**Press Release:**

In a blinded clinical comparative study, the IoFs Microwave-Accelerated Metal-Enhanced Fluorescence (MAMEF) assay and detection unit for the ultra-fast and sensitive detection of *Chlamydia trachomatis* (CT) has been evaluated as a potential STI (Sexually Transmitted Infection) point-of-care test. 257 Dry vaginal swabs were eluted, the solutions lysed to both release and fragment genomic DNA, followed by the collection and subsequent detection of the DNA on the MAMEF platform using two distinct assays, the results being compared to nucleic acid amplification tests (NAATs). The first assay targets the *C. trachomatis* 16S rRNA gene, the second assay targeting the CT cryptic plasmid. The MAMEF assays detected as few as 10 IFU/mL of CT in less than 9 minutes which included the DNA extraction and detection times. A total of 257 vaginal swabs from 245 adolescent women (ages 14–22) were analyzed. The overall prevalence of CT by NAAT was 17.5%. Of the 45 NAAT CT-positive samples and 212 CT-negative samples, 33/45 and 197/212 were correctly identified by both MAMEF assays (sens 73.3%, spec 92.9%). Using the plasmid-based assay alone, 37/45 CT+ and 197/212 CT- were detected (sens 82.2%; spec 92.9%). Using the 16S rRNA assay alone, 34/45 CT+ and 197/212 CT- (sens 75.5%; spec 92.9). For the overall % agreement with NAAT, the individual 16S rRNA and cryptic plasmid were 89.8% and 91%, respectively. Given the high sensitivity and specificity of our approach as compared to the gold standard, coupled with a rapid detection time and low cost per sample (<$2) then the MAMEF technology (assays and reader) is highly suited for commercialization and downstream clinical use.