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M Méchali, M Gusse, S Vriz, M Taylor, Y Andéol, J Moreau, J Hourdry, M Leibovici, A Brulfert, G Almouzni (1988 Jul 1)

Proto-oncogenes and embryonic development.

Biochimie : 895-8

Résumé

The role of proto-oncogenes in embryonic development was investigated using one of the most characterized vertebrates, the amphibian Xenopus laevis. Genes which belong to the major proto-oncogene families have been detected in Xenopus genome. The developmental control of the myc gene was assayed using a characterized Xenopus myc probe and specific antibodies. The myc gene is highly expressed as a stable maternal mRNA in oocyte, and an unfertilized egg contains 5 X 10(5)-fold the myc RNA content of a proliferative somatic cell. The myc RNA store is evenly distributed in the oocyte and the egg. Fertilization triggers a post-transcriptional control of the gene and the RNA store is progressively degraded to a constitutive value of 10 to 30 myc RNA copies registered per gastrula embryonic cell. The 62K myc protein is accumulated late in oogenesis. This uncoupling of myc expression and cell proliferation appears as a specific developmental regulation of the myc gene, adapted to the series of rapid cell cleavages occurring after fertilization.

G Almouzni, M Méchali (1988 Mar 1)

Assembly of spaced chromatin promoted by DNA synthesis in extracts from Xenopus eggs.

The EMBO journal : 665-72

Résumé

A cell-free system from Xenopus eggs mimics the reaction occurring at the eukaryotic replicative fork in vivo when chromatin assembly is coupled to complementary strand synthesis of DNA. DNA synthesis on single-stranded circular DNA promotes supercoiling and the replicated molecule sediments as a discrete nucleoprotein complex. Micrococcal nuclease digestion reveals a characteristic pattern of multiples of 200 bp of DNA. The kinetics of chromatin assembly and DNA synthesis are coincident and both processes occur with a rate comparable with chromosomal replication in vivo in early embryos. The DNA synthesis reaction can be uncoupled from the assembly reaction. Thus, titration of chromatin proteins by preincubation of the extract with double-stranded DNA prevents the supercoiling of replicated DNA without affecting the rate of synthesis. In contrast, chromatin assembly performed on unreplicated double-stranded DNA is a slower process as compared with the assembly coupled to DNA synthesis. Supercoiled molecules are detected after 30 min replication whereas at least 2 h are required to observe the first form I DNA with unreplicated double-stranded DNA. Such a system where chromatin assembly is promoted by DNA synthesis should be valuable for studying the interaction of specific factors with DNA during chromatin assembly at the replicative fork.