Electronic Supporting Information

Small Amine-Functionalized Diesel Soot-Derived Onion-like Nanocarbon for Selective Sensing of Glutamic Acid and Imaging Application

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pH, stabilityand ionic stability of f-en-ONC:

The pH-related studies by changing the pH from 3 to 11 have shown the fluorescence intensity first increased and then decreased with the change in pH while moving from acidic to basic conditions. The maximum optimal fluorescence intensity of f-en-ONC has appeared at pH 9 (Figure S1 (a)). The structure of f-en-ONC is relatively complicated, mostly with graphite carbon or amorphous carbon as the main skeleton. The surface is rich in carboxyl, hydroxyl, amide, and amine functional groups that may undergo protonation and deprotonation of basic and acidic groups in the ground or excited states, which could change the property and the rate of transition processes and finally affect the emissive properties of f-en-ONC. Additionally, the f-en-ONC shows good colloidal stability in the presence of Na_2SO_4 and KCl, as shown in Figure S1 (b and c), and didn't observe any precipitation even at high concentrations of the above-mentioned salts.

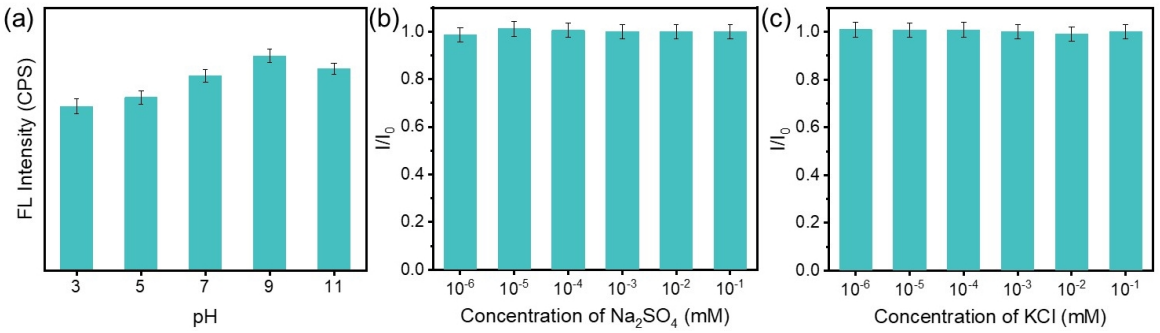

Figure S1:(a) Effect of different pH on fluorescence intensity of f-en-ONC; Fluorescence stability of f-en-ONC in the presence of different concentration of (b) Na_2SO_4 and (c) KCl

Selective sensing of GLA:

The bar graph was plotted for biomolecules and f-en-ONC-biomolecules and the change in I/I_0 was observed for interference study as the emission of f-en-ONC quenches for GLA even in the presence of other interfering biomolecules as shown by **Figure S2.**[1-3]

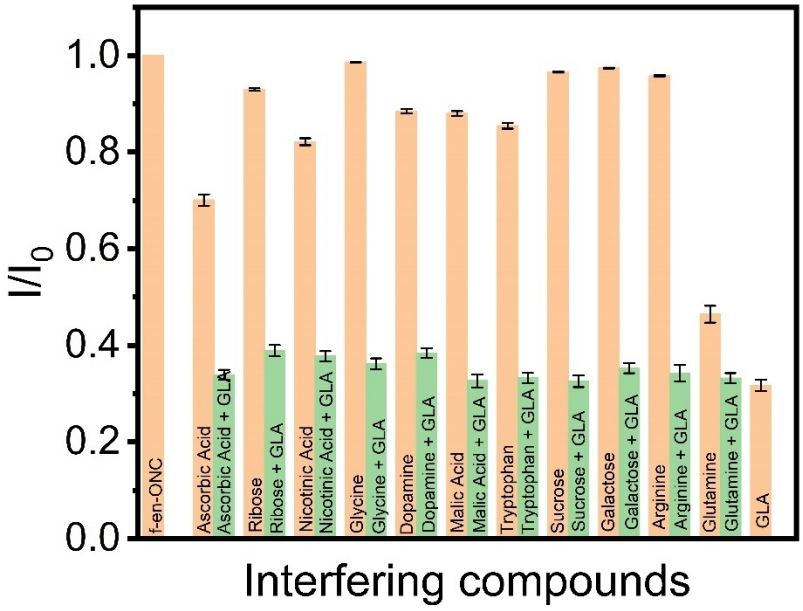

Figure S2: Bar plot for selective sensing of GLA by f-en-ONC at an excitation wavelength of 350 nm.

Interaction between f-en-ONC and f-en-ONC-GLA by FTIR:

Further, the interaction of f-en-ONC with GLA was evidenced by FTIR spectra shown in Figure S3. The comparison spectra of f-en-ONC in the absence and presence of GLA are plotted. In the f-en-ONC-GLA, broadening was observed in the region of 2400- 3600 cm^{-1} corresponding to the –OH and -NH_2 group, which was possibly due to the interaction of several -OH and –NH_2 groups of f-en-ONC with GLA. The peak located at ~1626 cm^{-1} in f-en-ONC-GLA, which corresponds to the C=O stretching of the amide group, appearing at a

lower wavenumber w.r.t f-en-ONC (1633 cm^{-1}), probably due to the interaction of GLA with the amide group present in f-en-ONC. [4,5]

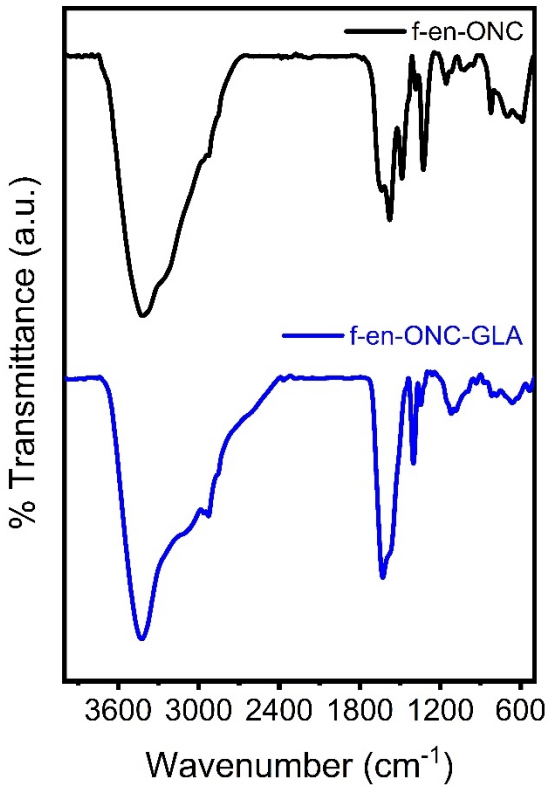

Figure S3: Comparative FTIR spectra of f-en-ONC and f-en-ONC-GLA.

Cytotoxicity Assay of f-en-ONC

A cytotoxicity assay carried out for f-en-ONC against HeLa cells was evaluated as shown in **Figure S4**. The effect of different dosages of f-en-ONC on thegrowth of HeLa cellscan be observed via MTT assay method. The cytotoxicity examinationinvolved the treatment of HeLa cell culture with different concentrations(0.2 mg mL^{-1}, 0.4 mg mL^{-1}, 0.6 mg mL^{-1}, 0.8 mg $mL^{-1}$and 1.0 mg mL^{-1}includingthe control sample (0.0 mg mL^{-1})) of f-en-ONC.Results show that the f-en-ONC is non-toxic up to 1.0 mg/mL, whereas 0.6 mg/mL was used for imaging studies.

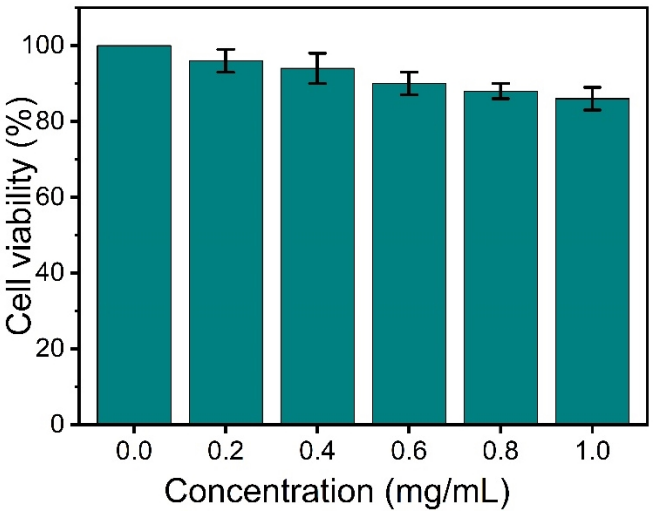

Figure S4: Percent cell viability vs concentration of f-en-ONC plot for the cytotoxicity analysis by MTT assay.

References:

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