



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 4, 2026 – 11:45 PM UTC

PDB ID : 5TTF / pdb_00005ttf
Title : Crystal structure of catalytic domain of G9a with MS012
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PEL, W.; Bountra, C.; Arrowsmith, C.H.; Edwards, A.M.; WU, H.; BROWN,
P.J.; Structural Genomics Consortium (SGC)
Deposited on : 2016-11-03
Resolution : 1.72 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	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

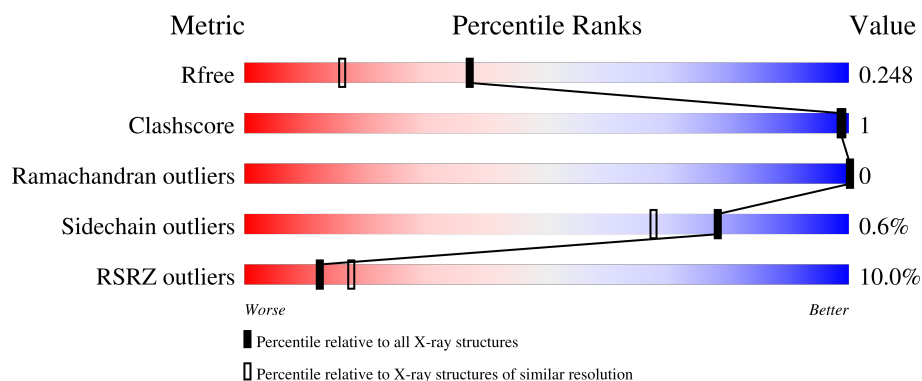
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.72 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	180053	1039 (1.72-1.72)
Clashscore	190562	1049 (1.72-1.72)
Ramachandran outliers	187476	1041 (1.72-1.72)
Sidechain outliers	187428	1041 (1.72-1.72)
RSRZ outliers	180081	1039 (1.72-1.72)

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 $\leq 5\%$. 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	283	8% 92% 6%
1	B	283	9% 94% 5%
1	C	283	8% 92% 6%
1	D	283	12% 90% 8%

2 Entry composition

There are 7 unique types of molecules in this entry. The entry contains 9234 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 Histone-lysine N-methyltransferase EHMT2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	265	Total	C	N	O	S	0	4	0
			2106	1323	363	396	24			
1	B	268	Total	C	N	O	S	0	3	0
			2117	1327	372	395	23			
1	C	265	Total	C	N	O	S	0	5	0
			2107	1324	369	391	23			
1	D	261	Total	C	N	O	S	0	6	0
			2090	1312	365	390	23			

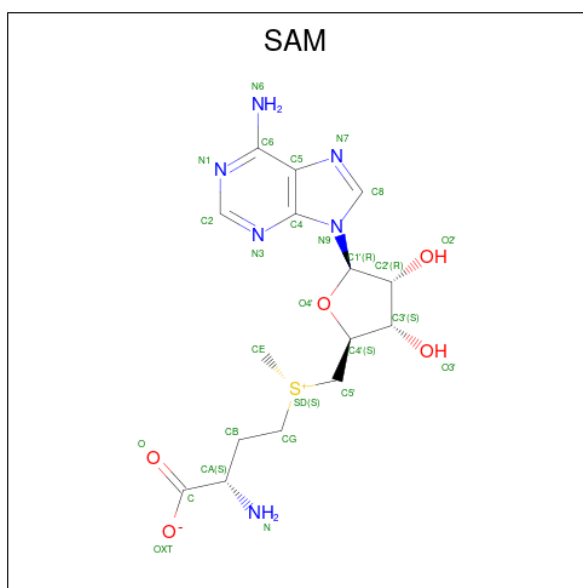
There are 8 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	911	GLY	-	expression tag	UNP Q96KQ7
A	912	SER	-	expression tag	UNP Q96KQ7
B	911	GLY	-	expression tag	UNP Q96KQ7
B	912	SER	-	expression tag	UNP Q96KQ7
C	911	GLY	-	expression tag	UNP Q96KQ7
C	912	SER	-	expression tag	UNP Q96KQ7
D	911	GLY	-	expression tag	UNP Q96KQ7
D	912	SER	-	expression tag	UNP Q96KQ7

- Molecule 2 is ZINC ION (CCD ID: ZN) (formula: Zn).

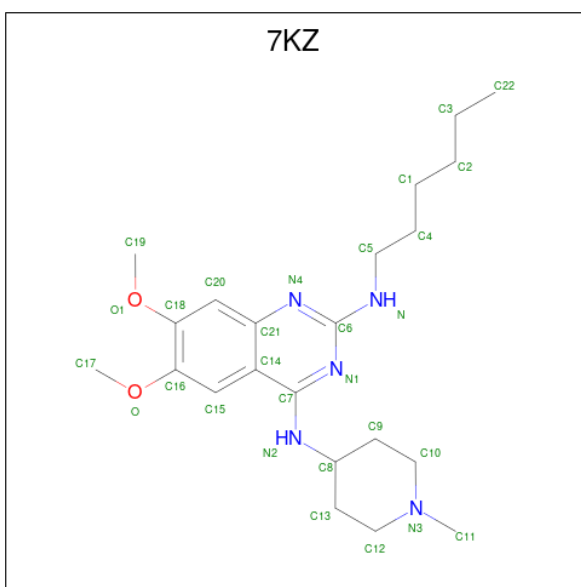
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	4	Total	Zn	0	0
			4	4		
2	B	4	Total	Zn	0	0
			4	4		
2	C	4	Total	Zn	0	0
			4	4		
2	D	4	Total	Zn	0	0
			4	4		

- Molecule 3 is S-ADENOSYLMETHIONINE (CCD ID: SAM) (formula: $C_{15}H_{22}N_6O_5S$).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total	C	N	O	S	0	0
			27	15	6	5	1		
3	B	1	Total	C	N	O	S	0	0
			27	15	6	5	1		
3	C	1	Total	C	N	O	S	0	0
			27	15	6	5	1		
3	D	1	Total	C	N	O	S	0	0
			27	15	6	5	1		

- Molecule 4 is N4-(1-methylpiperidin-4-yl)-N2-hexyl-6,7-dimethoxyquinazoline-2,4-diamine (CCD ID: 7KZ) (formula: $C_{22}H_{35}N_5O_2$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	A	1	Total	C	N	O	0	0
			24	17	5	2		
4	B	1	Total	C	N	O	0	0
			24	17	5	2		
4	C	1	Total	C	N	O	0	0
			24	17	5	2		
4	D	1	Total	C	N	O	0	0
			24	17	5	2		

- Molecule 5 is CHLORIDE ION (CCD ID: CL) (formula: Cl).

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

- Molecule 6 is UNKNOWN ATOM OR ION (CCD ID: UNX) (formula: X).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	1	Total	X	0	0
			1	1		
6	B	2	Total	X	0	0
			2	2		
6	C	1	Total	X	0	0
			1	1		
6	D	1	Total	X	0	0
			1	1		

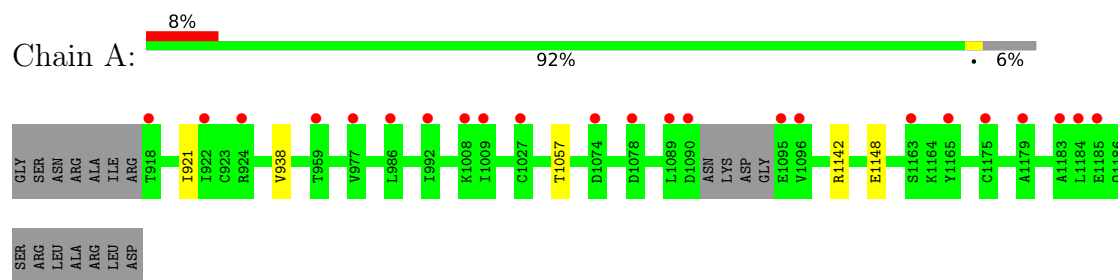
- Molecule 7 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	141	Total 142	O 142	0	1
7	B	148	Total 148	O 148	0	0
7	C	147	Total 148	O 148	0	1
7	D	150	Total 150	O 150	0	0

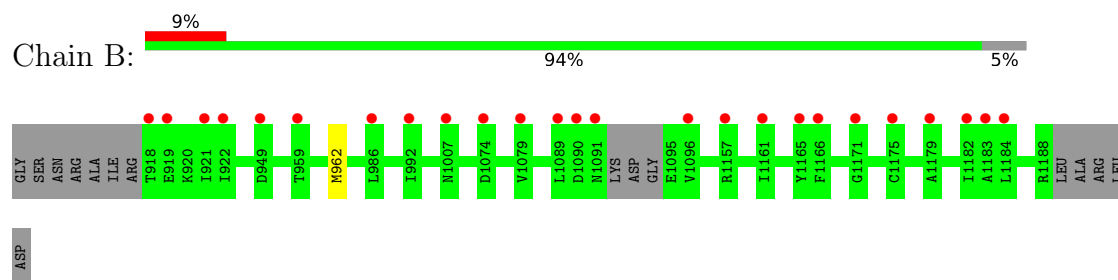
3 Residue-property plots [i](#)

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.

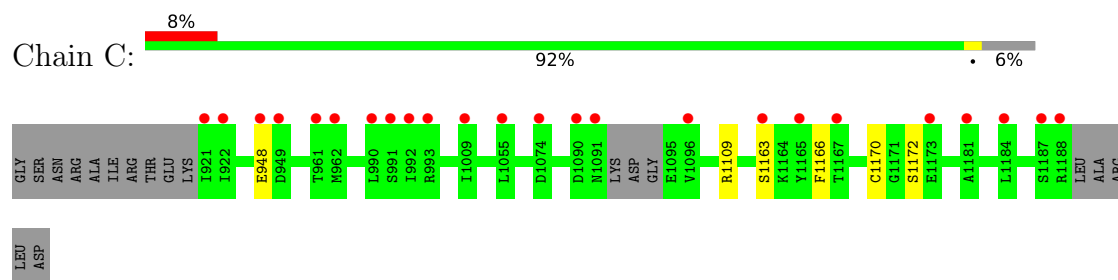
- Molecule 1: Histone-lysine N-methyltransferase EHMT2



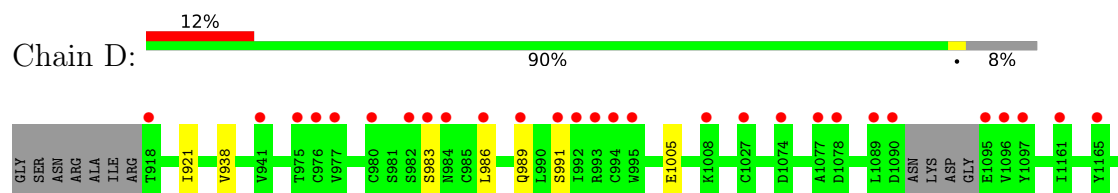
- Molecule 1: Histone-lysine N-methyltransferase EHMT2

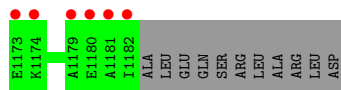


- Molecule 1: Histone-lysine N-methyltransferase EHMT2



- Molecule 1: Histone-lysine N-methyltransferase EHMT2





4 Data and refinement statistics

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α , β , γ	56.85Å 67.75Å 77.84Å 92.09° 90.05° 91.80°	Depositor
Resolution (Å)	50.01 – 1.72 50.01 – 1.72	Depositor EDS
% Data completeness (in resolution range)	96.5 (50.01-1.72) 96.5 (50.01-1.72)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.02 (at 1.72Å)	Xtriage
Refinement program	REFMAC 5.8.0155	Depositor
R, R_{free}	0.207 , 0.247 0.212 , 0.248	Depositor DCC
R_{free} test set	1277 reflections (1.03%)	wwPDB-VP
Wilson B-factor (Å ²)	21.6	Xtriage
Anisotropy	0.691	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.35 , 36.5	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtriage
Estimated twinning fraction	0.010 for h,-k,-l 0.010 for -h,k,-l 0.108 for -h,-k,l	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	9234	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 23.34 % 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 4.7570e-03. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

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: SAM, UNX, CL, 7KZ, ZN

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	0.71	0/2160	0.80	0/2925
1	B	0.72	0/2171	0.81	0/2940
1	C	0.72	0/2167	0.81	0/2933
1	D	0.68	0/2153	0.80	0/2914
All	All	0.71	0/8651	0.80	0/11712

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	2106	0	1964	2	0
1	B	2117	0	1981	0	0
1	C	2107	0	1987	4	0
1	D	2090	0	1968	3	0
2	A	4	0	0	0	0
2	B	4	0	0	0	0
2	C	4	0	0	0	0
2	D	4	0	0	0	0
3	A	27	0	22	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	B	27	0	22	0	0
3	C	27	0	22	1	0
3	D	27	0	22	0	0
4	A	24	0	0	0	0
4	B	24	0	0	0	0
4	C	24	0	0	0	0
4	D	24	0	0	0	0
5	A	1	0	0	0	0
6	A	1	0	0	0	0
6	B	2	0	0	0	0
6	C	1	0	0	0	0
6	D	1	0	0	0	0
7	A	142	0	0	0	0
7	B	148	0	0	0	0
7	C	148	0	0	2	0
7	D	150	0	0	0	0
All	All	9234	0	7988	9	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 1.

All (9) 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:921:ILE:HD13	1:A:938:VAL:HG12	1.83	0.61
1:D:921:ILE:HD13	1:D:938:VAL:HG12	1.83	0.61
1:C:1172:SER:N	7:C:1601:HOH:O	2.37	0.57
1:D:983:SER:O	1:D:989:GLN:NE2	2.45	0.49
1:C:1163:SER:HA	1:C:1166:PHE:O	2.14	0.48
1:C:1170:CYS:C	7:C:1601:HOH:O	2.58	0.46
1:A:1142[A]:ARG:NH2	1:A:1148:GLU:OE2	2.47	0.44
1:D:986:LEU:HD23	1:D:986:LEU:C	2.45	0.42
1:C:1109:ARG:O	3:C:1505:SAM:HE2	2.21	0.41

There are no symmetry-related clashes.

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	265/283 (94%)	249 (94%)	16 (6%)	0	100	100
1	B	267/283 (94%)	255 (96%)	12 (4%)	0	100	100
1	C	266/283 (94%)	257 (97%)	9 (3%)	0	100	100
1	D	263/283 (93%)	251 (95%)	12 (5%)	0	100	100
All	All	1061/1132 (94%)	1012 (95%)	49 (5%)	0	100	100

There are no Ramachandran outliers to report.

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	227/253 (90%)	225 (99%)	2 (1%)	70	57
1	B	227/253 (90%)	226 (100%)	1 (0%)	84	76
1	C	228/253 (90%)	227 (100%)	1 (0%)	84	76
1	D	228/253 (90%)	226 (99%)	2 (1%)	70	57
All	All	910/1012 (90%)	904 (99%)	6 (1%)	78	64

All (6) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	1057[A]	THR
1	A	1057[B]	THR

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Mol	Chain	Res	Type
1	B	962	MET
1	C	948	GLU
1	D	991	SER
1	D	1005	GLU

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	1177	HIS
1	B	1060	GLN
1	C	984	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 oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 30 ligands modelled in this entry, 17 are monoatomic and 5 are unknown - 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	SAM	A	1505	-	27,29,29	1.54	5 (18%)	34,42,42	1.82	9 (26%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
4	7KZ	D	1506	-	25,26,31	0.32	0	34,35,41	0.92	2 (5%)
4	7KZ	B	1506	-	25,26,31	0.30	0	34,35,41	1.04	2 (5%)
3	SAM	C	1505	-	27,29,29	1.44	3 (11%)	34,42,42	1.72	8 (23%)
3	SAM	D	1505	-	27,29,29	1.45	5 (18%)	34,42,42	1.87	8 (23%)
3	SAM	B	1505	-	27,29,29	1.46	5 (18%)	34,42,42	1.90	10 (29%)
4	7KZ	A	1506	-	25,26,31	0.27	0	34,35,41	0.79	2 (5%)
4	7KZ	C	1506	-	25,26,31	0.28	0	34,35,41	1.15	2 (5%)

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	SAM	A	1505	-	-	2/17/33/33	0/3/3/3
4	7KZ	D	1506	-	-	0/11/19/25	0/3/3/3
4	7KZ	B	1506	-	-	0/11/19/25	0/3/3/3
3	SAM	C	1505	-	-	2/17/33/33	0/3/3/3
3	SAM	D	1505	-	-	3/17/33/33	0/3/3/3
3	SAM	B	1505	-	-	2/17/33/33	0/3/3/3
4	7KZ	A	1506	-	-	0/11/19/25	0/3/3/3
4	7KZ	C	1506	-	-	1/11/19/25	0/3/3/3

All (18) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	1505	SAM	C5-C4	4.75	1.47	1.39
3	C	1505	SAM	C5-C4	4.59	1.47	1.39
3	B	1505	SAM	C5-C4	4.50	1.47	1.39
3	D	1505	SAM	C5-C4	4.10	1.46	1.39
3	C	1505	SAM	C5-C6	2.86	1.49	1.41
3	B	1505	SAM	C5-C6	2.75	1.48	1.41
3	A	1505	SAM	C5-C6	2.73	1.48	1.41
3	D	1505	SAM	C5-N7	-2.66	1.34	1.39
3	D	1505	SAM	C5-C6	2.63	1.48	1.41
3	D	1505	SAM	C4-N9	-2.46	1.32	1.37
3	A	1505	SAM	C5-N7	-2.30	1.34	1.39
3	A	1505	SAM	C4-N9	-2.22	1.33	1.37
3	A	1505	SAM	CE-SD	-2.14	1.65	1.78
3	B	1505	SAM	CE-SD	-2.11	1.65	1.78

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	D	1505	SAM	CE-SD	-2.10	1.65	1.78
3	B	1505	SAM	C8-N7	2.06	1.35	1.31
3	C	1505	SAM	CE-SD	-2.02	1.66	1.78
3	B	1505	SAM	C5-N7	-2.01	1.35	1.39

All (43) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	D	1505	SAM	C5-C4-N3	-5.52	119.12	126.72
3	B	1505	SAM	C5-C4-N3	-4.95	119.90	126.72
3	C	1505	SAM	C5-C4-N3	-4.68	120.27	126.72
4	B	1506	7KZ	C5-N-C6	4.51	131.00	124.35
3	B	1505	SAM	N3-C4-N9	4.44	134.72	127.17
4	C	1506	7KZ	C5-N-C6	4.39	130.81	124.35
3	A	1505	SAM	C5-C4-N3	-4.38	120.69	126.72
4	C	1506	7KZ	C7-N2-C8	4.32	131.62	124.06
3	D	1505	SAM	N3-C4-N9	4.13	134.19	127.17
3	A	1505	SAM	N3-C4-N9	3.81	133.65	127.17
3	C	1505	SAM	N3-C4-N9	3.79	133.62	127.17
3	D	1505	SAM	C4-C5-N7	-3.47	106.62	110.58
3	A	1505	SAM	N3-C2-N1	-3.41	123.42	128.58
4	D	1506	7KZ	C5-N-C6	3.37	129.32	124.35
3	B	1505	SAM	C4-N9-C8	3.17	109.07	105.74
3	C	1505	SAM	N3-C2-N1	-3.17	123.78	128.58
3	D	1505	SAM	C2-N3-C4	3.14	119.49	111.83
4	B	1506	7KZ	C7-N2-C8	3.12	129.53	124.06
4	D	1506	7KZ	C7-N2-C8	3.11	129.51	124.06
3	C	1505	SAM	C2-N3-C4	3.08	119.36	111.83
3	B	1505	SAM	C2-N3-C4	3.07	119.34	111.83
3	B	1505	SAM	N3-C2-N1	-3.07	123.93	128.58
3	B	1505	SAM	CG-SD-C5'	3.00	110.77	103.43
3	A	1505	SAM	C2-N1-C6	2.97	123.61	118.73
3	A	1505	SAM	C2-N3-C4	2.86	118.82	111.83
3	A	1505	SAM	C4-N9-C8	2.84	108.72	105.74
4	A	1506	7KZ	C5-N-C6	2.79	128.46	124.35
3	D	1505	SAM	CG-SD-C5'	2.78	110.22	103.43
3	C	1505	SAM	CG-SD-C5'	2.77	110.21	103.43
3	C	1505	SAM	C4-C5-N7	-2.75	107.44	110.58
3	A	1505	SAM	C4-C5-N7	-2.73	107.46	110.58
3	A	1505	SAM	CG-SD-C5'	2.69	110.02	103.43
3	D	1505	SAM	C5-N7-C8	2.61	107.55	103.45
3	D	1505	SAM	N3-C2-N1	-2.50	124.79	128.58

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	C	1505	SAM	C2-N1-C6	2.47	122.80	118.73
3	B	1505	SAM	C4-C5-N7	-2.40	107.83	110.58
3	B	1505	SAM	N6-C6-N1	2.24	123.36	118.38
4	A	1506	7KZ	C7-N2-C8	2.20	127.92	124.06
3	A	1505	SAM	C5-N7-C8	2.19	106.89	103.45
3	D	1505	SAM	C4-N9-C8	2.18	108.02	105.74
3	C	1505	SAM	C4-N9-C8	2.16	108.01	105.74
3	B	1505	SAM	N9-C8-N7	-2.15	110.89	113.94
3	B	1505	SAM	C5-N7-C8	2.14	106.81	103.45

There are no chirality outliers.

All (10) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	1505	SAM	CB-CG-SD-CE
3	A	1505	SAM	CB-CG-SD-C5'
3	B	1505	SAM	CB-CG-SD-CE
3	B	1505	SAM	CB-CG-SD-C5'
3	C	1505	SAM	CB-CG-SD-CE
3	C	1505	SAM	CB-CG-SD-C5'
3	D	1505	SAM	CB-CG-SD-CE
3	D	1505	SAM	CB-CG-SD-C5'
4	C	1506	7KZ	C4-C5-N-C6
3	D	1505	SAM	C-CA-CB-CG

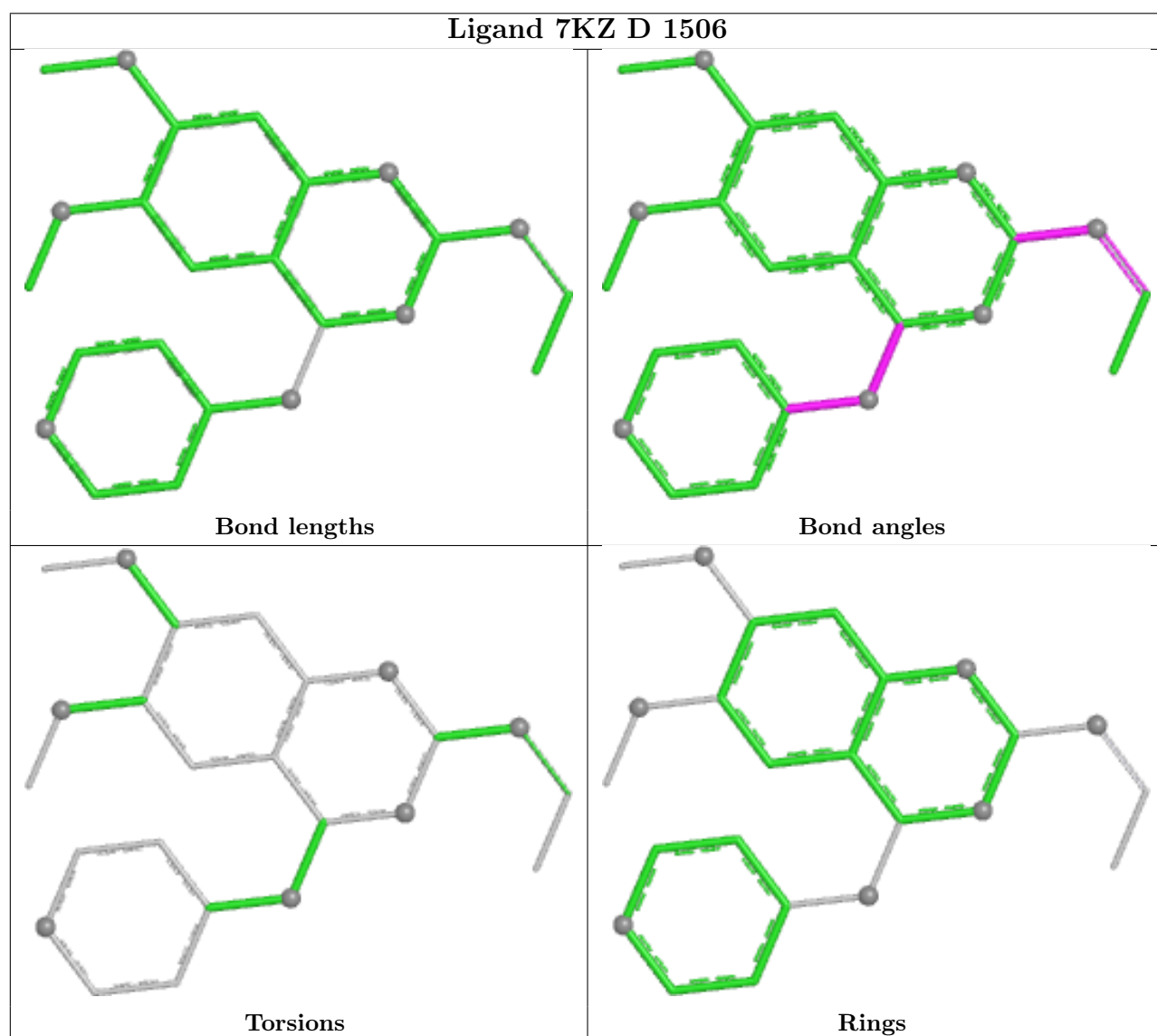
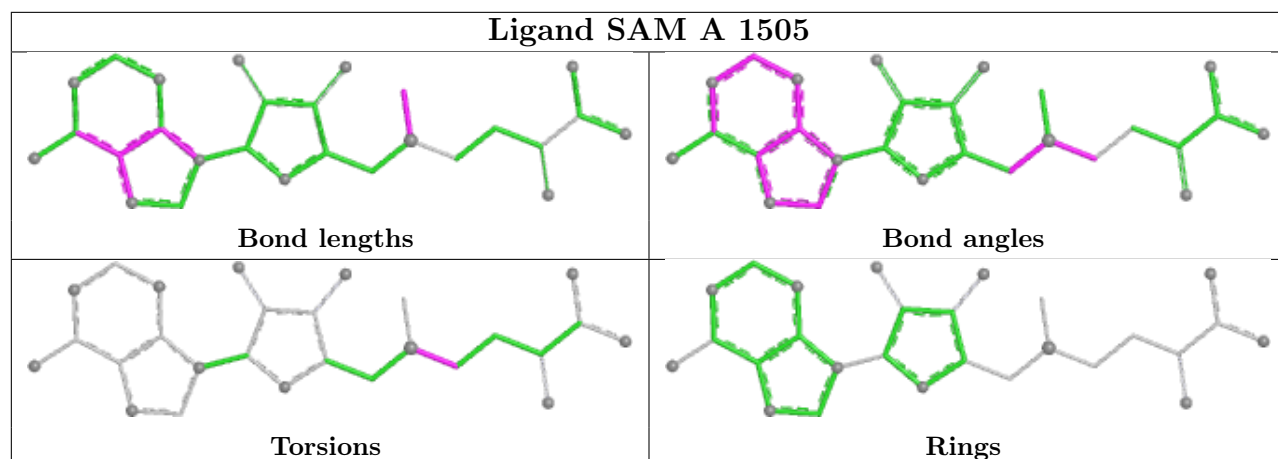
There are no ring outliers.

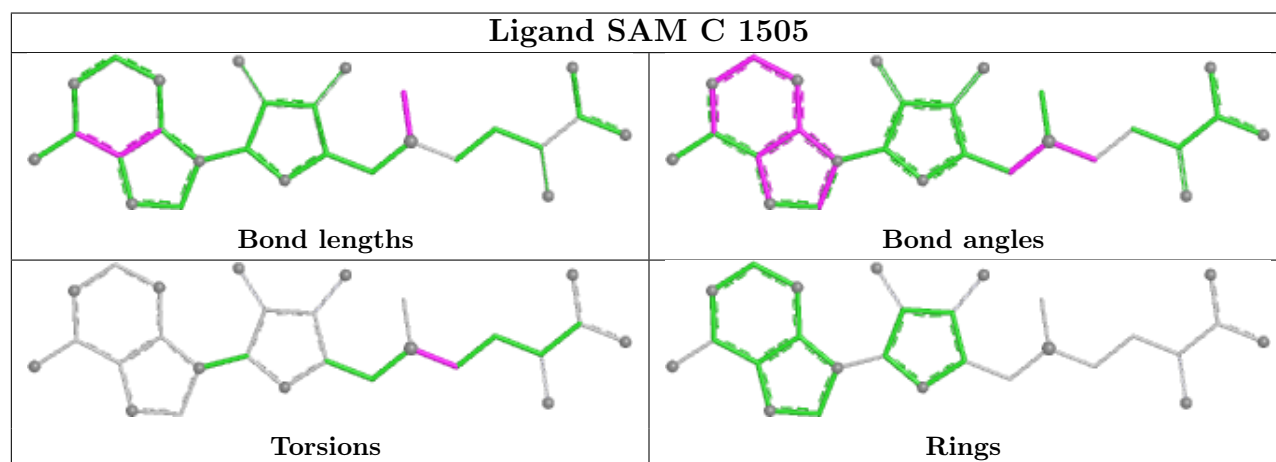
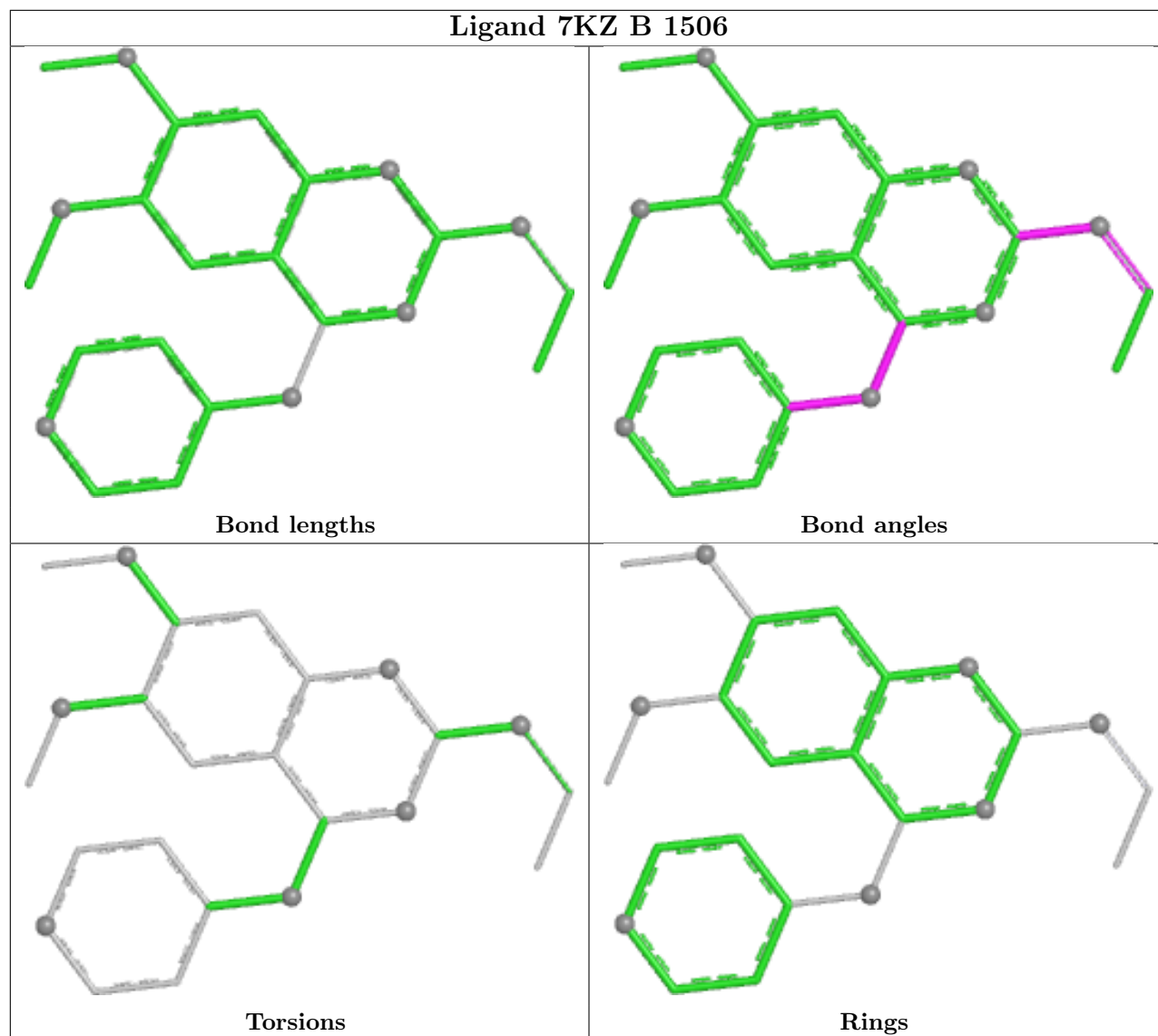
1 monomer is involved in 1 short contact:

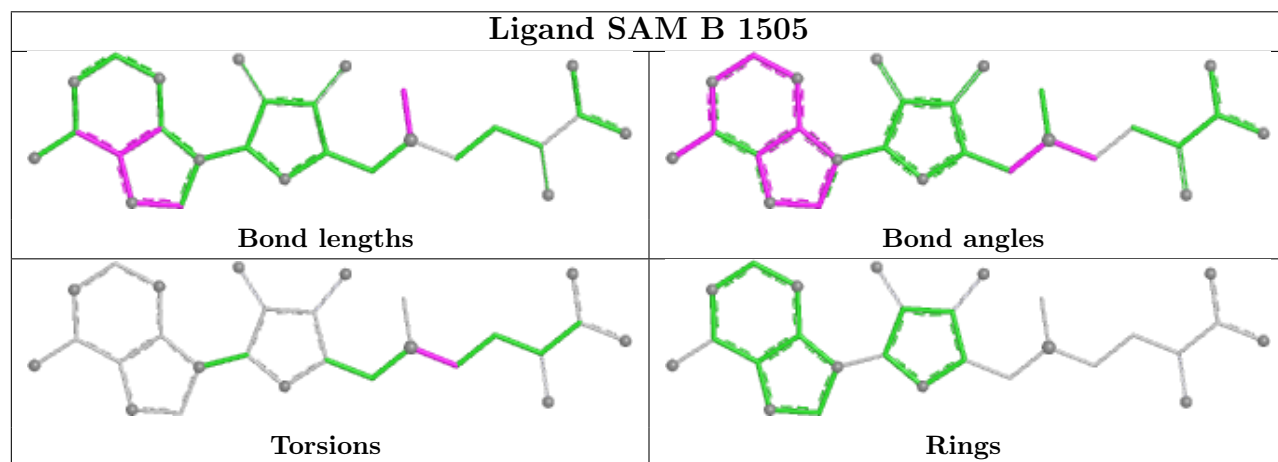
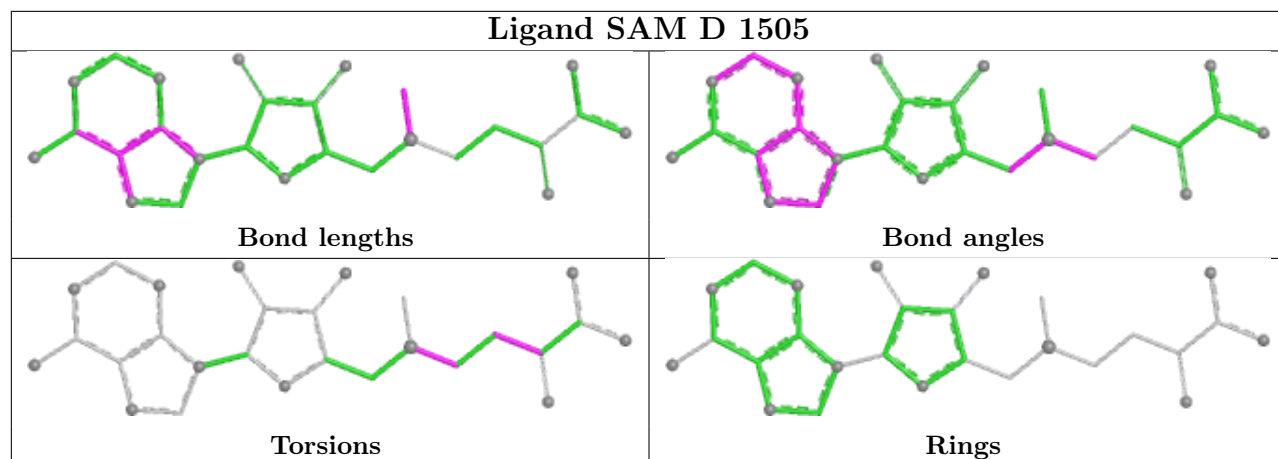
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	C	1505	SAM	1	0

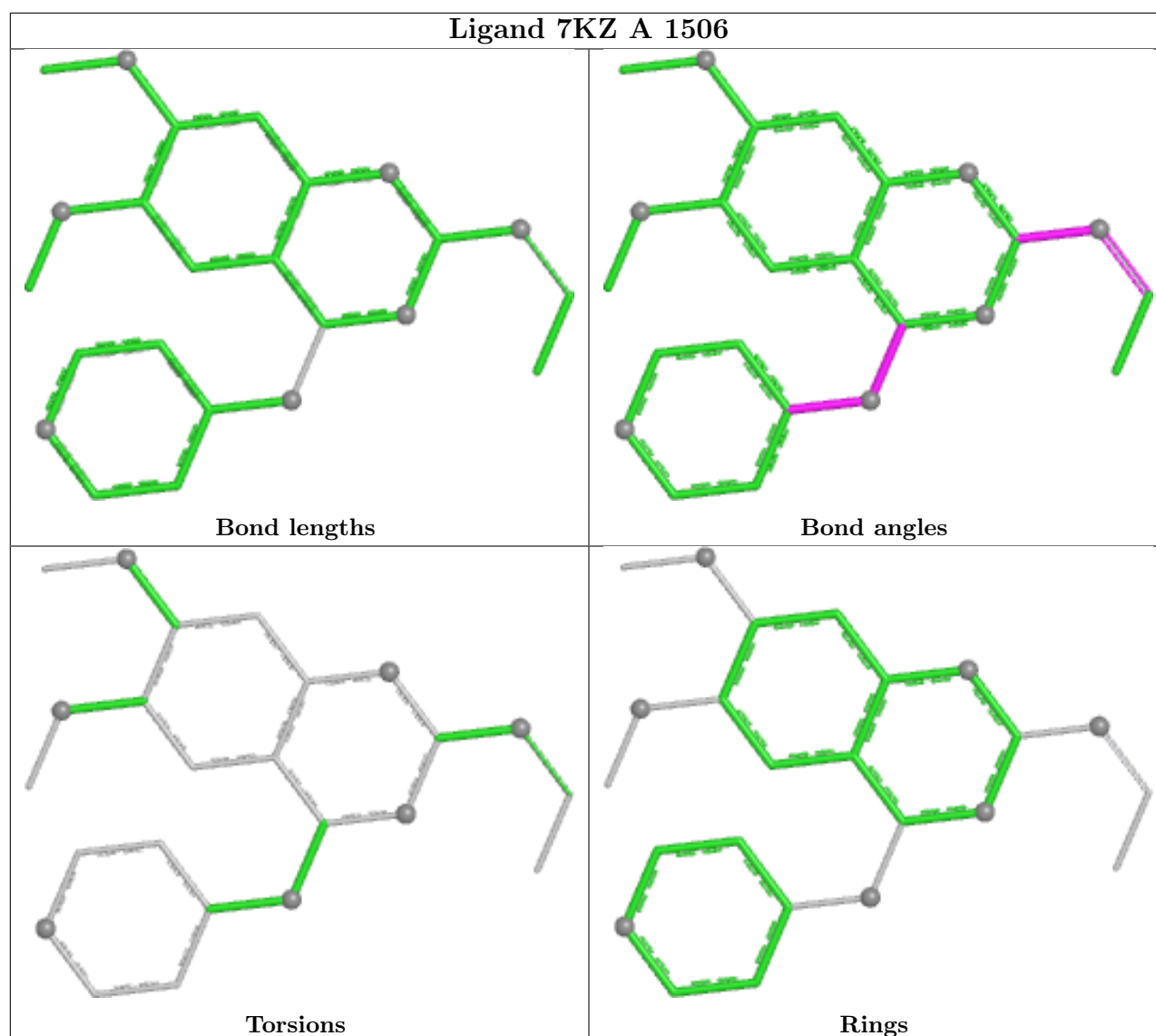
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

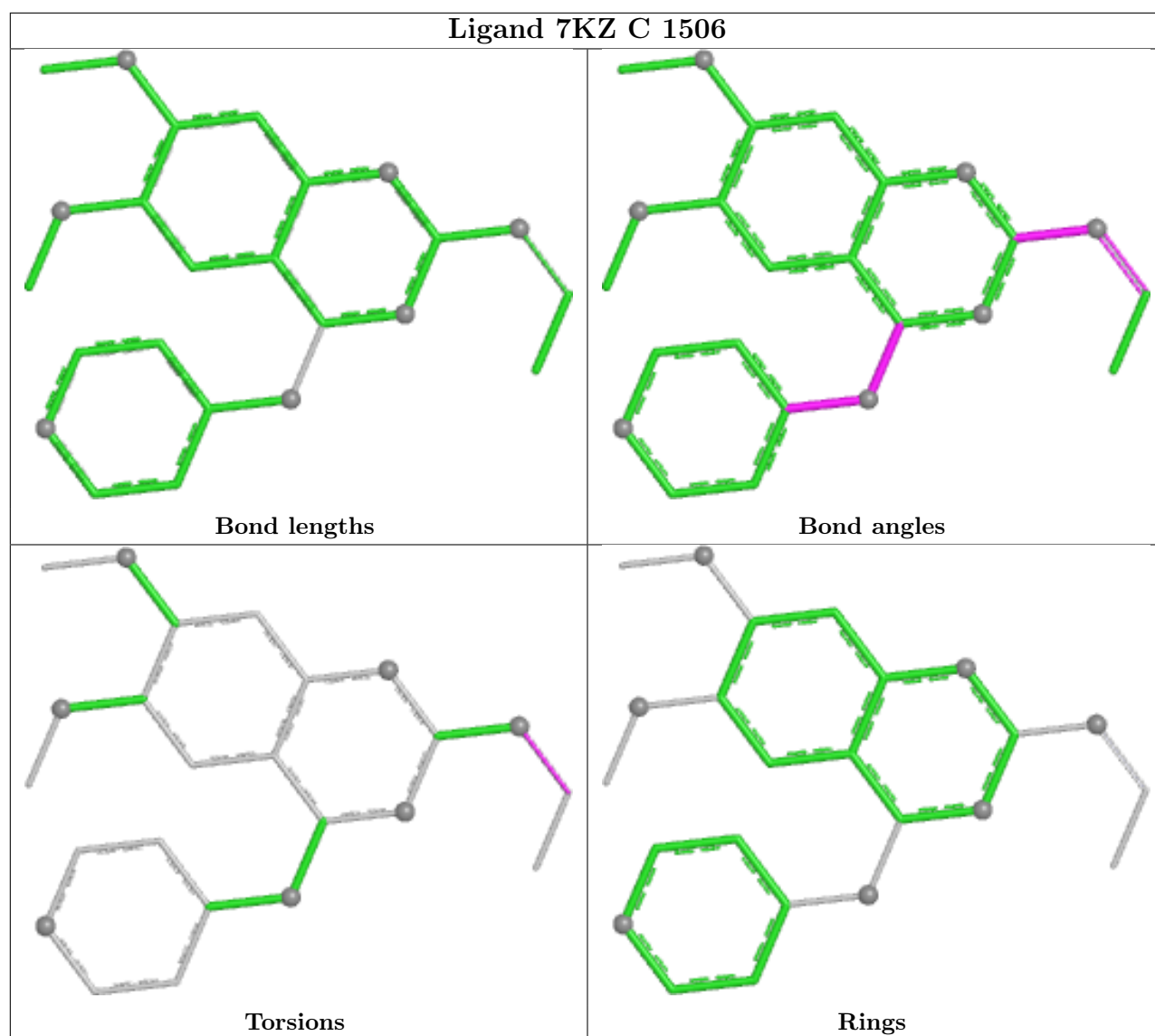
equivalents in the CSD to analyse the geometry.











5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [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, 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	265/283 (93%)	0.84	23 (8%)	16 21	13, 29, 45, 57	4 (1%)
1	B	268/283 (94%)	0.85	25 (9%)	14 19	14, 28, 47, 65	3 (1%)
1	C	265/283 (93%)	0.78	24 (9%)	15 20	12, 26, 45, 62	5 (1%)
1	D	261/283 (92%)	0.89	34 (13%)	7 11	13, 28, 48, 54	6 (2%)
All	All	1059/1132 (93%)	0.84	106 (10%)	12 18	12, 28, 47, 65	18 (1%)

All (106) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	921	ILE	6.6
1	C	1090	ASP	5.2
1	A	1009	ILE	4.4
1	D	991	SER	4.3
1	D	1161	ILE	4.2
1	A	1179	ALA	4.1
1	A	918	THR	3.9
1	C	1188	ARG	3.9
1	D	1096	VAL	3.8
1	B	918	THR	3.8
1	B	922	ILE	3.7
1	C	922	ILE	3.7
1	D	1095	GLU	3.6
1	D	1182	ILE	3.5
1	D	1090	ASP	3.5
1	B	1179	ALA	3.4
1	D	918	THR	3.4
1	B	1183	ALA	3.4
1	A	1090	ASP	3.4
1	A	1183	ALA	3.3
1	B	1089	LEU	3.3

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Mol	Chain	Res	Type	RSRZ
1	D	1074	ASP	3.2
1	C	1165	TYR	3.1
1	D	1165	TYR	3.1
1	B	1165	TYR	3.1
1	B	1184	LEU	3.1
1	B	1091	ASN	3.0
1	D	992	ILE	3.0
1	D	977	VAL	3.0
1	D	1173	GLU	2.9
1	C	992	ILE	2.9
1	B	1090	ASP	2.9
1	A	977	VAL	2.9
1	C	1091	ASN	2.9
1	B	1166	PHE	2.9
1	A	1096	VAL	2.9
1	B	921	ILE	2.8
1	B	959	THR	2.8
1	A	1184	LEU	2.8
1	B	1182	ILE	2.8
1	C	1187	SER	2.8
1	B	986	LEU	2.7
1	D	1180	GLU	2.7
1	A	1165	TYR	2.7
1	D	986	LEU	2.7
1	A	1095	GLU	2.7
1	D	1181	ALA	2.7
1	C	1163	SER	2.7
1	B	1161	ILE	2.7
1	B	949	ASP	2.7
1	C	1181	ALA	2.6
1	A	1175	CYS	2.5
1	D	1089	LEU	2.5
1	B	992	ILE	2.5
1	D	1078	ASP	2.5
1	D	982	SER	2.5
1	D	975	THR	2.5
1	D	1027	CYS	2.5
1	C	1096	VAL	2.4
1	D	976	CYS	2.4
1	D	994	CYS	2.4
1	A	986	LEU	2.4
1	C	1173	GLU	2.4

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Mol	Chain	Res	Type	RSRZ
1	D	980	CYS	2.4
1	A	1089	LEU	2.4
1	C	1055	LEU	2.4
1	D	983	SER	2.3
1	C	961	THR	2.3
1	A	1163	SER	2.3
1	A	1185	GLU	2.3
1	D	1174	LYS	2.3
1	D	1179	ALA	2.3
1	C	1184	LEU	2.3
1	B	1074	ASP	2.3
1	B	919	GLU	2.2
1	A	1074	ASP	2.2
1	C	949	ASP	2.2
1	B	1096	VAL	2.2
1	D	984[A]	ASN	2.2
1	A	1078	ASP	2.2
1	D	993	ARG	2.2
1	A	959	THR	2.2
1	C	993	ARG	2.2
1	B	1079	VAL	2.1
1	D	941	VAL	2.1
1	B	1157	ARG	2.1
1	D	1008	LYS	2.1
1	C	962	MET	2.1
1	D	989	GLN	2.1
1	A	922	ILE	2.1
1	C	1009	ILE	2.1
1	B	1175	CYS	2.1
1	A	992	ILE	2.1
1	D	1077	ALA	2.1
1	B	1007	ASN	2.1
1	C	991	SER	2.1
1	C	1074	ASP	2.1
1	A	924	ARG	2.1
1	C	990	LEU	2.1
1	C	1167	THR	2.1
1	A	1008	LYS	2.1
1	D	1097	TYR	2.1
1	B	1171	GLY	2.0
1	C	948	GLU	2.0
1	A	1027	CYS	2.0

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Mol	Chain	Res	Type	RSRZ
1	D	995	TRP	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, 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($\text{\AA}^2$)	Q<0.9
6	UNX	D	1507	1/1	0.75	0.20	30,30,30,30	0
4	7KZ	B	1506	24/29	0.84	0.12	32,36,42,43	0
4	7KZ	D	1506	24/29	0.85	0.13	29,34,42,42	0
4	7KZ	A	1506	24/29	0.87	0.12	31,33,42,43	0
6	UNX	B	1507	1/1	0.88	0.19	30,30,30,30	0
6	UNX	A	1508	1/1	0.89	0.27	30,30,30,30	0
6	UNX	B	1508	1/1	0.90	0.17	30,30,30,30	0
4	7KZ	C	1506	24/29	0.90	0.10	25,31,43,44	0
6	UNX	C	1507	1/1	0.91	0.24	30,30,30,30	0
3	SAM	B	1505	27/27	0.92	0.09	24,26,30,30	0
3	SAM	A	1505	27/27	0.94	0.08	23,26,30,31	0
3	SAM	C	1505	27/27	0.94	0.08	23,25,26,26	0
3	SAM	D	1505	27/27	0.94	0.09	23,26,28,28	0
2	ZN	A	1504	1/1	0.97	0.04	30,30,30,30	0
2	ZN	B	1504	1/1	0.97	0.04	29,29,29,29	0
2	ZN	C	1504	1/1	0.97	0.04	26,26,26,26	0
2	ZN	D	1501	1/1	0.97	0.04	27,27,27,27	0
2	ZN	D	1504	1/1	0.97	0.04	30,30,30,30	0
2	ZN	A	1503	1/1	0.97	0.04	26,26,26,26	0
2	ZN	D	1503	1/1	0.98	0.04	28,28,28,28	0
2	ZN	A	1502	1/1	0.98	0.04	24,24,24,24	0
2	ZN	A	1501	1/1	0.98	0.04	24,24,24,24	0

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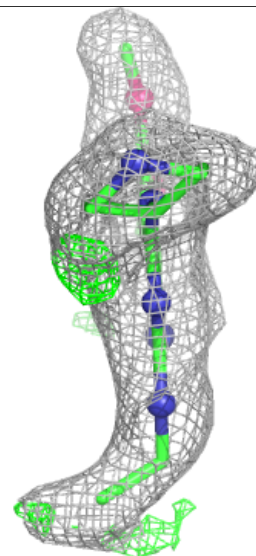
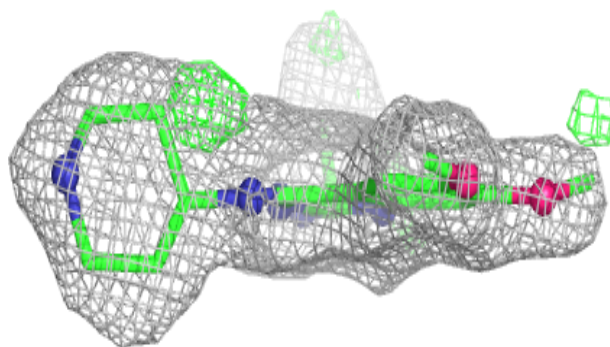
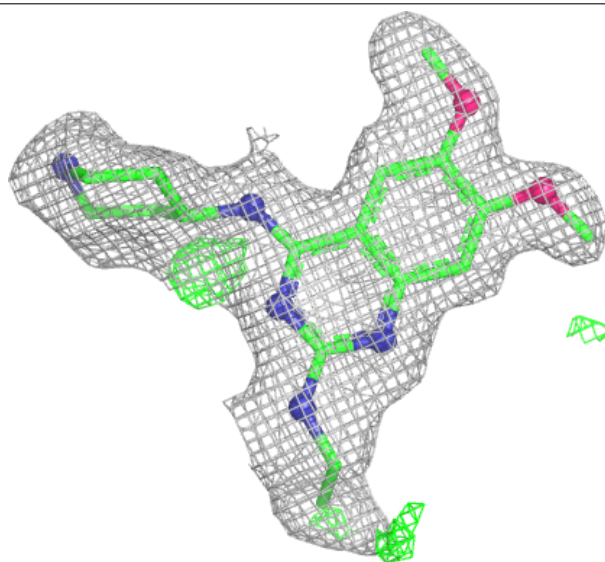
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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
5	CL	A	1507	1/1	0.99	0.07	28,28,28,28	0
2	ZN	C	1501	1/1	0.99	0.04	22,22,22,22	0
2	ZN	C	1503	1/1	0.99	0.02	21,21,21,21	0
2	ZN	B	1503	1/1	0.99	0.03	22,22,22,22	0
2	ZN	B	1501	1/1	0.99	0.04	22,22,22,22	0
2	ZN	D	1502	1/1	0.99	0.04	25,25,25,25	0
2	ZN	B	1502	1/1	1.00	0.01	20,20,20,20	0
2	ZN	C	1502	1/1	1.00	0.01	20,20,20,20	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.

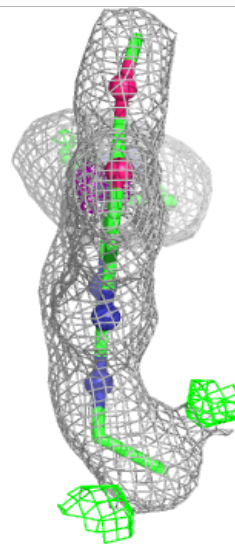
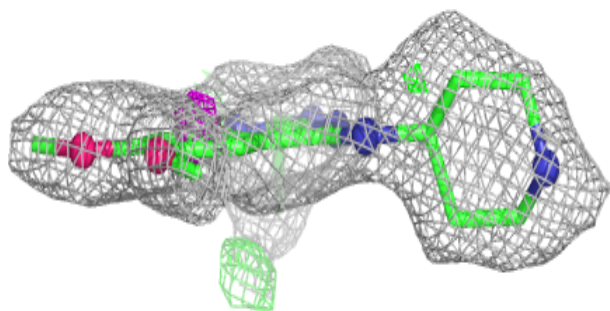
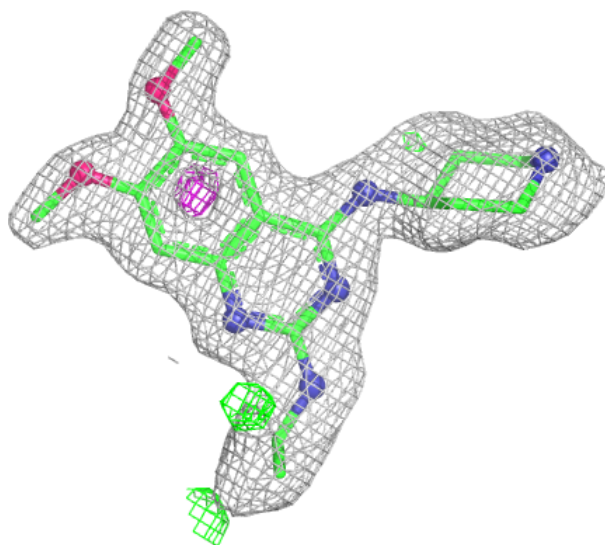
Electron density around 7KZ B 1506:

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



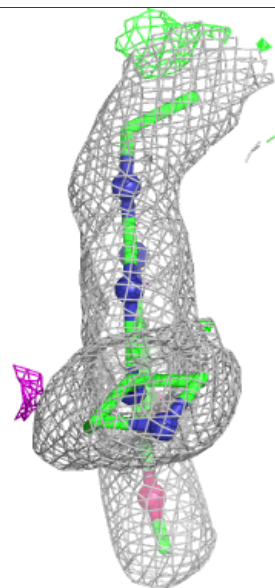
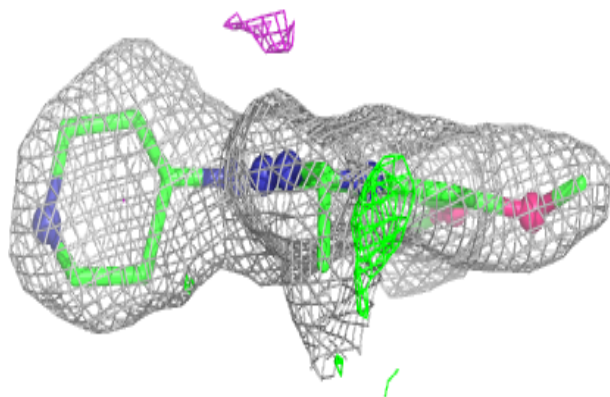
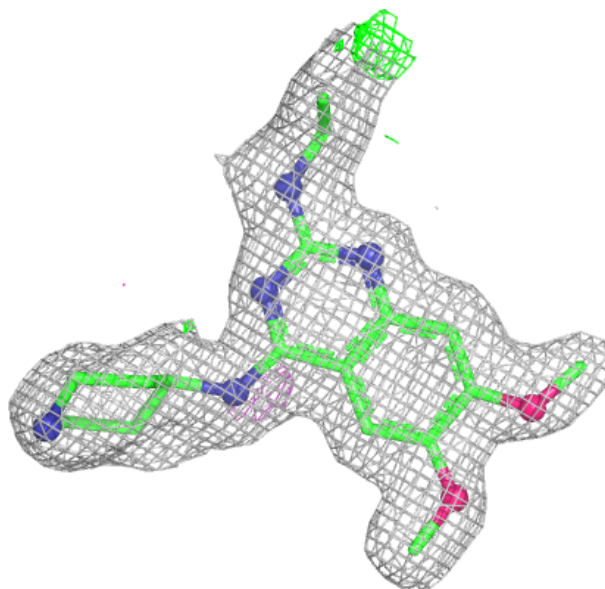
Electron density around 7KZ D 1506:

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



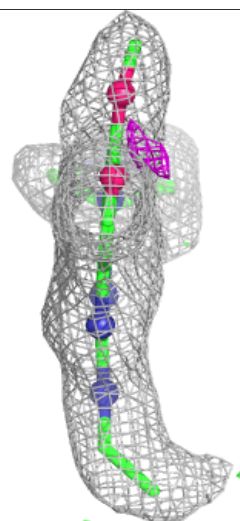
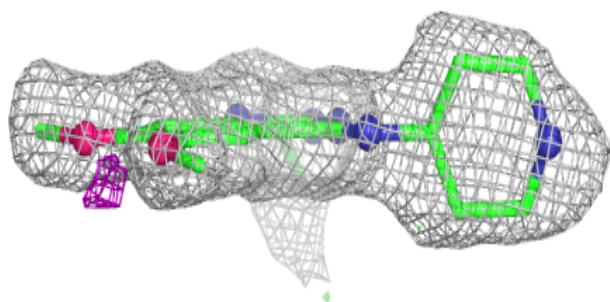
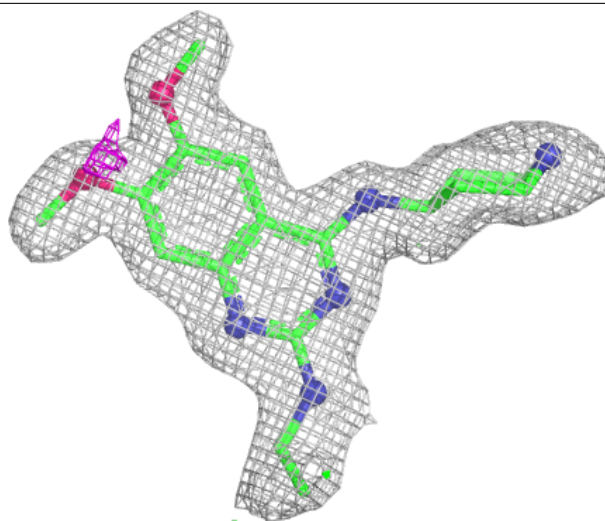
Electron density around 7KZ A 1506:

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



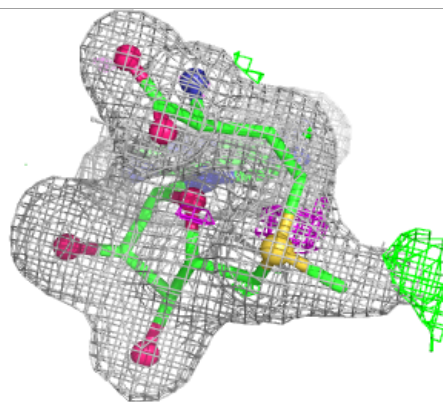
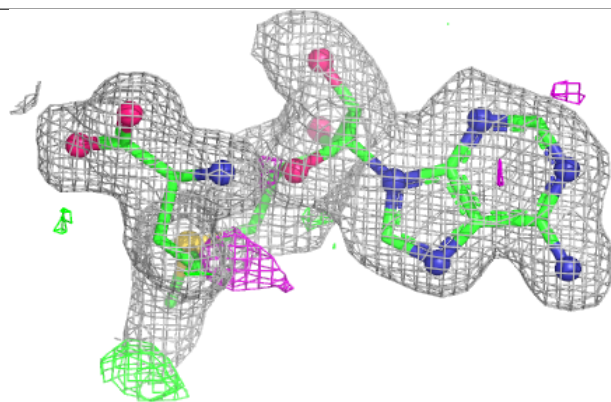
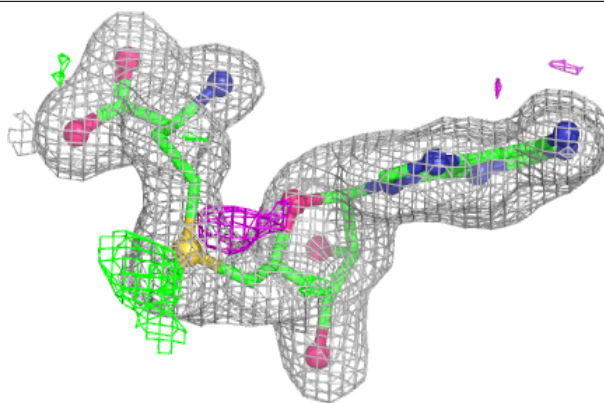
Electron density around 7KZ C 1506:

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

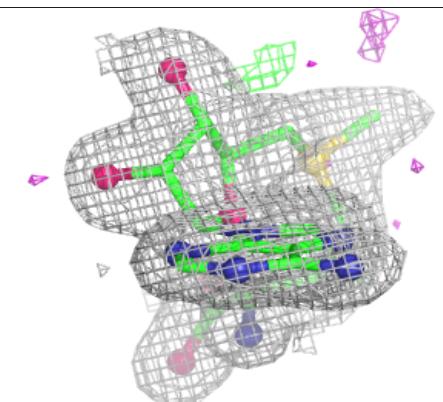
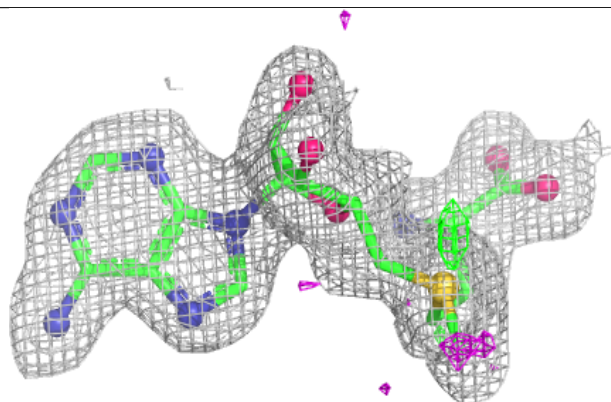
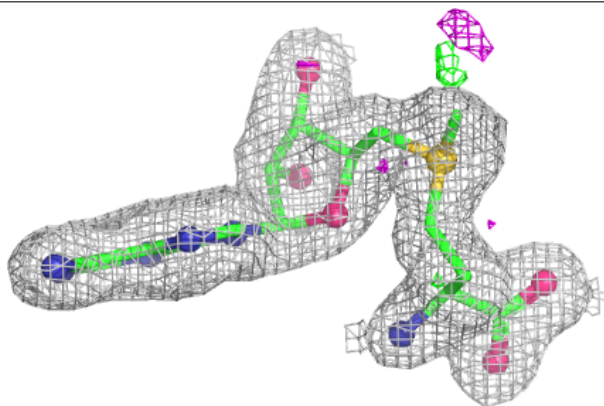


Electron density around SAM B 1505:

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

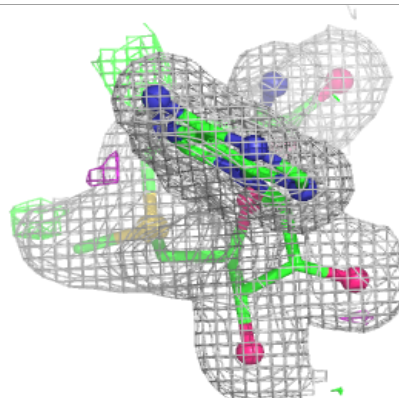
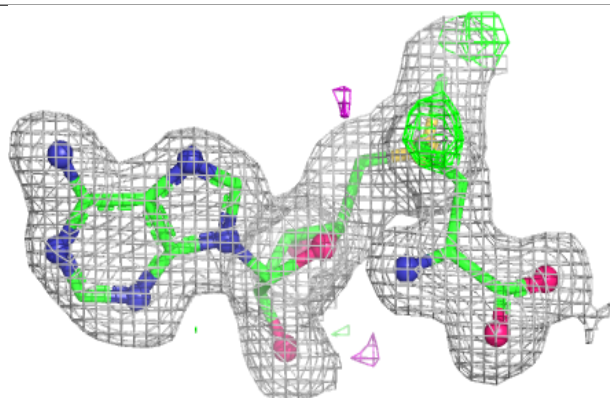
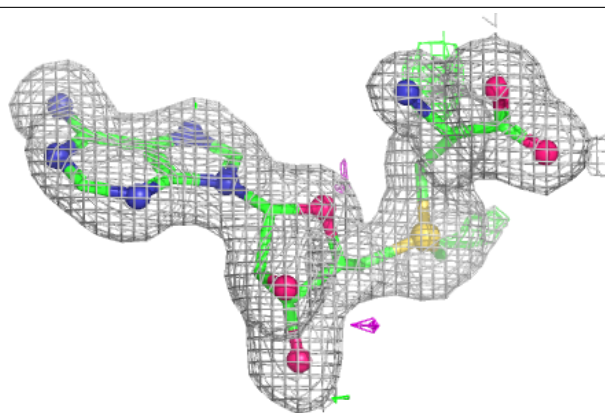
**Electron density around SAM A 1505:**

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

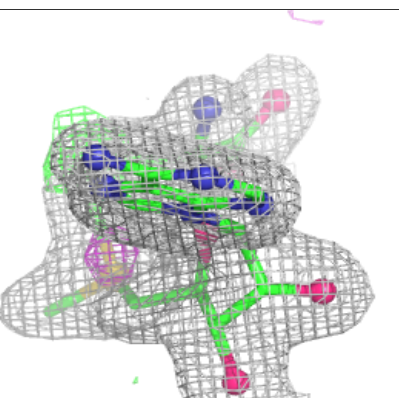
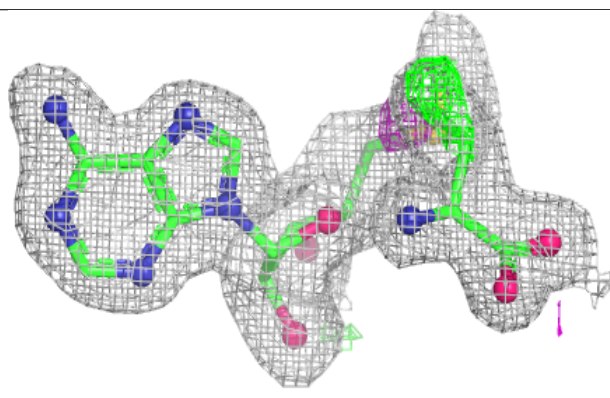
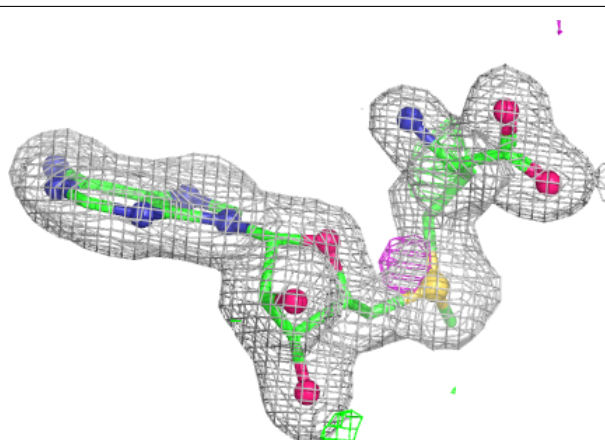


Electron density around SAM C 1505:

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

**Electron density around SAM D 1505:**

$2mF_o-DF_c$ (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.