



Offer #2020-02873

Post-Doctoral Research Visit F/M Quantitative modeling and machine learning for prediction of the response to immunotherapy in lung cancer

Level of qualifications required : PhD or equivalent

Fonction : Post-Doctoral Research Visit

About the research centre or Inria department

The Inria Sophia Antipolis - Méditerranée center counts 34 research teams as well as 8 support departments. The center's staff (about 500 people including 320 Inria employees) is made up of scientists of different nationalities (250 foreigners of 50 nationalities), engineers, technicians and administrative staff. 1/3 of the staff are civil servants, the others are contractual agents. The majority of the center's research teams are located in Sophia Antipolis and Nice in the Alpes-Maritimes. Four teams are based in Montpellier and two teams are hosted in Bologna in Italy and Athens. The Center is a founding member of Université Côte d'Azur and partner of the I-site MUSE supported by the University of Montpellier.

Context

The postdoc position will take place in the environment of a newly created Inria-Inserm team COMPO (COMputational Pharmacology in Oncology), located in the University Hospital of Marseille. This team is composed of mathematicians, pharmacists and clinicians and is a unique multidisciplinary environment focused on developing novel computational tools for decision- making in clinical oncology.

Specifically, the project is funded by the french National Cancer Institute (INCa) and will consist in developing mechanistic models of the response to immune-checkpoint inhibitors (ICI) with access to unique, large-scale (~450 patients), longitudinal and multi-modal biological data generated by the [PIONeer](#) consortium clinical study (RHU program). It will involve strong interactions with clinicians from APHM and biologists, from academy (CIML and CRCM in Marseille) as well as biotech (e.g. HalioDX) and pharma companies (InnatePharma, Imcheck therapeutics).

Travel expenses between Bordeaux and Marseille as well as participation to major international conferences (e.g. AACR, ASCO) will be covered within the limits of the scale in force.

Assignment

Missions :

With the help of experts in mathematical modeling in oncology, clinical pharmacology and clinical oncology, the recruited person will be in charge to develop and validate biologically-based models of the response to ICI in non-small cell lung cancer. To this end, large data sets containing multi-modal and longitudinal data from immuno- histochemistry, imaging, pharmacokinetics, immunoprofiling, soluble biomarkers and sequencing data (including circulating DNA) will be used. The models will be based on the current knowledge in the field of immuno-oncology. Advanced statistical learning methods combining machine learning techniques and mixed-effect models will be employed for calibration of the models and confrontation with the data.

For a better knowledge of the proposed research subject :

See the website of the PIONEER project: <https://marseille-immunopole.org/the-pioneer-project/>
For relevant previous publications, see: <http://benzekry.perso.math.cnrs.fr/recherche.html>

Collaboration :

The recruited person will work under the supervision of S. Benzekry and will collaborate with clinical pharmacists and pharmacometricians (Pr J. Ciccolini, COMPO), biotech companies (HalioDX), as well as clinical oncologists from thoracic oncology (Pr L. Greillier, AP-HM, Marseille).

Main activities

Main activities:

- Biological and clinical literature (immuno-oncology)
- Data analysis and visualization

- Mechanistic modeling
- Programming
- Model calibration
- Statistical learning
- Development of predictive tools

Skills

Technical skills and level researched :

- Excellent programming skills (python, R or Matlab)
- Familiarity with real-world data analysis
- Statistics (ideally, experience in mixed-effects modeling)
- Mechanistic modeling (differential equations)
- Basic knowledge of cancer biology or medicine is a plus

Languages :

- Proficient in English.

Good relational skills and ability to work and communicate in an interdisciplinary environment are required.

Benefits package

- Subsidized meals
- Partial reimbursement of public transport costs
- Leave: 7 weeks of annual leave + 10 extra days off due to RTT (statutory reduction in working hours) + possibility of exceptional leave (sick children, moving home, etc.)
- Possibility of teleworking (after 6 months of employment) 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

Remuneration

Gross Salary: 2653 € per month

General Information

- **Town/city** : Marseille
- **Inria Center** : [Centre Inria d'Université Côte d'Azur](#)
- **Starting date** : 2020-11-02
- **Duration of contract** : 2 years
- **Deadline to apply** : 2020-11-30

Contacts

- **Inria Team** : AT-SOP AE
- **Recruiter** :
Benzekry Sebastien / Sebastien.Benzekry@inria.fr

About Inria

Inria is the French national research institute dedicated to digital science and technology. It employs 2,600 people. Its 200 agile project teams, generally run jointly with academic partners, include more than 3,500 scientists and engineers working to meet the challenges of digital technology, often at the interface with other disciplines. The Institute also employs numerous talents in over forty different professions. 900 research support staff contribute to the preparation and development of scientific and entrepreneurial projects that have a worldwide impact.

Warning : you must enter your e-mail address in order to save your application to Inria. Applications must be submitted online on the Inria website. Processing of applications sent from other channels is not guaranteed.

Instruction to apply

Defence Security :

This position is likely to be situated in a restricted area (ZRR), as defined in Decree No. 2011-1425 relating to the protection of national scientific and technical potential (PPST). Authorisation to enter an area is granted by the director of the unit, following a favourable Ministerial decision, as defined in the decree of 3 July 2012 relating to the PPST. An unfavourable Ministerial decision in respect of a position situated

in a ZRR would result in the cancellation of the appointment.

Recruitment Policy :

As part of its diversity policy, all Inria positions are accessible to people with disabilities.