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Brief Report Open Access

The Impact of Ultraviolet-B Radiation on the Lucigenin Chemiluminescent Reaction in Yeast Cells.

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Introduction

Studying the biological impact of UV-B rays in cells plays a crucial role in solving some theoretical and practical issues [1]. Detecting the sensibility of cells towards radiation allows us to see the features of the kind of cells, the level of changeability, their defense mechanism toward dangerous impacts, and the effects of radiation in quantity regularity. UV-B rays cause a measurable increase in the production of free radicals and oxidative stress.

Superoxide anion is generated in the NADPH-oxidase complex and is identified as the first active form of oxygen. Probe the lucigenin-dependent chemiluminescent reaction allows for characterizing NADPH-oxidase activity in these cells. It is true that the lucigenin is oxidized by only a superoxide radical and leads to luminescence [2]. Superoxide anion radical is produced by the one-electron reduction of molecular oxygen and NADPH oxidase complex in the cell's cytoplasm. Chemiluminescence Imaging of Superoxide Anion does not detect their viscosity but the speed of reactions they attend [3,4].

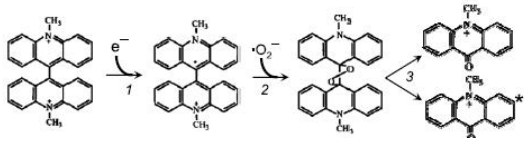
The current study aimed to study the intensity of the lucigenin-dependent chemiluminescent reaction in yeast cells irradiated with different UV-B rays.

The lucigenin-dependent chemiluminescent reaction has been shown in (Figure 1).

Candida guilliermondi U-916 was used as an experiment material and irradiated with the mercury ultraviolet lamp model PRK-4**.** The intensity of CL was measured on a quantometric device that works in the impulse regime (Figure 2).

However, in irradiated cell suspension, the chemiluminescence intensity increased, and compared with control, the time to reach the maximum point of chemiluminescence was decreased [5]. In addition, it shows that the activity of superoxide-anion radical rose. The highest chemiluminescence intensity was observed in the yeast cells exposed to 4.5·104 erg/mm2 UV-B rays. Figure 3 describes the lucigenin chemiluminescence dependence doses in yeast cells after exposure to UV-B radiation (Figure 3).

Dose $\times 10^4$ erq/mm^2



Lucigenin(Luc2+) Lusigenin kation-radicale (·Luc+) Lusigenin dioksetan N-metil-akridon (NMA)

(Luc= O2)

NMA→NMA+photon

Figure 1: Lucigenin chemiluminescence reaction.

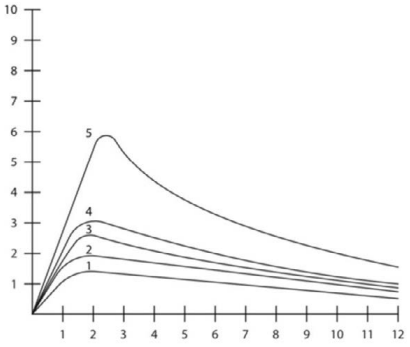


Figure 2: Lucigenin dependence chemiluminescent reaction intensity in yeast cells control, 2-2.2·104 erq/mm^2, 3-3.0·104 erq/mm2, 4-3.7·104 erq/mm^2, 5-4.5·104 erq/mm^2.

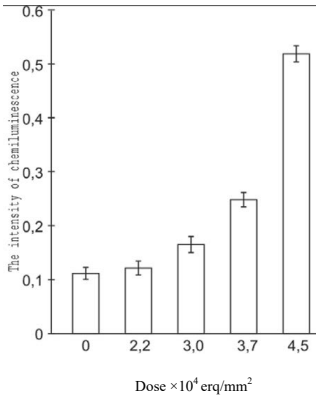


Figure 3: The chemiluminescence of lucigenin depends on the doses of UV-B rays in yeast cells.

References

1. Yu A Vladimirov, Proskurnina E V (2009) Free Radicals and Cell Chemiluminescence. Biologicheskoi Khimii 49: 341-388.

2. Obraztsov IV, Godkov MA (2013) Chemiluminescent Analysis of the blood cells in medicine: history, theory, practice. Federal Research Center for Pedia Hemo Oncolo and Immuno. 6-7.

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3. Freikin GY (2016) Molecular mechanisms of destructive protective and photobiological regulatory processes. Mono Freikin GJM: 88.
4. Galt N, Helikar T (2018) Cell collective Wicked problems: investigating real world problems in the biology classroom. QUBES Educational Resources.
5. Tansey JT, Baird TJr, Cox MM, Fox KM, Knight J, et al.(2013) Foundational concepts and underlying theories for majors in biochemistry and molecular biology. Biochem Mol Biol Educ 41: 289–296.