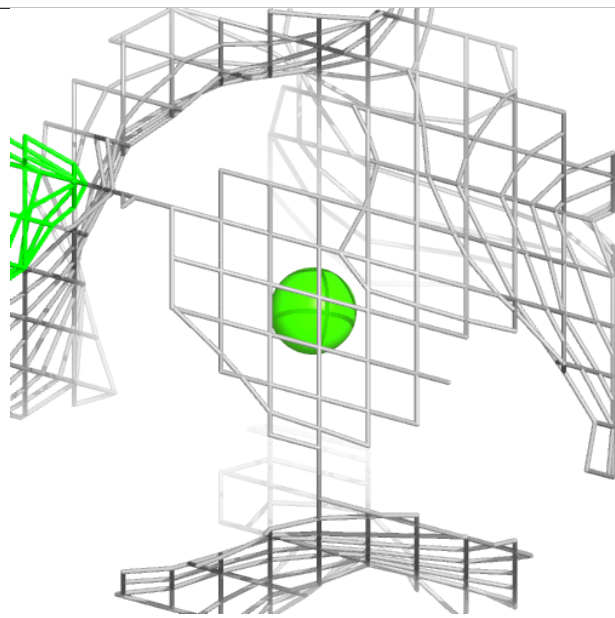
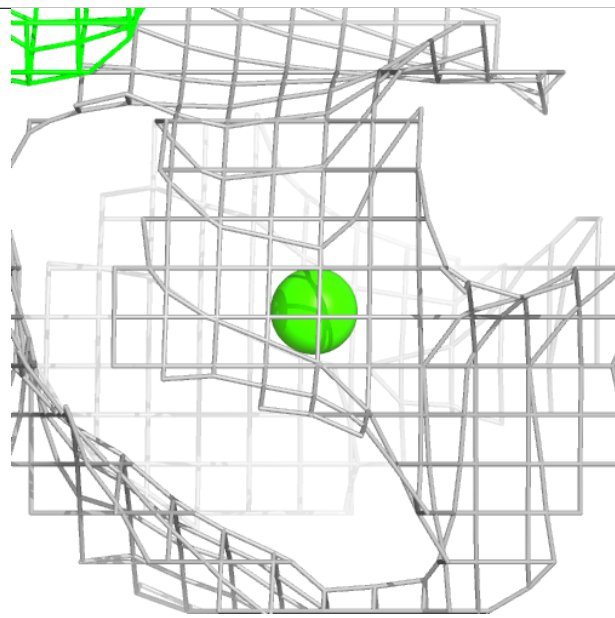
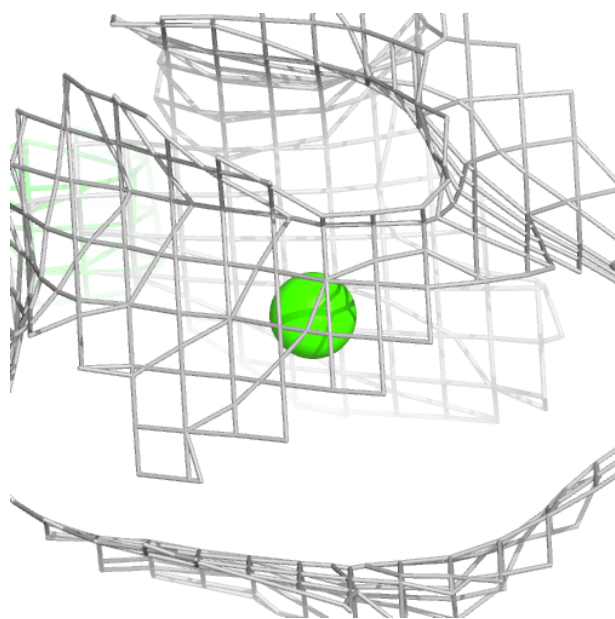
**Electron density around CA C 400:**

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



**Electron density around CA F 400:**

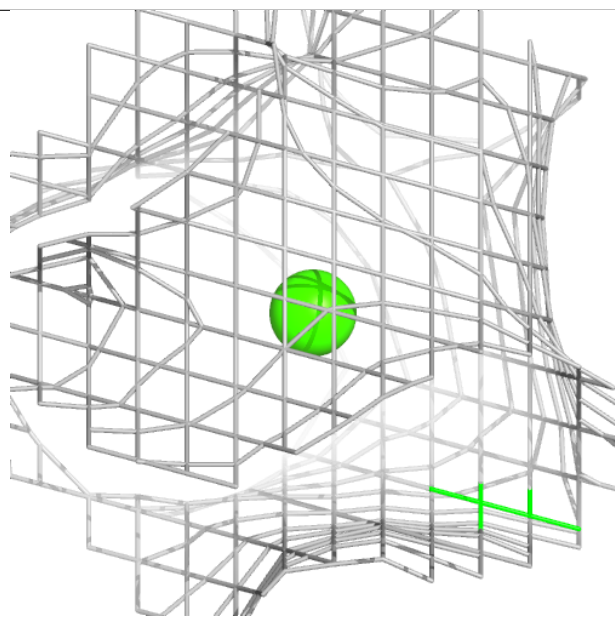
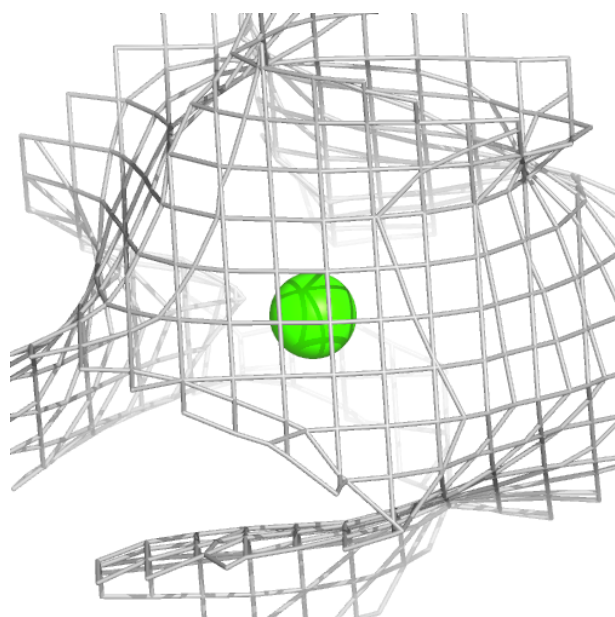
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)

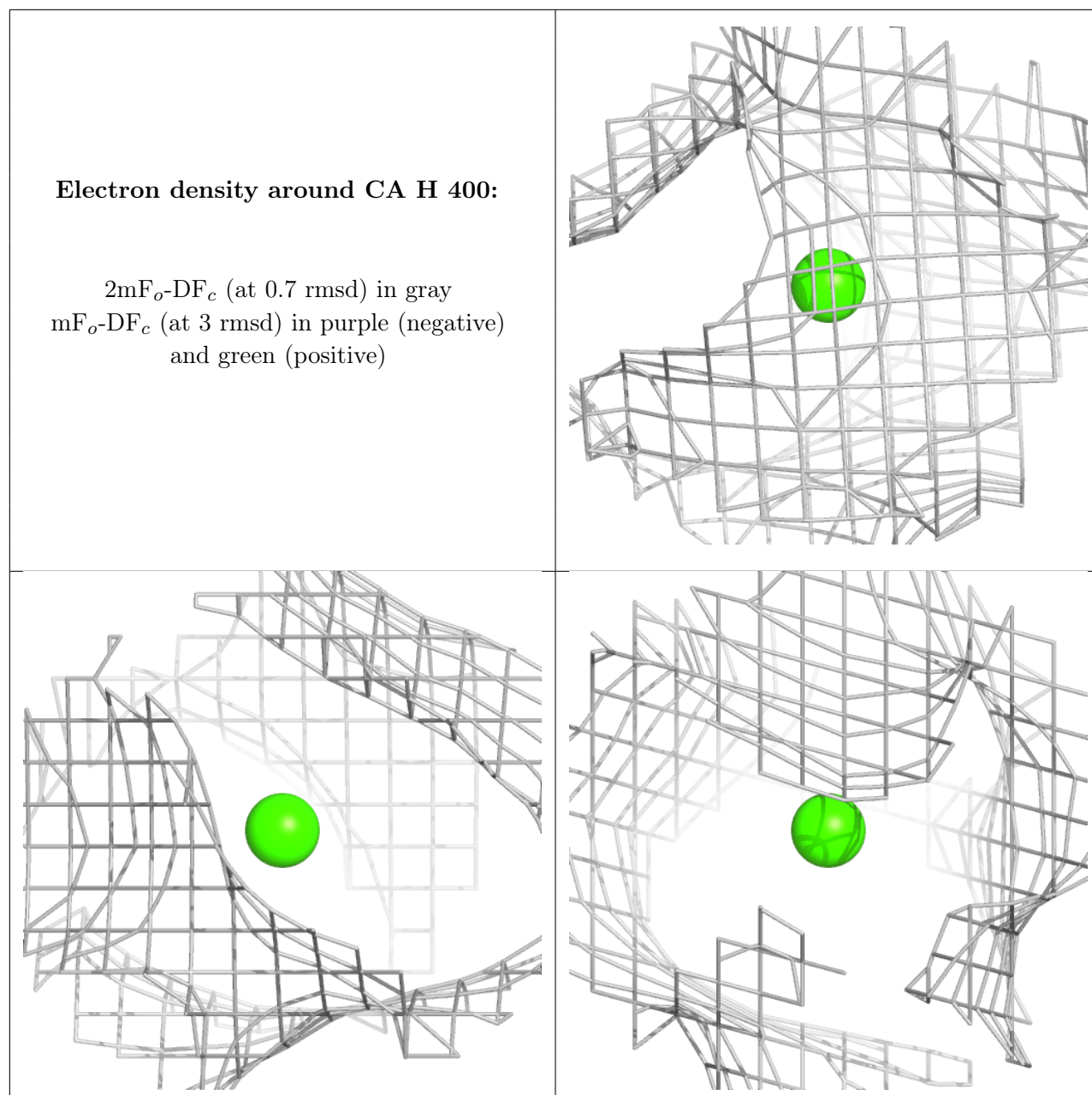




**Electron density around CA A 400:**

$2mF_o-DF_c$  (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.