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ABSTRACTS

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photosensitizing activity of oxygen upon irradiation at 630 nm was found. Based on these data absorption spectra of molecular dissolved in organic solvents and water have been obtained under natural conditions. The absorption coefficients of oxygen in solutions, Earth's atmosphere and compressed gas are compared and discussed. More detailed information can be found in papers cited below and references therein.

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G-3

THE EFFECT OF PHOTODYNAMIC THERAPY WITH TOPICAL APPLICATION OF 5-AMINOLEVULINIC ACID ON SKIN WOUND HEALING PROCESS BY MULTIPHOTON MICROSCOPY

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Wound healing is a complex physiological and dynamic process that occurs to the components of skin at the cellular and molecular levels. It consists of several overlapping stages: inflammation, proliferation, and remodeling. The characterization of wounds, their healing, and also the timeline of these sequential phases have major clinical significance in assessing severity, healing potential, and determining the correct treatment for all wound types. Because of the challenges of wound healing processes, many studies have been directed to control this process, whether using drugs or some methods, which have positive effects like antibacterial and antinflammatory. One of methods that has been focused on is photodynamic therapy. Photodynamic therapy (PDT) is a modern and non-invasive form of therapy, used in many fields of medicine. PDT has been successfully used in dermatology, especially in wound healing studies. Photodynamic therapy is based on the application of a photosensitive compound photosensitizer, light with the appropriate wavelength, and oxygen.

Multiphoton microscopy (MFM) is a promising method of visualization of wound healing. Multiphoton microscopy techniques, like second harmonic generation (SHG), autofluorescence (AF), have emerged as useful approaches to evaluate epithelial tissues and offer advantages in in-depth visualization and study dynamics of metabolism in the wound.

The goal of the work is to study the effect of photodynamic therapy on the wound healing process using 5-aminolevulinic acid as a photosensitizer by multiphoton microscopy techniques.

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G-4

PHYSIOLOGICAL ACTION OF UVB RADIATION ON WHEAT SEEDS AND SPROUTS (*TRITICUM AESTIVUM* L.)

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This work continues the cycle of our research on the physiological effect of UVB radiation on plants [1, 2]. Two research cycles were conducted. In the first case, XeCl excilamp radiation (model XeCl_BD_P), (308 nm) was used for pre sowing treatment of seeds of soft spring wheat (*Triticum aestivum L.*, Iren cultivar) at doses of 0.5 and 1.4 J/cm^2. Then the seeds were sown and their physiological parameters were recorded during growth. In the climate conditions of 2020 the UVB irradiation of seeds at a dose of 0.5 J/cm^2 had a stimulating effect on wheat plants (grain yield increased by 5.2% relative to the control), and at a dose of 1.4 J/cm^2 inhibition had place. In the second cycle of studies, 6 day old wheat seedlings were irradiated with doses of 0.5, 1.4, and 2.7 J/cm^2. At all radiation doses, the height of the plants and the area of the assimilating surface decreased, and the root mass increased. Also with increasing doses of UVB radiation was observed to decrease in parameters of photosynthesis both through direct effects on the photosystem, and by reducing pigment content and leaf area. It is concluded that at a radiation dose of 0.5 J/cm^2, plants are able to adapt to UVB radiation treatment. The degree of their damage, determined by the content of proline, ascorbic acid and chlorophylls *a* and *b*, is insignificant. This means that the hardening of seedlings with UVB radiation should be carried out at even lower doses than were chosen in the experiments. The study was carried out within the framework of Project No. 8.1.29.2018 (TSU Competitiveness Improvement Program) and partially within the framework of the state task for the ISE SB RAS, Project No. 13.1.4.

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