Opt Lett. 2008 Dec 15;33(24):2961-3.

Targeted photoporation and transfection in human HepG2 cells by a fiber femtosecond laser at 1554 nm.

He H, Kong SK, Lee RK, Suen YK, Chan KT.

Department of Electronic Engineering, The Chinese University of Hong Kong, Shatin, Hong Kong. hhe@ee.cuhk.edu.hk

We report the transfection of human hepatocarcinoma (HepG2) cells by femtosecond (fs) laser pulses at 1554 nm. It was found that HepG2 cells could be perforated transiently to admit propidium iodide by that laser. This photoporation was safe, as the membrane resealed itself within a short time and no mitochondrial depolarization was detected. The cells were next photoporated in the presence of DNA plasmids for the expression of green fluorescence protein, and about 80% of the exposed cells showed green fluorescence 24 h later. Thus it could be concluded that it is safe and efficient to use fs laser at 1554 nm to transfect foreign molecules into cells under a standard microscope.

PMID: 19079506 [PubMed - indexed for MEDLINE]