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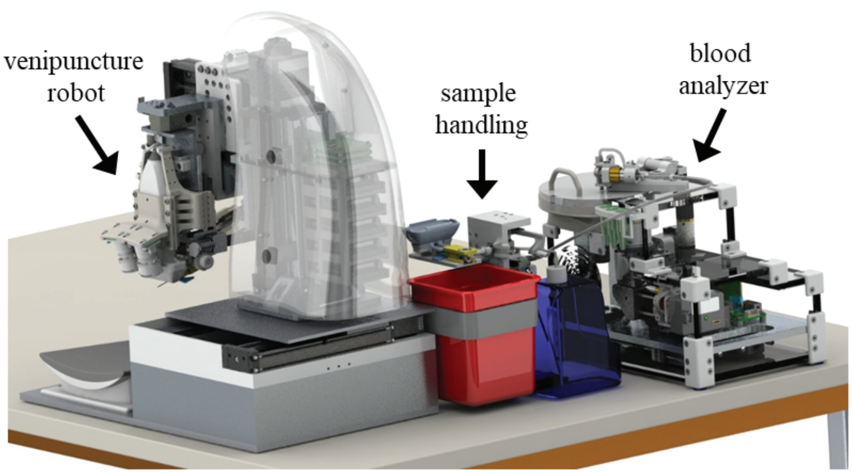
PRESS RELEASE

End-to-end blood testing device demonstrates capacity to draw sample and provide diagnostic results at the point-of-care

June 16, 2018 — Researchers from the Biomedical Engineering Department at Rutgers University have developed an end-to-end blood testing device that integrates robotic phlebotomy with downstream sample processing. This platform device performs blood draws and provides diagnostic results in a fully automated fashion at the point-of-care. By reducing turnaround times, the device has the potential to expedite hospital work-flow, allowing practitioners to devote more time to treating patients. The paper describing this novel device appears in the June 2018 issue of the journal *TECHNOLOGY*.



Design of the automated blood testing and analysis device. The main subsystems include a venipuncture robot, sample handling module, and blood analyzer.

Diagnostic blood testing is the most commonly performed clinical procedure in the world and influences the majority of medical decisions made in hospital and laboratory settings. However, manual blood draw success rates are dependent on clinician skill and patient physiology, and results are generated almost exclusively in centralized labs from large-volume samples using labor-intensive analytical techniques.

To address these issues, the team of researchers at Rutgers University created a device that includes an image-guided venipuncture robot, to address the challenges of routine venous access, with a centrifuge-based blood analyzer to obtain quantitative measurements of hematology. In the paper, results are presented on a white blood cell assay, using a blood mimicking fluid spiked with fluorescent microbeads. Studies were conducted on the integrated device — from blood draw to analysis — using blood vessel phantoms, demonstrating both high accuracy and repeatability of the cannulation and resulting white blood cell assay.

"This device represents the holy grail in blood testing technology," stated Martin Yarmush, M.D., Ph.D., the paper's senior author. "Integrating miniaturized robotic and microfluidic systems, this technology combines the breadth and accuracy of traditional laboratory testing with the speed and convenience of point-of-care testing."

"When designing the system, our focus was on creating a modular and expandable device", stated Max Balter, Ph.D., first author of the paper. "With our relatively simple chip design and analysis techniques, the device can be extended to incorporate a broader panel of assays in the future".

Additional co-authors of the TECHNOLOGY paper are Josh Leipheimer, Alvin Chen, Ph.D., Anil Shrirao, Ph.D., and Tim Maguire, Ph.D., all from the Biomedical Engineering Department at Rutgers University.

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