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## Abstract

Graphene Quantum Dots (GQDs) are highly perspective bioimaging agents due to a plethora of advantageous properties making them superior to conventional fluorophores. Those properties include stability to photobleaching, large Stokes shifts circumventing biological autofluorescence, and a capability of functionalization for drug delivery. In this work, a variety of GQD structures are imaged via visible fluorescence microscopy in order to evaluate the optimal GQD structures for bioimaging and bioengineering in vitro.

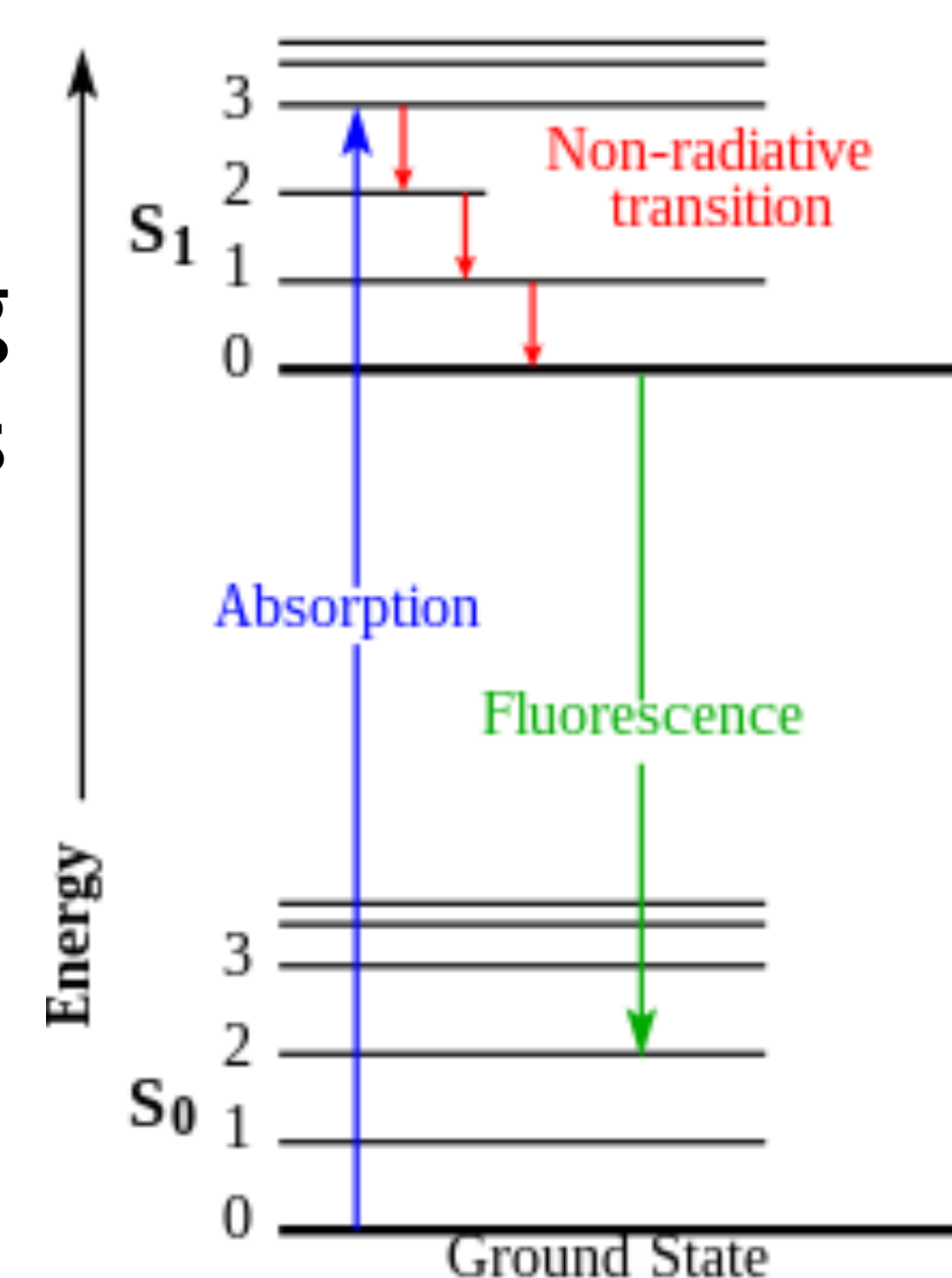
## Introduction

Advantages of using GQDs in bioimaging:

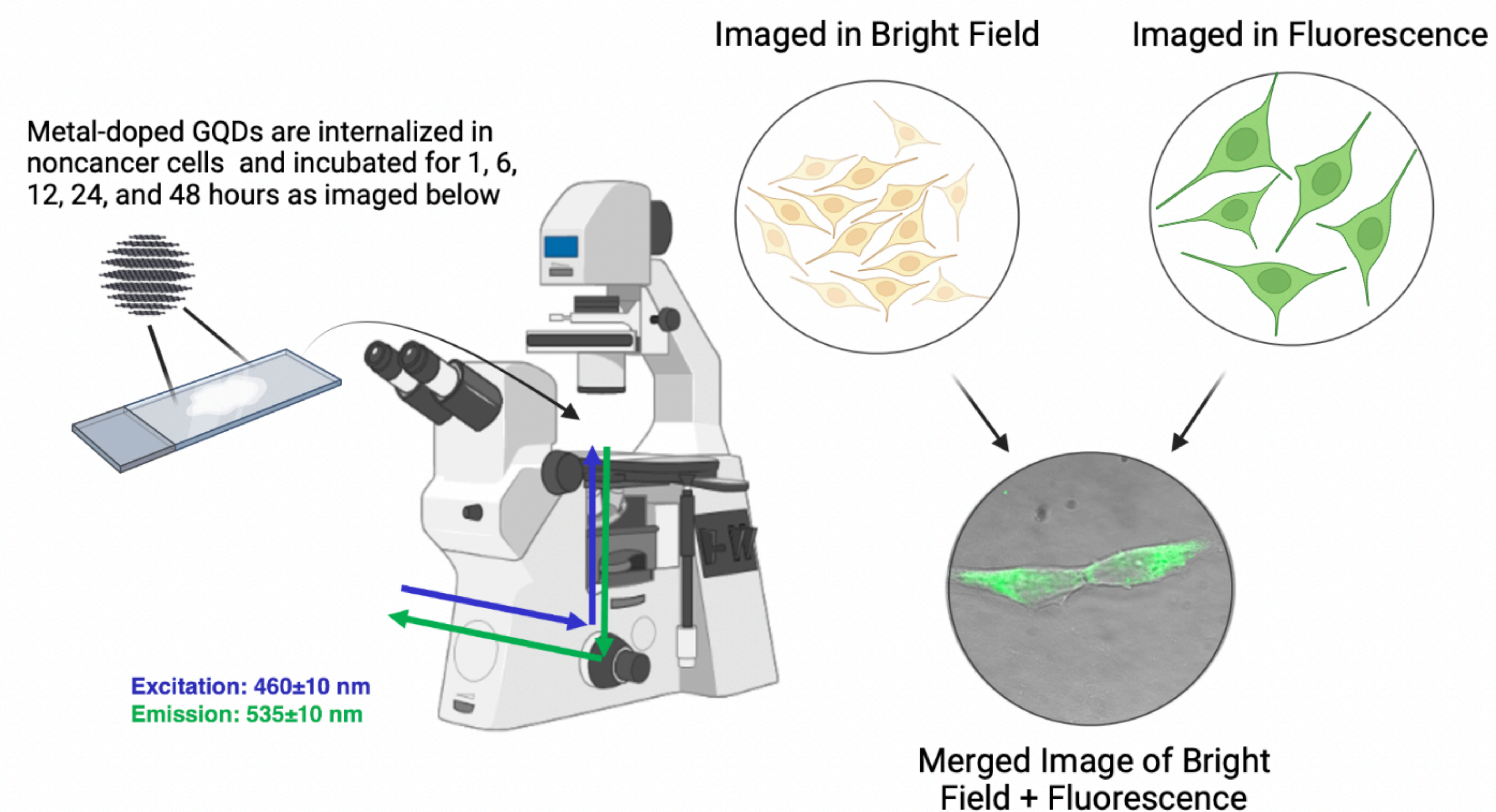
- Exhibit fluorescence in visible region
- Biocompatible
- Photostable

Advantages to using fluorescence as bioimaging method:

- Non-invasive
- Low cost
- Reliable for tracking and sensing



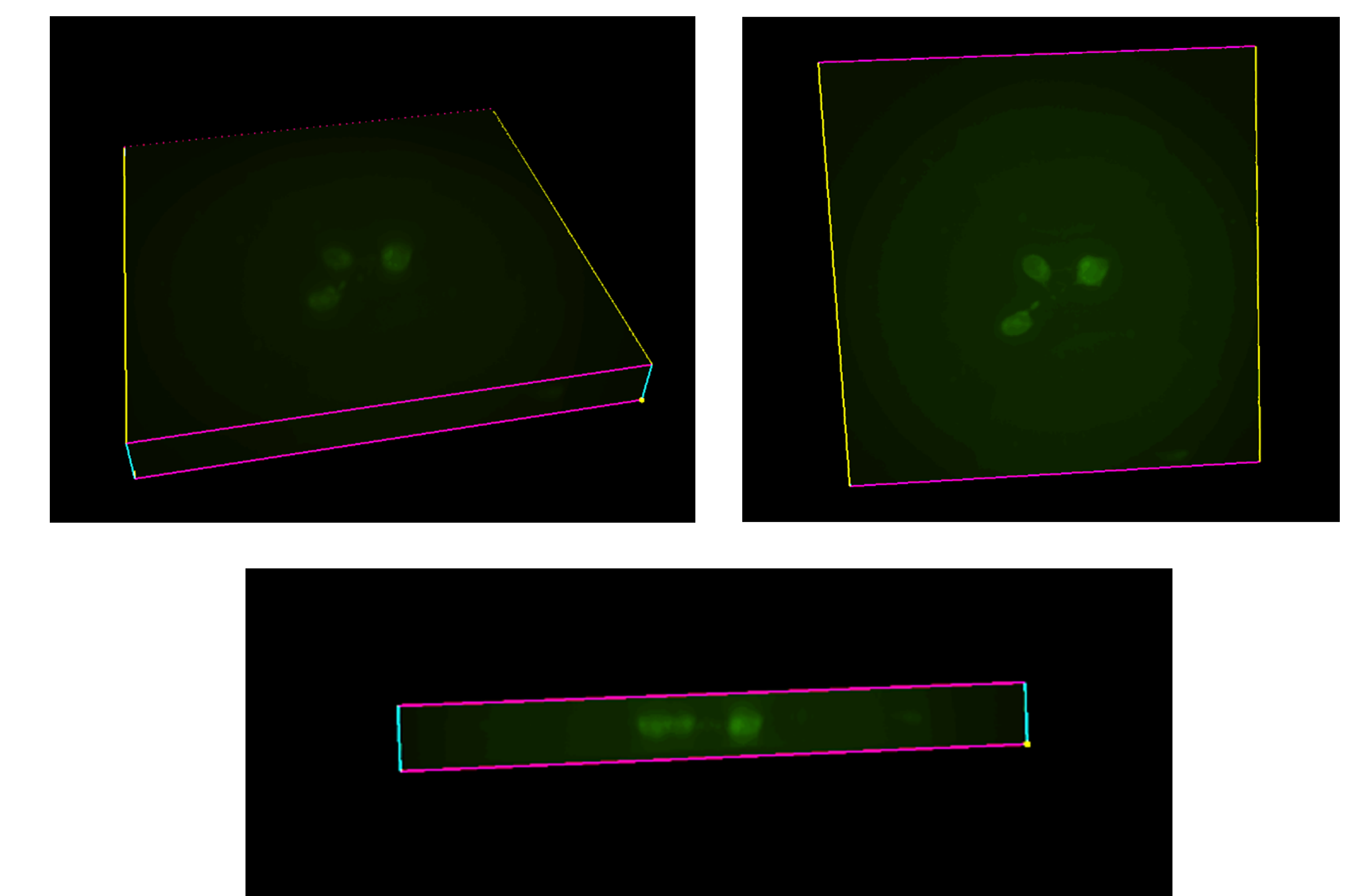
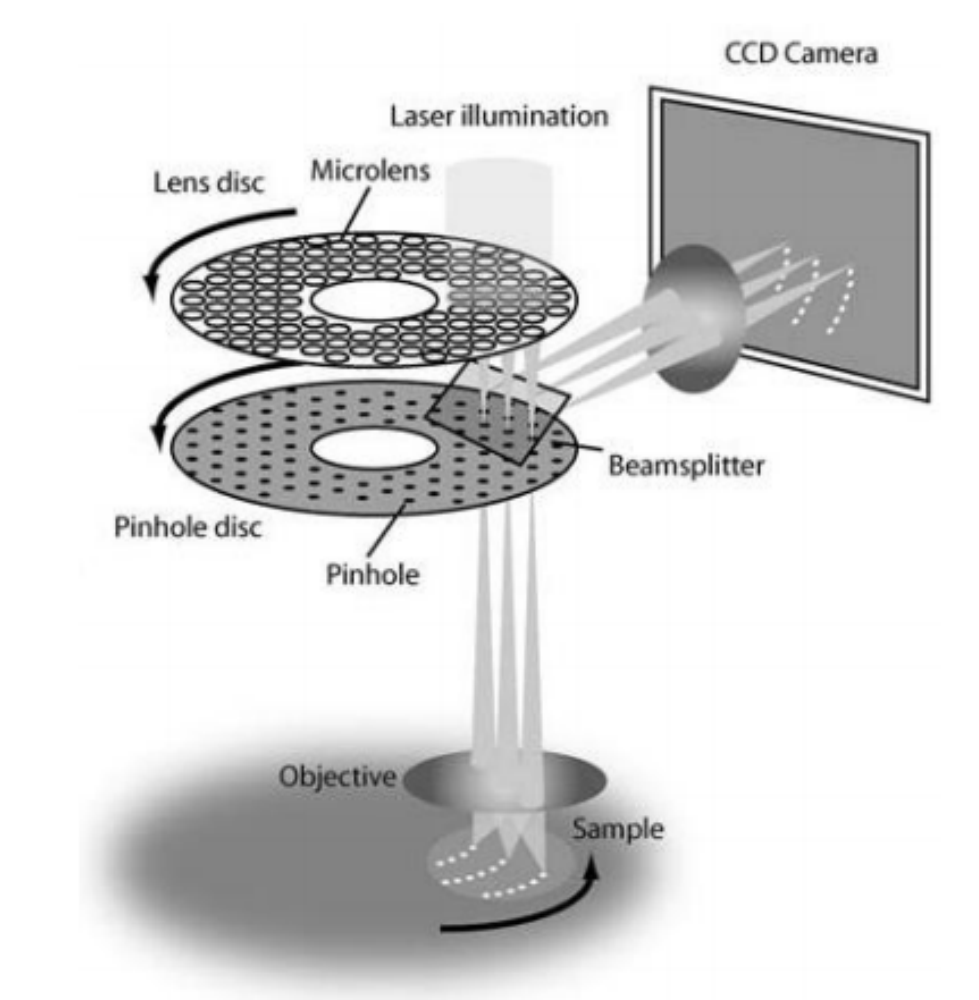
## Methods



## Results

Benefits of using confocal spinning disk imaging:

- Cell internalization in 3D
- High spatial and temporal resolution
- Low photo damage



## Results

	1h	6 h	12 h	24 h	48 h
Iron Oxide NP-NGQDs					
Tm-NGQDs					
MoS <sub>2</sub> -NGQDs					

## Conclusion

- Metal-doped GQDs demonstrate bright fluorescence allowed to perform cell internalization study
- 3D confocal imaging shows that GQDs were internalized inside the cell, and not simply attached to the cell surface
- Metal-doped GQDs offer high precision tracking in bioimaging and bioengineering