

Functional characterization of phosphorylated RNA polymerase II interacting factors

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2003 Fiscal Year Final Research Report Summary

Functional characterization of phosphorylated RNA polymerase II interacting factors

Research Project

Project/Area Number

14580682

Research Category

Grant-in-Aid for Scientific Research (C)

Allocation Type

Single-year Grants

Section

一般

Research Field

Molecular biology

Research Institution

KANAZAWA UNIVERSITY

Principal Investigator

HIROSE Yutaka KANAZAWA UNIVERSITY, Cancer Research Institute, Assistant Professor, がん研究所, 助手 (00218851)

Project Period (FY)

2002 - 2003

Keywords

gene expression / transcription / mRNA processing / RNA polymerase II / phosphorylation / WW domain / gene knock-out

Research Abstract

Phosphorylation of the carboxy-terminal domain (CTD) of RNA polymerase II largest subunit has important roles both in transcription and in coupling transcription to pre-mRNA processing. To better understand the molecular mechanism in which transcription coordinates with pre-mRNA processing, I have identified and characterized human factors that can directly interact with the phosphorylated CTD (pCTD). Recently I reported a novel human protein PCIF1 as a pCTD interacting factor. To investigate cellular functions of PCIF1, I disrupted the PCIF1 gene in the chicken B-cell line DT40. I have established two independent mutant DT40 cell lines in which all three copies of PCIF1 gene are disrupted by homologous recombination. One clone is a homozygous PCIF1-null mutant and the other is a conditional knock out cell line in which PCIF1 protein is expressed from a chicken PCIF1 cDNA under control of a tetracycline-repressible promoter. Addition of doxycycline to the cells results in depletion of PCIF1 protein within several days but not in growth defect. Thus, chicken PCIF1 is not essential for cell growth. Depletion of PCIF1 in DT40 cells did not significantly affect neither the phosphorylation status of the CTD nor the methylation status of the histone H3 N-terminus region. PCIF1-deficient cells exhibited normal heat shock-response, as measured by inducible expression of heat shock genes.

Research Products (2 results)

All Other
All Publications

[Publications] F.Hong, et al.: "PCIF1, a novel human WW domain-containing protein, interacts with the phosphorylated RNA polymerase II"Biochem.Biophys.Res.Commun.. 301. 378-385 (2003) ▼

[Publications] Y-X.Xu, et al.: "Pin1 modulates the structure and function of human RNA polymerase II"Genes & Development. 17. 2765-2776 (2003) ▼

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