AUTOMATED "SAMPLE TO ANSWER" DIAGNOSTIC PLATFORMS (MALVEC-LABDISK / ARBOVEC-LABDISK) FOR IMPROVING THE IMPACT OF VECTOR CONTROL INTERVENTIONS

Mavridis K.[1], **Hin S.**[2], **Mitsakakis K.**[2], **Müller P.**[3], **Wipf N.**[3], **Medves S.**[4] and **Vontas J.**[*#1,5]

[1] Institute Molecular Biology and Biotechnology - Foundation for Research and Technology (IMBB - FORTH), Greece

[2]Hahn-Schickard-Gesellschaft für angewandte Forschung e.V., Germany

[3]Swiss Tropical and Public Health Institute / Centre Suisse de Recherche Scientifique, Switzerland

[4]Fast Track Diagnostics (FTD), a Siemens Healthineers Company, Luxembourg

[5]Department of Crop Science, Agricultural University of Athens, Greece
Presenting and corresponding author: vontas@imbb.forth.gr

ABSTRACT

Prevention of vector-borne diseases (such as malaria, dengue, chikungunya and Zika virus infections) is best achieved by vector control, which relies on the use of insecticides. An essential part of vector control is the characterization and monitoring of field vector populations for species/subspecies ID, insecticide resistance traits and pathogen and symbiote infection status. Several diagnostic methods have been used for this task, but all have important limitations including protocol complexity, technical training requirements and high per-assay and platform cost. To address these limitations, diagnostic platforms (MalVec-LabDisk / ArboVec-LabDisk) for monitoring *Anopheles* and *Aedes* mosquito populations will be established. We have already developed novel multiplex assays, which are applicable to pooled specimens and integrable to such automated platforms. These assays can reliably calculate the frequency of target site resistance mutations in pooled specimens [1], monitor the levels of major detoxification genes and metabolic resistance [2] and detect pathogens (such as *P. falciparum*) at the infective stage without the need of head/thorax dissection and post-PCR processing [3]. We are currently in the phase of integrating these multiplex assays to the automated systems that will be evaluated as a whole in malaria and arbovirus endemic countries. We aim to deliver novel and improved tools to support informed decision-making in vector control and disease management to ultimately increase the efficacy of vector control programs. *Acknowledgements*: This work has received funding from the European Union's Horizon 2020 research and innovation programme under the DMC-MALVEC (GA: 688207) and INFRAVEC2 (GA: 731060) projects.

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