

Strengthening the Molecular Diagnosis of Arboviral Diseases through an Extension Initiative in Partnership with the Minas Gerais State Health Department

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Grupo Temático: Eixo VI: Saúde

Abstract: The incidence of arboviruses poses a growing challenge to public health, especially in tropical countries like Brazil, due to the epidemiological impact of diseases such as yellow fever, dengue, chikungunya, and Zika. This scenario highlights the need to strengthen laboratory diagnosis and the training of diverse professionals, integrating teaching, research, and outreach. This study reports on an outreach initiative focused on strengthening molecular arbovirus diagnosis and interdisciplinary academic training, conducted at the Center for Microbiology Studies (CEMIC/ICB) of the Federal University of Juiz de Fora (UFJF), in partnership with the Minas Gerais State Health Department (SES/MG), with the participation of users of the Unified Health System (SUS). Activities include the molecular detection of viruses such as yellow fever, dengue (serotypes 1 to 4), chikungunya, and Zika. The methodology encompasses the pre-analytical, analytical, and post-analytical phases, including team training, sample tracking and processing, RNA separation, RT-qPCR, report issuance, data analysis, and scientific production. Simultaneously, the project promotes the practical training of undergraduate and graduate students in molecular diagnostics, biosafety, and epidemiological surveillance. Among the main results are the decentralization of laboratory testing, the issuance of high-quality reports with an average response time of up to 72 hours, and the strengthening of integration between the university and health services. In total, more than 5,500 tests have already been performed. It is concluded that the initiative generates a relevant social impact, enhances academic training, and contributes to strengthening the diagnosis and surveillance of these arboviruses within the Brazilian Unified Health System (SUS).

Keywords: Arboviral Diseases; Molecular Diagnosis; Epidemiological Surveillance.