Predicting Potential Drugs to Reverse Diabetic Nephropathy Using L1000 Data

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Abstract:
Diabetic nephropathy is characterized as a progressive kidney disease caused by diabetes. In this project we extracted from public databases, and then analyzed, 27 gene expression signatures from published diabetic nephropathy studies. Through enrichment analysis and data visualization methods, specifically utilizing the software tools L1000CDS^2 and GEN3VA, we identified small molecules that are predicted to potentially reverse the disease state. Random gene lists were formulated and run through L1000CDS^2 to create a background distribution of expected probabilities for the different drugs. P-values were calculated for each drug to further prioritize the predictions. After examining the results for all signatures, the top five most consistent drugs were selected for experimental validation that will be carried out in mice.

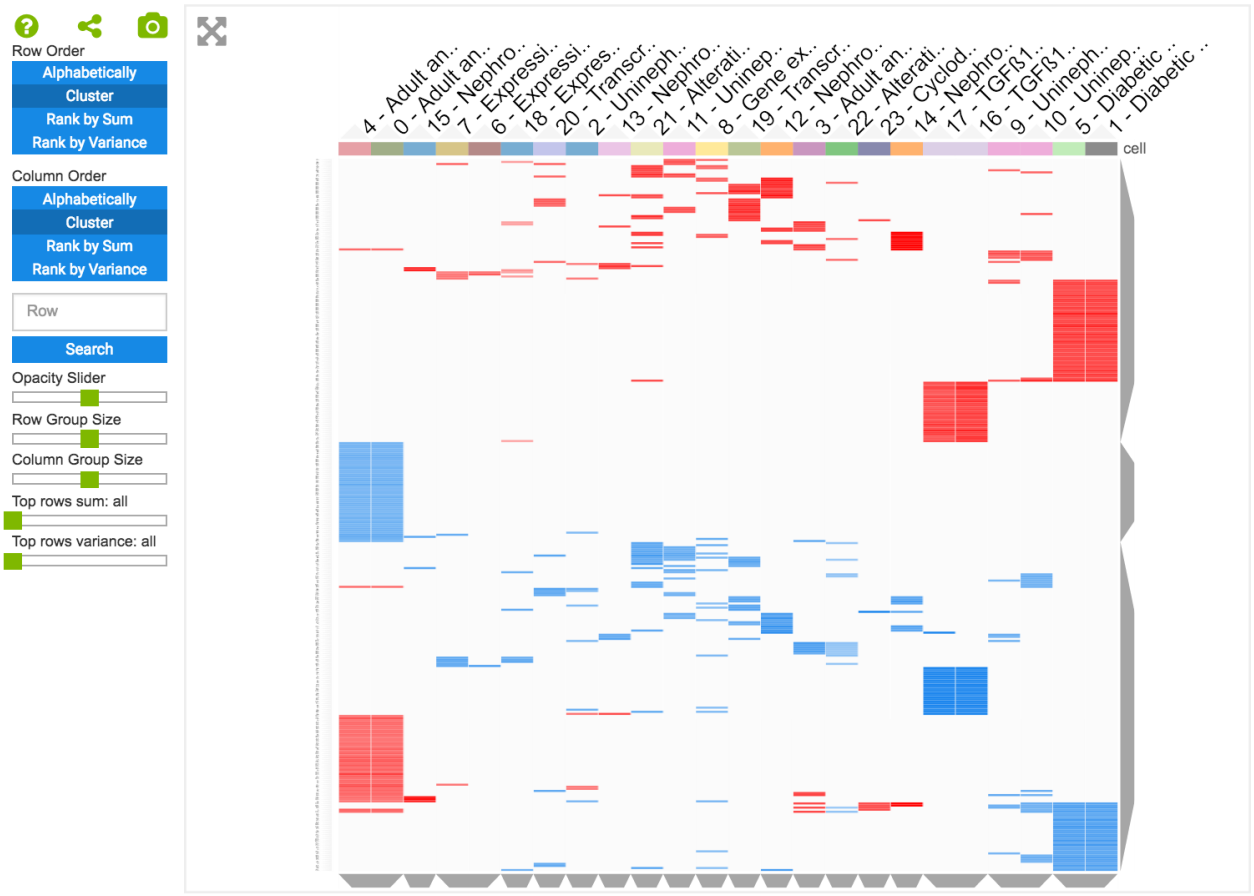

Fig. 1: Screenshot from the visualization of drugs that are predicted to mimic (red) or reverse (blue) the 27 diabetic nephropathy signatures.