

**SÉMINAIRE PhLAM**  
**20 février 2026, 10h30**  
**IRCICA**

**« Photoporation : leveraging light and nanoparticules for gentle, high-through put cell transfections »**

**Par**

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Delivery of bioactive compounds, such as proteins and nucleic acids, into cells *in vitro* or *ex vivo* is a generic requirement for many applications in the life sciences, such as for the engineering of therapeutic cells. Physical delivery methods are attractive in this context as they are well-controlled, and can accommodate a broad variety of effector molecules and cell types. Photoporation is such a recently developed physical delivery technology which combines laser stimulation with photothermal nanoparticles. Localized thermal effects upon laser irradiation can create pores in the cell membrane, allowing the influx of external molecules in cells. Importantly, photoporation is very gentle to cells, resulting in excellent cell viability and preservation of a cell's phenotype and functionality. In this presentation I will give an introduction to the concept of photoporation, followed by an overview of the most notable work that we performed on the development and application of this technique to biomedical problems. Finally, I will highlight how this research has led to the establishment of the spin-off company Trince and give an update on its current status.

**Biography**

Kevin Braeckmans first studied physics before doing his doctoral studies in pharmaceutical sciences at Ghent University in Belgium. From early on he was passionate about developing biophotonics technologies for drug delivery and diagnostics. In 2008 he was appointed professor at Ghent University as the group leader of the Bio-Photonics Research Group. In 2015 he received a prestigious ERC Consolidator Grant and became full professor in 2018. His research presently focuses on studying biological barriers to nanomedicines by advanced microscopy techniques, and combining light with nanoparticles to enable light-triggered drug delivery and related therapeutic applications. He is a co-author of >250 publications, Clarivate Highly Cited Author 2022-2024, and co-inventor of nearly 20 patent applications. Presently he is also a co-founder and CSO of the spin-off company Trince.