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Vahatra Joëlle Razafimahefa is a young anatomic and clinical pathology specialist at the Pathology Department of Andrainjato Fianarantsoa University Hospital. She received her medical degree from the Medicine Faculty of Antananarivo and specialized in pathology at the University of Antananarivo, Madagascar, and the University of Paris Descartes France. She is pursuing an academic research career and is particularly interested in neglected tropical pathologies and emerging infectious diseases with a particular focus on tuberculosis. She participated in a TB masterclass organized by L'initiative and Expertise France in Cameroon in December 2023 and is a member of the young researchers' network on tuberculosis in Francophone, Africa. She is the author of numerous scientific publications and has participated in several international and national scientific conferences. She received an award for best oral communication during the research days of the University of Fianarantsoa in June 2023. She is also a reviewer for several international scientific journals and does part-time teaching at the Medicine Faculty of Fianarantsoa Madagascar.

Project

Tracing tuberculosis cross species transmission in an emblematic cattle breeding region of South- eastern Madagascar

Tuberculosis still represents an important public health problem in Madagascar with an annual incidence rate of 233 cases per 100,000 inhabitants. This incidence is particularly high in the South – eastern part of this large island with around 800 new cases annually. Among those cases, more than 100 cases of extrapulmonary tuberculosis are diagnosed per year at the Pathology Department of the University Hospital of Fianarantsoa serving the study region. This region is also favourable to all speculation in terms of cattle breeding, where zebu live in close proximity to humans. Furthermore, in this area, the prevalence of bovine tuberculosis is not negligible with a prevalence rate of 20% in 2008, based on intradermal tuberculin tests. This represents socio-economic and livelihood consequences but also an important and often neglected threat to public health given that *Mycobacterium bovis*, the classical causative agent of bovine tuberculosis is naturally resistant to pyrazinamide. Our main objective is to assess the prevalence and molecular characterization of human and bovine tuberculosis in the South – East part of Madagascar. The isolation and characterization of mycobacterial strains from zebu and humans' samples will actually allow determining a potential cross-transmission between the two species that could eventually explain the high prevalence of TB in this region. To do this, we will search for tuberculous lesions in zebus slaughtered at Ankidona slaughterhouse. This latter receives all zebus from the south-eastern region of Madagascar. Lymph nodes or tissue samples suspected of tuberculosis will be sent to the Pathology Department of the University Hospital of Fianarantsoa for histological confirmation.

At the same time, we will also collect tissue samples sent by clinicians to the same Pathology Department for suspected extrapulmonary tuberculosis. All tissue samples from zebus and patients with histologically confirmed tuberculosis will subsequently be subject to microbiological analysis including GeneXpert, culture and whole genome sequencing.

This project would be a considerable step forward to better understand the transmission cycle of tuberculosis strains (zebu to human and human to zebu). This could also help setting up a control program for TB zoonotic and reverse zoonosis. Implementation of biosecurity measures could represent an effective tool for the prevention of tuberculosis in the South-eastern Region of Madagascar and also to lighten the heavy socio-economic burden that it causes.