

INN PAPER at a glance

Chemical detection tools are used in many industrial sectors. The development of quick assays requires a testing system that does not need additional instrumentation to provide a quantitative result. INN PAPER provides a **novel paper-based detection device** using inked electronic circuits designed to cover market's demands. Our tests are **easy to perform, compact and quick**, but also present **additional benefits in accuracy and environmental impact**. Our focus is set in the detection of **caffeine from beverages and THC from cannabis**, as they are part of well-established markets that are currently growing.

INN PAPER is a European research and innovation project focused on printed electronics that involves 15 scientific and industrial partners. We are developing new paper platforms and conductive inks to produce batteries, displays, antennas and sensors that **can be used industrially in many other sectors**. Chemical detection kits are only one of our three use cases, along with smart food labels and diagnostic tests, but the flexibility of the platform allows a wider market placement in the future.

- **Smart labeling**
of fresh food products
- **Drug testing**
of caffeine and THC
- **Diagnostic testing**
SARS CoV-2 of Influenza virus and *Streptococcus A*

The Project in numbers

- **7 EU Countries**
- **3.5 Years**
- **7.5 M€ Funding**
- **15 Partners**

Partners



Find out more!

www.innpaper.eu

 [@INNPAPER_EU](https://twitter.com/INNPAPER_EU)

 [/INNPAPER](https://www.facebook.com/INNPAPER)

 avinuales@cidetec.es



This project is funded by the European Union's Horizon 2020 research and innovation programme under grant agreement No 760876



INN PAPER

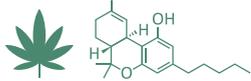
Paper electronics for drug testing of THC and caffeine

The Project

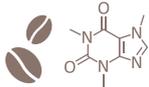
Rapid drug tests for routine use

Detection of chemical substances is useful in many areas regarding **people's health and safety**. Rapid assays are very common in industrial settings such as food testing or detection of illegal drugs. However, many current methods are unable to provide reliable test results without a laboratory analysis. The **development of quick and quantitative testing devices** is becoming a priority.

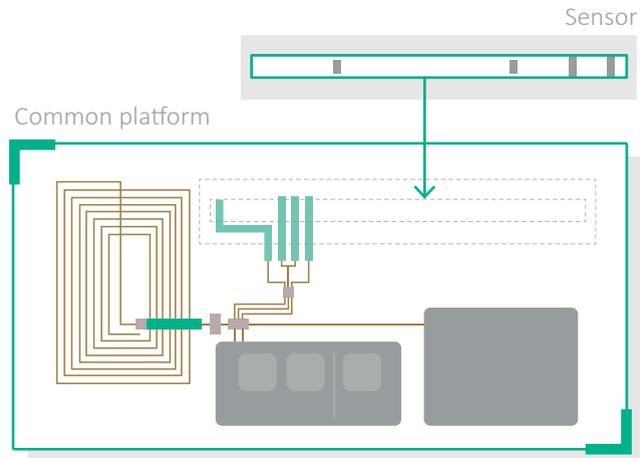
Cannabis and caffeine, our main targets



Cannabis is the **most used drug**, with over 200 million users worldwide. Although it has been legalized in some countries, many others hold different regulations against its use. The detection of its active component THC is therefore part of the **market for drug of abuse testing**, a sector worth over 3 billion dollars and projected to grow up to 4.6 billion by 2023.



Coffee is the **fourth most consumed beverage**, but is currently becoming a concern in food safety as population's health awareness has driven **a trend towards the decaffeinated** alternative. The decaf coffee market has risen to 1.7 billion dollars globally, and caffeine detection has become customary in food safety testing, a market of 15.2 billion dollars.



Paper-based detection kits

At INNAPER, we are developing a **chemical detection system using paper and electronic circuits made of ink** for use in the detection of caffeine and THC from cannabis. This technology will cover the need of security forces and food industry professionals, while providing additional benefits compared to other available technologies.



- **Compact, easy to perform and quick testing**, ready for its use in situ without specialised training.
- **Quantitative results** with no need of external instrumentation or facilities.
- **Environment protection** by using paper as a scaffold to lower electronic and plastic waste.

Testing steps

Our process consist on three simple steps:



1. Sample collection: from body fluids such as saliva or from other liquids.



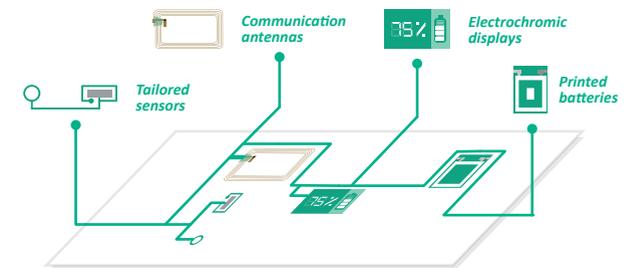
2. Immunodetection system: the compounds will be detected using antibodies attached to the device.



3. Display: the presence of THC or caffeine will be transmitted through the paper-based electronics to the display.

Beyond chemicals

INNAPER's **common platform** offers a combination of electronic components, all printed on paper using functional inks, that provide a configurable board **applicable to many other electronic purposes**.



- **Tailored sensors** adapted to the application.
- **Batteries** to power the platform.
- **Antennas** able to send information from the sensors to other electronic devices.
- **Displays** that can show information in the device.