



PhD PROJECT

Photoswitchable molecules for dynamic follow-up of inflammatory processes using photoacoustic imaging

*ANR Funding - Nantes University (France)
3 years – Starting date: October 2022, 1st*

Medical imaging keeps exploring novel technologies to gain sensitivity, reliability and spatial resolution, thereby improving detection of pathologies. Photoacoustic microscopy, based on light excitation and ultrasound detection, has recently appeared as a very promising technique to increase depth of probing and allow for dynamic follow-up, down to the scale of single cells. It is nowadays recognized as the privileged method to detect oxygen by monitoring hemoglobin and allow for in vivo quantification of biological dysfunctions. However, in order to diagnose and follow inflammatory processes implied in numerous pathologies (cancers, diabetes, cardiovascular diseases...), the development of novel contrast imaging agents is highly requested to complete the use of endogenous markers.

The PhD targeted studies will be developed in the framework of a national and collaborative project bolstered by the French National Agency of Research (ANR), implying chemists, biologists, and biophysicists working in Nantes and Grenoble. They aim at synthesizing innovating photoswitchable organic molecules with high performance to overpass the encountered limitations in terms of contrast, photostability, phototoxicity, and biodegradability. The syntheses will address π -conjugated structures whose imaging properties will be tuned as a function of electron-withdrawing and donating substituents. They will be combined with formulation methods to make the molecular systems biocompatible.

The recruited candidate will tightly interact with another PhD student, joining the biology team in Nantes. She/he will be trained to perform all characterizations and phototoxicity studies in cell media, and will acquire a large background and expertise in the field of nanosciences, and nanomedicine especially.

The host laboratory CEISAM-UMR CNRS 6230 is located at Nantes University and offers outstanding experimental facilities in organic synthesis, analysis and modelling, in close connection with biophysicists at IMN-UMR CNRS 6205 / Nantes University.

Expected profile: solid background in organic synthesis and motivation for interdisciplinarity
Application will first proceed by e-mail by sending a detailed CV, and two names of possible referees.

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