Full wwPDB EM Validation Report ⓘ

Jul 15, 2025 – 11:08 PM JST

PDB ID	:	8XTP / pdb_00008xtp
EMDB ID	:	EMD-38646
Title	:	Comamonas testosteroni KF-1 circularly permuted group II intron Post-2S state
Authors	:	Wang, L.; Xie, J.H.; Zhang, C.; Zou, J.; Huang, Z.R.; Shang, S.T.; Chen, X.Y.; Yang, Y.; Liu, J.; Dong, H.H.; Huang, D.M.; Su, Z.M.
Deposited on	:	2024-01-11
Resolution	:	2.90 Å(reported)

This is a Full wwPDB EM 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/EMValidationReportHelp
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:

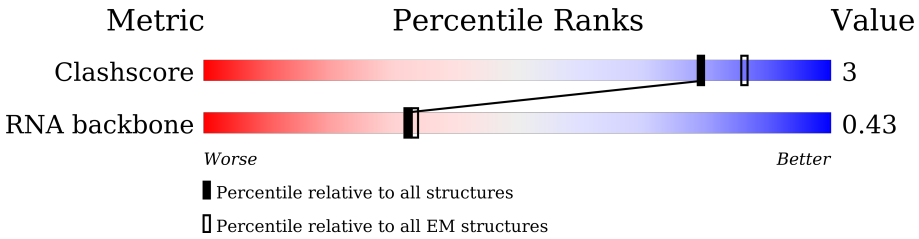
EMDB validation analysis	:	FAILED
Mogul	:	1.8.5 (274361), CSD as541be (2020)
MolProbity	:	4-5-2 with Phenix2.0rc1
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	FAILED
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.44

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
ELECTRON MICROSCOPY

The reported resolution of this entry is 2.90 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)	EM structures (#Entries)
Clashscore	210492	15764
RNA backbone	6643	2191

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the 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 <=5%

Mol	Chain	Length	Quality of chain
1	B	595	72% 24% .
2	A	133	66% 29% 5%

2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 15714 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, 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 RNA chain called RNA (595-MER).

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	B	595	12828	5711	2402	4120	595	0	0

- Molecule 2 is a RNA chain called RNA (133-MER).

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
2	A	133	2834	1265	513	924	132	0	0

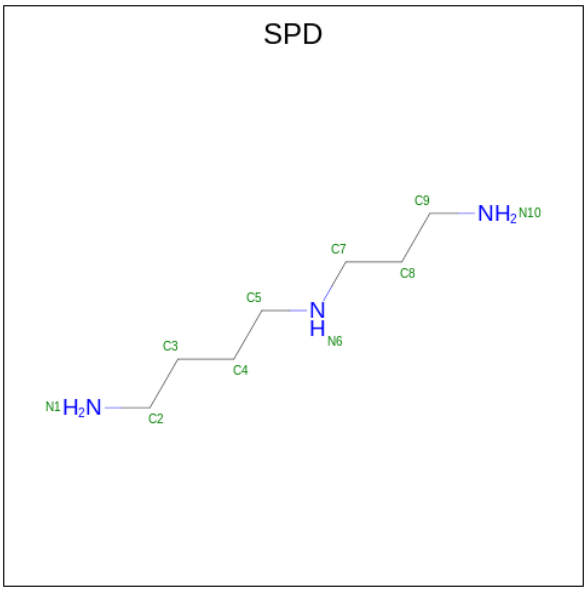
- Molecule 3 is POTASSIUM ION (CCD ID: K) (formula: K).

Mol	Chain	Residues	Atoms		AltConf
			Total	K	
3	B	2	2	2	0
3	A	2	Total	K	0
			2	2	

- Molecule 4 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
			Total	Mg	
4	B	33	33	33	0
4	A	5	Total	Mg	0
			5	5	

- Molecule 5 is SPERMIDINE (CCD ID: SPD) (formula: $C_7H_{19}N_3$).



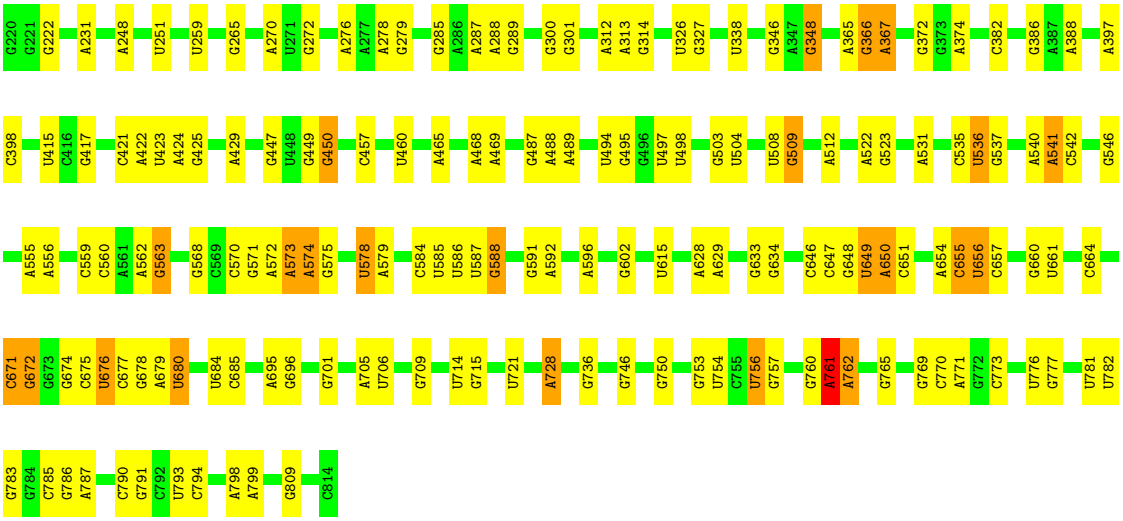
Mol	Chain	Residues	Atoms			AltConf
			Total	C	N	
5	B	1	10	7	3	0

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. 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. 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.

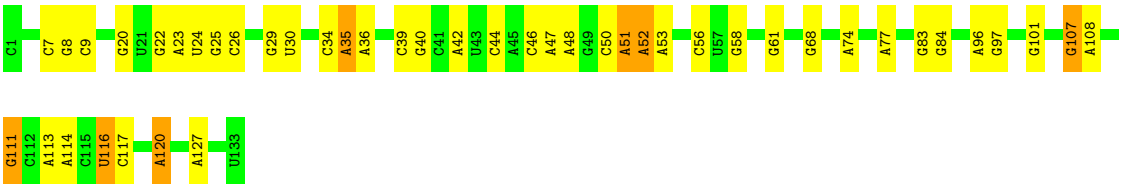
- Molecule 1: RNA (595-MER)

Chain B:



- Molecule 2: RNA (133-MER)

Chain A:



4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	59466	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	64	Depositor
Minimum defocus (nm)	800	Depositor
Maximum defocus (nm)	1500	Depositor
Magnification	Not provided	
Image detector	GATAN K2 QUANTUM (4k x 4k)	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: SPD, MG, K

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	B	0.43	1/14373 (0.0%)	0.50	1/22438 (0.0%)
2	A	0.40	0/3167	0.51	0/4936
All	All	0.42	1/17540 (0.0%)	0.50	1/27374 (0.0%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	649	U	C1'-N1	5.08	1.56	1.48

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	761	A	C4'-C3'-O3'	5.59	117.79	109.40

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

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	B	12828	0	6451	48	0
2	A	2834	0	1443	11	0
3	A	2	0	0	0	0
3	B	2	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	A	5	0	0	0	0
4	B	33	0	0	0	0
5	B	10	0	19	1	0
All	All	15714	0	7913	57	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 3.

All (57) 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:B:761:A:H3'	1:B:761:A:OP2	1.12	1.29
1:B:761:A:OP2	1:B:761:A:C3'	2.05	1.04
1:B:655:C:H3'	1:B:656:U:H4'	1.57	0.85
1:B:648:G:H1	1:B:680:U:H3	1.27	0.82
1:B:655:C:C3'	1:B:656:U:H4'	2.17	0.75
1:B:366:G:H4'	1:B:367:A:OP1	1.88	0.74
1:B:761:A:H3'	1:B:761:A:P	2.31	0.70
1:B:785:C:H3'	1:B:786:G:H8	1.57	0.69
1:B:587:U:H2'	1:B:588:G:H8	1.58	0.67
1:B:760:G:H2'	1:B:761:A:H2'	1.78	0.65
2:A:22:G:N2	2:A:23:A:N7	2.45	0.65
1:B:761:A:C4'	1:B:762:A:OP1	2.46	0.64
1:B:560:C:O2	1:B:560:C:O4'	2.15	0.62
1:B:728:A:H5'	1:B:736:G:H22	1.66	0.61
1:B:415:U:O4	5:B:936:SPD:H22	2.03	0.59
2:A:111:G:N2	2:A:113:A:OP2	2.35	0.59
1:B:372:G:H21	1:B:388:A:H62	1.51	0.58
2:A:35:A:H2'	2:A:36:A:H8	1.74	0.52
1:B:661:U:N3	1:B:664:C:OP2	2.42	0.52
1:B:285:G:H2'	1:B:287:A:N7	2.24	0.52
1:B:563:G:C8	1:B:573:A:H4'	2.45	0.51
1:B:785:C:H3'	1:B:786:G:C8	2.42	0.51
1:B:559:C:H2'	1:B:560:C:O2	2.11	0.50
1:B:578:U:H2'	1:B:579:A:H8	1.77	0.48
2:A:52:A:H2'	2:A:53:A:H8	1.78	0.48
1:B:574:A:H2'	1:B:575:G:O4'	2.13	0.48
1:B:372:G:N2	1:B:388:A:H62	2.11	0.48
1:B:761:A:H4'	1:B:762:A:OP1	2.12	0.48
2:A:52:A:H2'	2:A:53:A:C8	2.49	0.47
1:B:423:U:O4	1:B:541:A:N6	2.48	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:450:G:OP2	1:B:450:G:N2	2.46	0.47
1:B:536:U:H4'	1:B:537:G:H5'	1.97	0.47
1:B:656:U:H1'	2:A:116:U:O4	2.14	0.47
1:B:756:U:H2'	1:B:757:G:H8	1.80	0.46
1:B:786:G:N2	1:B:787:A:H62	2.13	0.46
1:B:790:C:H2'	1:B:791:G:H8	1.80	0.46
1:B:790:C:H2'	1:B:791:G:C8	2.51	0.45
1:B:633:G:H2'	1:B:634:G:C8	2.52	0.45
1:B:300:G:H2'	1:B:301:G:C8	2.52	0.45
1:B:509:G:N2	1:B:591:G:O2'	2.50	0.44
1:B:585:U:H2'	1:B:586:U:C6	2.52	0.44
1:B:348:G:H22	1:B:365:A:H2	1.66	0.44
1:B:798:A:H2'	1:B:799:A:C8	2.53	0.44
2:A:107:G:O6	2:A:120:A:N6	2.51	0.44
1:B:650:A:N1	1:B:676:U:C4	2.86	0.43
1:B:671:C:H2'	1:B:672:G:C8	2.53	0.43
2:A:39:C:H2'	2:A:40:G:H8	1.82	0.43
2:A:39:C:H2'	2:A:40:G:C8	2.54	0.43
1:B:756:U:H2'	1:B:757:G:C8	2.53	0.42
1:B:783:G:C6	2:A:36:A:H1'	2.54	0.42
2:A:50:C:O2'	2:A:51:A:N7	2.53	0.42
1:B:647:C:H2'	1:B:648:G:C8	2.55	0.42
1:B:457:C:O2'	1:B:546:G:OP1	2.36	0.41
1:B:468:A:H2'	1:B:469:A:C8	2.55	0.41
1:B:540:A:O2'	1:B:542:C:OP2	2.28	0.41
1:B:571:G:N2	1:B:573:A:O2'	2.54	0.40
1:B:573:A:HO2'	1:B:574:A:H8	1.69	0.40

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

There are no protein molecules in this entry.

5.3.2 Protein sidechains (i)

There are no protein molecules in this entry.

5.3.3 RNA (i)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	B	594/595 (99%)	121 (20%)	5 (0%)
2	A	132/133 (99%)	37 (28%)	0
All	All	726/728 (99%)	158 (21%)	5 (0%)

All (158) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	B	222	G
1	B	231	A
1	B	248	A
1	B	251	U
1	B	259	U
1	B	265	G
1	B	270	A
1	B	272	G
1	B	276	A
1	B	278	A
1	B	279	G
1	B	288	A
1	B	289	G
1	B	312	A
1	B	313	A
1	B	314	G
1	B	326	U
1	B	327	G
1	B	338	U
1	B	346	G
1	B	348	G
1	B	367	A
1	B	374	A
1	B	382	C
1	B	386	G
1	B	397	A
1	B	398	C
1	B	417	G
1	B	421	C
1	B	422	A
1	B	424	A
1	B	425	G
1	B	429	A
1	B	447	G

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Mol	Chain	Res	Type
1	B	449	G
1	B	450	G
1	B	460	U
1	B	465	A
1	B	487	G
1	B	488	A
1	B	489	A
1	B	494	U
1	B	495	G
1	B	497	U
1	B	498	U
1	B	504	U
1	B	508	U
1	B	509	G
1	B	512	A
1	B	522	A
1	B	523	G
1	B	531	A
1	B	535	C
1	B	536	U
1	B	541	A
1	B	555	A
1	B	556	A
1	B	562	A
1	B	563	G
1	B	568	G
1	B	570	C
1	B	572	A
1	B	573	A
1	B	574	A
1	B	578	U
1	B	584	C
1	B	588	G
1	B	592	A
1	B	596	A
1	B	602	G
1	B	615	U
1	B	628	A
1	B	629	A
1	B	646	C
1	B	649	U
1	B	650	A

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Mol	Chain	Res	Type
1	B	651	C
1	B	654	A
1	B	655	C
1	B	656	U
1	B	657	C
1	B	660	G
1	B	671	C
1	B	672	G
1	B	674	G
1	B	675	C
1	B	676	U
1	B	677	C
1	B	678	G
1	B	679	A
1	B	680	U
1	B	684	U
1	B	685	C
1	B	695	A
1	B	696	G
1	B	701	G
1	B	705	A
1	B	706	U
1	B	709	G
1	B	714	U
1	B	715	G
1	B	721	U
1	B	728	A
1	B	746	G
1	B	750	G
1	B	753	G
1	B	754	U
1	B	756	U
1	B	761	A
1	B	762	A
1	B	765	G
1	B	770	C
1	B	771	A
1	B	773	C
1	B	776	U
1	B	777	G
1	B	781	U
1	B	782	U

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Mol	Chain	Res	Type
1	B	793	U
1	B	794	C
1	B	809	G
2	A	7	C
2	A	8	G
2	A	9	C
2	A	20	G
2	A	24	U
2	A	25	G
2	A	26	C
2	A	29	G
2	A	30	U
2	A	34	C
2	A	35	A
2	A	42	A
2	A	44	C
2	A	46	C
2	A	47	A
2	A	48	A
2	A	51	A
2	A	52	A
2	A	56	C
2	A	58	G
2	A	61	G
2	A	68	G
2	A	74	A
2	A	77	A
2	A	83	G
2	A	84	G
2	A	96	A
2	A	97	G
2	A	101	G
2	A	107	G
2	A	108	A
2	A	111	G
2	A	114	A
2	A	116	U
2	A	117	C
2	A	120	A
2	A	127	A

All (5) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
1	B	366	G
1	B	503	G
1	B	728	A
1	B	761	A
1	B	769	G

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 43 ligands modelled in this entry, 42 are monoatomic - leaving 1 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	$\#\|Z\| > 2$
5	SPD	B	936	-	9,9,9	0.31	0	8,8,8	0.59	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
5	SPD	B	936	-	-	2/7/7/7	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (2) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	B	936	SPD	C3-C4-C5-N6
5	B	936	SPD	N1-C2-C3-C4

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	B	936	SPD	1	0

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.