

# Research Engineer: Advanced Application of 3 and 7 Tesla Magnetic Resonance Imaging (MRI) for the Study of Brain Development in Children (M/F)

Type of position: 2-year renewable fixed-term contract

Employer: Inserm

Job place: NeuroSpin (CEA, Saclay 91, France) and Robert Debré Hospital (APHP, Paris 19<sup>ème</sup>, France)

Start of contract: November 2025-February 2026

Level of study: Master, PhD highly recommended

## Context and work environment

The research engineer will join the inDEV research team, UMR1141 <https://neurodiderot.u-paris.fr/equipes-de-recherche/indev/>. This multidisciplinary team based at Robert-Debré Hospital and NeuroSpin (UNIACT Clinical and Translational Applied Neuroimaging Unit) is composed of researchers and clinician-scientists, experts in the fields of developmental, integrative and cognitive neuroscience, neuroimaging, neuropsychiatry, neuropsychology and neurophysiology. He/she will also work in close and integrated collaboration with the managers of the 3 and 7 Tesla (T) MRI imagers at the NeuroSpin and Robert-Debré sites, the radiographers, and the researchers of the NeuroSpin physics, MRI algorithms and image analysis teams, in particular the METRIC team of the Baobab unit as well as the researchers in cognitive neuroscience and psychology of the unit UNICOG <https://joliot.cea.fr/drf/joliot/recherche/neurospin>.

This position is part of the *Institut Hospitalier Universitaire (IHU) Robert-Debré du Cerveau de l'Enfant* (IRDCE), whose research theme is the neural and cognitive development of children, from birth to early adulthood (<https://cerveau-enfant.org/>). The IHU project is based in particular on 3 and 7 Tesla magnetic resonance imaging (MRI), and on a wide spectrum of modalities, some of which are conventionally used (e.g., anatomical and morphological imaging, diffusion imaging, functional resting-state and task imaging) and others to be developed in children (e.g., relaxometry imaging, perfusion imaging, spectroscopic imaging). The ambition is to implement innovative brain imaging techniques that are relevant to scientific questions and constraints related to the young ages of the imaged subjects.

## Missions and responsibilities

- Contribute to the **translation in children** of methodological innovations in terms of sequences and acquisition methods through:
  - An **analysis of the specific needs** for imaging the child's brain (e.g., acquisition speeds, involuntary movements during acquisition,

- acoustic noise, aspects of specific absorption rate SAR, ergonomics, adaptation of protocols to the age and maturity of brain tissues in young children) and for the studies under development at IRDCE
- The proposal of **imaging solutions** adapted to the needs and constraints related to pediatric imaging based on in-house developments (e.g. parallel transmission solution, compressed sensing, non-Cartesian acquisition, "custom" sequences), or on research partnerships (e.g. motion correction) or commercial partnerships
- **Testing** of dedicated sequences on phantoms or volunteers
- Data quality **analysis**
- All of this allowing **expertise in pediatric neuroimaging** covering image **acquisition, reconstruction and analysis**
- Contribute to the **production of imaging data** on the IRDCE's 3T and 7T platforms:
  - Install, parameterize MRI sequences on the different platforms (Siemens Healthineers 3T Cima.X & 7T Terra.X, and Philips 3T MR 7700)
  - Maintain these sequences and imaging protocols throughout clinical studies
  - Harmonize imaging protocols between sites and ensure inter-site innovation transfers
- Participate in the **communication** of research results (participation in the writing of scientific publications, participation in conferences)
- Conduct a "scientific watch" in the field of pediatric neuroimaging

## Technical and human skills required

- Mastery of MRI fundamentals
- Mastery of IT tools
- Knowledge of the technical and organizational rules governing magnetic resonance imaging on the human body (MRI operation & ethical aspects & risk awareness)
- Skills and interest in programming MRI sequence design software and in using imaging data analysis tools
- Ability to analyze user needs (neuroscience researchers, clinicians, radiologists)
- Ability to work as part of a team and interact in a multidisciplinary environment
- Ability to analyze and resolve MRI scanner operating problems (software operation of the scanner, error analysis, interpretation of image quality problems)
- Rigor, organization, curiosity, inventiveness, autonomy, initiative
- Fluency in written and spoken English

## **Desired qualifications / experience**

- Scientific background with higher education in engineering school or university (mathematics or physics, with a specialization in biomedical imaging recommended), with at least the equivalent of a master degree.
- PhD strongly recommended (physics or applied mathematics)
- At least initial experience in scientific research
- First experience in a project involving imaging in the healthcare field

## **To apply**

CV, covering letter and letters of recommendation (max. 2) should be sent to [jessica.dubois@inserm.fr](mailto:jessica.dubois@inserm.fr) and [vincent.gras@cea.fr](mailto:vincent.gras@cea.fr) by mid-September 2025.