TOXICITY BIOSENSOR

**ICN2** | Institut Català de Nanociència i Nanotecnologia — EXCELENCIA SEVERO OCHOA

A bioluminescent device based on bioluminescent bacteria (A. fischeri) is used as a toxicity biosensor to detect pesticides in water samples (tributyltin and pentachlorophenol).

TOOL OVERVIEW

Under laboratory conditions, these biosensor is able to detect tributyltin (TBT) and pentachlorophenol in water samples just in 5 minutes using a smartphone camera to capture the light intensity produced by the bacteria (bioluminescence). The weaker the light production is, the higher is the concentration of pesticide in the analysed water sample.

Parameters:
• Range of Measurement: a) TBT: From 2 μg/L to 1 mg/L, b)Pentachlorophenol: From 0,2 mg/L to 100 mg/L
• Detection Limit (LOD): For toxicity sensors, EC50 value is better considered than LOD. In this case, EC50 refers to the concentration of toxicant which induces a response halfway between the baseline and maximum after a specified exposure time (5 min).
• Reproducibility: a) TBT: EC50 from 15 μg/L to 70 μg/L, b) Pentachlorophenol: EC50 from 0,16 mg/L to 22 mg/L

Pesticide

5 min
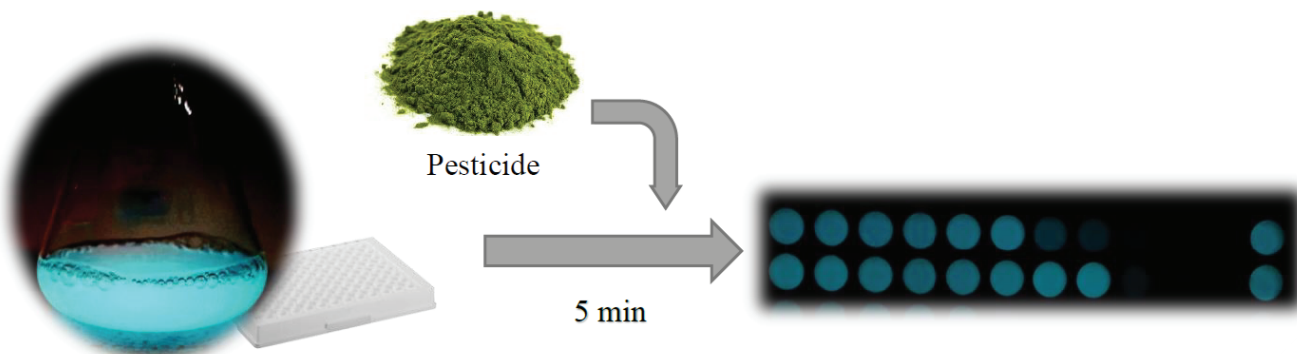
APPLICATIONS OF TOOL

• Toxicity assessment of waters coming out of industrial pipes.
• Toxicity assessment of waters coming out of crops irrigated with pesticides.

BENEFITS OF TOOL

• Easy mobile-phone analysis
• Stability and reproducibility from batch-to-batch.
• Low cost.
• Fast results (5 minutes).
• Sensitive for certain toxicants (i.e. TBT).

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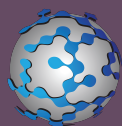
INTCATCH
2020

Water Pollution
Detectives

THE GREAT OUSE

URBAN RIVERS
IN LONDON

LAKE GARDA

TER RIVER

LAKE YLIKI

INTCATCH
2020

Development and application of Novel, Integrated Tools for monitoring and managing Catchments

INTCATCH will change the way current in which river and lake water monitoring is implemented. The project will accomplish this by developing efficient, user friendly water monitoring strategies and systems based on innovative techologies that will be able to provide real time datat for important parameters. The new business model will transform water governance by facilitating sustainable water quality management by community groups and NGOs using a decision support system and eco-innovative technologies. The INTCATCH systems will be implemented and validated in the urban London and rural Greta Ouse rivers in the UK and in Lake Garda (Italy) and will be demonstrated in Lake Yliki (Greece) and in River Tier (Spain).

INTCATCH Partners:

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Connecting communities to improve rivers

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