Skysong Innovations
Advancing the Arizona State University Knowledge Enterprise

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Controlling Current Flow in Implanted Neurostimulators

The neurostimulator market is projected to reach $10.2 billion by 2014, primarily driven by the ever increasing number of applications for neurostimation devices. Wireless neurostimulators, such as powered by ultrasound or rf GHz frequency antenna-based, have greatly helped in expanding the scope of applications for neurostimulators. Wireless neurostimulators are not without shortcomings though, particularly involving variable implant current delivery. Variable current delivery may be overcome by fixing the positions of the implant, antenna, coupling methods and transmit power, however, if any one of these situation variables changes, then the device must be recalibrated. It would be preferable to control current flow in implanted wireless neurostimulators in a manner that is independent of the situation variables.

Researchers at Arizona State University have developed a method that overcomes the existing difficulties experienced with variable current delivery in wireless neurostimulators. Using their method, current delivery of neurostimulators can be controlled so that it is constant and defined regardless of situational variables.

This novel method substantially improves neurostimulator performance and allows for their use in applications where more precise current control is required.

Potential Applications

- Therapeutic Neurostimulation
  - Pain management
  - Rehabilitation
  - Restoration of lost function
  - Treatment for epilepsy and neurological disorders of many types
  - Treatment of bioelectrical disorders
  - Possible replacement of drugs and pharmaceuticals in select medical applications

Benefits and Advantages

- Applicable to ultrasound-, antenna- or silicon photodetector-based devices
- Provides for precise control of current delivery - further increasing the applications of neurostimulators
- Allows for the form factor to remain small - further enabling the break-away from bulky battery based devices
  - Smaller form factor devices may be amenable to non-surgical syring injection
- Increased implant depth - allows for greater flexibility of implant site

For more information about the inventor(s) and their research, please see Dr.

Towe's Directory webpage