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News & Comments

SIT &TAT: Combined Medicines to defeat Covid-19

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The coronavirus, which first appeared in Wuhan, China, in 2019, has triggered a global epidemic. This virus, which has the potential to be lethal, was given the term SARS-CoV-2 because its RNA genome has an 82 percent similarity to the SARS coronavirus, which was discovered in 2020. The disease is still spreading rapidly over the world, posing a severe threat to public health. The TAT peptide, which is high in positively charged amino acids, is used as a research tool to increase drug transport and delivery in the cytoplasm.

The efficacy of these anti-COVID-19 drugs can be improved by combining them with TAT peptides. The goal of this study was to assess the efficiency and effectiveness of combining TAT and SIT against SARS-CoV-2 to pave the way for future research that could help eradicate this pandemic virus. No drug or vaccination has been proven effective in treating and curing COVID-19 patients30. As a result, this repurposed medicine may be a great alternative capable of fighting and possibly defeating this pathogen.

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The trials were conducted in the pharmaceutical nanotechnology lab at King Abdul-Aziz University's Faculty of Pharmacy.

Chemicals: Jamjoom Pharmaceuticals (Jeddah, Saudi Arabia) provided SIT, and Chengdu Youngshe Chemical Co., Ltd. provided HIV-1 Trans-Activator Transcription peptide (TAT) (Chengdu Youngshe Chemical Co., Chengdu, China).

The mentioned pattern is used to create SIT-TAT formations. SIT and TAT is mixed in varying quantities in 20 mL of 0.01 M phosphate buffer with varying pH values, then swirled for a few minutes before being dissolved. To evaluate the Zeta potential and particle size, a 1 mL aliquot of mixed solutions was diluted in 10 mL of the same buffer.

Identifying the process and formulation elements that may have an impact on the drug delivery system

is an important aspect of pharmaceutical formulation. In this case, the impact of evaluated components can be investigated simultaneously using factorial design. The effects of the observable factors were evaluated using Analysis of Variance (ANOVA). The projected R2 values for particle size were determined to be 0.9851 in both replies, while the predicted R2 for adjusted values was 0.9405. Furthermore, the R2 of the zeta potential was 0.999, whereas the projected R2 value was 0.9906. Given that appropriate precision, it is possible to conclude that this model can be utilized to explore the experimental design space. All feasible combinations of ingredients were used to create the formulas.

Based on the findings, an optimized SIT-TAT formulation might ensure increased delivery to target cells, improved cellular uptake, and synergistic blockade of the target active site. Further research towards formula optimization against SARS-CoV-2 would be warranted based on the findings reported. This work will aid researchers in identifying important areas of SARS 2 virus resistance that many researchers have been unable to investigate. As a result, a new hypothesis of repurposing SIT or old medications for the treatment of new diseases may have emerged.

JOURNAL REFERENCE

Asfour, H.Z., T.S. Ibrahim, O.A.A. Ahmed, N.A. Alhakamy, U.A. Fahmy and M.W. Al-Rabia, 2022. Sitagliptin combined HIV-TAT as potential therapeutic targeting of SARS-CoV-2 virus. Int. J. Pharmacol., 18: 70-78.

KEYWORDS

SIT & TAT, anti-COVID-19 drugs, TAT peptide, drug efficiency, SARS-CoV-2