

LEUKO-LABS

Stop hospitalisations. Your defences within arm's reach First medical device capable of monitoring your immune system non-invasively



Contact information

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Technological Offers type

Technological solutions

Research and innovation areas

- Digital Technologies, Artificial Intelligence, Cybersecurity, 5G, Robotics
- Health and Wellbeing

ODS



Where?

Biomedical imaging technology Information and Telecommunications Processing R&I Centre

Keywords: | Health | image | immune system

Brief description of the solution and the added value it delivers

At Leuko-Labs, we have identified a clinical need: the high rate of serious infections among cancer patients treated with chemotherapy. During chemotherapy treatment, these patients' white blood cell count can fall drastically, exposing them to a high risk of infection. If low white blood cell counts were detected early enough, many of those episodes could be avoided by administering antibiotics prophylactically. Currently, a blood sample taken by a specialist is required. For that reason, we have designed a device capable of measuring white blood cell concentration non-invasively, allowing patients to check their count every day from home, so that better decisions can be taken regarding their treatment.

Description of the technological basis

Portable microscopy device which, by looking through the skin on the finger, is able to capture videos of the capillary blood flow. In those capillaries, small transparent particles can be observed moving in the blood flow. Based on those images, our team has developed proprietary algorithms which identify and count those particles, in order to obtain an estimate of the number of white blood cells. Our prototype has been tested on 45 chemotherapy patients and has proven successful in identifying patients with dangerously low cell counts.

'This device will allow you to measure your white blood cell count from home, quickly and without needing a blood sample'

Business needs / application

Health

- Measurement from home, avoiding trips to have blood drawn, would reduce the number of possible hospitalisations and save doctors and nurses time, improving the quality of life of those patients.

Healthcare system / Insurance

- Health insurers seek to minimise adverse events in the treatments undergone by their policyholders. By reducing the number of death claims and hospitalisations, they would bring down the costs of such events.

Pharmaceutical companies

- Some drugs used to treat various diseases (e.g. psoriasis, multiple sclerosis, etc.) cause immunosuppression as a side effect.
- A diagnostic device to accompany such medication would ensure that the drugs are administered in way that is safer for the patient.

Competitive advantages

- It is a non-invasive system, it is not necessary to take blood or use reagents, and no particular sanitary conditions are required in order to obtain the measurement.
- One minute to gather data from the patient.
- Portable system. Improves the patient's quality of life. Reduces the number of trips to hospital.

- Data sent frequently and electronically to the doctor, making it possible to personalise the treatment.

'Improving the quality of life of these patients would represent added value for both doctors and patients

References

- Technology developed jointly by UPM and MIT.
- Clinical studies at Hospital La Paz in Madrid and Massachusetts General Hospital in Boston, USA.
- Multidisciplinary team advised by experts from MIT and other leaders in the field.
- Funded by the Madrid-MIT M+Vision Consortium, Spain's National Health Institute, the Coulter Foundation, the Deshpande Center for Technological Innovation and the MIT Sandbox Innovation Fund.

Industrial protection

Patent applied for in the USA: US 16/162006.

Stage of development

- Concept
- Research
- **Lab prototype**
- Industrial prototype
- Production

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