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Expression of protein kinase C (PKC) alpha, delta, epsilon, zeta in primary chick chondrocyte cultures: immunocytochemical study

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SUMMARY

PKC is a family of 12 serine/threonine isoenzymes that plays a pivotal role in signal transduction in a large number of biological processes. In the present work we have investigated the expression of PKC (α, δ, ε, ζ) in chick chondrocyte primary cultures at different differentiation times, i.e. at 48, 55, 62 and 69 days after cell collection from tibiae of 6-day old chick embryos. We would also detect cell differentiation stages towards the osteoblast-like cell phenotype by observing the immunocytochemical expression of the specific osteoblast marker, type I collagen. At the considered culture times, cells exhibeted immunocytochemical positivity for type I collagen, thus showing their differentiation towards the osteoblast-like phenotype. PKC-ζ was the isoenzyme that exhibited the most relevant immunocytochemical expression in all considered culture times, whereas PKC-ε always less expressed in comparison to the other PKC-isoforms. No relevant differences were observed for the immunocytochemical expressions of PKC-α and PKC-δ. On the basis of the immunocytochemical data obtained from the present investigation, we could affirm that PKC-α, -δ, -ε and -ζ may play peculiar roles in the differentiation process of chick chondrocytes towards the osteoblast-like cell phenotype.

INTRODUCTION

Protein kinase C (PKC) is a serine/threonine phosphorylating kinase that constitutes a family of at least 12 isoenzymes interacting intracellularly by phosphorylating specific target proteins (Martelli et al., 1999). The different PKC-isoforms can be divided into three subgroups that require different activators to act substrate phosphorylation: conventional PKCs (α, βI, βII, γ), that require phosphatidylserine (PS), Ca^{++} and diacylglycerol (DAG); novel PKCs (δ, ε, η, θ, μ), that require DAG