FUNDING PROGRAM FOR NEXT GENERATION WORLD-LEADING RESEARCHERS

Project Title: Understanding molecular basis and physiological roles of mitochondrial membrane dynamics	
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1. Background of research

Mitochondria are dynamic organelles, move in cytoplasm and frequently divide and fuse each other. The mitochondrial fusion and fission are regulated by three types of GTPase proteins, Mfn and Opa1 in fusion, and Drp1 in fission.

2. Research objectives

Mitochondrial morphology is changed in response to cell differentiation or pathological conditions. However, physiological roles of mitochondrial fusion and fission in mammal have been less understood.

3. Research characteristics (incl. originality and creativity)

We had been analyzing both molecular mechanisms and physiological roles of mitochondrial fusion and fission in mammal. We will further analyze the roles of mitochondrial fission using Drp1-deficient mice and cells, and analyze the regulation of the GTPase proteins for detailed understanding of fusion and fission.

4. Anticipated effects and future applications of research

Mitochondria are not only the main source of energy by oxidative phosphorylation, but play central roles in a variety of cellular processes such as lipid metabolism, apoptosis and Ca2+ signaling. Recently, mitochondrial dynamics was known to concerned in neurodegenerations.