Fonds National de la Recherche Luxembourg

# Researcher CV

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## Personal Statement:

Three motivations have guided my scientific career: (i) development of products, (ii) development of research tools and method standardization, (iii) multidisciplinarity. My two decades in research infrastructures have given me the opportunity to work in different disease areas, including infectious diseases, and to use a wide variety of analytical methods and models, applied to different types of biospecimens, including plants, bacteria, human tissues. They have also led me to appreciate the critical importance of standardization and method validation for robust and reproducible research outcomes and products. I have joined the LNS, a multidisciplinary laboratory in the healthcare sector. Here, I can initiate and support research projects that can lead to diagnostic or therapeutic applications in human health. It is important to me that this research be based on robust and reproducible science in an accredited environment, combining knowledge and tools from different disciplines, such as plant chemistry, toxicology, microbiology, immunology.

## Personal details – Individual narrative profile:

Following a Master's thesis in mycology, my molecular microbiology PhD at the Pasteur Institute was focused on an acellular pertussis vaccine and the immunological, structural and biochemical characterization of a bacterial adenylate cyclase haemolysin. After my PhD, I spent three years working with diagnostic companies on the development and validation of immunological and NAAT diagnostics for urogenital infections, and brought 3 kits to the market. Coincidentally, the laboratory where I worked was hosting one of the first biobank infrastructures, where I was offered the position of Head Laboratory manager. I pursued my research on diagnostics and immunopathology of chlamydial infections for few years till my "Habilitation", then switched focus towards biospecimen research (on biofluids, tissue, viable cells, molecular derivatives) to provide evidence-based practices to the biobank infrastructure and the wide range of clinical researchers the Amiens University Hospital supported.

After 8 years, I moved to Luxembourg for the start-up of the IBBL (Integrated Biobank of Luxembourg) and between 2010 and 2020 was Chief Scientific Officer. We developed the "production" and biospecimen research laboratory from scratch, managed its activities and scientific projects, and brought it in 2016 to ISO17025 accreditation for a series of biospecimen quality control assays. In parallel, I have developed a strong interest in methodology and standardization and have worked on the ISO technical committee on Biotechnology. I have recently joined the National Health Laboratory (LNS) in Luxembourg as scientific advisor, to support scientific activities and collaborative projects across its broad, and healthcare-embedded, scope of activities.

## Key outputs, contributions, and achievements:

My first achievement was designing and building an integrated and multidisciplinary research infrastructure laboratory, the IBBL laboratory. This included all the processes and procedures,

methods, assays, collaborations with national and international research teams in the areas of oncology, inflammatory, infectious diseases and the services provided to international consortia and pan-European clinical trials. In April 2020, in the context of the COVID-19 pandemic, I took a sabbatical and worked on a project funded by the WHO and UNITAID where I delivered the framework for an international network of pandemic preparedness biobanks. This will be important in the future to avoid delays in starting fit-for-purpose collections of specimens, and the WHO has taken up this concept.

Implementation of a controlled environment and controlled operations in such complex laboratories has to be supported by quality management systems (QMS) for both the organization of the processes and the organization of the specimen characterization. This explains my second achievement, the introduction of QMS and standardization, not in research per se, but in the processes underpinning research. Specifically:

- Development of an international Proficiency Testing program for biobank and processing research laboratories; implementation of this program, coordinated at the IBBL, and provided internationally since 2012 to more than 150 laboratories.
- Development of the concept of clinical Reference Materials, its publication and its integration into a new ISO technical standard (ISOTR79:2015 Reference Materials – Examples of reference Materials for Qualitative Properties)
- Development of technical standards for validation of specimen processing methods, formalized in a new ISO21899 norm, published in 2020
- Development of a biomarker validation platform for independent analytical and clinical validation of biomarkers discovered by academic or private researchers

Quality has to be science and evidence-based. Therefore the third achievement is the recognition of biospecimen research (BSR) as a scientific discipline of critical importance for robust and reproducible science. I have been an advocate of BSR in all the scientific advisory boards where I have been served and in all the training courses I have been giving over the past 12 years. I have been an active member of the International Society for Biological and Environmental Repositories (ISBER) for over 15 years, sat on the Education and Training Committee, contributed to the Best Practices 2$^{nd}$, 3$^{rd}$ and 4$^{th}$ editions, chaired the ISBER Biospecimen Science Working Group and the Proficiency Testing Advisory Group, and served as ISBER President in 2013. Specifically, my contributions include

- Development of the strategy for ISBER as a global society
- Development of experimental biospecimen research protocols and their publication
- Development of the SPREC, the standard preanalytical code, its periodical revision, publication and implementation in software
- Development of the Best Practices Self Assessment Tool, its revision (to each new edition of the Best Practices) and deployment
- Development of a university curriculum and university certificate on biobanking science; implementation at the University of Luxembourg as a continuing education 3-week program, provided every other year to international audience of scientists
- Development of several new quality control assays and their publication
- Among other publications on fundamental and applied biospecimen science, a series of 9 educational articles, providing methodological examples on method validation
- Compilation of quality control methods and strategies in an open access www.findmyassay.com online tool