ELECTRODE BIOCHIPS COUPLED TO
PERFORMANCE OF A LAMP-BASED
DETERMINATION OF HIGH-RISK HPV
INFECTION IN CLINICAL SETTINGS

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Introduction/Background Persistent infection with the high-risk types of HPV is considered a crucial initiating factor in cervical carcinogenesis. Tests detecting the presence and especially the activity of HPV infection offer a new quality to screening and diagnostics. The limitation of these tests is, however, the price. Standarily used PCR tests are time consuming and instrument-intensive. A perspective alternative, the LAMP isothermal amplification coupled to an electrochemical detection, is presented.

Methodology We developed an assay for parallel detection of two most oncogenic high-risk HPV types, HPV 16 and HPV 18, by combining loop-mediated amplification (LAMP) of viral DNA, its separation using magnetic beads and detection with an electrochemical technique – amperometry – at carbon-based electrode chips.

Results Optimization of the method was first published on pilot files with a small number of cases. Later, we carried out a small clinical study using electrochemical LAMP-based assay for detection of HPV 16/18 DNA in LBC samples obtained from 61 women undergoing conisation for cervical precancerous lesion. HPV 16 and 18 assays were performed by LAMP isothermal amplification combined with electrochemical reading. The results were confirmed by PCR amplification with gel electrophoresis and two commercial HPV assays (Cobas and INNO-LiPA). The best concordance was obtained with the PCR, reaching very good specificity for both genotypes (>93%) and positive and negative predictive values over 90%.

Conclusion These data indicate that the EC-LAMP isothermal amplification may serve as an interesting alternative tool for rapid screening of oncogenic HPVs.

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EVALUATION OF CERVICAL DYSPLASIA
WITH NOVAPREP-MIR-CERVIX

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Introduction/Background Cervical cancer (CC) is one of the most common types of cancer and the fourth leading cause of cancer-related deaths in women. Cervical carcinogenesis is multistep process of the cervical dysplasia development and progression. Correct diagnostic and effective therapy of cervical dysplasia presents an important approach to reduce CC morbidity and mortality. MicroRNAs in cervical