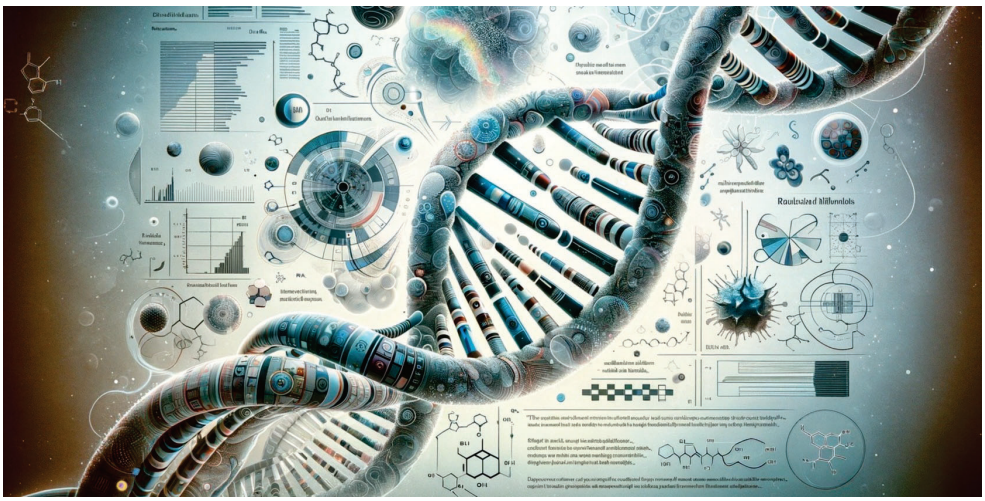

[Research Note] The Random Somatic Mutation is not Quite Random

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Abstract

This research note challenges the idea that Random Somatic Mutations are entirely random, highlighting their non-equiprobable nature and their influence on evolution, involution, or indeterminacy. It recalls the Neutrosophic Theory of Evolution, extending Darwin's theory, and emphasizes the importance of distinguishing between different senses of "random mutation" in evolutionary theory.

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1. Introduction

This is a review note on Neil S. Greenspan and Owen Han's paper[1] on Random Somatic Mutation that we are in accordance with.

> *"A foundational notion of modern biological and biomedical research is that mutation is "random," where random is defined in a relatively precise and technical sense. When the word "mutation" is preceded and characterized by "random," at least in an evolutionary context, the standard intent to be conveyed is that the frequency of the particular nucleotide substitution is unrelated to the functional, and therefore, evolutionary consequences."* [1]

We agree that the Random Somatic Mutation is not quite random, we mean not equiprobable, since some phenotypic change may have a greater probability to occur that others.

> *"Such a usage of "random mutation" is reasonable as long as it is clear that it is a different sense of the term from the one that is central in evolutionary theory. Unfortunately, the significance of instances of mutation for which all nucleotide substitutions are not equally probable can be misconstrued as violating the "dogma" of* ***evolution****. In fact, such mutations do not necessarily represent a significant challenge to evolutionary theory."* [1]

We also conclude that one has somatic mutations at various probabilities, we mean that one mutation may have a greater chance to occur than another, depending on multiple other factors.

2. Neutrosophic Theory of Evolution

In refereeing to the Theory of Evolution, in 2017 Smarandache introduced the Theory of Neutrosophic Evolution, i.e.: Degree of Evolution, Degree of Indeterminacy or Neutrality (no change), and Degree of Involution as extension of Darwin's Theory of Evolution) [2][3].

During the process of adaptation of a being (plant, animal, or human), to a new environment or conditions, the being partially evolves, partially devolves (degenerates), and partially is indeterminate i.e. neither evolving nor devolving, therefore unchanged (neutral), or the change is unclear, ambiguous, vague, as in neutrosophic logic.

Thank to adaptation, one therefore has: evolution, involution, and indeterminacy (or neutrality), each one of these three neutrosophic components in some degree.

The degrees of evolution/indeterminacy/involution are referred to both: the structure of the being (its body parts), and functionality of the being (functionality of each part, or inter-functionality of the parts among each other, or functionality of

the being as a whole). We therefore introduce now for the first time the Neutrosophic Theory of Evolution, Involution, and Indeterminacy (or Neutrality).

3. Cormorants Example

Let's take the flightless cormorants (Nannopterum harrisi) in Gal´apagos Islands, their wings and tail have atrophied (hence devolved) due to their no need to fly (for they having no predators on the land), and because their permanent need to dive on near-shore bottom after fish, octopi, eels etc. Their avian breastbone vanished (involution), since no flying muscles to support were needed. But their neck got longer, their legs stronger, and their feet got huge webbed is order to catch fish underwater (evolution). Yet, the flightless cormorants kept several of their ancestors' habits (functionality as a whole): make nests, hatch the eggs etc. (hence neutrality).

4. Cosmos Example

The astronauts, in space, for extended period of time get accustomed to low or no gravity (evolution), but they lose bone density (involution). Yet other body parts do not change, or it has not been found out so far (neutrality/indeterminacy).

5. General Biological Terms

Since this note is directed towards the general reader, for better understanding, we reveal from Merriam-Webster Dictionary [4] the general definitions of common terms use in biology:

- *somatic* = relating to, or affecting the body
- *somatic cell* = one of the cells of the body that compose the tissues, organs, and parts of that individual other than the germ cells
- *genome* = one haploid set of chromosomes with the genes they contain
- broadly the genetic material of an organism
- *haploid* = having or involving one set of homologous chromosomes
- *proteome* = the complement of proteins expressed in a cell, tissue, or organism by a genome
- *mutations* = a relatively permanent change in hereditary material that involves either a change in chromosome structure or number (as in translocation, deletion, duplication, or polyploidy) or a change in the nucleotide sequence of a gene's codons (as in frameshift or missense errors) and that occurs either in germ cells or in somatic cells but with only those in germ cells being capable of perpetuation by sexual reproduction

6. The degrees of evolution / indeterminacy / involution are referred to both:

- the structure of B (its body parts),

- and functionality of B (functionality of each part, or inter-functionality of the parts among each other, or functionality of B as a whole).

Adaptation to new environment conditions means de-adaptation from the old environment conditions. Evolution in one direction means involution in the opposite direction.

7. Conclusion

Somatic Mutations are possible in all directions: towards evolution, involution, or neither (indeterminate: partially evolution and partially involution), and they are not quite random but influenced by various natural and artificial factors (for example by genetic engineering).

Other References

- F. Smarandache, Posted Review of Article [1]: Darwin, Gödel, Luria, Delbrück: Biomedical, Mathematical, and Metamathematical Perspectives on Attributes and Consequences of Random Somatic Mutations Subject to Selection, https://www.qeios.com/read/PKOYBF, accessed on 15 November 2023.

References

1. [a, b, c] *Neil S. Greenspan, Owen Han, Darwin, Gödel, Luria, Delbrück: Biomedical, Mathematical, and Metamathematical Perspectives on Attributes and Consequences of Random Somatic Mutations Subject to Selection, Qeios, 2023, https://www.qeios.com/read/545BGM*
2. [^] *Florentin Smarandache: Introducing a Theory of Neutrosophic Evolution: Degrees of Evolution, Indeterminacy, and Involution. Progress in Physics, Volume 13 (2017) Issue 2 (April), 130-135, http://fs.unm.edu/neutrosophic-evolution-PP-49-13.pdf*
3. [^] *Neutrosophic Evolution as extension of Darwin's Evolution / The Cave Case, Kalendarium Publishing House Oneștilor str., Oradea, Romania, 2017, https://fs.unm.edu/NeutrosophicEvolution.pdf*
   https://fs.unm.edu/V/NeutrosophicEvolution.mp4
4. [^] *Merriam Webster Dictionary, An Encyclopaedia Britannica Company, https://www.merriam-webster.com/*

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