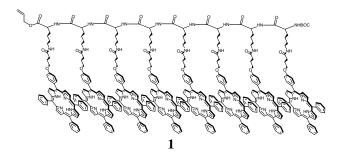
## Towards Multiporphyrinic α-Helices with a Polypeptidic Backbone as System Endowed with Light Harvesting Capabilities.

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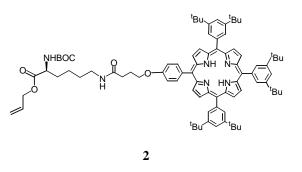
Multiporphyrinic devices attract more and more attention, for the synthesis of artificial light harvesting complexes<sup>1</sup> as well as for the elaboration of photonic and electronic wires.<sup>2</sup> In natural photosynthetic systems, the solar energy is collected by pigment molecules attached to the light harvesting complexes. In these units, the bacteriochlorophylls are held in a favored spacing and orientation by fairly short  $\alpha$ -helical polypeptides.<sup>3</sup> When a photon hits one of the chlorophylls, the absorbed energy spreads extremely rapidly to the others until the reaction center is reached. In this way, the energy contained in a single photon is conducted in a very short time and with minimal loss from the point where it is absorbed to where it is needed.

In order to mimic such systems, porphyrinfunctionalized  $\alpha$ -polypeptides such as the octamer represented below have been prepared.<sup>4</sup>



A polypeptidic backbone was chosen because it seems reasonable to expect, beyond a certain degree of oligomerisation, the establishment of a secondary structure such as  $\alpha$ -helices. Such a conformation, favored by the natural tendency of the porphyrins to aggregate, could induce an overlap of the chromophores, which may thus present sufficient electronic coupling to promote a good exciton migration within the molecular wire. In lower oligomers bearing Zn(II) porphyrins, we intend to take advantage of the axial coordination of the central metal in the porphyrins to force the parallel orientation of the chromophores and hence to favor the desired conformation.

The elaboration of octamer 1 is based on the synthesis of a new porphyrin functionalized amino-acid derived from the L-lysine and represented below (2). The synthesis of this new amino-acid 2 will allow the easy preparation of many analogs of 2 depending on the nature of the metallated porphyrin involved. Such a strategy opens the route to the synthesis of functionalized oligomers in which the sequence of metallated porphyrins can be chosen as desired, and thus to the possible elaboration of new photonic or electronic wires.



Increasing efforts are devoted in our group to these homo- and hetero-peptides<sup>5</sup> bearing a defined sequence of pendant metallated porphyrins, expected to be good candidates as molecular wires endowed with exciton migration or switching capabilities.

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