

Microfluidic device for low-cost screening of newborns for Severe Combined Immune Deficiency

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For the first time, screening all newborns for Severe Combined Immune Deficiency (SCID) can be made possible. SCID is a group of life-threatening disorders characterized by extreme susceptibility to infection because of profound T cell failure. We developed a microfluidic device that allows low cost and rapid detection of T cells to screen for SCID. The device uses T-cell-specific immobilized antibodies and adhesion molecules to capture T cells from a few drops of blood. Detection is accomplished by visualizing metallic silver precipitation catalyzed by secondary gold-nanoparticle tagged antibodies. Our device is compact (palm-sized), will cost a few dollars per test, and does not require fluorescence microscopy or trained personnel to operate. We have demonstrated the feasibility of our approach by detecting mouse and human T cells.