Low vision and blindness have a very important social and financial impact. Efficiency of current active molecules for ocular treatments is limited when they are administered by ophthalmic drops. Indeed, despite the high drug content of eye drops, a large proportion is eliminated by the tear film during the topical application. When optimal conditions are met, less than 0.02% of the active substance is absorbed. Therefore, it appeared necessary to design a new drug delivery system suitable for topical administration.

We have developed a new drug delivery system based on gold nanoparticles that increases the time of action of drugs administered by eye drops and thus reduces their frequency of administration (see Figure 1). Ultrastable gold nanoparticles were synthesized by a new method. The mucoadhesion properties were characterized by different qualitative and quantitative techniques. Finally, the encapsulation efficiency of the gold nanoparticles for different ocular drugs was determined.

These new ultrastable gold nanoparticles can have a major impact in nanomedicine. Indeed, the optimization of the mucoadhesion of the drugs by a new drug delivery system may significantly increase their effectiveness, reducing their frequency of administration as well as the toxicity related to their high content of active substance.

References

Corresponding author email: Elodie.Boisselier@fmed.ulaval.ca