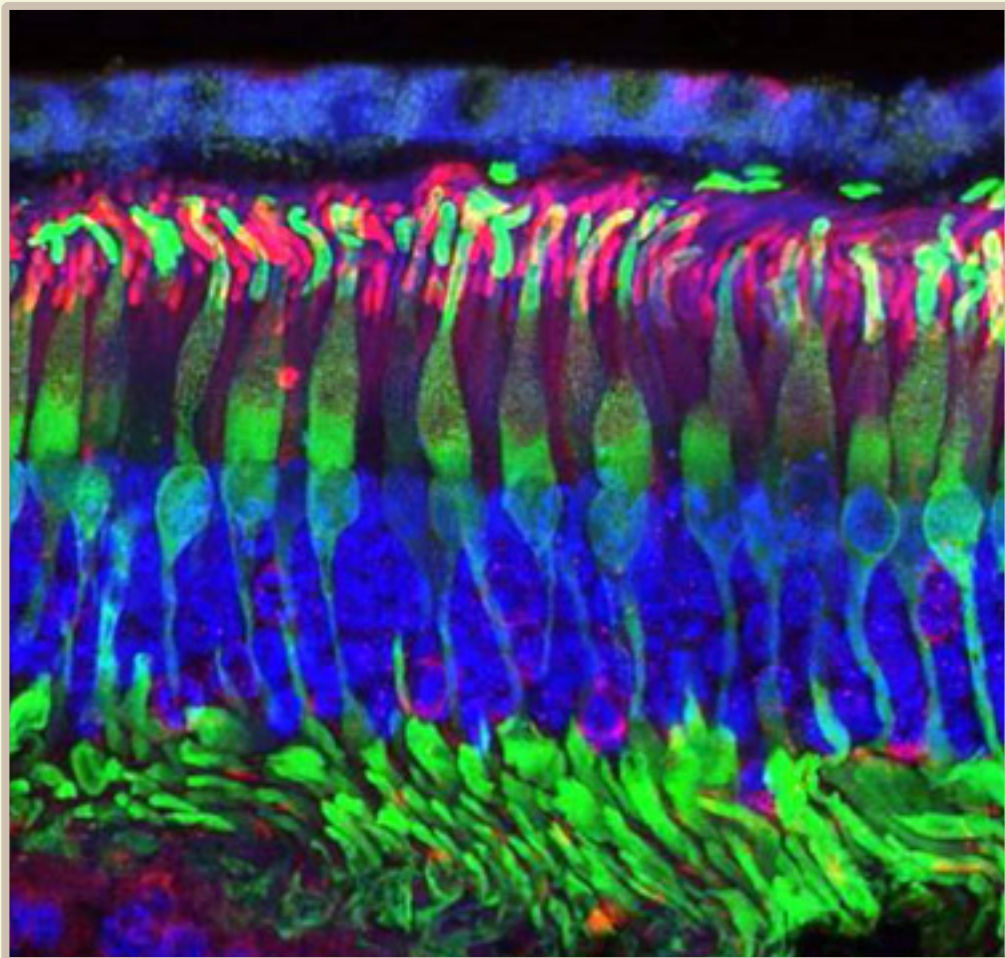


# TRANSDUCTION OF SENSORY SIGNALING



Photon & Phonon's Transduction

Sensory receptors are the interface between the environment and the nervous system, and the present approach in “Bio-Quantum Physics” is producing a re-examination of “transduction apparatus” of sensory receptors. In fact sensory information, such as that carried by light, sound, are stimulated by quantum particles, such as photons of light in the retina and phonons of sound wave /particles in the cochlea. The senses receptors operate a transduction of sensory stimuli in codified signals to transmit information to the brain in order to revealing the nature of the outside world.

To understand the detecting such “transduction” through specialized receptors, it is important to strengthening in importance of Bio-Quantum Physics. (BQP) As a matter of facts BQP support the macro- and micro-cosmos correlations, in a more complete view as it is effectively embodied in the nature of senses receptors, able to capture stimulus from Quantum particles with high specificity and sensitivity.

In BQP are no an exception, the mechanics receptor of cell’s membranes, able to detect, odour, touch and movement; in fact the foundation of any receptor’s system is based on the “transduction” of some quantized forms of energy, generating through the stimuli excitation, codified signalling of information in conformity with the working functions of some centralized elaboration of information signals, having some complex operational functions like the brain.

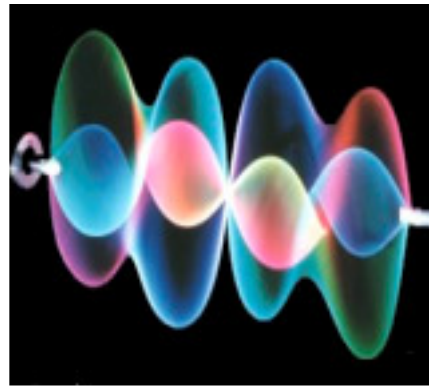
Hence the BQP is focused on the change of Quantum Properties outstanding the confinement of quantum particles, when they are trapped into specialized sensing receptors , e.g. through particular conditions of space time restrictions, where are increasing the emergence of “entangled quantum states”.

Erwin Schroedinger, coined the expression “entanglement” to describe the non-local interdependency between the wave-particles in a quantum system. (E. Schrödinger, 1935, "Discussion of probability relations between separated systems", Proceedings of the Cambridge Philosophical Society 31, p. 555.).

The BQP find in the “entanglement coherence”, a theoretical solution to understand the general principles of transposition of an energy input on sensory receptors in codified signalling pathways of communication between senses and brain . (1)

Sensory Information by means of entangled wave particles.

To understand how “entanglement” works to codify sensory information it is necessary to remember that the Photon and Phonons can be entangled in coupled pairs of Q. particles.



To understand how “entanglement” works to codify sensory information it is necessary to remember that the Photon and Phonons can be entangled in coupled pairs of Q. particles. In fact they do not obey to the “Exclusion Principle” of Wolfgang Pauli (1925), that forbid at two electrons, in an atom, to belong to the same quantum state configuration at in the same space and at the same time. (2) Thus the entangled pairs, co-existing in the same four-vector of space-time, will be coupled by means of a closed system of the sensory receptors, because they works as a restricted space-time system of wave particles. The coding of sensory information happen when the entangled Q. pairs will be “dis-entangled”, this because they cannot be confined and squeezed together in a short space for along time. So that the four-vector of the Q. Pair break down in four sub-units, through a “parametric down conversion of space-time coordinates” into fundamental “information signals” carrying fundamental “information energy”(I). The last can be included as an expression of the lowest quantized energy level or “Zero point Energy” ground state energy of an empty space.(3) Each vector sub-units in fact represents a signal corresponding to a "propagating mode of the ground state field of information energy." The inference that bring into being the “parametric down conversion” in signals of Information Energy can be simply described as follows:

The stimulus to sensing receptors is carried by two Q. particles ( Ph1 and Ph2 ); their status can be written by the following Cartesian Coordinates

$$(Ph1)= \langle x1,y1,z1 + t1 \rangle ; (Ph2) = \langle x2, y2, z2 + t2 \rangle$$

When the two wave Q. particles are confined in a reactive networking of as a sensor , it is becoming equal zero the vector component( z1-z2 = 0 ). Therefore the Entangled pairs (E 1.2) is becoming flat in space and works in a two-dimensional time duration. Therefore the four dimensional space vector of the Entangled - pair can be expressed as follow:

$$(E1-2) = x1-x2, y1-y2, x1-y2, y2-x1.$$

These coordinates, owing to the instability of the Entangled state can be decomposed in the four sub-units , working as super correlated parallel vector functions, during the (t1+t2) timing duration. Those sub –units of quantized space-time, can be characterized as an “*super dense codification of synchronised signalling-packet of information energy*”.

Schema – Parametric down conversion in parallel "information energy signals"

→	$\langle x1-x2 \rangle$	<b>vector unit correspond to the first symmetric signal</b>	<b>(1.1.)</b>
→	$\langle y1-y2 \rangle$	<b>vector unit correspond to the second symmetric signal</b>	<b>(0.0.)</b>
→	$\langle x1-y2 \rangle$	<b>vector unit correspond to the third asymmetric signal</b>	<b>(1.0.)</b>
→	$\langle y2-x1 \rangle$	<b>vector unit correspond to the fourth asymmetric signal</b>	<b>(0.1.)</b>

This model of transduction of space-time vectors in codified signals as carriers of “information energy”, is generated by means of the dynamics of “entanglement/dis-entanglement” of Q. Pairs of wave particles, in order to allow the transfer at distance of information energy signals, to some centre of elaboration or reiteration of the information collected through sense receptors.

The above theoretical explanation can be developed in a more complex approach during the Research trans-disciplinary project that EGOCREANET would like to develop on the SCIENCE of QUALITY, at an international level, in the next future. Certainly this approach would be useful to involve to a scientific rationalization some experimental sciences, as for instance the “Needle-Puncture Surgery” that till now belongs to the practical medicine without having a basic theoretical structure of interpretation outside of the old conception of “Vital Energy” .



Entangled Colours : by Frantisek Kupka, 1912

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