



***Research Doctorate (Ph.D.) in Chemical Sciences
XXXV Ciclo – Academic Year 2019-2020***

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Project Information

1. Research project title

Development of oligonucleotide aptamers conjugated with fluorescent probes for diagnostics and theranostics.

2. Key words

Oligonucleotide aptamers; Fluorescent probes; G-quadruplex; Molecular and conformational characterization; Biosensors.

3. Research project abstract

In order to develop useful biosensors, in this project novel oligonucleotide aptamers, identified against proteic targets that are well known markers for the early detection of tumors and/or inflammations will be studied. These aptamers will be conjugated with ad hoc designed probes able to give marked fluorescence changes in response to the aptamer folding into G-quadruplex (G4) or other peculiar structures - induced by the specific recognition of the target - in a conformation-specific binding process. Various methods for the conjugation of the aptamers with the fluorescent probes will be explored, evaluating different linkers and synthetic strategies. The conjugated aptamers will be characterized from a molecular and conformational point of view and then analyzed in their interaction with the target proteins. The best aptamers will be then tested on several cell lines or biological fluids samples to evaluate their efficacy.