# Accepted Manuscript


Title: Synthesis of a cationic poly(*p*-phenylenevinylene) derivative for lysosome-specific and long-term imaging

Authors: Zhuo Chen, Huanxiang Yuan, Haiyan Liang, Chichong Lu, Xiaolan Liu

PII: S1001-8417(17)30375-3
DOI: http://dx.doi.org/10.1016/j.cclet.2017.09.033
Reference: CCLET 4239

To appear in: *Chinese Chemical Letters*

Received date: 27-6-2017
Revised date: 8-9-2017
Accepted date: 12-9-2017

Please cite this article as: Zhuo Chen, Huanxiang Yuan, Haiyan Liang, Chichong Lu, Xiaolan Liu, Synthesis of a cationic poly(p-phenylenevinylene) derivative for lysosome-specific and long-term imaging, Chinese Chemical Lettershttp://dx.doi.org/10.1016/j.cclet.2017.09.033

Communication

# Synthesis of a cationic poly(*p*-phenylenevinylene) derivative for lysosome-specific and long-term imaging

Zhuo Chen, Huanxiang Yuan*, Haiyan Liang, Chichong Lu, Xiaolan Liu

*Department of Chemistry, School of Science, Beijing Technology and Business University, Beijing 100048, China*

∗ Corresponding author.
*E-mail address: yhx@iccas.ac.cn (H. Yuan).*

ARTICLE INFO

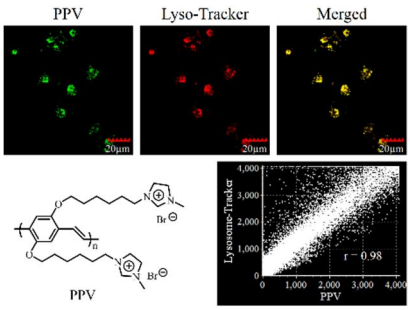
*Article history:*
Received
Received in revised form
Accepted
Available online

*Keywords: Cationic polymer*
Lysosome
long-term imaging
Fluorescence
Colocalization

ABSTRACT

The development of long-term imaging agents and subcellular imaging materials is of great importance in the research of cancer cell behaviors. In this work, a cationic poly(*p*-phenylenevinylene) derivative (PPV) is designed and synthesized to link quaternized *N*-methyl-imidazole groups as pendants which endow the polymer to bear positive charges. Absorption and fluorescence emission spectra of PPV display a large Stokes shift of 102 nm which is much larger than the commercial cell dyes. Positively charged polymer could adsorb onto the surface of cells *via* electrostatic interactions followed by cell endocytosis process to enter cells. Importantly, PPV barely has influence on the cell viability through cytotoxicity analysis. The colocalization data demonstrates that PPV and commercial lysosome-specific dye are highly colocalized in the same region, indicating that the green fluorescent PPV mainly distributes in the lysosomes. Moreover, the continuous imaging investigation shows that PPV could stay in cells for more than seven days while the commercial Lyso-Tracker would be extruded by cells after three days. PPV exhibits superior capabilities including strong fluorescence, large Stokes shift, good biocompatibility and high photostablity, which has great potential in the applications of cellular process monitoring.

## Graphical Abstract




A cationic poly(*p*-phenylenevinylene) derivative (PPV) is designed and synthesized to bear quaternized *N*-methyl-imidazole groups, which is successfully utilized in lysosome-specific and long-term imaging.

Subcellular imaging and continuous cell tracing of fluorescent probes is significantly important for researchers to investigate the various cell behaviors and processes, such as cell division, cell differentiation, cell cycle, cell apoptosis, *etc*. [1-5]. During the past decades, a variety of fluorescent agents, including fluorescent proteins, organic small molecular dyes, and quantum dots, have be explored for biological imaging and cell tracing [6-13]. However, some unavoidable drawbacks of fluorescent proteins, such as low photostablity and easy degradation by