Synthesis of β-Carboline Derivatives through Deprotolithiation of 2,3-Dibromopyridine

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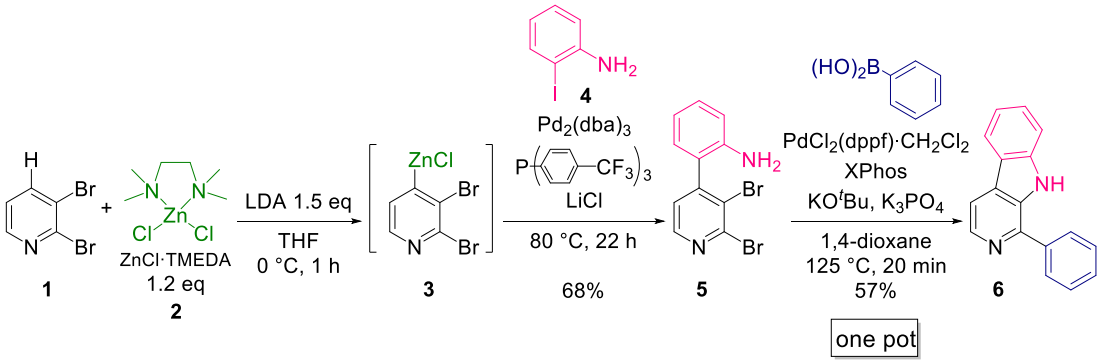
β-Carbolines possessing both an indole and a pyridine are found in pharmaceuticals.[1] Pictet–Spengler reaction of tryptamine followed by oxidation is a useful method to construct the β-carboline skeleton, whereas synthesis of functionalized β-carbolines required six steps from 3-amino-2-chloropyridine.[2] Herein we report a short-step synthesis of functionalized β-carbolines.

A THF solution of 2,3-dibromopyridine (**1**) and $ZnCl_2$·TMEDA (**2**) was treated with LDA at 0 ℃ for 1 h to generate organozinc **3**, which was subjected to Negishi cross coupling with 2-iodoaniline (**4**) to provide 4-aryl-2,3-dibromopyridine **5** in 68% yield. The resultant biaryl compound **5** underwent an intramolecular Buchwald–Hartwig amination and Suzuki–Miyaura cross coupling to give β-carboline derivative **6** bearing a phenyl group in 57% under the heating conditions within 20 min, according to our previous report.[3] The method allowed to construct the β-carboline skeleton and introduce a phenyl group in a single flask. This synthetic route provided a direct access to functionalized β-carboline without additional oxidation step. In this presentation scope of the reactions will be discussed.



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