

程娟,顾胜利,徐斐燕,陈亚青.超声微泡造影剂介导EGFP对兔视网膜的转染效率[J].中国医学影像技术,2012,28(10):1788-1792

超声微泡造影剂介导EGFP对兔视网膜的转染效率

Transfection of enhanced green fluorescent protein gene into retina of rabbits induced by ultrasound-mediated microbubbles destruction

投稿时间: 2012-05-17 最后修改时间: 2012-08-02

DOI:

中文关键词: [微泡](#) [造影剂](#) [增强型绿色荧光蛋白](#) [视网膜](#) [基因治疗](#)

英文关键词: [Microbubbles](#) [Contrast media](#) [Enhanced green fluorescent protein](#) [Retina](#) [Gene therapy](#)

基金项目:

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中文摘要:

目的 探讨在不同能量超声和一定剂量微泡作用下,超声微泡造影剂介导下增强型绿色荧光蛋白(EGFP)质粒对兔视网膜转染的效率、安全性以及可行性。方法 将30只新西兰大白兔随机分为6组:质粒组(A组)、质粒+微泡组(B组)、质粒+超声照射组①(C组)、质粒+超声照射组②(D组)、质粒+微泡+超声照射组①(E组)、质粒+微泡+超声照射组②(F组)。将1 ml pEGFP-C1质粒与1 ml SonoVue微泡造影剂混合,由耳缘静脉注入,分别用0.5、1.0 W/cm²超声波辐照眼球。转染7天后行视网膜光镜及透射电镜检查,观察质粒、微泡及超声照射对视网膜有无损害,并在荧光显微镜下观察pEGFP-C1质粒表达情况。结果 光镜及透射电镜结果显示质粒、微泡及超声照射对视网膜无损害。A~D组均可见少量绿色荧光表达($P>0.05$),E、F组的荧光表达较强,明显高于其他4组($P<0.05$),E、F组荧光强度差异无统计学意义($P>0.05$)。结论 在一定能量的超声照射下,超声微泡造影剂能够提高携带EGFP质粒在兔视网膜的转染效率。

英文摘要:

Objective To explore the efficiency, security and feasibility of enhanced green fluorescent protein (EGFP) transfected into retina of rabbits by means of applying ultrasound microbubbles for genetic carrier under different sound of intensity and microbubbles. **Methods** Thirty rabbits were randomly divided into 6 groups: Plasmid group (group A), plasmid+microbubble group (group B), plasmid+ultrasound group ① (group C), plasmid+ultrasound group ② (group D), plasmid+microbubble+ultrasound group ① (group E) and plasmid+microbubble+ultrasound group ② (group F). Microbubbles were combined with the naked plasmid pEGFP-C1 and followed the way of vein injection and 0.5, 1.0 W/cm² ultrasound-mediated microbubbles destruction. Seven days after gene transfection, the toxic effect of retina was evaluated by light microscope and electron microscope, and EGFP expression in the retina was observed under fluorescence microscope. **Results** No retina toxicity was found in the histopathology examination. A small amount of green fluorescence was seen in group A—D, while no statistical difference was found among the 4 groups (all $P>0.05$). The fluorescence intensity of EGFP expression in group E and F were significantly higher than the other 4 groups (all $P<0.05$), but no difference was found between group E and F (all $P>0.05$). **Conclusion** The efficiency of EGFP expression in rabbit retina increases with the way of ultrasound-mediated microbubbles destruction.

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