

MESSAGES IN THE GENETIC CODE: THE DRAM FORM

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ABSTRACT

Does the Genetic code contain non-structural information or even intelligible messages? The present work offers a mathematical investigation of the genetic code using a novel numeric procedure applied to both nucleobases and amino acids found in standard code tables. The numeric two step procedure amounts to an atom count of all the atoms in standard genetic code tables and shall be called Compound Numeric Triangulation. The first step called Compound Numeric Indexing (CNI) converts the DNA codon table (purines and pyrimidines), the RNA codon table (purines and pyrimidines) and the 20 standard amino acids into representative index numbers. In this step, cytosine ($C_4H_5N_3O$), for example, presents 13 total atoms ($4+5+3+1$) and would be assigned the index number 13. The codon CCC is assigned the CNI value 39 ($13+13+13$). Similarly index numbers are collected for the other codons in the DNA and RNA tables and substituted in place of the letter codes. The same procedure is applied to the amino acids. Three tables result. The code tables are next examined for reoccurring CNI values. For example, in DNA, the CNI value 39 is found 1 time but 46 is found 12 times. The patterns are next collected and arranged in ascending table arrays (39, 40, 41, etc.) with their respective frequencies and product totals. Since 46 occurs with a frequency of 12 it is entered into the table as its product ($46 \times 12 = 552$). This general method is repeated for the RNA codon table and the 20 standard Amino acid to give a total of three new product table arrays. In the second step, called Numeric Triangulation, the arrays are subjected to the method of finite differences. In this step, adjacent product numbers in an array table are subtracted and the result is placed above and between the adjacent numbers. The process is continued until a triangle is formed. Historically, difference triangles have been used to determine properties of polynomials but other attributes were studied in this examination. The difference triangle for the 10 base product numbers of DNA released 45 additional difference triangle values to give a completed triangle consisting of 55 elements. For the RNA code table 91 numeric elements are produced and the amino acid table 78 numeric elements. Inspection of the triangle tables show number matches at their perimeters which was interpreted as a design element and potentially an assembly motif. Surprisingly, a three triangle composite structure elegantly assembles to reveal a graphed object. This shall be called the DRAM (DNA, RNA, Amino Acid) form. Again, surprisingly the DRAM form is an intelligible pictogram consisting of 224 number pixels. The 2-D picture is next transformed, using suggestive internal number patterns, into a recognizable, printable 3-D object. An interpretative process is lastly applied to the 2-D DRAM form to reveal a startling communicative interactive tool. Theological implications with respect to the question of design and origins will be reviewed and potential applications of this discovery will also be discussed.

KEYWORDS

genetic code, difference triangle, DRAM form

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John is a resident of Mount Pleasant, South Carolina with his wife Grace and two children Luca (16) and Joseph (9). John received his Ph.D. in organic chemistry from the University of Massachusetts in Amherst and a Masters in Divinity from Liberty University in Lynchburg, VA. He worked as an industrial chemist for 30 years and transitioned to an instructor of chemistry. John also served as pulpit supply and a briefly as an interim pastor. John is passionate about finding evidence of God in nature but more recently understanding numeric patterns in the genetic code.