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TOPIC:

Opto-fluidic flow analysis for monitoring of immunity levels in HIV patients

ABSTRACT:

Delivery of primary health care requires that we develop low cost platforms for point of care screening of patients. We have designed an opto-fluidic flow-analyzer useful in resource-limited settings for applications such as HIV therapy follow-up. The device integrates microfluidics, optoelectronics and digital signal modulation and detector gating techniques onto a single platform. Infra-red lasers are used to monitor forward and side scatter signals, while a visible laser detects the presence of fluorescent CD4 cells. The use of tapered lensed fibres allows us to focus the light onto the cells flowing through a focused fluid channel. The detection data is collected and processed on electronics board to yield the level of CD4 cells in the patient. The same technology can also be adapted to cell culture assays, detection of water contamination, platelet and other blood cell counts and oncological tests.

PROFILE:

Dr. Anil Prabhakar received his PhD in 1997 from Carnegie Mellon University, with a dissertation on the Nonlinear Spin-wave Optical Interactions. He has been with the faculty at the Dept. of Electrical Engineering, IIT-Madras since 2002 with current research interests are in the areas of magnonics, photonics, bio-engineering and assistive technologies. He is actively involved in bio-medical devices for diagnostic and surgical applications, and is a founder-Director of Unilumen Photonics, an IIT-Madras incubated company that focuses on fibre laser development. Prior to joining IIT Madras, Dr. Prabhakar held staff and managerial positions in the hard disk drive industry, working in areas of design, characterization and failure analysis of GMR recording heads. In 2003, Dr. Prabhakar co-founded Chetana Charitable Trust, to raise societal awareness on issues of disability and to promote the indigenous development of assistive technologies.