UNIVERSITÀ DI PARMA

DIPARTIMENTO DI SCIENZE MATEMATICHE, FISICHE E INFORMATICHE

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Seminario ON-LINE

Dott.ssa **Giulia Fiscon**
Sapienza Università di Roma

Mercoledì 7 dicembre 2022
ore **8:30—10:30**

Join to the meeting

A network-based algorithm for identifying drug-repurposing opportunities along with its application to complex diseases

Il link alla riunione Teams disponibile alla pagina http://smfi.unipr.it

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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 a reduce the cost compared to de novo drug discovery [Pushpakom et al. 2019] .
In this context, we developed a new network-based algorithm for drug repurposing called SAveRUNNER (Searching off-lAbel 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 [Fiscon&Paci 2021; Fiscon et al. 2021] . 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 network-based similarity measure, which prioritizes associations between drugs and diseases located in the same network neighbourhoods. 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 Alzheimer's Disease (AD) [Fiscon et al. 2022], Amyotrophic Lateral Sclerosis (ALS) [Fiscon et al. 2021] , Multiple Sclerosis (MS) [Amadio et al. 2022]. 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. This tool has been developed in R and its source code is freely available at https://github.com/sportingCode/SAveRUNNER.git, along with a comprehensive user guide.

Keywords: Network Medicine, Drug Repurposing, COVID-19/SARS-CoV-2, Multiple Sclerosis, Amyotrophic lateral sclerosis, Alzheimer's Disease.