



Title	Alpha-synuclein elicits glucose uptake and utilization in adipocytes through the Gab1/PI3K/Akt transduction pathway
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博士の専攻分野の名称 博士 (医学)
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医学系研究科病態制御医学専攻
学位論文名 Alpha-synuclein elicits glucose uptake and utilization in
adipocytes through the Gab1/PI3K/Akt transduction pathway
(アルファシヌクレインは Gab1/PI3K/Akt を介して、脂肪細胞での糖取
り込み及び利用を促進する)
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論文内容の要旨

〔目的(Purpose)〕

To describe the function of alpha synuclein (SNCA) in the glucose metabolism

〔方法ならびに成績(Methods/Results)〕

In vitro, treatment of recombinant SNCA activates PI3K/Akt pathway through Gab1 activation, independently of insulin receptor activation, leading to glucose uptake in 3T3-L1 cells. Also in vivo, injection of SNCA activates Gab1-Akt-glucose uptake pathway in adipose tissue and muscle thereby promoting glucose utilization in mice. In addition, SNCA knock-out mice displayed evident alterations in glucose utilization. Interestingly, SNCA exerts its effects mainly through LPAR2 in human and mouse preadipocytes.

〔総括(Conclusion)〕

SNCA has important implications in the glucose metabolism in the adipose and skeletal tissues of the studied organisms.

論文審査の結果の要旨

Insulin is the main glucoregulator that promotes the uptake of glucose by tissues and the subsequent utilization of glucose as an energy source. In this paper, we describe a novel glucoregulator, the alpha-synuclein (SNCA) protein, that has previously been linked to Parkinson's disease. Treatment with recombinant SNCA promotes glucose uptake in vitro in preadipocytes and in vivo in the adipose tissues and skeletal muscles of mice through the LPAR2/Gab1/PI3K/Akt pathway; these effects occur independently of the insulin receptor. This function of SNCA represents a new mechanistic insight that creates novel avenues of research with respect to the process of glucose regulation.

以上の結果は、学術的に非常に有意義な成果であり、学位の授与に値すると考えられる。