

Research Projects

Dr. Wang-Yong Yang

1. Discovery of Small Molecules Selectively Binding to d(CGG)^{exp}

More than 40 neurodegenerative diseases are caused by simple repeat expansions spreading throughout the human genome.

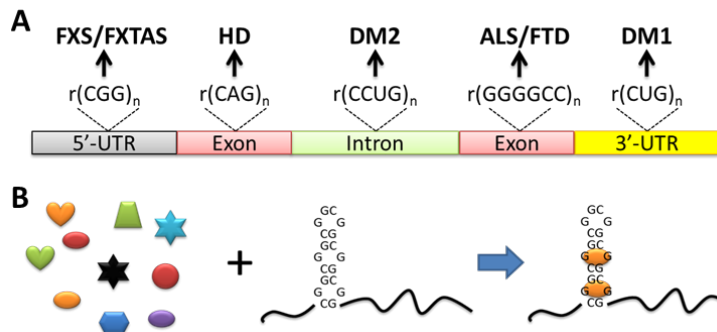


Fig 1. A: Examples of nucleotide repeat expansions related to human diseases. B: Screening of compound library to find a selective binder to d(CGG)^{exp}.

Therefore, of interest in the development of chemical probes of the function of those expanded nucleotide repeats is the use of small molecules to modulate various aspects of disease pathology. Fragile X-associated tremor ataxia syndrome (FXTAS) is an “adult onset” neurodegenerative disorder and it is caused by an expanded (CGG) repeat.

2. Mechanistic Study of DNA Damage by Photoactivated Double-Stranded DNA Cleavers and Their Applications

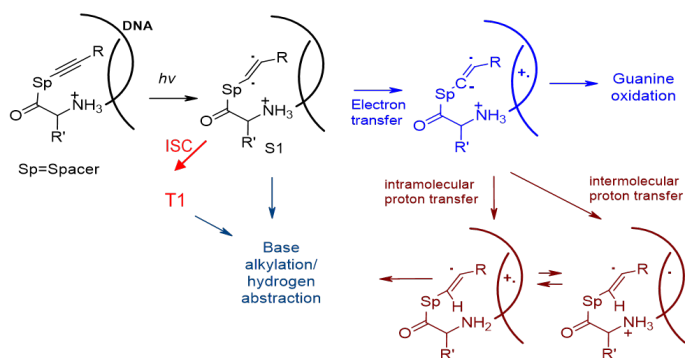


Fig 2. Proposed possible mechanisms for the DNA cleavage by C-lysine conjugates.

Double-stranded (ds) DNA damage is one of the most efficient ways to kill cells. Previously reported light-activated efficient ds DNA cleavers will be tested for possible DNA damage mechanisms such as base alkylation, base oxidation, and hydrogen abstraction. Besides, the DNA cleavers will be applied for the multi-drug resistant bacteria treatment and the cancer treatment.

The student will be expected to enroll in CHEM 4997 in Spring 2021 to prepare for the summer research project.