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Cross-talk between Brain cancer and Alzheimer's disease

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Statement of the Problem: Different to other cancers, brain tumors deaths are rising, representing 2.6% of all deaths from cancer and kill more children and people under 40 than any other cancers. As an important brain disease, Alzheimer's disease (AD) cause huge healthcare, social and economic problems as well, no cure exists for the AD as well as for brain cancer. Previous studies have evaluated gene expression in these two brain diseases to identify mechanistic processes, some studies revealed that transcriptional signaling pathways inversely regulated in AD and glioblastoma multiform (GBM), meanwhile some studies suggested patients with AD have a higher risk of developing GBM. The inconsistent conclusion may be caused by the limited size of the samples studied.

Methodology & Theoretical Orientation: Systematically studying the entire transcriptome on a big scale may profound potentially novel interactions, common pathways between AD and GBM, and lead to further understanding of their pathophysiology. A novel meta-analysis approach is implemented to identify differentially expressed genes (DEGs) in published datasets comprising GBM and controls, AD and controls. Ingenuity Pathway Analysis is conducted afterward to identify the most perturbed pathways. Protein-protein interaction network analysis is completed to discover the key interactions.

Findings: Significant DEGs are identified in GBM including some novel DEGs, as well as common pathways shared between GBM and AD.

Conclusion & Significance: GBM and AD do share common pathways and DEGs which indicate both diseases may be caused by the same reasons. Further investigates are necessary to confirm the findings which may lead to new treatments for both diseases.

Biography

Dr Xinzhong Li was born in China and completed his educations from Xi'an Jiaotong University, China. Currently, he is a lecturer in biostatistics and bioinformatics at Plymouth University Peninsula Schools of Medicine and Dentistry, UK. He has wide research interests and mainly focuses on biomarker discovery and early diagnosis of diseases, including dementia and cancer. He is the coordinator of EU H2020 Marie Skłodowska-Curie Action AiPBAND project aiming to train 14 PhD students in the field of early diagnosis of brain cancer.

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