

عنوان مقاله:

Investigation of the gene expression profiling of photoreceptors in separated reproductive and somatic cells in multicellular green algae *Volvox carteri* at low intensity of UV-B radiation

محل انتشار:

بیستمین کنگره ملی و هشتمین کنگره بین‌المللی زیست‌شناسی ایران (سال: 1397)

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خلاصه مقاله:

Light is an important source of energy for the photosynthetic organisms. *Volvox carteri* is a simple multicellular green alga with many features that recommend it as a lower eukaryote model organism for studying the development of photoreception. In the current work, the effect of UV-B radiation (0.056 mw.cm^{-2}) was studied on gene expression of 13 photoreceptors using RNA-seq data. These photoreceptors are required for accurate light-monitoring and adaption of its physiological activities to environmental changes. According to our results, under the low intensity of UV-B radiation, the photoreceptors were differentially expressed neither in reproductive cells nor in somatic cells as compared to their corresponding control groups. However, comparing the transcriptome of somatic cells with reproductive cells, revealed that Phot, CRYp, and ChR1-2, HKR1-4 and Vop (VR1) photoreceptors exhibited a cell-type specific expression pattern while photoreceptors such as UVR8, CRYd1-2, and CRYa were differentially expressed. However, it seems that due to significantly transcript accumulations in somatic cells, likely UV-B may indirectly affect gene transcription in this organism. Somatic cells differ in reproductive cells in function, biochemical composition, size, and structure. Therefore, they have different energy balance and possess their own circadian rhythms and metabolic profiling. Moreover, depends on their localization in an organism, they are subjected to various light intensities. The cell-type specific transcriptome pattern shows the different nature of somatic and reproductive cells, which is the first step in the differentiation and initial division of work between cells

کلمات کلیدی:

Cell types, Light signaling, Photoreceptor, UV-B radiation, *Volvox carteri*

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