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Arch Toxicol. 2021 Oct;95(10):3161-3169. doi: 10.1007/s00204-021-03139-4. Epub 2021 Aug 27.

Toxic effect of light on oocyte and pre-implantation embryo: a systematic review

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PMID: 34448882 DOI: [10.1007/s00204-021-03139-4](https://doi.org/10.1007/s00204-021-03139-4)

Abstract

In the female reproductive tract, oocytes and embryos are in a dark environment, while during the in vitro fertilization (IVF) they are exposed to various visible and invisible lights such as daylight, microscope, and laminar hood fluorescent lights. Studies have shown that light could damage cellular compartments of oocytes and embryos and consequently decrease rates of fertilization, development, and blastocyst formation. However, due to the lack of consensus about the effects of light on the embryos, and subsequently the inability to make definitive decisions regarding the light exposure management to improve IVF results, in the present study, we systematically reviewed the effect of light with different wavelengths and intensities on pre-implantation embryos. The toxic impact of light depends on the wavelength, intensity, and duration of light exposure and also the stage of embryo. Therefore, reducing the observation time of embryos out of the incubator and also using light filters can alleviate the detrimental effect of light in IVF labs.

Keywords: ART; Embryo; IVF; Light; Oxidative stress.

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