Reviewer's report

Title: Research Prioritization through prediction of future biomedical impact: a position paper

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Reviewer: Matthias Erwin Futschik

Reviewer's report:

In the submitted work, Ganapathiraju and Orii have posed an intriguing question: Can we predict the scientific impact of an interaction between proteins? Whereas many studies have addressed the importance of proteins and interactions within a network context, the attempt to predict, whether or not the discovery of an interaction will evoke follow-up research, is novel. As a measure of impact of an interaction, the authors have used citations recorded for the publication linked to this interaction.

Notably, the authors showed that the impact can be predict using a set of network features (i.e. without any additional information regarding the function of proteins), although the accuracy of this prediction remains low. In fact, it is somewhat surprised that there has not been a stronger correlation detected with basic features such as the number of interaction that proteins have. Although the final accuracy remains limited, the work have addressed an interesting task and outlined a procedure how this can be tackled.

Major Compulsory Revisions:

1. The authors used a PPI network which present the knowledge of today to assess the accuracy of their method. However, a more realistic set up would be to use a network which presents the knowledge at the point of time when a PPI was discovered, as such a discovery could lead to research activity and the identification of new interactions in the context of the interacting proteins. Thus, the identification of a PPI itself might lead to a change of local network features over time which might bias the approach that the authors took. In principle, the use of older version of the human interactome should be possible as both HPRD and BioGRID are versioned. Such procedure would present a more faithful assessment of the performance of the method.

2. Table 4 seems to contain several errors. For example, PCM1 - KIAA0368 refers to Pubmed 16189514, which is a large Y2H screen. The authors however noted that the excluded such publications and used only one-to-one relationships of interactions and publications. Furthermore, the Pubmed id 12928435 was listed for two interactions, again violating their filtering procedure. The authors need to carefully check this issue.

Minor Essential Revisions

1. The authors simplified their approach by using only interaction which were referenced by one publication. This excludes both publications with many interactions reported and interaction referred to by many publications. The authors may discuss how this exclusion is potentially influencing the performance of their method.

Level of interest: An article of importance in its field

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:

I declare that I have no competing interests.