

cap... Rapid Screening HIV

EARLY DETECTION OF HIV-1 USING
ULTRA-SENSITIVE, RAPID CAPACITIVE
BIOSENSOR



The capHIV project is co-funded by the
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Members of the consortium

Project Coordinator:

MFKK Feltalálói és Kutató Központ
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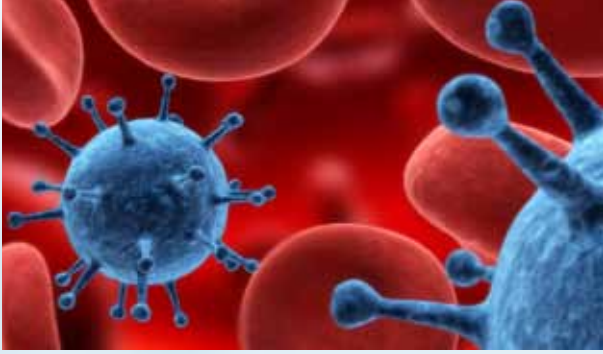
Project Partners:

Capsenze Handelsbolag (CAPSENZE), Sweden
Phenosystems SA (PHENO), Switzerland
Lionex GMBH (LIONEX), Germany
AbBcn S.L. (AntibodyBcn), Spain
Lund University (LU), Sweden

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Project facts

Project start: 01- 09 - 2011
Project duration: 24 months
Contact: caphiv@mfmk.hu



THE NEED

The HIV pandemic is a worldwide public-health problem. At the end of 2008 there were an estimated 850,000 individuals infected with HIV in western and central Europe and 25,656 new cases were reported by the countries of the EU and EEA in 2008.

HIV infects about 0.6% of the world's population



Estimated number of people in the world living with AIDS in 2008.
Source; UNAIDS 2008 global report.

An estimate of 30% of the individuals living with HIV in EU is undiagnosed.

HIV Transmitting

- Sexual intercourse
- Blood transfusion
- Contaminated hypodermic needles
- Exchange between mother and baby during pregnancy, childbirth and breastfeeding



PROJECT OBJECTIVES

The CAPHIV project aims at developing a quick and automatic biosensor that targets the detection of HIV-1 p24 released in the early stages of the disease.

The aims of the project:

- Develop a rapid, accurate, and portable biosensor for HIV-1 p24
- Evaluate the analysis of HIV-1 p24 in clinical samples

SHORTCOMINGS OF PRESENT TESTS

HIV Diagnostic Tests

- Rely on the presence of HIV antibodies
- It can take from three weeks to six months before antibodies are detectable
- New-borns cannot be tested with these methods due to maternal antibodies masking their true HIV status

Diagnostic p24-antigen tests have achieved great interest for the detection of HIV infection as antigens are detectable several days earlier than host-generated HIV antibodies and can be used to design assays with fast analysis time and without the need for PCR.

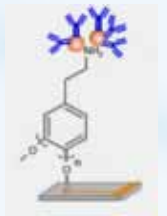


THE CAPACITIVE SENSOR

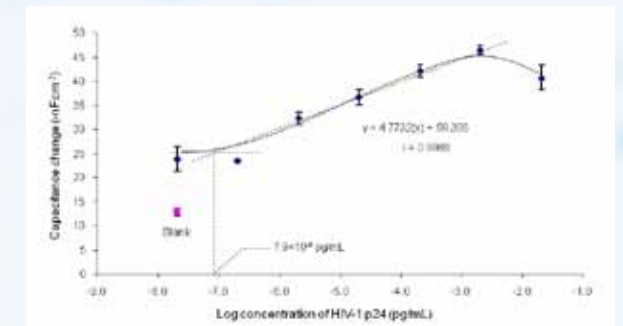
A sensor consists of a gold electrode on which selective antibodies are immobilized. When antigens bind to antibodies, a change in capacitance signal is registered.

Sensor Performances

- Ultra high sensitivity
- Reproducibility
- Real-time monitoring
- Suitable for process control



Capacitive Sensor for HIV-1 p24 Detection



Linear range (2×10^{-6} - 3×10^{-3} pg/mL)
Detection limit (8×10^{-8} pg/mL)
Analysis time (<20 min)