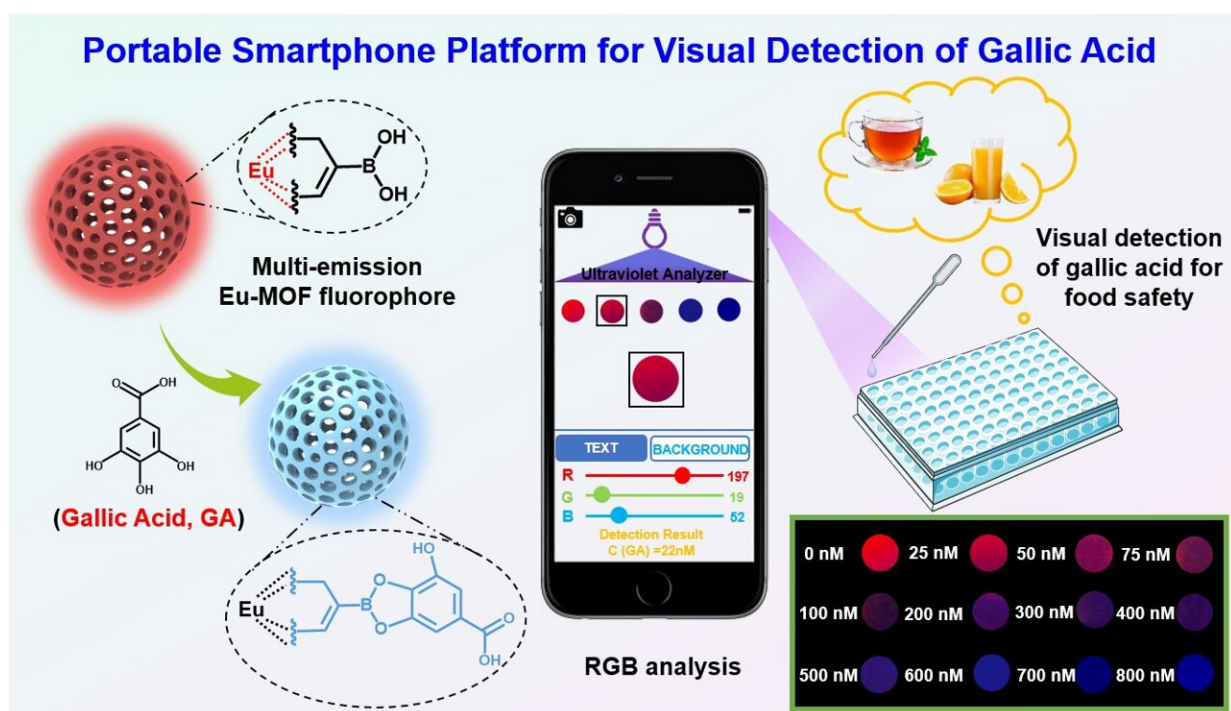


Novel fluorescence sensing platform developed for visual monitoring of food safety

August 9 2022, by Li Yuan



The portable smartphone platform based on the dual-emission Eu-MOF for visual detection of gallic acid in food safety. Credit: Pan Lei

A research team led by Prof. Jiang Changlong from the Institute of Solid State, Hefei Institutes of Physical Science (HFIPS) of the Chinese Academy of Sciences (CAS) has constructed a multi-emitting europium

metal organic framework fluorophore for the visual detection of gallic acid (GA) through a portable sensing platform.

They designed and synthesized dual-emission Europium Metal-Organic Frameworks (Eu-MOF) fluorescent probes through the covalent binding and enrichment of GA in tea and fruit juice.

The study was published in the *Chemical Engineering Journal*.

Gallic acid (GA) has various biological activities due to its reducing properties, and it can be found in green tea, black tea and other plants. It is also widely used in food and health-care products due to its strong antiradical activity and antioxidant effects. The rapid and visual detection of GA is essential for [human health](#) and [quality control](#) in food, drugs and health-care products.

In this study, based on the polymerization of boronic acid-based ligands and europium metal ions, the researchers developed a multi-emission Eu-MOF under single-wavelength excitation for rapid visual detection of GA.

They used a color identifier (a smartphone application) to identify fluorescent probe solutions. The Red-Green-Blue (RGB) value of the color realized the visual detection of GA.

After the introduction of boronic acid groups, Eu-MOF had two emission centers under single-wavelength excitation. When GA was detected, the emission color of Eu-MOF changed from red to blue under a UV lamp, which was caused by a shift in energy transfer efficiency in Eu-MOF.

"This multi-emission Eu-MOF exhibited remarkable luminescence properties, [high sensitivity](#), fast visual response to GA, good dispersion

and low detection limit in detection, which could be used in practical samples such as tea and [fruit juices](#)," said Pan Lei, first author of the study.

More information: Lei Pan et al, A boric acid functional multi-emission metal organic frameworks-based fluorescence sensing platform for visualization of gallic acid, *Chemical Engineering Journal* (2022). DOI: [10.1016/j.cej.2022.138283](https://doi.org/10.1016/j.cej.2022.138283)

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