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Novel Rapid Diagnostic Tools for Lung Transplantation: Bringing Omics to the Bedside

Status	Approved
Competition	Genomic Applications Partnership Program Funded Projects – Round 3
Genome Centre	Ontario Genomics Institute
Project Leaders	Shaf Keshavjee, University of Toronto; Thomas Hartnett, United Therapeutics (Lung Bioengineering Inc.)

Project Description

A considerable number of patients needing a lung transplant die due to a lack of donor organs deemed suitable for transplant. Now, a proposed genomics approach to assessing donor lungs has the potential to save thousands of lives while reducing healthcare costs.

The project, led by Dr. Shaf Keshavjee of Toronto's University Health Network (UHN) in collaboration with the U.S. biotech firm Lung Bioengineering Inc., a subsidiary of United Therapeutics Corp., intends to develop a genomics-based diagnostic test to determine whether a donor lung meets transplant requirements. At present, such evaluations are based on physiological assessments alone. As a result, less than 15 per cent of lungs, the healthiest, are deemed suitable for transplant, leaving unused countless "marginal" lungs that also could save lives. A genomics-based analysis could increase the number of transplant-acceptable lungs to nearly 50 per cent, resulting in a greater number of patients receiving this life-saving intervention. Using diagnostic test kits, donor lung conditions would be precisely monitored through biomarker analyses. Under Dr. Keshavjee's research leadership, some biomarkers have already been isolated that can predict lung quality. Building on these findings, this new initiative will result in the creation of rapid diagnostic tools that could be used in transplant centres around the world.

The world's first successful clinical lung transplant took place at Toronto General Hospital in 1983. Today's genome project has the potential to further cement Canada's global leadership in this high-tech medical sector. This initiative may also reduce the economic burden on the Canadian healthcare system while improving overall quality of life for lung-transplant patients.