

# Biological and electrochemical sensors in measuring the informational side of matter

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The representation of matter as consisting of 'weak' (subtle) and 'rigid' (material) parts is encountered in all historical epochs, cultures, geographic regions, even in fully isolated island cultures. The duality of matter represents the key issue in a long-term philosophical discussion during a historical development of natural sciences. The researchers of XIX and XX centuries tried to unify both sides that reflected in appearance of unconventional technologies and the emergence of such informational concepts as holographic/quantum universe, morphogenetic fields, noosphere and others.

The main argument against the dual concept of matter is a 'subtle nature' of the 'weak part' and consequently the measurement of subtle or informational effects was counted as impossible. However, the research performed in XX century in such countries as Germany, USSR, USA, China, Czechoslovakia, Israel and several others indicated that a 'subtle part' is involved into physical interactions with biological systems. Especial attention was attracted to the interaction with consciousness, which resulted in governmental programs exploring these phenomena primarily for military applications. The further research indicated that informational effects appear also in interactions with physical systems; however, they possess weak or even ultra-weak nature. Thereby the development was split up into the consciousness-related topics focused on mind-matter interactions, and the research on device-matter interactions, which involve the weak informational effects.

The last branch of unconventional research is especially important since 'subtle effects' can be produced by several devices and correspondingly measured. This represents a silent technological revolution because it opens the way for new 'subtle-technologies' and operations with informational side of matter. It is comparable to the first pioneer exploratory works on electricity about 400 years ago and can fundamentally affect our civilization.

The research and development from 1950x up to now revealed a few approaches to generate, to measure and to use informational effects in a technological way. As an example the shape-, LED-, laser-, EM-generating devices can be indicated. Measurement represents more complex issue because a number of technical solutions is required to separate environmental influences from weak informational interactions. They also possess specific properties related to a human operator, post- and pre-experimental conditions, long-range interactions, etc. Currently there are several solid-body, fluidic and electric-field-based sensors as well as microbiological and macrobiological test systems. Most sensitive are fluidic sensors, since water seems to be one of the most sensitive media for informational interactions. In the presentation we will focus primarily on fluidic and microbiological sensors based on potentiometry, UV/impedance spectroscopy and fermentation tests.

One of the interesting effects related to informational interaction is co-called imprinting effect. It has different names in Russia and China, sometimes it is denoted also as the 'transfer of information action' (TIA). The point is that several informational properties from the object-donor can be transferred to the object-recipient. Thereby specific conditions should be met, for instance the object-recipient should be in an unstable (e.g. developmental) or in a phase-transition state. One of the oldest usages of TIA effect is known in agriculture since 1960x, in 80x applications are extended to the metallurgy, water preparation and pharmaceuticals. The last area is of especial interest because here a large number of experiments on laboratory animals, microorganisms and small-scale clinical attempts are performed in different countries. The presentation will overview these studies based on the 'IC medicals' company, we will discuss this commercialization attempt (currently over 60 informational substances can be downloaded and used in experiments) and several further initiatives based on it.