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EXPLORING THE PATHOGENETIC ASSOCIATION BETWEEN SCHIZOPHRENIA AND TYPE 2 DIABETES MELLITUS DISEASES BASED ON PATHWAY ANALYSIS

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Accumulated studies indicate that schizophrenia patients are prone to present the type 2 diabetes symptoms, but the potential mechanisms behind their association remain unknown. Here we explored the pathogenetic association between SCZ and T2D based on pathway analysis and protein-protein interaction. To explore the pathway crosstalk, we constructed a pathway-based network including all of those significant pathways. Our results revealed that some pathways are shared by both SCZ and T2D diseases through a number of susceptibility genes. With 382 unique susceptibility proteins for SCZ and T2D, we further built a protein-protein interaction network by extracting their nearest interacting neighbours. Among 2,104 retrieved proteins, 364 of them were found simultaneously interacted with susceptibility proteins of both SCZ and T2D, and proposed as new candidate risk factors for both diseases. Moreover, some proteins were hub proteins with high connectivity and interacted with multiple proteins involved in both diseases.Some of these hub proteins are the components of our identified enriched pathways, including calcium signaling, g-secretase mediated ErbB4 signaling, adipocytokine signaling, insulin signaling, AKT signaling and type II diabetes mellitus pathways. Through the integration of multiple lines of information, we proposed that those signaling pathways, such as AKT signaling, that contain susceptibility genes for both diseases, could be the key pathways to bridge SCZ and T2D. AKT could be one of the important shared components and may play a pivotal role to link both of the pathogenetic processes. Our study provides the general pathway-based view of pathogenetic association between two diseases.

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