Center for Innovative Instrumentation Technology (CiiT)

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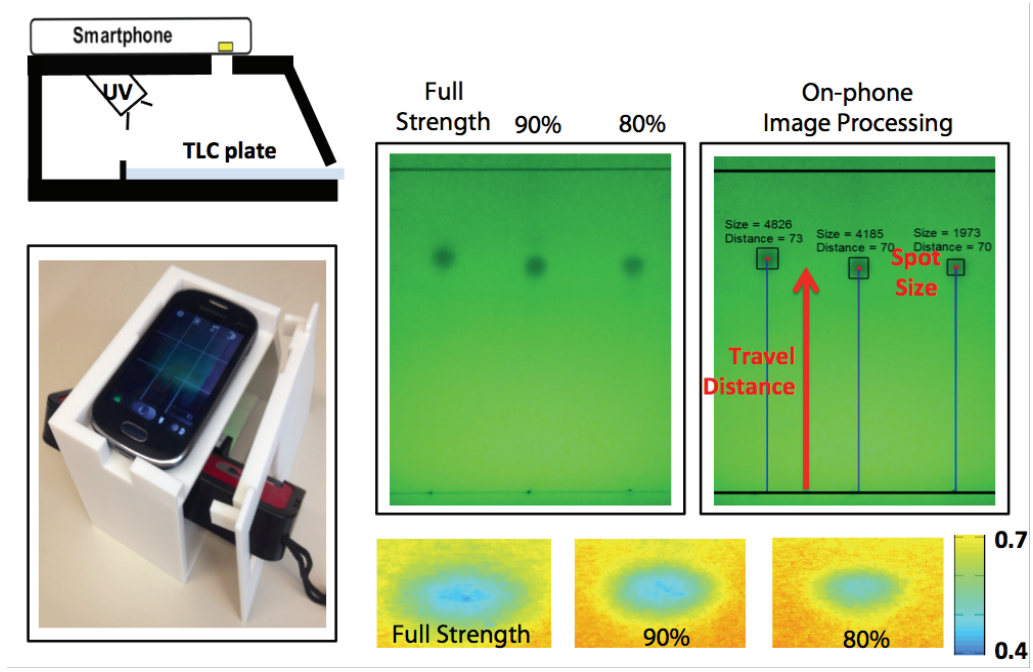
Smartphone Platform for Determining Prescription Drug Authenticity

Twenty-five percent (25%) of drugs distributed in Africa are counterfeit. CiiT researchers developed an innovative system that uses Thin-Plate Chromatography, a smartphone cradle, and a smartphone calibrated camera that determines the authenticity of drugs. This is a novel device/instrument for the life sciences. In addition to fabricating devices, the CiiT research group is also focused on the design, prototyping, and testing of biosensor instrumentation for high sensitivity, portability, and resolution.

Advanced instruments enable high resolution imaging of biochemical and cellular interactions. They provide the ability to monitor images of biochemical interactions as a function of time. Using the sensors and instrumentation, researchers are exploring new applications for optical biosensor technology including protein microarrays, biosensor/mass spectrometry systems, and microfluidics-based assays. All of these use nanoliter quantities of reagents. The methods and systems developed in the laboratory are then applied in the fields of life science research, drug discovery, diagnostic testing, and environmental monitoring.



Smartphone Thin Layer Chromatography. An example of testing Amodiaquine, a malaria therapy.

The researcher has also developed label-free high throughput optical biosensor and readout instrument technology that uses nanostructured plastic surfaces. These are microreplicated from silicon master wafers. Applications include high throughput pharmaceutical compound screening, molecular diagnostics, PCR, electrophoresis, label-free microarrays, proteomics, environmental detection, and whole-cell assays.

A CiiT member, Management Sciences for Health (MSH), has a widely distributed team to develop effective controls to improve healthcare in developing nations. MSH has been deploying this breakthrough technique to identify and remove counterfeit drugs, thus improving healthcare.

> **Economic impact**: Previous methods for counterfeit drug detection have required more expensive and complex equipment. The simplicity and reduced cost afforded by this breakthrough makes this work especially effective in developing countries where fraudulent drugs are very common.
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> Inspection of imported drugs at customs and distribution points can now more effectively identify shipments that appear legitimate but may have inadequate or fraudulent active ingredients.

This breakthrough will have significant impacts on actual drug availability, and as a result on actual clinical efficacy. It can be expected to contribute to reducing health care costs by helping assure that genuine quality drugs are available at the point of care.

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