Functionalized gold nanoparticles to detect GHB in aqueous media

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One of the most substantial problems present in our society is the consumption and abuse of drugs. Specifically, the practice of sexual crimes associated with drug use, called Drug-Facilitated Sexual Assault (DFSA) is a big concern. Many different compounds used in DFSA assaults have been identified, but among them γ-hydroxybutyric acid (GHB) is one of the most elusive.[1] Even though GHB presents suitable characteristics to be employed in medicine; it has also been used as an illicit drug because of its euphoriant and aphrodisiac properties. There are two reasons for its use as a rape drug: first, a high dose intake promotes a loss of conscious and second, it is difficult its detection due to its organoleptic properties.[2]
For this reason, we have developed a real time detection probe based on doubly functionalised gold nanoparticles (AuNPs). These AuNPs have been functionalized with a napthoxazole moiety, to recognise the carboxylic group,[3] and a phenanthroline derivate, to interact with the alcohol.[4] Once the double recognition takes place, AuNPs aggregate and a remarkable colour change is observed due to the plasmon band shift, from red to blue.

REFERENCES

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FIGURES

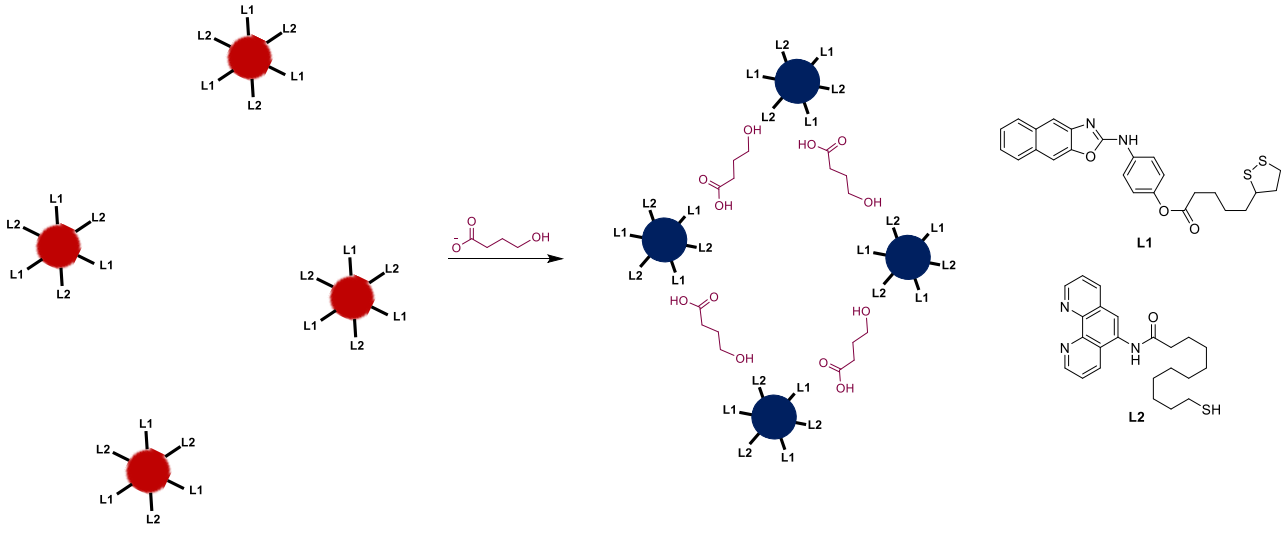

Figure 1: Recognition paradigm based on AuNPs functionalised with **L1** and **L2**

Figure 2: Colour changes observed due to the GHB recognition