Energy Scavenging for Implantable Biosensors

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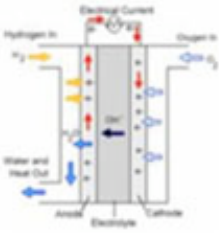
Presentation:

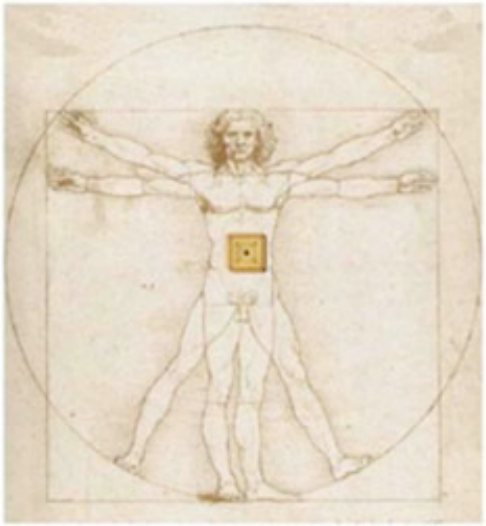
Nowadays the field of implantable biosensors is attracting increasing attention. The possibility of real-time monitoring of the human body from inside paves the way to a great number of applications and offers wide scenarios for the future. Several key challenges must be addressed to make these scenarios real. Power autonomy is among these challenges, since the performance of an implanted device will depend on its power availability and the battery duration will affect its global invasivity. Power constraints can be tackled by energy scavengers, devices exploiting natural or artificial power sources surrounding the person to assist the implanted batteries and in certain cases even substitute them.

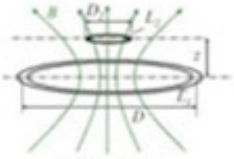
Goal:

The goal of the project is to remotely power an implantable biosensor for metabolites monitoring. Among the different scavenging techniques, inductive powering has been chosen for several reasons. It can provide a considerable amount of power wirelessly through the tissues, avoiding any connection between the implanted sensor and the power source. Moreover, it allows a bidirectional data communication between the sensor and the external devices without using any RF transmitter into the implanted chip. The project aims to study possible solutions to send, store and manage power through inductive links, focusing on the case where an implanted coil with a small form factor is used. The work is part of the i-IronIC project.


Solar

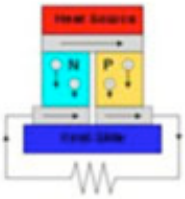

Fuel Cells




Inductive


Kinetic


Infrared


Thermoelectric