PHOTOSTABLE AND BIOCOMPATIBLE CARBON DOTS FROM CITRIC ACID FOR BIOIMAGING

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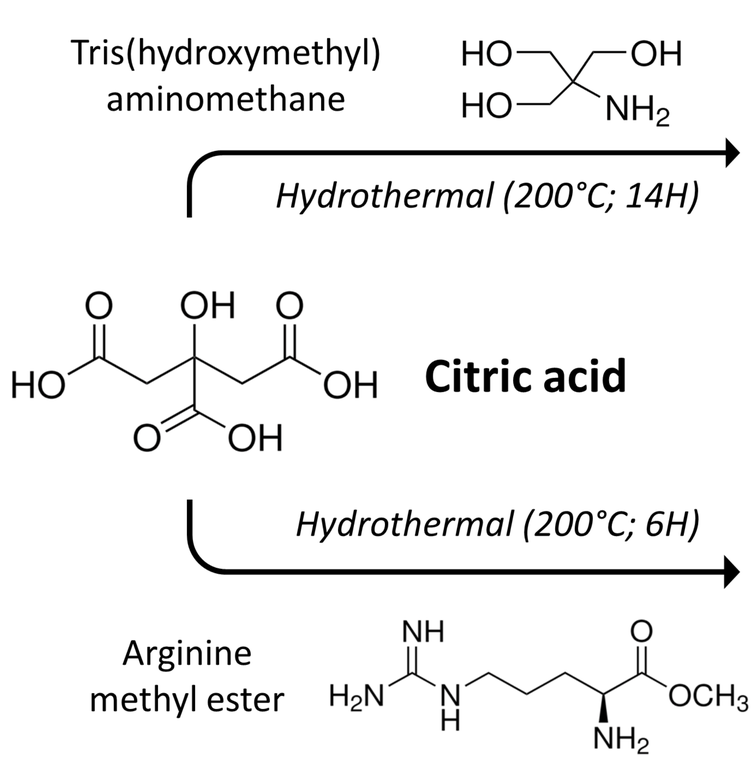
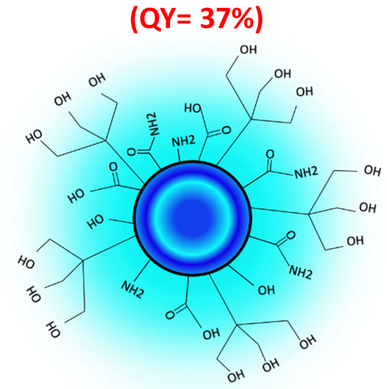
INTRODUCTION

Carbon dots (**C-dots**) are nanoparticles obtained by the assembly of simple organic molecules and characterized by a strong fluorescence emission, photostability and low cytotoxicity.
In this work[1], two C-dots were synthesized from **Citric acid**, which represents a common source to form a carbonaceous core[2].
Tris (hydroxymethyl) aminomethane was chosen for **CATris** because of the possible formation of a dendritic structure associated with photostability properties[3]. While Arginine, was selected for **CAArg** for its guanidinium group that is characterized by strong interactions with cell membranes and thus efficient uptake[4].

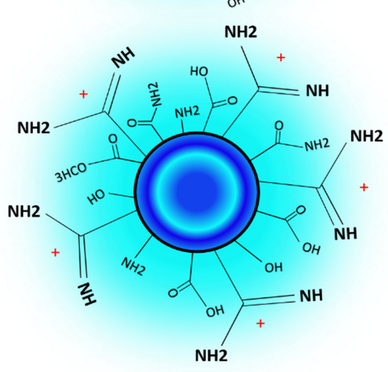
Synthesis of C-dots



CATris
(QY= 37%)

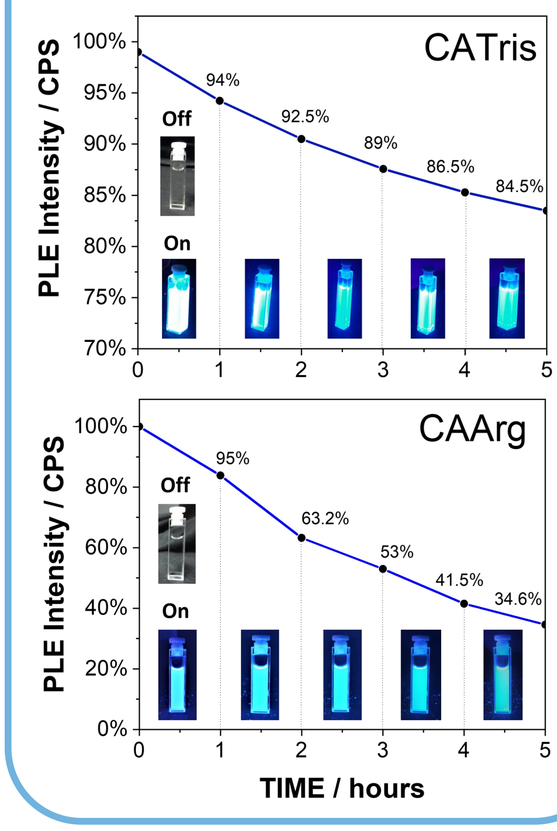


CAArg
(QY= 20%)



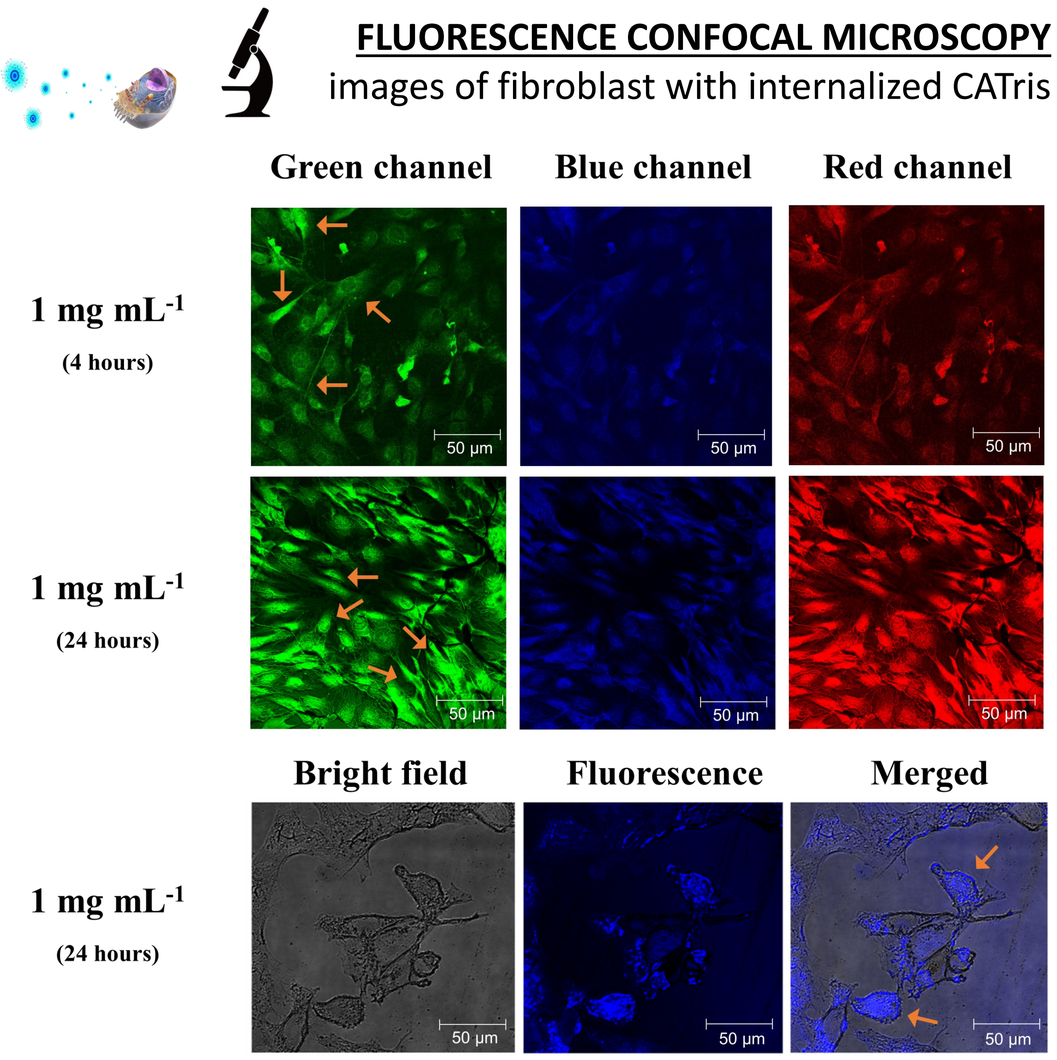
PHOTOSTABILITY

λex= 365 nm

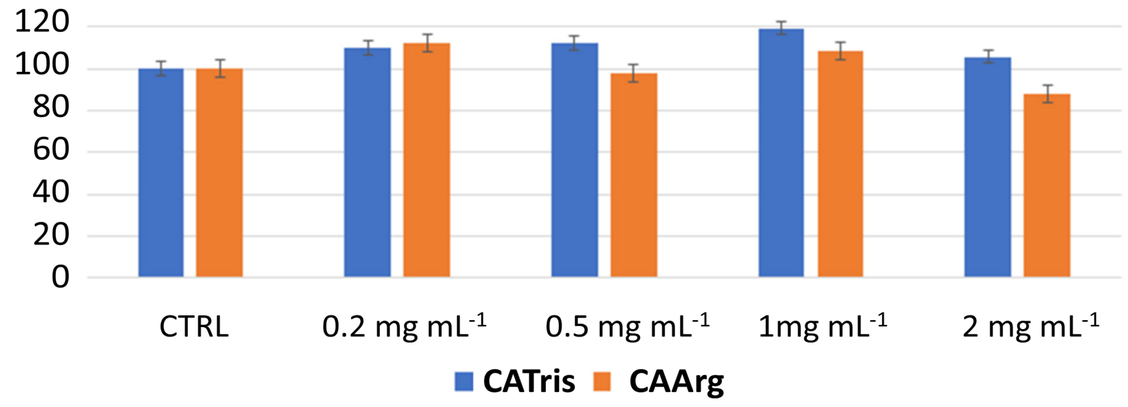


FLUORESCENCE CONFOCAL MICROSCOPY

images of fibroblast with internalized CATris



CELL VIABILITY ASSAY: (MTT - % of control) evaluated after 24 hours exposition of **Fibroblast Cells** to different concentrations of C-dots



CONCLUSIONS

The present study investigated the cellular uptake of two types of **C-dots** obtained from citric acid. **CATris** displayed a better optical performance over **CAArg** and a higher photostability under UV irradiation. The biocompatibility assay showed that up to the concentration of 2 mg mL^{-1}, both C-dots can be safely incubated in fibroblast cell coltures without any cytotoxicity.
Finally, during the fluorescence confocal microscopy experiments, C-dots mainly localized in the cytoplasm, with some nanoparticles also detected in the nucleus, proving their suitability for **bioimaging** applications.

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