Offre n°2025-09214

PhD Position F/M PhD Offer – 3 years – Oct 2025 to 0ct 2028 Adaptive phase I-II trial designs for early vaccine development

Type de contrat : Fixed-term contract

Niveau de diplôme exigé : Graduate degree or equivalent

Fonction : PhD Position

Contexte et atouts du poste

In clinical research, one of the objectives of early-phase trials (phases I and I/II) is to identify an optimal dose for further investigation in later studies. In vaccinology, the drug investigated is a vaccine, which is not solely defined by the active pharmaceutical ingredient dose but by multiple factors that together form a vaccination strategy. These factors include the vaccination regimen and characteristics of the antigen and adjuvant. In the traditional paradigm, vaccine development relies on empirical decisions which are not based on all available data. This approach is all the more limited given that the strategy – exposure – responses relationship is often insufficiently characterized, possibly resulting in selection of suboptimal vaccination strategies. Furthermore, due to time and budget constraints, it is not possible to test all possible strategies, increasing the risk overlooking a potentially promising one.

To address these limitations, the Model-Based Drug Development (MBDD) approach proposes to add model or rule – based methods at every stage of drug development. Such methods already exist for dose – finding trials in oncology, addressing the methodological challenged brought by new forms of therapy (immunotherapy, targeted therapy). Given the specific challenges of vaccinology and the innovative methods currently being developed in oncology, it appears relevant to apply the MBDD principle to early-phase vaccine trials. In this context, the development of adaptive designs tailored to the specificities of vaccinology represents a key tool for the quantitative evaluation of vaccination strategies and for informed decision-making.

This thesis project is part of the SMATCH consortium, funded by “PEPR Santé Numérique”, and contributes to Task 1.5, which involves the development of new Bayesian methods for early-phase trials in vaccinology. The work carried out will also help provide recommendations for the design and planning of future early-phase vaccine trials, with the aim of optimizing and accelerating vaccine development.

Mission confiée

An extensive review of the literature and state of the art will help identify suitable designs for the context of vaccinology. Performance of the evaluated methods will be assessed through simulation using programming languages such as R or Python. In particular, we will estimate the ability of these methods to identify the optimal vaccination strategy.

- The first research axis will focus on assessing the adaptability of existing designs to vaccine-specific issues.
- Subsequent work will address the formal integration of continuous data and preclinical study results.

Principales activités

Different use case will be considered in this thesis thanks to the early-phase vaccine trials conducted in collaboration between the Sistm team and the French Vaccine Research Institute (VRI). Data of completed clinical trials will be available within the labkey datawarehouse of the SISTM team and will serve as a basis for simulation.

The candidate will conduct simulation studies using synthetic data to compare the operating characteristics of different trial designs and adapt them to the vaccine development context.

Compétences

Required skills:

- Solid background in biostatistics
- Experience with clinical trial methodology, in particular early-phase trial designs Proficiency in statistical programming (R, Python)
- Familiarity with simulation studies and modelling
- Interest in interdisciplinary research in health
- Ability to work independently and in a team
- Strong scientific writing and communication skills in English

Additional appreciated skills:

- Knowledge of Bayesian inference or adaptive trial design
- Familiarity with medical applications

Avantages

- Subsidized meals

- Partial reimbursement of public transport costs
- Possibility of teleworking and flexible organization of working hours
- Professional equipment available (videoconferencing, loan of computer equipment, etc.)
- Social, cultural and sports events and activities
- Access to vocational training
- Social security coverage

Rémunération

2300€ per month before taxs

Informations générales

- **Thème/Domaine :** Modeling and Control for Life Sciences
  Biologie et santé, Sciences de la vie et de la terre (BAP A)
- **Ville :** Bordeaux
- **Centre Inria :** Centre Inria de l'université de Bordeaux
- **Date de prise de fonction souhaitée :** 2025-10-01
- **Durée de contrat :** 3 years
- **Date limite pour postuler :** 2025-07-30

Contacts

- **Équipe Inria :** SISTM
- **Directeur de thèse :**
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A propos d'Inria

Inria est l’institut national de recherche dédié aux sciences et technologies du numérique. Il emploie 2600 personnes. Ses 215 équipes-projets agiles, en général communes avec des partenaires académiques, impliquent plus de 3900 scientifiques pour relever les défis du numérique, souvent à l’interface d’autres disciplines. L’institut fait appel à de nombreux talents dans plus d’une quarantaine de métiers différents. 900 personnels d’appui à la recherche et à l’innovation contribuent à faire émerger et grandir des projets scientifiques ou entrepreneuriaux qui impactent le monde. Inria travaille avec de nombreuses entreprises et a accompagné la création de plus de 200 start-up. L'institut s'e?orce ainsi de répondre aux enjeux de la transformation numérique de la science, de la société et de l'économie.

L'essentiel pour réussir

Applicants should hold a Master’s degree (or equivalent) in one of the following fields:

- Biostatistics
- Statistical modeling

- Clinical pharmacology

Attention: Les candidatures doivent être déposées en ligne sur le site Inria. Le traitement des candidatures adressées par d'autres canaux n'est pas garanti.

Consignes pour postuler

Thank you to send:

- CV
- Cover letter
- Master marks and ranking
- Support letter(s)

Sécurité défense :
Ce poste est susceptible d'être affecté dans une zone à régime restrictif (ZRR), telle que définie dans le décret n°2011-1425 relatif à la protection du potentiel scientifique et technique de la nation (PPST). L'autorisation d'accès à une zone est délivrée par le chef d'établissement, après avis ministériel favorable, tel que défini dans l'arrêté du 03 juillet 2012, relatif à la PPST. Un avis ministériel défavorable pour un poste affecté dans une ZRR aurait pour conséquence l'annulation du recrutement.

Politique de recrutement :
Dans le cadre de sa politique diversité, tous les postes Inria sont accessibles aux personnes en situation de handicap.