



Prof. Michal Hocek, Ph.D., DSc.

Head of Research Team in Bioorganic and Medicinal Chemistry

Supervisor's evaluation and report on PhD thesis

Synthesis and delivery of novel fluorescently-labelled nucleotides and their nucleic acids for bio-analytical applications

author: **Pedro Güixens-Gallardo**

Pedro Güixens performed his PhD research project under my supervision from 2014 till 2020. He was working on several projects dealing with the synthesis of nucleotides bearing diverse fluorophores, study of their enzymatic incorporation to DNA, photophysical characterization of modified nucleotides and DNA and study of the transport and delivery to cells for imaging applications. He has also developed a modification of primer extension methodology preventing a non-templated addition of nucleotides by polymerases. In the fluorescent labelling of DNA, he designed and developed several new fluorophore-linked nucleotides for bright fluorescent tagging of DNA, nucleotides bearing viscosity sensitive molecular rotors as lifetime probes sensing changes of secondary structure or interactions with proteins and nucleotides bearing a push-pull solvatochromic fluorophore as colour-changing light-up probe for monitoring interactions with proteins. He also studied different ways of transport of nucleotides to the cell (transporter or prodrug approaches) and performed fluorescent cell microscopy analysis. So far, he published 3 papers (BMCL, Bioconjug. Chem. and OBC) and has another manuscript under revision (ChemComm).

Pedro is a talented and hardworking chemist. He worked very independently and with a lot of enthusiasm. He has gained broad spectrum of experience ranging from organic synthesis, spectroscopy and photophysics to biochemistry and cell imaging. He will continue his career on postdoctoral stay at the Institute Curie in Paris.

I am happy to conclude that **Pedro Güixens-Gallardo** fulfilled all the requirements for the PhD title and I recommend his thesis for defense and further proceeding to be awarded the PhD degree.

V Praze 1. 12. 2020



Prof. Ing. Michal Hocek, CSc., DSc.