W O R L D W I D E

wwPDB

P R O T E I N   D A T A   B A N K

wwPDB X-ray Structure Validation Summary Report (i)

Oct 2, 2023 – 05:00 AM EDT

PDB ID	:	6N7E
Title	:	Crystal structure of the cytosolic domain of human CNNM2 in complex with AMP-PNP and Mg2+
Authors	:	Chen, Y.S.; Gehring, K.
Deposited on	:	2018-11-27
Resolution	:	3.50 Å(reported)

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 3.50 Å.

There are no overall percentile quality scores available for this entry.

MolProbity and EDS failed to run properly - the sequence quality summary graphics cannot be shown.

2 Entry composition (i)

There are 4 unique types of molecules in this entry. The entry contains 18135 atoms, of which 8720 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 Metal transporter CNNM2,Metal transporter CNNM2.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	305	Total	C	H	N	O	S	0	0	0
			4483	1493	2169	369	439	13			
1	B	300	Total	C	H	N	O	S	0	0	0
			4506	1487	2195	372	439	13			
1	C	302	Total	C	H	N	O	S	0	0	0
			4369	1457	2104	365	432	11			
1	D	319	Total	C	H	N	O	S	0	0	0
			4591	1539	2202	386	453	11			

There are 40 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	428	MET	-	expression tag	UNP Q9H8M5
A	767	VAL	-	linker	UNP Q9H8M5
A	818	LEU	-	expression tag	UNP Q9H8M5
A	819	GLU	-	expression tag	UNP Q9H8M5
A	820	HIS	-	expression tag	UNP Q9H8M5
A	821	HIS	-	expression tag	UNP Q9H8M5
A	822	HIS	-	expression tag	UNP Q9H8M5
A	823	HIS	-	expression tag	UNP Q9H8M5
A	824	HIS	-	expression tag	UNP Q9H8M5
A	825	HIS	-	expression tag	UNP Q9H8M5
B	428	MET	-	expression tag	UNP Q9H8M5
B	767	VAL	-	linker	UNP Q9H8M5
B	818	LEU	-	expression tag	UNP Q9H8M5
B	819	GLU	-	expression tag	UNP Q9H8M5
B	820	HIS	-	expression tag	UNP Q9H8M5
B	821	HIS	-	expression tag	UNP Q9H8M5
B	822	HIS	-	expression tag	UNP Q9H8M5
B	823	HIS	-	expression tag	UNP Q9H8M5
B	824	HIS	-	expression tag	UNP Q9H8M5
B	825	HIS	-	expression tag	UNP Q9H8M5
C	428	MET	-	expression tag	UNP Q9H8M5

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Chain	Residue	Modelled	Actual	Comment	Reference
C	723	VAL	-	linker	UNP Q9H8M5
C	818	LEU	-	expression tag	UNP Q9H8M5
C	819	GLU	-	expression tag	UNP Q9H8M5
C	820	HIS	-	expression tag	UNP Q9H8M5
C	821	HIS	-	expression tag	UNP Q9H8M5
C	822	HIS	-	expression tag	UNP Q9H8M5
C	823	HIS	-	expression tag	UNP Q9H8M5
C	824	HIS	-	expression tag	UNP Q9H8M5
C	825	HIS	-	expression tag	UNP Q9H8M5
D	428	MET	-	expression tag	UNP Q9H8M5
D	723	VAL	-	linker	UNP Q9H8M5
D	818	LEU	-	expression tag	UNP Q9H8M5
D	819	GLU	-	expression tag	UNP Q9H8M5
D	820	HIS	-	expression tag	UNP Q9H8M5
D	821	HIS	-	expression tag	UNP Q9H8M5
D	822	HIS	-	expression tag	UNP Q9H8M5
D	823	HIS	-	expression tag	UNP Q9H8M5
D	824	HIS	-	expression tag	UNP Q9H8M5
D	825	HIS	-	expression tag	UNP Q9H8M5

- Molecule 2 is PHOSPHOAMINOPHOSPHONIC ACID-ADENYLATE ESTER (three-letter code: ANP) (formula: $C_{10}H_{17}N_6O_{12}P_3$).
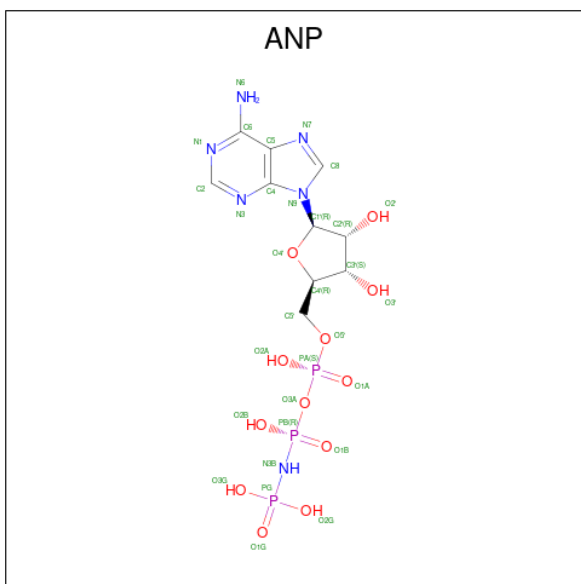
Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
			Total	C	H	N	O	P		
2	A	1	43	10	12	6	12	3	0	0

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Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
2	B	1	Total	C	H	N	O	P	0	0
			44	10	13	6	12	3		
2	C	1	Total	C	H	N	O	P	0	0
			44	10	13	6	12	3		
2	D	1	Total	C	H	N	O	P	0	0
			43	10	12	6	12	3		

- Molecule 3 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	2	Total	Mg	0	0
			2	2		
3	B	3	Total	Mg	0	0
			3	3		
3	C	1	Total	Mg	0	0
			1	1		
3	D	2	Total	Mg	0	0
			2	2		

- Molecule 4 is water.

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

MolProbity and EDS failed to run properly - this section is therefore empty.

3 Data and refinement statistics (i)

EDS failed to run properly - this section is therefore incomplete.

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α, β, γ	290.58Å 111.14Å 103.52Å 90.00° 101.01° 90.00°	Depositor
Resolution (Å)	48.76 – 3.50	Depositor
% Data completeness (in resolution range)	90.0 (48.76-3.50)	Depositor
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$<I/\sigma(I)>$ [1]	1.16 (at 3.48Å)	Xtriage
Refinement program	PHENIX 1.12-2829	Depositor
R, R_{free}	0.282 , 0.282	Depositor
Wilson B-factor (Å^2)	38.4	Xtriage
Anisotropy	0.159	Xtriage
L-test for twinning[2]	$<|L|> = 0.48,\ <L^2> = 0.31$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
Total number of atoms	18135	wwPDB-VP
Average B, all atoms (Å^2)	69.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.68% of the height of the origin peak. No significant pseudotranslation is detected.*

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[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.

4 Model quality ⓘ

4.1 Standard geometry ⓘ

MolProbity failed to run properly - this section is therefore empty.

4.2 Too-close contacts ⓘ

MolProbity failed to run properly - this section is therefore empty.

4.3 Torsion angles ⓘ

4.3.1 Protein backbone ⓘ

MolProbity failed to run properly - this section is therefore empty.

4.3.2 Protein sidechains ⓘ

MolProbity failed to run properly - this section is therefore empty.

4.3.3 RNA ⓘ

MolProbity failed to run properly - this section is therefore empty.

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

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

4.5 Carbohydrates ⓘ

There are no monosaccharides in this entry.

4.6 Ligand geometry ⓘ

Of 12 ligands modelled in this entry, 8 are monoatomic - leaving 4 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	ANP	D	901	3	29,33,33	1.09	4 (13%)	31,52,52	1.32	3 (9%)
2	ANP	A	901	3	29,33,33	1.08	4 (13%)	31,52,52	1.12	2 (6%)
2	ANP	B	901	3	29,33,33	1.11	4 (13%)	31,52,52	1.10	2 (6%)
2	ANP	C	901	3	29,33,33	1.09	4 (13%)	31,52,52	1.08	2 (6%)

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	ANP	D	901	3	-	7/14/38/38	0/3/3/3
2	ANP	A	901	3	-	3/14/38/38	0/3/3/3
2	ANP	B	901	3	-	9/14/38/38	0/3/3/3
2	ANP	C	901	3	-	5/14/38/38	0/3/3/3

The worst 5 of 16 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	901	ANP	PG-O1G	2.54	1.50	1.46
2	C	901	ANP	PG-O1G	2.52	1.50	1.46
2	A	901	ANP	PG-O1G	2.51	1.50	1.46
2	D	901	ANP	PG-O1G	2.49	1.50	1.46
2	B	901	ANP	PB-O3A	-2.48	1.55	1.59

The worst 5 of 9 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	D	901	ANP	PB-O3A-PA	-4.33	117.38	132.62
2	B	901	ANP	PB-O3A-PA	-4.13	118.06	132.62
2	A	901	ANP	PB-O3A-PA	-4.01	118.51	132.62
2	C	901	ANP	PB-O3A-PA	-3.78	119.32	132.62
2	D	901	ANP	C3'-C2'-C1'	3.09	105.64	100.98

There are no chirality outliers.

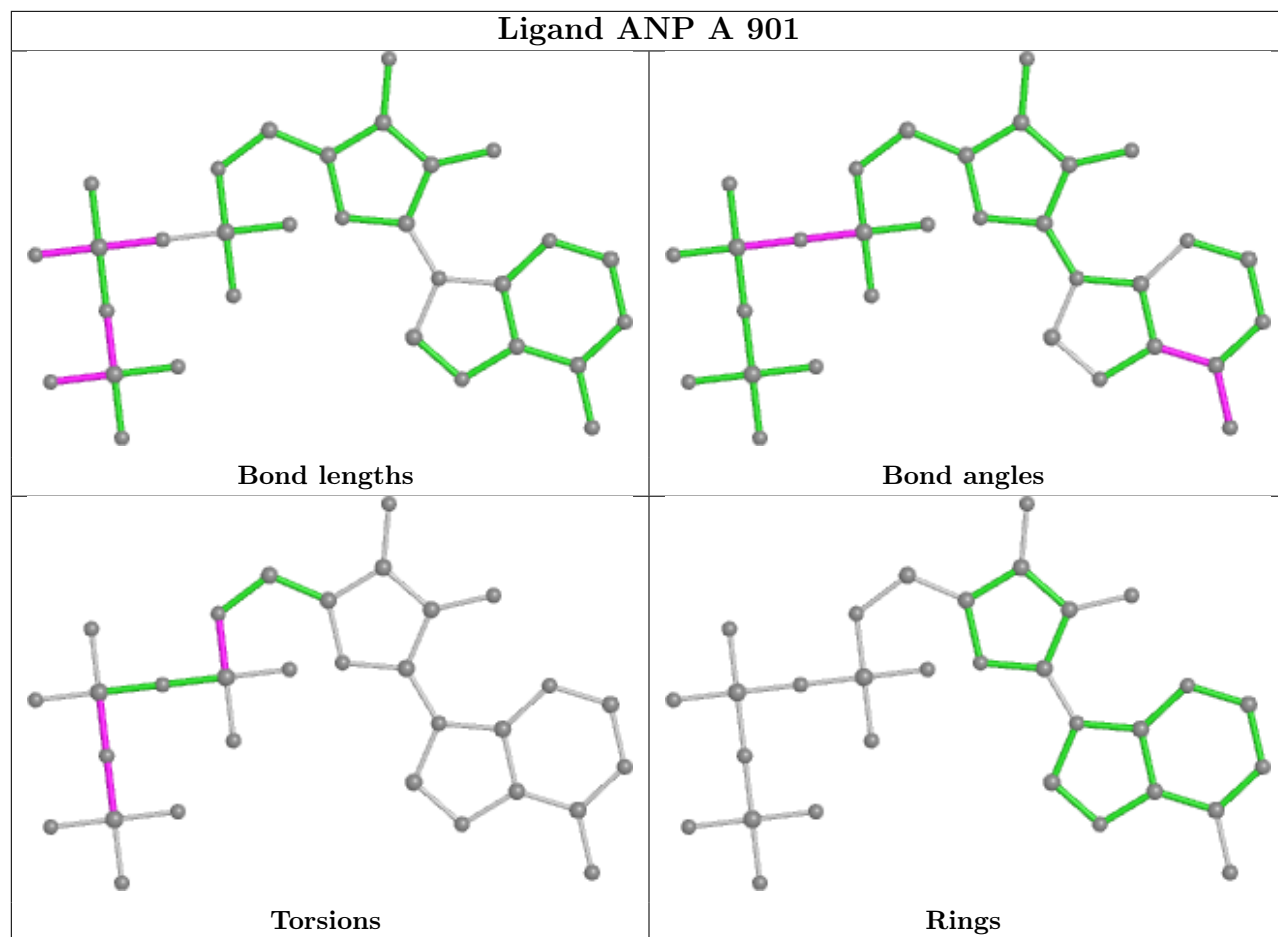5 of 24 torsion outliers are listed below:

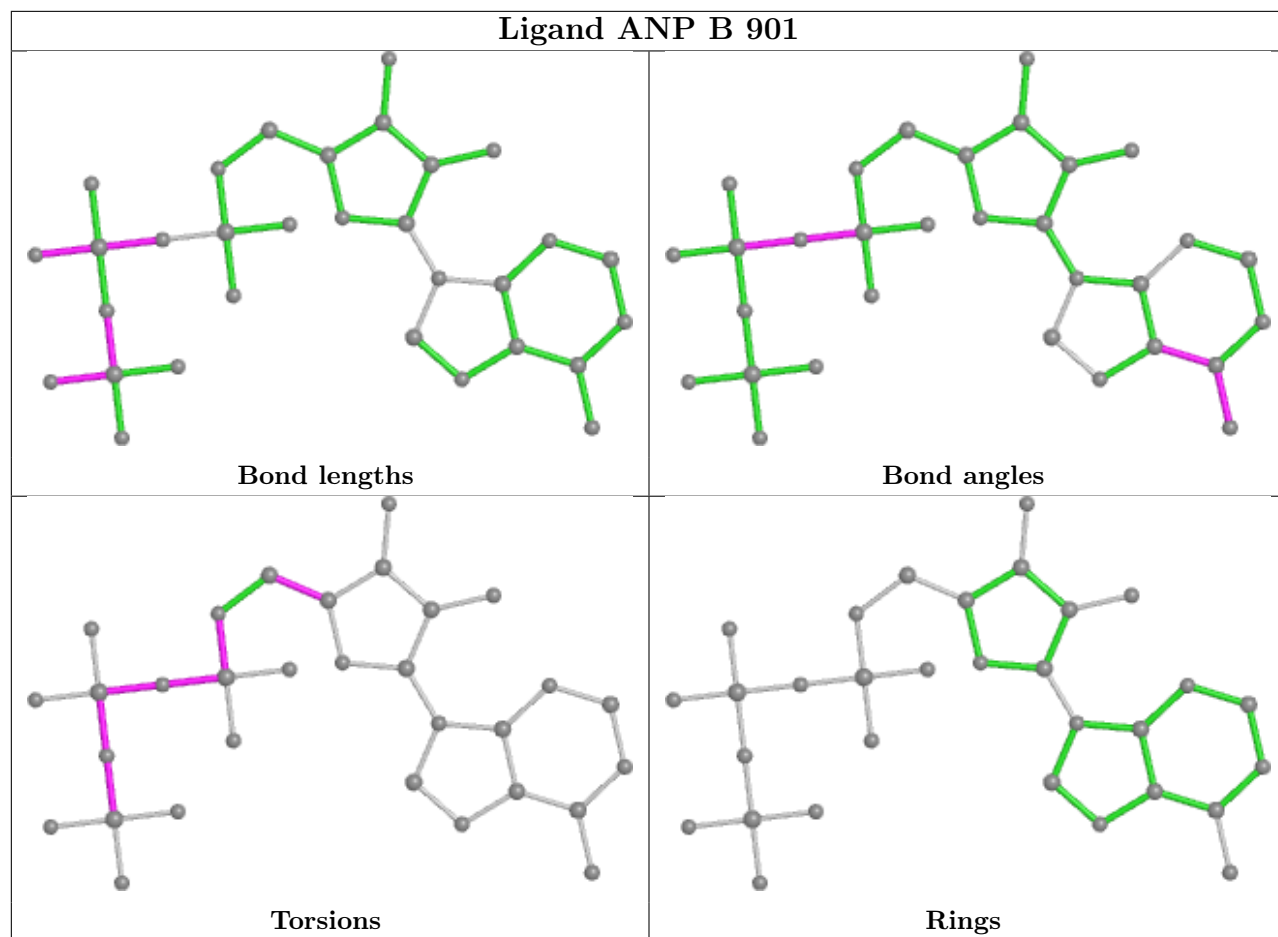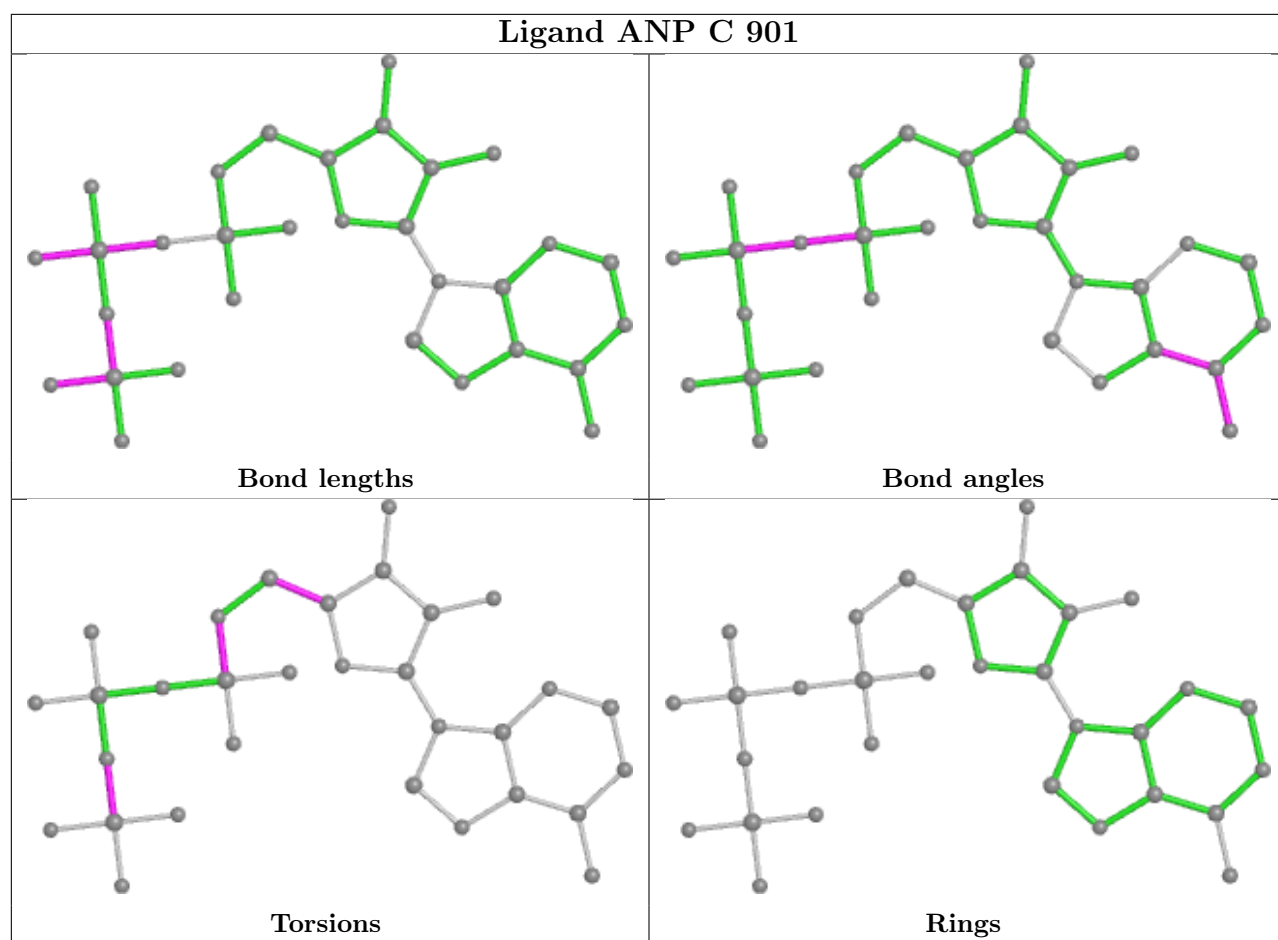| Mol	Chain	Res	Type	Atoms
2	A	901	ANP	PG-N3B-PB-O1B
2	B	901	ANP	PB-N3B-PG-O1G
2	B	901	ANP	PG-N3B-PB-O1B
2	B	901	ANP	PA-O3A-PB-O1B
2	B	901	ANP	PA-O3A-PB-O2B

There are no ring outliers.

No monomer is involved in short contacts.

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 ANP D 901

Bond lengths

Bond angles

Torsions

Rings

Ligand ANP A 901

Bond lengths

Bond angles

Torsions

Rings

Ligand ANP B 901

Bond lengths

Bond angles

Torsions

Rings

Ligand ANP C 901

Bond lengths

Bond angles

Torsions

Rings
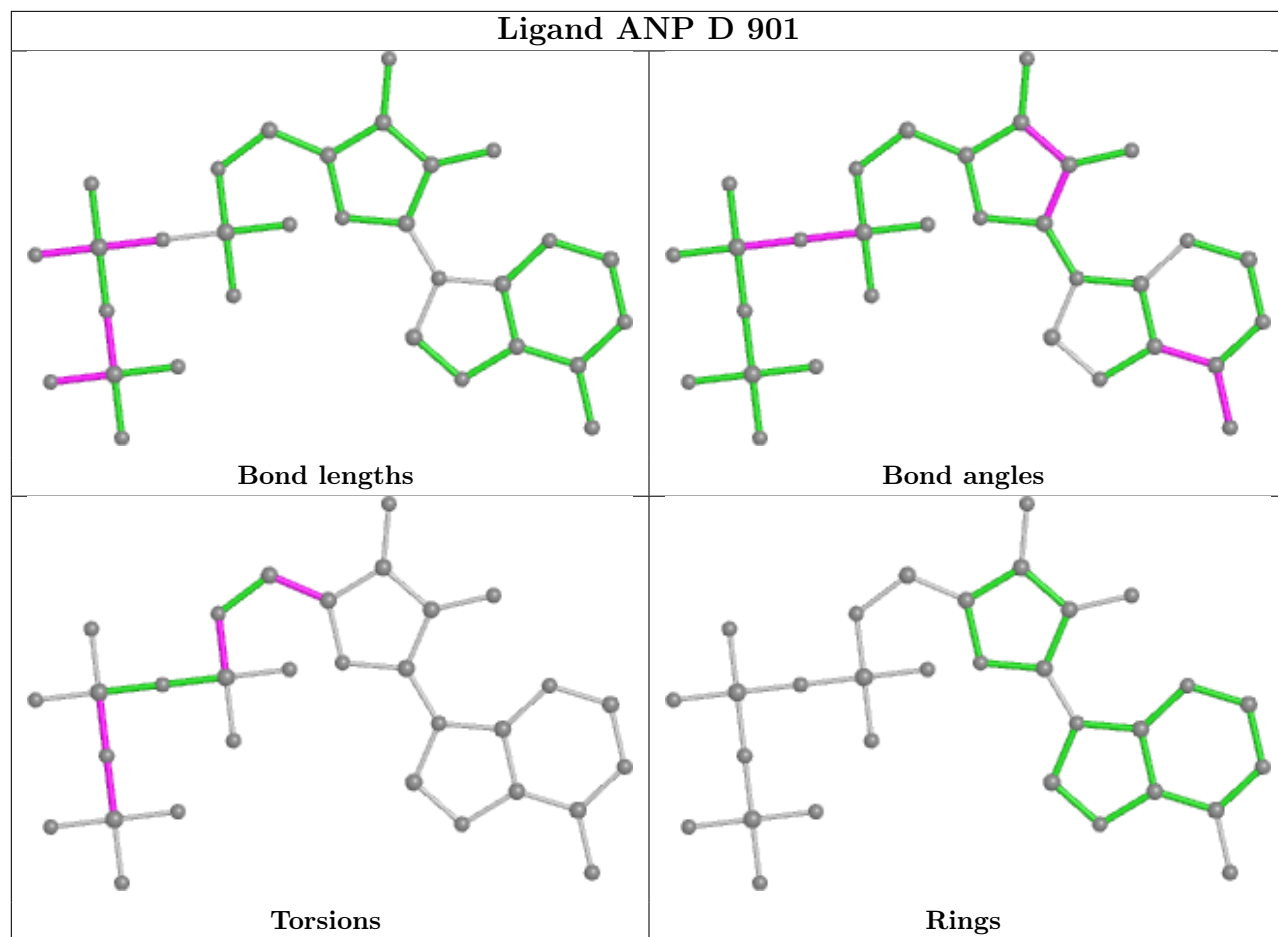
4.7 Other polymers ⓘ

There are no such residues in this entry.

4.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

5 Fit of model and data ⓘ

5.1 Protein, DNA and RNA chains ⓘ

EDS failed to run properly - this section is therefore empty.

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

EDS failed to run properly - this section is therefore empty.

5.3 Carbohydrates ⓘ

EDS failed to run properly - this section is therefore empty.

5.4 Ligands ⓘ

EDS failed to run properly - this section is therefore empty.

5.5 Other polymers ⓘ

EDS failed to run properly - this section is therefore empty.