



Navigating the Human Brain to Open a New World for the Visually Impaired and Beyond...

As the founder and director of the Polystim Research Group, Dr. Mohamad Sawan has introduced several new, implantable and smart medical devices to help improve the quality of life for those who have lost organs or suffer from chronic illness.

Dr. Mohamad Sawan and the Polystim Research Group at École Polytechnique de Montréal want to help improve the quality of life for people with brain-related injuries. While one may not understand the complexity of a microchip, it is not difficult to understand the gift of sight or the ability to walk. Working with the Montréal Neurological Institute at McGill University and experts from

many scientific disciplines, the team is aiming to deliver implantable smart medical devices within the next five to ten years to help people with a range of medical problems, including those who have lost organs or suffer from chronic illness.

Dr. Sawan's team has developed several biomedical innovations to help restore or enhance lost sensory ability or bodily functions by replacing commands from the brain to the body with low-power electrical charges to the brain that feed those commands to the central nervous systems. His innovations include the cochlear implant, the cardiac pacemaker, the bladder controller for those who have incurred spinal cord injuries, and several other sensors and catheters.

Most recently, the team has developed a working prototype of an electronic cortical visual stimulator, designed to create adequate vision for completely blind patients by providing direct electrical stimulation of the brain, bypassing the retina and the optic nerve.

Testing of the device is scheduled to begin in summer 2002, with future verification of the entire system in the human brain by the end of the decade. Companies from around the world are anxious to seize the opportunity to commercialize this technology. The impact of this discovery reaches far beyond the visually impaired, with applications for many neurological disorders and injuries to the spinal cord and nervous system. Dr. Sawan explains:

"Over the past 10 years, CMC has enabled the fabrication of all the low-power devices and microchips required to progress our ability to interact with the human brain. As we improve our ability to interact with the human brain, there are many biomedical applications for this technology that could enable a rich future for many people."

CMC is privileged to have enabled the fabrication of Dr. Sawan's first microchip as a PhD student in 1987, and to provide continued support for his important research on biomedical innovation. His legacy will be recognized and shared by Canadians and people around the world for many years to come. cmc