

‘Biological Transport System’ Charts New Opportunities to Improve Human Health and Security

Increasing health and security challenges of the 21st century demand new solutions—solutions that rely on new expertise, innovative approaches and combinations of technologies. Researchers at Concordia University are responding by creating microsystems that will enable more effective DNA sampling and analysis techniques; and will ultimately improve disease detection, diagnosis, treatment and prevention

“Over the next two to three years, our goal is to add optical and biological elements to the existing mechanical and electronic ones. This system could then be used in devices for a variety of life science and security applications.”

Dr. Muthukumar Packirisamy
Assistant Professor
Department of Mechanical and Industrial Engineering
Concordia University



Dr. Muthukumar Packirisamy, Assistant Professor, Department of Mechanical and Industrial Engineering, Concordia University, is creating microsystems that will enable more effective DNA sampling and analysis techniques; and will ultimately improve disease detection, diagnosis, treatment and prevention.

The ability to combine different technologies offers tremendous potential to improve human health and security. Just ask Dr. Muthukumar Packirisamy, an Assistant Professor at Concordia University who is benefiting from the technical expertise, tools and technologies provided by CMC to develop a novel ‘biological transport system’ for DNA sampling and analysis, chemical sensing and other related applications. The team is combining optical, biological, mechanical and electronic technologies, to create an ‘integrated system’ that is considered to be the first of its kind in the world.

Dr. Packirisamy and his team started the project with two separate research bases or platforms: the first for microfluidic technology and the second for micromechanical and photonics technologies. They relied heavily on the specialized microfluidic products and services made available through a strategic partnership between CMC and Micralyne Inc. of Edmonton, Alberta.

Dr. Packirisamy has used the products and services provided by CMC for over 10 years. “CMC Microsystems has provided critical support to our research team in many ways—from enabling the development and layout of the design, to the manufacturing and packaging of the device, and the technical guidance required to address processing and integration challenges. They also supported our use of exploratory technologies and experimental facilities—this was critical to the success of this research. We received outstanding support from the employees of CMC on all aspects of the project.”

He applauds the microsystems research capability delivered by CMC through strong alliances with industry leaders such as Micralyne. It has given him the confidence to move forward with the development of a fully integrated biophotonics microsystem. He currently holds a patent related to the project and anticipates commercializing the technology within the next five years.

“Access to microfluidic technology has provided a wealth of new opportunities for research, discovery and application.”

It is researchers such as Dr. Packirisamy who are keeping Canada at the forefront of the global race to commercialize a new generation of integrated microsystems. cmc