Post-doctoral Researcher in Human Immunology

Location: Institut de Recherche Saint Louis, INSERM U976, Hôpital Saint Louis, Paris
Offer type: Post-doctoral fellow
Type of contract: CDD, 1-year contract, renewable up to 3 years
Deadline for applications: October 30th 2022

The environment:

HIPI (“Human Immunology, Pathophysiology, Immunotherapy”) Unit is composed of ten interdisciplinary teams. HIPI is located at Saint-Louis Hospital allowing strong collaboration with clinical research and access to human samples, facilitated by on-site core facilities. The site is in the centre of Paris, in the very lively and dynamic neighbourhood of *Republique* and *Saint Martin channel*. The hospital hosted Prof. Jean Dausset, a pioneer in Haematology and Immunology who received the Nobel prize in Medicine in 1980 for the discovery and characterisation of the genes coding for the major histocompatibility complex.
An open position in the team Human **Systems Immunology & Inflammatory Networks** offers an opportunity to expand and develop your career in an exciting professional environment characterised by an open culture and a spirit of community.

Context:

Our research team has international leadership in studying human immune cell communication through a combination of experimental and computational approaches. We have developed ICELLNET, a computational framework to infer cell-cell communication from single cell or bulk cell transcriptomic data (*Noel et Massenet-Regad et al, Nat Commun 2021*). Using a systems approach inspired by linguistics, we were the first to establish a multivariate mathematical model of cell-cell communication, using dendritic cells (DC) and T cells as a model. We integrated 36 DC communication molecules with their impact on CD4 T cell activation and T helper cell differentiation (*Grandclaudon et al, Cell 2019*). At the next level, we aim at expanding the systems analysis of DC-T cell communication by introducing novel technologies and molecules, analyzing multiple DC and T cell subsets, and providing the first basis for a cellular linguistics.

Selected team publications:

Amblard E, Soumelis V. Context-Dependent Effects Explain Divergent Prognostic Roles of Tregs in Cancer. Cancers (Basel). 2022 Jun 17;14(12):2991.

Hoffmann C, Noel F, Grandclaudon M, Massenet-Regad L, Michea P, Sirven P, Faucheux L, Surun A, Lantz O, Bohec M, Ye J, Guo W, Rochefort J, Klijanienko J, Baulande S, Lecerf C, Kamal M, Le Tourneau C, Guillot-Delost M, Soumelis V. PD-L1 and ICOSL discriminate human Secretory and Helper dendritic cells in cancer, allergy and autoimmunity. Nat Commun. 2022 Apr 13;13(1):1983.

Karpf L, Trichot C, Faucheux L, Legbre I, Grandclaudon M, Lahoute C, Mattoo H, Pasquier B, Soumelis V. A multivariate modeling framework to quantify immune checkpoint context-dependent stimulation on T cells. Cell Discov. 2022 Jan 4;8(1):1.

Noël F, Massenet-Regad L, Carmi-Levy I, Cappuccio A, Grandclaudon M, Trichot C, Kieffer Y, Mechta-Grigoriou F, Soumelis V. Dissection of intercellular communication using the transcriptome-based framework ICELLNET. Nat Commun. 2021 Feb 17;12(1):1089.

Onodi F, Bonnet-Madin L, Meertens L, Karpf L, Poirot J, Zhang SY, Picard C, Puel A, Jouanguy E, Zhang Q, Le Goff J, Molina JM, Delaugerre C, Casanova JL, Amara A, Soumelis V. SARS-CoV-2 induces human plasmacytoid predendritic cell diversification via UNC93B and IRAK4. J Exp Med. 2021 Apr 5;218(4):e20201387.

Job description:

The project aims to uncover novel mechanisms and rules governing DC-T cell communication, with implications in immunopathology, cancer, and vaccine design. To achieve this goal the candidate's work will be distributed in the following tasks:

1) Design and perform experiments including
   - dendritic cell and T cell separation from the blood of healthy human donors,
   - primary cell culture and co-culture,
   - blocking experiments,
   - multiparametric flow cytometry and cell sorting,
   - protein measurements.
2) Analyse, present, and report the results in a comprehensive and structured manner in English and French
3) Maintain the collaboration with the partner team in charge of mathematical modelling and actively contribute to the biological interpretation of the results
4) Technological and literature monitoring relevant to the project (and beyond)

Job benefits:

- Active collaboration program with industrial partners unravelling a glimpse of the mindset and work culture of the private sector
- Health care benefits included in the French state health insurance (70-100% coverage)
- Hybrid work model with the possibility to work remotely
- Amazing 6 weeks annual paid holidays
- Salary calculated based on prior work experience and education

Profile :

- PhD in immunology or a related discipline
- Previous experience in flow cytometry and cell sorting is essential
- Experience in the manipulation of human samples is highly appreciated
- Good understanding of mathematics and computational models would be a plus

Personal traits & work ethics:

- Be organized and reactive in a fast-paced, high-achieving environment
- Ability to work independently, while nurturing a team spirit
- Strong communication skills to proactively interact with collaborators and nurture an interdisciplinary environment
- Excellent writing skills (reports, presentations, posters, manuscripts)
- Verbal work proficiency in French or English is mandatory

How to apply:

Please send your CV, a motivation letter and contact information of at least two referees to:
vassili.soumelis@aphp.fr and jasna.medvedovic@inserm.fr