



Therapeutic and diagnostic devices based on encephalographic frequencies programmed low intensity photo stimulation on visual Receptors

O.Kozhukhar, A.Zazulyak, O.Tkachenko, I. Didych

❖ National University «Lvivska politeknika»

E-m: akozhuha@rambler.ru, anzaz@lviv.farlep.net



KAPITAŁ LUDZKI
NARODOWA STRATEGIA SPÓJNOŚCI

UNIA EUROPEJSKA
EUROPEJSKI
FUNDUSZ SPOŁECZNY



Projekt współfinansowany przez Unię Europejską w ramach Europejskiego Funduszu Społecznego

**National University
«Lvivska polytechnika»
(NU "LP")**



NU "LP"

- ❖ Over 200 Ph. D Prof., 1000 Doctors and 50 Scientific Schools are working in National University "Lvivska Polytechnica" (NU"LP").

ITRE

❖ Institute of Telecommunications, Radio electronics and Electronic Techniques (ITRE) is the part of NU "LP" and have over 20 Ph. Prof. 30 Scientific Laboratories and international collaboration with partners, for example, from Poland (Warsaw, Krakow, Rzeszow). One of the Scientific specialties is "Biologic and Medical Devices and Systems".

ITRE



Scientific specialize “Biologic and Medical Devices and Systems”



The project

- ❖ The project is job of research group of department of electronic devices of ITRE NU"LP" (manager - prof. Zenon Gotra) performance in a collaboration with the department of **ENT** of the National medical university, Lviv (prof. Oleksandr Kitsera).

Realization

- ❖ Realization of management of optical radiation descriptions in facilities of photoinformatic medicine is more frequent all carried out the methods of electronic commutation of actinogens which are executed mainly by the set of light-emitting-diode elements. It enables to get the programmatic guided medical irradiations after variables in time by luminosity and spectrum.

Modern devices of colour-informatical therapy

Modern devices of colour-informatical therapy, allow to pass from the strictly specialized treatment of separate organs to the complex operating on all organism. Thus there is a start of reserve adaptation possibilities of man, immunity rises and an organism is mobilized on active counteraction rejections in a health, which arise up.

The modern PI devices



“ELKA-P”



«Barva-therapist»



«Barva-color»



«Geska»

DETA-
QUANTUM



" Barva-
OTO/KIK36"

BioNase



IRIS

«Mini-expert CT»



BioOral

Comparative descriptions of devices of phototherapy

№	Name of device	Industries of application	The medical effectis	Source of radiation	Bars of spectrum of radiat., nm	Middle Power of usage, W	Dipazon of frequenc. of photostimuls, nm	Methods of choice of the medical programs
1	RIKTA-ESMIL-1A	Stomatology, otolaryngology, gynecology and other.	Promotes immunity	A light-emitting diode is the Visible radiation (VV) 400-650	Visible radiation (VR) 400-650	10	100-4000	-
2	MINI-EKSPERT-TST	Surgery, dermatology, paediatrics, otolaryngology	Improves work of lot of organs and systems of organism	Light-emitting diodes (red, green, dark blue	Ultraviolet (UV) of 315-400, Visible radiation (VR) 400-650	-	0,1-1500	90 programs
3	IRIS	Practically in all industries of medicine	Treats stomach-aches, locks, enuresis, allergy, skin diseases	4 light-emitting diodes (red, green, yellow, dark blue)	VR 400-650	-	-	Possibility of individual selection of the mode of operations of vehicle is given

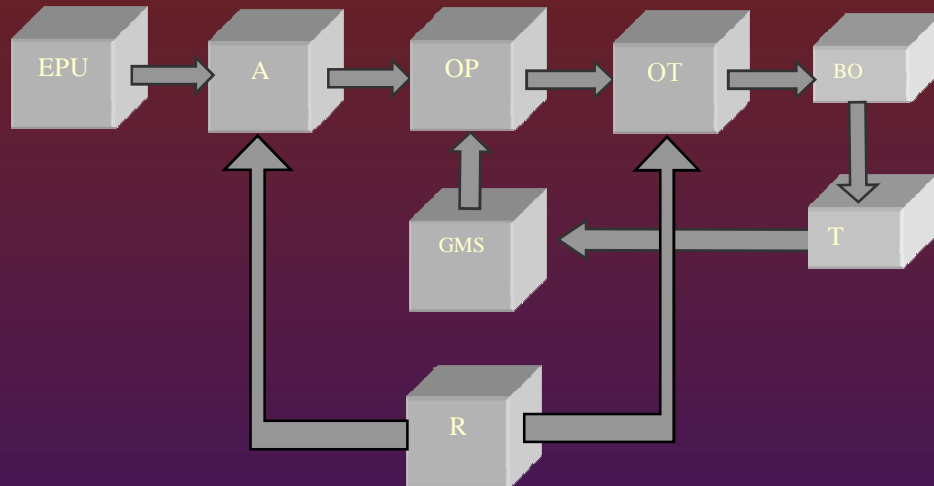
Comparative descriptions of devices of phototherapy

5	MINITAG	Practically in all industries of medicine	Promotes efficiency of medications	Light-emitting-diode matrix	VR, IR 450-1200	-	50	-
6	GESKA-U-MAG (2)	Surgery, dermatology, paediatrics, otolaryngology	Accelerates regeneration of the damaged fabrics, reduces the pain feelings, promotes tissue immunity	Light-emitting-diode matrix	IR 800-1200	14	-	-
7	GESKA-PC-MAG	Surgery, dermatology, paediatrics, otolaryngology	Treats ischemic heart trouble, stenocardia, high blood pressure, traumas and burns	Light-emitting-diode matrix	VR, IR 400-1000	-	-	-
8	DETA-QUANTUM (3)	Surgery, dermatology, paediatrics	Treats insomnia, has an anaesthetic action, improves displacing of blood	Light-emitting-diode matrix	VR, IR 400-650	-	0,1-100	programs of treatment is given, and handwritten to reprogram a vehicle according to diseases
9	DYUNA-T	Practically in all industries of medicine	Improves a hemopexis, cicatrisation wounds, gives an anti-virus action	Light-emitting-diode matrix	R: 640 IR: 840	6	50-60	-

Analysis

- ❖ The conducted analysis of modern photo medical devices rotined that them a basic problem and failing is absence of approach of the systems to the choice of methods and modes of treatment and stimulation. In particular this technique is deprived well-to-do reverse connection in accordance with the signals of review at bio resonance on the bio action of concrete biological object and does not provide complex gumoral and to create influence on a few biologically active areas of organism simultaneously during a therapeutic session.

Structure of the informative photo-treatment system from reverse connection



EPU – power source, A – light source, OP - an optical (spatially - spectral) transformer, OT- optical transport element, GMS - generator of management signals, R - a regulator, T - transformer of bio informative signal of reverse connection, BO- biomedical object.

❖ From the e reactions obviously, that the neurons of retina are converted by step after force photo stimulus in step after amplitude electric signals. This is relatively low-frequent modulation of potential of rest. Spectrum of force of reactions, specifies that most force of reaction is at frequencies, less than, than 30 Hz.

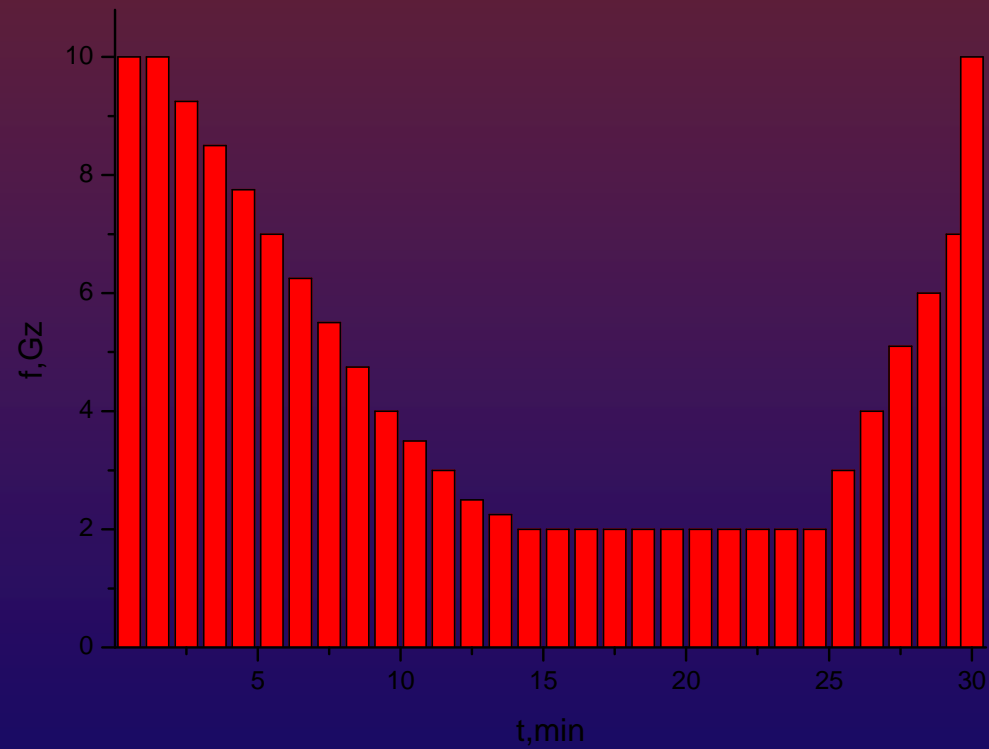
The receptors

The receptors, which perceive information, both the eventual vehicles of sensible nerves and macromoles serve, their aggregates are able preferentially to react on that or other type of energy. Information about the change of energy informative background from any part of body is passed in nerve-centres on ductings of connection — to the nervous explorers, to the gumoral ways or directly from a cage to the cage (creative way).

Project

- ❖ **The purpose of project is development of therapeutic and diagnostic low intensive devices with new application of visible non-coherent electromagnet field stimulation on the basis of medic psychological programs. Devices are provided by bioinfluential programmable photostymuls, modulated basic and activated action by encephalographice frequencies, on visual receptors.**

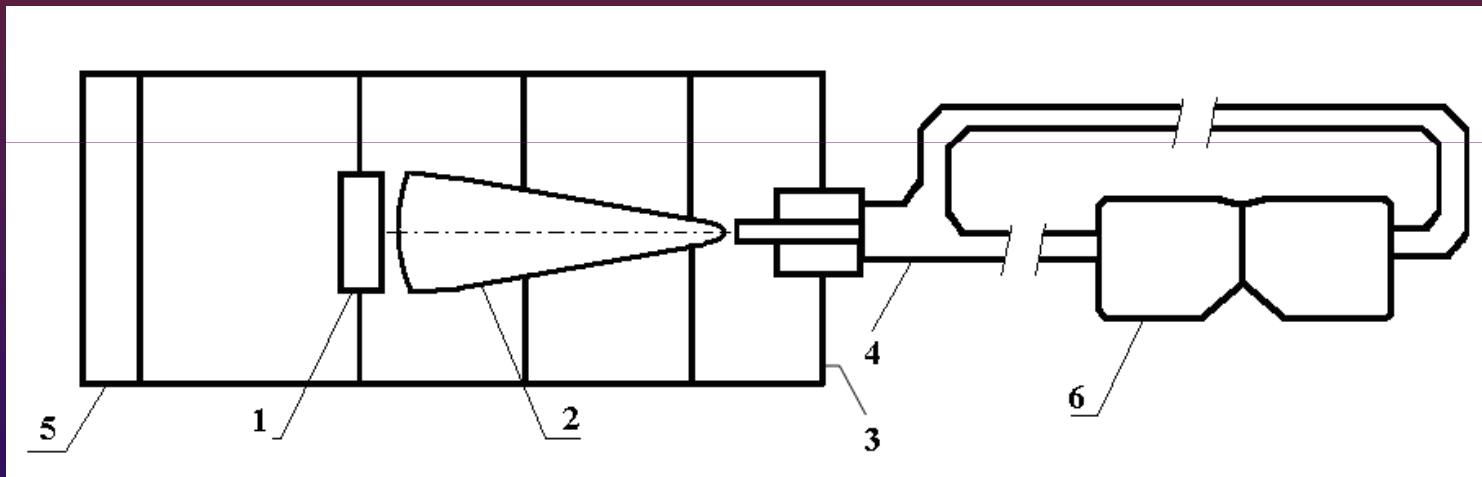
One of photostimulated programs



Basic problems

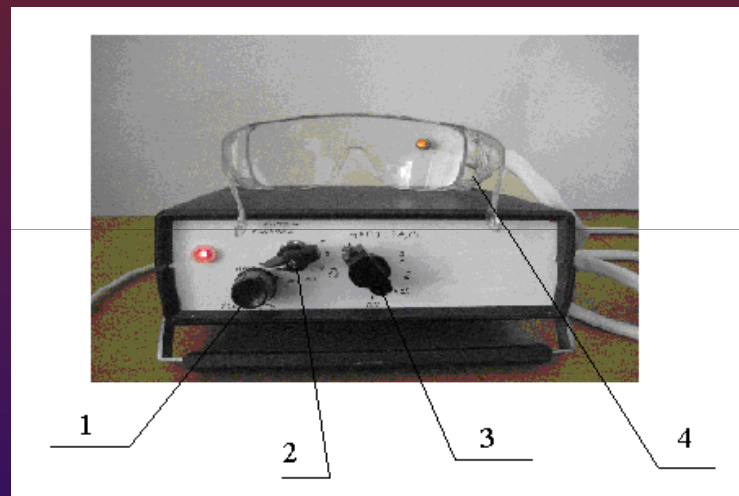
- ❖ . Basic problems in creation of such devices is optimization of LED-Lightguide of the optronic systems as generators of safe irradiation of visual receptors and parameters of photostimuls and correction of therapeutic diagnostic programs after the signals of changes of electro-physical parameters of human body during the leadthrough of procedure.

Structure of devices



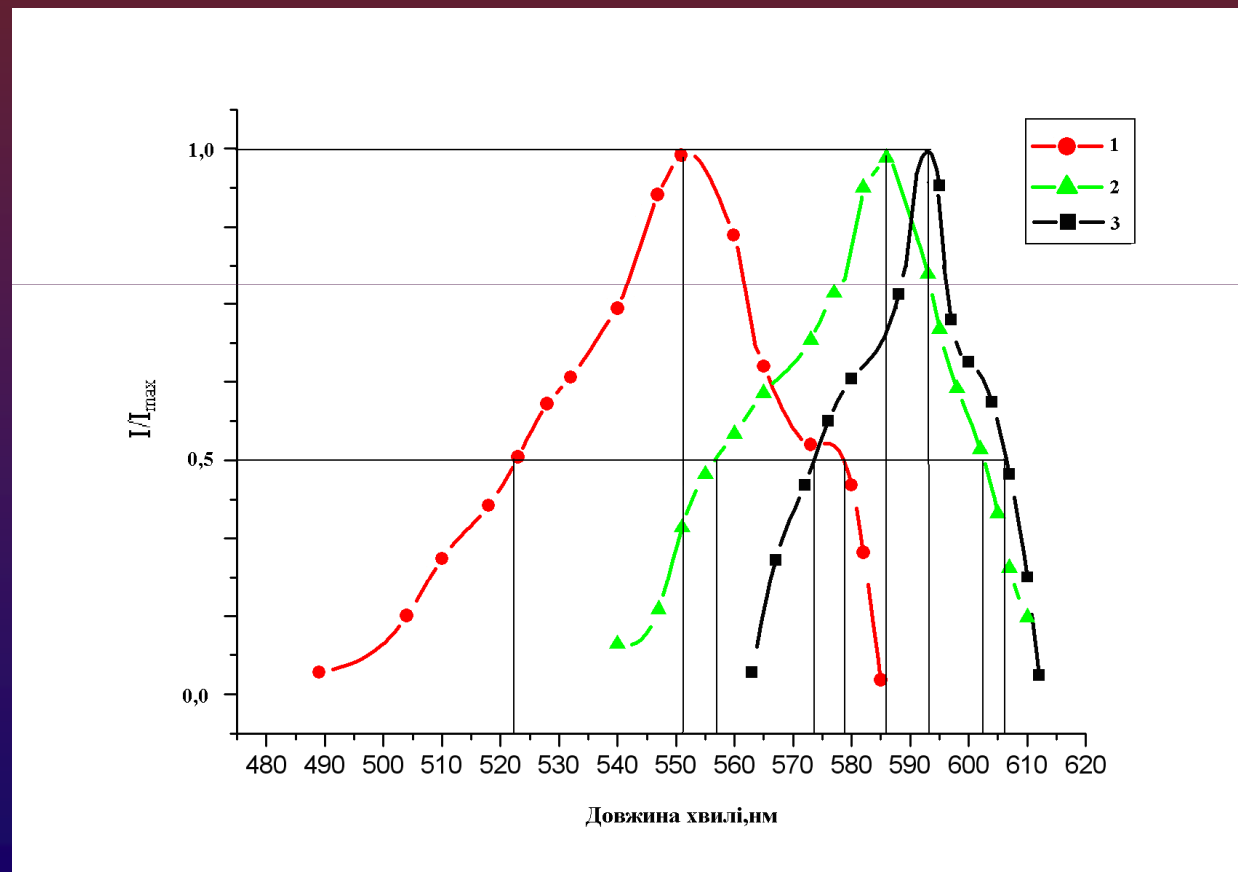
1 – light diode the terminal; 2 – focon the concentrator ; 3 – the case; 4 – an optical path; 5 – the management block; 6 – points.

One from the series of devices based on encephalographic frequencies programmed photostimulation on visual receptors



1 – a brightness regulator; 2 – the switch of colors; 3 – a frequency regulator; 4 - points

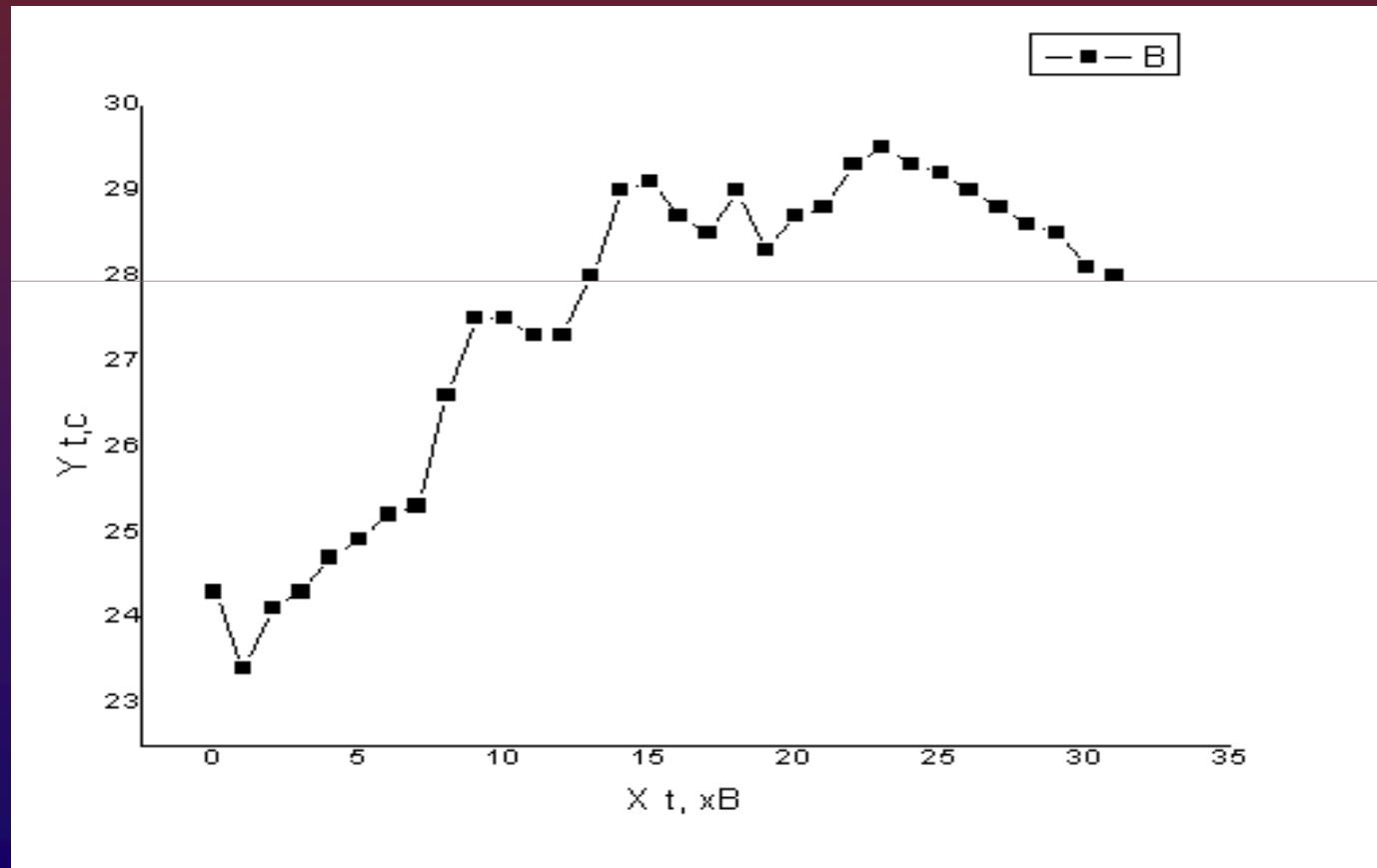
Spectral descriptions of OV are on the output of the system



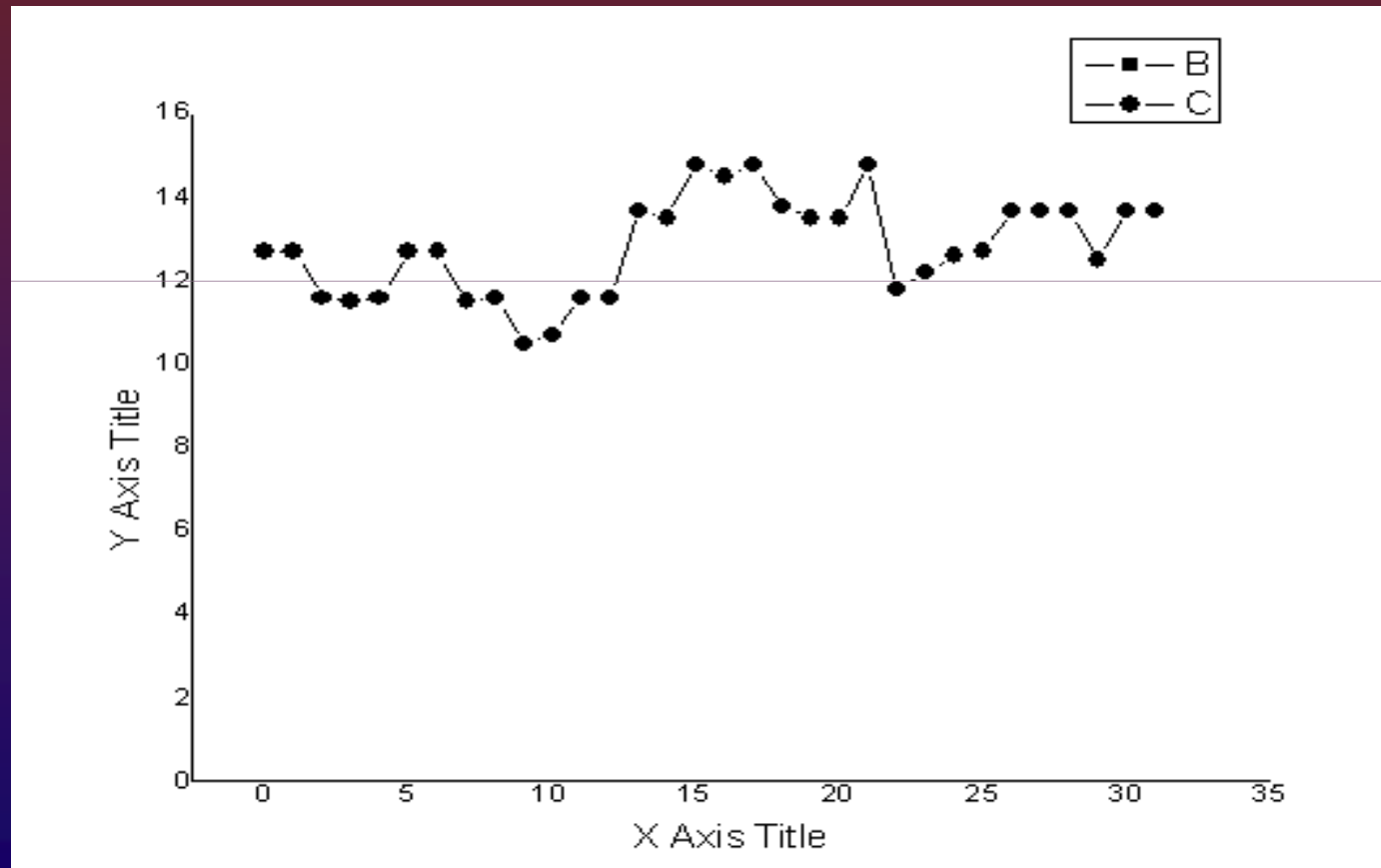
Information about the changes of the psychophysics state

Information about the changes of the psychophysics state of patient during procedure and about its completion turns out on the basis of the continuous measurings of electro-physical parameters of human body.

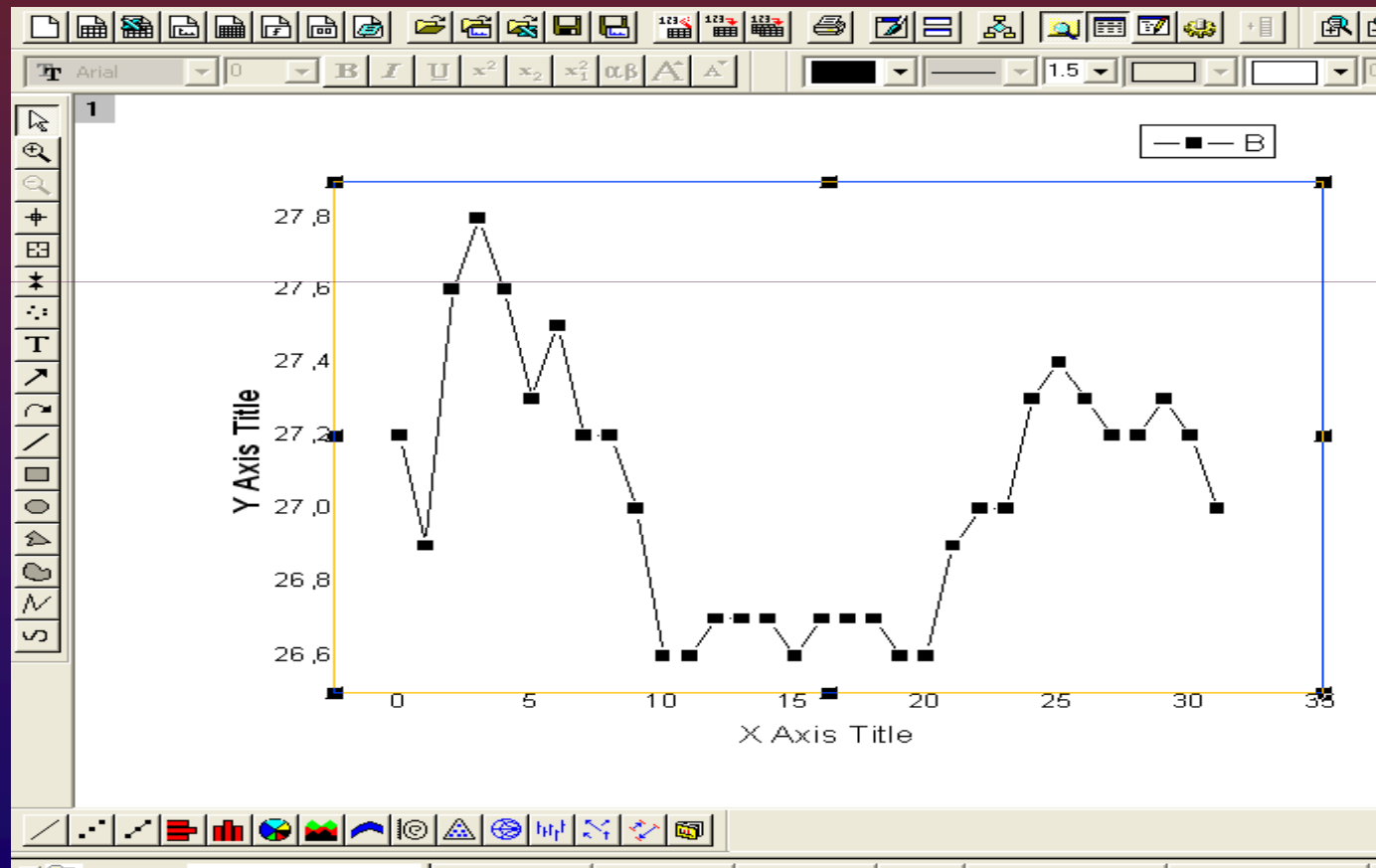
Temperature



$$F_2/F_1$$



R



The treatment based on encephalographic frequencies
programmed low intensity photostimulation on visual
Receptors



CONCLUSION

- ❖ **We show that modern light treatment devices has low effective because the information about the changes of the psychophysics human body state and reverse connection on electro physical parameters are absent.**
- ❖ **We propose a correction of therapeutic diagnostic programs with programs of encephalography frequencies with their operating on visual receptors after obtained of the information about the changes of the psychophysics human body state with help of the signals of changes of electro-physical human body parameters of a during the leadthrough of procedure.**
- ❖ **Application of devices can considerably promote speed and quality of treatment, in particular, ear noises and neurodiagnostic, in particular at the encephalography testing. Devices are universal, can be used for anaesthetizing and treatment.**
- ❖ **We propose a collaboration on clinical approbation and manufacturing of the proposed new way photo medical devices.**

Thank you for your attention



KAPITAŁ LUDZKI
NARODOWA STRATEGIA SPÓJNOŚCI

UNIA EUROPEJSKA
EUROPEJSKI
FUNDUSZ SPOŁECZNY



Projekt współfinansowany przez Unię Europejską w ramach Europejskiego Funduszu Społecznego