

Angular-based quantitative measurement in 3D paper-based analytical devices

김동호, 정성근, 이창수[†]

충남대학교

(rhadam@cnu.ac.kr[†])

Three-dimensional Paper-based analytical devices (3D PADs) represent the remarkable potential to overcome lateral flow test or dipstick. However, recent 3D PADs still need a peripheral device such as a camera for quantitative assay. Here, we demonstrate a paper-based technique for equipment-free, straightforward, quantitative assay using the angle of color development. 3D-PADs are rapidly fabricated by the wax-printing and laminating process. The 3D-PADs are treated with citrate buffer and tetrabromophenol blue to react with albumin in a sample solution. Dropping the sample solution into sample pad in the 3D-PAD, sample flows toward the 3D fluidic channel laterally and vertically by capillary action. Result showed that the change of angle of the discolored area reflects the concentration of albumin and is reliable determinant for the measurement of albumin concentration.