

## Smart microscopy solution for better diagnostics from CSIR lab

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New Delhi: November 18 (India Science Wire): Given the current health burden and scarcity of health professionals in rural areas, the Indian health system is in need of innovative and affordable solutions. There is lack of diagnostic labs and trained pathologists in many areas. In such a situation, it is necessary to develop smart solution for diagnostics.

To address these challenges, a smart microscopy solution has been developed by researchers at Chandigarh-based Central Scientific Instruments Organization (CSIO) of the Council of Scientific and Industrial Research (CSIR). It can acquire microscopic images or use stored microscopic images of blood sample under study for the quantification of Red Blood Cells (RBC) and White Blood Cells (WBC).

“It is a telepathology based technique, which can be operated by any technician and the reports can be send to the experts. It can be a very useful tool particularly for remote and inaccessible rural areas which lack diagnostic facilities,” said Dr Suman Tiwari, the lead researcher, while speaking with *India Science Wire*.



This microscopy technique is based on the deep learning algorithm. It uses the mathematical formulation which can be used as optimised model for optimal outputs. It uses software that calculates red and white blood cells using microscopic images of blood samples. The existing methods are visual, manual methods but this technique will use automated visual method. In

this, the microscope will have a camera mounted on it and from that camera images will be acquired. These images are then read in computers where the backend algorithm can produce tell the results. In this approach, detection and quantification for RBC and subtypes of WBC has shown 93% accuracy. The software can be mounted on a digital microscope developed by CSIO.

Dr Tiwari said "the system has been trained on data obtained from different clinical centers for lab-specific quantification. It can be developed an integrated approach and automated solution for real-time quantification of blood cells in diagnostic inferencing."

This microscopy technique was demonstrated in the Medical Innovations category at the Health Research Conclave held recently under the India International Science Festival-2019 in Kolkata, where the technique has won first prize.

CSIO Director Prof. R. Sinha congratulated the researchers who developed this microscopy technique, saying that "limited access of equipment and experts for diagnostic testing of diseases to India's vast population and people living in remote areas is a major problem. This smart technology can be useful in ensuring access to affordable and accessible diagnostic services. "

The technology of this digital microscope has recently been transferred to a Hyderabad-based company. (India Science Wire)

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