Full wwPDB X-ray Structure Validation Report ⓘ

Oct 2, 2023 – 01:24 PM EDT

PDB ID	:	6NR0
Title	:	SIRT2(56-356) with covalent intermediate between mechanism-based inhibitor Glucose-TM-1beta and 1'-SH ADP-ribose
Authors	:	Price, I.R.; Hong, J.
Deposited on	:	2019-01-22
Resolution	:	2.45 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	:	FAILED
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	FAILED
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.35.1

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 2.45 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

There are 8 unique types of molecules in this entry. The entry contains 9501 atoms, of which 4535 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.

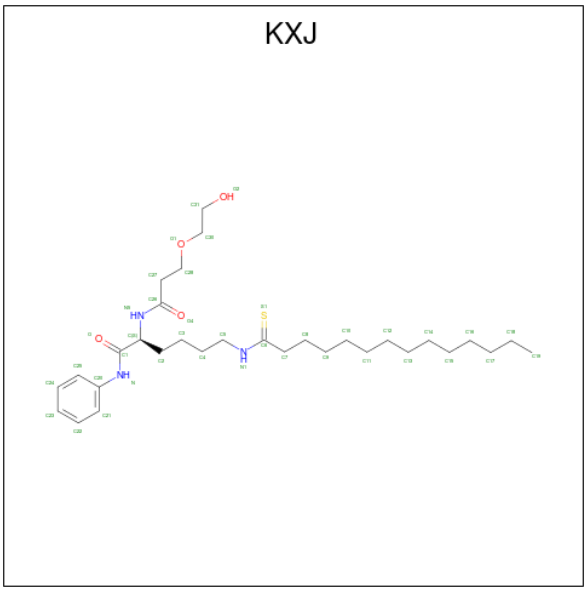
- Molecule 1 is a protein called NAD-dependent protein deacetylase sirtuin-2.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	289	Total	C	H	N	O	S	0	2	0
			4526	1481	2214	385	429	17			
1	B	291	Total	C	H	N	O	S	0	6	0
			4594	1497	2255	390	435	17			

- Molecule 2 is ZINC ION (three-letter code: ZN) (formula: Zn).

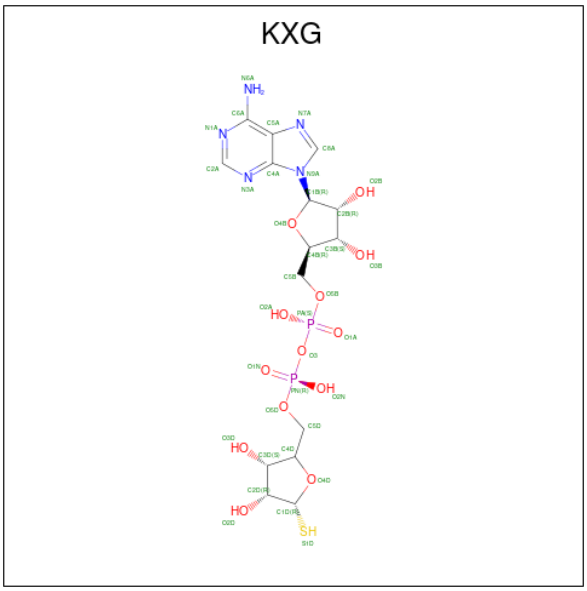
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	1	Total	Zn	0	0
			1	1		
2	B	1	Total	Zn	0	0
			1	1		

- Molecule 3 is N 2 -[3-(2-hydroxyethoxy)propanoyl]-N-phenyl-N 6 -tetradecanethioyl-L-lysinamide (three-letter code: KXJ) (formula: $C_{31}H_{53}N_3O_4S$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total C N O 34 29 3 2	0	0
3	B	1	Total C N O 35 28 3 4	0	0

- Molecule 4 is [[(2 {R},3 {S},4 {R},5 {R})-5-(6-aminopurin-9-yl)-3,4-bis(oxidanyl)oxolan-2-yl]methoxy-oxidanyl-phosphoryl] [(3 {S},4 {R},5 {R})-3,4-bis(oxidanyl)-5-sulfanyl-oxolan-2-yl]methyl hydrogen phosphate (three-letter code: KXG) (formula: $C_{15}H_{23}N_5O_{13}P_2S$) (labeled as "Ligand of Interest" by depositor).

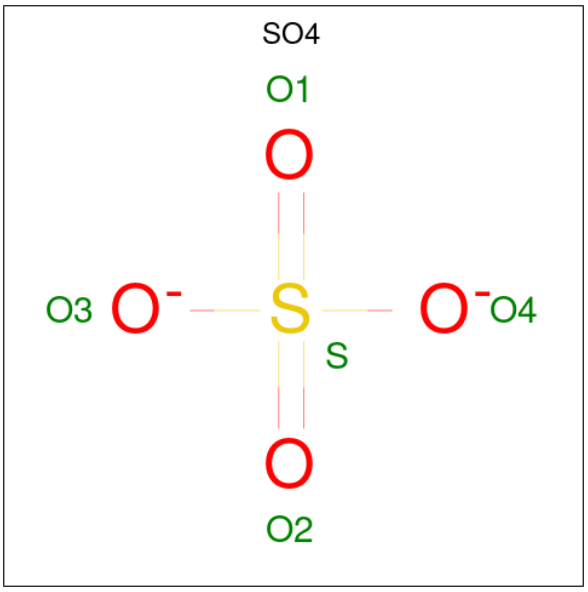


Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total C H N O P S 56 15 20 5 13 2 1	0	0
4	B	1	Total C H N O P S 56 15 20 5 13 2 1	0	0

- Molecule 5 is SODIUM ION (three-letter code: NA) (formula: Na).

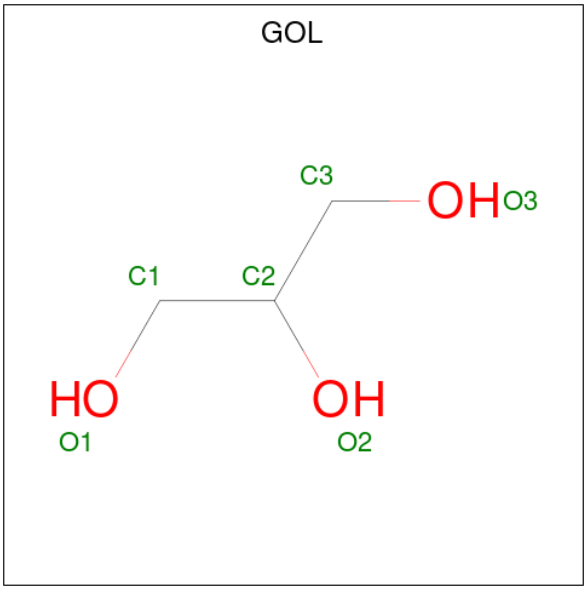
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	2	Total Na 2 2	0	0
5	B	2	Total Na 2 2	0	0

- Molecule 6 is SULFATE ION (three-letter code: SO4) (formula: O_4S).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	1	Total O S 5 4 1	0	0
6	B	1	Total O S 5 4 1	0	0

- Molecule 7 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	A	1	Total C H O 12 3 6 3	0	0
7	B	1	Total C H O 14 3 8 3	0	0

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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	B	1	Total C H O 12 3 6 3	0	0
7	B	1	Total C H O 12 3 6 3	0	0

- Molecule 8 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
8	A	69	Total O 69 69	0	0
8	B	65	Total O 65 65	0	0

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	I 1 2 1	Depositor
Cell constants a, b, c, α, β, γ	82.31Å 76.84Å 114.46Å 90.00° 95.87° 90.00°	Depositor
Resolution (Å)	63.69 – 2.45	Depositor
% Data completeness (in resolution range)	91.8 (63.69-2.45)	Depositor
R_{merge}	0.04	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.02 (at 2.45Å)	Xtriage
Refinement program	PHENIX 1.13_2998	Depositor
R, R_{free}	0.220 , 0.256	Depositor
Wilson B-factor (Å^2)	41.9	Xtriage
Anisotropy	0.403	Xtriage
L-test for twinning[2]	$< \|L\| > = 0.47$, $< L^2 > = 0.31$	Xtriage
Estimated twinning fraction	0.011 for -1/2*h+1/2*k+1/2*l,1/2*h-1/2*k+1/2*l,h+k 0.025 for -1/2*h-1/2*k+1/2*l,-1/2*h-1/2*k-1/2*l,h-k	Xtriage
Total number of atoms	9501	wwPDB-VP
Average B, all atoms (Å^2)	51.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 8.05% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

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 16 ligands modelled in this entry, 6 are monoatomic - leaving 10 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	$\#\|Z\| > 2$
7	GOL	B	409	-	5,5,5	1.08	0	5,5,5	1.22	1 (20%)
4	KXG	A	403	3	32,39,39	2.38	10 (31%)	36,60,60	2.13	9 (25%)
7	GOL	A	407	-	5,5,5	1.12	1 (20%)	5,5,5	1.34	1 (20%)
6	SO4	A	406	-	4,4,4	0.14	0	6,6,6	0.06	0
3	KXJ	A	402	4	34,34,39	1.98	5 (14%)	38,38,44	1.84	8 (21%)
4	KXG	B	403	5,3	32,39,39	1.73	4 (12%)	36,60,60	1.93	7 (19%)
6	SO4	B	406	-	4,4,4	0.14	0	6,6,6	0.06	0
7	GOL	B	408	-	5,5,5	0.84	0	5,5,5	1.15	0
3	KXJ	B	402	4	35,35,39	2.19	7 (20%)	38,39,44	1.61	7 (18%)
7	GOL	B	407	-	5,5,5	0.84	0	5,5,5	1.01	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
7	GOL	B	409	-	-	0/4/4/4	-
4	KXG	A	403	3	-	5/18/54/54	0/4/4/4
7	GOL	A	407	-	-	2/4/4/4	-
3	KXJ	A	402	4	-	15/33/33/39	0/1/1/1
4	KXG	B	403	5,3	-	7/18/54/54	0/4/4/4
7	GOL	B	408	-	-	1/4/4/4	-
3	KXJ	B	402	4	-	18/34/34/39	0/1/1/1
7	GOL	B	407	-	-	2/4/4/4	-

All (27) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	402	KXJ	C26-N5	7.18	1.49	1.34
3	B	402	KXJ	C1-N	6.98	1.51	1.35
3	B	402	KXJ	C26-N5	6.43	1.47	1.34
3	A	402	KXJ	C1-N	5.80	1.48	1.35
4	A	403	KXG	PA-O1A	-5.10	1.32	1.50
4	A	403	KXG	PN-O2N	-4.98	1.32	1.55
4	A	403	KXG	PN-O1N	-4.97	1.33	1.50

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	A	403	KXG	PA-O2A	-4.74	1.33	1.55
4	B	403	KXG	C4A-N3A	-4.72	1.29	1.35
3	B	402	KXJ	C20-N	4.56	1.50	1.41
3	B	402	KXJ	C6-N1	-4.55	1.31	1.46
4	A	403	KXG	C4A-N3A	-4.06	1.30	1.35
4	A	403	KXG	C3D-C2D	-3.84	1.42	1.53
4	B	403	KXG	O4B-C1B	3.70	1.46	1.41
3	A	402	KXJ	C9-C8	-3.68	1.30	1.51
4	B	403	KXG	C5A-N7A	3.65	1.53	1.39
4	A	403	KXG	C5A-N7A	3.48	1.52	1.39
3	B	402	KXJ	C9-C8	-3.33	1.32	1.51
3	A	402	KXJ	C20-N	3.22	1.48	1.41
4	B	403	KXG	C6A-N6A	3.17	1.45	1.34
3	A	402	KXJ	C6-N1	-3.10	1.36	1.46
3	B	402	KXJ	O4-C26	-2.45	1.18	1.23
4	A	403	KXG	C6A-N6A	2.43	1.42	1.34
4	A	403	KXG	O5D-C5D	-2.40	1.35	1.44
3	B	402	KXJ	O-C1	-2.09	1.19	1.23
7	A	407	GOL	O2-C2	-2.04	1.37	1.43
4	A	403	KXG	C2A-N1A	-2.01	1.30	1.33

All (33) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	B	403	KXG	C4A-C5A-N7A	-7.34	101.75	109.40
3	A	402	KXJ	C27-C26-N5	6.72	124.42	115.77
4	A	403	KXG	C1D-C2D-C3D	6.54	111.59	102.26
4	A	403	KXG	C4A-C5A-N7A	-6.39	102.74	109.40
4	B	403	KXG	N3A-C2A-N1A	-4.78	121.20	128.68
3	B	402	KXJ	O-C1-C	-4.60	110.76	120.45
3	A	402	KXJ	C2-C-C1	-4.56	99.54	110.20
3	B	402	KXJ	C7-C6-N1	-3.81	101.85	112.14
4	A	403	KXG	O4B-C1B-C2B	-3.72	101.49	106.93
3	B	402	KXJ	C27-C26-N5	3.63	122.13	115.83
3	A	402	KXJ	O4-C26-N5	-3.56	116.94	122.95
4	B	403	KXG	O4B-C1B-C2B	-3.54	101.76	106.93
3	B	402	KXJ	C1-C-N5	-3.52	101.57	111.16
4	A	403	KXG	N3A-C2A-N1A	-3.37	123.42	128.68
3	B	402	KXJ	O-C1-N	2.99	130.36	123.93
3	A	402	KXJ	O-C1-N	2.97	130.31	123.93
4	A	403	KXG	O3D-C3D-C4D	2.93	119.53	111.05
7	A	407	GOL	C3-C2-C1	-2.70	101.22	111.70

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	B	403	KXG	PN-O3-PA	-2.55	124.08	132.83
4	A	403	KXG	O2A-PA-O1A	-2.54	99.69	112.24
3	A	402	KXJ	C-N5-C26	2.42	127.86	121.65
4	A	403	KXG	C1B-N9A-C4A	-2.38	122.47	126.64
7	B	409	GOL	C3-C2-C1	-2.35	102.55	111.70
4	B	403	KXG	O2N-PN-O1N	-2.28	100.96	112.24
4	B	403	KXG	O3D-C3D-C4D	2.28	117.64	111.05
3	A	402	KXJ	C8-C7-C6	-2.26	102.86	113.56
3	B	402	KXJ	O4-C26-N5	-2.26	119.14	122.95
4	B	403	KXG	O2A-PA-O1A	-2.25	101.11	112.24
3	A	402	KXJ	C9-C8-C7	2.19	125.54	114.42
4	A	403	KXG	O3B-C3B-C4B	2.13	117.20	111.05
3	A	402	KXJ	C-C1-N	-2.11	108.80	115.10
4	A	403	KXG	O2N-PN-O1N	-2.10	101.88	112.24
3	B	402	KXJ	C4-C3-C2	2.05	120.88	113.62

There are no chirality outliers.

All (50) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	402	KXJ	C1-C-C2-C3
4	B	403	KXG	C5D-O5D-PN-O1N
4	B	403	KXG	C5D-O5D-PN-O2N
4	B	403	KXG	C5D-O5D-PN-O3
7	B	407	GOL	C1-C2-C3-O3
3	A	402	KXJ	C27-C26-N5-C
3	B	402	KXJ	C27-C26-N5-C
3	A	402	KXJ	N5-C-C2-C3
3	B	402	KXJ	N5-C-C2-C3
3	A	402	KXJ	O4-C26-N5-C
3	B	402	KXJ	O4-C26-N5-C
4	B	403	KXG	O4D-C4D-C5D-O5D
3	B	402	KXJ	C1-C-C2-C3
3	A	402	KXJ	N1-C6-C7-C8
3	B	402	KXJ	C3-C4-C5-N1
3	A	402	KXJ	C3-C4-C5-N1
3	B	402	KXJ	N1-C6-C7-C8
3	B	402	KXJ	C4-C5-N1-C6
4	B	403	KXG	C3D-C4D-C5D-O5D
3	B	402	KXJ	C-C2-C3-C4
3	B	402	KXJ	O1-C30-C31-O2
3	A	402	KXJ	C21-C20-N-C1

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Mol	Chain	Res	Type	Atoms
3	A	402	KXJ	C10-C11-C12-C13
3	B	402	KXJ	C10-C11-C12-C13
7	B	407	GOL	O2-C2-C3-O3
3	A	402	KXJ	C2-C3-C4-C5
3	B	402	KXJ	C6-C7-C8-C9
3	A	402	KXJ	C9-C10-C11-C12
3	A	402	KXJ	C25-C20-N-C1
3	A	402	KXJ	C4-C5-N1-C6
3	B	402	KXJ	C13-C14-C15-C16
3	B	402	KXJ	C9-C10-C11-C12
7	A	407	GOL	O1-C1-C2-O2
3	A	402	KXJ	C6-C7-C8-C9
4	B	403	KXG	C4D-C5D-O5D-PN
4	A	403	KXG	PN-O3-PA-O5B
3	B	402	KXJ	C11-C10-C9-C8
3	A	402	KXJ	C16-C17-C18-C19
4	A	403	KXG	C5D-O5D-PN-O3
4	A	403	KXG	C5D-O5D-PN-O1N
4	A	403	KXG	C5D-O5D-PN-O2N
3	A	402	KXJ	C12-C13-C14-C15
3	B	402	KXJ	C7-C6-N1-C5
3	B	402	KXJ	C12-C13-C14-C15
3	B	402	KXJ	C31-C30-O1-C28
7	B	408	GOL	C1-C2-C3-O3
4	A	403	KXG	O4B-C4B-C5B-O5B
4	B	403	KXG	O4B-C4B-C5B-O5B
3	B	402	KXJ	C11-C12-C13-C14
7	A	407	GOL	O1-C1-C2-C3

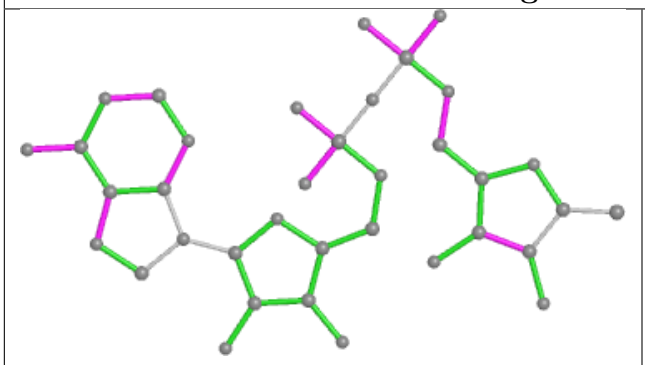
There are no ring outliers.

No monomer is involved in short contacts.

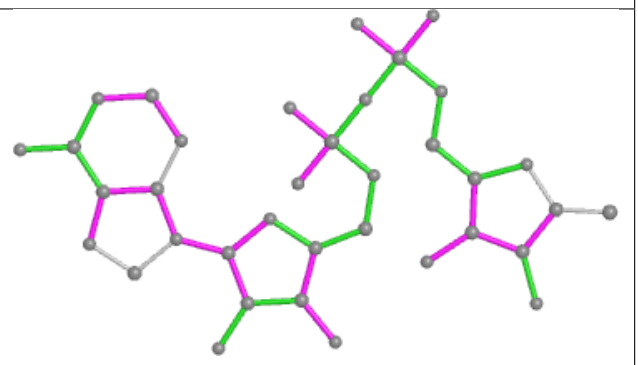
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. 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.

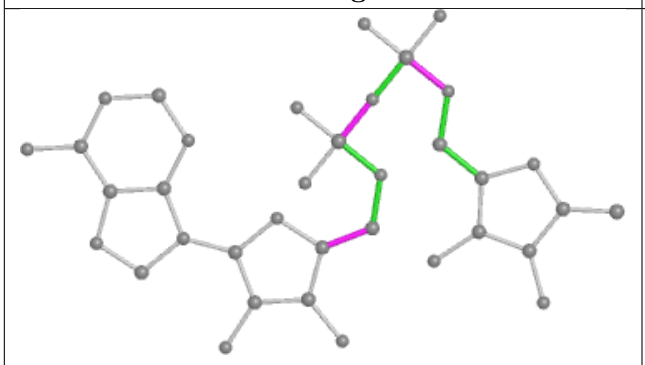
Ligand KXG A 403



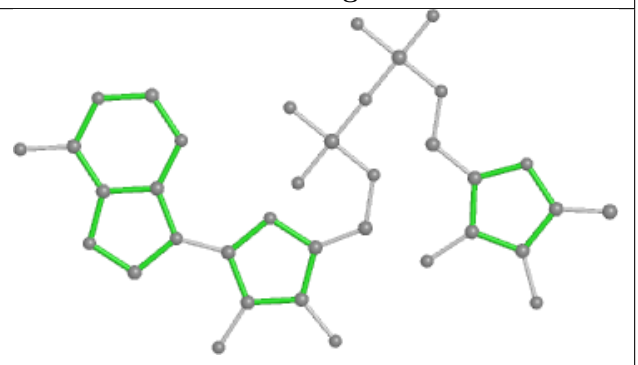
Bond lengths



Bond angles

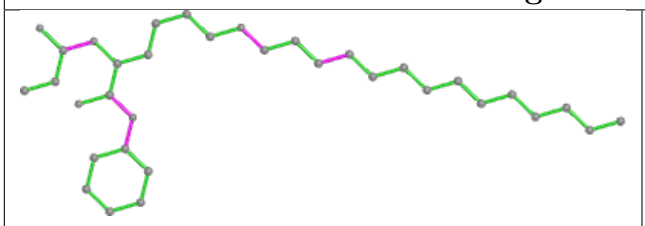


Torsions

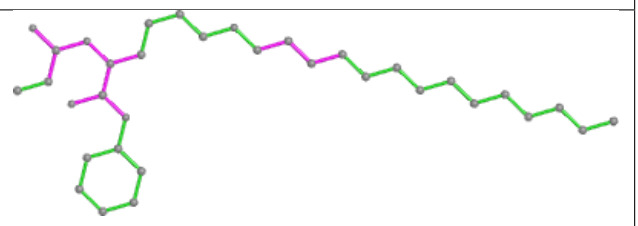


Rings

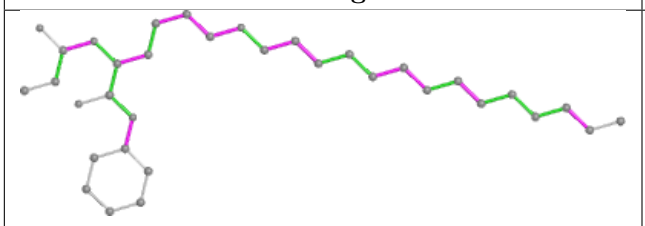
Ligand KXJ A 402



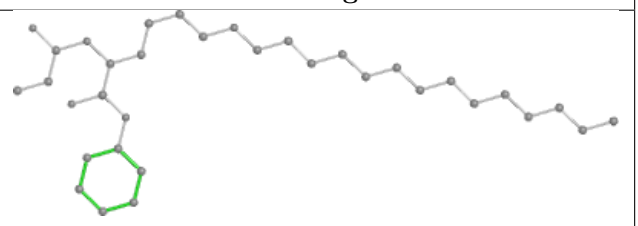
Bond lengths



Bond angles

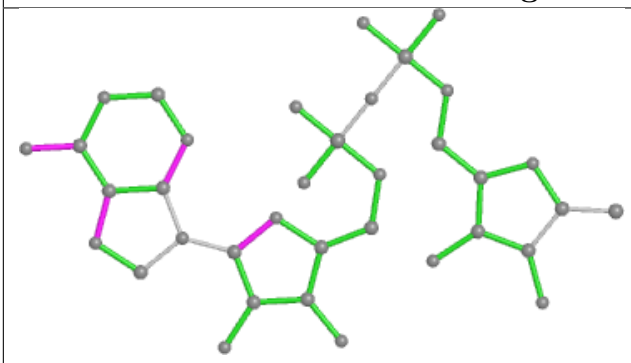


Torsions

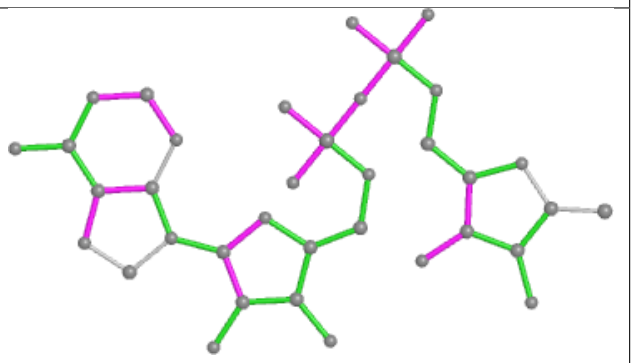


Rings

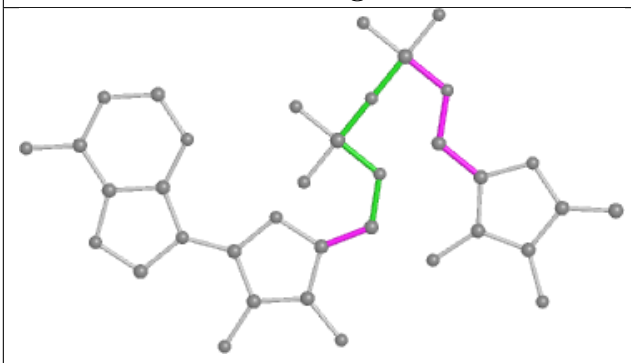
Ligand KXG B 403



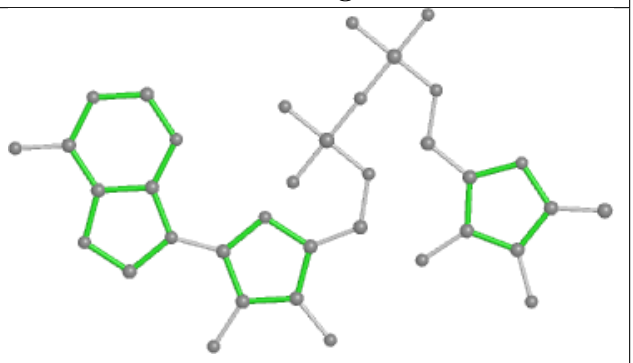
Bond lengths



Bond angles

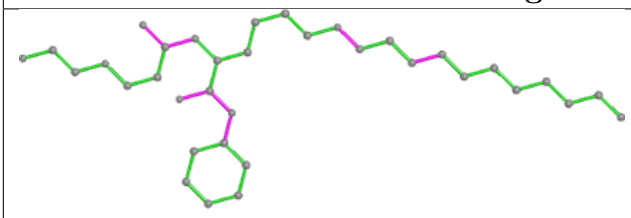


Torsions

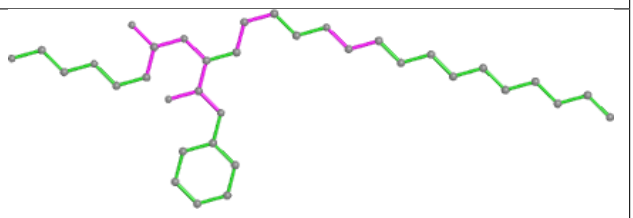


Rings

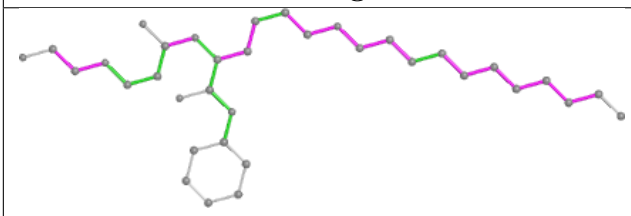
Ligand KXJ B 402



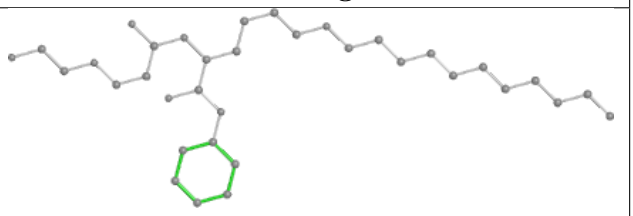
Bond lengths



Bond angles



Torsions



Rings

4.7 Other polymers (i)

There are no such residues in this entry.

4.8 Polymer linkage issues (i)

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.