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Short Communication

Autologous Stem Cell Mediated SARS-Cov-2 RNA Targeting: A New Hope for COVID-19 Treatment

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Coronavirus disease 2019 (COVID-19) caused by SARS-CoV-2 is firstly developed in Wuhan city in China and rapidly spread around the globe causing a potentially fatal highly contagious pandemic disease. Current clinical trials aim to test potential attenuated viral vaccines but the preventative measures are still considered the first line of disease management rather than treatment which relies on viral life cycle suppression with nonspecific antiviral drugs and antimalarial agents [1].

Researchers have found out that some asymptomatic recovered patients of the novel 2019 coronavirus were still testing positive by RT-PCR, suggesting that they may be virus carriers [2]. Therefore, this brief communication aims to share a new strategy to develop an effectively safe drug targeting SARS-CoV-2 genome and may also overcome the disadvantages and adverse effects of attenuated viral vaccines [1].

The demand for a rapid drug delivery system to cope with viral replication has been one of the most challenges facing researchers and scientists. Stem cells alone were used as a management strategy for COVID-19 caused pneumonia with high therapeutic outcomes [2]. Different types of self-renewal stem cells isolated or generated from body organs were used also to correct molecular errors and compensate deficiencies [3,4].

The innovative gene editing tool, Clustered Regularly Interspaced Short Palindromic Repeats associated Cas genes (CRISPR-Cas9), has raised a global hope for successful correction of mutation caused human diseases and is being investigated in many clinical settings (ClinicalTrials.gov: NCT02793856, NCT03044743, NCT03398967, and NCT03081715) [5]. One of its most important advantages is the ability to knockout certain genes or the whole genome at specific sequence regions [6,7].

SARS-CoV-2 is a positive sense single stranded RNA (+ssRNA) virus composed of 29,868 nucleotides encoding 12 viral proteins. Genome sequence had been reported first in January 2020 (Accession no. MN908947.3), followed by many studies with GenBank accession numbers LR757996.1, MN908947.3, MN975262.1, NC_045512.2, MN997409.1, MN985325.1, MN988669.1, MN988668.1, MN994468.1, MN994467.1, MN988713.1, and MN938384.1 [8,9].

Ideally, genome primary sequence assemblies using bioinformatic tools showed no annotation homology between SARS-CoV-2 (Accession no. LR757996.1) and *Homo-sapiens* (Accession no. NC_000001.11, NC_000002.12, NC_000003.12, NC_000004.12, NC_000005.10, NC_000006.12, NC_000007.14, NC_000008.11, NC_000009.12, NC_000010.11, NC_000011.10, NC_000012.12, NC_000013.11, NC_000014.9, NC_000015.10, NC_000016.10, NC_000017.11, NC_000018.10, NC_000019.10, NC_000020.11, NC_000021.9, NC_000022.11, NC_000023.11, NC_000024.10, NC_012920.1), which makes stem cells mediated CRISPR system SARS-CoV-2 gRNA targeting more easier to design and proceed into clinical trials very quickly [10].

This could be aided by SARS-CoV-2 RNA sequence knockout, with methylation, or knockdown by CRISPR system mediated silencing using viral or plasmid CRISPR gRNA construct which is then transfected into an isolated mononuclear stem cells from the patient's peripheral blood or bone marrow [11]. Cord blood stem cell transplantation has also showed significant outcomes in many nonspecific clinical trials [12]. Administration is preferable by parenteral or aerosol routes to facilitate rapid respiratory delivery through gas exchange.

This method is suggesting a permanent deactivation of viral gRNA which subsequently allows for efficient body immune system clearance and maintaining the low risk benefits [13].

Conflict of Interests

Author has no competing or conflict of interest to declare.

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