The machinery involved in mitochondrial dynamics

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Mitochondria are the primary site of energy production for the cell and as such are essential for cell viability. These organelles are also involved in other processes including apoptosis and calcium homeostasis. Since mitochondria are not created de novo, they require the constant synthesis of mitochondrial- and nuclear-encoded proteins for their biogenesis. Upon their entry into the organelle, proteins must often assemble into elaborate complexes including the oxidative phosphorylation machineries, which also require the synthesis of mtDNA encoded proteins. As mitochondria grow, they divide so that may be inherited by daughter cells following mitosis. Mitochondria also fuse in order to mix their contents. The dynamic nature of mitochondria are also linked to metabolic and disease states, stress and quality control. Fission and fusion is co-ordinated by a group of dynamin related GTPases and adaptor proteins and the precise molecular functions of these proteins are being characterized.