

## A 1-YEAR POST-DOCTORAL POSITION TO STUDY “HOW GENETIC FACTORS CONTRIBUTE TO DEMENTIA” (M/F/X)

**AREA: LIFE SCIENCES AND MEDICINE**

**START DATE: BEFORE 02/15/2025**

**DEADLINE: POSITION REMAINS OPEN UNTIL FILLED**

Located in the French-speaking part of Belgium, the University of Liège welcomes nearly 27,000 students of 123 different nationalities in a dynamic, multicultural city less than an hour away from Brussels and Cologne, two hours from Paris and three hours from London and Amsterdam. ULiège is spread across 4 campuses and boasts over 5,700 staff members, including 3,600 teachers and researchers active in all areas of the humanities and social sciences, science and technology, and health sciences.

As a key player in social change and environmental awareness, ULiège promotes ethical, transdisciplinary and open science. It contributes to the socio-economic development of its region through numerous partnerships with several institutions, including the university hospital (CHU). Given its international orientation, the University participates [in the European University of Post-Industrial Cities \(UNIC\)](#) initiative and has one of the most extensive collaborative networks in the world.

ULiège offers attractive career prospects [in a high-quality working environment](#) where well-being, diversity and equality of opportunity are promoted. Since 2011, ULiège has been proud to display the European [Human resources strategy for researchers \(HRS4R\)](#) label, which reflects its commitment to open, transparent and merit-based procedures. In addition, it upholds quality and diversity in line with the recommendations of the [Coalition for Advancing Research Assessment \(CoARA\)](#). ULiège encourages its academic staff to travel internationally and welcomes international researchers through its EURAXESS center.

### ABOUT THE RESEARCH PROJECT

Dave Fardo, PhD, and Pete Nelson, MD, PhD, professor and director of the neuropathology division of the Department of Pathology and Laboratory Medicine in UK's College of Medicine (USA), are co-investigators on a project focusing on how genetic factors contribute to dementia. The work was recently awarded funding from the National Institute on Aging that will total more than \$1.7 million. The recently funded project, led by Director Nelson of the Neuropathology Core at UK's Alzheimer's Disease Research Center (ADRC), utilizes data sourced from various ADRCs across the U.S., alongside other dementia research consortia. The project will delve into the exploration of connections between genetic factors and dementia-related pathologies, by using existing and developing novel data analytics. The goal is to leverage the

team's genetic discoveries and innovative statistical approaches to delineate the physiological pathways implicated in disease progression.

**Expected Result(s):**

The anticipated outcomes encompass various levels of analysis, ranging from methodological advancements, particularly concerning the refinement of individual-specific molecular interaction networks and the translation of pathway insights derived from them. Additionally, the research aims to yield practical implications at the medical level by identifying actionable pathways relevant to the management and care of dementia.

## **JOB DESCRIPTION**

---

Join us on the frontier of genomic medicine as we unlock new possibilities for precision healthcare:

Research suggests that a systems-oriented approach and the integration of omics data are promising strategies for uncovering molecular subtypes and elucidating pathways involved in complex diseases, such as dementia. By analyzing high-dimensional omics datasets in a systems biology framework, we will identify molecular signatures associated with (different subtypes of) dementia. This integrative approach allows for a comprehensive understanding of the complex molecular mechanisms underlying the disease, possibly including gene expression changes, protein interactions, and metabolic dysregulation. Furthermore, by considering the interconnectedness of biological pathways and networks, we aim to identify key nodes and pathways dysregulated in specific subtypes of dementia, paving the way for targeted therapeutic interventions and precision medicine approaches.

The team of Prof. Dr. Kristel Van Steen (BIO3) at the University of Liège in Belgium will spearhead targeted pathway analyses building on network-oriented techniques developed in the group, such as individual-specific network methodology. Individual-specific networks enable linking of an individual to their unique molecular network, comprising of node values and (weighted) connections between nodes tailored to that individual. As a consequence, these networks offer personalized insights into an individual's molecular makeup and interactions. The project's activities in the BIO3 research group will be carried out in close collaboration with the University of Kentucky (USA): Dr. Yuriko Katsumata, a research assistant professor in biostatistics, leads efforts to develop novel methodologies for genetic epidemiology data exploration. Additionally, Dr. Mark Ebbert, an assistant professor of biomedical informatics, specializes in investigating historically challenging regions of the human genome. Together we aim to enhance our understanding of individual health profiles, potentially leading to more targeted precision health strategies in dementia.

## SPECIFIC DUTIES AND ACTIVITIES

- ▶ To achieve the aforementioned goals, we are looking for individuals who are passionate about driving scientific innovation to join our team. As a member of BIO3, you will have the opportunity to collaborate with leading researchers, contribute to groundbreaking discoveries, and make a tangible impact on human health research and education. Whether you're a seasoned expert or a rising star in the field, we welcome scientists with a PhD degree and a multidisciplinary track record who share our vision and are eager to push the boundaries of scientific knowledge.

## PROFILE

### ○ **REQUIRED SKILLS :**

- ▶ Professional experience:
  - Mandatory qualifications include Bachelor's, Master's, and PhD degrees spanning multiple disciplines, with expertise in areas such as machine learning/statistical genetics, bioinformatics/molecular biology, or biotechnology/bioinformatics.
- ▶ Experience in Big Data Science.
- ▶ Proficiency in R/Bioconductor packages and familiarity with scripting/programming languages such as Bash and Python, as well as experience with Linux environments and computing clusters, is essential.
- ▶ Proficiency in utilizing electronic notebooks like Jupyter Notebook or its successor, JupyterLab, is considered essential for candidates in the role of a data scientist or bioinformatician on this project. These tools facilitate accessibility and streamline the integration of scientific explanations with executable code, thereby enabling the creation of reproducible research narratives.
- ▶ You are able to handle Big Omics Data (at least DNA, RNA) and are skilled in crafting novel methodologies and algorithms customized for extensive data analysis, especially within the context of precision medicine.

### ○ **DESIRABLE SKILLS :**

- ▶ Understanding TinyML fundamentals and their application in edge devices like Raspberry
- ▶ Having a strong foundation in machine learning and (bio-)statistics for statistical genetics is an advantage.
- ▶ Experience with containerization with Docker or similar.
- ▶ You have strong organizational skills.

### ○ **HUMAN SKILLS :**

- ▶ You exhibit strong motivation, creativity, and a proven track record of excellence. You are keen to collaborate within an interdisciplinary setting, bridging the fields of Biostatistics, Bioinformatics, and Biomedicine.

- ▶ You demonstrate the ability to work autonomously as well as collaboratively within an international team environment.
- ▶ You are a team player, with good management skills.

#### ○ LANGUAGES :

- ▶ Exceptional communication skills in both written and spoken English are a prerequisite.

## TERMS OF EMPLOYMENT

---

#### ▶ TYPE OF CONTRACT:

Appointment to the post-doctoral position requires that the applicant has a PhD within the position's specifications, at the time of employment decision. The doctoral degree should have been obtained no more than 10 years before the start of the position. Post-doctoral researcher. Importantly, the candidate should be in a situation of international mobility: he/she should not have worked or lived in Belgium for more than 24 months during the three years preceding his/her start date.

- ▶ **WORK SCHEDULE:** full-time; 38 hrs/week
- ▶ **CONTRACT DURATION :** 1 year
- ▶ **EXPECTED START DATE:** before 15 February 2025

## OUR OFFER

---

With your career path and personal details, ULiège Human Resources Department can assess the gross monthly salary. Employment benefits such as reimbursement of public transportation fees and access to a variety of training opportunities may also be included.

- ▶ Competitive salary in an affordable and lively environment
- ▶ Access to state-of-the-art facilities and resources
- ▶ Opportunities for professional development and career advancement
- ▶ Collaborative and inclusive work environment
- ▶ Located in the vibrant city of Liège, offering a rich cultural heritage and high quality of life.

**WORK ENVIRONMENT:** BIO3 (<http://bio3.giga.ulg.ac.be/>) is a dynamic small to medium-sized research team at the forefront of precision medicine, nestled within the GIGA Biomedical Research Center at the University of Liège. GIGA is an interdisciplinary powerhouse with a mission to drive medical innovation. With over 500 members, including principal investigators, senior researchers, post-doctoral scientists, and technicians, GIGA boasts expertise spanning medical genomics, in-silico medicine, neuroscience, oncology, infection and immunity, and

cardiovascular sciences. **At BIO3, we are committed to empowering biomedical researchers by providing expert data analysis, designing innovative statistical and bioinformatics methods, and optimizing algorithms.** We thrive at the interface of systems medicine and translational science, continually pushing the boundaries of what's possible.

## HOW TO APPLY?

---

If you are ready to embark on an exciting journey at the forefront of translational precision medicine, we invite you to apply for this position.

Please submit a complete application, as 1 PDF attachment to [rh.giga@uliege.be](mailto:rh.giga@uliege.be), using the reference BIO3.DEMENTIA (including in the subject title of the e-mail).

Your application should include 1) your CV, 2) contact details of at least 2 referees relevant for the job description, 3) a motivation letter (up to 2 pages long), in which you explain which publications of the lab you are most interested in and why and motivate why you are passionate about joining BIO3.

## SELECTION PROCEDURE

---

- ▶ **Evaluation Timeline:** Submitted dossiers will be assessed for excellence, profile matching, and eligibility within one month of submission.
- ▶ **Evaluation Team:** K Van Steen and at least one current team member will conduct the evaluation.
- ▶ **Interview Process:** Shortlisted candidates will be invited for an online video interview (in English). The interview will focus on technical, behavioural, and research-specific questions. The interview date will be arranged by mutual agreement.
- ▶ **Selection Completion:** The selection process will conclude once the appropriate candidate has been identified.

**Our corporate policy is based on diversity and equal opportunity. We select candidates based on their skills and do not discriminate on grounds of age, sexual orientation, origin, beliefs, disability or nationality.**

## CONTACT DETAILS

---

Informal inquiries about the project are welcome. Please feel free to contact Prof Dr Dr K Van Steen by email at [kristel.vansteen@uliege.be](mailto:kristel.vansteen@uliege.be), using the subject title "Inquiry BIO3 Job Offer".

Release date: 05/28/2024

## Privacy policy

Personal data collected following your application will be processed by application will be processed by the reviewing jury, at the University of Liège for the sole purpose of recruitment.

The data will be processed within the framework of pre-contractual measures (art. 6-1, b. of the General Data Protection Regulation) and kept for up to 9 months after the publication of the vacancy. Your personal data will not be passed on to any third parties.

In accordance with the provisions of the GDPR (EU 2016/679), you may exercise your data protection rights (right of access, rectification, erasure, restriction, and portability) by contacting ULiège Data Protection Officer (dpo@uliege.be - Mr. Data Protection Officer, Bât. B9 Cellule "GDPR", Quartier Village 3, Boulevard de Colonster 2, 4000 Liège, Belgium). You may also lodge a complaint with the Data Protection Authority (<https://www.autoriteprotectiondonnees.be> , contact@apd-gba.be).