



wwPDB X-ray Structure Validation Summary Report ⓘ

May 25, 2020 – 12:35 pm BST

PDB ID : 6CZ7
Title : The arsenate respiratory reductase (Arr) complex from Shewanella sp. ANA-3
Authors : Glasser, N.R.; Newman, D.K.
Deposited on : 2018-04-08
Resolution : 1.62 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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

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

MolProbity : 4.02b-467
Mogul : 1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix) : 1.13
EDS : 2.11
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) : 2.11

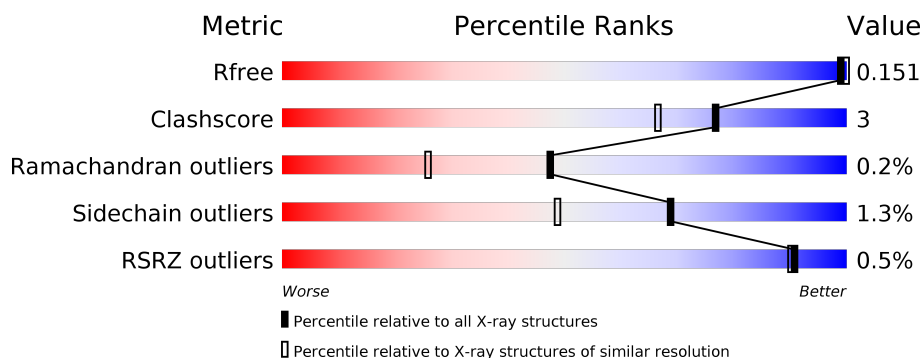
1 Overall quality at a glance ⓘ

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.62 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	4693 (1.64-1.60)
Clashscore	141614	5002 (1.64-1.60)
Ramachandran outliers	138981	4888 (1.64-1.60)
Sidechain outliers	138945	4887 (1.64-1.60)
RSRZ outliers	127900	4609 (1.64-1.60)

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 on 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 $\leq 5\%$. 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	814	<div> <div style="width: 100%; height: 10px; background: linear-gradient(to right, red 1%, orange 1%, yellow 1%, green 98%);"></div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> % 93% 7% </div> </div>
1	C	814	<div> <div style="width: 100%; height: 10px; background: linear-gradient(to right, green 93%, yellow 6%, grey 1%);"></div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> 93% 6% </div> </div>
2	B	234	<div> <div style="width: 100%; height: 10px; background: linear-gradient(to right, green 90%, yellow 10%);"></div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> 90% 10% </div> </div>
2	D	234	<div> <div style="width: 100%; height: 10px; background: linear-gradient(to right, red 1%, orange 1%, yellow 1%, green 91%);"></div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> % 91% 9% </div> </div>

2 Entry composition

There are 9 unique types of molecules in this entry. The entry contains 35459 atoms, of which 16247 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 ArrA.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	814	Total	C	H	N	O	S	0	7	0
			12739	4110	6302	1114	1185	28			
1	C	807	Total	C	H	N	O	S	0	13	0
			12721	4101	6300	1109	1183	28			

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	41	GLY	-	expression tag	UNP Q7WTU0
C	41	GLY	-	expression tag	UNP Q7WTU0

- Molecule 2 is a protein called 4Fe-4S ferredoxin, iron-sulfur binding domain protein.

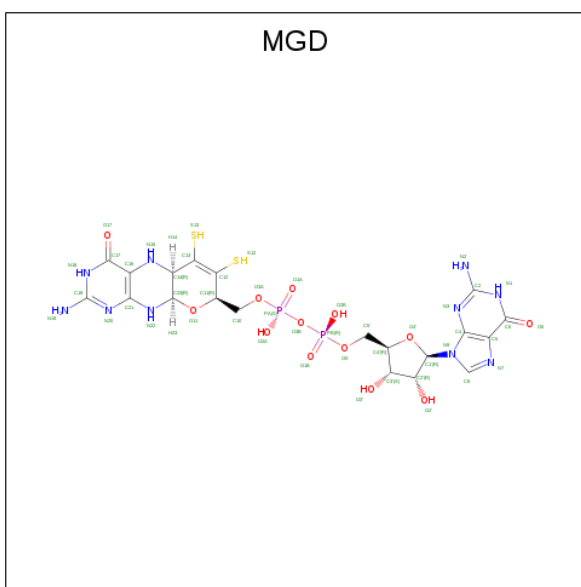
Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
2	B	234	Total	C	H	N	O	S	0	7	0
			3599	1123	1784	324	345	23			
2	D	234	Total	C	H	N	O	S	0	3	0
			3500	1100	1721	317	339	23			

- Molecule 3 is IRON/SULFUR CLUSTER (three-letter code: SF4) (formula: Fe₄S₄).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	Fe	S	0	0
			8	4	4		
3	B	1	Total	Fe	S	0	0
			8	4	4		
3	B	1	Total	Fe	S	0	0
			8	4	4		
3	B	1	Total	Fe	S	0	0
			8	4	4		
3	B	1	Total	Fe	S	0	0
			8	4	4		
3	C	1	Total	Fe	S	0	0
			8	4	4		
3	D	1	Total	Fe	S	0	0
			8	4	4		
3	D	1	Total	Fe	S	0	0
			8	4	4		
3	D	1	Total	Fe	S	0	0
			8	4	4		

- Molecule 4 is 2-AMINO-5,6-DIMERCAPTO-7-METHYL-3,7,8A,9-TETRAHYDRO-8-OXA-1,3,9,10-TETRAAZA-ANTHRACEN-4-ONE GUANOSINE DINUCLEOTIDE (three-letter code: MGD) (formula: C₂₀H₂₆N₁₀O₁₃P₂S₂) (labeled as "Ligand of Interest" by author).



Mol	Chain	Residues	Atoms							ZeroOcc	AltConf
4	A	1	Total	C	H	N	O	P	S	0	0
			67	20	20	10	13	2	2		
4	A	1	Total	C	H	N	O	P	S	0	0
			69	20	22	10	13	2	2		
4	C	1	Total	C	H	N	O	P	S	0	0
			69	20	22	10	13	2	2		
4	C	1	Total	C	H	N	O	P	S	0	0
			69	20	22	10	13	2	2		

- Molecule 5 is MOLYBDENUM ATOM (three-letter code: MO) (formula: Mo) (labeled as "Ligand of Interest" by author).

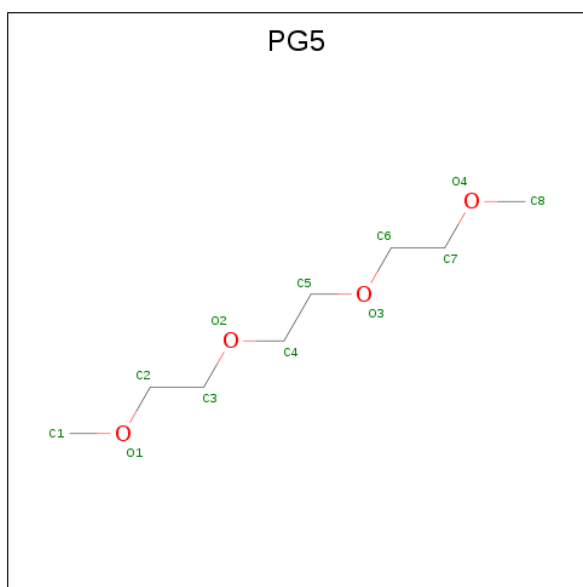
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	1	Total	Mo	0	0
			1	1		
5	C	1	Total	Mo	0	0
			1	1		

- Molecule 6 is FORMIC ACID (three-letter code: FMT) (formula: CH₂O₂).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
6	A	1	Total	C	H	O	0	0
			4	1	1	2		
6	A	1	Total	C	H	O	0	0
			4	1	1	2		
6	A	1	Total	C	H	O	0	0
			4	1	1	2		
6	B	1	Total	C	H	O	0	0
			4	1	1	2		
6	C	1	Total	C	H	O	0	0
			4	1	1	2		
6	C	1	Total	C	H	O	0	0
			4	1	1	2		
6	C	1	Total	C	H	O	0	0
			4	1	1	2		
6	D	1	Total	C	H	O	0	0
			4	1	1	2		

- Molecule 7 is 1-METHOXY-2-[2-(2-METHOXY-ETHOXY)]-ETHANE (three-letter code: PG5) (formula: C₈H₁₈O₄).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
7	A	1	Total	C	H	O	0	0
			30	8	18	4		
7	C	1	Total	C	H	O	0	0
			30	8	18	4		

- Molecule 8 is DI(HYDROXYETHYL)ETHER (three-letter code: PEG) (formula: $C_4H_{10}O_3$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
8	D	1	Total	C	H	O	0	0
			17	4	10	3		

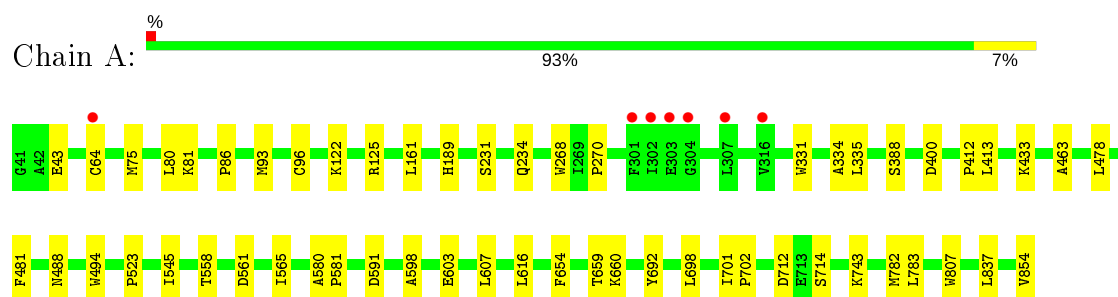
- Molecule 9 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
9	A	823	Total 823	O 823	0	0
9	B	319	Total 319	O 319	0	0
9	C	986	Total 986	O 986	0	0
9	D	307	Total 307	O 307	0	0

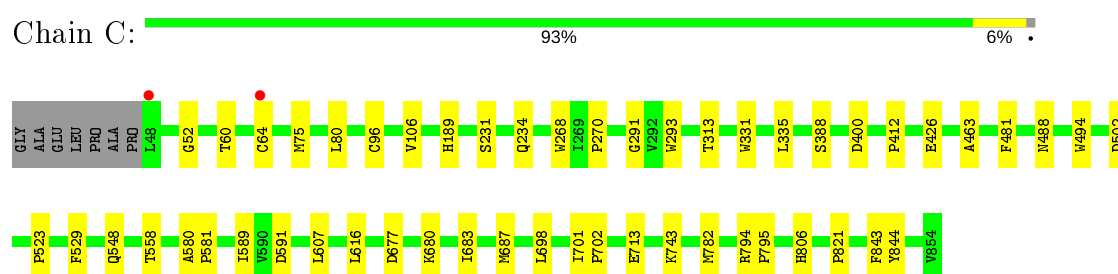
3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA and DNA 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.

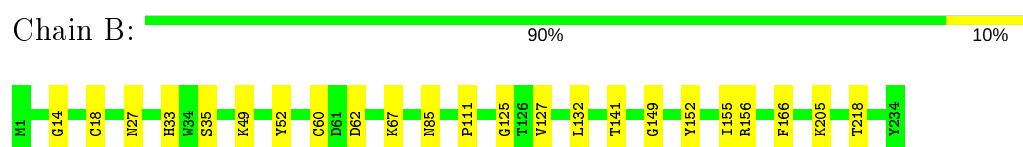
- Molecule 1: ArrA



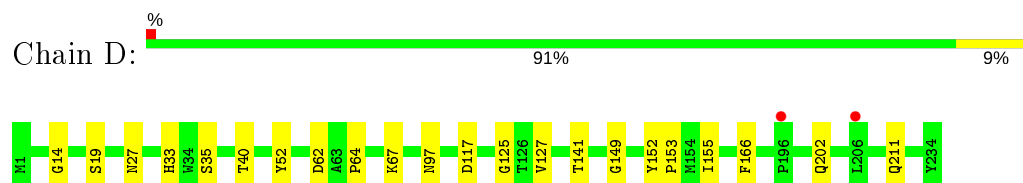
- Molecule 1: ArrA



- Molecule 2: 4Fe-4S ferredoxin, iron-sulfur binding domain protein



- Molecule 2: 4Fe-4S ferredoxin, iron-sulfur binding domain protein



4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	231.26 Å 85.64 Å 146.68 Å 90.00° 127.84° 90.00°	Depositor
Resolution (Å)	46.91 – 1.62 47.53 – 1.62	Depositor EDS
% Data completeness (in resolution range)	99.6 (46.91-1.62) 99.9 (47.53-1.62)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.31 (at 1.62 Å)	Xtriage
Refinement program	PHENIX	Depositor
R, R_{free}	0.137 , 0.155 0.133 , 0.151	Depositor DCC
R_{free} test set	3573 reflections (1.25%)	wwPDB-VP
Wilson B-factor (Å ²)	18.1	Xtriage
Anisotropy	0.433	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.38 , 44.3	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	0.010 for -h-2*k,l	Xtriage
F_o, F_c correlation	0.98	EDS
Total number of atoms	35459	wwPDB-VP
Average B, all atoms (Å ²)	29.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.90% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical 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: MGD, SF4, PG5, MO, PEG, FMT

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	0.34	0/6632	0.57	0/8988
1	C	0.35	0/6632	0.59	0/8984
2	B	0.36	0/1875	0.64	1/2545 (0.0%)
2	D	0.36	0/1827	0.62	0/2483
All	All	0.35	0/16966	0.59	1/23000 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	132	LEU	CB-CG-CD2	-5.03	102.45	111.00

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	6437	6302	6299	32	0
1	C	6421	6300	6302	31	0
2	B	1815	1784	1784	15	0
2	D	1779	1721	1721	16	0
3	A	8	0	0	0	0
3	B	32	0	0	2	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	C	8	0	0	0	0
3	D	32	0	0	1	0
4	A	94	42	41	4	0
4	C	94	44	40	4	0
5	A	1	0	0	0	0
5	C	1	0	0	0	0
6	A	9	3	3	0	0
6	B	3	1	1	0	0
6	C	9	3	3	0	0
6	D	3	1	1	1	0
7	A	12	18	18	0	0
7	C	12	18	18	2	0
8	D	7	10	10	0	0
9	A	823	0	0	7	1
9	B	319	0	0	8	1
9	C	986	0	0	7	3
9	D	307	0	0	8	0
All	All	19212	16247	16241	99	4

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 99 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)
4:A:903:MGD:O4'	4:A:903:MGD:C4'	1.64	1.21
4:C:903:MGD:C4'	4:C:903:MGD:O4'	1.64	1.18
2:D:211:GLN:HG2	9:D:402:HOH:O	1.57	1.01
3:B:301:SF4:S3	9:B:589:HOH:O	2.20	1.00
2:D:202:GLN:OE1	9:D:401:HOH:O	1.86	0.93

All (4) 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)
9:C:1852:HOH:O	9:C:1901:HOH:O[4_545]	2.12	0.08
9:C:1001:HOH:O	9:C:1654:HOH:O[4_555]	2.13	0.07
9:C:1669:HOH:O	9:C:1696:HOH:O[4_545]	2.17	0.03
9:A:1490:HOH:O	9:B:627:HOH:O[4_546]	2.17	0.03

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	819/814 (101%)	791 (97%)	27 (3%)	1 (0%)	51	28
1	C	818/814 (100%)	791 (97%)	27 (3%)	0	100	100
2	B	239/234 (102%)	232 (97%)	5 (2%)	2 (1%)	19	5
2	D	235/234 (100%)	231 (98%)	2 (1%)	2 (1%)	17	4
All	All	2111/2096 (101%)	2045 (97%)	61 (3%)	5 (0%)	47	26

All (5) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	334	ALA
2	D	125	GLY
2	B	127	VAL
2	D	127	VAL
2	B	125	GLY

5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	673/672 (100%)	664 (99%)	9 (1%)	69	49
1	C	676/672 (101%)	668 (99%)	8 (1%)	71	52
2	B	207/201 (103%)	204 (99%)	3 (1%)	67	46
2	D	199/201 (99%)	196 (98%)	3 (2%)	65	43
All	All	1755/1746 (100%)	1732 (99%)	23 (1%)	69	49

5 of 23 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	B	141	THR
1	C	96	CYS
2	D	141	THR
2	B	166	PHE
1	C	189	HIS

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no carbohydrates in this entry.

5.6 Ligand geometry ⓘ

Of 27 ligands modelled in this entry, 2 are monoatomic - leaving 25 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	SF4	D	303	2	0,12,12	0.00	-	-		
3	SF4	D	304	2	0,12,12	0.00	-	-		
7	PG5	A	908	-	11,11,11	0.65	0	10,10,10	1.05	0
3	SF4	A	901	1	0,12,12	0.00	-	-		
3	SF4	D	302	2	0,12,12	0.00	-	-		

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
6	FMT	D	305	-	0,2,2	0.00	-	0,1,1	0.00	-
4	MGD	A	902	5	41,52,52	5.31	27 (65%)	43,81,81	3.50	16 (37%)
6	FMT	A	906	-	0,2,2	0.00	-	0,1,1	0.00	-
6	FMT	A	907	-	0,2,2	0.00	-	0,1,1	0.00	-
3	SF4	B	303	2	0,12,12	0.00	-	-	-	-
4	MGD	C	903	5	41,52,52	5.61	27 (65%)	43,81,81	4.19	19 (44%)
4	MGD	A	903	5	41,52,52	5.72	26 (63%)	43,81,81	4.40	16 (37%)
6	FMT	C	907	-	0,2,2	0.00	-	0,1,1	0.00	-
6	FMT	B	305	-	0,2,2	0.00	-	0,1,1	0.00	-
3	SF4	B	302	2	0,12,12	0.00	-	-	-	-
6	FMT	C	905	-	0,2,2	0.00	-	0,1,1	0.00	-
3	SF4	D	301	2	0,12,12	0.00	-	-	-	-
3	SF4	B	304	2	0,12,12	0.00	-	-	-	-
6	FMT	C	906	-	0,2,2	0.00	-	0,1,1	0.00	-
3	SF4	C	901	1	0,12,12	0.00	-	-	-	-
6	FMT	A	905	-	0,2,2	0.00	-	0,1,1	0.00	-
8	PEG	D	306	-	6,6,6	0.68	0	5,5,5	0.23	0
4	MGD	C	902	5	41,52,52	5.30	28 (68%)	43,81,81	3.62	18 (41%)
3	SF4	B	301	9,2	0,12,12	0.00	-	-	-	-
7	PG5	C	908	-	11,11,11	0.49	0	10,10,10	0.38	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	SF4	D	303	2	-	-	0/6/5/5
3	SF4	D	304	2	-	-	0/6/5/5
3	SF4	B	304	2	-	-	0/6/5/5
7	PG5	A	908	-	-	7/9/9/9	-
3	SF4	B	303	2	-	-	0/6/5/5
3	SF4	B	302	2	-	-	0/6/5/5
3	SF4	A	901	1	-	-	0/6/5/5
3	SF4	C	901	1	-	-	0/6/5/5
4	MGD	C	903	5	-	2/18/66/66	0/6/6/6
3	SF4	D	302	2	-	-	0/6/5/5
4	MGD	A	903	5	-	1/18/66/66	0/6/6/6
8	PEG	D	306	-	-	2/4/4/4	-
4	MGD	C	902	5	-	4/18/66/66	0/6/6/6
3	SF4	D	301	2	-	-	0/6/5/5

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	MGD	A	902	5	-	4/18/66/66	0/6/6/6
3	SF4	B	301	9,2	-	-	0/6/5/5
7	PG5	C	908	-	-	7/9/9/9	-

The worst 5 of 108 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	A	903	MGD	O11-C11	14.38	1.63	1.43
4	C	903	MGD	O11-C11	13.77	1.62	1.43
4	A	903	MGD	O11-C23	-13.59	1.24	1.43
4	C	903	MGD	O11-C23	-13.28	1.24	1.43
4	C	902	MGD	C23-C14	-12.43	1.43	1.53

The worst 5 of 69 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	A	903	MGD	O11-C23-C14	19.75	122.14	108.96
4	C	903	MGD	O11-C23-C14	18.88	121.56	108.96
4	C	902	MGD	O11-C23-N22	-14.81	93.34	108.57
4	A	902	MGD	O11-C23-N22	-13.90	94.28	108.57
4	A	903	MGD	C16-C21-N22	9.25	126.59	118.13

There are no chirality outliers.

5 of 27 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	902	MGD	PB-O3B-PA-O3A
4	C	902	MGD	PB-O3B-PA-O3A
7	C	908	PG5	O2-C4-C5-O3
7	A	908	PG5	O3-C6-C7-O4
7	A	908	PG5	O2-C4-C5-O3

There are no ring outliers.

9 monomers are involved in 14 short contacts:

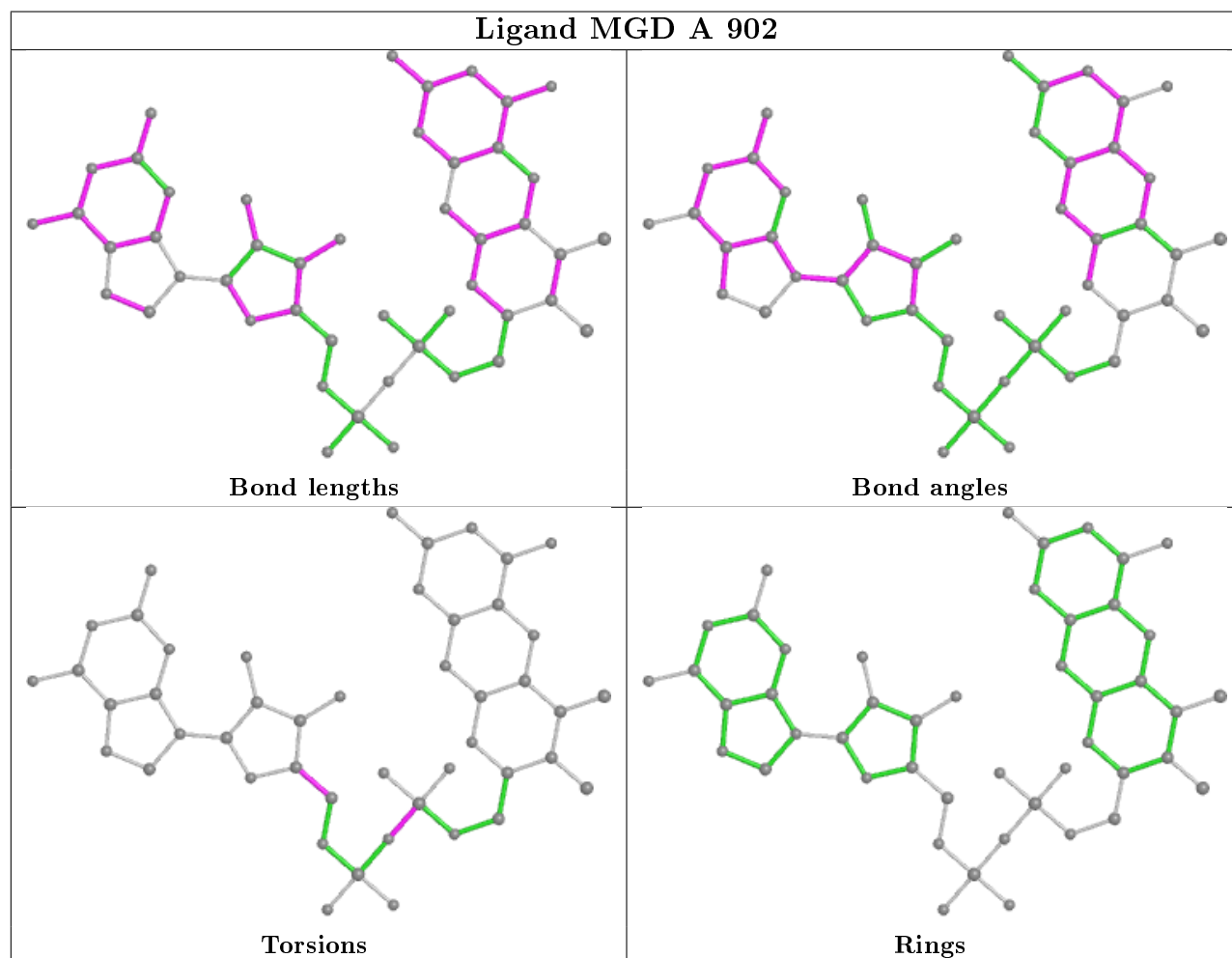
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	D	303	SF4	1	0
6	D	305	FMT	1	0
4	A	902	MGD	2	0
4	C	903	MGD	2	0

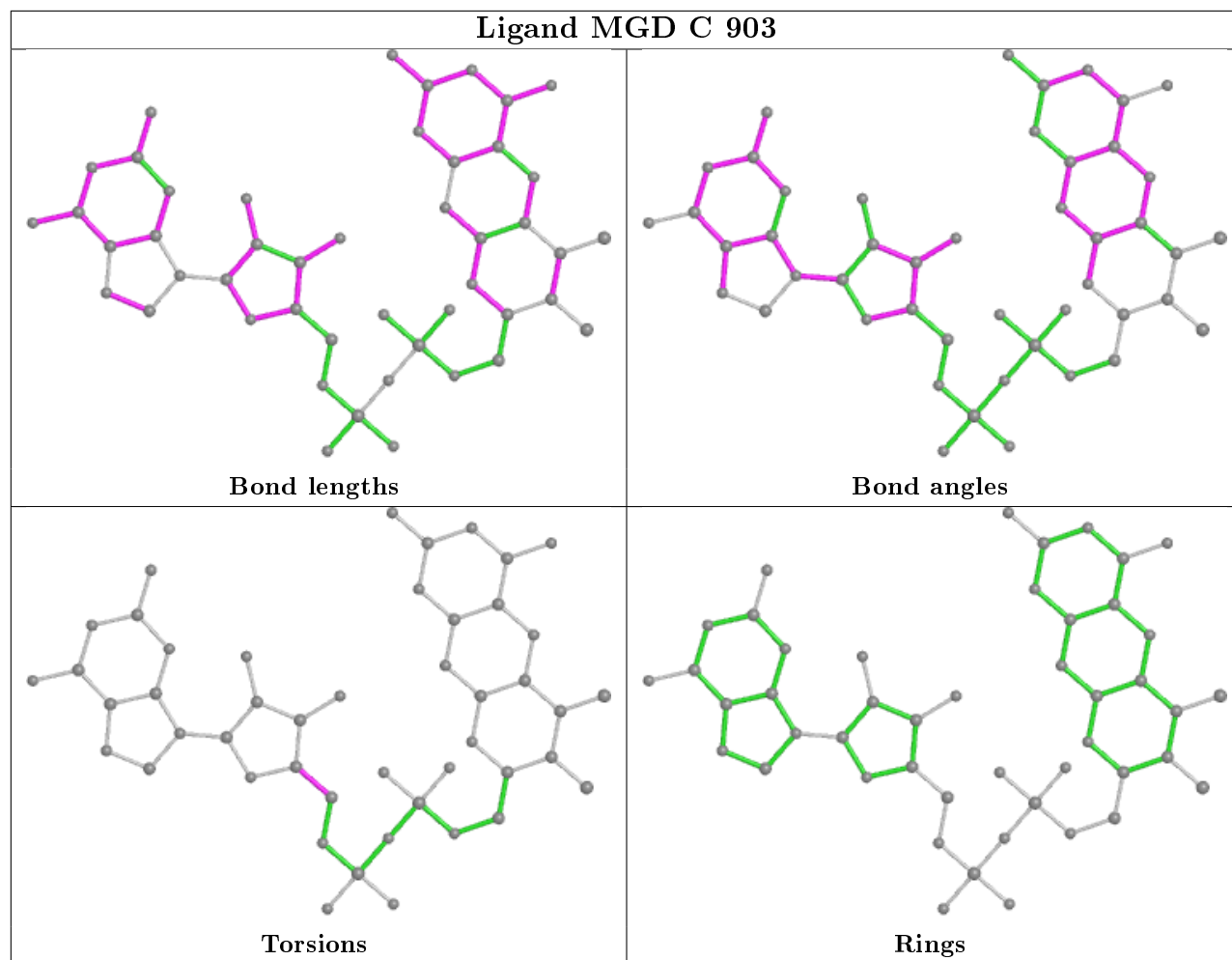
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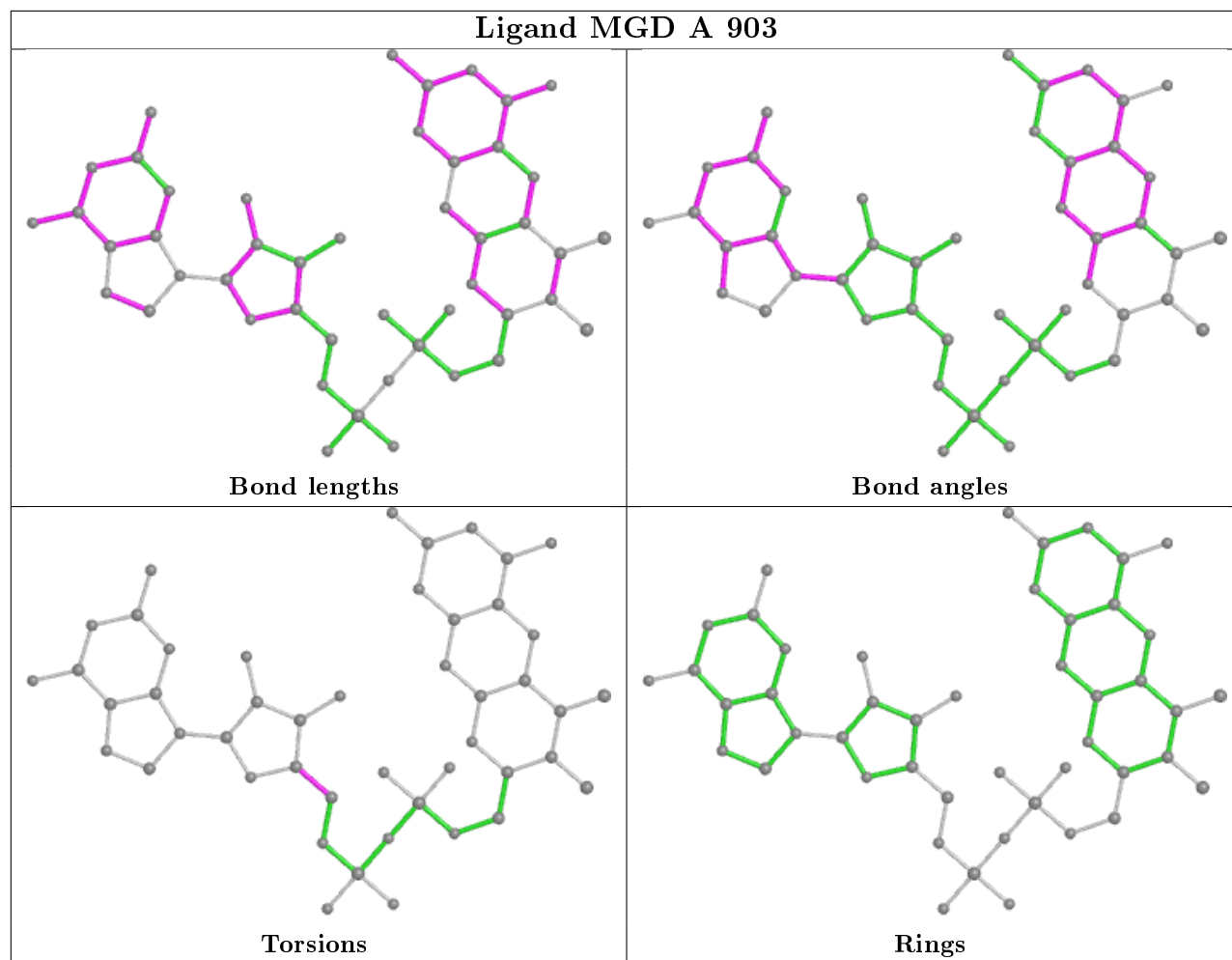
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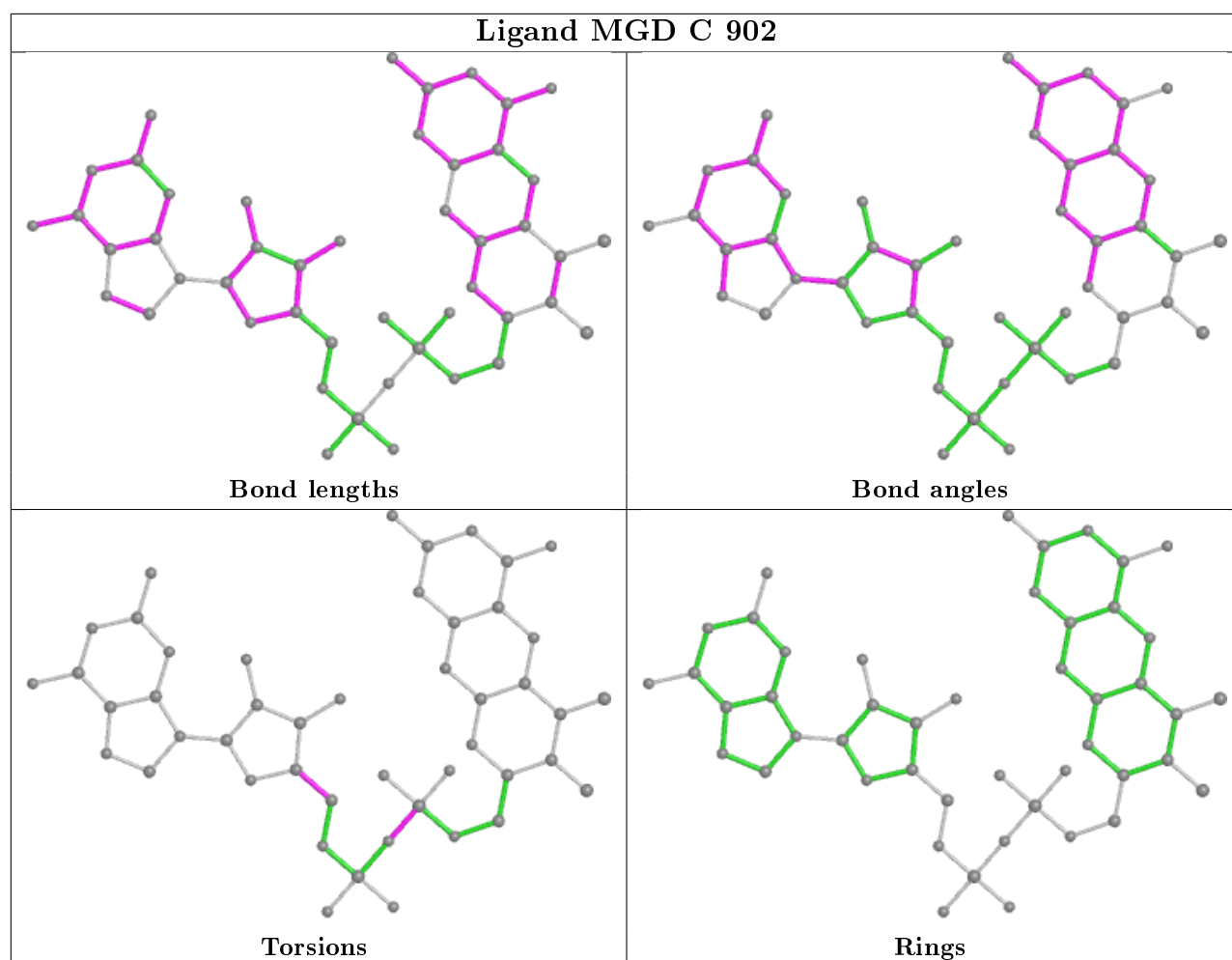
Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	A	903	MGD	2	0
3	B	302	SF4	1	0
4	C	902	MGD	2	0
3	B	301	SF4	1	0
7	C	908	PG5	2	0

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 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 [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, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q< 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	814/814 (100%)	-0.08	7 (0%) 84 84	15, 27, 48, 86	0
1	C	807/814 (99%)	-0.42	2 (0%) 95 94	14, 21, 36, 71	0
2	B	234/234 (100%)	-0.52	0 100 100	15, 21, 38, 55	0
2	D	234/234 (100%)	-0.39	2 (0%) 84 84	16, 21, 39, 59	0
All	All	2089/2096 (99%)	-0.30	11 (0%) 91 90	14, 23, 43, 86	0

The worst 5 of 11 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	48	LEU	4.8
1	A	302	ILE	4.1
1	A	307	LEU	4.0
1	A	301	PHE	3.6
1	A	304	GLY	2.8

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 carbohydrates in this entry.

6.4 Ligands [i](#)

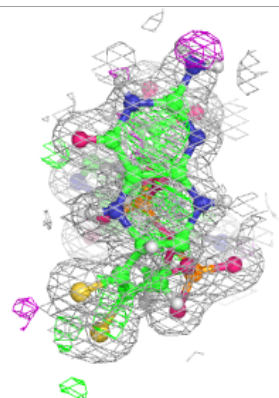
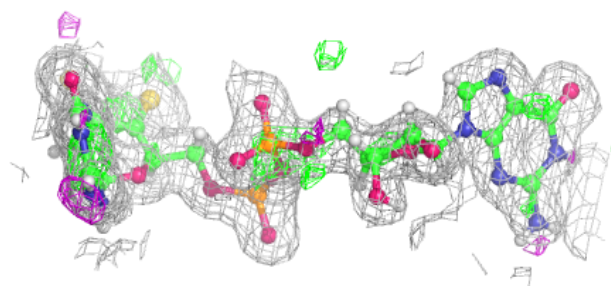
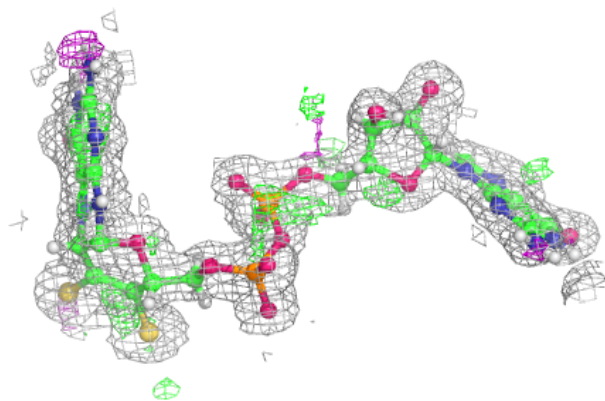
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled ‘Q< 0.9’ lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
7	PG5	A	908	12/12	0.72	0.27	53,65,73,75	0
7	PG5	C	908	12/12	0.81	0.17	48,60,68,81	0
6	FMT	A	907	3/3	0.85	0.16	32,36,56,68	0
8	PEG	D	306	7/7	0.87	0.12	38,49,60,72	0
6	FMT	C	907	3/3	0.95	0.16	27,30,33,35	0
6	FMT	D	305	3/3	0.96	0.10	27,31,38,44	0
6	FMT	A	906	3/3	0.96	0.08	31,32,33,40	0
6	FMT	C	906	3/3	0.97	0.10	24,26,29,29	0
4	MGD	A	902	47/47	0.97	0.15	16,22,30,31	0
6	FMT	C	905	3/3	0.97	0.12	17,18,21,25	0
4	MGD	C	903	47/47	0.98	0.11	13,16,21,22	0
6	FMT	A	905	3/3	0.98	0.12	19,20,23,29	0
6	FMT	B	305	3/3	0.98	0.18	39,44,46,47	0
4	MGD	C	902	47/47	0.98	0.12	12,17,22,23	0
4	MGD	A	903	47/47	0.98	0.12	17,21,27,30	0
3	SF4	B	301	8/8	0.99	0.06	17,18,18,18	0
3	SF4	D	301	8/8	0.99	0.07	18,18,18,18	0
3	SF4	B	303	8/8	1.00	0.05	17,18,19,19	0
3	SF4	B	304	8/8	1.00	0.05	21,22,23,23	0
5	MO	C	904	1/1	1.00	0.07	18,18,18,18	0
3	SF4	D	304	8/8	1.00	0.06	19,19,20,20	0
3	SF4	C	901	8/8	1.00	0.09	14,14,15,15	0
3	SF4	D	303	8/8	1.00	0.05	18,19,20,20	0
3	SF4	A	901	8/8	1.00	0.10	16,16,16,17	0
5	MO	A	904	1/1	1.00	0.07	22,22,22,22	0
3	SF4	B	302	8/8	1.00	0.06	15,16,16,16	0
3	SF4	D	302	8/8	1.00	0.06	16,17,17,17	0

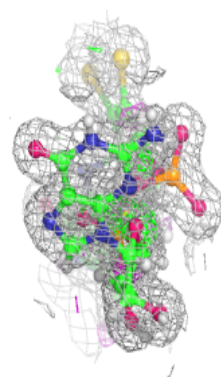
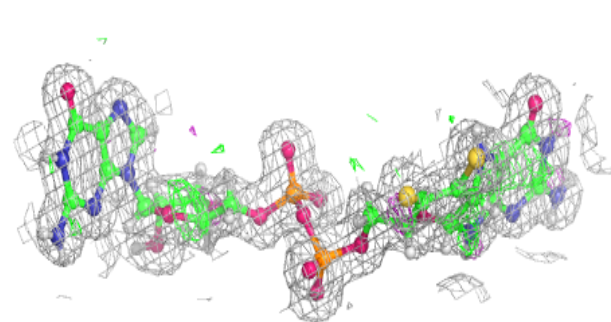
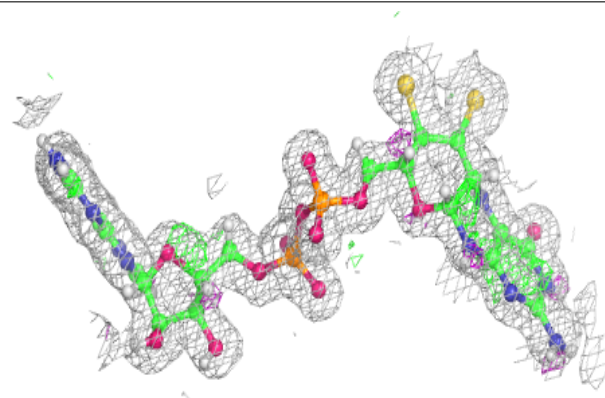
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.

Electron density around MGD A 902:

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

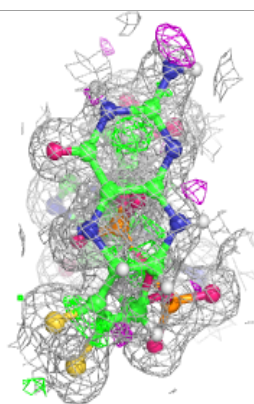
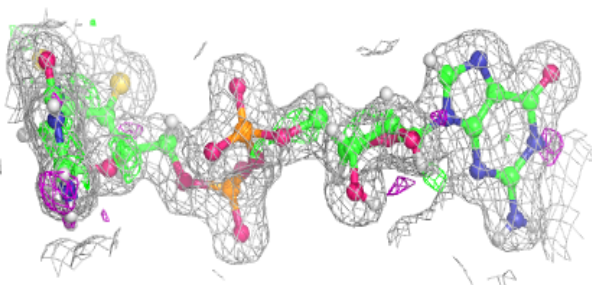
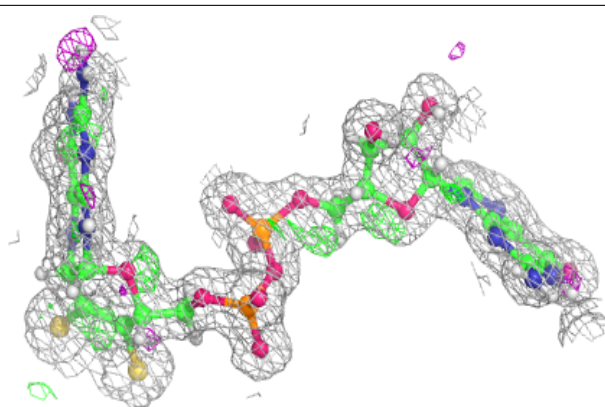
**Electron density around MGD C 903:**

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

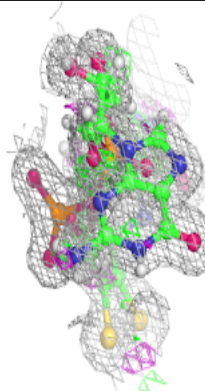
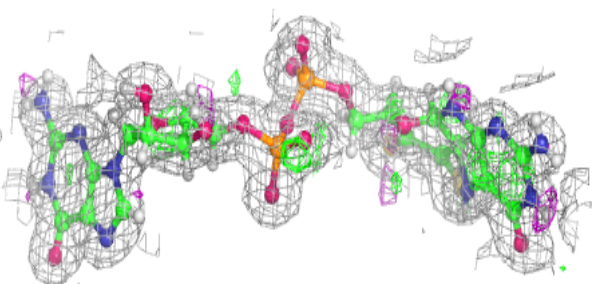
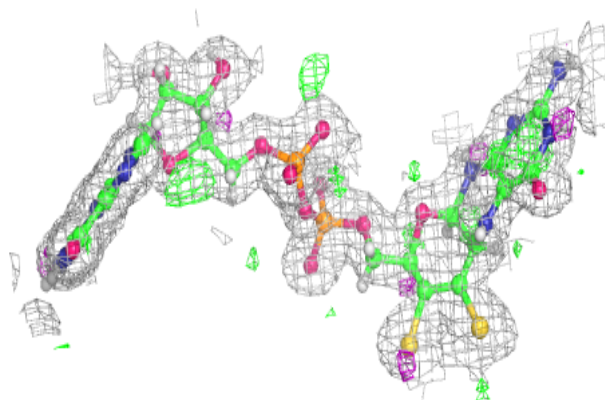


Electron density around MGD C 902:

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

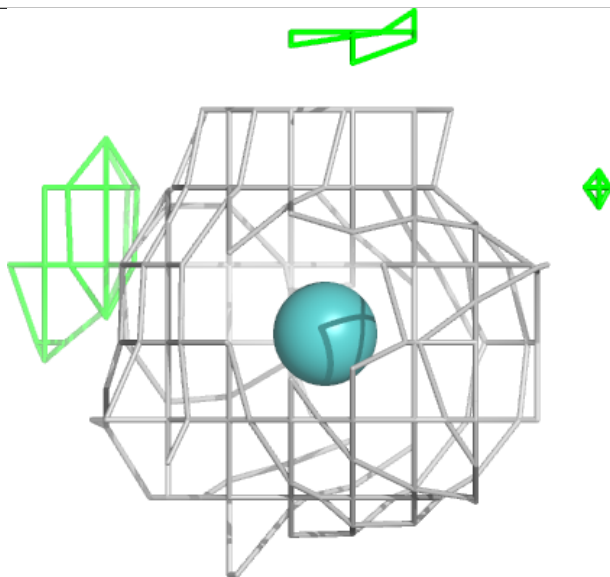
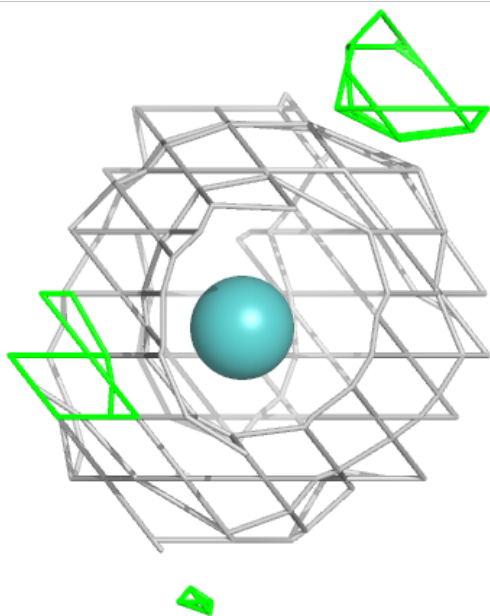
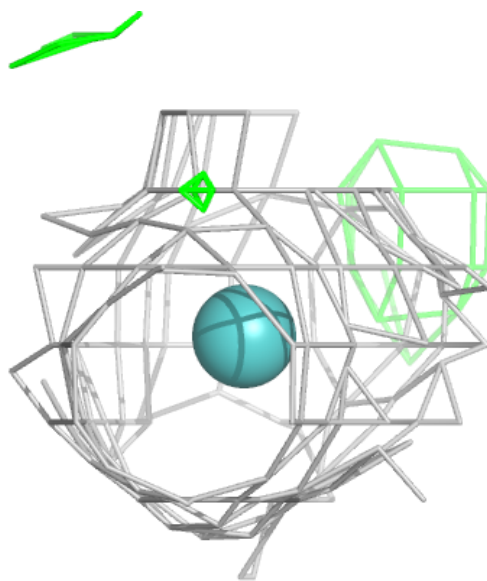
**Electron density around MGD A 903:**

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and green (positive)



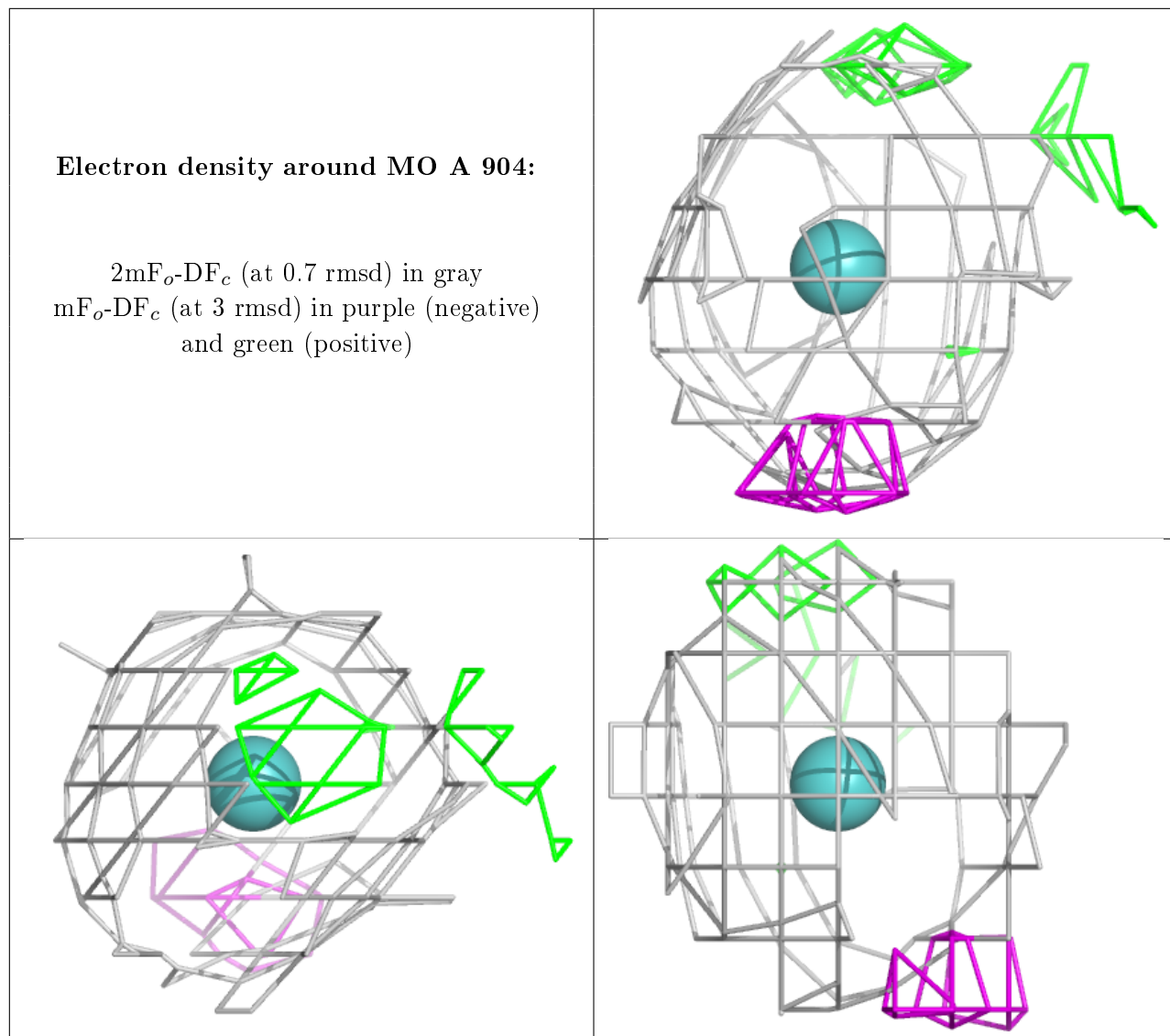
Electron density around MO C 904:

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



Electron density around MO A 904:

$2mF_o-DF_c$ (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.