# Fluorescent probes for the study of mitochondrial diseases

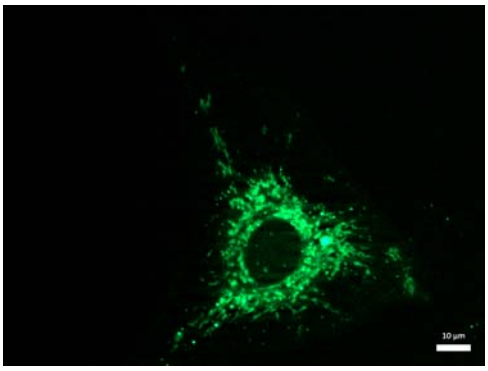
**CSIC, FICYT and FINBA have developed a fluorescent probe that allows monitoring the function and activity of mitochondria in living cells in very diverse diseases including cancer, certain heart diseases or diabetes, and also in aging and that could have applications in the diagnosis of the aforementioned pathologies, or other mitochondrial diseases of genetic origin. We are looking for companies specialized in fluorescent probes for biological research interested in the patent license.**

***Patent license offer***

## Study of mitochondrial and metabolic genetic diseases

Mitochondria are organelles present in almost all eukaryotic cells. The damage or deregulation of their dynamics and function is implicated in mitochondrial genetic diseases, or secondarily in neurodegenerative, inflammatory and cardiovascular diseases, as well as being a therapeutic target for the treatment of cancer as noted in the latest studies. Fluorescent probes are efficient and versatile molecular tools for the study of biological systems thanks to their great sensitivity, selectivity and ease of use, providing a variety of information in real time and non-destructively.

The new fluorescent probe comprises a BODIPY unit as a highly emissive and photostable fluorophore group and an L-carnitine unit for biolocalization. This minimalist molecular design greatly simplifies the synthesis process and can provide other similar probes with tunable absorption and emission frequencies throughout the visible spectrum depending on the selected BODIPY fluorophore. Unlike other commercially available mitochondrial-specific fluorescent dyes, which act by non-specific passive diffusion, the new probe is actively transported into the mitochondrial matrix through a membrane transporter, the the carnitine/acylcarnitine translocase. The deficiency or dysfunction of this transporter causes a metabolic syndrome of genetic origin, for which these probes could provide a diagnostic test.




Cell line derived from human paraganglioma stained with the BODIPY-carnitine probe

## Main applications and advantages

- The efficiency and selectivity of the probe is independent of the substitution pattern in the chromophore as well as the cell line tested.
- The molecular structure of the probe is simple and modular, thus simplifying its synthesis that is carried out in a single stage from commercially available BODIPYs.
- Staining is active, via a specific membrane transporter: the carnitine/acylcarnitine translocase. This is the first specific fluorescent marker for the study of the function of this transporter.

## Patent Status

PCT

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