

Novel drug delivery system using anionic nano bubbles (U572)

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Background

The development of cell-selective delivery system for anionic macromolecules such as DNA or RNA have been long-desired. Up until now, cationic macromolecules and liposomes have been reported as a feasible alternative to viral vectors. However, cationic vectors have high incidence of endocytosis, as well as cross-reaction with other biological components.

Therefore, there is a strong need for either neutral or anionic vector that can deliver gene/drug into targeted cells.

Professor Hashida *et al.* of Kyoto University have recently succeeded in developing a biodegradable and biocompatible liposome complex with anionic property with better safety profile than the conventional liposome.

Advantage

1. Anionic bubble lipoplex
2. Made of biodegradable/ biocompatible materials
3. Easy preparation: simply mix materials
4. Direct delivery into a cell
5. Selective delivery using ultrasound
6. Potential encapsulation of pDNA, siRNA and drug
7. Possibility of cell-targeting by ligand modification

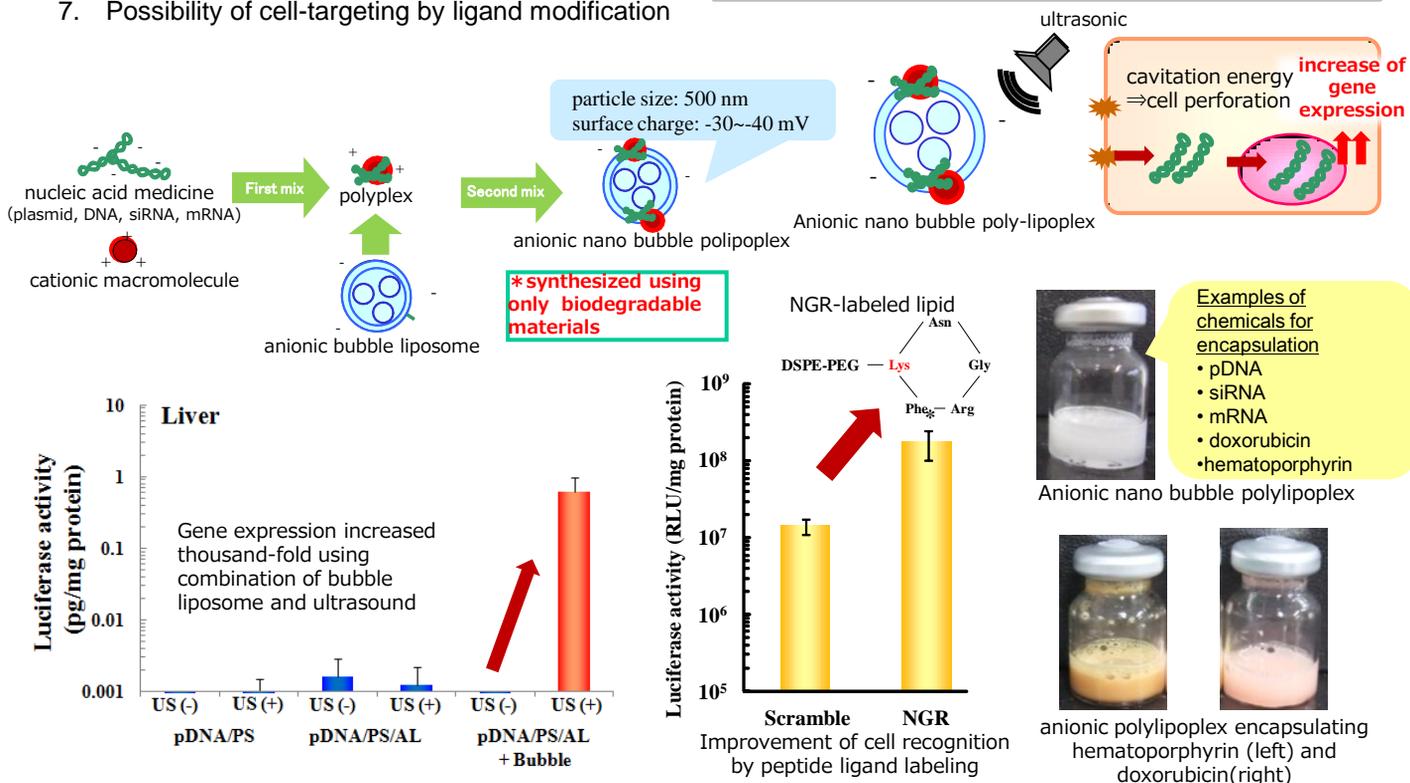
Current Status of Development

- Gene delivery using pDNA already demonstrated.
- Encapsulation of siRNA and other chemicals have been successfully conducted in research.
- Knock-out effects and pharmacological effects will be tested within a year.
- Selectivity of drug delivery could potentially be improved through peptide-labeling.

Potential Application

- Genetic medicine
- DDS for cirrhosis/cancer therapeutics
- Combination therapy with photodynamic therapy (in case of haematoporphyrin encapsulation)

[Patent Number] JP20XX-XXXXXX
[Invention Title] Cell-selective gene delivery using glycosylated bubble lipoplex with ultrasound exposure
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