PhD Studentship Opportunity at the Armauer Hansen Research Institute (AHRI).

The Armauer Hansen Research Institute (AHRI), founded in 1970 through the initiative of the Norwegian and Swedish Save the Children organizations and the Ethiopian Ministry of Health, is a leading biomedical research institute. Named after Gerhard Henrik Armauer Hansen, who first described the leprosy bacillus, AHRI specializes in developing tools for research, vaccines, prevention, control, and treatment of neglected tropical and other major public health diseases through applied biomedical research, studies, and training.

AHRI, operating under Ethiopia's Federal Ministry of Health, invites applications for a PhD studentship.

Title: Development of peptide/protein-based in-house immunoassays for accurate diagnosis of acute enteric typhoid fever in Ethiopia

Project Summery

Current assays for direct bacterial detection of *Salmonella Typhi*, the causative agent of enteric typhoid fever, are inherently limited by the low colony-forming unit (CFU) count in peripheral blood (median CFU, 1/mL), restricting their diagnostic utility. An alternative approach involves identifying infected patients based on host immune responses; however, existing serology-based diagnostics—such as Widal, Tubex (IDL Biotech), and Typhidot (Reszon Diagnostics)—exhibit poor sensitivity and

specificity, particularly in endemic settings. Studies in Ethiopia indicate the low diagnostic accuracy of the Widal test in Ethiopia, with high sensitivity but poor specificity and positive predictive value, leading to frequent overdiagnosis of enteric typhoid fever. Overdiagnosis contributes to antimicrobial resistance, while misdiagnosis due to low blood culture sensitivity delays appropriate treatment for patients with suspected enteric typhoid fever. Improved diagnostics for enteric typhoid fever would not only enhance patient management but also facilitate surveillance efforts to provide reliable estimates of disease burden and enable the implementation of optimized intervention strategies, such as vaccine, especially following the World Health Organization (WHO) endorsement of typhoid Vi conjugate vaccines.

Studies in South Asia and Africa revealed that hemolysin E (HlyE), lipopolysaccharide (LPS), putative toxin-like protein (cdtB, t1111), and membrane preparation (MP) are key immunoreactive antigens that can effectively distinguish acute *S. Typhi* bacteremia from other invasive bacterial infections. In this PhD thesis project, we will employ high-throughput immunoscreening technologies (e.g., peptide/protein microarray) and immunoinformatic tools to identify promising immunodominant *S. Typhi* epitopes for the development of a next-generation serodiagnostic assay. In line with this, the PhD candidate will focus on screening proteome-wide antigens, utilizing in silico analysis to identify *S. Typhi*-specific epitopes. These unique multi-epitope-based peptides will be integrated into immunoassays designed for developing serological assays that detect *S. Typ*hi-specific antibodies in serum or plasma samples. The optimized assay will then undergo analytical and clinical validation to assess its utility for early and accurate typhoid fever diagnosis in Ethiopia. The PhD student will participate in these key project activities under the close supervision of Research Scientists at both AHRI and collaborating institutions.

Duration

Studentship will typically be for three years. The research project starts immediately upon acceptance.

Study sites: Addis Ababa with travel for fieldwork.

Value of Studentship

This position/studentship covers full research costs and limited travel support.

Requirement

Applicants must be Ethiopian nationals and should hold a first or upper-second class honours BSc degree or equivalent in Life Sciences. Students are required to have completed a Master's degree in Biomedical Sciences, Microbiology, Biotechnology, Bioinformatics, Immunology or related fields before undertaking a PhD. Unless otherwise stated, students must be registered at public universities in Ethiopia and completed the required first year course work in their PhD program.

How to Apply

Applicants should submit the following documents to AHRI Research Training Directorate (research.training@ahri.gov.et and https://redcap.link/Typhoid_fever_ethiopia or )

- A cover letter and their CV, including full contact details of two referees
- Copies of their BSc and MSc degrees and transcripts, number of publications with link (if any)
- Copy of transcript reflecting PhD courses completion
- Recommendation letter from their university's PhD advisor to undertake this PhD studentship

For further information, please contact [Azeb Mekonnen, azeb.mekonnen@ahri.gov.et]

Application closing date: September **12, 2025**

Note: - Female candidates are strongly encouraged to apply

-Please make sure you mention the project title in the application (motivation letter)