



HIGHLIGHT

on the concept of

Biomimetics

Interview with **Dr. Gil Tirlet**



Gil Tirlet

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1/ “Hello Gil, can you tell us about the Bio-Emulation, or biomimetics, which you are working on?”

The term comes from the Greek, *bios* (life) and *mimesis* (imitate). Otto Schmitt (American academic and inventor) coined the English term biomimetics to describe the transfer process from biology to technology. In the scientific field, biomimetics means the reproduction or copy of a model or reference.^(1,2) More precisely, the concept of biomimetics consists in artificially reproducing and imitating natural processes in living organisms. We can also use the term bio-emulation, which means the reproduction of nature by bio-mimetic imitation.⁽¹⁾

Biomimetics has only been considered a science for a few decades, and was defined by, amongst others, Janine Banyuls (Biologist and Environmentalist) in 1997. It is an innovative process, based on the transfer and adaptation of principles and strategies used by living organisms and ecosystems, to produce sustainable goods and services and make human societies compatible with the biosphere.

She is the author of the reference book “Biomimetics: Innovation inspired by Nature”, in which we find this crucial sentence:

“Biomimetics introduces an era based not on what we can extract from nature, but what we can learn from her”.

In modern dentistry, the concept of “Biomimetics” is synonymous with the natural integration of biomaterials: meaning biological, biomechanical, functional and cosmetic integration, closely mimicking the physiological behaviour of natural teeth.^(1,2) Thanks to sophisticated bonding techniques and developments in ceramic materials, it now seems possible to strive towards biomimetic correspondence between cosmetic substitution materials and the anatomic substrate of a natural tooth.^(1,2) This modern concept originated in a histo-anatomic study of the natural tissues of teeth. Ideally, the tooth and restoration biomaterial should be, biologically and visually, a real “functional unit” that is able to withstand the biomechanical loads it is subjected to in its environment.

Biomimetics combines both these fundamental parameters at the heart of current treatments: tissue preservation and bonding. In the framework of modern dentistry, this paradigm change in the field of fixed prosthetics concerns both current uses and the biomaterials and bonding processes it uses. It is universally understood that conventional



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