New Liposomal Formulations for Light-Controlled Drug Release

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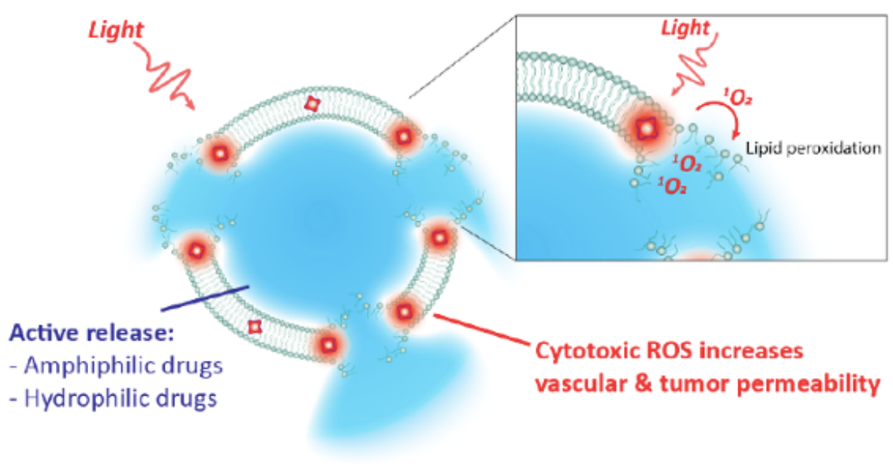
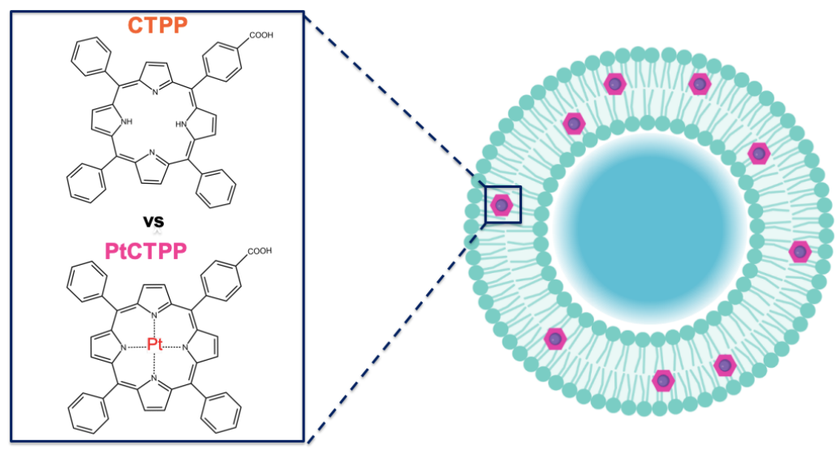
Liposomal drug delivery systems play a leading role in the treatment of cancer by reducing the toxicity profile of chemotherapeutics. Despite their success, there is an unanswered need to release chemotherapy specifically at the cancer site, thus increasing the efficiency of the treatment. Light-sensitive liposomes are the current approach proposed to improve controlled drug release.

1 Light-control drug release



2 Objective

To develop porphyrin-containing liposomes and its platinum-metallated analog for light-controlled drug release.

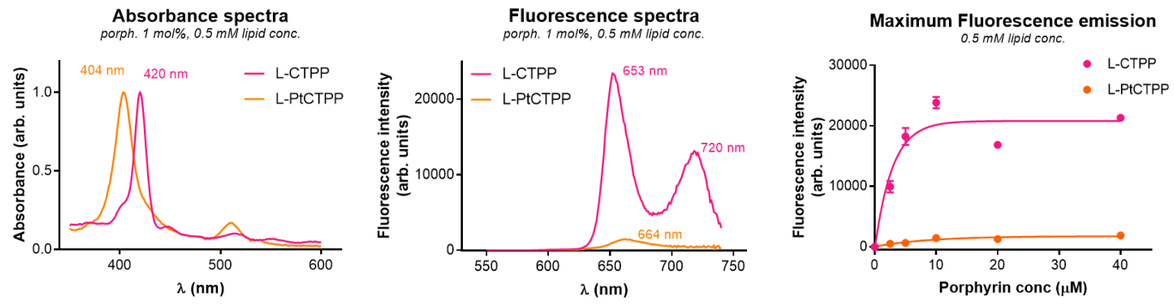


3 Liposomes synthesis and characterization

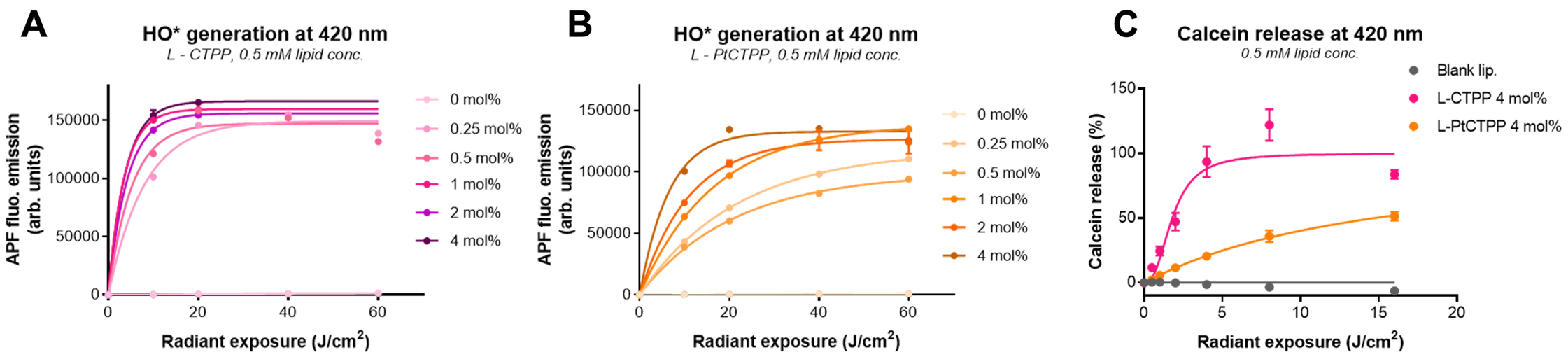
- **Synthesis** Lipid film hydration method
  Porphyrin concentration range: from 0 to 4 mol%

- **Physicochemical characterization (after extrusion)** Size 110 to 120 nm
  PDI < 0.2
  Z-potential -0.5 to -3 mV

- **Optical characterization**



4 Light irradiation



5 Conclusions

- A comparison between liposomal CTPP and PtCTPP has been performed.
- Both types of photosensitizers produce ROS.
- Concentration dependence in ROS production.
- Achievement of drug release. Reduced efficiency of PtCTPP due to irradiation at 420 nm.

Related literature
Crommelin DJA, van Hoogevest P, Storm G. The role of liposomes in clinical nanomedicine development. What now? Now what?. J Control Release. 2020;318:256-263.
Plaetzer K, Krammer B, Berlanda J, Berr F, Kiesslich T. Photophysics and photochemistry of photodynamic therapy: fundamental aspects. Lasers Med Sci. 2009;24(2):259-268.
Obaid G, Broekgaarden M, Bulin AL, et al. Photonanomedicine: a convergence of photodynamic therapy and nanotechnology. Nanoscale. 2016;8(25):12471-12503.