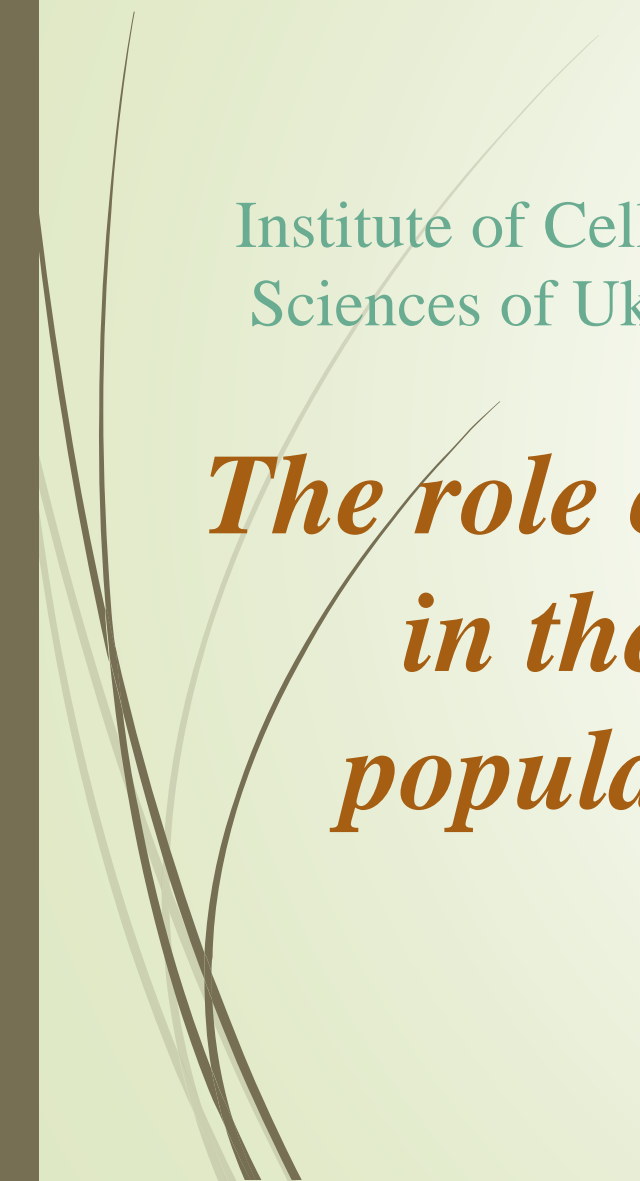


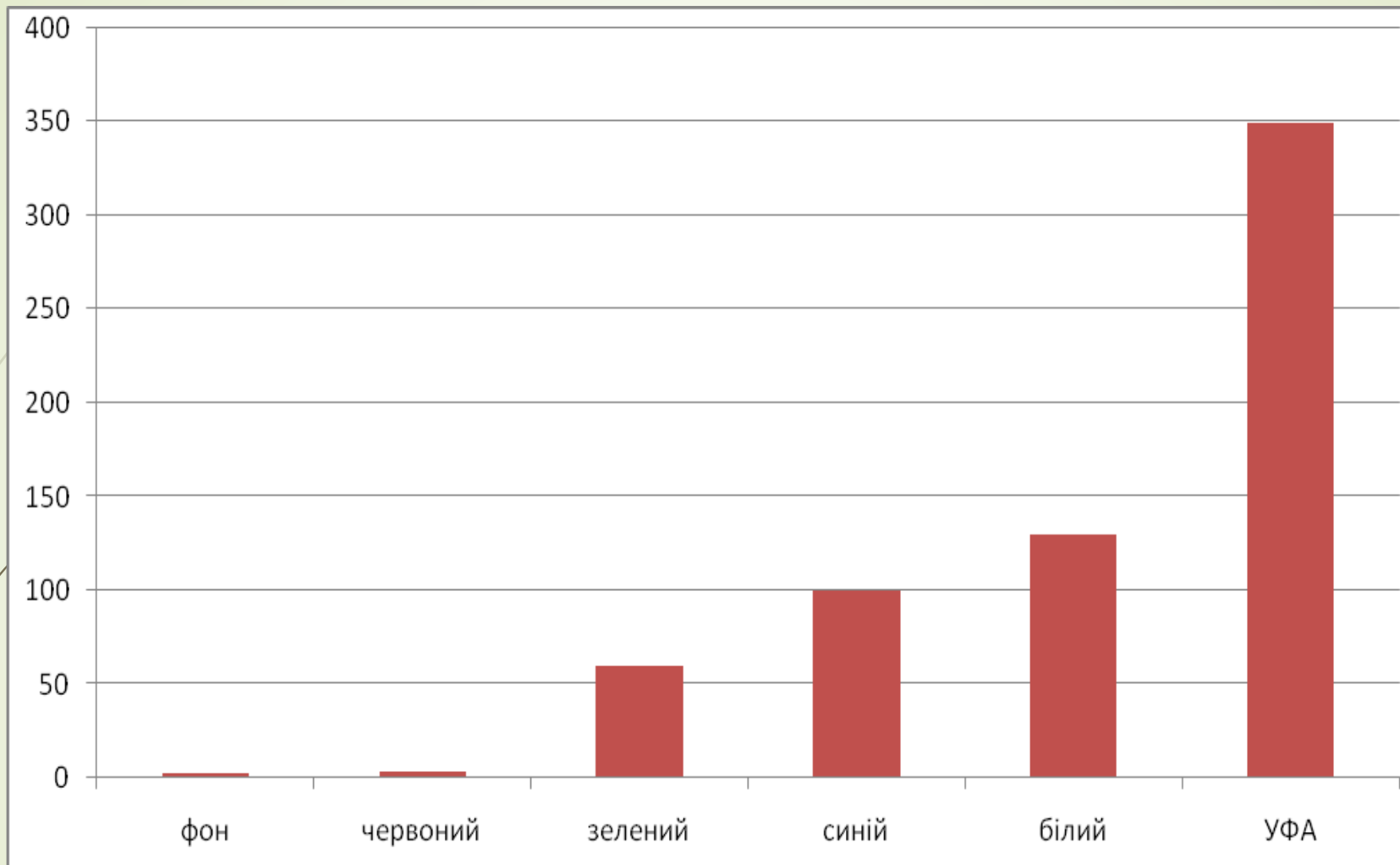


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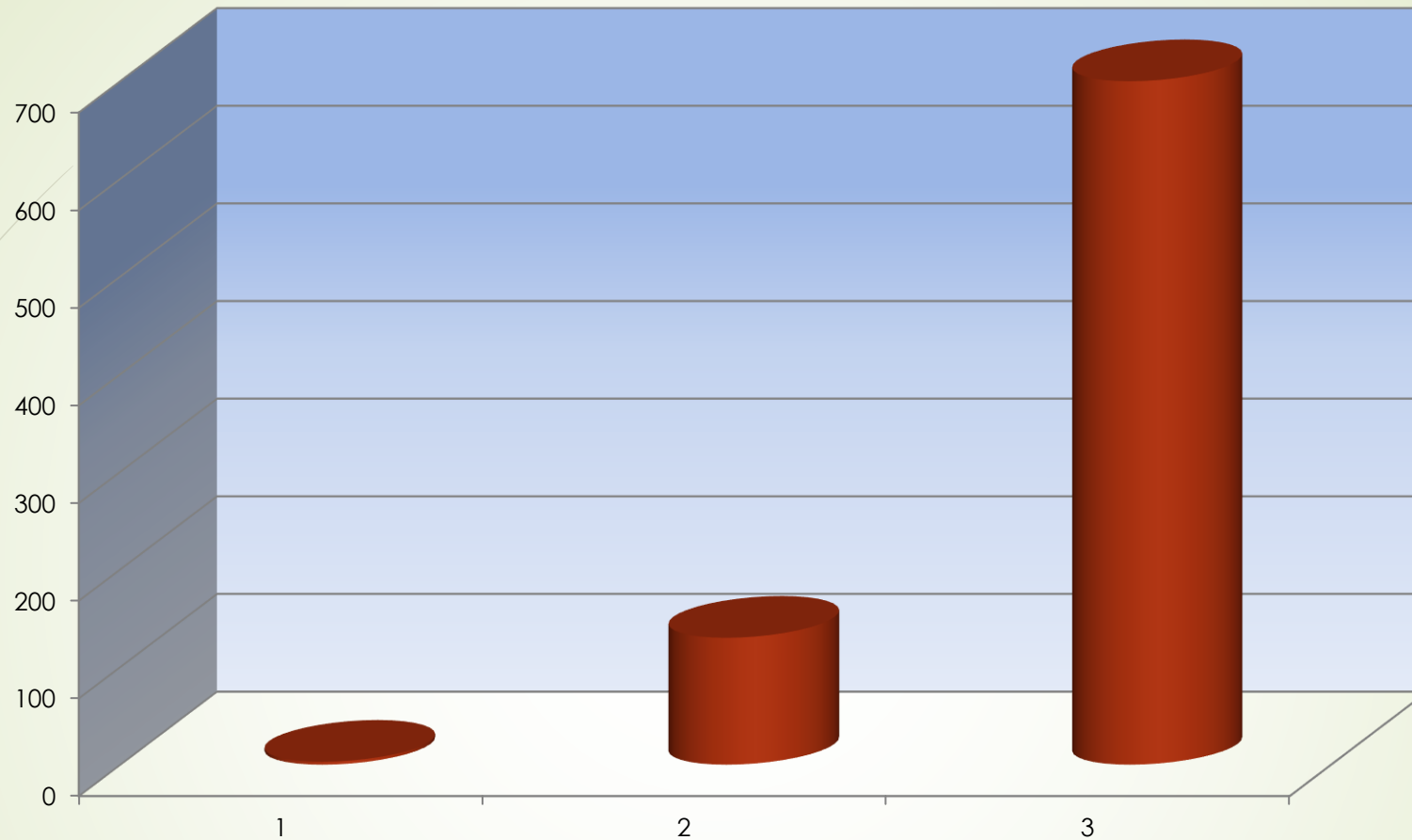
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*The role of endogenous and rhizosphere light  
in the functioning of plant organism,  
populations, biocenoses and ecosystems*





Comparative characteristics of the passage of different spectra of light directed at plants through their root system( $\times 10^{-10}$  from daylight (Lk) ; from left to right: background, red, green, blue, white, ultraviolet A light)



Transmission of light to the rhizosphere upon irradiation with a dose of 50 Gray ( $\times 10^{-10}$  from daylight (Lk)) 1. – background; 2. – white light; 3. – irradiated plants lighting white light

## Conclusions


- 1. Based on the HLM-1C chemiluminometer, a model system to study the light conductivity of Higher Plants was developed.*
- 2. Three light sources, the closest in terms of spectral characteristics to daytime sunlight for this model system, were selected.*
- 3. It is shown that bean plants conduct  $10^{-8} - 10^{-9}$  intensity of daylight to the rhizosphere. The amount of light conductivity of bean plants through the root system was determined, including when they were illuminated using different spectral ranges of light.*
- 4. It was shown that after irradiating bean plants with a dose of 50 Gray, when the bean plants were illuminated with white light, their light conductivity increased more than 5 times.*
- 5. The ability of 22 species of plants belonging to the 5 Divisions of the Plant Kingdom to conduct directed light through their own root system to the rhizosphere was determined.*
- 6. The need for light to enter the rhizosphere to maintain the homeostasis of its inhabitants: algae, light-sensitive microorganisms, etc., is theoretically substantiated.*
- 7. The signaling role of the rhizosphere light of plants in the functioning of populations, biocenoses, and ecosystems is explained.*




*Plants confirm the hypothesis of academician Dmytro Grodzinsky regarding the role of endogenous plant light in the expression of certain genes, in particular genes that ensure the flowering of flowering plants.*



At the end of December 2023, under the conditions of a short day, the Christmas zygocactus blooms. In one of the four long-day plants - geraniums, the only one that was in the shade of the endogenous light of the zygocactus, flowering was initiated at an average day length of about 8.5 hours. In 2022, during light masking, which ensured indoor maintenance of 8-9 daylight hours in the Christmas zygocactus, observed the initiation of flowering in the end of May.



Research of the scientific working group is currently focused on  
the following directions:

1. Model of radiation in colloids of different viscosity;
  2. Model of flowering initiation in short- and long-day plants;
  3. Light-dependent gene expression in plants.
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Thank you for your attention !