

Postdoctoral Researcher: Functional Genomics and Evolution of Transposable Elements

Category – Staff body – Group

Job category: A1A41 – Biologist Engineer in Data Analysis

Job title: Postdoctoral Researcher

Position open from: November 2026

The employer

The French Research Institute for Sustainable Development (IRD) is an international scientific research institute that contributes to strengthening the resilience of societies in the face of global change. It operates in more than 50 countries across Africa, Latin America, Asia and the Pacific, as well as in mainland France and the French overseas territories.

Its research activities address concrete and priority challenges: mitigating and adapting to climate change, combating poverty and inequality, preserving biodiversity, improving access to healthcare, and taking social dynamics into account. Research questions are developed together with local stakeholders and populations. Research teams bring together different perspectives, disciplines and forms of knowledge through long-term partnerships to develop robust, high-impact solutions.

IRD promotes research that benefits as many people as possible. It shares the results of its projects and puts science at the service of action. It thus supports the transformation of societies towards fairer and more sustainable social, economic and ecological models.

The research unit you will join

The DIADE research unit (*DI*versité, *Adaptation et DE*veloppement des plantes tropicales; IRD–University of Montpellier–CIRAD) studies plant biodiversity, the mechanisms underlying plant adaptation and interactions with the environment, and plant developmental mechanisms in order to develop new phenotypes required in the context of climate change. To achieve this, the unit develops a continuum of approaches, tools and methods, including genome analysis, biochemistry, physiology, microscopy, modelling and data integration.

The unit focuses particularly on plants from tropical regions, where current challenges are especially pressing: exceptional biodiversity, rapid population growth, sustained environmental pressure and increasing demand for plant production. The unit's research is primarily based in Montpellier, with field activities in Africa, Central and South America, and Asia.

An attractive mission

Development of integrative approaches combining functional genomics, regulatory networks, machine learning and population genomics to predict the evolutionary effects of transposable elements in date palm.

Under the supervision of Yann Bourgeois, your activities will include:

The successful candidate will contribute to the second component of an ANR project (DaTEPalm), which aims to understand how functional constraints and regulatory networks influence the deleterious effects of transposable elements (TEs) and their evolutionary dynamics in date palm. They will work closely with the project leader and will also contribute to the scientific supervision of the PhD student associated with the project, as well as to the dissemination and valorisation of results (analyses, publications and scientific presentations).

The main objective will be to integrate population genomic approaches with functional genomic data (gene expression, chromatin accessibility, DNA methylation and annotation of regulatory regions) in order to identify genomic and functional factors predictive of the selective effects of TEs.

The main activities will include:

- **Functional genomics–population genomics integration:** development of statistical approaches linking the genomic distribution of TEs to functional variables (expression levels of target genes, network centrality, epigenetic state, presence of transcription factor binding sites) and evolutionary parameters (insertion frequency, TE age, recombination, linked selection and ancestral recombination graphs).
- **Development of machine-learning approaches:** implementation of modern machine-learning approaches, ideally including deep-learning methods, to predict the potential functional impact of TE insertions. The ultimate goal will be to integrate large-scale heterogeneous datasets (genomic sequences, epigenetic profiles, gene expression, regulatory networks and population-genetic statistics).
- **Generation and analysis of functional genomic data:** participation in tissue sampling (young leaves and flowers) for RNA-seq, ATAC-seq and DNA methylation analyses across several date palm varieties; processing of sequencing data, quality control, alignment to reference genomes and differential expression analyses.
- **Construction and analysis of gene regulatory networks:** development of co-expression and regulatory networks integrating transcriptomic and epigenetic data; identification of tissue-specific functional modules and characterisation of gene centrality (connectivity, position within modules and functional importance).
- **Comparative analysis and evolutionary modelling:** comparison of TE dynamics among different date palm populations and lineages, integration with approaches modelling distributions of fitness effects (DFE), and contribution to the evolutionary interpretation of the results.

Your future team

You will join the DIADE research unit in Montpellier, a dynamic research environment at the forefront of plant evolutionary genomics. You will have access to regional and national high-performance computing infrastructures (Genotoul, French Institute of Bioinformatics) and will collaborate with a local (CBGP, IRD) and international network of researchers working on the genomics of speciation and plant evolutionary biology.

The project also involves fieldwork sessions in France and potentially in the Middle East, depending on the candidate's interest.

The profile we are looking for

You have developed the following skills:

- Demonstrated expertise in genomics, transcriptomics, genome annotation and comparative genomics; proficiency with command-line tools, scripting languages (Python, R, Bash) and version-control systems (Git); experience with job-management systems and cluster computing environments.
- Strong experience in the analysis of whole-genome resequencing data, including variant identification (SNPs, indels and transposable elements), selection scans, demographic inference, and experience with simulation tools (coalescent methods, msprime, SLiM).
- **Ideally:** knowledge of or expertise in deep-learning approaches.
- Experience with challenging genomic datasets, particularly large genomes (>2 Gb) with a high content of repetitive sequences; familiarity with long-read sequencing technologies (PacBio, Oxford Nanopore) and associated analytical tools.
- Knowledge of the identification, annotation and population-level analysis of transposable elements; understanding of TE dynamics and their impact on genome evolution.

You demonstrate the following personal qualities:

- **Autonomy and initiative:** ability to independently manage complex analytical projects while knowing when to seek advice and collaborate.
- **Rigour and attention to detail:** commitment to producing high-quality, reproducible research through careful documentation and validation of results.
- **Effective communication:** strong scientific writing skills and the ability to present complex concepts clearly to diverse audiences; English proficiency at B2–C1 level (French is an advantage but not required).
- **Adaptability and problem-solving:** ability to solve technical challenges, rapidly learn new methods and adapt approaches according to results.
- **Collaborative spirit:** enthusiasm for working in an interdisciplinary team, sharing knowledge and contributing to a stimulating research environment.

You hold a PhD in biology, evolutionary biology or bioinformatics.

Joining IRD

Throughout your career, IRD supports you in developing your skills.

The institute provides a range of resources, including a digital onboarding programme, access to continuing professional development, career advancement and mobility opportunities.

Depending on the activities, IRD offers the possibility of working remotely 1 to 3 days per week.

By joining IRD, you will benefit from:

- 32 days of annual leave + 13 additional days (RTT) for full-time employees
- Meal vouchers
- Optional annual membership of AOS, providing access to leisure, holiday, sports and cultural benefits
- Membership of the MGEN complementary social protection scheme, providing comprehensive health and insurance coverage

IRD – An institute that gives meaning to your career

Your mission in the service of science committed to a sustainable future: **IRD in 230 seconds.**

Our recruitment processes are based on skills, without distinction based on origin, age or gender, and all positions are open to people with disabilities.

Advancing research – Sharing science – Transforming the future

Application deadline

15 September 2026

Interviews

21–25 September 2026

Selection

25 September 2026

Start date

1 November 2026 to 1 February 2027, depending on availability and processing of the application in the case of an international candidate.