'Coffee Ring' Diagnostic for Point-of-Care Biomarker Detection

Published date: May 2, 2013

Technology description

Bright minds at Vanderbilt University have unveiled a breakthrough technology that could bring sophisticated biomarker diagnostics to the developing world. The point-of-care diagnostic is designed to be used in the field; no specialized equipment, expertise, or white lab coats are required. The diagnostic is based upon the ingenous observation that evaporating liquid droplets leave behind a characteristic ring pattern, which may be familiar to our readers in the form of a coffee-ring stain.

Description of Technology

How does this diagnostic work? Consider a liquid sample, such as a drop of blood from a person infected with the malaria parasite. Within that sample are proteins from the malaria parasite. If we place a drop of our sample on a hard surface and let it evaporate, proteins in the solution would preferentially be deposited around the edge of the liquid droplet border as the liquid flows outward during evaporation (akin to the coffee-ring). This diagnostic works by interrupting the outward flow of the malaria protein, or another biomarker of choice, in an evaporating drop. First, one selectively captures the biomarker of interest with targeted magnetic particles, then with the application of a simple magnet, the malaria protein is pulled to the middle of the drop. In this way, the diagnostic concentrates the biomarker internal to the ring pattern. Detection of the biomarker is then determined by a visual assessment of the dispersion pattern of the magnetic particles, or by color coding of the biomarker and a control particle, as seen at right.

Institution

Vanderbilt University

Inventors

Frederick Haselton

联系我们

叶先生

电 话：021-65679356

手 机：13414935137

邮 箱：yeyingsheng@zf-ym.com