UNIVERSITY OF MINNESOTA
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BEAN-Counter Quantitative Scoring of Chemical-Genetic Interactions

Chemical Genomics Barcode Sequencing

BEAN-counter (Barcoded Experiment Analysis from Next-generation sequencing) software is a pipeline for quantitative scoring of chemical-genetic interactions from sequencing-based chemical-genetic interaction screens. It provides a complete toolset for processing multiplexed sequencing data from barcoded mutant pools into chemical-genetic interaction profiles, based on these basic inputs: 1) sequences of multiplexed, pooled PCR products amplified from barcoded strain pools; 2) a mapping from the barcode sequences to the strain identities; and 3) a mapping from the index (multiplex) tags to the identities of the chemical conditions. In addition, post-processing normalization steps perform quality control corrections for biases and effects observable in large-scale chemical genomic screens.

Chemical-Genetic Interaction Scoring and Post-processing

BEAN-counter is a unique tool that implements both the scoring and post-processing steps in a single package. It is a full-featured pipeline that not only converts the raw data into chemical-genetic interaction scores but also performs well at scale and implements, featuring: 1) quality control checks on the strains and conditions; 2) normalization steps to remove technical artifacts and systematic biases especially visible in large-scale screens; and 3) methods to visualize the data at every step during its processing. BEAN-counter computes chemical-genetic interaction z-scores based on estimates of the standard deviation as a function of observed strain abundance.

BENEFITS AND FEATURES:

- Quantitative scoring of chemical-genetic interactions from sequencing-based chemical-genetic interaction screens
- Corrects for biases and effects observable in large-scale chemical genomic screens
- Provides scoring and post-processing in a single package
- Computes chemical-genetic interaction z-scores

APPLICATIONS:

- Chemical/pharmaceutical companies who perform chemical genomic experiments to determine compounds' modes-of-action.
- Processing raw data from chemical genomic experiments

Phase of Development Working prototype

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