Electronic Supplementary Material (ESI) for Journal of Materials Chemistry B.

Supporting Information

Green synthesis of nitrogen-doped carbon dots from konjac flour with "off-on" fluorescence by Fe^{3+} and L-lysine for bioimaging

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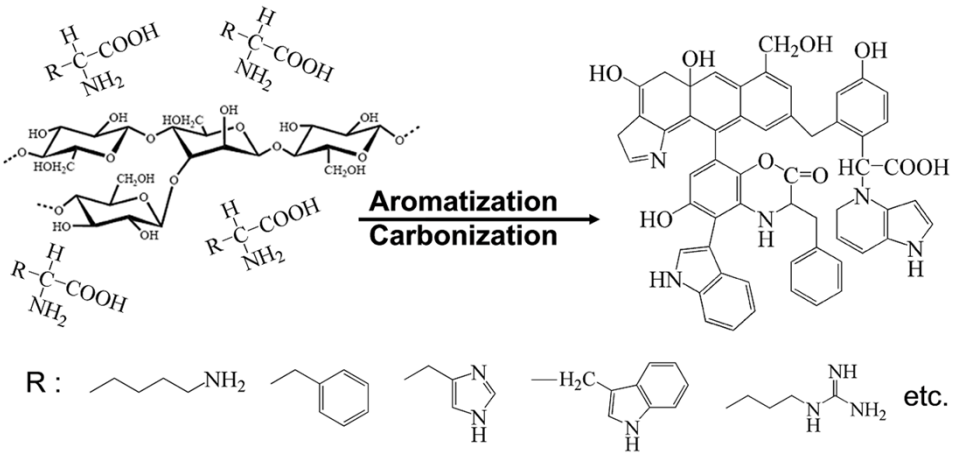

Fig. S1. Possible mechanism of C-N bond formation during pyrolysis of KF.

Table S1 Elemental analysis data of KF.

	Elemental analysis (wt%)		
Sample	C	N	H
KF	24.09	0.68	3.97

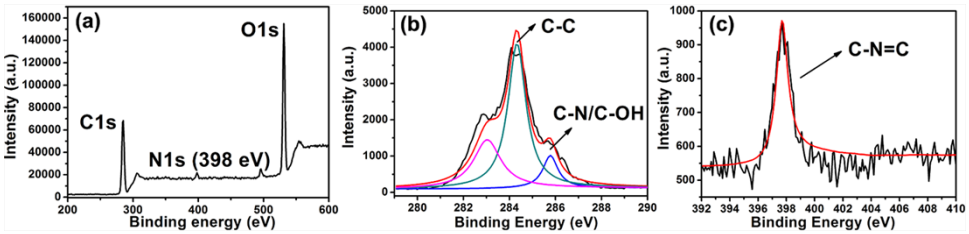

Fig. S2. (a) XPS survey spectrum; XPS (b) C1s and (c) N1s spectra of the pure KF (detected after dialysis of the inorganic salts).

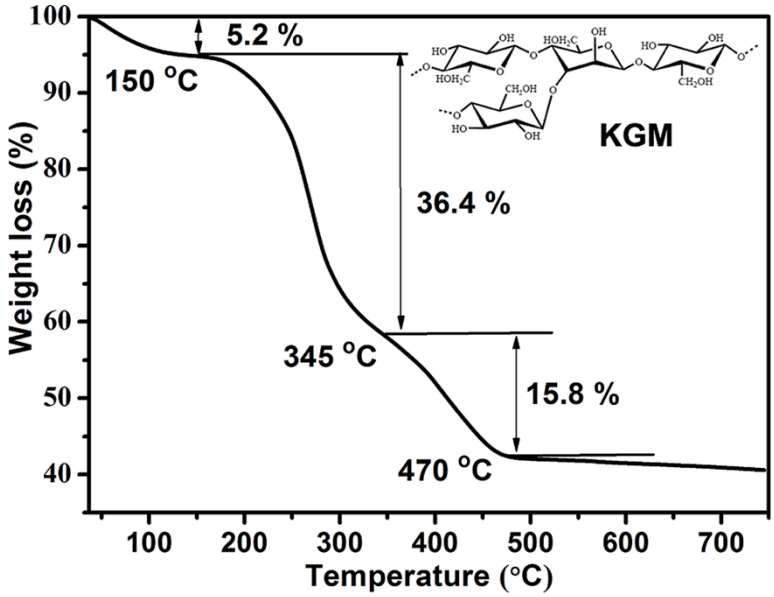

Fig. S3. The thermogravimetric analysis curve of KF in air atmosphere.

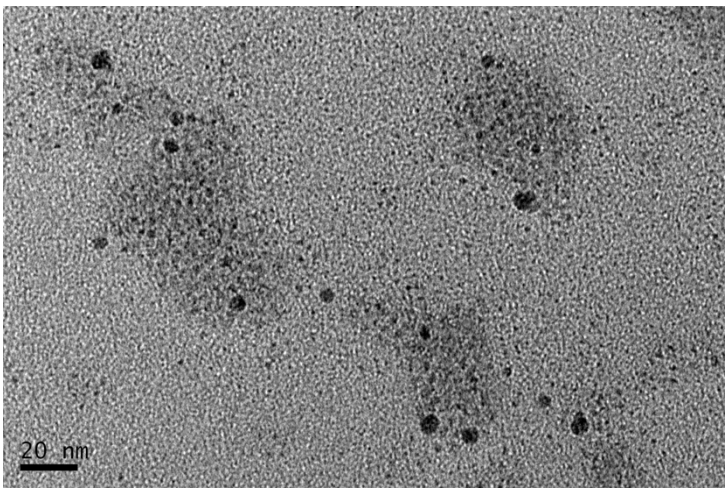

Fig. S4. TEM image of N-CDs obtained by extracting with ethanol solely.

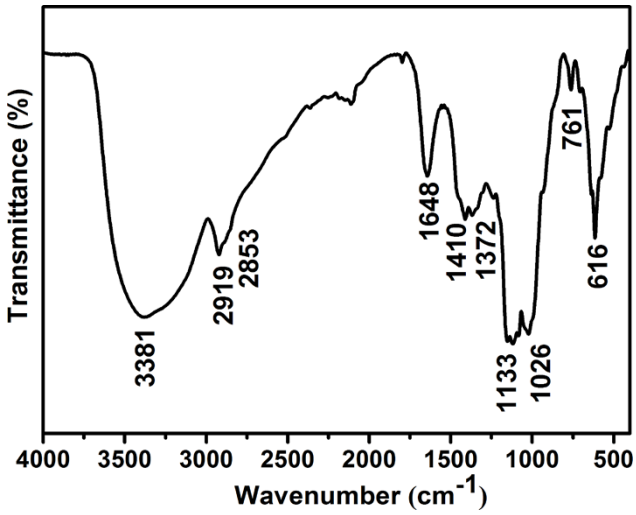

Fig. S5. FT-IR spectrum of KF.

Quantum Yield (QY) Measurements

Rhodamine B in ethanol (literature[S1] quantum yield 0.65) and distilled water (literature[S2] quantum yield 0.31) was selected as a control standard, respectively. The QY of N-CDs was estimated according to the follow equation 1:

$$\Phi = \Phi_r \times \frac{I}{A} \times \frac{A_r}{I_r} \times \frac{n^2}{n_r^2} \quad (1)$$

Where the Φ is the QY, I is the integrated PL emission intensity (excited at 335 nm for N-CDs and Rhodamine B), n is the refractive index (1.3614 for ethanol), and A is the absorbance value at the excitation wavelength of 330 nm (distilled water) and 335 nm (ethanol) (less than 0.1 at the excitation wavelength), respectively. The subscript "r" refers to the standards.

Table S2. QY of the N-CDs dispersed in distilled water and ethanol, respectively.

Sample	Integrated emission intensity (I)	Abs. nm (A)	Refractive index of solvent (n)	QY (Φ)
Rhodamine B	107384	0.0534	1.334 (in distilled water)	0.31
N-CDs	69984	0.0859	1.334 (in distilled water)	0.13
Rhodamine B	156412	0.0527	1.362 (in ethanol)	0.65
N-CDs	66563	0.0665	1.362 (in ethanol)	0.22

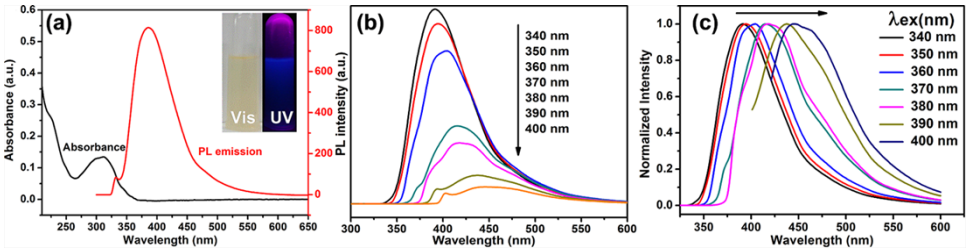

Fig. S6. (a) The UV-Vis absorbance (left) and PL emission spectra (right, λ_{ex}=330 nm) of the N-CDs in distilled water. (b,c)The excitation-dependent PL behavior of the N-CDs in distilled water.

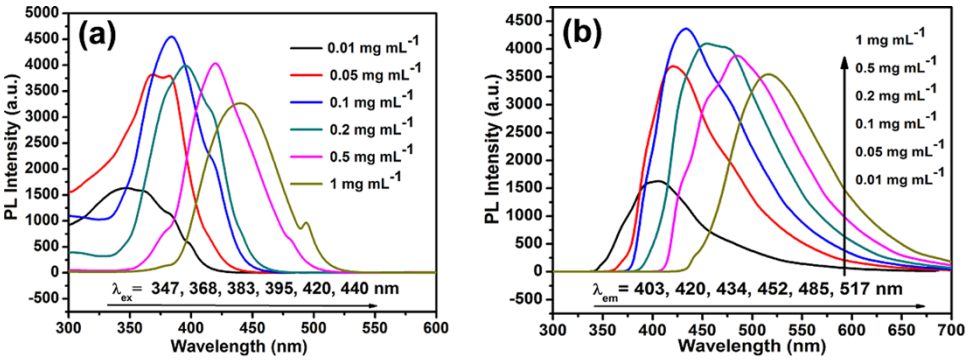

Fig. S7. (a) Excitation and (b) emission spectra of the N-CDs/ethanol at different concentrations.

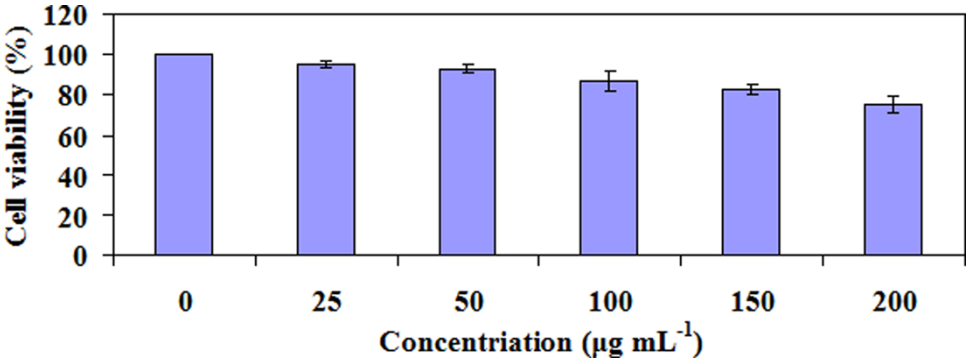

Fig. S8. Viabilities of HeLa cells after 24 h incubation with the N-CDs (mean ± SD, n = 3).

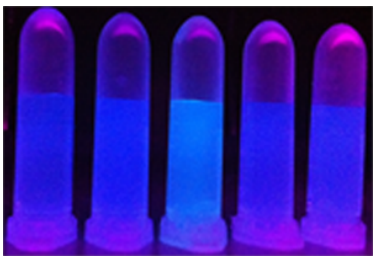

Fig. S9. The photographs (from left to right) of the N-CDs aqueous solutions added with NaOH, L-Arg, L-Lys, L-His, and control.

Fig. S10. The photographs of the N-CDs/H_2O (left) and the N-CDs/H_2O added with KF (right).

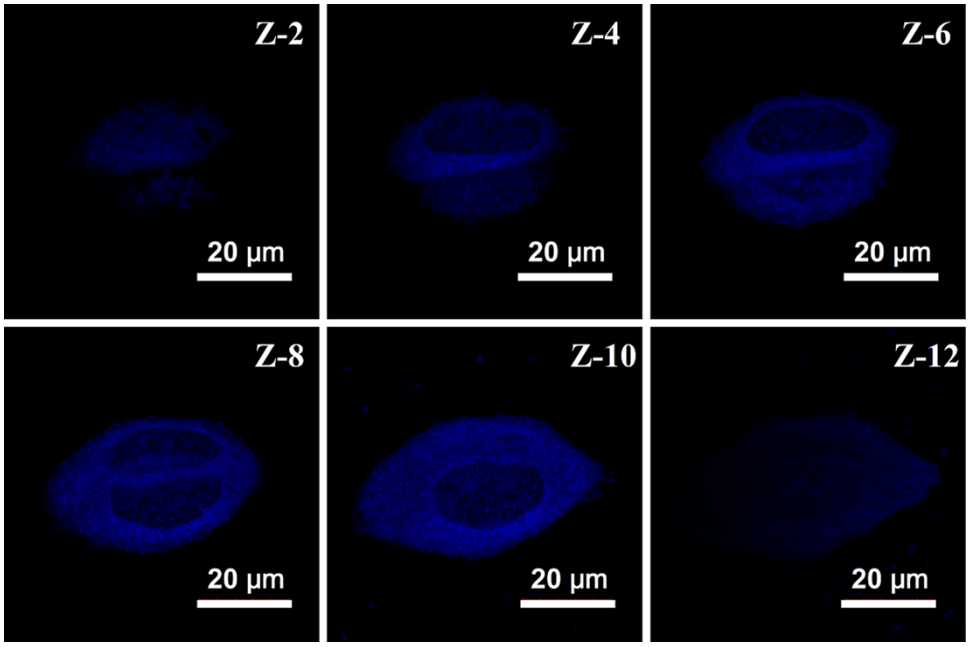

Fig. S11. Intracellular uptake of 200 μg mL^{-1} N-CDs in HeLa cells observed by CLSM. HeLa Cells are viewed under the excitation wavelength of 405 nm. Serial images of the x-y planes (Z-slices, from Z-2 to Z-12) of the same cells were taken at consecutive z-axis slices of 9 μm.

References in Supporting Information:

[S1] R. F. Kubin and A. N. Fletcher, J. Lumin. **1982**, 27, 455.

[S2] D. Magde, G. E. Rojas and P. G. Seybold, Photochem. Photobiol. **1999**, 70, 737.