

## Plan Overview

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*A Data Management Plan created using DMPTool*

**DMP ID:** <https://doi.org/10.48321/D1KS86>

**Title:** Desenvolvimento de biossensor impedimétrico baseado em eletrodo impresso em papel para detecção de HLB em plantas de citros

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**Project Administrator:** Hideko Yamanka

**Funder:** Institutos Nacionais de Ciência e Tecnologia (inct.cnpq.br)

**Funding opportunity number:** 104309/2023-7

**Template:** Digital Curation Centre

### **Project abstract:**

Citrus farming is one of the best organized sectors of the Brazilian agroindustry, with business foundations for advising and monitoring citrus production and quality. Currently, Brazilian production is concentrated in the so-called citrus belt of São Paulo and Minas Gerais, a geographic region that encompasses 481 municipalities and 12,000 farms, totaling a planted area of more than 400,000 hectares, accounting for 60% of world production of juice. of Orange. However, citrus farming has been facing a drop in productivity and quality of the fruits generated due to the spread of different diseases, of which we can highlight Huanglongbing (HLB) also known as “greening”, which is caused by the bacteria *Candidatus Liberibacter asiaticus* and

*Candidatus Liberibacter americana* which are transmitted to plants by the psyllid *Diaphorina citri*. The detection of plants contaminated with HLB in the crop occurs visually and subjectively, but the existing laboratory methods demand analysis time and high financial cost, such as qPCR and ELISA. In this sense, diagnostic methods such as electrochemical biosensors that use the electrochemical impedance spectroscopy (EIS) technique as a monitoring technique may be a viable option, since they are very sensitive devices, of low analysis cost and can be miniaturized and used for field measurements. As a way to carry out the use of these devices in fields, the use of electrodes printed on paper has been shown to be an excellent option for electroanalytical procedures, thanks to its versatility, reproducibility, and low cost, favoring its use in a disposable way, which for use in real samples becomes ideal, as it minimizes the possibility of cross-contamination between samples. Thus, the present project aims to develop a selective impedimetric immunosensor for the detection and determination of HLB in citrus samples using a disposable electrode printed on paper as a working electrode. Thus, the most appropriate forms for the immobilization of anti-HLB antibodies, obtained commercially from the outer membrane protein (OMP), will be evaluated for the development of a new HLB diagnostic device in citrus samples that can be applied in field. Experimental parameter optimization steps will be carried out so that the immunorecognition reaction (Ag-Ac) occurs with maximum efficiency. Next, the figures of merit and the performance of the disposition for the diagnosis of HLB in different HLB negative and positive samples will be evaluated.

**Start date:** 03-05-2023

**End date:** 01-05-2024

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# Desenvolvimento de biossensor impedimétrico baseado em eletrodo impresso em papel para detecção de HLB em plantas de citros

## Data Collection

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### What data will you collect or create?

Text data from experiments on electrochemical systems performed on potentiostats will be collected.

### How will the data be collected or created?

Data will be collected using appropriate software.

## Documentation and Metadata

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### What documentation and metadata will accompany the data?

txt files.

## Ethics and Legal Compliance

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### How will you manage any ethical issues?

Ethical issues will be managed according to IQ/UNESP rules.

### How will you manage copyright and Intellectual Property Rights (IP/IPR) issues?

The *dataset* will have total access restriction for 2 years due to patenting processes.

## Storage and Backup

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### How will the data be stored and backed up during the research?

In a folder on Google Drive associated with the institutional email.

### How will you manage access and security?

Through personal password.

## **Selection and Preservation**

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**Which data are of long-term value and should be retained, shared, and/or preserved?**

Due to its high potential, the raw data will be kept under the responsibility of the main researcher. The processed data will be made available.

**What is the long-term preservation plan for the dataset?**

Perform a backup on a duly identified external hard drive.  
The set of data will be made available in the institutional repository of UNESP.

## **Data Sharing**

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**How will you share the data?**

Via drive folder access link.

**Are any restrictions on data sharing required?**

Not applicable

## **Responsibilities and Resources**

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**Who will be responsible for data management?**

Data management will be carried out by researcher Lucas Moreira Silva.

**What resources will you require to deliver your plan?**

Virtual platform space and pen-drive 128GB (R\$~60,00).

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