UNIVERSITA' DEGLI STUDI DI PERUGIA

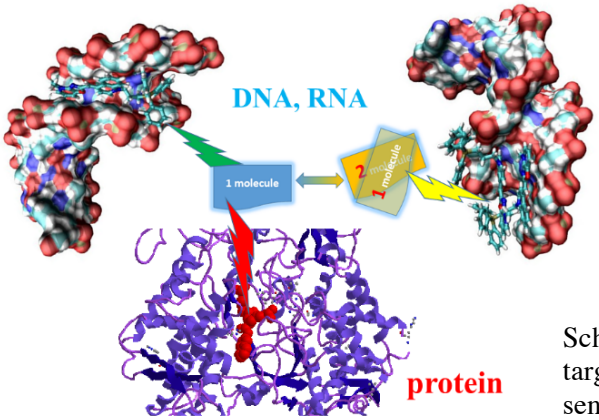
DIPARTIMENTO DI CHIMICA, BIOLOGIA E BIOTECNOLOGIE

AVVISO DI SEMINARIO

Lunedì 21 Ottobre 2019_ Ore 16:00

Aula A_via Elce di Sotto 8, Perugia

Ligands simultaneously targeting various DNA, RNA or proteins: advantages of non-selective affinity combined with selective response



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Scheme 1. Aggregation-prone dye interacting with various targets and reporting interaction with each target by sensitive and bio-applicable spectrometric method.

Ligands targeting DNA, RNA and/or proteins have many biochemical and biomedical applications, whereby one of the most widespread uses is spectrophotometric markers. For instance, fluorescent markers and techniques significantly developed within the last decades and now represent about 70% of the detection enabling technologies used in molecular biology and medicine. However, the design of low molecular weight ligand (Mw<600) for recognition of ds-DNA/RNA sequence or particular protein is very challenging due to a limited number of modifications in such restricted molecule size. Quite often, small modifications in ligand structure lead to a change of target preference, for instance from DNA-targeting to protein-targeting molecule. One of our research interests deals with the generally under-investigated approach: exploitation of intrinsic property of some ligands for aggregation, whereby monomeric and aggregated ligand differ strongly not only in target recognition but also in spectroscopic properties. Thus, one ligand molecule could bind with similar affinity to several targets (DNA, RNA, protein)[1] giving different spectroscopic responses for each target: to some polynucleotide sequence ligand would bind as monomer, to another sequence as dimer, and protein binding site would again result in spectroscopic response differing from DNA/RNA signal (Scheme 1). The ongoing research endeavors to establish for the low molecular weight ligands the structure-activity guidelines for the fine-tuning of DNA - RNA - protein preferences combined with a recognition by a complementary set of sensitive and bio-applicable spectrometric methods (fluorescence and CD/LD spectrophotometry).

Tutti gli interessati sono invitati a partecipare

Anna Spalletti

1. M. Ćehić et al, *J. Biomol. Struct. Dyn.* (2019) doi.org/10.1080/07391102.2019.1664936; T. Šmidlehner et al, *New J. Chem.* 42, (2018), 6655; J. Matić et al, *RSC Advances* **2016**, *6*, 83044; J. Gershberg et al, *Chem. Eur. J.* **2015**, *21*, 7886; I. Crnolatac et al, *Anal. Chim. Acta* **2016**, *940*, 128; L.-M. Tumir et al, *Chem., Eur. J.* **2012**, *18*, 3859.