

Postdoctoral Researcher / PhD Candidate Position: Cardiac targeting of connexin-43 with a mimetic peptide to reduce infarct size

DESCRIPTION

Organisation: Inserm

Research area: biology › cell biology › cardiovascular physiology

Required profile: postdoctoral researcher or doctoral candidate

Location: France › Paris-Saclay University, Faculty of Pharmacy › Orsay - Inserm UMR-S1180

Type of contract: Temporary – for postdoctoral: 1 year (renewable for 1 year) or 3 years for doctoral candidate

Status: Full-time – 35 hours

Start date: Early 2026

Salary: Salary will be determined based on years of postgraduate experience, in accordance with the institution's guidelines. Benefits included in accordance with Inserm guidelines.

How to apply: Send your resume and cover letter by email to guillaume.pidoux@inserm.fr with the reference **2026Expedience** before December 14, 2025

Project

Ischemic heart disease is a leading cause of death worldwide. It presents clinically as a myocardial infarction. Rapid cardiac reperfusion is critical to limit heart damage. However, reperfusion also causes injury that can increase the extent of the infarction (up to 50% of its final size). The size of the infarction is directly linked to patient mortality. Limiting its growth improves survival and health. Currently, there is no effective treatment to prevent infarct progression during reperfusion. Connexin-43 (Cx43) is the protein that mediates the spread of cell death signals during reperfusion, playing a key role in determining the infarct's final size. Therefore, Cx43 is a promising therapeutic target to reduce infarct size. We have developed and characterized a new Cx43 mimetic peptide (Cx43MP) that slows intercellular communication. To reduce toxic effects and increase the therapeutic benefit of our Cx43MP, it must be combined with a delivery system that specifically targets cardiomyocytes. To achieve this, we propose using a cardiac targeting peptide (SChoP) that we previously developed and patented. We have shown that SChoP can deliver therapeutic molecules directly to cardiomyocytes. Combining these two peptides will create a new therapeutic agent that specifically targets Cx43 in cardiomyocytes and is expected to limit infarct growth when administered at the onset of reperfusion after cardiac ischemia.

The candidate will be required to:

1/ Evaluate in vitro the ability of SChoP-Cx43MP to transduce cardiomyocytes, reduce intercellular communication, and hinder the spread of apoptosis/necrosis, while deciphering the underlying molecular mechanisms.

2/ Assess the efficacy of SChoP-Cx43MP in an ex vivo model of cardiac ischemia/reperfusion (I/R), particularly in targeting ventricular cardiomyocytes and decreasing infarct size.

3/ Examine the pharmacokinetics and biodistribution of SChoP-Cx43MP in vivo in an I/R model, emphasizing the study of cardiac function and infarct reduction.

To fully achieve these objectives, the candidate will need to combine cellular biology techniques (cell culture, immunohistochemistry and immunocytochemistry, live cell imaging) with biochemistry methods (immunoblots, mass spectrometry, RT-qPCR), as well as ex vivo and in vivo studies on small animals (ex vivo perfused isolated hearts, echocardiography).

Related Tasks and Activities

- Designing and conducting experiments

- Sharing data internally and at scientific meetings
- Scientific monitoring, reporting, and protocol development
- Contributing to the overall life of the laboratory and team
- Working independently and collaboratively

Level of responsibility: Working under the supervision of Dr. Guillaume Pidoux (Inserm UMR-S1180)

Specific constraints: Working with small animals (rodents)

Requirements

- A Master's degree or PhD in cell biology, or biochemistry, or physiology
- Knowledge in:
 - Cell biology and biochemistry
 - Cell signaling
 - International research environment
 - Strong oral and written communication skills in English (minimum B2)
 - Cardiac physiology would be a plus
- Expertise/Methodologies in:
 - Basic techniques in cell biology and biochemistry (e.g., cell culture, immunoblots, immunofluorescence, RT-qPCR)
 - Biochemistry
 - Interpretation and analysis of results
 - Computer skills (Level 3: familiar with computer use)
 - Technical approaches to cardiac function analysis would be a plus
- Skills:
 - Autonomy
 - Creativity
 - Scientific rigor
 - Ability to report and share results
 - Communication skills
 - Teamwork
 - Adaptability