

**Appel à manifestation d'intérêt - Chaire de professeur junior**  
**Fiche projet type**

**Établissement/organisme porteur :** Inserm

Nom du chef d'établissement/d'organisme : Gilles Bloch

Site concerné : Institut Cochin (Inserm U1016, CNRS UMR8104, Université Paris Cité)

Région académique : PARIS

**Établissements/organismes partenaires envisagés :** Université Paris Cité

**Nom du projet :** Physiopathology of reproduction

**Mots-clés :** endometriosis - fertility - reproduction - uterus

**Durée visée :** 4 years

**Scientific domain :** physiology- endocrinology- development- gynecology -stem cell

**Section (s) CNU/CoNRS/CSS correspondante (s) :** 64, 65, 66, 68

**Strategy of the host institution: (15 lignes maximum)**

Endometriosis is a major issue in women medicine. It is a disease where tissue similar to the uterus lining grows outside of the uterus, forming lesions. It is a major cause of infertility and pain in women of reproductive age. With its diverse symptoms and difficult visualization of the lesions, there is 7-year diagnosis delay. Since more than two years, INSERM has established a strategy to cope with this pervasive feminine disease. In this strategic plan, a series of priorities was defined, and took into consideration - priority fields of research, including epidemiology (better definition of prevalence and actual incidence of the pathology), identify the risk factors, better classify the disease which is actually very heterogeneous, identify the comorbidities, genetics, epigenetics, mechanisms of pain, inflammation and infertility and identification of biomarkers, aiming at decreasing the diagnosis uncertainty and improve prognostic. INSERM, as WHO, is committed to support more research and awareness raising to ensure effective prevention, early diagnosis, and improved management of the disease.

**Strategy of the host laboratory :(15 lignes maximum)**

Institut Cochin (IC) has an ongoing development strategy to support reproduction research as it is a major theme within one of the scientific priority axis of the Institute ("Cellular and genetic plasticity"). Several groups are working on endometriosis, infertility, gametes development, and these research programs have been developed in close collaboration with the Obstetrics-Gynecology II service of the Cochin hospital. These research groups focus on topics related to signaling, immune responses and inflammation, genetics and epigenetics. They benefit from interactions with each other and with the whole scientific community from IC, which brings together 41 teams focused on biomedical research at the interface of other scientific axes (cancer, metabolism-endocrinology, microbiology and immunology). In addition to this stimulating environment, IC provides technical support by 9 state-of-the art core facilities. The applicant's project will take part in the development of innovative approaches to study endometriosis and reproduction that will complement the investigations already explored within IC and Cochin hospital. The candidate is expected to demonstrate autonomy in the management of research projects and collaborations, as well as the ability to supervise young researchers, as head of an emerging team. Of note, prior research on endometriosis is not a prerequisite.

**Summary of the scientific project : 15 lignes maximum**

The scientific project will strengthen the importance of reproductive biology at Institut Cochin. Endometriosis is a major cause of female infertility, as half of the feminine infertilities are linked to this pathology. Endometriosis is a multifactorial disease for which an interdisciplinary approach is essential to achieve a transfer of scientific and technical innovations from basic research to translational research and clinical care. The proposed project should bring innovative approaches to tackle questions related to the heterogeneity of the disease and the plasticity of the cell populations within the lesions/uterus/ovary and their microenvironment, in order to better understand the mechanisms supporting the disease progression or the development of inflammation and infertility. The project could, for example, build on recent developments in the genetic field to identify novel genes involved in endometriosis, such as evaluating epistatic interactions in the genomic variants, or investigating how epigenetic modifications could contribute to the disease. It could also focus on stem cells, microbiota, endocrinology, environment interactions or mathematical models. Important criteria for selection will be the originality and relevance of experimental models. The project is therefore expected to provide understanding and tools for female infertility beyond endometriosis.

**Summary of the teaching project : 15 lignes maximum**

The person recruited will have to demonstrate his/her ability to teach at the interface of several disciplines focused on molecular biology/development by developing innovative teaching methods. The candidate will participate in teaching at the licence and master levels. The project must include teaching participation in medical studies, Master 2 (Repr Master BIP, M2 "Reproduction et Développement" (reprodevodev) Université Paris Cité and M2 sciences chirurgicales et nouvelles technologies interventionnelles, Université Paris Saclay.) or Masterclass. The candidate will also be involved in international continuous training sessions recently organized by Institut Cochin for the PhD students.

**Funding :**

ANR package	200k€
Co-funding*	€
Total project	€

\*source et montant

**Scientific communication and dissemination:**

The results of this work will be published in peer-reviewed journals. They will also be communicated at national and international conferences. A large part of the data will be made available through publications and deposit in public databases such as bioRxiv and HAL.

**Open Science :**

In line with international initiatives (UNESCO), European requirements (Horizon Europe program) and national plans (2nd National Plan for Open Science), Institut Cochin with Inserm, CNRS and Université Paris Cité is committed to an open science approach. Two aspects are concerned by the project: publications and research data. For the publications in open access, the way that will be privileged is that of the publications in the sites of "preprint" and on the HAL site. For research data, in particular

for raw data, Institut Cochin has set up a database in the form of a Cloud hosted by the Inserm Informatic Service (ISD) on the premises of Institut Cochin. A complete backup is made every day at the Inserm ISD of the Inserm Paris 5 delegation. If the Image server is damaged, a restoration is launched via the copy of the Paris 5 delegation. Via a unique login, each member of a team can save and archive all the data produced via this database. Targeted access can be given to collaborators for collaborative files and data can be made accessible to the outside world.

### **Science and society :**

The project is very committed to communicating with the general public through various means, including a focus on the web pages of Institut Cochin and through social networks such as Twitter and LinkedIn. These actions are being stepped up in coordination with the communication services of Inserm and Faculty of Health.

In addition, Institut Cochin has been organizing workshops for the general public and class visits every year since 2014, on the occasion of the “Fête de la science”, and also participates in the CNRS's “unusual visits”: in total, this means that nearly 300 people are welcomed every year (<https://www.institutcochin.fr/animation/>). Visits to charities and their donors are also organized. The laboratory was also open during the APHP's open days, with the Cochin Hospital, and it participated in 2019 in the national event to celebrate the 80 years of the CNRS with France BioImaging infrastructure. Since 2021, researchers from Institut Cochin have been participating in the Déclics operation (Dialogue Entre Chercheur(e)s et Lycéen(ne)s pour les Initier à la Construction des Savoirs) of the FSER circle (Fondation Schlumberger pour l'Education et la Recherche), which allows researchers to present the scientific process and the research professions in high school classes with time for informal exchanges. Thus, the candidate will be committed to getting involved in communication actions towards the general public, in order to be attentive to society's expectations and to reinforce the critical spirit of citizens.

### **Indicators :**

Teaching

Research

Knowledge transfer

Indicators for monitoring project deployment will be based on:

1. Patents and publications.
2. Papers in conferences in the field and ability to organize workshops;
3. The ability to obtain funding for the project;
5. The ability to supervise students;
6. The capacity to transmit knowledge through teaching;
7. The ability to integrate into European and international research networks.