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**A highly sensitive and selective off–on fluorescent chemosensor for hydrazine
based on coumarin β -diketone**

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Abstract:

A coumarin-based sensor **C1**, namely 3-acetoacetylcoumarin was designed, synthesized and applied for hydrazine detection. Hydrazinolysis of the chemosensor gives a fluorescent coumarin-pyrazole product **C1-N₂H₄** [3-(3-methyl-1H-pyrazol-5-yl)coumarin], and thus resulting in a prominent fluorescence off-on response toward hydrazine under physiological conditions. The probe is highly selective toward hydrazine over cations, anions and other biologically/environmentally abundant analytes. The detection limit of the probe is 3.2 ppb. The sensing mechanism was supported by ¹H NMR, IR, MS and DFT calculation. The application of the fluorescent probe in monitoring intracellular hydrazine in glioma cell line U251 was also demonstrated.

Key word: Fluorescent probe; coumarin; hydrazine; β -diketone; cell imaging.

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