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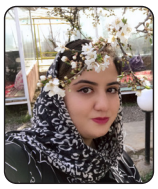
Abstract



Challenges of In vitro Genome Editing with CRISPR/Cas9 and Possible Solutions: A Review

Vida Ebrahimi

Shahid Beheshti University of Medical Sciences, Iran

Abstract:

Microbial production of bio-based ingredients often requires metabolically engineered bacterial strains with the edited genome. Genome editing tools are also essential for gene identification and investigating genotype-phenotype connections. Currently, one of the most common tools of genome editing is based on a natural bacterial adaptive immune system known as CRISPR (Clustered Regularly Interspaced Short Palindromic Repeats)/Cas9 (CRISPR-associated protein 9) due to its simple, rapid, and efficient activities. Although successful in some in vitro systems, its application as an approach of metabolic engineering and genome editing is still not so extensive. Here, we discuss existing barriers and challenges of the CRISPR/Cas9 editing tool for in vitro systems. Firstly, we aim to briefly introduce the CRISPR/Cas9 method as an in vitro gene editing tool. Next, we discuss existing obstacles to CRISPR-based editing in bacterial and in vitro model systems and offer guidelines to help achieve editing in an expanded range of in vitro systems. Keywords: CRISPR/Cas9, Genome editing, Challenges, Bacteria, In vitro model systems.

Biography:

Vida Ebrahimi currently works at the Department of Pharmacognosy and Pharmaceutical Biotechnology, Shahid Beheshti University of Medical Sciences. Vida does research in Cell Biology, Bioinformatics and Biotechnology. Their most recent publication is 'The Effects of Genistein on Renal Oxidative Stress and Inflammation of Ovariectomized Rats'.

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