

Supplementary Material

Super-resolution observation of lysosomal dynamics with fluorescent gold nanoparticles

Kangqiang Qiu^{1,2}, Yang Du^{2,3}, Jiyan Liu³, Jun-Lin Guan², Hui Chao^{1*}, Jiajie Diao^{2*}

1. MOE Key Laboratory of Bioinorganic and Synthetic Chemistry, School of Chemistry, Sun Yat-Sen University, Guangzhou 510275, China.
2. Department of Cancer Biology, University of Cincinnati College of Medicine, Cincinnati, OH 45267, USA.
3. Department of Biotherapy, Cancer Center, State Key Laboratory of Biotherapy, West China Hospital, West China Medical School, Sichuan University, Chengdu 610041, China.

* ceschh@mail.sysu.edu.cn (H.C.); jiajie.diao@uc.edu (J. D.).

Table of content

Figure S1 Cytotoxicity of Cy5@Au NPs	S2
Figure S2 Characterization data of Cy5@Au NPs	S3
Figure S3 Characterization parameters of Cy5@Au NPs	S4
Figure S4 Fluorescence intensity profiles of SIM and COM images.....	S5
Figure S5 Colocalization images of Cy5@Au NPs and LTG.....	S6
Figure S6 Colocalization images of Cy5@Au NPs and LAMP1-mGFP.....	S7
Figure S7 Colocalization images of Cy5 dye and LTG and MTG.....	S8
Figure S8 Images of chloroquine-treated and fixed cells stained with LTG.....	S9
Figure S9 Photobleaching of LTG or LAMP1-mGFP.....	S10
Figure S10 SIM images of HeLa cells stained with LTG for 3 d.....	S11
Figure S11 Intensities of Cy5@Au NPs during different processes.....	S12

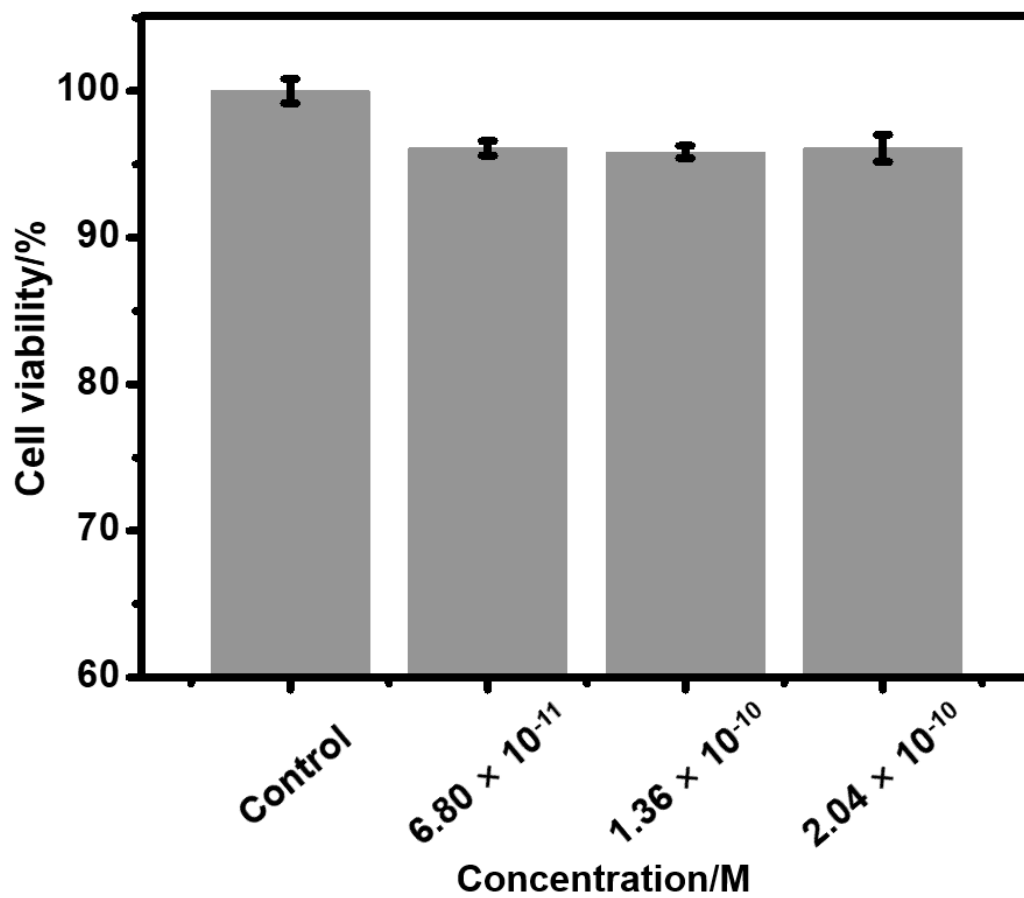


Figure S1. HeLa cells viability treated with different concentration of **Cy5@Au** NPs for 24 h via CCK-8 assay.

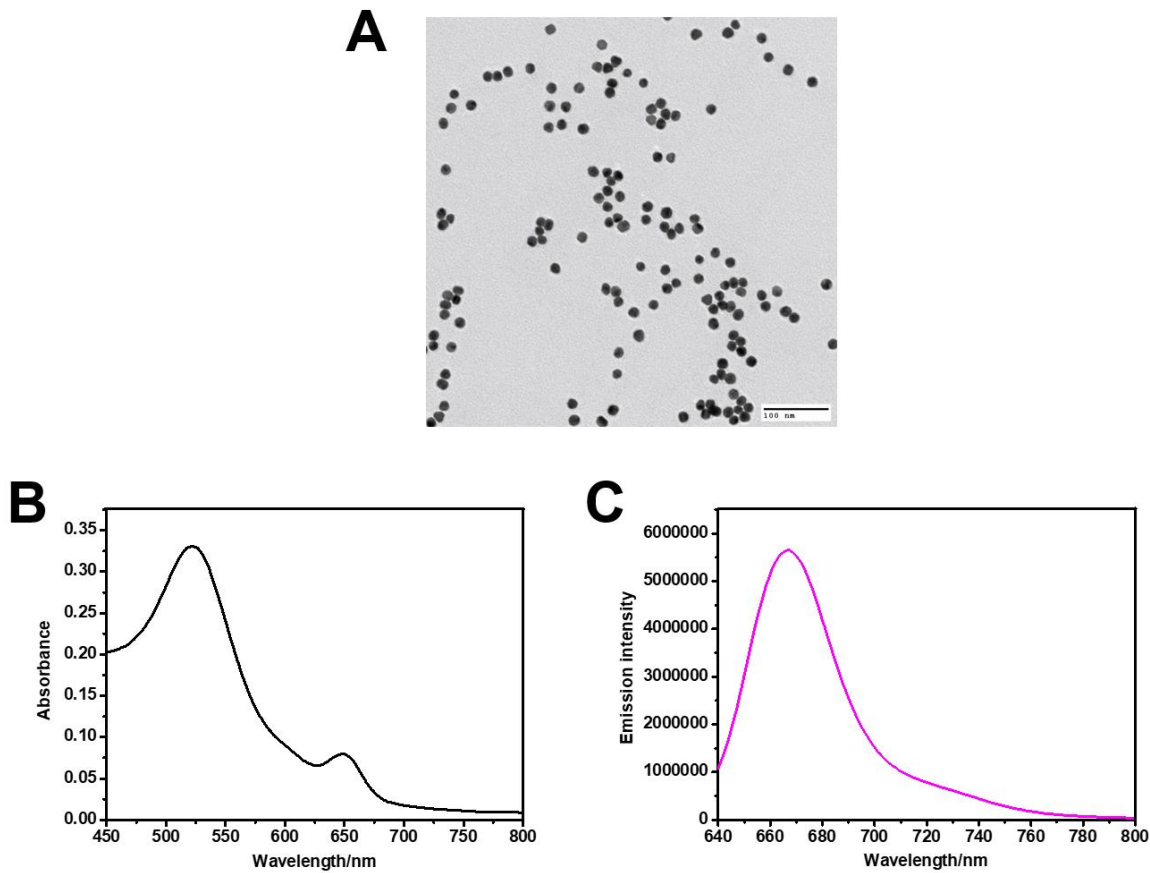


Figure S2. Characterization data of **Cy5@Au NPs** provided by Luna nanotech. (A) TEM image of the particles (scale bar: 100 nm); (B) Absorption and (C) fluorescence spectra of **Cy5@Au NPs**.

Parameter	Value
Core Diameter:	15 nm
Z-Average (DLS):	53.39 nm
PDI (DLS):	0.134
Z-Potential ¹ :	-4.19(+/-0.22) mV
Nanoparticle OD:	50
Nanoparticle Molar Conc.:	1.36x10 ⁻⁷ M
Solution Volume:	0.4 mL
Dye:	Cy5
PEG-Dye / mPEG Backfill:	15% / 85%
PEG-Dye Size	5 kDa
mPEG Backfill Size	5 kDa
Shelf Life:	1 year
Storage Buffer:	1x PBS

¹ Z-Potential measurements were performed in 10mM HEPES, 1 mM NaCl, pH 7.4 buffer.

Figure S3. Characterization parameters of **Cy5@Au NPs** provided by Luna nanotech.

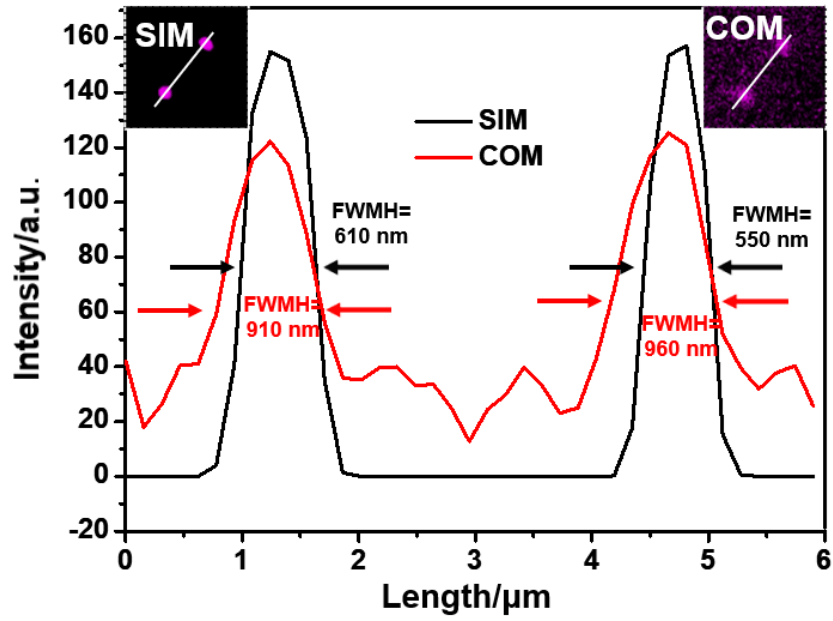


Figure S4. SIM and COM images and their corresponding fluorescence intensity profiles and calculated FWHM.

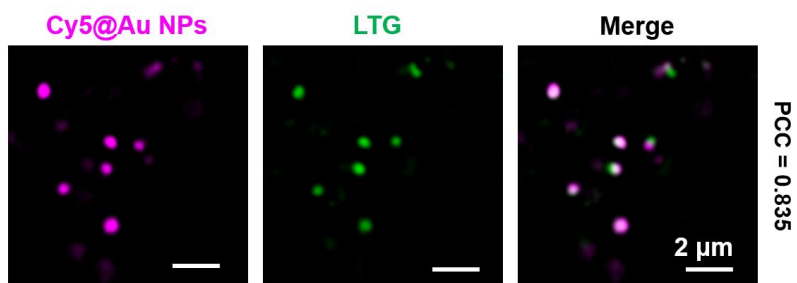


Figure S5. SIM images of a colocalization experiment with HeLa cells costained with **Cy5@Au NPs** and LTG.

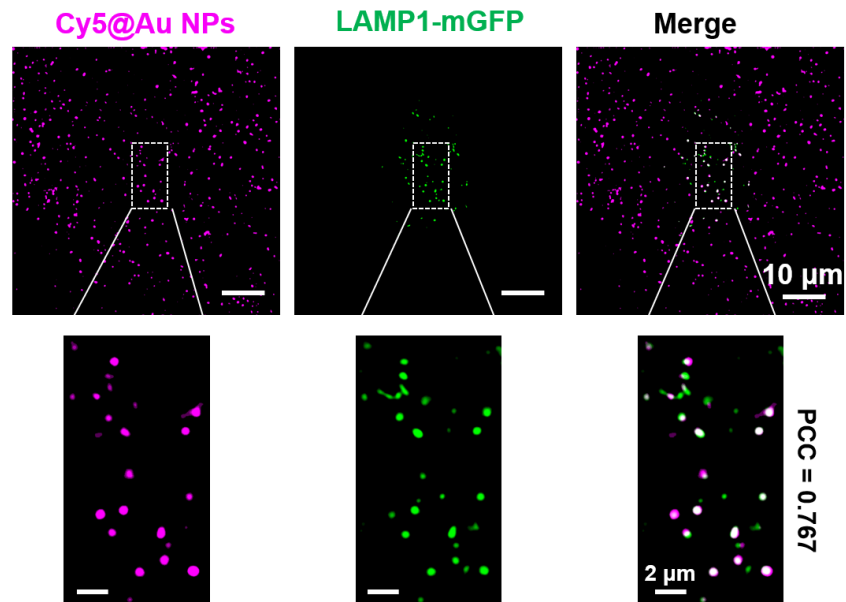


Figure S6. SIM images of a colocalization experiment with HeLa cells costained with **Cy5@Au NPs** and LAMP1-mGFP.

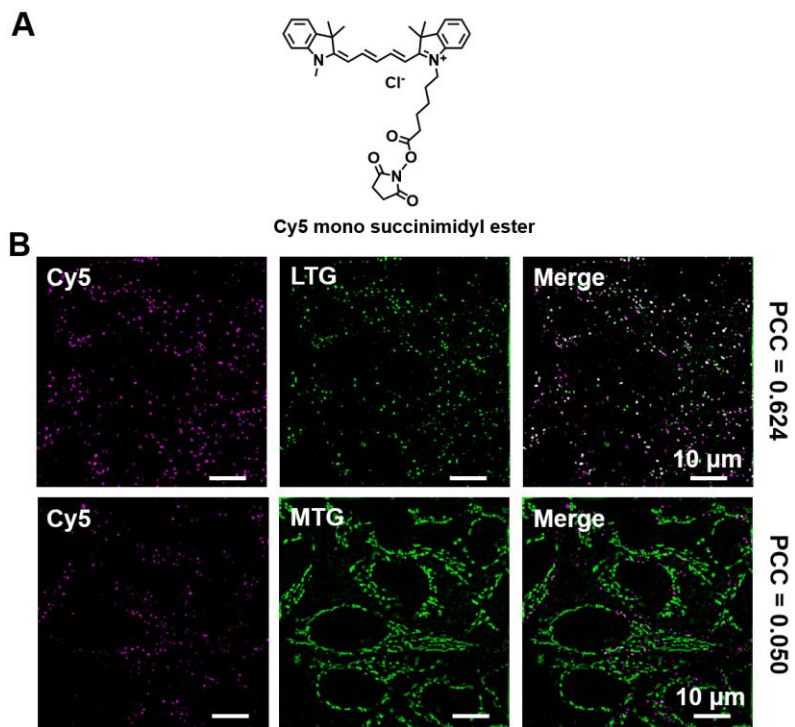


Figure S7. (A) The chemical structure of Cy5 for the experiment. (B) Colocalization images of HeLa cells stained by Cy5 and the commercial dyes LysoTracker Green (LTG) and MitoTracker Green (MTG).

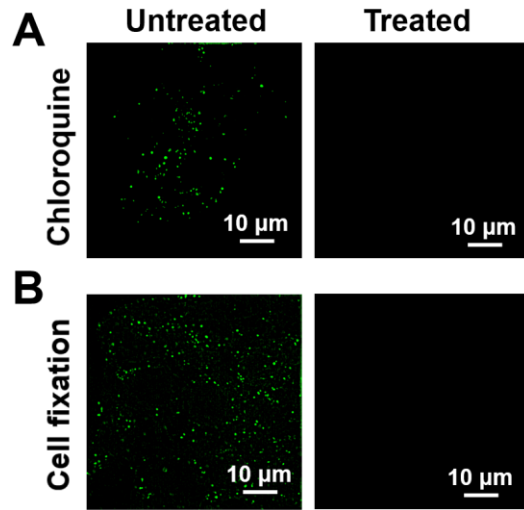


Figure S8. Images of untreated and (A) chloroquine-treated or (B) 4% paraformaldehyde-treated HeLa cells stained with LTG.

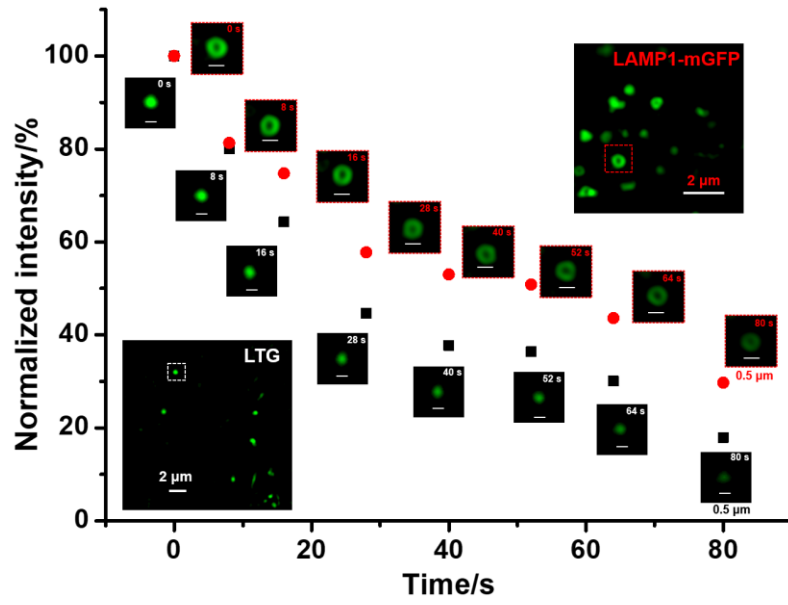


Figure S9. SIM image of HeLa cells stained with LTG or LAMP1-mGFP and their normalized intensity during photobleaching.

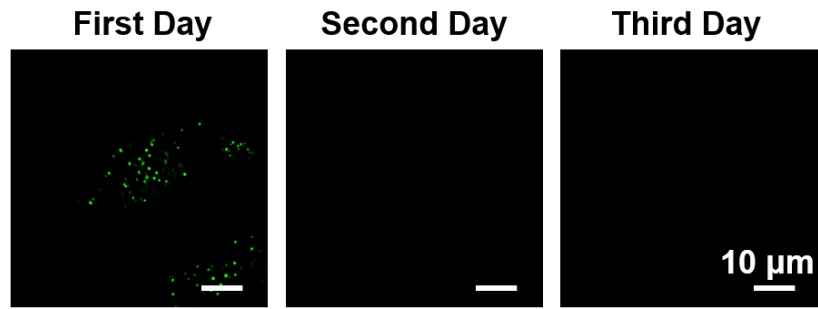


Figure S10. SIM images of HeLa cells stained with LTG for 3 d.

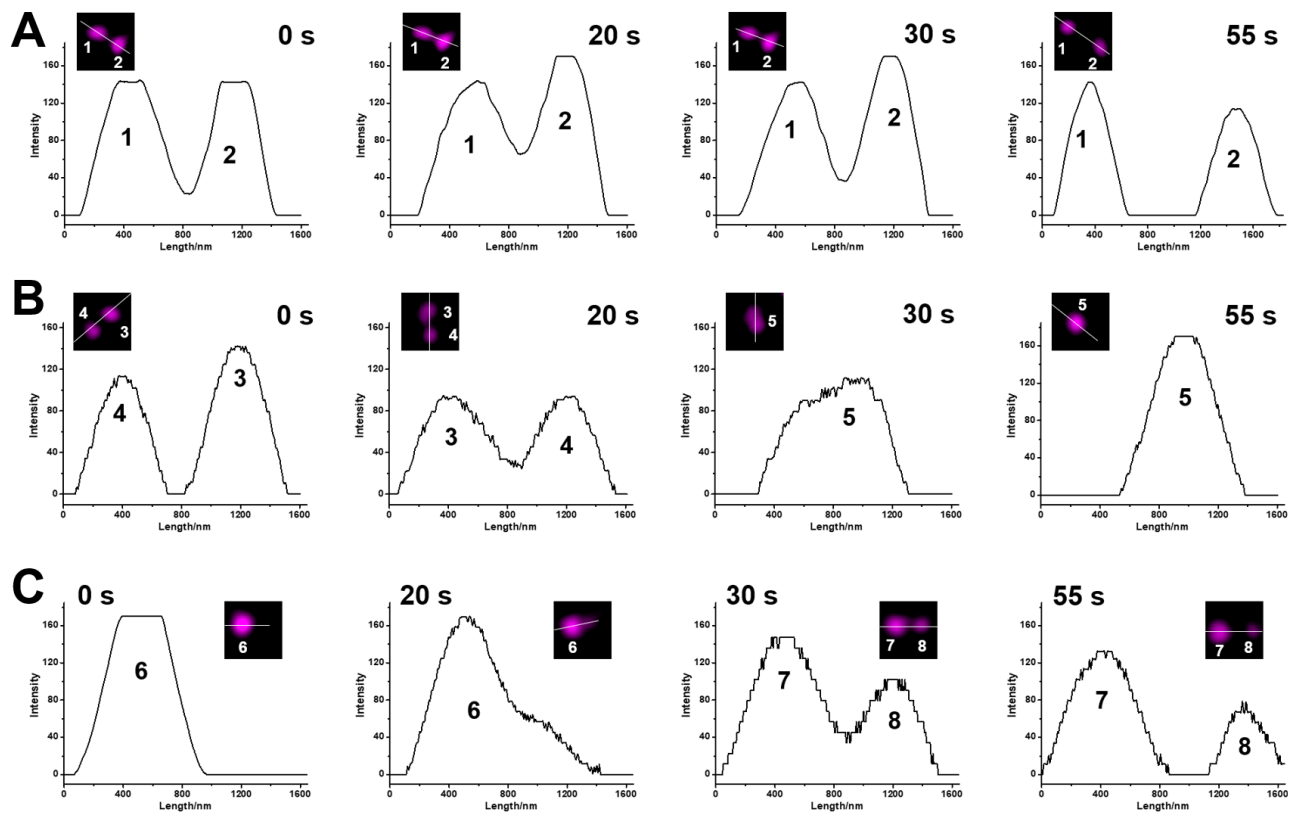


Figure S11. Intensities of Cy5@Au NPs on the white line in the images. (A) Kiss-and-run process. (B) Fusion. (C) Fission.