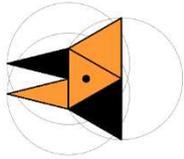# IMPACT PHOTONICS

Where there is a light, there is a way.

Incorporated in February 2019, IMPACT PHOTONICS engineers **open-source and cost-effective scientific instrumentation that makes the best out of photons**.

Via its **flagship project GAMMA**, IMPACT PHOTONICS goal is to provide healthcare-professionals with a **high sensitivity UV-Vis absorption spectrometer able to perform a blood chemistry analysis on-the-go for less than €2 per panel.**

CEO

Mejdi NCIRI
Engineer in optical science
Co-founder & CEO of ARCHIMEJ TECHNOLOGY

Advisory board

François PIUZZI
Chairman of "Physique sans Frontières", SFP
Antoine DURRBACH
Director of nephrology department, APHP

Core team

Five hirings pending fundraising: Fabmanager, Embedded signal engineer, Biochemist, Chemist, Data scientist.

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Headquarters and **Laboratory:**
GÉNOPOLE, Évry, FRANCE

Contact: mejdi@impact-photonics.com

Funding requirement

€1.6M for 2 years of R&D that demonstrates GAMMA's validity with KOL hospitals

Milestones:
- **TRL 8** for LED light-source and Open-source spectrometer; including spectral datasheet, advanced characterization and CE marking.
- **TRL 6** for "derivative", "thermo spectral" and "photo chemistry" data analysis; including a library of 1000+ carefully selected venous blood samples and patient files (pre regulatory approval).
- **TRL 4** for disposable strip
- **TRL 4** for "STED spectroscopy" technology

Breakdown:
- R&D	**€760k**
- Machines and equipment	**€320k**
- Operating cost	**€210k**
- Regulatory approval	**€180k**
- Comm. & marketing	**€130k**
- Patents	**€0**

Each day, doctors worldwide prescribe tens of millions of blood chemistry panels. These tests are performed using consumable titration reagents and optical spectroscopy; usually on high throughput automated machines.
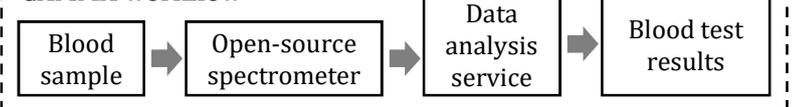
The consumable reagents are the main cost of the blood analysis, as well as being the limiting factor to their portability (expensive "lab-on-chip") and shelf-life.

Portable and cost-effective biochemistry analysis ?

The GAMMA project focuses on the natural spectral behavior of the biochemical elements of the blood serum to determine their concentrations. Eliminating the need for reagents. Therefore, radically reducing the cost of analysis while making tests more portable.

GAMMA workflow

Blood sample → Open-source spectrometer → Data analysis service → Blood test results

Current status

GAMMA is in the prototype phase (TRL3 to 4). The technology has shown promising results with following blood tests:
- BIL, ALB, TG, UA, CREA with "derivative" mode
- Ions (specifics K/Na/Cl tbc) with "thermo spectral" mode

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Market access strategy

2020-22: Establish GAMMA's validity with KOL hospitals
2022-24: Regulatory and pilot use on few demonstration markets
2024-30: Sales to healthcare system and pharmacy worldwide

1st demonstration market: Chronic Kidney Disease monitoring in partnership with dialysis centers. As with the glucometer for diabetes, GAMMA will steamline the treatment of CKD.
2024 KPI target: 100+ CKD analyses per day, ~€100k revenue/y

Long Term: GAMMA has made blood chemistry a vital sign as easy to monitor as heartbeat or blood-pressure. Healthcare professionals, but also chronic patients, elderly, worried mothers and athletes use it on a routine basis for screening and follow-up.
2030 KPI target: 100k+ analyses per day, ~€100M revenue/y

Current revenue stream: With a core expertise in optical spectroscopy, digital fabrication and data science, IMPACT PHOTONICS offers custom prototyping services for projects ranging from IR reflectance spectroscopy for plastic sorting, to multispectral imaging for bacterial-colony segmentation.

Early revenues: IMPACT PHOTONICS' hardware and know-how can supports other projects in various application markets. This could be deployed depending on the synergies with the investors' portfolio; by 2022 the sales of hardware (LEDs source, spectrometer) and services (R&D consulting, data analysis) could generate €500k/y.

Key words: Healthcare, IVD InVitro Diagnostic, POC Point Of Care, Remote patient monitoring, Self patient monitoring Frugal innovation, Human impact, Open source harware, Fablab, Appropriate technology, Low tech