

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 : Grenoble

Région académique : Auvergne-Rhône-Alpes

Établissements/organismes partenaires envisagés : *le cas échéant*

Projet porté à l'Institut pour l'Avancée des Biosciences, Inserm 1209-CNRS 5309-UGA

Nom du projet : interactions between epigenome, metabolism and cellular and mechanical microenvironments in development and diseases.

Mots-clés : Epigenetics, heterochromatin, cell plasticity, microenvironment, metabolism, experimental therapy

Durée visée : 4 years

Scientific domain : cell biology/molecular biology/experimental therapy

Section (s) CNU/CoNRS/CSS correspondante (s) : CSS1, 2, 5, 6; CoNRS 11, 21, 22,24,27,28 ; CNU 64,65

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

The Institute for Advanced Biosciences develops fundamental and translational research programs with a focus on understanding the molecular and cellular mechanisms by which cells adapt to the constraints of their environment at all scales of the living (from molecules to ecosystems). This strategy is based on 4 keywords: epigenetics, environment, cell plasticity and cancer. IAB brings together 19 research teams and groups supported by 6 technical platforms (300 staff). The main translational endpoints are cancers, infectious diseases (viruses and parasites), fertility and development pathologies and prevention of environmental exposures in early life.

IAB develops translational and pre-clinical research programs in partnership with CHU Grenoble-Alpes and actively cooperates with other research centers of the Grenoble site, in particular EMBL, IBS and molecular chemistry/pharmacology and physics departments of UGA.

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

Research at IAB encompasses a wide range of topics and expertise, from molecular genetics and epigenetics to cell biology, molecular pathology, parasitology, immunology and environmental epidemiology.

Research is organized in three interacting Departments: Signalling through Chromatin, Cell plasticity, Micro-environment and Signalling and Environment, Reproduction, Infections and Cancer. This scientific structure provides a framework for bringing together ideas, methods and people to find out innovative responses to biological and medical questions. The common goal of this interdisciplinary approach is to elucidate the mechanisms by which complex biological and pathological phenotypes emerge and transform along trajectories of health that link environmental

exposures, metabolism, infectious diseases and cancer. An underlying theme across all topics is experimental therapy, with many programs oriented towards pre-clinical proof of concept of novel targets and interventions. IAB programs take advantage of an exceptionally rich technological environment in Grenoble, encompassing platforms dedicated to structural biology (EMBL, IBS), proteomics (CEA), quantitative fluorescence microscopy, flow cytometry, genome and protein engineering, metabolomics/lipidomics, in vivo imaging and animal models.

Summary of the scientific project : 15 lignes maximum

The proposed project will aim at promoting original concepts and approaches for understanding the interactions between the dynamics of the epigenome, cellular metabolism and the cellular and mechanical microenvironment. Specifically, the project will aim at better understanding fundamental molecular and cellular processes that control heterochromatin dynamics and cellular plasticity in normal development and diseases.

Epigenome and the flow of information to and from the genome determine the type, position and precise function of each cell within complex systems of interactions between cells and their environment. The architecture of the epigenome and the activation of transcriptional programs is itself directly dependent on the metabolic and micro-environmental context of the cell. The disruption or alteration of these information flows are the basis of many pathologies, including cancers, and determine the trajectories of evolution towards resilient forms.

In addition to a solid fundamental component, the project should include a translational dimension (discovery of biomarkers, new therapeutic targets, experimental therapies). Two important criteria are (1) originality and relevance of the experimental models proposed and effective capacity to implement them; (2) consistency of the project with the strategic themes developed by the departments and teams of the IAB.

Summary of the teaching project : 15 lignes maximum

The teaching project fulfills a need to renew and increase academic and university leadership in the field of cell biology applied to pathology, a strategic area for UGA-CHUGA interfaces and health site projects. Specifically the project will aim at strengthening teaching in epigenetics, biology of cell-cell interactions and cell-substrate interactions and their implications for cell plasticity and tissue reprogramming in diseases including cancers, chronic and infectious diseases.

The development of the teaching offer should lead towards taking on responsibilities for teaching units and courses, at bachelor's and master's level.

The candidate will also be expected to contribute to the development of an international teaching offer by leading and/or participating in summer school projects such as epigenetics applied to health.

Funding :

ANR package	200k€
Co-funding : University Grenoble Alpes, IAB	130 k€
Total project	330 k€

*source et montant

Scientific communication and dissemination :

The successful applicant is expected to publish in the best journals and conference in his discipline as principal author but also as co-author of publications co-developed with other teams and departments of IAB. About 70% of IAB publications involve researchers from more

than one team, emphasizing the collaborative strategy of the unit. Whenever required, data and advanced results will be made available through publications and deposit in public databases such as bioRxiv and HAL. The successful applicant will comply with EU recommendations on Communication, Dissemination and Exploitation (<https://ec.europa.eu › quick-guide diss-expl en>) and with Inserm best practices on signing scientific publications (<https://pro.inserm.fr/rubriques/recherche-responsable/integrite-scientifique/signature-des-publications-scientifiques>)

Open Science : IAB is committed to Open Science and the successful applicant will comply with OS standards on two specific aspects: publications and data management, sharing and reuse. The relevant indicators for publication are those defined the EU indicators frameworks for fostering open knowledge practices in science and scholarship, including I4OC, OpenAIRE, Crossref and the European Open Science Cloud. Relevant indicators for data management, sharing and reuse and encapsulated into FAIR principles.

Within these general principles, major innovations will be identified and processes for IP protection and patent filling prior to open publication.

Science and society : the successful applicant will comply to Horizon 2020 Programme Open Innovation and Open Science Research Infrastructures-Research Infrastructure Impact Assessment Pathways/science and society P12 Promoting engagement between science, society and policy. Specifically, the successful applicant will comply with Inserm and IAB established practice for scientific mediation and dissemination to the public. He/she will also actively participate in mediation events such as Fête de la Sciences, Nuit des Chercheurs or Journées Patients / Chercheurs. The successful applicant will receive appropriate media training.

Indicators :

Teaching

1. Capacity to effectively transfer knowledge through teaching
2. Usage and development of innovative teaching and pedagogical practices
3. Capacity to ensure student training through research at L3, M1 and M2 levels

Research:

1. Patents and Publications
2. Invited papers lectures in national and international conferences
3. Ability to organize workshop and conferences
4. Ability to supervise doctoral students and support staff
5. Capacity to leverage and obtain competitive funding
6. Capacity to compete in EU excellence programs (ERC) and to integrate EU/international research networks.

Knowledge transfer

1. Capacity to identify and prioritize major innovation towards IP and patent filling
2. Capacity to initiate value creation processes within the framework of Inserm Transfer and other relevant actors.
3. Capacity to contribute expertise towards the development of expertise (e.g. risk evaluation), best practice (e.g. recommendations) or public policies.