For many years our research efforts have been focused on the design of structure and fluorescent probes for nucleic acids.\textsuperscript{1,2} In particular we are interested in targeting DNA domains containing base repeats likely to form secondary structures that are involved in dysfunctions related to cancer developments. Our aims are two-folded: i) providing mechanistic tools and imaging probes ii) identifying new anticancer drug candidates.

We will present last developments in this field using two examples of DNA-targeted drugs e.g. phenanthroline derivatives binding quadruplex DNA and triphenylamine derivatives binding minor groove of B-DNA. Synthesis, chemical methodologies for drug labelling\textsuperscript{2} and drug localisation using various imaging microscopies (one and two-photon fluorescence and chemical imaging)\textsuperscript{3,4} will be presented. We will also address in both cases the issues related to drug localisation in live cells.\textsuperscript{5}