Photoluminescence Imaging of Newly Synthesized Proteins in Living Cells

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Introduction

It is of great significance to study the newly synthesized proteins in living cells. Currently, two types of fluorescence probes (turn-on and always-on) could be applied to the purpose. Turn-on type probe can effectively distinguish the reaction probe and unreacted probe, but the imaging based on fluorescence intensity is a little difficult to completely exclude the fluorescence background from free probe interference. Recently, we introduced a lifetime probe for imaging of new synthesized proteins in living cells.

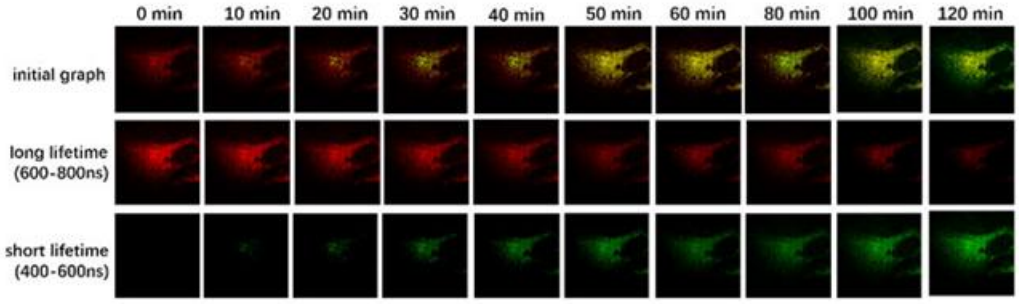
Materials and Methods

The probe was synthesized by a three-step synthetic route. The structure of the probe was characterized by 1H NMR. The probe exhibited large Stokes shift that could effectively avoid the interference of excitation and autofluorescence of cells.

Results and Discussion

An excellent group of the lifetime probes for the imaging of new synthesized proteins have been synthesized. The remarkable lifetime shifts over 400 ns before and after click reaction makes them easy to eliminate the background interferences and well distinguishes the reacted probes from the unreacted probes, thus enabling the wash-free imaging of the newly synthesized proteins in single living cells (Fig.1). In this symposium we would like to introduce the development of new synthesized proteins studies in living cells by our group very recently. [1-3]

Figure 1: A example of the photoluminescence lifetime images of HeLa cells



Conclusion

We are exploring applications of this strategy so as to take full advantage of this lifetime probe for living-cell analysis.

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Bibliography

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