



Showcasing research from Professor Han-Sheng Chuang's laboratory, Department of Biomedical Engineering, National Cheng Kung University, Tainan, Taiwan.

Realization of rapid diabetic retinopathy screening with lipocalin 1 in tear using enhanced immunofluorescence photonic crystal microchip

A portable lateral-flow microfluidic chip integrated with an immunofluorescence-enhancing photonic crystal (PhC) is made for non-invasive diabetic retinopathy (DR) screening. The device employs a sandwich immunoassay targeting lipocalin-1 using fluorescent particles for signal transduction and passive paper-driven capillary flow for controlled sample transport. The engineered PhC architecture enhances immunofluorescence, and the integration of the microfluidic chip with the PhC platform provides a compact, non-invasive, point-of-care solution for DR screening.

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Han-Sheng Chuang *et al.*,
Lab Chip, 2026, **26**, 54.