

Structurally optimized tetrazines for rapid biological labeling

Introduction

Bioorthogonal chemical reactions are closely associated with the characteristics of “click” chemistry, occurring with high selectivity and fast reaction kinetics *in vivo*.^{1,2} Consequently, these reactions found use as multipurpose tools for chemical biology. The Inverse-electron-Demand Diels–Alder (**iEDDA**) reaction between tetrazines and strained alkenes is fairly new ligation reaction, which displays **rates 3-7 orders of magnitude faster** than many bioorthogonal reactions.³ High reaction rates, biocompatibility, together with the ability of tetrazines to quench fluorescence of some fluorophores, widely used for fluorescent labeling, and recover it after **iEDDA**

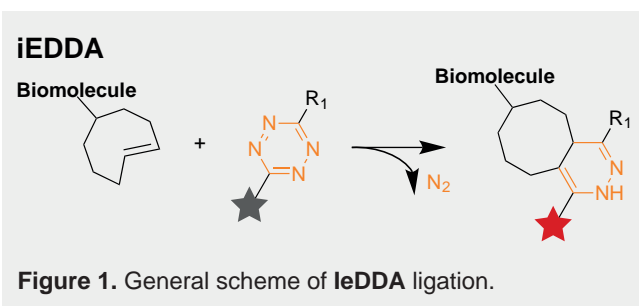


Figure 1. General scheme of **iEDDA** ligation.

reaction (**Figure 1**) make tetrazine derivatives unique and versatile tools for bioorthogonal chemistry. **Figure 2** is showcasing possible approach to modification of commonly used fluorophore as fluorescein (**A**) with tetrazines⁴ and application of tetrazine derivatives in DNA encoded libraries technologies (DELT), as the core scaffolds (**B**).⁵

Application

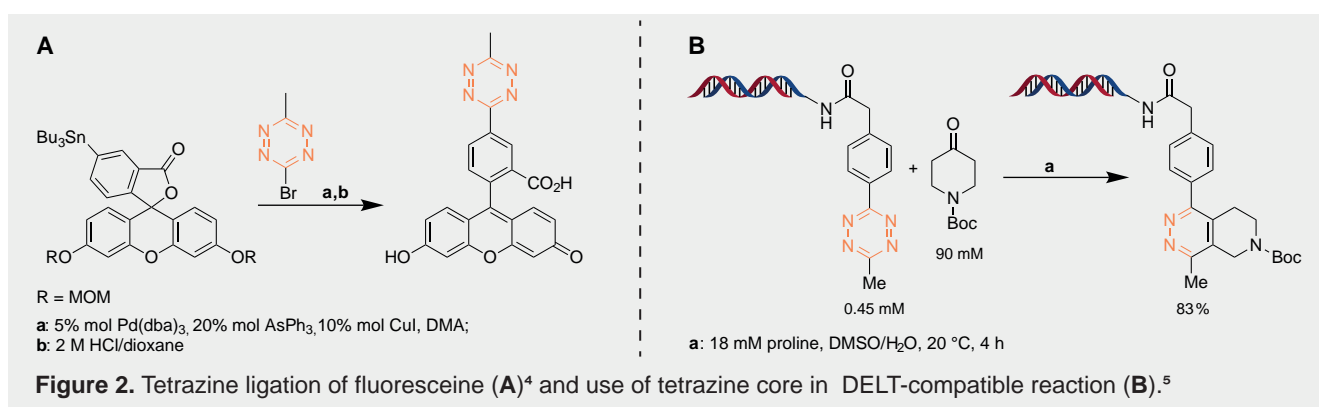
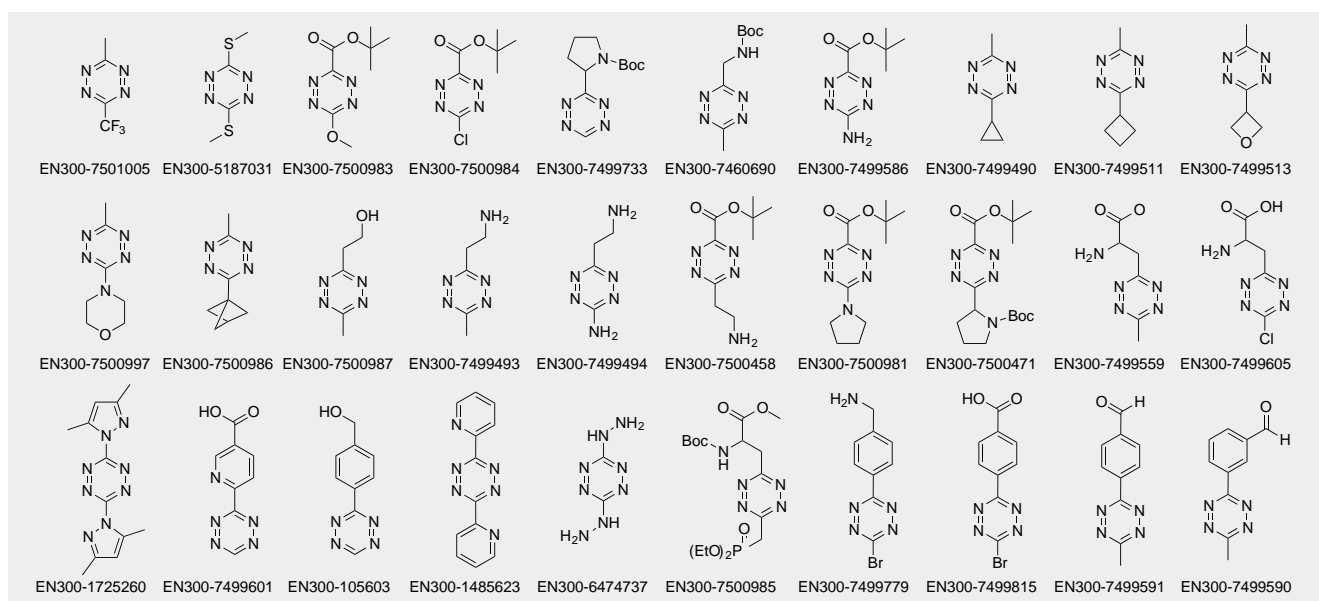


Figure 2. Tetrazine ligation of fluorescein (**A**)⁴ and use of tetrazine core in DELT-compatible reaction (**B**).⁵

We offer herein, we propose a diverse library of tetrazine derivatives, carefully selected to match the widest scope of chemical biology challenges (> 30 compounds in stock). Moreover custom synthesis of tetrazine building blocks is available.



References

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