Research Progress from a Standardized Human Brain Bank in China

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Abstract:
Human brain banking is one of the keystones for modern neuroscience research and plays a vital role in the discovery and diagnosis neurological diseases. Brain banks are well established in developed countries but have been largely ignored in China until recently. Drafted by a group of domestic and international experts in this field, a standardized operation protocol of human brain banking in China has been published at the end of 2014. Based on this protocol, we have established a human brain bank in Chinese Academy of Medical Sciences & Peking Union Medical College, and collected over 100 human brains (aged 22-100yrs, most with postmortem delay within 24hrs). Sample analysis showed a good quality of DNA, RNA and protein for most of the frozen tissue. We performed a proteomic study in the postmortem human brain tissue from donors without neurological disorders in different age groups, and discovered a series of proteomic changes correlated with aging. Bioinformatics analysis revealed a numbers of proteins involved in the cytoskeletal or electron transport chain were significantly changed in aged brain as compared to the younger groups. However, proteins highly associated with AD such as APP and tau showed no significant change in aged brains. This study demonstrated the feasibility of research based on a standardized human brain bank in China. Our results indicated a series of changes in proteomic profile in aged human brain that may relate to the normal aging process and potentially against age-related neurodegenerative disorders.

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