

PIPE MEDICAL ENGINEERING

LABORATORY DIAGNOSTICS

Direct and cost-competitive method to diagnose Blood Coagulation Disorders (2003/2/5)

This method is a technically simple and cost-effective determination of thrombolytic coagulation activity, which is usually performed by counting activated thrombocytes under a microscope. However, this novel procedure is performed using a transparent chip, which captures activated thrombocytes in measuring chambers and allows classification of different platelets activation stages according to their shape. The chips can be archived for follow-up studies.

IP-Holder: Saarland University/Germany

Status: European (EP 07785609.4, PCT/DE2007/001211) and international patent (Indien: 506/KOLNP/2009). The method has been successfully tested under laboratory scrutiny. A prototype has successfully been evaluated.

Cost-effective and precise diagnosis of current Heparin levels in blood and blood serum (J50055)

This optical device offers cost-effective and precise determination of current heparin levels. Individual drug dosage and efficient monitoring of blood coagulation during surgical interventions are conceivable. This simple and elegant detection method is based on scattered light intensity measurements, requires approximately one ml of blood sample, can be taken in one-minute intervals and is reliable within a wide range of Heparin levels.

IP-Holder: Goethe-University, Frankfurt am Main/Germany

Status: Patent application in progress (DE 10 2006 005 574 A1, EP 1982159, US 020090185160). The detection unit has been tested in laboratories

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Infrared spectroscopy for simultaneous drug analysis in body fluids (J50002)

This highly specific, fast and precise infrared device is able to simultaneously determine various drug concentrations in liquids without the need for sample preparations. Current infrared (IR) spectroscopy faces problems because of the high water absorption in the middle segment of the IR spectrum. However, this novel device utilizes the principle of Attenuated Total Reflexion (ATR): A beam, consisting of an IR-light source or several quantum cascade lasers (QCL) with variable frequencies or frequency bands, is directed alongside an IR-permeable ATR sample cell, like a light conductor, onto a detector. As a result, it is possible to determine the relevant middle part of the IR-spectrum by use of a software aided evaluation process. Most molecules exhibit a specific band spectrum, which can be considered a characteristic molecular finger print.

IP-Holder: Goethe-University, Frankfurt am Main/Germany

Status: German and European Patent granted.

DE 10214781 B4, PCT/EP03/03496

Further patent applications are pending. A prototype has successfully been evaluated under laboratory test conditions using blood and urine samples

Patient-friendly, reagent-free, and fast determination of laboratory parameters in and outside of laboratories (J50049)

This device utilizes IR-spectroscopy for fast, reagent-free determination of laboratory parameters in blood and urine samples. One or two drops of probe are inserted into custom-built Micro-ATR measurement device and sample evaluation can be performed without reagent addition in a patient-friendly manner within pharmacies, laboratories or hospital wards. By addition of a sample feeder, this unit could be converted into automated laboratory screening devices.

IP-Holder: Goethe-University, Frankfurt am Main/Germany

Status: A German patent was granted. DE 10 2005 048 807 B3

A prototype has been tested under laboratory conditions.