

Post-doctoral Position in Chemistry/Chemical Biology (Réf : 2026-2201921)

Targeted Photosensitisers to Meet the Challenge of Pancreatic Cancer using
Photodynamic Therapy

Starting date: 1er June 2026.

Duration : 1 year.

Workplace : Université de Limoges, Laboratoire LABCiS Faculté des Sciences et Techniques, 123 avenue Albert Thomas 87000 Limoges <https://www.unilim.fr/labcis/>

Funding: French National Research Agency (ANR).

Type of contrat: CDD

Salary: according to the current grids (University)

Context

Pancreatic ductal adenocarcinoma (PDAC) cancer is one of the deadliest cancer type due to poor prognosis, high metastatic potential and multidrug resistance. Surgery, radiotherapy and chemotherapy and their combinations did not much improve the survival rate which remains low around 5 % at 5 years. To meet the challenge of treating pancreatic cancer, photodynamic therapy (PDT) is a promising new modality. Thus, a strong consortium of renowned chemists, physicists, biologists, radio-physicists, radio-biologists and oncologists has been assembled under the **PEPR-LUMA** program (moonshot project: PDT-PDAC: <https://www.pepr-luma.fr/projet/pdt-pdac/>). It aims to develop a targeted, light-activated treatment for pancreatic cancer and to gain an in-depth understanding of the light-matter interactions required for an effective and selective treatment.

Research project

Our objectives are the design, synthesis and thorough biophysical and biological studies of a generation of PDAC-targeted photosensitisers like phenalenone. The design of the photosensitisers will ensure reactive oxygen species (ROS) generation under near visible photoactivation to treat deep-seated tumours without photodamage to healthy tissue. Targeting moiety for receptors overexpressed in PDAC cancer will be conjugated to the photosensitisers to specifically generate ROS at the tumour site. Different light sources and excitation mode will be tested to generate cytotoxic species (X-ray, ultrasound...)

The recruited post-doctorate fellow will be in charge of the synthesis of phenalenone-based photosensitisers and their coupling to targeting units developed within the consortium. He/she will perform physico-chemical characterization of the photosensitisers, contribute to and supervise their biological activities within the collaboration network. In collaboration with LUMA consortium, use of nanoscintillators, gold nanoparticles or biocompatible fluorescent organic NPs (FONPs) with different surface functionalization by photosensitizers and/or targeting agents should be developed for X-rays, ultrasound activations. Synthesis of PFC nanodroplets containing O₂ will lead to use ultrasound, for enhancement of PDT efficacy.

He/she will communicate the progress of his/her work through consortium seminars, written reports and presentations at scientific congresses.

Candidate profile

The candidate should have:

A PhD degree in molecular chemistry and a strong background in organic synthesis, skills and motivation for multistep synthesis, expertise in characterization techniques (NMR 1D and 2D, mass spectrometry, absorption/emission spectroscopy, DLS, zeta potential...) and purification techniques (TLC, column chromatography, HPLC). An expertise in the synthesis and design, functionalization of nanoparticles (Gold...) would be a plus.

High motivation to work in an interdisciplinary project at the interface of chemistry and biology.

Ability to conduct independent research and demonstrate open-mindedness, curiosity, and organization. English written and oral communication skills.

Host Laboratory

LABCiS UR 22722 and in particular his research group on "Chemistry of natural molecules" (<https://www.unilim.fr/labcis/>) has extensive experience in the design of photosensitisers for anticancer and antimicrobial PDT (Le Guern et al. *Bioconjugate Chemistry* **2017**, 28, 2493; Le Guern et al. *ACS Medicinal Chemistry letters* (**2018**), 9, 12; Bouramatane, S. et al. *Carbohydrate polymers* (**2019**) 213, 168, Godard, J. et al. *ACS Omega* (**2020**) 5, 43, 28264-28272, Godard, J. et al. *Colloids and surfaces: A physicochemical and Engineering Aspect* (**2021**) 612, 125988; Elkihel, A. et al. *ACS Applied Bio Materials* (**2021**), 4, 7204; Gresh, N. et al. *ChemPhysChem* (**2024**), 25, e202300776)

Link: <https://www.unilim.fr/recrutement-post-doctorant-chimie-organique-chimie-moleculaire/>

Application : Cover letter, a detailed CV (Master grades, summary of the project results PhD/Post-doc, publications), and two recommendation letter or two references (with contact details of two referees)

To Madame Djimila RAHMANI Directrice des Ressources Humaines Courriel : drh-recrutement-recherche@unilim.fr

and

To Prof Vincent Sol, Vincent.sol@unilim.fr

Application review will begin immediately and will continue until 25/03/2026