Self-assembling 1,8-Naphthalimide-based fluorophores as sensory probes for drugs in water

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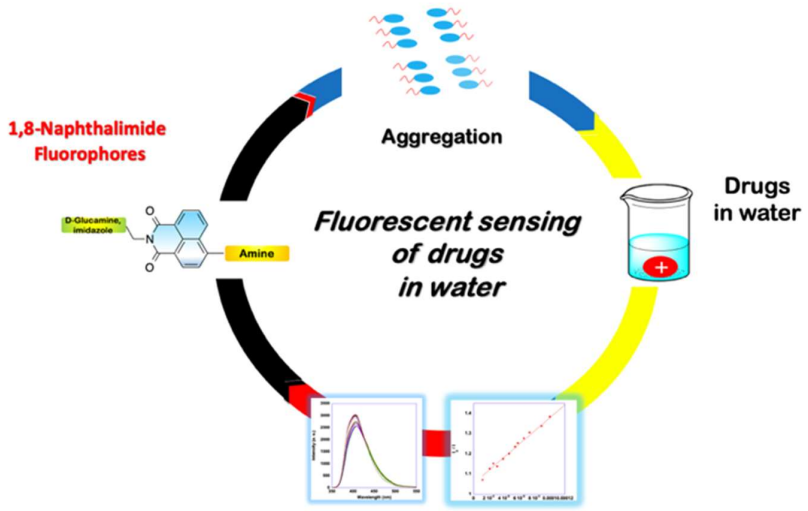
Contrasting pollution of water bodies and environment is a pressing problem, involving the two-fold task of monitoring and removing pollutants. To tackle this issue, fluorescent sensing can combine high sensitivity with low detection limits with fast, on-site response. Among the various systems available, emissive supramolecular aggregates can be used, when the presence of analytes perturbs their emission.[1] In this context, we obtained three 1,8-naphthalimide-based fluorophores differing for the functionalization at both the aromatic core and the amide position.



We firstly investigated their self-assembling ability by concentration- and temperature dependent spectroscopic measurements, finding that in water they form *J*-aggregates showing aggregation induced emission (AIE). Morphology of the aggregates was studied by SEM. Then, we used the fluorophores in the aggregated form as fluorescent sensors in aqueous solutions for drugs of different classes, like diclofenac, ketoprofen, nalidixic acid or carbamazepine, finding good linear response ranges and limits of detection (LOD) within micromolar values. Finally, we evaluated the possibility to embed the best-performing probe on paper strips and a polymer membrane.

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1. Q. Wang, Z. Li, D. Tao, Q. Zhang, P. Zhang, D. Guo, Y. Jiang,; *Chem. Commun.* **2016**, *52*, 12929–12939.