

UPR and heat shock proteins in neurodegenerative and neurological disorders: From mechanism to therapy and bench to bedside

Current research and evidence states that there are numerous novel overlapping pathways shared by neurodegenerative disorders and diseases like cancer. These diseases are defined by a set of molecular determinants that are either complementarily deregulated, or share remarkably overlapping functional paths. The inter-dependent regulation of brain cancers and neurodegeneration, mediated by intercellular communication between tumor and neuronal cells in the brain through the extracellular microenvironment is necessary in understanding this unique connection. One of such pivotal pillar which plays a huge role in both maladies is unfolded protein response (UPR).

The importance of tight protein quality control is elucidated by neurodegenerative disorders where disturbed neuronal proteostasis causes neuronal dysfunction and loss. This highlights the importance of protein quality control in the neuronal endomembrane system, to which the unfolded protein response (UPR) is instrumental. Hence, UPR signalling is vital in normal functioning and a malfunction in such mechanisms leads to development of neurodegenerative disorders. On the other hand, UPR alongside heat shock proteins play a key role not only in protein homeostasis but also in inflammation and diseases progression. Hence, the current special issue focuses on key elements and mechanisms interrelating UPR in neurological disorders which includes but not limited to therapeutics, clinical implications and underlying mechanisms.

The research subtopics of the current theme include:

1. Unraveling mechanisms for UPR and brain cancers.
2. Link between neurological cancers and neurodegenerative disorders- the nexus.
3. UPR and neurological inflammation.
4. Involvement of heat shock proteins in the progression of neurological disorders.
5. Clinical studies involving UPR and neurological disorders.
6. Utilization of herbal isolates or bioactive compounds in impeding the progression of neurological disorders utilizing UPR or stress pathways.
7. Role of food biotechnology advances.

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