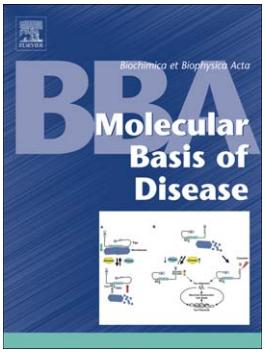

Re-expression of cell cycle markers in aged neurons and muscles: Whether cells should divide or die?

Renu Sharma, Dhiraj Kumar, Niraj Kumar Jha, Saurabh Kumar Jha, Rashmi K Ambasta, Pravir Kumar

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Re-expression of cell cycle markers in aged neurons and muscles: Whether cells should divide or die?

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Abstract

Emerging evidence revealed that abrogated cell cycle entry into highly differentiated mature neurons and muscles is having detrimental consequences in response to cell cycle checkpoints disruption, altered signaling cascades, pathophysiological and external stimuli, for instance, Aβ, Parkin, p-tau, α-synuclein, impairment in TRK, Akt/GSK3β, MAPK/Hsp90, and oxidative stress. These factors, reinitiate undesired cell division by triggering new DNA synthesis, replication, and thus exquisitely forced mature cell to enter intoa disturbed and vulnerable state that often leads to death as reported in many neuro-and myodegenerative disorders. A pertinent question arises how to reverse this unwanted pathophysiological phenomenon is attributed to the usage of cell cycle inhibitors to prevent the degradation of crucial cell cycle arresting proteins, cyclin inhibitors, chaperones and E3 ligases. Herein, we identified the major culprits behind the forceful cell cycle re-entry, elucidated the cyclin re-expression based on disturbed signaling mechanisms in neuromuscular degeneration together with plausible therapeutic strategies.