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CG-TARGET Interpretation of Chemical-Genetic Interaction Profiles

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Molecular Targets of Compounds Prediction

CG-TARGET (Chemical-Genetic Translation via A Reference Genetic interaction nETwork) software is a pipeline that uses a genetic interaction network for predicting the molecular target of a compound/mode-of-action from chemical-genetic interaction profiles. Three input datasets (chemical-genetic interaction profiles, reference genetic interaction profiles, and a mapping from the query genes in the reference genetic interaction profiles to biological processes, pathways, or other gene sets of interest) are required, and four distinct steps are involved: 1) a set of resampled profiles is generated; 2) similarity scores are computed between all chemical-genetic interaction profiles (real and resampled) and the reference genetic interaction profiles; 3) these “gene-level” target predictions are aggregated into process-level predictions and the z-score and empirical p-value are computed for each compound-to-process prediction; 4) false discovery rates for these predictions are estimated.

Genetic Interaction Profiles Aid Interpretation of Chemical-Genetic Interactions

While current methods directly interpret chemical-genetic interaction profiles to predict compound modes-of-action, they do not leverage reference genetic interaction profiles. The CG-TARGET software incorporates genetic interaction profiles into the process of interpreting chemical-genetic interaction profiles obtained from large-scale chemical-genomic screens.

Genetic interactions enable the prediction of mode-of-action at the process or pathway level from chemical-genetic interaction screens. This unique computational target prediction pipeline also includes appropriate statistical measures to assess significance of the predictions and correct for the large number of hypothesis tests when performing large-scale chemical genomic screens.

BENEFITS AND FEATURES:

- Uses a genetic interaction network for predicting the molecular target of a compound from chemical-genetic interaction profiles

- Predicts mode-of-action at the process or pathway level from chemical-genetic interaction screens
- Statistical measures assess significance of predictions and correct for large numbers of hypothesis tests

APPLICATIONS:

- Chemical/pharmaceutical companies who perform chemical genomic experiments to determine compounds' modes-of-action.
- Predicting the molecular target of a compound from its chemical-genetic interaction profile

Phase of Development Working prototype

Researchers

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