A plug-and-play solution to bring network exploration and drug repurposing to biomedical web platforms

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Abstract

Heterogeneous biological networks are an efficient way to represent interaction systems of biomedical entities such as disease modules or drug-protein interactomes. Online resources for multi-omics analyses and other biomedical tools have to either develop a suitable network representation for their results or to omit this feature. This results in a large variety of custom solutions of different quality for network visualization and network-enhanced drug repurposing prediction. We developed Drugst.One, a customizable plug-and-play solution for biomedical web-application developers in need of a feature-rich network explorer closing the gap between gene sets or modules and drugs. Drugst.One integrates multiple databases to complement visualized data, and network algorithms for drug target identification and drug repurposing analyses. Given lists of genes, proteins or small networks, Drugst.One instantly enriches the input with biomedical information such as protein-,drug-protein interactions, and disease associations. Network algorithms enable users to conduct follow-up analyses by connecting scattered proteins, by identifying additional drug targets as well as by ranking drugs regarding their repurposing potential. The lightweight and fully customizable plug-in can be integrated into any web application with just a few lines of code that developers can generate even automatically using the Drugst.One web code generator. Its components and functions are adjustable to fit the host web pages' purpose and style. "Drugst.One" buttons allow the integration into any existing network analysis web tool without the need to integrate the plugin into the website. Drugst.One is available at https://drugst.one/ and as a python package at https://pypi.org/project/drugstone/.

Keywords

Drug Repurposing, Web Development, Web Application, Biomedical Network Exploration, Heterogeneous Networks, Biomedical Data Analysis, Data Visualisation