

## Effect of tritium on luminous bacteria.

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Marine luminous bacteria are widely used as ecological bioassay for more than forty years. They are traditionally applied for monitoring of chemical toxicity, but not long ago they have been used for the first time to monitor radiation toxicity, with solutions of alpha-emitting radionuclide Am-241 taken as an example [1]. As tritium is one of the most widespread radionuclides now, evaluation of its effect on living organism is of great importance. Purpose of this work was to study chronic effect of tritium (0.25–1000 kBq/ml) on luminous bacteria *P.phosphoreum* from Collection of the Institute of Biophysics SB RAS (Krasnoyarsk, Russia). Bacterial growth and bioluminescence (BL) were used as living test-functions of the bacteria.

Aminoacid valine labeled with tritium by thermal activation method was used as a component of nutrient media for bacteria. It was found that the media with activity < 30 kBq/ml increases bacterial growth, but > 30 kBq/ml - inhibits it. The effects become evident after 20 h of exposure to tritium. Inhibition efficiency depended directly on activity of the media.

To study effect of tritium on bacterial BL, samples of bacteria were picked up at two stages of growth in the radioactive media – exponential (< 20h of exposure) and stationary (>20h of exposure). Exponential-stage-bacterial-samples revealed the absence of distinct effect of tritium on B. Stationary-stage-bacterial-samples demonstrated BL activation up to 8 times; BL quantum yields of this samples exceeded that of a control sample up to 1.7 – 5 times.

Activation of bacterial growth and BL intensity is a result of intensification of electron transfer followed by the increase of rates of biochemical processes.

Tritium accumulation in bacterial cells and DNA, mutagenic efficiency if tritium are under discussion.

1. Rozhko T., Kudryasheva N. et al. Photochem. Photobiol. Sci., 2007, V.6, p.67-70.