Open Access Library Journal
2023, Volume 10, e9716
ISSN Online: 2333-9721
ISSN Print: 2333-9705

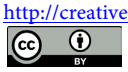
Can the Golden Ratio Numbers in Biochemistry and Mathematics Have a Common Explanation with Nucleotide Bases?

Tahir Ölmez

Social Sciences Department, Selçuk University, Konya, Turkey
Email: bsonmez3@gmail.com, tolmez123@yahoo.com

How to cite this paper: Ölmez, T. (2023) Can the Golden Ratio Numbers in Biochemistry and Mathematics Have a Common Explanation with Nucleotide Bases? *Open Access Library Journal*, **10**: e9716.
https://doi.org/10.4236/oalib.1109716

Received: December 30, 2022
Accepted: January 28, 2023
Published: January 31, 2023



Abstract

This paper attempts to express the golden ratio numbers with nucleotide bases (A T, G, C and U) as regards to Quantum Perspective Model. At first, if you take the exact value of golden ratio numbers after the comma, you can convert these decimal base numbers to binary number base system. Secondly, after converting process of these numbers, you should sequence these numbers as decimal number base system again. Thirdly, sum these decimal base numbers respectively. Fourthly, total adding processes correspond to genetic codes [Adenine (A), Thymine (T) Guanine (G), Cytosine (C) and Uracil (U)]. Fifthly, the result explanations of golden ratio numbers can be defined as this: [ACATCC]. Sixthly, the NCBI (The National Center for Biotechnology Information) search results of these sequences are very interesting model organism consequences just like "*Symphodus melops*" (Corking Wrasse) and "*Xyrauchen texanus*" (Xysmoking texanus). Seventhly, *Symphodus melops* is a special organism for removing parasites from other fishes. Eighthly, *Xyrauchen texanus* can create light reflections by using their eyes. Ninthly, defining some irrational numbers such as phi and pi in a ratio or as cyclic numbers may provide a new clue to evaluate irrationality in mathematics. As a result, the expression of golden ratio numbers with genetic codes reaches meaningful consequences to shed light on novel research method between Mathematics and Biochemistry.

Subject Areas

Biochemistry, Mathematics

Keywords

Biochemistry, Mathematics, Golden Ratio Numbers, Nucleotide Bases,

Symphodus melops, *Xyrauchen texanus*, Binary Number Base System, Quantum Perspective Model, Constant Numbers, Cyclic Numbers and Irrational Numbers

1. Introduction

Genetics is operating with these nitrogenous bases: Cytosine (C), Adenine (A), Guanine (G), Uracil (U) or Thymine (T). In the theory of Traditional Chinese Medicine (TCM), any process begins with the element of Wood. At the end of this process, Chinese philosophy ends with the Water element. So, these five elements: Wood, Fire, Earth, Metal and Water element. Furthermore, this article needs to get more researches about the relations with Nitrogenous bases with Chinese elements. With respect to this hypothesis, the correlations were found between Nitrogenous bases with Chinese elements just like in the following order: Uracil (Thymine)—Water element; Cytosine—Wood element inside Fire element; Adenine—Fire element and Guanine—Metal element. According to this hypothesis, the system is ***cyclic*** [1]. Besides, substances in the ecosystem are in ***cycle***, constantly transforming into their organic and inorganic forms, too. The water (H_2O), Carbon (C) and Nitrogen (N) cycle take place between the atmosphere and the earth. With evaporation, condensation, precipitation, photosynthesis and respiration, water transforms into solid and gas forms and transforms between the earth and the atmosphere. As a result of this mentioned article, purine and pyrimidine bases (Uracil, Thymine, Cytosine, Adenine and Guanine) are aromatic ***heterocycles***. These are planar ring system containing instead one or more carbon atoms (C), the atoms of oxygen (O), sulfur (S) and nitrogen (N) [1].

Prior to this article, the relationship between the nucleotide bases and some irrational numbers and some universal constant numbers was researched with Quantum Perspective Model by Kevser Köklü and Tahir Ölmez. With respect to Quantum Perspective Model Kevser Köklü researched the relationship between the **velocity of light numbers** and genetic codes [2]. Secondly, the relation with Pi numbers [3] and nucleotide bases were also explained by Kevser Köklü too. Thirdly, the link between the **Planck's constant numbers** [4] and genetic codes was published by Tahir Ölmez [5]. Fourthly, the calculated expression of the atomic weight of proton, neutron and electron with nucleotide bases was also researched by Tahir Ölmez. Fifthly, the atomic weight of **Avogardo's number** can be also expressed as "**Uracil (U)**" nucleotide base [5]. Fifthly, some other constant numbers just as the Boltzmann and the Bohr magneton constants were also researched by Tahir Ölmez, too [6]. Lastly, the link between some irrational numbers and genetic codes was also researched by Tahir Ölmez. However, the aim of this research article is to search the relations between the golden ratio numbers and chemical formulas of nucleotide bases.

2. Methods

According to Quantum Perspective Model, the representation of nucleotide bases (A T, G, C and U) was explained by chemical formulas. Regarding these chemical formulas, it was calculated based on the atomic masses of the elements. However, this article aims to investigate the relationship between the golden ratio numbers and nucleotide bases. In sum, the aim of this research article is searching the relations between the atomic weight of basic atomic particles, number base systems and chemical formulas of nucleotide bases.

The chemical structures of nucleotide bases consist of **Carbon (C), Nitrogen (N), Oxygen (O) and Hydrogen (H)** [7], for the representation of **nucleotide bases (A, T, C, G and U)** in chemical atoms (Table 1).

2.1. The Calculation of the Golden Ratio Numbers as Nucleotide Bases

The value of the **golden ratio numbers** is

1.6180339887498948482045868343656381177203091798057628621…

0.1618033988749894848204586834365638117720309179805762862 1… [8].

At first, Please take the first twenty-six values of the golden ratio numbers after comma (0, **16 18 03 39 88 74 98 94 84 82 04 58 68**). Secondly,convert this decimal numbers to binary number base. Please, See Table 2. Thirdly, after writing this binary numbers one by one, convert this binary numbers to decimal numbers again partially. For instance [(16:1000 18:100 10; 03:11; 39:100 111; 88:10 11000; 74:100 10 10; 98:11000 10; 94:10 11110; 84:10 10100; 82:10 100 10; 04:100; 58:1110 10 and 68:1000 100)]. Fourthly, sum the partial numbers respectively. For instance [(16 = **16**); (18 = 4 + 2 = **6**); (03 = **3**); (39 = 4 + 7 = **11**); (88 = 2 + 24 = **26**); (74 = 4 + 2 + 2 **= 8**); (98 = 24 + 2 = **26**); (94 = 2 + 30 = **32**);

Table 1. Representation of nucleotide bases (A, T, C, G and U) in chemical atoms.

ATOMS/NUCLEOTIDE BASES	*C* = 6	*H* = 1	*O* = 8	*N* = 7	*SUM*
ADENINE: C5H5N5	5	5	-	5	70
THYMINE: C5H6N2O2	5	6	2	2	66
CYTOSINE: C4H5N3O1	4	5	1	3	58
GUANINE: C5H5N5O1	5	5	1	5	78
URACIL: C5H4N2O2	5	4	2	2	64

Table 2. Representation of decimal numbers in binary base for the value of the golden ratio numbers after comma.

ECIMAL NUMBERS	2	3	4	7	14	16	20	24	30
BINARY NUMBERS	**10**	**11**	**100**	**111**	**1110**	**1000**	**10100**	**11000**	11110

(84 = 2 + 20 = **22**); (82 = 2 + 4 + 2 = **8**); (04 = **4**); (58 = 14 + 2 = **16**) and (68 = 16 + 4 = **20**)]. Fifthly, add the total partial decimal numbers, respectively (16 + 6 + 3 + 11 + 26 + 8 = 70; Adenine "**A**") (26 + 32 = 58; Cytosine "**C**") and (22 + 8 + 4 + 16 + 20 = 70; Adenine "**A**"). Lastly, see Table 2 for the equivalents of this numbers. Finally, the consequence of this numbers is "**ACA**" [**Adenine, Cytosine and Adenine**].

2.2. The Calculation of the Golden Ratio Numbers as Nucleotide Bases (The Rest of Golden Ratio Numbers after Comma)

At first, Please take the second thirty values of the golden ratio numbers after comma (0, 161803398874989484820458683**4 36 56 38 11 77 20 30 91 79 80 57 62 86 21**). Secondly, convert these decimal numbers to binary number base. (Table 3) Thirdly, after writing these binary numbers one by one, convert these binary numbers to decimal numbers again partially. For instance [(34:1000 10; 36:100 100; 56:1 11000 38:100 110; 11:10 11; 77:100 11 01; 20:10 100; 30:111 10; 91:101 1011; 79:100 1111; 80:10 1000; 57:11 100 1; 62:11 11 100; 86:1010 110 and 21:101 01)]. Fourthly, sum the partial numbers respectively. For instance [(34 = 16 + 2 = **18**) (36 = 4 + 4 = **8**); (56 = 1 + 24 = **25**); (38 = 4 + 6 = **10**); (11 = 2 + 3 = **5**); (77 = 4 + 3 + 1 = **8**); (20 = 2 + 4 = **6**); (30 = 7 + 2 = **9**); (91 = 5 + 11 = **16**); (79 = 4 + 15 = **19**); (80 = 2 + 16 = **18**); (57 = 3 + 4 + 1 = **8**); (62 = 3 + 3 + 4 = **10**); (86 = 10 + 6 = **16**) and (21 = 5 + 1 = **6**)]. Fifthly, add the total partial decimal numbers, respectively (18 + 8 + 25 + 10 + 5 = 66; Thymine "T") (8 + 6 + 9 + 16 + 19 = 58; Cytosine "C") and (18 + 8 + 10 + 16 + 6 = 58; Cytosine "C"). Lastly, see Table 3 for the equivalents of this numbers. Finally, the consequence of these numbers is "**TCC**" [**Thymine, Cytosine and Cytosine**]. In sum, the total consequence of golden ratio numbers after comma is "**ACATCC**" [**Adenine, Cytosine, Adenine, Thymine, Cytosine and Cytosine**].

In sum, as regards to Quantum Perspective Model, after the expression of golden ratio numbers as nucleotide bases, some important consequences were reached by this article. This result will be put forth in the next pages.

3. Results and Discussion

3.1. Results

At first, the **calculation of the first twenty-six golden ratio numbers as nucleotide bases** can be expressed with "*ACA*" [Adenine (**A**) Cytosine (**C**), and Adenine (**A**)] nucleotide bases. Secondly, the **calculation of the** thirty values of the golden ratio numbers after comma also can be expressed with "*TCC*" [Thymine (**T**) Cytosine (**C**) and Cytosine (**C**)] nucleotide bases. Thirdly, the total

Table 3. Representation of decimal numbers in binary base for the value of the golden ratio numbers after comma (The rest of golden ratio numbers after comma).

DECIMAL NUMBERS	1	2	3	4	5	6	7	9	10	11	15	16	24
BINARY NUMBERS	**1**	**10**	**11**	**100**	**101**	**110**	**111**	**1001**	**1010**	**1011**	**1111**	**1000**	**11000**

consequence of golden ratio numbers after comma is "**ACATCC**" [Adenine (**A**) Cytosine (**C**), Adenine (**A**), Thymine (**T**), Cytosine (**C**) and Cytosine (**C**)]. Fourthly, after searching this sequence at NCBI (**The National Center for Biotechnology Information**) database, the consequences are many living organisms. Fifthly, these are plants, bivalves, bees, rodents, moths, beetles, hawks, flies and in particular *bony fishes* "***Symphodus melops***" *and* "***Xyrauchen texanus***" [9]. Please, See (**Figures 1-4**). Lastly, could this relationship be a sign of

. cellular organisms			98
. . Eukaryota	eukaryotes		95
. . . Viridiplantae	green plants		12
. . . . Mesangiospermae	flowering plants		10
. . . . . Pentapetalae	eudicots		9
. . . . . Coriaria nepalensis	eudicots	48.1	5
. . . . . Diospyros lotus	eudicots	48.1	4
. . . . . Oryza sativa Japonica Group	monocots	48.1	1
. . . . Chlamydomonas reinhardtii	green algae	48.1	2
. . . Blastomussa wellsi	stony corals	48.1	1
. . . Symphodus melops	bony fishes	48.1	1
. . . Mimachlamys varia	bivalves	48.1	2
. . . Coelioxys conoideus	bees	48.1	2
. . . Clavelina lepadiformis	tunicates	48.1	1
. . . Synanthedon tipuliformis	moths	48.1	1
. . . Cladonia squamosa	ascomycete fungi	48.1	1
. . . Mus musculus	rodents	48.1	3
. . . Apocheima hispidaria	moths	48.1	1
. . . Thera obeliscata	moths	48.1	1
. . . Cydia strobilella	moths	48.1	1
. . . Puccinia triticina	rust fungi	48.1	2
. . . Fusarium falciforme	ascomycete fungi	48.1	1
. . . Lochmaea crataegi	beetles	48.1	1
. . . Archips xylosteana	moths	48.1	1
. . . Branchellion lobata	segmented worms	48.1	1
. . . Neoitamus cyanurus	flies	48.1	1
. . . Tenthredo distinguenda	hymenopterans	48.1	6
. . . Agonum fuliginosum	beetles	48.1	1
. . . Saturnia pavonia	moths	48.1	1
. . . Lithophane socia	moths	48.1	1
. . . Amphipoea lucens	moths	48.1	27
. . . Harmothoe impar	segmented worms	48.1	1
. . . Haliaeetus albicilla	hawks & eagles	48.1	1
. . . Pterostichus niger	beetles	48.1	2
. . . Thelaira solivaga	flies	48.1	1
. . . Coelopa pilipes	flies	48.1	3
. . . Melanchra persicariae	moths	48.1	1
. . . Xyrauchen texanus	bony fishes	48.1	4
. . . Exobasidium rhododendri	basidiomycete fungi	48.1	1

Figure 1. The NCBI Blast Result "ACATCC" of Nucleotide Bases for "*Symphodus melops*" and "*Xyrauchen texanus*" [9].

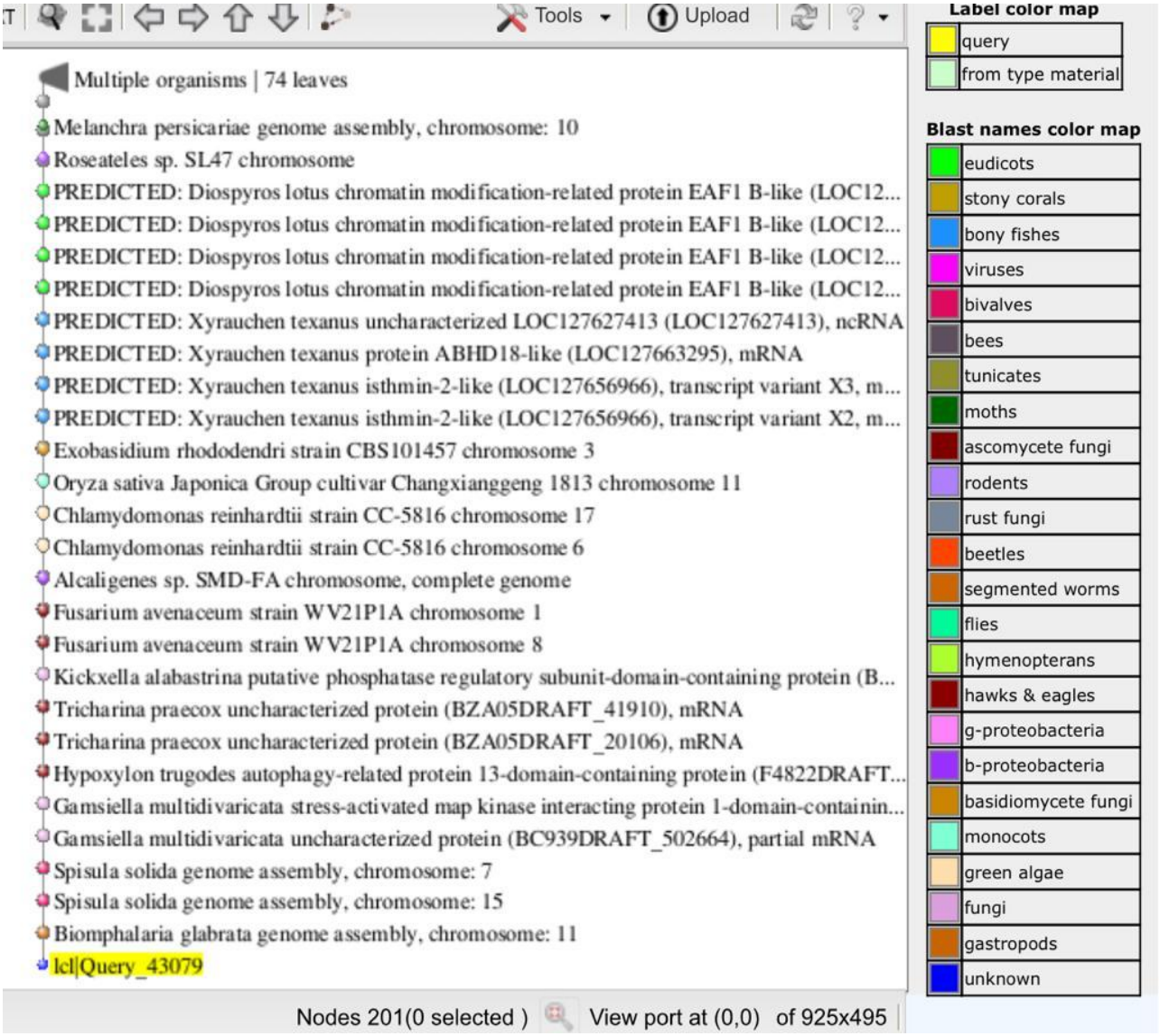


Figure 2. The NCBI distance tree of result for "ACATCC" [9].

relationships between the Universal Genetic Code Table, the chemical Periodic Table, and some irrational numbers?

3.2. Discussion

According to Quantum Perspective Model, prior to this article, the relationship between some irrational numbers and genetic codes were studied by T. Ölmez [10]. The consequence of this article can be expression of golden ratio numbers as nucleotide bases "ACATCC". But also the link between some irrational numbers and nucleotide bases was researched by Tahir Ölmez, too (**Table 4**) [10]. Prior to this article, not only the link between some irrational numbers and nucleotide bases was studied but also the link between golden ratio numbers "1, 618" and genetic codes was studied by T. Ölmez. The outcome of this article was related to both "TATA Box", "CAAT Box" and "GC"/"AT" base pairs, too.

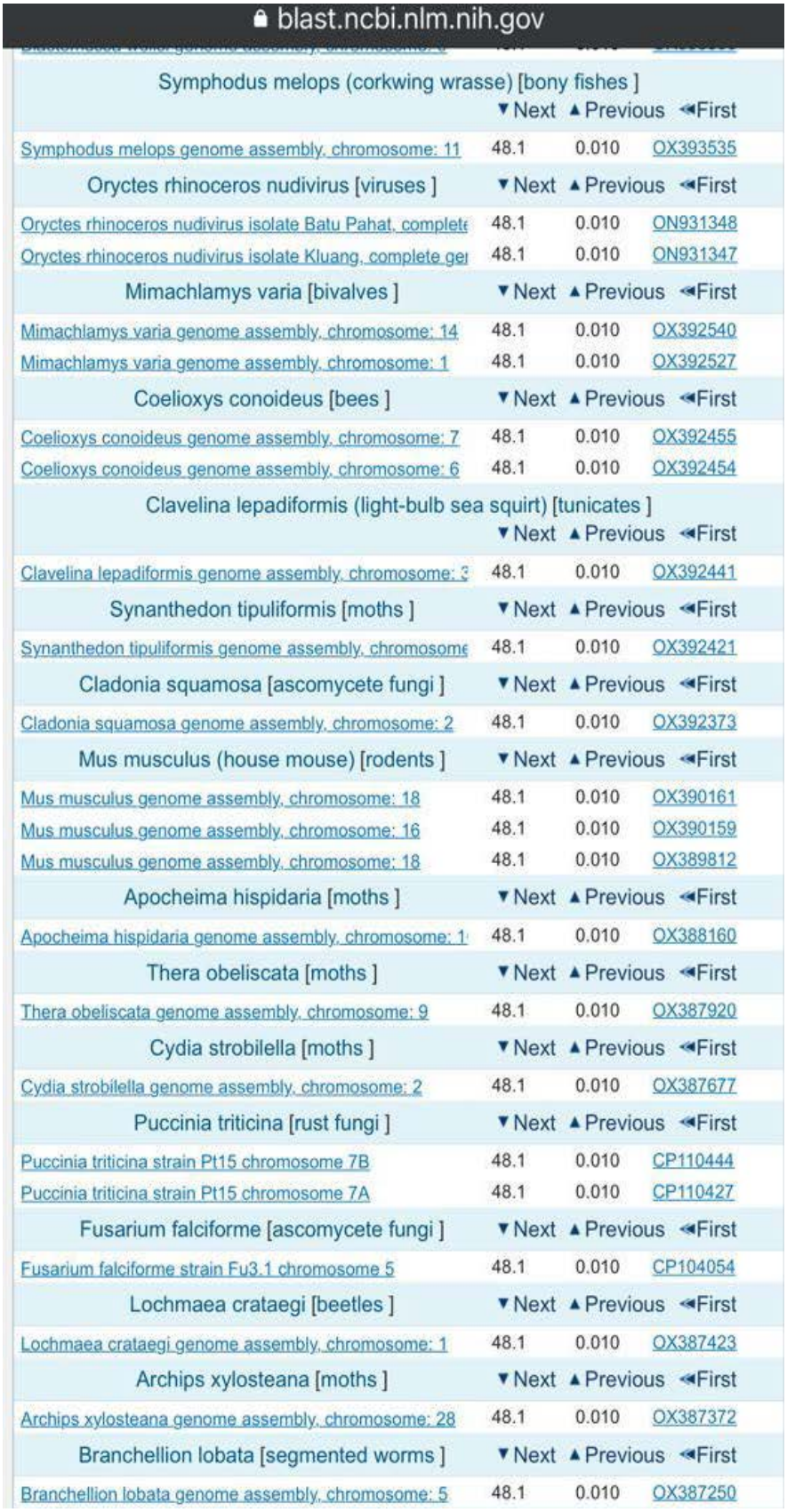


Figure 3. The NCBI Gene Search Result for "*Symphodus melops*" [9].

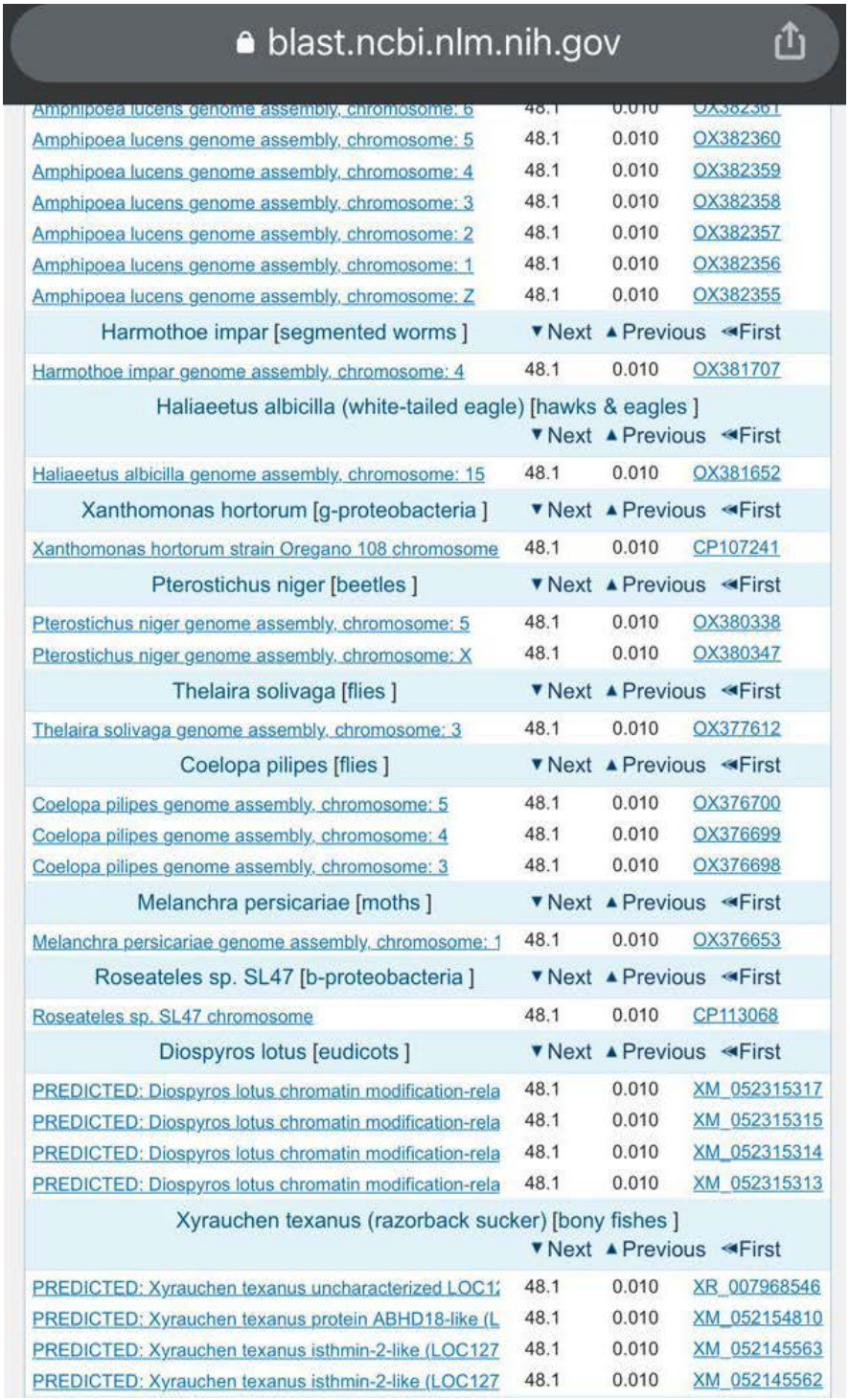


Figure 4. The NCBI gene search result for "*Xyrauchen texanus*" [9].

Besides, the molar mass of (**GC**) base pairs "**618**" is the same value of golden ratio numbers after comma (1, **618**034…) [11]. Let alone previous explanations, this paper attempts to investigate not only the relationship between the golden ratio numbers "618" and Adenine Thymine (AT) base pairs/Guanine Cytosine (GC) base pairs molar masses, but also the relationship between golden ratio

Table 4. The summary of some irrational numbers and nucleotide bases.

Irrational Numbers	Nucleotide Bases
√2 [13]	GGATGTUTATTGAGTGAUAA
√3 [14]	GGATGAUTAUGGGTTTAGAAA
√5 [15]	ATTTATTUAATAUATAAUUUUATTGA
√7 [16]	GATTCUUUACTAGAGTTACTAGTTTGATT
√10 [10]	ATAAGTCATAAGTGTATTAGTTTAAAACTG
Pi Numbers (as a 22/7) [2]	CTA [Cytosine (C), Thymine (T), Adenine (A)]
Pi Numbers (as an extended form) [17]	TUGATTATAUTGGTTGGTTGTTAAUGGTAU
Euler's Identity [18]	AAAGGCUUGCCCAACAAGCCAAACCCAGGC
Euler's Numbers [19]	ACGCCGACACTAACUATU
Golden Ratio Numbers (only "618") [12]	CAAT Box "GGCCAATCT"; TATA Box "TATAAAA"
Golden Ratio Numbers (Extended form)	ACATCC

numbers and both the average of TATA box nucleotides and CAAT box nucleotide bases sequence on the basis of molar masses [12].

As for this article, at first, after searching the CAAT box gene sequence "GGCCAATCT" and the TATA box gene sequence "TATAAAA" in the NCBI (National Center for Biotechnology) databases, NCBI blast results of TATA and CAAT Box were specifically focused on a variety of ***bony fishes*** especially "Denticle herring". Secondly, the **NCBI** (**The National Center for Biotechnology Information**) search result of golden ratio numbers' sequence is "ACATCC". Thirdly, after searching for this sequence in the NCBI database, similar living organism "***bony fishes***" were found in the same way in T. Ölmez's previously published article [10]. Fourthly, after searching for this sequence in the NCBI database, the outcome of this sequence is bony fishes just like "*Symphodus melops*" and "*Xyrauchen texanus*". Fifthly, while calculating golden ratio numbers as nucleotide bases numbers were taken by ***twins***. The reason of this twin numbers can be stemmed from "Adenine (A) and Thymine (*T*) pairs with ***two*** (**2**) hydrogen bonds" [20]. Besides, binary encoding systems consist of binary information from all data in a computer system that includes only ***two*** possible values: 0 and 1. If current passes through the transistor (switch on), this represents one (1). If the current doesn't pass (switch off) that means zero (0) [2]. Furthermore, at the present knowledge of brain neurology, it requires an organization of fine-tuned neural microsites that enable **two** types of transitions, consistency, and inconsistency, as a basis for information transfer. In fact, a "**Two-loop**" mental workspace is designed with protein-based perturbations for a fast and

causally efficient flow of information, similar to the **binary** number system. Possible cybernetic effects at various levels of the brain can be seen not only in **Planck**-scale spin networks, but also in elementary particles in the superstring model. This hypothetical mental workspace, depicted with a ***bidirectional*** (***circular***) ***quantum*** at the center, and this iso-energetic information flow may be related to ***Quantum Physics***. [21].

4. Conclusions

This paper tries to shed light on the relationships between some irrational numbers just like the golden ratio numbers and nucleotide bases [Adenine (A), Thymine (T) Guanine (G), Cytosine (C) and Uracil (U)]. According to Quantum Perspective Model, the chemical formulas of nucleotide bases [Adenine (A), Thymine (T) Guanine (G), Cytosine (C) and Uracil (U)] consist of Carbon (C), Nitrogen (N), Oxygen (O) and Hydrogen (H).

Normally, irrational numbers can't be written as the ratio of numbers but approximately phi (1618) and pi (22/7) numbers can be expressed as the ratio of numbers. One of the exceptions of these irrational numbers can be a sign of new discoveries between Mathematics and Genetics, especially about ***cyclic numbers***. It has been determined that not only the sum of the velocities of the light numbers [2] is "55", but also the number "55" in the ratio of the Fibonacci numbers. Besides, approximately the ratio of "55" and "34" equals to the ratio of golden ratio numbers (55/34 = 1, 618) [12]. That's to say, not only chemical atoms are cycling as in Carbon (C), Nitrogen (N), Oxygen (O) and Hydrogen (H) atoms, but also the chemical atomic weight of these elements are cycling, too. For example, please see **Table 4** [3]. Consequently, some of these irrational numbers can be expressed as a ratio, as opposed to the corresponding rule that irrational numbers cannot be written with ratio. Let alone previous explanations, some of the approximate numbers of phi and pi numbers are also cycling too. Pi numbers are sequenced as in forever "**CTA**'s" if the values of pi numbers are regarded as (22/7 = 3, **142857**142857…). Phi numbers are sequenced as in "ACATCC" (Please see **Table 4**). In addition, if we pay attention to the Pi numbers here, it is seen that the cyclic number "**142,857**" continues in the form of endless sequences. Finally, if you divide some Phi numbers "618" by "14", you will have the similar result "142,857". (618/14 = 44, **142857**142857…). As rergards to the relation with Pi and Phi numbers, Remember K. Köklü divided Pi number's into fourteen "14" groups and sequenced them as forever "CTA's. Even, K.Köklü was called Pi numbers' decimal" 428,571 as the same cyclic number as "142,857" (Remember, not only Cyclic numbers revolve their each number at each other from "142,857" to "428,571" but also the genetic codes revolve at each other at the gene expression period 3' to 5' and vice versa 5' to 3') [3]. In summary, not only do the electrons revolve around the proton at the micro level, but also some chemical atomic elements move cyclically at the macro level, just as in the Carbon (C), Nitrogen (N), Oxygen (O) and Hydrogen (H) ***cycles***. Is

this resemblance can be a sign of interrelationships of sciences as regards to Quantum Perspective Model? Could defining some irrational numbers such as phi and pi in a ratio or as cyclic numbers give a new clue to evaluate irrationality in mathematics? OR Since some irrational numbers can be sequenced as genetic codes, could these results be the result of the order in disorder? (Table 4)

At first, after converting the exact value of the golden ratio numbers, you will get a genetic sequence just like "ACATCC". Secondly, after searching the NCBI database results, some of the consequences are Corking Wrasse "*Symphodus melops*" and "*Xyrauchen texanus*". Please, See (Figures 1-4). Thirdly, both of these living organisms are bony fishes. Fourthly, not only the NCBI database results

Table 5. The summary of some constant numbers and nucleotide bases.

SOME CONSTANT NUMBERS	NUCLEOTIDE BASES
The square of the speed of light (c^2) [4]	AUC or CCATAUUTU/CCACAUUTU
Planck's constant numbers [6]	Adenine (A) or Thymine (T)
Avogardo's Number [5]	Uracil (U)
The atomic weight of proton [5]	Guanine (G)
The atomic weight of electron [5]	Uracil (U)
The atomic weight of neutron [5]	Adenine (A) or Thymine (T)
The Boltzmann constant [6]	Guanine (G)
The Bohr magneton constant [6]	Thymine (T)

Table 6. The NCBI (National Biotechnology Information Center) summary and genetic sequences of some irrational numbers.

Irrational Numbers	NCBI Results
√2 [13]	Danio Rerio, Timema, Bony fish
√3 [14]	Denticle Herring, Bony fish, Bats
√5 [15]	Danio Rerio (Zebra fish), Bony fish
√7 [16]	Danio Rerio, Danio Aesculapii, Bony fish
√10 [10]	Danio Kyathit, Danio Aesculapii, Bony fish
Pi Numbers (as a 22/7) [2]	Danio Rerio (Zebra fish), Bony fish
Pi Numbers (as an extended form) [17]	Danio Rerio (Zebra fish), Bony fish, Timema, Danio Kyathit
Euler's Identity [18]	Danio Kyathit, Danio Rerio (Zebra fish), Bony fish, Timema
Euler's Numbers [19]	Danio Rerio (Zebra fish), Bony fish, bat coronavirus
Golden ratio numbers	Bony fish *Symphodus melops*, *Xyrauchen texanus*

of some irrational numbers are bony fishes (**Table 4**), but also the NCBI database result of the golden ratio numbers are bony fishes, too. Fifthly, one of the NCBI database result of the golden ratio numbers is "***Symphodus melops***" is special organism for removing parasites from other fishes [22]. Sixthly, another NCBI database result of the golden ratio numbers is "***Xyrauchen texanus***" which can create light reflections by using their eyes. This defensive behavior is directed specifically against other milkers [23]. Also, some of the findings provide the first ecological evidence for the restricted distribution of **UV** (Ultraviolet) cones in a vertebrate retina [24]. Seventhly, the expression of the golden ratio numbers with genetic codes reaches meaningful consequences to shed light on novel research method between Mathematics and Biochemistry. Lastly, not only some constant numbers are related to genetic codes but also the golden ratio numbers [12] and Fibonacci sequence [25] are related to genetic codes, too. As a result, as regards to Quantum Perspective Model, let alone the previous results, not only some constant numbers (**Table 5**) are related to nucleotide bases but also some irrational numbers are related to nucleotide bases, too (**Table 6**). In sum, using some physical and chemical constants [6], can the relationships between both Biochemistry and Quantum Physics be explained by genetic codes?

Conflicts of Interest

The author declares no conflicts of interest.

References

[1] Fedoctov Sergei, P. (2016) The Genetic Code as a Structure of the Five Elements in Chinese Philosophy. *Cardiometry*, No. 9, 21-31. https://doi.org/10.12710/cardiometry.2016.9.2131

[2] Köklü, K. (2019) Is Relativity Theory Also Valid in Biogenetics and Mathematics? *NeuroQuantology*, **17**, 53-58. https://doi.org/10.14704/nq.2019.17.3.1999

[3] Köklü, K. (2019) A Quantum Perspective Model to Genetic Codes through Various Sciences. *Neuroquantology*, **17**, 15-18. https://doi.org/10.14704/nq.2019.17.3.1974

[4] Ölmez, T. (2022) Is There Any Meaning of Planck's Constant Numbers as Regards to Quantum Superposition via the Chemical Atomic Masses of Nucleotide Bases? *Open Access Library Journal*, **9**, e9482. https://doi.org/10.4236/oalib.1109482

[5] Ölmez, T. (2022) Is There Any Explanation for the Chemical Atomic Weights of Protons, Neutrons and Electrons through the Genetic Codes Attributed to Quantum Superposition? *Open Access Library Journal*, **9**, e9650. https://doi.org/10.4236/oalib.1109650

[6] Ölmez, T. (2023) Can the Boltzmann and Bohr Magneton Constants Be Expressed as Nucleotide Bases via Quantum Superposition? *Open Access Library Journal*, **10**, e9653. https://doi.org/10.4236/oalib.1109653

[7] Wieser, E.M., Holden, N., Coplen, B.T., *et al.* (2013) Atomic Weights of the Elements 2011. *Pure and Application Chemistry*, **85**, 1047-1078. https://doi.org/10.1351/PAC-REP-13-03-02

[8] The Golden Ratio Numbers (2022, December 25). https://oeis.org/A001622

[9] Basic Local Alignment Search Tool. https://blast.ncbi.nlm.nih.gov/Blast.cgi

[10] Ölmez, T. (2022) Can the Irrationality in Mathematics Be Explained by Genetic

Codes Expressed in the Square Root of the Number Ten? In: Ferreira, M.A.M., Ed., *Novel Research Aspects in Mathematical and Computer Science*, BP International Press, Vol. 4, 17-25. https://doi.org/10.9734/bpi/nramcs/v4/2120B

[11] The Golden Ratio Numbers (2022, December 25). https://en.wikipedia.org/wiki/Golden_ratio

[12] Ölmez, T. (2020) Is There an Aesthetics in Golden Ratio as Regards to the Common Cis-Regulatory Elements versus to Atomic Numbers of Elements with Respect to Quantum Perspective Model? Neurology and Neuroscience Reports, Vol. 3. https://doi.org/10.15761/NNR.1000119

[13] Ölmez, T. (2021) According to the Binary Number Base System, Are the Square Roots of Two Numbers Also Significant in Biochemistry? *Open Access Library Journal*, **8**, e7122. https://doi.org/10.4236/oalib.1107122

[14] Ölmez, T. (2021) What Is the Meaning of the Square Root of the Number Three in Biochemistry? *Open Access Library Journal*, **8**, e7123. https://doi.org/10.4236/oalib.1107123

[15] Ölmez, T. (2021) Can Irrational Numbers (Such as Square Root of the Number Five) Be Reached by Analysis of Genetic Sequences? *Open Access Library Journal*, **8**, e7104. https://doi.org/10.4236/oalib.1107104

[16] Ölmez, T. (2022) Are Irrational Numbers (Like the Square Root of the Number Seven) Applicable to Genetic Sequences? *Open Access Library Journal*, **9**, e8513. https://doi.org/10.4236/oalib.1108513

[17] Ölmez, T. (2021) According to Quantum Perspective Model, are the Numbers of Pi Also Meaningful in Biochemistry? *International Journal of Natural Sciences: Current and Future Research Trends*, **11**, 1-10.

[18] Ölmez, T. (2021) According to Quantum Perspective Model, Is Euler's Identity Also Meaningful in Biochemistry? *International Journal of Natural Sciences: Current and Future Research Trends*, **9**, 23-28. https://ijnscfrtjournal.isrra.org/index.php/Natural_Sciences_Journal/article/view/1037/15

[19] Ölmez, T. (2020) With Respect to Quantum Perspective Model, Can Euler Numbers Be Related to Biochemistry? *Global Journal of Science Frontier Research*, **20**, 7-14. https://doi.org/10.34257/GJSFRFVOL20IS9PG7

[20] Lodish, H., Berk, A., Zipursky, S.L., *et al.* (2018) Molecular Cell Biology. 6th Edition, Translated by Geçkil, H., Özmen, M., Yeşilada, Ö., Palme Publishing, New York, 294-302.

[21] Meijer, Dirk K.F. (2014) The Extended Brain: Cyclic Information Flow in a Quantum Physical Realm. *NeuroQuantology*, **12**, 1. https://doi.org/10.14704/nq.2014.12.2.754 https://www.jneuroquantology.com/index.php/journal/article/view/754

[22] Corkwing Wrasse. https://en.wikipedia.org/wiki/Corkwing_wrasse

[23] Razorback Sucker. https://en.wikipedia.org/wiki/Razorback_sucker

[24] Novales Flamarique, I., Mueller, G.A., Cheng, C.L. and Figiel, C.R. (2007) Communication Using Eye Roll Reflective Signalling. *Proceedings: Biological Sciences*, **274**, 877-882. https://doi.org/10.1098/rspb.2006.0246

[25] Ölmez, T. (2021) Is There a Similarity between Fibonacci Sequence and Euler's Number with Respect to Quantum Perspective Model? *Global Journal of Science Frontier Research*, **20**, 33.