Full wwPDB X-ray Structure Validation Report ⓘ

Oct 20, 2025 – 07:05 pm BST

PDB ID	:	9R0E / pdb_00009r0e
Title	:	Structure of the human heterotetrameric cis-prenyltransferase complex harboring NgBR-S249T in complex with magnesium, FsPP and IPP
Authors	:	Giladi, M.; Haitin, Y.
Deposited on	:	2025-04-24
Resolution	:	2.82 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 ⓘ 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 ⓘ) were used in the production of this report:

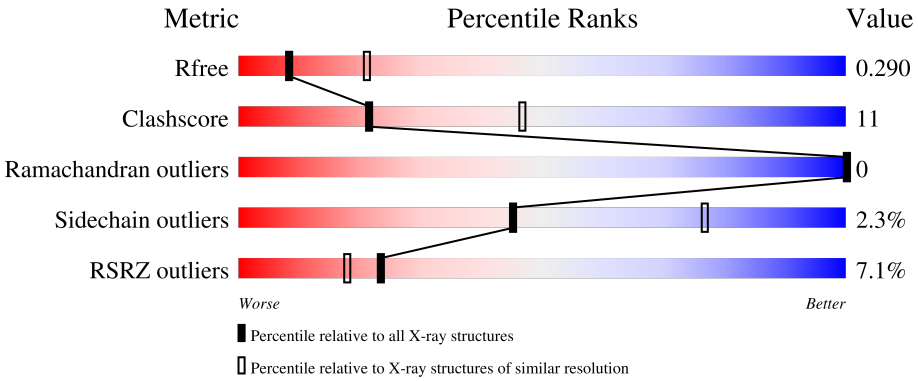
MolProbity	:	4-5-2 with Phenix2.0
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.46

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 2.82 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}	164625	4293 (2.84-2.80)
Clashscore	180529	4801 (2.84-2.80)
Ramachandran outliers	177936	4739 (2.84-2.80)
Sidechain outliers	177891	4741 (2.84-2.80)
RSRZ outliers	164620	4295 (2.84-2.80)

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 >=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	340	5% 77% 19% .
2	B	213	9% 68% 22% . 10%

2 Entry composition (i)

There are 5 unique types of molecules in this entry. The entry contains 3893 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 Dehydrodolichyl diphosphate synthase complex subunit DHDDS.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	328	Total	C	N	O	S	0	0	0
			2475	1568	444	447	16			

There are 7 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-6	GLY	-	expression tag	UNP Q86SQ9
A	-5	SER	-	expression tag	UNP Q86SQ9
A	-4	GLY	-	expression tag	UNP Q86SQ9
A	-3	SER	-	expression tag	UNP Q86SQ9
A	-2	GLY	-	expression tag	UNP Q86SQ9
A	-1	SER	-	expression tag	UNP Q86SQ9
A	0	GLY	-	expression tag	UNP Q86SQ9

- Molecule 2 is a protein called Dehydrodolichyl diphosphate synthase complex subunit NUS1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	192	Total	C	N	O	S	0	0	0
			1379	876	236	259	8			

There are 11 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	72	GLY	-	expression tag	UNP Q96E22
B	?	-	TYR	deletion	UNP Q96E22
B	?	-	SER	deletion	UNP Q96E22
B	?	-	PRO	deletion	UNP Q96E22
B	?	-	GLU	deletion	UNP Q96E22
B	?	-	PHE	deletion	UNP Q96E22
B	?	-	ALA	deletion	UNP Q96E22
B	?	-	ASN	deletion	UNP Q96E22
B	?	-	SER	deletion	UNP Q96E22

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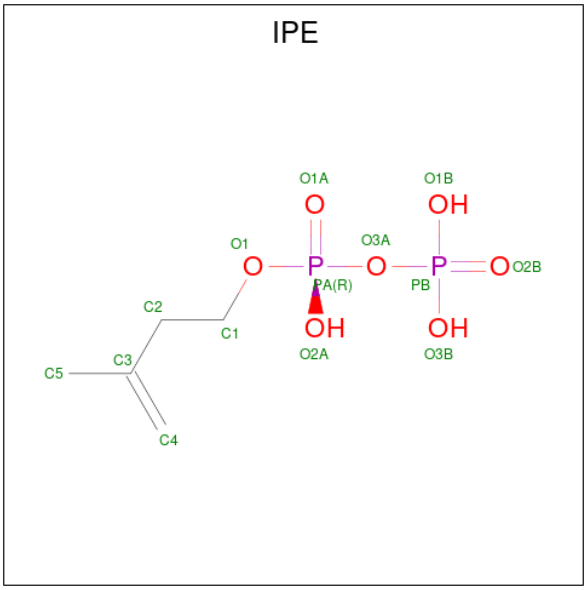
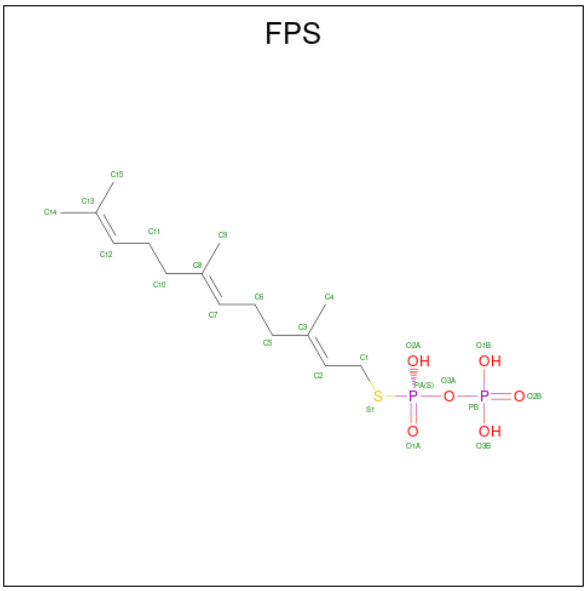
Chain	Residue	Modelled	Actual	Comment	Reference
B	?	-	ASN	deletion	UNP Q96E22
B	249	THR	SER	engineered mutation	UNP Q96E22

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



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

- Molecule 4 is S-[(2E,6E)-3,7,11-TRIMETHYLDODECA-2,6,10-TRIENYL] TRIHYDROGEN THIODIPHOSPHATE (CCD ID: FPS) (formula: $C_{15}H_{28}O_6P_2S$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
4	A	1	Total	C	O	P	S	0	0
			24	15	6	2	1		

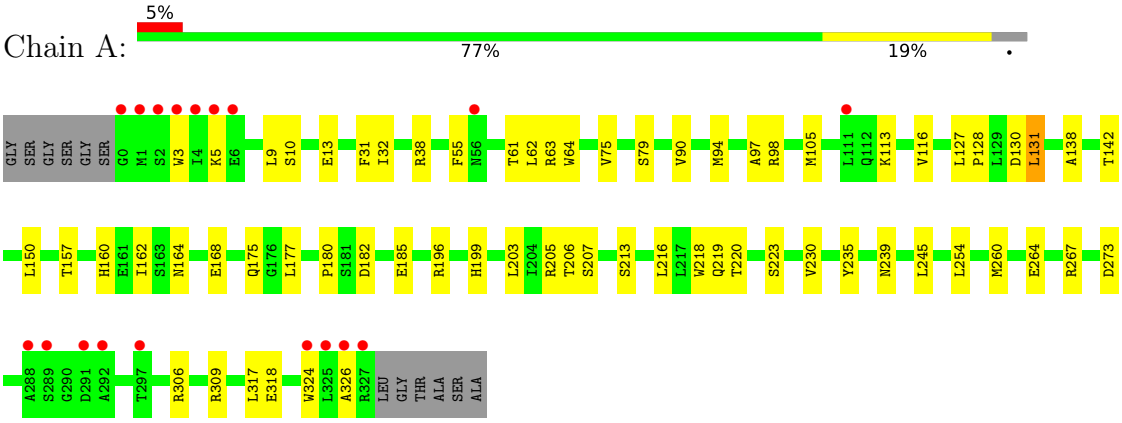
- Molecule 5 is MAGNESIUM ION (CCD ID: MG) (formula: Mg) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	1	Total	Mg	0	0
			1	1		

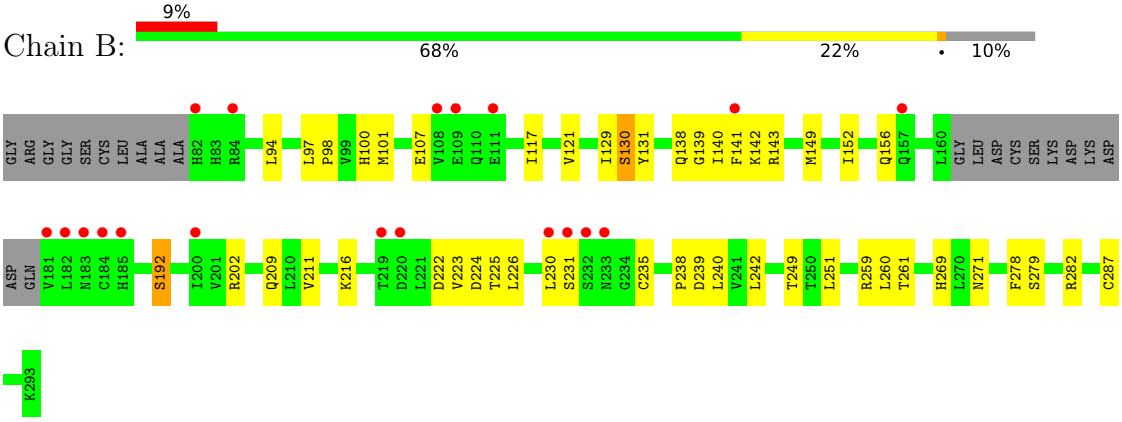
3 Residue-property plots (i)

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: Dehydrodolichyl diphosphate synthase complex subunit DHDDS



• Molecule 2: Dehydrodolichyl diphosphate synthase complex subunit NUS1



4 Data and refinement statistics (i)

Property	Value	Source
Space group	H 3 2	Depositor
Cell constants a, b, c, α, β, γ	184.66Å 184.66Å 112.73Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	46.16 – 2.82 46.16 – 2.82	Depositor EDS
% Data completeness (in resolution range)	98.0 (46.16-2.82) 98.0 (46.16-2.82)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	0.92 (at 2.81Å)	Xtriage
Refinement program	PHENIX 1.21.1_5286	Depositor
R, R_{free}	0.240 , 0.290 0.240 , 0.290	Depositor DCC
R_{free} test set	887 reflections (5.06%)	wwPDB-VP
Wilson B-factor (Å^2)	89.7	Xtriage
Anisotropy	0.318	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.32 , 81.5	EDS
L-test for twinning[2]	$< \|L\| > = 0.50$, $< L^2 > = 0.33$	Xtriage
Estimated twinning fraction	0.006 for -2/3*h-1/3*k-4/3*l,-1/3*h-2/3*k+4/3*l,-1/3*h+1/3*k+1/3*l 0.008 for -h,1/3*h-1/3*k-4/3*l,-1/3*h-2/3*k+1/3*l 0.000 for -1/3*h+1/3*k+4/3*l,-k,2/3*h+1/3*k+1/3*l	Xtriage
F_o,F_c correlation	0.93	EDS
Total number of atoms	3893	wwPDB-VP
Average B, all atoms (Å^2)	90.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.08% of the height of the origin peak. No significant pseudotranslation is detected.*

[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: FPS, IPE, MG

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	0.23	0/2527	0.38	0/3430
2	B	0.23	0/1407	0.38	0/1922
All	All	0.23	0/3934	0.38	0/5352

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	2475	0	2264	49	1
2	B	1379	0	1222	33	1
3	A	14	0	9	1	0
4	A	24	0	25	2	0
5	A	1	0	0	0	0
All	All	3893	0	3520	79	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 11.

All (79) 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)
2:B:202:ARG:NH2	2:B:231:SER:HB2	2.09	0.68
1:A:90:VAL:O	1:A:94:MET:HG2	1.95	0.67
2:B:107:GLU:OE1	2:B:269:HIS:ND1	2.25	0.66
2:B:138:GLN:HB2	2:B:140:ILE:HG13	1.78	0.66
1:A:38:ARG:NH2	4:A:402:FPS:O3B	2.31	0.64
2:B:222:ASP:HB3	2:B:225:THR:OG1	2.00	0.62
1:A:162:ILE:HD11	1:A:218:TRP:HB2	1.82	0.61
2:B:222:ASP:OD1	2:B:223:VAL:N	2.36	0.59
1:A:157:THR:OG1	1:A:160:HIS:ND1	2.35	0.58
1:A:260:MET:HE1	2:B:138:GLN:OE1	2.04	0.58
1:A:94:MET:HE2	1:A:128:PRO:HD2	1.87	0.57
1:A:273:ASP:CG	1:A:306:ARG:HH12	2.12	0.56
2:B:202:ARG:HH22	2:B:231:SER:HB2	1.68	0.56
1:A:62:LEU:HD21	1:A:150:LEU:HD13	1.88	0.56
2:B:98:PRO:HG2	2:B:129:ILE:HD12	1.88	0.56
2:B:101:MET:HB2	2:B:129:ILE:HG21	1.89	0.54
2:B:101:MET:CE	2:B:242:LEU:HD22	2.37	0.54
1:A:55:PHE:HB2	4:A:402:FPS:H91	1.90	0.53
1:A:97:ALA:HB3	1:A:131:LEU:HD11	1.88	0.53
2:B:238:PRO:O	2:B:261:THR:OG1	2.26	0.53
2:B:202:ARG:C	2:B:202:ARG:HD2	2.34	0.52
1:A:175:GLN:HB2	1:A:177:LEU:HD23	1.91	0.52
2:B:101:MET:HE1	2:B:242:LEU:HD22	1.91	0.52
1:A:105:MET:HE2	1:A:105:MET:HA	1.92	0.51
1:A:206:THR:O	1:A:207:SER:HB3	2.12	0.50
1:A:94:MET:HE1	1:A:127:LEU:HD22	1.93	0.50
2:B:117:ILE:HG13	2:B:141:PHE:CZ	2.47	0.50
2:B:117:ILE:O	2:B:121:VAL:HG23	2.12	0.49
2:B:130:SER:HB2	2:B:131:TYR:CD2	2.47	0.49
1:A:9:LEU:HD22	1:A:13:GLU:HB3	1.95	0.49
1:A:324:TRP:HA	1:A:324:TRP:CE3	2.48	0.48
1:A:164:ASN:O	1:A:168:GLU:HG2	2.12	0.48
1:A:182:ASP:OD2	1:A:309:ARG:NH2	2.31	0.48
1:A:113:LYS:HE2	1:A:113:LYS:HB2	1.49	0.48
1:A:264:GLU:OE2	1:A:267:ARG:NH1	2.47	0.48
1:A:5:LYS:O	1:A:63:ARG:NE	2.46	0.48
1:A:61:THR:HA	1:A:64:TRP:CE3	2.49	0.47
1:A:79:SER:HB2	3:A:401:IPE:H22	1.97	0.47
2:B:149:MET:HA	2:B:152:ILE:HD12	1.97	0.47
2:B:239:ASP:OD1	2:B:239:ASP:N	2.45	0.47
1:A:31:PHE:HB2	1:A:75:VAL:HG12	1.96	0.47
1:A:185:GLU:HG3	1:A:218:TRP:CZ2	2.50	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:94:LEU:HD11	2:B:278:PHE:CE1	2.51	0.46
2:B:249:THR:HG23	2:B:251:LEU:HG	1.96	0.46
1:A:138:ALA:O	1:A:142:THR:HG23	2.16	0.46
1:A:306:ARG:HA	1:A:309:ARG:NH2	2.31	0.46
2:B:152:ILE:O	2:B:156:GLN:HB2	2.16	0.46
1:A:98:ARG:HD3	1:A:130:ASP:OD2	2.15	0.45
1:A:32:ILE:HB	1:A:205:ARG:HG3	1.98	0.45
1:A:94:MET:HE2	1:A:128:PRO:CD	2.45	0.45
2:B:100:HIS:HB3	2:B:238:PRO:HA	1.98	0.45
2:B:259:ARG:HG3	2:B:260:LEU:N	2.32	0.45
1:A:168:GLU:HB3	1:A:317:LEU:HD11	1.99	0.45
1:A:94:MET:HE1	1:A:127:LEU:CD2	2.47	0.44
1:A:130:ASP:OD1	1:A:130:ASP:N	2.48	0.44
1:A:63:ARG:HA	1:A:63:ARG:HD3	1.85	0.44
2:B:98:PRO:HG3	2:B:240:LEU:HD23	1.99	0.44
2:B:211:VAL:HA	2:B:216:LYS:O	2.17	0.44
2:B:97:LEU:HD22	2:B:129:ILE:HD11	2.00	0.44
2:B:139:GLY:O	2:B:143:ARG:HD3	2.18	0.44
1:A:196:ARG:HH12	1:A:318:GLU:CD	2.27	0.43
1:A:235:TYR:CE1	1:A:239:ASN:HB3	2.52	0.43
2:B:117:ILE:HG13	2:B:141:PHE:HZ	1.82	0.43
1:A:98:ARG:NH1	1:A:130:ASP:OD2	2.52	0.43
1:A:324:TRP:C	1:A:326:ALA:H	2.27	0.42
1:A:213:SER:HA	2:B:260:LEU:HD12	2.02	0.42
1:A:216:LEU:HB3	1:A:219:GLN:HB2	2.01	0.42
2:B:226:LEU:O	2:B:230:LEU:N	2.53	0.42
2:B:142:LYS:HD2	2:B:192:SER:HB3	2.02	0.42
1:A:199:HIS:ND1	1:A:219:GLN:HA	2.35	0.42
2:B:279:SER:HA	2:B:282:ARG:HG3	2.01	0.42
1:A:254:LEU:HD23	1:A:254:LEU:HA	1.84	0.42
1:A:245:LEU:HD23	1:A:245:LEU:HA	1.70	0.41
1:A:116:VAL:O	1:A:142:THR:HB	2.19	0.41
1:A:94:MET:HE3	1:A:131:LEU:HD13	2.03	0.41
1:A:206:THR:HB	1:A:230:VAL:O	2.21	0.41
1:A:220:THR:HA	1:A:223:SER:OG	2.19	0.41
1:A:180:PRO:HG2	2:B:209:GLN:NE2	2.36	0.41
1:A:203:LEU:HG	1:A:220:THR:HG21	2.04	0.40

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)
1:A:113:LYS:NZ	2:B:271:ASN:O[2_665]	2.19	0.01

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	326/340 (96%)	309 (95%)	17 (5%)	0	100	100
2	B	188/213 (88%)	177 (94%)	11 (6%)	0	100	100
All	All	514/553 (93%)	486 (95%)	28 (5%)	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	229/295 (78%)	226 (99%)	3 (1%)	65	88
2	B	126/185 (68%)	121 (96%)	5 (4%)	27	58
All	All	355/480 (74%)	347 (98%)	8 (2%)	45	77

All (8) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	3	TRP
1	A	10	SER
1	A	131	LEU

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Mol	Chain	Res	Type
2	B	130	SER
2	B	192	SER
2	B	224	ASP
2	B	235	CYS
2	B	287	CYS

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	255	GLN
2	B	205	GLN
2	B	209	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 3 ligands modelled in this entry, 1 is 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	IPE	A	401	5	11,13,13	1.07	0	15,19,19	1.47	2 (13%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
4	FPS	A	402	5	19,23,23	0.86	0	23,31,31	1.34	4 (17%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	IPE	A	401	5	-	2/13/13/13	-
4	FPS	A	402	5	-	5/19/25/25	-

There are no bond length outliers.

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	A	401	IPE	PA-O3A-PB	-4.45	117.57	132.83
4	A	402	FPS	C4-C3-C5	2.63	119.70	115.27
4	A	402	FPS	C6-C7-C8	-2.51	121.62	127.66
4	A	402	FPS	C11-C12-C13	-2.20	120.24	127.75
4	A	402	FPS	C15-C13-C14	2.15	119.35	114.60
3	A	401	IPE	C5-C3-C2	2.03	121.59	115.24

There are no chirality outliers.

All (7) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	401	IPE	C1-C2-C3-C4
3	A	401	IPE	C1-C2-C3-C5
4	A	402	FPS	C3-C5-C6-C7
4	A	402	FPS	C2-C3-C5-C6
4	A	402	FPS	C4-C3-C5-C6
4	A	402	FPS	C8-C10-C11-C12
4	A	402	FPS	PB-O3A-PA-O2A

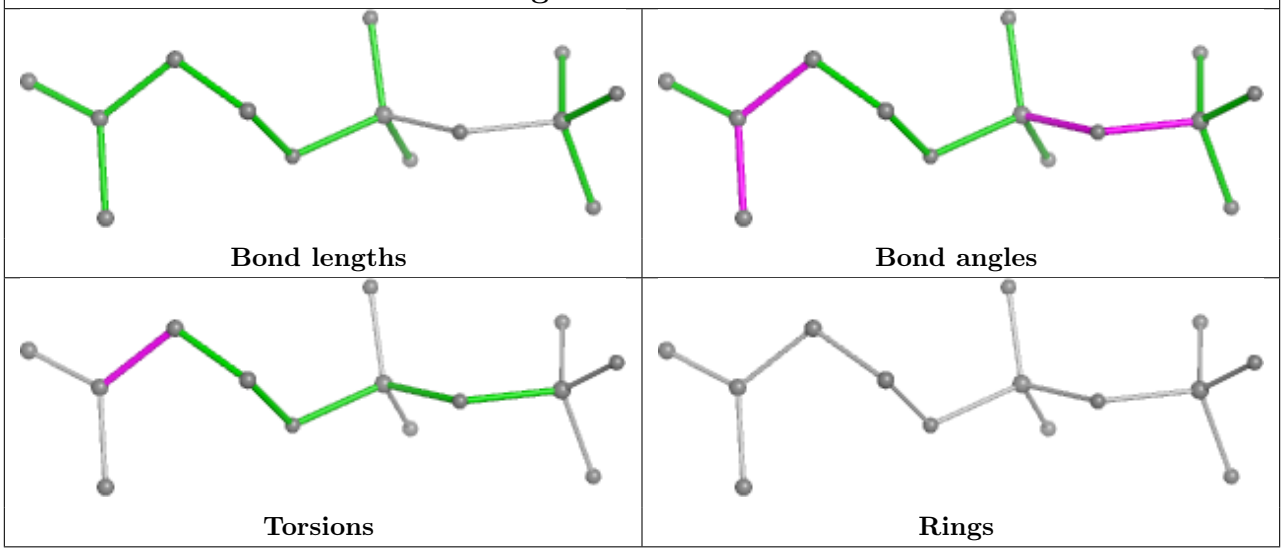
There are no ring outliers.

2 monomers are involved in 3 short contacts:

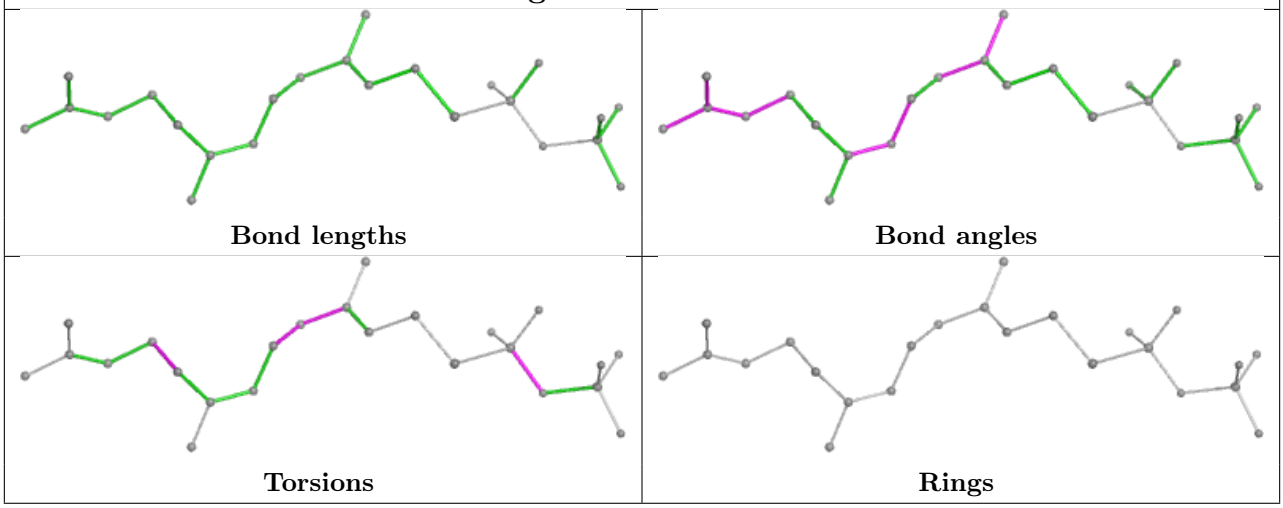
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	401	IPE	1	0
4	A	402	FPS	2	0

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 IPE A 401



Ligand FPS A 402



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, 95^{th} 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	328/340 (96%)	0.37	18 (5%)	32	25	60, 88, 122, 148	0
2	B	192/213 (90%)	0.66	19 (9%)	14	11	71, 92, 120, 135	0
All	All	520/553 (94%)	0.48	37 (7%)	23	18	60, 90, 122, 148	0

All (37) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	3	TRP	5.7
1	A	4	ILE	5.2
1	A	292	ALA	4.3
1	A	2	SER	4.1
2	B	181	VAL	3.9
1	A	0	GLY	3.8
1	A	6	GLU	3.6
1	A	326	ALA	3.1
1	A	291	ASP	3.0
1	A	289	SER	3.0
2	B	219	THR	2.8
2	B	182	LEU	2.8
2	B	230	LEU	2.8
1	A	5	LYS	2.7
2	B	111	GLU	2.7
2	B	200	ILE	2.6
1	A	327	ARG	2.6
1	A	324	TRP	2.6
2	B	185	HIS	2.5
2	B	231	SER	2.5
2	B	232	SER	2.5
2	B	184	CYS	2.5
1	A	297	THR	2.4
2	B	220	ASP	2.3

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Mol	Chain	Res	Type	RSRZ
1	A	325	LEU	2.3
2	B	109	GLU	2.2
2	B	108	VAL	2.2
2	B	82	HIS	2.2
2	B	157	GLN	2.1
1	A	288	ALA	2.1
1	A	56	ASN	2.1
2	B	183	ASN	2.1
1	A	111	LEU	2.1
1	A	1	MET	2.1
2	B	233	ASN	2.1
2	B	84	ARG	2.0
2	B	141	PHE	2.0

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)

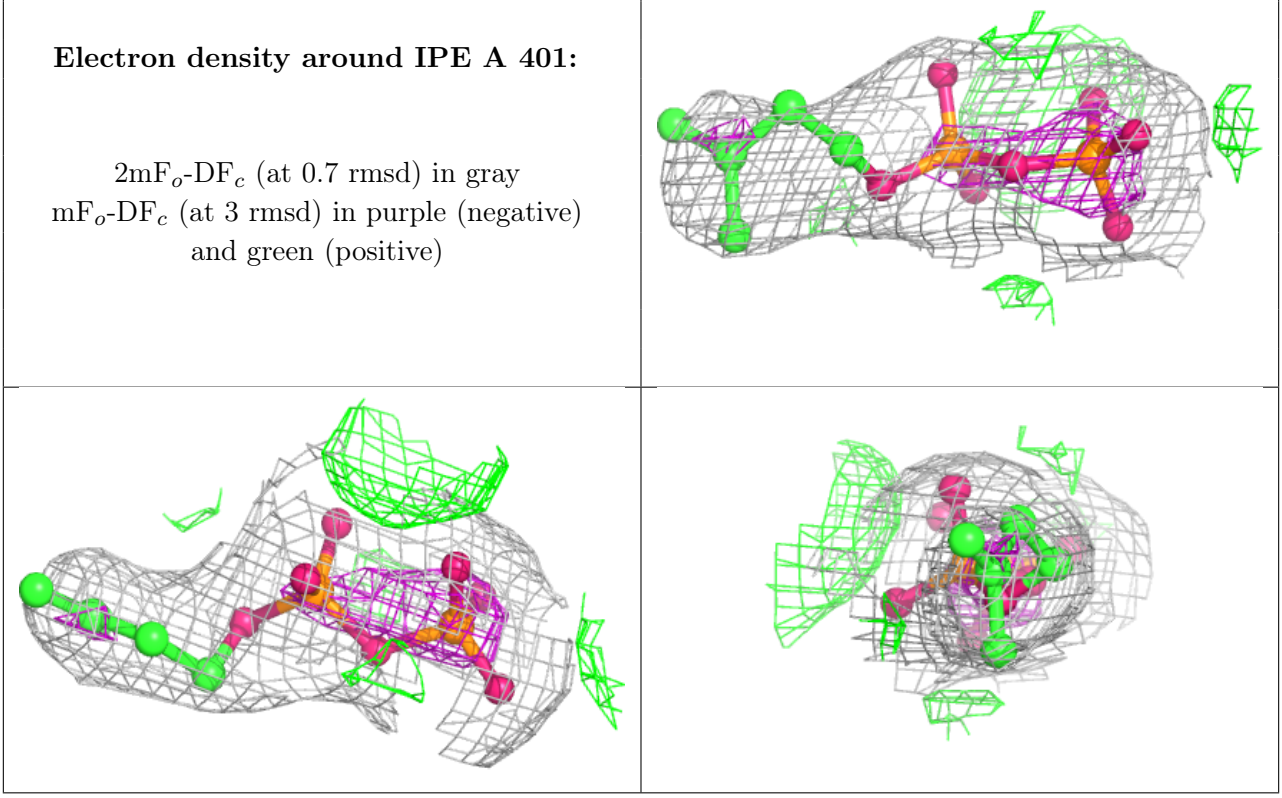
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' 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	IPE	A	401	14/14	0.95	0.10	38,44,46,48	0
4	FPS	A	402	24/24	0.95	0.10	42,48,51,63	0
5	MG	A	403	1/1	0.95	0.10	42,42,42,42	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.

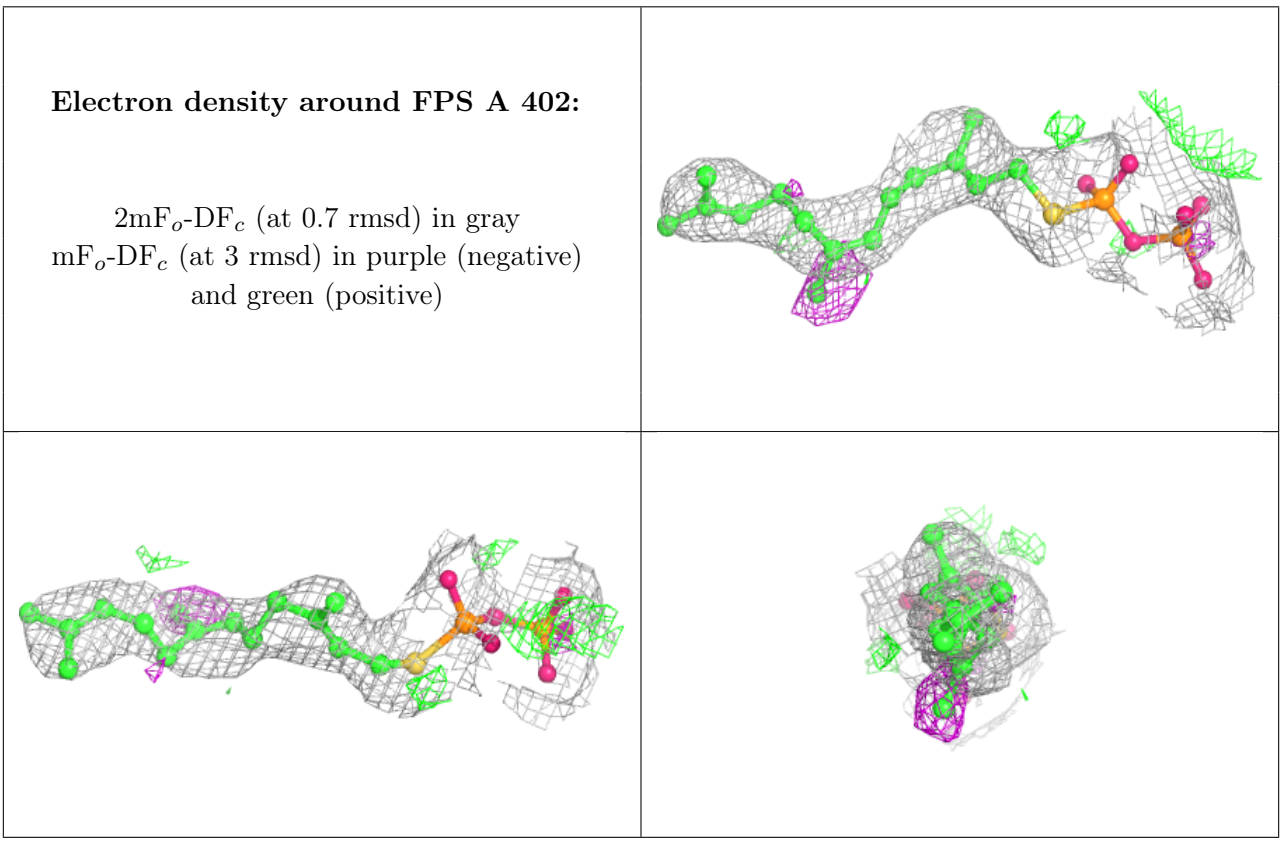
Electron density around IPE A 401:

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



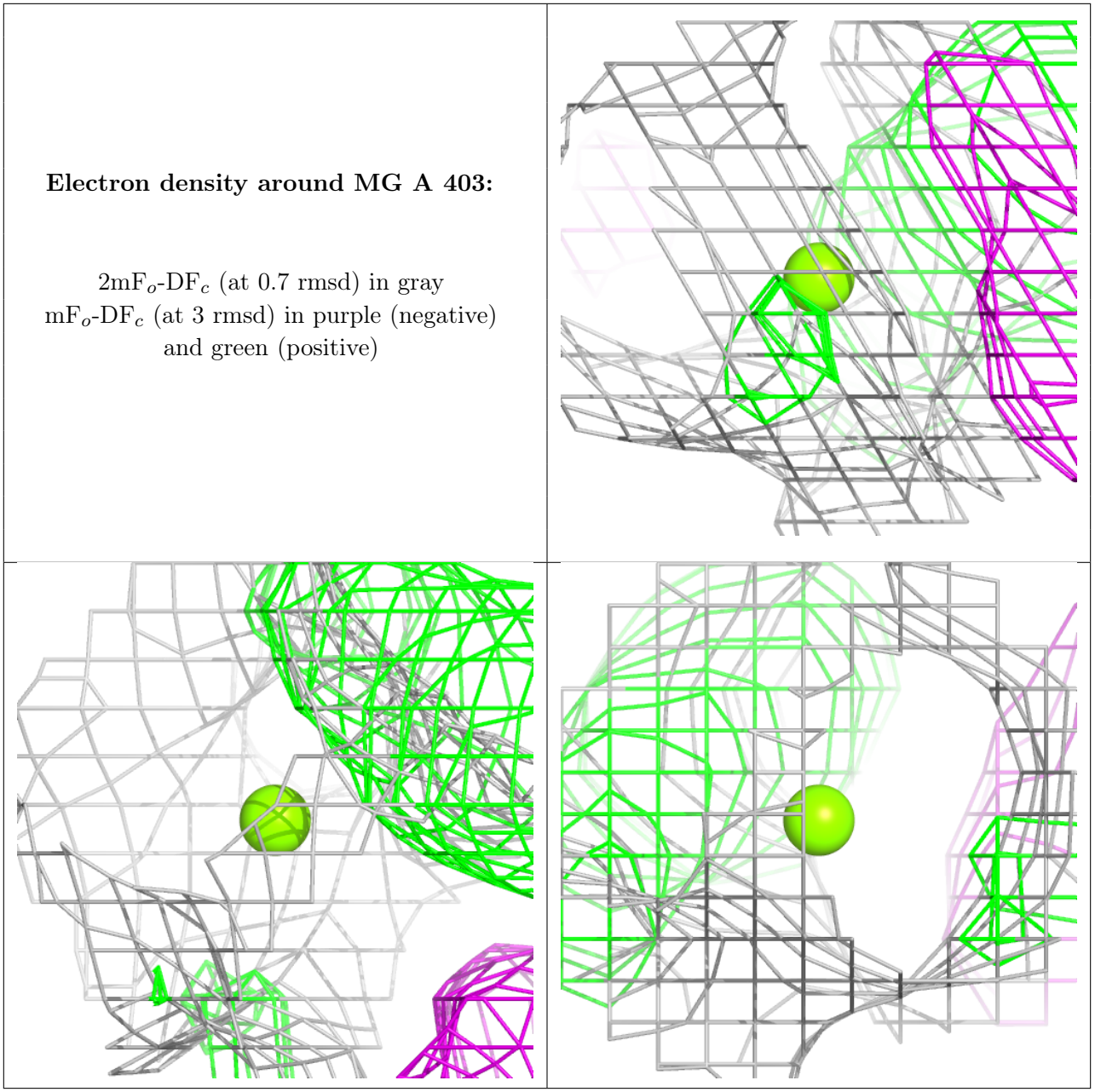
Electron density around FPS A 402:

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



Electron density around MG 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)



6.5 Other polymers (i)

There are no such residues in this entry.