

Analogical Representation of the Genetic Code in Terms of the Virtual Base “e” and Codons of Triplets

J. C. Tohá and M. A. Soto

Biofísica, Departamento de Física, Facultad de Ciencias Físicas y Matemáticas, Universidad de Chile, Casilla 487-3, Santiago, Chile

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Genetic Code Analogical Representation on “e” Base, Hardware of a “e” Base Code

The analogical representation of the genetic code on base “e” is described. The possible use of the “e” base in codification processes is emphasized.

In a previous report Achimowicz *et al.* [1] called attention to the minimal hardware displayed by the extant genetic code, where 20 amino acids are coded with a base value close to the optimal informational base “e” and the positions per codon are three. In such a way that: $20 = e^3$; and the product of the base “e” by the exponent 3 is a minimum for the representation of 20 elements. Later, it was shown [2] that considering a principle of conservation of a minimal hardware it was possible to follow the evolution of the genetic code up to the present days representa-

tion, where 4 bases under degeneracy, approaches a virtual code of base “e”. Along the evolution the minimum stages were attained at $e^1 = 3$ (elements), $e^2 = 7$ (elements) and $e^3 = 20$ (elements).

Here we describe the compact analogical representation and possible use of the genetic code information, in a network diagram with 64 positions where each one of the 64 triplets of the degenerate code can be read. That, using a connector involving 3 elements (the triplet), joined by articulated connections of constant length (see Fig.).

This hardware configuration is smaller than a similar binary code representation. In the diagram 60 different triplets are read directly by articulated codons, for instance:

U---U---U or $\begin{matrix} & A & \\ & | & \\ U & & G \end{matrix}$ (see Fig.) and 4 triplets: UAU, GCU + UCG and CUC as: CCU + UCC.

UCU, GUG and CUC can be read as follows: UAU as: UGA + AGU, UCU as: UGC + CGU, GUG as: GCU + UCG and CUC as: CCU + UCC.

The representation at the diagram is not read in a line as do the current genetic information, but nevertheless it deserves practical uses, as a simple and general device suitable for information storage and processing.

[1] K. Achimowicz, K. Kazimierski, and K. Wojcik, *Physiol. Chem. Phys.* **13**, 171 (1981).

[2] M. A. Soto and J. C. Tohá, *BioSystems* **18**, 204 (1985).

Reprint requests to J. C. Tohá.

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