

# Add-on device converts cell phones into wide-field fluorescent microscopes

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Wide-field Fluorescent Microscopy on a Cell-phone



A matchbox-sized fluorescent imager prototype attachment for cell phones weighs approximately one ounce and can be used to screen for labeled pathogens in drinking water or food, and to image various body fluid samples to search for disease markers.

UCLA researchers have developed a matchbox-sized attachment that converts a cell phone's camera into a fluorescent microscope.

The device utilizes an inexpensive lens and battery-powered, light-emitting diodes to create a field of view some two orders of magnitude larger than previous [cell-phone](#) fluorescent microscopy technology. It is more than five times smaller than previous cell phone microscopes.

By using side-illumination geometry, the device is also capable of dark-field microscopy on both fluorescent and non-fluorescent specimens, an illumination technique in which only light shown on a biological sample

is captured, making it appear as if the sample is on a black background and enhancing the image. The side-illumination technique negates the need for more expensive thin-film interference filters typically used in fluorescent microscopy; an inexpensive plastic color filter can be used for this purpose.

The compact and inexpensive cell phone add-on, with its ability to quickly and accurately test large sample sizes, could serve as a vital telemedicine tool in underdeveloped areas of the globe where conventional health care services are not available.

While the device does not achieve the resolution of conventional microscopes, its resolution is high enough to screen for labeled pathogens in drinking water or food and to image various body fluid samples to search for disease markers. The device easily fits on most cell phones and can be repeatedly attached and detached without fine alignment or tuning.

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**More information:** This research was recently published in the peer-reviewed journal *Lab on a Chip* and is available online at [pubs.rsc.org/en/Content/Article...g/2011/LC/C0LC00358A](https://pubs.rsc.org/en/Content/Article...g/2011/LC/C0LC00358A)

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