Special Issue

Next-Generation CRISPR and Immune Modulation: Advancing Precision Genome Editing Therapies for Genetic Disorders

Message from the Guest Editor

The field of precision genome editing for the treatment of genetic diseases has changed considerably over the past decade, as CRISPR technology has evolved from a promising concept to a vital tool in translational medicine. However, some difficulties encompass mosaicism in germline editing (ethically limited) and immune reaction to Cas proteins, originating from bacterial immunity. To overcome these difficulties, some improvements are being made: Anti-CRISPR proteins, found in bacteriophages, are being designed to temporally control Cas activity, reducing off-target effects. Furthermore, machine learning models, trained on extensive genomic data, foresee and avert off-target dangers, leading to safer therapeutic results. In the future, multiplex CRISPR aims to target polygenic diseases such as cardiomyopathy. AI-driven sgRNA design (e.g., DeepCRISPR, 2024 versions) maximizes efficacy, while in utero editing is demonstrating potential in preclinical models for congenital diseases. This Special Issue invites the submission of original articles or comprehensive reviews focusing on CRISPR/ Cas9, genome editing, monogenic disorders, and AI-driven CRISPR.

Guest Editor

Dr. Sukanta Jash

Department of Molecular Biology, Cell Biology and Biochemistry, Warren Alpert Medical School of Brown University, Providence, RI 02903, USA

Deadline for manuscript submissions

31 March 2026

Biomedicines

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Message from the Editor-in-Chief

Biomedicines (ISSN 2227-9059) is an open access journal devoted to all aspects of research on human health and disease, the discovery and characterization of new therapeutic targets, therapeutic strategies, and research of naturally driven biomedicines, pharmaceuticals, and biopharmaceutical products. Topics include pathogenesis mechanisms of diseases, translational medical research, biomaterial in biomedical research, natural bioactive molecules, biologics, vaccines, gene therapies, cell-based therapies, targeted specific antibodies, recombinant therapeutic proteins, nanobiotechnology driven products, targeted therapy, bioimaging, biosensors, biomarkers, and biosimilars. The journal is open for publication of studies conducted at the basic science and preclinical research levels. We invite you to consider submitting your work to Biomedicines, be it original research, review articles, or developing Special Issues of current key topics.

Editor-in-Chief

Prof. Dr. Felipe Fregni
1. Neuromodulation Center and Center for Clinical Research Learning, Spaulding Rehabilitation Hospital and Massachusetts General Hospital, Harvard Medical School, Boston, MA 02114, USA
2. Department of Epidemiology, Harvard T.H. Chan School of Public Health, Boston, MA 02115, USA

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