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Targeting quadruplex nucleic acids: From chemical biology tools to drug prototypes

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For many years our research efforts have been focused on the design of small molecules for probing nucleic acid structures. Our targets are more specifically tetra helical secondary structures such as G-quadruplexes (G4) that can be found in Guanine-rich regions. These structures are involved in various genomic dysfunctions and may ultimately cause genetic instability related to cancer development. Our primary aim is to provide chemical biology tools for a better understanding of the roles of these structures. Our secondary aim is to evaluate the anticancer therapeutic potential of quadruplex-targeted agents.

A large number of compounds have been developed for targeting quadruplexes, but few display the criteria of selectivity required for in-cell probing. We have contributed to develop the bisquinolinium phenanthroline compounds (PhenDC) that rank amongst the best G4 probes both in terms of affinity and selectivity and which are usable in yeast and mammalian cells. We will give a short overview of recent chemical developments of these agents, of their use for probing quadruplex formation in cells and of their anticancer drug properties.

Speaker Biography

Marie-Paule Teulade-Fichou has completed her first PhD (Pharmacology) in 1984 from D Diderot University and her second PhD (Organic Chemistry) in 1986 from P&M Curie University, Paris. She is the Director of the department "Chemistry Modelling and Imaging for Biology" at the Institut Curie, Orsay, France. Currently she is working as CNRS research Director and leader of the team " Structure and Fluorescence Probes for Nucleic Acids". She has over 180 publications that have been cited over 7000 times and her publication H-index is 45.

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