

7<sup>th</sup> International Conference on

# PHARMACEUTICS & ADVANCED DRUG DELIVERY SYSTEMS

March 27-28, 2023 | London, UK

Received date: 05-06-2022 | Accepted date: 07-06-2022 | Published date: 03-04-2023

## A network-based approach for drug-repurposing along with its application to sars-covs infection and neurodegenerative diseases

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Drug repositioning (or drug repurposing) represents an effective drug discovery strategy to find new uses from existing drugs out of the scope of their original medical indication, which could shorten the time and reduce the cost compared to de novo drug discovery [1]. In this context, we developed a new network-based algorithm for drug repurposing called SAveRUNNER (Searching off-IAbel dRUg aNd NETwoRk), with the aim to offer a promising framework to efficiently detect putative novel indications for currently marketed drugs against diseases of interest [2,3]. SAveRUNNER predicts drug-disease associations by quantifying the interplay between the drug targets and the disease-associated proteins in the human interactome through the computation of a novel networkbased similarity measure, which prioritizes associations between drugs and diseases located in the same network

neighborhoods. SAveRUNNER was successfully applied to predict off-label drugs to be repositioned against the new human coronavirus (2019-nCoV/SARS-CoV-2), and it achieved high accuracy in the identification of well-known drug indications, thus revealing itself as a powerful tool to rapidly detect potential novel medical indications for various drugs that are worthy of further investigation. More recently, it has been successfully applied to identify candidate repurposable drugs for neurodegenerative diseases such as Amyotrophic lateral sclerosis (ALS) [4] and Multiple Sclerosis (MS) [5]. By prioritizing the network-predicted drugs according to the decreasing value of their network similarity with ALS and MS, SAveRUNNER highlighted some interesting drugs related to histamine pathways, worthy of further investigation.

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