



Dr. Ridha Ben Mrad, Associate Professor, Mechatronics and Microsystems Design Laboratory at the University of Toronto, is combining microsystems technologies for biomedical diagnostic devices that aim to accelerate the analysis and delivery of results.

Diagnostics that Deliver Faster Results for Canadians— at a Fraction of the Cost

Researchers at the University of Toronto are combining microsystems technologies to build a 'miniature plumbing system' for biomedical diagnostic devices that aims to accelerate the analysis and delivery of results—at a fraction of the cost of diagnostic tools available today

"CMC has provided invaluable support to this project. This includes providing graduate students with feedback on their designs, facilitating fabrication through Micralyne and developing new packaging solutions to enable testing of the devices. CMC's proactive identification of new suppliers also enables researchers to access the specialized facilities required to explore new concepts and research possibilities."

Dr. Ridha Ben Mrad
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Microfluidic technology promises to revolutionize the detection and diagnosis of disease, improve the monitoring of food and water quality, and preserve our environment—provided we get the plumbing right.

Dr. Ridha Ben Mrad and his team at the University of Toronto are working with CMC Microsystems to realize this promise. Leveraging a suite of microfluidic tools and fabrication services, as well as years of technical expertise provided by CMC, Dr. Ben Mrad is developing the miniaturized pumps, dispensers, mixers and valves required to move, separate and combine minute amounts of biological fluids on a single microchip.

This 'lab-on-a-chip' complements DNA microarrays that enable scientists to scan tens of thousands of genes simultaneously for analysis. It dispenses fluids with far greater accuracy than current commercial systems, while using fewer reagents (the substances used to bring about chemical reactions). This has enabled researchers to reduce the overall cost of the diagnostic device, while improving the quality and turnaround time for results.

"Eventually, these systems will also become highly efficient and cost-effective alternatives to the microarraying systems used today," he says. Once the team has completed the testing and verification of their first prototype device, using services provided through CMC, they will collaborate with Engineering Services Inc. of Toronto, Ontario to combine all of the microsystems components required to create an integrated device for commercial application. *cmc*