

Quantum Analysis of Pharmacodynamics in Phytotherapy

Kaniskov VL^{1*} and Krastev K²

¹Sofia University "St. Kliment Ohridski", Sofia, Bulgaria

²Vasil Levski National Military University, Veliko Tarnovo, Bulgaria

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*For Correspondence

Vassil Kaniskov, Sofia University "St. Kliment Ohridski", Sofia, Bulgaria

E-mail: kaniskov@mail.bg

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ABSTRACT

Pharmacodynamics deals with drugs' mode of action and effectiveness. We explore the interactions between drug molecules and biological structures. Pharmaceuticals' action can be divided into two types: structurally specific and non-specific. The quantum analysis we introduce with a Similarity Principle (SP), provides an opportunity for a theoretically and practically applicable profound (at the level of elementary particles) elucidation of interaction mechanisms between medicinal substances and biological structures.

Objectives: This paper aims to create a single universal mechanism explaining drug action at a micro-level where no difference between animate and inanimate nature exists and in the process of exploring phytotherapeutic effects on diseased cells to find a universal answer to the questions asked here.

Methods: We introduce the quantum analysis as a scientific method to analyze these problems. Quantum objects are nucleus and particles. Under "quantification" we understand the occupation of precisely defined values. We call quantum the minimal value of change of any quantity (physical or of another kind). The quantum is also identified by the quality of energy, radiated or absorbed by the micro particles of matter during the smallest possible change of its state. The similarity principle is an inseparable part of this analysis.

Results: Medicinal substances must bind to the functionally impaired biological structure. According to modern pharmacology, this process takes place because of the so-called affinity. Cells with the biologically active substance (mx mass) of the medicinal substance approach and interact with the functionally impaired cells of the biological structure (Mx mass) because of the gravitational force of attraction. An exchange is performed at particle level-exchange of functional and sovereign quanta of life. Thus, a healing process occurs.

Conclusion: The new perspective of cell division, autophagy, and apoptosis, could show the way for a workable antiviral and anticancer defense of biological structures.

INTRODUCTION

The mode of action ^[1] of medicinal substances in human organism is the most complicated matter which modern pharmacology (the science of exploring drug characteristics) has to deal with. It is known that when medicinal substances enter the organism, thanks to their physico-chemical properties, they interact with certain tissues, cells, biochemical systems and trigger certain changes which result from their reaction with ferments, hormones, vitamins, trace-elements, proteins or with individual sections of proteins' complex structure.

Drug action is a molecular phenomenon, where drug molecules affect certain biological structures (specific and/or non-specific). Drug effect comprises the functional and morphological changes in organs and systems, which have developed as a consequence of certain action.

Regardless of the type of drug action, any medicinal substance should have affinity and internal activity ^[2]. Affinity is the ability of certain parts of drug molecules to bind to individual functional groups of a receptor or another biostructure through covalent, hydrogen, ionic, dipolar and other bonds. Covalent bonds are the most stable bonds and are relatively rare ^[3,4].

Internal or inherent activity is defined as the ability of a drug, after binding to a receptor, to trigger respective biological (pharmacological) effect. Agonists are ligands possessing affinity and internal activity. The so-called full or pure agonists produce a graduated effect until reaching a fixed maximum (e.g. noradrenaline, adrenaline, acetylcholine, histamine, serotonin, insulin).

Antagonists are ligands possessing only affinity. They don't possess any effect of their own but decrease and even completely block the effect of full agonists ^[5].

Partial agonists (incomplete blockers) bind to a receptor and stimulate it but to a much lesser extent in comparison to its endogenous mediator (respectively, neurotransmitter). For that reason, similar to antagonists, partial agonists can significantly reduce and even antagonise the effects of the endogenous mediator (respectively, neurotransmitter), as well as those of drugs-full agonists ^[6].

Some pharmaceuticals possess a dualistic or mixed action because they activate some types of receptors and block other types of receptors ^[7].

REVIEW OF RELEVANT LITERATURE

Pharmaceuticals' action is provisionally divided into two types:

1. Structurally specific and 2. Structurally non-specific ^[8].

Structurally specific actions of medicinal substances are connected to an influence on:

1. DNA, 2. Certain target protein macromolecules, or 3. Microbial organelles. It is held that a great part of the pharmaceuticals currently used, possess a receptor mode of action. Receptors are regulative target macro proteins mediating the effects of endogenous and exogenous chemical substances. Endogenous substances are neuromediators, autacoids, hormones, growth, respectively anti-growth factors, and exogenous-drugs and other xenobiotics. Receptors are the most sensitive element in a system of chemical communication which coordinates and regulates the functions of a great number of cells in the organism. The endogenous and exogenous molecules to which receptors bind, are their ligands ^[9].

According to their localisation, we distinguish two basic types of receptors: membrane and nuclear receptors. There are more than 150 different types of receptors-cholinergic (M and N), adrenergic (1, α 2, β 1, β 2); DA-, 5-HT- and histamine, opioid (μ , δ , κ , ORL1), GABA, hormonal, prostaglandin, benzodiazepine, aspartate, glutamate, adenosine receptors, nociceptors, thermoreceptors, etc. They are provisionally divided into 4 basic types: type 1, type 2 and type 3-membrane receptors, and one type 4-nuclear receptors. There are several receptor theories ^[10] which do not provide a comprehensive answer to the questions concerning mechanisms of interaction between drug molecules and certain biological structures (e.g., human physical body, organs or systems). These receptor theories address different features of the qualitative and quantitative aspects of drug-receptor interactions. For example: occupancy theory, macromolecular perturbation theory, rate theory, induced-fit theory, dualistic theory, etc. ^[11,12]. According to some authors, the structurally non-specific action of certain medicinal substances is of non-receptor type and their mode of action has not yet been clarified ^[13,14].

In homeopathy and the so-called Bach Therapy, there is actually no, so-called by pharmacologists, drug molecule in medicinal preparations (i.e., there is no receptor mode of action, and we cannot produce with not available molecules any known type of chemical or physical binding to diseased cells!-author's note). Nevertheless, treatment effects exist and this is no placebo effect. According to Prof. IV. Lambrev's paper: "*Homeopathy supporters presume that the information and energy of the active substance pass into the solvent and that is why homeopathy preparations possess medicinal qualities*". Here, with this note, we obviously conflict with the whole theory and practice of pharmacology.

For many years, in the section of phytotherapy, which is subject to official medicine, have been made successful experiments to pharmacochemically and pharmacologically present the so-called biologically active substances in plants in the convenient form of a medicinal substance which to be subject to the established theoretical statements in pharmacotherapy, together with the chemically synthesized substances. This does not correspond to the real natural mechanism of action of medicinal plants on the human physical (material) and energetic body ^[15].

OBJECTIVES

The main objective of this analysis is to search for, find and demonstrate the existence of a single universal mechanism to explain drug effects at a micro-level: atoms, electrons, protons, elementary particles-where no difference exists between the provisional concepts of animate and inanimate matter. To this main purpose, we naturally add the additional purposes to: prove a uniform mechanism of medicinal interaction derived in the process of exploring phytotherapeutic effects on diseased cells as a universal answer to the questions asked here.

To achieve the objectives of a scientific research, the following basic tasks were set:

1. To investigate the state of the problem connected to the mechanisms of medicinal interaction between drug substances, respectively drug molecules, and certain biological structures.
2. To develop and implement a scientific-practical methodology based on modern methods of quantum analysis, applicable to the pharmacodynamic processes of medicinal substances.
3. Using the quantum analysis presented here, to clearly introduce and define the following new categories: quantum of life; basic, functional and sovereign quanta of life; cell; mechanism of cell division; apoptosis; necrosis and autophagy; energetic and material (physical) body.
4. Using the similarity principle in quantum analysis as a scientific method, to realize a theoretical and practical research on pharmacodynamics in phytotherapy.
5. To prove in a convincing manner, the applicability of the theoretical-practical statements proposed here, in the interaction between drug molecules (respectively, quanta of life) of natural or synthetic type, and certain types of biological structures.
4. The object of this research are medicinal substances of natural origin (in this case, phytoproducts) and the modes of medicinal action of quanta of life (functional and sovereign) on certain energetic and biological (physical) structures-cells, respectively tissues, organs and bodies.
5. The subject of this research comprises the theoretical, methodical and practical matters, connected to the development of a single universal method of quantum analysis with its Similarity Principle (SP), applicable to the pharmacodynamical processes of medicinal substances in phytotherapy in particular, and in pharmacotherapy at all.
6. Theoretical and methodical matters. Regardless of the very good knowledge on the nature and mode of action of medicinal substances on biological structures from the latest strands of pharmacology, not clearly enough are formulated the practical achievements and theoretical knowledge on the matters concerning the modes of interaction between drug molecules and certain biological structures (e.g., human physical body, organs or systems).

It is held that there are different types of drug effects, according to their localisation, focus and reversibility. Quite often, one and the same drug possesses several effects. We know:

1. Resorption (systematic) effect, which occurs after the drug has been resorbed and has reached certain organs.
2. The direct effect is connected to an immediate impact of drug molecules on certain biostructures.
3. Indirect effect, indirect is also the reflex effect; where the drug activates certain receptors and the excitement reaches respective organs *via* a reflex pathway.

Most drugs have a reversible (temporary) effect on the organism and others-a non-reversible effect.

When under the influence of a drug a reduced function is being normalised, the effect is tonic, and when the function exceeds the norm, it is excitatory. In both cases the function is being increased but the starting point is different. With the decreasing effect, the increased function is being normalised and with the suppressing effect, it is decreased to levels under the normal function.

When a drug influences certain symptoms of a disease, it acts symptomatically and in other cases-substituting (replacing). If a drug influences certain stages of the pathogenesis of a disease, its action is defined as pathogenetic.

All of the above-mentioned statements about the basic types of drug effects show that there is an interaction between elements in the basic structural units of medicinal substances and biological units at a living cell level. Unfortunately, there are no serious scientific theories or life models to date, showing how living cells were created and how superior life forms (up to human beings) originated from inferior ones. There is no sufficiently clear scientific model elucidating the reasons for cell division and the mechanisms of cell death. On this unspecified scientific theoretical and practical basis, theories and models of drug effects, respectively of drug molecular effects on biological structures, are created. This, of course, leads to false conclusions and unsatisfying results of the application of medicinal substances in medical treatment practice.

There is a pressing need for a new view of pharmacodynamic processes.

METHODOLOGY

We introduce the quantum analysis as a scientific method to analyze the questions referred to us. We call quantum objects the nucleus and the elementary particles. Under "quantification" we understand the occupation of strict, precisely defined values, and the minimal value of change of any quantity (physical or of another kind), we call quantum. We identify the quantum also with the quality of energy, radiated or absorbed by the microparticles (a substance in quanta of life) of matter during the smallest possible change of its state. Analysis is a widely known scientific method of exploring laws of nature. More specifically, analysis is an operation of imaginary or real separation of objects into their component parts in the process of their understanding,

description and accumulation of practical experience with respective methods. The Similarity Principle (SP) is an inseparable part of this type of analysis.

Similarity Principle-An Expert-Analytic Method

For the sake of convenience, we introduce the following terms into the considerations to come:

Similarity principle: An endless K(n)P count of worlds exists, $n \in Z = \{\dots, -3, -2, -1, 0, 1, 2, 3, \dots\}$, for which the following is valid:

- Bigger worlds are constituted of smaller ones.
- In different worlds, functional subordinations are the same.
- In different worlds, threshold values are different.

Therefore, corresponding values in different worlds are proportional and are expressed with their relevant coefficient of proportionality by: mass, time, distance, speed, etc.

Expert-analytic method: The following quanta of life exist:

$$GB(K(0)P) = \sum GN(K(1)P) + \sum GB(K(1)P) = b - \text{basic quanta of life};$$

$$GF(K(0)P) = \sum GN(K(1)P) + \sum GF(K(1)P) = f - \text{functional quanta of life};$$

$$GW(K(0)P) = \sum GN(K(1)P) = s - \text{sovereign quanta of life}.$$

Quanta of life are emitted by the K(1)P stars (for us, the Sun of our Solar System) and possess bases $\sum GN(K(1)P)$, within which life develops $\sum GB(K(1)P)$ or $GF(K(1)P)$. Bases of quanta of life are composed of an enormous number of component parts. The basic characteristic of these component parts is that they contain a substance (Energy)-a whole of particles. These particles, irrespective of the world into which they exist and manifest themselves, possess a mass and a positive and negative pole. According to the SP (Similarity Principle), electric charges are equivalent to strictly defined masses. For instance, in the K(0)P world, the central mass is of the order of 10^{56} g with a gravitational charge; in the K(1)P world, the central mass is of the order of 10^0 g with an electric charge; in the K(2)P world, the central mass is of the order of 10^{56} g with a nuclear charge, etc. These and other quantities are expressed with respective coefficients of proportionality by: mass, time, distance, speed, etc.

Energy of our world: We will call the substance, constituting electrons and protons, energy of our world. Quanta of life: quanta of life are the Energy, the substance electrons and protons are composed of.

Life developing within stars (the K(1)P worlds), after being fully developed, passes from the stars (the K(1)P worlds) into the surrounding space (in the K(0)P world-our world). In star systems (in stars' surrounding space-the K(1)P worlds), there is an abundance of protons (p^+) and electrons (e^-).

Quanta of life receive the necessary raw materials from the electrons (e^-) located in their surrounding space.

From the quanta of life of the K(0)P world-our world, emerge the most inferior life forms in the K(0)P worlds. The development of these life forms through the stages of crystal, plant and animal leads to the emergence of human beings.

Quanta of life which govern the individuals of a life species, divide after an individual dies ^[16].

Properties and Characteristics of Quanta of Life

Emergence of organic matter: At a certain stage of their development, the ($GB(K(0)P) = \sum GN(K(1)P) + \sum GB(K(1)P) = b$
 $GF(K(0)P) = \sum GN(K(1)P) + \sum GF(K(1)P) = f$

$GW(K(0)P) = \sum GN(K(1)P) = s$) quanta of life catch protons (from them they receive the necessary heat) and electrons (from them they receive the necessary raw materials). In this way, in the space around quanta of life emerges the organic matter of the K(0)P worlds (the world we live in) and emerge the first and most inferior living organisms.

During the development of life in the K(0)P world (the world we live in), the ($GB(K(0)P) = \sum GN(K(1)P) + \sum GB(K(1)P) = b$) basic quanta of life are always found in the foremost (now human beings), most superior, leading life species. At the moment, there are only functional and sovereign quanta of life ($GF(K(0)P) = \sum GN(K(1)P) + \sum GF(K(1)P) = f$, $GW(K(0)P) = \sum GN(K(1)P) = s$) in the other life species (minerals, plants, animals). However, in the past, basic quanta of life were found in the foremost species of minerals, plants and animals.

Therefore, basic quanta of life are always to be found in the most superior, foremost species. New life species emerge from basic quanta of life (from minerals-inferior organisms, from them-plants, from them-animals, from them-human beings). Hence, basic quanta of life can convert.

Note: From every life species' functional quanta of life (minerals, plants, animals), can emerge varieties of already existing life forms depending on organisms' (physical bodies') environmental living conditions. Energetic body of the individual: We will

call the Union of all quanta of life taking part into the construction of an individual (plant, animal, human), energetic body of the individual. Material (physical) body of the individual: We will call the atoms accumulating in the form of organic molecules around the quanta of life constituting the energetic body of the individual, material (physical) body of the individual [147].

EXPERIMENTAL AND PRACTICAL STUDY OF THE QUANTUM ANALYSIS AND THE SIMILARITY PRINCIPLE AS A SCIENTIFIC METHOD IN PHARMACODYNAMICS

Cell

Cells are a structural-functional elementary unit of the constitution and vital activity of all organisms (except for viruses and virusoids whose life form has no cellular structure) [148]. According to quantum analysis:

Cells are governed by quanta of life, no matter whether they are independent or united.

The development and unification of quanta of life resulted in the emergence of unicellular living organisms. Unicellular living organisms are an extremely stable life form (nuclear and/or non-nuclear cellular organisms) [149].

The main task of living organisms is to provide the necessary raw materials for the quanta of life inside them. The human organism is an enormous collection of cells.

In the light of quanta of life's properties (functional and sovereign), each cell possesses two quanta of life: a functional and a sovereign one ($GF(K(0)P) = \sum GN(K(1)P) + \sum GF(K(1)P) = f$, $GW(K(0)P) = \sum GN(K(1)P) = s$).

Cells are necessary for the quanta of life which have already fully exploited their potential for self-development [20] (we refer to functional and sovereign quanta of life and to the physically (material body) manifested bodies of the different kinds of minerals, plants, animals and human beings-author's note). The functional and sovereign quanta of life of the life species, inferior to humans, exhausted their potential for self-development.

No matter whether they are independent or united, cells are governed by quanta of life.

Without quanta of life, cells would die. Cells are living organisms which can exist independently or united. The material body of the individual serves to feed the ($GB(K(0)P) = \sum GN(K(1)P) + \sum GB(K(1)P) = b$, $GF(K(0)P) = \sum GN(K(1)P) + \sum GF(K(1)P) = f$, $GW(K(0)P) = \sum GN(K(1)P) = s$) quanta of life from the energetic body, through cells, with the necessary raw materials. Quanta of life possess bases ($\sum(K(1)P)$) into which life develops. The life developing inside quanta of life's ($\sum(K(1)P)$) bases, is a collection of an enormous number of individuals: ($\sum GN(K(1)P)$, $\sum GF(K(1)P)$, $\sum GN(K(1)P)$).

It means that the human physical body is an appropriate evolutionary assembly of cells grouped in organs and systems with the functional and sovereign quanta of life they need. Quanta of life which in the past were basic quanta of life in respective foremost species (minerals, plants, animals), today have already exhausted their potential for self-development and are subject to one basic quantum of life (human quantum of life of the foremost species which can be basic, functional, and sovereign with a projection in the physical body-the so-called Monad or basic (central) cell) [21].

Cell nucleus possesses functional quanta of life ($GF(K(0)P) = \sum GN(K(1)P) + \sum GF(K(1)P) = f$). The rest of the cell, mainly represented by cytoplasmic organelles, possesses sovereign quanta of life ($((0)) = \sum GN(K(1)P) = s$).

Quanta of life's ($\sum(K(1)P)$) bases or also ($GW(K(0)P) = \sum GN(K(1)P) = s$) sovereign quanta of life, preserve in themselves enough raw materials for cells' normal functioning and life. Quanta of life are supplied through their bases with the necessary amount of raw materials by electrons. The basic purpose of quanta of life's bases is to serve life developing inside them.

Cell Division

Modern biology knows that cells divide. It means that there is a ($GB(K(0)P) = \sum GN(K(1)P) + \sum GB(K(1)P) = b$) basic or ($GF(K(0)P) = \sum GN(K(1)P) + \sum GF(K(1)P) = f$) functional quantum of life in cells. Moreover, every cell possesses also a ($GW(K(0)P) = \sum GN(K(1)P) = s$) sovereign quantum of life (from the division into a basic or functional quantum of life).

Unicellular (independent) living organisms cannot possess a basic ($GB(K(0)P) = \sum GN(K(1)P) + \sum GB(K(1)P) = b$) quantum of life. They used to be in possession of basic quanta of life when they were foremost (most superior, most advanced) life species and from them could have emerged new, more superior (more advanced) life. Therefore:

1. Cells of living organisms that are not the foremost species do not possess any basic quanta.

2. But the basic quanta of life, which the foremost species possesses, are not situated into individuals' physical body (respectively, in cells).

When life in a functional quantum of life doubles, it divides into three quanta of life: the old functional quantum of life-f is restored; a new functional quantum of life-f1 emerges and a new sovereign quantum of life-s1 emerges (**Figure 1**).

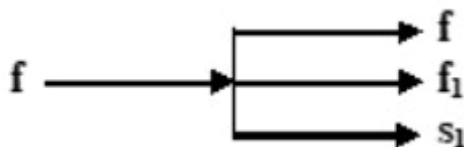


Figure 1. New sovereign quantum of life.

At the same time, the cell divides into two cells. It means, that the cell is governed not by one but by two quanta of life: a functional ($GF(K(0)P) = \sum GN(K(1)P) + \sum GF(K(1)P) = f$) and a sovereign ($GW(K(0)P) = \sum GN(K(1)P) = s$) one.

N.B.: In the ($GW(K(0)P) = \sum GN(K(1)P) = s$) sovereign quantum of life, there is only one ($\sum GN(K(1)P)$) base, into which no life develops but this quantum contains raw materials for supporting and developing life in biological units.

During cell division, old cells don't die but split into two new cells. We can illustrate this process schematically as follows (Figure 2):

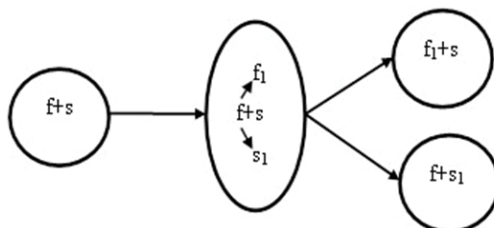


Figure 2. The Old cell possesses a functional and sovereign quantum of life: ($f+s$). The old functional quantum of life divides ($f=f1+s1$) and remains unchanged (s cannot divide and contains no life in it, it is only a base). When the old cell divides quanta of life are distributed as follows: ($f+s1$) and ($f1+s$). The first daughter cell contains: one f old functional quantum of life and one new $s1$ sovereign quantum of life. The second daughter cell contains: one new $f1$ functional quantum of life and one old s [21] sovereign quantum of life.

Mitosis

The process of mitosis is schematically depicted in Figure 3.

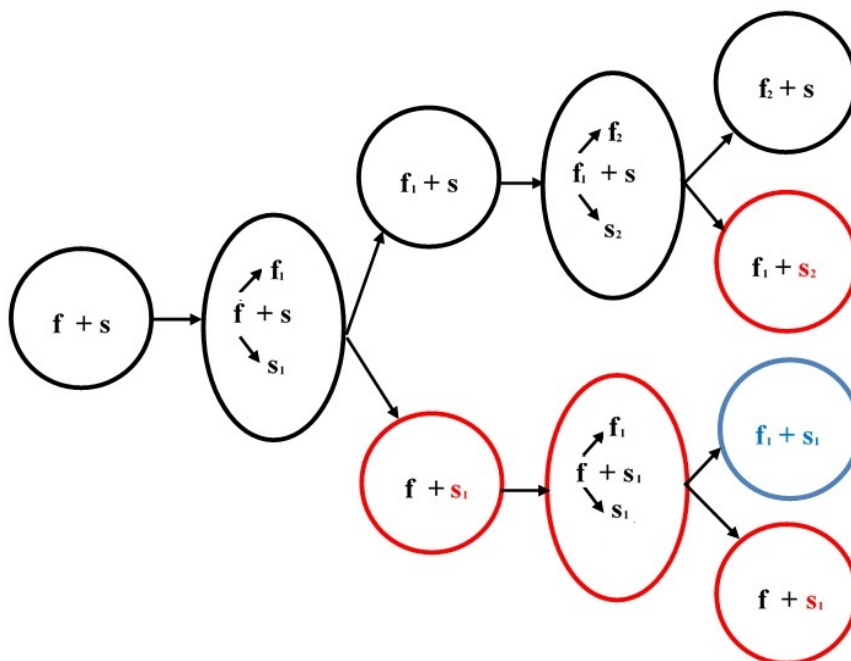


Figure 3. The process of mitosis.

The grouping of quanta of life in mitosis is as follows:

1. A new $f1$ functional quantum of life and an old s sovereign quantum of life form one of both daughter cells ($f1+s$).
2. An old f functional quantum of life and a new $s1$ sovereign quantum of life form the second daughter cell ($f+s1$) (Table 1).

Table 1. It represents mitosis with the distribution of quanta of life in daughter cells up to the 5th cellular degeneration. This distribution could be best presented with the following mathematical expression: $(f+s) \rightarrow (f_1+s) + (f+s_1)$. The cells from the both branches of cell division could be generally described as follows:

f_n+s (upper branch), whereas $n \in Z=\{1,2,3,\dots\}$ (always a positive whole number)

$f+s_n$ (lower branch), whereas $n \in Z=\{1,2,3,\dots\}$ (always a positive whole number).

					f_5+s
					f_4+s_5
					f_4+s_4
					f_3+s_4
					f_4+s_3
					f_3+s_4
					f_3+s_3
					f_2+s_3
				f_4+s	f_4+s_2
				f_3+s_4	f_3+s_4
				f_3+s_3	f_3+s_3
				f_2+s_3	f_2+s_3
			f_3+s	f_3+s_2	f_3+s_2
			f_2+s_3	f_2+s_3	f_2+s_3
		f_2+s	f_2+s_2	f_2+s_2	f_2+s_2
	f_1+s	f_1+s_2	f_1+s_2	f_1+s_2	f_1+s_2
	$f+s_1$	f_1+s_1	f_2+s_1	f_3+s_1	f_4+s_1
		$f+s_1$	f_1+s_2	f_2+s_3	f_3+s_4
			f_1+s_1	f_2+s_2	f_2+s_3
			$f+s_1$	f_1+s_2	f_3+s_2
				f_2+s_1	f_2+s_3
				f_1+s_2	f_2+s_2
				f_1+s_1	f_1+s_2
				$f+s_1$	f_3+s_1
					f_2+s_3
					f_2+s_2
					f_1+s_2
					f_2+s_1
					f_1+s_2
					f_1+s_1
					$f+s_1$
Old Cell	1st Cellular Generation	2nd Cellular Generation	3rd Cellular Generation	4th Cellular Generation	5th Cellular Generation

We assume that cells with functional and sovereign quanta of life of the $(fn+sn+1)$ type are non-functional. Therefore, we remain with the cells of the following sequence: $f+, f1+, f2+s, f3+s, f4+s, f5+s \dots \dots \dots fn+s$.

Meiosis

There are two types of quantum distribution in meiosis. The first one is depicted in **Figure 4**.

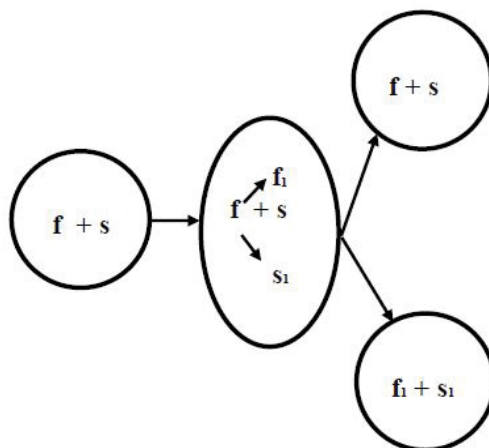


Figure 4. Quantum distribution in meiosis Type-I.

In meiosis quanta of life are distributed as follows:

1. An old f functional quantum of life and an old s sovereign quantum of life form one of both daughter cells ($f+s$).
2. A new $f1$ functional quantum of life and a new $s1$ sovereign quantum of life form the second daughter cell ($f1+s1$) (Table 2).

Table 2. It represents the first type of distribution of quanta of life in meiosis in daughter cells up to the 5th cellular degeneration. This distribution could be best presented with the following mathematical expression:

$(f+s) \rightarrow (f+s) + (f_1+s_1)$ The cells from the both branches of cell division could be generally described as follows:

$f+s$ (upper branch)

f_n+s_n (lower branch), whereas $n \in Z=\{1,2,3,\dots\}$ (always a positive whole number).

					$f+s$
					f_1+s_1
					f_1+s_1
					f_2+s_2
					f_1+s_1
					f_2+s_2
					f_2+s_2
					f_3+s_3
				$f+s$	f_1+s_1
				f_1+s_1	f_2+s_2
				f_1+s_1	f_2+s_2
				f_2+s_2	f_3+s_3
			$f+s$	f_1+s_1	f_2+s_2
			f_1+s_1	f_2+s_2	f_3+s_3
			f_1+s_1	f_2+s_2	f_3+s_3
			f_2+s_2	f_3+s_3	f_4+s_4
	f_1+s	f_1+s_1	f_2+s_2	f_3+s_3	f_4+s_4
	$f+s_1$	f_1+s_1	f_1+s_1	f_1+s_1	f_1+s_1
		f_2+s_2	f_2+s_2	f_2+s_2	f_2+s_2
			f_2+s_2	f_2+s_2	f_2+s_2
			f_3+s_3	f_3+s_3	f_3+s_3
				f_3+s_3	f_3+s_3
				f_3+s_3	f_3+s_3
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					f_4+s_4
					f_3+s_3
					f_4+s_4
					f_4+s_4
					f_4+s_4
					f_5+s_5
$f+s$	1st Cellular Generation	2nd Cellular Generation	3rd Cellular Generation	4th Cellular Generation	5th Cellular Generation

We assume that cells with functional and sovereign quanta of life of the $(fn+sn)$ type are functional. Therefore, we concentrate on the cells of the following sequence: $f+$, $f1+s1$, $f2+s2$, $f3+s3$, $f4+s4$, $f5+s5$... $fn+sn$.

The second type of quantum distribution in meiosis is shown in **Figure 5**.

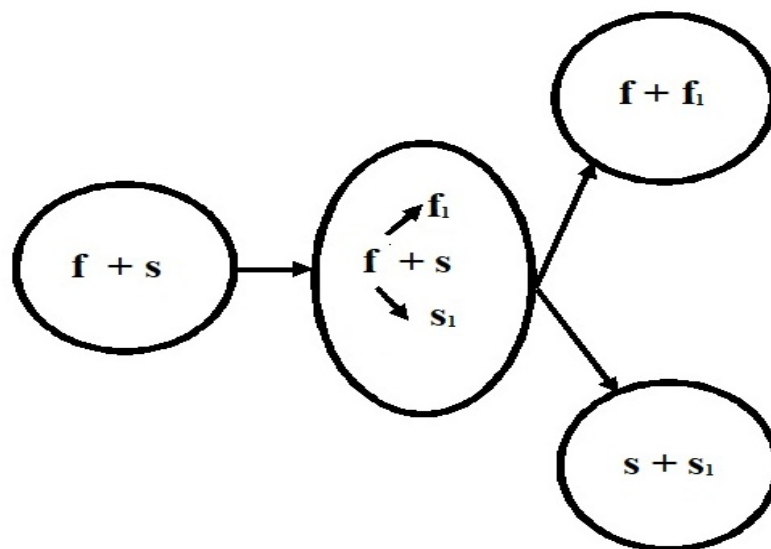


Figure 5. Quantum distribution in meiosis-Type II

Here quanta of life are grouped as follows: 1. An old f functional quantum of life and a new f_1 functional quantum of life form one of both daughter cells ($f+f_1$). 2. An old s sovereign quantum of life and a new s_1 sovereign quantum of life form the second daughter cell ($s+s_1$) (Table 3).

Table 3. It represents the second type of distribution of quanta of life in meiosis in daughter cells up to the 5th cellular degeneration. This distribution could be best presented with the following mathematical expression:

$(f+s) \rightarrow (f+f_1) + (s+s_1)$ The upper branch of new cells can be generally described as $(f+fn)$.

All other daughter cells are $(fn+)$, $(f+fn)$ and there is a special form of cells possessing only sovereign quanta of life: $s+s_1$ and s_1+sn , whereas $n \in Z = \{1, 2, 3, \dots\}$ (always a positive whole number). In this special type of cell division and grouping, there is no lower branch.

(f+s)					$f+f_1$
					f_1+s_1
					f_1+f_2
				$f+f_1$	s_1+s_2
				f_1+s_1	f_1+f_2
				f_1+f_2	f_2+s_2
			$f+f_1$	s_1+s_2	s_1+s_2
			f_1+s_1	f_1+f_2	f_1+f_2
		$f+f_1$	$f+f_2$	f_2+s_2	f_2+s_2
		$f+f_1$	f_1+s_1	s_1+s_2	s_1+s_2
	$s+s_1$	$s+s_1$	$s+s_1$	$s+s_1$	
Old Cell	1st Cellular Generation	2nd Cellular Generation	3rd Cellular Generation	4th Cellular Generation	5th Cellular Generation

We assume that the cells with sovereign quanta of life of the ($s+s_1$ and s_1+sn) type are functional but generated by a special type of division from functional and functional and sovereign quanta of life of the ($f+fn$) and ($fn+sn$) type.

Cell Death

Apoptosis is a physiological process which runs at cell level and rarely at tissue level. It begins intracellularly, under the influence of the conditions programmed in cell's DNA. At first, nucleus dies and decays. Subsequently, cytoplasmic organelles die and decay. This process is not connected to any inflammation. Cells and tissues which are useless for the organism die. The organism doesn't try to restore the cells and tissues lost [22-24].

Apoptosis is an energy-dependent process for which ATP is needed (adenosine triphosphate, or adenosine triphosphoric acid). This cell death pathway is important not only for the development of the organism and the normal functioning of the immune system but also for a particular defense against damages on healthy cells which may occur through malignant transformations or through viral infections.

In apoptosis, $(GF(K(0)P) = \sum GN(K(1)P) + \sum GF(K(1)P) = f)$ functional quanta of life leave the cell nucleus and break down into their component parts (substance or energy), of which electrons and protons are constituted. This process is accompanied by a flow of energy. $(GW(K(0)P) = \sum GN(K(1)P) = s)$ sovereign quanta of life do not have any reason to exist alone within cell's structure and leave it, too.

Necrosis is a pathological process. It affects tissues, organs and bigger parts of the organism. Its restriction to cell level is difficult. It begins extracellularly, under the influence of unfavorable factors. It takes place despite the counteraction of cell's inter-

nal adaptive and regulatory mechanisms. At first, cytoplasmic organelles die and disintegrate. The nucleus is the last one to die. Functional cells, tissues or organs, which the organism needs, die. This process is almost always accompanied by inflammation of surrounding tissues. Organism's internal adaptive and regulatory mechanisms strive to restrict and stop the advance of the process. The organism tries to restore the cells, tissues or organs lost [25].

Necrosis, in comparison to apoptosis, is a passive process. Necrosis is forced when a chemical or physical cellular damage occurs and also when there is a shortage of energy resources and/or oxygen [26].

In necrosis, ($GW(K(0)P) = \sum GN(K(1)P) = s$) sovereign quanta of life leave cell structures (mainly, cytoplasmic organelles) because of the interrupted flow and shortage of raw materials (energy). This process is relatively slow and accompanied by "a search for and attraction of energy" from neighboring cells, respectively tissues, which triggers inflammatory processes. ($GF(K(0)P) = \sum GN(K(1)P) + \sum GF(K(1)P) = f$) functional quanta of life don't have any reason to exist alone in cell nucleus, they do not have their ($GW(K(0)P) = \sum GN(K(1)P) = s$) raw-material base, and also leave it, as they split into their component parts (substance or energy), of which electrons and protons are constituted.

Autophagy is a process of "slow" cell death into which, under continuous shortage of ATP, cells remain viable for a while. It is a catabolic process of cellular and protein degradation in our body. Autophagy can be selective (micro-autophagy [27,28]), and non-selective (macro-autophagy [29]). In autophagy, the metabolism is predominantly active catabolism (process of breakdown into simpler substances), whereas certain organelles get enveloped by a double membrane thus forming the so-called autophagosomes, merging with lysosomes, where the process of decomposition of organic substances takes place. If starving continues (shortage of oxygen and/or ATP), then most of the organelles are "eaten out", and cells die through necrosis [30].

According to some authors, under certain conditions, autophagy can be assumed to be a separate type of cell death [31].

In autophagy or the process of "slow cell death" [32], there are functional and structural alterations in ($GW(K(0)P) = \sum GN(K(1)P) = s$) sovereign quanta of life (the base) and ($GF(K(0)P) = \sum GN(K(1)P) + \sum GF(K(1)P) = f$) functional quanta of life (life in the base), or respectively, in cell nucleus and cytoplasmic organelles. Cell nucleus, respectively functional quanta of life, strives to preserve cell stability and start dividing. In this division, a new functional quantum of life with a new base is obtained, the old quantum of life with an old base is preserved, and a new sovereign quantum of life with a new base is created. However, both new bases are modified due to shortage of raw materials (energy) and influence life in functional quanta (functional quanta attract the raw-material base to themselves, as necessary energy). If no raw materials (energy) enter the cell appropriately through its functional or sovereign quanta from outside, it (the cell) changes its functional and structural nature and dies after a certain period of time. Exactly within this period of time, with functional and structural changes occurring within the cell, in appropriate fashion the cell may be differentiated to the process of division, or to the process of apoptosis or necrosis! This, in my opinion, is the main task of medicinal therapy (pharmacotherapy).

Conclusion: Without quanta of life, cells are dead. Cells can remain only for a certain period of time (different for humans, plants, animals and minerals) without a functional ($GF(K(0)P) = \sum GN(K(1)P) + \sum GF(K(1)P) = f$), and/or ($GW(K(0)P) = \sum GN(K(1)P) = s$) basic quantum of life. Consequently, the energetic body leaves the cell (material (physical) body), and it stops being active at the physical level (dies).

QUANTA OF LIFE IN THE FOREMOST HUMAN SPECIES AND IN PLANT SPECIES

The foremost (currently, human beings), most superior, life species possesses three varieties of individuals: individuals who are governed by basic (**b**), functional (**f**) and sovereign (**s**) quanta of life.

$$GB(K(0)P) = \sum GN(K(1)P) + \sum GB(K(1)P) = b$$

$$GF(K(0)P) = \sum GN(K(1)P) + \sum GF(K(1)P) = f$$

$$GW(K(0)P) = \sum GN(K(1)P) = s$$

Life species which are inferior to the foremost life species (for our considerations-plant species), possess two varieties of individuals: individuals with functional (f) and individuals with sovereign (s) quanta of life.

$$GF(K(0)P) = \sum GN(K(1)P) + \sum GF(K(1)P) = f$$

$$GW(K(0)P) = \sum GN(K(1)P) = s$$

Special Characteristics

Since, during the development of life, some of the older species disappear: Old life species' quanta (functional and sovereign) which exhausted their potential for self-development, take part in building the structures of superior life species, and thus continue to develop. In different ways, millions of human quanta of life (basic, functional, sovereign) of deceased human individuals enter the human body. Some of them remain to help the basic quantum of life in making decisions, and all other head for the reproductive system where sperm cells are prepared for them, for the sake of fertilization (materialization) [33,34].

Important: The human individual is governed by a human quantum of life. The other quanta of life are unions of functional and sovereign quanta of life of other, inferior life species (minerals, plants, animals).

These unions are cellular entities. In the human energetic body, there are also free human quanta of life of deceased human individuals which help it but do not take part in the constitution of its energetic body.

The most essential characteristics of the human energetic body is that it can exist independently (without a material body) for a certain number of days (up to 40 days), until the material reserves in quanta of life are depleted.

For plant species, this period varies to up to 30 months! (Reference: Haberlea rhodopensis is a member of the Gesneriaceae family. It is a Balkan endemic species ^[35], a protected relict plant. It is famous for its long anabiotic drought tolerance (up to 30 months), also known as “Resurrection Plant” or “Orpheus Flower”. This means that when the conditions of provisional death are suspended, this plant species “resurrects” back to life-functional and sovereign quanta of life in its cells start functioning, i.e. cells divide again. For the rest of the plant species, we can introduce the following provisional scheme about the period of time of separation of the energetic body from the material one: blossoms-up to 3 months, stems and leaves-up to 12 months, barks and roots-up to 24 months.

If environmental conditions do not allow any of the old life species to reproduce sufficiently, with the death of the individuals their quanta of life may unify in superior life species. Thus, old life species may die off ^[36].

With the decomposition of energetic bodies, when quanta of life become autonomous, they can supply themselves with the necessary raw materials, without the need for a material body.

As life multiplies, in basic and functional quanta of life emerge individuals with functional and sovereign quanta of life who leave basic and functional quanta of life during their division and continue their development autonomously as quanta of life (functional and sovereign) of the same species.

Therefore: Life in the male quantum of life (basic or functional), through the base (When life in the basic quantum of life (male individual) modifies its own base, it modifies also the base of the sovereign quantum of life (female individual), being in contact with it.) of the male quantum of life (basic or functional), creates a female (sovereign) quantum of life.

Properties

1. During the division of any single $(GB(K(0)P) = \sum GN(K(1)P) + \sum GB(K(1)P) = b)$ basic or $(GF(K(0)P) = \sum GN(K(1)P) + \sum GF(K(1)P) = f)$ functional quantum of life, two new quanta of life originate from it, a $(GF1(K(0)P) = \sum GN(K(1)P) + \sum GF(K(1)P) = f_1)$ functional and a $(GW1(K(0)P) = \sum GN(K(1)P) = s_1)$ sovereign quantum of life; and the original $(GB(K(0)P) = \sum GN(K(1)P) + \sum GB(K(1)P) = b)$ basic or $(GW(K(0)P) = \sum GN(K(1)P) = s)$ sovereign quantum of life is restored ^[37].
2. From $(GB(K(0)P) = \sum GN(K(1)P) + \sum GB(K(1)P) = b)$ basic and $(GF(K(0)P) = \sum GN(K(1)P) + \sum GF(K(1)P) = f)$ functional quanta of life originate $(GF(K(0)P) = \sum GN(K(1)P) + \sum GF(K(1)P) = f)$ functional quanta of life and $(GW(K(0)P) = \sum GN(K(1)P) = s)$ sovereign quanta of life.
3. $(GB(K(0)P) = \sum GN(K(1)P) + \sum GB(K(1)P) = b)$ basic and $(GF(K(0)P) = \sum GN(K(1)P) + \sum GF(K(1)P) = f)$ functional quanta of life multiply. $(GW(K(0)P) = \sum GN(K(1)P) = s)$ sovereign quanta of life don't multiply.
4. Inside $(GB(K(0)P) = \sum GN(K(1)P) + \sum GB(K(1)P) = b)$ basic and $(GF(K(0)P) = \sum GN(K(1)P) + \sum GF(K(1)P) = f)$ functional quanta of life develops life. Inside $(GW(K(0)P) = \sum GN(K(1)P) = s)$ sovereign quanta of life develops no life. Individuals with basic and functional quanta of life (can divide) are male individuals, and individuals with sovereign quanta of life (cannot divide) are female individuals.
5. $(GB(K(0)P) = \sum GN(K(1)P) + \sum GB(K(1)P) = b)$ basic quanta of life are always present in the foremost, most superior, leading life species.
6. From basic quanta of life originate new life species. Basic quanta of life can convert.
7. There are no basic quanta of life in the cells of the living organisms which are not the foremost species (minerals, plants, animals - author's note). Cells in living biological systems divide in two cells. This means that cells contain two quanta of life: one $(GF(K(0)P) = \sum GN(K(1)P) + \sum GF(K(1)P) = f)$ functional and one $(GW(K(0)P) = \sum GN(K(1)P) = s)$ sovereign quantum of life.

8. In inferior life species exist biological unions of single, hundreds, thousands, millions and billions of quanta of life of the same species and quanta of life of inferior life species, in a joint living organism. Within this joint organism, quanta of life which represent it partially retain their autonomy, as they develop independent branches^[38]. For example, independent branches in plant species are: leaves, stems, blossoms, fruits, etc.
9. In the joint organism quanta of life representing it, have limited opportunities to develop autonomously. Perfection of these life species is observed in tree (plant-author's note) species.
10. In superior life species, individuals are governed by one quantum of life of this species. The human individual is governed by a human quantum of life which can be basic, functional or sovereign $GB(K(0)P) = \sum GN(K(1)P) + \sum GB(K(1)P) = b$ or $GF(K(0)P) = \sum GN(K(1)P) + \sum GF(K(1)P) = f$ or $GW(K(0)P) = \sum GN(K(1)P) = s$.

MECHANISM AND LEVELS OF INTERACTION BETWEEN QUANTA OF LIFE IN THE HUMAN-PLANT BIOLOGICAL STRUCTURES (AT CELL LEVEL)

Mechanism of Interaction

($GW(K(0)P) = \sum GN(K(1)P) = s$) sovereign quanta of life originate from ($GB(K(0)P) = \sum GN(K(1)P) + \sum GB(K(1)P) = b$) basic quanta of life and from ($GF(K(0)P) = \sum GN(K(1)P) + \sum GF(K(1)P) = f$) functional quanta of life.

Every ($GW(K(0)P) = \sum GN(K(1)P) = s$) sovereign quantum of life possesses a $\sum GN(K(1)P)$ base, into which life does not develop.

Sovereign quanta of life do not reproduce. No life develops inside them but they themselves are bases of life. Perfection of life requires from quanta of life's ($\sum GN(K(1)P)$) bases, respectively from ($GW(K(0)P) = \sum GN(K(1)P) = s$) sovereign quanta, to become longer when life in them grows in order to provide conditions for the development of life and to divide when life in them doubles (see division of functional quanta and cell division). The following statements are important for us:

1. At specified time intervals (a very small fraction of a second), life from basic and functional quanta of life (surrounding sovereign quanta) enters sovereign quanta of life and makes some adjustments inside them which require external interference (for example, intake of medicinal substances or energy in a form-author's note).
2. When sovereign quanta of life are in contact with basic quanta of life, they equalize them (the energetic potential of any kind of energy equalizes-author's note), since at specified time intervals (which are very short for us), life developing inside basic quanta of life, makes some adjustments in them^[39].
3. When sovereign quanta of life are in contact with functional quanta of life, they equalize them (the energetic potential of any kind of energy equalizes-author's note), since at specified time intervals (which are very short for us), life developing inside functional quanta of life, makes some adjustments in them.

Therefore: There is a continuous exchange at different energetic levels between basic, functional and sovereign quanta of life. Inside cells, as living organisms' (plants, animals, humans) most important structural unit, run continuous energetic processes with the irrevocable participation of quanta of life. Life in basic, functional and sovereign quanta of life of all biological structures is the same.

Levels of Interaction

According to the Similarity Principle (SP) developed by Vassil Manev in The Unity in the Universe, as a $K(0)P$ World exists, the world we live in (where mineral, plant, animal and human individuals are located), then:

- At least one $K(1)P$ World exists, which differs in size from the $K(0)P$ World but develops according to the same functional dependences (same laws of physics).
- At least one $K(2)P$ World exists which differs in size from the $K(0)P$ and $K(1)P$ World but develops according to the same functional dependencies (same laws of physics).
- At least one $K(n)P$ World exists which differs in size from the $K(0)P$, $K(1)P$, $K(2)P$, $K(3)P$,..... $K(n-1)P$ Worlds but develops according to the same functional dependencies (same laws of physics).

Respective forces ($F_0, F_1, F_2, \dots F_n$) in the respective $K(0)P$, $K(1)P$, $K(2)P$, ... $K(n)P$ Worlds are: F_0 - gravitational; F_1 - electric; F_2 - nuclear, etc.

Based on the above, we conclude:

- Our world is the $K(0)P$ World-the Gravitational World;
- Stars are the $K(1)P$ Worlds;
- Our World, the $K(0)P$ World, is composed of stars (the $K(1)P$ Worlds);

- The K(1)P World is composed of the K(2)P Worlds;
- Protons are the K(2)P Worlds.

Conclusion 1: The interaction between medicinal substances and biological structures takes place at proton level

It should be remembered that: Quanta of life are emitted by the K(1)P Stars (for us, the Sun of our Solar System) and possess bases ($\sum GN(K(1)P)$) into which life develops ($\sum GB(K(1)P)$ or $\sum GF(K(1)P)$). Life developing within stars (the K(1)P Worlds), after being fully developed, passes from the stars (the K(1)P Worlds) into the surrounding space (into the K(0)P World-our world). From the quanta of life of the K(0)P World, our world, emerge the most inferior life forms in the K(0)P Worlds. The development of these life forms through the stages of crystal, plant and animal leads to the emergence of humans ^[40].

It follows from all the foregoing that:

The K(0)P Worlds (our world) are composed of:

- fundamental particles-the K(1)P Worlds (stars)
- elementary particles-the K(2)P Worlds (protons)

The K(1)P Worlds (stars) are composed of:

- fundamental particles - the K(2)P Worlds (protons)
- elementary particles - the K(3)P Worlds (photons).

The K(2)P Worlds (protons) are composed of:

- fundamental particles - the K(3)P Worlds (photons)
- elementary particles - the K(4)P Worlds (gravitons)

Attention is drawn to the following:

Neutrons originate in atomic nuclei, where protons' critical zones intersect.

Neutrons are highly excited electrons.

Equilibrium zones between protons in atomic nuclei, and electrons spinning around them, specify atoms.

When we blow n protons (p) up for a very small fraction of a second, exactly n protons (p) and the same amount (n) of electrons (e) emerge.

The emergence of all nuclear particles is expressed in the expansion and shrinkage of a proton at the time of its explosion ^[41]. (Experiments conducted more than 60 years ago at the Joint Institute for Nuclear Research in Dubna, USSR, now Russian Federation.)

The electron and the proton are the last stable products of the proton after its explosion.

Conclusion: The different unstable nuclear particles that the experimenters found (for example, in covalent, hydrogen, ionic, dipolar and other bonds of the so-called "molecular phenomenon" in pharmacodynamics), are different transitory states of the matter of the exploded protons.

RESULTS

The force of attraction between cells in living organisms on Earth is the gravitational force of attraction (F_x).

The force of attraction (F_o) between two structures (biological and physical) obeys Newton's Law of Gravity.

The force of attraction between quanta of life (energy, substance, protons and neutrons) of plant cells and quanta of life in cells of biological structures in the process of treatment (interaction) is the gravitational force of attraction (F_x).

The gravitational force, with which homogeneous masses attract each other, is greater than the gravitational force with which heterogeneous masses attract each other.

The gravitational constant (G_x) ^[48] depends on bodies' x chemical composition (biologically active substances in phytotherapy).

The gravitational force (F_x) with which two homogeneous masses (m_x and M_x) attract each other depends on the x chemical composition of the masses (biologically active substances in phytotherapy).

When both masses, m and M, are homogeneous ^[49], a greater force of attraction emerges in comparison to the case of heterogeneous m and M. Quanta of life in cells of biological structures (human and plant) are similar. Quanta of life express one and the same life. The force of attraction (affinity) between them is naturally determined, and is subject to Plato's Law of Attrac-

tion and Newton's Law of Gravity. The direction of this process is from smaller to larger: from quanta of life, respectively biological cellular structures, cells of plant species towards quanta of life, respectively biological structures, living organisms, cells of human physical body's organism.

Cells with the biologically active substance with the mx mass of the medicinal substance (in this case, the biologically active substance of a medicinal plant), approach and interact with the functionally impaired cells of the biological structure with the Mx mass, because of the emerged gravitational force of attraction. An exchange is performed at particle level (protons, electrons, photons, etc. and other elementary particles), or, more specifically, of functional and sovereign quanta of life. Thus, a healing process takes place.

DISCUSSION

Plant-derived Medicinal Substances

One of plant organisms' basic characteristics is that they build the organic substances they need from inorganic mineral substances of soil and water, and from the carbon dioxide of air. Plants play a mediating role between the organic and inorganic world. The synthesis of organic substances in plant organisms ^[42] is performed with the help of an enormous amount of light energy ^[43] (photons-author's note). In comparison to plants, animals and humans cannot synthesize nutrients and receive them from plants.

The so-called "non-living structures" (inorganic world, "dead matter") are actually living structures because micro life with functional quanta of life ($GF(K(0)P) = \sum GN(K(1)P) + \sum GF(K(1)P) = f$) develops inside them (inorganic mineral substances, including the mineral world) and governs them.

Actually, the vegetable kingdom with its numerous representatives are not only mediators but also centers through which passes an enormous amount of energy (quanta of life) of the K(1)P Worlds (stars) composed of the K(2)P Worlds (protons), and the K(3)P Worlds (photons), as well as of the K(2)P Worlds (protons) composed of the K(3)P Worlds (photons) and the K(4)P Worlds (gravitons). (It must be recalled that during photosynthesis there are protons (p^+) and electrons (e^-) in the surroundings of the plants, too. In particular, during photolysis of water (H_2O), $4 e^-$ and $4 p^+$ are emitted and an oxygen (O_2) molecule is obtained).

Unambiguously, when preparing all types of medicinal substances from medicinal plants, death is caused in the plant world. The only exception is the harvest of seeds and/or fruits.

Therefore, we have entered the zones of "violent" or "slow" death: necrosis or autophagy. Practically, no plant species or parts of it die immediately. In fact, the process of autophagy starts, accompanying correspondent changes in plant cells, and after a certain period of time - the process of necrosis.

What happens during autophagy in plant cells and what happens to quanta of life sustaining life in these cells?

Plant cells which are subject to autophagy possess:

$$GF(K(0)P) = \sum GN(K(1)P) + \sum GF(K(1)P) = f \text{ - functional quanta of life}$$

$$GW(K(0)P) = \sum GN(K(1)P) = s \text{ - sovereign quanta of life}$$

Plant cells which completed the process of autophagy and have entered the process of necrosis, possess:

$GF(K(0)P) = \sum GN(K(1)P) + \sum GF(K(1)P) = f$ -functional quanta of life (we refer to the so-called "dead matter" with a functional quantum of life).

There are no sovereign quanta of life or bases into which life can develop because the energetic inflow to cells is interrupted.

Water is a mediator between cells, respectively quanta of life of plant species, medicinal substances and the biological structures of the diseased organism.

Water is a reasonable assembly of hydrogen and oxygen, and one more element: a quantum of life, a special $GB(K(0)P) = \sum GN(K(1)P) + \sum GB(K(1)P) = b$ basic quantum. With the intake of a medicinal substance, there is always a mediator-water or aqueous medium. Biological structures never take the medicinal substance in a "dry" form. Except, partially in topical applications.

State of Disease in Biological Structures

Cells in biological structures composing correspondent tissues, organs and systems, are undoubtedly subject to coordinated processes of apoptosis and autophagy, as well as, in contingent moments, forced to undergo necrosis. In the state of disease, in functional and sovereign quanta of life governing cell functions, changes are observed. Bases and life in bases of correspondent quanta of life change ^[44]. We designate this as follows: $\sum(K(1)P)$ and $\sum GN(K(1)P)$. These changes in quanta of life lead to changes in cells, in particular, in their: size, shape, mass, surface, volume, chemical composition, etc., and hence lead to changes in their functional suitability.

1. Therefore, the following process of autophagy takes place:

$$GF(K(0)P) = \sum GN(K(1)P) + \sum GF(K(1)P) = f - \text{functional quanta of life};$$

$$GW(K(0)P) = \sum GN(K(1)P) = s - \text{sovereign quanta of life}.$$

2. Or the following process of necrosis:

$$GB(K(0)P) = \sum GN(K(1)P) + \sum GB(K(1)P) = b - \text{basic quanta of life}.$$

3. When no treatment is implemented or in the course of the natural process of death, the energetic body leaves the physical body of the biological structures.

For our considerations, we are interested in the change in mass (Mx) of cells affected by the state of disease. It, the mass, increases! This is also seen in the process of dysplasia-change in cell shape, size and organization, as well as in the process of autolysis-decay of body tissues under the influence of tissue ferments.

The Process of Treatment-Phytotherapy

To enable a correct healing process, medicinal substances must bind to the functionally impaired biological structure. According to the theory of modern pharmacology, this process takes place because of the so-called affinity-“the ability of certain parts of drug molecules to bind to particular functional groups of a receptor or another bio structure, through covalent, hydrogen, ionic, dipolar and other bonds”-a rather unclear and provisional explanation of this process, without corresponding mathematical expressions of the laws of physics and chemistry, applicable at these moments [45,46].

In our considerations, in order to clarify the mechanism of interaction between medicinal substances and biological structures [47], we will use Plato's (346 BC) Law of Attraction and Newton's (1642) Law of Gravity.

The verbal expression of Plato's natural law is as follows: in their natural motion smaller objects seek larger objects, smaller pieces of land seek larger pieces of land; smaller amounts of water seek larger amounts of water, etc.

In its modern scientific form, after experiments have been conducted, Plato's Law is presented as follows:

$$Fx = Gx \frac{mx.Mx}{h^2}$$

Gravitational force (Fx) of attraction (affinity) between two masses (mx and Mx) is directly proportional to the product of both masses ($mx.Mx$) and the gravitational constant (Gx), and inversely proportional to the square of the distance (h^2) between both masses.

CONCLUSION

The scientific-practical methodology of the “quantum analysis of pharmacodynamics in phytotherapy” proposed, is fully entitled to be a universal mode of action in pharmacotherapy. It should be further developed in theoretical and practical aspects of application [50].

The scientific-practical methodology of the “quantum analysis of pharmacodynamics in phytotherapy” appears to be a sufficiently successful attempt to explain the mode of action of medicinal substances in biological structures based on the latest theories about the origin and structure of matter and life [51] in our world.

Pharmacodynamics, explained with the help of the quantum analysis [52], could successfully be coordinated with the already introduced theoretical and practical statements in pharmacology [53], in particular in pharmacotherapy.

PRACTICAL AND THEORETICAL SIGNIFICANCE OF THIS PAPER

In the process of development and realization of the “quantum analysis of pharmacodynamics in phytotherapy” proposed by the authors, appeared actual opportunities for a radically new way of selection and application of medicinal substances [54] (BAS-Biologically Active Substances) in treatment practices of plant origin.

Prerequisites are created for the successful combination of new medicinal substances in a mixture of natural vegetable components and synthetic ones. This creates the opportunity to efficiently use the medicinal effects of medicinal substances and to avoid undesired incompatibility and side effects which are often harmful.

The new perspective on the mechanisms of cell division, “slow cell death”-autophagy, as well as on the “natural death”-apoptosis, could show the way for a workable antiviral [55] and anticancer [56] defense of biological structures.

CONFLICT OF INTEREST STATEMENT

Both authors declare that they have no conflict of interest and meet the uniform requirements of the Journal of Pharmacognosy and Phytochemistry criteria for authorship. This article does not contain any studies with human or animal subjects

performed by any of the authors.

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Author Contributions Statement

VK conceived of the presented idea. VK developed the theory and performed the computations.

KK encouraged VK to investigate the quantum analysis and supervised the findings of this work. All authors discussed the results and contributed to the final manuscript.

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