Chapter 3

The Action of Low-Intensity Electromagnetic Oscillations on Biological Systems. Color Therapy

The following abbreviations are used in this chapter:

BAS—Biologically Active Substance

ULD—Ultra-Low Dose

Electromagnetic radiation is referred to as a low-intensity radiation if its flux density is less than 1 $\mu W/cm^2$ [22]. As spin supercurrent can emerge between photons and virtual photons (Section 1.2.1), the action of low-intensity electromagnetic radiation on BS can be accomplished by spin supercurrent.

Note. The effect on BS of photons that do not belong to a low-intensity electromagnetic radiation can be performed mainly by electric and/or magnetic photon components.

The features of the action of low-intensity electromagnetic oscillations on BS must be similar to the features of action of BAS in ULD on BS that is also accomplished by spin supercurrent (Section 2.1). In particular, the condition of effective action of low-intensity electromagnetic oscillations on BS must be similar to analogous condition of action of BAS in ULD on BS (Condition [2.3]):

$$\Delta\omega = \omega_{ph} - \omega_{BS} \to 0, \tag{3.1}$$

where ω_{ph} is the frequency of low-intensity electromagnetic oscillations.

As well as the action of BAS in ULD on BS, the action of photons on BS is characterized by the non-monotonic dose-effect dependence (Section 2.1, property 5). The non-monotonic character of the effects of BAS in ULD on BS is connected with the type of dependence of the spin supercurrent on the precession angle (phase) under the phase slippage, see Figure 1.2.

Examples of nonmonotonicity in case of the action of low-intensity electromagnetic oscillations on BS are shown in Figures 3.1-3.2. Figure 3.1 shows the dependence of human mortality (caused by leukemia) on the value of the equivalent dose *d* of ionizing radiation [31]. The curve is based on the data collected under E. Burlakova's guidance [32]. With regard to the death rate *K*, the ratio of the number of deaths per 100000 person-years to the number of deaths caused by the equivalent dose *d* of about 23 mSv is used (the equivalent dose is a dose of radiation that takes into account the specificity of the action of any type of ionizing radiation on a human

biological tissue on the basis of weighted radiation factors). It is noteworthy that there is a range of values of *d* (at about 75 mSv), where the magnitude of *K* is less than that for the background value of *d* (about 2 mSv). It can be said that ultra-low doses of ionizing radiation in this range have a therapeutic effect.

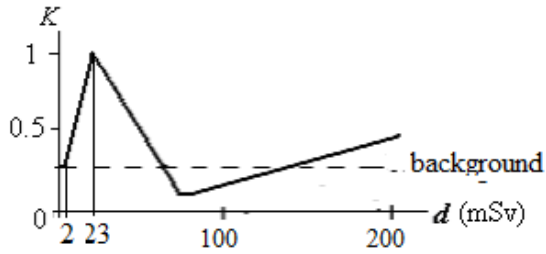

Figure 3.1. The type of dependence of human mortality (caused by leukemia) on the equivalent dose *d*. *K* is the ratio of the number of deaths per 100000 person-years caused by arbitrary value of *d* to the number of deaths at *d*~23 mSv.

Figure 3.2 shows the non-monotonic character of the action of a low-intensity magnetic field on the erythrocyte count in the blood of rats. It shows the difference *A* between the erythrocyte count in the blood of the test group rats and in the blood of the control group rats (not exposed to the magnetic field), divided by the erythrocyte count in the blood of control group, against the magnetic field strength *H*. The frequency *f* of the magnetic field is 10 Hz [33].

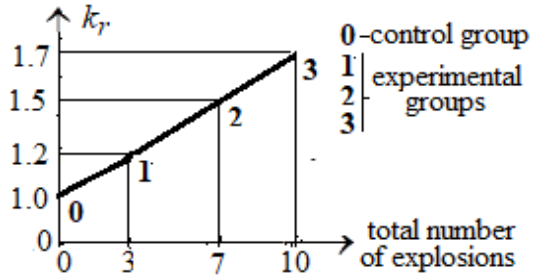

Figure 3.2. The effect of a magnetic field on the characteristics of rat blood. *A* is the difference between the erythrocyte count in the blood of the test group rats and the control group rats (not exposed to the magnetic field) divided by the erythrocyte count in the blood of control group; *H* is the magnetic field strength. The frequency *f* of the magnetic field is 10 Hz.

3.1. The Determination of the Precession Frequencies of the Spins of Virtual Photons Created by Quantum Objects of Biological Systems Using the Properties of Photon

According to Condition (3.1), by analyzing the action of photons on the BS, one can determine the precession frequencies of the spins in the virtual photons created by the quantum objects that constitute the BS.

The determination of the photon frequency meeting Condition (3.1) can be performed by two methods: 1) the analysis of the characteristics of photons on which the BS exerts effective action; and 2) the analysis of the state of the BS on which the photon acts.

Method 1. The photon beam under study passes at a small distance from the BS (for example, in experiments described in [34] the distance was 10–15mm). The amplitude and frequency modulation of the photon beam are measured. The experiments show that the BS impacts the photon beam, that is, the change in the measured characteristics of photon depends on the state of the BS. By varying the photon frequency, one can determine the frequency at which the impact on the photon beam is most pronounced for the given state of the BS.

Method 2. The BS is irradiated by a photon beam and its state is analyzed. For example, electric signals from different points of the BS and acupuncture points' electric resistance can be measured [35]. The frequency of the photons varies in these experiments and the frequency is determined to be where the reaction of the BS is most pronounced.

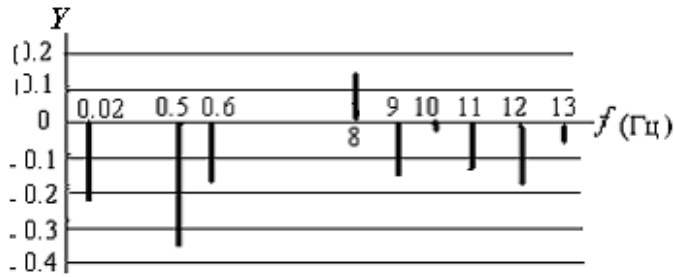

Figure 3.3. The difference *Y* between the normalized blood clotting time for test group rats (exposed to alternating magnetic field with frequency *f*) and that for control group rats (not exposed to the magnetic field).

The example illustrating this method is given in Figure 3.3. It shows the difference *Y* between the normalized blood clotting time for test group rats (exposed to alternating magnetic field) and that for control group rats (not exposed to the magnetic field) as a function of magnetic field frequency *f*. The magnetic field strength in the considered example is equal to 51γ [33].

As is shown in the given schema, the alternating magnetic field acts effectively on BS (blood of rats) only at the discrete frequencies. According to Eq. (3.1), these frequencies can be equal respectively to the frequencies of precession of the spins of virtual photons created by quantum objects of the rats.

3.2. Color-Therapy (Colorology or Chromotherapy)

It should be noted that there exists also a light therapy using high-intensity light and performed mainly by electric and/or magnetic photon components. But only color-therapy will be considered in this Section.

The energy of optical photon does not exceed $\sim 10^{-4} W$, and the action of optical photons on BS, at a small intensity of light, can be accomplished also as the action of BAS in ULD on BS: by spin supercurrent.

(In general, the energy U_{ph} of detected photon is associated with frequency ω_S of photon radiated by a source by expression: $U_{ph} = \hbar(\upsilon + c)^2 / 2 + \hbar\omega_S / 2$, where υ is a relative speed of the source and detector of photon, constant *c* is the speed of light [10,12,36]).

The spin supercurrent emerges between light's photons and virtual photons created by quantum objects of ill organs of BS.

For the increase in the effectiveness of color-therapy it is necessary to take into account property 3 ″kinetic paradox″ of the action of BAS in ULD on BS (Section 2.1): the paradox means that the effect of treatment is the strongest when the BAS is already contained in BS but in a dose that is some orders of magnitude greater than the dose of this substance used for treatment. Then, among the values of the spin's precession frequencies of the virtual photons produced by the BS's quantum objects there will be a value close to ω_{BAS} and Condition (3.1) will be fulfilled. For color-therapy it means the following: for an increase in its effectiveness the color of photons must be similar to the color of the ill organ. For example, the experienced healers use for treating the

medicinal herbal tinctures whose color, if possible, coincides with the color of ill organ of BS.

This principle does not contradict the results of investigation of many scientists: ("*red*" photons effectively act on blood and red erysipelas; "*yellow*" photons effectively act on the flow of the bile having yellow color).

In the works by Plinius Maior (Gaius Plinius Secundus AD 23/24-79), there is information about a stone which was believed to cure jaundice, since the stone's color was similar to the color of the skin of patient with this disease [37].

Avicenna (980–1037) regarded color as being of vital importance both in the diagnosis and in the treatment of disease. He created a chart that related color to the temperature and state of the patient's health. His view was that red moved the blood, blue or white cooled organism, and yellow reduced muscular pain and inflammation [38].

The similar approach was used by Paracelsus, the outstanding physician and philosopher of the 15th century [39] for treating some diseases. For example, Paracelsus thought that the disease whose symptoms were like those of anemia (in terms of modern medicine) should be cured by radiation of Mars. This conclusion was based on that this type of disease was treated by iron-containing preparations of red color and Mars is of reddish color, which accounts for the name "red planet". (Note that the color of the planet is due to the presence of iron oxide on its surface.)

Table 3.1. The types of diseases and respective colors

№	**Color**	**Types of main diseases**
1	Green	muscles issues
2	Turquoise	Brain
3	Blue	Itching
4	Indigo	glands and thickens
5	Violet	cardiac and spleen
6	Purple	veins and kidneys
7	Magenta	glands and heart
8	Scarlet	Kidneys
9	Red	liver, contraction blood vessels
10	Orange	Lung
11	Yellow	nerve, increasing value of bilirubin
12	Lemon	bony and joint

The intense investigation into the effects of colored light on the body was conducted by Dinshah from 1899 to his death in 1966 [40]. He developed a method of healing using *attuned* color waves and called it Spectro-Chrome therapy. Dinshah created a diagram of connection of types of diseases with colors (12 in number) that treat these diseases. The examples of Dinshah's classification are given in Table 3.1.

It follows from some experiments [41] that treating the diseases related to free radicals can be accomplished both by direct using of electromagnetic 644 nm radiation (red color) and by using an information matrix (the water irradiated with electromagnetic 644 nm oscillations). That is, in this case water is an information matrix having a therapeutic effect not less than the direct action of red color. Moreover, it was discovered experimentally that irradiated water with 644 nm light can be used not only for curative treatment but also can be used either as a preventive tool against all those diseases related to free radicals or intended to provide a better immune system. The water as a whole in most cases does not have electric and magnetic components and consequently the character of its action on quantum objects that constitute an ill organ is not electric or magnetic (see more detail in Section 2.1).