EXAMINATION OF REGULATROY MECHANISMS FOR CELL FUNCTIONS BY THE GOLGI APPARATUS

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2004 Fiscal Year Final Research Report Summary

EXAMINATION OF REGULATROY MECHANISMS FOR CELL FUNCTIONS BY THE GOLGI APPARATUS

Research Project

Project/Area Number

15570156

Research Category

Grant-in-Aid for Scientific Research (C)

Allocation Type

Single-year Grants

Section

一般

Research Field

Cell biology

Research Institution

KANAZAWA UNIVERSITY

Principal Investigator

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GOLGI APPARATUS / PHOSPHORYLATION / KINASE / GROWTH SIGNAL

Research Abstract

We have shown that a 277th amino acid residue of GRASP65 (S277) is phosphorylated in interphase cells and the phosphorylation signal is markedly enhanced by the growth factor treatment including EGF. ERK is activated by the EGF induced growth factor signal and the activated ERK phosphorylates S277 directly. We further found that S277 is heavily phosphorylated during M phase and analyzed the molecular mechanism for this up regulation of the phosphorylation. The amino acid sequence around S277 (PGSPG) is well conserved among mammalian CTRASP65 homologues. This sequence is well fitted with the target sequence of cdk1/cyclinB. S277 was strongly phosphorylated by a cytoplasmic extract of M phase cells and this was completely inhibited by roscovitine, a cdk specific inhibitor. S277 was also phosphorylated by an ERK inactive cytoplasmic extract of M phase cells that was prepared in the presence of U0126, a MEK inhibitor. These results strongly suggested that cdk1/cyclinB, and not ERK, is responsible for the phosphorylation of S277 in M phase. Surprisingly, the mitotic entry was strongly inhibited by the microinjection of purified GRASP65 without N-terminal myristoylation (Δm-GRASP65). This was not observed by the microinjection of Δm-GRASP65 in which S277 was changed with alanine. These results suggested that Δm-GRASP65 interact with some cytoplasmic factors and inhibits the mitotic entry. We have found that Plk1 specifically binds to phosphorylated S277 region of GRASP65 and there are some cytoplasmic factors that bind to unphosphorylated S277 region of GRASP65.

Research Products (8 results)

All 2005 2004 2003

All Journal Article

[Journal Article] Convergence of cell cycle regulation and growth factor signals on GRASP65 2005

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[Journal Article] Dynamics of Golgi matrix proteins after a block of ER to Golgi transport 2004

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[Journal Article] Structural Integrity of the Golgi is Temperature Sensitive in Conditional-Lethal Mutants with No Detectable GM130 2003

[Journal Article] Identification of a five-pass transmembrane protein family localizing in the Golgi apparatus and the ER 2003

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