

FLUIDIC TEST CASSETTE

Abstract

A disposable cassette for detecting nucleic acids or performing other assays. The cassette can be inserted into a base station during use. The cassette has numerous features to ensure correct operation of the device under gravity, such as vent pockets for enabling the flow of sample fluid from one chamber to the next when the vent pocket is unsealed. The vent pockets have protrusions to help prevent accidental resealing. The cassette also can have a gasket to ensure free air movement between open vent pockets. A flexible circuit with patterned metallic electrical components disposed on a heat stable material can be in direct contact with fluid in the chambers and has resistive heating elements aligned with the vent pockets and the chambers. The detection chamber, which houses a lateral flow detection strip can have a space below the strip that has sufficient capacity to accommodate an entire volume of the sample fluid entering the detection chamber at a height that enables the fluid to flow up the detection strip by capillary action without flooding or otherwise bypassing regions of the detection strip. The space can also contain detection particles. Recesses in the cassette channels or chambers can have structures such as ridges or grooves to direct fluid flow to enhance rehydration of lyophilized reagents disposed in the recess. Flow diverters in the chambers can reduce the flow velocity of the sample fluid and increase the effective fluid flow path length, enabling more accurate control of fluid flow in the cassette.

(Fig. 8C)