ALTERMAGNETISM in ANIMATED and INANIMATE

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ALTERMAGNETISM ANIMATED AND INANIMATE MATTER

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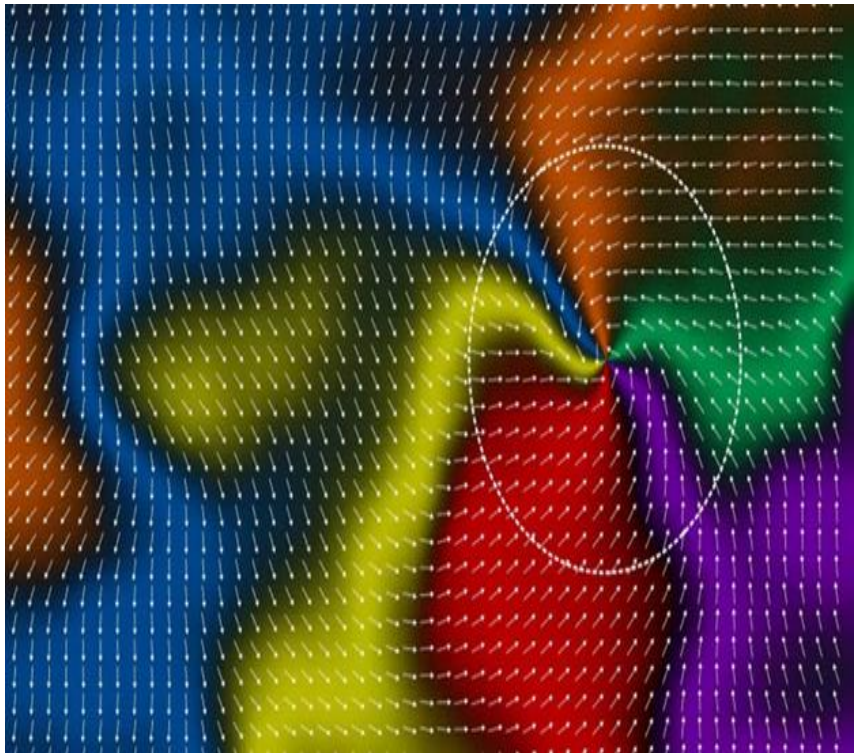
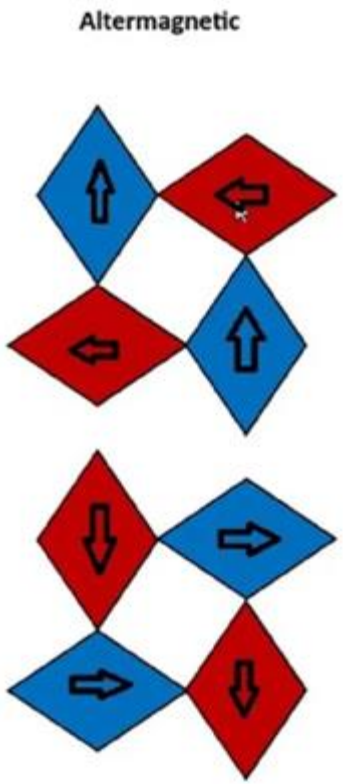
ALTERMAGNETISM

Altermagnetism is a novel state of matter in certain crystals, acting as a hybrid of ferromagnetism and antiferromagnetism. Unlike traditional ferromagnets, which have a net magnetic field, or antiferromagnets, whose fields cancel out, altermagnets exhibit alternating spin configurations with no overall magnetization. However, their unique crystal structure creates strong, alternating spin polarization in their electronic band structure, leading to properties similar to ferromagnets and opening new possibilities for spintronics and quantum computing applications



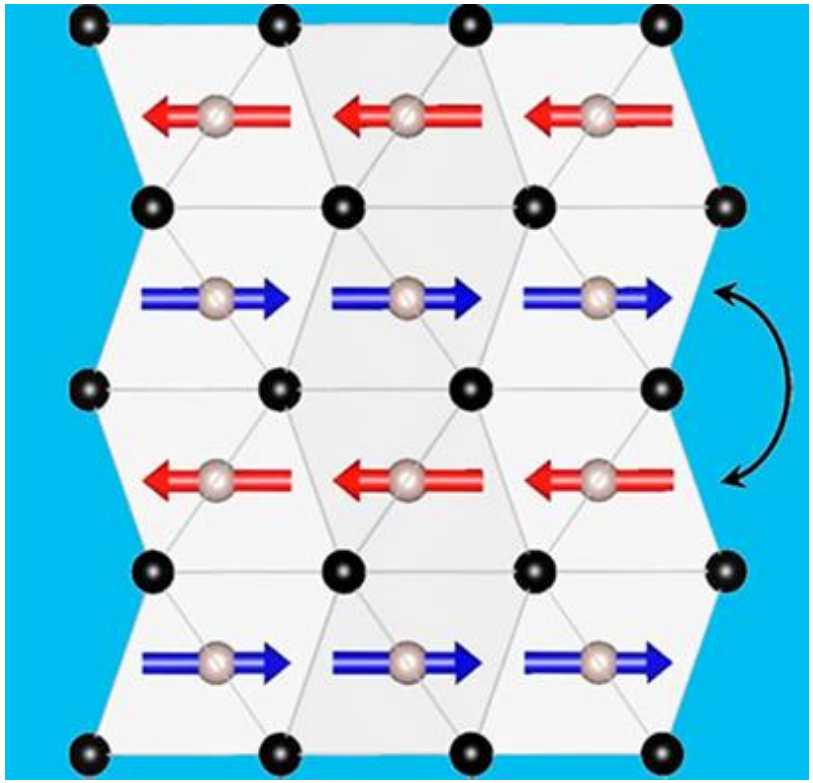
ALTERMAGNETISM

Altermagnetism is a new type of magnetic ordering of materials that combines the properties of ferromagnets and antiferromagnets. The concept was first proposed in 2022, but it wasn't until 2024 that scientists obtained convincing evidence of its existence components. The main difference between altermagnets is the unusual spatial arrangement of the magnetic moments of their atoms. Each magnetic moment is directed opposite to its neighbor, like an antiferromagnetic material, but is slightly curved relative to its neighbor, giving the material some ferromagnetic properties.



ALTERMAGNETISM

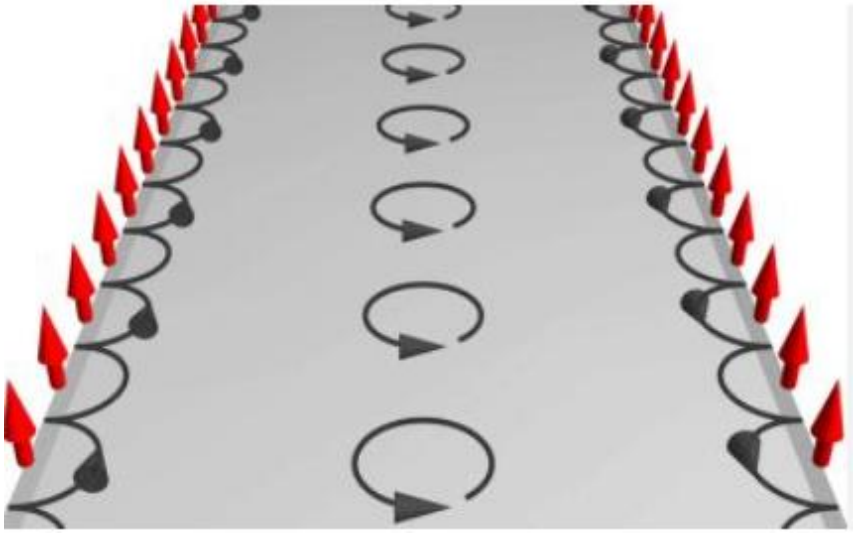
The main distinguishing feature of altermagnets is the unusual spatial arrangement of the atoms' magnetic moments. Each magnetic moment points in the opposite direction to its neighbor, like an antiferromagnetic material, but is slightly curved relative to its neighbor, giving the material some ferromagnetic properties. This arrangement of magnetic moments causes an unusual phenomenon: the material's crystal lattice rotates slightly relative to its neighboring regions, creating new dynamics in the structure. This alters the material's symmetry and introduces new possibilities for interaction between the elements.



MnTe

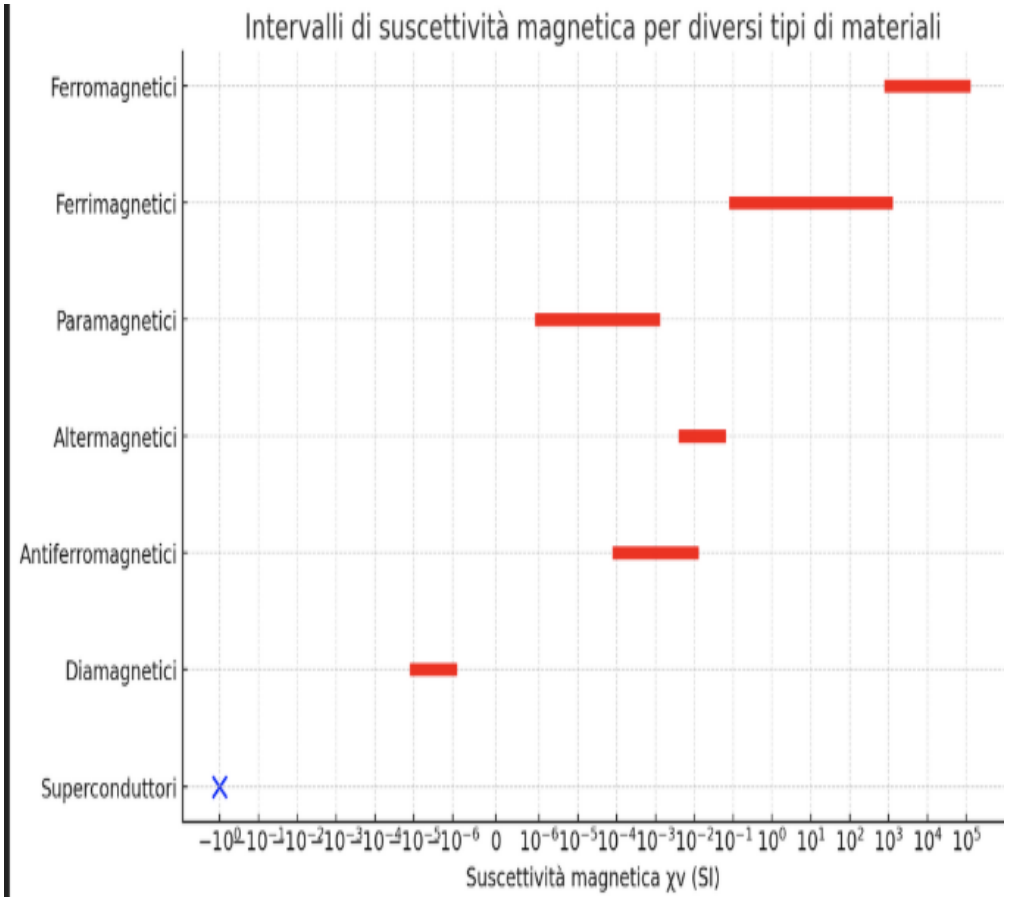
ALTERMAGNETISM - properties

- **Absence of net magnetization.**
- **Spin-separated electron structure. This unusual configuration allows for the generation of spontaneous spin currents and magneto-optical effects even with completely antiparallel spin arrangement.**
- **Violation of time reversal symmetry. Electrons, possessing quantum spin and magnetic moment, change their direction of rotation during time reversal, breaking the symmetry.**



ALTERMAGNETISM IN BIOLOGY

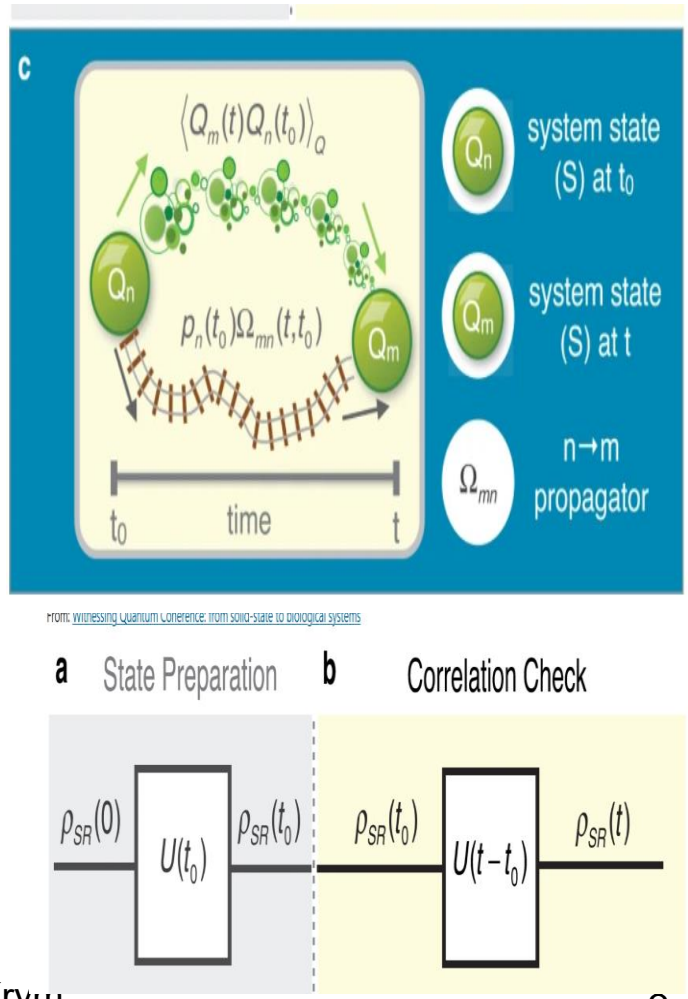
In biological systems, which are primarily composed of water, in addition to Brownian motions, ordered and organizing negentropic systems are being configured, which are studied as clusters and with the emergence of coherent quantum electrodynamics theories, such as coherence domains, that could play a role in the states of ALTERMAGNETISM [2-3- 4-5-6-7-8]



ALTERMAGNETISM IN BIOLOGY

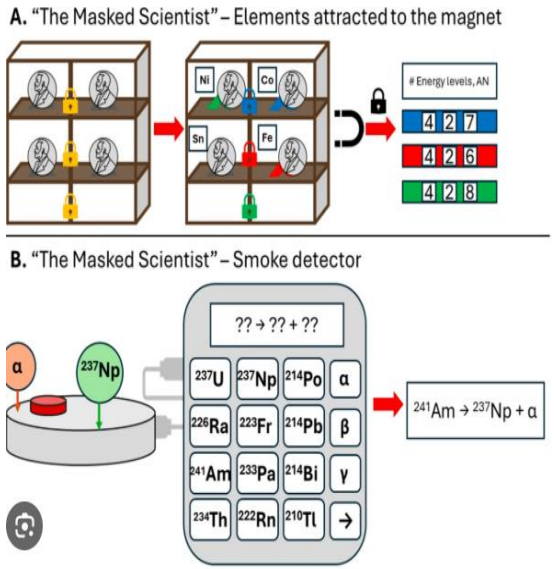
These considerations could be useful also to clear the enigmatic COHERENT EFFECT in superconductivity and in biological systems, where the biomagnetism seems to play a relevant role in biological regulation in the Benveniste Montagnier Widom Effect

Biological system, seen as microelectronics systems, under Josephson Effect, with enigmatic role of very low electromagnetic field [10], till Potential Vector, that as Preparata and Del Giudice wrote, " extends to a nearby large area, without transporting energy but just information, exerting a "fine influence", we could say "informatica", that alters the phase of the present coherent systems." (Scienza e Conoscenza, 17/2006)



ALTERMAGNETISM IN BIOLOGY

These observations and theory, also with correlate and innovative biotechnologies, was generally confused with esoteric functions, while it seems well connected to Mind Brain Body connections as studied in particular by David Bohm and under discussion in an interdisciplinary area in the context of COHERENCE CYCLE OF MEETING https://www.iiimb.me/ , with the last COHERENCE 2024 enriched by a lesson from Campanella and Avino on Catalytic Phenomena and Quantum Chemistry Puzzles https://www.iiimb.me/files/AVINO-CAMPANELLA--relazione-Quantum-Chemistry--1---1-.pdf and COSMOS AND BIOSPHERE2025 dedicated to Natalia Temuriansky leader of research in the field of biomagnetism https://conference.cfuv.ru/conference/biospace/



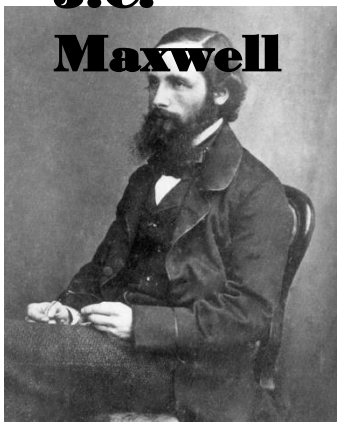
ALTERMAGNETISM IN BIOLOGY

- **Among the enigmas of the Vector Potential is its essence as the Source of the Electromagnetic Field, and consequently the type of forces that sustains it according to negentropic logics , see also the intervention at COHERNECE 2021 https://www.iiimb.me/files/04-presentation-vector-potential.pdf .**
- **From this new window on magnetism, developments are expected in multiple fields beyond those mentioned, including:**
- **Biomedical Devices: The increased speed, smaller footprint, and higher energy efficiency offered by altermagnetic materials could revolutionize the development of medical devices and diagnostic tools, making them more powerful and less reliant on traditional, more energy-intensive components.**
- **Neuromorphic Computing: By mimicking the human brain, neuromorphic computing systems rely on materials that can be scaled and operate efficiently. Altermagnets' unique properties make them well-suited for this field, potentially leading to more sophisticated AI that can better model complex biological systems.**
- **Finally, advancements are expected in materials science and industrial processes, where magnetism plays a relevant yet often enigmatic role.**

Potential Vector of Electromagnetic Field is Basement of the Modern Theory of Field

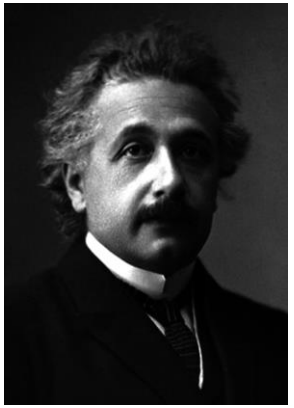
Michael Faraday

J.C. Maxwell



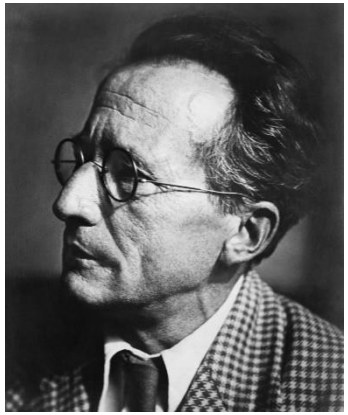
Hendrik Antoon Lorentz

Albert Einstein

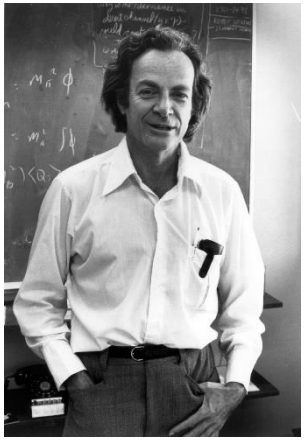


Electric and magnetic fields Electrodynamics of moving bodies Theory of Relativity

Niels Bohr



Ervin Shredinger



Richard Feynman

4 D Vector Potential of the Electromagnetic Field

$$A^i = (\varphi, \mathbf{A}).$$

$$S = \int_a^b \left(-mc\, ds - \frac{e}{c} A_i dx^i \right).$$

principle of a least action

$$L = -mc^2 \sqrt{1 - \frac{v^2}{c^2}} + \frac{e}{c}\mathbf{A}\mathbf{v} - e\varphi$$

$$\partial L / \partial \mathbf{v} = \mathbf{P} = \frac{m\mathbf{v}}{\sqrt{1 - v^2/c^2}} + \frac{e}{c}\mathbf{A} = \mathbf{p} + \frac{e}{c}\mathbf{A}$$

Euler–Lagrange equation

Equation of Motion of the Particle in the Electromagnetic Field

$$\frac{d}{dt}\frac{\partial L}{\partial \mathbf{v}} = \frac{\partial L}{\partial \mathbf{r}},$$

$$\frac{d\mathbf{p}}{dt} = -\frac{e}{c}\frac{\partial \mathbf{A}}{\partial t} - e\,\mathrm{grad}\,\varphi + \frac{e}{c}[\mathbf{v}\,\mathrm{rot}\,\mathbf{A}]$$

$$\mathbf{E} = -\frac{1}{c}\frac{\partial \mathbf{A}}{\partial t} - \mathrm{grad}\,\varphi \qquad \mathbf{H} = \mathrm{rot}\,\mathbf{A}.$$

$$\frac{d\mathbf{p}}{dt} = e\mathbf{E} + \frac{e}{c}[\mathbf{v}\mathbf{H}] \qquad \Delta\mathbf{P} = -e/c\,\Delta\mathbf{A}$$

Change of **A** leads to change of **P**

Static Vector Potential A

$$U = \frac{1}{2}\int \mathbf{j}\cdot\mathbf{A}\,dV. \qquad U = \frac{1}{2}\int \rho\varphi\,dV.$$

$$\mathbf{A}(1) = \frac{1}{4\pi\varepsilon_0 c^2}\int \frac{\mathbf{j}(2)\,dV_2}{r_{12}}, \qquad \varphi(1) = \frac{1}{4\pi\varepsilon_0}\int \frac{\rho(2)}{r_{12}}\,dV_2.$$

$$\mathbf{B}(1) = \frac{1}{4\pi\varepsilon_0 c^2}\int \frac{\mathbf{j}(2)\times\mathbf{e}_{12}}{r_{12}^2}\,dV_2. \quad \mathbf{E}(1) = \frac{1}{4\pi\varepsilon_0}\int \frac{\rho(2)\,\mathbf{e}_{12}}{r_{12}^2}\,dV_2.$$

$$\mathbf{H} = \mathrm{rot}\,\mathbf{A}.$$

Vector potential **A** exists whenever **H** exists, but not vice versa

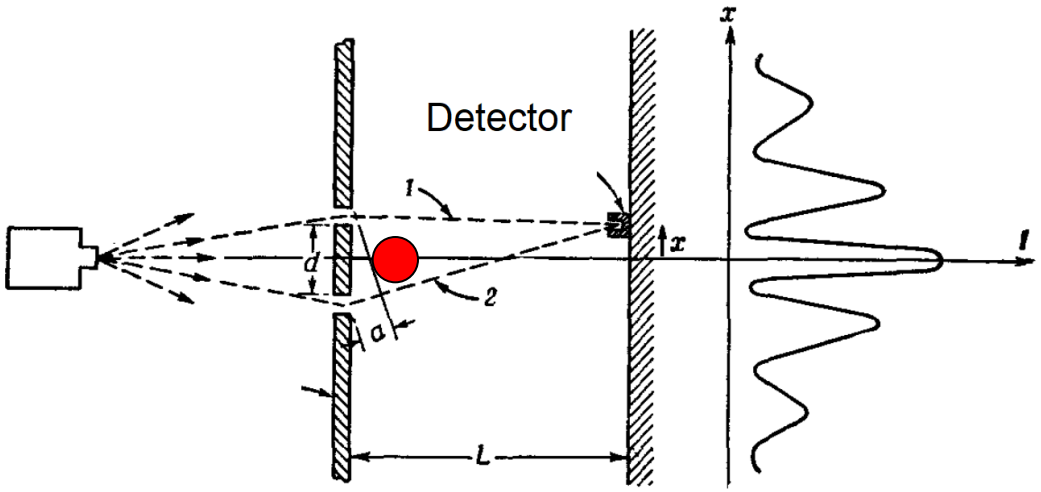
Schrödinger Equation in Magnetic Field

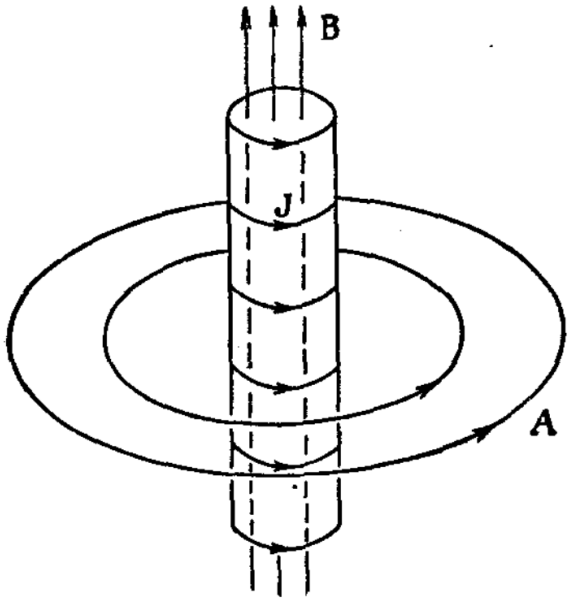
$$\frac{1}{2m}\left(\hat{\mathbf{p}} - \frac{e}{c}\hat{\mathbf{A}}\right)^2 \Psi_n(\mathbf{r}) = E_n \Psi_n(\mathbf{r}), \qquad (3)$$

$$\psi_{n,k_y}(x) = \frac{1}{\sqrt{2^n n! \pi^{1/2} l_H}} e^{-\frac{(x-k_y l_H^2)^2}{2l_H^2}} H_n\left(\frac{(x-k_y l_H^2)}{l_H}\right), \qquad (7)$$

$$E(n, k_z) = \frac{\hbar^2 k_z^2}{2m} + \hbar\omega_c\left(n + \frac{1}{2}\right), \qquad (1)$$

Aharonov and Bohm Effect





$\hat{C}_1 e^{i\Phi_1}$ $\hat{C}_2 e^{i\Phi_2}$

$\delta = \Phi_1 - \Phi_2$

$\delta = \frac{a}{\lambda\!\!\!^{-}}$.

$a = \frac{x}{L} d$

$\delta = \frac{x}{L} \frac{d}{\lambda\!\!\!^{-}}$

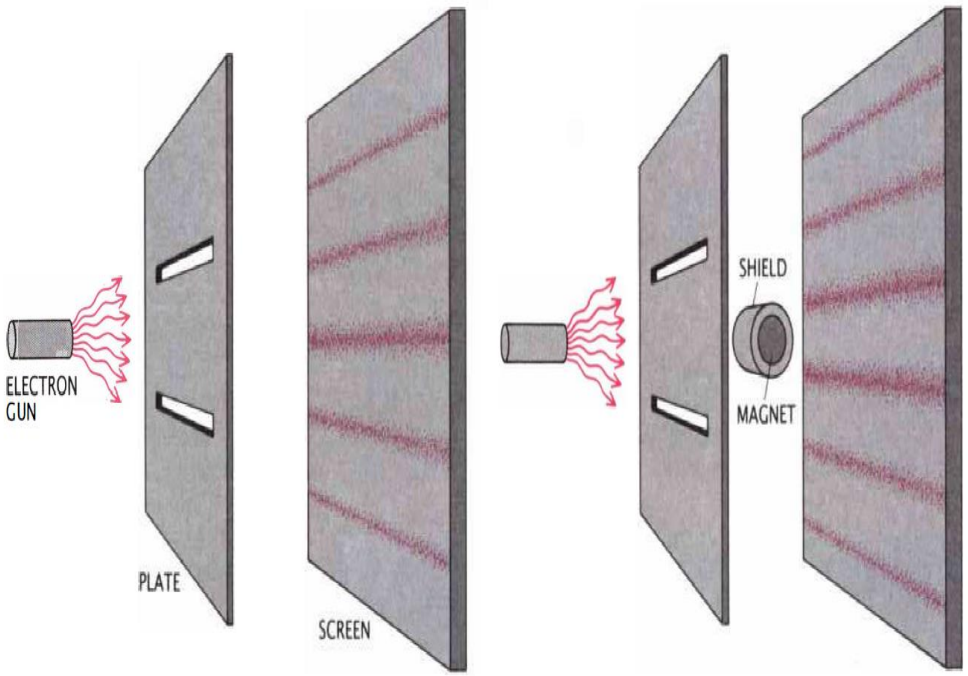
$\lambda\!\!\!^{-} = \hbar / p$ H = 0

$$\mathbf{A}(1) = \frac{1}{4\pi\varepsilon_0 c^2} \int \frac{\mathbf{j}(2)\, dV_2}{r_{12}},$$

$$\delta = \Phi_1 (B = 0) - \Phi_2 (B = 0) + \frac{q}{\hbar} \int_{(1)} \mathbf{A} \cdot d\mathbf{s} - \frac{q}{\hbar} \int_{(2)} \mathbf{A} \cdot d\mathbf{s}.$$

Aharonov Bohm effect

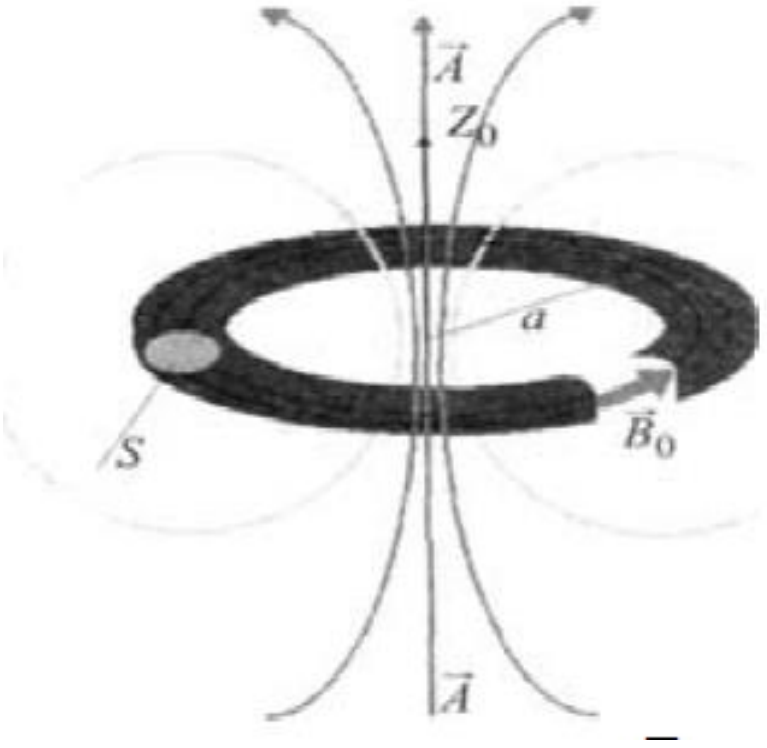
The Aharonov Bohm effect manifests itself in the form of displacement of the electron wave bands during Interference on 2 slots of electron waves in vacuum.



Imry, Y., & Webb, R. A. (1989). Quantum interference and the Aharonov-Bohm effect. Scientific American, 260(4), 56-65.B. .

Vector potential A Generation Principal

There are numerous reports on biological effects caused by weak and superweak magnetic fields. At the same time, the extremely small intensity of the primary act of exposure to the object speaks rather about the informational than the forceful nature of the influence of the field. There are also experiments in which the outer magnetic field is reduced to zero. However, hypotheses about the physical of these physical phenomena cannot be



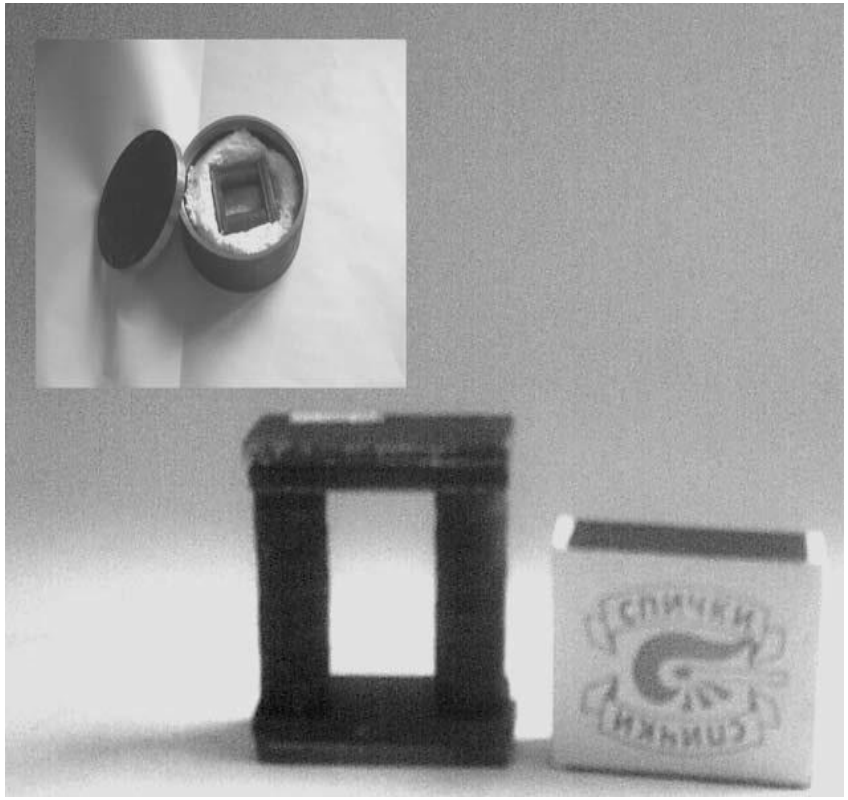
Апельцин, В. Ф., Полетаев, А. И., & Трухан, Э. М. (2019). МАГНИТНЫЙ ВЕКТОРНЫЙ ПОТЕНЦИАЛ КАК МОДУЛЯТОР ХИМИЧЕСКИХ И БИОЛОГИЧЕСКИХ ПРОЦЕССОВ.

Vector potential Generation device

One of the hypotheses to explain these effects is the effect of the vector potential of the electromagnetic field on these biological or medical bjec

$$\Delta\varphi = (e/\hbar)\int \mathbf{A}\,\mathbf{dr}\,,$$

As we see the vector potential associated with the phase. In the case of a wave function, the phase ψ does not affect the distribution of the electron density ρ (ρ = | ψ |^2) of the individual electron.



Аносов, В. Н., & Трухан, Э. М. (2003). Новый подход к проблеме воздействия слабых магнитных полей на живые объекты. In Доклады Академии Наук (Vol. 392,

Bio-information – sources, imprinting into water, erasure, measurements

Table 1 Bio-information – sources, imprinting into water, erasure, measurement

Sources of frequency bio-information	*Imprinting a frequency into water*	*Erasing a frequency imprint in water*	*Measuring a frequency imprint in water*
1 Whole Body Field 2 Acupuncture Meridians 3 Chakra Points 4 Chemical Signature 5 Scattered Light & Images.	1 Proximity 2 Succussion 3 Momentum Impulse 4 Permanent Magnet 5 Ferrite Toroid(s) 6 Toroid (A-field) 7 Solenoid (A-& B-fields) 8 Caduceus and Möbius coils (torsion & radial A-fields) 9 Vortex (angular momentum) 10 Digitally (7-voltage impulses) 11 Chirality (L-& D-) 12 Light scatter. 13 Arithmetic & Logic Functions 14 Chemically 15 Heart Chakra 16 Qi – Intention.	1 Closed Steel Box. 2 Imprinting 'nil-potent' Frequency 3 Prime Number Dilutions.	1 Pair of electrodes to differential amplifier. 2 Single electrode (detects A-field). 3 Dowsing Response (μHz to THz) 4 Modulated light scatter & its images.

Smith, C. W. (2015). Electromagnetic and magnetic vector potential bio-information and water. Homeopathy, 104(04), 301-304.

Vector potential effect on Water

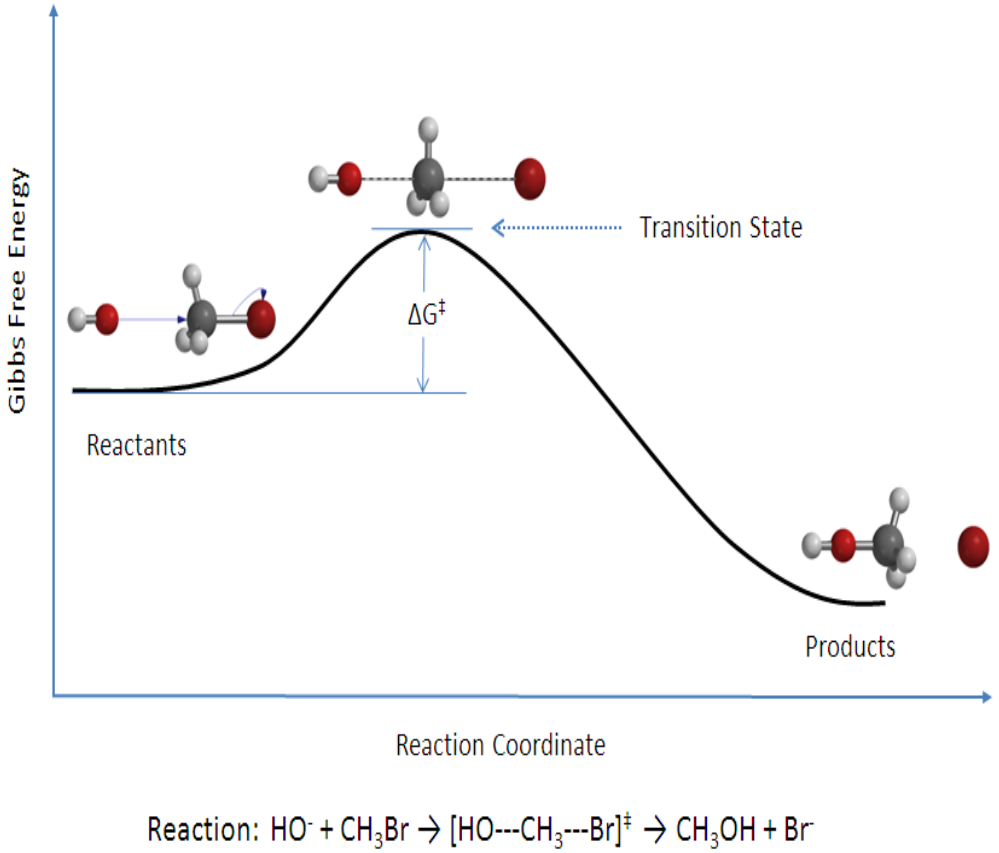
A possible object of exposure to vector potential can be water, which is an essential environment for biochemical and biophysical processes. The restructuring of the water structure caused by a violation of equilibrium conditions on an intracellular scale occurs mainly by tunneling protons along intermolecular hydrogen bonds. This process can also be the objects of the vector potential, changing the speed and direction of the process, as well as the fate of the biochemical cell system.

Апельцин, В. Ф., Полетаев, А. И., & Трухан, Э. М. (2019). МАГНИТНЫЙ ВЕКТОРНЫЙ ПОТЕНЦИАЛ КАК МОДУЛЯТОР ХИМИЧЕСКИХ И

Water and vector potential

Thus these **purely quantum phenomena** can cause noticeable **macroscopic changes** in the state and behavior of living systems. At the same time, the primary act of exposure consists in changing the phase of individual ψ functions, has a **signal informational nature**. And the expected macroscopic effect is a strengthening of primary processes due to the energy springs of the object itself.

Therefore, an experimental study of the influence of the vector effect on live objects is an important fundamental and applied research.

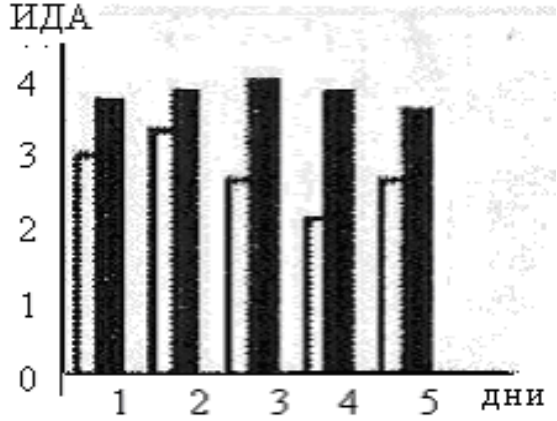


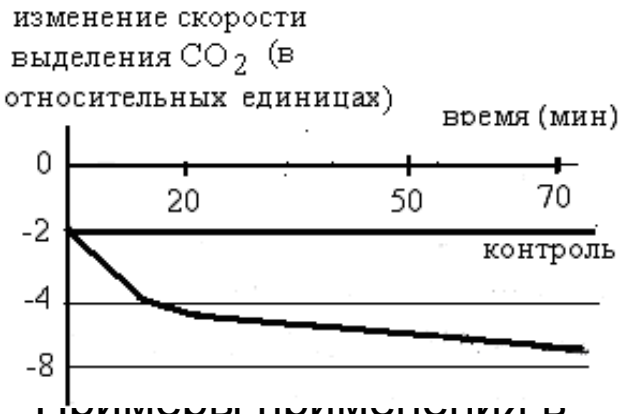
Апельцин, В. Ф., Полетаев, А. И., & Трухан, Э. М. (2019). МАГНИТНЫЙ ВЕКТОРНЫЙ ПОТЕНЦИАЛ КАК МОДУЛЯТОР ХИМИЧЕСКИХ И БИОЛОГИЧЕСКИХ ПРОЦЕССОВ.

Vector potential in life science experiments

Experimental results of the changing the motor activity index (IDA) of spirotoma infusories (*Spirostomus Ambicuum*) when the water-incubated infusories passed through the vector potential (dark columns) is added to a solution with incubated water infusories. Control is represented by light columns. (IDA - the number of intersections by infusories in the solution of the marker line in 5 minutes).

Changing the high speed of CO2 after exposure of the suspension for 20 minutes in the vector potential field.





Примеры применения в технике и биологии. Сложные системы, (1), 31-

Vector potential in life science experiments

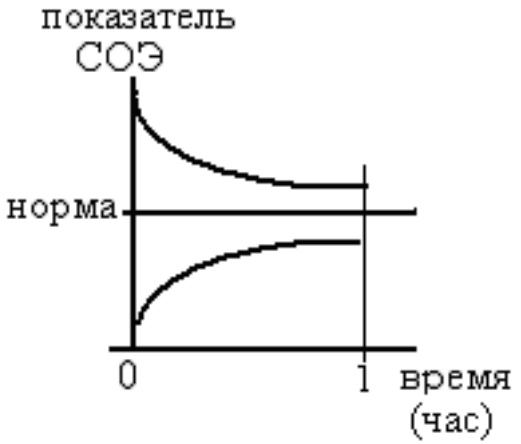
Experimental results of the effects of vector potential on the physical characteristics of the simplest living objects - the intensity of bioluminescence of living cells, the rate of sedimentation of erythrocytes, the mobility of hydrobionts, and the speed of a simple chemical reaction in solution.

Changing the differential absorption spectrum of the absorption of the physical (exposure in the vector potential) depending on the light wavelength

Болдырева, Л. Б. (2014). Квантовая нелокальность. Примеры применения в технике и биологии. Сложные системы, (1), 31-45

Vector Potential „Therapeutik“ effect on euritrocites sedimentation rate

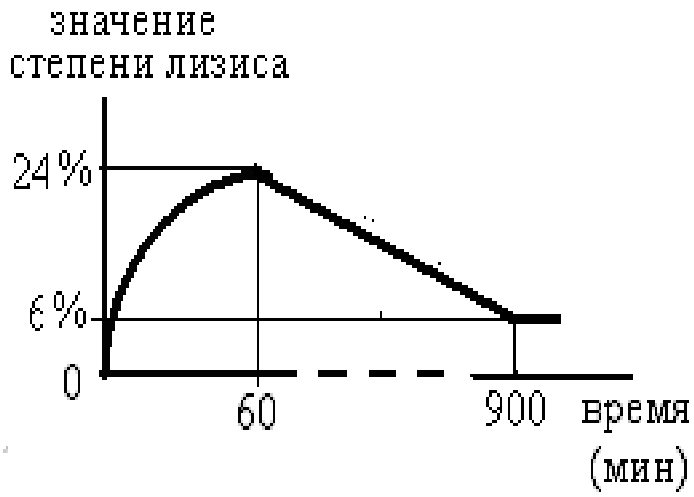
Experimental results of the Changes in the erythrocyte sedimentation rate (SE) in the test tube with the blood of the donor under the influence of vector potential. If the SE indicator was higher than the norm, then after processing by vector potential, it decreases (dependence 1), and if the norm is lower, then after processing by vector potential, it increases (dependence 2). That is, in these experiments, the effect of vectorpotential for blood was "therapeutic"



Trukhan E.M. Vozdeistvie slabykh magnitnykh polej na biologicheskuju aktivnost’ vodnoj fazy [Effects of weak magnetic fields on biological reactivity of water phase]. Komp’juternye issledovaniya i modelirovanie – Computer

Vector potential in life science experiments

From the venous blood of a person was isolated lymphocytes according to the standard method of flotation in the density gradient. The suspension of these lymphocytes at 20-25 ° C was placed in the vector potential of 60 minutes. After exposure, the degree of lysis was changed compared with the control (6%). At the same time, 15 hours exposure did not lead to differences in the degree of lysis.



Новоселецкий В.Н., Абрамов В.Ю., Заико В.М. и др. Изучение влияния безроторного векторного потенциала на опосредованный ксеногенными антителами комплемент-зависимый

Garyaev Peter

Bulletin of Experimental Biology and Medicine, Vol. 143, No. 2, 2007 GENERAL PATHOLOGY AND PATHOPHYSIOLOGY

Effect of Electromagnetic Radiation Modulated by Biostructures on the Course of Alloxan-Induced Diabetes Mellitus in Rats

P. P. Garyaev, A. A. Kokaya*, I. V. Mukhina*,
E. A. Leonova-Garyaeva, and N. G. Kokaya*

Translated from *Byulleten' Eksperimental'noi Biologii i Meditsiny*, Vol. 143, No. 2, pp. 155-158, February, 2007
Original article submitted May 29, 2006

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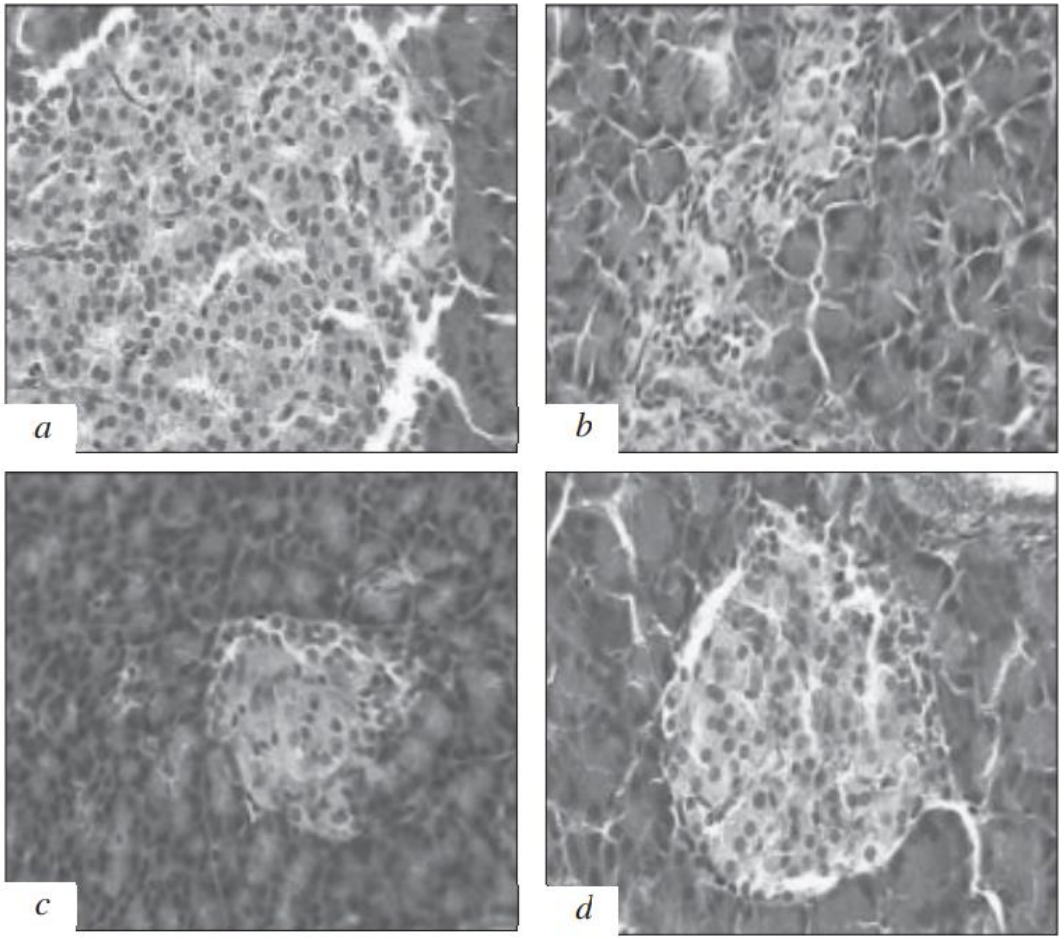
17.11.2020

Exposure of rats with experimental diabetes mellitus to wide-band electromagnetic radiation generated by He-Ne laser and modulated by the pancreas and spleen is informing and phenomenological method prolonging animal life span, normalizing blood glucose level, and promoting regeneration of the pancreas.

Wide-band electromagnetic radiation was generated by He-Ne laser and modulated by biological structures by our technology. He-Ne laser (2 MW po wer, of 632.8 nm wavelength) has two superposed orthogonally linearly polarized single-frequency radiation modes. Fresh preparations of the pancreas or spleen from a newborn Wistar rat were applied onto a slide and placed on the optical axis of laser beam. The slide with the preparation was adjusted to provide partial reflection of the beam into the laser resonator. Due to this multipassage mode, the preparation acts as an optical correlator and regulates the distribution of secondary modes of the laser.

Two spatially separated modes with perpen dicular polarization were used for registration of the correlation signal. Optical signals were recorded and transferred into electric circuit regulating laser generation regime, in which mode intensities were compensated best of all. In this regimen, the laser generates WER depending on the exposed biopreparation. The distance between the preparation and laser active element was 11 cm. Laser beam photons at counter-current beams were modulated by the preparation, including modulation by two orthogonally polarized components of radiation

Pancreatic tissue structure of rats



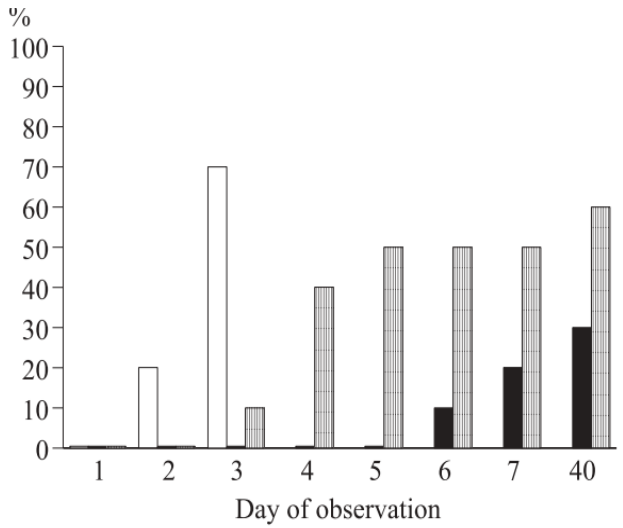


Fig. 1. Effect of WER exposure on the mortality of animals (%) with alloxan DM. Light bars: group 1; dark bars: group 2; cross-hatched bars: group 3.

Fig2. Langerhans islets. a) intact rats; b) control, after alloxan injection in a dose of 200 mg/kg; c) group 2 rats on day 7 after alloxan injection in a dose of 200 mg/kg and 1 day after WER exposure; d) group 2 rats 1.5 months after alloxan injection and WER exposure. Hematoxylin and eosin staining, ×400

ON BIOCHEMICAL MEMORIES Valenzi Yalta 2010 (1).pdf

But if the process of enzymatic activation in alcohol is quite clear, the mechanisms of action in the reduction of local and diffuse atherosclerotic plaque, appear to be much more complex, although two cases we have followed, demonstrate results of interest for strategies to prevent and to cure and atherosclerotic plaque. The first case was presented at a seminar in Rome, Tor Vergata, on the treatment of a perimalleolar ulcer and a carotid plaque; the second only concerns the carotid with a reduction of carotid obstruction from 70 to 40% https://www.vglobale.it/wp-content/uploads/2014/03/8Marzo-Valenzi-caso-clinico.pdf

Two works on the subject was published in the last ten years by Beninati Group [9-10]

This last development on mitocondria and Krebs Cycle researches, could help to understa the enigmatic role of Citozym line in many disorder in particular in the nutriceutical support with:

a) improvement of performance status in normal people and in sportsmen
b) immune response stimulation against virus bacteria, cancer cell, etc.,
c) improvement of lipid metabolism,
d) contrast side effect of drug, in chemio and radiotherapy
e) improvement of enzymatic activity in some genetic disease as leucodistrofia, duchenne, et
f) Regeneration of ulcerated tissues, traumatic wounds, burns, etc

with some laboratory results observed as emerged by study of Colizzi Beninati e coll .https://www.citozeatecsrl.ch/download/fondamentale-riduzione-dello-stress-ossidativo-e-dalle-radiazioni-fotochimiche/

Two important side effects was observed,

a) increase in intestinal peristalsis and gas in the first days of intake, with social problems (but may be useful for constipation),
b) increase in uric acid from activation of the purine line with risk of gout attacks.

As for all complex Active Biological Substance, side effect could arrive in form of intolerance or allergy

Some clinical case will be presented and discussed in the context of a new window on Quantum Chemistry Biological Regulatory System, that is at the center of intense interuniversity research, as emerged from the Tor Vergata seminar, of which you can find the main contributions in the report of that day of science https://www.vglobale.it/2014/03/12/enzimi-energia-e-salute/).

Recent advances in the last 40 years have developped between others an Quantum Analyzer to collects and analyzes the electromagnetic field emitted by cells, evaluates the coherence of frequencies to determine the functional state. Measures over 500 biophysical parameters in 2 minutes. Processes through AI for complete analysis and nutraceuticals suggestions with vitamins salt, minerals enzyme etc. type, see fig. 1-2-3, under testing and validation program of R&D.

(Coenzyme) Analysis Report Card

Name: ADDUCI ANTONIO13 Sex: Male Age: 28

Figure: 1700cm, 70kg Testing Time: 05/11/2024 18:38

Actual Testing Results

Testing Item	Normal Range	Actual Measurement Value	Testing Result
Nicotinamide	2.074 - 3.309	1,176	
Biotin	1.833 - 2.979	1,559	
Pantothenic acid	1.116 - 2.101	2,027	
Folic acid	1.449 - 2.246	1,881	
Coenzyme Q10	0.831 - 1.588	0,782	
Glutathione	0.726 - 1.281	1,165	

Reference Standard: Normal(-) Mildly Abnormal(+) Moderately Abnormal(++) Severely Abnormal(+++)

(Amino Acid) Analysis Report Card

Name: ADDUCI ANTONIO13 Sex: Male Age: 28

Figure: 1700cm, 70kg Testing Time: 05/11/2024 18:38

Actual Testing Results

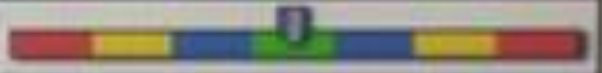
Testing Item	Normal Range	Actual Measurement Value	Testing Result
Lysine	0.962 - 1.213	1,058	
Tryptophan	4.978 - 6.289	3,432	
Phenylalanine	1.928 - 2.491	2,435	
Methionine	1.245 - 1.637	1,487	
Threonine	1.194 - 1.685	1,095	
Isoleucine	4.582 - 5.657	5,009	
Leucine	6.982 - 9.256	6,216	
Valine	6.982 - 9.677	5,702	
Histidine	5.113 - 6.258	6,167	
Arginine	1.812 - 2.337	2,315	
Homocysteine	0.983 - 1.265	1,227	

(Prostate) Analysis Report Card

Name: ADDUCI ANTONIO13 Sex: Male Age: 28

Figure: 1700cm, 70kg Testing Time: 05/11/2024 18:38

Actual Testing Results

Testing Item	Normal Range	Actual Measurement Value	Testing Result
Degree of Prostatic Hyperplasia	1.023 - 3.230	3,029	
Degree of Prostatic Calcification	1.471 - 6.079	3,259	
Prostatitis Syndrome	2.213 - 2.717	2,5	

Reference Standard:

Normal(-) **Mildly Abnormal(+)**

Moderately Abnormal (++) **Severely Abnormal (+++)**

Degree of Prostatic Hyperplasia:	1.023-3.230(-)	3.230-4.258(+)
	4.258-6.549(++)	>6.549(+++)
Degree of Prostatic Calcification:	1.471-6.079(-)	6.079-14.479(+)
	14.479-19.399(++)	>19.399(+++)

Conclusions

1. Even in the space where **H** =0 the change of mechanical impulse P of a classical particle can take place if **A** is changed.

2. The phase Φ of a charged quantum particle is changed due to **A** change, which can cause the observable interference effects.

3. Literature reports on the experimental works on the study of the action of **A** at **H**=0 seem to confirm its effects on biological objects and chemical substances and processes.

4. It may be wise to reconsider the paradigm that it is the dose that makes the drug; low doses up to the typical computing activity of a hard drive can play a key role in regulating biological processes (Allan Widom) [5]

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