عنوان مقاله:

Advantages and Challenges of CRISPR-Cas۹ Applications in Animal Modeling: A Concise Review

محل انتشار:

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خلاصه مقاله:

CRISPR is an extraordinarily powerful technique regulating any target gene across the genome with promising therapy intentions. CRISPR-Cas۹ is a convenient tool for gene manipulation. Notwithstanding this, the broad consequence of human gene editing, particularly germinal genes, cannot be predicted. Firstly, once edited, the genes would be part of the human population for successive generations and may be impossible to remove from humanity; secondly, success is not guaranteed; thirdly, the fidelity of editing, as it could affect unrelated genes or unspecified segments of DNA; and last but not least, its influence on gene interaction, network, and signaling pathways could be difficult to be predicted. CRISPR-Cas۹ mostly includes precise genome editing, rapidity and cost-effectiveness, creation of disease models, study of gene function, applications in gene therapy and translation research and wide diversity for species. The technique also ignited the moral and ethical concerns of scientific community. Ethics and safety approval for gene modification in human cells is required by the National Institutes of Health (NIH). The NIH does not currently fund studies of CRISPR in human embryos and opposes the CRISPR utilization in germline cells because these alterations would be permanent and heritable. The technology has promised with the most profound implications for cancer therapy. Recent advances in CRISPR-based technology is redefining how cancer is studied and potentially improves anti-cancer therapies. One way to improve the technology is to use machine-learning approaches to comprehending CRISPR errors and predicting more specific edits and repairing outcomes.

کلمات کلیدی:

CRISPR-Cas۹, genome editing, animal modeling, advantages, disadvantages