International Journal of Advanced Research in Physical Science (IJARPS)
Volume 9, Issue 5, 2022, PP 17-19
ISSN No. (Online) 2349-7882
www.arcjournals.org

715 Water Molecules in Serratia Marcescens Endonuclease

Janez Špringer*

Cankarjeva cesta 2, 9250GornjaRadgona, Slovenia, EU

Corresponding Author:** ***Janez Špringer, *Cankarjeva cesta 2, 9250GornjaRadgona, Slovenia, EU*

Abstract: *The presence of 715 water molecules in the crystal structure of bacteria Serratia marcescens endonuclease is noteworthy due to the special alignment frequency of the water cluster $(H_2O)_{715}$= $(H_2O)_{55\ x\ 13}$being lower than the alignment frequency of related neighbour clusters $(H_2O)_{54\ x\ 13}$and $(H_2O)_{56\ x\ 13}$.*

Keywords: *Alignment frequency of water clusters, Serratia marcescens endonuclease structure*

1. Introduction

Let us see what alignment frequency potential [1] for communication possesses the presence of 715 water molecules in the atomic structure of bacteria Serratia marcescens endonuclease[2].

2. Hundred and One Water Clusters Formed from $(H_2O)_{13}$ Units

Water cluster $(H_2O)_{13}$possesses the lowest alignment frequency amongst first 106 water clusters.[1]Frequency value of just mentioned the most favourable water cluster yielding 1,69 THz remains approximately (on two decimals) the same for all subsequent hundred clusters made of $(H_2O)_{13}$ units, i.e. from the cluster $(H_2O)_{13}$to the cluster $(H_2O)_{13\ x\ 101}$.Formation of water clusters $(H_2O)_{13\ x\ n}$ for n=2 to n=101 is therefore following alignment frequency concept energetically acceptable since the needed frequency equivalence of energy difference does not surpass 1,16 GHz as presented in previous article[1].

3. Special Alignment Frequency of 55TH Water ClusterFormed from $(H_2O)_{13}$ Units

In Table1 detailed alignment frequencies of all water clusters $(H_2O)_{13x\ n}$ for n=1 to n=101 are presented including step to step frequency difference.

Table1. *Alignment frequency of water clusters $(H_2O)_{13\ x\ n}$ for n=1 to n=101with calculated step to step frequency differences*

N0	Water cluster $(H_2O)_{13\ x\ n}$	Frequency (THz)	Step to step frequency difference	n	Water cluster $(H_2O)_{13\ x\ n}$	Frequency (THz)	Step to step frequency difference
1	$(H_2O)_{13}$	1,687028244	/	52	$(H_2O)_{676}$	1,688190499	0 KHz
2	$(H_2O)_{26}$	1,687900285	872,041 MHz	53	$(H_2O)_{689}$	1,688190526	27 KHz
3	$(H_2O)_{39}$	1,688061771	161,486MHz	**54**	**$(H_2O)_{702}$**	**1,688190581**	**55 KHz**
4	$(H_2O)_{52}$	1,688118288	56,517MHz	**55**	**$(H_2O)_{715}$**	**1,688190554**	**-27KHz**
5	$(H_2O)_{65}$	1,688144462	26,174 MHz	**56**	**$(H_2O)_{728}$**	**1,688190581**	**27 KHz**
6	$(H_2O)_{78}$	1,688158674	14,212 MHz	57	$(H_2O)_{741}$	1,688190581	0 KHz
7	$(H_2O)_{91}$	1,688167233	8,559 MHz	58	$(H_2O)_{754}$	1,688190636	55 KHz
8	$(H_2O)_{104}$	1,688172803	5,570 MHz	59	$(H_2O)_{767}$	1,688190636	0 KHz
9	$(H_2O)_{117}$	1,688176589	3,786 MHz	60	$(H_2O)_{780}$	1,688190609	-27 KHz
10	$(H_2O)_{130}$	1,688179305	2,716 MHz	61	$(H_2O)_{793}$	1,688190636	27 KHz
11	$(H_2O)_{143}$	1,688181363	2,058 MHz	62	$(H_2O)_{806}$	1,688190663	27KHz
12	$(H_2O)_{156}$	1,688182872	1,509 MHz	63	$(H_2O)_{819}$	1,688190663	0 KHz
13	$(H_2O)_{169}$	1,688184051	1,179 MHz	64	$(H_2O)_{832}$	1,688190691	28 KHz
14	$(H_2O)_{182}$	1,688185039	988 KHz	65	$(H_2O)_{845}$	1,688190663	-28 KHz
15	$(H_2O)_{195}$	1,688185807	768KHz	66	$(H_2O)_{858}$	1,688190691	28 KHz
16	$(H_2O)_{208}$	1,688186411	604 KHz	67	$(H_2O)_{871}$	1,688190691	0 KHz
17	$(H_2O)_{221}$	1,688186932	521KHz	68	$(H_2O)_{884}$	1,688190691	0 KHz
18	$(H_2O)_{234}$	1,688187371	439KHz	69	$(H_2O)_{897}$	1,688190718	27 KHz

19	$(H_2O)_{247}$	1,688187700	329 KHz	70	$(H_2O)_{910}$	1,688190746	28 KHz
20	$(H_2O)_{260}$	1,688188030	330 KHz	71	$(H_2O)_{923}$	1,688190718	-28 KHz
21	$(H_2O)_{273}$	1,688188331	301KHz	72	$(H_2O)_{936}$	1,688190746	28 KHz
22	$(H_2O)_{286}$	1,688188551	220KHz	73	$(H_2O)_{949}$	1,688190718	-28 KHz
23	$(H_2O)_{299}$	1,688188770	219 KHz	74	$(H_2O)_{962}$	1,688190746	28 KHz
24	$(H_2O)_{312}$	1,688188908	138KHz	75	$(H_2O)_{975}$	1,688190718	-28 KHz
25	$(H_2O)_{325}$	1,688189100	192KHz	76	$(H_2O)_{988}$	1,688190746	28 KHz
26	$(H_2O)_{338}$	1,688189237	137KHz	77	$(H_2O)_{1001}$	1,688190773	27 KHz
27	$(H_2O)_{351}$	1,688189347	110KHz	78	$(H_2O)_{1014}$	1,688190773	0 KHz
28	$(H_2O)_{364}$	1,688189484	137KHz	79	$(H_2O)_{1027}$	1,688190773	0 KHz
29	$(H_2O)_{377}$	1,688189566	82KHz	80	$(H_2O)_{1040}$	1,688190773	0 KHz
30	$(H_2O)_{390}$	1,688189676	110KHz	81	$(H_2O)_{1053}$	1,688190828	55 KHz
31	$(H_2O)_{403}$	1,688189731	55KHz	82	$(H_2O)_{1066}$	1,688190773	-55 KHz
32	$(H_2O)_{416}$	1,688189813	82 KHz	83	$(H_2O)_{1079}$	1,688190773	0 KHz
33	$(H_2O)_{429}$	1,688189895	82 KHz	84	$(H_2O)_{1092}$	1,688190773	0 KHz
34	$(H_2O)_{442}$	1,688189950	55KHz	85	$(H_2O)_{1105}$	1,688190773	0 KHz
35	$(H_2O)_{455}$	1,688190032	82 KHz	86	$(H_2O)_{1118}$	1,688190828	55 KHz
36	$(H_2O)_{468}$	1,688190060	28 KHz	87	$(H_2O)_{1131}$	1,688190801	-27 KHz
37	$(H_2O)_{481}$	1,688190115	55 KHz	88	$(H_2O)_{1144}$	1,688190828	27 KHz
38	$(H_2O)_{494}$	1,688190142	27KHz	89	$(H_2O)_{1157}$	1,688190773	-55 KHz
39	$(H_2O)_{507}$	1,688190197	55KHz	90	$(H_2O)_{1170}$	1,688190801	28 KHz
40	$(H_2O)_{520}$	1,688190224	27KHz	91	$(H_2O)_{1183}$	1,688190828	27 KHz
41	$(H_2O)_{533}$	1,688190279	55 KHz	92	$(H_2O)_{1196}$	1,688190801	-27 KHz
42	$(H_2O)_{546}$	1,688190279	0KHz	93	$(H_2O)_{1209}$	1,688190801	0 KHz
43	$(H_2O)_{559}$	1,688190334	55 KHz	94	$(H_2O)_{1222}$	1,688190828	27 KHz
44	$(H_2O)_{572}$	1,688190334	0 KHz	95	$(H_2O)_{1235}$	1,688190856	28 KHz
45	$(H_2O)_{585}$	1,688190389	55 KHz	96	$(H_2O)_{1248}$	1,688190856	0 KHz
46	$(H_2O)_{598}$	1,688190389	0 KHz	97	$(H_2O)_{1261}$	1,688190856	0 KHz
47	$(H_2O)_{611}$	1,688190444	55KHz	98	$(H_2O)_{1274}$	1,688190883	27 KHz
48	$(H_2O)_{624}$	1,688190444	0 KHz	99	$(H_2O)_{1287}$	1,688190856	-27 KHz
49	$(H_2O)_{637}$	1,688190471	27 KHz	100	$(H_2O)_{1300}$	1,688190856	0 KHz
50	$(H_2O)_{650}$	1,688190499	28KHz	101	$(H_2O)_{1313}$	1,688190828	-28 KHz
51	$(H_2O)_{663}$	1,688190499	0 KHz				

We can see in Table1 that for forming water clusters step by step out of $(H_2O)_{13}$ units in general the input of energy (in our case expressed in the frequency equivalence) is needed. However, the input of energy is step by step decreasing. Eventually, in some cases, no energy input is required. And in some cases, we are even witnessing a release of energy. The latter occurs for the first time in the formation of 55thwater cluster, i.e. $(H_2O)_{715}$ from $(H_2O)_{702}$with the help of added $(H_2O)_{13}$as follows:

$$(H_2O)_{702} + (H_2O)_{13} \rightarrow (H_2O)_{715} + 27 \text{ KHz}. \quad (1)$$

In forming the next (56th) water cluster, i.e. $(H_2O)_{728}$ from $(H_2O)_{715}$ with the help of added $(H_2O)_{13}$ the same energy is consumed again in accordance with the general trend:

$$(H_2O)_{715} + (H_2O)_{13} \rightarrow (H_2O)_{728} - 27 \text{ KHz}. \quad (2)$$

Endonuclease, which has 715 water molecules at its disposal, can therefore become a flexible very low frequency (VLF) radio waves receiver. Since water cluster $(H_2O)_{715}$ can consume 27 KHz in the case of acceptance as well as withdrawal of water cluster $(H_2O)_{13}$ as follows:

$$(H_2O)_{715} \pm (H_2O)_{13} + 27 \text{ KHz} \rightarrow (H_2O)_{715\pm13}. \quad (3)$$

Or:

$$2\,x\,(H_2O)_{715} + 2\,x\,27 \text{ KHz} \rightarrow (H_2O)_{715+13} + (H_2O)_{715-13}. \quad (4)$$

And endonuclease using the reverse reaction can play a role of VLF radio waves transmitter as follows:

$$(H_2O)_{715+13} + (H_2O)_{715-13} \rightarrow 2\,x\,(H_2O)_{715} + 2\,x\,27 \text{ KHz}. \quad (5)$$

The advantage of VLF radio frequencies in communication is their long range and high reliability.[3]Whether bacteria Serratia marcescensuse theircommunication potential of course remains an open question.

4. CONCLUSION

Special alignment frequency of the water cluster $(H_2O)_{715}$ = $(H_2O)_{55\ x\ 13}$ being lower than the alignment frequency of related neighbour clusters $(H_2O)_{54\ x\ 13}$ and $(H_2O)_{56\ x\ 13}$ represents a communication potential hidden in the crystal structure of bacteria Serratia marcescens endonuclease.

DEDICATION

To the Beatles and their song: "Yellow Submarine"

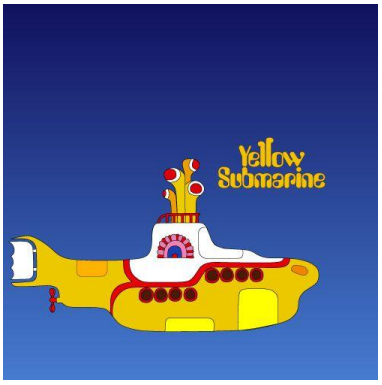

Figure1. *Yellow Submarine[4]*

REFERENCES

[1] Janez Špringer (2022) "Water Cluster Alignment Energy in Deionised Water"International Journal of Advanced Research in Physical Science (IJARPS) 9(5), pp.15-16, 2022.

[2] Shlyapnikov, S & Lunin, Vladimir & Perbandt, Markus & Polyakov, Konstatin & Lunin, V. & Levdikov, Vladimir & Betzel, Ch & Mikhailov, A. (2000). Atomic structure of the Serratia marcescens endonuclease at 1.1 A resolution and the enzyme reaction mechanism. Acta crystallographica. Section D, Biological crystallography. 56. 567-72. 10.1107/S090744490000322X.

[3]https://en.wikipedia.org/wiki/Very_low_frequency

[4] yellow submarine | Yellow submarine art, Yellow submarine, The beatles (pinterest.com)

Citation: *Janez Špringer, (2022). 715 Water Molecules in Serratia Marcescens Endonuclease. International Journal of Advanced Research in Physical Science (IJARPS) 9(5), pp. 17-19, 2022.*

Copyright: *© 2022, Authors, This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.*