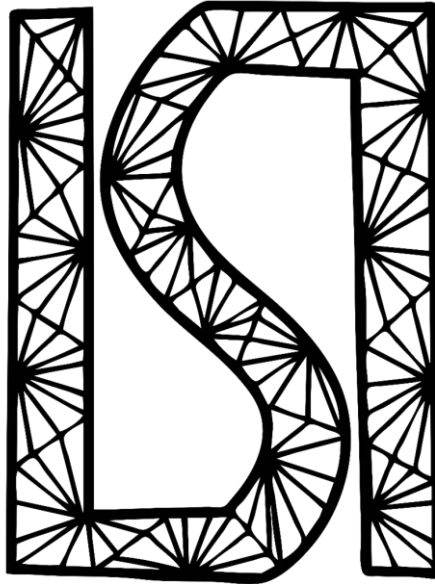


Biological writing: an appendix to the language metaphor of life

Escaping biological logocentrism

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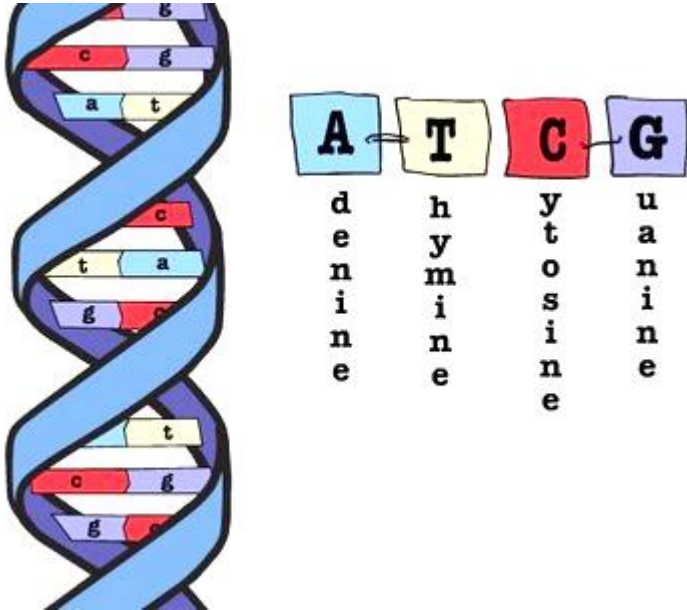


HOFFMEYER and EMMECHE 1991:
Code-Duality and the Semiotics of Nature

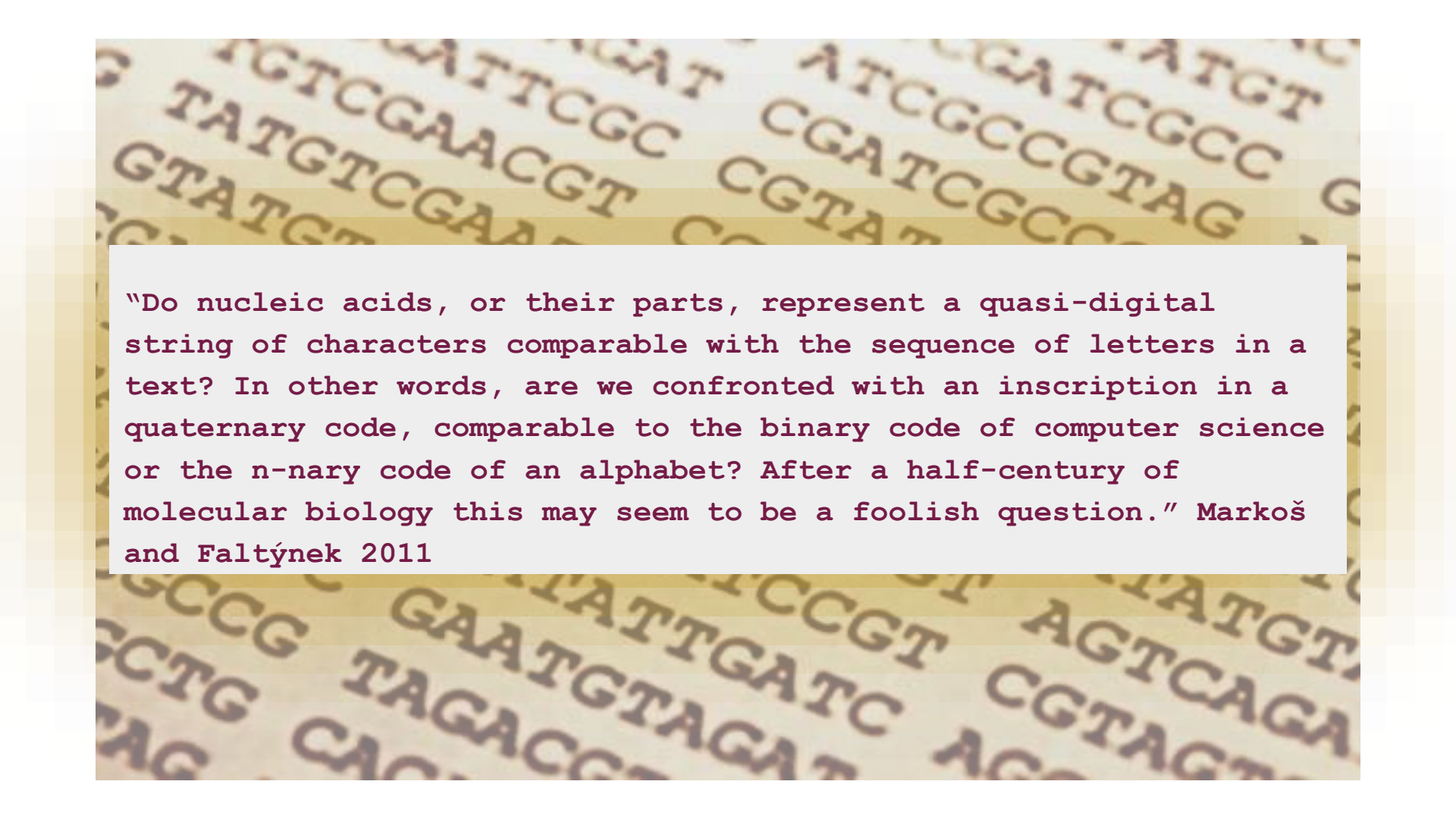
DIGITAL (dyadic/discrete) vs
ANALOG (triadic/continuous)

code duality in biosemiotics

The classical language metaphor of life by Jakobson is based on understanding both genetic code and language as digital code where

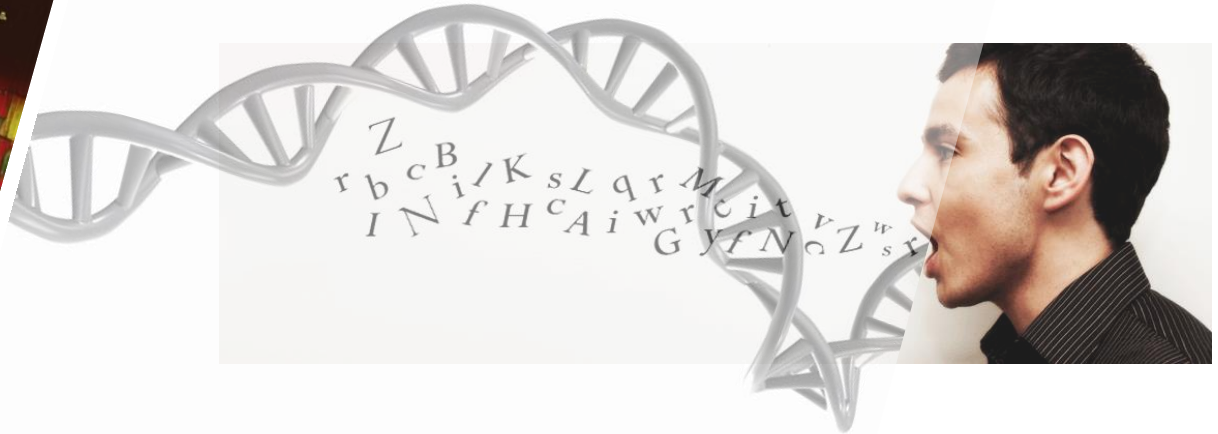
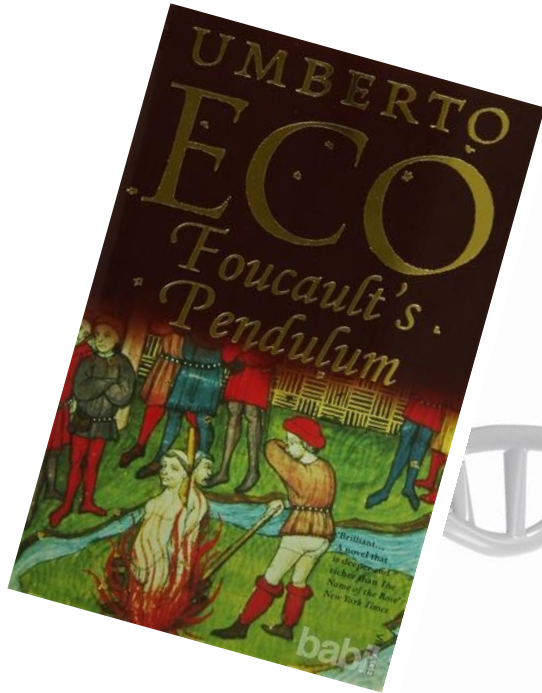


- **Nucleic bases (ACGT) are letters/phonemes thus the “digits”**
- **Triplets of bases are words (GCU ACG GAG) composed of the “digits” or letters/phonemes**
- **Genes are sentences composed of triplets/words composed of digits**



"Do nucleic acids, or their parts, represent a quasi-digital string of characters comparable with the sequence of letters in a text? In other words, are we confronted with an inscription in a quaternary code, comparable to the binary code of computer science or the n-nary code of an alphabet? After a half-century of molecular biology this may seem to be a foolish question." Markoš and Faltýnek 2011

“And what are cells? For months, like devout rabbis, we uttered different combinations of the letters of the Book. GCC, CGC, GCG, CGG. What our lips said, our cells learned.” (Eco: Foucault's Pendulum 2001[1988]: 566)



Jakobson's phonological "error"

- What if our cells are not using voice, the digital phonological quaternary code, *uttering* as Eco's fictional character sais (obviously influenced by the central dogma)
- Spoken language (or transcribed alphabetically) is limited by its unidirectional linearity
- De Saussure's phonocentric approach to language (1916): Linearity as second principle of language
- The central dogma of Modern Synthesis is only following Jakobson's phonological/alphabetical metaphor
- Interpretation of the genetic script is not unidirectional from left to right
- It is not linear static reading, it is multidirectional and dynamic
- Think about phenomena such as e.g. ribosomal frameshifting and protein folding

An alternative to Jakobson's metaphor

- **We need a new language metaphor of life:** a triadic, non-linear metaphor
- **Markoš:** replacing linear reading base by base (letter by letter) by a “superficial” reading, skimming

“Might it be the
overall shape
our perspective
shape (conform
can be unders
aperiodic line
the shape of t



ers but the
looks, from
important is the
g: a sweater
Such an
ret, yet it is

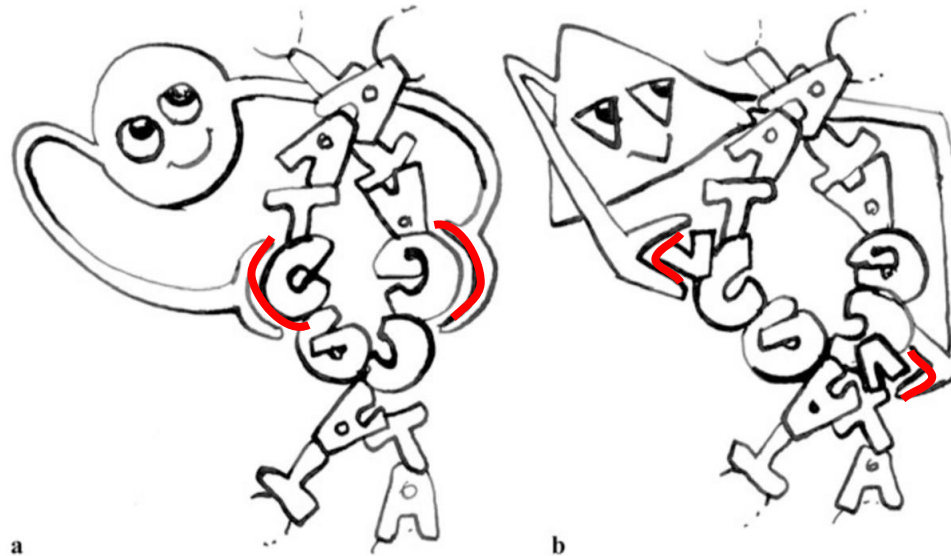
Gilles Deleuze: The Logic of Sense

the old depth having been spread out became width. The becoming unlimited is maintained entirely within this inverted width. "Depth" is no longer a complement. Only animals are deep, and they are not the noblest for that; the noblest are the flat animals. Events are like crystals, they become and grow only out of the edges, or on the edge. This is, indeed, the first secret of the stammerer or of the left-handed person: no longer to sink, but to slide the whole length in such a way that the old depth no longer exists at all, having been reduced to the opposite side of the surface. By sliding, one passes to the other side, since the other side is nothing but the opposite direction. If there is nothing to see behind the curtain, it is because everything is visible, or rather all possible science is along the length of the curtain. It suffices to follow it far enough, precisely enough, and superficially enough, in order to reverse sides and to make the right side become the left or vice versa. It is not therefore a question of *the adventures* of Alice, but of Alice's *adventure*: her climb to the surface, her disavowal of false depth and her discovery that everything happens at the border. This is why Carroll abandons the original title of the book: *Alice's Adventures Underground*.

Epigenetic marking:

changing some characters affects the overall shape of a section on DNA. If the section AGCTAA represents a ligand for a specific regulatory protein (a), a modification (to AGCTAA) turns it into another ligand; it becomes the target of a protein (b). The complex DNA-protein participates in the cell's protein network by influencing its ability to read other parts of the DNA script: the “reading machinery” behaves differently in cases a and b

(Markoš et al 2013)

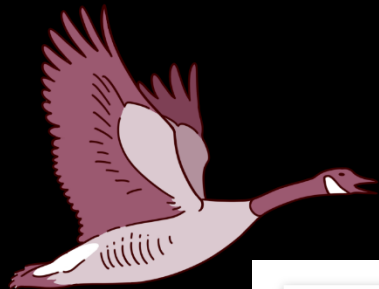


Instead of phonocentric approach to genetic code I propose the term Biological writing: what kind of writing?

- **“Reading the shape”** and not letters
- This is more closer to “reading” chinese character or hieroglyphs rather than alphabetical script
- Visual cl



- The major idea in Derrida's *Of Grammatology*, according to Bennett, is how being is falsely grounded in presence through the voice.
- What distinguishes phonocentric (alphabetical) writing systems from ideogrammatic ones for example, is that the former signify by reproducing the sounds of speech, whereas the latter do not. (Bennett 2021, 48)



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Second-Generation Semiology and Detotalization

[Tyler James Bennett](#)

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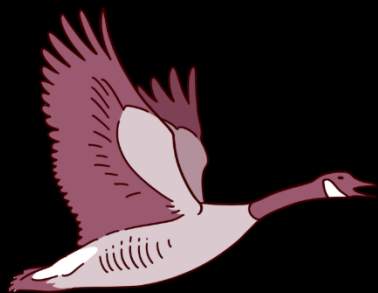


A heretic proposal

- The genetic code is not digital by its nature
- It is only digital from the scientists perspective who segmented it accordingly into digital units
- The same for language: the majority of the language users (especially those illiterate) do not “read” letters, do not hear or utter “phonemes”, but they utter ideas/thoughts/emotions...without having a slightest idea about the number of phonemes they use
- Whether the code duality (in terms digital vs analog) exists in nature (unobserved by a scientist) is the question

“Character (digit, mark, tag). A character is a member of some finite alphabet (or table), and its single quality is its position (its coordinate) in a given alphabet (or table). Characters have no meaning except through their membership of the set and their position in that set. A character bears no shape, and from other members of the set it is unequivocally distinguishable only by its coordinates in the alphabet (or matrix). It bears no meaning except its identity. Characters defined in this way dwell in the transcendent world, they do not belong to natural world of our lives.”

Markoš and Faltýnek 2011



Thank you



References

Bennett, Tyler James. "Second-Generation Semiology and Detotalization" *Linguistic Frontiers*, vol.4, no.2, 3921, pp.44-53. <https://doi.org/10.2478/lf-2021-0010>

Jakobson R (1971). Linguistics in relation to other sciences. In: *Selected writings, Word and language*, Mouton, 655–696.

JESPER HOFFMEYER and CLAUS EMMECHE: Code-Duality and the Semiotics of Nature, pp. 117-166 in: Myrdene Anderson and Floyd Merrell (eds.): *On Semiotic Modeling*. Mouton de Gruyter, Berlin and New York, 1991.

Markoš, A. & Faltýnek, D. (2011) Language metaphors of life. *Biosemiotics* 4:171–200 DOI 10.1007/s12304-010-9097-6

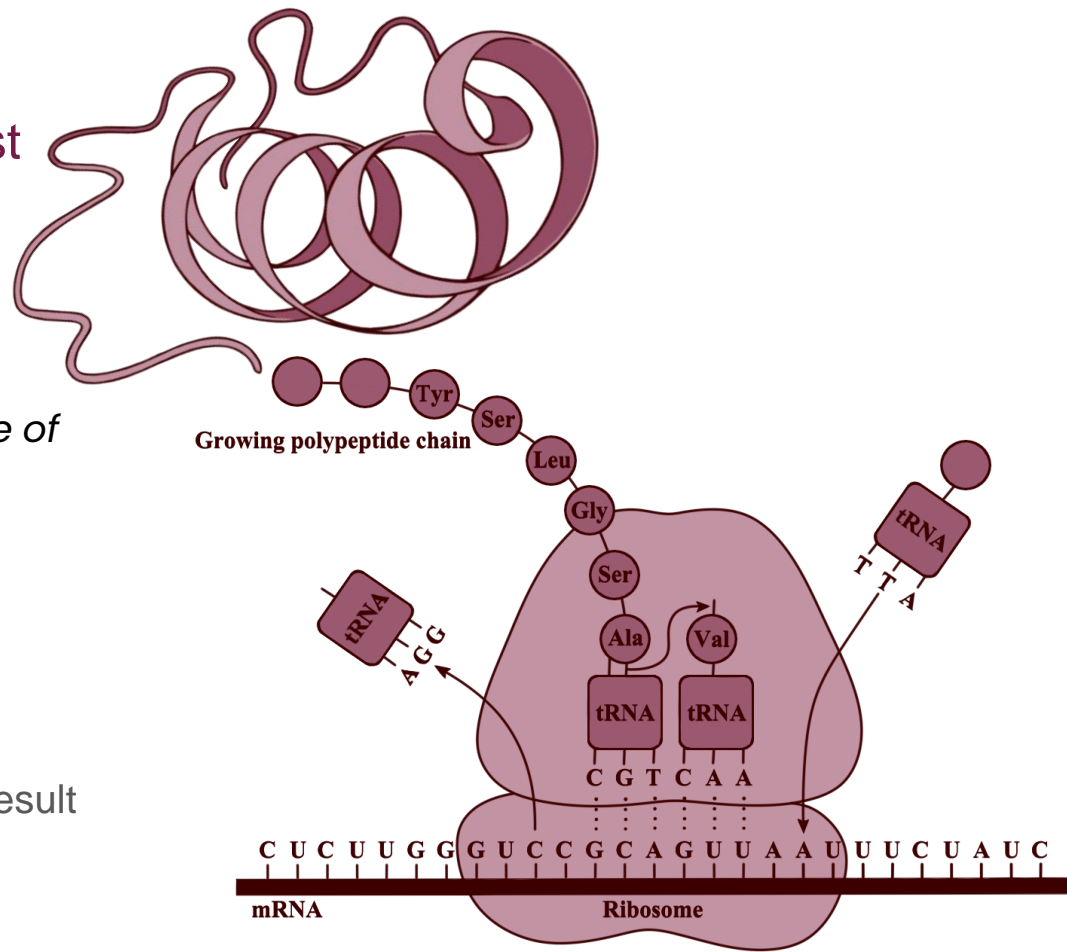
Markoš, A., Švorcová, J. & Lhotský, J. (2013) Living as Linguaging: Distributed Knowledge in Living Beings. S.J. Cowley, F. Vallée-Tourangeau (eds.), *Cognition Beyond the Brain*, S.J. Cowley, F. Vallée-Tourangeau (eds.), *Cognition Beyond the Brain*, Springer, 71-92
Stjernfelt, F. 2014: *Natural Propositions: The Actuality of Peirce's Doctrine of Dicisigns*.

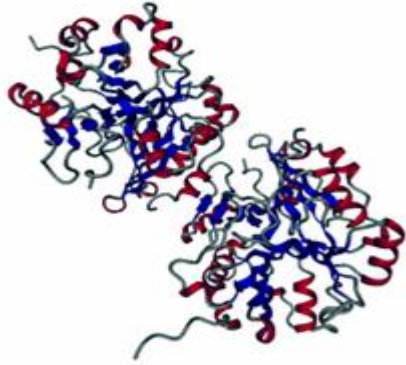
BUT is it really that a whole is just a bunch of its parts?

"Neither the three-dimensional structure of proteins nor their function is genetically encoded ... and genes alone do not determine the phenotype of organisms, contrary to what is assumed in neo-Darwinism."

(Sharov and Tønnessen 2021, 229)

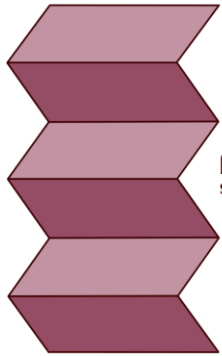
- Digital linear static script VS analog dimensional and dynamic proteins (result of the genetic reading)



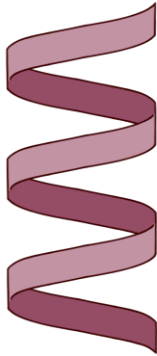


Proteins are more than just folded string

The function of a protein is not given by the combination of the “letters” but by the very shape it acquires by folding



β -pleated
sheet



α helix