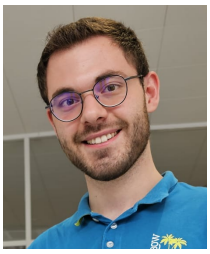

Chemical engineering of luminescent probes for trace amounts of exchangeable copper(II) in biological fluids

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Copper is a trace element found in most living organisms.[1] In biological fluid, such as blood or urine, this element mainly exists as Cu(II) and is always bound to a protein. This binding creates two distinct copper pools: an "inert" Cu-pool which is strongly and inertly associated with the protein, and an "exchangeable" Cu-pool that can be released by competing chelates.[2] This second pool is particularly linked to diseases like Wilson's and Menkes' diseases.[3] However, current methods for detecting exchangeable copper(II) are mostly indirect and lead to underestimations of measurements.[4] Therefore, it is important to develop new direct methods for detecting this cation.

Our research focuses on the synthesis and spectroscopic characterisation of new selective probes for the detection of copper(II) based on BODIPY dyes.[5] In particular, complexation turn-on probes are targeted, which are known for their high sensitivity and are less prone to false positives *in vivo*. The biggest challenge is that copper(II) always tends to quench fluorescence through a controversial mechanism.[6] In this work, we will present the synthesis and the titrations of two probes (Figure 1) that show a turn-on effect upon complexation with Cu(II) in dichloromethane.

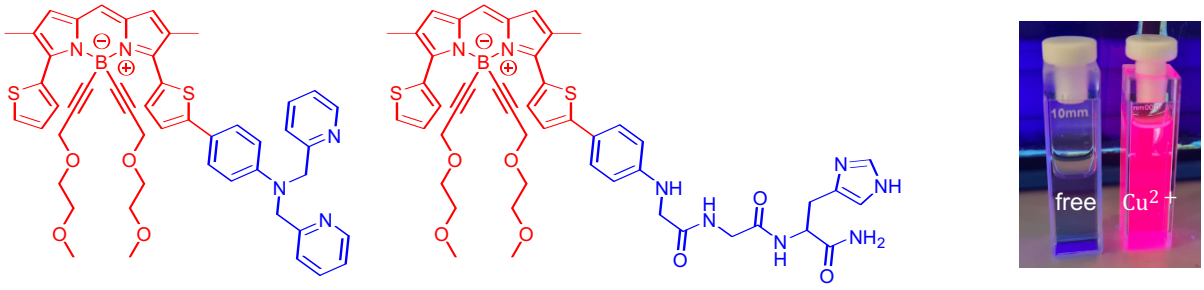

Figure 1: Example of probes synthetized using BODIPY dyes and different chelates.

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