

## 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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**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.

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

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

Data will be collected using appropriate software.

txt files.

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

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

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

Through personal password.

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.

Perform a backup on a duly identified external hard drive.

The set of data will be made available in the institutional repository of UNESP.

Via drive folder access link.

Not applicable

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

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

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