

EARLY REPLICATED CHROMATIN DETECTED BY ANTI-ACTIN ANTIBODY IDENTIFIES A NEW EPIGENETIC CHROMATIN MARKER

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We shall describe an evidence for the reversible, cold-dependent detection of the epitope (referred to as epiC), recognized by a canonical monoclonal anti-actin antibody in diploid human fibroblast cell nuclei and mitotic chromosomes. With a help of the detailed 3D confocal and cross correlation analysis along with immunochemical experiments, we shall show that the epiC positivity appears on the newly replicated chromatin domains with some delay (of about 1 h) with respect to their DNA replication and then persists on the newly replicated chromatin until next early G1, during which it disappears. However, while this epiC positivity is detected in the early replicated chromatin domains, it is not found in the late replicating heterochromatin domains either during S phase, or at any other cell cycle phases. The unique spatio-temporal pattern of epiC positivity suggests that some replication-coupled modulation of early replicated chromatin domains, which could be involved in transfer/maintenance of epigenetic information on transcriptionally competent part of genome, is detected. We shall describe the identification of the epiC epitope, that in contrast to the actin epitope, consists of different sequence and represents a new complex epigenetic histone marker. The relevance of epiC marker in the transfer/maintenance of epigenetic information on the transcriptionally competent part of the genome will be discussed.

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