عنوان مقاله:

Editing The Mitochondrial Genome Using The NovelMethod Of DddA

محل انتشار:

کنفرانس بین المللی ژنتیک و ژنومیکس انسانی (سال: 1400)

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خلاصه مقاله:

Mitochondrial DNA (mtDNA) plays a crucial role in cellular respiration bythe mitochondrial oxidative phosphorylation system which is vital forsurvival. Mutation in mtDNA may end up in severe malfunctions innumerous organs and muscles, especially in tissues with high energy demand.Mitochondrial diseases with clinical phenotype are developed when themutant and wild-type mtDNA balance is gone. Mitochondrial genome editingcan be a new approach to the treatment of mitochondrial dysfunction which isa key player in the development of numerous diseases. DddA is aninterbacterial toxin that catalyzes the deamination of cytidines withindsDNA. The aim of this study is to edit the mtDNA using the novel methodof DddA. In this study, out of ۸۱ primary articles searched in PubMed andGoogle Scholar databases from ۲۰۱۴ to ۲۰۲۱, ۳۳ articles with the mtDNA,genome editing techniques, DddA, mitochondria, base editor were selectedand studied. DddAtox base editing method using cytidine deaminase toxinhas recently been introduced by Mok et al. to facilitate C-to-T baseconversion in vitro. Split DddAtox nontoxic halves fused to transcriptionactivator-like effector proteins which could be custom-designed to identifypredetermined target DNA sequences form a functional cytosine deaminasewithin the editing window to induce C-to-T base editing at the mark site inmtDNA. Combination of the split-DddA halves, transcription activator-likeeffector array (TALE) proteins, and a uracil glycosylase inhibitor occasionedin RNA-free DddA-derived cytosine base editors (DdCBEs) that catalyze CGto .T-A conversions in human mtDNA with high target specificity andmerchandise purity

کلمات کلیدی:

mtDNA, genome editing techniques, DddA, mitochondria, baseeditor

لینک ثابت مقاله در پایگاه سیویلیکا: