

Author's Accepted Manuscript

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PII: S0039-9140(17)30682-3
DOI: <http://dx.doi.org/10.1016/j.talanta.2017.06.051>
Reference: TAL17670

To appear in: *Talanta*

Received date: 19 April 2017
Revised date: 8 June 2017
Accepted date: 18 June 2017

Cite this article as: Jianbin Chao, Huijuan Wang, Yongbin Zhang, Caixia Yin, Fangjun Huo, Kailun Song, Zhiqing Li, Ting Zhang and Yaqin Zhao, A novel “donor- π -acceptor” type fluorescence probe for sensing pH: mechanism and application *in vivo*, *Talanta*, <http://dx.doi.org/10.1016/j.talanta.2017.06.051>

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**A novel “donor- π -acceptor” type fluorescence probe for sensing pH:
mechanism and application *in vivo***

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Abstract:

A novel pH fluorescent probe 1-(pyren-1-yl)-3-(6-methoxypridin-3-yl)-acrylketone, (**PMPA**), which had a pyrene structure attached to methoxypyridine, was synthesized for monitoring extremely acidic and alkaline pH. The pH titrations indicated that **PMPA** displayed a remarkable emission enhancement with a pK_a of 2.70 and responded linearly to minor pH fluctuations within the extremely acidic range of 1.26-3.97. Interestingly, **PMPA** also exhibited strong pH-dependent characteristics with pK_a 9.32 and linear response to extreme-alkalinity range of 8.54-10.36. In addition, **PMPA** displayed a good selectivity, excellent photostability and large Stokes shift (165 nm). Furthermore, the probe **PMPA** had excellent cell membrane permeability and was applied

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