



Full wwPDB X-ray Structure Validation Report ⓘ

Oct 5, 2023 – 02:55 AM EDT

PDB ID : 6VCU
Title : Homo sapiens FKBP12 protein bound with APX879 in P32 space group
Authors : Gobeil, S.; Spicer, L.
Deposited on : 2019-12-23
Resolution : 1.69 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)
Xtrriage (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

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.69 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 4 unique types of molecules in this entry. The entry contains 4531 atoms, of which 292 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.

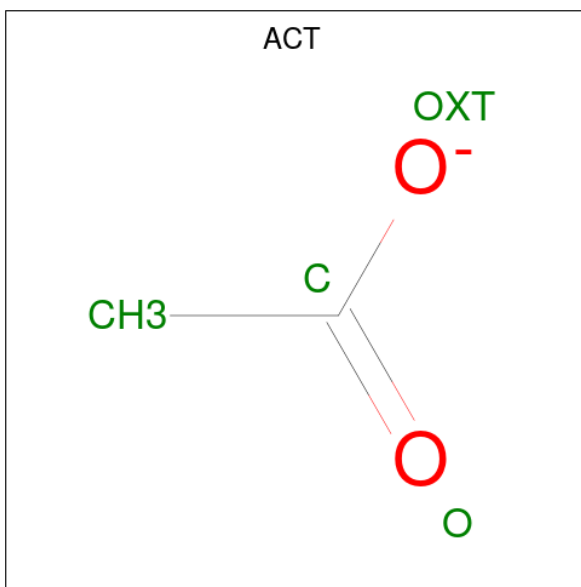
- Molecule 1 is a protein called Peptidyl-prolyl cis-trans isomerase FKBP1A.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	107	840	533	147	156	4	0	1	0
1	B	107	848	538	150	156	4	0	2	0
1	C	108	848	538	148	157	5	0	1	0
1	D	108	848	538	148	157	5	0	1	0

There are 12 discrepancies between the modelled and reference sequences:

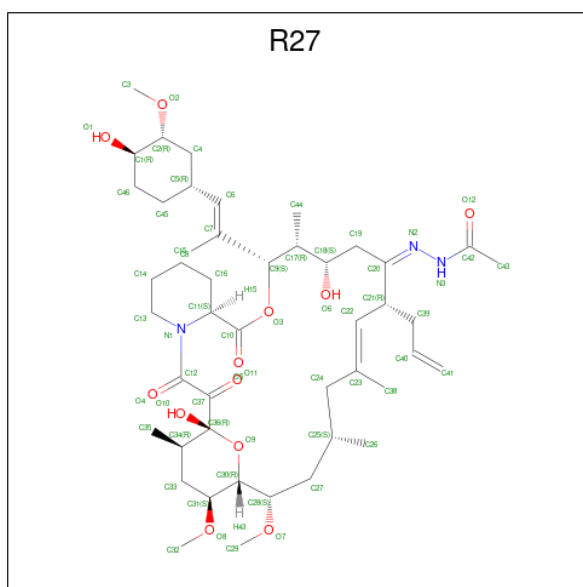
Chain	Residue	Modelled	Actual	Comment	Reference
A	-3	GLY	-	expression tag	UNP P62942
A	-2	SER	-	expression tag	UNP P62942
A	-1	HIS	-	expression tag	UNP P62942
B	-3	GLY	-	expression tag	UNP P62942
B	-2	SER	-	expression tag	UNP P62942
B	-1	HIS	-	expression tag	UNP P62942
C	-3	GLY	-	expression tag	UNP P62942
C	-2	SER	-	expression tag	UNP P62942
C	-1	HIS	-	expression tag	UNP P62942
D	-3	GLY	-	expression tag	UNP P62942
D	-2	SER	-	expression tag	UNP P62942
D	-1	HIS	-	expression tag	UNP P62942

- Molecule 2 is ACETATE ION (three-letter code: ACT) (formula: C₂H₃O₂).



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

- Molecule 3 is N'-[(3S,4R,5S,8R,9E,12S,14S,15R,16S,18R,19R,26aS)-5,19-dihydroxy-3-{(1E)-1-[(1R,3R,4R)-4-hydroxy-3-methoxycyclohexyl]prop-1-en-2-yl}-14,16-dimethoxy-4,10,12,18-tetramethyl-1,20,21-trioxo-8-(prop-2-en-1-yl)-1,3,4,5,6,8,11,12,13,14,15,16,17,18,19,20,21,23,24,25,26,26a-docosahydro-7H-15,19-epoxyprido[2,1-c][1,4]oxazacyclotricosin-7-ylidene]acetohydrazide (three-letter code: R27) (formula: C₄₆H₇₃N₃O₁₂) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	
			Total	C	H	N			O
3	A	1	Total	C	H	N	O	0	0
			134	46	73	3	12		
3	B	1	Total	C	H	N	O	0	0
			134	46	73	3	12		
3	C	1	Total	C	H	N	O	0	0
			134	46	73	3	12		
3	D	1	Total	C	H	N	O	0	0
			134	46	73	3	12		

- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	143	Total	O	0	0
			143	143		
4	B	146	Total	O	0	0
			146	146		
4	C	150	Total	O	0	0
			150	150		
4	D	152	Total	O	0	0
			152	152		

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	P 32	Depositor
Cell constants a, b, c, α , β , γ	53.59Å 53.59Å 126.89Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	31.26 – 1.69	Depositor
% Data completeness (in resolution range)	99.9 (31.26-1.69)	Depositor
R_{merge}	(Not available)	Depositor
R_{sym}	0.12	Depositor
$\langle I/\sigma(I) \rangle$ ¹	5.08 (at 1.69Å)	Xtrriage
Refinement program	PHENIX 1.17.1_3660	Depositor
R, R_{free}	0.156 , 0.196	Depositor
Wilson B-factor (Å ²)	12.4	Xtrriage
Anisotropy	0.061	Xtrriage
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	0.022 for -h,-k,l 0.480 for h,-h-k,-l 0.025 for -k,-h,-l	Xtrriage
Total number of atoms	4531	wwPDB-VP
Average B, all atoms (Å ²)	16.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.56% 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.

4 Model quality [i](#)

4.1 Standard geometry [i](#)

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

4.2 Too-close contacts [i](#)

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

4.3 Torsion angles [i](#)

4.3.1 Protein backbone [i](#)

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

4.3.2 Protein sidechains [i](#)

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

4.3.3 RNA [i](#)

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

4.4 Non-standard residues in protein, DNA, RNA chains [i](#)

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

4.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

4.6 Ligand geometry [i](#)

9 ligands are modelled in this entry.

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	R27	D	202	-	58,64,64	2.92	21 (36%)	65,91,91	2.52	15 (23%)
2	ACT	A	202	-	3,3,3	1.31	0	3,3,3	1.45	0
2	ACT	B	202	-	3,3,3	1.30	0	3,3,3	1.50	0
3	R27	B	203	-	58,64,64	2.90	20 (34%)	65,91,91	2.13	15 (23%)
3	R27	A	203	-	58,64,64	2.91	18 (31%)	65,91,91	2.09	15 (23%)
2	ACT	D	201	-	3,3,3	1.33	0	3,3,3	1.46	0
3	R27	C	201	-	58,64,64	2.89	22 (37%)	65,91,91	2.46	16 (24%)
2	ACT	A	201	-	3,3,3	1.35	0	3,3,3	1.57	0
2	ACT	B	201	-	3,3,3	1.34	0	3,3,3	1.53	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. '2' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	R27	D	202	-	-	7/72/119/119	0/3/4/4
3	R27	B	203	-	-	6/72/119/119	0/3/4/4
3	R27	A	203	-	-	5/72/119/119	0/3/4/4
3	R27	C	201	-	-	7/72/119/119	0/3/4/4

All (81) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	D	202	R27	C42-N3	12.79	1.48	1.35
3	C	201	R27	C42-N3	12.51	1.48	1.35
3	A	203	R27	C42-N3	12.32	1.47	1.35
3	B	203	R27	C42-N3	12.31	1.47	1.35
3	A	203	R27	C12-N1	8.06	1.47	1.34
3	D	202	R27	C12-N1	7.84	1.46	1.34
3	B	203	R27	C12-N1	7.81	1.46	1.34
3	C	201	R27	C12-N1	7.61	1.46	1.34
3	A	203	R27	C11-N1	6.68	1.55	1.47
3	B	203	R27	C11-N1	6.63	1.55	1.47
3	D	202	R27	C11-N1	6.54	1.54	1.47
3	C	201	R27	C11-N1	6.46	1.54	1.47
3	C	201	R27	C19-C20	5.79	1.59	1.51

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	B	203	R27	C19-C20	5.72	1.58	1.51
3	D	202	R27	C19-C20	5.66	1.58	1.51
3	A	203	R27	C19-C20	5.55	1.58	1.51
3	A	203	R27	O3-C10	5.55	1.47	1.34
3	C	201	R27	O3-C10	5.54	1.47	1.34
3	B	203	R27	O3-C10	5.40	1.46	1.34
3	D	202	R27	O3-C10	5.30	1.46	1.34
3	A	203	R27	C5-C6	5.11	1.58	1.50
3	B	203	R27	C5-C6	4.91	1.58	1.50
3	D	202	R27	C5-C6	4.74	1.58	1.50
3	C	201	R27	C5-C6	4.48	1.57	1.50
3	D	202	R27	C24-C23	3.74	1.59	1.51
3	B	203	R27	C24-C23	3.71	1.58	1.51
3	A	203	R27	C24-C23	3.69	1.58	1.51
3	C	201	R27	C24-C23	3.63	1.58	1.51
3	D	202	R27	N3-N2	3.52	1.44	1.38
3	C	201	R27	C13-N1	3.41	1.53	1.47
3	D	202	R27	C13-N1	3.36	1.52	1.47
3	A	203	R27	N3-N2	3.32	1.43	1.38
3	C	201	R27	N3-N2	3.29	1.43	1.38
3	A	203	R27	C13-N1	3.22	1.52	1.47
3	B	203	R27	C13-N1	3.18	1.52	1.47
3	D	202	R27	O6-C18	-3.05	1.36	1.43
3	A	203	R27	C33-C31	-3.04	1.46	1.52
3	C	201	R27	O6-C18	-3.01	1.37	1.43
3	A	203	R27	O6-C18	-2.98	1.37	1.43
3	B	203	R27	N3-N2	2.96	1.43	1.38
3	B	203	R27	O6-C18	-2.93	1.37	1.43
3	B	203	R27	C38-C23	2.93	1.58	1.50
3	B	203	R27	C19-C18	2.89	1.57	1.53
3	B	203	R27	C33-C31	-2.88	1.46	1.52
3	D	202	R27	C33-C31	-2.84	1.46	1.52
3	D	202	R27	C38-C23	2.79	1.57	1.50
3	A	203	R27	O4-C12	-2.79	1.17	1.23
3	B	203	R27	O4-C12	-2.78	1.17	1.23
3	C	201	R27	C33-C31	-2.75	1.46	1.52
3	A	203	R27	C38-C23	2.73	1.57	1.50
3	D	202	R27	C8-C7	2.71	1.55	1.50
3	C	201	R27	C8-C7	2.69	1.55	1.50
3	A	203	R27	C15-C16	-2.68	1.46	1.53
3	B	203	R27	C8-C7	2.68	1.55	1.50
3	A	203	R27	C19-C18	2.66	1.57	1.53

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	B	203	R27	C15-C16	-2.64	1.46	1.53
3	C	201	R27	C38-C23	2.63	1.57	1.50
3	C	201	R27	O4-C12	-2.59	1.17	1.23
3	A	203	R27	C8-C7	2.50	1.55	1.50
3	A	203	R27	C6-C7	2.49	1.38	1.33
3	C	201	R27	C35-C34	2.47	1.58	1.53
3	D	202	R27	O4-C12	-2.47	1.17	1.23
3	D	202	R27	C15-C16	-2.43	1.46	1.53
3	B	203	R27	C6-C7	2.41	1.38	1.33
3	C	201	R27	C19-C18	2.39	1.56	1.53
3	D	202	R27	C6-C7	2.38	1.38	1.33
3	C	201	R27	C6-C7	2.37	1.38	1.33
3	C	201	R27	C15-C16	-2.36	1.47	1.53
3	B	203	R27	C35-C34	2.36	1.58	1.53
3	D	202	R27	C35-C34	2.28	1.58	1.53
3	C	201	R27	C22-C23	2.27	1.36	1.33
3	A	203	R27	C35-C34	2.26	1.58	1.53
3	B	203	R27	C12-C37	2.18	1.56	1.53
3	D	202	R27	O9-C30	2.12	1.47	1.44
3	D	202	R27	C12-C37	2.11	1.56	1.53
3	D	202	R27	C22-C23	2.10	1.36	1.33
3	C	201	R27	O11-C37	-2.08	1.18	1.22
3	C	201	R27	O3-C9	-2.04	1.41	1.44
3	D	202	R27	C19-C18	2.03	1.56	1.53
3	B	203	R27	O12-C42	-2.02	1.18	1.23
3	C	201	R27	O9-C30	2.01	1.47	1.44

All (61) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	C	201	R27	C20-N2-N3	13.36	136.36	118.59
3	D	202	R27	C20-N2-N3	13.12	136.04	118.59
3	B	203	R27	C20-N2-N3	10.32	132.32	118.59
3	A	203	R27	C20-N2-N3	6.73	127.54	118.59
3	A	203	R27	C42-N3-N2	5.48	124.73	119.35
3	D	202	R27	C28-C30-C31	5.36	121.78	113.57
3	D	202	R27	O3-C9-C17	5.32	112.01	105.91
3	C	201	R27	C28-C30-C31	5.29	121.68	113.57
3	D	202	R27	C21-C22-C23	-5.26	122.25	127.64
3	B	203	R27	C45-C5-C6	-5.06	104.33	111.14
3	C	201	R27	C45-C5-C6	-4.91	104.53	111.14
3	A	203	R27	C4-C5-C45	4.90	114.27	108.66

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	C	201	R27	C21-C22-C23	-4.77	122.75	127.64
3	D	202	R27	C45-C5-C6	-4.74	104.76	111.14
3	A	203	R27	C45-C5-C6	-4.73	104.77	111.14
3	A	203	R27	O3-C9-C17	4.71	111.31	105.91
3	B	203	R27	O3-C9-C17	4.56	111.13	105.91
3	A	203	R27	C43-C42-N3	4.48	124.11	117.21
3	A	203	R27	C28-C30-C31	4.43	120.36	113.57
3	B	203	R27	C4-C5-C45	4.38	113.67	108.66
3	C	201	R27	O3-C9-C17	4.11	110.62	105.91
3	D	202	R27	C46-C45-C5	4.05	117.33	110.76
3	D	202	R27	C43-C42-N3	3.90	123.23	117.21
3	B	203	R27	C28-C30-C31	3.50	118.94	113.57
3	A	203	R27	O3-C10-C11	3.50	118.50	110.78
3	A	203	R27	C46-C45-C5	3.43	116.34	110.76
3	B	203	R27	C46-C45-C5	3.42	116.31	110.76
3	C	201	R27	C46-C45-C5	3.39	116.27	110.76
3	C	201	R27	O4-C12-C37	3.38	121.83	116.28
3	B	203	R27	O3-C10-C11	3.32	118.09	110.78
3	C	201	R27	C37-C12-N1	-3.26	115.52	119.25
3	C	201	R27	C43-C42-N3	3.17	122.10	117.21
3	B	203	R27	C21-C22-C23	-3.06	124.50	127.64
3	C	201	R27	C9-O3-C10	-3.05	109.52	117.36
3	D	202	R27	O3-C10-C11	2.98	117.35	110.78
3	B	203	R27	C43-C42-N3	2.96	121.78	117.21
3	D	202	R27	C4-C5-C45	2.95	112.04	108.66
3	D	202	R27	C9-O3-C10	-2.93	109.84	117.36
3	B	203	R27	O4-C12-C37	2.92	121.08	116.28
3	B	203	R27	O12-C42-C43	-2.90	116.68	122.06
3	D	202	R27	O12-C42-C43	-2.78	116.89	122.06
3	A	203	R27	C21-C22-C23	-2.78	124.79	127.64
3	A	203	R27	O12-C42-C43	-2.60	117.22	122.06
3	A	203	R27	O5-C10-C11	-2.60	118.65	124.49
3	C	201	R27	O3-C10-C11	2.58	116.47	110.78
3	D	202	R27	O9-C30-C28	-2.57	101.99	106.70
3	D	202	R27	O4-C12-C37	2.53	120.45	116.28
3	A	203	R27	C27-C28-C30	-2.46	108.62	113.34
3	C	201	R27	C4-C5-C45	2.43	111.44	108.66
3	A	203	R27	O4-C12-C37	2.40	120.22	116.28
3	C	201	R27	O9-C30-C28	-2.36	102.37	106.70
3	D	202	R27	O5-C10-C11	-2.33	119.25	124.49
3	B	203	R27	O5-C10-C11	-2.30	119.30	124.49
3	C	201	R27	O12-C42-C43	-2.23	117.92	122.06

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	203	R27	C27-C28-C30	-2.20	109.12	113.34
3	C	201	R27	O5-C10-C11	-2.17	119.60	124.49
3	B	203	R27	C9-O3-C10	-2.17	111.78	117.36
3	A	203	R27	O9-C30-C28	-2.14	102.77	106.70
3	D	202	R27	C27-C28-C30	-2.13	109.26	113.34
3	B	203	R27	C37-C12-N1	-2.05	116.91	119.25
3	C	201	R27	C8-C7-C9	2.01	119.16	115.68

There are no chirality outliers.

All (25) torsion outliers are listed below:

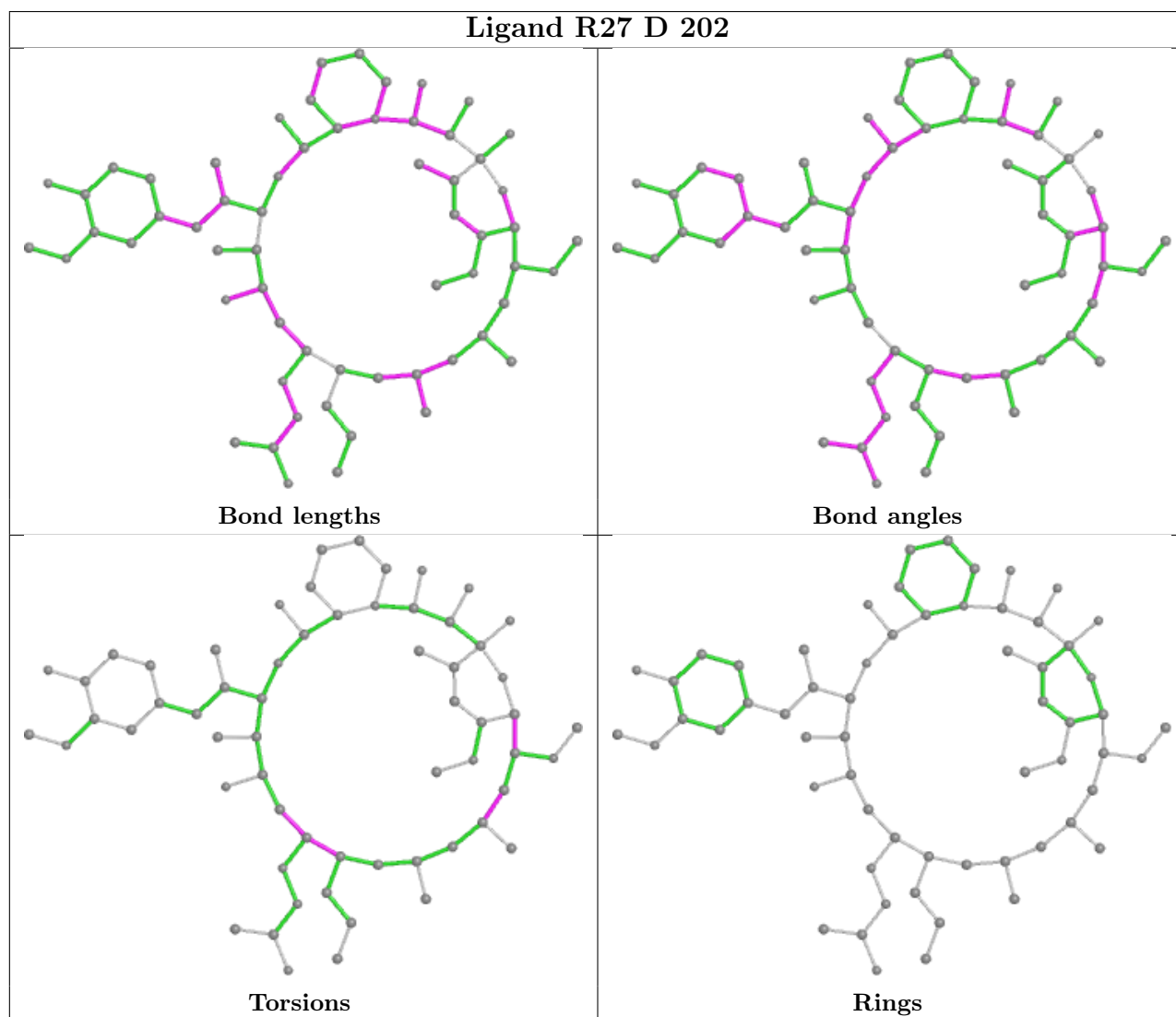
Mol	Chain	Res	Type	Atoms
3	A	203	R27	C27-C28-C30-C31
3	C	201	R27	C26-C25-C27-C28
3	D	202	R27	C26-C25-C27-C28
3	D	202	R27	C27-C28-C30-C31
3	D	202	R27	O7-C28-C30-O9
3	A	203	R27	O7-C28-C30-C31
3	B	203	R27	O7-C28-C30-C31
3	C	201	R27	O7-C28-C30-C31
3	D	202	R27	O7-C28-C30-C31
3	B	203	R27	C27-C28-C30-C31
3	C	201	R27	C27-C28-C30-C31
3	A	203	R27	C23-C24-C25-C26
3	A	203	R27	C27-C28-C30-O9
3	B	203	R27	C23-C24-C25-C26
3	C	201	R27	C23-C24-C25-C26
3	D	202	R27	C27-C28-C30-O9
3	C	201	R27	C18-C19-C20-N2
3	D	202	R27	C18-C19-C20-N2
3	A	203	R27	O7-C28-C30-O9
3	B	203	R27	C26-C25-C27-C28
3	C	201	R27	C19-C20-C21-C22
3	D	202	R27	C19-C20-C21-C22
3	B	203	R27	O7-C28-C30-O9
3	C	201	R27	O7-C28-C30-O9
3	B	203	R27	C20-C21-C22-C23

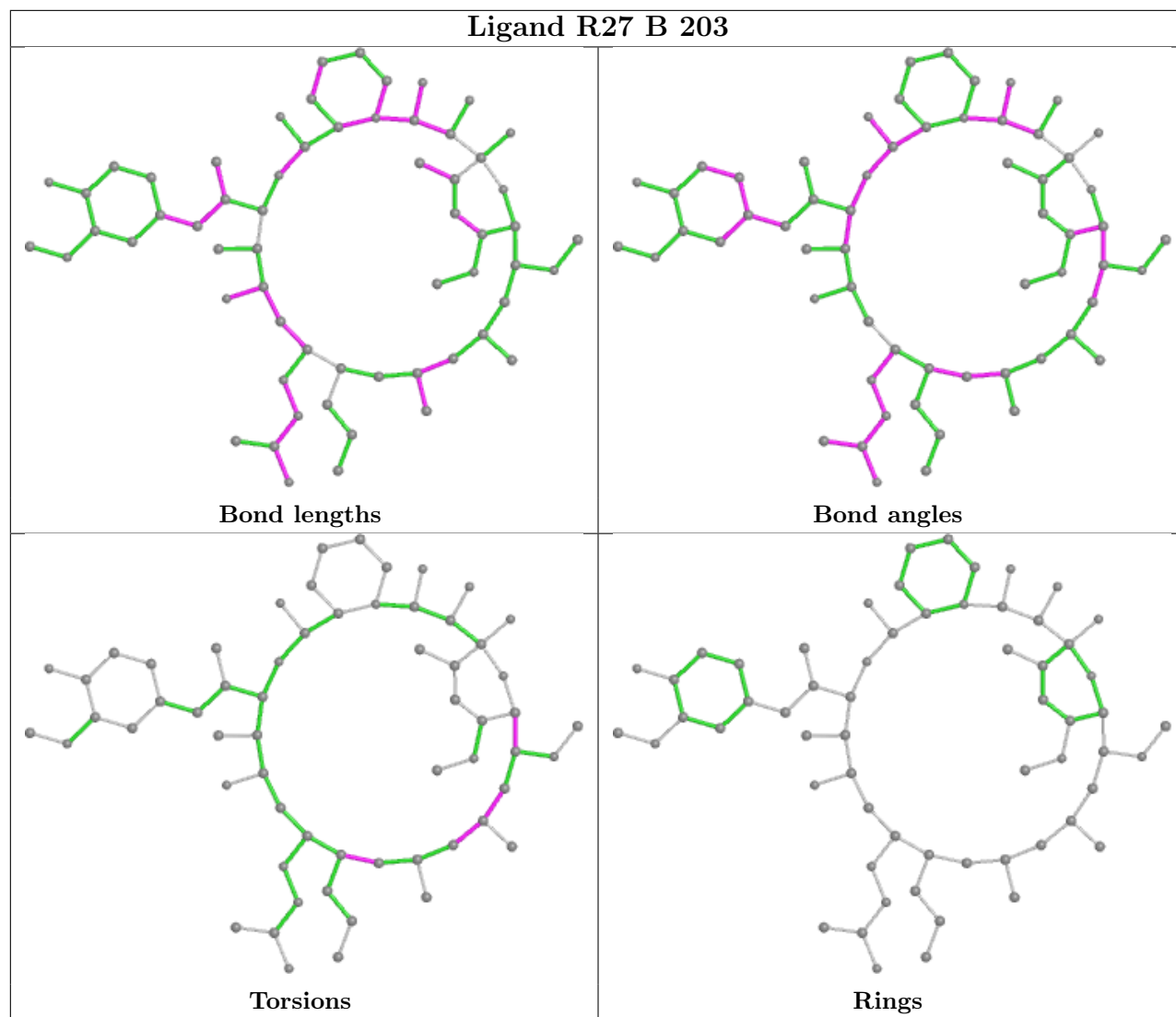
There are no ring outliers.

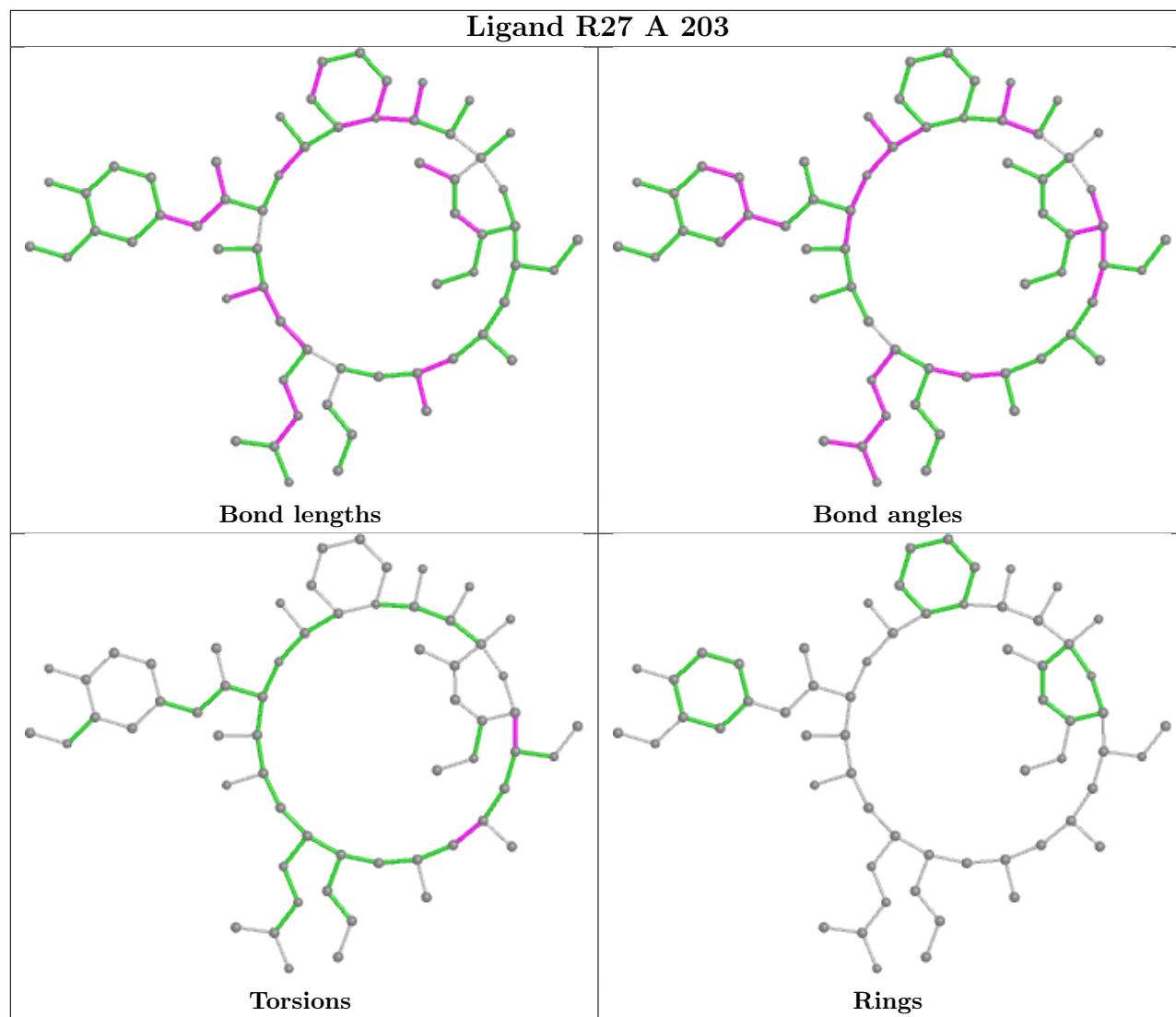
No monomer is involved in short contacts.

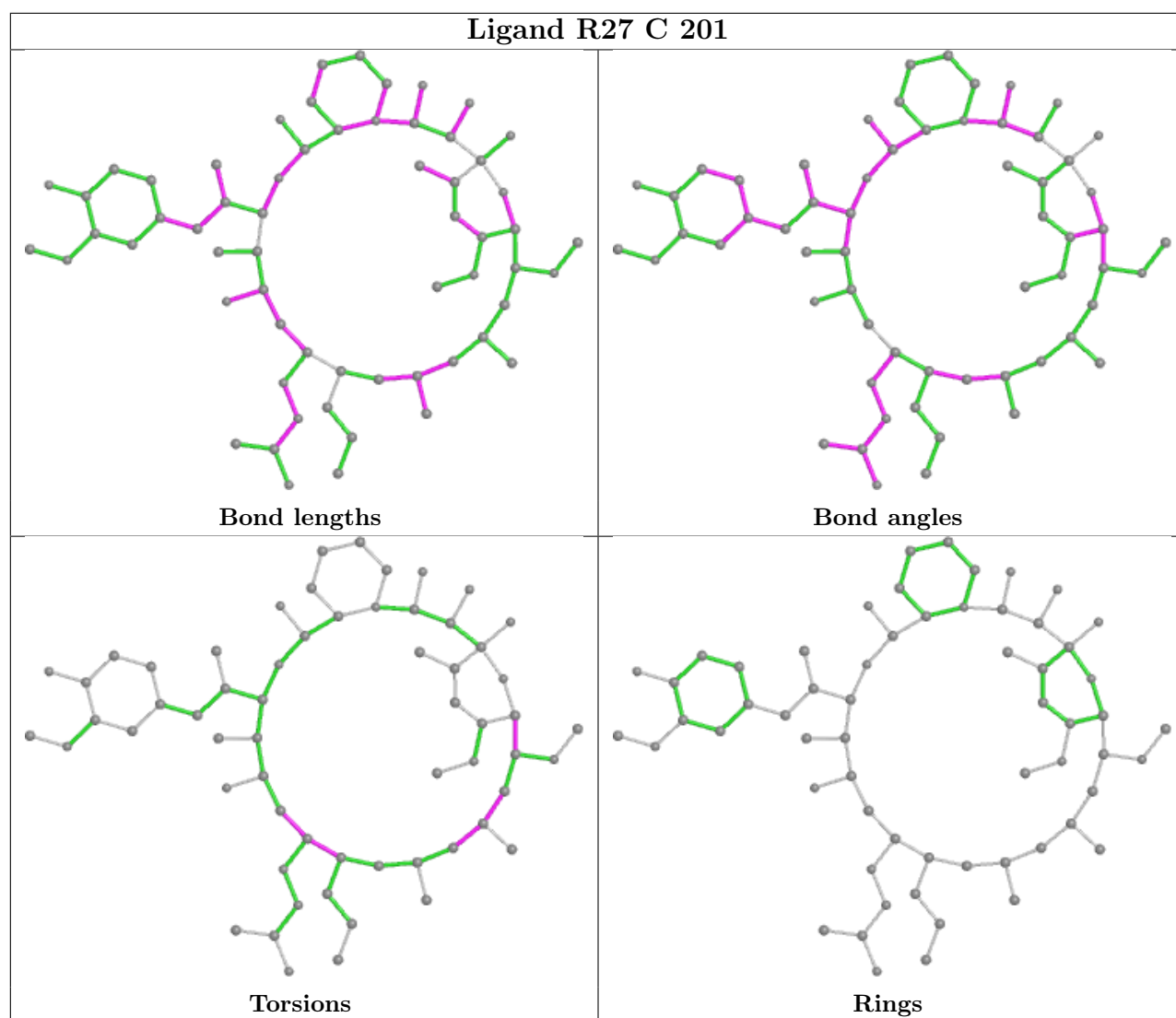
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths,

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 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.









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 [i](#)

5.1 Protein, DNA and RNA chains [i](#)

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

5.2 Non-standard residues in protein, DNA, RNA chains [i](#)

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

5.3 Carbohydrates [i](#)

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

5.4 Ligands [i](#)

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

5.5 Other polymers [i](#)

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