Biocompatible quantum dots micelles for cancer cell imaging

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Introduction

Quantum dots are highly fluorescent, but it cannot be soluble in water. Therefore, it cannot be used directly for diagnosis and treatment of human disease. To circumvent this limitation, the surface of quantum dots must be modified to increase their water solubility and biocompatibility.

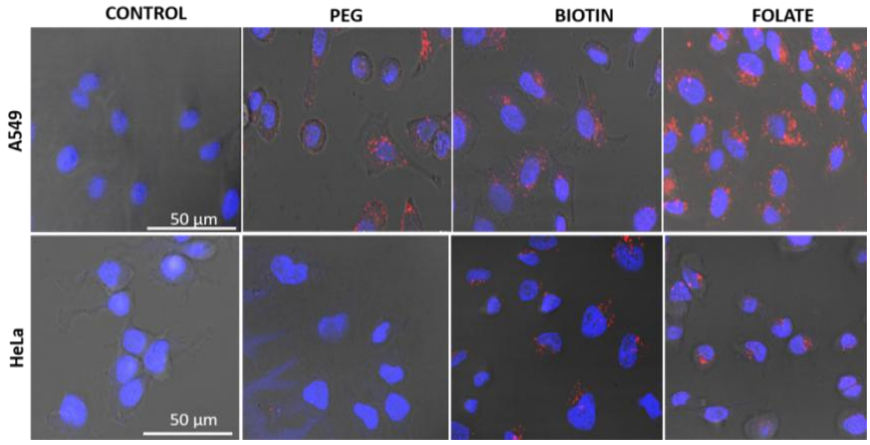
Materials and Methods

CdSe/ZnS core-shell-type QDs stabilized with octadecylamine ligands were purchased from Sigma-Aldrich.Fe3O4 NPs in chloroform with oleic acid coating was from Nanotech Ocean. DSPE–PEG (2000)–biotin DSPE–PEG (2000)–Folate, DSPE–PEG (2000) was from Avanti Polar Lipids. All chemicals were used without further purification. HeLa (RCB0007) and A549 (RCB0098) cell lines were obtained from Riken Bio- Resource Center (Tsukuba, Japan).We used fluorescence confocal microscopy for Cellular uptake of the different surface modified micelles.

Results and Discussion

We prepared three kinds of surface modified quantum dot micelles for cancer cell imaging.the size of the micelle were around 120 nm. In the case of A549 cancer cell lines, the uptake order is PEG < Biotin < Folate, for HeLa cell lines PEG < Folate < Biotin. We checked Th-1 cell lines ther is no uptake. (Fig.1)

Figure 1: Cellular uptake of fluorescence phospholipid micelles[2].



Conclusion

Folate-conjugated phospholipid lipid micelles were a more efficient biomarker for cancer cell detection.

Bibliography

[1] S.Chinnathambi, et all., Biocompatible CdSe/ZnS quantum dot micelles for long-term cell imaging without alteration to the native structure of the blood plasma protein human serum albumin, 2017, 7, 2392–2402