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Synthesis of fluorescent purine derivatives with *N(9)* amorphousing groups

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Synthesis of substituted triazolyl purines with linkers at *N(9)* position is described. Introduction of electron-donor and electron-acceptor groups in purine ring provide fluorescent properties. Trityl group increases amorphous properties [1], while triethoxysilyl group enables use in organosilica materials. The title compounds exhibit fluorescence with quantum yields up to 97%. The synthesis of fluorescent triazolyl purine nucleosides was reported by our group earlier [2].

Alkylation of **1** with different alcochols using Mitsunobu reaction gave 9-alkylated purines **2**. In reaction of **2** with sodium azide, diazidopurines **3** were obtained. Nucleophilic aromatic substitution was performed on diazide**s 3** with piperidine, yielding compounds **4**. Azides **4** underwent copper-catalyzed 1,3-dipolar cycloaddition reactions with different terminal alkynes yielding compounds **5a-d**. Esterification was performed with deprotected compound **5d** to yield **6e**. Compound **9** was obtained *via* Mitsunobu reaction, followed by 1,3-dipolar cycloaddition yielding **10a-b**.

Compounds **5a-b**, **10a-b**, were tested for fluorescence in films with quantum yield up to 46%. In conclusion, two synthetic routes were designed to obtain *C(6)* and *C(2)* substituted purines, which were then used to yield title compounds, which were tested for their fluorescent properties in solutions and films.

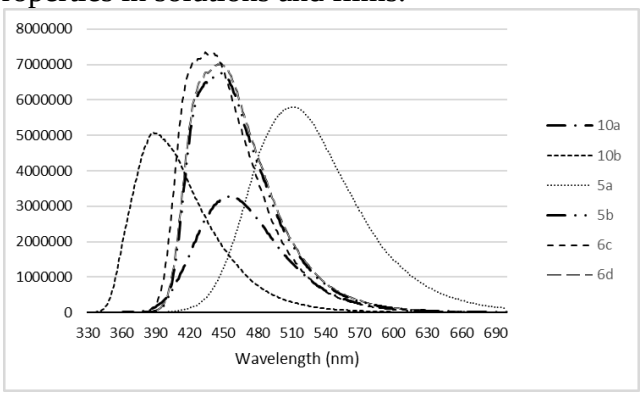

Figure 1. Emission spectra for title compounds **5a-b**, **6c-d**, **10a-b** in DCM.

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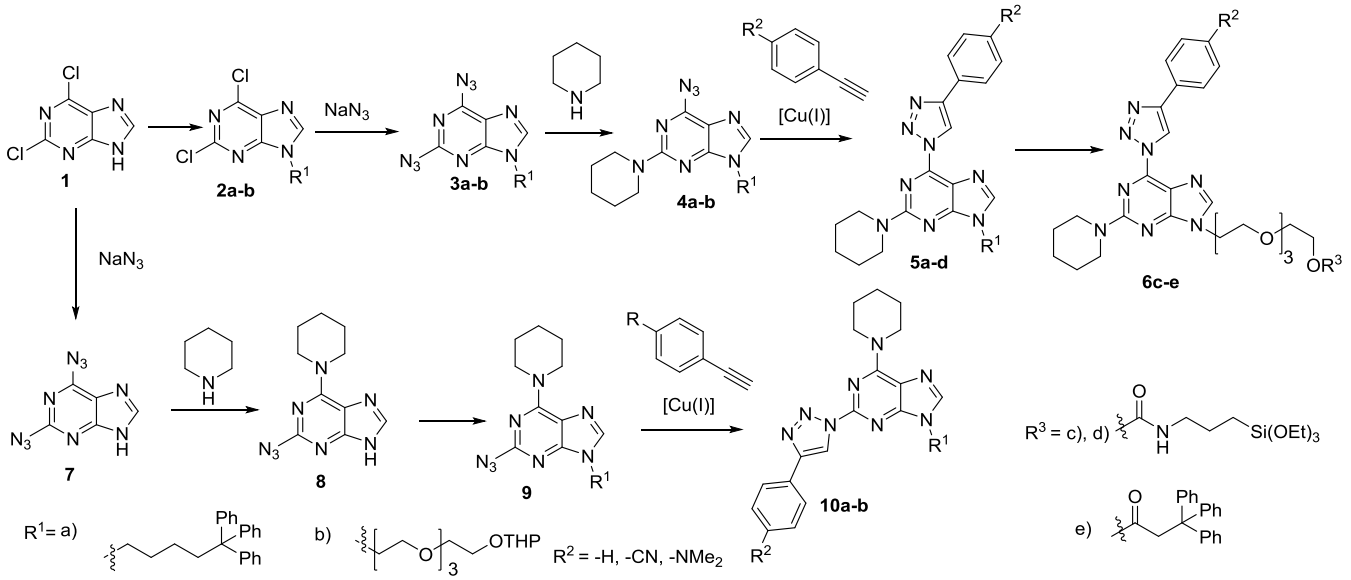

Scheme 1. Synthesis of title compounds.