

## ISCHEMIA/HYPOXIA DETECTION USING O<sub>2</sub>/PH SENSORS (ISCHEMSURG)

### Patient need addressed

### Detection and control of tissue ischemia

### The Solution

The present invention discloses a new disposable and miniaturized array of electrochemical sensors for the minimally invasive monitoring of tissue ischemia (ISCHEMSURG).

Early recognition of tissue compromise is a primary aim of every microsurgical and trauma unit. The standard monitoring method is based on subjective clinical observations, which depend on the professional experience. Early tissue compromise is often asymptomatic, increasing ischemic times and reducing successful salvage rates. Moreover, deep tissues are very complex to monitor by clinical observation. On the market, only two options have been proposed to overcome this trouble: flap micro dialysis and the Cook-Swarts implantable device.

### Innovative Aspects

ISCHEMSURG technology is based on the detection of physiological changes that occur under ischemia conditions, which are analyzed by means of potentiometry and bioimpedance. This wireless sensor permits the continuous control of deep tissues, whose blood perfusion may be compromised.

Ischemia control by means of ISCHEMSURG technology can be carried out by both physicians and caregiver professionals. Moreover, the small dimensions of the sensor as well as the probe design, permits ISCHEMSURG to be easily removed from the site of insertion with minimal pain and risk.

In case of ischemia complications, ISCHEMSURG will permit an immediate surgical response before irreversible tissue damage occurs.

The device was pre-validated for hypoxia monitoring by means of pH and O<sub>2</sub> detection in tissue and blood in rabbit model.

**Stage of Development:** Large-scale prototype tested on stomach pig-model. Micro-sized prototype under development. Multi-sensing integration achieved

### Intellectual Property

International patent application [WO2022/023499A1](#)

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