P16.06-Self-made PEI cationic nanobubbles to enhance gene delivery by ultrasound in vitro

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Objective

1. To prepare a nanoscale cationic lipid ultrasound contrast agent.
2. Evaluating its physical and chemical properties, evaluating its imaging effects both in vitro and in vivo, to verify its passive targeting effect on tumor and in vitro.

Methods

Film hydration method, microscope was used to observe its morphology and calculate the concentrations, surface potential, particle size was measured by Zetasizer Nano particle and potential instrument evaluate its imaging effects both in vitro and in vivo. Immunofluorescence staining was taken to observe the passive targeting of tumor.

Results

1. The cationic nanobubble has a good stability, the average particle size of the nanobubble is 484.8 ± 8.5 nm, and the average surface potential is 24.78 ± 3.52 mV.
2. The average particle diameter and concentration was not significantly changed in one week.
3. The cationic nanobubble demonstrate great contrast effect in vitro, contrast enhancement in vivo show that cationic nanobubble can significantly enhance the heart and subcutaneous transplantation tumor, imaging in heart can last for more than 20min.

Conclusion

1. The zeta potential of self-made nano bubble is positive and has good particle size and concentration stability.
2. The self-made cationic nano bubbles have good acoustic character.
3. The self-made cationic nanobubbles have good passive targeting ability of tumor.
4. The self-made cationic nanobubble has low toxicity and is a safe ultrasound contrast agent.