

[P8] Drug Targetor – Prioritizing Drugs and Targets Using Genetics

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New results from genomics could help drug discovery and repurposing. Genome-wide association studies (GWASs) have shown their ability to identify drug targets - such as dopamine receptor D2, the main target of antipsychotics, significant in schizophrenia GWASs.[1,2] International consortia have unraveled genes of interest in hundreds of phenotypes, such as psychiatric disorders, cardiovascular diseases or metabolite levels. New statistical techniques have been developed to impute expression levels in different tissues (transcriptome-wide association study or TWAS)[3] or to analyze sets of genes for association with a phenotype[4].

However, using this heterogeneous data to prioritize drugs and drug targets is non-trivial. Here, we present Drug Targetor (drugtargetor.com, v1.0 beta), a web app to visualize phenotype-dependent bipartite drug/target networks. The app orders drugs and targets by GWAS association for a specific phenotype or disorder, connects drugs and targets/genes by type of drug/target or drug/gene interaction, and helps to visualize predicted expression changes in tissues. To build this tool, we collected and curated GWAS summary statistics for over 500 phenotypes, used MetaXcan[3] and MAGMA[4] to perform TWAS and pathway analysis, and mined drug/target interactions from various databases (e.g. ChEMBL[5] and DSigDB[6] gene-expression signatures).

Drug Targetor is a visualization tool that could provide a better understanding of drug mechanisms for a phenotype of interest, such as diabetes or bipolar disorder. Regularly updated, it is an interface to visualize results from genetics and to identify drugs that might have an effect on a phenotype.

Bibliography:

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