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A series of water-soluble pyridinium derivatives with two-photon absorption in the near infrared region for mitochondria targeting under stimulated emission depletion (STED) nanoscopy

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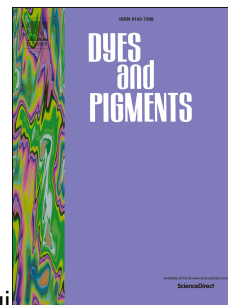
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1 **A series of water-soluble pyridinium derivatives with two-**  
2 **photon absorption in the near infrared region for**  
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13 **Abstract:** Convenient and rational design of small molecular weight, water-soluble, two-  
14 photon excited fluorescence (TPEF) probes remains a challenge for practical biological  
15 applications. In this study, we designed six novel water-soluble, near infrared TPEF probes  
16 (**NL1-3**, **PL1-3**), bearing N-methyl pyridinium moiety, which are specifically sensitive to  
17 local viscosity. Fluorescence emission bands and two-photon absorption cross-sections of the  
18 title compounds showed a significant enhancement with increased solvent viscosity. The  
19 compound **NL1**, a high fluorescent probe that selectively targeted the mitochondria and was  
20 sensitive to mitochondrial environment changes, could be applied to differentiate between  
21 nystatin treated and normal cell mitochondrial environment. Furthermore, **NL1** is membrane  
22 potential independent, which was rarely found in contemporary probes. In addition to two-

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