Researchers develop reproducibility score for SNPs associated with human disease in GWAS

October 8 2014

To reduce false positives when identifying genetic variations associated with human disease through genome-wide association studies (GWAS), Dartmouth researchers have identified nine traits that are not dependent on P values to predict single nucleotide polymorphisms (SNP) reproducibility as reported in *Human Genetics* on October 2, 2014.

Reproducibility rates of SNPs based solely on P values is low. Dartmouth authors' analysis of GWAS studies published in Nature Genetics showed a 1-5 percent replication rate.

"It is important to improve our ability to select SNPs for validation using a formalized process. In this paper, we propose a combination of traits that improve replication success," said first author Ivan P. Gorlov, PhD, DSC, associate professor of Community and Family Medicine, Geisel School of Medicine at Dartmouth.

The team assigned a value of zero or one to nine different predictors. To compute the Replication Score (RS), one totals the individual scores for all significant predictors. The predictors include "Online Mendelian Inheritance in Man" (OMIM, a list of genetically caused diseases), receptors, kinases, growth factors, transcription factors, tissue specific, plasma membrane localization, nuclear localization and conversation index. The authors provided detailed information to construct the RS in supplementary material to the paper.

An RS score is not disease specific but shows the potential for impact on human disease. "The disease-associated genes have something in common," said Gorlov. "And we know what specific characteristics should be present to ensure the SNP is likely to be replicated"

Gorlov says the empirical model can be used to select SNPs for validation and prioritization. "We believe that RS-based SNP prioritization may provide guidance for more targeted and powered approach to detecting the disease-associated SNPs with small effect size," he concluded.

More information: *Human Genetics*, link.springer.com/article/10.1 … 07/s00439-014-1493-6

Provided by The Geisel School of Medicine at Dartmouth

Citation: Researchers develop reproducibility score for SNPs associated with human disease in GWAS (2014, October 8) retrieved 26 April 2024 from https://medicalxpress.com/news/2014-10-score-snps-human-disease-gwas.html