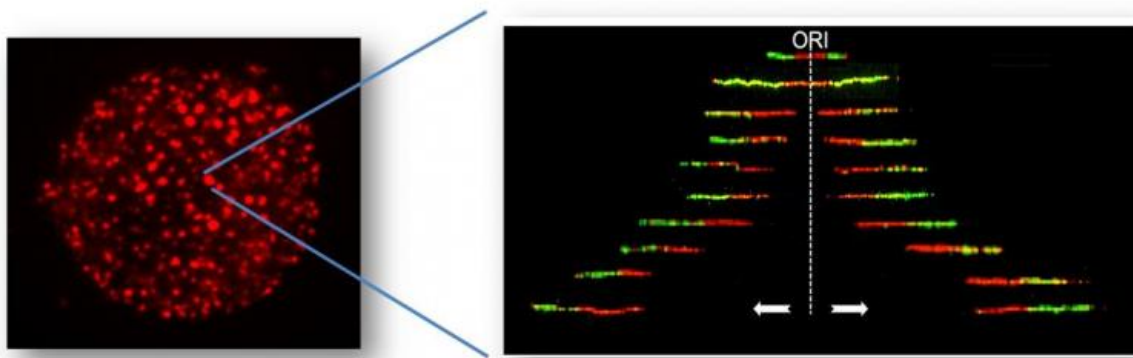


The chromatin environment shapes replication origin organization and defines origin classes

November 12 2015



Microscopy-Mechali : Replication occurs in the nucleus of a cell (left) and can be observed at numerous sites by the presence of foci detected by the incorporation of fluorescent nucleotides (red dots). Within each focus, replication starts from the replication origins and spreads to the right and left of DNA fibers. On the right, two fluorescent nucleotides (green and red) are added one after the other and show the progression of replication. Credit: Slavica Stanojcik and Marcel Méchali

The source of any life involves the duplication (or replication) of DNA, a mechanism that is essential to cell division. A team of biologists has recently performed the most exhaustive analysis to date of thousands of sites (called origins) where this replication of the genome is initiated in

multicellular organisms.

They were able to distinguish three principal categories, reflecting the adaptive capacities of cells. Knowledge of this "origins code" should make it possible to determine any alterations in the event of cancer, or even to develop new tools for gene therapy.

These findings, which mainly result from a collaboration between molecular biologists at the Institut de Génétique Humaine (CNRS) and bioinformatics specialists in the Laboratoire Technologie Avancée pour le Génome et la Clinique (TAGC, Inserm/Aix-Marseille Université), are published on 11 November 2015 in *Genome Research*.



Origins-Mechali: Deciphering the origins code : to initiate its replication, DNA (represented here by a zip) opens up at several sites called replication origins, which exceed 50,000 in the DNA of each cell. These sites are defined by three different code types (featured here in blue, orange and green) that have been deciphered in this study. During replication, each strand of the zip recreates a full zip. The DNA of each cell is thus replicated and shared between two daughter cells. Credit: Adrien Méchali

More information: C. Cayrou et al. The chromatin environment shapes DNA replication origin organization and defines origin classes, *Genome Research* (2015). [DOI: 10.1101/gr.192799.115](https://doi.org/10.1101/gr.192799.115)

Provided by CNRS

Citation: The chromatin environment shapes replication origin organization and defines origin classes (2015, November 12) retrieved 21 June 2024 from <https://phys.org/news/2015-11-chromatin-environment-replication-classes.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.