Advancements in CRISPR-Cas9 Technology for Genome Editing

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Abstract. CRISPR-Cas9 technology has revolutionized genome editing by providing a precise and efficient method for altering genetic sequences. This article reviews recent advancements in CRISPR-Cas9 applications, highlighting innovations in targeting specificity and delivery methods. We discuss the implications of these advancements for therapeutic applications, including the potential for correcting genetic disorders and improving crop resistance. The ethical considerations and challenges associated with CRISPR-Cas9 technology are also addressed.

Keywords: CRISPR-Cas9, Genome editing, Genetic disorders, Targeting specificity, Therapeutic applications

Introduction

The CRISPR-Cas9 system has emerged as a groundbreaking tool for genome editing, enabling precise modifications of genetic sequences across various organisms. Its versatility and efficiency have accelerated research in genetics, biotechnology, and medicine. Recent advancements in CRISPR-Cas9 technology have focused on enhancing targeting specificity and developing novel delivery methods to improve its applicability and safety. In this article, we review the latest innovations in CRISPR-Cas9 applications, exploring their potential to correct genetic disorders, enhance agricultural productivity, and revolutionize therapeutic strategies. We also address the ethical considerations and technical challenges associated with the widespread adoption of this technology. As CRISPR-Cas9 continues to evolve, it holds promise for transforming the landscape of molecular biology and medicine.

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