

Call for expression of interest - Chaire de professeur junior

Supporting institution: INSERM

Name of the head of the institution: Gilles Bloch

Site concerned: Toulouse

Academic region: Toulouse

Proposed partner institutions/organizations: Université Toulouse-3

Project name: CHRONnic diseases: use of Organoids and Stem cells as Therapeutic options

Acronym: CHRONOS-therapies

Keywords: Stem cells, Organoids, Chronic Diseases, Biotherapy

Target period: 5 to 6 years according to the candidate's experience

Scientific fields: Chronic Diseases (metabolic diseases, inflammation) and Biotherapies

Corresponding CNU/CoNRS/CSS sections: CNU 56/57/65/66/86/87

CSS3, CSS5, CSS7

Institution strategy:

Stem cell discoveries (either embryonic or adult stem cells) have revolutionized our understanding of pathophysiological mechanisms. Further, their potential use in regenerative medicine has emerged as a major new area for therapeutic options. The capacity of stem cells to self-organize in organoids, 3-D structures that are functionally and histologically very similar to tissues, has allowed the development of tissue modelling for different purposes, including development and disease models as well as drug screening models. Such approaches have also fostered the development of new cell-based biotherapies, where tissue or cell transplantation are now feasible. Knowledge about such self-organizing cellular mechanisms, and the possibility to produce and control tissue bioproduction from stem cells and/or organoids, constitute new major challenges for tissue repair, in particular in the setting of chronic diseases, where tissues are chronically damaged and unrepaired.

Inserm is resolutely a key actor in France in the development of biotherapies. Major initiatives in the domain of cell-based biotherapies are coordinated by Inserm. This is particularly true in the Occitanie Region, where Inserm coordinates a "Key Challenge" on cell-based biotherapies. The present chair constitutes an important "brick" to this scientific strategy in Inserm in the Occitanie region.

Strategy of the host laboratories:

With the aim to strengthen the Toulouse scientific community in the field of cell-based biotherapies, a lecturer-researcher chair is to be funded. High-level young scientists aiming at developing a research group leader career in the field of biotherapies are encouraged to apply.

Research assignment will be in one of the three INSERM research units, depending on the candidate's research topic:

- Inserm U1220 (IRSD): Digestive Health Research Institute
- Inserm U1301 (Restore): Institute of geroscience and rejuvenative medicine
- Inserm U1291 (Infinity): Institute for Infectious and Inflammatory Diseases of Toulouse

The successful chairholder will be recruited on a fixed-term contract (3 to 5 years) as a lecturer-researcher. At the end of this period and depending on his/her performance and professional skills, a definitive tenure at the level of research director will be considered at the end of the fixed-term contract.

With the financial support of the Occitanie region, the Toulouse Health Science community has gathered a number of forces on the general theme of Biotherapies. The candidate will be expected to contribute dynamically to this ambitious regional research focus, with the long-term goal of placing the Toulouse site at the forefront of the national and international scene in the field of cell-based biotherapies.

The chairholder will benefit from office and laboratory space as well as access to on-site state-of-the-art core facilities. Other cutting-edge facilities are accessible through an integrated local network of platforms (<http://www.genotoul.fr/>). Independently of an initial package, Junior candidates should be eligible for start-up programs such as ERC Starting/Consolidator Grant, ATIP-Avenir, or equivalent. It is expected the candidate to become rapidly a group/team leader, pending that additional funding could be secured by the candidate. Support will be provided to obtain research funding. The chairholder will also be allocated additional resources to facilitate integration.

Summary of the scientific project:

The use of stem cells and/or organoids as new therapeutic options for tissue repair or regeneration is in its infancy, while it is clear that it will occupy a large place in the future therapeutic arsenal. Stem cells or organoid engraftments, and more broadly cell-based biotherapies are on the rise. However, many questions are still unanswered: control of cell fate, biosecurity, best indications? Chronic diseases, such as chronic inflammation or metabolic diseases lead to severe organ dysfunction, and the potential repair or replacement of organs are now clearly considered as new therapeutic options. Tissue engineering, and imaging in view of the use of cell-based biotherapies take also an important part to this field in development. Mechanistic studies aiming at defining the best conditions for tissue or cell engraftment are needed, including but not limited to immune mechanisms associated with engraftment (allogenic or autologous).

The candidate's scientific project will focus on cell-based (possibly organoids or stem or adult cells) bioassays and biotherapies in the context of chronic inflammatory diseases or metabolic disorders. The general objective is to conduct research on functional repair of organs, using cell-based technology approaches.

The focus is large and many organs (liver, pancreas, intestine, skin, lungs, brain, muscle, adipose tissue, etc..) and related diseases could be considered. The project could focus on the resolution of metabolic diseases such as diabetes, or on the resolutions of chronic inflammatory disorders through cell-based therapies.

The candidate must hold a PhD and must have demonstrated his/her ability to conduct excellent research, as evidenced by high-level publications and international visibility. A strong potential for supervision and animation of research is expected.

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Summary of the teaching project:

Pedagogical assignment will be at the Toulouse-3 University (Paul Sabatier). The chairholder will be involved in master and PhD programs in line with his/her skills, mainly through the international graduate school CARE (<https://care-graduateschool.fr>).

Financial summary: using the attached financial form, describe the financial needs and their distribution to carry out the scientific project (doctoral student, post-doctoral student, IT, equipment, etc.)

ANR funding package	200 000 €
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Scientific dissemination: Communications in scientific congresses, highly visible publications in international journals are expected.

Open science: No

Science and Society: Communications and press release will be issued upon major scientific achievements.

Indicators: Scientific publications, securing funds for research, participation to national and international networks, invitations to internationally recognized institutions and conferences.