Foldscope could be a better alternative to clinical microscope

- Foldscope is an affordable origami-based microscopy device composed of a series of paper clippings.
- (Origami is the Japanese art of folding paper into decorative shapes and figures)
- Upon assembly, the device can hold a specimen slide for observation, and this specimen can be viewed via a mobile phone camera attached to it.

Dr. Alka Rao’s group at the Institute of Microbial Technology (IMTECH), Chandigarh, in collaboration with a team of doctors from a government hospital in Panchkula, Haryana, a private hospital in the National Capital Region (NCR), and a medical college from Imphal, have explored and validated the clinical utility of Foldscope in the diagnosis of diseases using various patient samples.

- The study evaluated the use of the Foldscope in the clinical diagnosis of oral and urinary tract infections and evaluated its efficacy as a motivational tool for improving oral health among school children in India.
- The study identifies that Foldscope is particularly convenient to diagnose urinary tract infection (UTI) and monitor kidney stone.
- Using this tool, one can easily monitor own-kidney stone status at home with a simple glass-slide, a Foldscope and a phone in hand.
- Such monitoring could perhaps avoid kidney stone reaching a painful state or surgery in recurring cases.
- Given the ease of operation and low cost, Foldscope may be employed in public healthcare centres for primary diagnosis of oral health and UTI or as personal health monitoring device.
- To do the assessment, a patient sample like urine is smeared on a transparent glass slide and visualized under a Foldscope mounted on a cell phone.
- Sample images can be enlarged using the zoom function of the mobile, which can be stored on mobile memory card for later reference/patient records.
- Foldscope can be assembled using paper clips and mounted on cell phone using coupler and glue drops.
- The researchers qualitatively compared the Foldscope to a clinical microscope by examining five different types of clinical samples.
- Of the different types of clinical samples, the Foldscope was effective in detecting infection in dental plaque samples and urine samples.

- Based on the study findings, Foldscope appeared to be capable of visualizing calcium oxalate crystals, which are a major cause of kidney stones.
- The Foldscope can be used as an in-house diagnostic tool and personal health monitoring tool on a routine basis due to its affordability and zero maintenance cost.

The study findings have been published in the Journal of Microscopy.