

# ***TECO Mobility grant***

**Rapid determination of aflatoxins and estrogenic compounds in water and food**

**Beneficiary of the grant:** Laura Micheli

**Home Institution/Company (EU):** University of Rome Tor Vergata

**Host Institution/Company (INDIA):** NanoBiosensor Laboratory, Department of Chemistry, Jai Narain Vyas University, Jodhpur

**Period of the stay in India:** 30 September -31 October 2018



**TECO Project**

*Technological ECO-innovations for the quality control and the decontamination of polluted waters and soils*

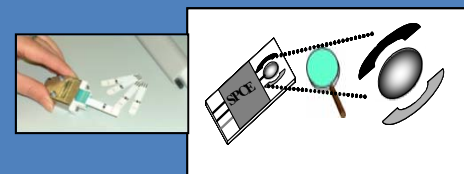
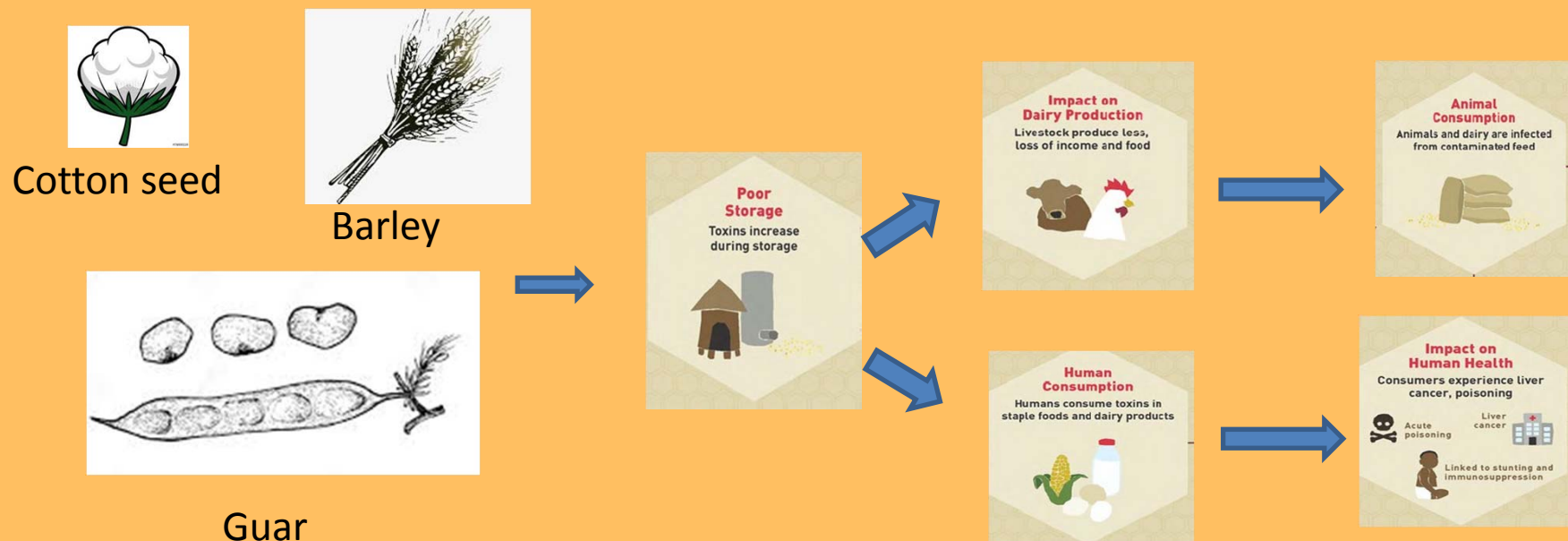
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# Objective of the project →

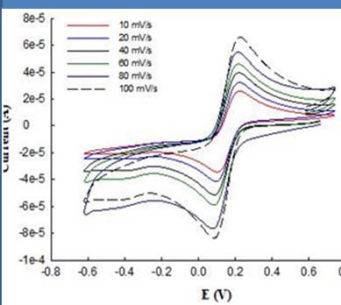
Develop a portable monitoring system to avoid that AFLATOXINS presence on food or feed in Indian region



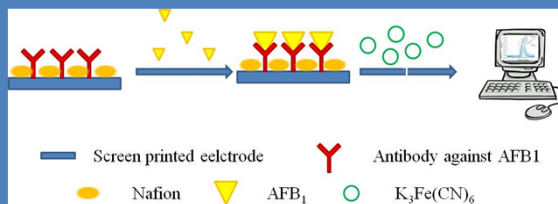
Screen Printed Electrode

# Activities carried out during the period of the grant

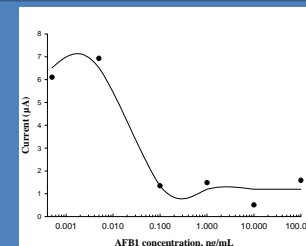
- Electrochemical characterization of screen printed graphite electrodes, SPEs (produced by the applicant at University of Rome Tor Vergata), modified with graphene oxide, GO, synthesized at Host Institution and comparison of graphite SPEs, and commercial glassy carbon SPEs
- Development of label-free immunosensors for aflatoxins employing GO modified graphite SPEs employing technique developed at NanoBiosensor Laboratory, JNV University, Jodhpur
- Application of the developed immunosensors for real samples (milk, cotton seed, barley, guar, goat feed) of Jodhpur, Rajasthan (India)



Electrochemical characterization of SPEs modified with graphene oxide by drop casting



Scheme of label free immunosensor for aflatoxin detection



Calibration curve of the developed label-free immunosensor for Aflatoxin

# Main outcomes

- Electrochemical characterization of modified graphene oxide screen printed electrodes (GO-SPEs) for the amplification of the performance of label free immunosensor
- Development of label free immunosensor for detection of aflatoxin B1 in buffer based on modified graphene oxide screen printed electrodes
- Study of effect of extracted feed on proposed electrochemical label free immunosensor

During the TECO project period, the applicant demonstrated the possibility to monitor the aflatoxin presence in different Indian feed without interference. This tool will allow to respect the India level tolerance of these toxins in feed and to prevent the presence of AFM1 in milk, working as warming system create a scientific knowledge platform of aflatoxins present in the India.



Extract solution of real sample of feed, collected in India



# Future work

- Monitoring *in-situ* the presence of aflatoxins using the developed electrochemical tool
- Development of label free immunosensor for estrogen in water
- Monitoring *water (irrigation and ground water, indian river or/and lake)* the presence of estrogen using the developed electrochemical tool
- Create a scientific knowledge platform of aflatoxins and estrogen present in the India
- Dissemination and transfer of results to stakeholders.

For these goals, in particular for the development of disposable electrochemical tool for estrogen in water, Prof. Sunita Kumbhat and Prof. Laura Micheli will submit new proposal in order to obtain new funding to continue the research and collaboration work.



## TECO Project

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