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5th International Electronic Conference  
on Medicinal Chemistry

1-30 November 2019

chaired by Dr. Jean Jacques Vanden Eynde

sponsored by  
pharmaceuticals

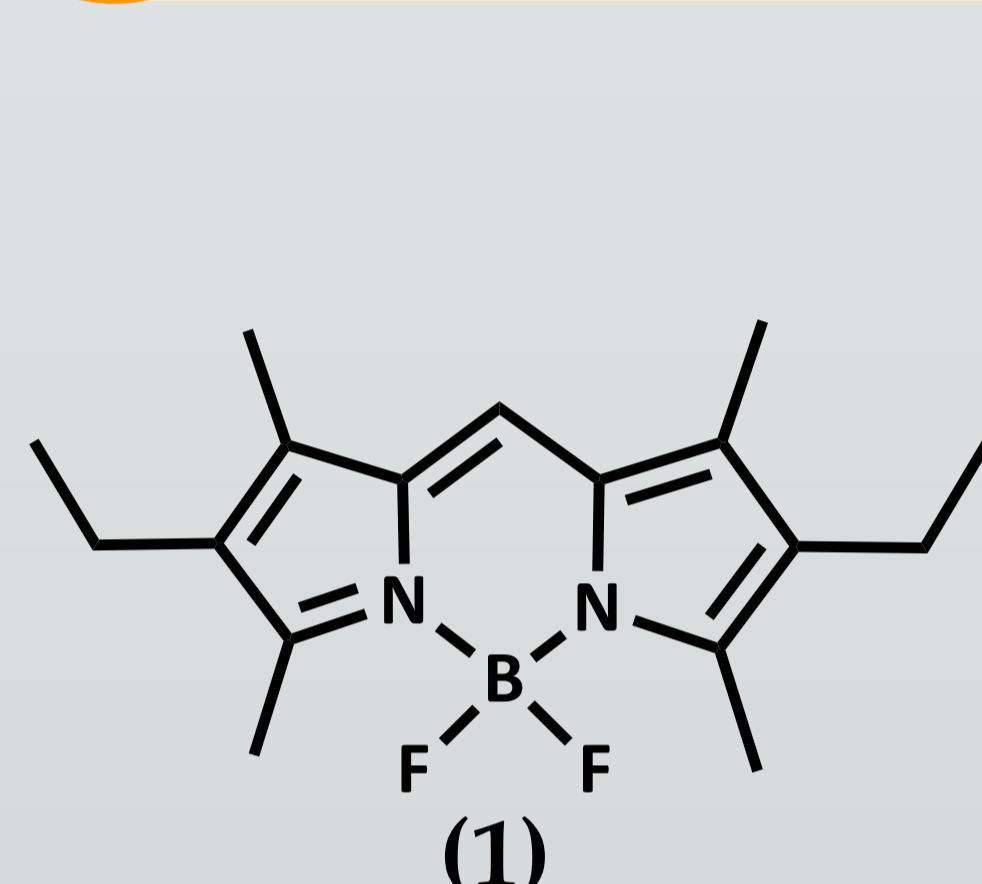
## INTRODUCTION

Lung cancer is the most incident and the deadliest cancer for both men and women. Therefore, the need for new and more effective therapies with fewer side effects is a concern. Photodynamic Therapy (PDT) relies on the administration of a photosensitizer that is subsequently activated by irradiation with light of appropriate wavelength. As a result, reactive oxygen species (ROS) are produced leading to cell death. The use of PDT in the treatment of cancer is still limited, due to the low number of new approved drugs. In light with this, as an alternative class of the porphyrin-based photosensitizers, boron-dipyrromethenes (BODIPY) have been studied.

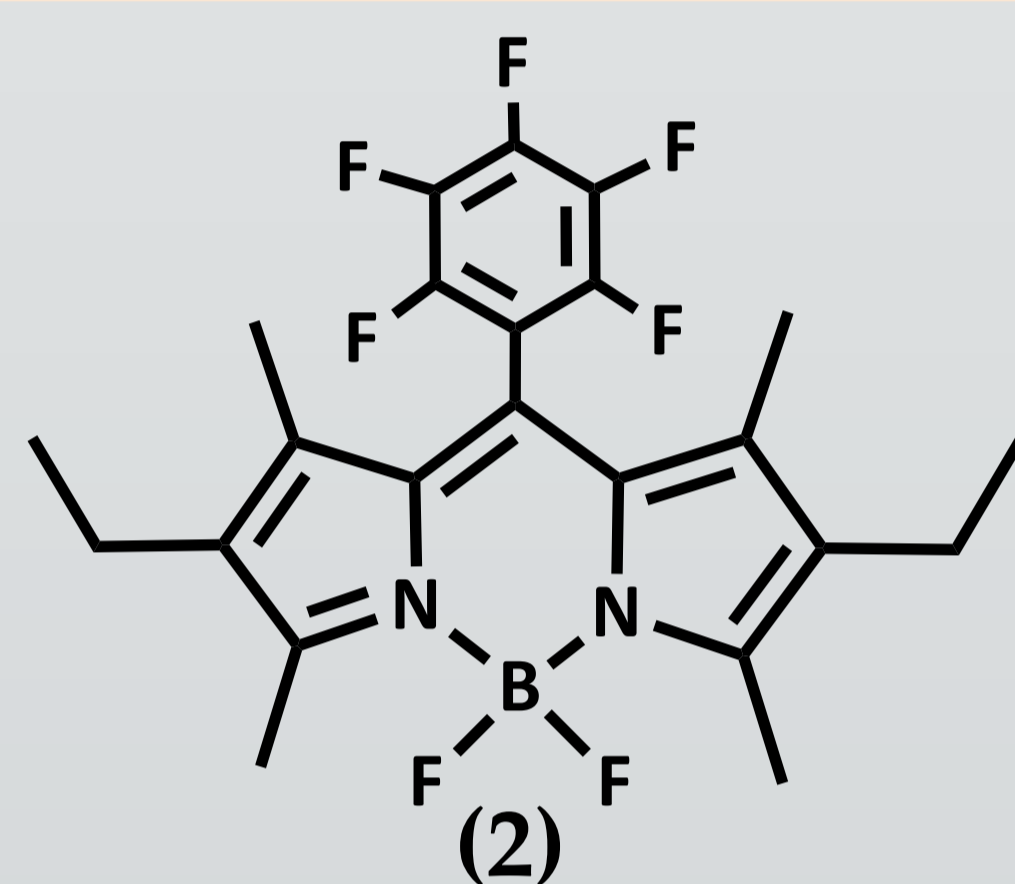
## MATERIALS AND METHODS

1

Compounds 1 and 2 were synthesized



2,8-diethyl-5,5-difluoro-1,3,7,9-tetramethyl-5H-dipyrrolo[1,2-c:2',1'-f][1,3,2]diazaborinin-4-ium-5-uide



2,8-diethyl-5,5-difluoro-1,3,7,9-tetramethyl-(perfluorophenyl)-5H-dipyrrolo[1,2-c:2',1'-f][1,3,2]diazaborinin-4-ium-5-uide

BODIPY 1 and BODIPY 2 were prepared through the condensation of pentafluorobenzaldehyde with two mono  $\alpha$ -free pyrroles, leading to the formation of a dipyrromethane which was oxidized to dipyrromethene by 2,3-dichloro-5,6-dicyano-1,4-benzoquinone (DDQ) and, finally, complexed with boron by addition of  $\text{BF}_3 \cdot \text{Et}_2\text{O}$ .

2

Cells were seeded at a density of 100.0000 cells/mL. Cells were incubated with two concentrations of each compound 10 and 50  $\mu\text{M}$ .

3

Cells were irradiated with 10 Joules for photodynamic therapy.

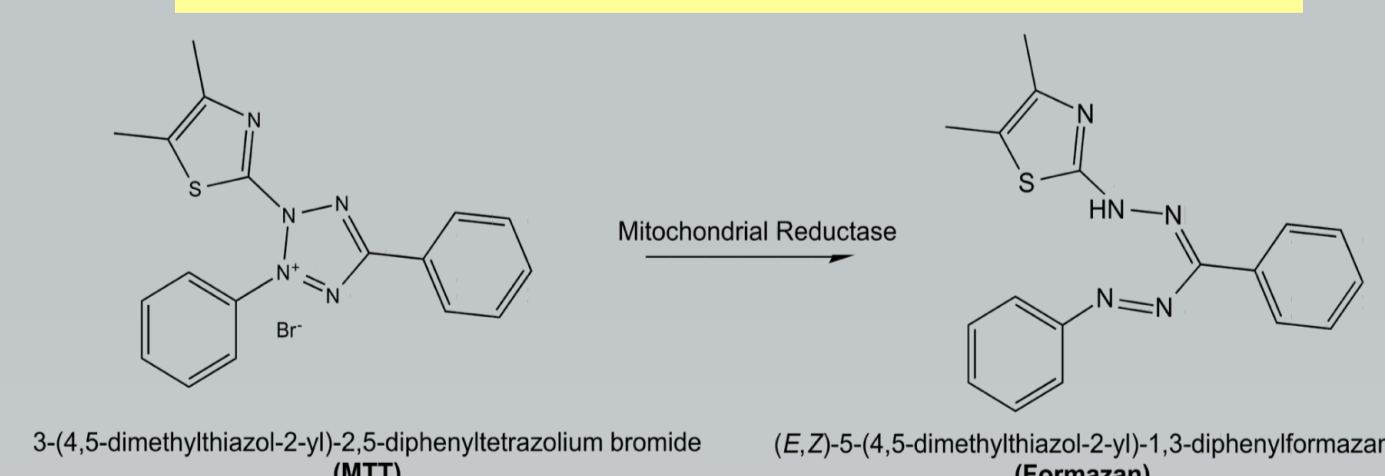


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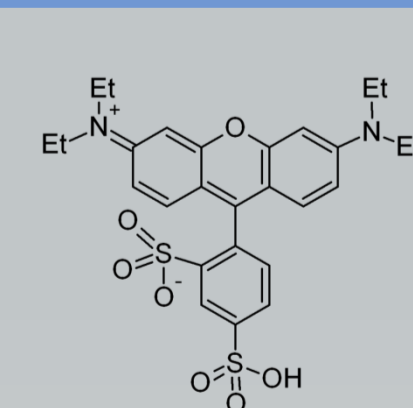
Metabolic activity and protein synthesis were measured by colorimetric cytotoxicity assays.

The sulforhodamine B (SRB) assay is based on the ability of the SRB dye to bind basic amino acid residues on proteins. The MTT (dimethylthiazol-diphenyltetrazolium bromide) assay is based on mitochondrial uptake and succinate dehydrogenase reduction of soluble, yellow, MTT tetrazolium salt to an insoluble blue MTT formazan product.

## MTT assay



## SRB assay



## CONCLUSION

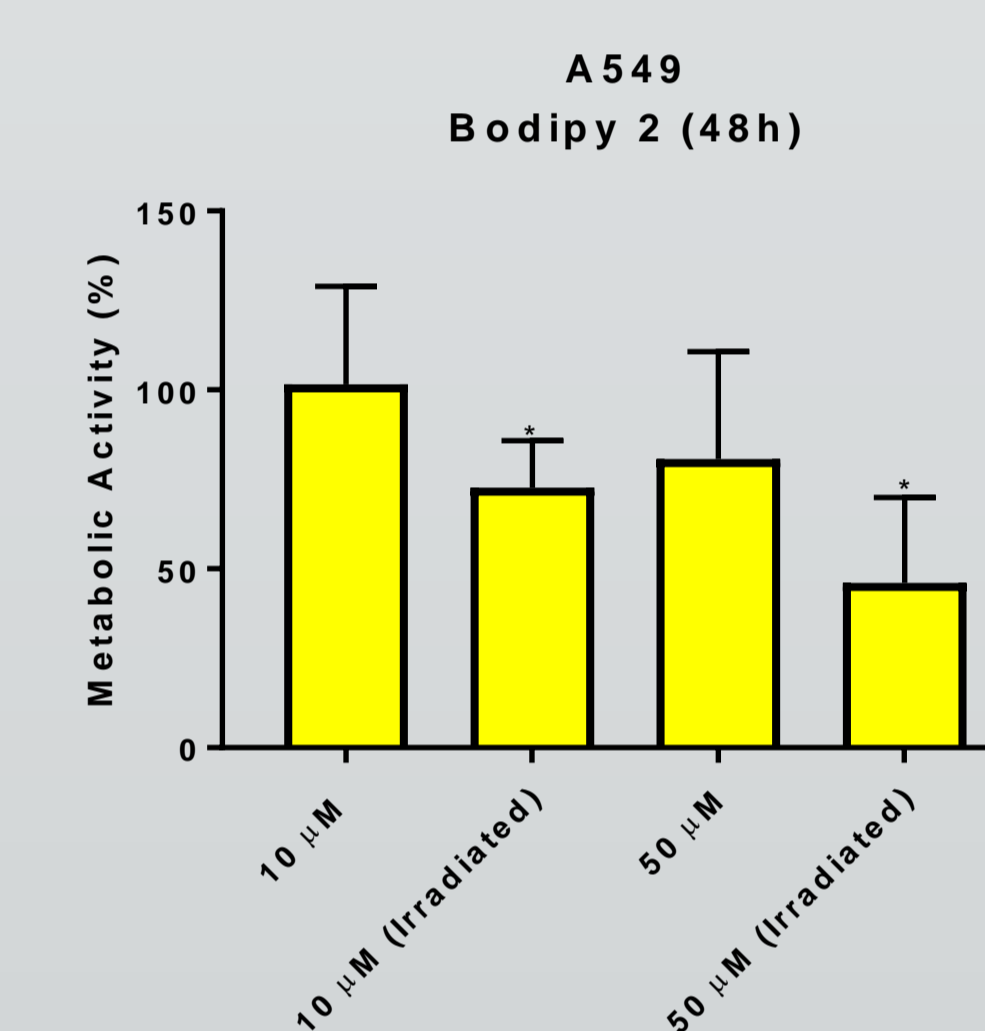
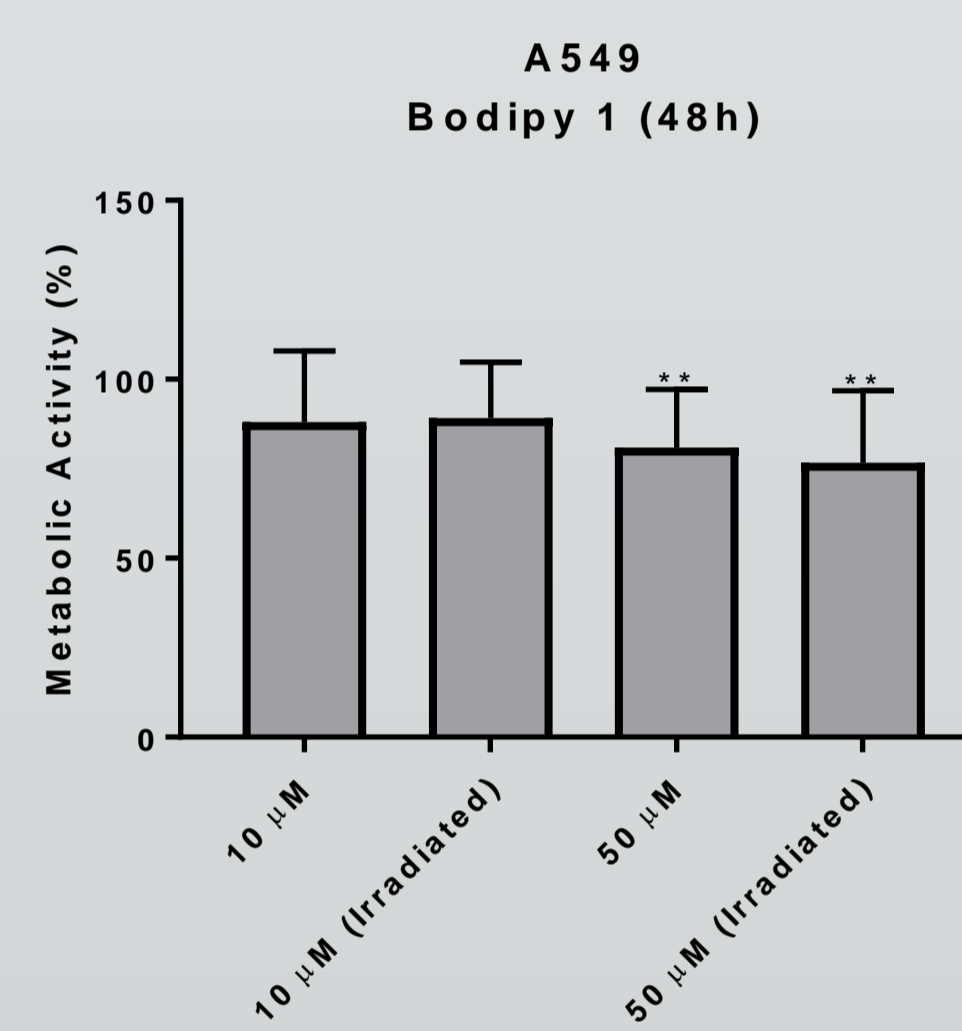
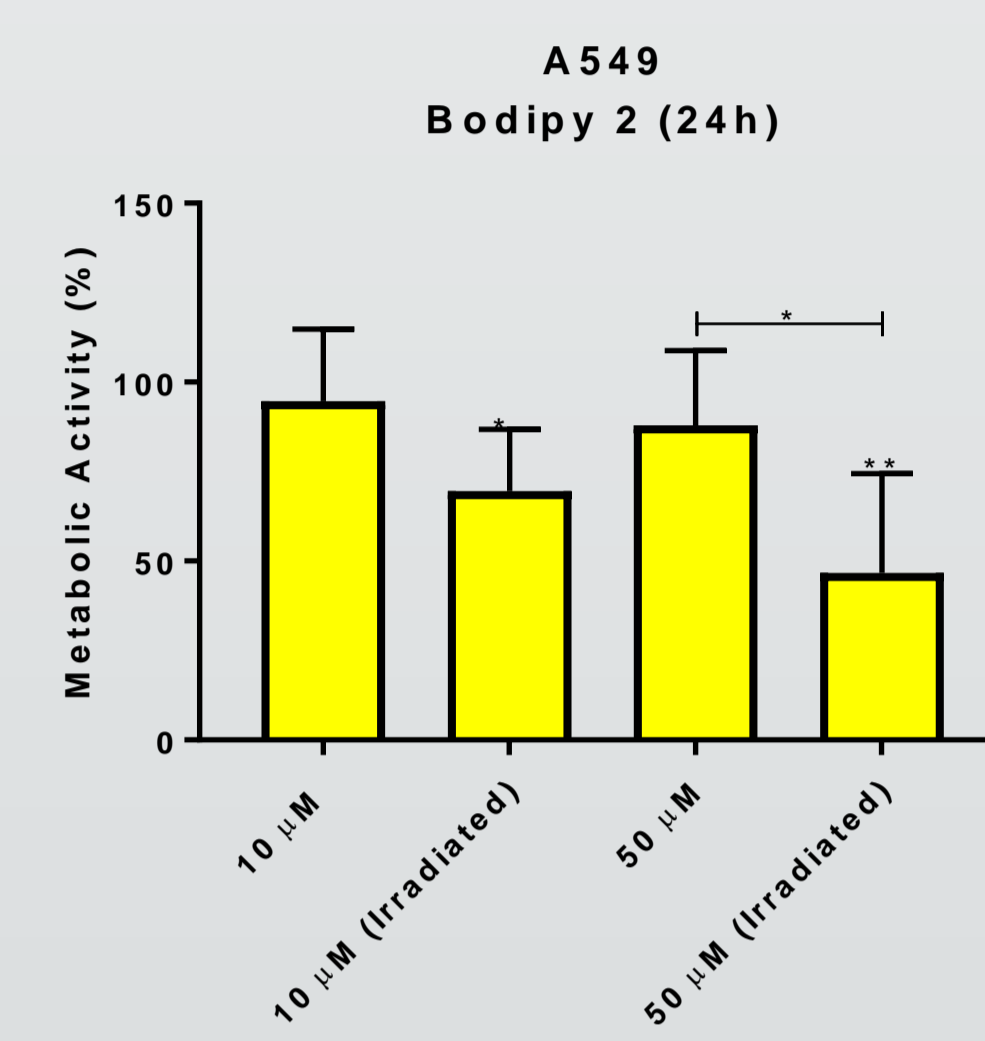
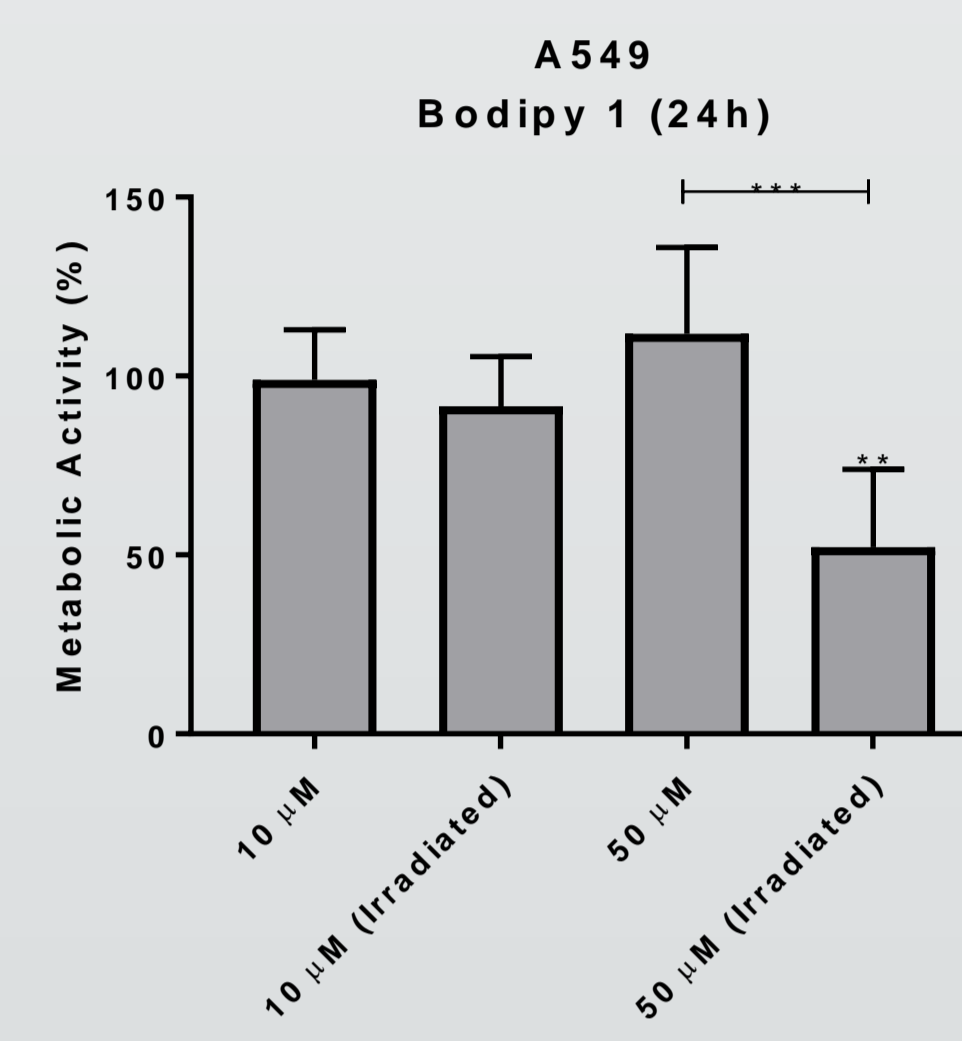
Our results suggest that the synthesized compounds Bodipy-1 and BODIPY-2 might have an antitumoral effect which encourages further studies, being BODIPY-2 a good candidate as photosensitizer in Photodynamic Therapy.

## AIM

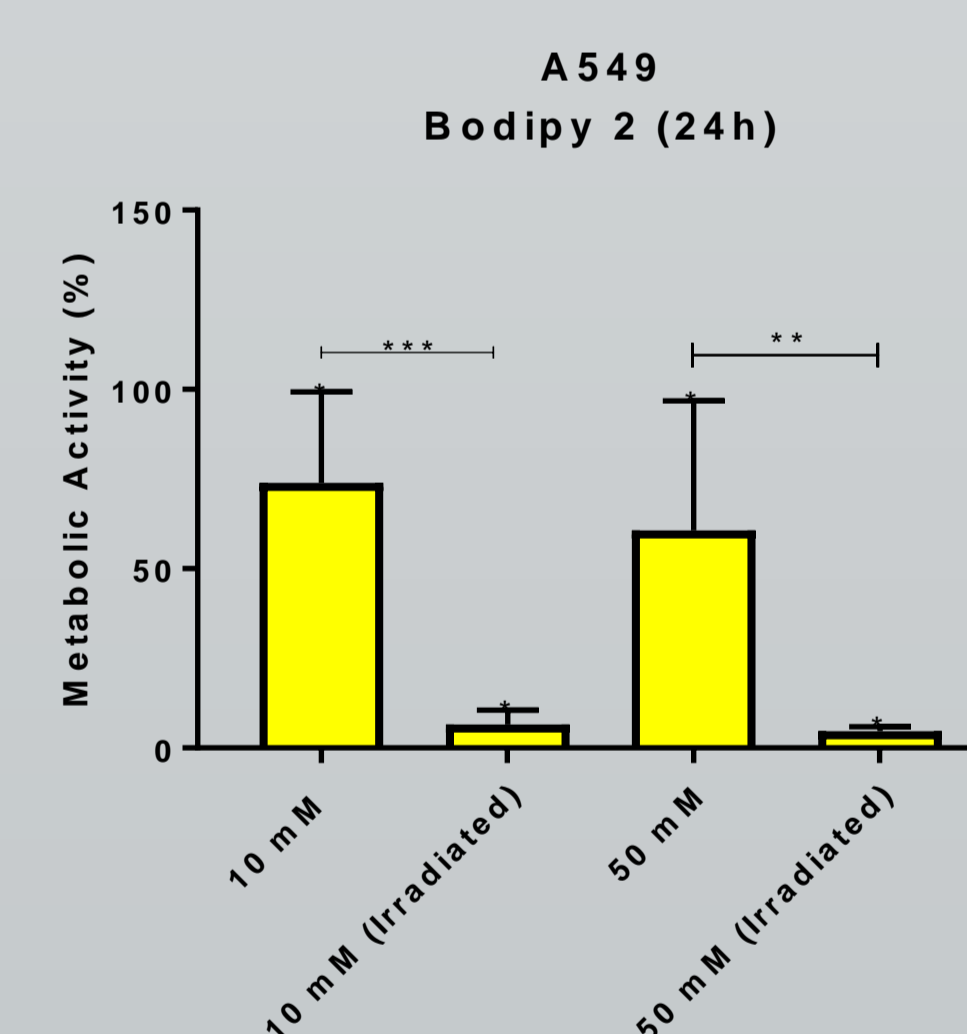
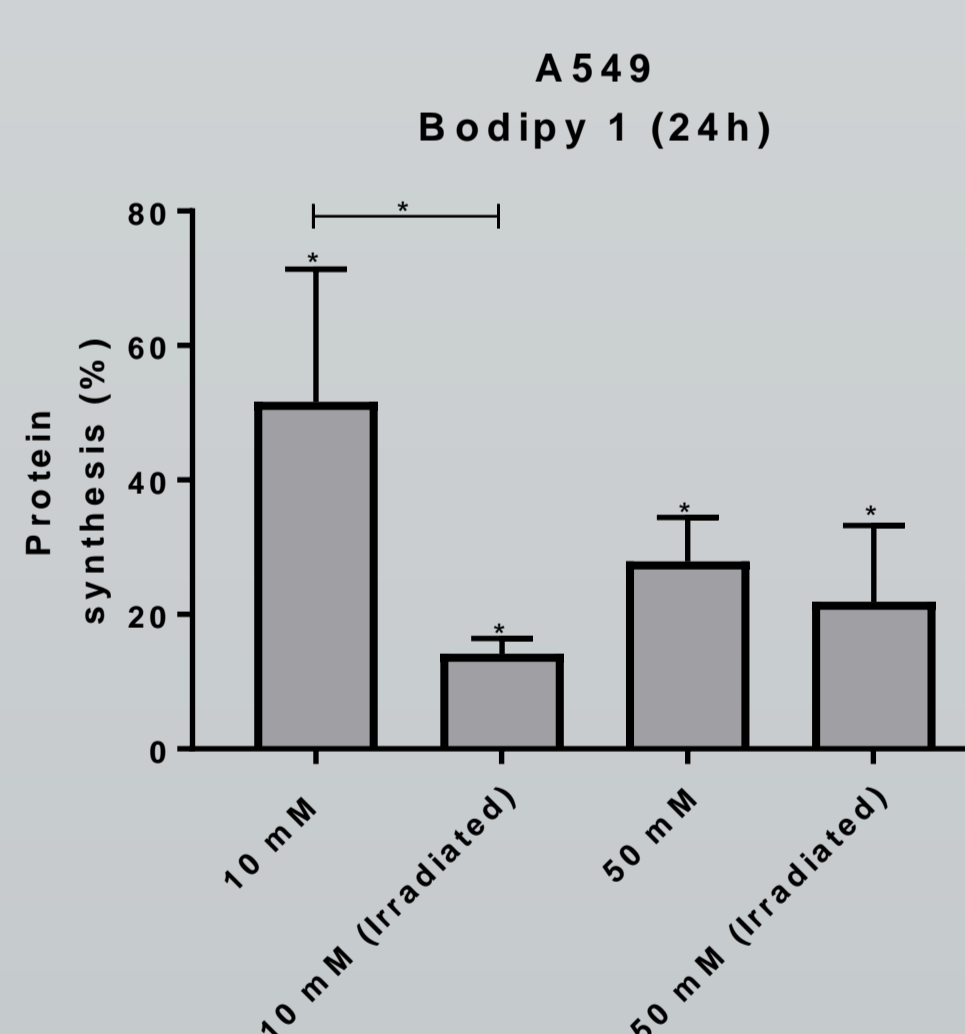
This work aims to develop new photosensitizers for PDT. Two compounds of the family of the boron-dipyrromethenes (BODIPY) have been synthesized and evaluated on the human lung cancer cell line A549.

## RESULTS AND DISCUSSION

## MTT assay



## SRB assay



- ❖ The most effective compound was BODIPY 2.
- ❖ The response of photodynamic treatment is dependent not only on the concentration of the photosensitizer but also on the incubation time.
- ❖ There is a significant decrease in protein content after treatment.
- ❖ Photodynamic treatment has generally been found to induce a decrease in cell biomass and, therefore, a decrease in cell viability.

## REFERENCES

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## Acknowledgments

The authors acknowledge Fundação para a Ciência e a Tecnologia (FCT) for the PhD research grant PD/BD/113702/2015 and "The Coimbra Chemistry Centre" through the project UID/QUI/UI0313/2013. CNC.IBILI Consortium is supported by PEst-UID/NEU/04539/2013 and POCI-01-0145-FEDER-007440.