

Titel:

InterCellar empowers lab-scientists in the exploration and analysis of cellular communication from single-cell transcriptomics

Abstract:

Unprecedented advantages have been offered by single-cell RNA-sequencing in the investigation of gene expression of living organisms, which can now occur at the level of single cells composing the tissue of interest. Many bioinformatics tools have been developed to enlarge possibilities of analysis for this new data type. Among them, computational models are able to predict the occurrence of cell-to-cell communication mediated by ligand-receptor interactions. Due to the complexity of the results, further analysis and exploration require the aid of computational tools to visualize, annotate and interpret the predicted communication. In order to foster the collaboration between computer-scientists and lab-scientists we developed InterCellar, an interactive web-based tool that allows downstream analysis of the predicted communication, with no programming skills required. InterCellar guides the analyst in the biological interpretation of cell-cell communication by providing interactive visualizations, filtering options and functional annotations of the interacting molecules. Here we present InterCellar's functionalities by analyzing two published single-cell RNA-seq datasets concerning COVID-19 and melanoma. We were able to obtain comprehensive insights on the modalities of cell-cell communication, indicating that InterCellar is a powerful tool for identifying and highlighting previously unknown molecular interactions.

Preprint available at: <https://www.researchsquare.com/article/rs-525466/v1>