SYNTHESIS OF A POTENTIAL COMPOUND BASED ON A DIAMINODIPHENYLBUTADIENE TO REPAIR DNA-LESIONS

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The aim of this work is to synthesized a novel molecule containing one of the most abundant DNA-lesions due to direct irradiation, namely cyclobutane pyrimidine dimers (CPD, T_m<>T_m, Fig.1) and a photosensitizer able to generate photoinduced injection of one electron into the CPD that leads to a clean cycloreversion and repairs the damage. This hypothesis was assumed taking into account previous results obtained in our group were we demonstrated that photosensitizers like 3,3´,5,5´-tetramethylbenzidine (λ_{abs} = 330 nm) was able to repair CPD by an electron transfer process.[1]

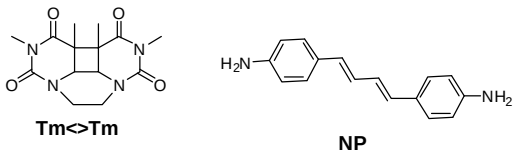

Fig. 1

With this background, we used as precursor a diaminodiphenylbutadiene derivative (NP, Fig.1) which has been reported to generate selectively photo-active electron transfer in biomolecules.[2] The synthesis of the derivative 2NP-T<>T (Fig.2) started with a Wittig reaction and was achieved after 13 steps. The novel compound shows an absorption shifted to the IR (λ_{abs} = 380 nm), what allowed us to avoid UV-spectrum regions where thymines absorb. Its capability to lead to repaired thymines through a photoinduced electron transfer process has been evaluated.

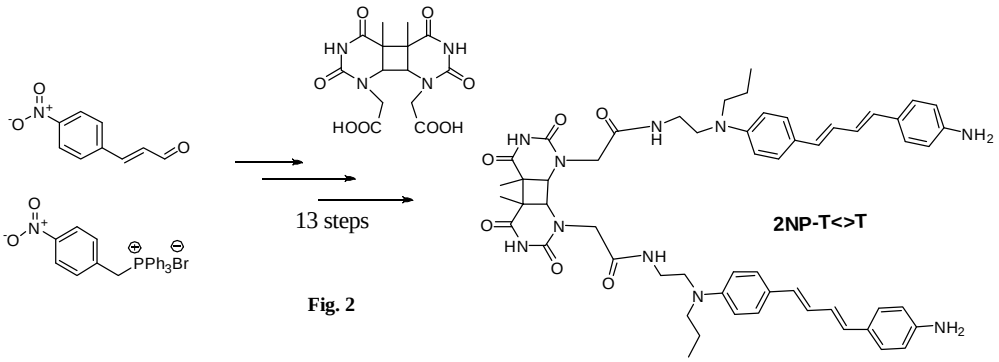

Fig. 2

[1] Fraga-Timiraos, A.B.; Lhiaubet-Vallet, V.; Miranda, M.A. *Angew. Chem. Int. Ed.* **2016**, 55, 6037.

[2] Beaumont, B.; Lambry, J. C; Blanchard-Desce, M.; Martasek, P.; Panda, S.P; van Faassen, E.H.E.; Brochon, J.C.; Deprez, E.; Slama-Schwok, A. *ChemBioChem.* **2009**, 10, 690.