G-quadruplex DNA Methods and protocols
Peter Baumann (Ed)
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Thanks to the end of several genome sequencing projects it has become a reality the notion that mammal genomes (notably mouse and human) harbor hundreds of thousands of Guanine-quartets which have the potential to interact to form Guanine-quadruplexes, that is to say, non-standard DNA conformation of stabilized planar arrangement of four guanine bases. Then, in very recent years, it becomes clear enought that G-quadruplexes have general functions in Biology, not only at the telomeric ends (where the canonic sequence of TTAGGG is particularly prone to form G-quadruplexes), such as playing roles in processes as different as gene expression, DNA recombination, DNA transcription, mRNA maturation and translation. Furthermore, it is widely accepted that much more has to be discovered as for the physiological role played by this intriguing DNA structure. Peter Baumann preface highlights these points stressing the relevance that in very few years these structures have gained interest within the scientific community both for basic researches (developing methods to detect them and to quantify their presence) and for translational medicine with the possible clinical applications for therapies dedicated to control the oncogenesis progression thanks to their capacity to interfere with trascription factors active in the neoplastic trasformation. Not to forget, following Peter Baumann's preface, the recent application of G-quadruplexes as sensors in nano-technology applications since G-quadruplexes have self-asembling and supramolecular properties that can be exploited. Clearly the book is devoted to highlight all of the current methods to detect, and protocols for current applications, of this new reality in Biology. Thus, fifteen chapters in just one section presents G-quadruplexes basic Biology and their current applications.

Chapter one, by the Editor himself with the collaboration of Tracy M. Bryan, frameworks all other fourteen contributions: from Guanine gels to chemotherapeutics. Personally I was intrigued by the possibility to use advanced cytochemical methods such as the Fluorescence Resonance Energy Transfer (FRET) for the real-time observation of G-quadruplexes dynamics, which have basic cytochemical interests in understanding, just as an example, the mechanisms underlying telomeric-associated diseases.

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