BIMANE AND CYANINE DYES AS SCAFFOLDS FOR MULTIMODAL IMAGING

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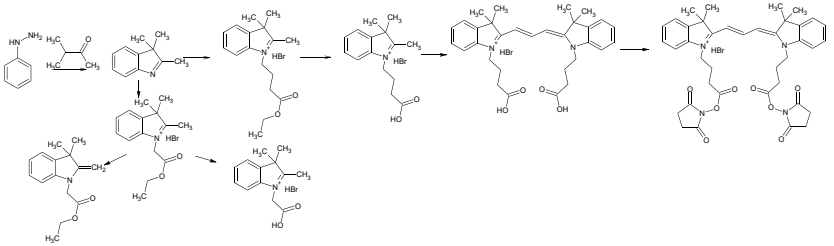
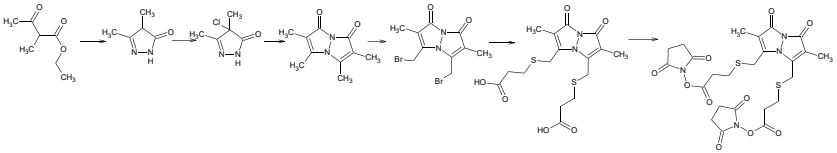
Rapid development of fluorescent dyes for single molecules tracking, both *in vitro* and *in vivo*, requires novel and versatile synthesis methods of fluorescent scaffolds that would accommodate subsequent "decoration" steps. In the present work, we describe several important intermediates steps in the synthesis of dyes. Scheme 1 depicts synthesis of Cyanine 3 (Cy3) with two butanoic acid "arms" and an N-hydroxysuccinamide ester (NHSI). NHSI esters at the end of the arms activate acid functionalities toward free amino groups, thereby highly suitable for subsequent tethering of biologically-relevant moieties. Scheme No. 2 shows the main steps for obtaining a bimane-based platform, namely a bimane thiopropanoic acid [1].



Scheme 1. Transformation scheme for obtaining cyanine dye with an acid tail



Scheme 2. Transformation scheme for obtaining bimane dye with two acid tails and NHSI-ester

These intermediates test as a central part for attaching protein tags and/or additional parts for bimodal imaging of biological processes.

References

1. Petrotchenko, Evgeniy V., et al. "BiPS, a photocleavable, isotopically coded, fluorescent cross-linker for structural proteomics." Molecular & Cellular Proteomics 8.2 (2009): 273-286.