Full wwPDB X-ray Structure Validation Report (i)

May 12, 2025 – 10:08 AM JST

PDB ID	:	9JWS / pdb_00009jws
Title	:	Haloquadratum walsbyi middle rhodopsin
Authors	:	Ko, L.N.; Lim, G.Z.; Ko, T.; Yang, C.S.; Li, G.Y.; Chen, J.C.
Deposited on	:	2024-10-10
Resolution	:	2.50 Å(reported)

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

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

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

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

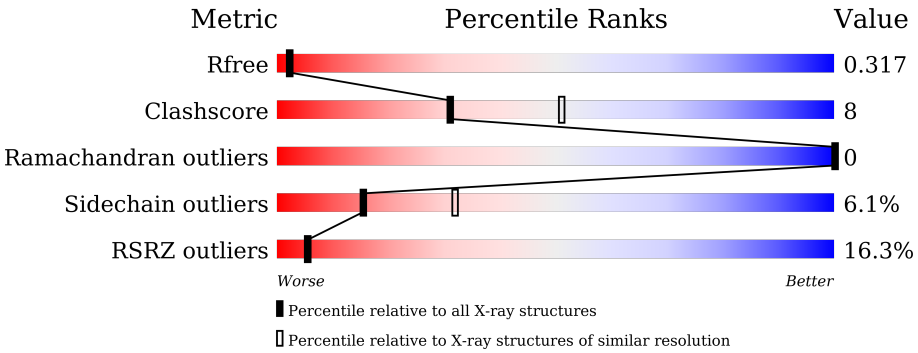
MolProbity	:	4-5-2 with Phenix2.0rc1
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	2.0rc1
EDS	:	3.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.006 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.43.1

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 2.50 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}	164625	5504 (2.50-2.50)
Clashscore	180529	6282 (2.50-2.50)
Ramachandran outliers	177936	6191 (2.50-2.50)
Sidechain outliers	177891	6193 (2.50-2.50)
RSRZ outliers	164620	5504 (2.50-2.50)

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 >=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	252	14% 67% 19% · 13%
1	B	252	14% 69% 18% · 12%

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
3	MG	B	303	-	-	X	X

2 Entry composition (i)

There are 4 unique types of molecules in this entry. The entry contains 3453 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.

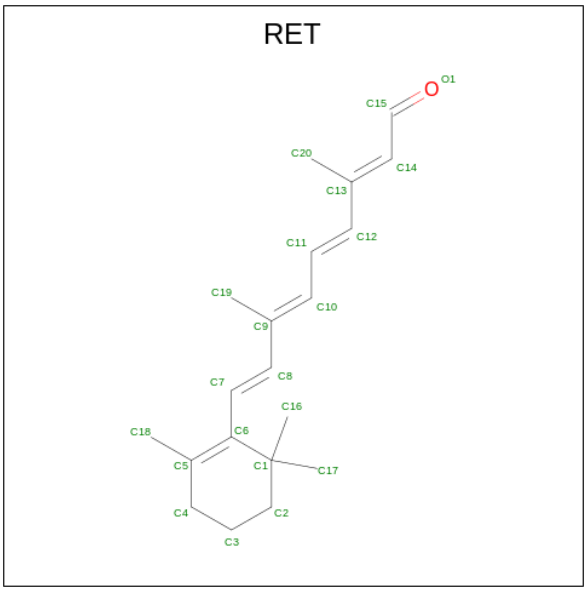
- Molecule 1 is a protein called Bacteriorhodopsin-II-like protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	220	Total	C	N	O	S	0	0	0
			1687	1115	270	295	7			
1	B	223	Total	C	N	O	S	0	0	0
			1710	1129	275	299	7			

There are 12 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	247	HIS	-	expression tag	UNP Q18DH5
A	248	HIS	-	expression tag	UNP Q18DH5
A	249	HIS	-	expression tag	UNP Q18DH5
A	250	HIS	-	expression tag	UNP Q18DH5
A	251	HIS	-	expression tag	UNP Q18DH5
A	252	HIS	-	expression tag	UNP Q18DH5
B	247	HIS	-	expression tag	UNP Q18DH5
B	248	HIS	-	expression tag	UNP Q18DH5
B	249	HIS	-	expression tag	UNP Q18DH5
B	250	HIS	-	expression tag	UNP Q18DH5
B	251	HIS	-	expression tag	UNP Q18DH5
B	252	HIS	-	expression tag	UNP Q18DH5

- Molecule 2 is RETINAL (CCD ID: RET) (formula: $C_{20}H_{28}O$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	1	Total C 20 20	0	0
2	B	1	Total C 20 20	0	0

- Molecule 3 is MAGNESIUM ION (CCD ID: MG) (formula: Mg) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	2	Total Mg 2 2	0	0
3	B	2	Total Mg 2 2	0	0

- Molecule 4 is water.

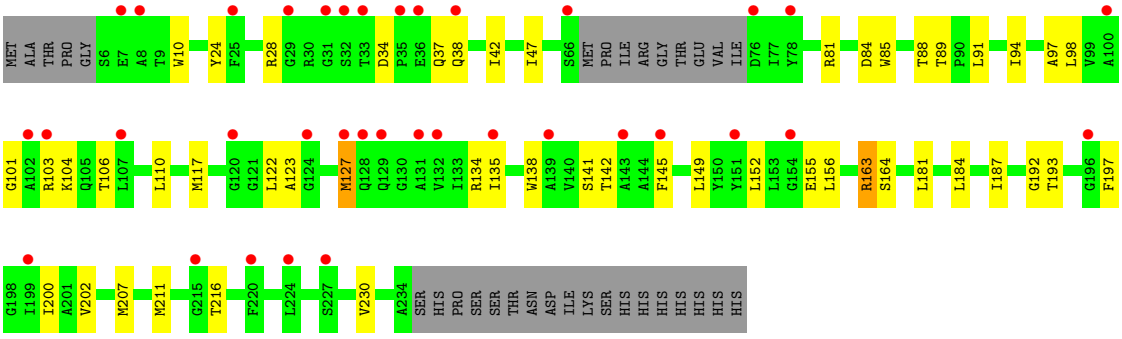
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	7	Total O 7 7	0	0
4	B	5	Total O 5 5	0	0

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.

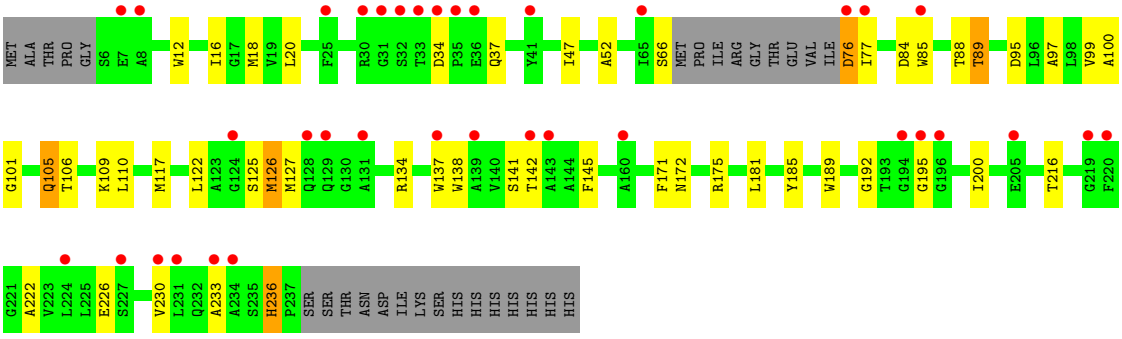
• Molecule 1: Bacteriorhodopsin-II-like protein

Chain A:



• Molecule 1: Bacteriorhodopsin-II-like protein

Chain B:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	61.46Å 62.47Å 122.35Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	43.81 – 2.50 43.81 – 2.50	Depositor EDS
% Data completeness (in resolution range)	78.3 (43.81-2.50) 78.3 (43.81-2.50)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.78 (at 2.51Å)	Xtriage
Refinement program	PHENIX (1.20.1_4487: ???)	Depositor
R, R_{free}	0.296 , 0.324 0.295 , 0.317	Depositor DCC
R_{free} test set	15530 reflections (10.17%)	wwPDB-VP
Wilson B-factor (Å^2)	23.1	Xtriage
Anisotropy	1.101	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.37 , 72.4	EDS
L-test for twinning[2]	$< \|L\| > = 0.46$, $< L^2 > = 0.30$	Xtriage
Estimated twinning fraction	0.000 for k,h,-l	Xtriage
F_o,F_c correlation	0.88	EDS
Total number of atoms	3453	wwPDB-VP
Average B, all atoms (Å^2)	29.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 43.20 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 1.8259e-04. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

[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: MG, RET

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	0.29	0/1721	0.49	0/2348
1	B	0.34	0/1746	0.57	2/2383 (0.1%)
All	All	0.31	0/3467	0.53	2/4731 (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	A	0	1
1	B	0	1
All	All	0	2

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	126	MET	CA-C-N	-5.23	113.28	121.02
1	B	126	MET	C-N-CA	-5.23	113.28	121.02

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	163	ARG	Sidechain
1	B	134	ARG	Sidechain

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	1687	0	1755	24	0
1	B	1710	0	1775	31	0
2	A	20	0	27	3	0
2	B	20	0	27	3	0
3	A	2	0	0	0	0
3	B	2	0	0	2	0
4	A	7	0	0	1	0
4	B	5	0	0	0	0
All	All	3453	0	3584	57	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 (57) 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:184:LEU:HA	1:A:187:ILE:HD12	1.69	0.74
1:B:233:ALA:HA	1:B:236:HIS:HD2	1.53	0.73
1:B:16:ILE:O	1:B:20:LEU:HG	1.93	0.69
1:B:141:SER:HB2	2:B:301:RET:H41	1.75	0.68
2:A:301:RET:H8	2:A:301:RET:H161	1.79	0.65
1:B:34:ASP:HB2	1:B:37:GLN:HG3	1.79	0.65
1:A:38:GLN:O	1:A:42:ILE:HG12	1.97	0.64
1:A:34:ASP:HB2	1:A:37:GLN:HG3	1.80	0.63
1:A:141:SER:HB2	2:A:301:RET:H41	1.81	0.63
1:B:181:LEU:HB3	1:B:216:THR:HG22	1.81	0.63
1:B:185:TYR:OH	3:B:303:MG:MG	1.44	0.59
1:B:233:ALA:HA	1:B:236:HIS:CD2	2.36	0.59
1:A:207:MET:O	1:A:211:MET:HG3	2.04	0.58
1:B:181:LEU:HB3	1:B:216:THR:CG2	2.33	0.57
1:A:117:MET:SD	2:A:301:RET:H7	2.45	0.57
1:A:103:ARG:NH1	4:A:401:HOH:O	2.34	0.56
1:B:47:ILE:HG23	1:B:88:THR:HB	1.88	0.54
1:B:192:GLY:HA2	1:B:200:ILE:HG13	1.90	0.53
1:A:135:ILE:HD11	1:A:197:PHE:HZ	1.73	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:117:MET:HE2	1:A:145:PHE:HA	1.92	0.52
1:B:138:TRP:HB2	1:B:189:TRP:HZ3	1.74	0.51
1:A:152:LEU:HA	1:A:156:LEU:HD13	1.91	0.51
1:B:105:GLN:O	1:B:109:LYS:HG3	2.12	0.50
1:A:123:ALA:O	1:A:127:MET:HB2	2.13	0.49
1:B:106:THR:O	1:B:110:LEU:HG	2.14	0.48
1:B:138:TRP:O	1:B:142:THR:OG1	2.29	0.47
1:B:172:ASN:OD1	1:B:175:ARG:NH2	2.47	0.47
1:A:138:TRP:O	1:A:142:THR:OG1	2.26	0.47
1:A:106:THR:O	1:A:110:LEU:HG	2.15	0.47
1:A:181:LEU:HB3	1:A:216:THR:HG22	1.97	0.47
1:A:10:TRP:CZ2	1:A:207:MET:HE2	2.50	0.46
1:A:192:GLY:HA2	1:A:200:ILE:HG13	1.98	0.45
1:B:117:MET:HE2	1:B:145:PHE:HA	2.00	0.44
1:B:138:TRP:HD1	1:B:189:TRP:CE3	2.35	0.44
1:B:222:ALA:O	1:B:226:GLU:HG3	2.18	0.43
1:A:24:TYR:OH	1:A:28:ARG:NE	2.51	0.43
1:B:141:SER:CB	2:B:301:RET:H41	2.47	0.43
1:B:185:TYR:HH	3:B:303:MG:MG	1.27	0.43
1:B:127:MET:HE3	1:B:137:TRP:CZ2	2.54	0.43
1:A:104:LYS:HD3	1:A:104:LYS:H	1.84	0.43
1:B:95:ASP:O	1:B:99:VAL:HG23	2.19	0.43
1:B:12:TRP:O	1:B:16:ILE:HG12	2.19	0.42
1:B:189:TRP:CE2	1:B:195:GLY:HA3	2.54	0.42
1:B:66:SER:HA	1:B:76:ASP:N	2.35	0.42
1:B:97:ALA:O	1:B:101:GLY:N	2.53	0.42
1:B:100:ALA:HB2	1:B:171:PHE:CE1	2.54	0.42
1:B:85:TRP:O	1:B:89:THR:OG1	2.34	0.41
1:A:97:ALA:O	1:A:101:GLY:N	2.53	0.41
1:B:18:MET:HB3	1:B:52:ALA:HB2	2.01	0.41
1:B:127:MET:HE3	1:B:137:TRP:CE2	2.56	0.41
1:A:94:ILE:O	1:A:98:LEU:HG	2.21	0.41
1:A:24:TYR:O	1:A:28:ARG:HG3	2.21	0.41
1:B:127:MET:HE2	1:B:127:MET:HB2	1.94	0.40
1:A:81:ARG:HD2	1:A:85:TRP:CZ2	2.57	0.40
1:A:47:ILE:HG23	1:A:88:THR:HB	2.03	0.40
1:A:193:THR:OG1	1:A:202:VAL:HG22	2.22	0.40
2:B:301:RET:H8	2:B:301:RET:H161	2.04	0.40

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	216/252 (86%)	214 (99%)	2 (1%)	0	100	100
1	B	219/252 (87%)	217 (99%)	2 (1%)	0	100	100
All	All	435/504 (86%)	431 (99%)	4 (1%)	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	170/199 (85%)	159 (94%)	11 (6%)	14	29
1	B	173/199 (87%)	163 (94%)	10 (6%)	17	34
All	All	343/398 (86%)	322 (94%)	21 (6%)	15	32

All (21) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	84	ASP
1	A	89	THR
1	A	91	LEU
1	A	122	LEU
1	A	127	MET
1	A	134	ARG
1	A	149	LEU
1	A	155	GLU

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Mol	Chain	Res	Type
1	A	163	ARG
1	A	164	SER
1	A	230	VAL
1	B	76	ASP
1	B	77	ILE
1	B	84	ASP
1	B	89	THR
1	B	105	GLN
1	B	122	LEU
1	B	125	SER
1	B	126	MET
1	B	230	VAL
1	B	236	HIS

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

Mol	Chain	Res	Type
1	A	105	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 6 ligands modelled in this entry, 4 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	$\#\|Z\| > 2$
2	RET	A	301	1	20,20,21	0.69	1 (5%)	27,27,28	0.53	0
2	RET	B	301	1	20,20,21	2.10	4 (20%)	27,27,28	1.30	4 (14%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	RET	A	301	1	-	7/13/30/31	0/1/1/1
2	RET	B	301	1	-	6/13/30/31	0/1/1/1

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	301	RET	C14-C13	6.43	1.38	1.33
2	B	301	RET	C8-C9	-3.45	1.38	1.45
2	B	301	RET	C10-C9	3.35	1.40	1.35
2	B	301	RET	C12-C13	-2.63	1.40	1.45
2	A	301	RET	C14-C13	2.53	1.35	1.33

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	301	RET	C19-C9-C10	-4.04	117.27	122.92
2	B	301	RET	C8-C9-C10	2.64	122.99	118.94
2	B	301	RET	C2-C1-C6	2.51	114.35	110.48
2	B	301	RET	C10-C11-C12	2.24	130.22	123.22

There are no chirality outliers.

All (13) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	301	RET	C7-C8-C9-C10
2	A	301	RET	C7-C8-C9-C19
2	B	301	RET	C1-C6-C7-C8

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Mol	Chain	Res	Type	Atoms
2	B	301	RET	C5-C6-C7-C8
2	A	301	RET	C11-C12-C13-C20
2	B	301	RET	C7-C8-C9-C19
2	A	301	RET	C11-C12-C13-C14
2	B	301	RET	C7-C8-C9-C10
2	A	301	RET	C1-C6-C7-C8
2	A	301	RET	C9-C10-C11-C12
2	B	301	RET	C12-C13-C14-C15
2	B	301	RET	C20-C13-C14-C15
2	A	301	RET	C5-C6-C7-C8

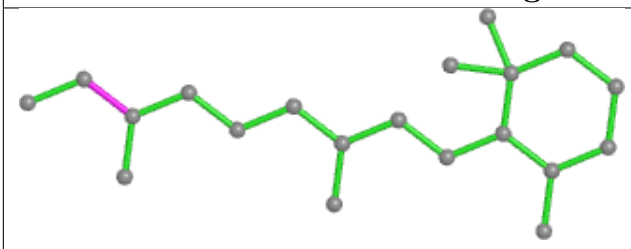
There are no ring outliers.

2 monomers are involved in 6 short contacts:

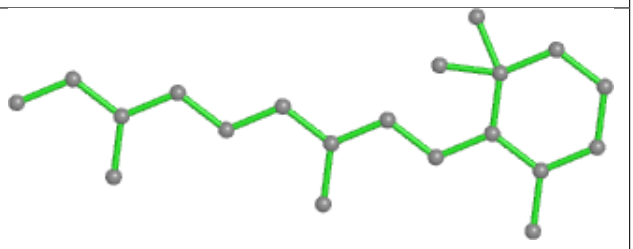
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	301	RET	3	0
2	B	301	RET	3	0

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.

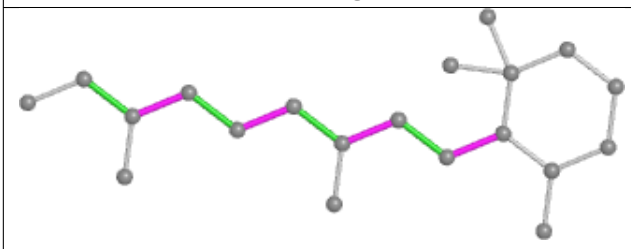
Ligand RET A 301



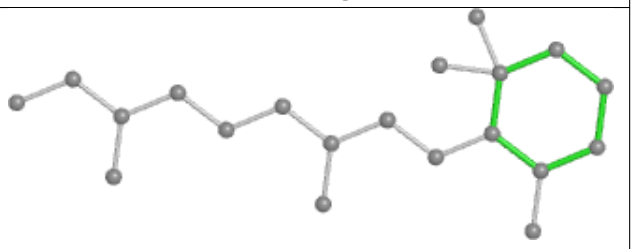
Bond lengths



Bond angles

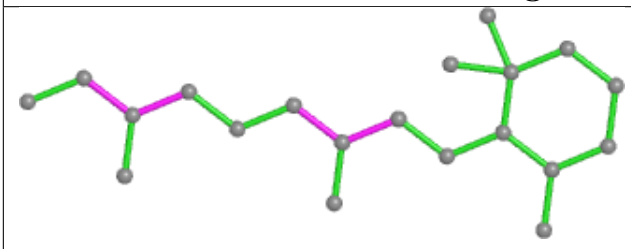


Torsions

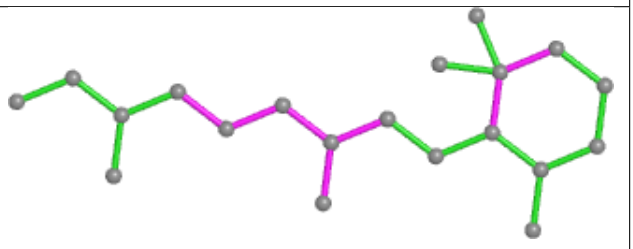


Rings

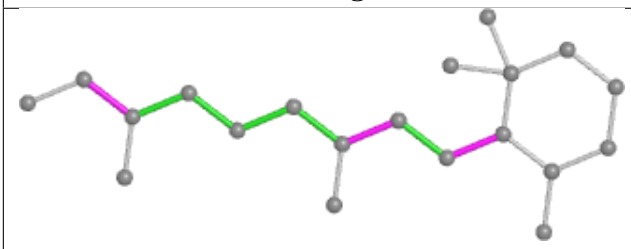
Ligand RET B 301



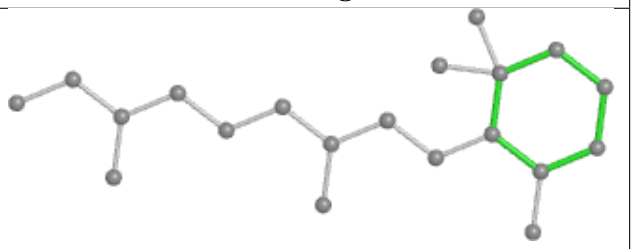
Bond lengths



Bond angles



Torsions



Rings

5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 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	220/252 (87%)	1.13	36 (16%)	5	5	15, 24, 56, 73	0
1	B	223/252 (88%)	1.16	36 (16%)	5	6	14, 25, 69, 80	0
All	All	443/504 (87%)	1.15	72 (16%)	5	5	14, 24, 62, 80	0

All (72) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	234	ALA	7.2
1	B	33	THR	4.9
1	B	195	GLY	4.6
1	A	33	THR	4.1
1	B	230	VAL	4.1
1	A	102	ALA	3.8
1	A	32	SER	3.8
1	A	31	GLY	3.7
1	B	194	GLY	3.7
1	A	8	ALA	3.7
1	A	196	GLY	3.6
1	B	205	GLU	3.5
1	B	231	LEU	3.5
1	A	29	GLY	3.5
1	B	233	ALA	3.4
1	B	227	SER	3.3
1	B	76	ASP	3.0
1	B	124	GLY	3.0
1	A	224	LEU	3.0
1	A	36	GLU	3.0
1	A	131	ALA	3.0
1	A	120	GLY	2.9
1	A	127	MET	2.9
1	A	215	GLY	2.8

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Mol	Chain	Res	Type	RSRZ
1	A	227	SER	2.8
1	A	154	GLY	2.8
1	A	139	ALA	2.8
1	A	151	TYR	2.7
1	A	25	PHE	2.7
1	A	78	TYR	2.7
1	B	143	ALA	2.7
1	B	160	ALA	2.6
1	A	145	PHE	2.6
1	B	220	PHE	2.6
1	B	128	GLN	2.6
1	B	35	PRO	2.5
1	B	77	ILE	2.5
1	A	35	PRO	2.5
1	A	7	GLU	2.5
1	B	196	GLY	2.5
1	B	8	ALA	2.5
1	A	135	ILE	2.5
1	B	65	ILE	2.5
1	B	31	GLY	2.4
1	B	219	GLY	2.4
1	B	34	ASP	2.3
1	B	139	ALA	2.3
1	A	76	ASP	2.3
1	A	103	ARG	2.3
1	B	131	ALA	2.3
1	A	124	GLY	2.3
1	B	41	TYR	2.3
1	A	132	VAL	2.3
1	A	143	ALA	2.3
1	B	25	PHE	2.2
1	B	30	ARG	2.2
1	A	129	GLN	2.2
1	B	7	GLU	2.2
1	B	129	GLN	2.2
1	B	142	THR	2.2
1	A	66	SER	2.2
1	A	220	PHE	2.1
1	A	38	GLN	2.1
1	B	36	GLU	2.1
1	A	100	ALA	2.1
1	A	107	LEU	2.1

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Mol	Chain	Res	Type	RSRZ
1	B	224	LEU	2.1
1	B	137	TRP	2.1
1	A	128	GLN	2.1
1	A	199	ILE	2.0
1	B	85	TRP	2.0
1	B	32	SER	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 monosaccharides in this entry.

6.4 Ligands (i)

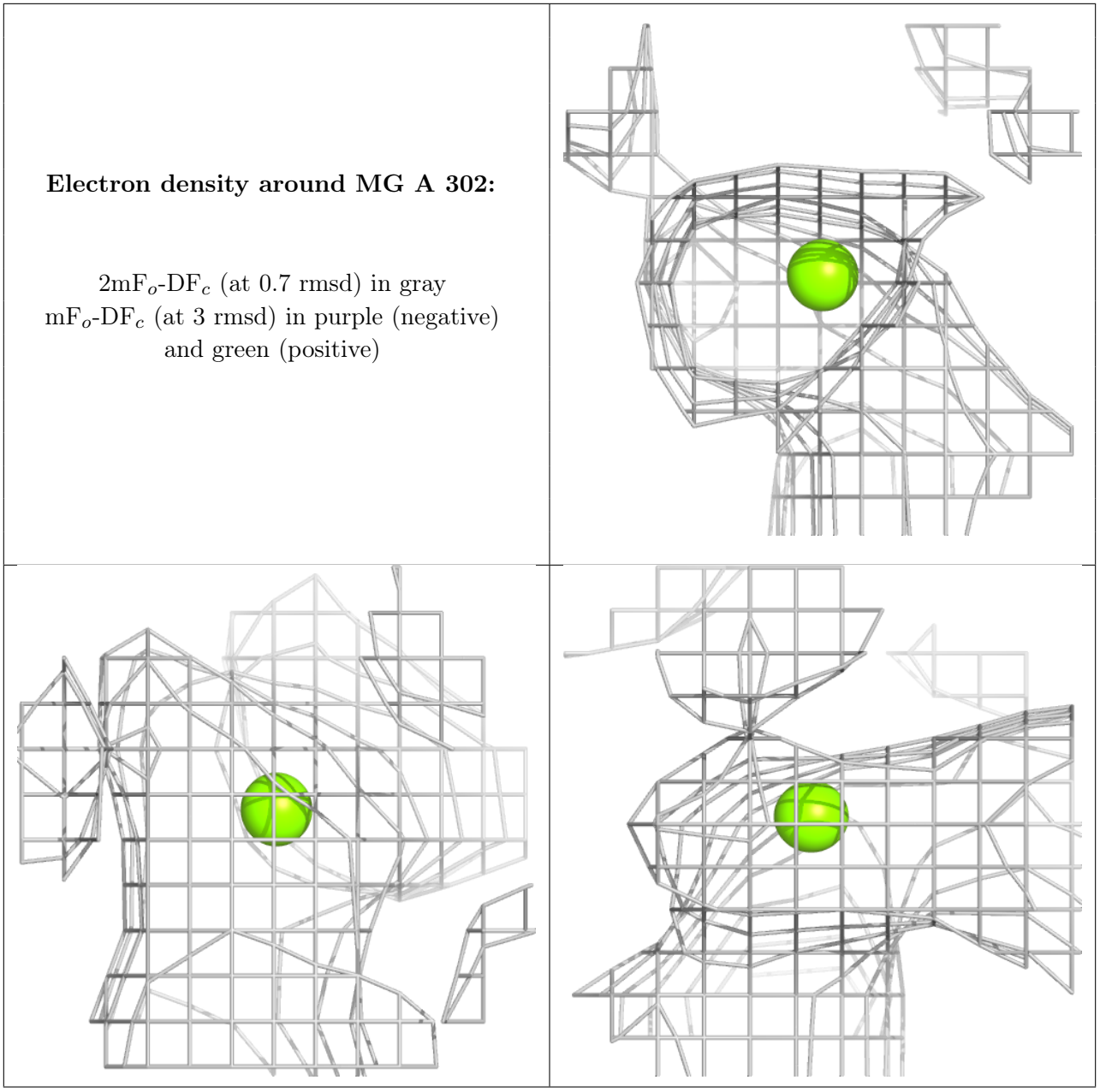
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' 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	MG	A	302	1/1	0.71	0.16	28,28,28,28	0
3	MG	B	303	1/1	0.72	0.42	28,28,28,28	0
2	RET	A	301	20/21	0.78	0.17	15,24,27,28	0
3	MG	B	302	1/1	0.79	0.10	23,23,23,23	0
2	RET	B	301	20/21	0.84	0.14	12,18,23,24	0
3	MG	A	303	1/1	0.95	0.16	23,23,23,23	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.

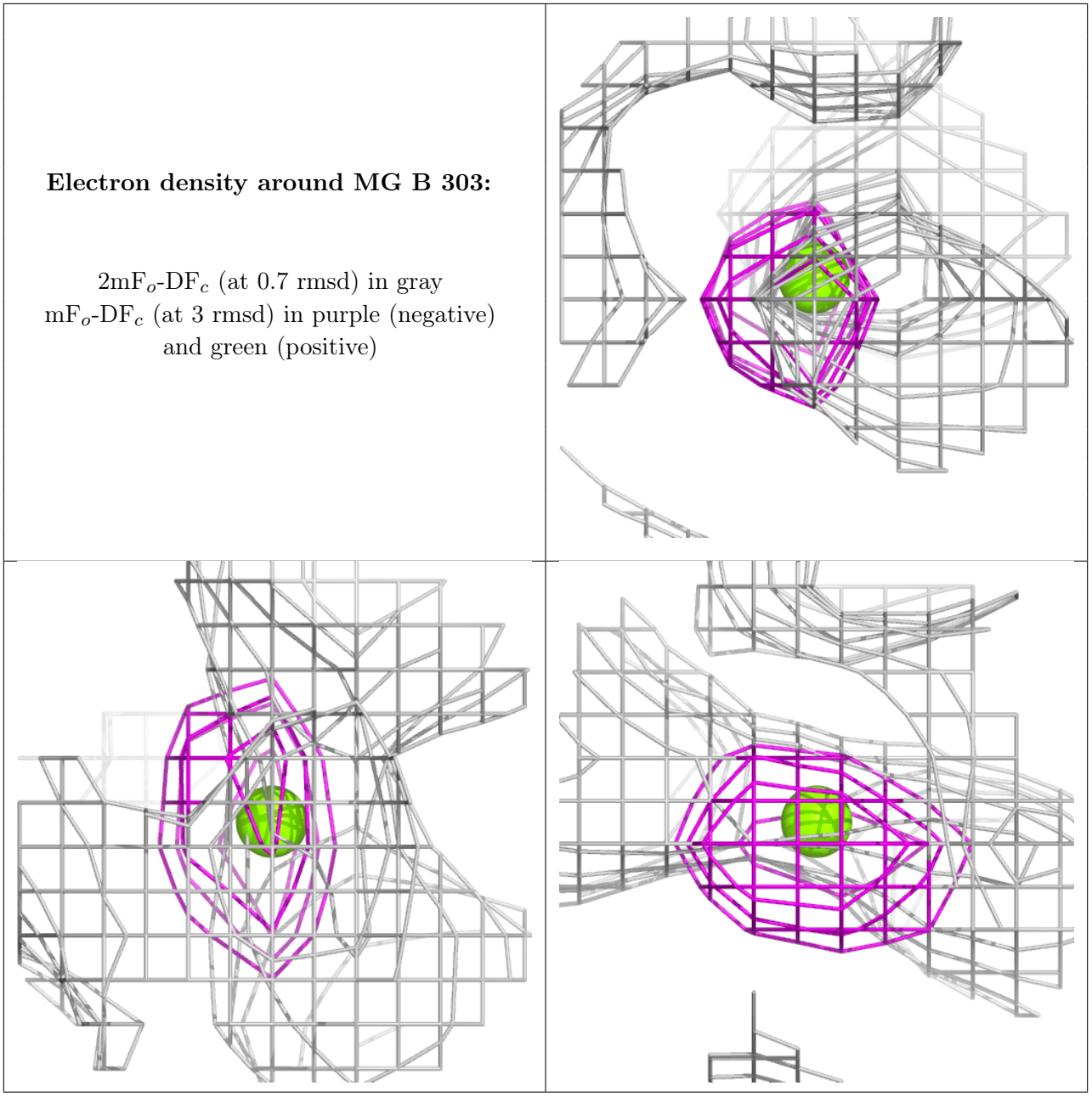
Electron density around MG A 302:

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



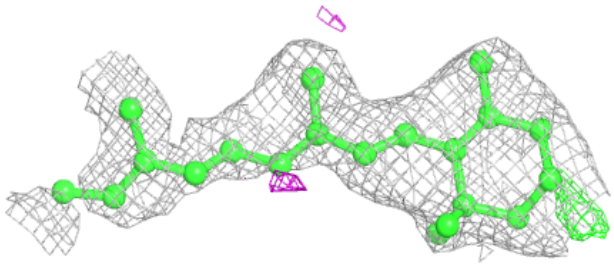
Electron density around MG B 303:

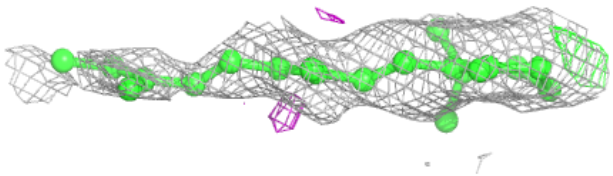
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

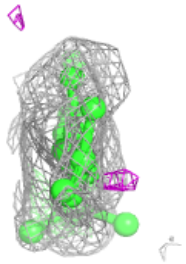


Electron density around RET A 301:

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

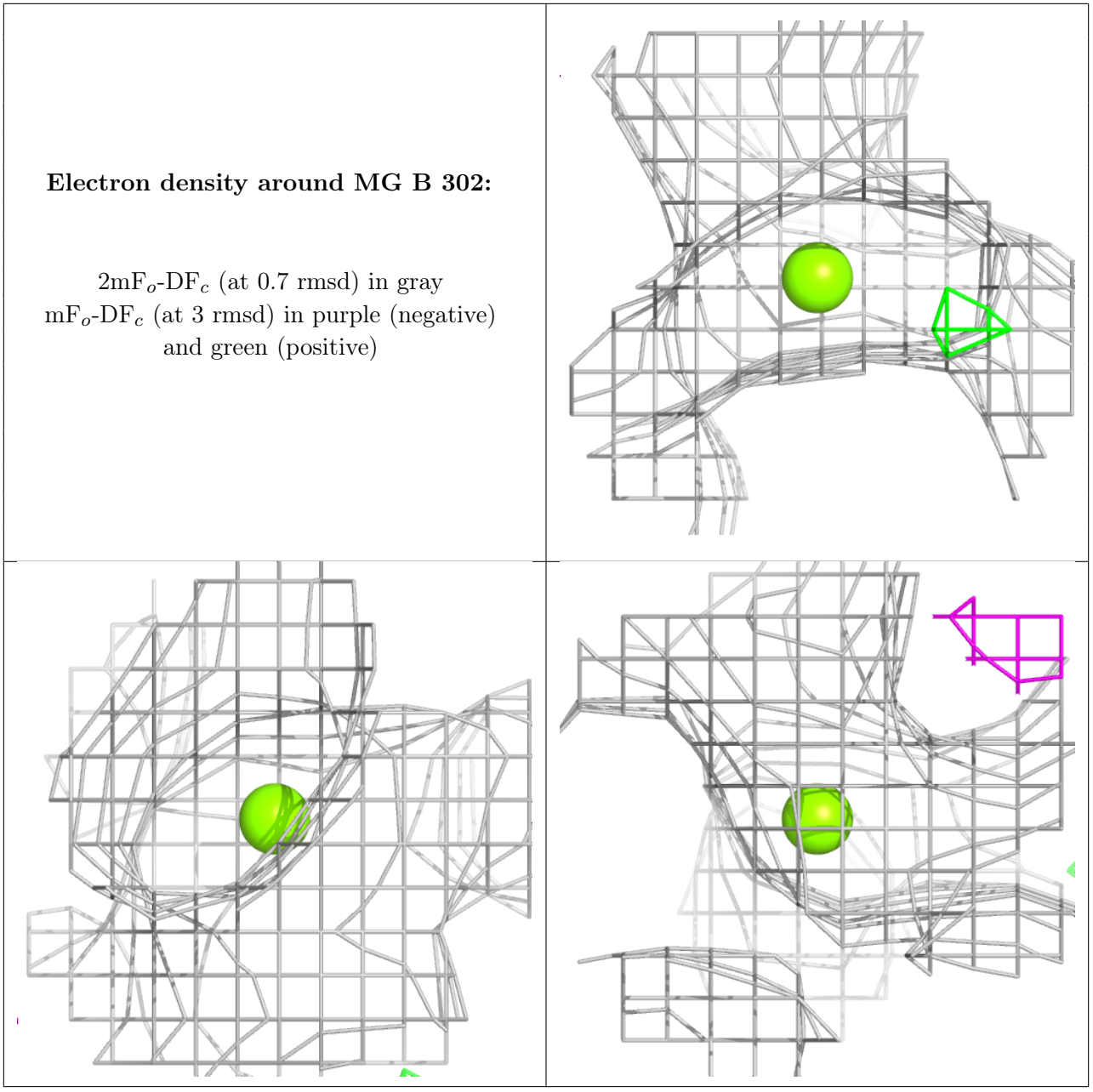






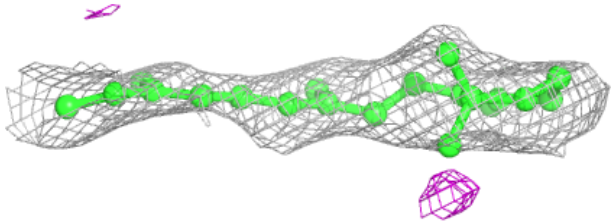
Electron density around MG B 302:

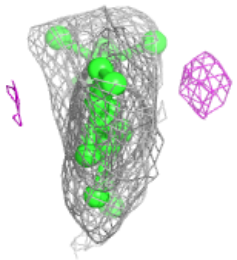
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



Electron density around RET B 301:

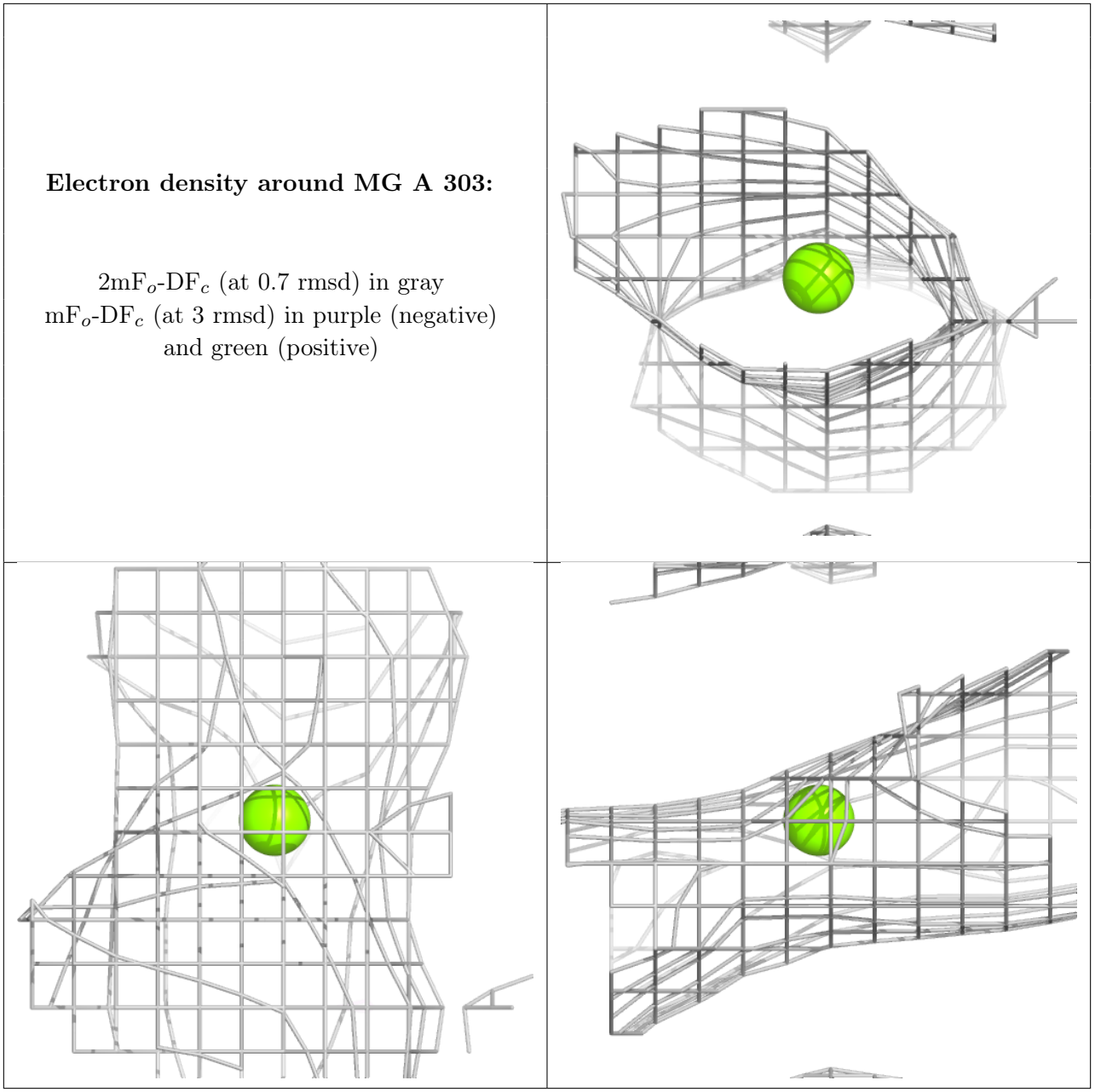
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)





Electron density around MG A 303:

$2mF_o$-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.