Accepted Manuscript

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PII:	S1386-1425(17)30616-9
DOI:	doi: 10.1016/j.saa.2017.07.057
Reference:	SAA 15344
To appear in:	*Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy*
Received date:	21 May 2017
Revised date:	12 July 2017
Accepted date:	30 July 2017

Please cite this article as: Ran Jia, Yingying Zhu, Lei Hu, Qiru Xiong, Meng Zhao, Mingzhu Zhang, Xiaohe Tian , A series of terpyridine containing flexible amino diethylacetate derivatives with large two-photon action cross-sections for effective mitochondrial imaging in living liver cancerous cells, *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy* (2017), doi: 10.1016/j.saa.2017.07.057

A series of terpyridine containing flexible amino diethylacetate derivatives with large two-photon action cross-sections for effective mitochondrial imaging in living liver cancerous cells

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Abstract:

Small molecules possess large two-photon action cross sections (Φσ) are highly demanded for biological purpose. Herein, three novel terpyridine containing flexible amino diethylacetate organic small molecules (**A1**, **A2** and **A3**) were rationally designed and their photophysical properties were investigated both experimentally and theoretically. The results revealed that the three chromophores possess large Φσ and remarkable Stokes' shift in high polar solvents, which are particularly benefit for further biological imaging application. One chromophore (**A1**) displayed an effective intracellular uptake against lung cancerous living cells A549. Colocolization studies suggested the internalized subcellular compartment was mitochondria. Consequently, chromophore **A1** provides a promising platform to directly monitor mitochondria in living cells under two-photon confocal laser scanning microscopy.

Keywords: terpyridine; crystal structure; two-photon property; bioimaging

Introduction

Mitochondria could be found in all of the mammal's cells and act as a 'power