

# Quenching of chlorophyll fluorescence induced by silver nanoparticles

## OBJETIVE

To obtain fundamental knowledge about interaction between Chl molecules and AgNPs and to evaluate the potential application of Chf spectroscopy as an analytical technique for further investigation about nanoparticle effects on plants.

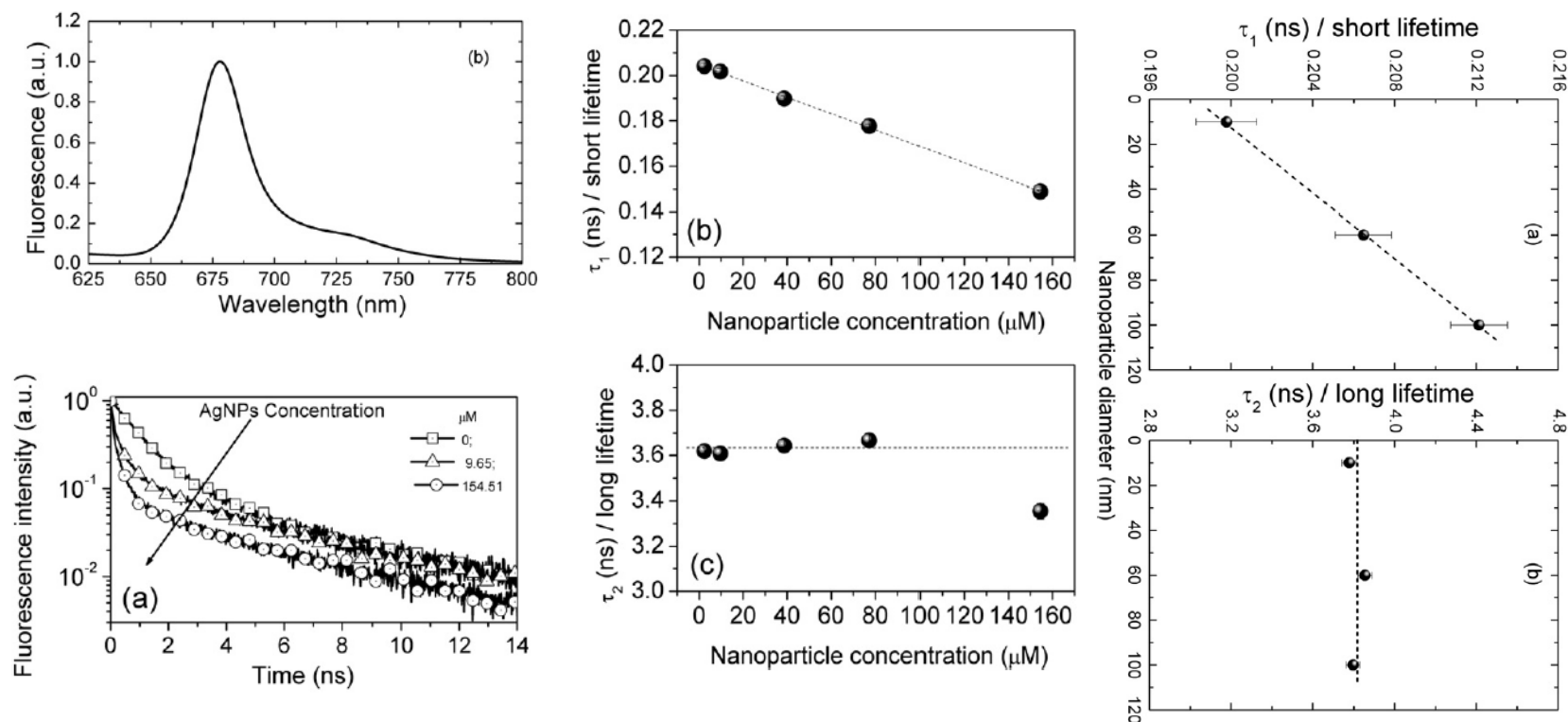
## SAMPLE PREPARATION

In all analyses performed, the AgNPs were suspended in a dilute aqueous citrate buffer for stabilizing and to prevent aggregation. This solution was selected because the citrate based agent is weakly bound with the nanoparticle surface and can be readily replaced by other molecule, allowing a direct interaction between chlorophyll molecules and AgNPs surface.

## DATA ACQUISITION

Fluorimeter consisting of a laser excitation source, a monochromator and a Y-type optical fiber. Wavelengths between 450 and 800 nm with excitation at 405 nm. Fluorescence lifetime measurements were performed using a multiphoton confocal microscope (Zeiss LSM 780) with a 20× objective. A tunable 690–1100 nm laser (Chameleon, Coherent) was used as the excitation source. Lifetime measurements of the samples were taken at 678 nm.

## REPRESENTATIVE FIGURE AND RESULT



## CONCLUSION

Optical measurements can be used for monitoring the interaction between Chl and AgNPs. It was demonstrated that AgNPs quenched the Chf and contributed for the reduction in the Chf lifetime.

## REFERENCE

A. M. Queiroz et al, "Quenching of chlorophyll fluorescence induced by silver nanoparticles," *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy*, vol. 168, pp. 73 – 77, 2016.