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Mutation Rates in Cancer Cells Strongly Linked to How Chromatin Is Organized

ScienceDaily (July 26, 2012) — Inside our cells, DNA is packed in a dense structure called chromatin so the cell can replicate, repair any DNA damage during cell division, and control which genes are expressed. Researchers from the Center for Genomic Regulation CRG have found that chromatin has a lot to do with where mutations occur in the genome in cancer cells.

Cancer is considered to be a genetic disease, with its leading cause the various mutations occurring while the genome is duplicated during cell division. Many genetic and epigenetic features have been proposed to influence the rate at which mutations occur along the genome. Researchers from the CRG have found that chromatin organization is the feature most strongly linked with mutation rates, at least in cancer cells.

The researchers studied samples from different types of tissues and with different types of mutations in cancer cells like leukemia, melanoma, small lung cancer and prostate cancer. They obtained the data through open access repositories of genome databases. Since the first genome was sequenced, all genomic data from public funded research are supposed to freely available through these repositories. Among many other interests, one strong point of using data already collected by multiple other scientists is that biases are cancelled out because of the amount of experiments.

The principal investigator, ICREA research professor Ben Lehner, says 'Large-scale experiments such as the cancer genome projects mean that in biology it is now often possible to test an idea using data that has already been generated. The data from these projects can be used by groups worldwide to help us learn about the causes of cancer, but they can also be used to understand some basic problems in genetics such as why some regions of the genome mutate faster than others.'

The study was funded by the European Research Council (ERC), the EU Framework 7 project 4DCellFate, the Ministry of Science and Technology of Spain and Agaur.

Story Source:

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