



ABSTRACT

"Mitochondrial Biogenesis in Plants"

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In addition to playing central roles in energy and carbon metabolism, mitochondria are biosynthetic factories for a variety of compounds, a target for various stresses and also play an integral role in stress responses. The control of these processes is achieved in an integrated manner with a variety of other cellular functions that occur in other organelles. Mitochondrial mass and composition varies in a cell specific manner to achieve these various functions in response to internal and external stimuli. Studies in our laboratory are aimed at understanding the molecular components required to regulate mitochondrial function and make mitochondria. Examples of the systems used to study these processes include; seed germination, where mitochondria undergo a rapid transition from metabolically inert organelles to highly metabolically active organelles in a short period of time; mitochondrial responses to stress and the components mediating these responses; and finally functional characterization of the machinery required to make mitochondria. Taken together, the results from these experiments reveal that, not only is mitochondrial function integrated with various cellular processes, but that mitochondrial function plays important signaling roles in defining these processes throughout the cell.