Line-1 modes of nuclear entrance and retrotransposition

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Authors Jef D. Boeke and Paolo Mita. Credit: Jef D. Boeke and Paolo Mita

In a new *SLAS Discovery* auto-commentary, two authors of an article recently published in *eLife* ("LINE-1 Protein Localization and Functional Dynamics During the Cell Cycle") explain their general views on their novel discoveries and discuss ideas on the relevant new questions generated by their data.

Authors Authors Paolo Mita and Jef D. Boeke employ genetic, biochemistry and imaging techniques to identify, characterize and ultimately employ the biological properties and the interactions of LINE-1 retrotransposons with mammalian cells. They added new pieces to the LINE-1 life-cycle puzzle, demonstrating the importance of the cell cycle in L1 cellular localization, activity, and surprisingly, revealing that the DNA replication complex is a possible new important regulator of LINE-1 activity.

Retrotransposons are retrovirus-like genetic units that are able to expand their copy number within the host genome. LINE-1 is a very relevant member of this class of transposable elements by reason of its activity in human cells. Retrotransposons play a pivotal role in the evolution of the genomes of virtually all organisms, including humans, rewiring the regulatory regions of genomes and providing reinvented genetic material for the evolution of new traits.

More recently, LINE-1 retrotransposons, previously thought to be expressed exclusively in specific stages of germline and embryonic development, are being shown to have unexpected roles in processes such as aging, brain activity, cancer immunology and cancer development. Despite this growing awareness of the relevance of LINE-1 retrotransposons, the basic mechanisms of how LINE-1 lives

and proliferates in human cells are still debated.

More information: Paolo Mita et al, Cycling to Maintain and Improve Fitness: Line-1 Modes of Nuclear Entrance and Retrotransposition, *SLAS DISCOVERY: Advancing Life Sciences R&D* (2018). DOI: 10.1177/2472555218767842

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