Abstract

The evolutionarily conserved mitochondrial Rho (Miro) is a small GTPase belongs to Ras superfamily member with three unique features. It has two GTPase domains, unlike only one found in other small GTPases, and it also has two EF-hand calcium-binding domains, which allow Ca2+-dependent modulation of its activity and functions. Miro has been shown to act as a key player in mitochondrial transport and dynamics. However, whether Miro function regulates major cell biological processes such as cell growth, cell proliferation, cell death and cell differentiation has not yet worked out. In this study, we report that Miro can enhance the overgrowth phenotype associated with CycD/CDK4 overexpression in the adult eye of Drosophila. Moreover, Miro knockdown in fat body cells leads to the increase in fat body cell size, suggesting Miro functions as a negative regulator of cell growth. Furthermore, Miro loss of function cells in larval eye imaginal disc has accelerated proliferation. However, Miro loss of function does not seem to affect other cell biological processes. This study suggests that perturbed mitochondrial dynamics by Miro loss of function can regulate cell growth and consequent proliferation