The **LumiPore™**, a Non-Viral Transfection Platform

Moving Towards Bigger Cargo Delivery

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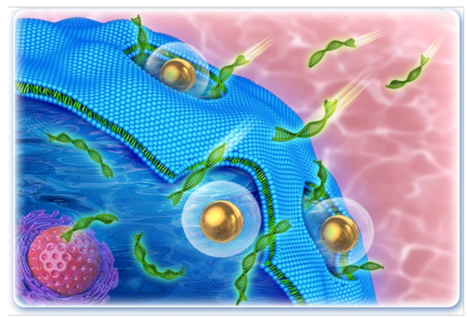
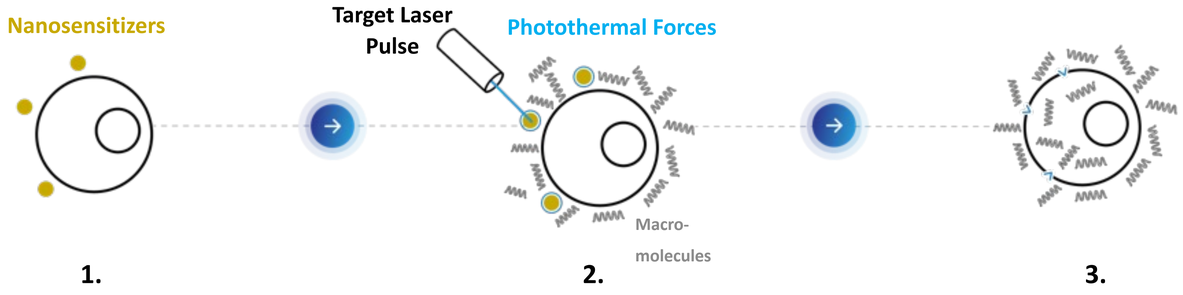
Introduction

- **Efficient delivery** of exogenous cargo material into cells is crucial in designing **clinical cell therapies,** as it directly determines the number of modified cells, and thus the treatment efficacy. In particular, delivery of nucleic acids, a challenge for various cell types. Among these, morpholinos …
- An attractive solution is the Trince's LumiPore™ transfection platform, which combines laser exposure with photothermal nanoparticles to convert light energy into heat to **transiently permeabilize** the cellular plasma membrane.
- The platform has a **high-throughput rate** and results in **high viability**, **proliferative capacity** and **functionality** of photoporated cells.
- Our photoporation technology could be used as an advanced delivery platform that efficiently delivers morpholinos into adherent cells, enhancing their cellular uptake and activity.

Photoporation Method

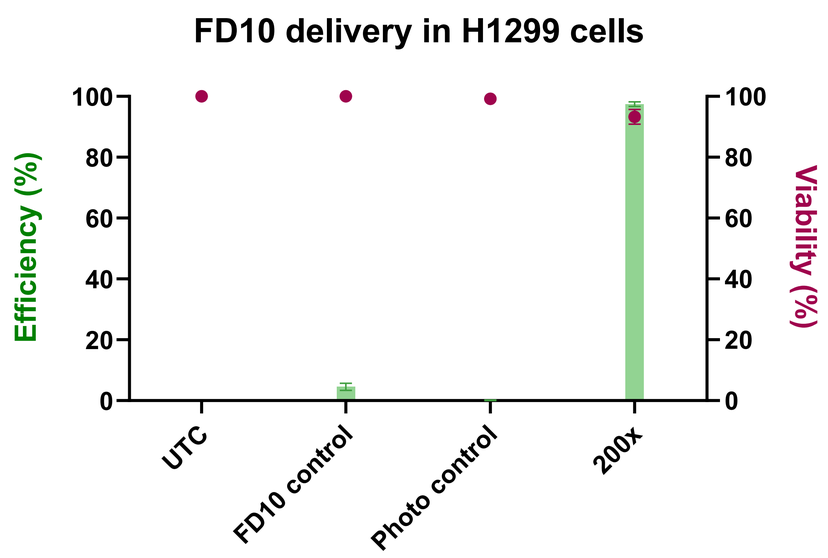
1. Nanosensitizers are added to cells.
2. Pulsed laser irradiation induces heating and vapor nanobubbles (VNBs) of the nanosensitizer.
3. Transient membrane pores are generated which allow passage of macromolecules into the cytosol.

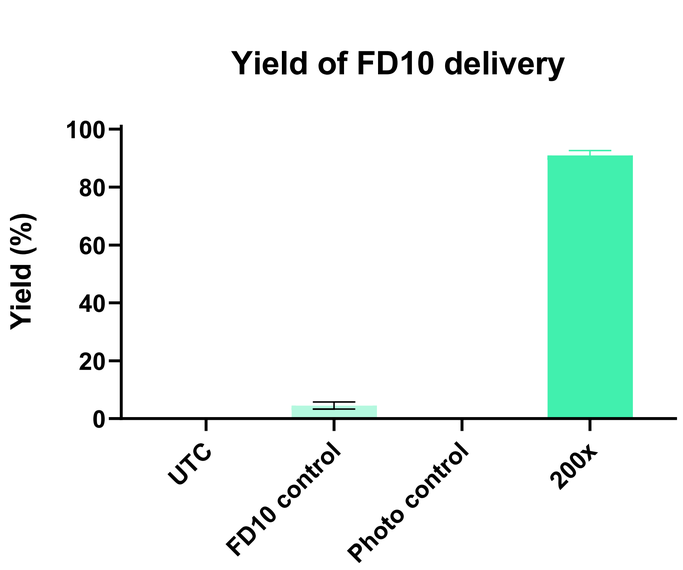




Ramon et al. Current Opinion in Colloid & Interface Science (2021)

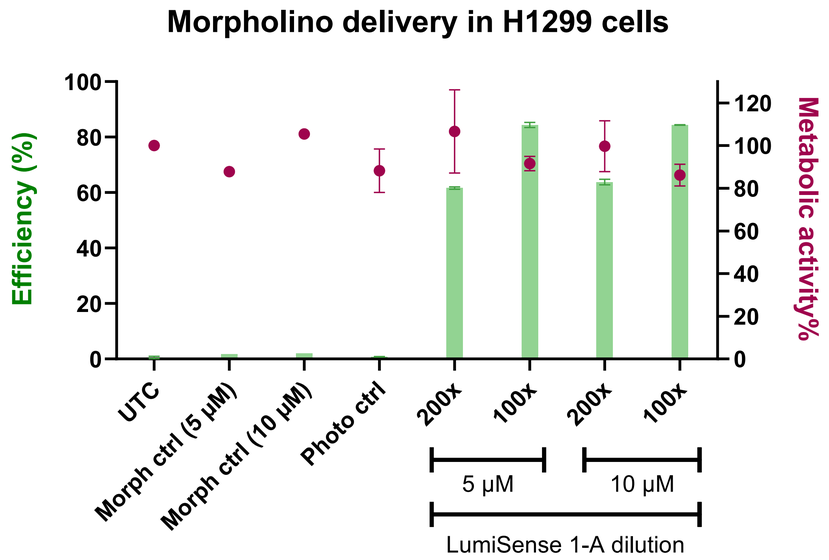
FD10 delivery in H1299 cells

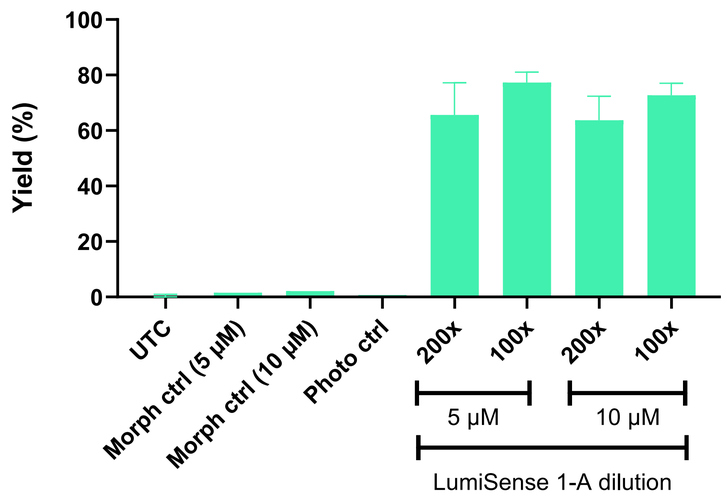




✓ **Photoporation can efficiently deliver FD10 (model macromolecule for siRNA, morpholino, miRNA, etc.) into H1299 cells**

Morpholino delivery in H1299 cells





✓ **Photoporation can efficiently deliver Morpholinos into H1299 cells.**

LumiPore™ photoporation device



- Benchtop transfection system.
- Delivery of a variety of cargoes.
- Excellent recovery of cells.
- Compatible with well-plates (6-384), flasks and slides.
- Full 96-well plate in < 10 min.
- Special selectivity photoporation.

Conclusion

- Morpholinos delivery and cell viability higher than 85%.
- Photoporation can deliver both small and large cargoes.
- Photoporation is gentle to cells:
  - Suspension and adherent cells can be photoporated.
  - Photoporation does not require any cell detachment.

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