



**Ben-Gurion University of the Negev
Blaustein Institutes for Desert Research**

The Swiss Institute for Dryland Environmental and Energy Research
Alexandre Yersin Department of Solar Energy and Environmental Physics

Extracting and harvesting energy from a biological cell

Luigi Catacuzzeno

*Dipartimento di Chimica, Biologia e Biotecnologie, Università
di Perugia, Perugia, Italy*

luigi.catacuzzeno@unipg

Abstract:

This work shows how electrical energy can be harvested directly from the membrane potential of biological cells, and used to power a [wireless communication](#). Experiments were first performed by exploiting the membrane potential of large *Xenopus* oocytes from female frogs. The electrical potential energy harvested from *Xenopus* oocytes membrane was first transferred to a [capacitor](#) connected to the cell via a proper electrical [circuit](#), and then used to power a radio frequency communication that carries bio-sensed information to a distant receiving circuit. A similar amount of energy could also be extracted from skeletal myotubes obtained from murine C2C12 myoblasts, suggesting that mammalian cells can be used as well. Our results show that electrical energy can be harvested directly from biological cells and used for a number of purposes, including wireless communication of sensed biological quantities to a remote receiving hub, or the design of auto-rechargeable biological batteries.

Date & Location:

Tuesday, December 15, 2020, 11:00

Zoom meeting